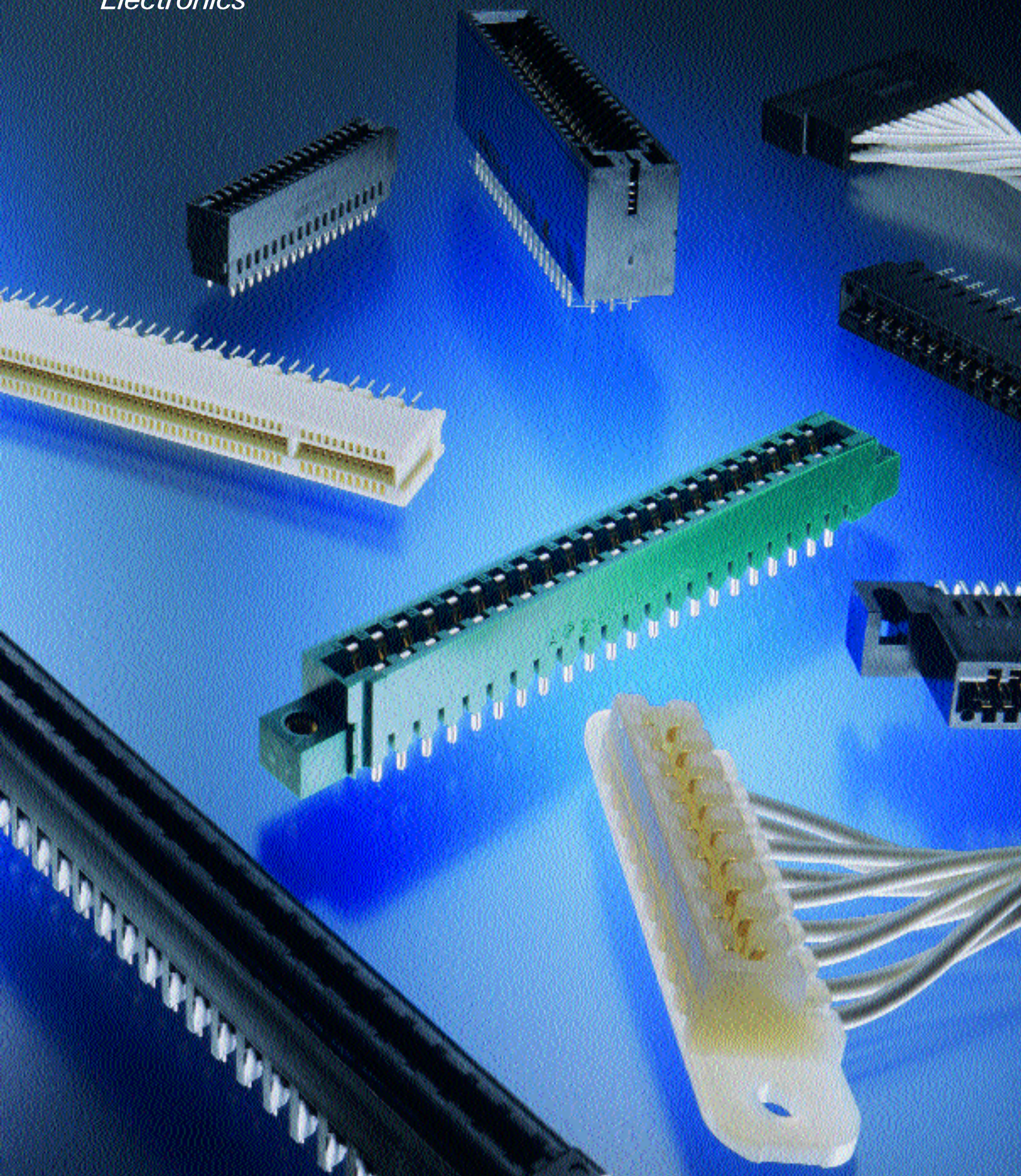


***tyco***

*Electronics*

**Card Edge Connectors**  
Catalog 1654080 Issued 7-03

**AMP**



### Introduction

This catalog contains product descriptions of AMP Card Edge Connectors. These connectors are presented in three groups: Solder Type Board-to-Board, Press-fit Board-to-Board, and Wire-to-Board connectors.

To assist you in the selection of the appropriate connector for your application, a selection guide is provided at the beginning of each section. See the Table of Contents on the following page for the exact location.

A comprehensive description and features of a partic-

ular printed circuit board connector family are provided at the beginning of that section. Various technical documents are referenced in the connector family sections and are listed and described at the rear of this catalog.

The Tyco Electronics products presented in this catalog are designed and manufactured according to the highest possible standards of quality and craftsmanship. They offer optimum reliability at the lowest possible cost.

### Need more information?

Call Technical Support at the numbers listed at the bottom of the catalog pages.

Technical Support is staffed with specialists well versed in Tyco Electronics products. They can provide you with:

- Technical Support
- Catalogs
- Technical Documents
- Product Samples
- Tyco Electronics Authorized Distributor Locations

### Dimensioning:

Dimensions are in inches and millimeters unless specified otherwise. Values in brackets are metric equivalents.

Metric symbols used are:

- m (meter)
- mm (millimeter)
- mm<sup>2</sup> (square millimeter)
- kg (kilogram)
- C (Celsius)
- N (newton)

**Note:** Dimensions in this catalog are for reference purposes only. Customer drawings are available upon request.

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A copy of the certificate is available upon request



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## Selection Guide, Board-to-Board Connectors

### Introduction

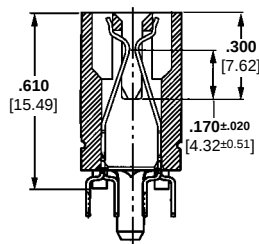
Board-to-board (mother/daughter board) connectors are ideally suited to back-plane wiring or any other application requiring the circuit connection of one printed circuit board to another. Designed to shorten manufacturing time and reduce applied costs, these one-step, pre-assembled connectors are ready for mounting and mass insertion.

Many of the connectors are available with the proven and reliable ACTION PIN contact. This unique contact has superior electrical and physical characteristics that are top of the line in the industry.

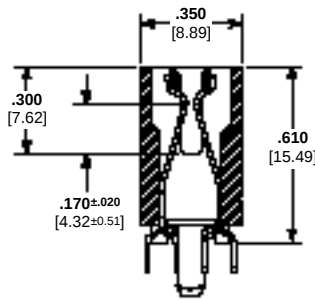
Board-to-board connectors come in a range of contact centerline spacings of .050 [1.27] to .156 [3.96]. A wide range of dual position sizes and post styles are available. One family of connectors features zero insertion force of the daughter board, along with a choice of actuating devices. A variety of housing and contact materials further expands the choice of connectors available to meet many application requirements.

To help in choosing a connector for your application, a Selection Guide is provided on pages 4 through 6.

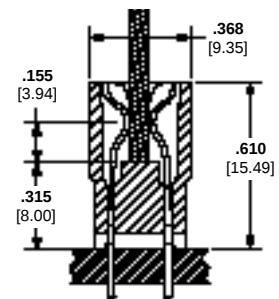
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### Centerlines

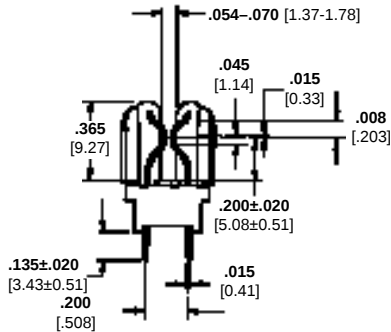
|             |   |   |   |
|-------------|---|---|---|
| .050 [1.27] | X | X |   |
| .100 [2.54] |   |   | X |
| .125 [3.18] |   |   | X |
| .150 [3.81] |   |   |   |
| .156 [3.96] |   |   |   |

### Tail Styles

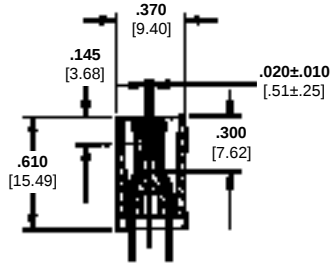
|                    |   |   |   |
|--------------------|---|---|---|
| Solder             | X | X | X |
| Right-Angle Solder |   |   | X |
| Wrap-Type          |   |   | X |
| Card Extender      |   |   | X |
| Solder Eyelet      |   |   |   |
| Press-Fit          |   |   |   |
| Surface-Mount      |   |   |   |

**Selection Guide, Board-to-Board Connectors** (Continued)

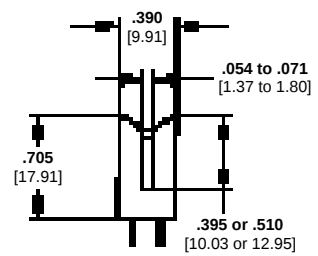
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**Cantilever Beam Connectors Scoop Housing**  
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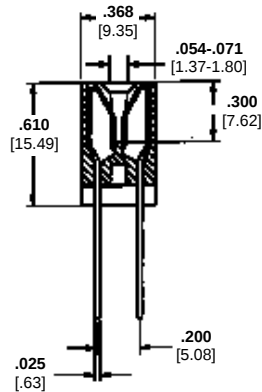
**Centerlines**

|   |   |   |               |
|---|---|---|---------------|
|   |   |   | .050 [1.27]   |
|   |   |   | .0625 [1.588] |
|   | X | X | .100 [2.54]   |
|   | X | X | .125 [3.18]   |
| X |   |   | .150 [3.81]   |
|   | X | X | .156 [3.96]   |

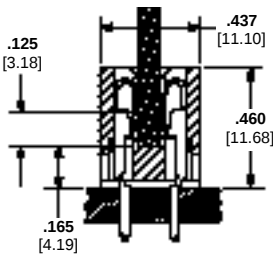
**Tail Styles**

|  |   |   |                    |
|--|---|---|--------------------|
|  |   | X | Solder             |
|  |   |   | Right-Angle Solder |
|  |   |   | Wrap-Type          |
|  |   |   | Card Extender      |
|  |   |   | Solder Eyelet      |
|  | X | X | Press-Fit          |
|  |   |   | Surface-Mount      |

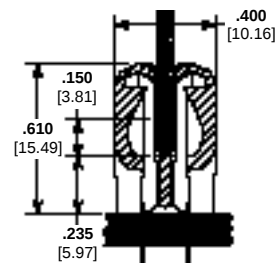
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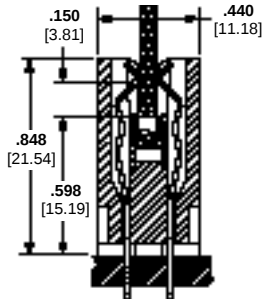
**Centerlines**

|   |   |   |             |
|---|---|---|-------------|
|   |   |   | .050 [1.27] |
|   |   | X | .100 [2.54] |
|   | X |   | .125 [3.18] |
|   |   | X | .150 [3.81] |
| X |   | X | .156 [3.96] |

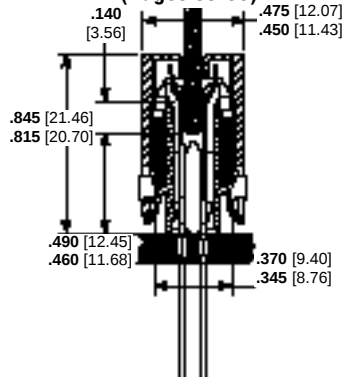
**Tail Styles**

|  |   |   |                    |
|--|---|---|--------------------|
|  |   | X | Solder             |
|  |   |   | Right-Angle Solder |
|  |   |   | Wrap-Type          |
|  |   |   | Card Extender      |
|  |   |   | Solder Eyelet      |
|  | X |   | Press-Fit          |
|  |   |   | Surface-Mount      |

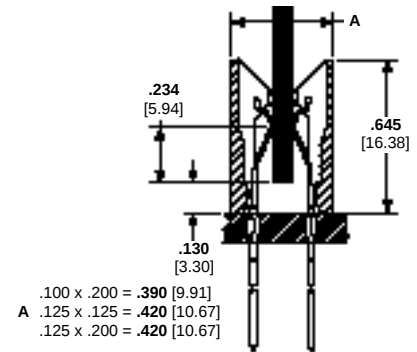
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**Linear ZIF Connectors  
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Card Scoop Housing  
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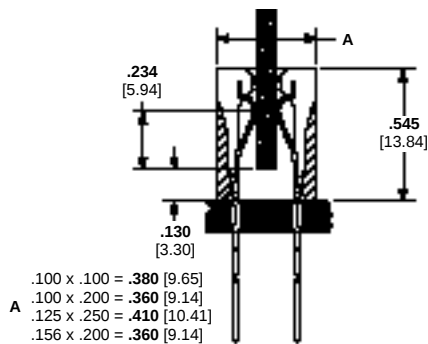
**Centerlines**

|               |   |   |   |
|---------------|---|---|---|
| .050 [1.27]   |   |   |   |
| .0625 [1.588] |   |   |   |
| .100 [2.54]   | X | X | X |
| .125 [3.18]   | X | X | X |
| .150 [3.81]   |   |   |   |
| .156 [3.96]   | X |   |   |

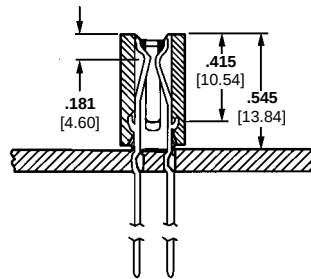
**Tail Styles**

|                    |   |   |   |
|--------------------|---|---|---|
| Solder             | X | X |   |
| Right-Angle Solder | X |   |   |
| Wrap-Type          | X | X | X |
| Card Extender      |   |   |   |
| Solder Eyelet      |   |   |   |
| Press-Fit          |   | X | X |
| Surface-Mount      |   |   |   |

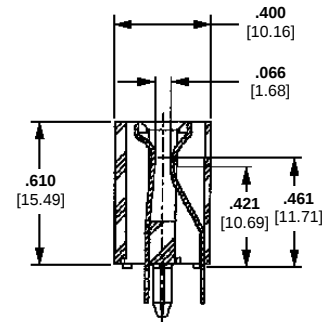
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**ECONOMATE  
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**High Density Press Fit  
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**Centerlines**

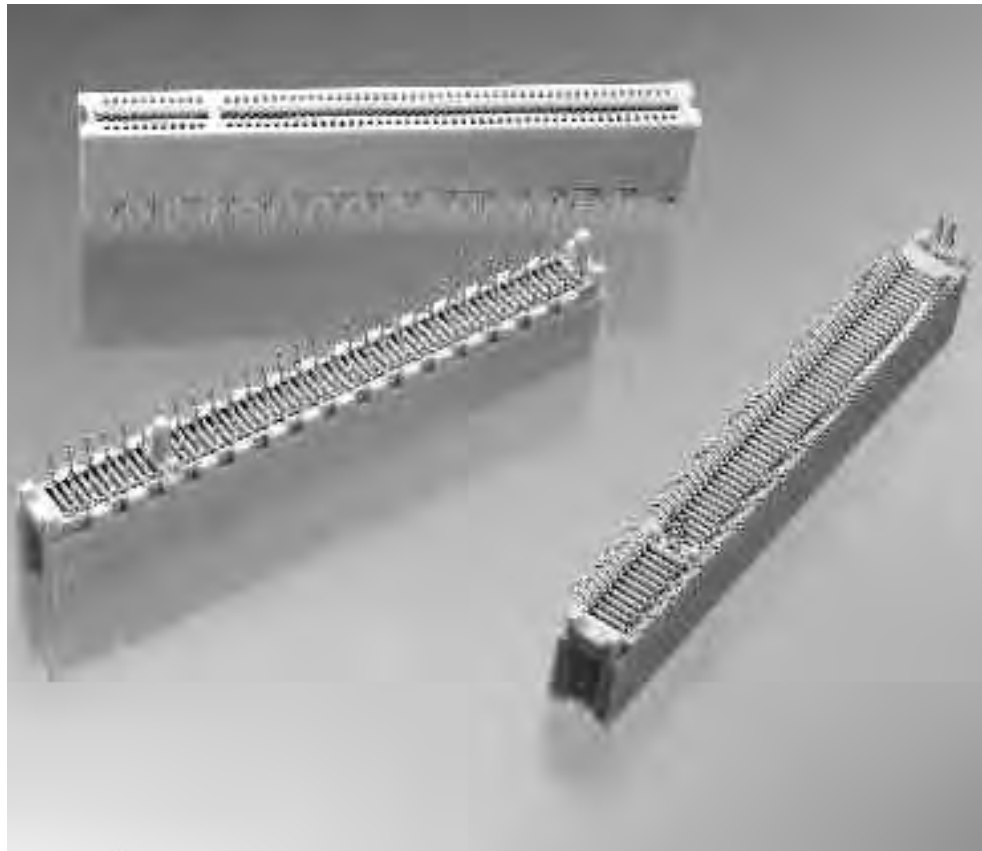
|               |   |   |   |
|---------------|---|---|---|
| .050 [1.27]   |   |   | X |
| .0625 [1.588] |   |   |   |
| .100 [2.54]   | X | X |   |
| .125 [3.18]   | X |   |   |
| .150 [3.81]   |   |   |   |
| .156 [3.96]   | X | X |   |

**Tail Styles**

|                    |   |   |   |
|--------------------|---|---|---|
| Solder             |   |   |   |
| Right-Angle Solder |   |   |   |
| Wrap-Type          | X |   |   |
| Card Extender      |   |   |   |
| Solder Eyelet      |   |   |   |
| Press-Fit          | X | X | X |
| Surface-Mount      |   |   |   |

**Product Facts**

- High density .050 [1.27] centerline contact spacing
- Easy mating of high circuit count daughter boards
- Polarizing web for positive board-to-connector registration
- Choice of plastic pylons or metal holdowns

**Standard Edge .050 Series PCI Card Edge Connectors**


Connectors that support PCI expansion cards are derived from those on the MicroChannel Architecture (MCA) bus. The MCA connectors are well defined and have proven value and reliability.

There are four connectors that can be used depending upon the PCI implementation. The differences between these connectors are 32 bit and 64 bit, and the 5 volt and 3.3 volt signaling environments. PCI-X is a version of PCI at 133 MHz which is under development and employs standard PCI connectors. PCI-X is limited to 1 slot versus 4 slots of PCI.

A key differentiates the signaling environment voltages. The same physical connector is used for the 32 bit signaling environments. In one orientation, the key accepts 5 volt boards. When rotated 180°, the connector accepts 3.3 volt signaling boards. The pin numbering of the connector changes for the different signaling environments to maintain the same relative position of signals on the connector.

**Performance Specifications:**

- Durability**—Tested to 100 mating cycles
- Mating Force**—8 oz [2.22 N] max. per contact pair
- Unmating Force**—.5 oz [0.14 N] min. per contact pair
- Contact Resistance**—20 milliohms max. (initial) 30 milliohms max. (final)
- Insulation Resistance**—1000 megohms min.
- Dielectric Withstanding Voltage**—500 VAC (at sea level)
- Capacitance**—2 picofarads max.
- Current Rating**—1 ampere max.
- Voltage Rating**—203 VAC
- Thermal Shock**—-55°C to +85°C for 5 cycles
- Mixed Flowing Gas**—Class II with mated board for 20 days

**Technical Documents:**

- Product Specification**  
108-14034
- Application Specification**  
114-26012
- Qualification Test Report**  
501-203

64 Bit, 5 Volt Signaling

92 Dual Positions  
with 3 Plastic Pylons or  
3 Metal Holddowns

Material and Finish:

**Housing**—High temperature thermo-plastic 94V-0 rated, white

**Contacts**—Phosphor bronze, plated as follows:

**Plating B**—Duplex plated .000015 [0.00038] min. gold in contact area, .000100 [0.00254] min. tin-lead on solder tails, with entire contact underplated .000050 [0.00127] min. nickel

**Plating C**—Duplex plated .000030 [0.00076] min. gold in contact area, .000100 [0.00254] min. tin-lead on solder tails, with entire contact underplated .000050 [0.00127] min. nickel

Related Product Data:

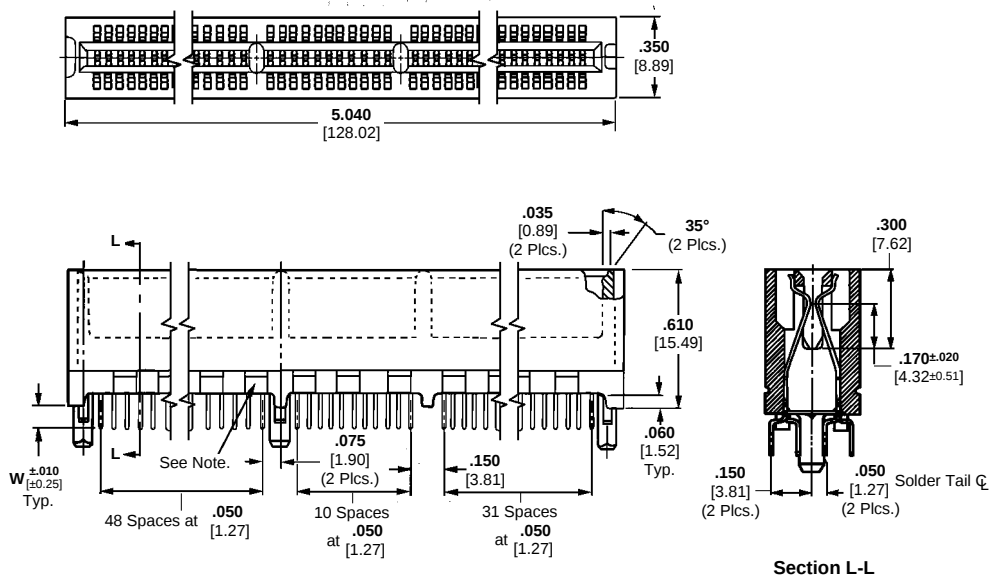
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Technical Documents:

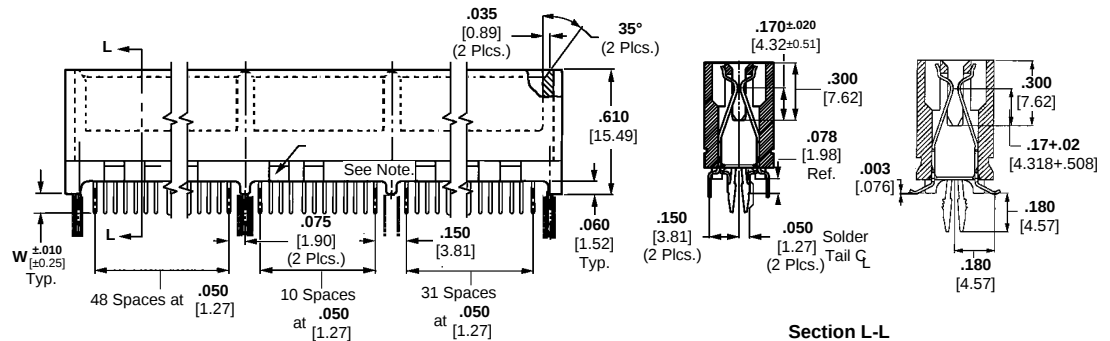
**Product Specification**  
108-14034

**Application Specification**  
114-26012

Plastic Pylons



Metal Holddowns



| W<br>(Post Length) | Contact<br>Finish | Part Numbers        |                      |
|--------------------|-------------------|---------------------|----------------------|
|                    |                   | 5 Volt              |                      |
|                    |                   | 3 Plastic<br>Pylons | 3 Metal<br>Holddowns |
| .100<br>2.54       | Plating B         | 145166-2            | —                    |
|                    | Plating C         | 145166-4            | 145169-4             |
| .125<br>3.18       | Plating C         | 145166-8            | 145169-8             |
| Surface<br>Mount   | Plating C         | —                   | 145113-1             |

**Notes:** 1. Connectors are supplied with either cored (shown above) or solid side walls.  
2. Other connector sizes can be made available, consult Tyco Electronics.

**Standard Edge .050 Series PCI Card Edge Connectors**

**32 Bit, 3.3 and 5 Volt  
Signaling**

**60 Dual Positions  
with 2 Plastic Pylons or  
2 Metal Holddowns**

**Material and Finish:**

**Housing Y**—High temperature thermo-  
plastic 94V-0 rated, white

**Housing Z**—Nylon 6/6, white

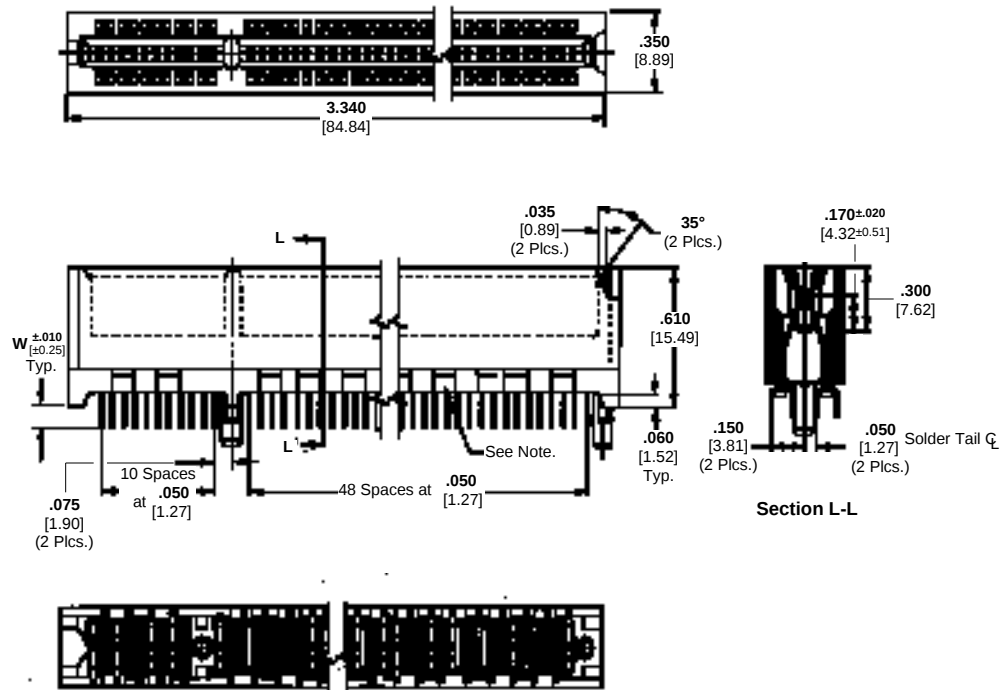
**Contacts**—Phosphor bronze, plated as  
follows:

**Plating A**—Duplex plated gold flash in  
contact area, .000100 [0.00254] min.  
tin-lead on solder tails, with entire con-  
tact underplated .000050 [0.00127] min.  
nickel

**Plating B**—Duplex plated .000015  
[0.00038] min. gold in contact area,  
.000100 [0.00254] min. tin-lead on solder  
tails, with entire contact underplated  
.000050 [0.00127] min. nickel

**Plating C**—Duplex plated .000030  
[0.00076] min. gold in contact area,  
.000100 [0.00254] min. tin-lead on solder  
tails, with entire contact underplated  
.000050 [0.00127] min. nickel

**Plastic Pylons**



**Related Product Data:**

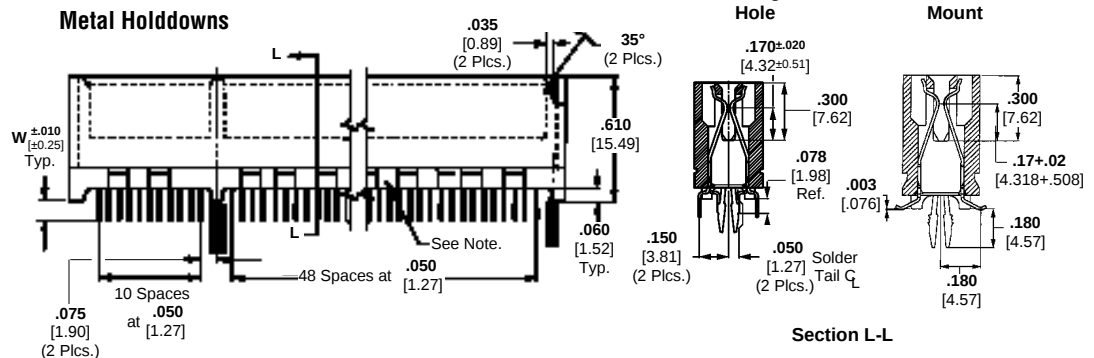
**Performance Specifications**—  
page 7

**Technical Documents:**

**Product Specification**  
108-14034

**Application Specification**  
114-26012

**Metal Holddowns**



| W<br>(Post Length)  | Housing<br>Material | Contact<br>Finish | Part Numbers        |                      |
|---------------------|---------------------|-------------------|---------------------|----------------------|
|                     |                     |                   | 2 Plastic<br>Pylons | 2 Metal<br>Holddowns |
| <b>.100</b><br>2.54 | Y                   | Plating A         | 145154-1            | 145167-1             |
|                     |                     | Plating B         | 145154-2            | —                    |
|                     |                     | Plating C         | 145154-4            | 145167-4             |
| <b>.118</b><br>3.00 | Z                   | Plating A         | 11299-1             | —                    |
|                     |                     | Plating B         | 11299-6             | —                    |
| <b>.125</b><br>3.18 | Y                   | Plating C         | 145154-8            | —                    |
| Surface<br>Mount    | Y                   | Plating C         | —                   | 145098-1             |

**Notes:** 1. Connectors are supplied with either cored (shown above) or solid side walls.  
2. Other connector sizes can be made available, consult Tyco Electronics.

**Standard Edge .050 Series PCI Card Edge Connectors**

**64 Bit, 3.3 Volt Signaling**

**92 Dual Positions  
with 3 Plastic Pylons or  
3 Metal Holddowns**

**Material and Finish:**

**Housing**—High temperature thermo-plastic 94V-0 rated, white

**Contacts**—Phosphor bronze, plated as follows:

**Plating B**—Duplex plated .000015 [0.00038] min. gold in contact area, .000100 [0.00254] min. tin-lead on solder tails, with entire contact underplated .000050 [0.00127] min. nickel

**Plating C**—Duplex plated .000030 [0.00076] min. gold in contact area, .000100 [0.00254] min. tin-lead on solder tails, with entire contact underplated .000050 [0.00127] min. nickel

**Related Product Data:**

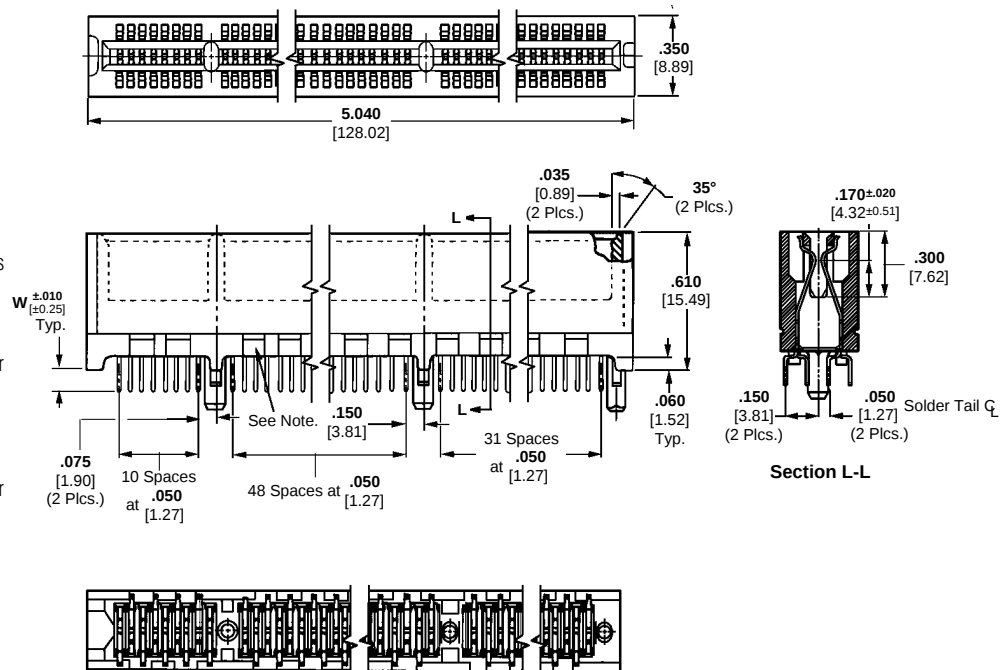
**Performance Specifications**—  
page 7

**Technical Documents:**

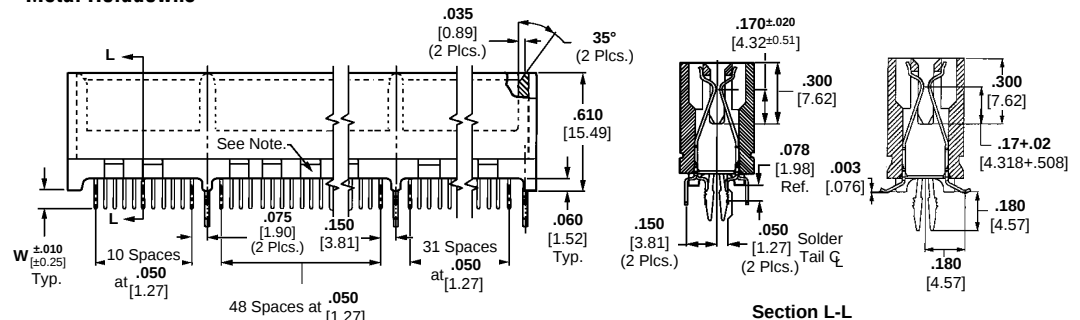
**Product Specification**  
108-14034

**Application Specification**  
114-26012

**Plastic Pylons**



**Metal Holddowns**



| W<br>(Post Length) | Contact<br>Finish | Part Numbers        |                      |
|--------------------|-------------------|---------------------|----------------------|
|                    |                   | 3.3 Volt            |                      |
|                    |                   | 3 Plastic<br>Pylons | 3 Metal<br>Holddowns |
| .100<br>2.54       | Plating B         | —                   | 145168-2             |
|                    | Plating C         | 145165-4            | 145168-4             |
| .125<br>3.18       | Plating C         | 145165-8            | —                    |
| Surface<br>Mount   | Plating C         | —                   | 145246-1             |

**Notes:** 1. Connectors are supplied with either cored (shown above) or solid side walls.  
2. Other connector sizes can be made available, consult Tyco Electronics.

**Product Facts**

- High density .050 [1.27] centerline spacing of contacts
- Easy mating of high-circuit count daughter boards
- Compatible with infrared reflow (IR) soldering techniques
- Polarizing web for positive board-to-connector registration
- Choice of plastic pylons or metal holddowns
- Recognized under the Component Program of Underwriter Laboratories Inc.  File No. E28476
- Certified by Canadian Standards Association,  File No. LR 7189

**Performance Specifications:**

**Contact Current Rating\*** — 1 ampere

**Termination Resistance** —

20 milliohms max. (initial)

30 milliohms max. (final)

**Dielectric Withstanding Voltage** — 500 VAC min.

**Insulation Resistance** — 1000 megohms min.

**Mating Force** — .5 oz. [0.14 N] per contact pair

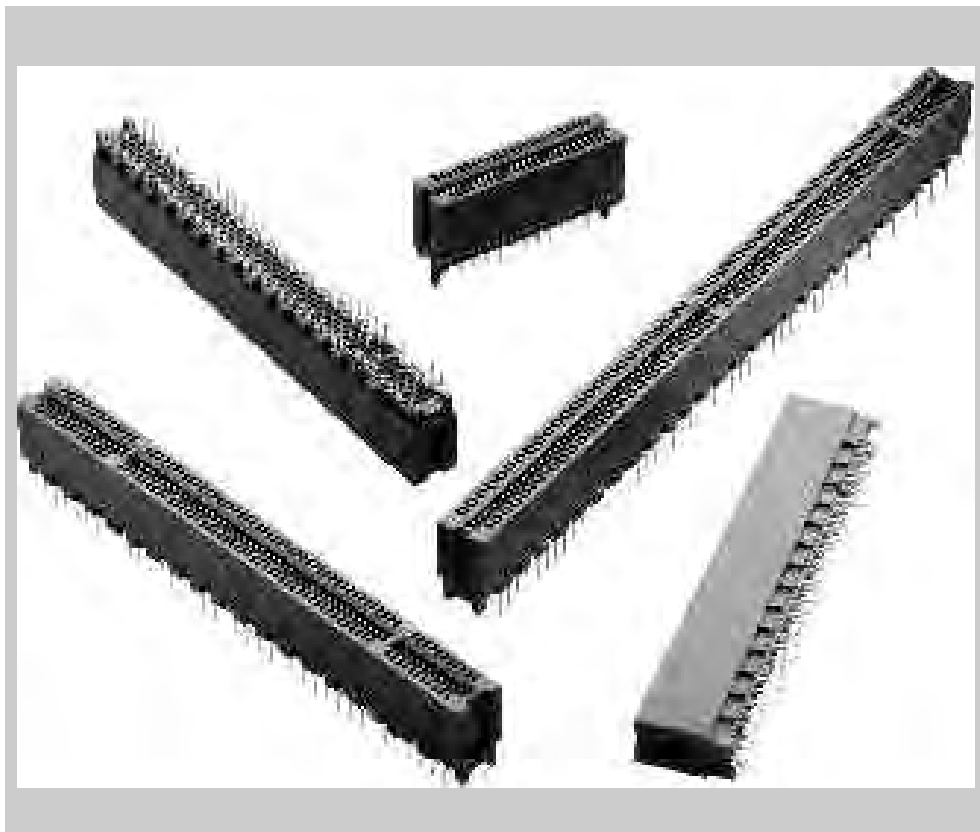
**Unmating Force** — 1 oz. [0.3 N] per contact pair

**Durability (Tested to)** — 100 mating cycles

**Application Temperature** — +215°C for 120 seconds max.

**Temperature Range** — -55°C to +85°C

\*Consult Tyco Electronics engineering when paralleling contacts for power applications.

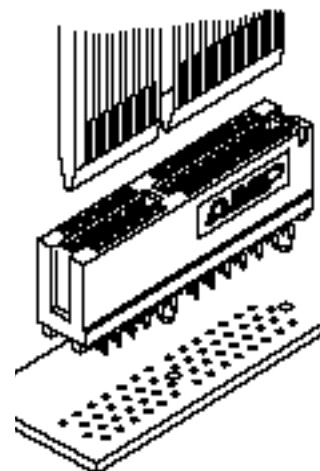
**Standard Edge .050 Series Connectors**


The need to conserve space and pack more function into a given area has demanded that .050 [1.27] centerline spacing become a reality. AMP Standard Edge .050 Series connectors are the ideal vehicle for mother/daughter board applications requiring this real estate.

These rugged connectors have two rows of contacts on .050 [1.27] centerlines. Polarizing webs provide positive board-to-connector registration, while insertion force allows even high circuit-count daughter boards to mate easily. The connectors accept .054 to .070 [1.37 to 1.78] thick daughter boards and feature an overstress protected contact design.

AMP Standard Edge .050 Series connectors are ideal for fast automated robotic assembly with registration features and dimensional tolerancing for more accurate pickup and placement, and are packaged in robotics-compatible trays.

Plastic guide posts or metal holddowns align the connector with the mother board and retain it for soldering. To make circuit routing easy, connector solder posts are arranged in a four-row .100 [2.54] staggered grid. High-temperature tolerant materials promote that these connectors withstand infrared reflow (IR) soldering, while standoffs ease flux cleaning.



**High Density for DataBus Applications**

**Configuration;  
1 Key—2 Plastic Pylons**

**Material and Finish:**

**Housing**—High temperature thermo-plastic, brown

**Contacts**—Phosphor bronze, duplex plated .000030 [0.00076] min. gold in contact area, .000100 [0.00254] min. tin-lead on solder tails, with entire contact underplated .000050 [0.00127] min. nickel

**Related Product Data:**

**Performance Specifications**—  
page 11

**Technical Documents:**

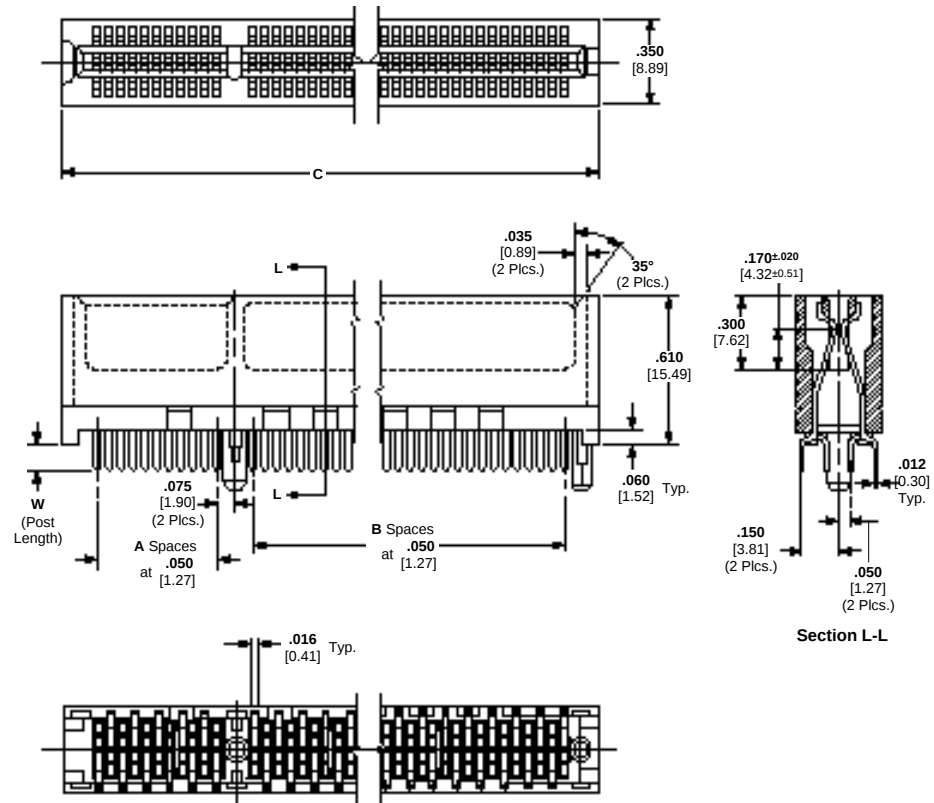
**Product Specification**

108-14034

**Application Specification**

114-26012

**Standard Edge .050 Series Connectors**



| No. of<br>Dual<br>Positions | Dimensions |    |                 | W<br>(Post<br>Length) | PC Board<br>Hole<br>Layout | Connector<br>Part Numbers |
|-----------------------------|------------|----|-----------------|-----------------------|----------------------------|---------------------------|
|                             | A          | B  | C               |                       |                            |                           |
| 23                          | 10         | 11 | 1.490<br>37.85  | .100<br>2.54          | A                          | 650090-7                  |
| 30                          | 10         | 18 | 1.840<br>46.74  | .100<br>2.54          | B                          | 650090-6                  |
| 40                          | 10         | 28 | 2.340<br>59.44  | .100<br>2.54          | B                          | 650090-3                  |
| 45                          | 10         | 33 | 2.590<br>65.79  | .100<br>2.54          | B                          | 650181-2                  |
| 56                          | 10         | 44 | 3.140<br>79.76  | .100<br>2.54          | B                          | 650090-11                 |
| 80                          | 37         | 41 | 4.340<br>110.24 | .100<br>2.54          | B                          | 650181-1                  |
| 91                          | 41         | 48 | 4.890<br>124.21 | .100<br>2.54          | C                          | 650090-9                  |
|                             |            |    |                 | .140<br>3.56          | A                          | 650092-12                 |
|                             |            |    |                 | .140<br>3.56          | A                          | 650092-2                  |

<sup>1</sup> Connector used for VLocal Bus and MCA Bus applications.

<sup>2</sup> Connector used for MCA Bus applications.

**Notes:** 1. Other connector sizes can be made available, consult Tyco Electronics.

2. .125 [3.18] post length is available, consult Tyco Electronics.

**Standard Edge .050 Series Connectors**

**Configuration;  
1 Key—2 Plastic Pylons**

**Material and Finish:**

**Housing**—High temperature thermo-plastic, brown

**Contacts**—Phosphor bronze, duplex plated .000030 [0.00076] min. gold in contact area, .000100 [0.00254] min. tin-lead on solder tails, with entire contact underplated .000050 [0.00127] min. nickel

**Related Product Data:**

**Performance Specifications**—  
page 11

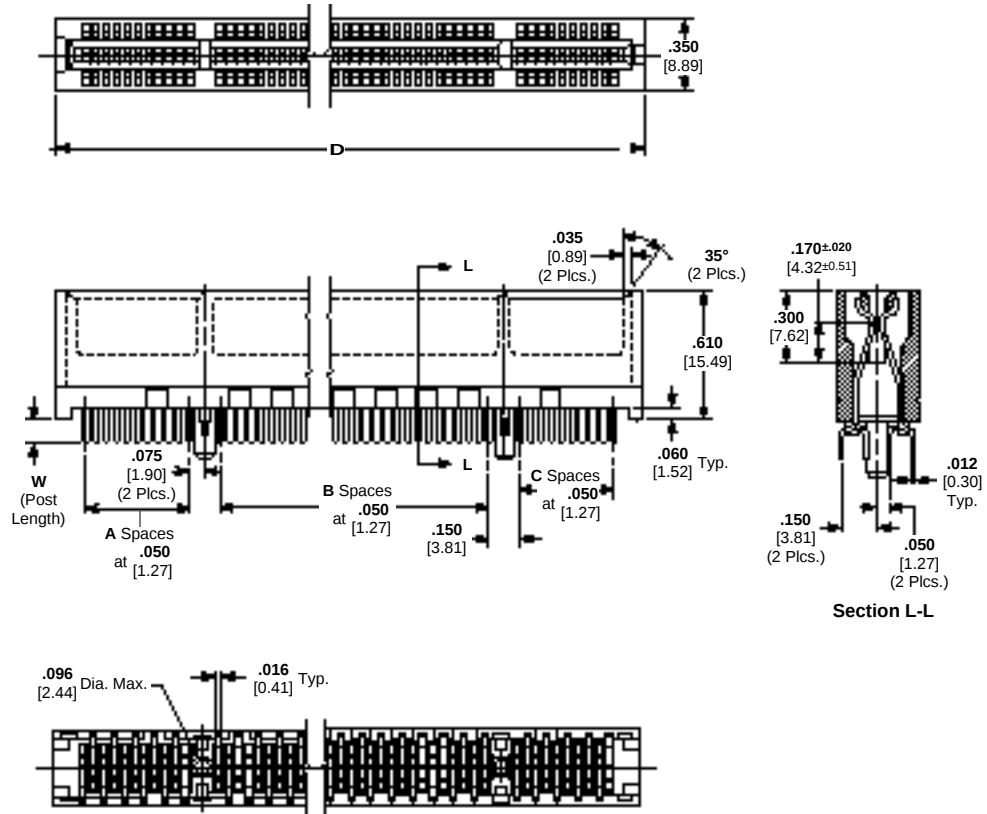
**Technical Documents:**

**Product Specification**

108-14034

**Application Specification**

114-26012



| No. of<br>Dual<br>Positions | Dimensions |    |   |                | W<br>(Post<br>Length) | PC Board<br>Hole<br>Layout | Connector<br>Part Numbers |
|-----------------------------|------------|----|---|----------------|-----------------------|----------------------------|---------------------------|
|                             | A          | B  | C | D              |                       |                            |                           |
| 66                          | 10         | 44 | 9 | 3.740<br>95.00 | .100<br>2.54          | A                          | 650091-1*                 |
|                             |            |    |   |                | .140<br>3.56          | A                          | 650091-2                  |

\*Connectors used for MCA Bus applications.

- Notes:** 1. Other connector sizes can be made available, consult Tyco Electronics.  
2. .125 [3.18] post length is available, consult Tyco Electronics.

**Configuration;  
1 Key/1 Web —3 Metal  
Holddowns**

**120 Dual Positions**

**Material and Finish:**

**Housing**—High temperature thermo-plastic, brown

**Holddowns**—Brass, plated .000150 [0.00381] min. tin-lead over .000050 [0.00127] min. nickel

**Contacts**—Phosphor bronze, duplex plated .000030 [0.00076] min. gold in contact area, .000100 [0.00254] min. tin-lead on solder tails, with entire contact underplated .000050 [0.00127] min. nickel

**Related Product Data:**

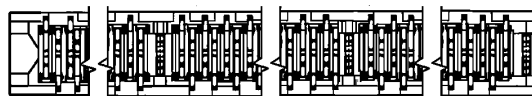
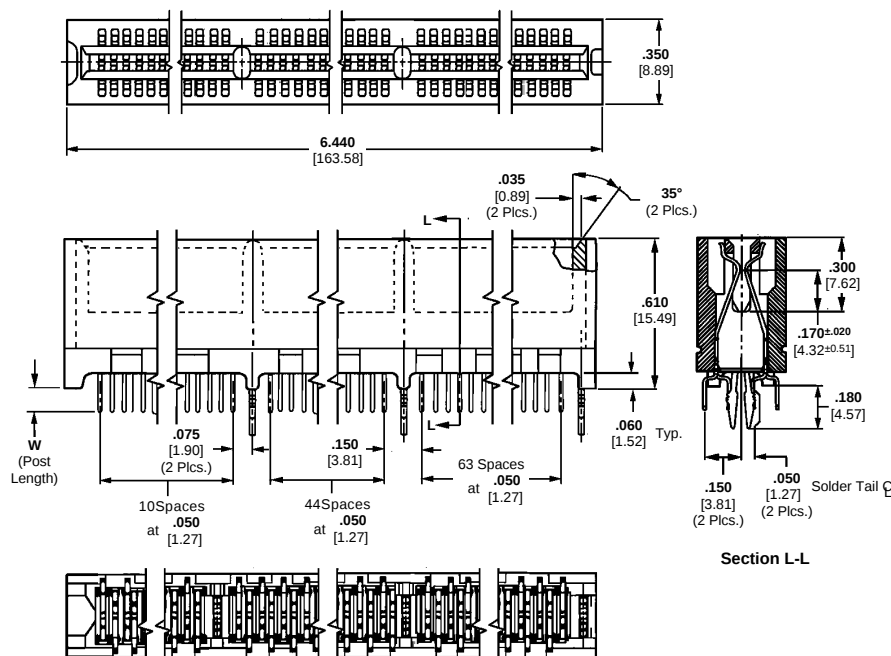
**Performance Specifications**—  
page 11

**Technical Documents:**

**Product Specification**  
104-14034

**Application Specification**  
114-26012

**Standard Edge .050 Series Connectors**



| No. of Dual Positions | W (Post Length) | Connector Part Numbers |
|-----------------------|-----------------|------------------------|
| 120                   | .140<br>3.56    | 145031-3               |

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**Configuration; End Key**

**Material and Finish:**

**Housing**—High temperature thermo-plastic, brown

**Contacts**—Phosphor bronze, duplex plated .000030 [0.00076] min. gold in contact area, .000100 [0.00254] min. tin-lead on solder tails, with entire contact underplated .000050 [0.00127] min. nickel

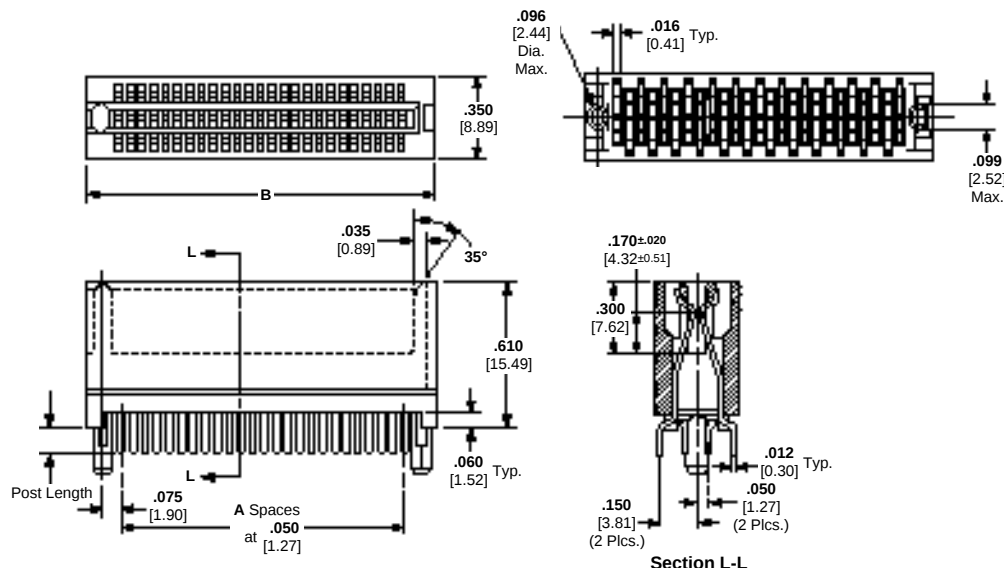
**Related Product Data:**

**Performance Specifications**—  
page 11

**Technical Documents:**

**Product Specification**  
108-14034

**Application Specification**  
114-26012



| No. of Dual Positions | Dimensions |                |                |                | Post Length  | Connector Part Numbers |
|-----------------------|------------|----------------|----------------|----------------|--------------|------------------------|
|                       | A          | B              | C              | D              |              |                        |
| 25                    | 24         | 1.480<br>37.59 | 1.350<br>34.29 | 1.310<br>33.27 | .100<br>2.54 | 650719-1               |

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

### Product Facts

- Maximum number of dual positions  
.100 [2.54] Centerlines-70,  
.125 [3.18] Centerlines-50,  
.150 [3.81] Centerlines-31
- Selective gold plating of contacts for high performance at low cost
- .025 [0.64] square solid posts meet standard wrap-type specifications
- For flow solder applications
- Glass-filled polyester housing is 94V-0 rated
- Accepts double sided PC boards, .054-.070 [1.27-1.78] thick
- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E28476 
- Certified by Canadian Standards Association, File No. LR 7189 

### Performance Specifications

**Contact Rating\*:** 3 amperes continuous (UL and CSA)

**Contact Resistance:** 10 milliohms max.

**Operating Temperature:** -55°C to +85°C

**Voltage Rating (Sea Level):**  
.100 [2.54] centerline—1000 VAC (test)  
.125 [3.18] centerline—1500 VAC (test)  
.150 [3.81] centerline—1500 VAC (test)

**Insulation Resistance:** 5000 megohms min., after exposure to humidity

**Vibration Tolerance:** 10 to 500 hertz

**Contact Engagement Force:** 12 oz [3.3 N] average per pair with .062 [1.57] PC board

**Contact Separation Force:** 2 oz [0.6 N] average per pair with .062 [1.57] PC board

**Humidity Tolerance:** 90%-95% for 96 hours

\*Consult Tyco Electronics engineering when paralleling contacts for power applications.

## Standard Edge II Connectors



AMP Standard Edge II Connectors provide high reliability and economy in packages compatible with industry standards for double sided printed circuit boards.

Tyco Electronics offers Standard Edge II Connectors with or without mounting ears, for rack mounting and soldering. Contacts are arranged on .100 [2.54] centers, .125 [3.18] centers, .150 [3.81] centers, .200 [5.08] row-to-row; and .250 [6.35] row-to-row.

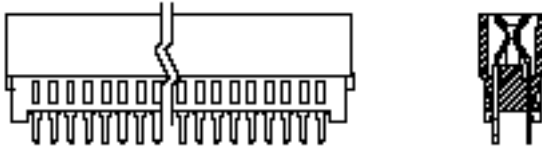
Right-angle connectors are also available with contacts arranged on .100 [2.54] centers, .150 [3.81] row-to-row or .200 [5.08] row-to-row.

Card extenders with contacts on .100 [2.54] and .125 [3.18] centers also are available.

Precision formed phosphor bronze contacts are selectively gold plated. Phosphor bronze has excellent strength characteristics which help the connector absorb load deflection movement of a PC board while maintaining sufficient contact force for good electrical connection. Bifurcated cantilever beam contacts provide redundant contact.

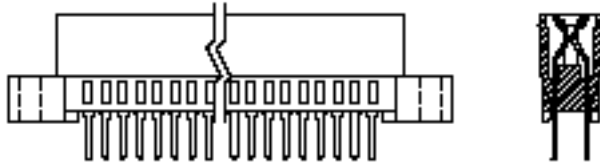
**.100 [2.54] and .125 [3.18] Centerline Solder Posts  
without Mounting Ears**

Pages 17 and 18



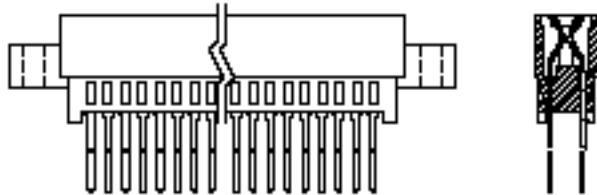
**.100 [2.54] and .125 [3.18] Centerline Solder Posts  
with Low and Mid-High Mounting Ears**

Page 20



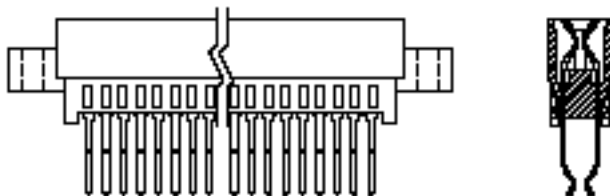
**.100 [2.54] and .125 [3.18] Centerline Wrap-Type Posts  
with Mid-High Mounting Ears**

Page 21



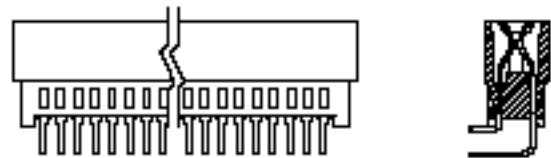
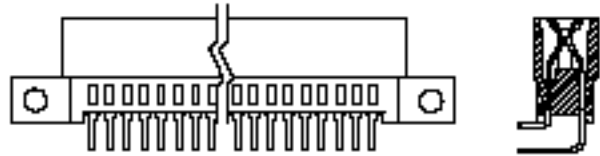
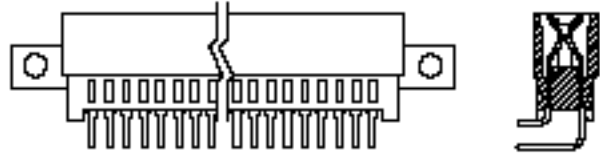
**.100 [2.54] and .125 [3.18] Centerline  
Card Extenders**

Page 22



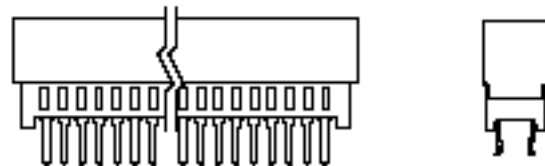
**.100 [2.54] Centerline Right-Angle Posts  
with Low and No Mounting Ears**

Page 23



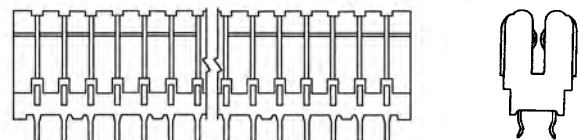
**.100 [2.54] Centerline Solder Posts with Board  
Retention Feature, without Mounting Ears**

Page 24



**.150 [3.81] Centerline Solder Posts (with Board  
Retention Feature), without Mounting Ears**

Page 19



**.100 [2.54] Centerline,  
Vertical Solder Posts,  
Without Mounting Ears**

**Material and Finish:**

**Housing**—Black glass-filled polyester,  
94V-0 rated

**Contacts**—Phosphor bronze, duplex  
plated as follows:

**Plating A**—.000030 [0.00076] gold in  
contact area, tin on posts, with entire  
contact nickel underplated

**Plating B**—.000015 [0.00038] gold in  
contact area, tin on posts, with entire  
contact nickel underplated

**Plating C**—Gold flash in contact area,  
tin on posts, with entire contact nickel  
underplated

**Technical Documents:**

**Product Specification**

108-9039

**Intercontact Keying Plug**

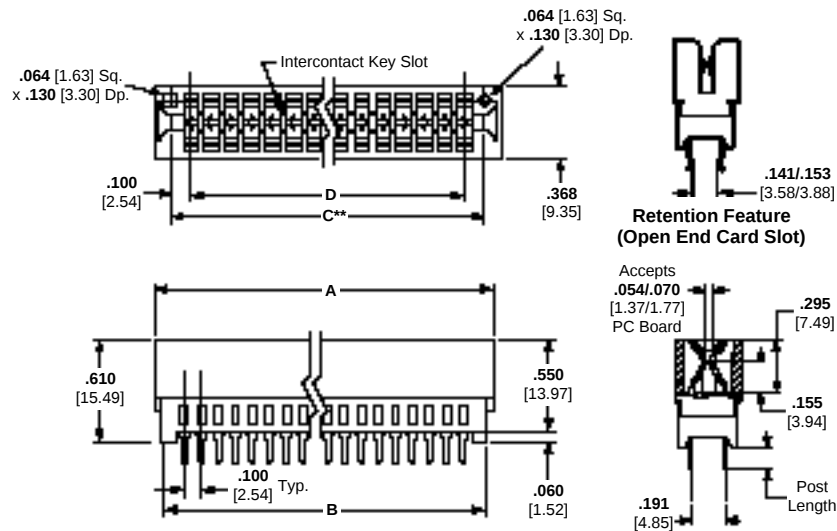
**Material:**

Natural color polyester



**Part Number 650025-2**  
(.100 [2.54] Centerline)

**Standard Edge II Card Edge Connectors**



| No. of<br>Dual<br>Positions | Dimensions      |                 |                 |                 | Post<br>Length* | Part Numbers             |            |                       |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|--------------------------|------------|-----------------------|
|                             | A               | B               | C**             | D               |                 | Plating A                | Plating B  | Plating C             |
| 3                           | .560<br>14.22   | .450<br>11.43   | Open<br>End     | .200<br>5.08    | .125            | 650263-1 <sup>1</sup>    | —          | —                     |
| 6                           | .860<br>21.84   | .750<br>19.05   | .700<br>17.78   | .500<br>12.70   | .125<br>.187    | 7-530843-5<br>7-530843-6 | —          | —                     |
| 10                          | 1.260<br>32.00  | 1.150<br>29.21  | 1.100<br>27.94  | .900<br>22.86   | .125<br>.187    | 5-530843-0<br>4-530843-9 | —          | —                     |
| 12                          | 1.460<br>37.08  | 1.350<br>34.29  | 1.300<br>33.02  | 1.100<br>27.94  | .125            | 530843-1                 | —          | —                     |
| 15                          | 1.760<br>44.70  | 1.650<br>41.91  | 1.600<br>40.64  | 1.400<br>35.56  | .125            | 530843-2                 | —          | —                     |
| 17                          | 1.960<br>49.78  | 1.850<br>46.99  | 1.800<br>45.72  | 1.600<br>40.64  | .125            | 5-530843-3               | —          | —                     |
| 18                          | 2.060<br>52.32  | 1.950<br>49.53  | 1.900<br>48.26  | 1.700<br>43.18  | .125            | 530843-3                 | 2-530843-7 | 176137-1 <sup>1</sup> |
| 20                          | 2.260<br>57.40  | 2.150<br>54.61  | 2.100<br>53.34  | 1.900<br>48.26  | .125            | 5-530843-4               | —          | —                     |
| 22                          | 2.460<br>62.48  | 2.350<br>59.69  | 2.300<br>58.42  | 2.100<br>53.34  | .125            | 530843-4                 | —          | —                     |
| 25                          | 2.760<br>70.10  | 2.650<br>67.31  | 2.600<br>66.04  | 2.400<br>60.96  | .125            | 530843-5                 | —          | —                     |
| 28                          | 3.060<br>77.72  | 2.950<br>74.93  | 2.900<br>73.66  | 2.700<br>68.58  | .125            | 530843-6                 | —          | —                     |
| 30                          | 3.260<br>82.80  | 3.150<br>80.01  | 3.100<br>78.74  | 2.900<br>73.66  | .125<br>.187    | 530843-7<br>1-530843-8   | —          | —                     |
| 31                          | 3.360<br>85.34  | 3.250<br>82.55  | 3.200<br>81.28  | 3.000<br>76.20  | .125            | 6-530843-5               | 7-530843-0 | —                     |
| 36                          | 3.860<br>98.04  | 3.750<br>95.25  | 3.700<br>93.98  | 3.500<br>88.90  | .125            | 530843-8                 | —          | —                     |
| 40                          | 4.260<br>108.20 | 4.150<br>105.41 | 4.100<br>104.14 | 3.900<br>99.06  | .187            | 2-530843-0               | —          | —                     |
| 50                          | 5.260<br>133.60 | 5.150<br>130.81 | 5.100<br>129.54 | 4.900<br>124.46 | .125            | 1-530843-1               | —          | —                     |

\*Metric equivalent for post lengths are .125 = 3.18; .187 = 4.75.

\*\*C dimension is card slot length.

<sup>1</sup> Connectors with Retention Feature.

**Notes:** 1. Other connector sizes can be made available, consult Tyco Electronics.

2. High temperature IR reflow compatible connectors can be made available, consult Tyco Electronics.

**Standard Edge II Connectors (Continued)**

**.125 [3.18] Centerline,  
Vertical Solder Posts,  
Without Mounting Ears**

**Material and Finish:**

**Housing**—Black glass-filled polyester,  
94V-0 rated

**Contacts**—Phosphor bronze, plated  
with .000030 [0.00076] gold in contact  
area, tin on posts, with entire contact  
nickel underplated

**Related Product Data:**

**Performance Specifications**—  
page 15

**PC Board Hole Layout**—page 26

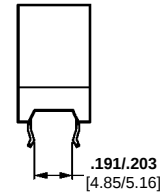
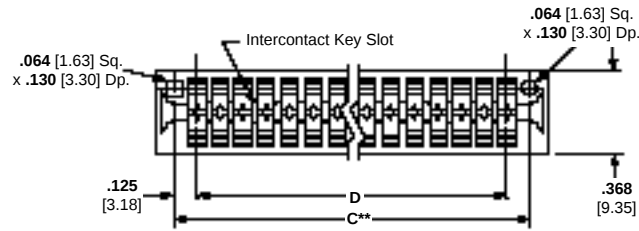
**PC Board Edge Pattern**—page 27

**Special Application**—page 96

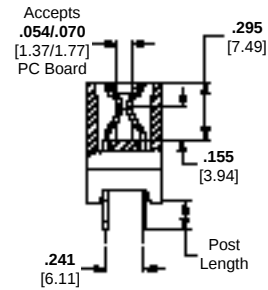
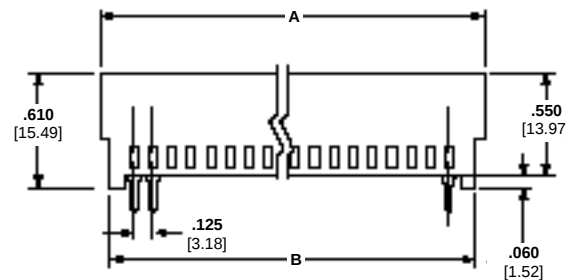
**Technical Documents:**

(pages 186, 187):

Product Specification  
108-9039



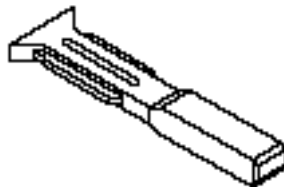
**Retention Feature**



**Intercontact Keying Plug**

**Material:**

Natural color polyester



**Part No. 650025-1**  
(.125 [3.18] Centerline)

| No. of<br>Dual<br>Positions | Dimensions      |                 |                 |                 | Post<br>Length* | Part Numbers             |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|--------------------------|
|                             | A               | B               | C**             | D               |                 |                          |
| 6                           | 1.035<br>26.29  | .875<br>22.22   | .875<br>22.22   | .625<br>15.88   | .125            | 650207-1 <sup>1</sup>    |
| 14                          | 2.035<br>51.69  | 1.875<br>47.62  | 1.875<br>47.62  | 1.625<br>41.28  | .187            | 5-530844-8               |
| 18                          | 2.535<br>64.39  | 2.375<br>60.33  | 2.375<br>60.33  | 2.125<br>53.98  | .187            | 1-530844-5               |
| 22                          | 3.035<br>77.09  | 2.875<br>73.03  | 2.875<br>73.03  | 2.625<br>66.68  | .187            | 1-530844-6               |
| 28                          | 3.785<br>96.14  | 3.625<br>92.08  | 3.625<br>92.08  | 3.375<br>85.73  | .187            | 1-530844-7               |
| 30                          | 4.035<br>102.49 | 3.875<br>98.42  | 3.875<br>98.42  | 3.625<br>92.08  | .187            | 1-530844-8               |
| 36                          | 4.785<br>121.54 | 4.625<br>117.48 | 4.625<br>117.48 | 4.375<br>111.13 | .187            | 1-530844-9               |
| 40                          | 5.285<br>134.24 | 5.125<br>130.18 | 5.125<br>130.18 | 4.875<br>123.82 | .187            | 2-530844-0               |
| 43                          | 5.660<br>143.76 | 5.500<br>139.70 | 5.500<br>139.70 | 5.250<br>133.35 | .125            | 1-530844-0               |
| 50                          | 6.535<br>165.99 | 6.375<br>161.93 | 6.375<br>161.93 | 6.125<br>155.58 | .125<br>.187    | 1-530844-1<br>2-530844-2 |

\*Metric equivalent for post lengths are .125 = [3.18]; .187 = [4.75]

\*\*C dimension is card slot length.

<sup>1</sup>Connector with Retention Feature.

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**.150 [3.81] Centerline,  
Vertical Solder Posts,  
Retention Feature, Without  
Mounting Ears**

**Material and Finish:**

**Housing**—Black glass-filled polyester, 94V-0 rated

**Contacts**—Phosphor bronze, plated with .000030 [0.00076] gold in contact area, tin on posts, with entire contact nickel underplated

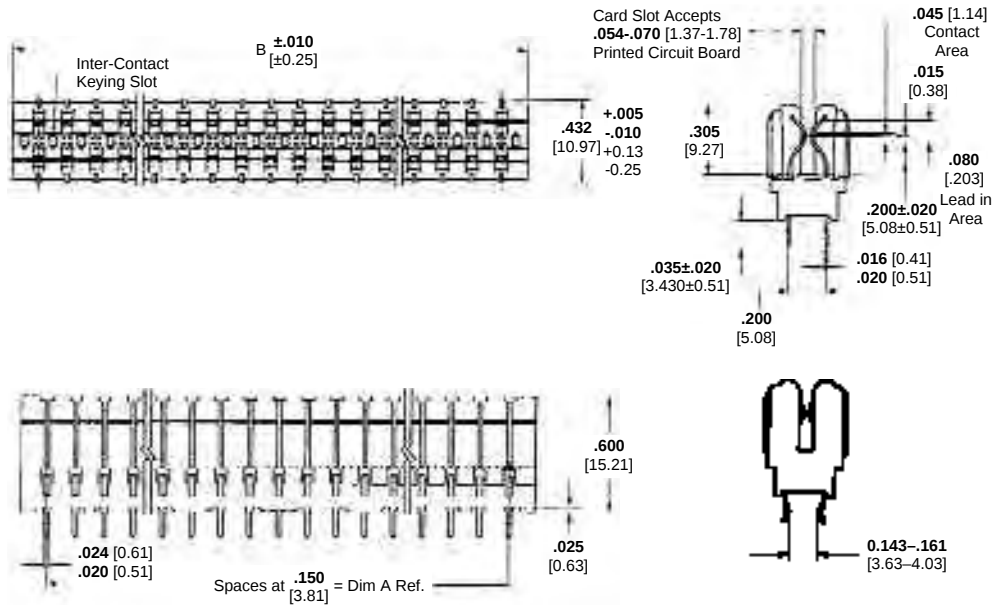
**Related Product Data:**

**Performance Specifications**—page 15

**PC Board Hole Layout**—page 26

**PC Board Edge Pattern**—page 27

**Special Application**—page 96



| No. of<br>Dual<br>Positions | Dimensions      |                 | Retention<br>Location | Post<br>Length* | Part<br>Numbers |
|-----------------------------|-----------------|-----------------|-----------------------|-----------------|-----------------|
|                             | A               | B               |                       |                 |                 |
| 12                          | 1.650<br>41.91  | 1.920<br>48.77  | 7-10,<br>15-18        | .135            | 1-650728-2      |
| 19                          | 2.700<br>68.58  | 2.970<br>75.44  | 7-10,<br>29-32        | .135            | 1-650728-9      |
| 28                          | 4.050<br>102.87 | 4.320<br>109.73 | 7-10,<br>25-32,47-50  | .135            | 2-650728-9      |
| 31                          | 4.500<br>114.30 | 4.770<br>121.16 | 7-10,<br>27-34,53-56  | .135            | 3-650728-1      |

\*Metric equivalent for post length is .135 = [3.43]

\*\*C dimension is card slot length.

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**.100 [2.54] and .125 [3.18]  
Centerline, Vertical Solder  
Posts, Low and Mid-High  
Mounting Ears**

**Material and Finish:**

**Housing**—Black glass-filled polyester, 94V-0 rated

**Contacts**—Phosphor bronze, plated with .000030 [0.00076] gold in contact area, tin on posts, with entire contact nickel underplated

**Related Product Data:**

**Performance Specifications—**  
page 15

**PC Board Hole Layout**—page 26

**PC Board Edge Pattern**—page 27

**Special Application**—page 96

### Technical Documents:

(pages 186, 187):

Product Specification  
108-9039

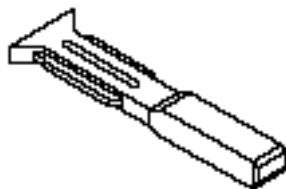
## Intercontact Keying Plugs

**Material:**

Natural color polyester

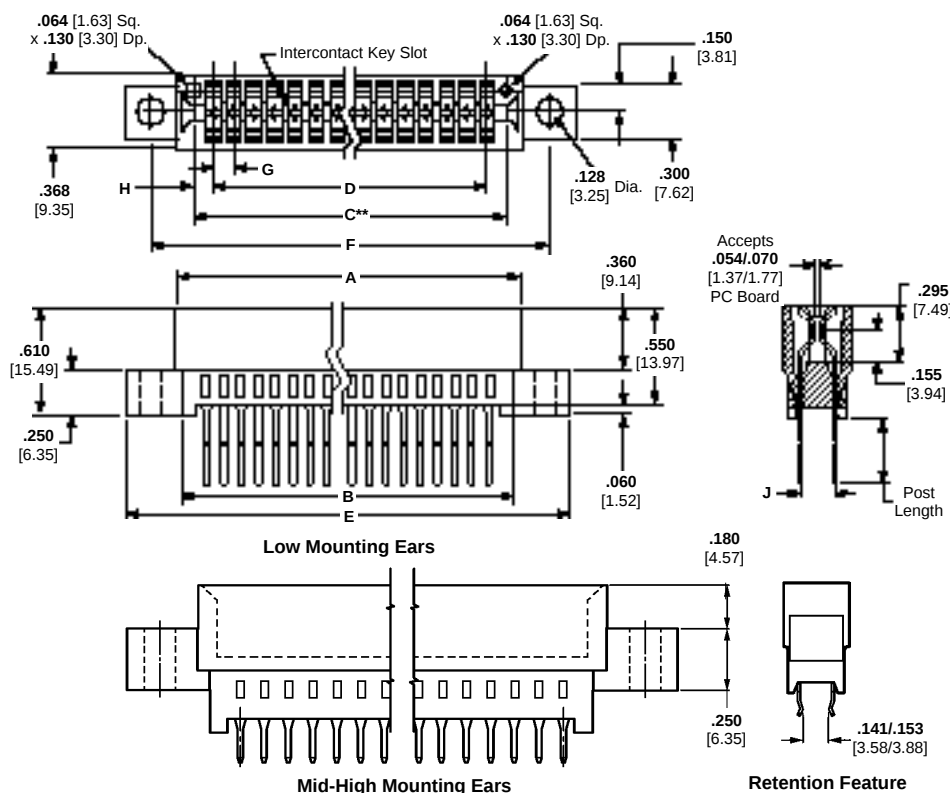


**Part No. 650025-2**  
**(.100 [2.54] Centerline)**



**Part No. 650025-1**  
(.125 [3.18] Centerline)

### Standard Edge II Connectors (Continued)



**.100 [2.54] Centerline**

| No. of<br>Dual<br>Positions | Dimensions      |                 |                 |                 |                 |                 |              |              |                        | Post<br>Length* | Part<br>Numbers         |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|--------------|--------------|------------------------|-----------------|-------------------------|
|                             | A               | B               | C**             | D               | E               | F               | G            | H            | J                      |                 |                         |
| 15                          | 1.760<br>44.70  | 1.650<br>41.91  | 1.600<br>40.64  | 1.400<br>35.56  | 2.385<br>67.18  | 2.075<br>52.71  | .100<br>2.54 | .100<br>2.54 | .191<br>4.85           | .125            | 530841-2                |
| 18                          | 2.060<br>52.32  | 1.950<br>49.53  | 1.900<br>48.26  | 1.700<br>43.18  | 2.645<br>67.18  | 2.375<br>60.32  | .100<br>2.54 | .100<br>2.54 | .191<br>4.85           | .125            | 530841-3                |
| 25                          | 2.760<br>70.10  | 2.650<br>67.31  | 2.600<br>66.04  | 2.400<br>60.96  | 3.345<br>84.96  | 3.075<br>78.11  | .100<br>2.54 | .100<br>2.54 | .191<br>4.85           | .125<br>.187    | 530841-5<br>1-530841-6  |
| 30                          | 3.260<br>82.80  | 3.160<br>80.01  | 3.100<br>78.74  | 2.900<br>73.66  | 3.845<br>97.66  | 3.575<br>90.81  | .100<br>2.54 | .100<br>2.54 | .191<br>4.85           | .187            | 1-530841-8              |
| 36                          | 3.860<br>98.04  | 3.750<br>95.25  | 3.700<br>93.98  | 3.500<br>88.90  | 4.445<br>112.90 | 4.175<br>106.21 | .100<br>2.54 | .100<br>2.54 | .191<br>4.85           | .125            | 530841-8                |
| 50                          | 5.260<br>133.60 | 5.150<br>130.81 | 5.100<br>129.54 | 4.900<br>124.46 | 5.845<br>148.46 | 5.575<br>141.60 | .100<br>2.54 | .100<br>2.54 | .191<br>4.85           | .125            | 1-530841-1              |
|                             |                 |                 |                 |                 |                 |                 |              |              | .141-.153<br>3.58-3.88 | .187            | 2-530841-2              |
|                             |                 |                 |                 |                 |                 |                 |              |              |                        | .125            | 650718-1 <sup>1,2</sup> |

\*Metric equivalent for post lengths are **.125** = [3.18]; **.187** = [4.75]

**\*\*C** dimension is card slot length.

<sup>1</sup>Connector with Retention Feature.<sup>2</sup>Connector with Mid-High Mounting Ears.

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**.125 [3.18] Centerline**

| No. of<br>Dual<br>Positions | Dimensions      |                 |                 |                 |                 |                 |              |              |              | Post<br>Length* | Part<br>Numbers         |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|--------------|--------------|--------------|-----------------|-------------------------|
|                             | A               | B               | C**             | D               | E               | F               | G            | H            | J            |                 |                         |
| 6                           | 1.035<br>26.29  | .875<br>22.22   | .875<br>22.22   | .625<br>15.88   | 1.555<br>39.50  | 1.295<br>32.89  | .125<br>3.18 | .125<br>3.18 | .241<br>6.11 | .125            | 1-531341-3              |
| 28                          | 3.785<br>96.14  | 3.505<br>89.03  | 3.625<br>92.08  | 3.375<br>85.73  | 4.305<br>109.35 | 4.045<br>102.74 | .125<br>3.18 | .125<br>3.18 | .241<br>6.11 | .187            | 1-530842-7              |
|                             |                 |                 |                 |                 |                 |                 |              |              | .241<br>6.11 | .187            | 3-531341-0 <sup>2</sup> |
| 50                          | 6.535<br>165.99 | 6.255<br>158.88 | 6.375<br>161.93 | 6.125<br>155.58 | 7.055<br>179.20 | 6.795<br>172.59 | .125<br>3.18 | .125<br>3.18 | .241<br>6.11 | .125            | 1-530842-1              |

\*Metric equivalent for post lengths are **.125** = [3.18]; **.187** = [4.75]

\*\*C dimension is card slot length.

<sup>1</sup>Connector with Retention Feature.<sup>2</sup>Connector with Mid-High Mounting Ears.

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**Standard Edge II Connectors (Continued)**

**.100 [2.54] and .125 [3.18]  
Centerline, Vertical Wrap-  
Type Posts, Mid-High  
Mounting Ears**

**Material and Finish:**

**Housing**—Black glass-filled polyester,  
94V-0 rated

**Contacts**—Phosphor bronze, plated  
with .000030 [0.00076] gold in contact  
area, tin on posts, with entire contact  
nickel underplated

**Related Product Data:**

**Performance Specifications**—  
page 15

**PC Board Hole Layout**—page 26

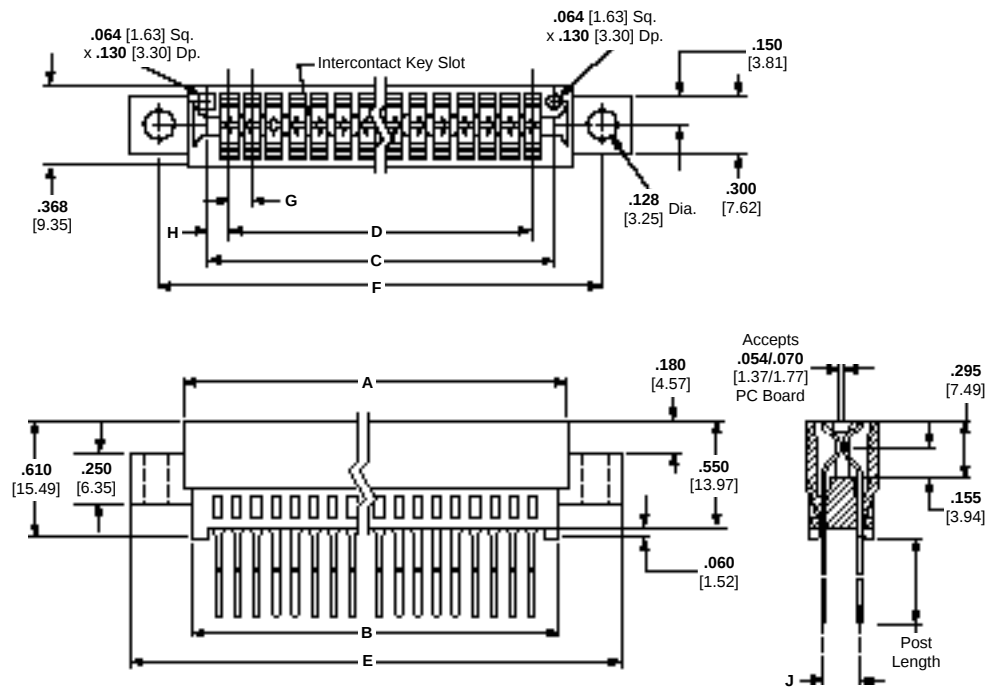
**PC Board Edge Pattern**—page 27

**Special Application**—page 96

**Technical Documents:**

(pages 186, 187):

Product Specification  
108-9039



**Intercontact Keying Plugs**

**Material:**

Natural color polyester



**Part No. 650025-2**  
(.100 [2.54] Centerline)

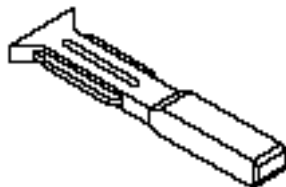
**.100 [2.54] Centerline**

| No. of<br>Dual<br>Positions | Dimensions      |                 |                 |                |                 |                 |              |              |              | Post<br>Length* | Part<br>Numbers |
|-----------------------------|-----------------|-----------------|-----------------|----------------|-----------------|-----------------|--------------|--------------|--------------|-----------------|-----------------|
|                             | A               | B               | C**             | D              | E               | F               | G            | H            | J            |                 |                 |
| 30                          | 3.260<br>82.80  | 3.150<br>80.01  | 3.100<br>78.74  | 2.900<br>73.66 | 3.845<br>97.41  | 3.575<br>90.80  | .100<br>2.54 | .100<br>2.54 | .200<br>5.08 | .570            | 3-530396-3      |
| 36                          | 3.860<br>98.04  | 3.750<br>95.25  | 3.700<br>93.98  | 3.500<br>88.90 | 4.435<br>112.65 | 4.175<br>106.04 | .100<br>2.54 | .100<br>2.54 | .200<br>5.08 | .570            | 3-530396-4      |
| 40                          | 4.260<br>108.20 | 4.150<br>105.41 | 4.100<br>104.14 | 3.900<br>99.06 | 4.845<br>123.06 | 4.575<br>116.21 | .100<br>2.54 | .100<br>2.54 | .200<br>5.08 | .570            | 3-530396-4      |

\*Metric equivalent for post length is .570 = [14.48].

\*\*C dimension is card slot length.

**Note:** Other connector sizes can be made available, consult Tyco Electronics.



**Part No. 650025-1**  
(.125 [3.18] Centerline)

**.125 [3.18] Centerline**

| No. of<br>Dual<br>Positions | Dimensions     |                |                |                |                |                |              |              |              | Post<br>Length* | Part<br>Numbers |
|-----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------|--------------|--------------|-----------------|-----------------|
|                             | A              | B              | C**            | D              | E              | F              | G            | H            | J            |                 |                 |
| 22                          | 3.035<br>77.09 | 2.755<br>69.98 | 2.875<br>73.02 | 2.625<br>66.67 | 3.555<br>90.30 | 3.295<br>83.69 | .125<br>3.18 | .125<br>3.18 | .250<br>6.35 | .570            | 4-530825-5      |

\*Metric equivalent for post length is .570 = [14.48].

\*\*C dimension is card slot length.

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

## .100 [2.54] and .125 [3.18] Centerlines, Card Extender Contacts

### Material and Finish:

**Housing**—Black glass-filled polyester,  
94V-0 rated

**Contacts**—Phosphor bronze, plated  
with .000030 [0.00076] gold in contact  
area, tin on posts, with entire contact  
nickel underplated

### Related Product Data:

**Performance Specifications**—

page 15

**PC Board Hole Layout**—page 26

**PC Board Edge Pattern**—page 27

### Technical Documents:

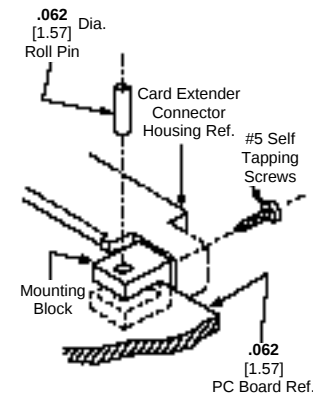
(pages 186, 187):

Product Specification  
108-9039

### Mounting Block

#### Material:

Natural color nylon



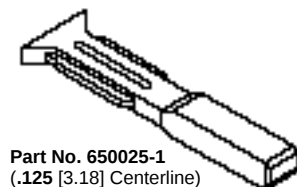
#### Kit Part No. 531250-4

Each kit includes 2 mounting blocks,  
2 self tapping screws, #5 x .437  
[11.10] and 2 roll pins, .075 x .250  
[1.57 x 6.35]

### Intercontact Keying Plugs

#### Material:

Natural color polyester

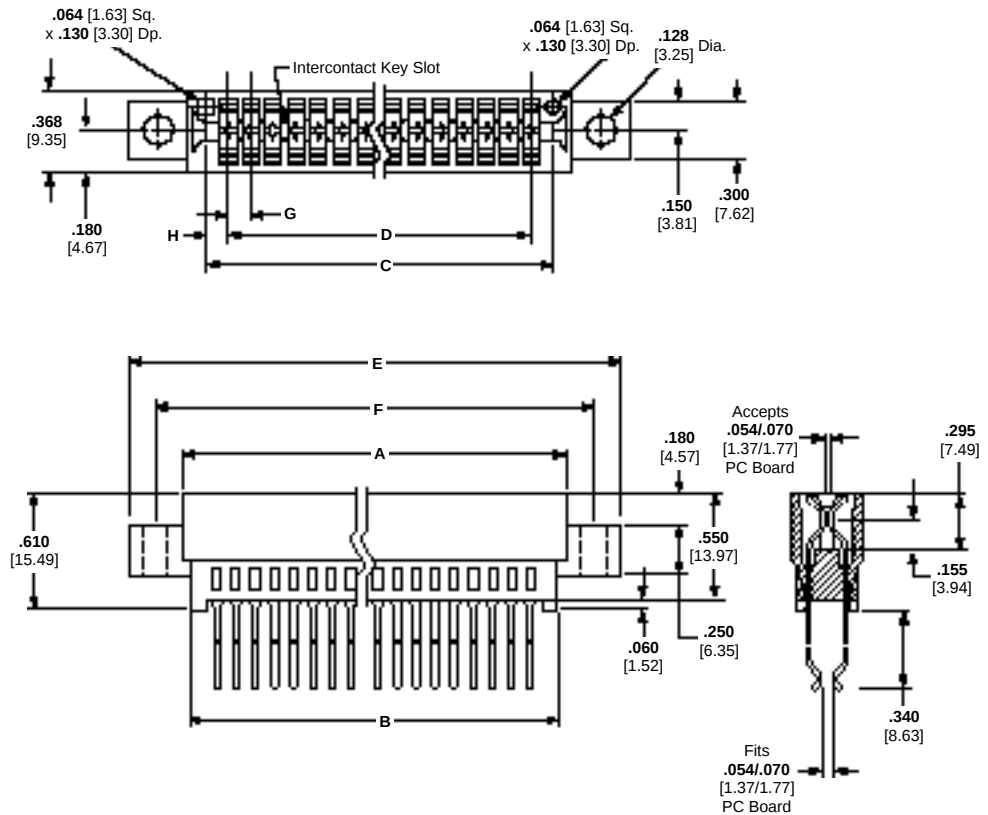


**Part No. 650025-1**  
(.125 [3.18] Centerline)



**Part Number 650025-2**  
(.100 [2.54] Centerline)

## Standard Edge II Connectors (Continued)



### .100 [2.54] Centerline

| No. of<br>Dual<br>Positions | Dimensions      |                 |                 |                 |                 |                 |              |              | Part Numbers |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|--------------|--------------|--------------|
|                             | A               | B               | C**             | D               | E               | F               | G            | H            |              |
| 50                          | 5.260<br>133.60 | 5.160<br>130.81 | 5.100<br>129.54 | 4.900<br>124.46 | 5.845<br>148.46 | 5.575<br>141.60 | .100<br>2.54 | .100<br>2.54 | 530826-3     |

\*C dimension is card slot length.

†No mounting ears.

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

### .125 [3.18] Centerline

| No. of<br>Dual<br>Positions | Dimensions      |                 |                 |                 |                 |                 |              |              | Part Numbers |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|--------------|--------------|--------------|
|                             | A               | B               | C**             | D               | E               | F               | G            | H            |              |
| 36                          | 4.785<br>121.54 | 4.505<br>114.43 | 4.625<br>117.48 | 4.375<br>111.13 | 5.035<br>134.75 | 5.045<br>128.14 | .125<br>3.18 | .125<br>3.18 | 530384-2     |

\*C dimension is card slot length.

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

## .100 [2.54] Right-Angle Solder Posts, with Low and No Mounting Ears

### Material and Finish:

**Housing**—Black glass-filled polyester, 94V-0 rated

**Contacts**—Phosphor bronze, duplex plated as follows:

**Plating A**—.000030 [0.00076] gold in contact area, tin on posts, with entire contact nickel underplated

**Plating B**—.000015 [0.00038] gold in contact area, tin on posts, with entire contact nickel underplated

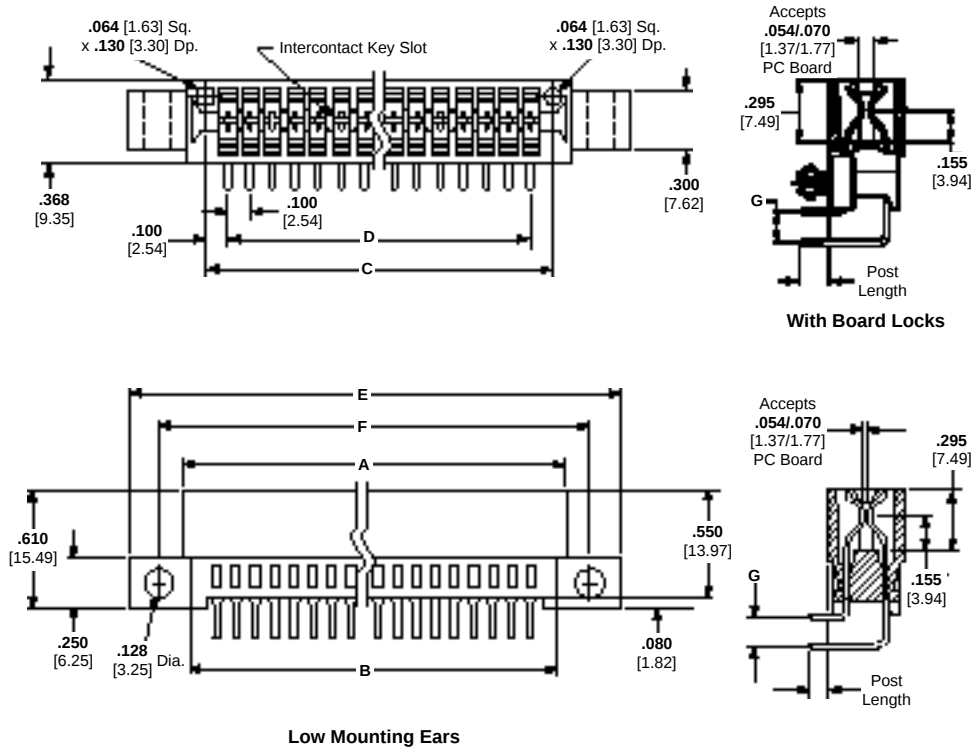
### Related Product Data:

**Performance Specifications**—  
page 15

### Technical Documents:

**Product Specification**  
108-9039

## Standard Edge II Card Edge Connectors



### Intercontact Keying Plug

#### Material:

Natural color polyester



**Part Number 650025-2**  
(.100 [2.54] Centerline)

### Low Mounting Ears

| No. of Dual Positions | Dimensions     |                |                |                |                |                | Post Length <sup>2</sup> | Part Numbers (Plating A) |
|-----------------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------------------|--------------------------|
|                       | A              | B              | C*             | D              | E              | F              |                          |                          |
| 12                    | 1.460<br>37.08 | 1.350<br>34.29 | 1.300<br>33.02 | 1.100<br>27.94 | 2.045<br>51.94 | 1.775<br>45.08 | .100x<br>.150            | 145089-1 <sup>3</sup>    |
| 18                    | 2.060<br>52.32 | 1.950<br>49.53 | 1.900<br>48.26 | 1.700<br>43.18 | 2.645<br>67.18 | 2.375<br>60.32 | .100x<br>.150            | 645384-1                 |
| 20                    | 2.260<br>57.40 | 2.150<br>54.61 | 2.100<br>53.34 | 1.900<br>48.26 | 2.845<br>72.30 | 2.575<br>65.40 | .100x<br>.150            | 645384-3                 |

\*C dimension is card slot length.

<sup>1</sup> Metric equivalent for .100 x .150 and .100 x .200 are [2.54 x 3.81] and [2.54 x 5.08].

<sup>2</sup> Metric equivalent for post length is .090 = [2.27].

<sup>3</sup> Connector with Board Locks.

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

### No Mounting Ears

| No. of Dual Positions | Dimensions     |                |                |                |                | Post Length <sup>2</sup> | Part Numbers |           |
|-----------------------|----------------|----------------|----------------|----------------|----------------|--------------------------|--------------|-----------|
|                       | A              | B              | C*             | D              | G <sup>1</sup> |                          | Plating A    | Plating B |
| 15                    | 1.760<br>44.70 | 1.650<br>41.91 | 1.600<br>40.64 | 1.400<br>35.56 | .100x<br>.150  | .090                     | 650118-1     | —         |
| 17                    | 1.960<br>49.78 | 1.850<br>46.99 | 1.800<br>45.72 | 1.600<br>40.64 | .100x<br>.200  | .090                     | 650187-1     | —         |
| 25                    | 2.760<br>70.10 | 2.350<br>67.61 | 2.600<br>66.04 | 2.400<br>60.96 | .100x<br>.150  | .090                     | —            | 532600-2  |
| 31                    | 3.360<br>85.34 | 3.250<br>82.55 | 3.200<br>81.28 | 3.000<br>76.20 | .100x<br>.150  | .090                     | —            | 532600-4  |
| 32                    | 3.460<br>87.88 | 3.350<br>85.09 | 3.300<br>83.82 | 3.100<br>78.74 | .100x<br>.150  | .090                     | —            | 532600-5  |
| 19                    | 2.160<br>54.86 | 2.750<br>69.85 | 2.700<br>68.58 | 1.800<br>45.72 | .100x<br>.150  | .090                     | —            | 532600-6  |

\*C dimension is card slot length.

<sup>1</sup> Metric equivalent for .100 x .150 and .100 x .200 are [2.54 x 3.81] and [2.54 x 5.08].

<sup>2</sup> Metric equivalent for post length is .090 = [2.27].

**Notes:** 1. Other connector sizes can be made available, consult Tyco Electronics.

2. High temperature IR reflow compatible connectors can be made available, consult Tyco Electronics.

**.100 [2.54] Centerline  
Vertical Solder Posts,  
Retention Feature,  
Without Mounting Ears**

**Material and Finish:**

**Housing**—Black glass-filled polyester,  
94V-0 rated

**Contacts**—Phosphor bronze, duplex  
plated as follows:

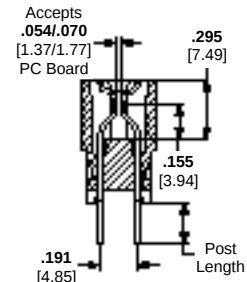
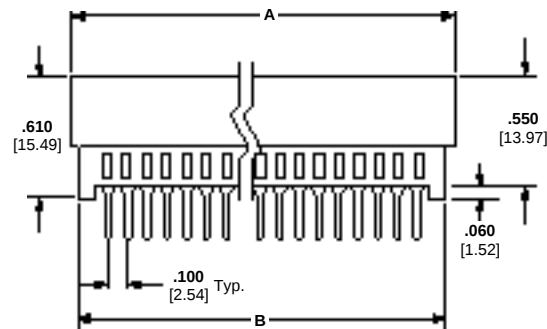
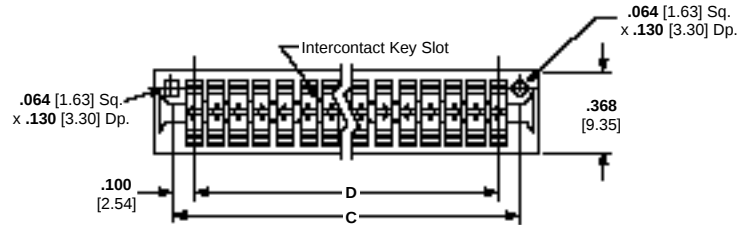
**Plating A**—.000030 [0.00076] gold in  
contact area, tin on posts, with entire  
contact nickel underplated

**Plating B**—.000015 [0.00038] gold in  
contact area, tin on posts, with entire  
contact nickel underplated

**Plating C**—Gold flash in contact area,  
tin on posts, with entire contact nickel  
underplated

**Technical Documents:**

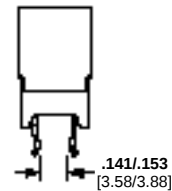
**Product Specification**  
108-9039



**Intercontact Keying Plug**

**Material:**

Natural color polyester



Retention Feature

**Part Number 650025-2**  
(.100 [2.54] Centerline)

| No. of<br>Dual<br>Positions | Dimensions      |                 |                 |                 | Post<br>Length* | Retention<br>Feature          | PartNumbers |  |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------------------|-------------|--|
|                             | A               | B               | C**             | D               |                 |                               | Plating A   |  |
| 18                          | 2.060<br>52.32  | 1.950<br>49.53  | 1.900<br>48.26  | 1.700<br>43.18  | .125            | 3-6, 31-34                    | 645235-4    |  |
| 31                          | 3.360<br>85.34  | 3.250<br>82.55  | 3.200<br>81.28  | 3.000<br>76.20  | .125            | 3-6, 29-32 or<br>31-34, 57-60 | 645235-1    |  |
| 50                          | 5.260<br>133.60 | 5.150<br>130.81 | 5.100<br>129.54 | 4.900<br>124.46 | .125            | 3-6, 49-52,<br>95-98          | 645235-3    |  |
| 60                          | 6.260<br>159.00 | 6.150<br>156.21 | 6.100<br>154.94 | 5.900<br>149.86 | .125            | 3-6, 55-58,<br>63-66, 115-118 | 645235-8    |  |

\*Metric equivalent for post length is .125 = [3.18].

\*\*C dimension is card slot length.

**Notes:** 1. Other connector sizes can be made available, consult Tyco Electronics.

2. High temperature IR reflow compatible connectors can be made available, consult Tyco Electronics.

**.100 [2.54] Centerline,  
Special 18/31 Dual  
Combination Connector,  
Vertical Solder Posts,  
Without Mounting Ears**

**Material and Finish:**

**Housing**—Black glass-filled polyester, 94V-0 rated, except where noted

**Contacts**—Phosphor bronze, plated with .000030 [0.00076] gold in contact area (except where noted), tin on posts, with entire contact nickel underplated

**Technical Documents:**

**Product Specification**  
108-9039

**Intercontact Keying Plug**

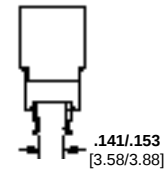
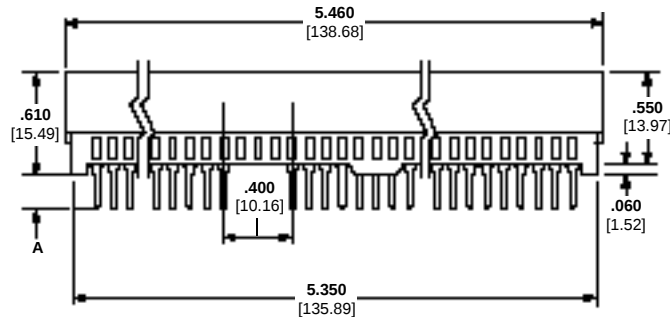
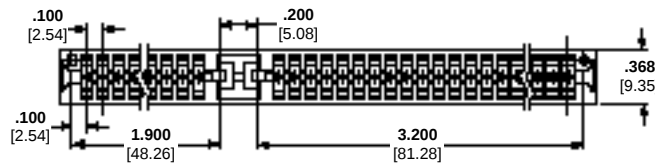
**Material:**

Natural color polyester

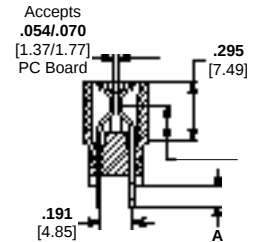


**Part Number 650025-2**  
(.100 [2.54] Centerline)

**Standard Edge II Card Edge Connectors**



**Retention Feature**



**Solder Posts**

| No. of Dual Positions | Post Type    | Dimension A  | Retention Feature               | Part Numbers                      |
|-----------------------|--------------|--------------|---------------------------------|-----------------------------------|
| 52                    | Solder Posts | .125<br>3.18 | 3-6, 41, 42,<br>51, 52, 93-96   | 645169-2<br>536128-1 <sup>1</sup> |
| 52                    | Solder Posts | .125<br>3.18 | None                            | 645169-3                          |
| 52                    | Solder Posts | .125<br>3.18 | 3-14, 41, 42,<br>51, 52, 85-96  | 645169-4                          |
| 52                    | Solder Posts | .125<br>3.18 | 5, 6, 31, 32,<br>41, 42, 93, 94 | 176139-1 <sup>2</sup>             |
| 52                    | Solder Posts | .187<br>4.75 | None                            | 650616-1                          |

<sup>1</sup> Housing material is high temperature glass-filled polyester, gray.

<sup>2</sup> Contact area is gold flash.

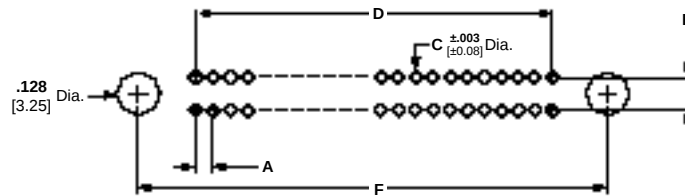
**Notes:** 1. Card slot length is 5.300 [134.62].

2. Other connector sizes can be made available, consult Tyco Electronics.

3. High temperature IR reflow compatible connectors can be made available, consult Tyco Electronics.

Recommended  
PC Board Hole Layouts

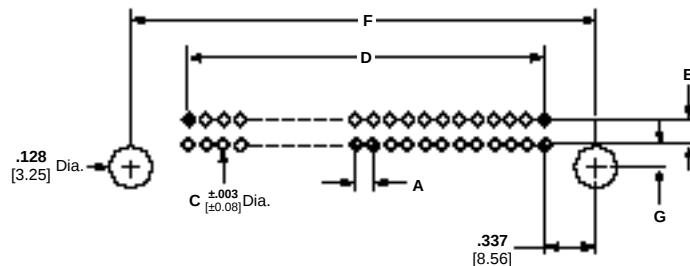
Vertical Post Connectors



| Connector Type                 | Dimensions             |                        |              |            |            |
|--------------------------------|------------------------|------------------------|--------------|------------|------------|
|                                | A                      | B                      | C            | D          | F          |
| Solder Post/Retention          | .100<br>2.54           | .200<br>5.08           | .040<br>1.02 | See Note 1 | See Note 2 |
| Solder Post/Retention          | .150<br>3.81           | .200<br>5.08           | .040<br>1.02 | See Note 4 | See Note 2 |
| Solder Post, Mounting Ears     | .125<br>3.18           | .250<br>6.35           | .040<br>1.02 | See Note 3 | See Note 3 |
| Solder Post, W/O Mounting Ears | .100/.125<br>2.54/3.18 | .200/.250<br>5.08/6.35 | .040<br>1.02 | See Note 4 | See Note 2 |
| Wrap-Type Post                 | .100<br>2.54           | .200<br>5.08           | .042<br>1.07 | See Note 5 | See Note 5 |
| Wrap-Type Post                 | .125<br>3.18           | .250<br>6.35           | .042<br>1.07 | See Note 5 | See Note 5 |

- Notes:**
1. Refer to page 24 for **D** Dimensions and Dual Positions.
  2. No mounting ears. Dimensions do not apply.
  3. Refer to page 20 for **D** and **F** Dimensions and Dual Positions.
  4. Refer to pages 18 and 19 for **D** Dimensions and Dual Positions.
  5. Refer to page 21 for **D** and **F** Dimensions and Dual Positions.

Right-Angle Post Connectors



| Connector Type                      | Dimensions   |                              |              |            |            |              |
|-------------------------------------|--------------|------------------------------|--------------|------------|------------|--------------|
|                                     | A            | B                            | C            | D          | F          | G            |
| Right-Angle Posts, Mounting Ears    | .100<br>2.54 | .150<br>3.81                 | .042<br>1.07 | See Note 1 | See Note 1 | .137<br>3.48 |
| Right-Angle Posts, No Mounting Ears | .100<br>2.54 | .150 or .200<br>3.81 or 5.08 | .042<br>1.07 | See Note 2 | See Note 3 | See Note 3   |

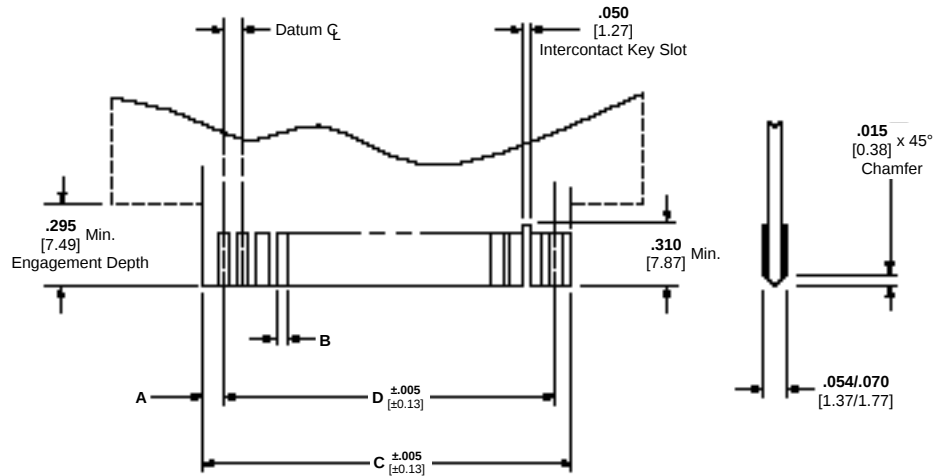
- Notes:**
1. Refer to page 23 for **D** and **F** Dimensions and Dual Positions.
  2. Refer to page 23 for **D** Dimensions and Dual Positions.
  3. No Mounting Ears, Dimensions do not apply.

**Recommended  
PC Board Edge Pattern**

Card Edge Connectors  
(Solder Type, Board-to-Board)

**Standard Edge II Connectors (Continued)**

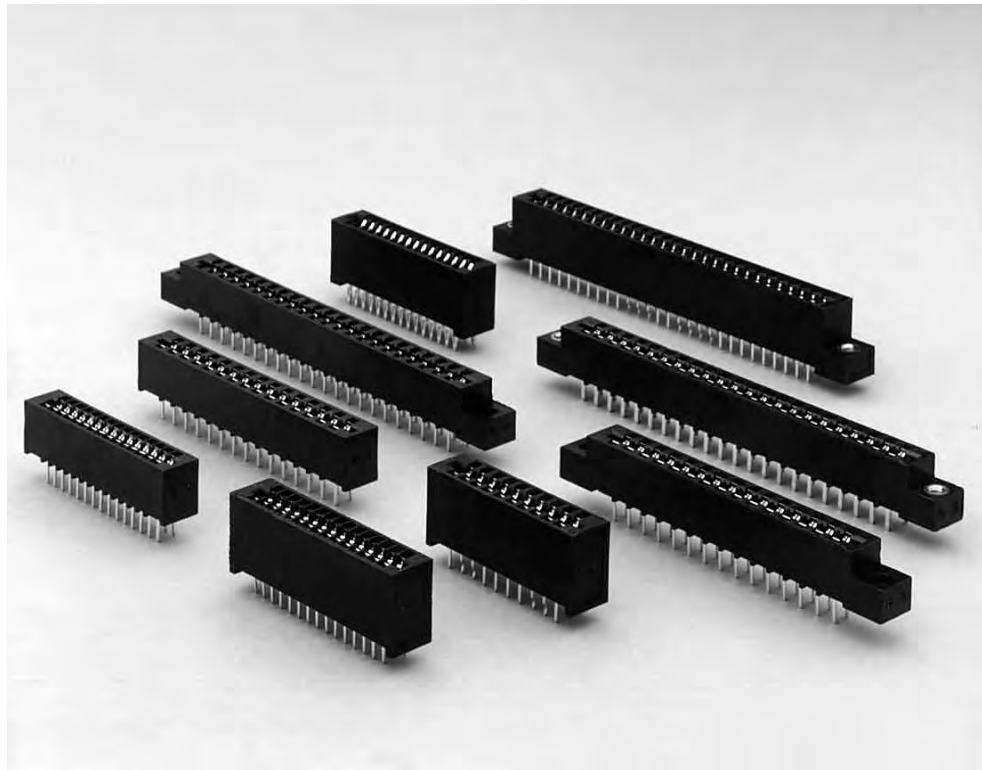
**PC Board Edge Pattern for  
.100 [2.54] and .125 [3.18]  
Centerline**



| No. of<br>Dual<br>Positions | .100 [2.54] Centerline<br>A = .093 [2.36]<br>B = .050 [1.27] |                 | .125 [3.18] Centerline<br>A = .118 [3.00]<br>B = .075 [1.90] |                 |
|-----------------------------|--------------------------------------------------------------|-----------------|--------------------------------------------------------------|-----------------|
|                             | C                                                            | D               | C                                                            | D               |
| 3                           | .386<br>9.80                                                 | .200<br>5.08    | —                                                            | —               |
| 6                           | .686<br>17.42                                                | .500<br>12.70   | .861<br>21.87                                                | .625<br>15.88   |
| 10                          | 1.086<br>27.58                                               | .900<br>22.86   | 1.361<br>34.57                                               | 1.125<br>28.58  |
| 12                          | 1.286<br>32.66                                               | 1.100<br>27.94  | —                                                            | —               |
| 13                          | 1.386<br>35.20                                               | 1.200<br>30.48  | —                                                            | —               |
| 14                          | —                                                            | —               | 1.861<br>47.27                                               | 1.625<br>41.28  |
| 15                          | 1.586<br>40.28                                               | 1.400<br>35.56  | —                                                            | —               |
| 17                          | 1.786<br>45.36                                               | 1.600<br>40.64  | —                                                            | —               |
| 18                          | 1.886<br>47.90                                               | 1.700<br>43.18  | 2.361<br>59.97                                               | 2.125<br>53.98  |
| 22                          | 2.286<br>58.06                                               | 2.100<br>53.34  | 2.861<br>72.67                                               | 2.625<br>66.68  |
| 25                          | 2.586<br>65.68                                               | 2.400<br>60.96  | —                                                            | —               |
| 28                          | 2.886<br>73.30                                               | 2.700<br>68.58  | 3.611<br>91.72                                               | 3.375<br>85.73  |
| 30                          | 3.086<br>78.38                                               | 2.900<br>73.66  | 3.861<br>98.07                                               | 3.625<br>92.08  |
| 31                          | 3.186<br>80.92                                               | 3.000<br>76.20  | 3.986<br>101.24                                              | 3.750<br>95.25  |
| 35                          | 3.586<br>91.08                                               | 3.400<br>86.36  | —                                                            | —               |
| 36                          | 3.686<br>93.62                                               | 3.500<br>88.90  | 4.611<br>117.12                                              | 4.375<br>111.13 |
| 40                          | 4.086<br>103.78                                              | 3.900<br>99.06  | 5.111<br>129.82                                              | 4.875<br>123.82 |
| 43                          | 4.386<br>111.40                                              | 4.200<br>106.68 | 5.486<br>139.34                                              | 5.250<br>133.35 |
| 50                          | 5.086<br>129.18                                              | 4.900<br>124.46 | 6.361<br>161.57                                              | 6.125<br>155.58 |
| 60                          | 6.086<br>154.58                                              | 5.900<br>149.86 | —                                                            | —               |
| 70                          | 7.086<br>179.98                                              | 6.900<br>175.26 | —                                                            | —               |

**Product Facts**

- Double readout Card Edge connectors use dip solder contacts
- Large lead-in chamfers allow easy PC board installation
- Insulator standoffs prevent solder from wicking
- Various lengths for custom applications
- Contact option, single or dual row

**Cantilever Series Card Edge Connectors**

**Description**

The Cantilever Beam Series products from Tyco Electronics are double readout cardedge connectors, using dip solder contacts. Tooled for flexible manufacturing, these Card Edge connectors are readily available in a broad assortment of sizes and mounting styles. Our connectors meet industry standards.

**Design Advantages**

- **Circuit Integrity:** Robust cantilever contacts are designed to promote optimal normal forces at the lowest possible cost. Our uniquely contoured contact mating surface gives you constant engagement, even when subjected to continuous vibration.
- **Ease of Assembly:** Generous lead-in chamfers let your P.C. board slide easily into the connector. Insulator standoffs are provided to facilitate cleaning and prevent solder from wicking.

Availability, flexibility, performance and very low cost make the Cantilever Series from Tyco Electronics the clear choice in Card Edge connectors.

**Cantilever Beam**

The Cantilever Beam Card Edge connector comes with standard high temperature plastic insulators. Contacts are available in a variety of lengths to accommodate various custom applications. Standoffs allow for cleaning and draining and are available as an option on most insulator bodies.

Cantilever Beam Card Edge offers a variety of card slot depths. A full scoop option is available for ease of installation in applications where visibility is limited.

Contact options vary in this series from dual row standard contacts, single row options and press-fit.

## Product Facts

- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E60980 
- Certified by Canadian Standards Association, File No. LR49571 

## Physical Properties:

**Insulation Resistance**—5000 megohms minimum.

**Insertion/Withdrawal Force (Daughter Card)**—8 oz./2 oz. [35.6 N/ 8.9 N] average contact pair using .0620 [1.57] steel blade.

**Insulator Body**—Glass filled thermoplastic, UL rating 94V-0. High temp. plastic option is available; add suffix M399 to part number.

**Color**—Black

**Contacts**—High strength copper alloy.

**Contact Plating**—.000050 [0.00127] nickel underplate with .000030 [0.00076] gold in the mating area, tin/lead on tails, .000100 [0.00254] minimum

## Electrical Properties:

**Operation Voltage**—600 VDC (sea level)

**Current Rating**—3 Amperes

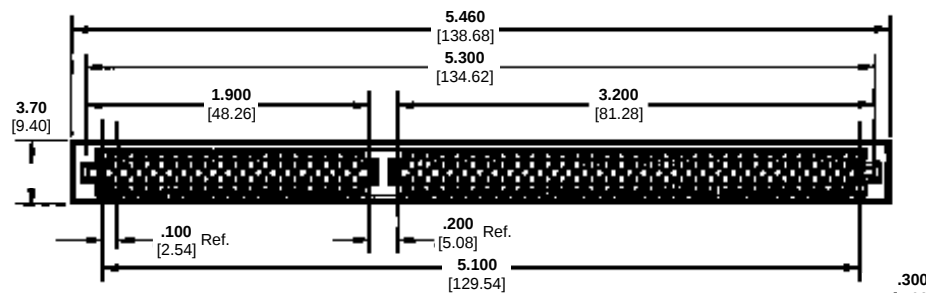
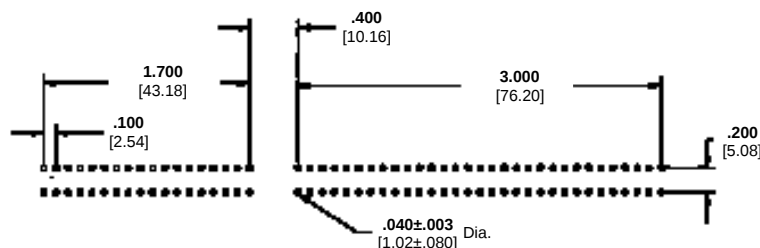
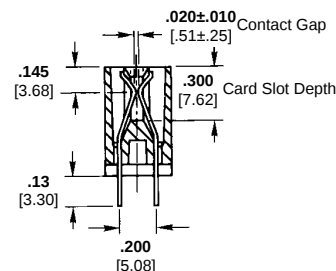
**Initial Contact Resistance**—10 milliohms

## Environmental Properties:

**Operating Temperature**—-55°C to +125°C

**Temperature Cycling**—MIL-STD-202 method 107

## Cantilever Series Connectors .100 x .200 [2.54 x 5.08] Centerline



## Ordering Information

### Acquired Part Number

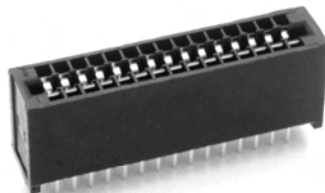
**C8D52DS29C1M191** — Insulator with molded-in polarizing key with card guide chamber. The card slot lengths are 1.900 [48.26] and 3.200 [81.28]. Includes retention tails for .062 [1.57] PCB to hold connectors securely during handling.

**C8D52DS29C1M195** — Same as above. No retention tails.

**Cantilever Series Connectors .100 x .200 [2.54 x 5.08] Centerline  
Dip Solder Tails, .300 [7.62] Card Slot Depth**

**Product Facts**

- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E60980
- Certified by Canadian Standards Association, File No. LR49571



**Physical Properties:**

**Insulation Resistance**—5000 megohms minimum.

**Insertion/Withdrawal Force (Daughter Card)**—8 oz./2 oz. [35.6 N/ 8.9 N] average contact pair using .0620 [1.57] steel blade.

**Insulator Body**—Glass filled thermoplastic, UL rating 94V-0. High temp. plastic option is available; add suffix M399 to part number.

**Color**—Black

**Contacts**—High strength copper alloy.

**Contact Plating**—.000050 [0.00127] nickel underplate with .000030 [0.00076] gold in the mating area, tin/lead on tails, .000100 [0.00254] minimum

**Electrical Properties:**

**Operation Voltage**—600 VDC (sea level)

**Current Rating**—3 Amperes

**Initial Contact Resistance**—10 milliohms

**Environmental Properties:**

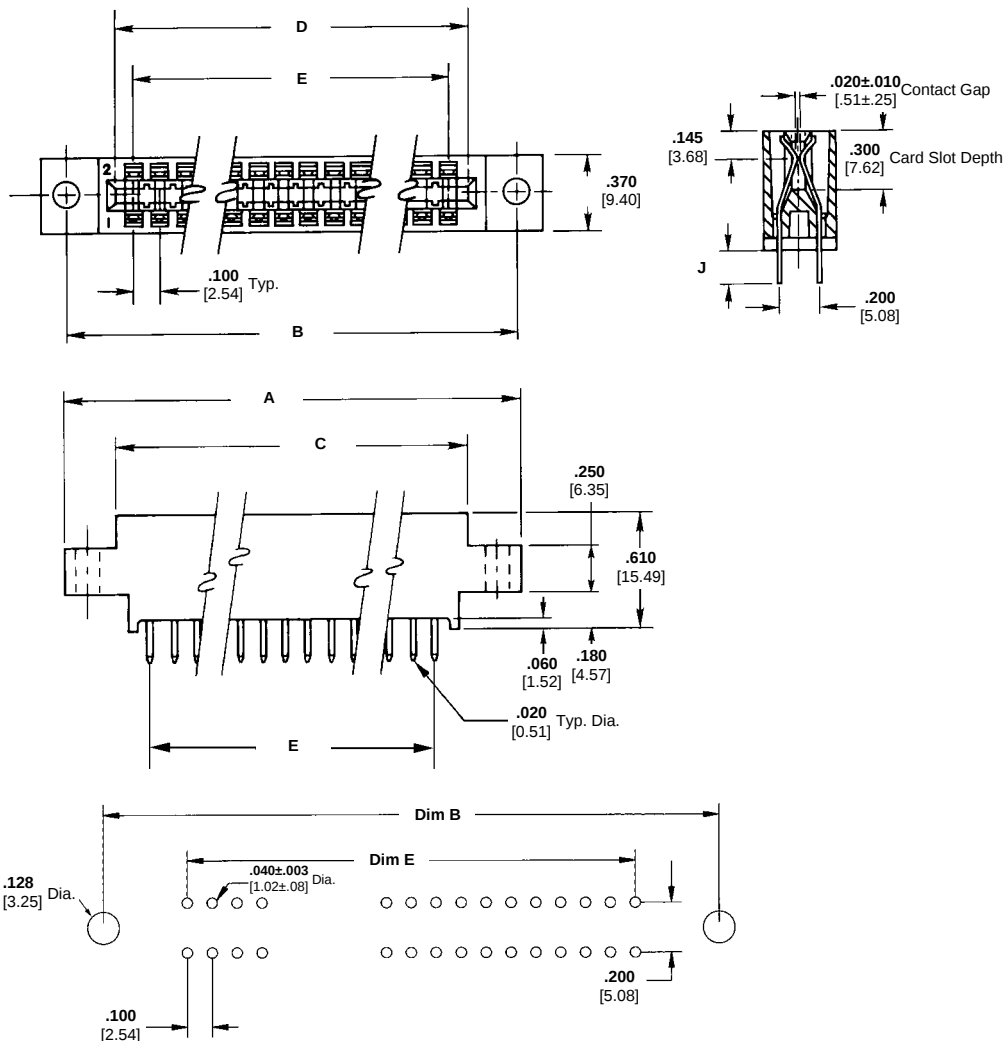
**Operating Temperature**—-55°C to +125°C

**Temperature Cycling**—MIL-STD-202 method 107

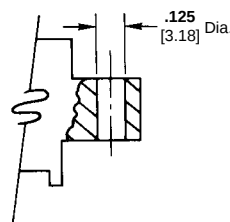
**Vibration**—MIL-STD-202 method 204

**Related Product Data:**

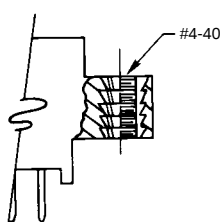
**Daughter Card Edge Pattern**—page 57



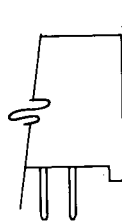
**Mounting Styles**



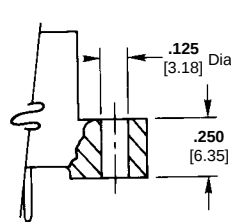
**Centered Mounting Ear**  
.125 [3.18] Thru Hole



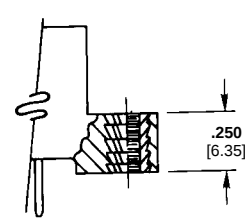
**Centered Mounting Ear**  
4-40 Threaded Insert



**No Mounting Ears**



**Flush Mounting Ear**  
.125 [3.18] Thru Hole



**Flush Mounting Ear**  
4-40 Threaded Insert

Ordering Information

.100" [2.54] Centerline / .200" [5.08] Row-to-Row

| No. of<br>Dual<br>Readout<br>Positions    | Dimensions      |                 |                 |                 |                 | Mounting Ear Options                                  |                                                     |                        |                                                    |                                                  |
|-------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------------------------------------------|-----------------------------------------------------|------------------------|----------------------------------------------------|--------------------------------------------------|
|                                           | A               | B               | C               | D               | E               | Centered<br>Mounting Ear<br>.125" [3.18]<br>Thru Hole | Centered<br>Mounting Ear<br>4-40 Threaded<br>insert | No<br>Mounting<br>Ears | Flush<br>Mounting Ear<br>.125" [3.18]<br>Thru Hole | Flush<br>Mounting Ear<br>4-40 Threaded<br>insert |
| <b>Tail Length .130" [3.30] (DIM "J")</b> |                 |                 |                 |                 |                 |                                                       |                                                     |                        |                                                    |                                                  |
| 6                                         | 1.435<br>36.45  | 1.175<br>29.85  | 0.860<br>21.84  | 0.700<br>17.78  | 0.500<br>12.70  | C8D06DS29A1                                           | C8D06DS29B1                                         | C8D06DS29C1            | C8D06DS29D1                                        | C8D06DS29E1                                      |
| 10                                        | 1.835<br>46.61  | 1.575<br>40.01  | 1.260<br>32.00  | 1.100<br>27.94  | 0.900<br>22.86  | C8D10DS29A1                                           | C8D10DS29B1                                         | C8D10DS29C1            | C8D10DS29D1                                        | C8D10DS29E1                                      |
| 12                                        | 2.035<br>51.69  | 1.775<br>45.09  | 1.460<br>37.08  | 1.300<br>33.02  | 1.100<br>27.94  | C8D12DS29A1                                           | C8D12DS29B1                                         | C8D12DS29C1            | C8D12DS29D1                                        | C8D12DS29E1                                      |
| 15                                        | 2.335<br>59.31  | 2.075<br>52.71  | 1.760<br>44.70  | 1.600<br>40.64  | 1.400<br>35.56  | C8D15DS29A1                                           | C8D15DS29B1                                         | C8D15DS29C1            | C8D15DS29D1                                        | C8D15DS29E1                                      |
| 18                                        | 2.635<br>66.93  | 2.375<br>60.33  | 2.060<br>52.32  | 1.900<br>48.26  | 1.700<br>43.18  | C8D18DS29A1                                           | C8D18DS29B1                                         | C8D18DS29C1            | C8D18DS29D1                                        | C8D18DS29E1                                      |
| 20                                        | 2.835<br>72.01  | 2.575<br>65.41  | 2.260<br>57.40  | 2.100<br>53.34  | 1.900<br>48.26  | C8D20DS29A1                                           | C8D20DS29B1                                         | C8D20DS29C1            | C8D20DS29D1                                        | C8D20DS29E1                                      |
| 22                                        | 3.035<br>77.09  | 2.775<br>70.49  | 2.460<br>62.48  | 2.300<br>58.42  | 2.100<br>53.34  | C8D22DS29A1                                           | C8D22DS29B1                                         | C8D22DS29C1            | C8D22DS29D1                                        | C8D22DS29E1                                      |
| 25                                        | 3.335<br>84.71  | 3.075<br>78.11  | 2.760<br>70.10  | 2.600<br>66.04  | 2.400<br>60.96  | C8D25DS29A1                                           | C8D25DS29B1                                         | C8D25DS29C1            | C8D25DS29D1                                        | C8D25DS29E1                                      |
| 28                                        | 3.635<br>92.33  | 3.375<br>85.73  | 3.060<br>77.72  | 2.900<br>73.66  | 2.700<br>68.58  | C8D28DS29A1                                           | C8D28DS29B1                                         | C8D28DS29C1            | C8D28DS29D1                                        | C8D28DS29E1                                      |
| 30                                        | 3.835<br>97.41  | 3.575<br>90.81  | 3.260<br>82.80  | 3.100<br>78.74  | 2.900<br>73.66  | C8D30DS29A1                                           | C8D30DS29B1                                         | C8D30DS29C1            | C8D30DS29D1                                        | C8D30DS29E1                                      |
| 31                                        | 3.935<br>99.95  | 3.675<br>93.35  | 3.360<br>85.34  | 3.200<br>81.28  | 3.000<br>76.20  | C8D31DS29A1                                           | C8D31DS29B1                                         | C8D31DS29C1            | C8D31DS29D1                                        | C8D31DS29E1                                      |
| 35                                        | 4.335<br>110.11 | 4.075<br>103.51 | 3.760<br>95.50  | 3.600<br>91.44  | 3.400<br>86.36  | C8D35DS29A1                                           | C8D35DS29B1                                         | C8D35DS29C1            | C8D35DS29D1                                        | C8D35DS29E1                                      |
| 36                                        | 4.435<br>112.65 | 4.175<br>106.05 | 3.860<br>98.04  | 3.700<br>93.98  | 3.500<br>88.90  | C8D36DS29A1                                           | C8D36DS29B1                                         | C8D36DS29C1            | C8D36DS29D1                                        | C8D36DS29E1                                      |
| 40                                        | 4.835<br>122.81 | 4.575<br>116.21 | 4.260<br>108.20 | 4.100<br>104.14 | 3.900<br>99.06  | C8D40DS29A1                                           | C8D40DS29B1                                         | C8D40DS29C1            | C8D40DS29D1                                        | C8D40DS29E1                                      |
| 43                                        | 5.135<br>130.43 | 4.875<br>123.83 | 4.560<br>115.82 | 4.400<br>111.76 | 4.200<br>106.68 | C8D43DS29A1                                           | C8D43DS29B1                                         | C8D43DS29C1            | C8D43DS29D1                                        | C8D43DS29E1                                      |
| 50                                        | 5.835<br>148.21 | 5.575<br>141.61 | 5.260<br>133.60 | 5.100<br>129.54 | 4.900<br>124.46 | C8D50DS29A1                                           | C8D50DS29B1                                         | C8D50DS29C1            | C8D50DS29D1                                        | C8D50DS29E1                                      |
| 60                                        | 6.835<br>173.61 | 6.575<br>167.01 | 6.260<br>159.00 | 6.100<br>154.94 | 5.900<br>149.86 | C8D60DS29A1                                           | C8D60DS29B1                                         | C8D60DS29C1            | C8D60DS29D1                                        | C8D60DS29E1                                      |
| <b>Tail Length .160" [4.06] (DIM "J")</b> |                 |                 |                 |                 |                 |                                                       |                                                     |                        |                                                    |                                                  |
| 6                                         | 1.435<br>36.45  | 1.175<br>29.85  | 0.860<br>21.84  | 0.700<br>17.78  | 0.500<br>12.70  | C8D06DS29A2                                           | C8D06DS29B2                                         | C8D06DS29C2            | C8D06DS29D2                                        | C8D06DS29E2                                      |
| 10                                        | 1.835<br>46.61  | 1.575<br>40.01  | 1.260<br>32.00  | 1.100<br>27.94  | 0.900<br>22.86  | C8D10DS29A2                                           | C8D10DS29B2                                         | C8D10DS29C2            | C8D10DS29D2                                        | C8D10DS29E2                                      |
| 12                                        | 2.035<br>51.69  | 1.775<br>45.09  | 1.460<br>37.08  | 1.300<br>33.02  | 1.100<br>27.94  | C8D12DS29A2                                           | C8D12DS29B2                                         | C8D12DS29C2            | C8D12DS29D2                                        | C8D12DS29E2                                      |
| 15                                        | 2.335<br>59.31  | 2.075<br>52.71  | 1.760<br>44.70  | 1.600<br>40.64  | 1.400<br>35.56  | C8D15DS29A2                                           | C8D15DS29B2                                         | C8D15DS29C2            | C8D15DS29D2                                        | C8D15DS29E2                                      |
| 18                                        | 2.635<br>66.93  | 2.375<br>60.33  | 2.060<br>52.32  | 1.900<br>48.26  | 1.700<br>43.18  | C8D18DS29A2                                           | C8D18DS29B2                                         | C8D18DS29C2            | C8D18DS29D2                                        | C8D18DS29E2                                      |
| 20                                        | 2.835<br>72.01  | 2.575<br>65.41  | 2.260<br>57.40  | 2.100<br>53.34  | 1.900<br>48.26  | C8D20DS29A2                                           | C8D20DS29B2                                         | C8D20DS29C2            | C8D20DS29D2                                        | C8D20DS29E2                                      |
| 22                                        | 3.035<br>77.09  | 2.775<br>70.49  | 2.460<br>62.48  | 2.300<br>58.42  | 2.100<br>53.34  | C8D22DS29A2                                           | C8D22DS29B2                                         | C8D22DS29C2            | C8D22DS29D2                                        | C8D22DS29E2                                      |
| 25                                        | 3.335<br>84.71  | 3.075<br>78.11  | 2.760<br>70.10  | 2.600<br>66.04  | 2.400<br>60.96  | C8D25DS29A2                                           | C8D25DS29B2                                         | C8D25DS29C2            | C8D25DS29D2                                        | C8D25DS29E2                                      |
| 28                                        | 3.635<br>92.33  | 3.375<br>85.73  | 3.060<br>77.72  | 2.900<br>73.66  | 2.700<br>68.58  | C8D28DS29A2                                           | C8D28DS29B2                                         | C8D28DS29C2            | C8D28DS29D2                                        | C8D28DS29E2                                      |
| 30                                        | 3.835<br>97.41  | 3.575<br>90.81  | 3.260<br>82.80  | 3.100<br>78.74  | 2.900<br>73.66  | C8D30DS29A2                                           | C8D30DS29B2                                         | C8D30DS29C2            | C8D30DS29D2                                        | C8D30DS29E2                                      |
| 31                                        | 3.935<br>99.95  | 3.675<br>93.35  | 3.360<br>85.34  | 3.200<br>81.28  | 3.000<br>76.20  | C8D31DS29A2                                           | C8D31DS29B2                                         | C8D31DS29C2            | C8D31DS29D2                                        | C8D31DS29E2                                      |
| 35                                        | 4.335<br>110.11 | 4.075<br>103.51 | 3.760<br>95.50  | 3.600<br>91.44  | 3.400<br>86.36  | C8D35DS29A2                                           | C8D35DS29B2                                         | C8D35DS29C2            | C8D35DS29D2                                        | C8D35DS29E2                                      |
| 36                                        | 4.435<br>112.65 | 4.175<br>106.05 | 3.860<br>98.04  | 3.700<br>93.98  | 3.500<br>88.90  | C8D36DS29A2                                           | C8D36DS29B2                                         | C8D36DS29C2            | C8D36DS29D2                                        | C8D36DS29E2                                      |
| 40                                        | 4.835<br>122.81 | 4.575<br>116.21 | 4.260<br>108.20 | 4.100<br>104.14 | 3.900<br>99.06  | C8D40DS29A2                                           | C8D40DS29B2                                         | C8D40DS29C2            | C8D40DS29D2                                        | C8D40DS29E2                                      |
| 43                                        | 5.135<br>130.43 | 4.875<br>123.83 | 4.560<br>115.82 | 4.400<br>111.76 | 4.200<br>106.68 | C8D43DS29A2                                           | C8D43DS29B2                                         | C8D43DS29C2            | C8D43DS29D2                                        | C8D43DS29E2                                      |

Ordering Information

.100" [2.54] Centerline / .200" [5.08] Row-to-Row

| No. of<br>Dual<br>Readout<br>Positions                | Dimensions      |                 |                 |                 |                 | Mounting Ear Options                                  |                                                     |                        |                                                    |                                                  |
|-------------------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------------------------------------------|-----------------------------------------------------|------------------------|----------------------------------------------------|--------------------------------------------------|
|                                                       | A               | B               | C               | D               | E               | Centered<br>Mounting Ear<br>.125" [3.18]<br>Thru Hole | Centered<br>Mounting Ear<br>4-40 Threaded<br>insert | No<br>Mounting<br>Ears | Flush<br>Mounting Ear<br>.125" [3.18]<br>Thru Hole | Flush<br>Mounting Ear<br>4-40 Threaded<br>insert |
| <b>Tail Length .160" [4.06] (DIM "J") (Continued)</b> |                 |                 |                 |                 |                 |                                                       |                                                     |                        |                                                    |                                                  |
| 50                                                    | 5.835<br>148.21 | 5.575<br>141.61 | 5.260<br>133.60 | 5.100<br>129.54 | 4.900<br>124.46 | C8D50DS29A2                                           | C8D50DS29B2                                         | C8D50DS29C2            | C8D50DS29D2                                        | C8D50DS29E2                                      |
| 60                                                    | 6.835<br>173.61 | 6.575<br>167.01 | 6.260<br>159.00 | 6.100<br>154.94 | 5.900<br>149.86 | C8D60DS29A2                                           | C8D60DS29B2                                         | C8D60DS29C2            | C8D60DS29D2                                        | C8D60DS29E2                                      |
| <b>Tail Length .220" [5.59] (DIM "J")</b>             |                 |                 |                 |                 |                 |                                                       |                                                     |                        |                                                    |                                                  |
| 6                                                     | 1.435<br>36.45  | 1.175<br>29.85  | 0.860<br>21.84  | 0.700<br>17.78  | 0.500<br>12.70  | C8D06DS29A3                                           | C8D06DS29B3                                         | C8D06DS29C3            | C8D06DS29D3                                        | C8D06DS29E3                                      |
| 10                                                    | 1.835<br>46.61  | 1.575<br>40.01  | 1.260<br>32.00  | 1.100<br>27.94  | 0.900<br>22.86  | C8D10DS29A3                                           | C8D10DS29B3                                         | C8D10DS29C3            | C8D10DS29D3                                        | C8D10DS29E3                                      |
| 12                                                    | 2.035<br>51.69  | 1.775<br>45.09  | 1.460<br>37.08  | 1.300<br>33.02  | 1.100<br>27.94  | C8D12DS29A3                                           | C8D12DS29B3                                         | C8D12DS29C3            | C8D12DS29D3                                        | C8D12DS29E3                                      |
| 15                                                    | 2.335<br>59.31  | 2.075<br>52.71  | 1.760<br>44.70  | 1.600<br>40.64  | 1.400<br>35.56  | C8D15DS29A3                                           | C8D15DS29B3                                         | C8D15DS29C3            | C8D15DS29D3                                        | C8D15DS29E3                                      |
| 18                                                    | 2.635<br>66.93  | 2.375<br>60.33  | 2.060<br>52.32  | 1.900<br>48.26  | 1.700<br>43.18  | C8D18DS29A3                                           | C8D18DS29B3                                         | C8D18DS29C3            | C8D18DS29D3                                        | C8D18DS29E3                                      |
| 20                                                    | 2.835<br>72.01  | 2.575<br>65.41  | 2.260<br>57.40  | 2.100<br>53.34  | 1.900<br>48.26  | C8D20DS29A3                                           | C8D20DS29B3                                         | C8D20DS29C3            | C8D20DS29D3                                        | C8D20DS29E3                                      |
| 22                                                    | 3.035<br>77.09  | 2.775<br>70.49  | 2.460<br>62.48  | 2.300<br>58.42  | 2.100<br>53.34  | C8D22DS29A3                                           | C8D22DS29B3                                         | C8D22DS29C3            | C8D22DS29D3                                        | C8D22DS29E3                                      |
| 25                                                    | 3.335<br>84.71  | 3.075<br>78.11  | 2.760<br>70.10  | 2.600<br>66.04  | 2.400<br>60.96  | C8D25DS29A3                                           | C8D25DS29B3                                         | C8D25DS29C3            | C8D25DS29D3                                        | C8D25DS29E3                                      |
| 28                                                    | 3.635<br>92.33  | 3.375<br>85.73  | 3.060<br>77.72  | 2.900<br>73.66  | 2.700<br>68.58  | C8D28DS29A3                                           | C8D28DS29B3                                         | C8D28DS29C3            | C8D28DS29D3                                        | C8D28DS29E3                                      |
| 30                                                    | 3.835<br>97.41  | 3.575<br>90.81  | 3.260<br>82.80  | 3.100<br>78.74  | 2.900<br>73.66  | C8D30DS29A3                                           | C8D30DS29B3                                         | C8D30DS29C3            | C8D30DS29D3                                        | C8D30DS29E3                                      |
| 31                                                    | 3.935<br>99.95  | 3.675<br>93.35  | 3.360<br>85.34  | 3.200<br>81.28  | 3.000<br>76.20  | C8D31DS29A3                                           | C8D31DS29B3                                         | C8D31DS29C3            | C8D31DS29D3                                        | C8D31DS29E3                                      |
| 35                                                    | 4.335<br>110.11 | 4.075<br>103.51 | 3.760<br>95.50  | 3.600<br>91.44  | 3.400<br>86.36  | C8D35DS29A3                                           | C8D35DS29B3                                         | C8D35DS29C3            | C8D35DS29D3                                        | C8D35DS29E3                                      |
| 36                                                    | 4.435<br>112.65 | 4.175<br>106.05 | 3.860<br>98.04  | 3.700<br>93.98  | 3.500<br>88.90  | C8D36DS29A3                                           | C8D36DS29B3                                         | C8D36DS29C3            | C8D36DS29D3                                        | C8D36DS29E3                                      |
| 40                                                    | 4.835<br>122.81 | 4.575<br>116.21 | 4.260<br>108.20 | 4.100<br>104.14 | 3.900<br>99.06  | C8D40DS29A3                                           | C8D40DS29B3                                         | C8D40DS29C3            | C8D40DS29D3                                        | C8D40DS29E3                                      |
| 43                                                    | 5.135<br>130.43 | 4.875<br>123.83 | 4.560<br>115.82 | 4.400<br>111.76 | 4.200<br>106.68 | C8D43DS29A3                                           | C8D43DS29B3                                         | C8D43DS29C3            | C8D43DS29D3                                        | C8D43DS29E3                                      |
| 50                                                    | 5.835<br>148.21 | 5.575<br>141.61 | 5.260<br>133.60 | 5.100<br>129.54 | 4.900<br>124.46 | C8D50DS29A3                                           | C8D50DS29B3                                         | C8D50DS29C3            | C8D50DS29D3                                        | C8D50DS29E3                                      |
| 60                                                    | 6.835<br>173.61 | 6.575<br>167.01 | 6.260<br>159.00 | 6.100<br>154.94 | 5.900<br>149.86 | C8D60DS29A3                                           | C8D60DS29B3                                         | C8D60DS29C3            | C8D60DS29D3                                        | C8D60DS29E3                                      |

**Product Facts**

- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E60980 
- Certified by Canadian Standards Association, File No. LR49571 

**Physical Properties:**

**Insulation Resistance**—5000 megohms minimum.

**Insertion/Withdrawal Force (Daughter Card)**—8 oz./2 oz. [35.6 N/ 8.9 N] average contact pair using .0620 [1.57] steel blade.

**Insulator Body**—Glass filled thermoplastic, UL rating 94V-0. High temp. plastic option is available; add suffix M399 to part number.

**Color**—Black

**Contacts**—High strength copper alloy.

**Contact Plating**—.000050 [0.00127] nickel underplate with .000030 [0.00076] gold in the mating area, tin/lead on tails, .000100 [0.00254] minimum

**Electrical Properties:**

**Operation Voltage**—600 VDC (sea level)

**Current Rating**—3 Amperes

**Initial Contact Resistance**—10 milliohms

**Environmental Properties:**

**Operating Temperature**—-55°C to +125°C

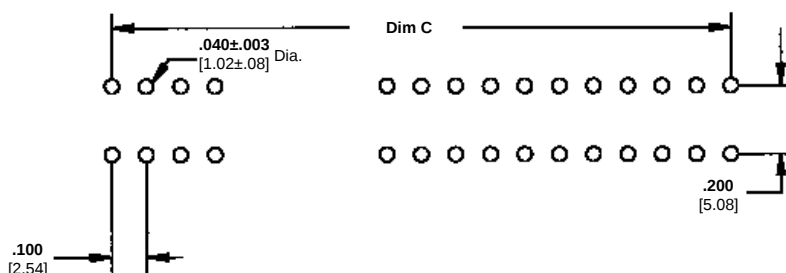
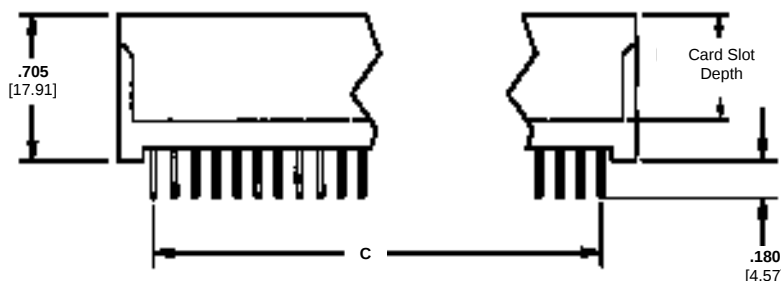
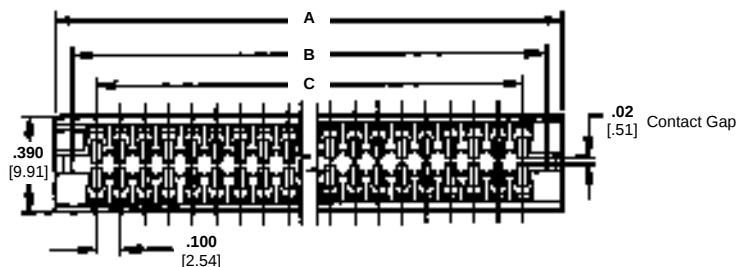
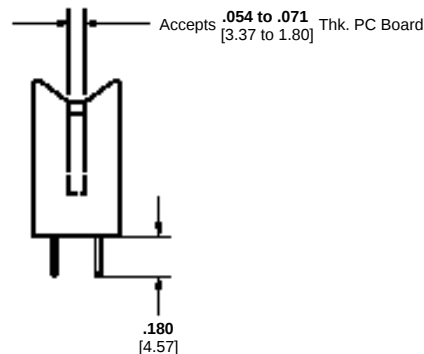
**Temperature Cycling**—MIL-STD-202 method 107

**Vibration**—MIL-STD-202 method 204

**Related Product Data**

**Daughter Card Edge Pattern**—page 57

**Cantilever Series Connectors 100 x .200 [2.54 x 5.08], .510 [12.95] and .395 [10.03] Card Slot Depth, Full Scoop**



**Ordering Information**

.100" [2.54] Centerline / .200" [5.08] Row-to-Row Full Scoop

| No. of Dual<br>Readout Pos.   | Dimensions      |                 |                 | Acquired Part<br>Number |
|-------------------------------|-----------------|-----------------|-----------------|-------------------------|
|                               | A               | B               | C               |                         |
| .510" [12.95] Card Slot Depth |                 |                 |                 |                         |
| 18                            | 2.034<br>51.66  | 1.904<br>48.36  | 1.700<br>43.18  | W8D18DS29063            |
| 20                            | 2.234<br>56.74  | 2.104<br>53.44  | 1.900<br>48.26  | W8D20DS29063            |
| 22                            | 2.434<br>61.82  | 2.304<br>58.52  | 2.100<br>53.34  | W8D22DS29063            |
| 25                            | 2.734<br>69.44  | 2.604<br>66.14  | 2.400<br>60.96  | W8D25DS29063            |
| 28                            | 3.034<br>77.06  | 2.904<br>73.76  | 2.700<br>68.58  | W8D28DS29063            |
| 30                            | 3.234<br>82.14  | 3.104<br>78.84  | 2.900<br>73.66  | W8D30DS29063            |
| 35                            | 3.734<br>94.84  | 3.604<br>91.54  | 3.400<br>86.36  | W8D35DS29063            |
| 36                            | 3.834<br>97.38  | 3.704<br>94.08  | 3.500<br>88.90  | W8D36DS29063            |
| 40                            | 4.234<br>107.54 | 4.104<br>104.24 | 3.900<br>99.06  | W8D40DS29063            |
| 43                            | 4.534<br>115.16 | 4.404<br>111.86 | 4.200<br>106.68 | W8D43DS29063            |
| 45                            | 4.734<br>120.24 | 4.604<br>116.94 | 4.400<br>111.76 | W8D45DS29063            |
| 50                            | 5.234<br>132.94 | 5.104<br>129.64 | 4.900<br>124.46 | W8D50DS29063            |
| 60                            | 6.234<br>158.34 | 6.104<br>155.04 | 5.900<br>149.86 | W8D60DS29063            |
| .395" [10.03] Card Slot Depth |                 |                 |                 |                         |
| 18                            | 2.034<br>51.66  | 1.904<br>48.36  | 1.700<br>43.18  | W8D18DS29093            |
| 20                            | 2.234<br>56.74  | 2.104<br>53.44  | 1.900<br>48.26  | W8D20DS29093            |
| 22                            | 2.434<br>61.82  | 2.304<br>58.52  | 2.100<br>53.34  | W8D22DS29093            |
| 25                            | 2.734<br>69.44  | 2.604<br>66.14  | 2.400<br>60.96  | W8D25DS29093            |
| 28                            | 3.034<br>77.06  | 2.904<br>73.76  | 2.700<br>68.58  | W8D28DS29093            |
| 30                            | 3.234<br>82.14  | 3.104<br>78.84  | 2.900<br>73.66  | W8D30DS29093            |
| 35                            | 3.734<br>94.84  | 3.604<br>91.54  | 3.400<br>86.36  | W8D35DS29093            |
| 36                            | 3.834<br>97.38  | 3.704<br>94.08  | 3.500<br>88.90  | W8D36DS29093            |
| 40                            | 4.234<br>107.54 | 4.104<br>104.24 | 3.900<br>99.06  | W8D40DS29093            |
| 43                            | 4.534<br>115.16 | 4.404<br>111.86 | 4.200<br>106.68 | W8D43DS29093            |
| 45                            | 4.734<br>120.24 | 4.604<br>116.94 | 4.400<br>111.76 | W8D45DS29093            |
| 50                            | 5.234<br>132.94 | 5.104<br>129.64 | 4.900<br>124.46 | W8D50DS29093            |
| 60                            | 6.234<br>158.34 | 6.104<br>155.04 | 5.900<br>149.86 | W8D60DS29093            |

**Product Facts**

- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E60980 
- Certified by Canadian Standards Association, File No. LR49571 

**Physical Properties:**

**Insulation Resistance**—5000 megohms minimum.

**Insertion/Withdrawal Force (Daughter Card)**—8 oz./2 oz. [35.6 N/ 8.9 N] average contact pair using .0620 [1.57] steel blade.

**Insulator Body**—Glass filled thermoplastic, UL rating 94V-0. High temp. plastic option is available; add suffix M399 to part number.

**Color**—Black

**Contacts**—High strength copper alloy.

**Contact Plating**—.000050 [0.00127] nickel underplate with .000030 [0.00076] gold in the mating area, tin/lead on tails, .000100 [0.00254] minimum

**Electrical Properties:**

**Operation Voltage**—1000 VDC (sea level)

**Current Rating**—3 Amperes

**Initial Contact Resistance**—10 milliohms

**Environmental Properties:**

**Operating Temperature**—-55°C to +125°C

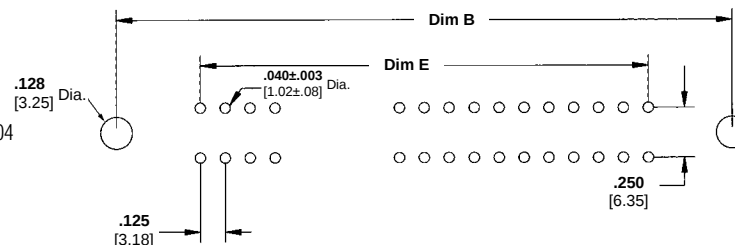
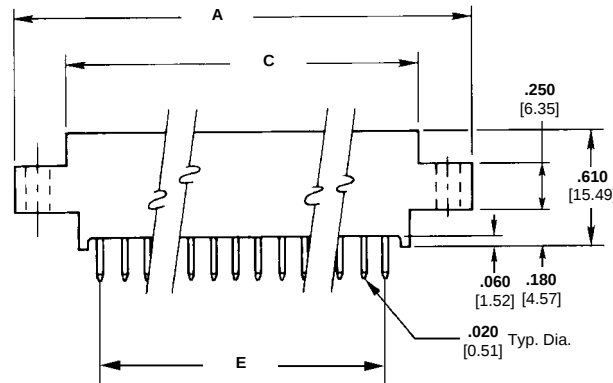
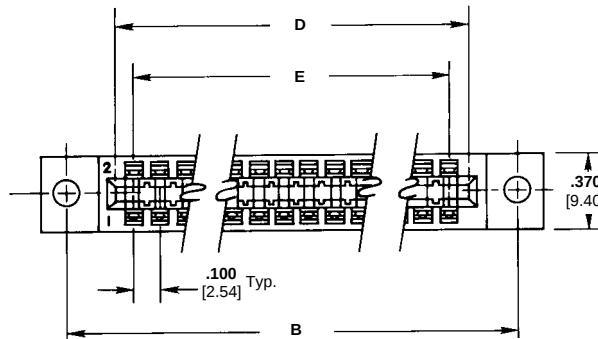
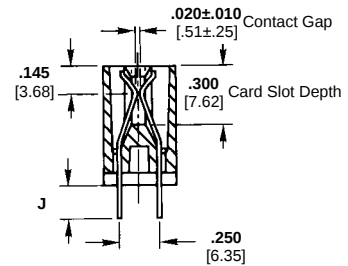
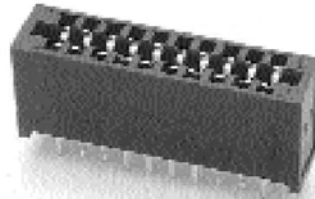
**Temperature Cycling**—MIL-STD-202 method 107

**Vibration**—MIL-STD-202 method 204

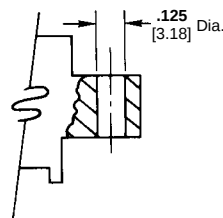
**Related Product Data:**

**Daughter Card Edge Pattern**—page 57

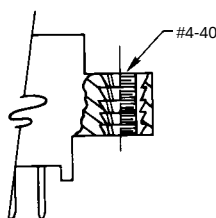
**Cantilever Series Connectors .125 x .250 [3.18 x 6.35] Centerline, Dip Solder Tails, .300 [7.62] Card Slot Depth**



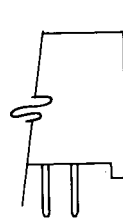
**Mounting Styles**



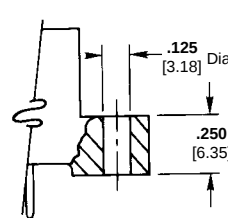
**Centered Mounting Ear**  
.125 [3.18] Thru Hole



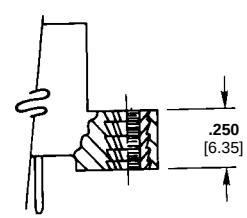
**Centered Mounting Ear**  
4-40 Threaded Insert



**No Mounting Ears**



**Flush Mounting Ear**  
.125 [3.18] Thru Hole



**Flush Mounting Ear**  
4-40 Threaded Insert

.125" [3.18] Centerline / .250" [6.35] Row-to-Row

| No. of<br>Dual<br>Readout<br>Positions    | Dimensions      |                 |                 |                 |                 | Mounting Ear Options                                  |                                                     |                        |                                                    |                                                  |
|-------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------------------------------------------|-----------------------------------------------------|------------------------|----------------------------------------------------|--------------------------------------------------|
|                                           | A               | B               | C               | D               | E               | Centered<br>Mounting Ear<br>.125" [3.18]<br>Thru Hole | Centered<br>Mounting Ear<br>4-40 Threaded<br>insert | No<br>Mounting<br>Ears | Flush<br>Mounting Ear<br>.125" [3.18]<br>Thru Hole | Flush<br>Mounting Ear<br>4-40 Threaded<br>insert |
| <b>Tail Length .130 [3.30] (DIM. "J")</b> |                 |                 |                 |                 |                 |                                                       |                                                     |                        |                                                    |                                                  |
| 6                                         | 1.555<br>39.50  | 1.295<br>32.89  | 1.035<br>26.29  | 0.875<br>22.23  | 0.625<br>15.88  | C7D06DS29A1                                           | C7D06DS29B1                                         | C7D06DS29C1            | C7D06DS29D1                                        | C7D06DS29E1                                      |
| 10                                        | 2.055<br>52.20  | 1.795<br>45.59  | 1.535<br>38.99  | 1.375<br>34.93  | 1.125<br>28.58  | C7D10DS29A1                                           | C7D10DS29B1                                         | C7D10DS29C1            | C7D10DS29D1                                        | C7D10DS29E1                                      |
| 15                                        | 2.680<br>68.07  | 2.420<br>61.47  | 2.160<br>54.86  | 2.000<br>50.80  | 1.750<br>44.45  | C7D15DS29A1                                           | C7D15DS29B1                                         | C7D15DS29C1            | C7D15DS29D1                                        | C7D15DS29E1                                      |
| 18                                        | 3.055<br>77.60  | 2.795<br>70.99  | 2.535<br>64.39  | 2.375<br>60.33  | 2.125<br>53.98  | C7D18DS29A1                                           | C7D18DS29B1                                         | C7D18DS29C1            | C7D18DS29D1                                        | C7D18DS29E1                                      |
| 22                                        | 3.555<br>90.30  | 3.295<br>83.69  | 3.035<br>77.09  | 2.875<br>73.03  | 2.625<br>66.68  | C7D22DS29A1                                           | C7D22DS29B1                                         | C7D22DS29C1            | C7D22DS29D1                                        | C7D22DS29E1                                      |
| 25                                        | 3.930<br>99.82  | 3.670<br>93.22  | 3.410<br>86.61  | 3.250<br>82.55  | 3.000<br>76.20  | C7D25DS29A1                                           | C7D25DS29B1                                         | C7D25DS29C1            | C7D25DS29D1                                        | C7D25DS29E1                                      |
| 28                                        | 4.305<br>109.35 | 4.045<br>102.74 | 3.785<br>96.14  | 3.625<br>92.08  | 3.375<br>85.73  | C7D28DS29A1                                           | C7D28DS29B1                                         | C7D28DS29C1            | C7D28DS29D1                                        | C7D28DS29E1                                      |
| 30                                        | 4.555<br>115.70 | 4.295<br>109.09 | 4.035<br>102.49 | 3.875<br>98.43  | 3.625<br>92.08  | C7D30DS29A1                                           | C7D30DS29B1                                         | C7D30DS29C1            | C7D30DS29D1                                        | C7D30DS29E1                                      |
| 31                                        | 4.680<br>118.87 | 4.420<br>112.27 | 4.160<br>105.66 | 4.000<br>101.60 | 3.750<br>95.25  | C7D31DS29A1                                           | C7D31DS29B1                                         | C7D31DS29C1            | C7D31DS29D1                                        | C7D31DS29E1                                      |
| 35                                        | 5.180<br>131.57 | 4.920<br>124.97 | 4.660<br>118.36 | 4.500<br>114.30 | 4.250<br>107.95 | C7D35DS29A1                                           | C7D35DS29B1                                         | C7D35DS29C1            | C7D35DS29D1                                        | C7D35DS29E1                                      |
| 36                                        | 5.305<br>134.75 | 5.045<br>128.14 | 4.785<br>121.54 | 4.625<br>117.48 | 4.375<br>111.13 | C7D36DS29A1                                           | C7D36DS29B1                                         | C7D36DS29C1            | C7D36DS29D1                                        | C7D36DS29E1                                      |
| 40                                        | 5.805<br>147.45 | 5.545<br>140.84 | 5.285<br>134.24 | 5.125<br>130.18 | 4.875<br>123.83 | C7D40DS29A1                                           | C7D40DS29B1                                         | C7D40DS29C1            | C7D40DS29D1                                        | C7D40DS29E1                                      |
| 43                                        | 6.180<br>156.97 | 5.920<br>150.37 | 5.660<br>143.76 | 5.500<br>139.70 | 5.250<br>133.35 | C7D43DS29A1                                           | C7D43DS29B1                                         | C7D43DS29C1            | C7D43DS29D1                                        | C7D43DS29E1                                      |
| 50                                        | 7.055<br>179.20 | 6.795<br>172.59 | 6.535<br>165.99 | 6.375<br>161.93 | 6.125<br>155.58 | C7D50DS29A1                                           | C7D50DS29B1                                         | C7D50DS29C1            | C7D50DS29D1                                        | C7D50DS29E1                                      |
| <b>Tail Length .160 [4.06] (DIM. "J")</b> |                 |                 |                 |                 |                 |                                                       |                                                     |                        |                                                    |                                                  |
| 6                                         | 1.555<br>39.50  | 1.295<br>32.89  | 1.035<br>26.29  | 0.875<br>22.23  | 0.625<br>15.88  | C7D06DS29A3                                           | C7D06DS29B3                                         | C7D06DS29C3            | C7D06DS29D3                                        | C7D06DS29E3                                      |
| 10                                        | 2.055<br>52.20  | 1.795<br>45.59  | 1.535<br>38.99  | 1.375<br>34.93  | 1.125<br>28.58  | C7D10DS29A3                                           | C7D10DS29B3                                         | C7D10DS29C3            | C7D10DS29D3                                        | C7D10DS29E3                                      |
| 15                                        | 2.680<br>68.07  | 2.420<br>61.47  | 2.160<br>54.86  | 2.000<br>50.80  | 1.750<br>44.45  | C7D15DS29A3                                           | C7D15DS29B3                                         | C7D15DS29C3            | C7D15DS29D3                                        | C7D15DS29E3                                      |
| 18                                        | 3.055<br>77.60  | 2.795<br>70.99  | 2.535<br>64.39  | 2.375<br>60.33  | 2.125<br>53.98  | C7D18DS29A3                                           | C7D18DS29B3                                         | C7D18DS29C3            | C7D18DS29D3                                        | C7D18DS29E3                                      |
| 22                                        | 3.555<br>90.30  | 3.295<br>83.69  | 3.035<br>77.09  | 2.875<br>73.03  | 2.625<br>66.68  | C7D22DS29A3                                           | C7D22DS29B3                                         | C7D22DS29C3            | C7D22DS29D3                                        | C7D22DS29E3                                      |
| 25                                        | 3.930<br>99.82  | 3.670<br>93.22  | 3.410<br>86.61  | 3.250<br>82.55  | 3.000<br>76.20  | C7D25DS29A3                                           | C7D25DS29B3                                         | C7D25DS29C3            | C7D25DS29D3                                        | C7D25DS29E3                                      |
| 28                                        | 4.305<br>109.35 | 4.045<br>102.74 | 3.785<br>96.14  | 3.625<br>92.08  | 3.375<br>85.73  | C7D28DS29A3                                           | C7D28DS29B3                                         | C7D28DS29C3            | C7D28DS29D3                                        | C7D28DS29E3                                      |
| 30                                        | 4.555<br>115.70 | 4.295<br>109.09 | 4.035<br>102.49 | 3.875<br>98.43  | 3.625<br>92.08  | C7D30DS29A3                                           | C7D30DS29B3                                         | C7D30DS29C3            | C7D30DS29D3                                        | C7D30DS29E3                                      |
| 31                                        | 4.680<br>118.87 | 4.420<br>112.27 | 4.160<br>105.66 | 4.000<br>101.60 | 3.750<br>95.25  | C7D31DS29A3                                           | C7D31DS29B3                                         | C7D31DS29C3            | C7D31DS29D3                                        | C7D31DS29E3                                      |
| 35                                        | 5.180<br>131.57 | 4.920<br>124.97 | 4.660<br>118.36 | 4.500<br>114.30 | 4.250<br>107.95 | C7D35DS29A3                                           | C7D35DS29B3                                         | C7D35DS29C3            | C7D35DS29D3                                        | C7D35DS29E3                                      |
| 36                                        | 5.305<br>134.75 | 5.045<br>128.14 | 4.785<br>121.54 | 4.625<br>117.48 | 4.375<br>111.13 | C7D36DS29A3                                           | C7D36DS29B3                                         | C7D36DS29C3            | C7D36DS29D3                                        | C7D36DS29E3                                      |
| 40                                        | 5.805<br>147.45 | 5.545<br>140.84 | 5.285<br>134.24 | 5.125<br>130.18 | 4.875<br>123.83 | C7D40DS29A3                                           | C7D40DS29B3                                         | C7D40DS29C3            | C7D40DS29D3                                        | C7D40DS29E3                                      |
| 43                                        | 6.180<br>156.97 | 5.920<br>150.37 | 5.660<br>143.76 | 5.500<br>139.70 | 5.250<br>133.35 | C7D43DS29A3                                           | C7D43DS29B3                                         | C7D43DS29C3            | C7D43DS29D3                                        | C7D43DS29E3                                      |
| 50                                        | 7.055<br>179.20 | 6.795<br>172.59 | 6.535<br>165.99 | 6.375<br>161.93 | 6.125<br>155.58 | C7D50DS29A3                                           | C7D50DS29B3                                         | C7D50DS29C3            | C7D50DS29D3                                        | C7D50DS29E3                                      |

**Ordering Information**

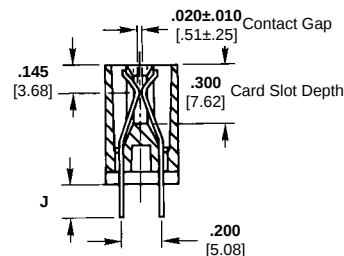
.125" [3.18] Centerline / .250" [6.35] Row-to-Row

| No. of<br>Dual<br>Readout<br>Positions | Dimensions      |                 |                 |                 |                 | Mounting Ear Options                                  |                                                     |                        |                                                    |                                                  |
|----------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------------------------------------------|-----------------------------------------------------|------------------------|----------------------------------------------------|--------------------------------------------------|
|                                        | A               | B               | C               | D               | E               | Centered<br>Mounting Ear<br>.125" [3.18]<br>Thru Hole | Centered<br>Mounting Ear<br>4-40 Threaded<br>insert | No<br>Mounting<br>Ears | Flush<br>Mounting Ear<br>.125" [3.18]<br>Thru Hole | Flush<br>Mounting Ear<br>4-40 Threaded<br>insert |
| Tail Length .220 [5.59] (DIM. "J")     |                 |                 |                 |                 |                 |                                                       |                                                     |                        |                                                    |                                                  |
| 6                                      | 1.555<br>39.50  | 1.295<br>32.89  | 1.035<br>26.29  | 0.875<br>22.23  | 0.625<br>15.88  | C7D06DS29A4                                           | C7D06DS29B4                                         | C7D06DS29C4            | C7D06DS29D4                                        | C7D06DS29E4                                      |
| 10                                     | 2.055<br>52.20  | 1.795<br>45.59  | 1.535<br>38.99  | 1.375<br>34.93  | 1.125<br>28.58  | C7D10DS29A4                                           | C7D10DS29B4                                         | C7D10DS29C4            | C7D10DS29D4                                        | C7D10DS29E4                                      |
| 15                                     | 2.680<br>68.07  | 2.420<br>61.47  | 2.160<br>54.86  | 2.000<br>50.80  | 1.750<br>44.45  | C7D15DS29A4                                           | C7D15DS29B4                                         | C7D15DS29C4            | C7D15DS29D4                                        | C7D15DS29E4                                      |
| 18                                     | 3.055<br>77.60  | 2.795<br>70.99  | 2.535<br>64.39  | 2.375<br>60.33  | 2.125<br>53.98  | C7D18DS29A4                                           | C7D18DS29B4                                         | C7D18DS29C4            | C7D18DS29D4                                        | C7D18DS29E4                                      |
| 22                                     | 3.555<br>90.30  | 3.295<br>83.69  | 3.035<br>77.09  | 2.875<br>73.03  | 2.625<br>66.68  | C7D22DS29A4                                           | C7D22DS29B4                                         | C7D22DS29C4            | C7D22DS29D4                                        | C7D22DS29E4                                      |
| 25                                     | 3.930<br>99.82  | 3.670<br>93.22  | 3.410<br>86.61  | 3.250<br>82.55  | 3.000<br>76.20  | C7D25DS29A4                                           | C7D25DS29B4                                         | C7D25DS29C4            | C7D25DS29D4                                        | C7D25DS29E4                                      |
| 28                                     | 4.305<br>109.35 | 4.045<br>102.74 | 3.785<br>96.14  | 3.625<br>92.08  | 3.375<br>85.73  | C7D28DS29A4                                           | C7D28DS29B4                                         | C7D28DS29C4            | C7D28DS29D4                                        | C7D28DS29E4                                      |
| 30                                     | 4.555<br>115.70 | 4.295<br>109.09 | 4.035<br>102.49 | 3.875<br>98.43  | 3.625<br>92.08  | C7D30DS29A4                                           | C7D30DS29B4                                         | C7D30DS29C4            | C7D30DS29D4                                        | C7D30DS29E4                                      |
| 31                                     | 4.680<br>118.87 | 4.420<br>112.27 | 4.160<br>105.66 | 4.000<br>101.60 | 3.750<br>95.25  | C7D31DS29A4                                           | C7D31DS29B4                                         | C7D31DS29C4            | C7D31DS29D4                                        | C7D31DS29E4                                      |
| 35                                     | 5.180<br>131.57 | 4.920<br>124.97 | 4.660<br>118.36 | 4.500<br>114.30 | 4.250<br>107.95 | C7D35DS29A4                                           | C7D35DS29B4                                         | C7D35DS29C4            | C7D35DS29D4                                        | C7D35DS29E4                                      |
| 36                                     | 5.305<br>134.75 | 5.045<br>128.14 | 4.785<br>121.54 | 4.625<br>117.48 | 4.375<br>111.13 | C7D36DS29A4                                           | C7D36DS29B4                                         | C7D36DS29C4            | C7D36DS29D4                                        | C7D36DS29E4                                      |
| 40                                     | 5.805<br>147.45 | 5.545<br>140.84 | 5.285<br>134.24 | 5.125<br>130.18 | 4.875<br>123.83 | C7D40DS29A4                                           | C7D40DS29B4                                         | C7D40DS29C4            | C7D40DS29D4                                        | C7D40DS29E4                                      |
| 43                                     | 6.180<br>156.97 | 5.920<br>150.37 | 5.660<br>143.76 | 5.500<br>139.70 | 5.250<br>133.35 | C7D43DS29A4                                           | C7D43DS29B4                                         | C7D43DS29C4            | C7D43DS29D4                                        | C7D43DS29E4                                      |
| 50                                     | 7.055<br>179.20 | 6.795<br>172.59 | 6.535<br>165.99 | 6.375<br>161.93 | 6.125<br>155.58 | C7D50DS29A4                                           | C7D50DS29B4                                         | C7D50DS29C4            | C7D50DS29D4                                        | C7D50DS29E4                                      |

**Product Facts**

- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E60980 
- Certified by Canadian Standards Association, File No. LR49571 

**Cantilever Series .156 x .200 [3.96 x 5.08] Centerline, Dip Solder Tails, .300 [7.62] Card Slot Depth**



**Physical Properties:**

**Insulation Resistance**—5000 megohms minimum.

**Insertion/Withdrawal Force (Daughter Card)**—8 oz./2 oz. [35.6 N/ 8.9 N] average contact pair using .0620 [1.57] steel blade.

**Insulator Body**—Glass filled thermoplastic, UL rating 94V-0. High temp. plastic option is available; add suffix M399 to part number.

**Color**—Black

**Contacts**—High strength copper alloy.

**Contact Plating**—.000050 [0.00127] nickel underplate with .000030 [0.00076] gold in the mating area, tin/lead on tails, .000100 [0.00254] minimum

**Electrical Properties:**

**Operation Voltage**—1500 VDC (sea level)

**Current Rating**—3 Amperes

**Initial Contact Resistance**—10 milliohms

**Environmental Properties:**

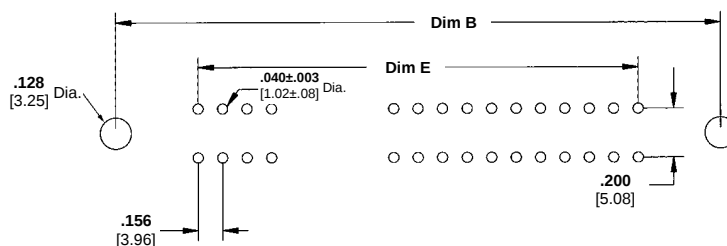
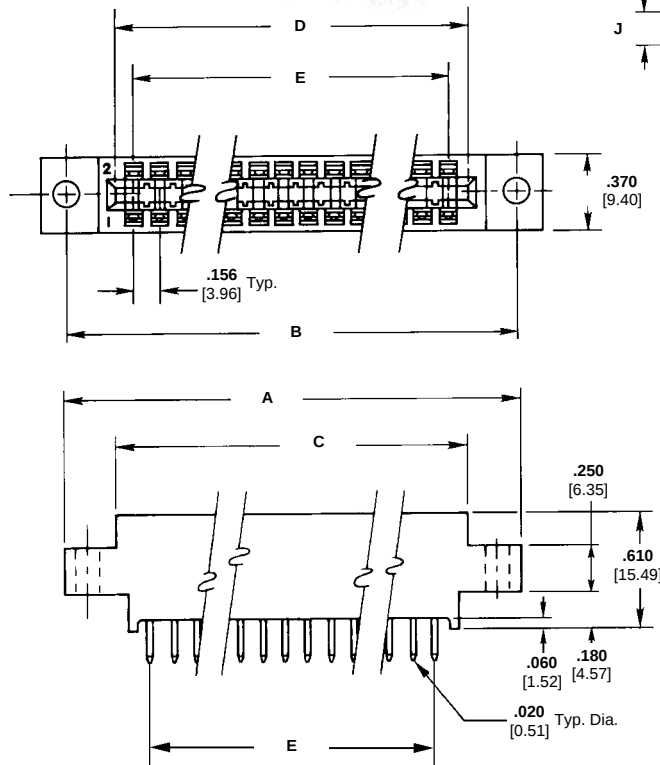
**Operating Temperature**—-55°C to +125°C

**Temperature Cycling**—MIL-STD-202 method 107

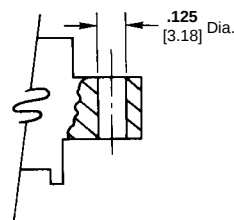
**Vibration**—MIL-STD-202 method 204

**Related Product Data:**

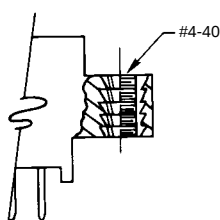
**Daughter Card Edge Pattern**—page 57



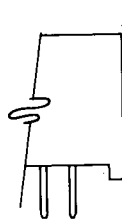
**Mounting Styles**



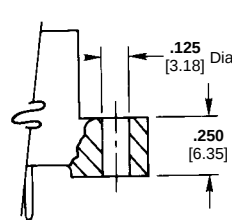
Centered Mounting Ear  
.125 [3.18] Thru Hole



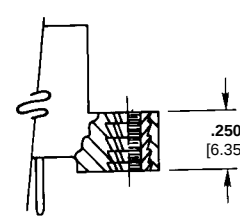
Centered Mounting Ear  
4-40 Threaded Insert



No Mounting Ears



Flush Mounting Ear  
.125 [3.18] Thru Hole



Flush Mounting Ear  
4-40 Threaded Insert

Ordering Information

.156" [3.96] Centerline / .200" [5.08] Row-to-Row

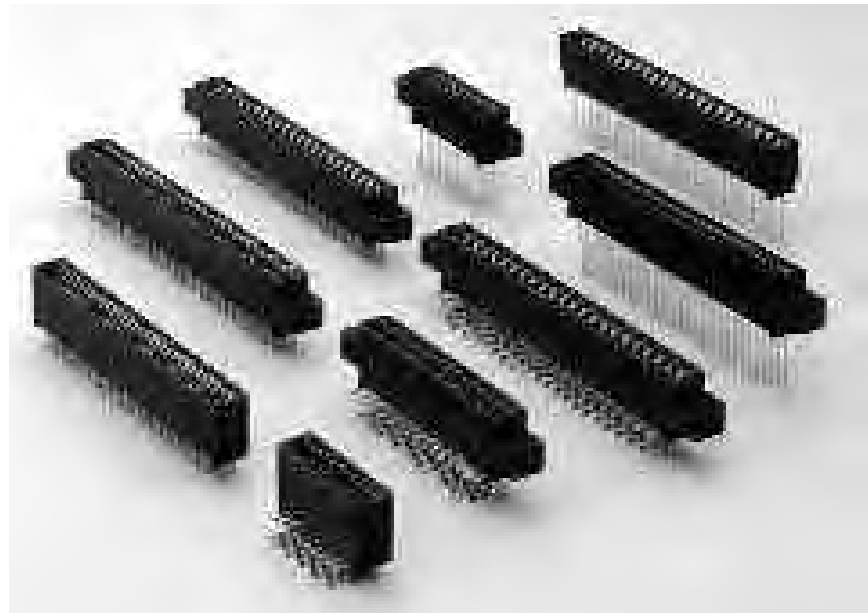
| No. of<br>Dual<br>Readout<br>Positions | Dimensions      |                 |                 |                 |                 | Mounting Ear Options                                  |                                                     |                        |                                                    |                                                  |
|----------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------------------------------------------|-----------------------------------------------------|------------------------|----------------------------------------------------|--------------------------------------------------|
|                                        | A               | B               | C               | D               | E               | Centered<br>Mounting Ear<br>.125" [3.18]<br>Thru Hole | Centered<br>Mounting Ear<br>4-40 Threaded<br>insert | No<br>Mounting<br>Ears | Flush<br>Mounting Ear<br>.125" [3.18]<br>Thru Hole | Flush<br>Mounting Ear<br>4-40 Threaded<br>insert |
| Tail Length .130 [3.30] (DIM. "J")     |                 |                 |                 |                 |                 |                                                       |                                                     |                        |                                                    |                                                  |
| 6                                      | 1.784<br>45.31  | 1.534<br>38.96  | 1.221<br>31.01  | 1.100<br>27.94  | 0.780<br>19.81  | C6D06DS29A1                                           | C6D06DS29B1                                         | C6D06DS29C1            | C6D06DS29D1                                        | C6D06DS29E1                                      |
| 10                                     | 2.408<br>61.16  | 2.158<br>54.81  | 1.845<br>46.86  | 1.724<br>43.79  | 1.404<br>35.66  | C6D10DS29A1                                           | C6D10DS29B1                                         | C6D10DS29C1            | C6D10DS29D1                                        | C6D10DS29E1                                      |
| 12                                     | 2.720<br>69.09  | 2.470<br>62.74  | 2.157<br>54.79  | 2.036<br>51.71  | 1.716<br>43.59  | C6D12DS29A1                                           | C6D12DS29B1                                         | C6D12DS29C1            | C6D12DS29D1                                        | C6D12DS29E1                                      |
| 15                                     | 3.188<br>80.98  | 2.938<br>74.63  | 2.625<br>66.68  | 2.504<br>63.60  | 2.184<br>55.47  | C6D15DS29A1                                           | C6D15DS29B1                                         | C6D15DS29C1            | C6D15DS29D1                                        | C6D15DS29E1                                      |
| 18                                     | 3.656<br>92.86  | 3.406<br>86.51  | 3.093<br>78.56  | 2.972<br>75.49  | 2.652<br>67.36  | C6D18DS29A1                                           | C6D18DS29B1                                         | C6D18DS29C1            | C6D18DS29D1                                        | C6D18DS29E1                                      |
| 20                                     | 3.968<br>100.79 | 3.718<br>94.44  | 3.405<br>86.49  | 3.284<br>83.41  | 2.964<br>75.29  | C6D20DS29A1                                           | C6D20DS29B1                                         | C6D20DS29C1            | C6D20DS29D1                                        | C6D20DS29E1                                      |
| 22                                     | 4.280<br>108.71 | 4.030<br>102.36 | 3.717<br>94.41  | 3.595<br>91.31  | 3.276<br>83.21  | C6D22DS29A1                                           | C6D22DS29B1                                         | C6D22DS29C1            | C6D22DS29D1                                        | C6D22DS29E1                                      |
| 25                                     | 4.748<br>120.60 | 4.498<br>114.25 | 4.185<br>106.30 | 4.064<br>103.23 | 3.744<br>95.10  | C6D25DS29A1                                           | C6D25DS29B1                                         | C6D25DS29C1            | C6D25DS29D1                                        | C6D25DS29E1                                      |
| 28                                     | 5.216<br>132.49 | 4.966<br>126.14 | 4.653<br>118.19 | 4.532<br>115.11 | 4.212<br>106.98 | C6D28DS29A1                                           | C6D28DS29B1                                         | C6D28DS29C1            | C6D28DS29D1                                        | C6D28DS29E1                                      |
| 30                                     | 5.528<br>140.41 | 5.278<br>134.06 | 4.965<br>126.11 | 4.844<br>123.04 | 4.524<br>114.91 | C6D30DS29A1                                           | C6D30DS29B1                                         | C6D30DS29C1            | C6D30DS29D1                                        | C6D30DS29E1                                      |
| 31                                     | 5.684<br>144.37 | 5.434<br>138.02 | 5.121<br>130.07 | 5.000<br>127.00 | 4.680<br>118.87 | C6D31DS29A1                                           | C6D31DS29B1                                         | C6D31DS29C1            | C6D31DS29D1                                        | C6D31DS29E1                                      |
| 35                                     | 6.308<br>160.22 | 6.058<br>153.87 | 5.745<br>145.92 | 5.624<br>142.85 | 5.304<br>134.72 | C6D35DS29A1                                           | C6D35DS29B1                                         | C6D35DS29C1            | C6D35DS29D1                                        | C6D35DS29E1                                      |
| 36                                     | 6.464<br>164.19 | 6.214<br>157.84 | 5.901<br>149.89 | 5.780<br>146.81 | 5.460<br>138.68 | C6D36DS29A1                                           | C6D36DS29B1                                         | C6D36DS29C1            | C6D36DS29D1                                        | C6D36DS29E1                                      |
| 40                                     | 7.088<br>180.04 | 6.838<br>173.69 | 6.525<br>165.74 | 6.404<br>162.66 | 6.085<br>154.56 | C6D40DS29A1                                           | C6D40DS29B1                                         | C6D40DS29C1            | C6D40DS29D1                                        | C6D40DS29E1                                      |
| 43                                     | 7.556<br>191.92 | 7.306<br>185.57 | 6.993<br>177.62 | 6.872<br>174.55 | 6.552<br>166.42 | C6D43DS29A1                                           | C6D43DS29B1                                         | C6D43DS29C1            | C6D43DS29D1                                        | C6D43DS29E1                                      |
| 50                                     | 8.648<br>219.66 | 8.398<br>213.31 | 8.085<br>205.36 | 7.964<br>202.29 | 7.644<br>194.16 | C6D50DS29A1                                           | C6D50DS29B1                                         | C6D50DS29C1            | C6D50DS29D1                                        | C6D50DS29E1                                      |
| Tail Length .160 [4.06] (DIM. "J")     |                 |                 |                 |                 |                 |                                                       |                                                     |                        |                                                    |                                                  |
| 6                                      | 1.784<br>45.31  | 1.534<br>38.96  | 1.221<br>31.01  | 1.100<br>27.94  | 0.780<br>19.81  | C6D06DS29A3                                           | C6D06DS29B3                                         | C6D06DS29C3            | C6D06DS29D3                                        | C6D06DS29E3                                      |
| 10                                     | 2.408<br>61.16  | 2.158<br>54.81  | 1.845<br>46.86  | 1.724<br>43.79  | 1.404<br>35.66  | C6D10DS29A3                                           | C6D10DS29B3                                         | C6D10DS29C3            | C6D10DS29D3                                        | C6D10DS29E3                                      |
| 12                                     | 2.720<br>69.09  | 2.470<br>62.74  | 2.157<br>54.79  | 2.036<br>51.71  | 1.716<br>43.59  | C6D12DS29A3                                           | C6D12DS29B3                                         | C6D12DS29C3            | C6D12DS29D3                                        | C6D12DS29E3                                      |
| 15                                     | 3.188<br>80.98  | 2.938<br>74.63  | 2.625<br>66.68  | 2.504<br>63.60  | 2.184<br>55.47  | C6D15DS29A3                                           | C6D15DS29B3                                         | C6D15DS29C3            | C6D15DS29D3                                        | C6D15DS29E3                                      |
| 18                                     | 3.656<br>92.86  | 3.406<br>86.51  | 3.093<br>78.56  | 2.972<br>75.49  | 2.652<br>67.36  | C6D18DS29A3                                           | C6D18DS29B3                                         | C6D18DS29C3            | C6D18DS29D3                                        | C6D18DS29E3                                      |
| 20                                     | 3.968<br>100.79 | 3.718<br>94.44  | 3.405<br>86.49  | 3.284<br>83.41  | 2.964<br>75.29  | C6D20DS29A3                                           | C6D20DS29B3                                         | C6D20DS29C3            | C6D20DS29D3                                        | C6D20DS29E3                                      |
| 22                                     | 4.280<br>108.71 | 4.030<br>102.36 | 3.717<br>94.41  | 3.595<br>91.31  | 3.276<br>83.21  | C6D22DS29A3                                           | C6D22DS29B3                                         | C6D22DS29C3            | C6D22DS29D3                                        | C6D22DS29E3                                      |
| 25                                     | 4.748<br>120.60 | 4.498<br>114.25 | 4.185<br>106.30 | 4.064<br>103.23 | 3.744<br>95.10  | C6D25DS29A3                                           | C6D25DS29B3                                         | C6D25DS29C3            | C6D25DS29D3                                        | C6D25DS29E3                                      |
| 28                                     | 5.216<br>132.49 | 4.966<br>126.14 | 4.653<br>118.19 | 4.532<br>115.11 | 4.212<br>106.98 | C6D28DS29A3                                           | C6D28DS29B3                                         | C6D28DS29C3            | C6D28DS29D3                                        | C6D28DS29E3                                      |
| 30                                     | 5.528<br>140.41 | 5.278<br>134.06 | 4.965<br>126.11 | 4.844<br>123.04 | 4.524<br>114.91 | C6D30DS29A3                                           | C6D30DS29B3                                         | C6D30DS29C3            | C6D30DS29D3                                        | C6D30DS29E3                                      |
| 31                                     | 5.684<br>144.37 | 5.434<br>138.02 | 5.121<br>130.07 | 5.000<br>127.00 | 4.680<br>118.87 | C6D31DS29A3                                           | C6D31DS29B3                                         | C6D31DS29C3            | C6D31DS29D3                                        | C6D31DS29E3                                      |
| 35                                     | 6.308<br>160.22 | 6.058<br>153.87 | 5.745<br>145.92 | 5.624<br>142.85 | 5.304<br>134.72 | C6D35DS29A3                                           | C6D35DS29B3                                         | C6D35DS29C3            | C6D35DS29D3                                        | C6D35DS29E3                                      |
| 36                                     | 6.464<br>164.19 | 6.214<br>157.84 | 5.901<br>149.89 | 5.780<br>146.81 | 5.460<br>138.68 | C6D36DS29A3                                           | C6D36DS29B3                                         | C6D36DS29C3            | C6D36DS29D3                                        | C6D36DS29E3                                      |
| 40                                     | 7.088<br>180.04 | 6.838<br>173.69 | 6.525<br>165.74 | 6.404<br>162.66 | 6.085<br>154.56 | C6D40DS29A3                                           | C6D40DS29B3                                         | C6D40DS29C3            | C6D40DS29D3                                        | C6D40DS29E3                                      |
| 43                                     | 7.556<br>191.92 | 7.306<br>185.57 | 6.993<br>177.62 | 6.872<br>174.55 | 6.552<br>166.42 | C6D43DS29A3                                           | C6D43DS29B3                                         | C6D43DS29C3            | C6D43DS29D3                                        | C6D43DS29E3                                      |
| 50                                     | 8.648<br>219.66 | 8.398<br>213.31 | 8.085<br>205.36 | 7.964<br>202.29 | 7.644<br>194.16 | C6D50DS29A3                                           | C6D50DS29B3                                         | C6D50DS29C3            | C6D50DS29D3                                        | C6D50DS29E3                                      |

.156" [3.96] Centerline / .200" [5.08] Row-to-Row

| No. of<br>Dual<br>Readout<br>Positions | Dimensions      |                 |                 |                 |                 | Mounting Ear Options                                 |                                                     |                        |                                                    |                                                  |
|----------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------------------------------------------|-----------------------------------------------------|------------------------|----------------------------------------------------|--------------------------------------------------|
|                                        | A               | B               | C               | D               | E               | Centered<br>Mounting Ear<br>.125" [3.18]<br>ThruHole | Centered<br>Mounting Ear<br>4-40 Threaded<br>insert | No<br>Mounting<br>Ears | Flush<br>Mounting Ear<br>.125" [3.18]<br>Thru Hole | Flush<br>Mounting Ear<br>4-40 Threaded<br>insert |
| Tail Length .220" [5.59] (DIM. "J")    |                 |                 |                 |                 |                 |                                                      |                                                     |                        |                                                    |                                                  |
| 6                                      | 1.784<br>45.31  | 1.534<br>38.96  | 1.221<br>31.01  | 1.100<br>27.94  | 0.780<br>19.81  | C6D06DS29A4                                          | C6D06DS29B4                                         | C6D06DS29C4            | C6D06DS29D4                                        | C6D06DS29E4                                      |
| 10                                     | 2.408<br>61.16  | 2.158<br>54.81  | 1.845<br>46.86  | 1.724<br>43.79  | 1.404<br>35.66  | C6D10DS29A4                                          | C6D10DS29B4                                         | C6D10DS29C4            | C6D10DS29D4                                        | C6D10DS29E4                                      |
| 12                                     | 2.720<br>69.09  | 2.470<br>62.74  | 2.157<br>54.79  | 2.036<br>51.71  | 1.716<br>43.59  | C6D12DS29A4                                          | C6D12DS29B4                                         | C6D12DS29C4            | C6D12DS29D4                                        | C6D12DS29E4                                      |
| 15                                     | 3.188<br>80.98  | 2.938<br>74.63  | 2.625<br>66.68  | 2.504<br>63.60  | 2.184<br>55.47  | C6D15DS29A4                                          | C6D15DS29B4                                         | C6D15DS29C4            | C6D15DS29D4                                        | C6D15DS29E4                                      |
| 18                                     | 3.656<br>92.86  | 3.406<br>86.51  | 3.093<br>78.56  | 2.972<br>75.49  | 2.652<br>67.36  | C6D18DS29A4                                          | C6D18DS29B4                                         | C6D18DS29C4            | C6D18DS29D4                                        | C6D18DS29E4                                      |
| 20                                     | 3.968<br>100.79 | 3.718<br>94.44  | 3.405<br>86.49  | 3.284<br>83.41  | 2.964<br>75.29  | C6D20DS29A4                                          | C6D20DS29B4                                         | C6D20DS29C4            | C6D20DS29D4                                        | C6D20DS29E4                                      |
| 22                                     | 4.280<br>108.71 | 4.030<br>102.36 | 3.717<br>94.41  | 3.595<br>91.31  | 3.276<br>83.21  | C6D22DS29A4                                          | C6D22DS29B4                                         | C6D22DS29C4            | C6D22DS29D4                                        | C6D22DS29E4                                      |
| 25                                     | 4.748<br>120.60 | 4.498<br>114.25 | 4.185<br>106.30 | 4.064<br>103.23 | 3.744<br>95.10  | C6D25DS29A4                                          | C6D25DS29B4                                         | C6D25DS29C4            | C6D25DS29D4                                        | C6D25DS29E4                                      |
| 28                                     | 5.216<br>132.49 | 4.966<br>126.14 | 4.653<br>118.19 | 4.532<br>115.11 | 4.212<br>106.98 | C6D28DS29A4                                          | C6D28DS29B4                                         | C6D28DS29C4            | C6D28DS29D4                                        | C6D28DS29E4                                      |
| 30                                     | 5.528<br>140.41 | 5.278<br>134.06 | 4.965<br>126.11 | 4.844<br>123.04 | 4.524<br>114.91 | C6D30DS29A4                                          | C6D30DS29B4                                         | C6D30DS29C4            | C6D30DS29D4                                        | C6D30DS29E4                                      |
| 31                                     | 5.684<br>144.37 | 5.434<br>138.02 | 5.121<br>130.07 | 5.000<br>127.00 | 4.680<br>118.87 | C6D31DS29A4                                          | C6D31DS29B4                                         | C6D31DS29C4            | C6D31DS29D4                                        | C6D31DS29E4                                      |
| 35                                     | 6.308<br>160.22 | 6.058<br>153.87 | 5.745<br>145.92 | 5.624<br>142.85 | 5.304<br>134.72 | C6D35DS29A4                                          | C6D35DS29B4                                         | C6D35DS29C4            | C6D35DS29D4                                        | C6D35DS29E4                                      |
| 36                                     | 6.464<br>164.19 | 6.214<br>157.84 | 5.901<br>149.89 | 5.780<br>146.81 | 5.460<br>138.68 | C6D36DS29A4                                          | C6D36DS29B4                                         | C6D36DS29C4            | C6D36DS29D4                                        | C6D36DS29E4                                      |
| 40                                     | 7.088<br>180.04 | 6.838<br>173.69 | 6.525<br>165.74 | 6.404<br>162.66 | 6.085<br>154.56 | C6D40DS29A4                                          | C6D40DS29B4                                         | C6D40DS29C4            | C6D40DS29D4                                        | C6D40DS29E4                                      |
| 43                                     | 7.556<br>191.92 | 7.306<br>185.57 | 6.993<br>177.62 | 6.872<br>174.55 | 6.552<br>166.42 | C6D43DS29A4                                          | C6D43DS29B4                                         | C6D43DS29C4            | C6D43DS29D4                                        | C6D43DS29E4                                      |
| 50                                     | 8.648<br>219.66 | 8.398<br>213.31 | 8.085<br>205.36 | 7.964<br>202.29 | 7.644<br>194.16 | C6D50DS29A4                                          | C6D50DS29B4                                         | C6D50DS29C4            | C6D50DS29D4                                        | C6D50DS29E4                                      |

### Product Facts

- Sizes from 6 to 65 dual positions.
- Contact mating surface optimizes reliability by concentrating the normal force in the actual contact area.
- Mounting ear options accommodate both Panel and PC Board attachment.
- Solder stand-offs facilitate cleaning.
- Bifurcated contact design provides redundant points of contact to maximize reliability.
- Tail lengths available to accommodate .062" [1.57] through .125" [3.18] thick PCB Boards and Wire Wrap termination.
- Straight or Right Angle contact configurations.



Bifurcated contact design provides maximum reliability

### Description/Application

The modified bellows card edge connectors are dual readout and are designed for reliable termination to double sided PCB boards.

### Modified Bellows

The modified bellows card edge connector offers a variety of tail lengths for solder and wire wrap applications. Contacts are available in straight tail or right angle configurations to meet your individual purpose. The modified bellows line of connectors offers a variety of card slot depths and has optional high temperature plastic insulators.

**Product Facts**

- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E60980 
- Certified by Canadian Standards Association, File No. LR49571 

**Physical Properties:**

**Insulation Resistance**—5000 megohms minimum.

**Insertion/Withdrawal Force (Daughter Card)**—8 oz./2 oz. [35.6 N/ 8.9 N] average contact pair using .0620 [1.57] steel blade.

**Insulator Body**—Glass filled thermoplastic, UL rating 94V-0. High temp. plastic option is available; add suffix M399 to part number.

**Color**—Black

**Contacts**—High strength copper alloy.

**Contact Plating**—.000050 [0.00127] nickel underplate with .000030 [0.00076] gold in the mating area, tin/lead on tails, .000100 [0.00254] minimum

**Electrical Properties:**

**Operation Voltage**—600 VDC (sea level)

**Current Rating**—3 Amperes

**Initial Contact Resistance**—10 milliohms

**Environmental Properties:**

**Operating Temperature**—-55°C to +125°C

**Temperature Cycling**—MIL-STD-202 method 107

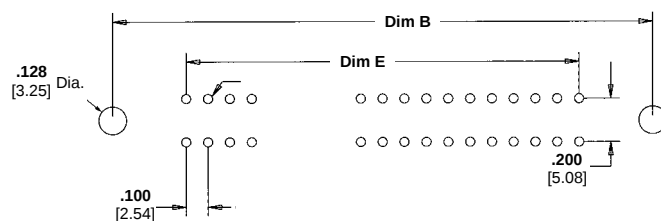
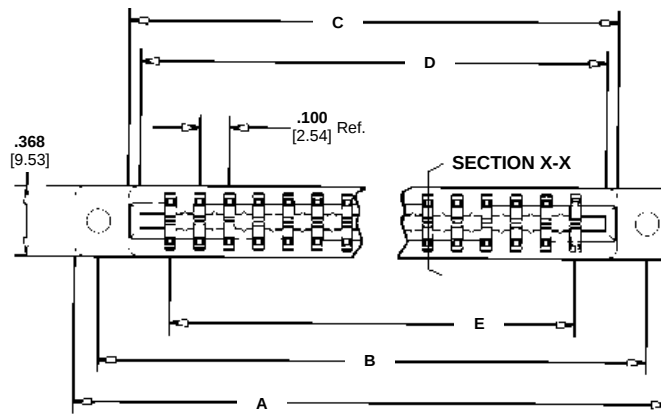
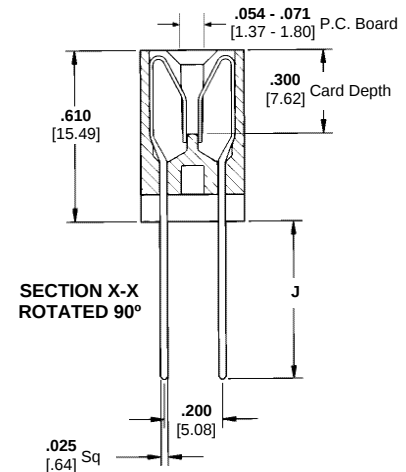
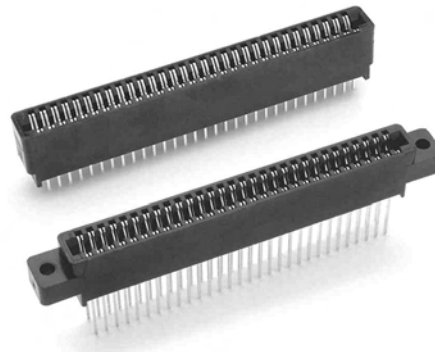
**Vibration**—MIL-STD-202 method 204

**Related Product Data:**

**Polarization Key**—page 57

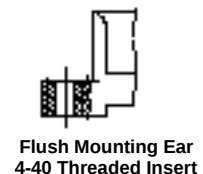
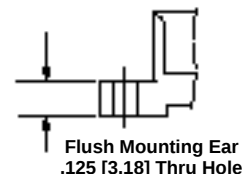
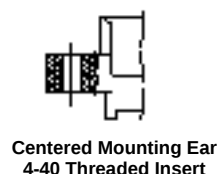
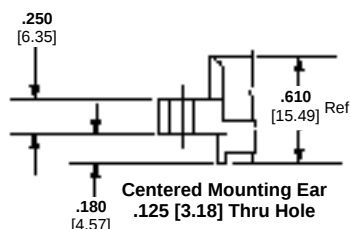
**Daughter Card Edge Pattern**—page 57

**Modified Bellows Connectors .100 x .200 [2.54 x 5.08], Straight Dip Solder And Wire Wrap Tails**



P=.040 [1.02] Dip Solder Applications  
P=.042 [1.07] For Wire Wrap Applications

**Mounting Styles**



Ordering Information

.100" [2.54] Centerline / .200" [5.08] Row-to-Row

| No. of<br>Dual<br>Readout<br>Positions | Dimensions      |                 |                 |                 |                 | Mounting Ear Options                                  |                                                     |                        |                                                    |                                                  |
|----------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------------------------------------------|-----------------------------------------------------|------------------------|----------------------------------------------------|--------------------------------------------------|
|                                        | A               | B               | C               | D               | E               | Centered<br>Mounting Ear<br>.125" [3.18]<br>Thru Hole | Centered<br>Mounting Ear<br>4-40 Threaded<br>insert | No<br>Mounting<br>Ears | Flush<br>Mounting Ear<br>.125" [3.18]<br>Thru Hole | Flush<br>Mounting Ear<br>4-40 Threaded<br>insert |
| Tail Length .160" [4.06] (DIM "J")     |                 |                 |                 |                 |                 |                                                       |                                                     |                        |                                                    |                                                  |
| 10                                     | 1.835<br>46.61  | 1.575<br>40.01  | 1.260<br>32.00  | 1.100<br>27.94  | 0.900<br>22.86  | A8D10DS29A2                                           | A8D10DS29B2                                         | A8D10DS29C2            | A8D10DS29D2                                        | A8D10DS29E2                                      |
| 12                                     | 2.035<br>51.69  | 1.775<br>45.09  | 1.460<br>37.08  | 1.300<br>33.02  | 1.100<br>27.94  | A8D12DS29A2                                           | A8D12DS29B2                                         | A8D12DS29C2            | —                                                  | —                                                |
| 15                                     | 2.335<br>59.31  | 2.075<br>52.71  | 1.760<br>44.70  | 1.600<br>40.64  | 1.400<br>35.56  | A8D15DS29A2                                           | A8D15DS29B2                                         | A8D15DS29C2            | A8D15DS29D2                                        | A8D15DS29E2                                      |
| 18                                     | 2.635<br>66.93  | 2.375<br>60.33  | 2.060<br>52.32  | 1.900<br>48.26  | 1.700<br>43.18  | A8D18DS29A2                                           | A8D18DS29B2                                         | A8D18DS29C2            | A8D18DS29D2                                        | A8D18DS29E2                                      |
| 20                                     | 2.835<br>72.01  | 2.575<br>65.41  | 2.260<br>57.40  | 2.100<br>53.34  | 1.900<br>48.26  | A8D20DS29A2                                           | A8D20DS29B2                                         | A8D20DS29C2            | —                                                  | —                                                |
| 22                                     | 3.035<br>77.09  | 2.775<br>70.49  | 2.460<br>62.48  | 2.300<br>58.42  | 2.100<br>53.34  | A8D22DS29A2                                           | A8D22DS29B2                                         | A8D22DS29C2            | —                                                  | —                                                |
| 25                                     | 3.335<br>84.71  | 3.075<br>78.11  | 2.760<br>70.10  | 2.600<br>66.04  | 2.400<br>60.96  | A8D25DS29A2                                           | A8D25DS29B2                                         | A8D25DS29C2            | A8D25DS29D2                                        | A8D25DS29E2                                      |
| 28                                     | 3.635<br>92.33  | 3.375<br>85.73  | 3.060<br>77.72  | 2.900<br>73.66  | 2.700<br>68.58  | A8D28DS29A2                                           | A8D28DS29B2                                         | A8D28DS29C2            | —                                                  | —                                                |
| 30                                     | 3.835<br>97.41  | 3.575<br>90.81  | 3.260<br>82.80  | 3.100<br>78.74  | 2.900<br>73.66  | A8D30DS29A2                                           | A8D30DS29B2                                         | A8D30DS29C2            | A8D30DS29D2                                        | A8D30DS29E2                                      |
| 31                                     | 3.935<br>99.95  | 3.675<br>93.35  | 3.360<br>85.34  | 3.200<br>81.28  | 3.100<br>78.74  | A8D31DS29A2                                           | A8D31DS29B2                                         | A8D31DS29C2            | A8D31DS29D2                                        | A8D31DS29E2                                      |
| 35                                     | 4.335<br>110.11 | 4.075<br>103.51 | 3.760<br>95.50  | 3.600<br>91.44  | 3.400<br>86.36  | A8D35DS29A2                                           | A8D35DS29B2                                         | A8D35DS29C2            | —                                                  | —                                                |
| 36                                     | 4.435<br>112.65 | 4.175<br>106.05 | 3.860<br>98.04  | 3.700<br>93.98  | 3.500<br>88.90  | A8D36DS29A2                                           | A8D36DS29B2                                         | A8D36DS29C2            | —                                                  | —                                                |
| 40                                     | 4.835<br>122.81 | 4.575<br>116.21 | 4.260<br>108.20 | 4.100<br>104.14 | 3.900<br>99.06  | A8D40DS29A2                                           | A8D40DS29B2                                         | A8D40DS29C2            | —                                                  | —                                                |
| 43                                     | 5.135<br>130.43 | 4.875<br>123.83 | 4.560<br>115.82 | 4.400<br>111.76 | 4.200<br>106.68 | A8D43DS29A2                                           | A8D43DS29B2                                         | A8D43DS29C2            | —                                                  | —                                                |
| 44                                     | 5.235<br>132.97 | 4.975<br>126.37 | 4.660<br>118.36 | 4.500<br>114.30 | 4.300<br>109.22 | A8D44DS29A2                                           | A8D44DS29B2                                         | A8D44DS29C2            | —                                                  | —                                                |
| 50                                     | 5.835<br>148.21 | 5.575<br>141.61 | 5.260<br>133.60 | 5.100<br>129.54 | 4.800<br>121.92 | A8D50DS29A2                                           | A8D50DS29B2                                         | A8D50DS29C2            | A8D50DS29D2                                        | A8D50DS29E2                                      |
| 60                                     | 6.835<br>173.61 | 6.575<br>167.01 | 6.260<br>159.00 | 6.100<br>154.94 | 5.900<br>149.86 | A8D60DS29A2                                           | A8D60DS29B2                                         | A8D60DS29C2            | —                                                  | —                                                |
| 65                                     | 7.335<br>186.31 | 7.075<br>179.71 | 6.760<br>171.70 | 6.600<br>167.64 | 6.400<br>162.56 | A8D65DS29A2                                           | A8D65DS29B2                                         | A8D65DS29C2            | A8D65DS29D2                                        | A8D65DS29E2                                      |
| Tail Length .220" [5.59] (DIM "J")     |                 |                 |                 |                 |                 |                                                       |                                                     |                        |                                                    |                                                  |
| 10                                     | 1.835<br>46.61  | 1.575<br>40.01  | 1.260<br>32.00  | 1.100<br>27.94  | 0.900<br>22.86  | A8D10DS29A3                                           | A8D10DS29B3                                         | A8D10DS29C3            | A8D10DS29D3                                        | A8D10DS29E3                                      |
| 12                                     | 2.035<br>51.69  | 1.775<br>45.09  | 1.460<br>37.08  | 1.300<br>33.02  | 1.100<br>27.94  | A8D12DS29A3                                           | A8D12DS29B3                                         | A8D12DS29C3            | —                                                  | —                                                |
| 15                                     | 2.335<br>59.31  | 2.075<br>52.71  | 1.760<br>44.70  | 1.600<br>40.64  | 1.400<br>35.56  | A8D15DS29A3                                           | A8D15DS29B3                                         | A8D15DS29C3            | A8D15DS29D3                                        | A8D15DS29E3                                      |
| 18                                     | 2.635<br>66.93  | 2.375<br>60.33  | 2.060<br>52.32  | 1.900<br>48.26  | 1.700<br>43.18  | A8D18DS29A3                                           | A8D18DS29B3                                         | A8D18DS29C3            | A8D18DS29D3                                        | A8D18DS29E3                                      |
| 20                                     | 2.835<br>72.01  | 2.575<br>65.41  | 2.260<br>57.40  | 2.100<br>53.34  | 1.900<br>48.26  | A8D20DS29A3                                           | A8D20DS29B3                                         | A8D20DS29C3            | —                                                  | —                                                |
| 22                                     | 3.035<br>77.09  | 2.775<br>70.49  | 2.460<br>62.48  | 2.300<br>58.42  | 2.100<br>53.34  | A8D22DS29A3                                           | A8D22DS29B3                                         | A8D22DS29C3            | —                                                  | —                                                |
| 25                                     | 3.335<br>84.71  | 3.075<br>78.11  | 2.760<br>70.10  | 2.600<br>66.04  | 2.400<br>60.96  | A8D25DS29A3                                           | A8D25DS29B3                                         | A8D25DS29C3            | A8D35DS29D3                                        | A8D35DS29E3                                      |
| 28                                     | 3.635<br>92.33  | 3.375<br>85.73  | 3.060<br>77.72  | 2.900<br>73.66  | 2.700<br>68.58  | A8D28DS29A3                                           | A8D28DS29B3                                         | A8D28DS29C3            | —                                                  | —                                                |
| 30                                     | 3.835<br>97.41  | 3.575<br>90.81  | 3.260<br>82.80  | 3.100<br>78.74  | 2.900<br>73.66  | A8D30DS29A3                                           | A8D30DS29B3                                         | A8D30DS29C3            | A8D30DS29D3                                        | A8D30DS29E3                                      |
| 31                                     | 3.935<br>99.95  | 3.675<br>93.35  | 3.360<br>85.34  | 3.200<br>81.28  | 3.100<br>78.74  | A8D31DS29A3                                           | A8D31DS29B3                                         | A8D31DS29C3            | A8D31DS29D3                                        | A8D31DS29E3                                      |
| 35                                     | 4.335<br>110.11 | 4.075<br>103.51 | 3.760<br>95.50  | 3.600<br>91.44  | 3.400<br>86.36  | A8D35DS29A3                                           | A8D35DS29B3                                         | A8D35DS29C3            | —                                                  | —                                                |
| 36                                     | 4.435<br>112.65 | 4.175<br>106.05 | 3.860<br>98.04  | 3.700<br>93.98  | 3.500<br>88.90  | A8D36DS29A3                                           | A8D36DS29B3                                         | A8D36DS29C3            | —                                                  | —                                                |
| 40                                     | 4.835<br>122.81 | 4.575<br>116.21 | 4.260<br>108.20 | 4.100<br>104.14 | 3.900<br>99.06  | A8D40DS29A3                                           | A8D40DS29B3                                         | A8D40DS29C3            | —                                                  | —                                                |
| 43                                     | 5.135<br>130.43 | 4.875<br>123.83 | 4.560<br>115.82 | 4.400<br>111.76 | 4.200<br>106.68 | A8D43DS29A3                                           | A8D43DS29B3                                         | A8D43DS29C3            | —                                                  | —                                                |

.100" [2.54] Centerline / .200" [5.08] Row-to-Row

| No. of<br>Dual<br>Readout<br>Positions                               | Dimensions      |                 |                 |                 |                 | Mounting Ear Options                                  |                                                     |                        |                                                    |                                                  |
|----------------------------------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------------------------------------------|-----------------------------------------------------|------------------------|----------------------------------------------------|--------------------------------------------------|
|                                                                      | A               | B               | C               | D               | E               | Centered<br>Mounting Ear<br>.125" [3.18]<br>Thru Hole | Centered<br>Mounting Ear<br>4-40 Threaded<br>insert | No<br>Mounting<br>Ears | Flush<br>Mounting Ear<br>.125" [3.18]<br>Thru Hole | Flush<br>Mounting Ear<br>4-40 Threaded<br>insert |
| <b>Tail Length .220" [5.59] (DIM "J") (Continued)</b>                |                 |                 |                 |                 |                 |                                                       |                                                     |                        |                                                    |                                                  |
| 44                                                                   | 5.235<br>132.97 | 4.975<br>126.37 | 4.660<br>118.36 | 4.500<br>114.30 | 4.300<br>109.22 | A8D44DS29A3                                           | A8D44DS29B3                                         | A8D44DS29C3            | —                                                  | —                                                |
| 50                                                                   | 5.835<br>148.21 | 5.575<br>141.61 | 5.260<br>133.60 | 5.100<br>129.54 | 4.800<br>121.92 | A8D50DS29A3                                           | A8D50DS29B3                                         | A8D50DS29C3            | A8D50DS29D3                                        | A8D50DS29E3                                      |
| 60                                                                   | 6.835<br>173.61 | 6.575<br>167.01 | 6.260<br>159.00 | 6.100<br>154.94 | 5.900<br>149.86 | A8D60DS29A3                                           | A8D60DS29B3                                         | A8D60DS29C3            | —                                                  | —                                                |
| 65                                                                   | 7.335<br>186.31 | 7.075<br>179.71 | 6.760<br>171.70 | 6.600<br>167.64 | 6.400<br>162.56 | A8D65DS29A3                                           | A8D65DS29B3                                         | A8D65DS29C3            | A8D65DS29D3                                        | A8D65DS29E3                                      |
| <b>Tail Length .560" [14.22] (DIM "J") for Wire Wrap Termination</b> |                 |                 |                 |                 |                 |                                                       |                                                     |                        |                                                    |                                                  |
| 10                                                                   | 1.835<br>46.61  | 1.575<br>40.01  | 1.260<br>32.00  | 1.100<br>27.94  | 0.900<br>22.86  | A8D10WW29A3                                           | A8D10WW29B3                                         | —                      | —                                                  | —                                                |
| 12                                                                   | 2.035<br>51.69  | 1.775<br>45.09  | 1.460<br>37.08  | 1.300<br>33.02  | 1.100<br>27.94  | A8D12WW29A3                                           | A8D12WW29B3                                         | —                      | —                                                  | —                                                |
| 15                                                                   | 2.335<br>59.31  | 2.075<br>52.71  | 1.760<br>44.70  | 1.600<br>40.64  | 1.400<br>35.56  | A8D15WW29A3                                           | A8D15WW29B3                                         | —                      | —                                                  | —                                                |
| 18                                                                   | 2.635<br>66.93  | 2.375<br>60.33  | 2.060<br>52.32  | 1.900<br>48.26  | 1.700<br>43.18  | A8D18WW29A3                                           | A8D18WW29B3                                         | —                      | —                                                  | —                                                |
| 20                                                                   | 2.835<br>72.01  | 2.575<br>65.41  | 2.260<br>57.40  | 2.100<br>53.34  | 1.900<br>48.26  | A8D20WW29A3                                           | A8D20WW29B3                                         | —                      | —                                                  | —                                                |
| 22                                                                   | 3.035<br>77.09  | 2.775<br>70.49  | 2.460<br>62.48  | 2.300<br>58.42  | 2.100<br>53.34  | A8D22WW29A3                                           | A8D22WW29B3                                         | —                      | —                                                  | —                                                |
| 25                                                                   | 3.335<br>84.71  | 3.075<br>78.11  | 2.760<br>70.10  | 2.600<br>66.04  | 2.400<br>60.96  | A8D25WW29A3                                           | A8D25WW29B3                                         | —                      | —                                                  | —                                                |
| 28                                                                   | 3.635<br>92.33  | 3.375<br>85.73  | 3.060<br>77.72  | 2.900<br>73.66  | 2.700<br>68.58  | A8D28WW29A3                                           | A8D28WW29B3                                         | —                      | —                                                  | —                                                |
| 30                                                                   | 3.835<br>97.41  | 3.575<br>90.81  | 3.260<br>82.80  | 3.100<br>78.74  | 2.900<br>73.66  | A8D30WW29A3                                           | A8D30WW29B3                                         | —                      | —                                                  | —                                                |
| 31                                                                   | 3.935<br>99.95  | 3.675<br>93.35  | 3.360<br>85.34  | 3.200<br>81.28  | 3.100<br>78.74  | A8D31WW29A3                                           | A8D31WW29B3                                         | —                      | —                                                  | —                                                |
| 35                                                                   | 4.335<br>110.11 | 4.075<br>103.51 | 3.760<br>95.50  | 3.600<br>91.44  | 3.400<br>86.36  | A8D35WW29A3                                           | A8D35WW29B3                                         | —                      | —                                                  | —                                                |
| 36                                                                   | 4.435<br>112.65 | 4.175<br>106.05 | 3.860<br>98.04  | 3.700<br>93.98  | 3.500<br>88.90  | A8D36WW29A3                                           | A8D36WW29B3                                         | —                      | —                                                  | —                                                |
| 40                                                                   | 4.835<br>122.81 | 4.575<br>116.21 | 4.260<br>108.20 | 4.100<br>104.14 | 3.900<br>99.06  | A8D40WW29A3                                           | A8D40WW29B3                                         | —                      | —                                                  | —                                                |
| 43                                                                   | 5.135<br>130.43 | 4.875<br>123.83 | 4.560<br>115.82 | 4.400<br>111.76 | 4.200<br>106.68 | A8D43WW29A3                                           | A8D43WW29B3                                         | —                      | —                                                  | —                                                |
| 44                                                                   | 5.235<br>132.97 | 4.975<br>126.37 | 4.660<br>118.36 | 4.500<br>114.30 | 4.300<br>109.22 | A8D44WW29A3                                           | A8D44WW29B3                                         | —                      | —                                                  | —                                                |
| 50                                                                   | 5.835<br>148.21 | 5.575<br>141.61 | 5.260<br>133.60 | 5.100<br>129.54 | 4.800<br>121.92 | A8D50WW29A3                                           | A8D50WW29B3                                         | —                      | —                                                  | —                                                |
| 60                                                                   | 6.835<br>173.61 | 6.575<br>167.01 | 6.260<br>159.00 | 6.100<br>154.94 | 5.900<br>149.86 | A8D60WW29A3                                           | A8D60WW29B3                                         | —                      | —                                                  | —                                                |
| 65                                                                   | 7.335<br>186.31 | 7.075<br>179.71 | 6.760<br>171.70 | 6.600<br>167.64 | 6.400<br>162.56 | A8D65WW29A3                                           | A8D65WW29B3                                         | —                      | —                                                  | —                                                |

**Product Facts**

- **Recognized under the Component Program of Underwriters Laboratories Inc.,** File No. E60980 
- **Certified by Canadian Standards Association,** File No. LR49571 

**Physical Properties:**

**Insulation Resistance**—5000 megohms minimum.

**Insertion/Withdrawal Force (Daughter Card)**—8 oz./2 oz. [35.6 N/ 8.9 N] average contact pair using .0620 [1.57] steel blade.

**Insulator Body**—Glass filled thermoplastic, UL rating 94V-0. High temp. plastic option is available; add suffix M399 to part number.

**Color**—Black

**Contacts**—High strength copper alloy.

**Contact Plating**—.000050 [0.00127] nickel underplate with .000030 [0.00076] gold in the mating area, tin/lead on tails, .000100 [0.00254] minimum

**Electrical Properties:**

**Operation Voltage**—600 VDC (sea level)

**Current Rating**—3 Amperes

**Initial Contact Resistance**—10 milliohms

**Environmental Properties:**

**Operating Temperature**—-55°C to +125°C

**Temperature Cycling**—MIL-STD-202 method 107

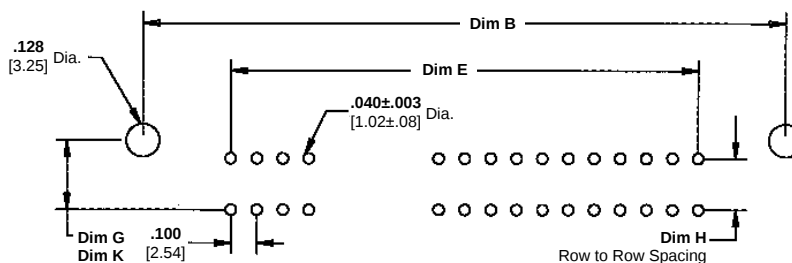
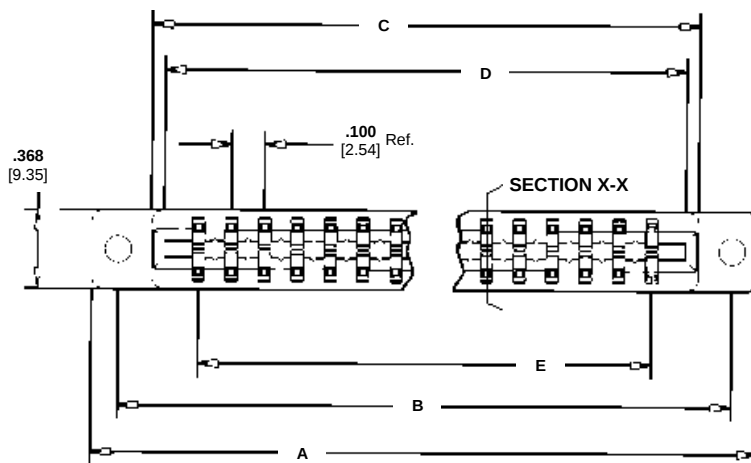
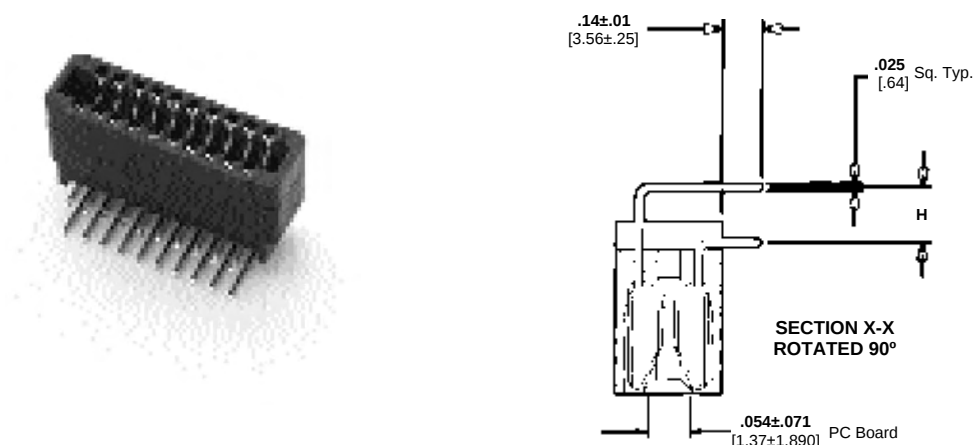
**Vibration**—MIL-STD-202 method 204

**Related Product Data:**

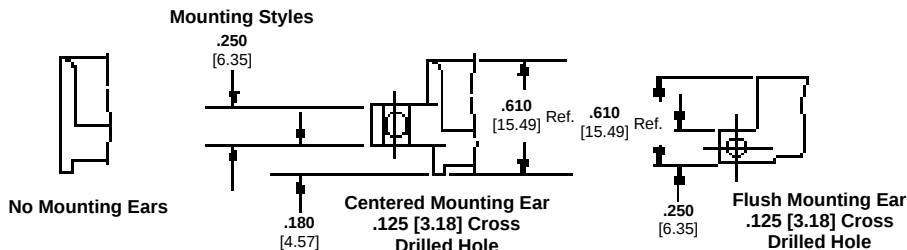
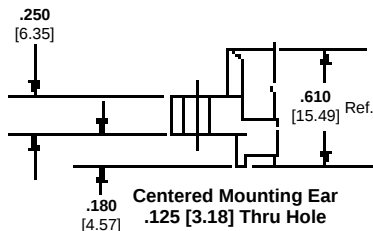
**Polarization Key**—page 57

**Daughter Card Edge Pattern**—page 57

**Modified Bellows Connectors .100 x .200 [2.54 x 5.08] and .100 x .150 [2.54 x 3.81] Right Angle Dip Solder Tails**



Dim G - Centered Mounting Ear .125 [3.18] Cross Drilled Hole Only  
Dim K - Flush Mounting Ear .125 [3.18] Cross Drilled Hole Only



.100" [2.54] Centerline / .200" [5.08] Row-to-Row (Dim. "H") Spacing

| No. of Dual Readout Positions | Dimensions      |                 |                 |                 |                 | Mounting Ear Options         |                           |                                              |                  |                                                       |                                                    |
|-------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------------------|---------------------------|----------------------------------------------|------------------|-------------------------------------------------------|----------------------------------------------------|
|                               | A               | B               | C               | D               | E               | Centered Mounting Ear Only G | Flush Mounting Ear Only K | Centered Mounting Ear .125" [3.18] Thru Hole | No Mounting Ears | Centered Mounting Ear .125" [3.18] Cross-Drilled Hole | Flush Mounting Ear .125" [3.18] Cross-Drilled Hole |
| 10                            | 1.835<br>46.61  | 1.575<br>40.01  | 1.260<br>32.00  | 1.100<br>27.94  | 0.900<br>22.86  | 0.470<br>11.94               | 0.290<br>7.37             | A8D10RA29A                                   | A8D10RA29C       | A8D10RA29E                                            | A8D10RA29F                                         |
| 12                            | 2.035<br>51.69  | 1.775<br>45.09  | 1.460<br>37.08  | 1.300<br>33.02  | 1.100<br>27.94  | 0.470<br>11.94               | 0.290<br>7.37             | A8D12RA29A                                   | A8D12RA29C       | A8D12RA29E                                            | —                                                  |
| 15                            | 2.335<br>59.31  | 2.075<br>52.71  | 1.760<br>44.70  | 1.600<br>40.64  | 1.400<br>35.56  | 0.470<br>11.94               | 0.290<br>7.37             | A8D15RA29A                                   | A8D15RA29C       | A8D15RA29E                                            | A8D15RA29F                                         |
| 18                            | 2.635<br>66.93  | 2.375<br>60.33  | 2.060<br>52.32  | 1.900<br>48.26  | 1.700<br>43.18  | 0.470<br>11.94               | 0.290<br>7.37             | A8D18RA29A                                   | A8D18RA29C       | A8D18RA29E                                            | A8D18RA29F                                         |
| 20                            | 2.835<br>72.01  | 2.575<br>65.41  | 2.260<br>57.40  | 2.100<br>53.34  | 1.900<br>48.26  | 0.470<br>11.94               | 0.290<br>7.37             | A8D20RA29A                                   | A8D20RA29C       | A8D20RA29E                                            | —                                                  |
| 22                            | 3.035<br>77.09  | 2.775<br>70.49  | 2.460<br>62.48  | 2.300<br>58.42  | 2.100<br>53.34  | 0.470<br>11.94               | 0.290<br>7.37             | A8D22RA29A                                   | A8D22RA29C       | A8D22RA29E                                            | —                                                  |
| 25                            | 3.335<br>84.71  | 3.075<br>78.11  | 2.760<br>70.10  | 2.600<br>66.04  | 2.400<br>60.96  | 0.470<br>11.94               | 0.290<br>7.37             | A8D25RA29A                                   | A8D25RA29C       | A8D25RA29E                                            | A8D25RA29F                                         |
| 28                            | 3.635<br>92.33  | 3.375<br>85.73  | 3.060<br>77.72  | 2.900<br>73.66  | 2.700<br>68.58  | 0.470<br>11.94               | 0.290<br>7.37             | A8D28RA29A                                   | A8D28RA29C       | A8D28RA29E                                            | —                                                  |
| 30                            | 3.835<br>97.41  | 3.575<br>90.81  | 3.260<br>82.80  | 3.100<br>78.74  | 2.900<br>73.66  | 0.470<br>11.94               | 0.290<br>7.37             | A8D30RA29A                                   | A8D30RA29C       | A8D30RA29E                                            | A8D30RA29F                                         |
| 31                            | 3.935<br>99.95  | 3.675<br>93.35  | 3.360<br>85.34  | 3.200<br>81.28  | 3.100<br>78.74  | 0.470<br>11.94               | 0.290<br>7.37             | A8D31RA29A                                   | A8D31RA29C       | A8D31RA29E                                            | A8D31RA29F                                         |
| 35                            | 4.335<br>110.11 | 4.075<br>103.51 | 3.760<br>95.50  | 3.600<br>91.44  | 3.400<br>86.36  | 0.470<br>11.94               | 0.290<br>7.37             | A8D35RA29A                                   | A8D35RA29C       | A8D35RA29E                                            | —                                                  |
| 36                            | 4.435<br>112.65 | 4.175<br>106.05 | 3.860<br>98.04  | 3.700<br>93.98  | 3.500<br>88.90  | 0.470<br>11.94               | 0.290<br>7.37             | A8D36RA29A                                   | A8D36RA29C       | A8D36RA29E                                            | —                                                  |
| 40                            | 4.835<br>122.81 | 4.575<br>116.21 | 4.260<br>108.20 | 4.100<br>104.14 | 3.900<br>99.06  | 0.470<br>11.94               | 0.290<br>7.37             | A8D40RA29A                                   | A8D40RA29C       | A8D40RA29E                                            | —                                                  |
| 43                            | 5.135<br>130.43 | 4.875<br>123.83 | 4.560<br>115.82 | 4.400<br>111.76 | 4.200<br>106.68 | 0.470<br>11.94               | 0.290<br>7.37             | A8D43RA29A                                   | A8D43RA29C       | A8D43RA29E                                            | —                                                  |
| 44                            | 5.235<br>132.97 | 4.975<br>126.37 | 4.660<br>118.36 | 4.500<br>114.30 | 4.300<br>109.22 | 0.470<br>11.94               | 0.290<br>7.37             | A8D44RA29A                                   | A8D44RA29C       | A8D44RA29E                                            | —                                                  |
| 50                            | 5.835<br>148.21 | 5.575<br>141.61 | 5.260<br>133.60 | 5.100<br>129.54 | 4.800<br>121.92 | 0.470<br>11.94               | 0.290<br>7.37             | A8D50RA29A                                   | A8D50RA29C       | A8D50RA29E                                            | A8D50RA29F                                         |
| 60                            | 6.835<br>173.61 | 6.575<br>167.01 | 6.260<br>159.00 | 6.100<br>154.94 | 5.900<br>149.86 | 0.470<br>11.94               | 0.290<br>7.37             | A8D60RA29A                                   | A8D60RA29C       | A8D60RA29E                                            | —                                                  |
| 65                            | 7.335<br>186.31 | 7.075<br>179.71 | 6.760<br>171.70 | 6.600<br>167.64 | 6.400<br>162.56 | 0.470<br>11.94               | 0.290<br>7.37             | A8D65RA29A                                   | A8D65RA29C       | A8D65RA29E                                            | A8D65RA29F                                         |

.100" [2.54] Centerline / .150" [3.81] Row-to-Row (Dim. "H") Spacing

| No. of<br>Dual<br>Readout<br>Positions | Dimensions      |                 |                 |                 |                 | Mounting Ear Options                  |                                    |                                                       |                        |                                                                |                                                             |  |
|----------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------------------------------|------------------------------------|-------------------------------------------------------|------------------------|----------------------------------------------------------------|-------------------------------------------------------------|--|
|                                        | A               | B               | C               | D               | E               | Centered<br>Mounting<br>Ear Only<br>G | Flush<br>Mounting<br>Ear Only<br>K | Centered<br>Mounting Ear<br>.125" [3.18]<br>Thru Hole | No<br>Mounting<br>Ears | Centered<br>Mounting Ear<br>.125" [3.18]<br>Cross-Drilled Hole | Flush<br>Mounting Ear<br>.125" [3.18]<br>Cross-Drilled Hole |  |
|                                        |                 |                 |                 |                 |                 |                                       |                                    |                                                       |                        |                                                                |                                                             |  |
| 10                                     | 1.835<br>46.61  | 1.575<br>40.01  | 1.260<br>32.00  | 1.100<br>27.94  | 0.900<br>22.86  | 0.420<br>10.67                        | 0.240<br>6.10                      | A8D10RA29AM233                                        | A8D10RA29CM233         | A8D10RA29EM233                                                 | A8D10RA29FM233                                              |  |
| 12                                     | 2.035<br>51.69  | 1.775<br>45.09  | 1.460<br>37.08  | 1.300<br>33.02  | 1.100<br>27.94  | 0.420<br>10.67                        | 0.240<br>6.10                      | A8D12RA29AM233                                        | A8D12RA29CM233         | A8D12RA29EM233                                                 | —                                                           |  |
| 15                                     | 2.335<br>59.31  | 2.075<br>52.71  | 1.760<br>44.70  | 1.600<br>40.64  | 1.400<br>35.56  | 0.420<br>10.67                        | 0.240<br>6.10                      | A8D15RA29AM233                                        | A8D15RA29CM233         | A8D15RA29EM233                                                 | A8D15RA29FM233                                              |  |
| 18                                     | 2.635<br>66.93  | 2.375<br>60.33  | 2.060<br>52.32  | 1.900<br>48.26  | 1.700<br>43.18  | 0.420<br>10.67                        | 0.240<br>6.10                      | A8D18RA29AM233                                        | A8D18RA29CM233         | A8D18RA29EM233                                                 | A8D18RA29FM233                                              |  |
| 20                                     | 2.835<br>72.01  | 2.575<br>65.41  | 2.260<br>57.40  | 2.100<br>53.34  | 1.900<br>48.26  | 0.420<br>10.67                        | 0.240<br>6.10                      | A8D20RA29AM233                                        | A8D20RA29CM233         | A8D20RA29EM233                                                 | —                                                           |  |
| 22                                     | 3.035<br>77.09  | 2.775<br>70.49  | 2.460<br>62.48  | 2.300<br>58.42  | 2.100<br>53.34  | 0.420<br>10.67                        | 0.240<br>6.10                      | A8D22RA29AM233                                        | A8D22RA29CM233         | A8D22RA29EM233                                                 | —                                                           |  |
| 25                                     | 3.335<br>84.71  | 3.075<br>78.11  | 2.760<br>70.10  | 2.600<br>66.04  | 2.400<br>60.96  | 0.420<br>10.67                        | 0.240<br>6.10                      | A8D25RA29AM233                                        | A8D25RA29CM233         | A8D25RA29EM233                                                 | A8D25RA29FM233                                              |  |
| 28                                     | 3.635<br>92.33  | 3.375<br>85.73  | 3.060<br>77.72  | 2.900<br>73.66  | 2.700<br>68.58  | 0.420<br>10.67                        | 0.240<br>6.10                      | A8D28RA29AM233                                        | A8D28RA29CM233         | A8D28RA29EM233                                                 | —                                                           |  |
| 30                                     | 3.835<br>97.41  | 3.575<br>90.81  | 3.260<br>82.80  | 3.100<br>78.74  | 2.900<br>73.66  | 0.420<br>10.67                        | 0.240<br>6.10                      | A8D30RA29AM233                                        | A8D30RA29CM233         | A8D30RA29EM233                                                 | A8D30RA29FM233                                              |  |
| 31                                     | 3.935<br>99.95  | 3.675<br>93.35  | 3.360<br>85.34  | 3.200<br>81.28  | 3.100<br>78.74  | 0.420<br>10.67                        | 0.240<br>6.10                      | A8D31RA29AM233                                        | A8D31RA29CM233         | A8D31RA29EM233                                                 | A8D31RA29FM233                                              |  |
| 35                                     | 4.335<br>110.11 | 4.075<br>103.51 | 3.760<br>95.50  | 3.600<br>91.44  | 3.400<br>86.36  | 0.420<br>10.67                        | 0.240<br>6.10                      | A8D35RA29AM233                                        | A8D35RA29CM233         | A8D35RA29EM233                                                 | —                                                           |  |
| 36                                     | 4.435<br>112.65 | 4.175<br>106.05 | 3.860<br>98.04  | 3.700<br>93.98  | 3.500<br>88.90  | 0.420<br>10.67                        | 0.240<br>6.10                      | A8D36RA29AM233                                        | A8D36RA29CM233         | A8D36RA29EM233                                                 | —                                                           |  |
| 40                                     | 4.835<br>122.81 | 4.575<br>116.21 | 4.260<br>108.20 | 4.100<br>104.14 | 3.900<br>99.06  | 0.420<br>10.67                        | 0.240<br>6.10                      | A8D40RA29AM233                                        | A8D40RA29CM233         | A8D40RA29EM233                                                 | —                                                           |  |
| 43                                     | 5.135<br>130.43 | 4.875<br>123.83 | 4.560<br>115.82 | 4.400<br>111.76 | 4.200<br>106.68 | 0.420<br>10.67                        | 0.240<br>6.10                      | A8D43RA29AM233                                        | A8D43RA29CM233         | A8D43RA29EM233                                                 | —                                                           |  |
| 44                                     | 5.235<br>132.97 | 4.975<br>126.37 | 4.660<br>118.36 | 4.500<br>114.30 | 4.300<br>109.22 | 0.420<br>10.67                        | 0.240<br>6.10                      | A8D44RA29AM233                                        | A8D44RA29CM233         | A8D44RA29EM233                                                 | —                                                           |  |
| 50                                     | 5.835<br>148.21 | 5.575<br>141.61 | 5.260<br>133.60 | 5.100<br>129.54 | 4.800<br>121.92 | 0.420<br>10.67                        | 0.240<br>6.10                      | A8D50RA29AM233                                        | A8D50RA29CM233         | A8D50RA29EM233                                                 | A8D50RA29FM233                                              |  |
| 60                                     | 6.835<br>173.61 | 6.575<br>167.01 | 6.260<br>159.00 | 6.100<br>154.94 | 5.900<br>149.86 | 0.420<br>10.67                        | 0.240<br>6.10                      | A8D60RA29AM233                                        | A8D60RA29CM233         | A8D60RA29EM233                                                 | —                                                           |  |
| 65                                     | 7.335<br>186.31 | 7.075<br>179.71 | 6.760<br>171.70 | 6.600<br>167.64 | 6.400<br>162.56 | 0.420<br>10.67                        | 0.240<br>6.10                      | A8D65RA29AM233                                        | A8D65RA29CM233         | A8D65RA29EM233                                                 | A8D65RA29FM233                                              |  |

*Electronics*

**Product Facts**

- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E60980 
- Certified by Canadian Standards Association, File No. LR49571 

**Physical Properties:**

**Insulation Resistance**—5000 megohms minimum.

**Insertion/Withdrawal Force (Daughter Card)**—8 oz./2 oz. [35.6 N/ 8.9 N] average contact pair using .0620 [1.57] steel blade.

**Insulator Body**—Glass filled thermoplastic, UL rating 94V-0. High temp. plastic option is available; add suffix M399 to part number.

**Color**—Black

**Contacts**—High strength copper alloy.

**Contact Plating**—.000050 [0.00127] nickel underplate with .000030 [0.00076] gold in the mating area, tin/lead on tails, .000100 [0.00254] minimum

**Electrical Properties:**

**Operation Voltage**—600 VDC (sea level)

**Current Rating**—3 Amperes

**Initial Contact Resistance**—10 milliohms

**Environmental Properties:**

**Operating Temperature**—-55°C to +125°C

**Temperature Cycling**—MIL-STD-202 method 107

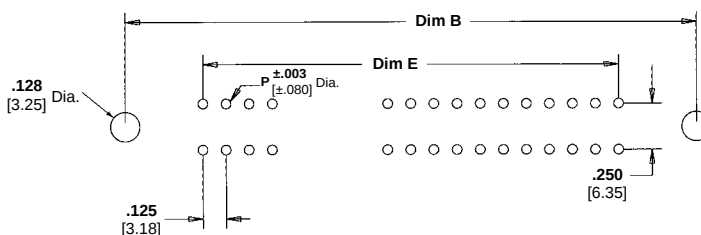
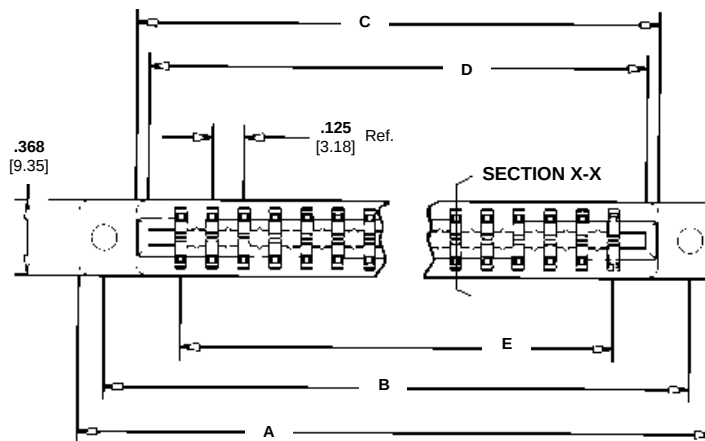
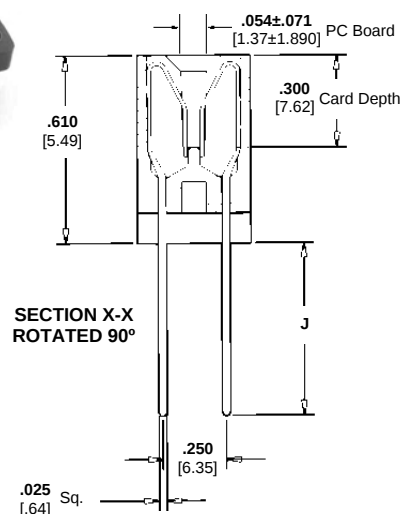
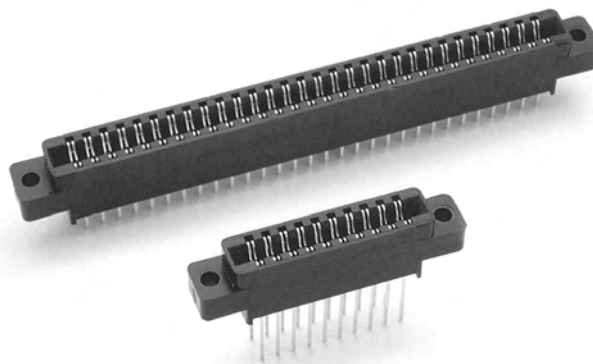
**Vibration**—MIL-STD-202 method 204

**Related Product Data:**

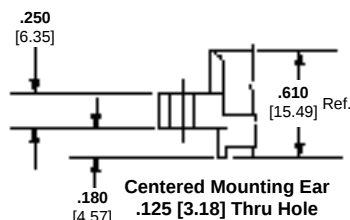
**Polarization Key**—page 57

**Daughter Card Edge Pattern**—page 57

**Modified Bellows Connectors .125 x .250 [3.18 x 6.35], Centerline Straight Dip Solder and Wire Wrap Tails**

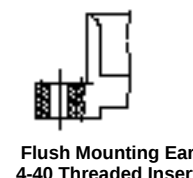
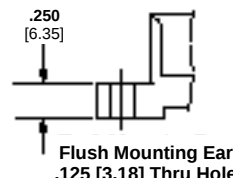


**Mounting Styles**



Centered Mounting Ear  
4-40 Threaded Insert

No Mounting Ears



.125" [3.18] Centerline / .250" [6.35] Row-to-Row Dip Solder

| No. of Dual Readout Positions      | Dimensions      |                 |                 |                 |                 | Mounting Ear Options                         |                                            |                  |                                           |                                         |
|------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------------------------------------|--------------------------------------------|------------------|-------------------------------------------|-----------------------------------------|
|                                    | A               | B               | C               | D               | E               | Centered Mounting Ear .125" [3.18] Thru Hole | Centered Mounting Ear 4-40 Threaded insert | No Mounting Ears | Flush Mounting Ear .125" [3.18] Thru Hole | Flush Mounting Ear 4-40 Threaded insert |
| Tail Length .160" [4.06] (DIM "J") |                 |                 |                 |                 |                 |                                              |                                            |                  |                                           |                                         |
| 6                                  | 1.555<br>39.50  | 1.295<br>32.89  | 1.035<br>26.29  | 0.875<br>22.23  | 0.625<br>15.88  | A7D06DS29A2                                  | A7D06DS29B2                                | A7D06DS29C2      | A7D06DS29D2                               | A7D06DS29E2                             |
| 10                                 | 2.055<br>52.20  | 1.795<br>45.59  | 1.535<br>38.99  | 1.375<br>34.93  | 1.125<br>28.58  | A7D10DS29A2                                  | A7D10DS29B2                                | A7D10DS29C2      | A7D10DS29D2                               | A7D10DS29E2                             |
| 15                                 | 2.680<br>68.07  | 2.420<br>61.47  | 2.160<br>54.86  | 2.000<br>50.80  | 1.750<br>44.45  | A7D15DS29A2                                  | A7D15DS29B2                                | A7D15DS29C2      | A7D15DS29D2                               | A7D15DS29E2                             |
| 18                                 | 3.055<br>77.60  | 2.795<br>70.99  | 2.535<br>64.39  | 2.375<br>60.33  | 2.125<br>53.98  | A7D18DS29A2                                  | A7D18DS29B2                                | A7D18DS29C2      | A7D18DS29D2                               | A7D18DS29E2                             |
| 22                                 | 3.555<br>90.30  | 3.295<br>83.69  | 3.035<br>77.09  | 2.875<br>73.03  | 2.625<br>66.68  | A7D22DS29A2                                  | A7D22DS29B2                                | A7D22DS29C2      | –                                         | –                                       |
| 25                                 | 3.930<br>99.82  | 3.670<br>93.22  | 3.410<br>86.61  | 3.250<br>82.55  | 3.000<br>76.20  | A7D25DS29A2                                  | A7D25DS29B2                                | A7D25DS29C2      | A7D25DS29D2                               | A7D25DS29E2                             |
| 28                                 | 4.305<br>109.35 | 4.045<br>102.74 | 3.785<br>96.14  | 3.625<br>92.08  | 3.375<br>85.73  | A7D28DS29A2                                  | A7D28DS29B2                                | A7D28DS29C2      | –                                         | –                                       |
| 30                                 | 4.555<br>115.70 | 4.295<br>109.09 | 4.035<br>102.49 | 3.875<br>98.43  | 3.625<br>92.08  | A7D30DS29A2                                  | A7D30DS29B2                                | A7D30DS29C2      | A7D30DS29D2                               | A7D30DS29E2                             |
| 35                                 | 5.180<br>131.57 | 4.920<br>124.97 | 4.660<br>118.36 | 4.500<br>114.30 | 4.250<br>107.95 | A7D35DS29A2                                  | A7D35DS29B2                                | A7D35DS29C2      | –                                         | –                                       |
| 36                                 | 5.305<br>134.75 | 5.045<br>128.14 | 4.785<br>121.54 | 4.625<br>117.48 | 4.375<br>111.13 | A7D36DS29A2                                  | A7D36DS29B2                                | A7D36DS29C2      | –                                         | –                                       |
| 40                                 | 5.805<br>147.45 | 5.545<br>140.84 | 5.285<br>134.24 | 5.125<br>130.18 | 4.875<br>123.83 | A7D40DS29A2                                  | A7D40DS29B2                                | A7D40DS29C2      | –                                         | –                                       |
| 43                                 | 6.180<br>156.97 | 5.920<br>150.37 | 5.660<br>143.76 | 5.500<br>139.70 | 5.250<br>133.35 | A7D43DS29A2                                  | A7D43DS29B2                                | A7D43DS29C2      | –                                         | –                                       |
| 50                                 | 7.055<br>179.20 | 6.795<br>172.59 | 6.535<br>165.99 | 6.375<br>161.93 | 6.125<br>155.58 | A7D50DS29A2                                  | A7D50DS29B2                                | A7D50DS29C2      | A7D50DS29D2                               | A7D50DS29E2                             |

.125" [3.18] Centerline / .250" [6.35] Row-to-Row Wire Wrap

| No. of Dual Readout Positions       | Dimensions      |                 |                 |                 |                 | Mounting Ear Options                         |                                            |                  |                                           |                                         |
|-------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------------------------------------|--------------------------------------------|------------------|-------------------------------------------|-----------------------------------------|
|                                     | A               | B               | C               | D               | E               | Centered Mounting Ear .125" [3.18] Thru Hole | Centered Mounting Ear 4-40 Threaded insert | No Mounting Ears | Flush Mounting Ear .125" [3.18] Thru Hole | Flush Mounting Ear 4-40 Threaded insert |
| Tail Length .560" [14.22] (DIM "J") |                 |                 |                 |                 |                 |                                              |                                            |                  |                                           |                                         |
| 6                                   | 1.555<br>39.50  | 1.295<br>32.89  | 1.035<br>26.29  | 0.875<br>22.23  | 0.625<br>15.88  | A7D06WW29A3                                  | A7D06WW29B3                                | –                | –                                         | –                                       |
| 10                                  | 2.055<br>52.20  | 1.795<br>45.59  | 1.535<br>38.99  | 1.375<br>34.93  | 1.125<br>28.58  | A7D10WW29A3                                  | A7D10WW29B3                                | –                | –                                         | –                                       |
| 15                                  | 2.680<br>68.07  | 2.420<br>61.47  | 2.160<br>54.86  | 2.000<br>50.80  | 1.750<br>44.45  | A7D15WW29A3                                  | A7D15WW29B3                                | –                | –                                         | –                                       |
| 18                                  | 3.055<br>77.60  | 2.795<br>70.99  | 2.535<br>64.39  | 2.375<br>60.33  | 2.125<br>53.98  | A7D18WW29A3                                  | A7D18WW29B3                                | –                | –                                         | –                                       |
| 22                                  | 3.555<br>90.30  | 3.295<br>83.69  | 3.035<br>77.09  | 2.875<br>73.03  | 2.625<br>66.68  | A7D22WW29A3                                  | A7D22WW29B3                                | –                | –                                         | –                                       |
| 25                                  | 3.930<br>99.82  | 3.670<br>93.22  | 3.410<br>86.61  | 3.250<br>82.55  | 3.000<br>76.20  | A7D25WW29A3                                  | A7D25WW29B3                                | –                | –                                         | –                                       |
| 28                                  | 4.305<br>109.35 | 4.045<br>102.74 | 3.785<br>96.14  | 3.625<br>92.08  | 3.375<br>85.73  | A7D28WW29A3                                  | A7D28WW29B3                                | –                | –                                         | –                                       |
| 30                                  | 4.555<br>115.70 | 4.295<br>109.09 | 4.035<br>102.49 | 3.875<br>98.43  | 3.625<br>92.08  | A7D30WW29A3                                  | A7D30WW29B3                                | –                | –                                         | –                                       |
| 35                                  | 5.180<br>131.57 | 4.920<br>124.97 | 4.660<br>118.36 | 4.500<br>114.30 | 4.250<br>107.95 | A7D35WW29A3                                  | A7D35WW29B3                                | –                | –                                         | –                                       |
| 36                                  | 5.305<br>134.75 | 5.045<br>128.14 | 4.785<br>121.54 | 4.625<br>117.48 | 4.375<br>111.13 | A7D36WW29A3                                  | A7D36WW29B3                                | –                | –                                         | –                                       |
| 40                                  | 5.805<br>147.45 | 5.545<br>140.84 | 5.285<br>134.24 | 5.125<br>130.18 | 4.875<br>123.83 | A7D40WW29A3                                  | A7D40WW29B3                                | –                | –                                         | –                                       |
| 43                                  | 6.180<br>156.97 | 5.920<br>150.37 | 5.660<br>143.76 | 5.500<br>139.70 | 5.250<br>133.35 | A7D43WW29A3                                  | A7D43WW29B3                                | –                | –                                         | –                                       |
| 50                                  | 7.055<br>179.20 | 6.795<br>172.59 | 6.535<br>165.99 | 6.375<br>161.93 | 6.125<br>155.58 | A7D50WW29A3                                  | A7D50WW29B3                                | –                | –                                         | –                                       |

*Electronics*

**Product Facts**

- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E60980
- Certified by Canadian Standards Association, File No. LR49571



**Physical Properties:**

**Insulation Resistance**—5000 megohms minimum.

**Insertion/Withdrawal Force (Daughter Card)**—8 oz./2 oz. [35.6 N/ 8.9 N] average contact pair using .0620 [1.57] steel blade.

**Insulator Body**—Glass filled thermoplastic, UL rating 94V-0. High temp. plastic option is available; add suffix M399 to part number.

**Color**—Black

**Contacts**—High strength copper alloy.

**Contact Plating**—.000050 [0.00127] nickel underplate with .000030 [0.00076] gold in the mating area, tin/lead on tails, .000100 [0.00254] minimum

**Electrical Properties:**

**Operation Voltage**—1000 VDC (sea level)

**Current Rating**—3 Amperes

**Initial Contact Resistance**—10 milliohms

**Environmental Properties:**

**Operating Temperature**—-55°C to +125°C

**Temperature Cycling**—MIL-STD-202 method 107

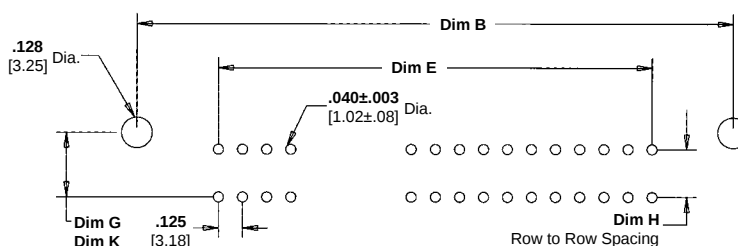
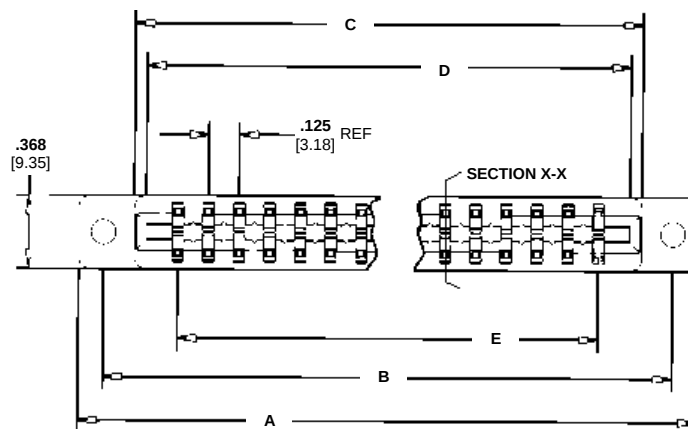
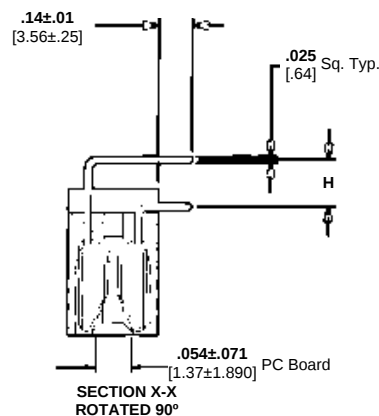
**Vibration**—MIL-STD-202 method 204

**Related Product Data:**

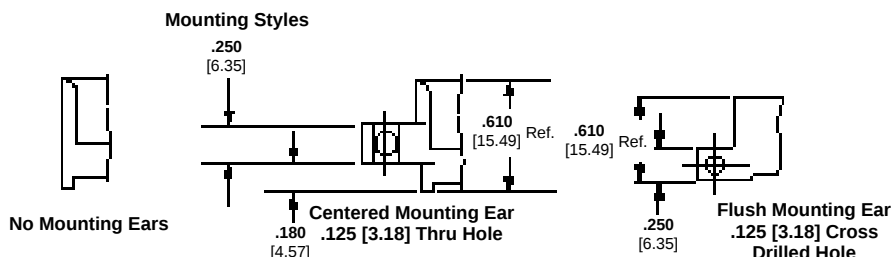
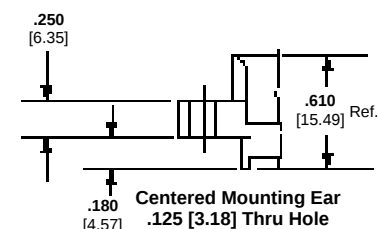
**Polarization Key**—page 57

**Daughter Card Edge Pattern**—page 57

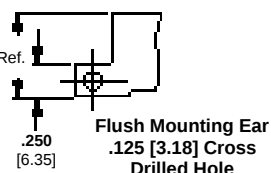
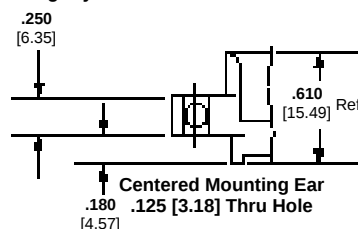
**Modified Bellows Connectors .125 x .250 [3.18 x 6.35], .125 x .150 [3.18 x 3.81], .125 x .200 [3.18 x 5.08] Centerline, Right Angle Tails**



Dim G - Centered Mounting Ear .125 [3.18] Cross Drilled Hole Only  
Dim K - Flush Mounting Ear .125 [3.18] Cross Drilled Hole Only



**Mounting Styles**



## .125" [3.18] Centerline / .200" [5.08] and .150" [3.81] Row-to-Row (Dim. "H") Spacing

| No. of<br>Dual<br>Readout<br>Positions     | Dimensions      |                 |                 |                 |                 |                                       |                                    | Mounting Ear Options                                  |                        |                                                    |                                                    |
|--------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------------------------------|------------------------------------|-------------------------------------------------------|------------------------|----------------------------------------------------|----------------------------------------------------|
|                                            | A               | B               | C               | D               | E               | Centered<br>Mounting<br>Ear Only<br>G | Flush<br>Mounting<br>Ear Only<br>K | Centered<br>Mounting Ear<br>.125" [3.18]<br>Thru Hole | No<br>Mounting<br>Ears | Centered                                           | Flush                                              |
|                                            |                 |                 |                 |                 |                 |                                       |                                    |                                                       |                        | Mounting Ear<br>.125" [3.18]<br>Cross-Drilled Hole | Mounting Ear<br>.125" [3.18]<br>Cross-Drilled Hole |
| .150" [3.81] Row-to-Row (Dim. "H") Spacing |                 |                 |                 |                 |                 |                                       |                                    |                                                       |                        |                                                    |                                                    |
| 6                                          | 1.555<br>39.50  | 1.295<br>32.89  | 1.035<br>26.29  | 0.875<br>22.23  | 0.625<br>15.88  | 0.420<br>10.67                        | 0.240<br>6.10                      | A7D06RA29AM231                                        | A7D06RA29CM231         | A7D06RA29EM231                                     | A7D06RA29FM231                                     |
| 10                                         | 2.055<br>52.20  | 1.795<br>45.59  | 1.535<br>38.99  | 1.375<br>34.93  | 1.125<br>28.58  | 0.420<br>10.67                        | 0.240<br>6.10                      | A7D10RA29AM231                                        | A7D10RA29CM231         | A7D10RA29EM231                                     | A7D10RA29FM231                                     |
| 15                                         | 2.680<br>68.07  | 2.420<br>61.47  | 2.160<br>54.86  | 2.000<br>50.80  | 1.750<br>44.45  | 0.420<br>10.67                        | 0.240<br>6.10                      | A7D15RA29AM231                                        | A7D15RA29CM231         | A7D15RA29EM231                                     | A7D15RA29FM231                                     |
| 18                                         | 3.055<br>77.60  | 2.795<br>70.99  | 2.535<br>64.39  | 2.375<br>60.33  | 2.125<br>53.98  | 0.420<br>10.67                        | 0.240<br>6.10                      | A7D18RA29AM231                                        | A7D18RA29CM231         | A7D18RA29EM231                                     | A7D18RA29FM231                                     |
| 22                                         | 3.555<br>90.30  | 3.295<br>83.69  | 3.035<br>77.09  | 2.875<br>73.03  | 2.625<br>66.68  | 0.420<br>10.67                        | 0.240<br>6.10                      | A7D22RA29AM231                                        | A7D22RA29CM231         | A7D22RA29EM231                                     | A7D22RA29FM231                                     |
| 25                                         | 3.930<br>99.82  | 3.670<br>93.22  | 3.410<br>86.61  | 3.250<br>82.55  | 3.000<br>76.20  | 0.420<br>10.67                        | 0.240<br>6.10                      | A7D25RA29AM231                                        | A7D25RA29CM231         | A7D25RA29EM231                                     | A7D25RA29FM231                                     |
| 28                                         | 4.305<br>109.35 | 4.045<br>102.74 | 3.785<br>96.14  | 3.625<br>92.08  | 3.375<br>85.73  | 0.420<br>10.67                        | 0.240<br>6.10                      | A7D28RA29AM231                                        | A7D28RA29CM231         | A7D28RA29EM231                                     | A7D28RA29FM231                                     |
| 30                                         | 4.555<br>115.70 | 4.295<br>109.09 | 4.035<br>102.49 | 3.875<br>98.43  | 3.625<br>92.08  | 0.420<br>10.67                        | 0.240<br>6.10                      | A7D30RA29AM231                                        | A7D30RA29CM231         | A7D30RA29EM231                                     | A7D30RA29FM231                                     |
| 35                                         | 5.180<br>131.57 | 4.920<br>124.97 | 4.660<br>118.36 | 4.500<br>114.30 | 4.250<br>107.95 | 0.420<br>10.67                        | 0.240<br>6.10                      | A7D35RA29AM231                                        | A7D35RA29CM231         | A7D35RA29EM231                                     | A7D35RA29FM231                                     |
| 36                                         | 5.305<br>134.75 | 5.045<br>128.14 | 4.785<br>121.54 | 4.625<br>117.48 | 4.375<br>111.13 | 0.420<br>10.67                        | 0.240<br>6.10                      | A7D36RA29AM231                                        | A7D36RA29CM231         | A7D36RA29EM231                                     | A7D36RA29FM231                                     |
| 40                                         | 5.805<br>147.45 | 5.545<br>140.84 | 5.285<br>134.24 | 5.125<br>130.18 | 4.875<br>123.83 | 0.420<br>10.67                        | 0.240<br>6.10                      | A7D40RA29AM231                                        | A7D40RA29CM231         | A7D40RA29EM231                                     | A7D40RA29FM231                                     |
| 43                                         | 6.180<br>156.97 | 5.920<br>150.37 | 5.660<br>143.76 | 5.500<br>139.70 | 5.250<br>133.35 | 0.420<br>10.67                        | 0.240<br>6.10                      | A7D43RA29AM231                                        | A7D43RA29CM231         | A7D43RA29EM231                                     | A7D43RA29FM231                                     |
| 50                                         | 7.055<br>179.20 | 6.795<br>172.59 | 6.535<br>165.99 | 6.375<br>161.93 | 6.125<br>155.58 | 0.420<br>10.67                        | 0.240<br>6.10                      | A7D50RA29AM231                                        | A7D50RA29CM231         | A7D50RA29EM231                                     | A7D50RA29FM231                                     |
| .200" [5.08] Row-to-Row (Dim. "H") Spacing |                 |                 |                 |                 |                 |                                       |                                    |                                                       |                        |                                                    |                                                    |
| 6                                          | 1.555<br>39.50  | 1.295<br>32.89  | 1.035<br>26.29  | 0.875<br>22.23  | 0.625<br>15.88  | 0.470<br>11.94                        | 0.290<br>7.37                      | A7D06RA29AM232                                        | A7D06RA29CM232         | A7D06RA29EM232                                     | A7D06RA29FM232                                     |
| 10                                         | 2.055<br>52.20  | 1.795<br>45.59  | 1.535<br>38.99  | 1.375<br>34.93  | 1.125<br>28.58  | 0.470<br>11.94                        | 0.290<br>7.37                      | A7D10RA29AM232                                        | A7D10RA29CM232         | A7D10RA29EM232                                     | A7D10RA29FM232                                     |
| 15                                         | 2.680<br>68.07  | 2.420<br>61.47  | 2.160<br>54.86  | 2.000<br>50.80  | 1.750<br>44.45  | 0.470<br>11.94                        | 0.290<br>7.37                      | A7D15RA29AM232                                        | A7D15RA29CM232         | A7D15RA29EM232                                     | A7D15RA29FM232                                     |
| 18                                         | 3.055<br>77.60  | 2.795<br>70.99  | 2.535<br>64.39  | 2.375<br>60.33  | 2.125<br>53.98  | 0.470<br>11.94                        | 0.290<br>7.37                      | A7D18RA29AM232                                        | A7D18RA29CM232         | A7D18RA29EM232                                     | A7D18RA29FM232                                     |
| 22                                         | 3.555<br>90.30  | 3.295<br>83.69  | 3.035<br>77.09  | 2.875<br>73.03  | 2.625<br>66.68  | 0.470<br>11.94                        | 0.290<br>7.37                      | A7D22RA29AM232                                        | A7D22RA29CM232         | A7D22RA29EM232                                     | A7D22RA29FM232                                     |
| 25                                         | 3.930<br>99.82  | 3.670<br>93.22  | 3.410<br>86.61  | 3.250<br>82.55  | 3.000<br>76.20  | 0.470<br>11.94                        | 0.290<br>7.37                      | A7D25RA29AM232                                        | A7D25RA29CM232         | A7D25RA29EM232                                     | A7D25RA29FM232                                     |
| 28                                         | 4.305<br>109.35 | 4.045<br>102.74 | 3.785<br>96.14  | 3.625<br>92.08  | 3.375<br>85.73  | 0.470<br>11.94                        | 0.290<br>7.37                      | A7D28RA29AM232                                        | A7D28RA29CM232         | A7D28RA29EM232                                     | A7D28RA29FM232                                     |
| 30                                         | 4.555<br>115.70 | 4.295<br>109.09 | 4.035<br>102.49 | 3.875<br>98.43  | 3.625<br>92.08  | 0.470<br>11.94                        | 0.290<br>7.37                      | A7D30RA29AM232                                        | A7D30RA29CM232         | A7D30RA29EM232                                     | A7D30RA29FM232                                     |
| 35                                         | 5.180<br>131.57 | 4.920<br>124.97 | 4.660<br>118.36 | 4.500<br>114.30 | 4.250<br>107.95 | 0.470<br>11.94                        | 0.290<br>7.37                      | A7D35RA29AM232                                        | A7D35RA29CM232         | A7D35RA29EM232                                     | A7D35RA29FM232                                     |
| 36                                         | 5.305<br>134.75 | 5.045<br>128.14 | 4.785<br>121.54 | 4.625<br>117.48 | 4.375<br>111.13 | 0.470<br>11.94                        | 0.290<br>7.37                      | A7D36RA29AM232                                        | A7D36RA29CM232         | A7D36RA29EM232                                     | A7D36RA29FM232                                     |
| 40                                         | 5.805<br>147.45 | 5.545<br>140.84 | 5.285<br>134.24 | 5.125<br>130.18 | 4.875<br>123.83 | 0.470<br>11.94                        | 0.290<br>7.37                      | A7D40RA29AM232                                        | A7D40RA29CM232         | A7D40RA29EM232                                     | A7D40RA29FM232                                     |
| 43                                         | 6.180<br>156.97 | 5.920<br>150.37 | 5.660<br>143.76 | 5.500<br>139.70 | 5.250<br>133.35 | 0.470<br>11.94                        | 0.290<br>7.37                      | A7D43RA29AM232                                        | A7D43RA29CM232         | A7D43RA29EM232                                     | A7D43RA29FM232                                     |
| 50                                         | 7.055<br>179.20 | 6.795<br>172.59 | 6.535<br>165.99 | 6.375<br>161.93 | 6.125<br>155.58 | 0.470<br>11.94                        | 0.290<br>7.37                      | A7D50RA29AM232                                        | A7D50RA29CM232         | A7D50RA29EM232                                     | A7D50RA29FM232                                     |

.125" [3.18] Centerline / .250" [6.35] Row-to-Row (Dim. "H") Spacing

| No. of<br>Dual<br>Readout<br>Positions            | Dimensions      |                 |                 |                 |                 |                                       | Mounting Ear Options               |                                                       |                        |                                                                |                                                             |
|---------------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------------------------------|------------------------------------|-------------------------------------------------------|------------------------|----------------------------------------------------------------|-------------------------------------------------------------|
|                                                   | A               | B               | C               | D               | E               | Centered<br>Mounting<br>Ear Only<br>G | Flush<br>Mounting<br>Ear Only<br>K | Centered<br>Mounting Ear<br>.125" [3.18]<br>Thru Hole | No<br>Mounting<br>Ears | Centered<br>Mounting Ear<br>.125" [3.18]<br>Cross-Drilled Hole | Flush<br>Mounting Ear<br>.125" [3.18]<br>Cross-Drilled Hole |
| <b>.250" [6.35] Row-to-Row (Dim. "H") Spacing</b> |                 |                 |                 |                 |                 |                                       |                                    |                                                       |                        |                                                                |                                                             |
| 6                                                 | 1.555<br>39.50  | 1.295<br>32.89  | 1.035<br>26.29  | 0.875<br>22.23  | 0.625<br>15.88  | 0.520<br>13.21                        | 0.340<br>8.64                      | A7D06RA29A                                            | A7D06RA29C             | A7D06RA29E                                                     | A7D06RA29F                                                  |
| 10                                                | 2.055<br>52.20  | 1.795<br>45.59  | 1.535<br>38.99  | 1.375<br>34.93  | 1.125<br>28.58  | 0.520<br>13.21                        | 0.340<br>8.64                      | A7D10RA29A                                            | A7D10RA29C             | A7D10RA29E                                                     | A7D10RA29F                                                  |
| 15                                                | 2.680<br>68.07  | 2.420<br>61.47  | 2.160<br>54.86  | 2.000<br>50.80  | 1.750<br>44.45  | 0.520<br>13.21                        | 0.340<br>8.64                      | A7D15RA29A                                            | A7D15RA29C             | A7D15RA29E                                                     | A7D15RA29F                                                  |
| 18                                                | 3.055<br>77.60  | 2.795<br>70.99  | 2.535<br>64.39  | 2.375<br>60.33  | 2.125<br>53.98  | 0.520<br>13.21                        | 0.340<br>8.64                      | A7D18RA29A                                            | A7D18RA29C             | A7D18RA29E                                                     | A7D18RA29F                                                  |
| 22                                                | 3.555<br>90.30  | 3.295<br>83.69  | 3.035<br>77.09  | 2.875<br>73.03  | 2.625<br>66.68  | 0.520<br>13.21                        | 0.340<br>8.64                      | A7D22RA29A                                            | A7D22RA29C             | A7D22RA29E                                                     | A7D22RA29F                                                  |
| 25                                                | 3.930<br>99.82  | 3.670<br>93.22  | 3.410<br>86.61  | 3.250<br>82.55  | 3.000<br>76.20  | 0.520<br>13.21                        | 0.340<br>8.64                      | A7D25RA29A                                            | A7D25RA29C             | A7D25RA29E                                                     | A7D25RA29F                                                  |
| 28                                                | 4.305<br>109.35 | 4.045<br>102.74 | 3.785<br>96.14  | 3.625<br>92.08  | 3.375<br>85.73  | 0.520<br>13.21                        | 0.340<br>8.64                      | A7D28RA29A                                            | A7D28RA29C             | A7D28RA29E                                                     | A7D28RA29F                                                  |
| 30                                                | 4.555<br>115.70 | 4.295<br>109.09 | 4.035<br>102.49 | 3.875<br>98.43  | 3.625<br>92.08  | 0.520<br>13.21                        | 0.340<br>8.64                      | A7D30RA29A                                            | A7D30RA29C             | A7D30RA29E                                                     | A7D30RA29F                                                  |
| 35                                                | 5.180<br>131.57 | 4.920<br>124.97 | 4.660<br>118.36 | 4.500<br>114.30 | 4.250<br>107.95 | 0.520<br>13.21                        | 0.340<br>8.64                      | A7D35RA29A                                            | A7D35RA29C             | A7D35RA29E                                                     | A7D35RA29F                                                  |
| 36                                                | 5.305<br>134.75 | 5.045<br>128.14 | 4.785<br>121.54 | 4.625<br>117.48 | 4.375<br>111.13 | 0.520<br>13.21                        | 0.340<br>8.64                      | A7D36RA29A                                            | A7D36RA29C             | A7D36RA29E                                                     | A7D36RA29F                                                  |
| 40                                                | 5.805<br>147.45 | 5.545<br>140.84 | 5.285<br>134.24 | 5.125<br>130.18 | 4.875<br>123.83 | 0.520<br>13.21                        | 0.340<br>8.64                      | A7D40RA29A                                            | A7D40RA29C             | A7D40RA29E                                                     | A7D40RA29F                                                  |
| 43                                                | 6.180<br>156.97 | 5.920<br>150.37 | 5.660<br>143.76 | 5.500<br>139.70 | 5.250<br>133.35 | 0.520<br>13.21                        | 0.340<br>8.64                      | A7D43RA29A                                            | A7D43RA29C             | A7D43RA29E                                                     | A7D43RA29F                                                  |
| 50                                                | 7.055<br>179.20 | 6.795<br>172.59 | 6.535<br>165.99 | 6.375<br>161.93 | 6.125<br>155.58 | 0.520<br>13.21                        | 0.340<br>8.64                      | A7D50RA29A                                            | A7D50RA29C             | A7D50RA29E                                                     | A7D50RA29F                                                  |

### Product Facts

- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E60980
- Certified by Canadian Standards Association, File No. LR49571



### Physical Properties:

**Insulation Resistance**—5000 megohms minimum.

**Insertion/Withdrawal Force (Daughter Card)**—8 oz./2 oz. [35.6 N/ 8.9 N] average contact pair using .0620 [1.57] steel blade.

**Insulator Body**—Glass filled thermoplastic, UL rating 94V-0. High temp. plastic option is available; add suffix M399 to part number.

**Color**—Black

**Contacts**—High strength copper alloy.

**Contact Plating**—.000050 [0.00127] nickel underplate with .000030 [0.00076] gold in the mating area, tin/lead on tails, .000100 [0.00254] minimum

### Electrical Properties:

**Operation Voltage**—1500 VDC (sea level)

**Current Rating**—3 Amperes

**Initial Contact Resistance**—10 milliohms

### Environmental Properties:

**Operating Temperature**—-55°C to +125°C

**Temperature Cycling**—MIL-STD-202 method 107

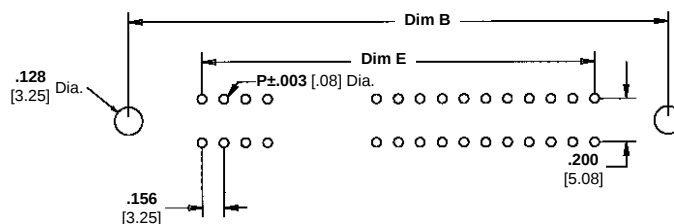
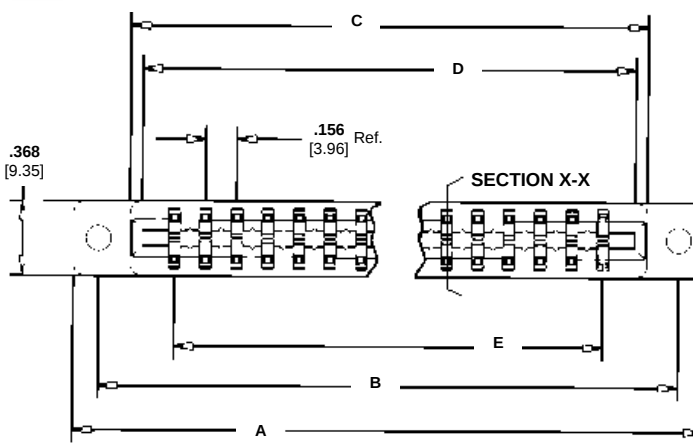
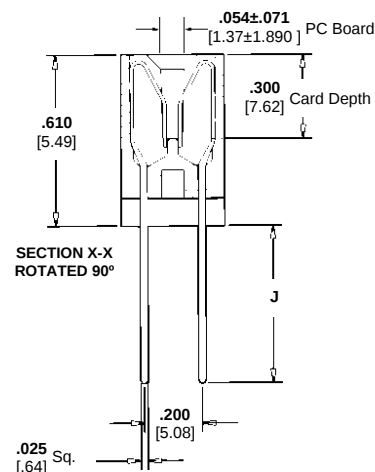
**Vibration**—MIL-STD-202 method 204

### Related Product Data:

**Polarization Key**—page 57

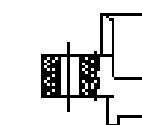
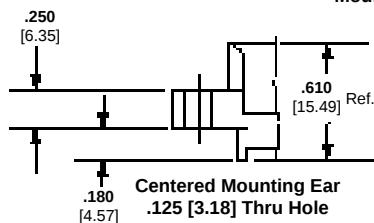
**Daughter Card Edge Pattern**—page 57

## Modified Bellows Connectors, .156 x .200 [3.96 x 5.08] Centerline, Straight Dip Solder and Wire Wrap Tails



P=.040 [1.02] Dip Solder Applications  
P=.042 [1.07] For Wire Wrap Applications

### Mounting Styles



Centered Mounting Ear  
4-40 Threaded Insert



No Mounting Ears

.156" [3.96] Centerline / .200" [5.08] Row-to-Row

| No. of Dual Readout Positions                                        | Dimensions      |                 |                 |                 |                 | Mounting Ear Options                         |                                            |                  |
|----------------------------------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------------------------------------|--------------------------------------------|------------------|
|                                                                      | A               | B               | C               | D               | E               | Centered Mounting Ear .125" [3.18] Thru Hole | Centered Mounting Ear 4-40 Threaded Insert | No Mounting Ears |
| <b>Tail Length .160" [4.06] (DIM "J")</b>                            |                 |                 |                 |                 |                 |                                              |                                            |                  |
| 6                                                                    | 1.784<br>45.31  | 1.534<br>38.96  | 1.221<br>31.01  | 1.100<br>27.94  | 0.780<br>19.81  | A6D06DS29A2                                  | A6D06DS29B2                                | A6D06DS29C2      |
| 10                                                                   | 2.408<br>61.16  | 2.158<br>54.81  | 1.845<br>46.86  | 1.724<br>43.79  | 1.404<br>35.66  | A6D10DS29A2                                  | A6D10DS29B2                                | A6D10DS29C2      |
| 12                                                                   | 2.720<br>69.09  | 2.470<br>62.74  | 2.157<br>54.79  | 2.036<br>51.71  | 1.716<br>43.59  | A6D12DS29A2                                  | A6D12DS29B2                                | A6D12DS29C2      |
| 15                                                                   | 3.188<br>80.98  | 2.938<br>74.63  | 2.625<br>66.68  | 2.504<br>63.60  | 2.184<br>55.47  | A6D15DS29A2                                  | A6D15DS29B2                                | A6D15DS29C2      |
| 18                                                                   | 3.656<br>92.86  | 3.406<br>86.51  | 3.093<br>78.56  | 2.972<br>75.49  | 2.652<br>67.36  | A6D18DS29A2                                  | A6D18DS29B2                                | A6D18DS29C2      |
| 22                                                                   | 4.280<br>108.71 | 4.030<br>102.36 | 3.717<br>94.41  | 3.596<br>91.34  | 3.276<br>83.21  | A6D22DS29A2                                  | A6D22DS29B2                                | A6D22DS29C2      |
| 25                                                                   | 4.748<br>120.60 | 4.498<br>114.25 | 4.185<br>106.30 | 4.064<br>103.23 | 3.744<br>95.10  | A6D25DS29A2                                  | A6D25DS29B2                                | A6D25DS29C2      |
| 28                                                                   | 5.216<br>132.49 | 4.966<br>126.14 | 4.653<br>118.19 | 4.532<br>115.11 | 4.212<br>106.98 | A6D28DS29A2                                  | A6D28DS29B2                                | A6D28DS29C2      |
| 36                                                                   | 6.464<br>164.19 | 6.214<br>157.84 | 5.901<br>149.89 | 5.780<br>146.81 | 5.460<br>138.68 | A6D36DS29A2                                  | A6D36DS29B2                                | A6D36DS29C2      |
| 43                                                                   | 7.556<br>191.92 | 7.306<br>185.57 | 6.993<br>177.62 | 6.872<br>174.55 | 6.552<br>166.42 | A6D43DS29A2                                  | A6D43DS29B2                                | A6D43DS29C2      |
| <b>Tail Length .220" [5.59] (DIM "J")</b>                            |                 |                 |                 |                 |                 |                                              |                                            |                  |
| 6                                                                    | 1.784<br>45.31  | 1.534<br>38.96  | 1.221<br>31.01  | 1.100<br>27.94  | 0.780<br>19.81  | A6D06DS29A3                                  | A6D06DS29B3                                | A6D06DS29C3      |
| 10                                                                   | 2.408<br>61.16  | 2.158<br>54.81  | 1.845<br>46.86  | 1.724<br>43.79  | 1.404<br>35.66  | A6D10DS29A3                                  | A6D10DS29B3                                | A6D10DS29C3      |
| 12                                                                   | 2.720<br>69.09  | 2.470<br>62.74  | 2.157<br>54.79  | 2.036<br>51.71  | 1.716<br>43.59  | A6D12DS29A3                                  | A6D12DS29B3                                | A6D12DS29C3      |
| 15                                                                   | 3.188<br>80.98  | 2.938<br>74.63  | 2.625<br>66.68  | 2.504<br>63.60  | 2.184<br>55.47  | A6D15DS29A3                                  | A6D15DS29B3                                | A6D15DS29C3      |
| 18                                                                   | 3.656<br>92.86  | 3.406<br>86.51  | 3.093<br>78.56  | 2.972<br>75.49  | 2.652<br>67.36  | A6D18DS29A3                                  | A6D18DS29B3                                | A6D18DS29C3      |
| 22                                                                   | 4.280<br>108.71 | 4.030<br>102.36 | 3.717<br>94.41  | 3.596<br>91.34  | 3.276<br>83.21  | A6D22DS29A3                                  | A6D22DS29B3                                | A6D22DS29C3      |
| 25                                                                   | 4.748<br>120.60 | 4.498<br>114.25 | 4.185<br>106.30 | 4.064<br>103.23 | 3.744<br>95.10  | A6D25DS29A3                                  | A6D25DS29B3                                | A6D25DS29C3      |
| 28                                                                   | 5.216<br>132.49 | 4.966<br>126.14 | 4.653<br>118.19 | 4.532<br>115.11 | 4.212<br>106.98 | A6D28DS29A3                                  | A6D28DS29B3                                | A6D28DS29C3      |
| 36                                                                   | 6.464<br>164.19 | 6.214<br>157.84 | 5.901<br>149.89 | 5.780<br>146.81 | 5.460<br>138.68 | A6D36DS29A3                                  | A6D36DS29B3                                | A6D36DS29C3      |
| 43                                                                   | 7.556<br>191.92 | 7.306<br>185.57 | 6.993<br>177.62 | 6.872<br>174.55 | 6.552<br>166.42 | A6D43DS29A3                                  | A6D43DS29B3                                | A6D43DS29C3      |
| <b>Tail Length .560" [14.22] (DIM "J") For Wire Wrap Termination</b> |                 |                 |                 |                 |                 |                                              |                                            |                  |
| 6                                                                    | 1.784<br>45.31  | 1.534<br>38.96  | 1.221<br>31.01  | 1.100<br>27.94  | 0.780<br>19.81  | A6D06WW29A3                                  | A6D06WW29B3                                | —                |
| 10                                                                   | 2.408<br>61.16  | 2.158<br>54.81  | 1.845<br>46.86  | 1.724<br>43.79  | 1.404<br>35.66  | A6D10WW29A3                                  | A6D10WW29B3                                | —                |
| 12                                                                   | 2.720<br>69.09  | 2.470<br>62.74  | 2.157<br>54.79  | 2.036<br>51.71  | 1.716<br>43.59  | A6D12WW29A3                                  | A6D12WW29B3                                | —                |
| 15                                                                   | 3.188<br>80.98  | 2.938<br>74.63  | 2.625<br>66.68  | 2.504<br>63.60  | 2.184<br>55.47  | A6D15WW29A3                                  | A6D15WW29B3                                | —                |
| 18                                                                   | 3.656<br>92.86  | 3.406<br>86.51  | 3.093<br>78.56  | 2.972<br>75.49  | 2.652<br>67.36  | A6D18WW29A3                                  | A6D18WW29B3                                | —                |
| 22                                                                   | 4.280<br>108.71 | 4.030<br>102.36 | 3.717<br>94.41  | 3.596<br>91.34  | 3.276<br>83.21  | A6D22WW29A3                                  | A6D22WW29B3                                | —                |
| 25                                                                   | 4.748<br>120.60 | 4.498<br>114.25 | 4.185<br>106.30 | 4.064<br>103.23 | 3.744<br>95.10  | A6D25WW29A3                                  | A6D25WW29B3                                | —                |
| 28                                                                   | 5.216<br>132.49 | 4.966<br>126.14 | 4.653<br>118.19 | 4.532<br>115.11 | 4.212<br>106.98 | A6D28WW29A3                                  | A6D28WW29B3                                | —                |
| 36                                                                   | 6.464<br>164.19 | 6.214<br>157.84 | 5.901<br>149.89 | 5.780<br>146.81 | 5.460<br>138.68 | A6D36WW29A3                                  | A6D36WW29B3                                | —                |
| 43                                                                   | 7.556<br>191.92 | 7.306<br>185.57 | 6.993<br>177.62 | 6.872<br>174.55 | 6.552<br>166.42 | A6D43WW29A3                                  | A6D43WW29B3                                | —                |

# Product Facts

■ Recognized under the  
Component Program  
of Underwriters  
Laboratories Inc.,  
File No. E60980



■ Certified  
by Canadian  
Standards  
Association,  
File No. LR49571



# Physical Properties:

**Insulation Resistance**—5000  
megohms minimum.

**Insertion/Withdrawal Force  
(Daughter Card)**—8 oz./2 oz.  
[35.6 N/ 8.9 N] average contact pair  
using .0620 [1.57] steel blade.

**Insulator Body**—Glass filled  
thermoplastic, UL rating 94V-0. High  
temp. plastic option is available; add  
suffix M399 to part number.

**Color**—Black

**Contacts**—High strength copper alloy.

**Contact Plating**—.000050 [0.00127]  
nickel underplate with .000030  
[0.00076] gold in the mating area,  
tin/lead on tails, .000100 [0.00254]  
minimum

# Electrical Properties:

**Operation Voltage**—1500 VDC (sea  
level)

**Current Rating**—3 Amperes

**Initial Contact Resistance**—10  
milliohms

# Environmental Properties:

**Operating Temperature**—  
-55°C to +125°C

**Temperature Cycling**—  
MIL-STD-202 method 107

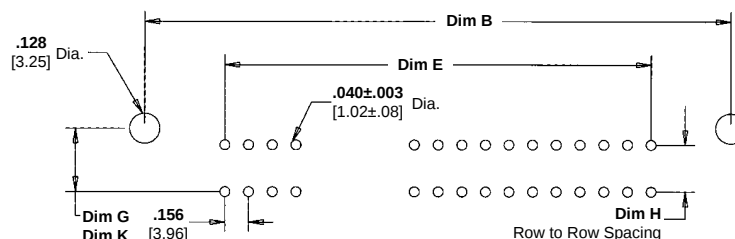
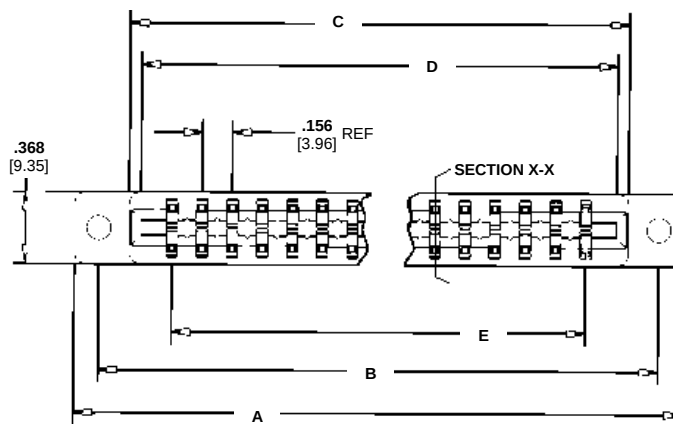
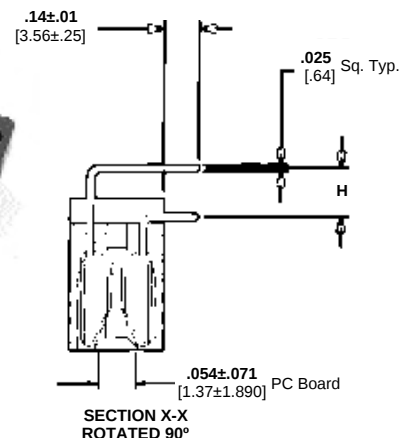
**Vibration**—MIL-STD-202 method 204

# Related Product Data:

**Polarization Key**—page 57

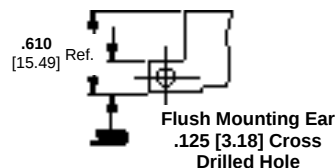
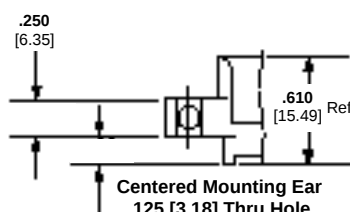
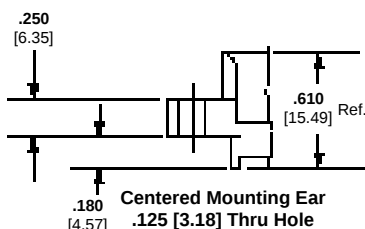
**Daughter Card Edge Pattern**—  
page 57

## Modified Bellows Connectors .156 x .200 [3.96 x 5.08] Centerline, .156 x .150 [3.96 x 3.81], Right Angle, Dip Solder Tails



Dim G - Centered Mounting Ear .125 [3.18] Cross Drilled Hole Only  
Dim K - Flush Mounting Ear .125 [3.18] Cross Drilled Hole Only

# Mounting Styles



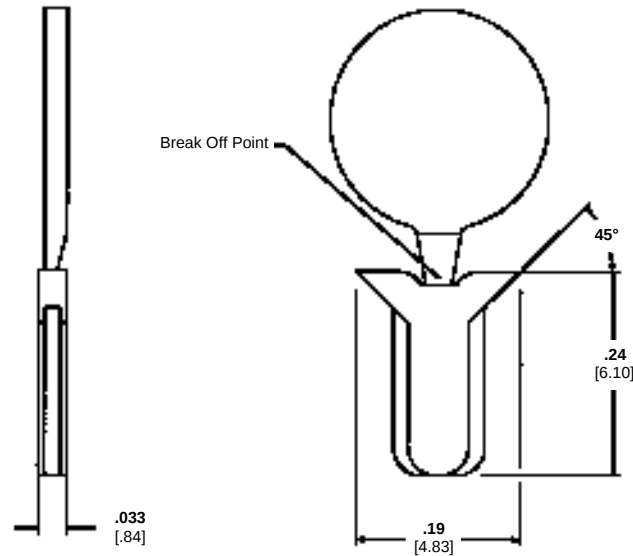
## .156" [3.96] Centerline / .200" [5.08] and .150" [3.81] Row-to-Row (Dim. "H") Spacing

| No. of<br>Dual<br>Readout<br>Positions     | Dimensions      |                 |                 |                 |                 |                                       |                                    | Mounting Ear Options                                  |                        |                                                                |                                                             |
|--------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------------------------------|------------------------------------|-------------------------------------------------------|------------------------|----------------------------------------------------------------|-------------------------------------------------------------|
|                                            | A               | B               | C               | D               | E               | Centered<br>Mounting<br>Ear Only<br>G | Flush<br>Mounting<br>Ear Only<br>K | Centered<br>Mounting Ear<br>.125" [3.18]<br>Thru Hole | No<br>Mounting<br>Ears | Centered<br>Mounting Ear<br>.125" [3.18]<br>Cross-Drilled Hole | Flush<br>Mounting Ear<br>.125" [3.18]<br>Cross-Drilled Hole |
| .200" [5.08] Row-to-Row (Dim. "H") Spacing |                 |                 |                 |                 |                 |                                       |                                    |                                                       |                        |                                                                |                                                             |
| 6                                          | 1.784<br>45.31  | 1.534<br>38.96  | 1.221<br>31.01  | 1.100<br>27.94  | 0.780<br>19.81  | 0.470<br>11.94                        | 0.290<br>7.37                      | A6D06RA29A                                            | A6D06RA29C             | A6D06RA29E                                                     | A6D06RA29F                                                  |
| 10                                         | 2.408<br>61.16  | 2.158<br>54.81  | 1.845<br>46.86  | 1.724<br>43.79  | 1.404<br>35.66  | 0.470<br>11.94                        | 0.290<br>7.37                      | A6D10RA29A                                            | A6D10RA29C             | A6D10RA29E                                                     | A6D10RA29F                                                  |
| 12                                         | 2.720<br>69.09  | 2.470<br>62.74  | 2.157<br>54.79  | 2.036<br>51.71  | 1.716<br>43.59  | 0.470<br>11.94                        | 0.290<br>7.37                      | A6D12RA29A                                            | A6D12RA29C             | A6D12RA29E                                                     | A6D12RA29F                                                  |
| 15                                         | 3.188<br>80.98  | 2.938<br>74.63  | 2.625<br>66.68  | 2.504<br>63.60  | 2.184<br>55.47  | 0.470<br>11.94                        | 0.290<br>7.37                      | A6D15RA29A                                            | A6D15RA29C             | A6D15RA29E                                                     | A6D15RA29F                                                  |
| 18                                         | 3.656<br>92.86  | 3.406<br>86.51  | 3.093<br>78.56  | 2.972<br>75.49  | 2.652<br>67.36  | 0.470<br>11.94                        | 0.290<br>7.37                      | A6D18RA29A                                            | A6D18RA29C             | A6D18RA29E                                                     | A6D18RA29F                                                  |
| 22                                         | 4.280<br>108.71 | 4.030<br>102.36 | 3.717<br>94.41  | 3.596<br>91.34  | 3.276<br>83.21  | 0.470<br>11.94                        | 0.290<br>7.37                      | A6D22RA29A                                            | A6D22RA29C             | A6D22RA29E                                                     | A6D22RA29F                                                  |
| 25                                         | 4.748<br>120.60 | 4.498<br>114.25 | 4.185<br>106.30 | 4.064<br>103.23 | 3.744<br>95.10  | 0.470<br>11.94                        | 0.290<br>7.37                      | A6D25RA29A                                            | A6D25RA29C             | A6D25RA29E                                                     | A6D25RA29F                                                  |
| 28                                         | 5.216<br>132.49 | 4.966<br>126.14 | 4.653<br>118.19 | 4.532<br>115.11 | 4.212<br>106.98 | 0.470<br>11.94                        | 0.290<br>7.37                      | A6D28RA29A                                            | A6D28RA29C             | A6D28RA29E                                                     | A6D28RA29F                                                  |
| 36                                         | 6.464<br>164.19 | 6.214<br>157.84 | 5.901<br>149.89 | 5.780<br>146.81 | 5.460<br>138.68 | 0.470<br>11.94                        | 0.290<br>7.37                      | A6D36RA29A                                            | A6D36RA29C             | A6D36RA29E                                                     | A6D36RA29F                                                  |
| 40                                         | 7.088<br>180.04 | 6.838<br>173.69 | 6.525<br>165.74 | 6.404<br>213.46 | 6.084<br>154.53 | 0.470<br>11.94                        | 0.290<br>7.37                      | A6D40RA29A                                            | A6D40RA29C             | A6D40RA29E                                                     | A6D40RA29F                                                  |
| 43                                         | 7.556<br>191.92 | 7.306<br>185.57 | 6.993<br>177.62 | 6.872<br>174.55 | 6.552<br>166.42 | 0.470<br>11.94                        | 0.290<br>7.37                      | A6D43RA29A                                            | A6D43RA29C             | A6D43RA29E                                                     | A6D43RA29F                                                  |
| .150" [3.81] Row-to-Row (Dim. "H") Spacing |                 |                 |                 |                 |                 |                                       |                                    |                                                       |                        |                                                                |                                                             |
| 6                                          | 1.784<br>45.31  | 1.534<br>38.96  | 1.221<br>31.01  | 1.100<br>27.94  | 0.780<br>19.81  | 0.420<br>10.67                        | 0.240<br>6.10                      | A6D06RA29AM233                                        | A6D06RA29CM233         | A6D06RA29EM233                                                 | A6D06RA29FM233                                              |
| 10                                         | 2.408<br>61.16  | 2.158<br>54.81  | 1.845<br>46.86  | 1.724<br>43.79  | 1.404<br>35.66  | 0.420<br>10.67                        | 0.240<br>6.10                      | A6D10RA29AM233                                        | A6D10RA29CM233         | A6D10RA29EM233                                                 | A6D10RA29FM233                                              |
| 12                                         | 2.720<br>69.09  | 2.470<br>62.74  | 2.157<br>54.79  | 2.036<br>51.71  | 1.716<br>43.59  | 0.420<br>10.67                        | 0.240<br>6.10                      | A6D12RA29AM233                                        | A6D12RA29CM233         | A6D12RA29EM233                                                 | A6D12RA29FM233                                              |
| 15                                         | 3.188<br>80.98  | 2.938<br>74.63  | 2.625<br>66.68  | 2.504<br>63.60  | 2.184<br>55.47  | 0.420<br>10.67                        | 0.240<br>6.10                      | A6D15RA29AM233                                        | A6D15RA29CM233         | A6D15RA29EM233                                                 | A6D15RA29FM233                                              |
| 18                                         | 3.656<br>92.86  | 3.406<br>86.51  | 3.093<br>78.56  | 2.972<br>75.49  | 2.652<br>67.36  | 0.420<br>10.67                        | 0.240<br>6.10                      | A6D18RA29AM233                                        | A6D18RA29CM233         | A6D18RA29EM233                                                 | A6D18RA29FM233                                              |
| 22                                         | 4.280<br>108.71 | 4.030<br>102.36 | 3.717<br>94.41  | 3.596<br>91.34  | 3.276<br>83.21  | 0.420<br>10.67                        | 0.240<br>6.10                      | A6D22RA29AM233                                        | A6D22RA29CM233         | A6D22RA29EM233                                                 | A6D22RA29FM233                                              |
| 25                                         | 4.748<br>120.60 | 4.498<br>114.25 | 4.185<br>106.30 | 4.064<br>103.23 | 3.744<br>95.10  | 0.420<br>10.67                        | 0.240<br>6.10                      | A6D25RA29AM233                                        | A6D25RA29CM233         | A6D25RA29EM233                                                 | A6D25RA29FM233                                              |
| 28                                         | 5.216<br>132.49 | 4.966<br>126.14 | 4.653<br>118.19 | 4.532<br>115.11 | 4.212<br>106.98 | 0.420<br>10.67                        | 0.240<br>6.10                      | A6D28RA29AM233                                        | A6D28RA29CM233         | A6D28RA29EM233                                                 | A6D28RA29FM233                                              |
| 36                                         | 6.464<br>164.19 | 6.214<br>157.84 | 5.901<br>149.89 | 5.780<br>146.81 | 5.460<br>138.68 | 0.420<br>10.67                        | 0.240<br>6.10                      | A6D36RA29AM233                                        | A6D36RA29CM233         | A6D36RA29EM233                                                 | A6D36RA29FM233                                              |
| 40                                         | 7.088<br>180.04 | 6.838<br>173.69 | 6.525<br>165.74 | 6.404<br>162.66 | 6.084<br>154.53 | 0.420<br>10.67                        | 0.240<br>6.10                      | A6D40RA29AM233                                        | A6D40RA29CM233         | A6D40RA29EM233                                                 | A6D40RA29FM233                                              |
| 43                                         | 7.556<br>191.92 | 7.306<br>185.57 | 6.993<br>177.62 | 6.872<br>174.55 | 6.552<br>166.42 | 0.420<br>10.67                        | 0.240<br>6.10                      | A6D43RA29AM233                                        | A6D43RA29CM233         | A6D43RA29EM233                                                 | A6D43RA29FM233                                              |

### Description/Application

Tyco Electronics can provide polarization keys in the basic configuration shown on this page. Our Modified Bellows and Cantilever Beam Series Card Edge Connectors use these keys. The part number and the connector series for which it was designed are listed in the table below.

### Card Edge Polarization Keys

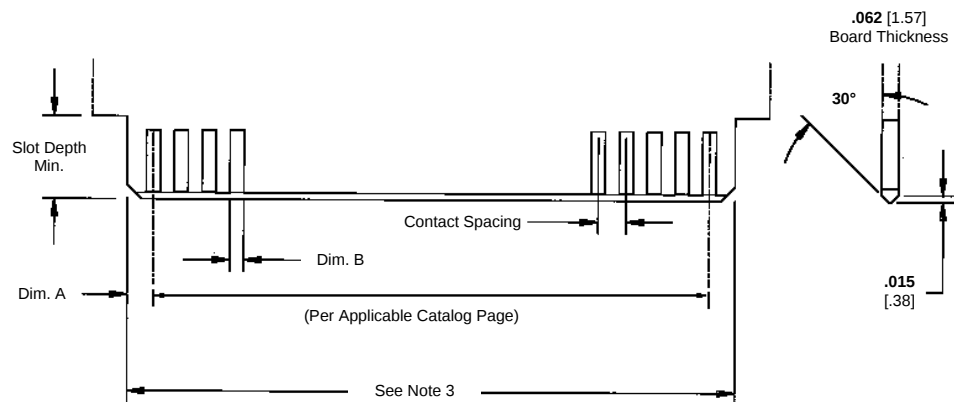


#### Ordering Information

| Acquired Part Number | Used on Connector Series | Shown on Pages |
|----------------------|--------------------------|----------------|
| 98014-01             | Modified Bellows         | 41-56          |
| 98014-01             | Cantilever Beam          | 28-40          |

### Card Edge Connectors Recommended Daughter Card Edge Pattern

Per MIL-C-21097E



#### Daughter Card

| Contact Spacing<br>Non-Accum. | Dim A<br>±.005 (.13) | Dim B       |
|-------------------------------|----------------------|-------------|
| .100 [2.54]                   | .093 [2.36]          | .052 [1.32] |
| .125 [3.18]                   | .093 [2.36]          | .052 [1.32] |
| .156 [3.96]                   | .105* [2.67]         | .094 [2.39] |

\* Except MIL-C-21097E 8-4 which is .070 [1.78]

#### NOTES:

1. Dimensions are in inches
2. Unless otherwise specified, tolerance is ±.005 [0.13 mm] for three place decimals.
3. Number of contact fingers shall be the same as the corresponding printed wiring connector.

**Product Facts**

- Low profile housing is .460 [11.68] deep
- 6 through 43 dual positions on .156 [3.96] centerline; 6 through 50 dual positions on .125 [3.18] centerline
- Solder eyelet for wire-to-board or solder post for mother-daughter board application
- Selective gold plating of contact area for high performance at low cost
- Alternate platings are available on request
- Contacts bifurcated for redundancy
- Tin plate for high solderability of solder eyelets and posts
- Accepts .055-.070 [1.40-1.78] thick printed circuit boards
- Housings available with or without mounting ears
- Intercontact keying available
- UL 94V-0 rated, glass-filled polyester housings
- Variety of solder post lengths
- 5 ampere current rating per contact\*
- Recognized under the Component Program of Underwriters Laboratories Inc. File No. E28476



For printed circuit board packaging, AMP Low Profile Edge Connectors provide high performance, low cost connections on .125 [3.18] and .156 [3.96] centerline spacings. .100 [2.54] centerline connectors can be made available, consult Tyco Electronics.

Mounted connector housings extend only .460 [11.68] from the mother board to allow efficient use of available space.

These low profile connectors are available in 6 through 43 dual position sizes on .156 [3.96] centerline spacing and with 6 through 50 dual positions on .125 [3.18] centers. Connectors are supplied

with either solder posts for mother-daughter board applications or solder eyelet contacts for wire-to-board use.

Low Profile Edge Connectors feature clear slot entry and accept .055-.070 [1.40-1.78] thick double-sided printed circuit boards. Solder posts are available with .150 [3.18] and .180 [4.57] long tails on .140 [3.56] or .200 [5.08] row-to-row spacing.

Impact-resistant thermoplastic housing, UL rated 94V-0, have molded-in cavity identification and are available with or without mounting ears. Additional features of the housings include intercontact keying

provisions, probe slots and identification of number one position.

The precision formed contacts made of phosphor bronze are gold plated on the contact mating surface only. This selective plating provides high reliability while maintaining low cost. Solder eyelets and posts are tin plated for excellent solderability. The contact is bifurcated for redundancy. Shorting contacts are available.

All connector configurations are furnished preloaded. Selectively loaded connectors can be made available for added economy.

\*Consult Tyco Electronics engineering when paralleling contacts for power applications.

**Low Profile Connectors, .125 [3.18] Centerline**

**Material and Finish:**

**Housing**—Green, glass-filled polyester

**Contacts**—Phosphor bronze, duplex plated .000030 [0.00076] gold in contact area; .000100 [0.00254] bright tin on posts, with entire contact under-plated .000030 [0.00076] nickel

**Related Product Data:**

**Keying Plug**—page 63

**PC Board Hole Layouts**—See below

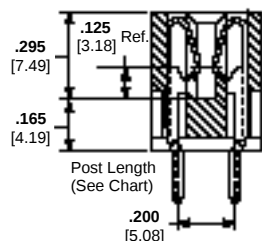
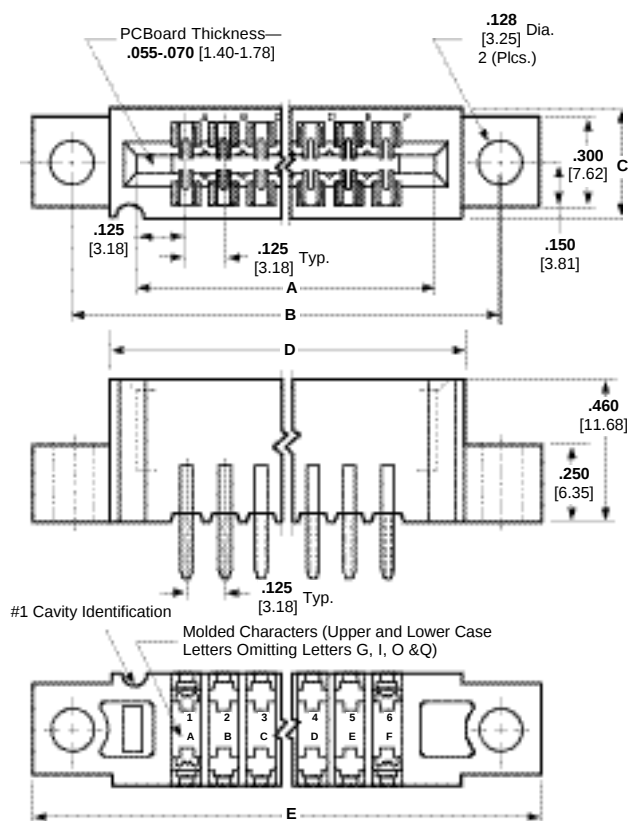
**PC Board Edge Pattern**—page 63

**Technical Documents:**

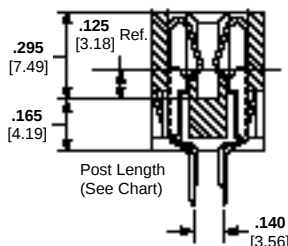
(pages 186, 187):

Product Specification  
108-9044

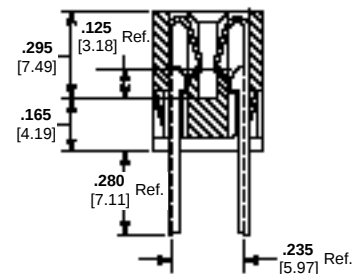
Instruction Sheet 408-7772



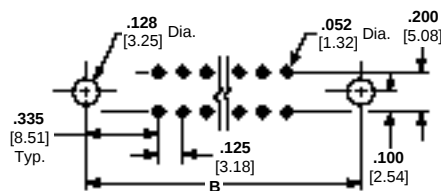
**Flow Solder Post**  
.200 [5.08] Row-to-Row Spacing



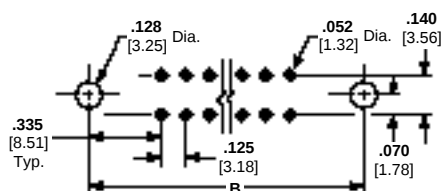
**Flow Solder Post**  
.140 [3.56] Row-to-Row Spacing



**Solder Eyelet Contact**  
.235 [5.97] Row-to-Row Spacing



**Recommended PC Board Hole Layout**



**Recommended PC Board Hole Layout**

**Flow Solder Post  
.200 [5.08] Row-to-Row  
Spacing**

**Low Profile Connectors, .125 [3.18] Centerline** (Continued)

| No. of<br>Dual<br>Positions | Dimensions      |                 |               |                 |                 | Post<br>Length* | With<br>Mounting<br>Ears | Without<br>Mounting<br>Ears |
|-----------------------------|-----------------|-----------------|---------------|-----------------|-----------------|-----------------|--------------------------|-----------------------------|
|                             | A               | B               | C             | D               | E               |                 |                          |                             |
| 6                           | .875<br>22.23   | —               | .370<br>9.40  | 1.035<br>26.29  | —               | .150            | —                        | 2-530671-1                  |
| 10                          | 1.375<br>34.93  | 1.795<br>45.59  | .370<br>9.40  | 1.535<br>38.99  | 2.055<br>52.20  | .150<br>.180    | —<br>2-530663-2          | 2-530671-2<br>—             |
| 15                          | 2.000<br>50.80  | 2.420<br>61.47  | .370<br>9.40  | 2.160<br>54.86  | 2.680<br>68.07  | .150            | —                        | 2-530671-3                  |
| 18                          | 2.375<br>60.33  | 2.795<br>70.99  | .370<br>9.40  | 2.535<br>64.39  | 3.055<br>77.60  | .180            | 2-530663-4               | 2-530671-4                  |
| 22                          | 2.875<br>73.03  | 3.295<br>83.69  | .370<br>9.40  | 3.035<br>77.09  | 3.555<br>90.30  | .150            | 2-530662-5               | 2-530671-5                  |
| 24                          | 3.125<br>79.38  | —               | .370<br>9.40  | 3.285<br>83.44  | —               | .150            | —                        | 3-530671-3                  |
| 28                          | 3.625<br>92.08  | 4.045<br>102.74 | .370<br>9.40  | 3.785<br>96.14  | 4.305<br>109.35 | .150            | 2-530662-6               | 2-530671-6                  |
| 30                          | 3.875<br>98.43  | —               | .370<br>9.40  | 4.035<br>102.49 | —               | .150            | —                        | 2-530671-7                  |
| 36                          | 4.625<br>117.48 | 5.045<br>128.14 | .370<br>9.40  | 4.785<br>121.54 | 5.305<br>134.75 | .150<br>.180    | —<br>—                   | 2-530671-9<br>2-530672-9    |
| 40                          | 5.125<br>130.18 | 5.545<br>140.84 | .437<br>11.10 | 5.285<br>134.24 | 5.805<br>147.45 | .150            | —                        | 3-530671-0                  |
| 50                          | 6.375<br>161.93 | 6.795<br>172.59 | .437<br>11.10 | 6.535<br>165.99 | 7.055<br>179.20 | .150            | 3-530662-2               | —                           |

**Flow Solder Post  
.140 [3.56] Row-to-Row  
Spacing**

| No. of<br>Dual<br>Positions | Dimensions      |                 |               |                 |                 | Post<br>Length* | With<br>Mounting<br>Ears | Without<br>Mounting<br>Ears |
|-----------------------------|-----------------|-----------------|---------------|-----------------|-----------------|-----------------|--------------------------|-----------------------------|
|                             | A               | B               | C             | D               | E               |                 |                          |                             |
| 15                          | 2.000<br>50.80  | —               | .370<br>9.40  | 2.160<br>54.86  | —               | .150            | —                        | 2-530673-3                  |
| 28                          | 3.625<br>92.08  | —               | .370<br>9.40  | 3.785<br>96.14  | —               | .150<br>.180    | —<br>2-530674-6          | 2-530673-6<br>—             |
| 50                          | 6.375<br>161.93 | 6.795<br>172.59 | .437<br>11.10 | 6.535<br>165.99 | 7.055<br>179.20 | .180            | 3-530659-2               | —                           |

**Solder Eyelet Contact  
.235 [5.97] Row-to-Row  
Spacing**

| No. of<br>Dual<br>Positions | Dimensions      |                 |               |                 |                 | With<br>Mounting<br>Ears |
|-----------------------------|-----------------|-----------------|---------------|-----------------|-----------------|--------------------------|
|                             | A               | B               | C             | D               | E               |                          |
| 15                          | 2.000<br>50.80  | 2.420<br>61.47  | .370<br>9.40  | 2.160<br>54.86  | 2.680<br>68.07  | 2-530664-3               |
| 22                          | 2.875<br>73.02  | 3.295<br>83.69  | .370<br>9.40  | 3.035<br>77.08  | 3.555<br>90.29  | 2-530664-5               |
| 28                          | 3.625<br>92.08  | 4.045<br>102.74 | .370<br>9.40  | 3.785<br>96.14  | 4.305<br>109.35 | 2-530664-6               |
| 40                          | 5.125<br>130.17 | 5.545<br>140.84 | .437<br>11.10 | 5.285<br>134.23 | 5.805<br>147.44 | 3-530664-0               |
| 50                          | 6.375<br>161.92 | 6.795<br>172.59 | .437<br>11.10 | 6.535<br>165.98 | 7.055<br>179.19 | 3-530664-2               |

\*Metric equivalents for post length are .150 = [3.81]; .180 = [4.57].

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**Low Profile Connectors, .156 [3.96] Centerline**

**Material and Finish:**

**Housing**—Green, glass-filled polyester

**Contacts**—Phosphor bronze, duplex plated .000030 [0.00076] gold in contact area; .000100 [0.00254] bright tin on posts, with entire contact under-plated .000030 [0.00076] nickel

**Insert**—Brass

**Related Product Data:**

**Keying Plug**—page 63

**PC Board Hole Layouts**—See below

**PC Board Edge Pattern**—page 63

**Technical Documents:**

(pages 186, 187):

Product Specification

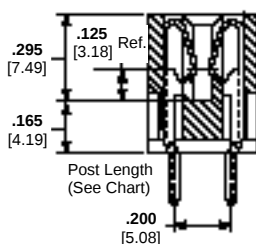
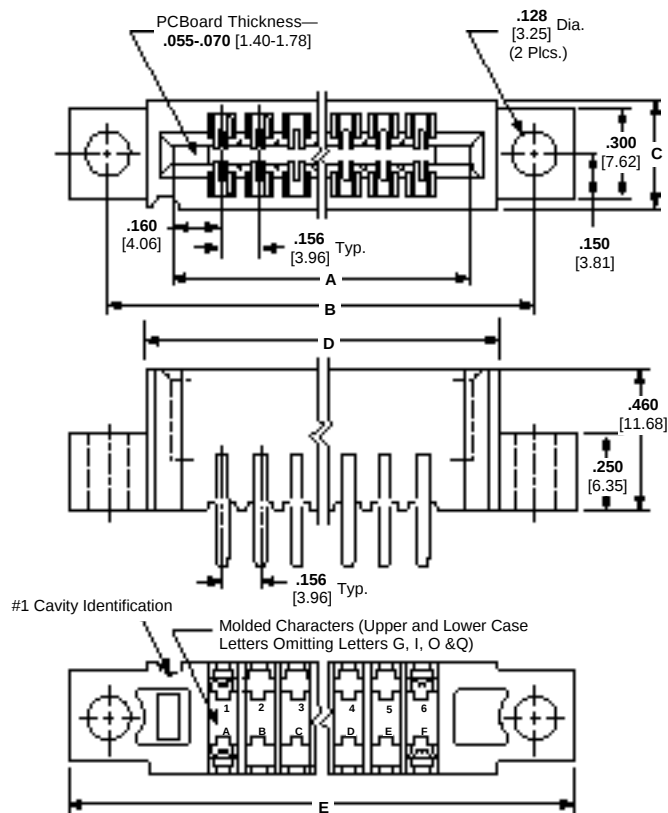
108-9044

Instruction Sheet 408-7772

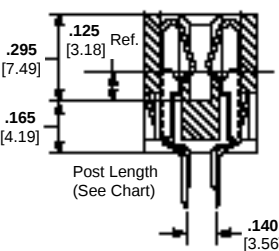
**Mounting Ear with Insert**



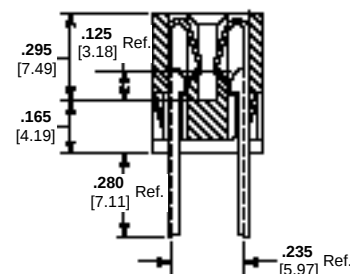
Threaded Inserts  
4-40 NC-2B  
(2 per connector)



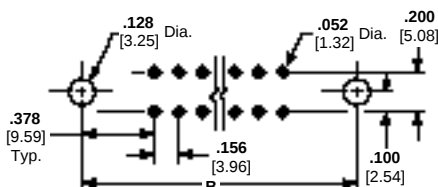
**Flow Solder Post**  
.200 [5.08] Row-to-Row Spacing



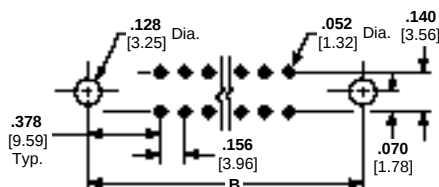
**Flow Solder Post**  
.140 [3.56] Row-to-Row Spacing



**Solder Eyelet Contact**  
.235 [5.97] Row-to-Row Spacing



**Recommended  
PC Board Hole Layout**



**Recommended  
PC Board Hole Layout**

**Flow Solder Post  
.200 [5.08] Row-to-Row  
Spacing**
**Low Profile Connectors, .156 [3.96] Centerline** (Continued)

| No. of<br>Dual<br>Positions | Dimensions   |              |             |              |              | Post<br>Length* | With<br>Mounting<br>Ears | With<br>Mounting Ears<br>and Inserts | Without<br>Mounting<br>Ears |
|-----------------------------|--------------|--------------|-------------|--------------|--------------|-----------------|--------------------------|--------------------------------------|-----------------------------|
|                             | A            | B            | C           | D            | E            |                 |                          |                                      |                             |
| 6                           | <b>1.100</b> | <b>1.535</b> | <b>.370</b> | <b>1.240</b> | <b>1.785</b> | <b>.150</b>     | 2-530655-1               | 2-530677-1                           | —                           |
|                             | 27.94        | 38.99        | 9.40        | 31.50        | 45.34        |                 | 2-530689-1 <sup>1</sup>  | —                                    | 2-530666-1                  |
| 10                          | <b>1.724</b> | <b>2.159</b> | <b>.370</b> | <b>1.864</b> | <b>2.409</b> | <b>.150</b>     | 2-530655-2               | —                                    | 2-530666-2                  |
|                             | 43.79        | 54.84        | 9.40        | 47.35        | 61.19        |                 | <b>.180</b>              | 2-530656-2                           | —                           |
| 12                          | <b>2.036</b> | <b>2.471</b> | <b>.370</b> | <b>2.176</b> | <b>2.721</b> | <b>.150</b>     | 2-530655-3               | —                                    | 2-530666-3                  |
|                             | 51.71        | 62.76        | 9.40        | 55.27        | 69.11        |                 | 2-530655-4               | —                                    | 2-530666-4                  |
| 15                          | <b>2.504</b> | <b>2.939</b> | <b>.370</b> | <b>2.644</b> | <b>3.189</b> | <b>.150</b>     | 2-530689-4 <sup>1</sup>  | —                                    | —                           |
|                             | 63.60        | 74.65        | 9.40        | 67.16        | 81.00        |                 | 2-530655-5               | —                                    | 2-530666-5                  |
| 18                          | <b>2.972</b> | <b>3.407</b> | <b>.370</b> | <b>3.112</b> | <b>3.657</b> | <b>.150</b>     | —                        | —                                    | 2-530667-5                  |
|                             | 75.49        | 86.54        | 9.40        | 79.04        | 92.89        |                 | <b>.180</b>              | 2-530655-6                           | 2-530666-6                  |
| 22                          | <b>3.596</b> | <b>4.031</b> | <b>.370</b> | <b>3.736</b> | <b>4.281</b> | <b>.150</b>     | 2-530689-6 <sup>1</sup>  | —                                    | 531433-4 <sup>1</sup>       |
|                             | 91.34        | 102.39       | 9.40        | 94.89        | 108.74       |                 | <b>.180</b>              | 2-530656-6                           | 2-530667-6                  |
| 25                          | <b>4.064</b> | <b>4.499</b> | <b>.370</b> | <b>4.204</b> | <b>4.749</b> | <b>.150</b>     | 2-530655-8               | —                                    | 531433-1 <sup>1</sup>       |
|                             | 103.23       | 114.27       | 9.40        | 106.78       | 120.62       |                 | <b>.180</b>              | 2-530656-8                           | 2-530666-8                  |
| 28                          | <b>4.532</b> | <b>4.967</b> | <b>.370</b> | <b>4.672</b> | <b>5.217</b> | <b>.150</b>     | 3-530655-2               | —                                    | 3-530666-2                  |
|                             | 115.11       | 126.16       | 9.40        | 118.67       | 132.51       |                 | <b>.180</b>              | 3-530656-2                           | —                           |
| 30                          | <b>4.844</b> | <b>5.279</b> | <b>.437</b> | <b>4.984</b> | <b>5.529</b> | <b>.150</b>     | 2-530655-9               | —                                    | 2-530666-9                  |
|                             | 123.04       | 134.09       | 11.10       | 126.59       | 140.44       |                 | 2-530689-9 <sup>1</sup>  | —                                    | —                           |
| 36                          | <b>5.780</b> | <b>6.215</b> | <b>.437</b> | <b>5.920</b> | <b>6.465</b> | <b>.150</b>     | —                        | —                                    | 531433-2 <sup>1</sup>       |
|                             | 146.18       | 157.86       | 11.10       | 150.37       | 164.21       |                 | <b>.180</b>              | 3-530689-0 <sup>1</sup>              | 2-530667-0                  |
| 43                          | <b>6.872</b> | <b>7.307</b> | <b>.437</b> | <b>7.012</b> | <b>7.557</b> | <b>.150</b>     | 3-530655-3               | 3-530677-3                           | 3-530666-3                  |
|                             | 174.55       | 185.60       | 11.10       | 178.10       | 191.95       |                 | <b>.180</b>              | 3-530656-3                           | 3-530667-3                  |

**Flow Solder Post  
.140 [3.56] Row-to-Row  
Spacing  
and  
Solder Eyelet Contact  
.235 [5.97] Row-to-Row  
Spacing**

| No. of<br>Dual<br>Positions | Dimensions   |              |             |              |              | Post<br>Length* | Flow Solder Post         |                             | Solder Eyelet Contact    |                             |
|-----------------------------|--------------|--------------|-------------|--------------|--------------|-----------------|--------------------------|-----------------------------|--------------------------|-----------------------------|
|                             | A            | B            | C           | D            | E            |                 | With<br>Mounting<br>Ears | Without<br>Mounting<br>Ears | With<br>Mounting<br>Ears | Without<br>Mounting<br>Ears |
| 6                           | <b>1.100</b> | <b>1.535</b> | <b>.370</b> | <b>1.240</b> | <b>1.785</b> | <b>.150</b>     | —                        | —                           | 2-530654-1               | —                           |
|                             | 27.94        | 38.99        | 9.40        | 31.50        | 45.34        |                 | 2-530657-2               | —                           | 2-530654-2               | —                           |
| 10                          | <b>1.724</b> | <b>2.159</b> | <b>.370</b> | <b>1.864</b> | <b>2.409</b> | <b>.150</b>     | 2-530657-4               | —                           | 2-530654-4               | 2-530667-4                  |
|                             | 43.79        | 54.84        | 9.40        | 47.35        | 61.19        |                 | —                        | 2-530669-4                  | —                        | —                           |
| 15                          | <b>2.504</b> | <b>2.939</b> | <b>.370</b> | <b>2.644</b> | <b>3.189</b> | <b>.150</b>     | —                        | 2-530668-5                  | 2-530654-5               | —                           |
|                             | 63.60        | 74.65        | 9.40        | 67.16        | 81.00        |                 | —                        | 2-530668-6                  | 2-530654-6               | —                           |
| 18                          | <b>2.972</b> | <b>3.407</b> | <b>.370</b> | <b>3.112</b> | <b>3.657</b> | <b>.150</b>     | —                        | —                           | —                        | —                           |
|                             | 75.49        | 86.54        | 9.40        | 79.04        | 92.89        |                 | 2-530657-6               | 2-530668-6                  | 2-530654-7               | —                           |
| 22                          | <b>3.596</b> | <b>4.031</b> | <b>.370</b> | <b>3.736</b> | <b>4.281</b> | <b>.150</b>     | —                        | —                           | —                        | —                           |
|                             | 91.34        | 102.39       | 9.40        | 94.89        | 108.74       |                 | —                        | —                           | —                        | —                           |
| 24                          | <b>3.908</b> | <b>4.343</b> | <b>.370</b> | <b>4.048</b> | <b>4.593</b> | <b>.150</b>     | —                        | —                           | —                        | —                           |
|                             | 99.26        | 110.31       | 9.40        | 102.81       | 116.66       |                 | —                        | —                           | —                        | —                           |
| 28                          | <b>4.532</b> | <b>4.967</b> | <b>.370</b> | <b>4.672</b> | <b>5.217</b> | <b>.150</b>     | 3-530657-2               | 3-530668-2                  | 3-530654-2               | —                           |
|                             | 115.11       | 126.16       | 9.40        | 118.67       | 132.51       |                 | —                        | —                           | —                        | —                           |
| 30                          | <b>4.844</b> | <b>5.279</b> | <b>.437</b> | <b>4.984</b> | <b>5.529</b> | <b>.150</b>     | —                        | —                           | —                        | —                           |
|                             | 123.04       | 134.09       | 11.10       | 126.59       | 140.44       |                 | —                        | —                           | —                        | —                           |
| 36                          | <b>5.780</b> | <b>6.215</b> | <b>.437</b> | <b>5.920</b> | <b>6.465</b> | <b>.150</b>     | —                        | —                           | 3-530654-0               | —                           |
|                             | 146.81       | 155.58       | 11.10       | 150.36       | 164.21       |                 | —                        | 3-530669-0                  | —                        | —                           |
| 43                          | <b>6.872</b> | <b>7.307</b> | <b>.437</b> | <b>7.012</b> | <b>7.557</b> | <b>.150</b>     | 3-530657-3               | —                           | 3-530654-3               | —                           |
|                             | 174.55       | 185.60       | 11.10       | 178.10       | 191.95       |                 | —                        | —                           | —                        | —                           |

\*Metric equivalents for post length are .150 = [3.81]; .180 = [4.57].

<sup>1</sup>For .040 [1.02] diameter hole.

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

### Keying Plug

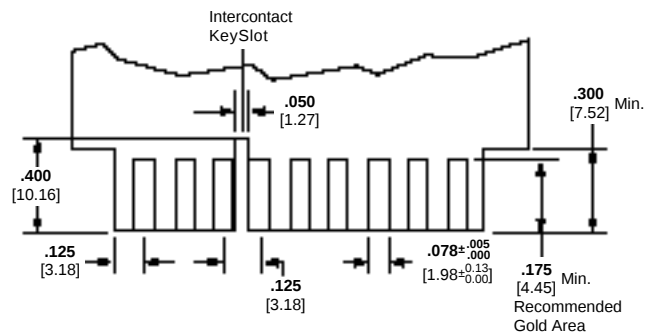
**Material:** Glass-filled nylon  
**Part No.** 650025-2

### Intercontact Key

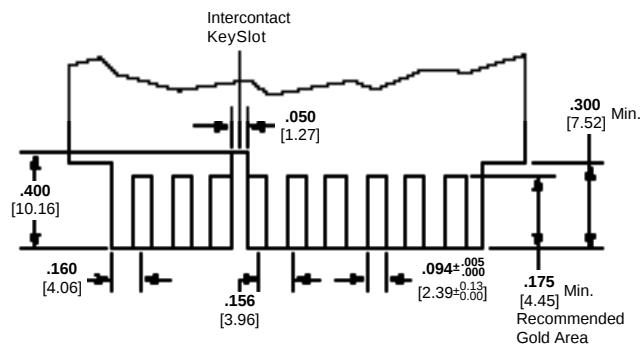


### Recommended PC Board Edge Patterns

#### .125 [3.18] Centerline Boards



#### .156 [3.96] Centerline Boards



### Product Facts

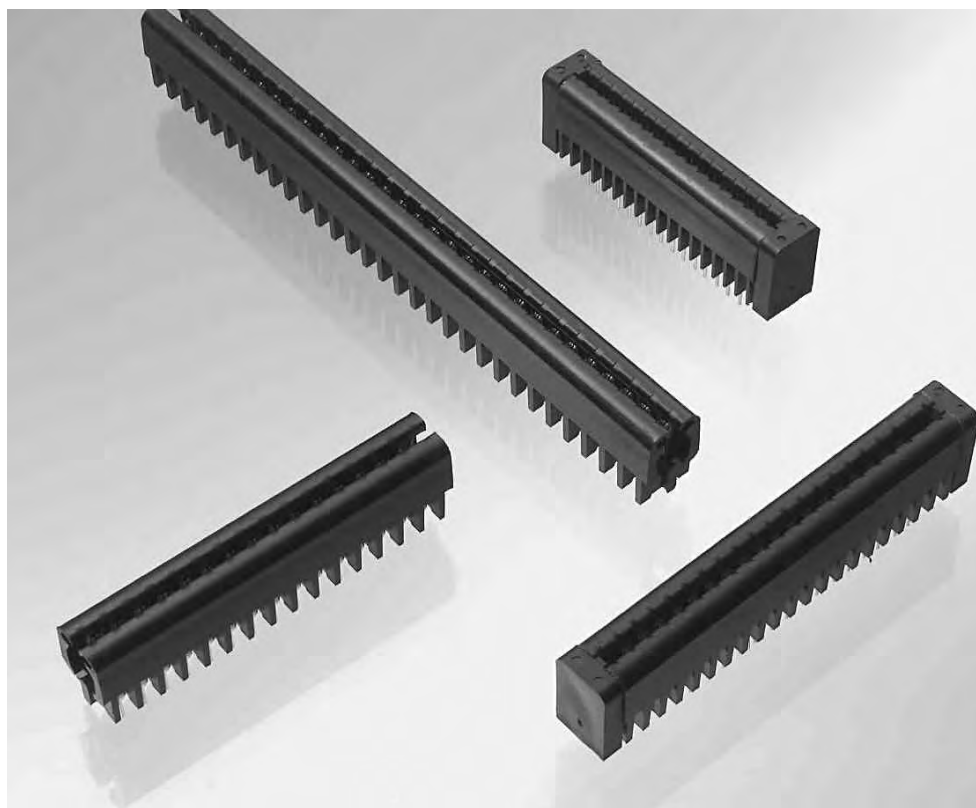
- Wide variety of sizes available from 3 dual positions and up—no initial tooling investment required for new versions
- Connectors can be selectively loaded with contacts in custom patterns
- Connectors tooled on all standard centerlines—.100 [2.54], .125 [3.18], .150 [3.81], .156 [3.96], and .200 [5.08]

**Note:** .200 [5.08] centerline capabilities provided by loading every-other dual position of .100 [2.54] centerline housings.

- Closed card entry protects contacts and daughter board pads
- Adapts to a wide range of mother board thicknesses to .104 [2.64] maximum
- Phosphor bronze contacts selectively plated for top performance and maximum economy
- Protective channel helps prevent overstress of contacts
- Daughter board keying available in intercontact or on-contact styles
- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E28476



## Twin Leaf Mother Board Connectors



The AMP Twin Leaf Connector is a highly reliable, low-cost mother/daughter board connector designed for solid-state circuitry. The one-piece, multi-contact connector requires no front-end tooling. This versatile connector for double-sided printed circuit boards uses preloaded contacts and selective plating to give lowest applied cost. Critical contact areas are gold-over-nickel plated to provide positive electrical connection between contacts and daughter board pads. Contact posts are tin plated for efficient dip soldering to mother boards up to .104 [2.64] thick. The Twin Leaf Connector delivers high reliability because the contacts possess superior tolerance of environmental stresses including shock, vibration and variations of temperature and humidity. Other characteristics such as high insulation resistance, low

termination resistance, long life and moderate contact separation force meet industry requirements for reliability. Connectors are tooled in sizes from 3 through 80 dual-contact positions with contacts on .100 [2.54], .125 [3.18], .150 [3.81], .156 [3.96] or .200 [5.08] centers. Other sizes and custom-loaded contact patterns are available on request. The connector housing, made of glass-filled polyester with a UL 94V-0 rating, features a standoff which facilitates the use of a probe for electrical continuity checks without risk of damage to the contacts. A closed card-entry design of the housing protects the contacts and daughter board pads. Housings accept daughter boards ranging from .055 [1.40] to .070 [1.78] in thickness. Intercontact and on-contact keys are available for polarization of the housings.

Card guides or end caps make alignment of daughter board pads with Twin Leaf Connector contacts quick and easy.

### Performance Specifications

#### Contact Rating\*:

3 amperes continuous

#### Temperature Rating:

-55°C to +105°C

#### Insulation Resistance:

5,000 megohms

#### Dielectric Withstanding Voltage:

| Altitude              | Test Voltage (AC, RMS) |             |
|-----------------------|------------------------|-------------|
|                       | Contact Spacing        |             |
|                       | .100 [2.54]            | .150 [3.81] |
| Sea Level             | 1,000                  | 1,500       |
| 50,000 ft<br>15 240 m | 400                    | 600         |
| 70,000 ft<br>21 336 m | 280                    | 400         |

#### Termination Resistance:

10 milliohms, max.

**Durability:** Tested to 100 cycles (engage/withdraw)

**Contact Plating:** .000015 [0.00038] selective gold plating on contact area; bright tin on solder tie

\*Consult Tyco Electronics engineering when paralleling contacts for power applications.

**Twin Leaf Mother Board Connectors Without End Caps**

**.100 [2.54], .125 [3.18],  
.150 [3.81] and  
.156 [3.96] Centerlines,  
With Solder Posts**

**Material and Finish:**

**Housing**—Glass-filled polyester,  
94V-0 rated

**Contacts**—Phosphor bronze, plated  
.000015 [0.00038] gold in contact area;  
tin on posts, with entire contact under-  
plated .000030 [0.00076] nickel, except  
where noted

**Related Product Data:**

**Performance Specifications**—  
page 64

**Card Guides**—pages 70, 71

**Keying Plugs**—page 72

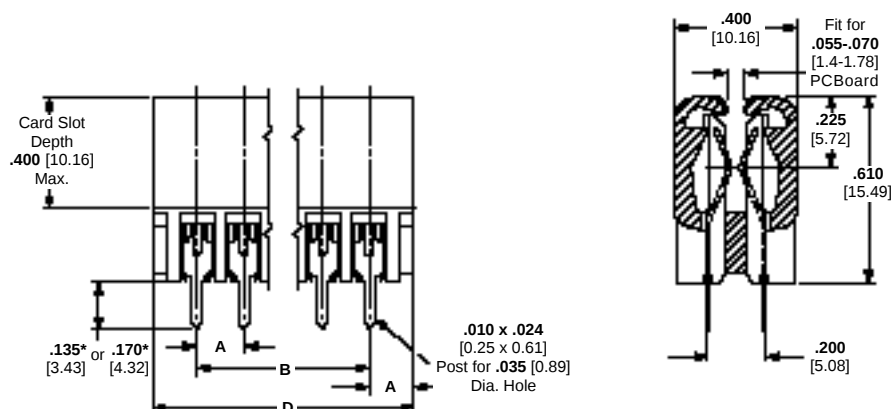
**PC Board Hole Layouts**—page 71

**Technical Documents:**

(pages 186, 187):

Product Specification  
108-9027

Instruction Sheets 408-7479,  
408-7498, 408-7506



\*Post length: .135 [3.43] for .150 [3.81] and .156 [3.96] centerlines, except where noted;  
.170 [4.32] for .100 [2.54] and .125 [3.18] centerlines, except where noted.

| No. of Dual Positions | A = .100 [2.54]<br>Centerline Spacing |                 |              | A = .125 [3.18]<br>Centerline Spacing |                 |                       | A = .150 [3.81]<br>Centerline Spacing |                 |                                     | A = .156 [3.96]<br>Centerline Spacing |                 |              |
|-----------------------|---------------------------------------|-----------------|--------------|---------------------------------------|-----------------|-----------------------|---------------------------------------|-----------------|-------------------------------------|---------------------------------------|-----------------|--------------|
|                       | B                                     | D               | Part Numbers | B                                     | D               | Part Numbers          | B                                     | D               | Part Numbers                        | B                                     | D               | Part Numbers |
| 2                     | —                                     | —               | —            | —                                     | —               | —                     | .300<br>7.62                          | .600<br>15.24   | 1-583694-1                          | —                                     | —               | —            |
| 3                     | .200<br>5.08                          | .400<br>10.16   | 583485-6     | —                                     | —               | —                     | .300<br>7.62                          | .600<br>15.24   | 645155-11.3                         | .312<br>7.92                          | .624<br>15.85   | 4-583486-8   |
| 4                     | —                                     | —               | —            | —                                     | —               | —                     | .450<br>11.43                         | .750<br>19.05   | 583407-5                            | —                                     | —               | —            |
| 5                     | .400<br>10.16                         | .600<br>15.24   | 583485-7     | —                                     | —               | —                     | .600<br>15.24                         | .900<br>22.86   | 583407-6                            | —                                     | —               | —            |
| 8                     | —                                     | —               | —            | —                                     | —               | —                     | 1.050<br>26.67                        | 1.350<br>34.29  | 583407-9                            | —                                     | —               | —            |
| 9                     | —                                     | —               | —            | 1.000<br>25.40                        | 1.250<br>31.75  | 583533-7              | —                                     | —               | —                                   | —                                     | —               | —            |
| 10                    | .900<br>22.86                         | 1.100<br>27.94  | 1-583485-2   | —                                     | —               | —                     | —                                     | —               | —                                   | 1.400<br>35.56                        | 1.720<br>43.69  | 4-583486-1   |
| 11                    | —                                     | —               | —            | —                                     | —               | —                     | 1.500<br>38.10                        | 1.800<br>45.72  | 1-583407-2                          | —                                     | —               | —            |
| 14                    | 1.300<br>33.02                        | 1.500<br>38.10  | 1-583485-6   | —                                     | —               | —                     | —                                     | —               | —                                   | —                                     | —               | —            |
| 15                    | —                                     | —               | —            | —                                     | —               | —                     | 2.100<br>53.34                        | 2.400<br>60.96  | 1-583407-5                          | —                                     | —               | —            |
| 18                    | —                                     | —               | —            | 2.125<br>53.97                        | 2.375<br>60.32  | 1-583533-6            | —                                     | —               | —                                   | 2.652<br>67.36                        | 2.964<br>75.28  | 3-583486-3   |
| 20                    | —                                     | —               | —            | —                                     | —               | —                     | 2.850<br>72.39                        | 3.150<br>80.01  | 2-583407-0<br>530292-9 <sup>3</sup> | —                                     | —               | —            |
| 22                    | —                                     | —               | —            | 2.625<br>66.67                        | 2.875<br>73.02  | 2-583533-0            | —                                     | —               | —                                   | —                                     | —               | —            |
| 28                    | —                                     | —               | —            | —                                     | —               | —                     | 4.050<br>102.87                       | 4.350<br>110.49 | 583407-1                            | 4.212<br>106.99                       | 4.524<br>114.91 | 2-583486-3   |
| 30                    | —                                     | —               | —            | 3.625<br>92.08                        | 3.875<br>98.43  | 531534-2 <sup>2</sup> | —                                     | —               | —                                   | 4.524<br>114.91                       | 4.836<br>122.83 | 2-583486-1   |
| 31                    | —                                     | —               | —            | —                                     | —               | —                     | 4.500<br>53.34                        | 4.800<br>60.96  | 530292-3 <sup>3</sup>               | —                                     | —               | —            |
| 33                    | —                                     | —               | —            | —                                     | —               | —                     | —                                     | —               | —                                   | 4.992<br>126.80                       | 5.304<br>134.72 | 1-583486-8   |
| 36                    | —                                     | —               | —            | —                                     | —               | —                     | —                                     | —               | —                                   | 5.460<br>138.68                       | 5.772<br>146.61 | 1-583486-5   |
| 40                    | —                                     | —               | —            | 4.875<br>123.83                       | 5.125<br>130.18 | 3-583533-8            | 5.850<br>148.59                       | 6.150<br>156.21 | 3-583407-8                          | 6.084<br>154.53                       | 6.396<br>162.46 | 1-583486-1   |
| 43                    | —                                     | —               | —            | —                                     | —               | —                     | —                                     | —               | —                                   | 6.552<br>166.42                       | 6.864<br>174.35 | 583486-8     |
| 50                    | 4.900<br>124.46                       | 5.100<br>129.54 | 583485-3     | 6.130<br>155.70                       | 6.380<br>162.05 | 5-583533-01           | 7.350<br>186.69                       | 7.650<br>194.31 | 4-583407-8                          | 7.640<br>194.06                       | 7.960<br>202.18 | 583486-1     |
| 56                    | —                                     | —               | —            | —                                     | —               | —                     | —                                     | —               | —                                   | 8.580<br>217.93                       | 8.892<br>225.86 | 5-583486-0   |
| 65                    | 6.400<br>162.56                       | 6.600<br>167.64 | 5-583485-6   | —                                     | —               | —                     | —                                     | —               | —                                   | —                                     | —               | —            |
| 80                    | 7.900<br>200.66                       | 8.100<br>205.74 | 5-583485-5   | —                                     | —               | —                     | —                                     | —               | —                                   | —                                     | —               | —            |

<sup>1</sup>Contacts are plated .000030 [0.00076] gold in contact area, tin on posts, with entire contact underplated .000030 [0.00076] nickel.

<sup>2</sup>Post length .135 [3.43]

<sup>3</sup>Post length .170 [4.32]

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**Twin Leaf Mother Board Connectors With End Caps**

**.100 [2.54], .125 [3.18],  
.150 [3.81] and  
.156 [3.96] Centerlines,  
With Solder Posts**

**Material and Finish:**

**Housing**—Glass-filled polyester,  
94V-0 rated

**Contacts**—Phosphor bronze, plated  
.000015 [0.00038] gold in contact area;  
tin on posts, with entire contact under-  
plated .000030 [0.00076] nickel

**Related Product Data:**

**Performance Specifications**—  
page 64

**Keying Plugs**—page 72

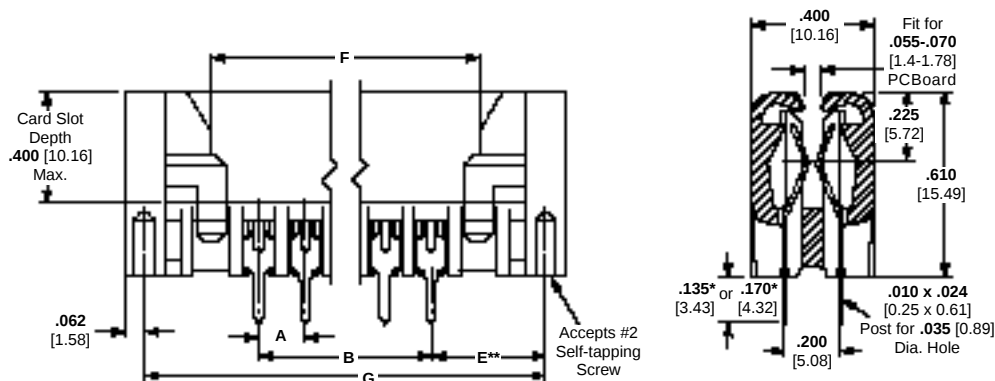
**PC Board Hole Layouts**—page 71

**Technical Documents:**

(pages 186, 187):

Product Specification  
108-9027

Instruction Sheets 408-7479,  
408-7498, 408-7506



\*Post length: .135 [3.43] for .150 [3.81] and .156 [3.96] centerlines;  
.170 [4.32] for .100 [2.54] and .125 [3.18] centerlines.

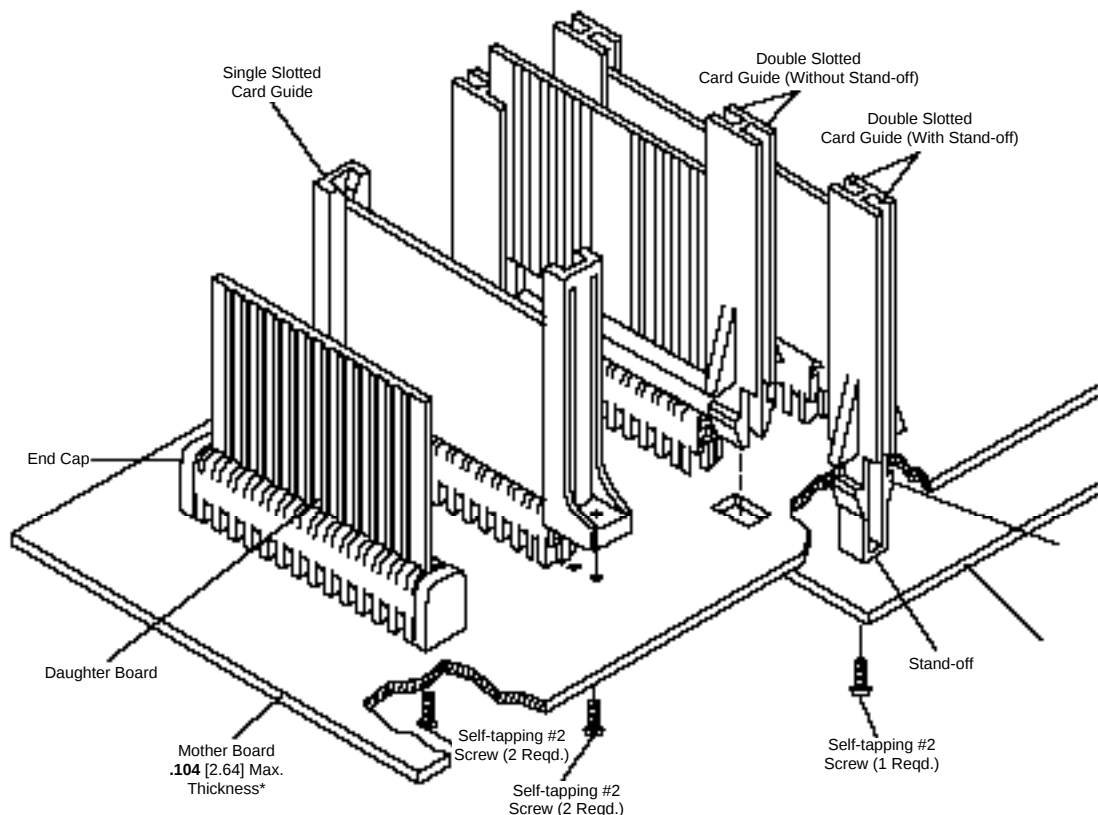
\*\*See page 27 for dimensions.

| No. of Dual Pos. | A = .100 [2.54] Centerline Spacing |                 |                 |              | A = .125 [3.18] Centerline Spacing |                 |                 |              | A = .150 [3.81] Centerline Spacing |                 |                 |              | A = .156 [3.96] Centerline Spacing |                 |                 |              |
|------------------|------------------------------------|-----------------|-----------------|--------------|------------------------------------|-----------------|-----------------|--------------|------------------------------------|-----------------|-----------------|--------------|------------------------------------|-----------------|-----------------|--------------|
|                  | B                                  | F               | G               | Part Numbers | B                                  | F               | G               | Part Numbers | B                                  | F               | G               | Part Numbers | B                                  | F               | G               | Part Numbers |
| 3                | .200<br>5.03                       | .400<br>10.16   | .734<br>18.64   | 583715-1     | —                                  | —               | —               | —            | —                                  | —               | —               | —            | —                                  | —               | —               | —            |
| 5                | .400<br>10.16                      | .600<br>15.24   | .934<br>23.72   | 583715-3     | —                                  | —               | —               | —            | —                                  | —               | —               | —            | —                                  | —               | —               | —            |
| 6                | .500<br>12.70                      | .700<br>17.78   | 1.034<br>26.26  | 583715-4     | .625<br>15.88                      | .875<br>22.23   | 1.259<br>31.96  | 583679-5     | —                                  | —               | —               | —            | .780<br>19.81                      | 1.092<br>27.74  | 1.538<br>39.07  | 583660-6     |
| 7                | .600<br>15.24                      | .800<br>20.32   | 1.134<br>28.80  | 583715-5     | —                                  | —               | —               | —            | —                                  | —               | —               | —            | —                                  | —               | —               | —            |
| 9                | .800<br>20.32                      | 1.000<br>25.40  | 1.334<br>33.88  | 583715-7     | —                                  | —               | —               | —            | —                                  | —               | —               | —            | —                                  | —               | —               | —            |
| 10               | .900<br>22.86                      | 1.100<br>27.94  | 1.434<br>36.42  | 583715-8     | —                                  | —               | —               | —            | —                                  | —               | —               | —            | 1.404<br>35.66                     | 1.716<br>43.59  | 2.162<br>54.91  | 1-583660-0   |
| 12               | 1.100<br>27.94                     | 1.300<br>33.02  | 1.634<br>41.50  | 1-583715-0   | —                                  | —               | —               | —            | —                                  | —               | —               | —            | 1.716<br>43.58                     | 2.028<br>51.51  | 2.474<br>62.84  | 1-583660-2   |
| 13               | 1.200<br>30.48                     | 1.400<br>35.56  | 1.734<br>44.04  | 1-583715-1   | —                                  | —               | —               | —            | —                                  | —               | —               | —            | —                                  | —               | —               | —            |
| 14               | —                                  | —               | —               | —            | —                                  | —               | —               | —            | 1.950<br>49.53                     | 2.250<br>57.15  | 2.684<br>68.17  | 1-583692-3   | 2.028<br>51.51                     | 2.340<br>59.44  | 2.786<br>70.76  | 1-583660-4   |
| 15               | 1.400<br>35.56                     | 1.600<br>40.64  | 1.934<br>49.12  | 1-583715-3   | —                                  | —               | —               | —            | 2.100<br>53.34                     | 2.400<br>60.96  | 2.834<br>71.98  | 1-583692-4   | 2.184<br>55.47                     | 2.496<br>63.40  | 2.942<br>74.73  | 583660-2     |
| 17               | 1.600<br>40.64                     | 1.800<br>45.72  | 2.134<br>54.20  | 1-583715-5   | 2.000<br>50.80                     | 2.250<br>57.15  | 2.634<br>66.90  | 1-583679-6   | —                                  | —               | —               | —            | —                                  | —               | —               | —            |
| 18               | 1.700<br>43.18                     | 1.900<br>48.26  | 2.234<br>56.74  | 1-583715-6   | 2.125<br>53.98                     | 2.375<br>60.33  | 2.759<br>70.08  | 1-583679-7   | —                                  | —               | —               | —            | 2.652<br>67.36                     | 2.964<br>75.28  | 3.410<br>86.61  | 1-583660-7   |
| 20               | 1.900<br>48.26                     | 2.100<br>53.34  | 2.434<br>61.82  | 1-583715-8   | 2.375<br>60.33                     | 2.625<br>66.68  | 3.009<br>76.43  | 1-583679-9   | —                                  | —               | —               | —            | —                                  | —               | —               | —            |
| 22               | —                                  | —               | —               | —            | —                                  | —               | —               | —            | —                                  | —               | —               | —            | 3.276<br>83.21                     | 3.588<br>91.14  | 4.034<br>102.46 | 2-583660-1   |
| 25               | 2.400<br>60.96                     | 2.600<br>66.04  | 2.934<br>74.52  | 2-583715-3   | 3.000<br>76.20                     | 3.250<br>82.55  | 3.634<br>92.30  | 2-583679-4   | 3.600<br>91.44                     | 3.900<br>99.06  | 4.334<br>110.08 | 2-583692-4   | 3.744<br>95.10                     | 4.065<br>103.02 | 4.502<br>114.35 | 2-583660-4   |
| 26               | 2.500<br>63.50                     | 2.700<br>68.58  | 3.034<br>77.05  | 2-583715-4   | —                                  | —               | —               | —            | —                                  | —               | —               | —            | —                                  | —               | —               | —            |
| 28               | 2.700<br>68.58                     | 2.900<br>73.66  | 3.234<br>82.14  | 2-583715-6   | 3.375<br>85.73                     | 3.625<br>92.08  | 4.009<br>101.83 | 2-583679-6   | —                                  | —               | —               | —            | 4.212<br>106.98                    | 4.524<br>114.91 | 4.979<br>126.24 | 2-583660-7   |
| 30               | 2.900<br>73.66                     | 3.100<br>78.74  | 3.434<br>87.22  | 2-583715-8   | —                                  | —               | —               | —            | 4.350<br>110.49                    | 4.650<br>118.11 | 5.084<br>129.13 | 583692-1     | 4.524<br>114.91                    | 4.836<br>122.83 | 5.282<br>134.16 | 2-583660-9   |
| 31               | 3.000<br>76.20                     | 3.200<br>81.28  | 3.534<br>89.76  | 2-583715-9   | —                                  | —               | —               | —            | —                                  | —               | —               | —            | —                                  | —               | —               | —            |
| 32               | 3.100<br>78.74                     | 3.300<br>83.82  | 3.634<br>92.30  | 3-583715-0   | —                                  | —               | —               | —            | —                                  | —               | —               | —            | 4.836<br>122.83                    | 5.148<br>130.76 | 5.594<br>142.09 | 3-583660-1   |
| 33               | —                                  | —               | —               | —            | —                                  | —               | —               | —            | 4.800<br>121.92                    | 5.100<br>129.54 | 5.534<br>140.56 | 3-583692-1   | —                                  | —               | —               | —            |
| 34               | 3.300<br>83.82                     | 3.500<br>88.90  | 3.834<br>97.38  | 3-583715-2   | —                                  | —               | —               | —            | —                                  | —               | —               | —            | —                                  | —               | —               | —            |
| 35               | 3.400<br>83.36                     | 3.600<br>91.44  | 3.934<br>99.92  | 3-583715-3   | —                                  | —               | —               | —            | 5.100<br>129.54                    | 5.400<br>137.16 | 5.834<br>148.18 | 3-583692-3   | 5.304<br>134.72                    | 5.616<br>142.64 | 6.062<br>153.97 | 3-583660-4   |
| 36               | 3.500<br>88.90                     | 3.700<br>93.98  | 4.034<br>102.46 | 3-583715-4   | —                                  | —               | —               | —            | 5.250<br>133.35                    | 5.550<br>140.97 | 5.984<br>151.99 | 3-583692-4   | 5.460<br>138.68                    | 5.772<br>146.61 | 6.218<br>157.94 | 583660-1     |
| 40               | 3.900<br>99.06                     | 4.100<br>104.14 | 4.434<br>112.62 | 3-583715-8   | 4.875<br>123.83                    | 5.125<br>130.18 | 5.509<br>139.93 | 3-583679-8   | 5.850<br>148.59                    | 6.150<br>156.21 | 6.584<br>167.23 | 3-583692-8   | —                                  | —               | —               | —            |
| 41               | 4.000<br>101.60                    | 4.200<br>106.68 | 4.534<br>115.16 | 3-583715-9   | —                                  | —               | —               | —            | —                                  | —               | —               | —            | —                                  | —               | —               | —            |
| 43               | —                                  | —               | —               | —            | —                                  | —               | —               | —            | —                                  | —               | —               | —            | 6.552<br>166.42                    | 6.864<br>174.35 | 7.310<br>185.67 | 4-583660-1   |
| 50               | 4.900<br>124.46                    | 5.100<br>129.54 | 5.434<br>138.02 | 4-583715-8   | 6.125<br>155.58                    | 6.375<br>161.93 | 6.759<br>171.68 | 4-583679-8   | 7.350<br>186.69                    | 7.650<br>194.31 | 8.084<br>205.33 | 4-583692-8   | 7.644<br>194.16                    | 7.956<br>202.08 | 8.402<br>213.41 | 4-583660-8   |
| 80               | 7.900<br>200.66                    | 8.100<br>205.74 | 8.434<br>214.22 | 5-583715-7   | —                                  | —               | —               | —            | —                                  | —               | —               | —            | —                                  | —               | —               | —            |

Note: Other connector sizes can be made available, consult Tyco Electronics.

**Twin Leaf Mother Board Connectors With End Caps (Continued)**

**Typical Connector and Card Guide Assembly**



\*Must be .063 [1.59] thick for use with Double Slotted Card Guides.

**Twin Leaf Mother Board Connectors** (Continued)

**Card Guides**

**Material:** Glass-filled nylon, black

**Part No. 583671-1**

**Related Product Data:**

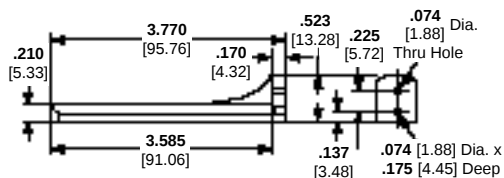
**Connectors used with**—page 65

**Technical Documents:**

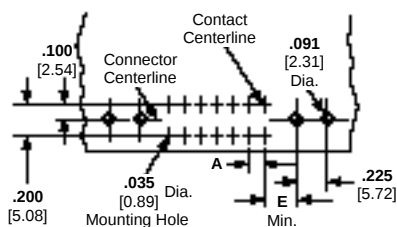
(pages 186, 187):

Instruction Sheets 408-7498,  
408-7506

**Single Slotted**



**Single Slotted Card Guide  
and Connector Mounting**



| Dimensions   |              |
|--------------|--------------|
| A            | E            |
| .100<br>2.54 | .263<br>6.68 |
| .125<br>3.18 | .288<br>7.31 |
| .150<br>3.81 | .313<br>7.95 |
| .156<br>3.96 | .319<br>8.10 |

**Card Guides**

(Continued)

**Material:** Nylon, natural

**Part No. 583425-1**

**Related Product Data:**

**Connectors used with**—page 65

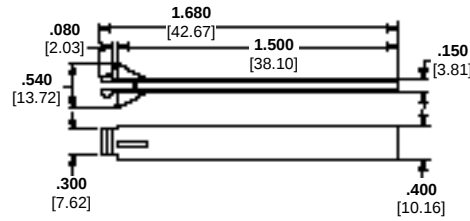
**Technical Documents:**

(pages 186, 187):

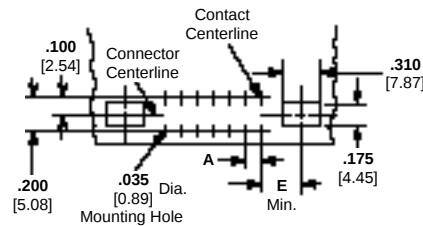
Instruction Sheets 408-7498,  
408-7506

**Twin Leaf Mother Board Connectors (Continued)**

**Double Slotted Without Stand-off**



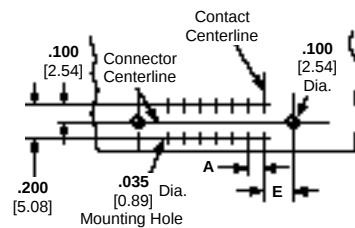
**Double Slotted Card Guide  
and Connector Mounting**



| Dimensions   |              |
|--------------|--------------|
| A            | E            |
| .100<br>2.54 | .328<br>8.33 |
| .125<br>3.18 | .353<br>8.96 |
| .150<br>3.81 | .376<br>9.60 |
| .156<br>3.96 | .384<br>9.75 |

**Note:** Mother Board must be .063 [1.59] thick for use with Double Slotted Card Guides.

**Recommended PC Board  
Layout for Connectors  
With End Caps**



| Dimensions   |              |
|--------------|--------------|
| A            | E            |
| .100<br>2.54 | .267<br>6.78 |
| .125<br>3.18 | .317<br>8.05 |
| .150<br>3.81 | .367<br>9.32 |
| .156<br>3.96 | .379<br>9.62 |

## Keying Plugs

**Material:** Nylon, natural

### Technical Documents:

(pages 186, 187):

Instruction Sheet 408-7479



Type A



Type B

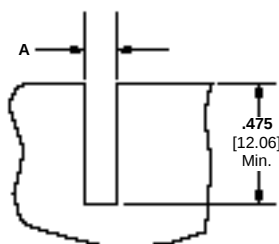


On-Contact

Intercontact

| In-Row Contact Spacing | Type of Contact | Connector Style* |                  | Intercontact Keying Plug |                     |                           | On-Contact Keying Plug |                           |
|------------------------|-----------------|------------------|------------------|--------------------------|---------------------|---------------------------|------------------------|---------------------------|
|                        |                 | with End Caps    | without End Caps | Type A Part Numbers      | Type B Part Numbers | Insertion/Extraction Tool | Part Numbers           | Insertion/Extraction Tool |
| <b>.100</b><br>2.54    | Solder Post     | 583715           | 583485           | 530286-3                 | —                   | 91081-2                   | 583714-1               | 91088-1                   |
|                        | Card Extender   | 530268           | 530291           |                          |                     |                           |                        |                           |
| <b>.125</b><br>3.18    | Solder Post     | 583679           | 583533           | 530286-2                 | 530030-1            | 91081-1                   | 583714-1               | 91088-1                   |
|                        | Card Extender   | 530265           | 530290           |                          |                     |                           |                        |                           |
| <b>.150</b><br>3.81    | Solder Post     | 583692           | 583407           | 530286-2                 | 530030-1            | 91081-1                   | —                      | —                         |
|                        | Wrap-Type Post  | 583754           | 583752           |                          |                     |                           |                        |                           |
|                        | Card Extender   | 530278           | 530270           |                          |                     |                           |                        |                           |
| <b>.156</b><br>3.96    | Solder Post     | 583660           | 583486           | 530286-2                 | 530030-1            | 91081-1                   | —                      | —                         |
|                        | Wrap-Type Post  | 583755           | 583753           |                          |                     |                           |                        |                           |
|                        | Card Extender   | 530267           | 530282           |                          |                     |                           |                        |                           |

\*Refer to pages 66-68, as applicable, for specific connector sizes.



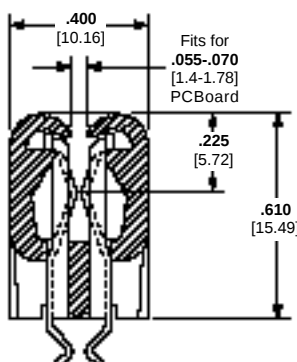
| Connector Centerlines | Dimension A         |                     |
|-----------------------|---------------------|---------------------|
|                       | Intercontact        | On-Contact          |
| <b>.100</b><br>2.54   | <b>.040</b><br>1.02 | <b>.129</b><br>3.28 |
| <b>.125</b><br>3.18   | <b>.050</b><br>1.27 | <b>.129</b><br>3.28 |
| <b>.150</b><br>3.81   | <b>.050</b><br>1.27 | <b>.160</b><br>4.06 |
| <b>.156</b><br>3.96   | <b>.050</b><br>1.27 | <b>.160</b><br>4.06 |

Recommended PC Board Cutout for Keying Plugs

## Other Twin Leaf Mother Board Connectors

For more information on the connectors shown here, consult Tyco Electronics.

## Card Extender Connectors



## Connectors With End Caps

| Centerlines         | Part Number Series* |
|---------------------|---------------------|
| <b>.150</b><br>3.81 | 530278              |
| <b>.156</b><br>3.96 | 530267              |

\*Consult Tyco Electronics for specific connector sizes.

## Rotary Cam ZIF Connectors

### Product Facts

- Zero insertion force; little or no effort required to insert and withdraw PC boards
- Reduced pad wear for extended board life
- Allows all four sides of board to be used for input/output functions
- Accepts double-sided boards
- Three contact styles to choose from: vertical solder post, right-angle solder post and wrap-type post (2 and 3 high)
- Available in .100 [2.54], .125 [3.18] and .156 [3.96] centerlines
- Three configurations available: open one end, open both ends and closed both ends
- Products indicated are recognized under the Component Program of Underwriters Laboratories Inc., File No. E28476



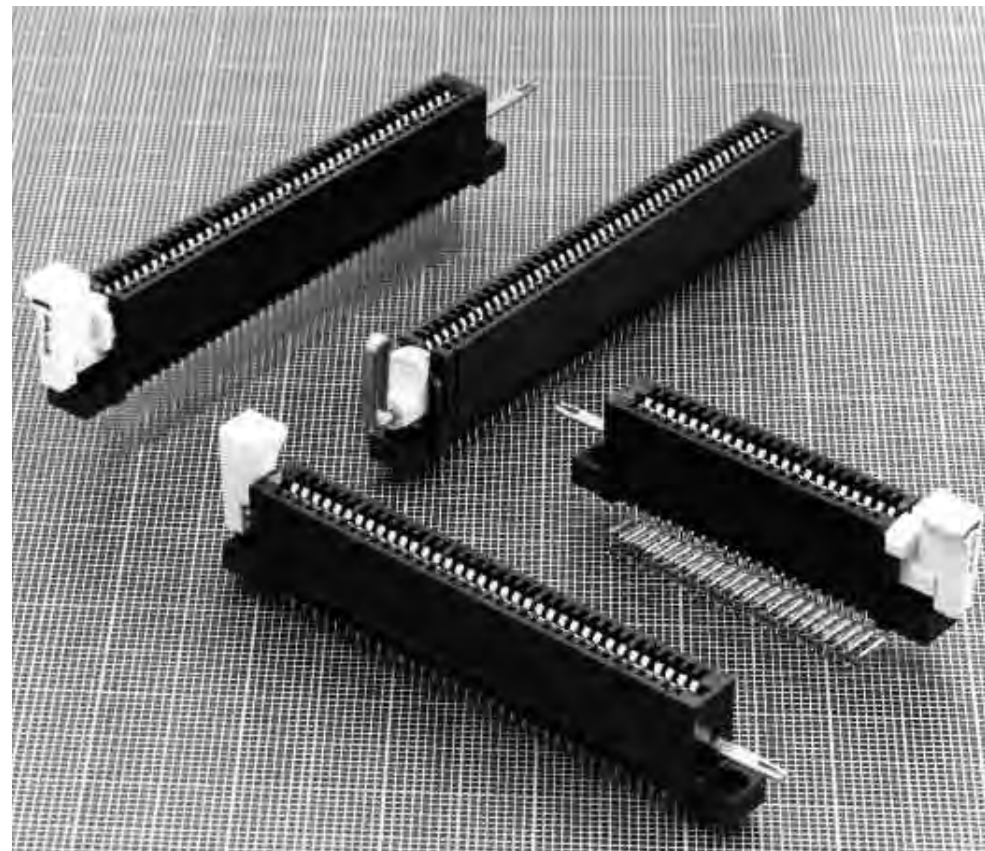
### Performance Specifications

**Current vs. Temperature Rise\*:**  
3 amperes at 30°C

**Operating Temperature:**  
-55°C to +105°C

**Contact Resistance:**  
20 milliohms max.

**Durability:** Tested to 5000 cycles



AMP Rotary Cam Zero Insertion Force (ZIF) Card Edge Connectors are available in sizes to fit most industry-standard printed circuit boards. A clockwise rotation of the cam handle opens contacts to allow zero-force insertion or removal of PC boards—even boards with a large number of contacts. Turning the cam handle to close the connector locks the board securely in place. Rotary Cam ZIF Connectors accept double-sided PC boards .054-.070 [1.37-

1.78] thick, with contact centerline intervals of .100 [2.54], .125 [3.18] and .156 [3.96]. Row-to-row spacing of connector posts is .200 [5.08] for .100 [2.54] and .156 [3.96] connectors and .250 [6.35] for .125 [3.18] connectors.

Contacts are nickel under-plated phosphor bronze with gold plate in the contact area and tin-lead plated posts. Contact configurations include vertical and right-angle solder posts and wrap-type posts. Preassembled connectors

feature housings made from 94V-0 rated glass-filled polyester and mounting ears for easy mounting to the mother board. Housings are available with one end open, both ends open and both ends closed for side and top daughter board insertion. Integral board locks secure boards in the connectors. Accessories include dust covers, cam rods (with and without boots) and cam keys for nut-driver actuation and for tandem operation of connectors.

\*Consult Tyco Electronics engineering when paralleling contacts for power applications.

## Vertical Connector, Solder Post Terminals

### Material and Finish:

**Housing**—Glass-filled polyester,  
94V-0 rated

**Contacts**—Phosphor bronze, plated  
.000030 [0.00076] gold per MIL-G-  
45204 in contact area; .000100  
[0.00254] tin-lead per MIL-P-81728  
on post with entire contact underplated  
.000050 [0.00127] nickel per QQ-N-290

### Related Product Data:

**Board Lock Feature**—On connectors  
open one end and open both ends

**Daughter PC Board**—.054-.070  
[1.37-1.78] thick

**Performance Specifications**—  
page 73

**Dust Cover**—page 79

**PC Board Hole Layout and Edge  
Patterns**—pages 81, 82

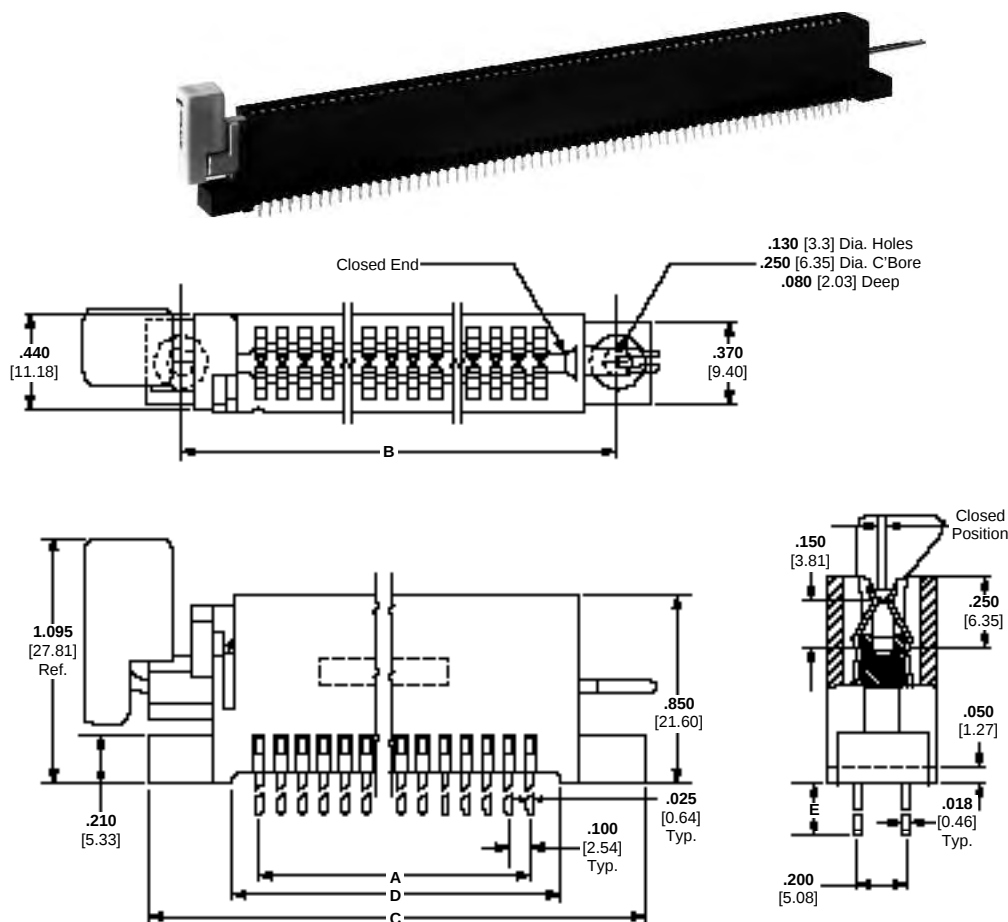
**Special Application**—pages 82, 96

### Technical Documents:

(pages 186, 187):

Product Specification  
108-9048

Instruction Sheet 408-7911



| No. of<br>Dual<br>Positions | Dimensions |        |        |        |      | Part Numbers                 |                                |                     |
|-----------------------------|------------|--------|--------|--------|------|------------------------------|--------------------------------|---------------------|
|                             | A          | B      | C      | D      | E*   | Open<br>One End <sup>1</sup> | Open<br>Both Ends <sup>1</sup> | Closed<br>Both Ends |
| 22                          | 2.100      | 2.800  | 3.100  | 2.300  | .125 | 531020-1                     | —                              | 531019-1            |
|                             | 53.34      | 71.12  | 78.74  | 58.42  | .160 | 1-531020-1                   | —                              | —                   |
| 25                          | 2.400      | 3.100  | 3.400  | 2.600  | .125 | 531020-2                     | —                              | 531019-2            |
|                             | 60.96      | 78.74  | 86.36  | 66.04  | .160 | 1-531020-2                   | —                              | —                   |
| 28                          | 2.700      | 3.400  | 3.700  | 2.900  | .160 | 1-531020-3                   | —                              | —                   |
|                             | 68.58      | 86.36  | 93.98  | 73.66  |      |                              |                                |                     |
| 31                          | 3.000      | 3.700  | 4.000  | 3.200  | .160 | 2-531020-1                   | —                              | —                   |
|                             | 76.20      | 93.98  | 101.60 | 81.28  |      |                              |                                |                     |
| 36                          | 3.500      | 4.200  | 4.500  | 3.700  | .125 | 3-531020-2                   | —                              | 531019-4            |
|                             | 88.90      | 106.68 | 114.30 | 93.98  | .160 | 1-531020-4                   | —                              | —                   |
| 40                          | 3.900      | 4.600  | 4.900  | 4.100  | .125 | 531020-5                     | —                              | —                   |
|                             | 99.06      | 116.84 | 124.46 | 104.14 | .160 | 1-531020-5                   | —                              | —                   |
| 43                          | 4.200      | 4.900  | 5.200  | 4.400  | .125 | 3-531020-3                   | —                              | —                   |
|                             | 106.68     | 124.46 | 132.08 | 111.76 | .160 | 1-531020-7                   | —                              | —                   |
| 50                          | 4.900      | 5.600  | 5.900  | 5.100  | .125 | 2-531020-8 <sup>2</sup>      | —                              | —                   |
|                             | 124.46     | 142.24 | 149.86 | 129.54 | .160 | 531020-8                     | 531021-8                       | —                   |
| 60                          | 5.900      | 6.600  | 6.900  | 6.100  | .160 | 1-531020-8                   | —                              | 1-531019-8          |
|                             | 149.86     | 167.64 | 175.26 | 154.94 |      | 2-531020-9 <sup>2</sup>      | —                              | —                   |
| 65                          | 6.400      | 7.100  | 7.400  | 6.600  | .125 | 1-531020-9                   | 1-531021-9                     | 1-531019-9          |
|                             | 162.56     | 180.34 | 187.96 | 167.64 | .160 | 1-531020-0                   | —                              | —                   |
|                             |            |        |        |        |      | 2-531020-0                   | —                              | —                   |
|                             |            |        |        |        |      | 3-531020-0 <sup>2</sup>      | —                              | —                   |

\*Metric equivalents in millimeters for post lengths E are .125 = [3.18]; .160 = [4.06].

<sup>1</sup>Recognized under the Component Program of Underwriters Laboratories Inc.

<sup>2</sup>Connectors without cam rod and boardlock.

**Notes:** 1. Connector with card slot open one end is shown for illustration purposes.

2. Other connector sizes can be made available, consult Tyco Electronics.

**Rotary Cam ZIF Connectors, .100 x .200 [2.54 x 5.08] Centerline (Continued)**

**Right-Angle Connector,  
Solder Post Terminals**

**Material and Finish:**

**Housing**—Glass-filled polyester,  
94V-0 rated

**Contacts**—Phosphor bronze, plated  
.000030 [0.00076] gold per MIL-G-  
45204 in contact area; .000100  
[0.00254] tin-lead per MIL-P-81728  
on post with entire contact underplated  
.000050 [0.00127] nickel per QQ-N-290

**Related Product Data:**

**Board Lock Feature**—On connectors  
open one end and open both ends

**Daughter PC Board**—.054-.070  
[1.37-1.78] thick

**Performance Specifications**—  
page 73

**Dust Cover**—page 79

**PC Board Hole Layout and Edge  
Patterns**—pages 81, 82

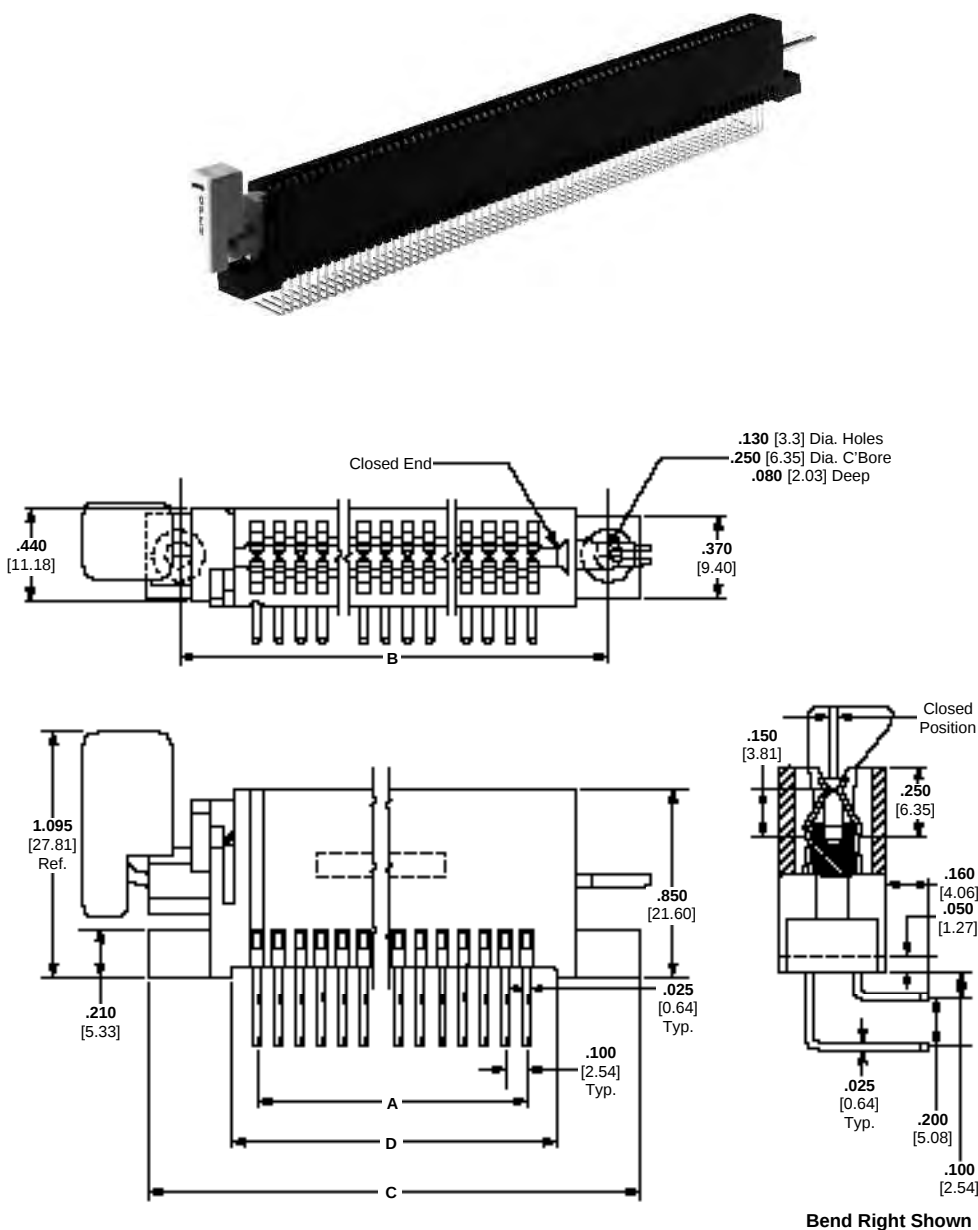
**Special Application**—page 82, 96

**Technical Documents:**

(pages 186, 187):

Product Specification  
108-9048

Instruction Sheet 408-7911



| No. of<br>Dual<br>Positions | Dimensions      |                 |                 |                 | Bend<br>Right | Part Numbers<br>(Open End <sup>1</sup> ) |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|---------------|------------------------------------------|
|                             | A               | B               | C               | D               |               |                                          |
| 25                          | 2.400<br>60.96  | 3.100<br>78.74  | 3.400<br>86.36  | 2.800<br>71.12  | R             | 531395-2 <sup>3</sup>                    |
| 36                          | 3.500<br>88.90  | 4.200<br>106.68 | 4.500<br>114.30 | 3.700<br>93.98  | R             | 531396-4                                 |
| 50                          | 4.900<br>124.56 | 5.600<br>142.24 | 5.900<br>149.86 | 5.100<br>129.54 | L             | 1-531396-8                               |
| 65                          | 6.400<br>162.56 | 7.100<br>180.34 | 7.400<br>187.96 | 6.600<br>167.64 | R             | 1-531396-0                               |

<sup>1</sup>Recognized under the Component Program of Underwriters Laboratories Inc.

**Notes:** 1. Connector with card slot open one end is shown.

2. Other connector sizes can be made available, consult Tyco Electronics.

3. Open both ends.

## Vertical Connector, Wrap-Type Post Terminals

### Material and Finish:

**Housing**—Glass-filled polyester,  
94V-0 rated

**Contacts**—Phosphor bronze, plated  
.000030 [0.00076] gold per MIL-G-  
45204 in contact area; .000100  
[0.00254] tin-lead per MIL-P-81728  
on post with entire contact underplated  
.000050 [0.00127] nickel per QQ-N-290

### Related Product Data:

**Board Lock Feature**—On connectors  
open one end and open both ends

**Daughter PC Board**—.054-.070  
[1.37-1.78] thick

**Performance Specifications**—  
page 73

**Dust Cover**—page 79

**PC Board Hole Layout and Edge  
Patterns**—pages 81, 82

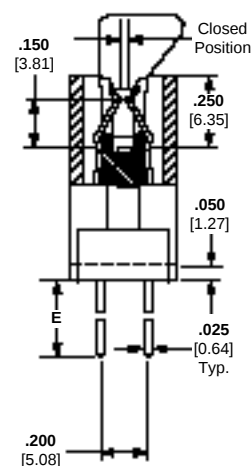
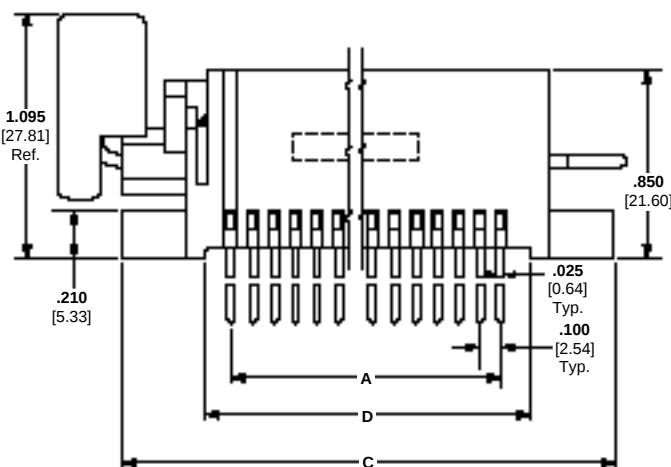
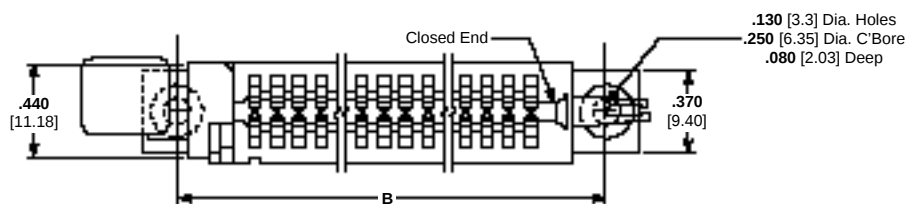
**Special Application**—pages 82, 96

### Technical Documents:

(pages 186, 187):

Product Specification  
108-9048

Instruction Sheet 408-7911



| No. of<br>Dual<br>Positions | Dimensions      |                 |                 |                 |      | Part Numbers                 |                                |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|------|------------------------------|--------------------------------|
|                             | A               | B               | C               | D               | E*   | Open<br>One End <sup>1</sup> | Open<br>Both Ends <sup>1</sup> |
| 25                          | 2.400<br>60.96  | 3.100<br>78.74  | 3.400<br>86.36  | 2.600<br>66.04  | .380 | 1-531414-2                   | —                              |
| 36                          | 3.500<br>88.90  | 4.200<br>106.68 | 4.500<br>114.30 | 3.700<br>93.98  | .580 | 531414-4                     | 531415-4                       |
|                             |                 |                 |                 |                 | .380 | 1-531414-4                   | —                              |
| 40                          | 3.900<br>99.06  | 4.600<br>116.84 | 4.900<br>124.46 | 4.100<br>104.14 | .580 | 531414-5                     | —                              |
| 42                          | 4.100<br>104.14 | 4.800<br>121.92 | 5.100<br>129.54 | 4.300<br>109.22 | .380 | 1-531414-6                   | —                              |
| 50                          | 4.900<br>124.46 | 5.600<br>142.24 | 5.900<br>149.86 | 5.100<br>129.54 | .580 | 2-531414-4                   | 531415-8                       |
| 60                          | 5.900<br>149.86 | 6.600<br>167.64 | 6.900<br>175.26 | 6.100<br>154.94 | .580 | 531414-9                     | —                              |
| 65                          | 6.400<br>162.56 | 7.100<br>180.34 | 7.400<br>187.96 | 6.600<br>167.64 | .580 | 1-531414-0                   | —                              |

\*Metric equivalents in millimeters for post lengths E are .580 = [14.73] (3-high wrap-type); .380 = [9.65] (2-high wrap-type).

<sup>1</sup>Recognized under the Component Program of Underwriters Laboratories Inc.

**Notes:** 1. Connector with card slot open one end is shown for illustration purposes.  
2. Other connector sizes can be made available, consult Tyco Electronics.

**Rotary Cam ZIF Connectors, .125 x .250 [3.18 x 6.35] Centerline**

**Vertical Connector,  
Solder Post Terminals**

**Material and Finish:**

**Housing**—Glass-filled polyester,  
94V-0 rated

**Contacts**—Phosphor bronze, plated  
.000030 [0.00076] gold per MIL-G-  
45204 in contact area; .000100  
[0.00254] tin-lead per MIL-P-81728  
on post with entire contact underplated  
.000050 [0.00127] nickel per QQ-N-290

**Related Product Data:**

**Board Lock Feature**—On connectors  
open one end and open both ends

**Daughter PC Board**—.054-.070  
[1.37-1.78] thick

**Performance Specifications**—  
page 73

**Dust Cover**—page 79

**PC Board Hole Layout and Edge  
Patterns**—pages 81, 82

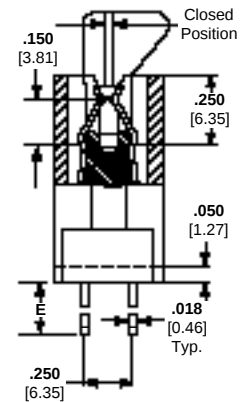
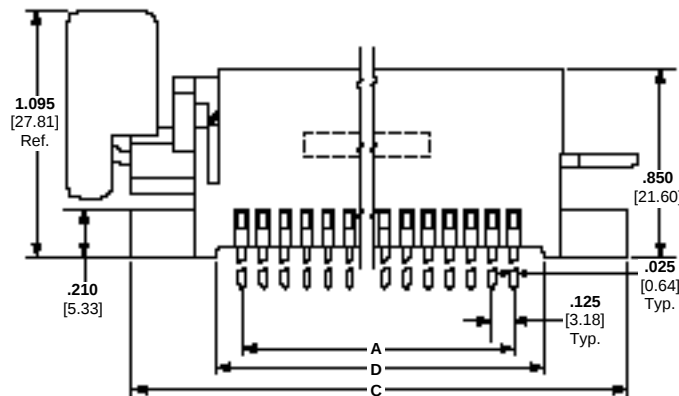
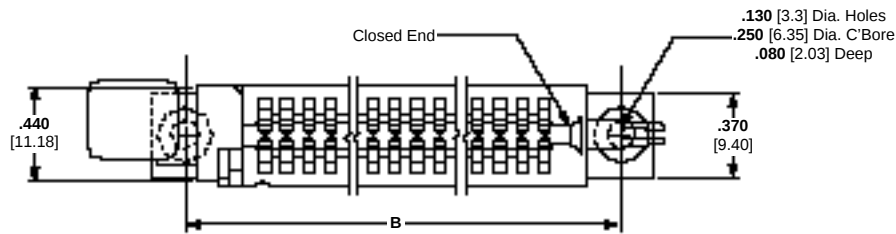
**Special Application**—pages 82, 96

**Technical Documents:**

(pages 186,187):

Product Specification  
108-9048

Instruction Sheet 408-7911



| No. of<br>Dual<br>Positions | Dimensions      |                 |                 |                 |      | Part Numbers                 |                                |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|------|------------------------------|--------------------------------|
|                             | A               | B               | C               | D               | E*   | Open<br>One End <sup>1</sup> | Open<br>Both Ends <sup>1</sup> |
| 28                          | 3.375<br>85.73  | 4.125<br>104.76 | 4.425<br>112.40 | 3.625<br>92.08  | .125 | —                            | 531024-3                       |
| 30                          | 3.625<br>92.08  | 4.375<br>111.13 | 4.675<br>118.75 | 3.875<br>98.43  | .125 | 531023-4                     | —                              |
| 40                          | 4.875<br>123.83 | 5.625<br>142.88 | 5.925<br>150.50 | 5.125<br>130.18 | .160 | 1-531023-4                   | 1-531024-4                     |

\*Metric equivalents in millimeters for post lengths E are .125 = [3.18]; .160 = [4.06].

<sup>1</sup>Recognized under the Component Program of Underwriters Laboratories Inc.

**Notes:** 1. Connector with card slot open one end is shown for illustration purposes.  
2. Other connector sizes can be made available, consult Tyco Electronics.

**Rotary Cam ZIF Connectors, .156 x .200 [3.96 x 5.08] Centerline**

**Vertical Connector,  
Solder Post Terminals**

**Material and Finish:**

**Housing**—Glass-filled polyester,  
94V-0 rated

**Contacts**—Phosphor bronze, plated  
.000030 [0.00076] gold per MIL-G-  
45204 in contact area; .000100  
[0.00254] tin-lead per MIL-P-81728  
on post with entire contact underplated  
.000050 [0.00127] nickel per QQ-N-290

**Related Product Data:**

**Board Lock Feature**—On connectors  
open one end and open both ends

**Daughter PC Board**—.054-.070  
[1.37-1.78] thick

**Performance Specifications**—  
page 73

**Dust Cover**—page 79

**PC Board Hole Layout and Edge  
Patterns**—pages 81, 82

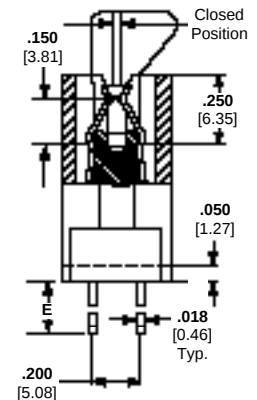
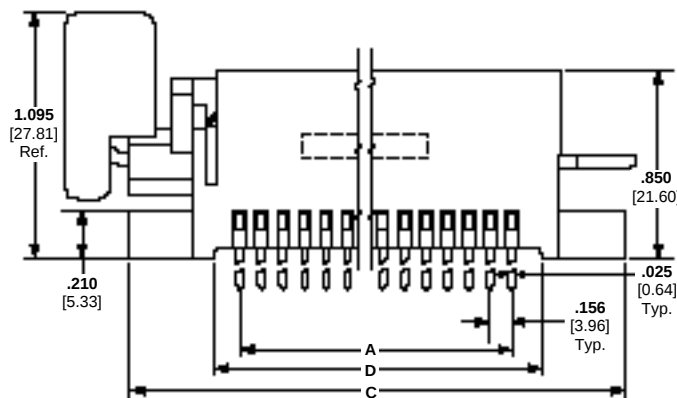
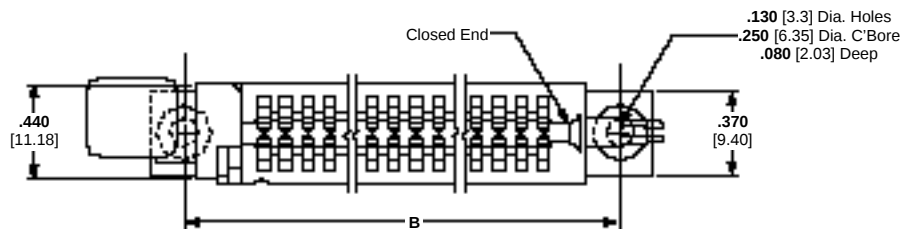
**Special Application**—pages 82, 96

**Technical Documents:**

(pages 186, 187):

Product Specification  
108-9048

Instruction Sheet 408-7911



| No. of<br>Dual<br>Positions | Dimensions |        |        |        |      | Part Numbers                 |                                |                     |
|-----------------------------|------------|--------|--------|--------|------|------------------------------|--------------------------------|---------------------|
|                             | A          | B      | C      | D      | E*   | Open<br>One End <sup>1</sup> | Open<br>Both Ends <sup>1</sup> | Closed<br>Both Ends |
| 22                          | 3.276      | 4.088  | 4.388  | 3.588  | .125 | 531025-3                     | —                              | —                   |
|                             | 83.21      | 103.83 | 111.46 | 91.14  | .160 | 531025-9                     | —                              | 531007-9            |
| 36                          | 5.460      | 6.272  | 6.572  | 5.772  | .160 | —                            | 1-531026-1                     | —                   |
|                             | 138.68     | 159.31 | 166.93 | 146.61 | .160 | —                            | 1-531026-1                     | —                   |
| 43                          | 6.552      | 7.364  | 7.664  | 6.864  | .125 | 531025-6                     | —                              | —                   |
|                             | 166.42     | 187.05 | 194.67 | 174.35 | .125 | 531025-6                     | —                              | —                   |

\*Metric equivalents in millimeters for post lengths E are .125 = [3.18]; .160 = [4.06].

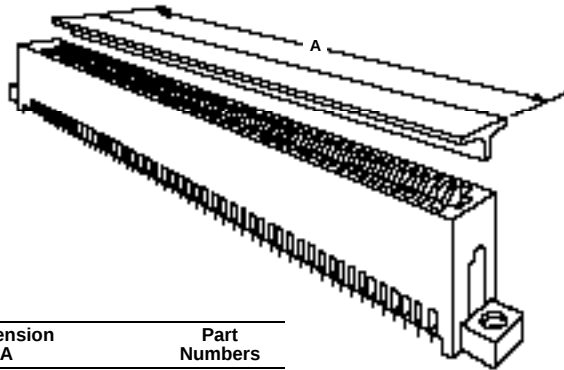
<sup>1</sup>Recognized under the Component Program of Underwriters Laboratories Inc.

**Notes:** 1. Connector with card slot open one end is shown for illustration purposes.  
2. Other connector sizes can be made available, consult Tyco Electronics.

## Accessories

### Dust Covers

**Material:** Rigid vinyl, black



| Dimension<br>A           | Part<br>Numbers |
|--------------------------|-----------------|
| <b>11.050</b><br>280.67  | 531863-2        |
| <b>48.000</b><br>1219.20 | 531863-1        |

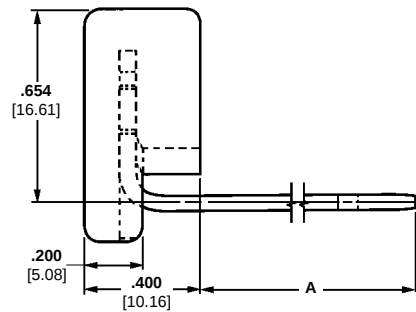
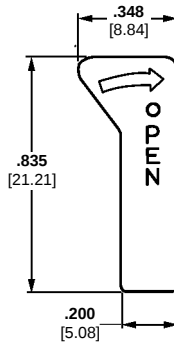
**Note:** Other lengths can be made available upon request, consult Tyco Electronics.

### Cam Rods with Boot

**Material:**

**Cam Rod**—Stainless steel

**Boot**—Glass-filled polyester, yellow



| Dimension<br>A         | Part<br>Numbers |
|------------------------|-----------------|
| <b>3.185</b><br>80.90  | 650083-1        |
| <b>3.705</b><br>94.11  | 650083-2        |
| <b>4.470</b><br>113.54 | 650083-3        |
| <b>5.285</b><br>134.24 | 650083-4        |
| <b>5.900</b><br>149.86 | 650083-6        |
| <b>5.975</b><br>151.77 | 532563-7        |

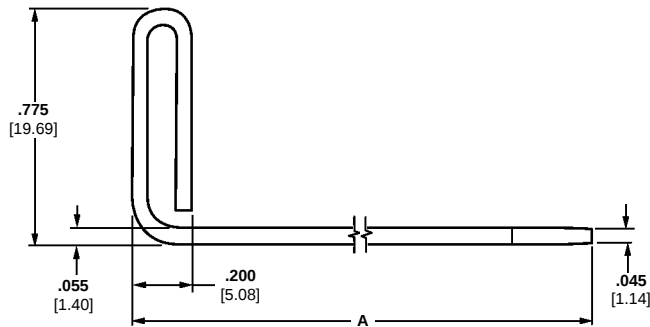
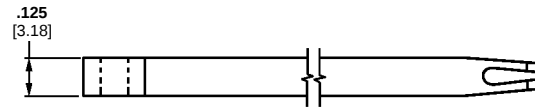
| Dimension<br>A         | Part<br>Numbers |
|------------------------|-----------------|
| <b>6.385</b><br>162.18 | 650083-7        |
| <b>6.985</b><br>177.42 | 650083-8        |
| <b>7.485</b><br>190.12 | 650083-9        |
| <b>7.725</b><br>196.22 | 1-532563-0      |
| <b>8.320</b><br>211.34 | 1-650083-7      |

**Note:** Other lengths can be made available upon request, consult Tyco Electronics.

**Accessories** (Continued)

**Cam Rods without Boot**

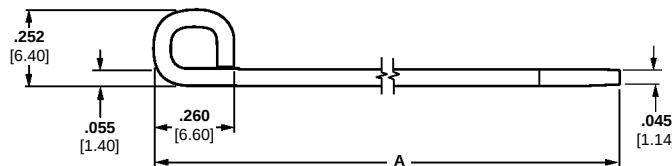
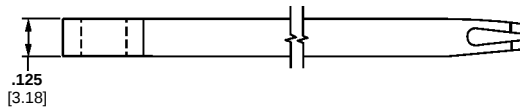
**Material:** Stainless steel



| Dimension A            | Part Numbers |
|------------------------|--------------|
| <b>2.200</b><br>55.88  | 2-531004-8   |
| <b>2.700</b><br>68.58  | 2-531004-9   |
| <b>3.300</b><br>83.82  | 3-531004-0   |
| <b>4.750</b><br>120.65 | 531004-4     |
| <b>5.000</b><br>127.00 | 1-531004-4   |
| <b>5.500</b><br>139.70 | 531004-6     |

| Dimension A             | Part Numbers |
|-------------------------|--------------|
| <b>6.000</b><br>152.40  | 531004-7     |
| <b>6.250</b><br>158.75  | 1-531004-6   |
| <b>6.750</b><br>171.45  | 1-531004-7   |
| <b>8.250</b><br>209.55  | 3-531004-2   |
| <b>12.500</b><br>317.50 | 2-531004-0   |

**Note:** Other lengths can be made available upon request, consult Tyco Electronics.

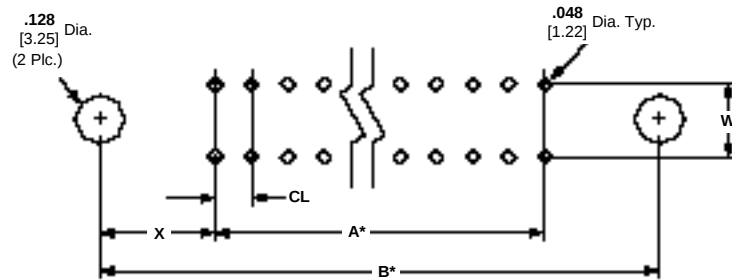


| Dimension A             | Part Numbers |
|-------------------------|--------------|
| <b>3.380</b><br>85.85   | 645293-3     |
| <b>4.50</b><br>114.30   | 645293-8     |
| <b>5.200</b><br>132.08  | 645293-6     |
| <b>6.90</b><br>175.30   | 645293-7     |
| <b>13.120</b><br>333.25 | 645293-5     |

**Note:** Other lengths can be made available upon request, consult Tyco Electronics.

## Recommended PC Board Hole Layouts

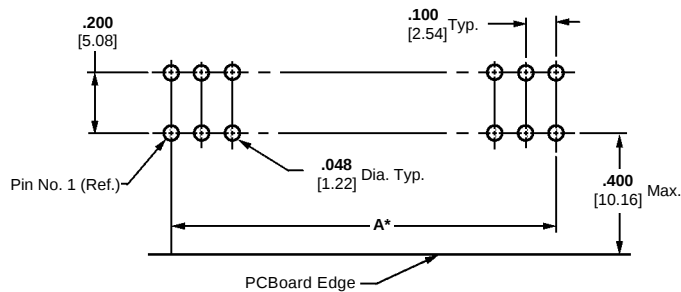
### Mother Board Hole Layout, Vertical Through-Board Connectors



\*Refer to individual connector specifications.

| CL           | W            | X             |
|--------------|--------------|---------------|
| .100<br>2.54 | .200<br>5.08 | .350<br>8.89  |
| .125<br>2.18 | .250<br>6.35 | .375<br>9.53  |
| .156<br>3.96 | .200<br>5.08 | .406<br>10.31 |

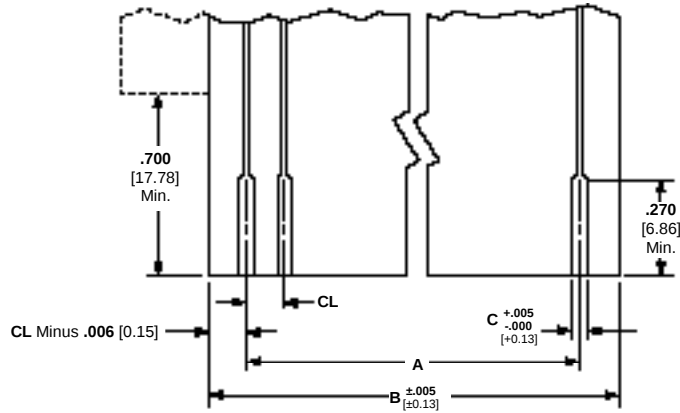
### Mother Board Hole Layout, Right-Angle Through-Board Connectors



\*Refer to individual connector specifications.

## Recommended PC Board Edge Pattern

### Daughter Board Edge Pattern



| No. of<br>Dual<br>Positions | CL = .100 [2.54]<br>C = .050 [1.27] |                 | CL = .125 [3.18]<br>C = .078 [1.98] |                 | CL = .156 [3.96]<br>C = .094 [2.39] |                 |
|-----------------------------|-------------------------------------|-----------------|-------------------------------------|-----------------|-------------------------------------|-----------------|
|                             | A                                   | B               | A                                   | B               | A                                   | B               |
| 22                          | 2.100<br>53.34                      | 2.288<br>58.12  | —                                   | —               | 3.267<br>83.21                      | 3.576<br>90.83  |
| 25                          | 2.400<br>60.96                      | 2.588<br>65.74  | —                                   | —               | —                                   | —               |
| 28                          | 2.700<br>68.58                      | 2.888<br>73.36  | 3.375<br>85.73                      | 3.613<br>91.77  | —                                   | —               |
| 30                          | —                                   | —               | 3.625<br>92.08                      | 3.863<br>98.12  | —                                   | —               |
| 31                          | 3.000<br>76.20                      | 3.188<br>80.98  | —                                   | —               | —                                   | —               |
| 36                          | 3.500<br>88.90                      | 3.688<br>93.68  | —                                   | —               | 5.460<br>138.68                     | 5.760<br>146.30 |
| 40                          | 3.900<br>99.06                      | 4.088<br>103.84 | 4.875<br>123.83                     | 5.113<br>129.87 | —                                   | —               |
| 43                          | 4.200<br>106.68                     | 4.388<br>111.46 | —                                   | —               | 6.552<br>166.42                     | 6.852<br>174.04 |
| 50                          | 4.900<br>124.46                     | 5.088<br>129.24 | —                                   | —               | —                                   | —               |
| 60                          | 5.900<br>149.86                     | 6.088<br>154.64 | —                                   | —               | —                                   | —               |
| 65                          | 6.400<br>162.56                     | 6.588<br>167.34 | —                                   | —               | —                                   | —               |

### Special Application

### Tandem Application



**Note:** Contact Tyco Electronics for information concerning special tandem connectors.

## Linear ZIF Connectors

### Product Facts

- Minimizes force needed to install and remove printed circuit boards
- Available in lever and bell crank styles
- Lever styles allow side and top card entry
- Wiping action contacts enhance electrical properties
- Contacts on .100 x .100 [2.54 x 2.54] or .125 x .125 [3.18 x 3.18] centers
- .025 [0.64] square posts
- Accepts PC boards from .054 to .070 [1.37 to 1.78] in thickness
- Normally closed design leaves springs in relaxed position
- 50 to 175 dual positions available on .100 [2.54] centerline connectors and 40 to 140 dual positions available on .125 [3.18] centerline connectors

### Performance Specifications

**Current vs. Temperature Rise\*:**  
3 amperes at 30°C

**Operating Temperature:**  
-65°C to +85°C

**Contact Resistance:**  
16 milliohms max.

**Durability:** Tested to 250 cycles  
(board-to-contact actuation)

\*Consult Tyco Electronics engineering when paralleling contacts for power applications.



AMP Linear Zero Insertion Force (ZIF) PC Board Edge Connectors are available in both lever and bell crank actuated styles and can be provided as panel assemblies, separate housings and contacts or as pre-assembled with solder post terminals.

Panel assemblies include a housing with ACTION PIN press-fit solderless contacts mounted on an epoxy board for rack application. Separate housing assemblies and ACTION PIN contacts allow customer assembly. These can be mounted as close as .625 [15.88]. More design latitude for high density application is provided by the side entry lever-type connector, permitting use of all sides of the PC board for edge-type I/O connections (see page 133). Where solder applications are

required, Tyco Electronics has a line of preassembled connectors with tin-plated solder terminals. All these configurations are available in a broad range of sizes.

With ZIF style connectors, intermittencies can occur if a contact comes to rest on a piece of foreign matter (dust and dirt particles) found on PC boards. To decrease the probability of this happening, all connectors have been designed to include a wiping contact which produces a wiping action. This action, produced by the geometry and bending movements of the beam, pushes aside debris and allows for good electrical connection by cleaning the actual point of contact.

In addition, all connectors have removable wings which make it possible to repair or replace damaged cam rails, handles, contacts

and housing modules without removing the entire housing assembly from the board.

**Linear ZIF Connectors, .100 x .100 [2.54 x 2.54] Centerline**

**Housing with Solder Posts**

**Lever Style, Side Entry**

**Material and Finish:**

**Housing**—Glass-filled polyester, black

**Contacts**—Copper alloy 725, plated .000015 [0.00038] min. gold per MIL-G-45204 in contact area; .000100 [0.00254] min. tin-lead on post with entire contact underplated .000050 [0.00127] min. nickel per QQ-N-290

**Related Product Data:**

**Daughter PC Board**—.054-.070 [1.37-1.78] thick

**Performance Specifications**—page 83

**PC Board Hole Layout and Edge Pattern**—page 88

**Special Application**—page 96

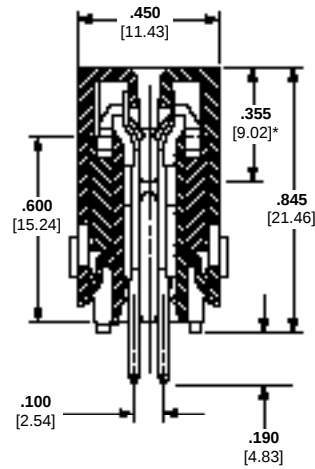
**Technical Documents:**

(pages 186, 187):

Product Specification  
108-14015

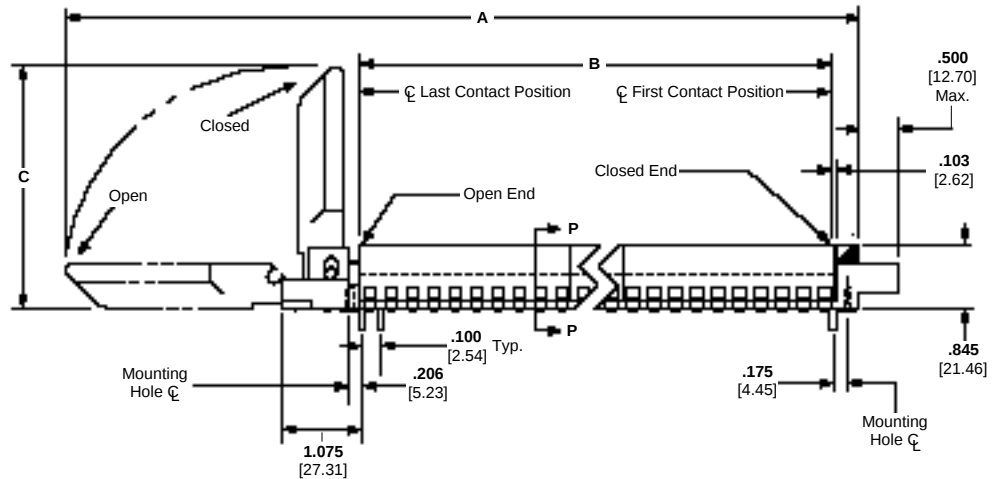
Application Specification  
114-26003

Instruction Sheets 408-2995,  
408-2999, 408-6915



Section P-P

\*Card slot depth.



| No. of Dual Positions | Dimensions       |                 |                | Part Number |
|-----------------------|------------------|-----------------|----------------|-------------|
|                       | A                | B               | C              |             |
| 35                    | 6.113<br>155.27  | 3.400<br>86.36  | 2.000<br>50.80 | 645135-2    |
| 80                    | 11.613<br>294.97 | 7.900<br>200.66 | 3.000<br>76.20 | 1-645135-1  |
| 100                   | 13.613<br>345.77 | 9.900<br>251.46 | 3.000<br>76.20 | 1-645135-5  |

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**Linear ZIF Connectors, .100 x .100 [2.54 x 2.54] Centerline (Continued)**

**Panel Assembly**

**Lever Style, Side Entry**

**Material and Finish:**

**Housing**—Glass-filled polyester, black

**Contacts**—Copper alloy 725, plated .000015 [0.00038] gold per MIL-G-45204 in contact area; .000001 [0.00003] min. gold flash per MIL-G-45204 on post with entire contact under-plated .000050 [0.00127] nickel per QQ-N-290

**Related Product Data:**

**Daughter PC Board**—.054-.070 [1.37-1.78] thick

**Performance Specifications**—page 83

**PC Board Hole Layout and Edge Pattern**—page 88

**ACTION PIN Contacts**—pages 88, 94

**Tooling**—page 95

**Special Application**—page 96

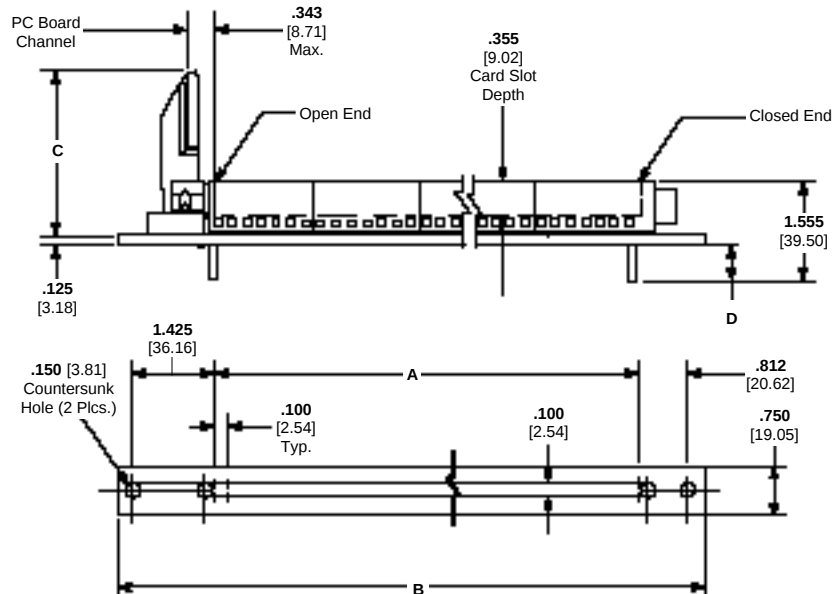
**Technical Documents:**

(pages 186, 187):

Product Specification  
108-14015

Application Specification  
114-26003

Instruction Sheets 408-2995,  
408-2999, 408-6915



| No. of Dual Positions | Dimensions       |                  |                |               | Part Numbers |
|-----------------------|------------------|------------------|----------------|---------------|--------------|
|                       | A                | B                | C              | D             |              |
| 75                    | 7.400<br>251.46  | 10.125<br>320.68 | 3.000<br>76.20 | .615<br>15.62 | 1-645145-0   |
| 100                   | 9.900<br>251.46  | 12.625<br>320.68 | 3.000<br>76.20 | .615<br>15.62 | 1-645145-5   |
| 130                   | 12.900<br>251.46 | 15.625<br>320.68 | 3.000<br>76.20 | .615<br>15.62 | 2-645145-1   |
| 140                   | 13.900<br>353.06 | 16.625<br>422.28 | 3.000<br>76.20 | .615<br>15.62 | 2-645145-3   |
| 150                   | 14.900<br>251.46 | 17.625<br>320.68 | 3.000<br>76.20 | .615<br>15.62 | 2-645145-5   |
| 160                   | 15.900<br>403.86 | 18.625<br>473.07 | 3.000<br>76.20 | .615<br>15.62 | 2-645145-7   |
| 160                   | 15.900<br>403.86 | 18.625<br>473.07 | 3.000<br>76.20 | .455<br>11.56 | 147400-1     |

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**Linear ZIF Connectors, .100 x .100 [2.54 x 2.54] Centerline** (Continued)

**Panel Assembly**

**Lever Style, Top Entry**

**Material and Finish:**

**Housing**—Glass-filled polyester, black

**Contacts**—Copper alloy 725, plated .000015 [0.00038] gold per MIL-G-45204 in contact area; .000001 [0.00003] min. gold flash per MIL-G-45204 on post with entire contact under-plated .000050 [0.00127] nickel per QQ-N-290

**Related Product Data:**

**Daughter PC Board**—.054-.070 [1.37-1.78] thick

**Performance Specifications**—page 83

**PC Board Hole Layout and Edge Pattern**—page 88

**ACTION PIN Contacts**—pages 88, 94

**Tooling**—page 95

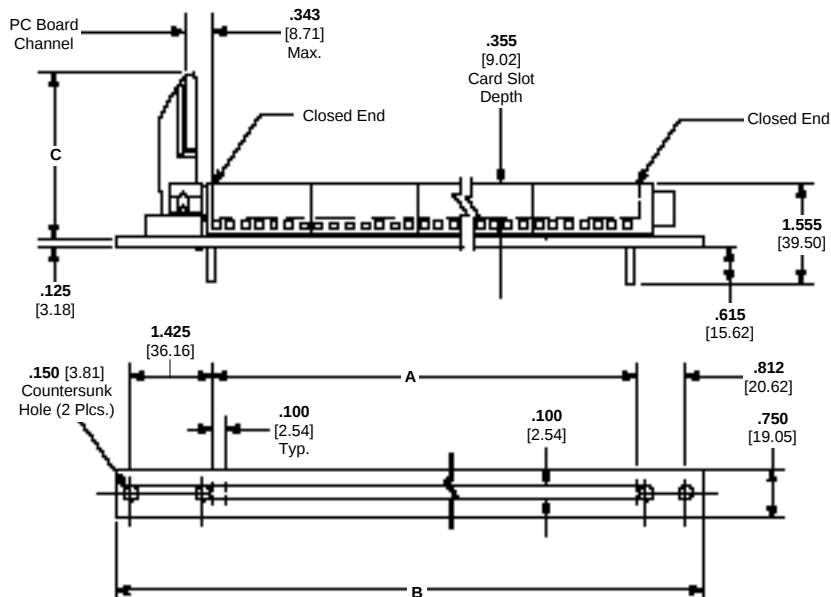
**Technical Documents:**

(pages 186, 187):

Product Specifications  
108-14015, 108-26003

Application Specification  
114-26003

Instruction Sheets 408-2995,  
408-2999, 408-6915



| No. of Dual Positions | Dimensions       |                  |                | Part Numbers |
|-----------------------|------------------|------------------|----------------|--------------|
|                       | A                | B                | C              |              |
| 110                   | 10.900<br>276.86 | 13.625<br>346.08 | 3.000<br>76.20 | 1-645147-7   |
| 120                   | 11.900<br>302.26 | 14.625<br>371.48 | 3.000<br>76.20 | 1-645147-9   |

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**Linear ZIF Connectors, .100 x .100 [2.54 x 2.54] Centerline** (Continued)

**Housing**

**Material:** Glass-filled polyester, black

**Related Product Data:**

**Daughter PC Board**—.054-.070  
[1.37-1.78] thick

**Mounting Screws**—Customer supplies, must be applied before opening connector

**Performance Specifications**—  
page 83

**PC Board Hole Layout and Edge Pattern**—page 88

**ACTION PIN Contacts**—  
pages 88, 94

**Tooling**—page 95

**Special Application**—page 96

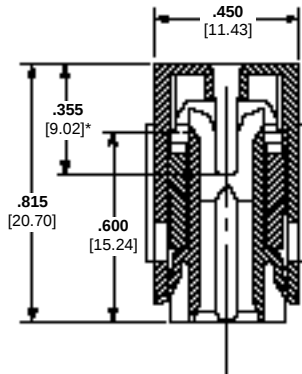
**Technical Documents:**

(pages 186, 187):

Product Specifications  
108-14015, 108-26003

Application Specification  
108-26003

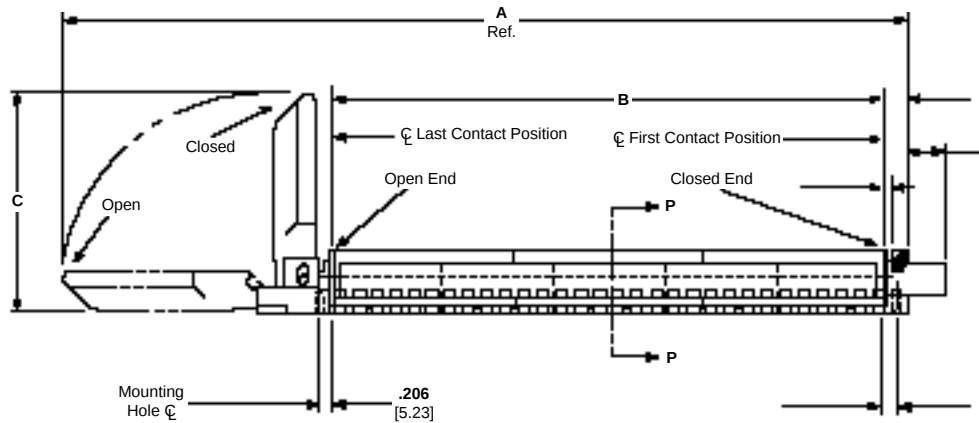
Instruction Sheets 408-2995,  
408-2999, 408-6915



Section P-P

\*Card slot depth.

**Lever Style, Side Entry**



| No. of Dual Positions | Dimensions       |                  |                | Part Numbers             |
|-----------------------|------------------|------------------|----------------|--------------------------|
|                       | A                | B                | C              |                          |
| 50                    | 7.613<br>193.37  | 4.900<br>124.46  | 2.000<br>50.80 | 645115-5                 |
| 75                    | 11.113<br>282.27 | 7.400<br>187.96  | 3.000<br>76.20 | 1-645115-0               |
| 80                    | 11.613<br>294.97 | 7.900<br>200.66  | 3.000<br>76.20 | 1-645115-1               |
| 100                   | 13.613<br>345.77 | 9.900<br>251.46  | 3.000<br>76.20 | 1-645115-5               |
| 110                   | 14.613<br>371.17 | 10.900<br>276.86 | 3.000<br>76.20 | 1-645115-7<br>3-645115-2 |
| 115                   | 15.113<br>383.87 | 11.400<br>289.56 | 3.000<br>76.20 | 1-645115-8               |
| 125                   | 16.113<br>409.27 | 12.400<br>314.96 | 3.000<br>76.20 | 2-645115-0               |
| 130                   | 16.613<br>421.97 | 12.900<br>327.66 | 3.000<br>76.20 | 2-645115-1               |
| 140                   | 17.613<br>447.37 | 13.900<br>353.06 | 3.000<br>76.20 | 2-645115-3               |
| 160                   | 19.613<br>498.17 | 15.900<br>403.86 | 3.000<br>76.20 | 3-645115-3               |
| 175                   | 21.113<br>536.27 | 17.400<br>441.96 | 3.000<br>76.20 | 3-645115-0               |

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**ACTION PIN Contacts with Wiping Feature,  
.100 [2.54] Centerline**

**Material and Finish:**

Copper alloy 725, plated .000015  
[0.00038] gold per MIL-G-45204 in  
contact area; .000001 [0.00003] min.  
gold flash per MIL-G-45204 on post  
with entire contact underplated .000050  
[0.00127] nickel per QQ-N-290

**Related Product Data:**

**Performance Specifications—**  
page 83

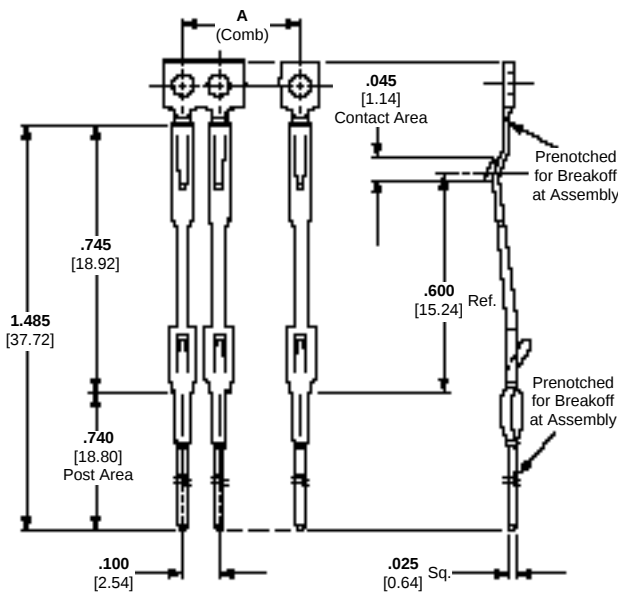
**ACTION PIN Contact Description  
and Application Specification—**  
page 94

**Tooling—**page 95

**Technical Documents:**

(pages 186, 187):

Instruction Sheet 408-2665



**Contact Combs**

| Number of<br>Contacts<br>Per Comb* | Dimension<br>A  | Part<br>Number |
|------------------------------------|-----------------|----------------|
| 55                                 | 5.400<br>137.16 | 4-119311-1     |

\*At least two (2) contact combs required per housing.

**Note:** Other sizes can be made available, consult Tyco Electronics.

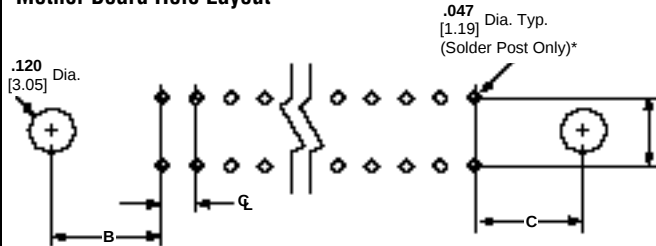
**Reeled Contacts**

| Number of<br>Contacts<br>Per Reel | Part<br>Number |
|-----------------------------------|----------------|
| 35,000                            | 119196-6       |

**Note:** Other plating combinations and thicknesses can be made available,  
consult Tyco Electronics.

**Recommended PC Board Hole Layout and Edge Pattern,  
.100 [2.54] Centerline**

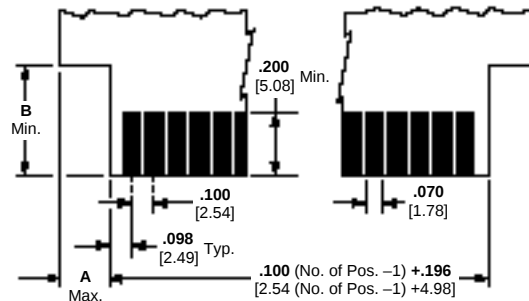
**Mother Board Hole Layout**



\*For ACTION PIN post hole diameter, see page 94.

| Connector<br>Style | Dimensions   |              |              |              |
|--------------------|--------------|--------------|--------------|--------------|
|                    | CL           | A            | B            | C            |
| Lever              | .100<br>2.54 | .100<br>2.54 | .206<br>5.23 | .175<br>4.45 |

**Daughter Board Edge Pattern**



| Connector<br>Style | Entry<br>Style | Dimensions   |              |
|--------------------|----------------|--------------|--------------|
|                    |                | A            | B            |
| Lever              | Side           | .240<br>6.10 | —            |
|                    | Top            | .240<br>6.10 | .320<br>8.13 |

**Linear ZIF Connectors, .125 x .125 [3.18 x 3.18] Centerline**

**Panel Assembly**

**Lever Style, Side Entry**

**Material and Finish:**

**Housing**—Glass-filled polyester, black

**Contacts**—Copper alloy 725, plated .000015 [0.00038] gold per MIL-G-45204 in contact area; .000001 [0.00003] min. gold flash per MIL-G-45204 on post with entire contact under-plated .000050 [0.00127] nickel per QQ-N-290

**Related Product Data:**

**Daughter PC Board**—.054-.070 [1.37-1.78] thick

**Performance Specifications**—page 83

**PC Board Hole Layout and Edge Pattern**—page 93

**ACTION PIN Contacts**—pages 93, 94

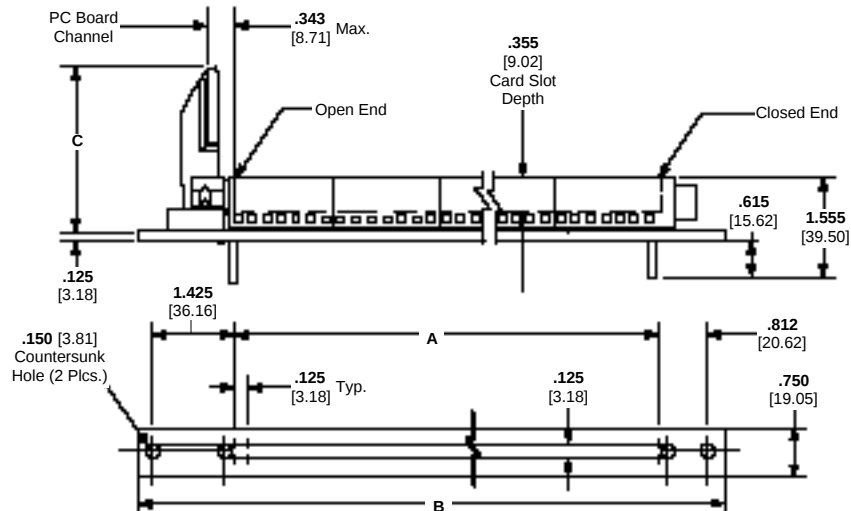
**Tooling**—page 95

**Special Application**—page 96

**Technical Documents:**

(pages 186, 187):

Instruction Sheets 408-2995, 408-6915, 408-6916



| No. of Dual Positions | Dimensions       |                  |                | Part Numbers |
|-----------------------|------------------|------------------|----------------|--------------|
|                       | A                | B                | C              |              |
| 40                    | 4.875<br>123.83  | 7.625<br>193.68  | 2.000<br>50.80 | 645146-5     |
| 56                    | 6.875<br>174.63  | 9.625<br>244.48  | 3.000<br>76.20 | 645146-9     |
| 60                    | 7.375<br>187.32  | 10.125<br>257.17 | 3.000<br>76.20 | 1-645146-0   |
| 72                    | 8.875<br>225.43  | 11.625<br>295.28 | 3.000<br>76.20 | 1-645146-3   |
| 84                    | 10.375<br>250.83 | 13.125<br>320.68 | 3.000<br>76.20 | 1-645146-6   |
| 124                   | 15.375<br>390.53 | 18.125<br>460.38 | 3.000<br>76.20 | 2-645146-6   |

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**Linear ZIF Connectors, .125 x .125 [3.18 x 3.18] Centerline** (Continued)

**Panel Assembly**

**Bell Crank Style, Top Entry**

**Material and Finish:**

**Housing**—Glass-filled polyester, black

**Contacts**—Copper alloy 725, plated .000015 [0.00038] gold per MIL-G-45204 in contact area; .000001 [0.00003] min. gold flash per MIL-G-45204 on post with entire contact under-plated .000050 [0.00127] nickel per QQ-N-290

**Related Product Data:**

**Daughter PC Board**—.054-.070 [1.37-1.78] thick

**Performance Specifications**—page 83

**PC Board Hole Layout and Edge Pattern**—page 93

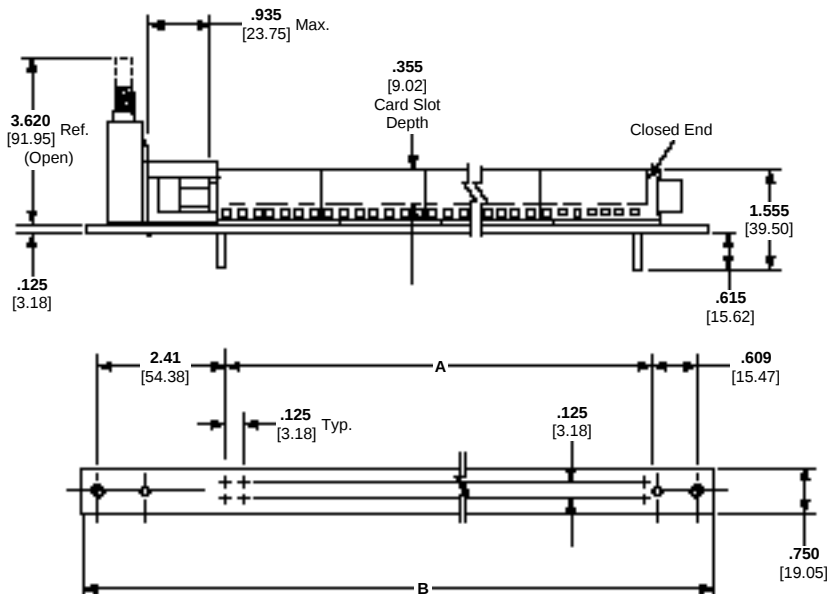
**ACTION PIN Contacts**—pages 93, 94

**Tooling**—page 95

**Technical Documents:**

(pages 186, 187):

Instruction Sheets 408-2995, 408-6915, 408-6916



| No. of Dual Positions | Dimensions       |                  | Part Numbers |
|-----------------------|------------------|------------------|--------------|
|                       | A                | B                |              |
| 60                    | 7.375<br>187.33  | 10.625<br>269.88 | 1-645149-0   |
| 80                    | 9.875<br>250.82  | 13.125<br>333.38 | 1-645149-5   |
| 112                   | 13.875<br>352.43 | 17.125<br>434.98 | 2-645149-3   |
| 140                   | 17.375<br>441.33 | 20.625<br>523.88 | 3-645149-0   |

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**Linear ZIF Connectors, .125 x .125 [3.18 x 3.18] Centerline** (Continued)

**Housing**

**Lever Style, Side Entry**

**Material:** Glass-filled polyester, black

**Related Product Data:**

**Daughter PC Board**—.054-.070  
[1.37-1.78] thick

**Mounting Screws**—Customer  
supplied, must be applied before  
opening connector

**Performance Specifications**—  
page 83

**PC Board Hole Layout and Edge  
Pattern**—page 93

**ACTION PIN Contacts**—  
pages 93, 94

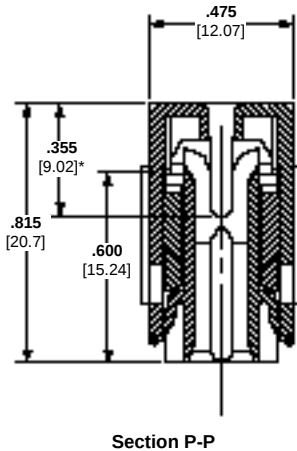
**Tooling**—page 95

**Special Application**—page 96

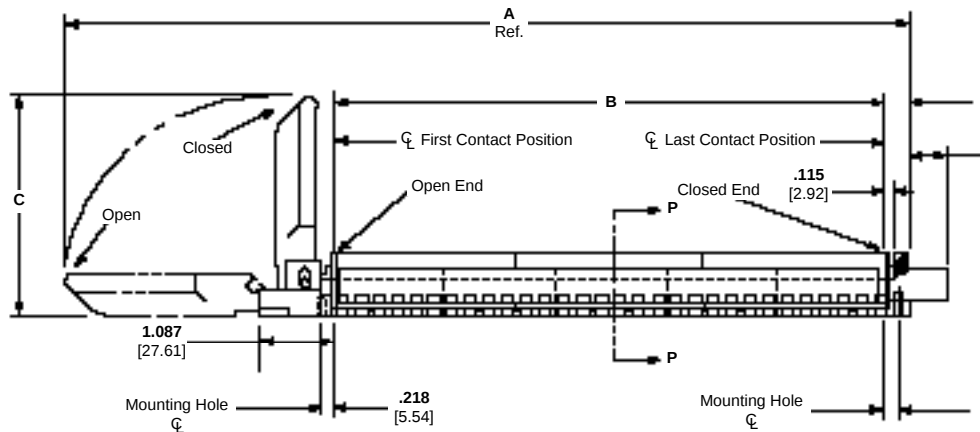
**Technical Documents:**

(pages 186, 187):

Instruction Sheets 408-2995,  
408-6915, 408-6916



\*Card slot depth.



| No. of<br>Dual<br>Positions | Dimensions       |                  |                | Part<br>Number |
|-----------------------------|------------------|------------------|----------------|----------------|
|                             | A                | B                | C              |                |
| 84                          | 14.112<br>358.44 | 10.375<br>263.52 | 3.000<br>76.20 | 1-645116-6     |
| 100                         | 16.112<br>409.24 | 12.375<br>314.33 | 3.000<br>76.20 | 2-645116-0     |
| 112                         | 17.612<br>447.34 | 15.775<br>400.68 | 3.000<br>76.20 | 2-645116-3     |
| 124                         | 19.112<br>485.44 | 17.275<br>438.78 | 3.000<br>76.20 | 2-645116-6     |

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**Linear ZIF Connectors, .125 x .125 [3.18 x 3.18] Centerline** (Continued)

**Housing**

**Material:** Glass-filled polyester, black

**Related Product Data:**

**Daughter PC Board**—.054-.070  
[1.37-1.78] thick

**Mounting Screws**—Customer  
supplied, must be applied before  
opening connector

**Performance Specifications**—  
page 83

**PC Board Hole Layout and Edge  
Pattern**—page 93

**ACTION PIN Contacts**—  
pages 93, 94

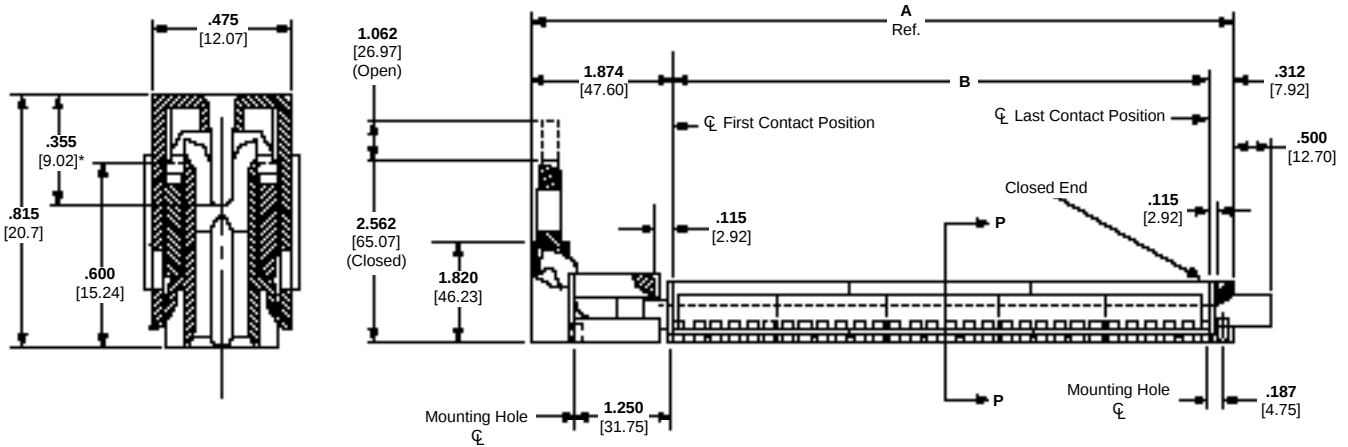
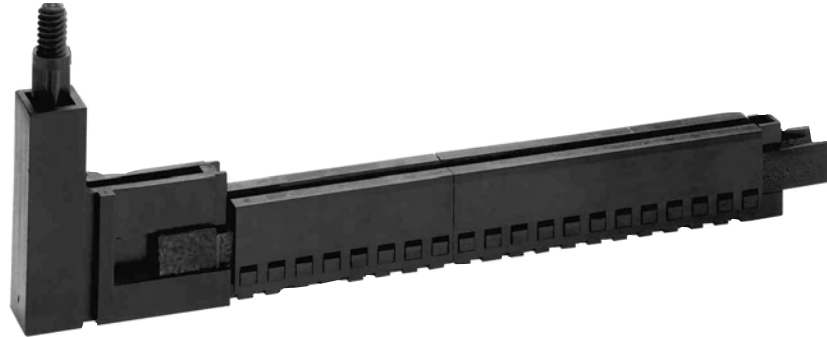
**Tooling**—page 95

**Technical Documents:**

(pages 186, 187):

Instruction Sheets 408-2995,  
408-6915, 408-6916

**Bell Crank Style, Top Entry**



Section P-P

\*Card slot depth.

| No. of<br>Dual<br>Positions | Dimensions       |                  | Part<br>Numbers |
|-----------------------------|------------------|------------------|-----------------|
|                             | A                | B                |                 |
| 52                          | 8.562<br>217.47  | 6.375<br>161.93  | 645142-8        |
| 60                          | 9.562<br>242.87  | 7.375<br>187.32  | 1-645142-0      |
| 80                          | 13.125<br>333.37 | 9.875<br>250.82  | 1-645142-5      |
| 112                         | 16.062<br>407.97 | 13.875<br>352.43 | 2-645142-3      |

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**Linear ZIF Connectors, .125 x .125 [3.18 x 3.18] Centerline** (Continued)

**ACTION PIN Contacts with Wiping Feature,  
.125 [3.18] Centerline**

**Material and Finish:**

Copper alloy 725, plated .000015  
[0.00038] gold per MIL-G-45204 in  
contact area; .000001 [0.00003] min.  
gold flash per MIL-G-45204 on post  
with entire contact underplated .000050  
[0.00127] nickel per QQ-N-290

**Related Product Data:**

**Performance Specifications—**  
page 83

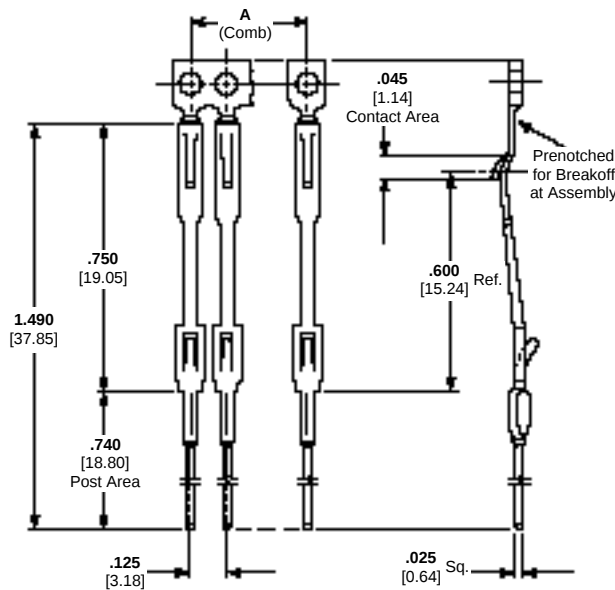
**ACTION PIN Contact Description  
and Application Specification—**  
page 94

**Tooling—**page 95

**Technical Documents:**

(pages 186, 187):

Instruction Sheet 408-2665



**Contact Combs**

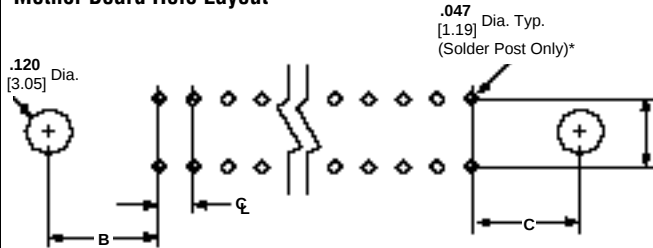
| Number of<br>Contacts<br>Per Comb* | Dimension<br>A  | Part<br>Number |
|------------------------------------|-----------------|----------------|
| 56                                 | 6.875<br>174.63 | 1-119950-2     |

\*At least two (2) contact combs required per housing.

**Note:** Other sizes can be made available, consult Tyco Electronics.

**Recommended PC Board Hole Layout and Edge Pattern,  
.125 [3.18] Centerline**

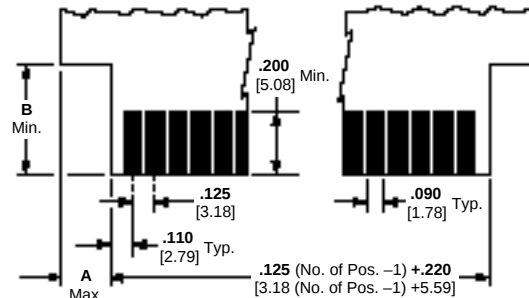
**Mother Board Hole Layout**



\*For ACTION PIN post hole diameter, see page 94.

| Connector<br>Style | Dimensions   |              |                |              |
|--------------------|--------------|--------------|----------------|--------------|
|                    | ℄            | A            | B              | C            |
| Lever              | .125<br>3.18 | .125<br>3.18 | .218<br>5.54   | .187<br>4.75 |
| Bell-Crank         | .125<br>3.18 | .125<br>3.18 | 1.250<br>31.75 | .187<br>4.75 |

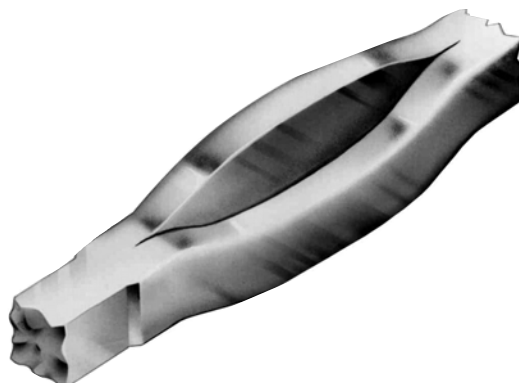
**Daughter Board Edge Pattern**



| Connector<br>Style | Entry<br>Style | Dimensions    |               |
|--------------------|----------------|---------------|---------------|
|                    |                | A             | B             |
| Lever              | Side           | .240<br>6.10  | —             |
|                    | Top            | .240<br>6.10  | .320<br>8.13  |
| Bell-Crank         | Top            | .775<br>19.68 | .600<br>15.24 |

**Linear ZIF Connectors** (Continued)

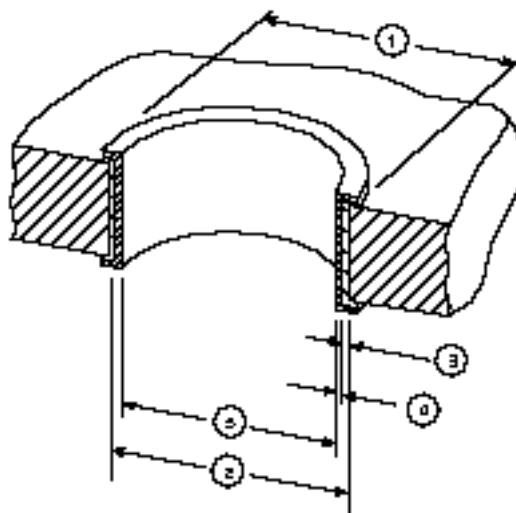
**AMP ACTION PIN  
Press-Fit Contacts**



ACTION PIN contacts provide a reliable press-fit connection. Localized pressure in the interface area entails oxide break-through and helps prevent corrosion in the harshest environments to provide a reliable connection virtually every time. Also, radial and axial distortion are controlled to meet today's standards for multilayer board applications.

**PC Board Thickness**

ACTION PIN contacts are designed for use in a variety of PC board thicknesses. However, certain ACTION PIN contacts are to be used in specific ranges of board thicknesses. To promote optimum performance, the recommended board thicknesses provided with the connector being used must be followed.



- ① Annular Ring (See Note)
- ② Drilled Hole
- ③ Copper Thickness
- ④ Tin-Lead Thickness
- ⑤ Plated Through-Hole

**ACTION PIN Contact/PC Board Applications**

| Connector Type | ACTION PIN Contact Material Thickness | Drilled Hole Diameter <sup>②</sup> | Plating Thicknesses    |                       | Plated Through-Hole Diameter <sup>⑤</sup> | Radial Hole Distortion |               |
|----------------|---------------------------------------|------------------------------------|------------------------|-----------------------|-------------------------------------------|------------------------|---------------|
|                |                                       |                                    | Copper <sup>③*</sup>   | Tin-Lead <sup>④</sup> |                                           | Average                | Maximum       |
| Linear ZIF     | .025<br>0.64                          | .0453±.001<br>1.151±0.03           | .001-.003<br>0.03-0.08 | .0003<br>0.008 Min.   | .037-.043<br>0.94-1.09                    | Not Specified          | Not Specified |

\*Maximum hardness of copper layer is 150 Knoop.

**Note:** Recommended annular ring diameter is hole diameter plus .020 [0.51].

**Linear ZIF Connectors** (Continued)

**Tooling**

Assembly tooling is not required except when using connectors with ACTION PIN contacts. ACTION PIN contact assembly requires an arbor-style bench tool with a capacity of 40 lb [178 N] per contact, a support fixture, contact applicator, carrier removal tool and housing assembly tool.

Typical procedure is to place a PC board on the support fixture, insert contact combs into the printed circuit board with the contact applicator and seat with the arbor tool. Next, remove the carrier strip from the contact combs with the carrier break-off tool. Place the housing over the contacts with the housing assembly tool, and repeat the entire process until the board is complete.

**.100 x .100 [2.54 x 2.54] Centerline Connectors**

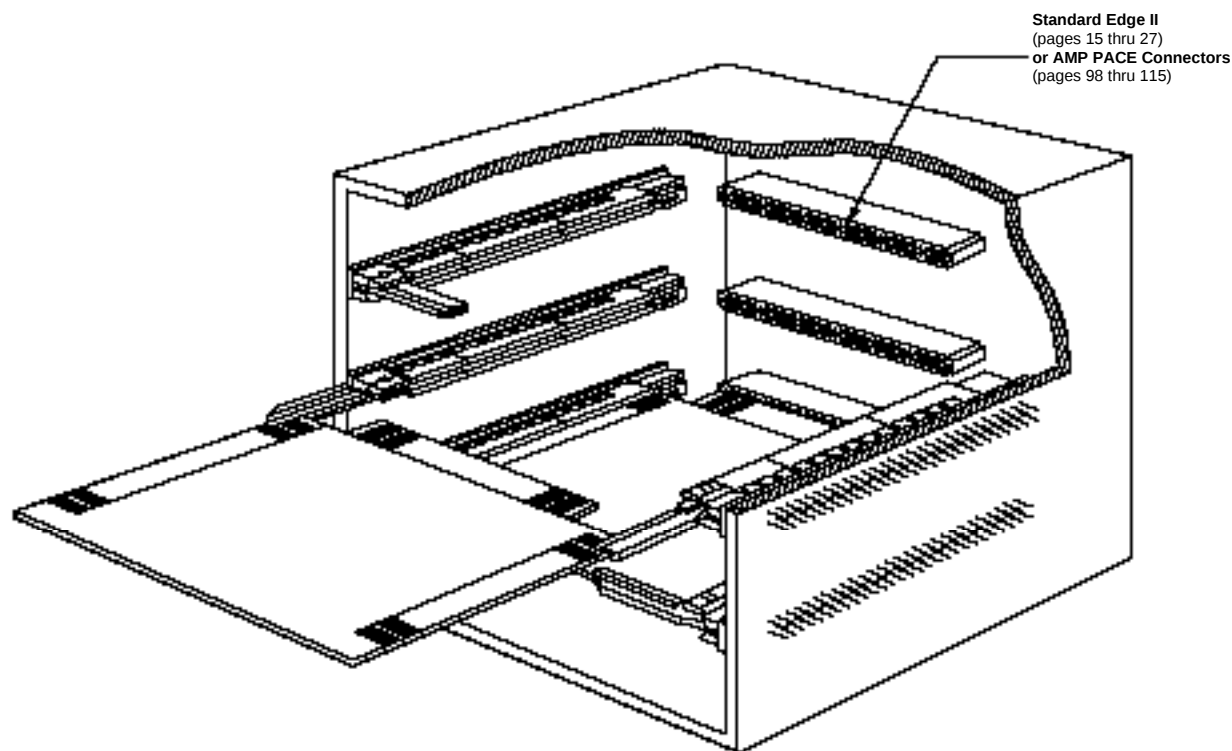
| No. of Dual Positions | T-Bar Applicator | Carrier Removal Tool | Housing Assembly Tool | Housing Removal Tool | Wing Removal/Replacement Tool | Housing Insertion Tool | Contact Replacement Tools |                 |
|-----------------------|------------------|----------------------|-----------------------|----------------------|-------------------------------|------------------------|---------------------------|-----------------|
|                       |                  |                      |                       |                      |                               |                        | With Housing              | Without Housing |
| 50                    | 266267-4         | 265924-4             | 313136-1              |                      |                               |                        |                           |                 |
| 80                    | 266267-3         | 265924-4             | 313136-2              |                      |                               |                        |                           |                 |
| 100                   | 266267-4         | 265924-4             |                       |                      |                               |                        |                           |                 |
| 110                   | 266267-5         | 265924-4             | 313136-3              |                      |                               |                        |                           |                 |
| 115                   | 266267-5         | 265924-4             |                       | 313256-1             | 266233-1                      | 266264-1               | 266235-1                  | 3-265871-2      |
| 120                   | 266267-5         | 265924-4             |                       |                      |                               |                        |                           |                 |
| 125                   | 266267-4         | 265924-4             | 313136-4              |                      |                               |                        |                           |                 |
| 140                   | 266267-4         | 265924-4             |                       |                      |                               |                        |                           |                 |
| 175                   | 266267-5         | 265924-4             | 313136-5              |                      |                               |                        |                           |                 |

**.125 x .125 [3.18 x 3.18] Centerline Connectors**

| No. of Dual Positions | T-Bar Applicator | Carrier Removal Tool | Housing Assembly Tool | Housing Removal Tool | Wing Removal/Replacement Tool | Housing Insertion Tool | Contact Replacement Tools |                 |
|-----------------------|------------------|----------------------|-----------------------|----------------------|-------------------------------|------------------------|---------------------------|-----------------|
|                       |                  |                      |                       |                      |                               |                        | With Housing              | Without Housing |
| 40                    | 313139-1         | 265924-4             | 313136-1              |                      |                               |                        |                           |                 |
| 52                    | 313139-2         | 265924-6             |                       |                      |                               |                        |                           |                 |
| 56                    | 313139-2         | 265924-6             | 313136-2              |                      |                               |                        |                           |                 |
| 60                    | 313139-2         | 265924-7             |                       |                      |                               |                        |                           |                 |
| 72                    | 313139-3         | 265924-4             |                       | 313256-1             | 266233-1                      | 266264-1               | 266235-1                  | 3-265871-2      |
| 84                    | 313139-2         | 265924-5             | 313136-3              |                      |                               |                        |                           |                 |
| 112                   | 313139-2         | 265924-7             | 313136-4              |                      |                               |                        |                           |                 |
| 124                   | 313139-2         | 265924-5             |                       |                      |                               |                        |                           |                 |
| 140                   | 313139-2         | 265924-5             | 313136-5              |                      |                               |                        |                           |                 |

**Special Application**

Use Linear and Rotary ZIF Connectors as Card Guides to access more sides of the Daughter Board.



## ACTION PIN Press-Fit Contacts

### The Reliable Plated Through-Hole Interconnect

Solderless interconnections have been popular in electrical and electronic application with world-wide success for decades. They provide reliable electrical and mechanical stability and offer applied-cost savings across the board. For PC board applications, ACTION PIN contacts from Tyco Electronics provide these features:

- Large gas-tight contact zone
- Reliability due to stored energy in compliant pin contacts
- No damage to plated through-holes during installation
- Especially suited for multilayer PC boards
- Less costly board manufacturing due to larger hole tolerances compared to use of solid pins
- Application can be made by end-user
- Repairability—contact can be replaced in the same pin location (two repairs)
- Installation with no heat cycling of board
- Permits mass insertion by minimizing forces needed to insert pins as compared to solid pin press-fit application
- Significant applied-cost savings in many applications

Since ACTION PIN contacts do not have to be soldered, issues associated with solder are eliminated, such as:

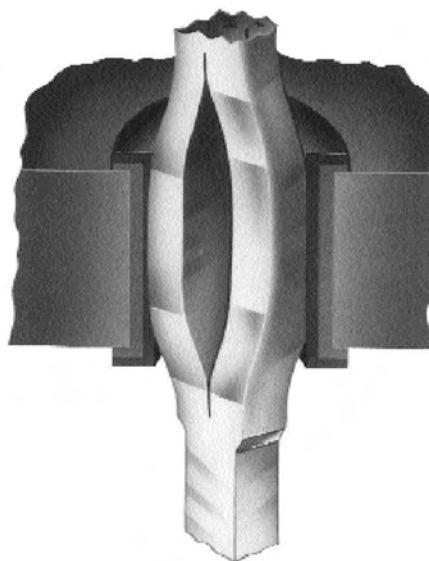
- Faulty solder joints
- Solder fumes; contaminant's are deposited on the contacts

- Solder spots; short circuits between printed circuits
- Flux residuals
- Thermal strain on printed circuit boards and components
- Degassing of plated through-holes

Solderless press-fit interconnections using the ACTION PIN contact are primarily integrated in, but not limited to, backplanes.

Solderless press-fit interconnections are used in racks, especially where connectors must be fixed on the solder side of the PC board and/or component side. In these applications, the holes for ACTION PIN contact connectors are covered during the soldering process and press-fitting is performed after soldering.

Other applications for ACTION PIN contact interconnections include PC boards that incorporate components using surface mount technology (SMT). Here, too, press-fit interconnections can be applied after soldering, thus eliminating complications associated with connectors suitable for surface mounting.

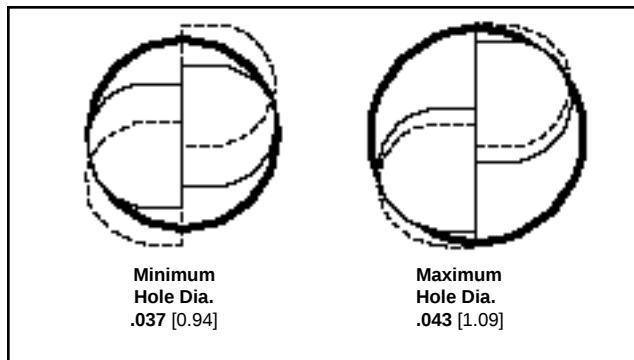


### Principle of the Tyco Electronics Compliant ACTION PIN Contact

When an ACTION PIN contact is inserted into a plated through-hole, two spring members are compressed, exerting force against the hole for gas-tight connection. The diameter of the hole is smaller than the diagonal size of the pin (see cross-section illustration below).

The beam characteristics of the pin are designed so that a plastic, as well as an elastic, deformation takes place during insertion. The two spring members compress to different degrees

to accommodate hole tolerances. The compliant pin also reduces strain on the board. With a rigid pin, the elastic strain energy is stored entirely in the board, leading to damage of the plated through-holes. With the ACTION PIN contact, the residual force of the elastic deformation maintains stored energy to produce a tight contact zone between the pin and the plated through-hole. This provides long term electrical and mechanical reliability of the interconnection.



**Cross-Section Area from Tyco Electronics ACTION PIN Press-Fit Contact in Printed Circuit Board Holes from Tyco Electronics.**

**Note:** ACTION PIN contact mounting hole specifications are presented in each product section, where applicable.

**AMP PACE Connectors**
**Performance Specifications**
**Electrical Characteristics**

**Contact Resistance:** ACTION PIN  
Contact Interface—5 milliohm

Spring Contact to Test Board—11.5 milliohms

**Total Circuit Resistance:**  
12 milliohms

**Continuous Current Rating\*:**  
3 amperes

**Insulation Resistance:**  
5,000 milliohms

**Dielectric Withstanding Voltage:**  
.100 [2.54] Centerline Spacing—  
1,000 VAC at sea level;  
350 VAC at 50,000 ft. [15,240 m];  
275 VAC at 70,000 ft. [21,336 m]  
.125 [3.18] Centerline Spacing—  
1,500 VAC at sea level;  
500 VAC at 50,000 ft. [15,240 m];  
235 VAC at 70,000 ft. [21,336 m]

**Physical Characteristics**

**Card Insertion Force (Max.):**  
16 oz [4.45 N] per contact pair  
ACTION PIN Contact Post

**Card Extraction Force (Min.):**  
1 oz [.278 N] per contact pair  
ACTION PIN Contact Post

**Retention (in PC board):**  
.100 x .100 [2.54 x 2.54]—  
7.5 lb. [33.4 N] min.

**Operating Temperature:**  
-55°C to +85°C

**Durability:** Tested to 100 cycles (100  
insertions and withdrawals at a rate not  
exceeding 10 cycles per minute)

**Salt Spray:** MIL-STD-1344,  
Method 1001

**Physical Shock:** MIL-STD-1344,  
Method 2004

**Thermal Shock:** MIL-STD-1344,  
Method 1003, Cond. A

**Humidity:** MIL-STD-1344,  
Method 1002, Type II

**Vibration:** MIL-STD-1344,  
Method 2005

**Recognized under the  
Component Program  
of Underwriters  
Laboratories Inc.,  
File No. E28476**



**Certified by  
Canadian Standards  
Association,  
File No. LR7189**



**\*Consult Tyco Electronicsengi-  
neering when paralleling con-  
tacts for power applications.**



AMP PACE (Pre-Assembled Card Edge) Connectors are the latest innovation in the evolution of backplane architecture. Designed to shorten manufacturing time and reduce applied costs, these one-step, pre-assembled connectors are ready for mounting and mass insertion. In addition, design features such as removable housings and contacts, that

are replaceable through the top of the connector housing, for maximum flexibility in your backplane packaging.

At the heart of the AMP PACE Connector is AMP's proven and reliable ACTION PIN Contact. This unique contact has superior electrical and physical characteristics that are top of the line in the industry.

AMP PACE Connectors are available with post center-line spacings of:

.100 x .100 [2.54 x 2.54]  
.100 x .200 [2.54 x 5.08]  
.125 x .125 [3.18 x 3.18]  
.125 x .250 [3.18 x 6.35]  
.156 x .200 [3.96 x 5.08]

**Important:**

Application tooling is absolutely necessary to insert connectors into PC boards. See page 115 for application tooling.

**AMP PACE Connectors** (Continued)

**Product Facts**

**Repairability—**

(See below for details)  
Individual contacts can be removed without removing the housing; housings can be removed without removing posts. **Important:** APC must be inserted into the connector when removing the contact.

**Precision Plated**

Selective plating put: it is needed for superior contact at a reasonable

**Beam Contact Design**

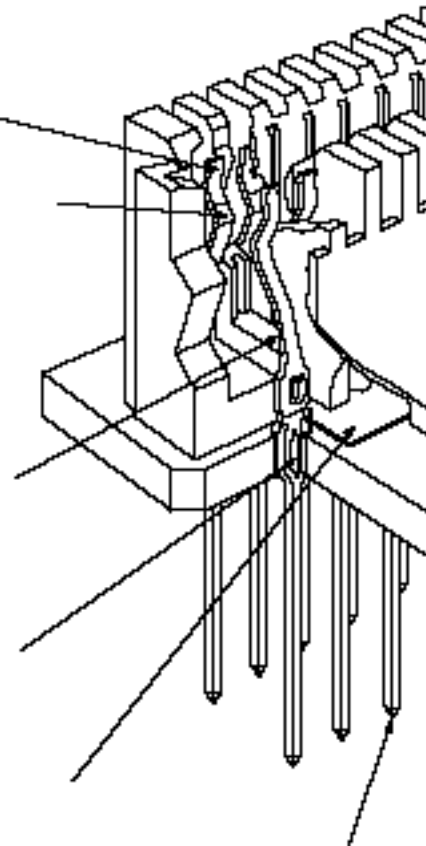
The contact's unique beam accommodates and compensates for daughter board warpage and stress providing long-term performance (100 gram normal force).

**Gas-Tight Connector**

Spring sections of ACTI Contacts compress in opposite directions, maintaining a tight fit with the PC board.

**Contact Tip Alignment**

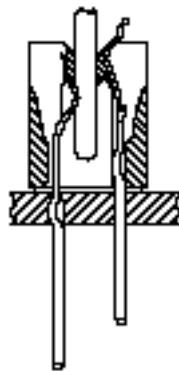
Polyester strip provides stable pin alignment and damage-free entry into PC board.



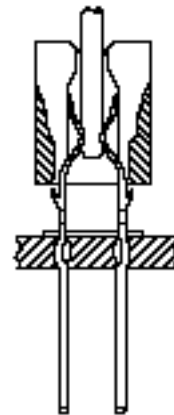
**Precision Plated Post—**

Gold plating can be applied to the entire post, or just the post tip for improved pluggability.

**Repairability Details**



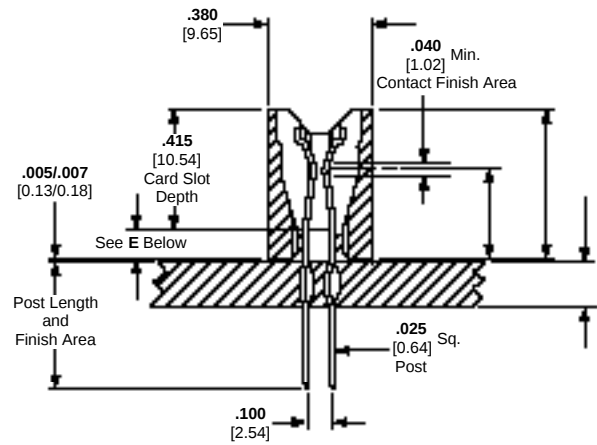
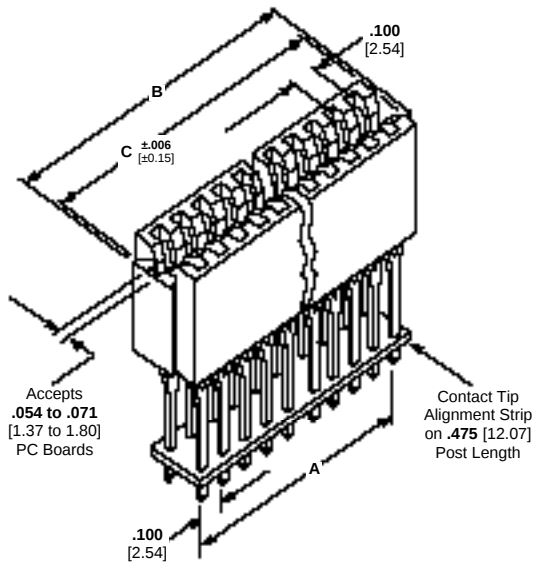
Remove and replace contacts without removing housing. (See page 115 for Contact Replacement Tools.)



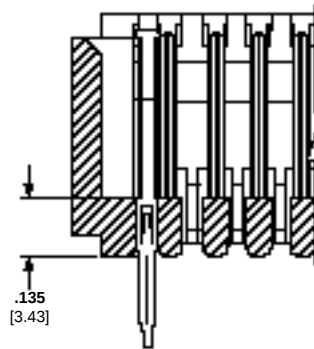
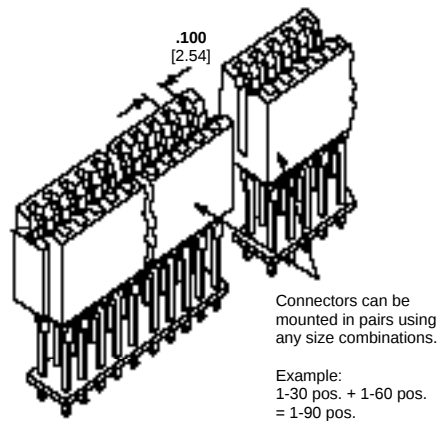
Remove and replace housing without removing contacts.

**AMP PACE Connectors, .100 x .100 [2.54 x 2.54] Centerline**

**Standard Housing**



**Typical Closed End/  
Open End Housing~**



**Detail E**

**Keying Plugs**



**Intercontact (Plastic)  
Part No. 118982-1**



**On-Contact (Plastic)  
Part No. 119802-2**

**Material and Finish:**

**Housing**—Black glass-filled polyester, 94V-0 rated

**Contacts**—Phosphor bronze, plated gold .000030 [0.00076] min. thk. over .000050 [0.00127] min. thk. nickel in contact area, .000100 [0.00254] min. tin-lead on posts, with entire contact underplated .000050 [0.00127] min. nickel

**Contact Tip Alignment Strip**—Clear polyester, type D

**Note:** Full palladium-nickel plated posts and other platings and plating thicknesses can be made available.

**Related Product Data:**

**Performance Specifications**—page 98

**Accessories**—page 112

**PC Board Edge Pattern**—page 113

**ACTION PIN Contact Mounting Hole Specifications**—page 114

**Application Tooling**—page 115

**Contact Replacement Tools**—page 115

**Special Application**—page 96

**Technical Documents:**

(pages 186, 187):

Product Specifications

108-14019, 108-26003

Application Specification

114-26002

Instruction Sheets 408-2978,  
408-2979, 408-6881, 408-9091,  
408-9188

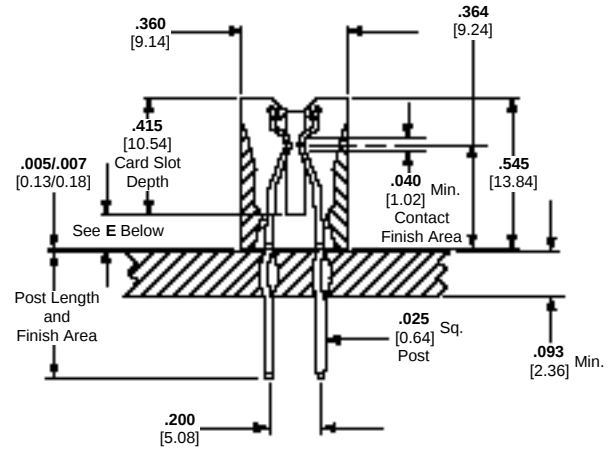
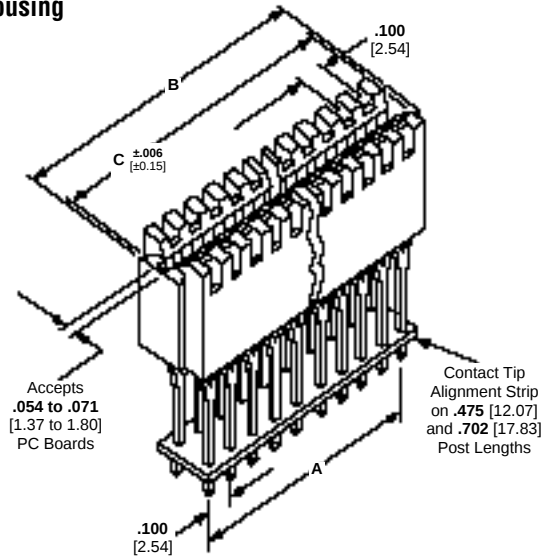
**AMP PACE Connectors, .100 x .100 [2.54 x 2.54] Centerline** (Continued)

| No. of Dual Positions | Dimensions      |                 |                 | Post Length   | Closed/Closed |            | Closed/Open Standard |
|-----------------------|-----------------|-----------------|-----------------|---------------|---------------|------------|----------------------|
|                       | A               | B               | C               |               | Standard      | Scoop      |                      |
| 15                    | 1.400<br>35.56  | 1.734<br>44.04  | 1.604<br>40.74  | .180<br>4.57  | 119734-1      | 119736-1   | —                    |
|                       |                 |                 |                 | .475<br>12.07 | 119237-1      | —          | —                    |
| 20                    | 1.900<br>48.26  | 2.234<br>56.74  | 2.104<br>53.44  | .180<br>4.57  | 119734-6      | —          | —                    |
| 25                    | 2.400<br>60.96  | 2.734<br>69.44  | 2.604<br>66.14  | .180<br>4.57  | 1-119734-1    | —          | —                    |
| 28                    | 2.700<br>68.58  | 3.034<br>77.06  | 2.904<br>73.76  | .180<br>4.57  | 1-119734-4    | —          | —                    |
| 31                    | 3.000<br>76.20  | 3.334<br>84.68  | 3.204<br>81.38  | .475<br>12.07 | 1-119237-7    | —          | —                    |
| 35                    | 3.400<br>83.36  | 3.734<br>94.84  | 3.604<br>91.54  | .180<br>4.57  | 2-119734-1    | —          | 119831-6             |
|                       |                 |                 |                 | .475<br>12.07 | —             | —          | 119413-6             |
| 40                    | 3.900<br>99.06  | 4.234<br>107.54 | 4.104<br>104.24 | .180<br>4.57  | 2-119734-6    | 2-119736-6 | —                    |
| 48                    | 4.700<br>119.38 | 5.034<br>127.86 | 4.904<br>124.56 | .475<br>12.07 | 3-119237-4    | —          | —                    |
| 50                    | 4.900<br>124.46 | 5.234<br>132.94 | 5.104<br>129.64 | .180<br>4.57  | 3-119734-6    | —          | —                    |
| 60                    | 5.900<br>149.86 | 6.234<br>158.34 | 6.104<br>155.04 | .180<br>4.57  | 4-119734-6    | 4-119736-6 | —                    |

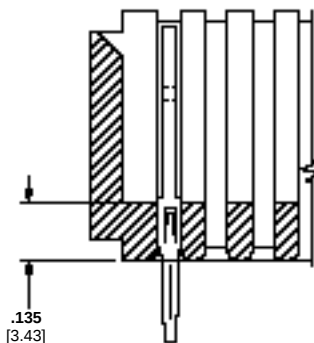
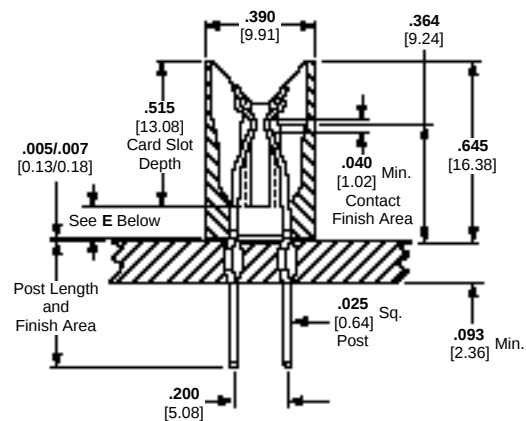
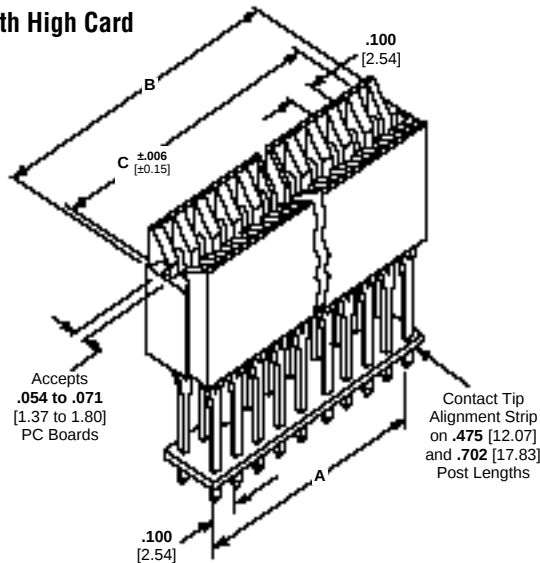
**Note:** Other connector sizes and connectors with card scoops can be made available, consult Tyco Electronics.

**AMP PACE Connectors, .100 x .200 [2.54 x 5.08] Centerline**

**Standard Housing**



**Housing with High Card Scoops**



Detail E

**Keying Plugs**



Intercontact (Plastic)  
Part No. 118982-1



On-Contact (Plastic)  
Part No. 118902-2

**Material and Finish:**

**Housing**—Black glass-filled polyester, 94V-0 rated

**Contacts**—Phosphor bronze, plated gold .000030 [0.00076] min. thk. over .000050 [0.00127] min. thk. nickel in contact area, .000100 [0.00254] min. tin-lead on posts, with entire contact underplated .000050 [0.00127] min. nickel

**Contact Tip Alignment Strip**—Clear polyester, type D

**Note:** Full palladium-nickel plated posts and other platings and plating thicknesses can be made available.

**Related Product Data:**

**Performance Specifications**—page 98

**Accessories**—page 112

**PC Board Edge Pattern**—page 113

**ACTION PIN Contact Mounting Hole Specifications**—page 114

**Application Tooling**—page 115

**Contact Replacement Tools**—page 115

**Special Application**—page 96

**Technical Documents:**

(pages 186, 187):

Product Specifications  
108-14019, 108-26003

Application Specification  
114-26002

Instruction Sheets 408-2933,  
408-2978, 408-2979, 408-9058,  
408-9067, 408-9091, 408-9186

**AMP PACE Connectors, .100 x .200 [2.54 x 5.08] Centerline** (Continued)

| No. of Dual Positions | Dimensions      |                 |                 | Post Length                                    | Closed End/Closed End                  |                               |
|-----------------------|-----------------|-----------------|-----------------|------------------------------------------------|----------------------------------------|-------------------------------|
|                       | A               | B               | C               |                                                | Standard                               | High Scoop                    |
| 10                    | .900<br>22.86   | 1.234<br>31.34  | 1.104<br>28.04  | .180<br>4.57                                   | —                                      | 650297-1                      |
| 15                    | 1.400<br>35.56  | 1.734<br>44.04  | 1.604<br>40.74  | .180<br>4.57                                   | 119738-1                               | 119791-1                      |
| 18                    | 1.700<br>43.18  | 2.034<br>51.66  | 1.904<br>48.36  | .180<br>4.57                                   | 119738-4                               | —                             |
| 20                    | 1.900<br>48.26  | 2.234<br>56.74  | 2.104<br>53.44  | .180<br>4.57                                   | 119738-6                               | —                             |
| 22                    | 2.100<br>53.34  | 2.434<br>61.82  | 2.304<br>58.52  | .180<br>4.57<br>.475<br>12.07                  | 119738-8<br>119216-8                   | —<br>650123-8                 |
| 24                    | 2.300<br>58.42  | 2.634<br>66.90  | 2.504<br>63.60  | .180<br>4.57                                   | 1-119738-0                             | —                             |
| 25                    | 2.400<br>60.96  | 2.734<br>69.44  | 2.604<br>66.14  | .180<br>4.57<br>.702<br>17.83                  | 1-119738-1<br>1-119163-1               | —<br>—                        |
| 28                    | 2.700<br>68.58  | 3.034<br>77.06  | 2.904<br>73.76  | .180<br>4.57<br>.475<br>12.07                  | 1-119738-4<br>1-119216-4               | —<br>—                        |
| 30                    | 2.900<br>73.66  | 3.234<br>82.14  | 3.104<br>78.84  | .180<br>4.57<br>.475<br>12.07<br>.702<br>17.83 | 1-119738-6<br>1-119216-6<br>1-119163-6 | 1-119791-6<br>—<br>—          |
| 31                    | 3.000<br>76.20  | 3.334<br>84.68  | 3.204<br>81.38  | .180<br>4.57                                   | 1-119738-7                             | —                             |
| 32                    | 3.100<br>78.74  | 3.434<br>87.22  | 3.304<br>83.92  | .180<br>4.57                                   | 1-650122-8                             | —                             |
| 34                    | 3.300<br>83.82  | 3.634<br>92.30  | 3.504<br>88.90  | .180<br>4.57<br>.475<br>12.06                  | —<br>2-119216-0                        | 2-119791-0<br>—               |
| 35                    | 3.400<br>86.36  | 3.734<br>94.84  | 3.604<br>91.54  | .475<br>12.06                                  | 2-119216-1                             | —                             |
| 36                    | 3.500<br>88.90  | 3.834<br>97.38  | 3.704<br>94.08  | .180<br>4.57<br>.475<br>12.06                  | 2-119738-2<br>2-119216-2               | —<br>—                        |
| 37                    | 3.600<br>91.44  | 3.934<br>99.92  | 3.804<br>96.62  | .180<br>4.57                                   | 2-650122-3                             | —                             |
| 40                    | 3.900<br>99.06  | 4.234<br>107.54 | 4.104<br>104.24 | .180<br>4.57<br>.475<br>12.06                  | 2-119738-6<br>2-119216-6               | —<br>—                        |
| 43                    | 4.200<br>106.68 | 4.534<br>115.16 | 4.404<br>111.86 | .180<br>4.57                                   | 2-650122-9                             | —                             |
| 44                    | 4.300<br>109.22 | 4.634<br>117.70 | 4.504<br>114.40 | .475<br>12.07                                  | 3-119216-0                             | —                             |
| 50                    | 4.900<br>124.46 | 5.234<br>132.94 | 5.104<br>129.64 | .180<br>4.57<br>.475<br>12.07<br>.702<br>17.83 | 3-119738-6<br>3-119216-6<br>—          | 3-119791-6<br>—<br>3-119726-6 |
| 55                    | 5.400<br>137.16 | 5.734<br>145.54 | 5.604<br>142.34 | .180<br>4.57                                   | 4-119738-1                             | 4-650124-1                    |
| 60                    | 5.900<br>149.86 | 6.234<br>158.34 | 6.104<br>155.04 | .180<br>4.57<br>.702<br>17.83                  | 4-119738-6<br>119677-1                 | —<br>—                        |

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**AMP PACE Connectors, .125 x .125 [3.18 x 3.18] Centerline**

**Material and Finish:**

**Housing**—Black glass-filled polyester, 94V-0 rated

**Contacts**—Phosphor bronze, plated gold .000030 [0.00076] min. thk. over .000050 [0.00127] min. thk. palladium-nickel in contact area, .000100 [0.00254] min. tin-lead on posts, with entire contact underplated .000050 [0.00127] min. nickel

**Contact Tip Alignment Strip**—Clear polyester, type D

**Note:** Full palladium-nickel plated posts and other platings and plating thicknesses can be made available.

**Related Product Data:**

**Performance Specifications**—page 98

**Accessories**—page 112

**PC Board Edge Pattern**—page 113

**ACTION PIN Contact Mounting Hole Specifications**—page 114

**Application Tooling**—page 115

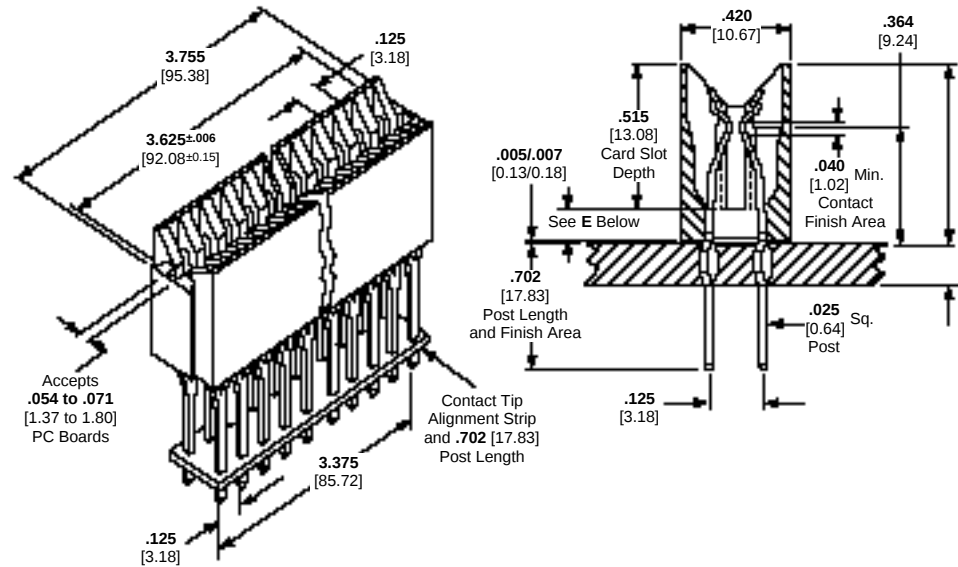
**Contact Replacement Tools**—page 115

**Special Application**—page 96

**Housing with High Card Scoops**

**28 Dual Positions**

**Part Number 1-119853-4**



**Technical Documents:**

(pages 186, 187):

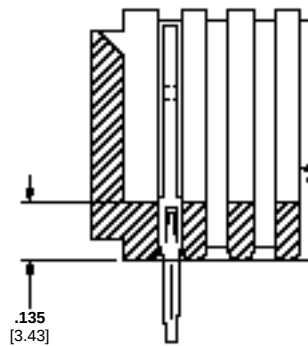
Product Specifications

108-14019, 108-26003

Application Specification

114-26002

Instruction Sheets 408-6727, 408-9186



Detail E

**Keying Plugs**



Intercontact (Plastic)  
Part No. 118982-1



On-Contact (Plastic)  
Part No. 119802-2

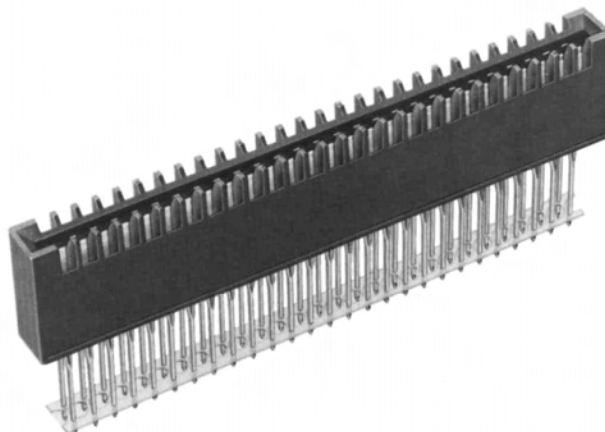
**AMP PACE Connector Specials, .125 x .125 [3.18 x 3.18] Centerline**

**27 Dual Positions**

**Tin-Lead Posts**

**.634 [16.10] Long**

Part No. 645394-1



**18 or 36  
Dual Positions**

**Tin-Lead Posts**

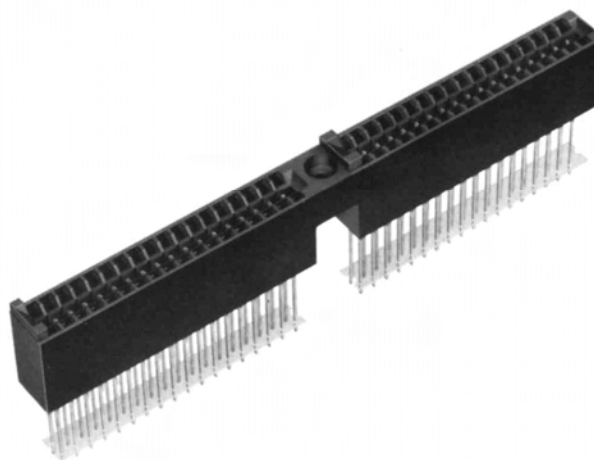
**.740 [18.80] Long**

Part No. 119552-2

**Tin-Lead Posts**

**.180 [4.57] Long**

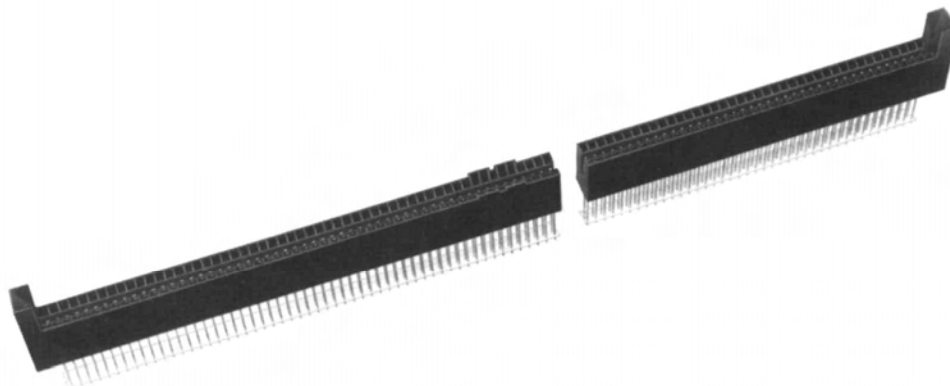
Part No. 119880-1



**97 Dual Positions**

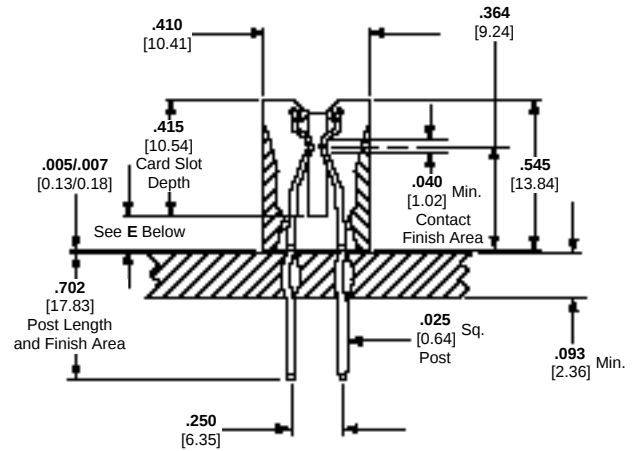
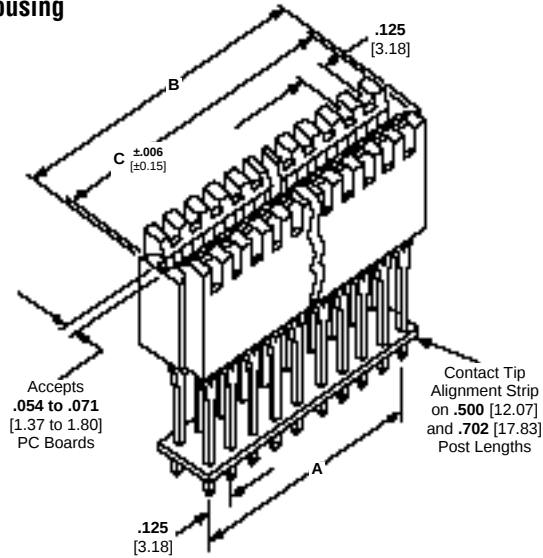
(Two-piece Closed  
End/Open End with Partial  
Card Scoops and Card  
Guides)

Contact Tyco Electronics for  
specific Part Number infor-  
mation.

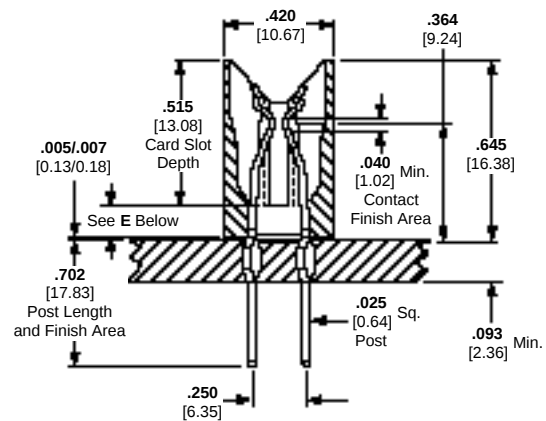
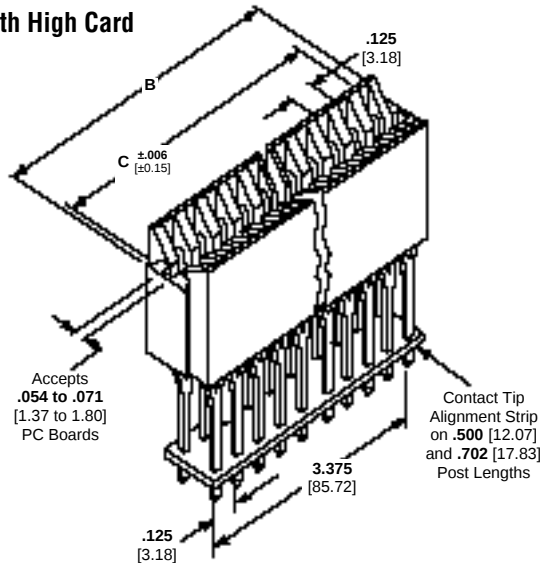


Press-Fit  
Board-to-Board Connectors

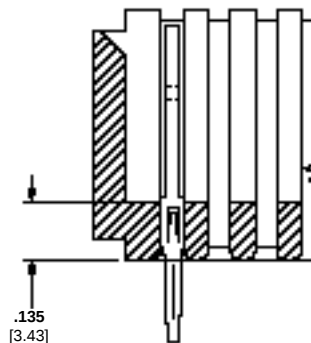
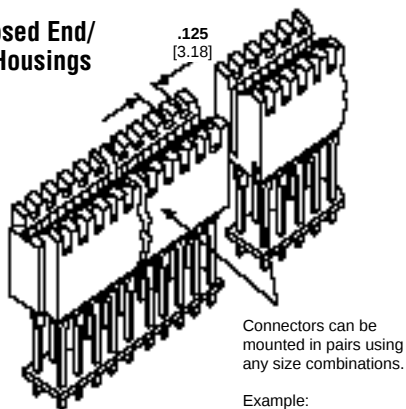
**Standard Housing**



**Housing with High Card Scoops**



**Typical Closed End/  
Open End Housings**



**Keying Plugs**



Intercontact (Plastic)  
Part No. 118982-1



On-Contact (Plastic)  
Part No. 118982-2

**Material and Finish:**

**Housing**—Black glass-filled polyester, 94V-0 rated

**Contacts**—Phosphor bronze, plated gold .000030 [0.00076] min. thk. over .000050 [0.00127] min. thk. nickel in contact area, .000100 [0.00254] min. tin-lead on posts, with entire contact underplated .000050 [0.00127] min. nickel

**Contact Tip Alignment Strip**—Clear polyester, type D

**Note:** Full palladium-nickel plated posts and other platings and plating thicknesses can be made available.

**Related Product Data:**

**Performance Specifications**—page 98

**Accessories**—page 112

**PC Board Edge Pattern**—page 113

**ACTION PIN Contact Mounting Hole Specifications**—page 114

**Application Tooling**—page 115

**Contact Replacement Tools**—page 115

**Special Application**—page 96

**Technical Documents:**

(pages 186, 187):

Product Specifications  
108-14019, 108-26003

Application Specification  
114-26002

Instruction Sheets 408-2933,  
408-2978, 408-2979, 408-9063,  
408-9091, 408-9119, 408-9186

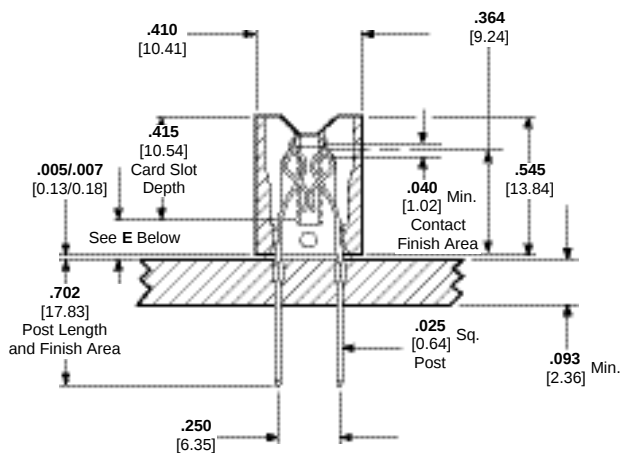
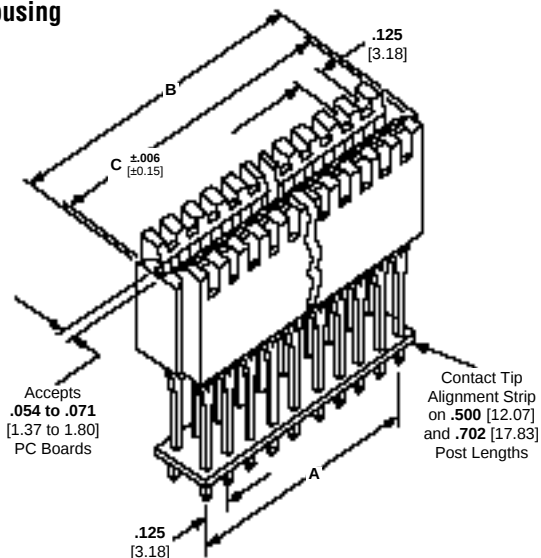
**AMP PACE Connectors, .125 x .250 [3.18 x 6.35] Centerline** (Continued)

| No. of Dual Positions | Dimensions      |                 |                 | Post Length   | Closed End/Closed End |            | Closed End/Open End High Scoop |
|-----------------------|-----------------|-----------------|-----------------|---------------|-----------------------|------------|--------------------------------|
|                       | A               | B               | C               |               | Standard              | High Scoop |                                |
| 18                    | 2.125<br>53.98  | 2.373<br>60.27  | 2.505<br>63.63  | .180<br>4.57  | 119822-4              | —          | 3-119840-2                     |
| 22                    | 2.625<br>66.68  | 3.005<br>76.33  | 2.875<br>73.02  | .180<br>4.57  | 119822-8              | —          | —                              |
|                       |                 |                 |                 | .500<br>12.70 | 119200-8              | —          | —                              |
|                       |                 |                 |                 | .702<br>17.83 | 119202-8              | —          | —                              |
| 25                    | 3.000<br>76.20  | 3.380<br>85.85  | 3.250<br>82.55  | .180<br>4.57  | 1-119822-1            | —          | —                              |
| 27                    | 3.250<br>82.55  | 3.630<br>92.20  | 3.500<br>88.90  | .702<br>17.83 | 1-119202-3            | —          | —                              |
| 28                    | 3.375<br>85.72  | 3.755<br>95.38  | 3.625<br>92.08  | .180<br>4.57  | 1-119822-4            | —          | —                              |
|                       |                 |                 |                 | .500<br>12.70 | 1-119200-4            | —          | —                              |
| 30                    | 3.625<br>92.08  | 4.005<br>101.73 | 3.875<br>98.24  | .180<br>4.57  | 1-119822-6            | 678034-1   | —                              |
|                       |                 |                 |                 | .500<br>12.70 | —                     | 1-119841-6 | —                              |
| 36                    | 4.375<br>111.82 | 4.755<br>120.78 | 4.625<br>117.48 | .180<br>4.57  | 2-119822-2            | 678034-2   | —                              |
|                       |                 |                 |                 | .500<br>12.70 | —                     | 2-119841-2 | —                              |
| 38                    | 4.625<br>117.47 | 4.873<br>123.77 | 5.005<br>127.13 | .180<br>4.57  | 2-119822-4            | —          | 119840-9                       |
| 40                    | 4.875<br>123.83 | 5.255<br>133.48 | 5.125<br>130.18 | .180<br>4.57  | 2-119822-6            | —          | —                              |
|                       |                 |                 |                 | .702<br>17.83 | 2-119200-6            | —          | —                              |
| 50                    | 6.125<br>155.58 | 6.505<br>165.23 | 6.375<br>161.93 | .180<br>4.57  | 3-119822-6            | —          | —                              |
| 51                    | 6.250<br>158.75 | 6.630<br>168.40 | 6.500<br>165.10 | .500<br>12.70 | 3-119200-7            | —          | —                              |
| 60                    | 7.375<br>187.33 | 7.755<br>196.98 | 7.625<br>193.68 | .180<br>4.57  | 4-119822-6            | —          | —                              |

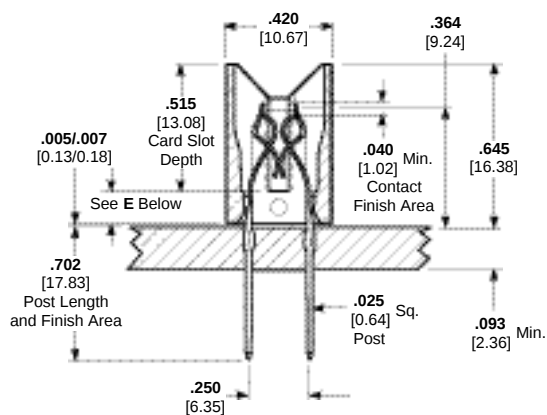
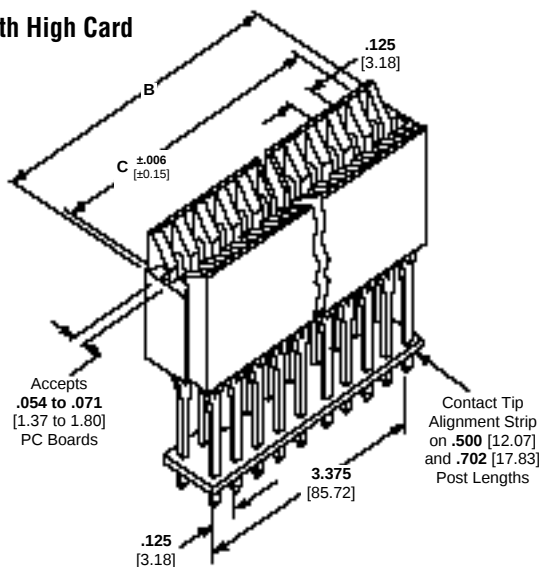
**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**AMP PACE Connectors, .125 x .250 [3.18 x 6.35] Centerline w/ Make Before Break Contacts**

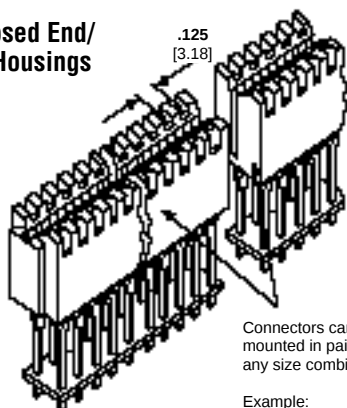
**Standard Housing**



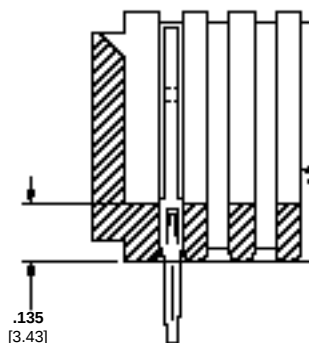
**Housing with High Card Scoops**



**Typical Closed End/ Open End Housings**



Example:  
1-30 pos. + 1-60 pos.  
= 1-90 pos.



Detail E

**Keying Plugs**



Intercontact (Plastic)  
Part No. 118982-1



On-Contact (Plastic)  
Part No. 118982-2

**AMP PACE Connectors, .125 x .250 [3.18 x 6.35] Centerline w/ Make Before Break Contacts** (Continued)

**Material and Finish:**

**Housing**—Black glass-filled polyester, 94V-0 rated

**Contacts**—Phosphor bronze, plated gold .000030 [0.00076] min. thk. over .000050 [0.00127] min. thk. nickel in contact area, .000100 [0.00254] min. tin-lead on posts, with entire contact underplated .000050 [0.00127] min. nickel

**Contact Tip Alignment Strip**—Clear polyester, type D

**Note:** Full palladium-nickel plated posts and other platings and plating thicknesses can be made available.

**Related Product Data:**

**Performance Specifications**—page 98

**Accessories**—page 112

**PC Board Edge Pattern**—page 113

**ACTION PIN Contact Mounting Hole Specifications**—page 114

**Application Tooling**—page 115

**Contact Replacement Tools**—page 115

**Special Application**—page 96

**Technical Documents:**

(pages 186, 187):

Product Specifications  
108-14019, 108-26003

Application Specification  
114-26002

Instruction Sheets 408-2933,  
408-2978, 408-2979, 408-9063,  
408-9091, 408-9119, 408-9186

| No. of Dual Positions | Dimensions     |                |                | Post Length  | Closed End/Closed End | Closed End/Open End |
|-----------------------|----------------|----------------|----------------|--------------|-----------------------|---------------------|
|                       | A              | B              | C              |              | Standard              | High Scoop          |
| 18                    | 2.125<br>53.98 | 2.505<br>63.63 | 2.373<br>60.27 | .180<br>4.57 | 1571235-1             | —                   |
| 24                    | 2.875<br>76.20 | 3.123<br>79.25 | 3.058<br>77.67 | .180<br>4.57 | —                     | 650059-2            |

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**AMP PACE Connectors, .156 x .200 [3.96 x 5.08] Centerline**

**Material and Finish:**

**Housing**—Black glass-filled polyester, 94V-0 rated

**Contacts**—Phosphor bronze, plated gold .000030 [0.00076] min. thk. over .000050 [0.00127] min. thk. nickel in contact area, .000100 [0.00254] min. tin-lead on posts, with entire contact underplated .000050 [0.00127] min. nickel

**Contact Tip Alignment Strip**—Clear polyester, type D

**Note:** Full palladium-nickel plated posts and other platings and plating thicknesses can be made available.

**Related Product Data:**

**Performance Specifications**—page 98

**Accessories**—page 112

**PC Board Edge Pattern**—page 113

**ACTION PIN Contact Mounting Hole Specifications**—page 114

**Application Tooling**—page 115

**Contact Replacement Tools**—page 115

**Special Application**—page 96

**Technical Documents:**

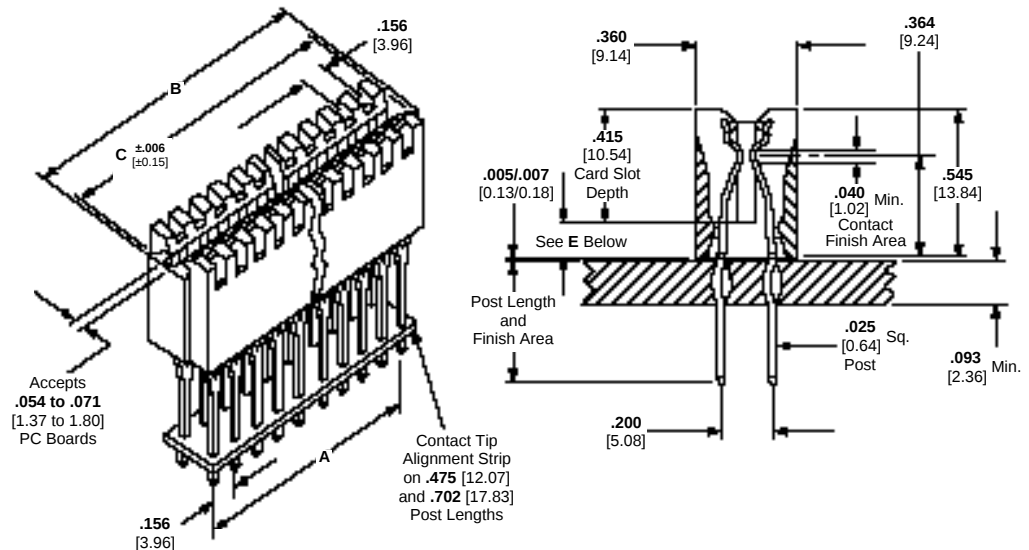
(pages 186, 187):

Product Specifications  
108-14019, 108-26003

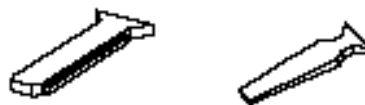
Application Specification  
114-26002

Instruction Sheets 408-6726,  
408-9186

**Standard Housing**

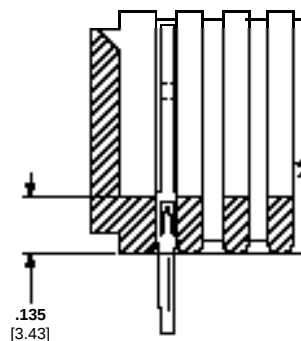


**Keying Plugs**



Intercontact (Plastic)  
Part No. 118982-1

On-Contact (Plastic)  
Part No. 119802-2



Detail E

| No. of<br>Dual<br>Positions | Dimensions      |                 |                 | Post<br>Length | Closed End/Closed End<br>Standard |
|-----------------------------|-----------------|-----------------|-----------------|----------------|-----------------------------------|
|                             | A               | B               | C               |                |                                   |
| 15                          | 2.184<br>55.47  | 2.626<br>66.70  | 2.495<br>63.39  | .180<br>4.57   | 119790-1                          |
|                             |                 |                 |                 | .475<br>12.07  | 119254-1                          |
|                             |                 |                 |                 | .702<br>17.83  | 119256-1                          |
| 18                          | 2.652<br>67.36  | 3.094<br>78.59  | 2.964<br>75.29  | .475<br>12.07  | 119254-4                          |
|                             |                 |                 |                 | .180<br>4.57   | 119790-8                          |
|                             |                 |                 |                 | .475<br>12.07  | 119254-8                          |
| 22                          | 3.276<br>83.21  | 3.718<br>94.44  | 3.588<br>91.13  | .702<br>17.83  | 119256-8                          |
|                             |                 |                 |                 | .180<br>4.57   | 1-119790-4                        |
|                             |                 |                 |                 | .475<br>12.07  | 1-119254-4                        |
| 28                          | 4.212<br>106.98 | 4.654<br>118.21 | 4.524<br>114.91 | .702<br>17.83  | 1-119256-4                        |
|                             |                 |                 |                 | .180<br>4.57   | 2-119790-9                        |
|                             |                 |                 |                 | .475<br>12.07  | 2-119254-9                        |
| 43                          | 6.552<br>166.42 | 6.994<br>177.65 | 6.864<br>174.35 | .702<br>17.83  | 2-119256-9                        |
|                             |                 |                 |                 | .180<br>4.57   |                                   |

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**AMP PACE Connectors, .156 x .200 [3.96 x 5.08] Centerline w/Make Before Break Contacts**

**Material and Finish:**

**Housing**—Black glass-filled polyester, 94V-0 rated

**Contacts**—Phosphor bronze, plated gold flash over .000030 [0.00076] min. thk. over .000050 [0.00127] min. thk. nickel in contact area, .000100 [0.00254] min. tin-lead on posts, with entire contact underplated .000050 [0.00127] min. nickel

**Contact Tip Alignment Strip**—Clear polyester, type D

**Note:** Full palladium-nickel plated posts and other platings and plating thicknesses can be made available.

**Related Product Data:**

**Performance Specifications**—page 98

**Accessories**—page 112

**PC Board Edge Pattern**—page 113

**ACTION PIN Contact Mounting Hole Specifications**—page 114

**Application Tooling**—page 115

**Contact Replacement Tools**—page 115

**Special Application**—page 96

**Technical Documents:**

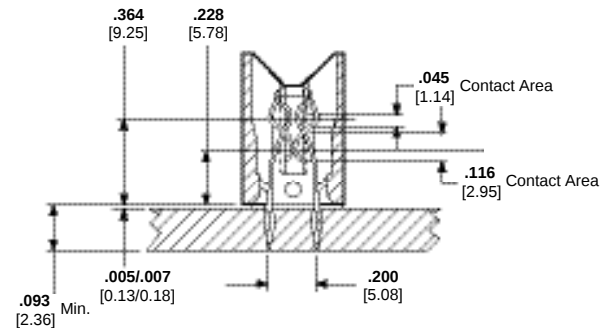
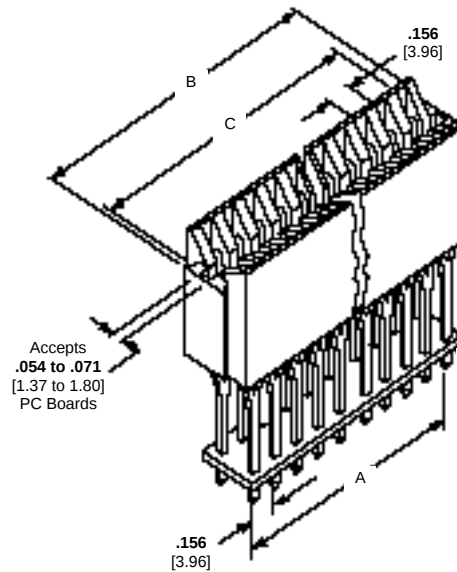
(pages 186, 187):

Product Specifications  
108-14019, 108-26003

Application Specification  
114-26002

Instruction Sheets 408-6726,  
408-9186

**Card Scoop Housing**



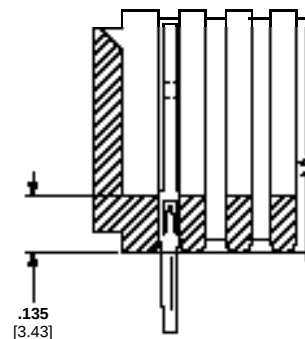
**Keying Plugs**



**Intercontact (Plastic)**  
Part No. 118982-1



**On-Contact (Plastic)**  
Part No. 119802-2



Detail E

| No. of Dual Positions | Dimensions     |                |                | Post Length  | Closed End/Closed End Scoop |
|-----------------------|----------------|----------------|----------------|--------------|-----------------------------|
|                       | A              | B              | C              |              |                             |
| 18                    | 2.652<br>67.36 | 3.094<br>78.59 | 2.964<br>75.29 | .180<br>4.57 | 678035-1                    |

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

Accessories for AMP PACE Connectors

Connector Card Guide

**Material:** Black glass-filled polyester

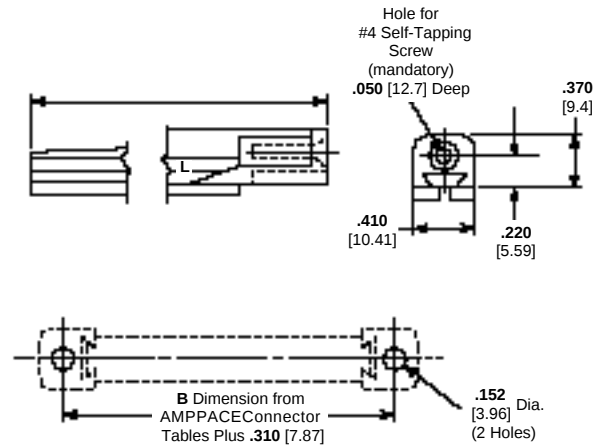
**Related Product Data:**

Mates with all standard housings (will not mate with some special housings)

**Technical Documents:**

(pages 186, 187):

Instruction Sheet 408-9091



| L <sup>1</sup>  | Part Numbers |
|-----------------|--------------|
| 2.500<br>63.50  | 117169-3     |
| 6.000<br>152.40 | 1-117169-3   |

<sup>1</sup>Other lengths up to 6.0 [152.4] can be made available. Consult Tyco Electronics for details.

Ground Module

**Rating:**

**20 amperes per contact**—Copper or aluminum bus

**Material and Finish:**

**Housing**—Black glass-reinforced thermoplastic

**Contact**—CA 195, 3/4 hard, plated .000050 [0.00127] gold in contact area (front face only); .000100 [0.00254] tin-lead on post, with entire contact under-plated .000050 [0.00127] nickel

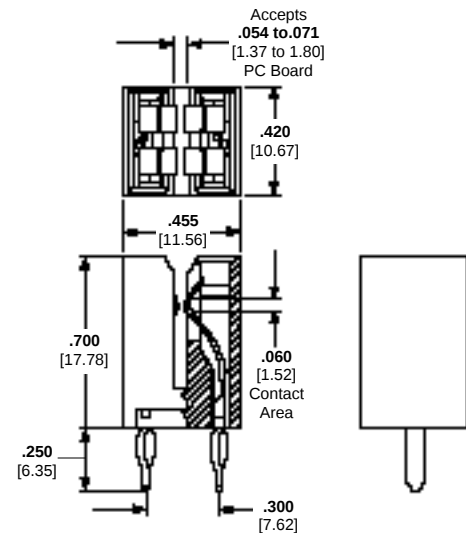
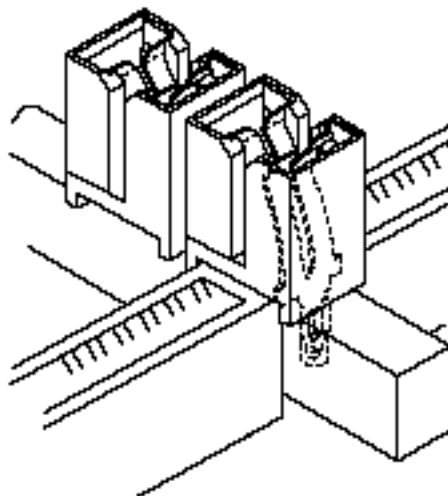
**Related Product Data:**

Mates with all standard housings (will not mate with some special housings)

**Technical Documents:**

(pages 186, 187):

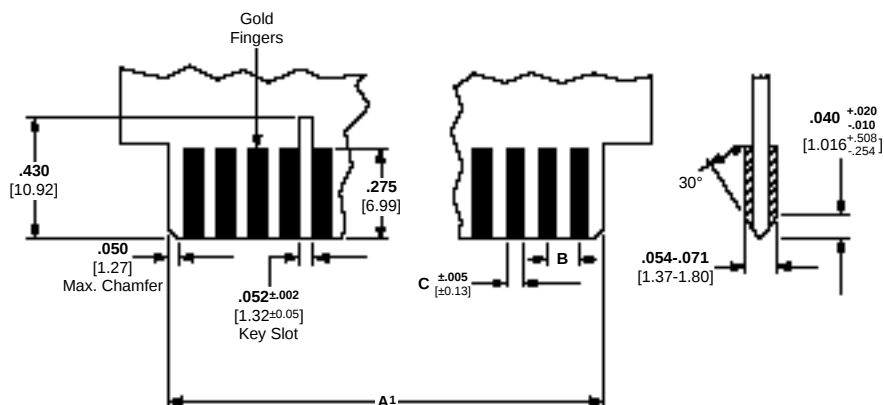
Instruction Sheet 408-2978



Part No. 119341-1  
Seating Tool 59881-1

**Recommended  
PC Board Edge Pattern**

**PC Board Layout for AMP PACE Connectors**



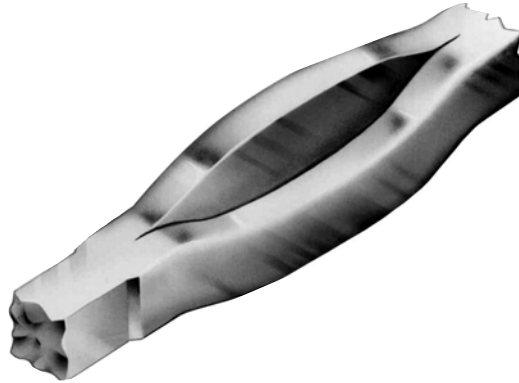
<sup>1</sup>A Max. = Minimum connector card slot -.001 [-0.03].  
A Min. = Minimum connector card slot -.011 [-0.28].

**Note:** Finger pattern to be centered on daughter card.  
Each finger can deviate .003 [0.08] from true position.

| AMP PACE Connector<br>Centerline Spacing | Dimensions          |                     |
|------------------------------------------|---------------------|---------------------|
|                                          | B                   | C                   |
| <b>.100 x .100</b><br>2.54 x 2.54        | <b>.100</b><br>2.54 | <b>.070</b><br>1.78 |
| <b>.100 x .200</b><br>2.54 x 5.08        | <b>.100</b><br>2.54 | <b>.070</b><br>1.78 |
| <b>.125 x .125</b><br>3.18 x 3.18        | <b>.125</b><br>3.18 | <b>.080</b><br>2.03 |
| <b>.125 x .250</b><br>3.18 x 6.35        | <b>.125</b><br>3.18 | <b>.080</b><br>2.03 |
| <b>.156 x .200</b><br>3.96 x 5.08        | <b>.156</b><br>3.96 | <b>.080</b><br>2.03 |

**AMP PACE Connectors** (Continued)

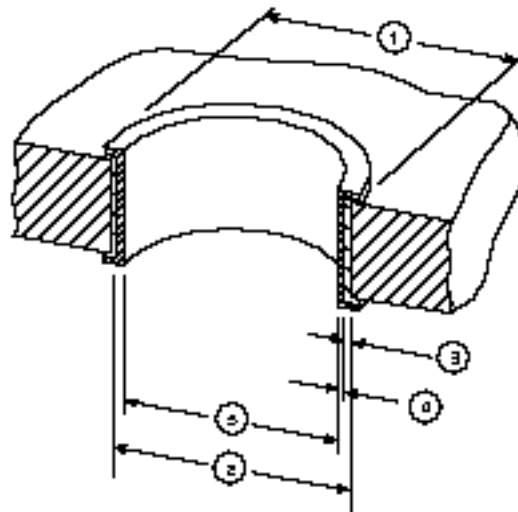
**AMP ACTION PIN  
Press-Fit Contacts**



ACTION PIN contacts provide a reliable press-fit connection. Localized pressure in the interface area entails oxide break-through and helps prevent corrosion in the harshest environments to provide a reliable connection virtually every time. Also, radial and axial distortion are controlled to meet today's standards for multilayer board applications.

**PC Board Thickness**

ACTION PIN contacts are designed for use in a variety of PC board thicknesses. However, certain ACTION PIN contacts are to be used in specific ranges of board thicknesses. To promote optimum performance, the recommended board thicknesses provided with the connector being used must be followed.



- ① Annular Ring (See Note)
- ② Drilled Hole
- ③ Copper Thickness
- ④ Tin-Lead Thickness
- ⑤ Plated Through-Hole

**Mounting Hole Specifications**

| Connector                  |                          | ACTION PIN Contact<br>Material<br>Thickness | Drilled Hole<br>Diameter② | Plating Thicknesses    |                        | Plated<br>Through-Hole<br>Diameter⑤ | Radial Hole Distortion |                  |
|----------------------------|--------------------------|---------------------------------------------|---------------------------|------------------------|------------------------|-------------------------------------|------------------------|------------------|
| Centerline                 | No. of Dual<br>Positions |                                             |                           | Copper③*               | Tin-Lead④              |                                     | Average                | Maximum          |
| .125 x .125<br>3.18 x 3.18 | 28, 97                   | .025<br>0.64                                | .0453±.001<br>1.151±0.03  | .001-.003<br>0.03-0.08 | .0003<br>0.008<br>Min. | .037-.043<br>0.94-1.09              | Not<br>Specified       | Not<br>Specified |
| .156 x .200<br>3.96 x 5.08 | 15-43                    |                                             |                           |                        |                        |                                     |                        |                  |
| .125 x .125<br>3.18 x 3.18 | 27                       |                                             |                           |                        |                        |                                     |                        |                  |
| .100 x .100<br>2.54 x 2.54 | 15-60                    | .025<br>0.64                                | .0453±.001<br>1.151±0.03  | .001-.003<br>0.03-0.08 | .0003<br>0.008<br>Min. | .037-.043<br>0.94-1.09              | Not<br>Specified       | Not<br>Specified |
| .100 x .200<br>2.54 x 5.08 | 15-60                    |                                             |                           |                        |                        |                                     |                        |                  |
| .125 x .125<br>3.18 x 3.18 | 18, 36                   |                                             |                           |                        |                        |                                     |                        |                  |
| .125 x .250<br>3.18 x 6.35 | 18-60                    |                                             |                           |                        |                        |                                     |                        |                  |

\*Maximum hardness of copper layer is 150 Knoop.

**Note:** Recommended annular ring diameter is hole diameter plus .020 [0.51].

### Modular Seating Tools

Available from Tyco Electronics is a complete series of AMP PACE Modular Seating Tools for installing AMP PACE Connectors on printed circuit boards and panels. These tools are modular in design in that housing tool holders may be added or subtracted to accommodate several different connector sizes. In addition, all tool parts are individually replaceable should the tool become damaged.

Modular seating tools are supplied in two basic designs: One which covers all connector centerlines except .100 x .100 [2.54 x 2.54] and one for the .100 x .100 [2.54 x 2.54] centerline connectors.

All seating tools have a common shut height of 1.5 inches [38]. This allows AMP PACE and other ACTION PIN products to be seated at the same time on AMP seating machines. See page 149 for a description of the AMP seating machines.

## Application Tooling for AMP PACE Connectors



**.100 x .100 [2.54 x 2.54]  
Centerline Spacing**

**.100 x .200 [2.54 x 5.08],  
.125 x .125 [3.18 x 3.18],  
.125 x .250 [3.18 x 6.35],**

**.156 x .200 [3.96 x 5.08]  
Centerline Spacing**

### For Connectors without Scoops

| No. of<br>Dual<br>Positions | Centerline                   |                              |                              |                              |
|-----------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
|                             | .100 x .100<br>[2.54 x 2.54] | .100 x .200<br>[2.54 x 5.08] | .125 x .250<br>[3.18 x 6.35] | .156 x .200<br>[3.96 x 5.08] |
| 15                          | 58200-1                      | 58140-1                      | —                            | 58143-1                      |
| 18                          | —                            | 58140-4                      | 58142-4                      | —                            |
| 20                          | 58200-6                      | 58140-6                      | —                            | —                            |
| 22                          | —                            | 58140-8                      | 58142-8                      | 58143-8                      |
| 25                          | 1-58200-1                    | 1-58140-1                    | 1-58142-1                    | —                            |
| 28                          | 1-58200-4                    | 1-58140-4                    | 1-58142-4                    | 1-58143-4                    |
| 30                          | 1-58200-6                    | 1-58140-6                    | 1-58142-6                    | —                            |
| 31                          | 1-58200-7                    | —                            | —                            | —                            |
| 32                          | —                            | 1-58140-8                    | —                            | —                            |
| 34                          | —                            | 2-58140-0                    | —                            | —                            |
| 35                          | 2-58200-1                    | 2-58140-1                    | —                            | —                            |
| 36                          | —                            | 2-58140-2                    | 2-58142-2                    | —                            |
| 37                          | —                            | 2-58140-3                    | —                            | —                            |
| 40                          | 2-58200-6                    | 2-58140-6                    | 2-58142-6                    | —                            |
| 43                          | —                            | 2-58140-9                    | —                            | 2-58143-9                    |
| 44                          | —                            | 3-58140-0                    | —                            | —                            |
| 48                          | 3-58200-4                    | —                            | —                            | —                            |
| 50                          | 3-58200-6                    | 3-58140-6                    | 3-58142-6                    | —                            |
| 51                          | 3-58200-7                    | —                            | 3-58142-7                    | —                            |
| 54                          | 4-58200-0                    | —                            | —                            | —                            |
| 55                          | 4-58200-1                    | 4-58140-1                    | —                            | —                            |
| 56                          | —                            | —                            | 4-58142-2                    | —                            |
| 60                          | 4-58200-6                    | 4-58140-6                    | 4-58142-6                    | —                            |

### For Connectors with Scoops

| No. of<br>Dual<br>Positions | Centerline                   |                              |                              |
|-----------------------------|------------------------------|------------------------------|------------------------------|
|                             | .100 x .200<br>[2.54 x 5.08] | .125 x .125<br>[3.18 x 3.18] | .125 x .250<br>[3.18 x 6.35] |
| 15                          | 58150-1                      | —                            | —                            |
| 18                          | —                            | —                            | 58184-4                      |
| 22                          | 58150-8                      | —                            | —                            |
| 28                          | —                            | 1-58218-4                    | —                            |
| 30                          | 1-58150-6                    | —                            | —                            |
| 38                          | —                            | —                            | 2-58184-4                    |
| 50                          | 3-58150-6                    | —                            | 3-58184-6                    |
| 55                          | 4-58150-1                    | —                            | —                            |

### Contact Replacement Tools

Replacement tools listed in the chart at the right are used to install replacement contacts in AMP PACE connector housings. Replacement Tool **1-265871-7** is used to remove all .025 [0.64] square posts from PC boards.

| Centerline                 | Housing Style |                 |
|----------------------------|---------------|-----------------|
|                            | Standard      | Full Card Scoop |
| .100 x .100<br>2.54 x 2.54 | 266220-3      | —               |
| .100 x .200<br>2.54 x 5.08 | 266220-1      | 58210-1         |
| .125 x .125<br>3.18 x 3.18 | —             | 58210-4         |
| .125 x .250<br>3.18 x 6.35 | 266220-2      | 58210-2         |
| .156 x .200<br>3.96 x 5.08 | 266220-2      | —               |

**Note:** Tooling availability is dependent upon part number activity. Consult Tyco Electronics for further information.

### TELEDENSITY Connectors

#### Product Facts

- High density - .0625 [1.586] contact centerlines
- Compliant ACTION PIN contacts press-fit into plated-through holes for solderless application
- Individually replaceable contacts
- Accommodates up to three levels of daughter card pads for sequencing
- .125 [3.18] square grid post arrangement

#### Performance Specifications

**Current Rating\*:**  
3 amperes max.

**Mating Force (Contact Pair):**  
1 lb. [4.4 N] max.

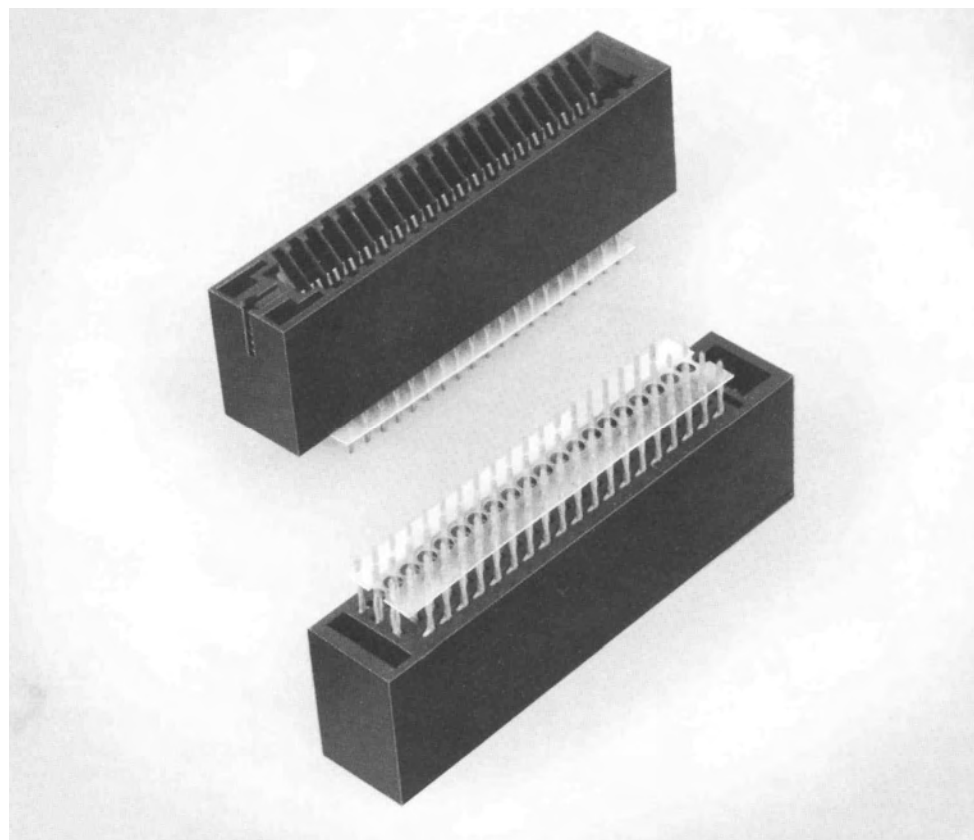
**Durability (Mating Cycles):**  
100 min.

**Termination Resistance:**  
12 milliohms max.

**Dielectric Rating:**  
1200 VAC (rms)

**Insulation Resistance:**  
5000 megohms max.

**Operating Temperature:**  
-55°C to +85°C



The high performance AMP TELEDENSITY connector is a high density, card edge, telecommunications connector. It features compliant ACTION PIN contacts for solderless application to multi-layer printed circuit boards with plated-through or bare copper holes.

These connectors accept .054 to .072 [1.37 to 1.83] thick daughter cards. To satisfy the broadest range of application needs, the

contacts are plated with 30 microinches of gold in the mating area and tin-lead on the posts. A plastic locating strip keeps posts positioned correctly for board insertion.

For high-density needs, TELEDENSITY connectors offer a .0625 [1.586] daughter card contact centerline spacing in 39-, 71-, or 99-dual positions. The connector's .330 [8.38] slot depth accommodates up to three levels of daughter card

pads for sequencing, while a biasing wedge maintains proper pad alignment during card extraction. Posts are arranged in a .125 [3.18] square grid to ease circuit routing.

\*Consult Tyco Electronics when paralleling contacts for power applications.

**TELEDENSITY Connectors, .0625 [1.586] Centerline**

**Material and Finish:**

**Housing**—Black polyester

**Contacts**—Copper alloy 725, plated .000030 [0.00076] gold in contact area, .000030 [0.00076] solder plate on post, with entire contact underplated .000100 [0.00254] nickel

**Coil Spring**—Stainless steel

**Contact Tip Alignment Strip**—Clear polyester

**Related Product Data:**

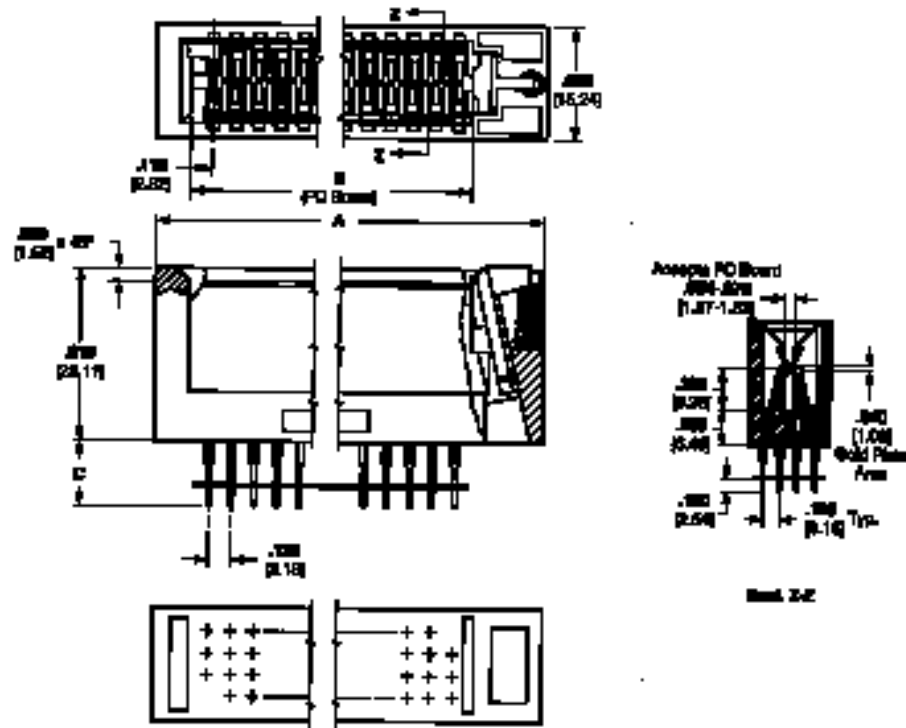
**Performance Specifications**—  
page 116

**ACTION PIN Contact Mounting  
Hole Specifications**—page 118

**Technical Document**—pages 186,  
187

**Product Specification**—  
108-26003

**Instruction Sheet**—  
408 6866

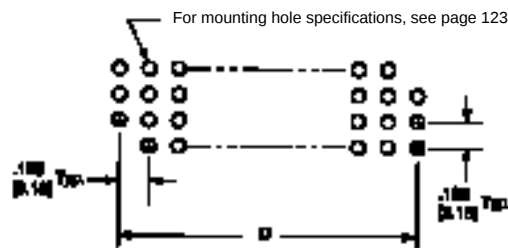


| Number of<br>Dual<br>Positions | Dimensions      |                              |               |                 | Connector<br>Part<br>Numbers | Seating<br>Tool<br>Numbers** |
|--------------------------------|-----------------|------------------------------|---------------|-----------------|------------------------------|------------------------------|
|                                | A               | B                            | C             | D               |                              |                              |
| 39                             | 3.168<br>80.47  | 2.588-2.600<br>65.74-66.04   | .634<br>16.10 | 2.375<br>60.33  | 650148-1                     | 58084-1                      |
|                                |                 |                              | .350<br>8.89  |                 | 650281-1*                    |                              |
| 71                             | 5.168<br>131.27 | 4.588-4.600<br>116.54-116.84 | .634<br>16.10 | 4.375<br>111.13 | 650149-1                     | 58084-3                      |
| 99                             | 6.918<br>175.72 | 6.338-6.350<br>160.99-161.29 | .634<br>16.10 | 6.125<br>155.58 | 650150-1                     | 58084-2                      |

\* Contacts in this connector are underplated .000150 [0.00381] nickel.

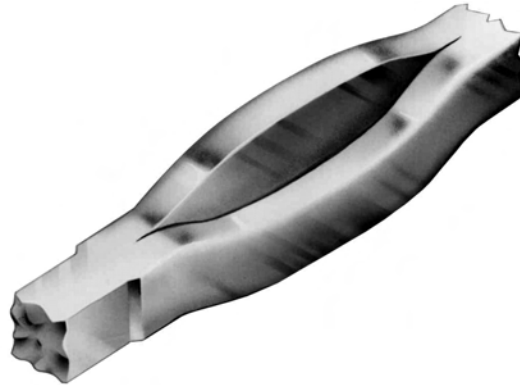
\*\* See page 149 for a description of AMP seating machines.

**Recommended  
PC Board Layout  
(Shown from post side)**



**Note:** ACTION PIN posts require .093 [2.36] min. thick PC board.

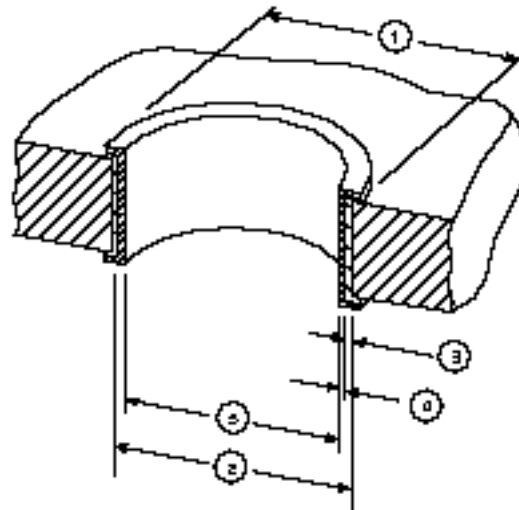
**TELEDENSITY Connectors** (Continued)



ACTION PIN contacts provide a reliable press-fit connection. Localized pressure in the interface area entails oxide breakthrough and helps prevent corrosion in the harshest environments to provide a reliable connection virtually every time. Also, radial and axial distortion are controlled to meet today's standards for multilayer board applications.

**PC Board Thickness**

ACTION PIN contacts are designed for use in a variety of PC board thicknesses. However, certain ACTION PIN contacts are to be used in specific ranges of board thicknesses. To promote optimum performance, the recommended board thicknesses provided with the connector being used must be followed.



- ① Annular Ring (See Note)
- ② Drilled Hole
- ③ Copper Thickness
- ④ Tin-Lead Thickness
- ⑤ Plated Through-Hole

**Mounting Hole Specifications**

| ACTION PIN<br>Contact<br>Material Thickness | Drilled Hole<br>Diameter <sup>②</sup> | Plating Thicknesses    |                       | Plated-Through<br>Hole<br>Diameter <sup>⑤</sup> | Radial Hole Distortion |              |
|---------------------------------------------|---------------------------------------|------------------------|-----------------------|-------------------------------------------------|------------------------|--------------|
|                                             |                                       | Copper <sup>③*</sup>   | Tin-Lead <sup>④</sup> |                                                 | Average                | Maximum      |
| .025<br>0.64                                | .0453±.001<br>1.151±0.03              | .001-.003<br>0.03-0.08 | .0003<br>0.008 Min.   | .037-.043<br>0.94-1.09                          | .0015<br>0.038         | .002<br>0.05 |

\*Maximum hardness of copper layer is 150 Knoop

**Note:** Recommended annular ring diameter is hole diameter plus .020 [0.51]

**ECONOMATE Connectors**

**Performance Specifications**

**Electrical Characteristics**

**Contact Resistance:**

8 milliohms (max.)

**Insulation Resistance:**

2,000 megohms (min.)

**Continuous Current Rating\*:**

3 amperes

**Physical Characteristics**

**Card Insertion Force:**

16 oz [4.45 N] (max.) per contact pair

**Card Extraction Force:**

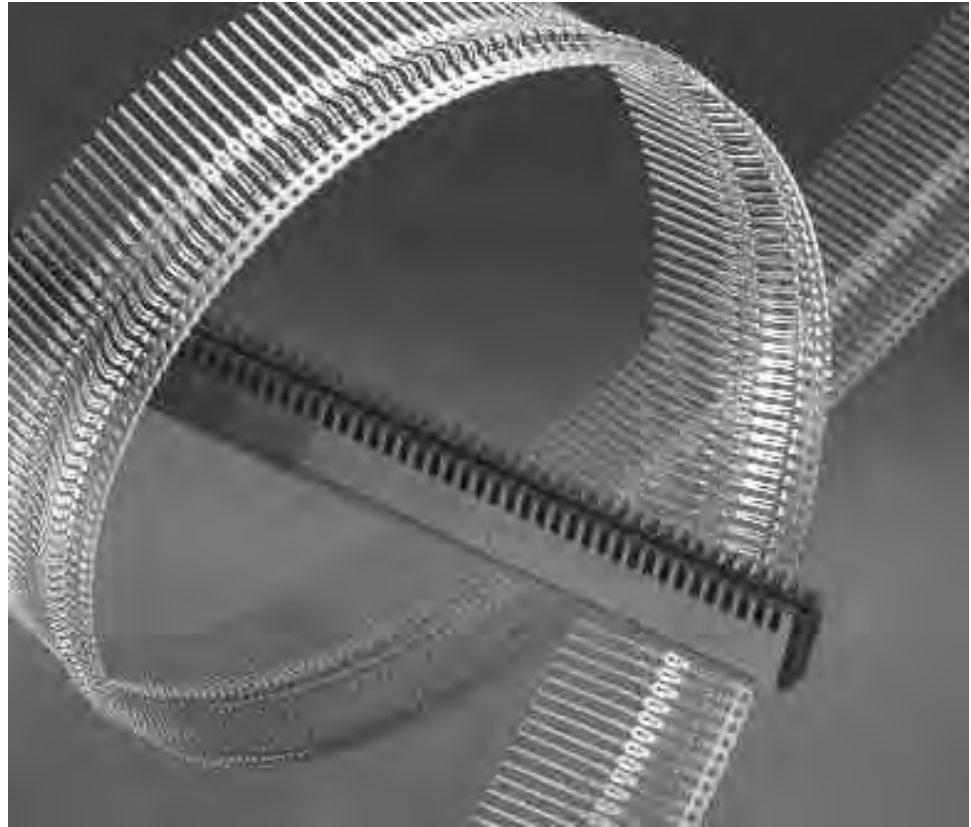
1 oz [0.28 N] (min.) per contact pair

**Retention (in PC Board):**

7 lb [31.1 N] (min.)

**Operating Temperature:**

-65°C to +125°C



AMP ECONOMATE Connectors provide a reliable and economical method for interconnecting backplane panels, using either two-sided or multi-layer PC boards.

Connector housings are furnished unloaded and are available for post centerline spacings of: .100 x .200 [2.54 x 5.08] and .156 x .200 [3.96 x 5.08]. The housings are simply positioned onto the contacts, after the contacts have been inserted into the PC board and the carrier strip removed.

Contacts from Tyco Electronics feature the proven and reliable ACTION PIN contact design. These press-fit contacts employ two spring members that compress to exert force against the plated through-holes for a gas-tight connection. Gold plating of contacts promotes the electrical integrity of the connection.

Feed-through posts are also available for accepting wrap-type terminations. These posts also feature the ACTION PIN contact design and are supplied in strip form and stored on reels for insertion into PC boards.

**Important:**

Application tooling is absolutely necessary for installing contacts and housings onto PC boards. See page 126 for application tooling.

**\*Consult Tyco Electronics engineering when paralleling contacts for power applications.**

**.100 x .200 [2.54 x 5.08]  
Centerline Spacing**

**Material and Finish:**

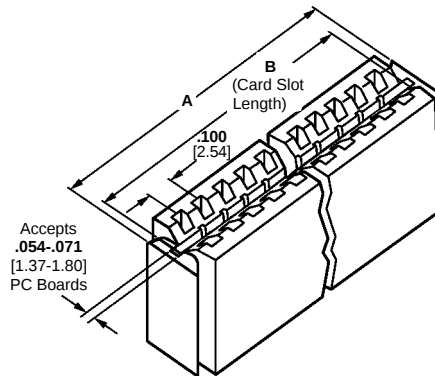
**Housing**—Black glass-filled nylon

**Contacts**—Copper alloy 725, plated as follows:

**Plating A**—Selectively plated .000030 [0.00076] min. gold in contact area, .000001 [0.00003] min. gold on remainder of contact, with entire contact underplated .000050 [0.00127] min. nickel

**Plating B**—Duplex plated .000030 [0.00076] min. gold in contact area, .000100 [0.00254] min. tin-lead on posts, with entire contact underplated .000050 [0.00127] min. nickel

**Plating C**—Selectively plated .000100 [0.00254] min. gold in contact area, .000001 [0.00003] min. gold on remainder of contact, except .000050 [0.00127] min. gold for .200 [5.08] from tip of post, with entire contact underplated .000050 [0.00127] min. nickel



| No. of Dual Positions | Dimensions      |                 | Housing Part Numbers |
|-----------------------|-----------------|-----------------|----------------------|
|                       | A               | B               |                      |
| 25                    | 2.734<br>82.14  | 2.604<br>78.84  | 1-117798-4           |
| 30                    | 3.234<br>82.14  | 3.104<br>78.84  | 117798-3             |
| 35                    | 3.734<br>94.84  | 3.604<br>91.54  | 117798-6             |
| 36                    | 3.834<br>97.38  | 3.704<br>94.08  | 117798-7             |
| 40                    | 4.234<br>107.54 | 4.104<br>104.24 | 117798-8             |
| 50                    | 5.234<br>132.94 | 5.104<br>129.64 | 1-117798-1           |
| 60                    | 6.234<br>158.34 | 6.104<br>155.04 | 1-117798-2           |

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**Related Product Data:**

**Performance Specifications**—page 119

**Card Guides**—page 122

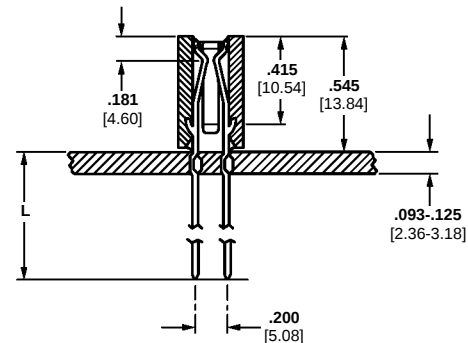
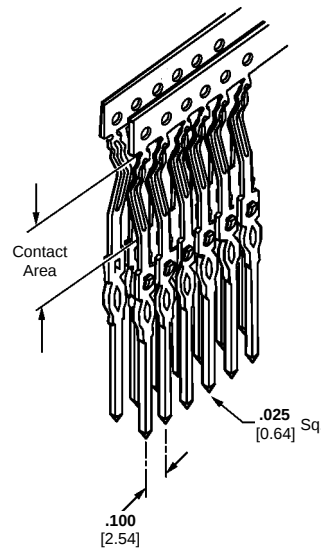
**ACTION PIN Contact Mounting Hole Specifications**—page 125

**Application Tooling**—page 126

**Technical Documents:**

(pages 186, 187):

Product Specification  
108-26002



**Keying Plugs**

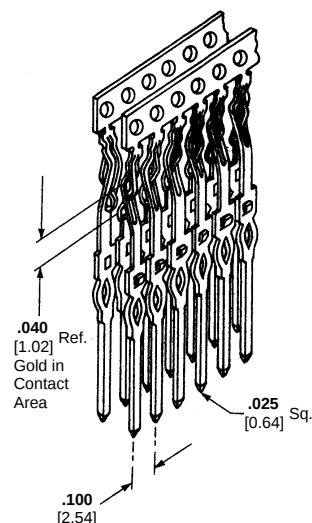
**Make-Before-Break Contacts**



**Intercontact (Plastic)**  
Part No. 118982-1



**On-Contact (Plastic)**  
Part No. 118982-2



| Dimension L   | Contact Part Numbers* |            |            |
|---------------|-----------------------|------------|------------|
|               | Plating A             | Plating B  | Plating C  |
| .475<br>12.07 | 2-117795-4            | 4-117795-0 | —          |
| .702<br>17.83 | 117795-3              | 2-117795-6 | 4-117795-8 |

\*Contacts are strip form, 35,000 per reel.

| Dimension L   | Make Before Break Contact Part Numbers* |           |
|---------------|-----------------------------------------|-----------|
|               | Plating A                               | Plating B |
| .475<br>12.07 | —                                       | 118951-8  |
| .702<br>17.83 | 118951-4                                | —         |

**.156 x .200 [3.96 x 5.08]  
Centerline Spacing**

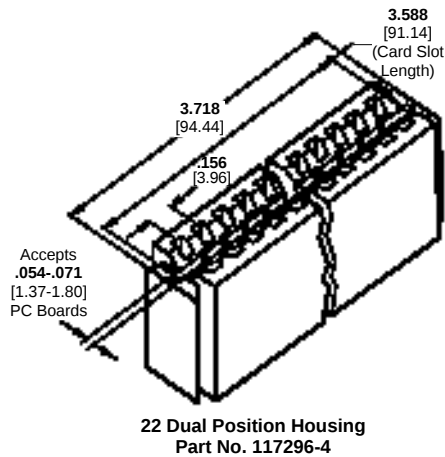
**Material and Finish:**

**Housing**—Black glass-filled nylon

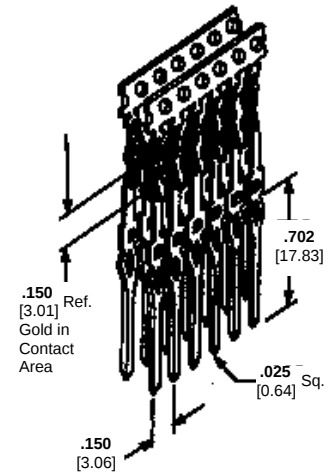
**Contacts**—Copper alloy 725, plated as follows:

**Plating A**—Selectively plated .000030 [0.00076] min. gold in contact area, .000001 [0.00003] min. gold on remainder of contact, with entire contact underplated .000050 [0.00127] min. nickel

**Plating B**—Duplex plated .000030 [0.00076] min. gold in contact area, .000100 [0.00254] min. tin-lead on posts, with entire contact underplated .000050 [0.00127] min. nickel



**22 Dual Position Housing  
Part No. 117296-4**



**Make-Before-Break Contacts**

**Related Product Data:**

**Performance Specifications**—  
page 119

**Card Guides**—page 122

**ACTION PIN Contact Mounting  
Hole Specifications**—page 125

**Application Tooling**—page 126

**Technical Documents:**

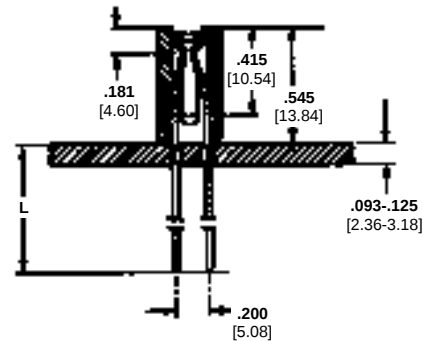
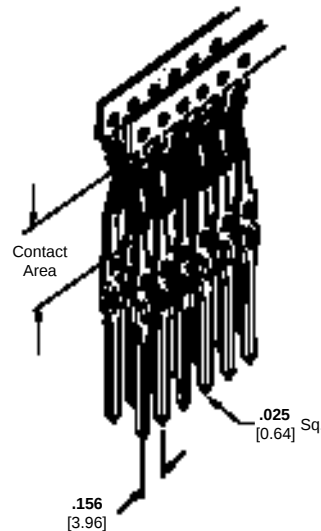
(pages 186, 187):

Product Specification  
108-26002

**Keying Plug**



**Intercontact (Plastic)  
Part No. 118982-1**



**Note:** Other connector sizes can be made available, consult Tyco Electronics.

| Make Before Break Contacts |         |               |
|----------------------------|---------|---------------|
| Dimension L                | Plating | Part Numbers* |
| .475<br>12.07              | B       | 1-118778-2    |
| .702<br>17.83              | A       | 118778-6      |

| Dimension L   | Contact Part Numbers* |
|---------------|-----------------------|
| .475<br>12.07 | 117285-7              |
| .702<br>17.83 | 117285-8              |

\*Contacts are strip form, 15,000 per reel.

**Card Guides for ECONOMATE Connectors**

**Material:** Black glass-filled nylon

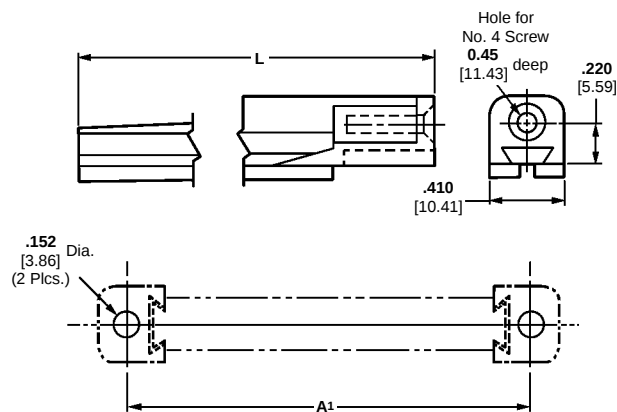
**Related Product Data:**

Mates with all .100 x .200 [2.54 x 5.08]  
and .156 x .200 [3.96 x 5.08] centerline  
housings

**Technical Documents:**

(pages 186, 187):

Instruction Sheet 408-9091



**Recommended Mounting Dimensions**

| Dimension<br>L* | Card Guide<br>Part Numbers |
|-----------------|----------------------------|
| 2.500<br>63.50  | 117169-3                   |
| 6.000<br>152.40 | 1-117169-3                 |

\*Other lengths can be made available in .500 [12.70] increments from 1.500 [38.10] to 6.500 [165.10]. Consult Tyco Electronics for details.

| Housing                    |                          | Dimension<br>A <sup>1</sup> |
|----------------------------|--------------------------|-----------------------------|
| Centerline<br>Spacing      | No. of Dual<br>Positions |                             |
| .100 x .200<br>2.54 x 5.08 | 30                       | 3.544<br>90.02              |
|                            | 35                       | 4.044<br>102.72             |
|                            | 36                       | 4.144<br>105.26             |
|                            | 40                       | 4.544<br>115.42             |
|                            | 50                       | 5.544<br>140.82             |
|                            | 60                       | 6.544<br>166.22             |
| .156 x .200<br>3.96 x 5.08 | 22                       | 4.028<br>102.31             |

**Note:** A<sup>1</sup> dimension = A dimension of ECONOMATE housing plus .310 [7.87].

**.100 [2.54] Centerline, Wrap Type**

**Material:**

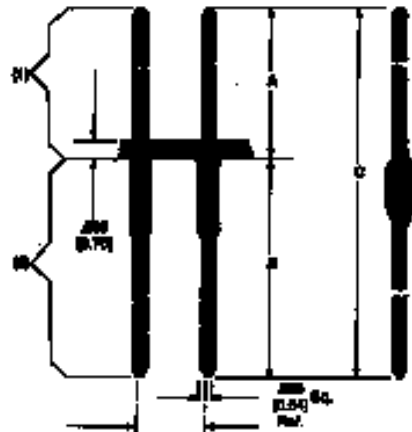
Copper Alloy 725

**Finish** — Gold plate per MIL-G-45204 over nickel plate per QQ-N-290 (see table for thicknesses)

Recommended Hole Size:

**Non-Plated-thru Hole** - .0453±.001 [1.15±0.03], 1.15 mm drill

**Plated-thru Hole** - .039±.004 [0.99±0.1], 1.15 mm drill



| Dimensions    |               |                | Part Numbers                                                                 |
|---------------|---------------|----------------|------------------------------------------------------------------------------|
| A             | B             | C              |                                                                              |
|               |               |                | 1) .000001 [0.00003] min. gold flash over .000050 [0.0013] min. nickel plate |
|               |               |                | 2) .000050 [0.0013] min. gold plate over .000050 [0.0013] min. nickel plate  |
| .318<br>8.08  | .687<br>17.45 | 1.005<br>25.53 | —                                                                            |
| .578<br>14.68 | .460<br>11.68 | 1.038<br>26.37 | 118243-8                                                                     |
| .578<br>14.68 | .550<br>13.97 | 1.128<br>28.65 | 1-118243-1                                                                   |
| .380<br>9.65  | .823<br>20.90 | 1.203<br>30.56 | —                                                                            |

**.100 [2.54] Centerline, TERMI-POINT Clip Part Number 119136-2**

**Material:**

Copper Alloy 725

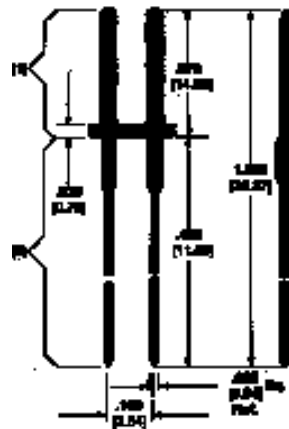
**Finish** —

- 1) Gold plate per MIL-G-45204, .000030 [0.00076] min. thk. over nickel plate per QQ-N-290, .000050 [0.0013] min. thk.
- 2) Gold flash per MIL-G-45204, .000001 [0.00003] min. thk. over nickel plate per QQ-N-290, .000050 [0.0013] min. thk.

**Recommended Hole Size:**

**Non Plated-thru Hole** - .0453±.001 [1.15±0.03], 1.15 mm drill

**Plated-thru Hole** - .039±.004 [0.99±0.1], 1.15 mm drill



**.125 [3.18] Centerline, Wrap Type**

**Material:**

Copper Alloy 725

**Finish** — Gold plate per MIL-G-45204 or solder plate over nickel plate per QQ-N-290 (see table for thicknesses)

**Recommended Hole Size:**

**Non Plated-thru Hole** - .0453±.001 [1.15±0.03], 1.15 mm drill

**Plated-Thru Hole** - .039±.004 [0.99±0.1], 1.15 mm drill



| Dimensions    |               | Part Numbers                                                            |                                                                 |
|---------------|---------------|-------------------------------------------------------------------------|-----------------------------------------------------------------|
| A             | B             | .000100 [0.0025] min. tin plate over .000050 [0.0013] min. nickel plate | .000030 [0.00076] gold plate over .000050 [0.0013] nickel plate |
| .703<br>17.68 | .548<br>13.92 | 117311-7                                                                | 1-117311-0                                                      |

\*Use AMP Cut and Transfer Machine for center carrier post insertion. Consult Tyco Electronics.

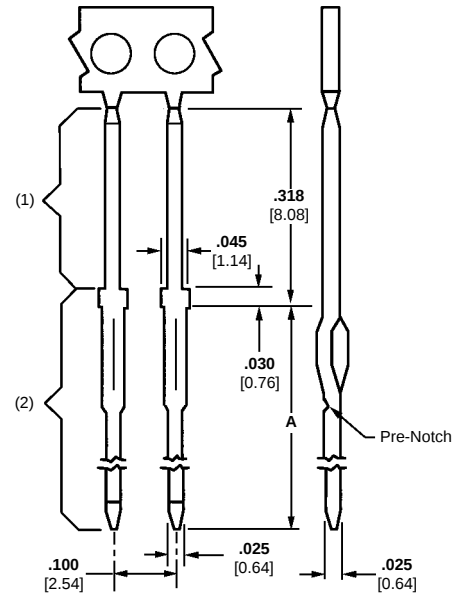
**ECONOMATE Connectors** (Continued)

**Feed-Through Posts**

**Material and Finish:**

Copper alloy 725, plated as follows:  
**Plating A**—Selectively plated .000030 [0.00076] min. gold in Area (1), .000001 [0.00003] min. gold in Area (2), with entire post underplated .000050 [0.00127] min. nickel  
**Plating B**—.000030 [0.00076] min. gold over .000100 [0.00254] min. nickel on entire post  
**Plating C**—.000050 [0.00127] min. gold over .000100 [0.00254] min. nickel on entire post  
**Plating D**—.000100 [0.00254] min. tin-lead over .000050 [0.00127] min. nickel on entire post

**.100 [2.54] Centerline Spacing**



| Dimension<br>A | Feed-Through Post Part Numbers*     |            |           |            |
|----------------|-------------------------------------|------------|-----------|------------|
|                | Plating A                           | Plating B  | Plating C | Plating D  |
| .687<br>17.45  | 117249-7<br>3-117249-1 <sup>1</sup> | 1-117249-2 | 117249-2  | 6-117249-5 |
| .500<br>12.70  | 3-117249-2                          | —          | —         | 5-117249-6 |

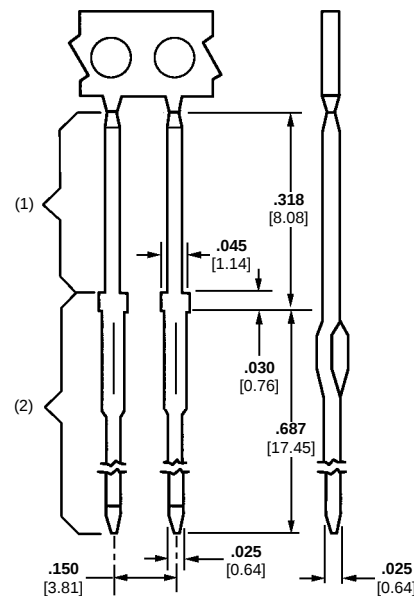
\*Posts in strip form, 50,000 per reel.

<sup>1</sup>Pre-notched to break with 120° bend.

**.150 [3.81] Centerline Spacing**

**Material and Finish:**

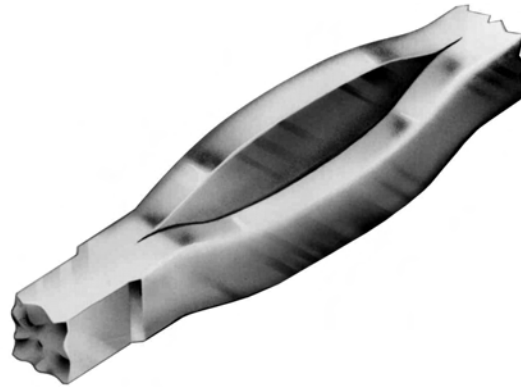
Copper alloy 725, selectively plated  
.000030 [0.00076] min. gold in Area (1),  
.000001 [0.00003] min. gold in Area (2),  
with entire post underplated .000050  
[0.00127] min. nickel



50,000 per reel  
Part No. 117269-5

**ECONOMATE Connectors** (Continued)

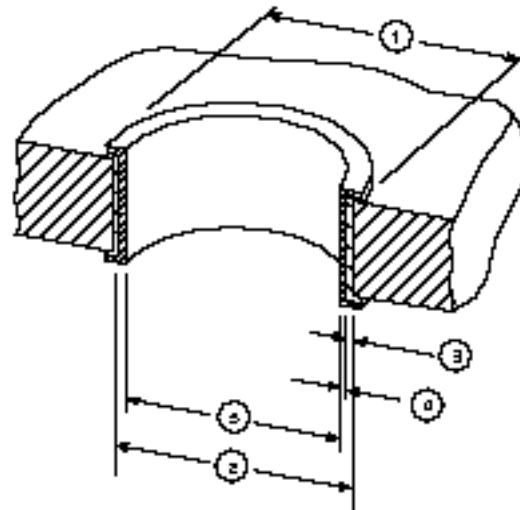
**AMP ACTION PIN  
Press-Fit Contacts**



ACTION PIN contacts provide a reliable press-fit connection. Localized pressure in the interface area entails oxide break-through and helps prevent corrosion in the harshest environments to provide a reliable connection virtually every time. Also, radial and axial distortion are controlled to meet today's standards for multilayer board applications.

**PC Board Thickness**

ACTION PIN contacts are designed for use in a variety of PC board thicknesses. However, certain ACTION PIN contacts are to be used in specific ranges of board thicknesses. To promote optimum performance, the recommended board thicknesses provided with the connector being used must be followed.



- ① Annular Ring (See Note)
- ② Drilled Hole
- ③ Copper Thickness
- ④ Tin-Lead Thickness
- ⑤ Plated Through-Hole

**Mounting Hole Specifications**

| Connector                  |                           | ACTION PIN Contact<br>Material<br>Thickness | Drilled Hole<br>Diameter② | Plating Thicknesses    |                        | Plated<br>Through-Hole<br>Diameter⑤ | Radial Hole Distortion |                  |
|----------------------------|---------------------------|---------------------------------------------|---------------------------|------------------------|------------------------|-------------------------------------|------------------------|------------------|
| Centerline                 | No. of Dual<br>Positions  |                                             |                           | Copper③*               | Tin-Lead④              |                                     | Average                | Maximum          |
| .100 x .200<br>2.54 x 5.08 | 30, 35, 36,<br>40, 50, 60 | .025<br>0.64                                | .0453±.001<br>1.151±0.03  | .001-.003<br>0.03-0.08 | .0003<br>0.008<br>Min. | .037-.043<br>0.94-1.09              | Not<br>Specified       | Not<br>Specified |
| .156 x .200<br>3.96 x 5.08 | 22                        |                                             |                           |                        |                        |                                     |                        |                  |

\*Maximum hardness of copper layer is 150 Knoop.

**Note:** Recommended annular ring diameter is hole diameter plus .020 [0.51].

## Application Tooling for ECONOMATE Connectors

Available from Tyco Electronics is a complete series of ACTION PIN Assembly Tooling Kits for ECONOMATE connector housings and feed-through posts. Assembly Kit tools provide the means for installing housings and contacts onto printed circuit boards, as well as removing

housings and contacts from the printed circuit boards. All tools are available in kits, or may be purchased individually.

In many instances, part number series are listed in the charts. Specific dash numbers and detailed information on the contacts and

housings are presented on the respective product specification pages. For specific dash numbers and complete information on the tooling, contact Tyco Electronics.

### For ECONOMATE Connectors

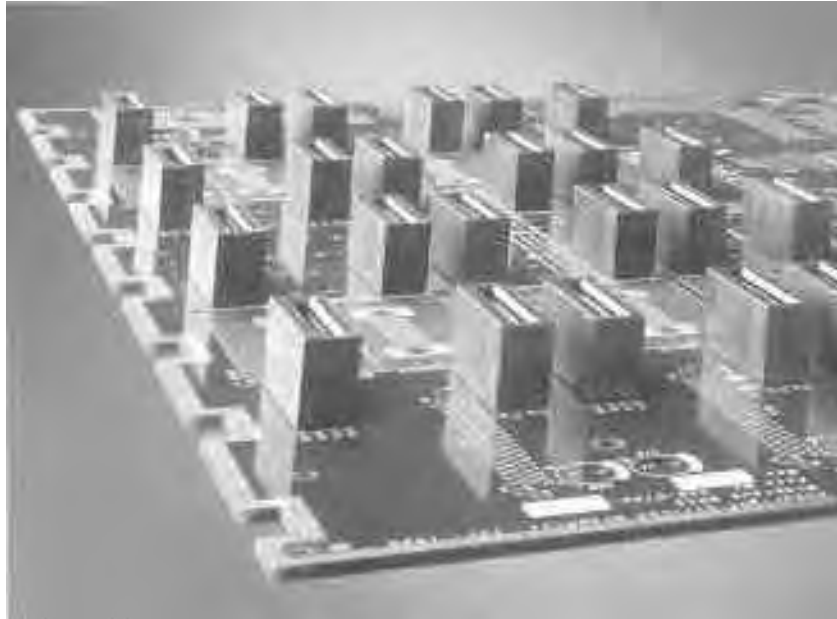
| ACTION PIN Contacts        |               |              | ECONOMATE Housings    |              | ACTION PIN Assembly Tool Numbers                                                                                                                           |
|----------------------------|---------------|--------------|-----------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Centerline                 | Pin Length    | Part Numbers | No. of Dual Positions | Part Numbers |                                                                                                                                                            |
| .125 x .125<br>3.18 x 3.18 | .702<br>17.83 | 117793-□     | 15-60                 | 117796-□     | Applicator 265902-□<br>Carrier Removal Tool 265924-□<br>Housing Assembly Tool 58292-□<br>Housing Removal Tool 265868-1<br>Pin Replacement Tool 265871-2    |
| .100 x .200<br>2.54 x 5.08 | .702<br>17.83 | 117795-□     | 15-60                 | 117798-□     | Applicator 265904-□<br>Carrier Removal Tool 265924-□<br>Housing Assembly Tool 265879-□<br>Housing Removal Tool 265868-1<br>Pin Replacement Tool 265871-2   |
| .156 x .200<br>3.96 x 5.08 | .702<br>17.83 | 117285-□     | 15-50                 | 117296-□     | Applicator 265905-□<br>Carrier Removal Tool 265924-□<br>Housing Assembly Tool 265881-□<br>Housing Removal Tool 265868-1<br>Pin Replacement Tool 265871-2   |
| .156 x .200<br>3.96 x 5.08 | .475<br>12.07 | 117285-□     | 15-50                 | 117296-□     | Applicator 265906-□<br>Carrier Removal Tool 265924-□<br>Housing Assembly Tool 265881-□<br>Housing Removal Tool 265868-1<br>Pin Replacement Tool 265871-3   |
| .100 x .200<br>2.54 x 5.08 | .475<br>12.07 | 117795-□     | 15-60                 | 117798-□     | Applicator 266129-□<br>Carrier Removal Tool 265924-□<br>Housing Assembly Tool 265879-□<br>Housing Removal Tool 265868-1<br>Pin Replacement Tool 265871-3   |
| .100<br>2.54               | .340<br>8.64  | 117880-□     | 20-60                 | 117879-□     | Applicator 265937-□<br>Carrier Removal Tool 265924-□<br>Housing Assembly Tool 265962-□<br>Housing Removal Tool 265868-2<br>Pin Replacement Tool 1-265871-1 |

### For Feed-Through Posts

| ACTION PIN Contacts |                          |                  |              | ACTION PIN Assembly Tool Numbers                                                      |
|---------------------|--------------------------|------------------|--------------|---------------------------------------------------------------------------------------|
| Centerline          | Pin Length               | No. of Positions | Part Numbers |                                                                                       |
| .100<br>2.54        | .500-.687<br>12.70-17.45 | 8-60             | 117249-□     | Applicator 265910-□<br>Carrier Removal Tool 265924-□<br>Pin Replacement Tool 265871-7 |
| .125<br>3.18        | .687<br>17.45            | 8-60             | 117272-□     | Applicator 265911-□<br>Carrier Removal Tool 265924-□<br>Pin Replacement Tool 265871-7 |
| .150<br>3.81        | .687<br>17.45            | 8-50             | 117269-□     | Applicator 265912-□<br>Carrier Removal Tool 265924-□<br>Pin Replacement Tool 265871-7 |
| .150<br>3.81        | .365-.475<br>9.27-12.07  | 8-50             | 117269-□     | Applicator 265931-□<br>Carrier Removal Tool 265924-□<br>Pin Replacement Tool 265871-7 |

**Product Facts**

- High density .050" [1.27] center spacing.
- Staggered contacts for low insertion force.
- Designed for multi-layer .093" [2.36] daughter cards.
- High temperature SMT solder reflow temperatures of 260° for 30 seconds.
- Unique pin geometry allows for even distribution of forces reducing axial pin rotation and preserving perpendicularity to the PCB board.
- Edge and side coining provides a uniform pin radius ensuring maximum contact without "skiving" the plated hole.
- Full complement of application tooling available.
- Recognized under the Component Program of Underwriters Laboratories Inc.,  File No. E60980
- Certified by Canadian Standards Association,  File No. LR 49571

**High Density Press-Fit Card Edge**


High Density (.050" [1.27] center spacing) Press-Fit connectors from Tyco Electronics are designed for high density backplane or mid-plane applications. Compliant pin connectors from Tyco Electronics meet or exceed requirements of current industry standards, including Bellcore specifications, which address critical performance issues such as hole retention, hole deformation and environmental performance.

**Electrical Characteristics:**

**Operating Voltage**—600VDC (sea level)

**Current Rating**—1.5 Amperes

**Initial Contact Resistance**—30 milliohms

**Environmental Characteristics:**

**Operating Temperature**—-55°C to +125°C

**Temperature Cycling**—MIL-STD-202 method 107

**Vibration**—MIL-STD-202, method 204

**.050 [1.27] Centerline For .093 [2.36] Thick Daughter Cards**

**Material and Finish:**

**Insulation Resistance**—1000 megohms minimum

**Contact Retention into PCB**—2 lbs. min.

**Insertion Force**—10 oz. max.

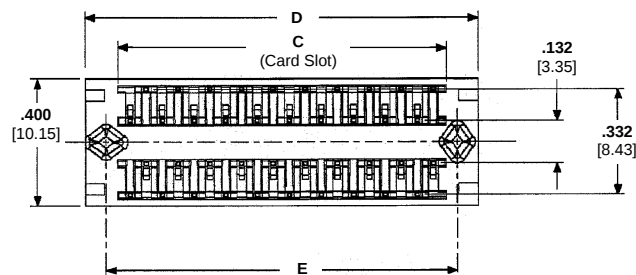
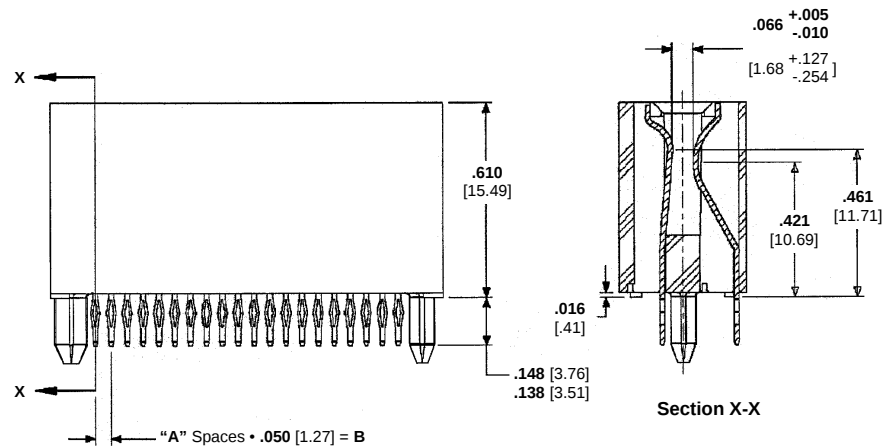
**Mating Force**—2 oz. per contact

**Housing**—High Temp. Glass filled thermoplastic, UL rating 94V-0

**Color**—Black

**Spring Contact**—BeCu

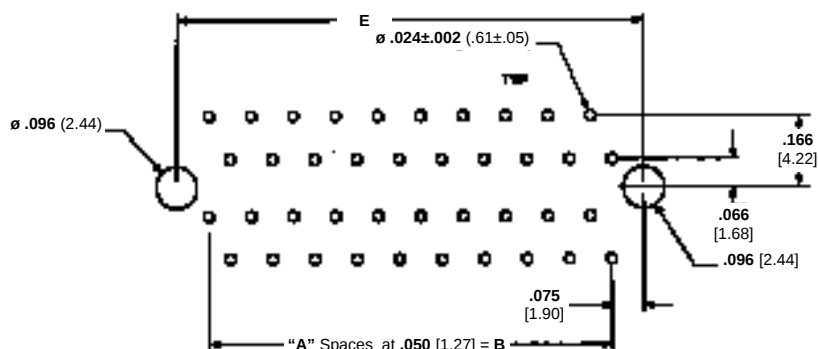
**Contact Plating**—Palladium Nickel



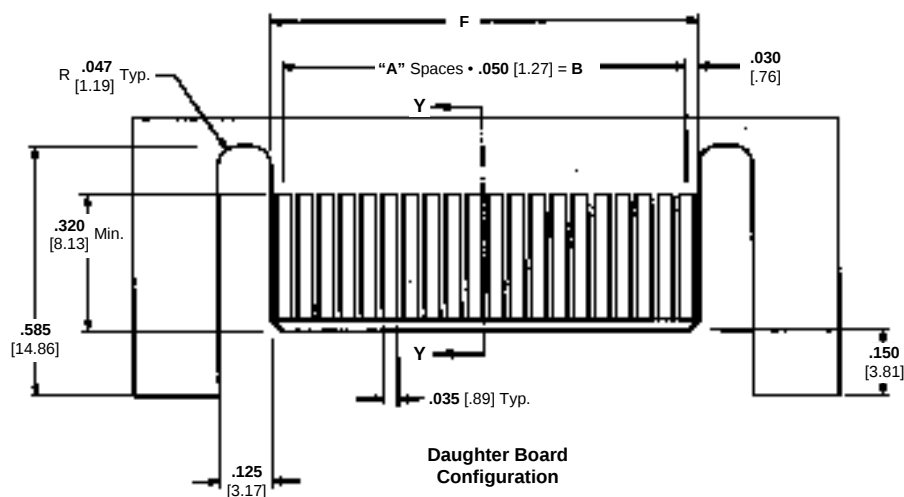
**Note:** Dimension E is Connector Mounting PC Hole Pattern.

## Ordering Information

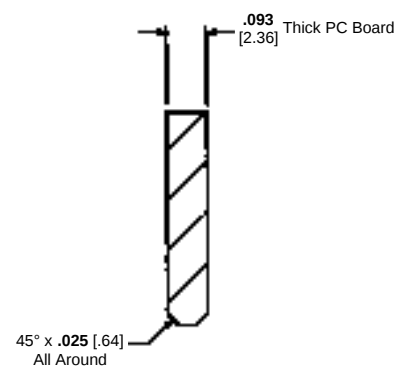
| No. of Dual<br>Readout<br>Position | Dimensions |                  |                  |                  |                  |                  | TYCO<br>Part Number | Acquired<br>Part Number |
|------------------------------------|------------|------------------|------------------|------------------|------------------|------------------|---------------------|-------------------------|
|                                    | A          | B                | C                | D                | E                | F                |                     |                         |
| 20                                 | 19         | 0.950<br>[24.13] | 1.040<br>[26.42] | 1.230<br>[31.24] | 1.100<br>[27.94] | 1.010<br>[25.65] | 147668-2            | C9D020PF60048           |
| 30                                 | 29         | 1.450<br>[36.83] | 1.540<br>[39.12] | 1.730<br>[43.94] | 1.600<br>[40.64] | 1.510<br>[38.35] | 147668-3            | C9D030PF60048           |
| 40                                 | 39         | 1.950<br>[49.53] | 2.040<br>[51.82] | 2.230<br>[56.64] | 2.100<br>[53.34] | 2.010<br>[51.05] | 147668-4            | C9D040PF60048           |
| 50                                 | 49         | 2.450<br>[62.23] | 2.540<br>[64.52] | 2.730<br>[69.34] | 2.600<br>[66.04] | 2.510<br>[63.75] | 147668-5            | C9D050PF60048           |
| 60                                 | 59         | 2.950<br>[74.93] | 3.040<br>[77.22] | 3.230<br>[82.04] | 3.100<br>[78.74] | 3.010<br>[76.45] | 147668-6            | C9D060PF60048           |



Connector Mounting  
PC Hole Pattern



Daughter Board  
Configuration

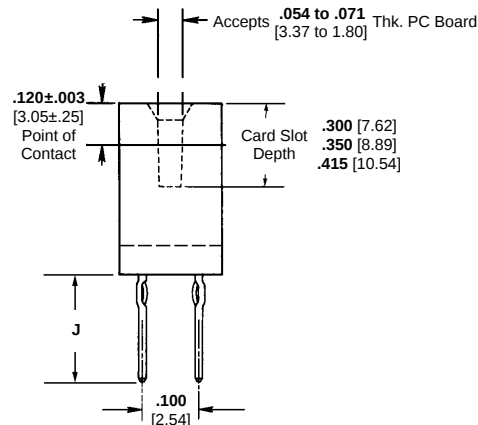
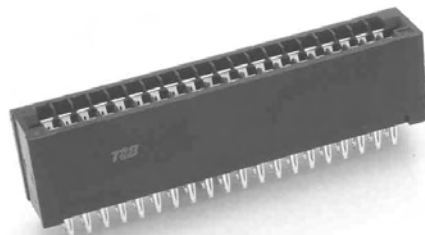


Section Y-Y

**.100 x .100 [2.54 x 2.54] Centerline Press Fit, with Standoffs**

**Product Facts**

- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E60980
- Certified by Canadian Standards Association, File No. LR49571



**Physical Properties:**

**Insulation Resistance**—

5000 megohms minimum

**Contact Retention Into PCB**—

5lbs. min. [356 N]

**Insertion Force**—10 oz. [44.5 N]

max. measured with a .0700 ± .0001 [1.80±.00254] THK polished blade per MIL-C-21097C

**Withdrawal Force**—1 oz. min.

[4.54 N] measured with a .0540 ± .0001 [3.37±.000254] THK polished test blade per MIL-C-21097C after sizing 3 times with a .0700 ± .0001 [1.80±.00254] THK blade

**Insulator Body**—High Temp. Glass filled thermoplastic, UL rating 94V-0

**Color**—Black

**Spring Contact**—Phosphor Bronze alloy

**Contact Plating**—.000050 [0.00127] nickel underplate with .000030 [0.00076] gold in the mating area, tin/lead on tails, .000100 [0.00254] minimum

**Electrical Properties:**

**Operating Voltage**—600 VDC (sea level)

**Current Rating**—3 Amperes

**Initial Contact Resistance**—10 milliohms

**Environmental Properties:**

**Operating Temperature**—-55°C to +125°C

**Temperature Cycling**—MIL-STD-202 method 107

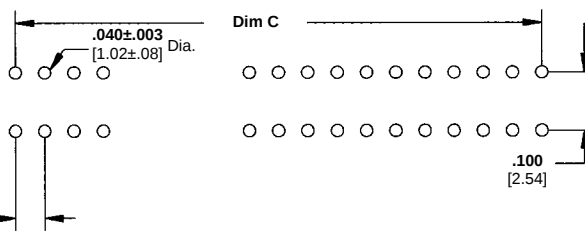
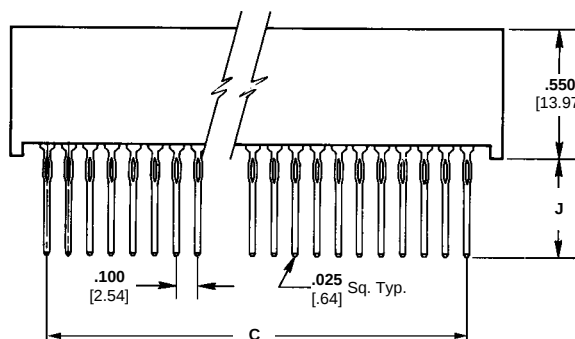
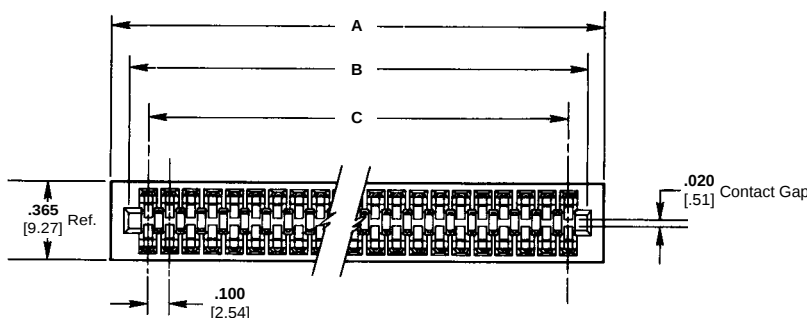
**Vibration**—MIL-STD-202, method 204

**Application Tooling:**

**Insertion Tool**—page 150

**Related Product Data:**

**Daughter Card Edge Pattern**—page 57



## Ordering Information

| .100 [2.54] Centerline/.100 [2.54] Row-To-Row with Standoffs |                 |                 |                 | Acquired Part Numbers       |                             |                              |
|--------------------------------------------------------------|-----------------|-----------------|-----------------|-----------------------------|-----------------------------|------------------------------|
| No. of Dual<br>Readout Positions                             | Dimensions      |                 |                 |                             |                             |                              |
|                                                              | A               | B               | C               | .300 [7.62] Card Slot Depth | .350 [8.89] Card Slot Depth | .415 [10.54] Card Slot Depth |
| <b>Tail Length .180 [4.57] (Dim. "J")</b>                    |                 |                 |                 |                             |                             |                              |
| 18                                                           | 2.034<br>51.66  | 1.904<br>48.36  | 1.700<br>43.18  | C1D18PF29013                | C1D18PF29133                | C1D18PF29043                 |
| 20                                                           | 2.234<br>56.74  | 2.104<br>53.44  | 1.900<br>48.26  | C1D20PF29013                | C1D20PF29133                | C1D20PF29043                 |
| 22                                                           | 2.434<br>61.82  | 2.304<br>58.52  | 2.100<br>53.34  | C1D22PF29013                | C1D22PF29133                | C1D22PF29043                 |
| 25                                                           | 2.734<br>69.44  | 2.604<br>66.14  | 2.400<br>60.96  | C1D25PF29013                | C1D25PF29133                | C1D25PF29043                 |
| 28                                                           | 3.034<br>77.06  | 2.904<br>73.76  | 2.700<br>68.58  | C1D28PF29013                | C1D28PF29133                | C1D28PF29043                 |
| 30                                                           | 3.234<br>82.14  | 3.104<br>78.84  | 2.900<br>73.66  | C1D30PF29013                | C1D30PF29133                | C1D30PF29043                 |
| 35                                                           | 3.734<br>94.84  | 3.604<br>91.54  | 3.400<br>86.36  | C1D35PF29013                | C1D35PF29133                | C1D35PF29043                 |
| 36                                                           | 3.834<br>97.38  | 3.704<br>94.08  | 3.500<br>88.90  | C1D36PF29013                | C1D36PF29133                | C1D36PF29043                 |
| 40                                                           | 4.234<br>107.54 | 4.104<br>104.24 | 3.900<br>99.06  | C1D40PF29013                | C1D40PF29133                | C1D40PF29043                 |
| 43                                                           | 4.534<br>115.16 | 4.404<br>111.86 | 4.200<br>106.68 | C1D43PF29013                | C1D43PF29133                | C1D43PF29043                 |
| 45                                                           | 4.734<br>120.24 | 4.604<br>116.94 | 4.400<br>111.76 | C1D45PF29013                | C1D45PF29133                | C1D45PF29043                 |
| 50                                                           | 5.234<br>132.94 | 5.104<br>129.64 | 4.900<br>124.46 | C1D50PF29013                | C1D50PF29133                | C1D50PF29043                 |
| 60                                                           | 6.234<br>158.34 | 6.104<br>155.04 | 5.900<br>149.86 | C1D60PF29013                | C1D60PF29133                | C1D60PF29043                 |
| <b>Tail Length .475 [12.07] (Dim. "J")</b>                   |                 |                 |                 |                             |                             |                              |
| 18                                                           | 2.034<br>51.66  | 1.904<br>48.36  | 1.700<br>43.18  | C1D18PF29015                | C1D18PF29135                | C1D18PF29045                 |
| 20                                                           | 2.234<br>56.74  | 2.104<br>53.44  | 1.900<br>48.26  | C1D20PF29015                | C1D20PF29135                | C1D20PF29045                 |
| 22                                                           | 2.434<br>61.82  | 2.304<br>58.52  | 2.100<br>53.34  | C1D22PF29015                | C1D22PF29135                | C1D22PF29045                 |
| 25                                                           | 2.734<br>69.44  | 2.604<br>66.14  | 2.400<br>60.96  | C1D25PF29015                | C1D25PF29135                | C1D25PF29045                 |
| 28                                                           | 3.034<br>77.06  | 2.904<br>73.76  | 2.700<br>68.58  | C1D28PF29015                | C1D28PF29135                | C1D28PF29045                 |
| 30                                                           | 3.234<br>82.14  | 3.104<br>78.84  | 2.900<br>73.66  | C1D30PF29015                | C1D30PF29135                | C1D30PF29045                 |
| 35                                                           | 3.734<br>94.84  | 3.604<br>91.54  | 3.400<br>86.36  | C1D35PF29015                | C1D35PF29135                | C1D35PF29045                 |
| 36                                                           | 3.834<br>97.38  | 3.704<br>94.08  | 3.500<br>88.90  | C1D36PF29015                | C1D36PF29135                | C1D36PF29045                 |
| 40                                                           | 4.234<br>107.54 | 4.104<br>104.24 | 3.900<br>99.06  | C1D40PF29015                | C1D40PF29135                | C1D40PF29045                 |
| 43                                                           | 4.534<br>115.16 | 4.404<br>111.86 | 4.200<br>106.68 | C1D43PF29015                | C1D43PF29135                | C1D43PF29045                 |
| 45                                                           | 4.734<br>120.24 | 4.604<br>116.94 | 4.400<br>111.76 | C1D45PF29015                | C1D45PF29135                | C1D45PF29045                 |
| 50                                                           | 5.234<br>132.94 | 5.104<br>129.64 | 4.900<br>124.46 | C1D50PF29015                | C1D50PF29135                | C1D50PF29045                 |
| 60                                                           | 6.234<br>158.34 | 6.104<br>155.04 | 5.900<br>149.86 | C1D60PF29015                | C1D60PF29135                | C1D60PF29045                 |

## Ordering Information

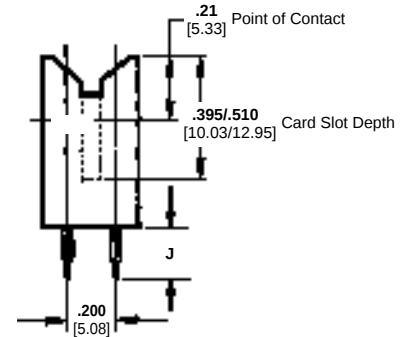
.100" [2.54] Centerline / .100" [2.54] Row-to-Row with Standoffs

| No. of Dual<br>Readout Positions    | Dimensions      |                 |                 | Acquired Part Numbers       |                             |                              |
|-------------------------------------|-----------------|-----------------|-----------------|-----------------------------|-----------------------------|------------------------------|
|                                     | A               | B               | C               | .300 [7.62] Card Slot Depth | .350 [8.84] Card Slot Depth | .415 [10.54] Card Slot Depth |
| Tail Length .625 [15.88] (Dim. "J") |                 |                 |                 |                             |                             |                              |
| 18                                  | 2.034<br>51.66  | 1.904<br>48.36  | 1.700<br>43.18  | C1D18PF29017                | C1D18PF29137                | C1D18PF29047                 |
| 20                                  | 2.234<br>56.74  | 2.104<br>53.44  | 1.900<br>48.26  | C1D20PF29017                | C1D20PF29137                | C1D20PF29047                 |
| 22                                  | 2.434<br>61.82  | 2.304<br>58.52  | 2.100<br>53.34  | C1D22PF29017                | C1D22PF29137                | C1D22PF29047                 |
| 25                                  | 2.734<br>69.44  | 2.604<br>66.14  | 2.400<br>60.96  | C1D25PF29017                | C1D25PF29137                | C1D25PF29047                 |
| 28                                  | 3.034<br>77.06  | 2.904<br>73.76  | 2.700<br>68.58  | C1D28PF29017                | C1D28PF29137                | C1D28PF29047                 |
| 30                                  | 3.234<br>82.14  | 3.104<br>78.84  | 2.900<br>73.66  | C1D30PF29017                | C1D30PF29137                | C1D30PF29047                 |
| 35                                  | 3.734<br>94.84  | 3.604<br>91.54  | 3.400<br>86.36  | C1D35PF29017                | C1D35PF29137                | C1D35PF29047                 |
| 36                                  | 3.834<br>97.38  | 3.704<br>94.08  | 3.500<br>88.90  | C1D36PF29017                | C1D36PF29137                | C1D36PF29047                 |
| 40                                  | 4.234<br>107.54 | 4.104<br>104.24 | 3.900<br>99.06  | C1D40PF29017                | C1D40PF29137                | C1D40PF29047                 |
| 43                                  | 4.534<br>115.16 | 4.404<br>111.86 | 4.200<br>106.68 | C1D43PF29017                | C1D43PF29137                | C1D43PF29047                 |
| 45                                  | 4.734<br>120.24 | 4.604<br>116.94 | 4.400<br>111.76 | C1D45PF29017                | C1D45PF29137                | C1D45PF29047                 |
| 50                                  | 5.234<br>132.94 | 5.104<br>129.64 | 4.900<br>124.46 | C1D50PF29017                | C1D50PF29137                | C1D50PF29047                 |
| 60                                  | 6.234<br>158.34 | 6.104<br>155.04 | 5.900<br>149.86 | C1D60PF29017                | C1D60PF29137                | C1D60PF29047                 |

**.100 x .200 [2.54 x 5.08] Centerline Press-Fit, Full Scoop**

**Product Facts**

- **Recognized under the Component Program of Underwriters Laboratories Inc., File No. E60980**
- **Certified by Canadian Standards Association, File No. LR49571**



**Physical Properties:**

**Insulation Resistance**—  
5000 megohms minimum.

**Contact Retention Into PCB**—  
5lbs. min. [356 N]

**Insertion Force**—10 oz. [44.5 N]  
max. measured with a .0700 ± .0001  
[1.80 ± .00254] THK polished blade per  
MIL-C-21097C

**Withdrawal Force**—1 oz. min.  
[4.5 N] measured with a .0540 ± .0001  
[3.37 ± .00254] THK polished test blade  
per MIL-C-21097C after sizing 3 times  
with a .0700 ± .0001 [1.80 ± .00254] THK  
blade

**Insulator Body**—High Temp. Glass  
filled thermoplastic, UL rating 94V-0

**Color**—Black

**Spring Contact**—Phosphor Bronze  
alloy

**Contact Plating**—.000050 [0.00127]  
nickel underplate with .000030  
[0.00076] gold in the mating area,  
tin/lead on tails, .000100 [0.00254]  
minimum

**Electrical Properties**

**Operating Voltage**—600 VDC  
(sea level)

**Current Rating**—3 Amperes

**Contact Resistance**—10 milliohms

**Environmental Properties:**

**Operating Temperature**—  
-55°C to +125°C

**Temperature Cycling**—  
MIL-STD-202 method 107

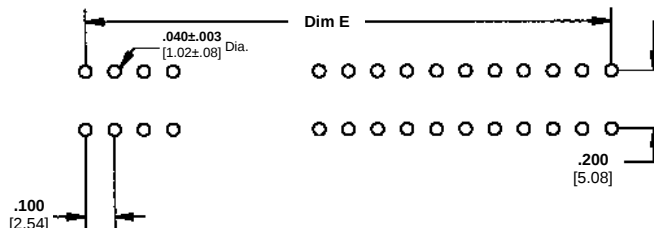
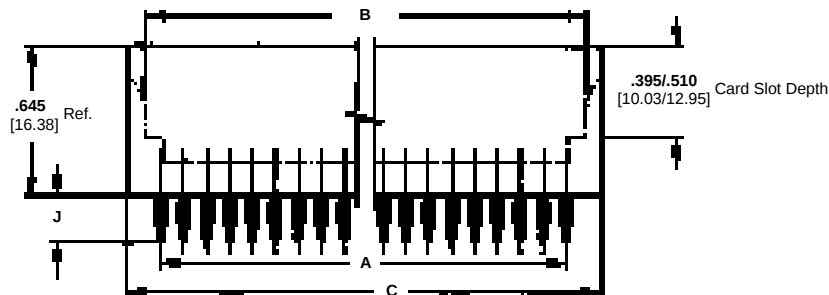
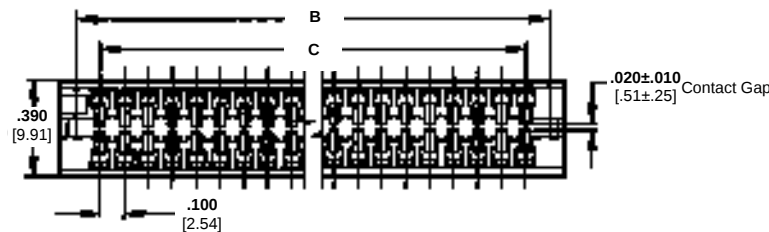
**Vibration**—  
MIL-STD-202, method 204

**Application Tooling:**

**Insertion Tool**—page 150

**Related Product Data:**

**Daughter Card Edge Pattern**—  
page 57



Note: Open ends and open/closed  
ends are available. Consult Tyco  
Electronics.

**Ordering Information**

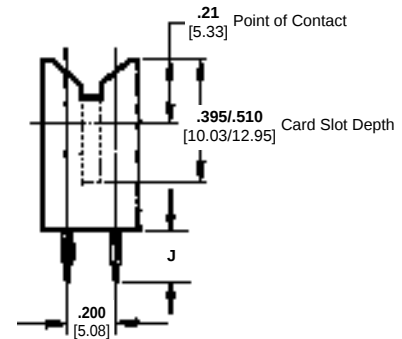
.100 [2.54] Centerline / .200 [5.08] Row-to-Row Full Scoop

| No. of Dual<br>Readout Positions          | Dimensions      |                 |                 | Acquired Part Numbers        |                              |
|-------------------------------------------|-----------------|-----------------|-----------------|------------------------------|------------------------------|
|                                           | A               | B               | C               | .510 [12.95] Card Slot Depth | .395 [10.03] Card Slot Depth |
| <b>Tail Length .670 [17.02] (DIM "J")</b> |                 |                 |                 |                              |                              |
| 18                                        | 2.034<br>51.66  | 1.904<br>48.36  | 1.700<br>43.18  | W8D18PF29012                 | W8D18PF29042                 |
| 20                                        | 2.234<br>56.74  | 2.104<br>53.44  | 1.900<br>48.26  | W8D20PF29012                 | W8D20PF29042                 |
| 22                                        | 2.434<br>61.82  | 2.304<br>58.52  | 2.100<br>53.34  | W8D22PF29012                 | W8D22PF29042                 |
| 25                                        | 2.734<br>69.44  | 2.604<br>66.14  | 2.400<br>60.96  | W8D25PF29012                 | W8D25PF29042                 |
| 28                                        | 3.034<br>77.06  | 2.904<br>73.76  | 2.700<br>68.58  | W8D28PF29012                 | W8D28PF29042                 |
| 30                                        | 3.234<br>82.14  | 3.104<br>78.84  | 2.900<br>73.66  | W8D30PF29012                 | W8D30PF29042                 |
| 35                                        | 3.734<br>94.84  | 3.604<br>91.54  | 3.400<br>86.36  | W8D35PF29012                 | W8D35PF29042                 |
| 36                                        | 3.834<br>97.38  | 3.704<br>94.08  | 3.500<br>88.90  | W8D36PF29012                 | W8D36PF29042                 |
| 40                                        | 4.234<br>107.54 | 4.104<br>104.24 | 3.900<br>99.06  | W8D40PF29012                 | W8D40PF29042                 |
| 43                                        | 4.534<br>115.16 | 4.404<br>111.86 | 4.200<br>106.68 | W8D43PF29012                 | W8D43PF29042                 |
| 45                                        | 4.734<br>120.24 | 4.604<br>116.94 | 4.400<br>111.76 | W8D45PF29012                 | W8D45PF29042                 |
| 50                                        | 5.234<br>132.94 | 5.104<br>129.64 | 4.900<br>124.46 | W8D50PF29012                 | W8D50PF29042                 |
| 60                                        | 6.234<br>158.34 | 6.104<br>155.04 | 5.900<br>149.86 | W8D60PF29012                 | W8D60PF29042                 |
| <b>Tail Length .180 [4.57] (DIM "J")</b>  |                 |                 |                 |                              |                              |
| 18                                        | 2.034<br>51.66  | 1.904<br>48.36  | 1.700<br>43.18  | W8D18PF29013                 | W8D18PF29043                 |
| 20                                        | 2.234<br>56.74  | 2.104<br>53.44  | 1.900<br>48.26  | W8D20PF29013                 | W8D20PF29043                 |
| 22                                        | 2.434<br>61.82  | 2.304<br>58.52  | 2.100<br>53.34  | W8D22PF29013                 | W8D22PF29043                 |
| 25                                        | 2.734<br>69.44  | 2.604<br>66.14  | 2.400<br>60.96  | W8D25PF29013                 | W8D25PF29043                 |
| 28                                        | 3.034<br>77.06  | 2.904<br>73.76  | 2.700<br>68.58  | W8D28PF29013                 | W8D28PF29043                 |
| 30                                        | 3.234<br>82.14  | 3.104<br>78.84  | 2.900<br>73.66  | W8D30PF29013                 | W8D30PF29043                 |
| 35                                        | 3.734<br>94.84  | 3.604<br>91.54  | 3.400<br>86.36  | W8D35PF29013                 | W8D35PF29043                 |
| 36                                        | 3.834<br>97.38  | 3.704<br>94.08  | 3.500<br>88.90  | W8D36PF29013                 | W8D36PF29043                 |
| 40                                        | 4.234<br>107.54 | 4.104<br>104.24 | 3.900<br>99.06  | W8D40PF29013                 | W8D40PF29043                 |
| 43                                        | 4.534<br>115.16 | 4.404<br>111.86 | 4.200<br>106.68 | W8D43PF29013                 | W8D43PF29043                 |
| 45                                        | 4.734<br>120.24 | 4.604<br>116.94 | 4.400<br>111.76 | W8D45PF29013                 | W8D45PF29043                 |
| 50                                        | 5.234<br>132.94 | 5.104<br>129.64 | 4.900<br>124.46 | W8D50PF29013                 | W8D50PF29043                 |
| 60                                        | 6.234<br>158.34 | 6.104<br>155.04 | 5.900<br>149.86 | W8D60PF29013                 | W8D60PF29043                 |

**.100 x .200 [2.54 x 5.08] Centerline, Press-Fit, Full Scoop with Standoffs**

**Product Facts**

- **Recognized under the Component Program of Underwriters Laboratories Inc., File No. E60980**
- **Certified by Canadian Standards Association, File No. LR49571**



**Physical Properties:**

**Insulation Resistance**—  
5000 megohms minimum.

**Contact Retention Into PCB**—  
5lbs. min. [356 N]

**Insertion Force**—10 oz. [44.5 N]  
max. measured with a .0700 ± .0001  
[1.80±.00254] THK polished blade per  
MIL-C-21097C

**Withdrawal Force**—1 oz. min.  
[4.5 N] measured with a .0540 ± .0001  
[3.37±.00254] THK polished test blade  
per MIL-C-21097C after sizing 3 times  
with a .0700 ± .0001 [1.80±.00254] THK  
blade

**Insulator Body**—High Temp. Glass  
filled thermoplastic, UL rating 94V-0

**Color**—Black

**Spring Contact**—Phosphor Bronze  
alloy

**Contact Plating**—.000050 [0.00127]  
nickel underplate with .000030  
[0.00076] gold in the mating area,  
tin/lead on tails, .000100 [0.00254]  
minimum

**Electrical Properties:**

**Operating Voltage**—600 VDC  
(sea level)

**Current Rating**—3 Amperes

**Initial Contact Resistance**—  
10 milliohms

**Environmental Properties:**

**Operating Temperature**—  
-55°C to +125°C

**Temperature Cycling**—  
MIL-STD-202 method 107

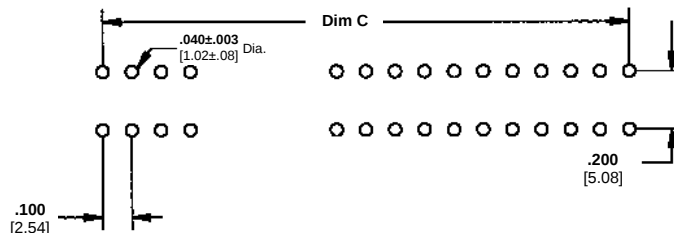
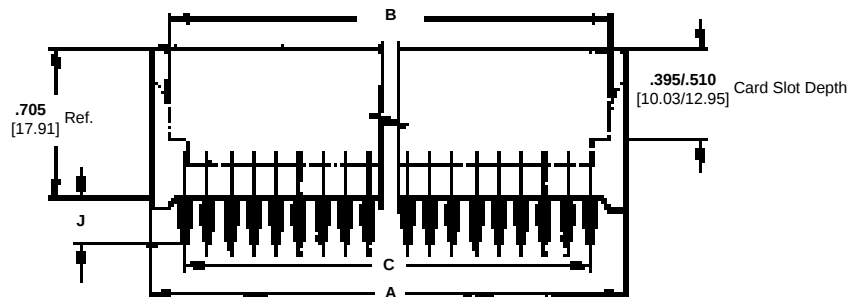
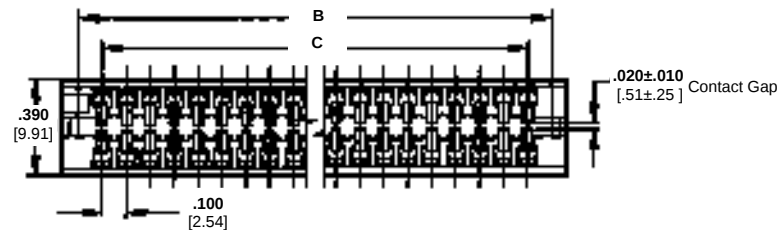
**Vibration**—  
MIL-STD-202, method 204

**Application Tooling:**

**Insertion Tool**—page 150

**Related Product Data:**

**Daughter Card Edge Pattern**—  
page 57



Note: Open ends and open/closed  
ends are available. Consult Tyco  
Electronics.

**Ordering Information**

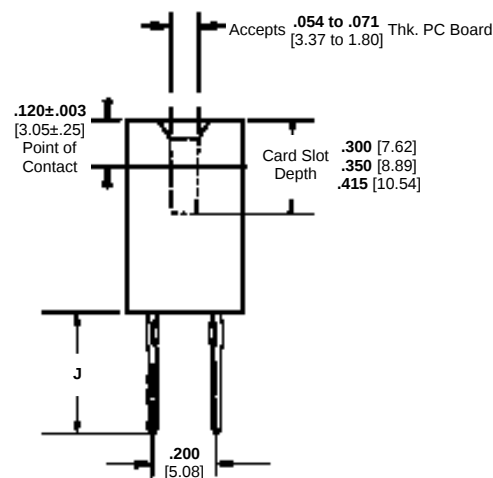
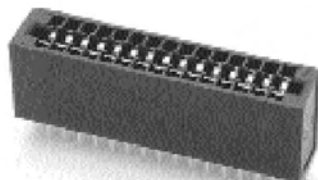
.100 [2.54] Centerline / .200 [5.08] Row-to-Row Full Scoop with Standoffs

| No. of Dual<br>Readout Positions          | Dimensions      |                 |                 | Acquired Part Numbers        |                              |
|-------------------------------------------|-----------------|-----------------|-----------------|------------------------------|------------------------------|
|                                           | A               | B               | C               | .510 [12.95] Card Slot Depth | .395 [10.03] Card Slot Depth |
| <b>Tail Length .670 [17.02] (DIM "J")</b> |                 |                 |                 |                              |                              |
| 18                                        | 2.034<br>51.66  | 1.904<br>48.36  | 1.700<br>43.18  | W8D18PF29062                 | W8D18PF29092                 |
| 20                                        | 2.234<br>56.74  | 2.104<br>53.44  | 1.900<br>48.26  | W8D20PF29062                 | W8D20PF29092                 |
| 22                                        | 2.434<br>61.82  | 2.304<br>58.52  | 2.100<br>53.34  | W8D22PF29062                 | W8D22PF29092                 |
| 25                                        | 2.734<br>69.44  | 2.604<br>66.14  | 2.400<br>60.96  | W8D25PF29062                 | W8D25PF29092                 |
| 28                                        | 3.034<br>77.06  | 2.904<br>73.76  | 2.700<br>68.58  | W8D28PF29062                 | W8D28PF29092                 |
| 30                                        | 3.234<br>82.14  | 3.104<br>78.84  | 2.900<br>73.66  | W8D30PF29062                 | W8D30PF29092                 |
| 35                                        | 3.734<br>94.84  | 3.604<br>91.54  | 3.400<br>86.36  | W8D35PF29062                 | W8D35PF29092                 |
| 36                                        | 3.834<br>97.38  | 3.704<br>94.08  | 3.500<br>88.90  | W8D36PF29062                 | W8D36PF29092                 |
| 40                                        | 4.234<br>107.54 | 4.104<br>104.24 | 3.900<br>99.06  | W8D40PF29062                 | W8D40PF29092                 |
| 43                                        | 4.534<br>115.16 | 4.404<br>111.86 | 4.200<br>106.68 | W8D43PF29062                 | W8D43PF29092                 |
| 45                                        | 4.734<br>120.24 | 4.604<br>116.94 | 4.400<br>111.76 | W8D45PF29062                 | W8D45PF29092                 |
| 50                                        | 5.234<br>132.94 | 5.104<br>129.64 | 4.900<br>124.46 | W8D50PF29062                 | W8D50PF29092                 |
| 60                                        | 6.234<br>158.34 | 6.104<br>155.04 | 5.900<br>149.86 | W8D60PF29062                 | W8D60PF29092                 |
| <b>Tail Length .180 [4.57] (DIM "J")</b>  |                 |                 |                 |                              |                              |
| 18                                        | 2.034<br>51.66  | 1.904<br>48.36  | 1.700<br>43.18  | W8D18PF29063                 | W8D18PF29093                 |
| 20                                        | 2.234<br>56.74  | 2.104<br>53.44  | 1.900<br>48.26  | W8D20PF29063                 | W8D20PF29093                 |
| 22                                        | 2.434<br>61.82  | 2.304<br>58.52  | 2.100<br>53.34  | W8D22PF29063                 | W8D22PF29093                 |
| 25                                        | 2.734<br>69.44  | 2.604<br>66.14  | 2.400<br>60.96  | W8D25PF29063                 | W8D25PF29093                 |
| 28                                        | 3.034<br>77.06  | 2.904<br>73.76  | 2.700<br>68.58  | W8D28PF29063                 | W8D28PF29093                 |
| 30                                        | 3.234<br>82.14  | 3.104<br>78.84  | 2.900<br>73.66  | W8D30PF29063                 | W8D30PF29093                 |
| 35                                        | 3.734<br>94.84  | 3.604<br>91.54  | 3.400<br>86.36  | W8D35PF29063                 | W8D35PF29093                 |
| 36                                        | 3.834<br>97.38  | 3.704<br>94.08  | 3.500<br>88.90  | W8D36PF29063                 | W8D36PF29093                 |
| 40                                        | 4.234<br>107.54 | 4.104<br>104.24 | 3.900<br>99.06  | W8D40PF29063                 | W8D40PF29093                 |
| 43                                        | 4.534<br>115.16 | 4.404<br>111.86 | 4.200<br>106.68 | W8D43PF29063                 | W8D43PF29093                 |
| 45                                        | 4.734<br>120.24 | 4.604<br>116.94 | 4.400<br>111.76 | W8D45PF29063                 | W8D45PF29093                 |
| 50                                        | 5.234<br>132.94 | 5.104<br>129.64 | 4.900<br>124.46 | W8D50PF29063                 | W8D50PF29093                 |
| 60                                        | 6.234<br>158.34 | 6.104<br>155.04 | 5.900<br>149.86 | W8D60PF29063                 | W8D60PF29093                 |

**.100 x .200 [2.54 x 5.08] Centerline, Press-Fit without Standoffs**

**Product Facts**

- **Recognized under the Component Program of Underwriters Laboratories Inc., File No. E60980**
- **Certified by Canadian Standards Association, File No. LR49571**



**Physical Properties:**

**Insulation Resistance**—

5000 megohms minimum.

**Contact Retention Into PCB**—5 lbs.

[356 N]

**Insertion/Withdrawal Force**—

8 oz./2 oz. [35.6 N/ 8.9 N] average contact pair using .0620 [1.57] steel blade.

**Insulator Body**—Glass filled thermoplastic, UL rating 94V-0

**Color**—Black

**Contacts**—High strength copper alloy.

**Contact Plating**—.000050 [0.00127]

nickel underplate with .000030

[0.00076] gold in the mating area,

tin/lead on tails, .000100 [0.00254] minimum

**Electrical Properties:**

**Operating Voltage**—600 VDC

(sea level)

**Current Rating**—3 Amperes

**Initial Contact Resistance**—

10 milliohms

**Environmental Properties:**

**Operating Temperature**—

-55°C to +125°C

**Temperature Cycling**—

MIL-STD-202 method 107

**Vibration**—

MIL-STD-202, method 204

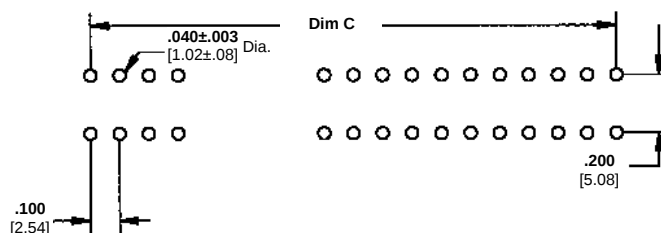
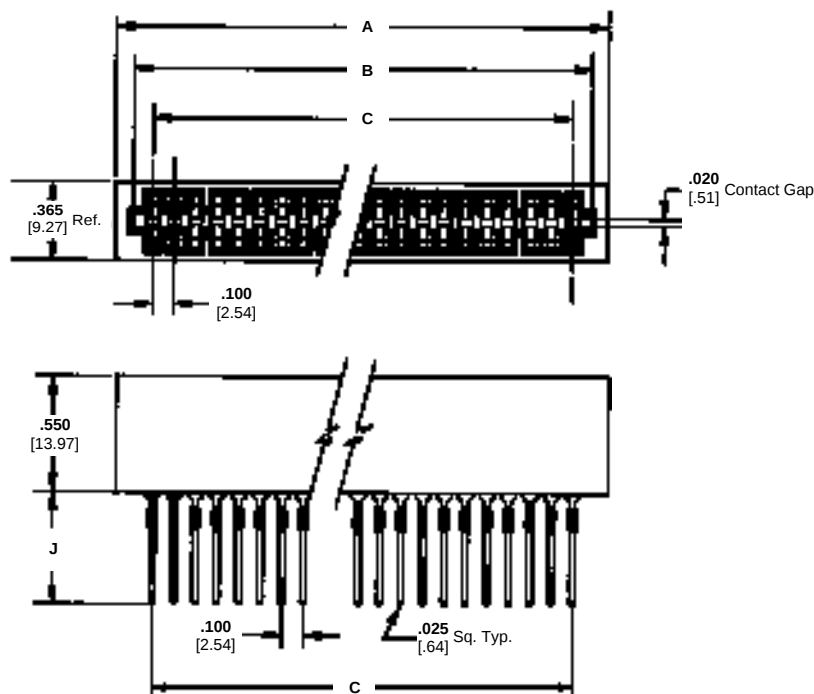
**Application Tooling:**

**Insertion Tool**—page 150

**Related Product Data:**

**Daughter Card Edge Pattern**—

page 57



Note: Open ends and open/closed ends are available. Consult Tyco Electronics.

**Ordering Information**

.100" [2.54] Centerline / .200" [5.08] Row-to-Row without Standoffs

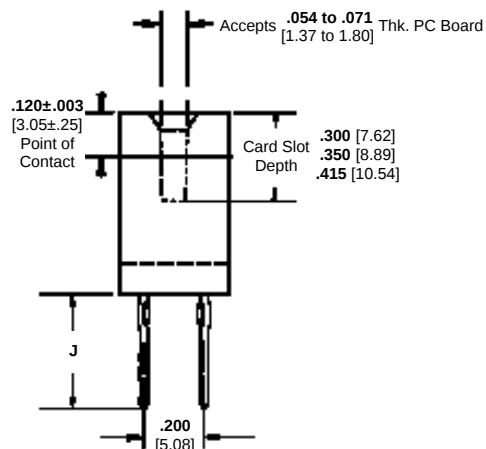
| No. of Dual<br>Readout Positions | Dimensions      |                 |                 | Acquired Part Numbers       |                             |                              |
|----------------------------------|-----------------|-----------------|-----------------|-----------------------------|-----------------------------|------------------------------|
|                                  | A               | B               | C               | .300 [7.62] Card Slot Depth | .350 [8.89] Card Slot Depth | .415 [10.54] Card Slot Depth |
| Tail Length .670 [17.02] ("J")   |                 |                 |                 |                             |                             |                              |
| 6                                | 0.860<br>21.84  | 0.700<br>17.78  | 0.500<br>12.70  | C8D06PF29032                | C8D06PF29142                | C8D06PF29022                 |
| 10                               | 1.260<br>32.00  | 1.100<br>27.94  | 0.900<br>22.86  | C8D10PF29032                | C8D10PF29142                | C8D10PF29022                 |
| 12                               | 1.460<br>37.08  | 1.300<br>33.02  | 1.100<br>27.94  | C8D12PF29032                | C8D12PF29142                | C8D12PF29022                 |
| 15                               | 1.760<br>44.70  | 1.600<br>40.64  | 1.400<br>35.56  | C8D15PF29032                | C8D15PF29142                | C8D15PF29022                 |
| 20                               | 2.260<br>57.40  | 2.100<br>53.34  | 1.900<br>48.26  | C8D20PF29032                | C8D20PF29142                | C8D20PF29022                 |
| 22                               | 2.460<br>62.48  | 2.300<br>58.42  | 2.100<br>53.34  | C8D22PF29032                | C8D22PF29142                | C8D22PF29022                 |
| 25                               | 2.760<br>70.10  | 2.600<br>66.04  | 2.400<br>60.96  | C8D25PF29032                | C8D25PF29142                | C8D25PF29022                 |
| 28                               | 3.060<br>77.72  | 2.900<br>73.66  | 2.700<br>68.58  | C8D28PF29032                | C8D28PF29142                | C8D28PF29022                 |
| 30                               | 3.260<br>82.80  | 3.100<br>78.74  | 2.900<br>73.66  | C8D30PF29032                | C8D30PF29142                | C8D30PF29022                 |
| 31                               | 3.360<br>85.34  | 3.200<br>81.28  | 3.000<br>76.20  | C8D31PF29032                | C8D31PF29142                | C8D31PF29022                 |
| 35                               | 3.760<br>95.50  | 3.600<br>91.44  | 3.400<br>86.36  | C8D35PF29032                | C8D35PF29142                | C8D35PF29022                 |
| 36                               | 3.860<br>98.04  | 3.700<br>93.98  | 3.500<br>88.90  | C8D36PF29032                | C8D36PF29142                | C8D36PF29022                 |
| 40                               | 4.260<br>108.20 | 4.100<br>104.14 | 3.900<br>99.06  | C8D40PF29032                | C8D40PF29142                | C8D40PF29022                 |
| 43                               | 4.560<br>115.82 | 4.400<br>111.76 | 4.200<br>106.68 | C8D43PF29032                | C8D43PF29142                | C8D43PF29022                 |
| 50                               | 5.260<br>133.60 | 5.100<br>129.54 | 4.900<br>124.46 | C8D50PF29032                | C8D50PF29142                | C8D50PF29022                 |
| 60                               | 6.260<br>159.00 | 6.100<br>154.94 | 5.900<br>149.86 | C8D60PF29032                | C8D60PF29142                | C8D60PF29022                 |
| Tail Length .180 [4.57] ("J")    |                 |                 |                 |                             |                             |                              |
| 6                                | 0.860<br>21.84  | 0.700<br>17.78  | 0.500<br>12.70  | C8D06PF29033                | C8D06PF29143                | C8D06PF29023                 |
| 10                               | 1.260<br>32.00  | 1.100<br>27.94  | 0.900<br>22.86  | C8D10PF29033                | C8D10PF29143                | C8D10PF29023                 |
| 12                               | 1.460<br>37.08  | 1.300<br>33.02  | 1.100<br>27.94  | C8D12PF29033                | C8D12PF29143                | C8D12PF29023                 |
| 15                               | 1.760<br>44.70  | 1.600<br>40.64  | 1.400<br>35.56  | C8D15PF29033                | C8D15PF29143                | C8D15PF29023                 |
| 20                               | 2.260<br>57.40  | 2.100<br>53.34  | 1.900<br>48.26  | C8D20PF29033                | C8D20PF29143                | C8D20PF29023                 |
| 22                               | 2.460<br>62.48  | 2.300<br>58.42  | 2.100<br>53.34  | C8D22PF29033                | C8D22PF29143                | C8D22PF29023                 |
| 25                               | 2.760<br>70.10  | 2.600<br>66.04  | 2.400<br>60.96  | C8D25PF29033                | C8D25PF29143                | C8D25PF29023                 |
| 28                               | 3.060<br>77.72  | 2.900<br>73.66  | 2.700<br>68.58  | C8D28PF29033                | C8D28PF29143                | C8D28PF29023                 |
| 30                               | 3.260<br>82.80  | 3.100<br>78.74  | 2.900<br>73.66  | C8D30PF29033                | C8D30PF29143                | C8D30PF29023                 |
| 31                               | 3.360<br>85.34  | 3.200<br>81.28  | 3.000<br>76.20  | C8D31PF29033                | C8D31PF29143                | C8D31PF29023                 |
| 35                               | 3.760<br>95.50  | 3.600<br>91.44  | 3.400<br>86.36  | C8D35PF29033                | C8D35PF29143                | C8D35PF29023                 |
| 36                               | 3.860<br>98.04  | 3.700<br>93.98  | 3.500<br>88.90  | C8D36PF29033                | C8D36PF29143                | C8D36PF29023                 |
| 40                               | 4.260<br>108.20 | 4.100<br>104.14 | 3.900<br>99.06  | C8D40PF29033                | C8D40PF29143                | C8D40PF29023                 |
| 43                               | 4.560<br>115.82 | 4.400<br>111.76 | 4.200<br>106.68 | C8D43PF29033                | C8D43PF29143                | C8D43PF29023                 |
| 50                               | 5.260<br>133.60 | 5.100<br>129.54 | 4.900<br>124.46 | C8D50PF29033                | C8D50PF29143                | C8D50PF29023                 |
| 60                               | 6.260<br>159.00 | 6.100<br>154.94 | 5.900<br>149.86 | C8D60PF29033                | C8D60PF29143                | C8D60PF29023                 |

**.100 x .200 [2.54 x 5.08] Centerline, Press-Fit with Standoffs**

**Product Facts**

■ Recognized under the Component Program of Underwriters Laboratories Inc., File No. E60980

■ Certified by Canadian Standards Association, File No. LR49571



**Physical Properties:**

**Insulation Resistance**—

5000 megohms minimum.

**Contact Retention Into PCB**—5 lbs.

[356 N]

**Insertion/Withdrawal Force**—

8 oz./2 oz. [35.6 N/ 8.9 N] average contact pair using .0620 [1.57] steel blade.

**Insulator Body**—Glass filled thermoplastic, UL rating 94V-0

**Color**—Black

**Contacts**—High strength copper alloy.

**Contact Plating**—.000050 [0.00127] nickel underplate with .000030 [0.00076] gold in the mating area, tin/lead on tails, .000100 [0.00254] minimum

**Electrical Properties:**

**Operating Voltage**—600 VDC (sea level)

**Current Rating**—3 Amperes

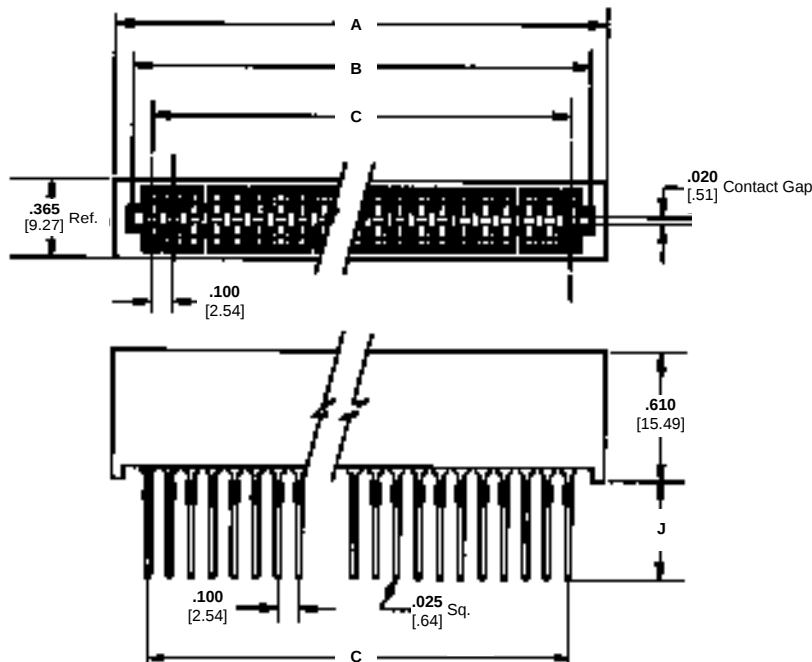
**Initial Contact Resistance**—10 milliohms

**Environmental Properties:**

**Operating Temperature**—-55°C to +125°C

**Temperature Cycling**—MIL-STD-202 method 107

**Vibration**—MIL-STD-202, method 204

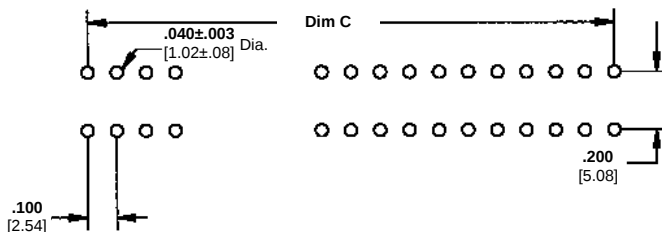


**Application Tooling:**

**Insertion Tool**—page 150

**Related Product Data:**

**Daughter Card Edge Pattern**—page 57



Note: Open ends and open/closed ends are available. Consult Tyco Electronics.

Press-Fit  
Board-to-Board Connectors

**Ordering Information**

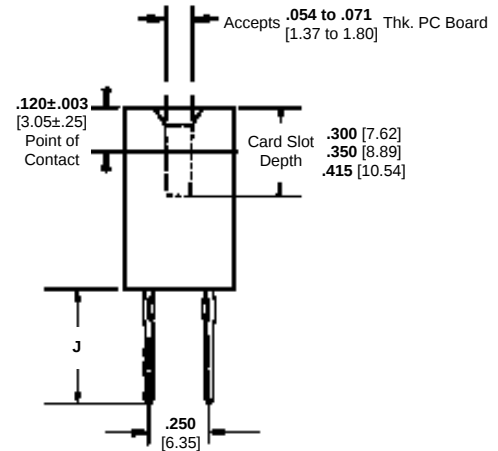
.100 [2.54] Center-to-Center/.200 [5.08] Row-To-Row with Standoffs

| No. of Dual<br>Readout Positions   | Dimensions      |                 |                 | Acquired Part Numbers       |                             |                              |
|------------------------------------|-----------------|-----------------|-----------------|-----------------------------|-----------------------------|------------------------------|
|                                    | A               | B               | C               | .300 [7.62] Card Slot Depth | .350 [8.89] Card Slot Depth | .415 [10.54] Card Slot Depth |
| Tail Length .670 [17.02] (dim "J") |                 |                 |                 |                             |                             |                              |
| 6                                  | 0.860<br>21.84  | 0.700<br>17.78  | 0.500<br>12.70  | C8D06PF29012                | C8D06PF29132                | C8D06PF29042                 |
| 10                                 | 1.260<br>32.00  | 1.100<br>27.94  | 0.900<br>22.86  | C8D10PF29012                | C8D10PF29132                | C8D10PF29042                 |
| 12                                 | 1.460<br>37.08  | 1.300<br>33.02  | 1.100<br>27.94  | C8D12PF29012                | C8D12PF29132                | C8D12PF29042                 |
| 15                                 | 1.760<br>44.70  | 1.600<br>40.64  | 1.400<br>35.56  | C8D15PF29012                | C8D15PF29132                | C8D15PF29042                 |
| 20                                 | 2.260<br>57.40  | 2.100<br>53.34  | 1.900<br>48.26  | C8D20PF29012                | C8D20PF29132                | C8D20PF29042                 |
| 22                                 | 2.460<br>62.48  | 2.300<br>58.42  | 2.100<br>53.34  | C8D22PF29012                | C8D22PF29132                | C8D22PF29042                 |
| 25                                 | 2.760<br>70.10  | 2.600<br>66.04  | 2.400<br>60.96  | C8D25PF29012                | C8D25PF29132                | C8D25PF29042                 |
| 28                                 | 3.060<br>77.72  | 2.900<br>73.66  | 2.700<br>68.58  | C8D28PF29012                | C8D28PF29132                | C8D28PF29042                 |
| 30                                 | 3.260<br>82.80  | 3.100<br>78.74  | 2.900<br>73.66  | C8D30PF29012                | C8D30PF29132                | C8D30PF29042                 |
| 31                                 | 3.360<br>85.34  | 3.200<br>81.28  | 3.000<br>76.20  | C8D31PF29012                | C8D31PF29132                | C8D31PF29042                 |
| 35                                 | 3.760<br>95.50  | 3.600<br>91.44  | 3.400<br>86.36  | C8D35PF29012                | C8D35PF29132                | C8D35PF29042                 |
| 36                                 | 3.860<br>98.04  | 3.700<br>93.98  | 3.500<br>88.90  | C8D36PF29012                | C8D36PF29132                | C8D36PF29042                 |
| 40                                 | 4.260<br>108.20 | 4.100<br>104.14 | 3.900<br>99.06  | C8D40PF29012                | C8D40PF29132                | C8D40PF29042                 |
| 43                                 | 4.560<br>115.82 | 4.400<br>111.76 | 4.200<br>106.68 | C8D43PF29012                | C8D43PF29132                | C8D43PF29042                 |
| 50                                 | 5.260<br>133.60 | 5.100<br>129.54 | 4.900<br>124.46 | C8D50PF29012                | C8D50PF29132                | C8D50PF29042                 |
| 60                                 | 6.260<br>159.00 | 6.100<br>154.94 | 5.900<br>149.86 | C8D60PF29012                | C8D60PF29132                | C8D60PF29042                 |
| Tail Length .180 [4.57] (dim "J")  |                 |                 |                 |                             |                             |                              |
| 6                                  | 0.860<br>21.84  | 0.700<br>17.78  | 0.500<br>12.70  | C8D06PF29013                | C8D06PF29133                | C8D06PF29043                 |
| 10                                 | 1.260<br>32.00  | 1.100<br>27.94  | 0.900<br>22.86  | C8D10PF29013                | C8D10PF29133                | C8D10PF29043                 |
| 12                                 | 1.460<br>37.08  | 1.300<br>33.02  | 1.100<br>27.94  | C8D12PF29013                | C8D12PF29133                | C8D12PF29043                 |
| 15                                 | 1.760<br>44.70  | 1.600<br>40.64  | 1.400<br>35.56  | C8D15PF29013                | C8D15PF29133                | C8D15PF29043                 |
| 20                                 | 2.260<br>57.40  | 2.100<br>53.34  | 1.900<br>48.26  | C8D20PF29013                | C8D20PF29133                | C8D20PF29043                 |
| 22                                 | 2.460<br>62.48  | 2.300<br>58.42  | 2.100<br>53.34  | C8D22PF29013                | C8D22PF29133                | C8D22PF29043                 |
| 25                                 | 2.760<br>70.10  | 2.600<br>66.04  | 2.400<br>60.96  | C8D25PF29013                | C8D25PF29133                | C8D25PF29043                 |
| 28                                 | 3.060<br>77.72  | 2.900<br>73.66  | 2.700<br>68.58  | C8D28PF29013                | C8D28PF29133                | C8D28PF29043                 |
| 30                                 | 3.260<br>82.80  | 3.100<br>78.74  | 2.900<br>73.66  | C8D30PF29013                | C8D30PF29133                | C8D30PF29043                 |
| 31                                 | 3.360<br>85.34  | 3.200<br>81.28  | 3.000<br>76.20  | C8D31PF29013                | C8D31PF29133                | C8D31PF29043                 |
| 35                                 | 3.760<br>95.50  | 3.600<br>91.44  | 3.400<br>86.36  | C8D35PF29013                | C8D35PF29133                | C8D35PF29043                 |
| 36                                 | 3.860<br>98.04  | 3.700<br>93.98  | 3.500<br>88.90  | C8D36PF29013                | C8D36PF29133                | C8D36PF29043                 |
| 40                                 | 4.260<br>108.20 | 4.100<br>104.14 | 3.900<br>99.06  | C8D40PF29013                | C8D40PF29133                | C8D40PF29043                 |
| 43                                 | 4.560<br>115.82 | 4.400<br>111.76 | 4.200<br>106.68 | C8D43PF29013                | C8D43PF29133                | C8D43PF29043                 |
| 50                                 | 5.260<br>133.60 | 5.100<br>129.54 | 4.900<br>124.46 | C8D50PF29013                | C8D50PF29133                | C8D50PF29043                 |
| 60                                 | 6.260<br>159.00 | 6.100<br>154.94 | 5.900<br>149.86 | C8D60PF29013                | C8D60PF29133                | C8D60PF29043                 |

**.125 x .250 [3.18 x 6.35] Centerline without Standoffs**

**Product Facts**

- **Recognized under the Component Program of Underwriters Laboratories Inc., File No. E60980**
- **Certified by Canadian Standards Association, File No. LR49571**



**Physical Properties:**

**Insulation Resistance**—5000 megohms minimum.

**Contact Retention Into PCB**—5 lbs. [356 N]

**Insertion/Withdrawal Force**—8 oz./2 oz. [35.6 N/ 8.9 N] average contact pair using .0620 [1.57] steel blade.

**Insulator Body**—Glass filled thermoplastic, UL rating 94V-0

**Color**—Black

**Contacts**—High strength copper alloy.

**Contact Plating**—.000050 [0.00127] nickel underplate with .000030 [0.00076] gold in the mating area, tin/lead on tails, .000100 [0.00254] minimum

**Electrical Properties:**

**Operating Voltage**—1000 VDC (sea level)

**Current Rating**—3 Amperes

**Initial Contact Resistance**—10 milliohms

**Environmental Properties:**

**Operating Temperature**—-55°C to +125°C

**Temperature Cycling**—MIL-STD-202 method 107

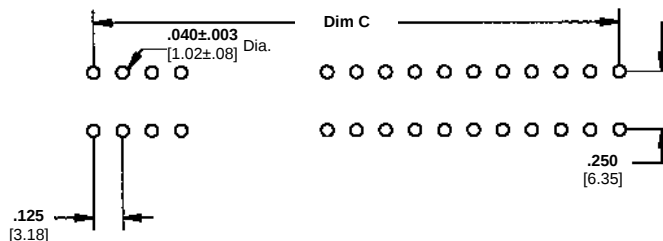
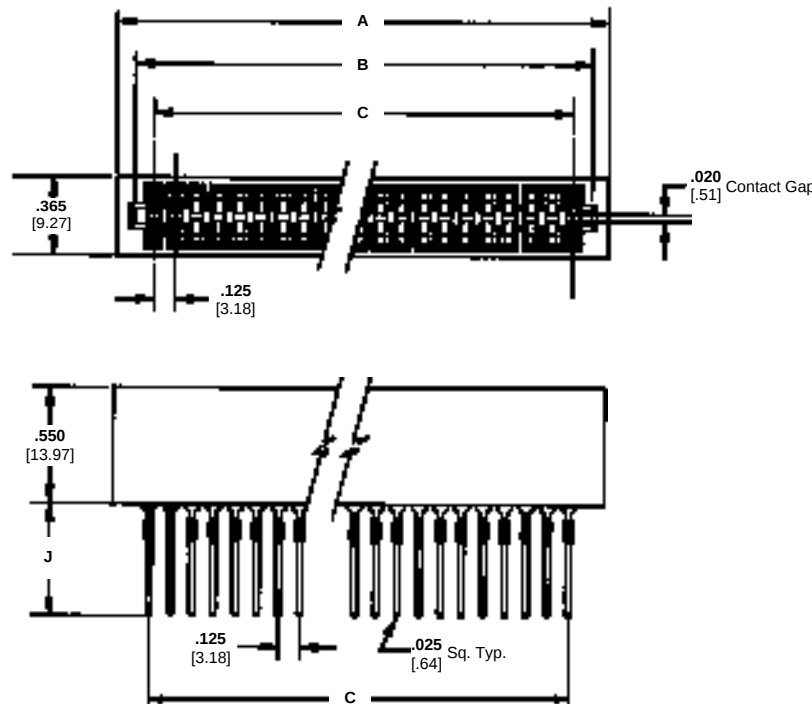
**Vibration**—MIL-STD-202, method 204

**Application Tooling:**

**Insertion Tool**—page 150

**Related Product Data:**

**Daughter Card Edge Pattern**—page 57



Note: Open ends and open/closed ends are available. Consult Tyco Electronics.

Ordering Information

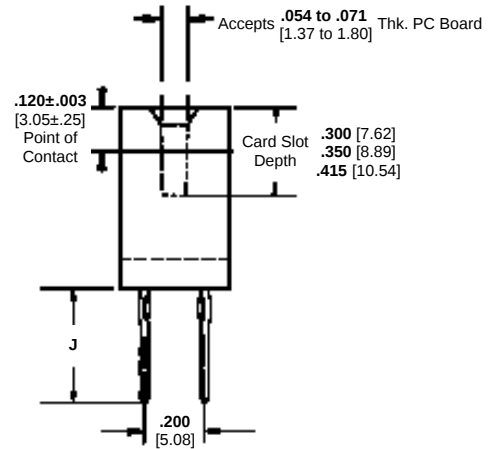
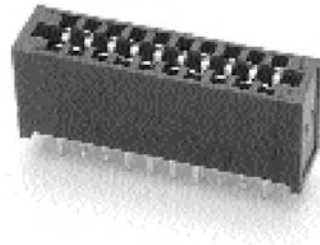
.125 [3.18] Centerline / .250 [6.35] Row-to-Row without Standoffs

| No. of Dual<br>Readout Positions   | Dimensions      |                 |                 | Acquired Part Numbers       |                             |                              |
|------------------------------------|-----------------|-----------------|-----------------|-----------------------------|-----------------------------|------------------------------|
|                                    | A               | B               | C               | .300 [7.62] Card Slot Depth | .350 [8.89] Card Slot Depth | .415 [10.54] Card Slot Depth |
| Tail Length .670 [17.02] (DIM "J") |                 |                 |                 |                             |                             |                              |
| 6                                  | 1.035<br>26.29  | 0.875<br>22.23  | 0.625<br>15.88  | C7D06PF29032                | C7D06PF29142                | C7D06PF29022                 |
| 10                                 | 1.535<br>38.99  | 1.375<br>34.93  | 1.125<br>28.58  | C7D10PF29032                | C7D10PF29142                | C7D10PF29022                 |
| 12                                 | 1.785<br>45.34  | 1.625<br>41.28  | 1.375<br>34.93  | C7D12PF29032                | C7D12PF29142                | C7D12PF29022                 |
| 15                                 | 2.160<br>54.86  | 2.000<br>50.80  | 1.750<br>44.45  | C7D15PF29032                | C7D15PF29142                | C7D15PF29022                 |
| 18                                 | 2.535<br>64.39  | 2.375<br>60.33  | 2.125<br>53.98  | C7D18PF29032                | C7D18PF29142                | C7D18PF29022                 |
| 20                                 | 2.785<br>70.74  | 2.625<br>66.68  | 2.375<br>60.33  | C7D20PF29032                | C7D20PF29142                | C7D20PF29022                 |
| 22                                 | 3.035<br>77.09  | 2.875<br>73.03  | 2.625<br>66.68  | C7D22PF29032                | C7D22PF29142                | C7D22PF29022                 |
| 25                                 | 3.410<br>86.61  | 3.250<br>82.55  | 3.000<br>76.20  | C7D25PF29032                | C7D25PF29142                | C7D25PF29022                 |
| 28                                 | 3.785<br>96.14  | 3.625<br>92.08  | 3.375<br>85.73  | C7D28PF29032                | C7D28PF29142                | C7D28PF29022                 |
| 30                                 | 4.035<br>102.49 | 3.875<br>98.43  | 3.625<br>92.08  | C7D30PF29032                | C7D30PF29142                | C7D30PF29022                 |
| 31                                 | 4.160<br>105.66 | 4.000<br>101.60 | 3.750<br>95.25  | C7D31PF29032                | C7D31PF29142                | C7D31PF29022                 |
| 35                                 | 4.660<br>118.36 | 4.500<br>114.30 | 4.250<br>107.95 | C7D35PF29032                | C7D35PF29142                | C7D35PF29022                 |
| 36                                 | 4.785<br>121.54 | 4.625<br>117.48 | 4.375<br>111.13 | C7D36PF29032                | C7D36PF29142                | C7D36PF29022                 |
| 40                                 | 5.285<br>134.24 | 5.125<br>130.18 | 4.875<br>123.83 | C7D40PF29032                | C7D40PF29142                | C7D40PF29022                 |
| 43                                 | 5.660<br>143.76 | 5.500<br>139.70 | 5.250<br>133.35 | C7D43PF29032                | C7D43PF29142                | C7D43PF29022                 |
| 50                                 | 6.535<br>165.99 | 6.375<br>161.93 | 6.125<br>155.58 | C7D50PF29032                | C7D50PF29142                | C7D50PF29022                 |
| Tail Length .180 [4.57] (DIM "J")  |                 |                 |                 |                             |                             |                              |
| 6                                  | 1.035<br>26.29  | 0.875<br>22.23  | 0.625<br>15.88  | C7D06PF29033                | C7D06PF29143                | C7D06PF29023                 |
| 10                                 | 1.535<br>38.99  | 1.375<br>34.93  | 1.125<br>28.58  | C7D10PF29033                | C7D10PF29143                | C7D10PF29023                 |
| 12                                 | 1.785<br>45.34  | 1.625<br>41.28  | 1.375<br>34.93  | C7D12PF29033                | C7D12PF29143                | C7D12PF29023                 |
| 15                                 | 2.160<br>54.86  | 2.000<br>50.80  | 1.750<br>44.45  | C7D15PF29033                | C7D15PF29143                | C7D15PF29023                 |
| 18                                 | 2.535<br>64.39  | 2.375<br>60.33  | 2.125<br>53.98  | C7D18PF29033                | C7D18PF29143                | C7D18PF29023                 |
| 20                                 | 2.785<br>70.74  | 2.625<br>66.68  | 2.375<br>60.33  | C7D20PF29033                | C7D20PF29143                | C7D20PF29023                 |
| 22                                 | 3.035<br>77.09  | 2.875<br>73.03  | 2.625<br>66.68  | C7D22PF29033                | C7D22PF29143                | C7D22PF29023                 |
| 25                                 | 3.410<br>86.61  | 3.250<br>82.55  | 3.000<br>76.20  | C7D25PF29033                | C7D25PF29143                | C7D25PF29023                 |
| 28                                 | 3.785<br>96.14  | 3.625<br>92.08  | 3.375<br>85.73  | C7D28PF29033                | C7D28PF29143                | C7D28PF29023                 |
| 30                                 | 4.035<br>102.49 | 3.875<br>98.43  | 3.625<br>92.08  | C7D30PF29033                | C7D30PF29143                | C7D30PF29023                 |
| 31                                 | 4.160<br>105.66 | 4.000<br>101.60 | 3.750<br>95.25  | C7D31PF29033                | C7D31PF29143                | C7D31PF29023                 |
| 35                                 | 4.660<br>118.36 | 4.500<br>114.30 | 4.250<br>107.95 | C7D35PF29033                | C7D35PF29143                | C7D35PF29023                 |
| 36                                 | 4.785<br>121.54 | 4.625<br>117.48 | 4.375<br>111.13 | C7D36PF29033                | C7D36PF29143                | C7D36PF29023                 |
| 40                                 | 5.285<br>134.24 | 5.125<br>130.18 | 4.875<br>123.83 | C7D40PF29033                | C7D40PF29143                | C7D40PF29023                 |
| 43                                 | 5.660<br>143.76 | 5.500<br>139.70 | 5.250<br>133.35 | C7D43PF29033                | C7D43PF29143                | C7D43PF29023                 |
| 50                                 | 6.535<br>165.99 | 6.375<br>161.93 | 6.125<br>155.58 | C7D50PF29033                | C7D50PF29143                | C7D50PF29023                 |

**.125 x .250 [3.18 x 6.35] Centerline with Standoffs**

**Product Facts**

- **Recognized under the Component Program of Underwriters Laboratories Inc., File No. E60980**
- **Certified by Canadian Standards Association, File No. LR49571**



**Physical Properties:**

**Insulation Resistance**—  
5000 megohms minimum.

**Contact Retention Into PCB**—5 lbs.  
[356 N]

**Insertion/Withdrawal Force**—  
8 oz./2 oz. [35.6 N/ 8.9 N] average  
contact pair using .0620 [1.57] steel  
blade.

**Insulator Body**—Glass filled  
thermoplastic, UL rating 94V-0

**Color**—Black

**Contacts**—High strength copper alloy.

**Contact Plating**—.000050 [0.00127]  
nickel underplate with .000030  
[0.00076] gold in the mating area,  
tin/lead on tails, .000100 [0.00254]  
minimum

**Electrical Properties:**

**Operating Voltage**—1000 VDC  
(sea level)

**Current Rating**—3 Amperes

**Initial Contact Resistance**—  
10 milliohms

**Environmental Properties:**

**Operating Temperature**—  
-55°C to +125°C

**Temperature Cycling**—  
MIL-STD-202 method 107

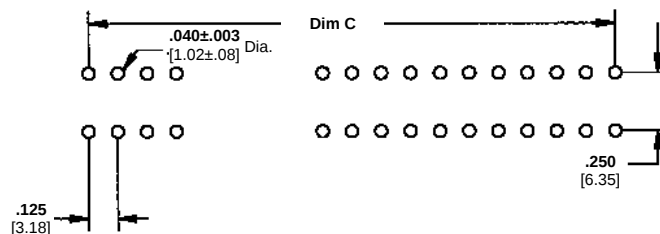
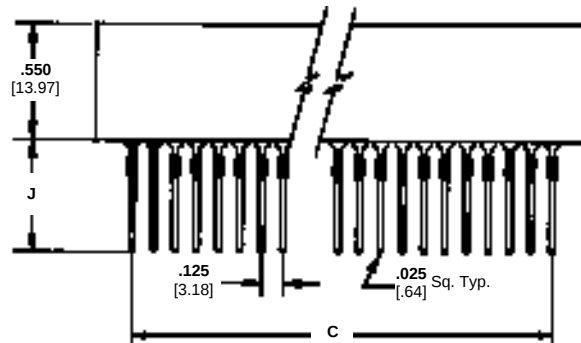
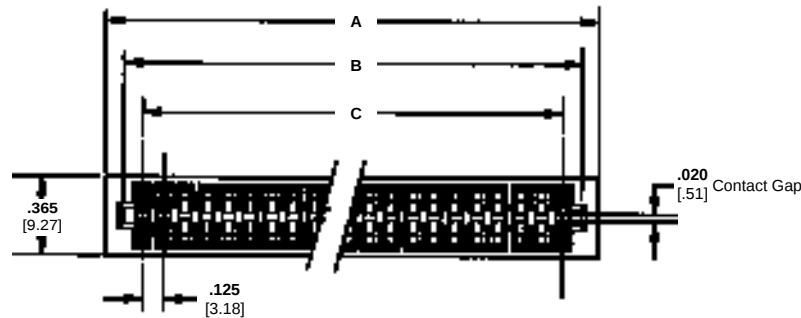
**Vibration**—  
MIL-STD-202, method 204

**Application Tooling:**

**Insertion Tool**—page 150

**Related Product Data:**

**Daughter Card Edge Pattern**—  
page 57



Note: Open ends and open/closed  
ends are available. Consult Tyco  
Electronics.

.125 [3.18] Centerline / .250 [6.35] Row-to-Row with Standoffs

| No. of Dual<br>Readout Positions   | Dimensions      |                 |                 | Acquired Part Numbers       |                             |                              |
|------------------------------------|-----------------|-----------------|-----------------|-----------------------------|-----------------------------|------------------------------|
|                                    | A               | B               | C               | .300 [7.62] Card Slot Depth | .350 [8.89] Card Slot Depth | .415 [10.54] Card Slot Depth |
| Tail Length .670 [17.02] (DIM "J") |                 |                 |                 |                             |                             |                              |
| 6                                  | 1.035<br>26.29  | 0.875<br>22.23  | 0.625<br>15.88  | C7D06PF29012                | C7D06PF29132                | C7D06PF29042                 |
| 10                                 | 1.535<br>38.99  | 1.375<br>34.93  | 1.125<br>28.58  | C7D10PF29012                | C7D10PF29132                | C7D10PF29042                 |
| 12                                 | 1.785<br>45.34  | 1.625<br>41.28  | 1.375<br>34.93  | C7D12PF29012                | C7D12PF29132                | C7D12PF29042                 |
| 15                                 | 2.160<br>54.86  | 2.000<br>50.80  | 1.750<br>44.45  | C7D15PF29012                | C7D15PF29132                | C7D15PF29042                 |
| 18                                 | 2.535<br>64.39  | 2.375<br>60.33  | 2.125<br>53.98  | C7D18PF29012                | C7D18PF29132                | C7D18PF29042                 |
| 20                                 | 2.785<br>70.74  | 2.625<br>66.68  | 2.375<br>60.33  | C7D20PF29012                | C7D20PF29132                | C7D20PF29042                 |
| 22                                 | 3.035<br>77.09  | 2.875<br>73.03  | 2.625<br>66.68  | C7D22PF29012                | C7D22PF29132                | C7D22PF29042                 |
| 25                                 | 3.410<br>86.61  | 3.250<br>82.55  | 3.000<br>76.20  | C7D25PF29012                | C7D25PF29132                | C7D25PF29042                 |
| 28                                 | 3.785<br>96.14  | 3.625<br>92.08  | 3.375<br>85.73  | C7D28PF29012                | C7D28PF29132                | C7D28PF29042                 |
| 30                                 | 4.035<br>102.49 | 3.875<br>98.43  | 3.625<br>92.08  | C7D30PF29012                | C7D30PF29132                | C7D30PF29042                 |
| 31                                 | 4.160<br>105.66 | 4.000<br>101.60 | 3.750<br>95.25  | C7D31PF29012                | C7D31PF29132                | C7D31PF29042                 |
| 35                                 | 4.660<br>118.36 | 4.500<br>114.30 | 4.250<br>107.95 | C7D35PF29012                | C7D35PF29132                | C7D35PF29042                 |
| 36                                 | 4.785<br>121.54 | 4.625<br>117.48 | 4.375<br>111.13 | C7D36PF29012                | C7D36PF29132                | C7D36PF29042                 |
| 40                                 | 5.285<br>134.24 | 5.125<br>130.18 | 4.875<br>123.83 | C7D40PF29012                | C7D40PF29132                | C7D40PF29042                 |
| 43                                 | 5.660<br>143.76 | 5.500<br>139.70 | 5.250<br>133.35 | C7D43PF29012                | C7D43PF29132                | C7D43PF29042                 |
| 50                                 | 6.535<br>165.99 | 6.375<br>161.93 | 6.125<br>155.58 | C7D50PF29012                | C7D50PF29132                | C7D50PF29042                 |
| Tail Length .180 [4.57] (DIM "J")  |                 |                 |                 |                             |                             |                              |
| 6                                  | 1.035<br>26.29  | 0.875<br>22.23  | 0.625<br>15.88  | C7D06PF29013                | C7D06PF29133                | C7D06PF29043                 |
| 10                                 | 1.535<br>38.99  | 1.375<br>34.93  | 1.125<br>28.58  | C7D10PF29013                | C7D10PF29133                | C7D10PF29043                 |
| 12                                 | 1.785<br>45.34  | 1.625<br>41.28  | 1.375<br>34.93  | C7D12PF29013                | C7D12PF29133                | C7D12PF29043                 |
| 15                                 | 2.160<br>54.86  | 2.000<br>50.80  | 1.750<br>44.45  | C7D15PF29013                | C7D15PF29133                | C7D15PF29043                 |
| 18                                 | 2.535<br>64.39  | 2.375<br>60.33  | 2.125<br>53.98  | C7D18PF29013                | C7D18PF29133                | C7D18PF29043                 |
| 20                                 | 2.785<br>70.74  | 2.625<br>66.68  | 2.375<br>60.33  | C7D20PF29013                | C7D20PF29133                | C7D20PF29043                 |
| 22                                 | 3.035<br>77.09  | 2.875<br>73.03  | 2.625<br>66.68  | C7D22PF29013                | C7D22PF29133                | C7D22PF29043                 |
| 25                                 | 3.410<br>86.61  | 3.250<br>82.55  | 3.000<br>76.20  | C7D25PF29013                | C7D25PF29133                | C7D25PF29043                 |
| 28                                 | 3.785<br>96.14  | 3.625<br>92.08  | 3.375<br>85.73  | C7D28PF29013                | C7D28PF29133                | C7D28PF29043                 |
| 30                                 | 4.035<br>102.49 | 3.875<br>98.43  | 3.625<br>92.08  | C7D30PF29013                | C7D30PF29133                | C7D30PF29043                 |
| 31                                 | 4.160<br>105.66 | 4.000<br>101.60 | 3.750<br>95.25  | C7D31PF29013                | C7D31PF29133                | C7D31PF29043                 |
| 35                                 | 4.660<br>118.36 | 4.500<br>114.30 | 4.250<br>107.95 | C7D35PF29013                | C7D35PF29133                | C7D35PF29043                 |
| 36                                 | 4.785<br>121.54 | 4.625<br>117.48 | 4.375<br>111.13 | C7D36PF29013                | C7D36PF29133                | C7D36PF29043                 |
| 40                                 | 5.285<br>134.24 | 5.125<br>130.18 | 4.875<br>123.83 | C7D40PF29013                | C7D40PF29133                | C7D40PF29043                 |
| 43                                 | 5.660<br>143.76 | 5.500<br>139.70 | 5.250<br>133.35 | C7D43PF29013                | C7D43PF29133                | C7D43PF29043                 |
| 50                                 | 6.535<br>165.99 | 6.375<br>161.93 | 6.125<br>155.58 | C7D50PF29013                | C7D50PF29133                | C7D50PF29043                 |

NOTE: Optional stacking designs are available (consult Tyco Electronics).

**.156 x .200 [3.18 x 5.08] Centerline without Standoffs**

**Product Facts**

- **Recognized under the Component Program of Underwriters Laboratories Inc., File No. E60980**
- **Certified by Canadian Standards Association, File No. LR49571**



**Physical Properties:**

**Insulation Resistance**—  
5000 megohms minimum.

**Contact Retention Into PCB**—  
5 lbs. [356 N]

**Insertion/Withdrawal Force**—  
8 oz./2 oz. [35.6 N/ 8.9 N] average  
contact pair using .0620 [1.57] steel  
blade.

**Insulator Body**—Glass filled  
thermoplastic, UL rating 94V-0

**Color**—Black

**Contacts**—High strength copper alloy.

**Contact Plating**—.000050 [0.00127]  
nickel underplate with .000030  
[0.00076] gold in the mating area,  
tin/lead on tails, .000100 [0.00254]  
minimum

**Electrical Properties:**

**Operating Voltage**—1500 VDC  
(sea level)

**Current Rating**—3 Amperes

**Initial Contact Resistance**—  
10 milliohms

**Environmental Properties:**

**Operating Temperature**—  
-55°C to +125°C

**Temperature Cycling**—  
MIL-STD-202 method 107

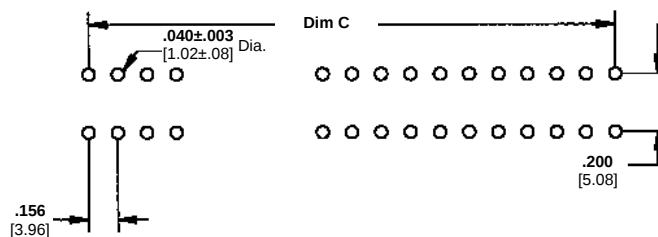
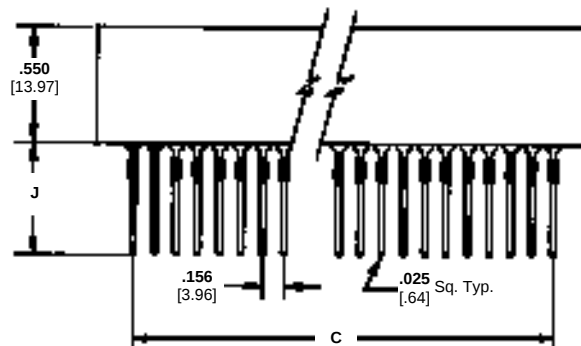
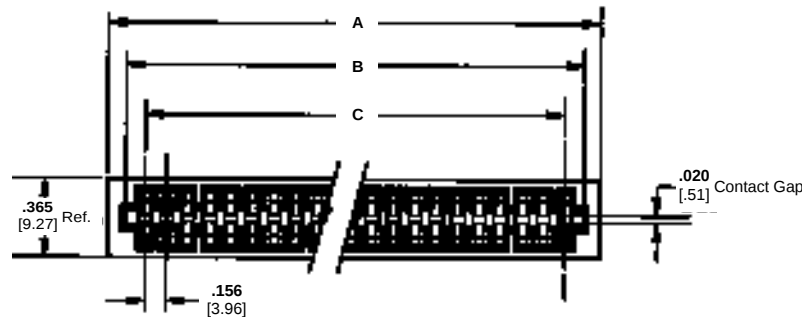
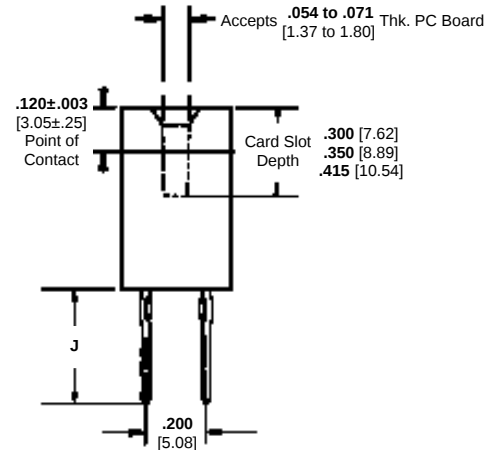
**Vibration**—  
MIL-STD-202, method 204

**Application Tooling:**

**Insertion Tool**—page 150

**Related Product Data:**

**Daughter Card Edge Pattern**—  
page 57



Press-Fit  
Board-to-Board Connectors

Note: Open ends and open/closed  
ends are available. Consult Tyco  
Electronics.

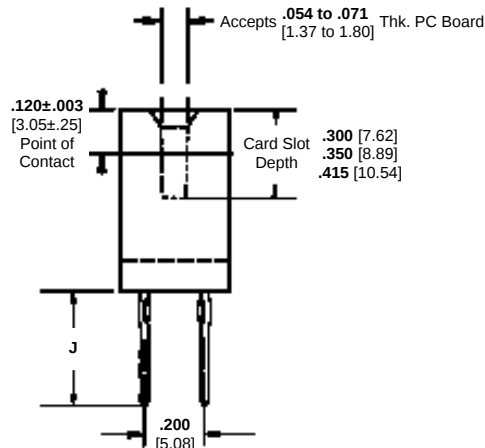
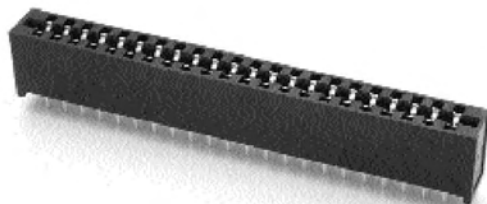
.156 [3.18] Centerline/.200 [5.08] Row-to-Row without Standoffs

| No. of Dual<br>Readout Positions          | Dimensions      |                 |                 | Acquired Part Numbers       |                             |                              |
|-------------------------------------------|-----------------|-----------------|-----------------|-----------------------------|-----------------------------|------------------------------|
|                                           | A               | B               | C               | .300 [7.62] Card Slot Depth | .350 [8.84] Card Slot Depth | .415 [10.54] Card Slot Depth |
| <b>.670 [17.02] Tail Length (DIM "J")</b> |                 |                 |                 |                             |                             |                              |
| 6                                         | 1.221<br>31.01  | 1.100<br>27.94  | 0.780<br>19.81  | C6D06PF29032                | C6D06PF29142                | C6D06PF29022                 |
| 10                                        | 1.845<br>46.86  | 1.724<br>43.79  | 1.404<br>35.66  | C6D10PF29032                | C6D10PF29142                | C6D10PF29022                 |
| 12                                        | 2.157<br>54.79  | 2.036<br>51.71  | 1.716<br>43.59  | C6D12PF29032                | C6D12PF29142                | C6D12PF29022                 |
| 15                                        | 2.625<br>66.68  | 2.504<br>63.60  | 2.184<br>55.47  | C6D15PF29032                | C6D15PF29142                | C6D15PF29022                 |
| 18                                        | 3.093<br>78.56  | 2.972<br>75.49  | 2.652<br>67.36  | C6D18PF29032                | C6D18PF29142                | C6D18PF29022                 |
| 20                                        | 3.405<br>86.49  | 3.284<br>83.41  | 2.964<br>75.29  | C6D20PF29032                | C6D20PF29142                | C6D20PF29022                 |
| 22                                        | 3.717<br>94.41  | 3.596<br>91.34  | 3.276<br>83.21  | C6D22PF29032                | C6D22PF29142                | C6D22PF29022                 |
| 25                                        | 4.185<br>106.30 | 4.064<br>103.23 | 3.744<br>95.10  | C6D25PF29032                | C6D25PF29142                | C6D25PF29022                 |
| 28                                        | 4.653<br>118.19 | 4.532<br>115.11 | 4.212<br>106.98 | C6D28PF29032                | C6D28PF29142                | C6D28PF29022                 |
| 30                                        | 4.965<br>126.11 | 4.844<br>123.04 | 4.524<br>114.91 | C6D30PF29032                | C6D30PF29142                | C6D30PF29022                 |
| 31                                        | 5.121<br>130.07 | 5.000<br>127.00 | 4.680<br>118.87 | C6D31PF29032                | C6D31PF29142                | C6D31PF29022                 |
| 35                                        | 5.745<br>145.92 | 5.624<br>142.85 | 5.304<br>134.72 | C6D35PF29032                | C6D35PF29142                | C6D35PF29022                 |
| 36                                        | 5.901<br>149.89 | 5.780<br>146.81 | 5.460<br>138.68 | C6D36PF29032                | C6D36PF29142                | C6D36PF29022                 |
| 40                                        | 6.525<br>165.74 | 6.404<br>162.66 | 6.085<br>154.56 | C6D40PF29032                | C6D40PF29142                | C6D40PF29022                 |
| 43                                        | 6.993<br>177.62 | 6.872<br>174.55 | 6.552<br>166.42 | C6D43PF29032                | C6D43PF29142                | C6D43PF29022                 |
| <b>.180 [4.57] Tail Length (DIM "J")</b>  |                 |                 |                 |                             |                             |                              |
| 6                                         | 1.221<br>31.01  | 1.100<br>27.94  | 0.780<br>19.81  | C6D06PF29033                | C6D06PF29143                | C6D06PF29023                 |
| 10                                        | 1.845<br>46.86  | 1.724<br>43.79  | 1.404<br>35.66  | C6D10PF29033                | C6D10PF29143                | C6D10PF29023                 |
| 12                                        | 2.157<br>54.79  | 2.036<br>51.71  | 1.716<br>43.59  | C6D12PF29033                | C6D12PF29143                | C6D12PF29023                 |
| 15                                        | 2.625<br>66.68  | 2.504<br>63.60  | 2.184<br>55.47  | C6D15PF29033                | C6D15PF29143                | C6D15PF29023                 |
| 18                                        | 3.093<br>78.56  | 2.972<br>75.49  | 2.652<br>67.36  | C6D18PF29033                | C6D18PF29143                | C6D18PF29023                 |
| 20                                        | 3.405<br>86.49  | 3.284<br>83.41  | 2.964<br>75.29  | C6D20PF29033                | C6D20PF29143                | C6D20PF29023                 |
| 22                                        | 3.717<br>94.41  | 3.596<br>91.34  | 3.276<br>83.21  | C6D22PF29033                | C6D22PF29143                | C6D22PF29023                 |
| 25                                        | 4.185<br>106.30 | 4.064<br>103.23 | 3.744<br>95.10  | C6D25PF29033                | C6D25PF29143                | C6D25PF29023                 |
| 28                                        | 4.653<br>118.19 | 4.532<br>115.11 | 4.212<br>106.98 | C6D28PF29033                | C6D28PF29143                | C6D28PF29023                 |
| 30                                        | 4.965<br>126.11 | 4.844<br>123.04 | 4.524<br>114.91 | C6D30PF29033                | C6D30PF29143                | C6D30PF29023                 |
| 31                                        | 5.121<br>130.07 | 5.000<br>127.00 | 4.680<br>118.87 | C6D31PF29033                | C6D31PF29143                | C6D31PF29023                 |
| 35                                        | 5.745<br>145.92 | 5.624<br>142.85 | 5.304<br>134.72 | C6D35PF29033                | C6D35PF29143                | C6D35PF29023                 |
| 36                                        | 5.901<br>149.89 | 5.780<br>146.81 | 5.460<br>138.68 | C6D36PF29033                | C6D36PF29143                | C6D36PF29023                 |
| 40                                        | 6.525<br>165.74 | 6.404<br>162.66 | 6.085<br>154.56 | C6D40PF29033                | C6D40PF29143                | C6D40PF29023                 |
| 43                                        | 6.993<br>177.62 | 6.872<br>174.55 | 6.552<br>166.42 | C6D43PF29033                | C6D43PF29143                | C6D43PF29023                 |

**.156 x .200 [3.18 x 5.08] Centerline with Standoffs**

**Product Facts**

- **Recognized under the Component Program of Underwriters Laboratories Inc., File No. E60980**
- **Certified by Canadian Standards Association, File No. LR49571**



**Physical Properties:**

**Insulation Resistance**—

5000 megohms minimum.

**Contact Retention Into PCB**—5 lbs.

[356 N]

**Insertion/Withdrawal Force**—

8 oz./2 oz. [35.6 N/ 8.9 N] average contact pair using .0620 [1.57] steel blade.

**Insulator Body**—Glass filled thermoplastic, UL rating 94V-0

**Color**—Black

**Contacts**—High strength copper alloy.

**Contact Plating**—.000050 [0.00127] nickel underplate with .000030 [0.00076] gold in the mating area, tin/lead on tails, .000100 [0.00254] minimum

**Electrical Properties:**

**Operating Voltage**—1500 VDC (sea level)

**Current Rating**—3 Amperes

**Initial Contact Resistance**—10 milliohms

**Environmental Properties:**

**Operating Temperature**—-55°C to +125°C

**Temperature Cycling**—MIL-STD-202 method 107

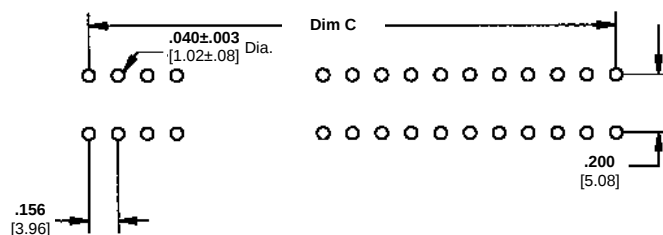
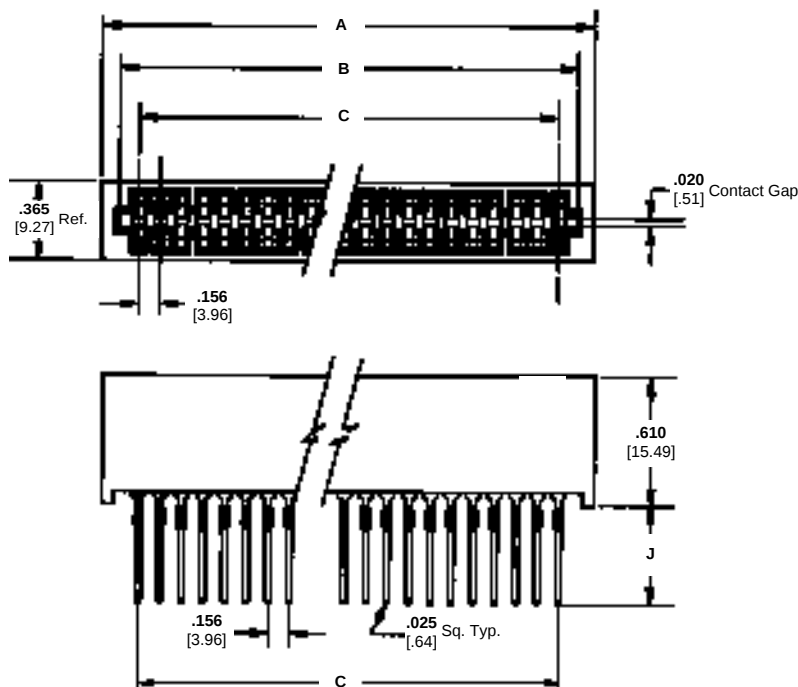
**Vibration**—MIL-STD-202, method 204

**Application Tooling:**

**Insertion Tool**—page 150

**Related Product Data:**

**Daughter Card Edge Pattern**—page 57



Note: Open ends and open/closed ends are available. Consult Tyco Electronics.

**Press-Fit  
Board-to-Board Connectors**

Ordering Information

.156 [3.18] Centerline/.200 [5.08] Row-to-Row with Standoffs

| No. of Dual<br>Readout Positions          | Dimensions      |                 |                 | Acquired Part Numbers       |                             |                              |
|-------------------------------------------|-----------------|-----------------|-----------------|-----------------------------|-----------------------------|------------------------------|
|                                           | A               | B               | C               | .300 [7.62] Card Slot Depth | .350 [8.89] Card Slot Depth | .415 [10.54] Card Slot Depth |
| <b>.670 [17.02] Tail Length (DIM "J")</b> |                 |                 |                 |                             |                             |                              |
| 6                                         | 1.221<br>31.01  | 1.100<br>27.94  | 0.780<br>19.81  | C6D06PF29012                | C6D06PF29132                | C6D06PF29042                 |
| 10                                        | 1.845<br>46.86  | 1.724<br>43.79  | 1.404<br>35.66  | C6D10PF29012                | C6D10PF29132                | C6D10PF29042                 |
| 12                                        | 2.157<br>54.79  | 2.036<br>51.71  | 1.716<br>43.59  | C6D12PF29012                | C6D12PF29132                | C6D12PF29042                 |
| 15                                        | 2.625<br>66.68  | 2.504<br>63.60  | 2.184<br>55.47  | C6D15PF29012                | C6D15PF29132                | C6D15PF29042                 |
| 18                                        | 3.093<br>78.56  | 2.972<br>75.49  | 2.652<br>67.36  | C6D18PF29012                | C6D18PF29132                | C6D18PF29042                 |
| 20                                        | 3.405<br>86.49  | 3.284<br>83.41  | 2.964<br>75.29  | C6D20PF29012                | C6D20PF29132                | C6D20PF29042                 |
| 22                                        | 3.717<br>94.41  | 3.596<br>91.34  | 3.276<br>83.21  | C6D22PF29012                | C6D22PF29132                | C6D22PF29042                 |
| 25                                        | 4.185<br>106.30 | 4.064<br>103.23 | 3.744<br>95.10  | C6D25PF29012                | C6D25PF29132                | C6D25PF29042                 |
| 28                                        | 4.653<br>118.19 | 4.532<br>115.11 | 4.212<br>106.98 | C6D28PF29012                | C6D28PF29132                | C6D28PF29042                 |
| 30                                        | 4.965<br>126.11 | 4.844<br>123.04 | 4.524<br>114.91 | C6D30PF29012                | C6D30PF29132                | C6D30PF29042                 |
| 31                                        | 5.121<br>130.07 | 5.000<br>127.00 | 4.680<br>118.87 | C6D31PF29012                | C6D31PF29132                | C6D31PF29042                 |
| 35                                        | 5.745<br>145.92 | 5.624<br>142.85 | 5.304<br>134.72 | C6D35PF29012                | C6D35PF29132                | C6D35PF29042                 |
| 36                                        | 5.901<br>149.89 | 5.780<br>146.81 | 5.460<br>138.68 | C6D36PF29012                | C6D36PF29132                | C6D36PF29042                 |
| 40                                        | 6.525<br>165.74 | 6.404<br>162.66 | 6.085<br>154.56 | C6D40PF29012                | C6D40PF29132                | C6D40PF29042                 |
| 43                                        | 6.993<br>177.62 | 6.872<br>174.55 | 6.552<br>166.42 | C6D43PF29012                | C6D43PF29132                | C6D43PF29042                 |
| <b>.180 [4.57] Tail Length (DIM "J")</b>  |                 |                 |                 |                             |                             |                              |
| 6                                         | 1.221<br>31.01  | 1.100<br>27.94  | 0.780<br>19.81  | C6D06PF29013                | C6D06PF29133                | C6D06PF29043                 |
| 10                                        | 1.845<br>46.86  | 1.724<br>43.79  | 1.404<br>35.66  | C6D10PF29013                | C6D10PF29133                | C6D10PF29043                 |
| 12                                        | 2.157<br>54.79  | 2.036<br>51.71  | 1.716<br>43.59  | C6D12PF29013                | C6D12PF29133                | C6D12PF29043                 |
| 15                                        | 2.625<br>66.68  | 2.504<br>63.60  | 2.184<br>55.47  | C6D15PF29013                | C6D15PF29133                | C6D15PF29043                 |
| 18                                        | 3.093<br>78.56  | 2.972<br>75.49  | 2.652<br>67.36  | C6D18PF29013                | C6D18PF29133                | C6D18PF29043                 |
| 20                                        | 3.405<br>86.49  | 3.284<br>83.41  | 2.964<br>75.29  | C6D20PF29013                | C6D20PF29133                | C6D20PF29043                 |
| 22                                        | 3.717<br>94.41  | 3.596<br>91.34  | 3.276<br>83.21  | C6D22PF29013                | C6D22PF29133                | C6D22PF29043                 |
| 25                                        | 4.185<br>106.30 | 4.064<br>103.23 | 3.744<br>95.10  | C6D25PF29013                | C6D25PF29133                | C6D25PF29043                 |
| 28                                        | 4.653<br>118.19 | 4.532<br>115.11 | 4.212<br>106.98 | C6D28PF29013                | C6D28PF29133                | C6D28PF29043                 |
| 30                                        | 4.965<br>126.11 | 4.844<br>123.04 | 4.524<br>114.91 | C6D30PF29013                | C6D30PF29133                | C6D30PF29043                 |
| 31                                        | 5.121<br>130.07 | 5.000<br>127.00 | 4.680<br>118.87 | C6D31PF29013                | C6D31PF29133                | C6D31PF29043                 |
| 35                                        | 5.745<br>145.92 | 5.624<br>142.85 | 5.304<br>134.72 | C6D35PF29013                | C6D35PF29133                | C6D35PF29043                 |
| 36                                        | 5.901<br>149.89 | 5.780<br>146.81 | 5.460<br>138.68 | C6D36PF29013                | C6D36PF29133                | C6D36PF29043                 |
| 40                                        | 6.525<br>165.74 | 6.404<br>162.66 | 6.085<br>154.56 | C6D40PF29013                | C6D40PF29133                | C6D40PF29043                 |
| 43                                        | 6.993<br>177.62 | 6.872<br>174.55 | 6.552<br>166.42 | C6D43PF29013                | C6D43PF29133                | C6D43PF29043                 |

Tyco Electronics offers a complete line of servo-electric driven presses for the application of press-fit connectors. Each system features a PC controlled servo electric drive for precise application and monitoring of force, speed, and press height. The entire process is data driven to provide flexible programming and automatic set-up. SPC analysis is provided for each connector pressed to assure the quality of every application.

**Press-Fit Application Tooling**
**BMEP 1K/2K Servo Electric Press**

- 1000 or 2000 lb force [4.5 or 9 kN]
- 12" [305 mm] throat depth
- Compact footprint – 16" x 24" [406 x 610 mm]
- Force resolution of approximately 1 lb [4.4 N] for delicate press applications.


**BMEP 3T/5T Benchtop Electric Servo Press**

- 3 or 5 tons force [27 or 44 kN]
- 18" x 24" [460 x 610 mm] PCB capacity
- Compact footprint – 24" x 48" [610 x 1220 mm]
- Midrange force and board size capacity in a benchtop unit.


**MEP 6T/12 T Manual Electric Servo Press**

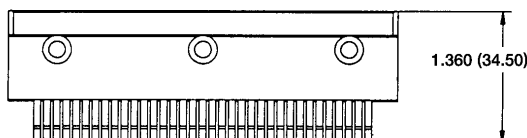
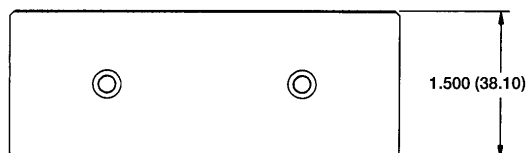
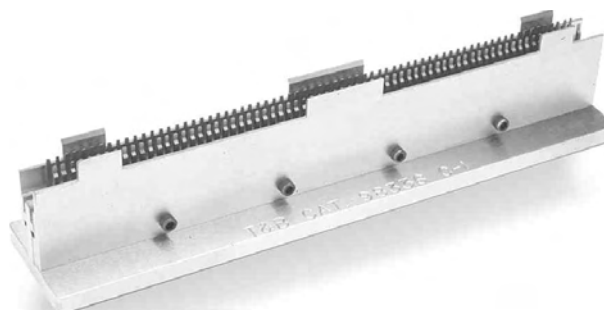
- 6 or 12 tons force [53 or 107 kN]
- 24" x 36" [610 x 914 mm] PCB capacity
- Self-contained, portable unit
- Compact, manual unit capable of handling large boards and high force applications.


**Automatic Pick, Place and Press (AP3)**

- 8 tons force [71 kN]
- 18" x 30" [457 x 762 mm] PCB capacity
- SMEMA compatible unit for automatic pick, place and press of connectors and odd-from components.
- Vision system for pin inspection prior to placement.



## Press-Fit Card Edge Insertion Tools

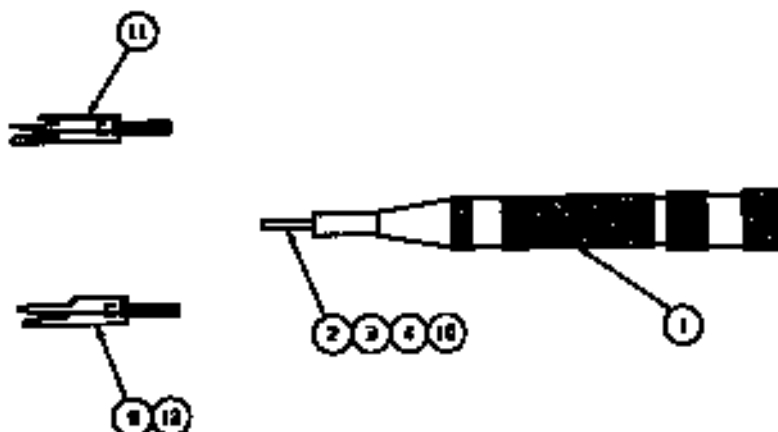


## Ordering Information

| Center-to-Center                           | Connector Prefix | Max. No. Of Positions | Tool Part Number |             | Replacement Blade Part Number |           |
|--------------------------------------------|------------------|-----------------------|------------------|-------------|-------------------------------|-----------|
|                                            |                  |                       | Acquired P/N     | TYCO        | Acquired P/N                  | Tyco      |
| .100 x .100<br>2.54 x 2.54                 | C1               | 70                    | 98336            | 3-1437266-5 | 98293                         | 1437274-1 |
| .100 x .100<br>2.54 x 2.54                 | C1               | 100                   | 98341            | —           | 98293                         | 1437274-1 |
| .156 x .200<br>3.96 x 5.08                 | C6               | 43                    | 98231            | 1-1437266-1 | 98206                         | 1437266-8 |
| .125 x .250<br>3.18 x 6.35                 | C7               | 50                    | 98230            | 1-1437266-0 | 98206                         | 1437266-8 |
| .100 x .200<br>2.54 x 5.08                 | C8               | 70                    | 98224            | 1437266-9   | 98206                         | 1437266-8 |
| .100 x .200<br>2.54 x 5.08<br>(Full Scoop) | W8               | 70                    | 98236            | 1490560-1   | 98238                         | 1490563-1 |
| .100 x .200<br>2.54 x 5.08<br>(Full Scoop) | W8               | 35                    | 98236            | 1490560-2   | 98238                         | 1490563-1 |

### Description

Removal tool kits include:  
impact tools, removal tips  
for tail lengths ranging from  
.180 in. [4.57] to .680 in.  
[17.27] Kits for .100" x .200"  
[2.54 x 5.08] Series Card  
Edge connectors include  
the insertion tip.



### Ordering Information

| Center x Row                                  | Prefix | Acquired Kit Number | Tyco Kit Number |
|-----------------------------------------------|--------|---------------------|-----------------|
| .156 x .200<br>3.96 x 5.08                    | C6     | 9818002             | 1437266-3       |
| .125 x .250<br>3.18 x 6.35                    | C7     | 9818002             | 1437266-3       |
| .100 x .200<br>2.54 x 5.08                    | C8     | 9818002             | 1437266-3       |
| .100 x .100<br>2.54 x 2.54                    | C1     | 9818004             | 1437266-4       |
| .100 x .200<br>2.54 x 5.08<br>Wide Full Scoop | W8     | 9818005             | 1437266-5       |

### Ordering Information

| Item No. | Description                                 | Applies to Kit No. |         |         |         |         | Replacement Part Number | Tyco Part Number |
|----------|---------------------------------------------|--------------------|---------|---------|---------|---------|-------------------------|------------------|
|          |                                             | 9818001            | 9818001 | 9818003 | 9818004 | 9818005 |                         |                  |
| 1        | Impact Tool                                 | ÷                  | ÷       | ÷       | ÷       | ÷       | 9820401                 | 1437266-7        |
| 2        | Removal Tip - .180 [4.57] Tail              | ÷                  | ÷       | ÷       | ÷       | ÷       | 9820301                 | 1437266-6        |
| 3        | Removal Tip - .378/.475 Tail<br>9.60/12.07  |                    | ÷       | ÷       | ÷       | ÷       | 9820302                 | 1437260-4        |
| 4        | Removal Tip - .670/.680 Tail<br>17.02/17.27 |                    | ÷       | ÷       | ÷       | ÷       | 9820303                 | —                |
| 6        | Insertion Tip - C6, 7 & 8 PF                |                    | ÷       |         |         |         | 9836701                 | 3-1437266-9      |
| 10       | Removal Tip - .550/.625 Tail<br>13.97/15.88 |                    | ÷       |         |         |         | 9820305                 | 1437260-5        |
| 11       | Insertion Tip - C1 Series PF                |                    |         |         | ÷       |         | 9836301                 | 1437260-6        |
| 12       | Insertion Tip - W8 Series PF                |                    |         |         |         | ÷       | 9836702                 | 1437260-7        |

## Wire-to-Board Connectors

Except for DUO-TYNE flag connectors, which are exclusively for wire-to-board application, the connectors presented in this section are primarily wire-to-board connectors, but do have some board-to-board capabilities. These connectors are available in a wide range of styles to suit almost any wire-to-board application. This versatile connector family features snap-in contacts of various configurations including crimp, post, eyelet and solder types.

Wire-to-board crimp, snap-in contacts are easily inserted into the connector housing and are furnished in reel-fed strip form for automatic machine application and loose piece for hand tool termination. The Wire-to-Board Printed Circuit Board Connector family includes:

### Crimp Snap Twin Leaf Connectors

(Pages 154-163)

These connectors are designed for high density wire-to-board applications and feature bifurcated, crimp and solder eyelet contacts on .100 [2.54] and .125 [3.18] centers. Design flexibility allows the customer to save by purchasing only enough contacts for his circuit design requirements. Contact styles include crimp, solder eyelet and vertical and right-angle posts, in a variety of sizes.

### AMP-LEAF Connectors

(Pages 164-172)

These connectors are for single- or double-sided printed circuit boards. Snap-in contacts lock in place on .156 [3.96] centers, maintaining constant pressure on circuit paths. Contact options are available for precision crimped terminations and solder dip applications.

### High Current Connectors

(Pages 173-176)

Designed for a current capability of up to 30 amperes, these connectors are an economical answer to the costly problem of interconnecting high current printed circuitry. Styles are available for wire-to-board and board-to-board applications. Contacts are on .312 [7.92] centers.

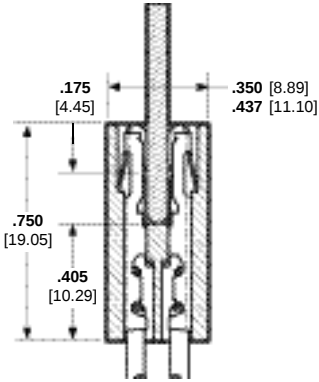
### DUO-TYNE Flag Connectors

(Pages 177-180)

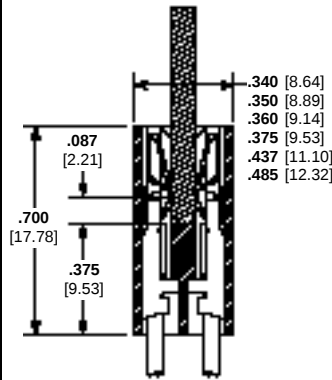
These economical connectors are designed to meet the quality and reliability requirements of industries such as appliance controls, vending machine subassemblies, television, stereo, business machines and other areas with similar control needs. The right-angle design of the connector permits close-quarter cabling. Contacts are doubly locked in when a PC board is inserted.

**Wire-to-Board Connector Selection Guide**

**Crimp Snap  
Twin Leaf Connectors  
(Pages 154-163)**



**AMP-LEAF  
Connectors  
(Pages 164-172)**



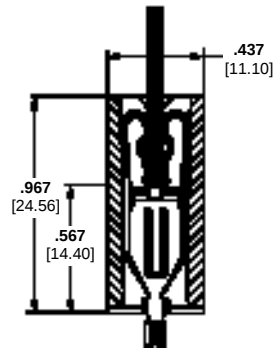
**Centerlines**

|             |   |   |
|-------------|---|---|
| .100 [2.54] | X |   |
| .125 [3.18] | X |   |
| .156 [3.96] | X | X |
| .197 [5.00] |   |   |
| .260 [6.60] |   |   |
| .312 [7.92] |   |   |

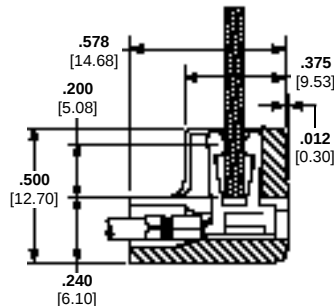
**Styles**

|                  |   |   |
|------------------|---|---|
| Crimp            | X | X |
| Right-Angle Post | X | X |
| Wrap-Type Post   | X | X |
| Solder Eyelet    | X | X |
| Solder Tail      | X | X |
| Double Sided     | X | X |
| Single Sided     | X | X |

**High Current  
Connectors  
(Pages 173-176)**



**DUO-TYNE Flag  
Connectors  
(Pages 177-180)**



**Centerlines**

|             |   |   |
|-------------|---|---|
| .100 [2.54] |   |   |
| .125 [3.18] |   |   |
| .156 [3.96] |   | X |
| .197 [5.00] |   |   |
| .260 [6.60] |   |   |
| .312 [7.92] | X |   |

**Styles**

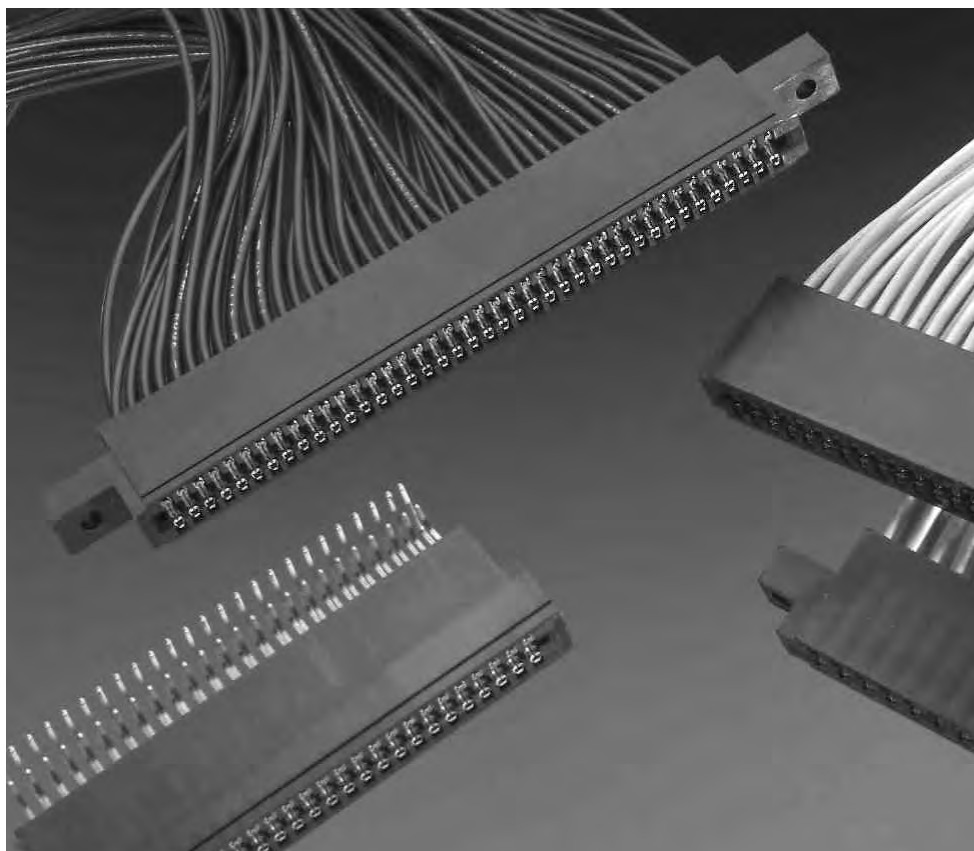
|                  |   |    |
|------------------|---|----|
| Crimp            | X | X  |
| Right-Angle Post |   |    |
| Wrap-Type Post   |   |    |
| Solder Eyelet    |   |    |
| Solder Tail      | X |    |
| Double Sided     | X | X* |
| Single Sided     |   |    |

\*Double-sided board; single readout.

## Crimp Snap Twin Leaf Connectors

### Product Facts

- Crimp snap-in, solder eye-let, .025 [0.64] square posted and right angle contacts on .100 [2.54], .125 [3.18] or .156 [3.96] centers
- Customer buys only enough contacts to meet circuit and retention requirements
- Contacts bifurcated for redundancy
- Single leaf version available for higher contact normal forces
- Low insertion forces
- Accommodates AWG 16-28 [1.4-0.08 mm<sup>2</sup>] wire range and insulation diameters .035-.105 [0.89-2.67]
- Large variety of connector sizes
- Cavity identification on face of card slot and wire entry
- High speed automatic machine terminations provide uniform reliability at lowest applied cost
- Recognized under the Component Program of Underwriters Laboratories Inc. File No. E28476
- Certified by Canadian Standards Association File No. LR 7189



The Crimp Snap Twin Leaf Connector is designed especially for high density wire-to-board applications. Termination styles include crimp, solder, posted and right angle, in a variety of sizes.

Design flexibility allows the customer to save by purchasing only enough contacts for the circuit requirements. Easy replaceability of each contact cuts repair cost in the event of contact or wire damage.

### Performance Specifications

**Contact Rating\*:** 5 amperes, continuous 3 amperes, max. (for .025 [0.64] posted contacts)

**Contact Resistance:** 10 milliohms, max.

**Insulation Resistance:** 5000 megohms (initial)  
1000 megohms

**Voltage Rating:**  
.100 [2.54] Centerline-1000 Vrms  
.125 [3.18] Centerline-1500 Vrms  
.156 [3.96] Centerline-1800 Vrms

**Insertion Force (per pair):** Twin Leaf-10 oz. [2.78 N], max.; 7.6 oz. [2.11 N], avg. Non-Bifurcated Contacts-20 oz. [5.57 N], max.

**Extraction Force (per pair):** Twin Leaf-0.7 oz. [0.195 N], min.; 1.2 oz. [0.334 N], avg.

**Operating Temperature:** -55°C to +105°C

\*Consult Tyco Electronics engineering when paralleling contacts for power applications.



**Crimp Snap Twin Leaf Connectors** (Continued)

**Snap-In Solder Eyelet Contacts**

**Material and Finish:**

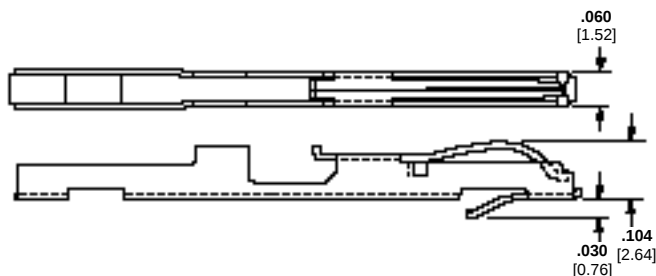
Phosphor bronze, plated .000030 [0.00076] nickel on entire contact, with the addition of one of the following platings:

**Plating A**—.000030 [0.00076] gold in mating area

**Plating B**—.000015 [0.00038] gold in mating area

Solder eyelet portion is tin plated.

**Note:** Tin plating of entire contact is available upon request.



**Related Product Data:**

**Performance Specifications**—page 154

**Connector Housings**—pages 157, 159, 161

| Connector Centerline | Contact Finish (Plating) | Part Numbers         |
|----------------------|--------------------------|----------------------|
| .100<br>2.54         | A<br>B                   | 583854-3<br>583854-5 |
| .125<br>3.18         | A                        | 530245-3             |

**Technical Documents**

(pages 186, 187):

Product Specification  
108-9031

Application Specification  
114-9004

Instruction Sheets 408-7527,  
408-7529

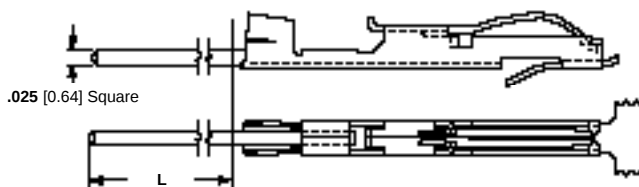
**Snap-In Wrap Post Contacts**

**Material and Finish:**

**Contact**—Phosphor bronze, plated .000015 [0.00038] gold in mating area, with entire contact underplated .000030 [0.00076] nickel

**Post**—Phosphor bronze, tin-plated

**Note:** Tin plated contacts are available upon request.



| Connector Centerline Spacing | Dimension L   | Part Numbers |
|------------------------------|---------------|--------------|
| .100<br>2.54                 | .451<br>11.46 | 583879-1     |
|                              | .535<br>13.59 | 583879-4     |
| .125<br>3.18                 | .525<br>13.34 | 583884-1     |
| .156<br>3.96                 | .525<br>13.34 | 583884-1     |

**Related Product Data:**

**Performance Specifications**—page 154

**Connector Housings**—pages 157, 159, 161

**Technical Documents:**

(pages 186, 187):

Product Specification  
108-9031

Application Specification  
114-9004

Instruction Sheets 408-7527,  
408-7529

Hand



Contact Extraction Tool



# Crimp Snap Twin Leaf Connectors, .100 [2.54] Centerline

## Housings

**Material:** Black glass-filled polyester,  
94V-0 rated

### Related Product Data:

**Performance Specifications**—  
page 154

**Contacts**—pages 155, 156

**Accessories**—page 162\*

**PCB Edge Pattern**—page 163

### Technical Documents:

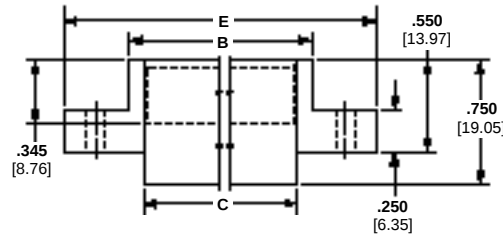
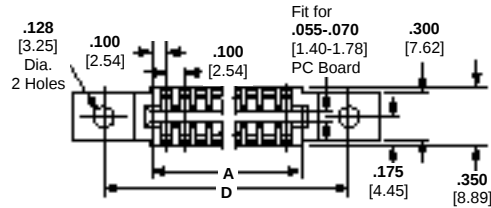
(pages 186, 187):

Product Specification  
108-9031

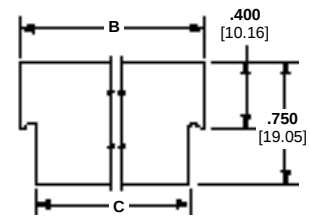
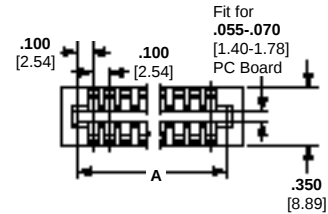
Application Specification  
114-9004

Instruction Sheet 408-7527

## With Mounting Ears



## Without Mounting Ears



| No. of<br>Dual<br>Positions | Dimensions |        |        |        |        | Part Numbers             |                       |
|-----------------------------|------------|--------|--------|--------|--------|--------------------------|-----------------------|
|                             | A          | B      | C      | D      | E      | Without<br>Mounting Ears | With<br>Mounting Ears |
| 6                           | .700       | .900   | .720   | —      | —      | 2-583717-1               | —                     |
|                             | 17.78      | 22.86  | 18.29  | 1.175  | 1.430  | —                        | 583861-5              |
| 7                           | .800       | 1.000  | .820   | —      | —      | 2-583717-3               | —                     |
|                             | 20.32      | 25.4   | 20.83  | —      | —      | —                        | —                     |
| 8                           | .900       | 1.100  | .920   | —      | —      | 3-583717-9               | —                     |
|                             | 22.86      | 27.94  | 23.36  | —      | —      | —                        | —                     |
| 10                          | 1.100      | 1.300  | 1.120  | 1.700  | 2.100  | 583717-1                 | 583718-1              |
|                             | 27.94      | 33.02  | 28.49  | 43.18  | 53.34  | —                        | 583861-7              |
| 13                          | 1.200      | 1.400  | 1.600  | —      | —      | 3-583717-3               | —                     |
|                             | 30.48      | 35.56  | 40.64  | —      | —      | —                        | —                     |
| 14                          | 1.500      | 1.700  | 1.520  | —      | —      | 2-583717-7               | —                     |
|                             | 38.1       | 43.16  | 38.61  | —      | —      | —                        | —                     |
| 15                          | 1.600      | 1.800  | 1.620  | 2.200  | 2.600  | 583717-3                 | 583718-3              |
|                             | 40.64      | 45.72  | 41.15  | 55.88  | 66.04  | —                        | 583861-9              |
| 17                          | 1.800      | 2.000  | 1.820  | 2.075  | 2.330  | 583717-5                 | 1-583861-1            |
|                             | 45.72      | 50.8   | 46.30  | 52.71  | 59.18  | —                        | —                     |
| 18                          | 1.900      | 2.100  | 1.920  | 2.400  | 2.800  | 583717-7                 | —                     |
|                             | 48.26      | 53.34  | 48.76  | 60.96  | 71.12  | —                        | —                     |
| 20                          | 2.100      | 2.300  | 2.120  | —      | —      | 3-583717-1               | —                     |
|                             | 53.34      | 58.42  | 53.84  | —      | —      | —                        | —                     |
| 22                          | 2.300      | 2.500  | 2.320  | 2.200  | 2.600  | 583717-9                 | 583718-9              |
|                             | 58.42      | 63.50  | 58.93  | 73.66  | 83.82  | —                        | —                     |
| 25                          | 2.600      | 2.800  | 2.620  | 3.200  | 3.600  | 1-583717-1               | 1-583718-1            |
|                             | 66.04      | 71.12  | 66.55  | 81.28  | 91.44  | —                        | —                     |
| 30                          | 3.100      | 3.300  | 3.120  | 3.700  | 4.100  | 1-583717-3               | 1-583718-3            |
|                             | 78.74      | 83.82  | 79.25  | 93.98  | 104.14 | —                        | 583861-1              |
| 32                          | 3.300      | 3.500  | 3.320  | 3.575  | 3.830  | —                        | 2-583718-7            |
|                             | 83.82      | 88.90  | 84.33  | 90.81  | 97.28  | —                        | —                     |
| 36                          | 3.700      | 3.900  | 3.720  | 3.900  | 4.300  | —                        | 2-583861-5            |
|                             | 93.98      | 93.06  | 94.49  | 99.06  | 109.22 | —                        | —                     |
| 40                          | 4.100      | 4.300  | 4.120  | 4.175  | 4.430  | —                        | 1-583718-5            |
|                             | 104.14     | 109.22 | 104.65 | 106.04 | 112.52 | —                        | 583861-3              |
| 50                          | 4.700      | 5.100  | 4.720  | 4.700  | 5.100  | 1-583717-9               | 1-583718-7            |
|                             | 119.38     | 129.54 | 119.68 | 119.38 | 129.54 | —                        | —                     |
|                             | 4.575      | 4.830  | 4.595  | 4.575  | 4.830  | —                        | 583861-3              |
|                             | 116.21     | 122.68 | 116.21 | 116.21 | 122.68 | —                        | —                     |
|                             | 5.700      | 6.100  | 5.720  | 5.700  | 6.100  | 1-583717-9               | 1-583718-7            |
|                             | 144.78     | 154.94 | 145.08 | 144.78 | 154.94 | —                        | —                     |
|                             | 5.575      | 5.830  | 5.595  | 5.575  | 5.830  | —                        | 2-583861-1            |
|                             | 141.61     | 148.08 | 141.61 | 141.61 | 148.08 | —                        | —                     |

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**Crimp Snap Twin Leaf Connectors, .100 [2.54] Centerline** (Continued)

**Housings Preloaded with Right-Angle Posts**

**Material and Finish:**

**Housing**—Black glass-filled polyester, 94V-0 rated

**Contacts**—Phosphor bronze, plated .000015 [0.00038] gold in mating area, with entire contact underplated .000030 [0.00076] nickel

**Posts**—Phosphor bronze, tin plated

**Related Product Data:**

**Performance Specifications**—page 154

**Accessories**—page 162\*

**PCB Edge Pattern and Hole Layout**—page 163

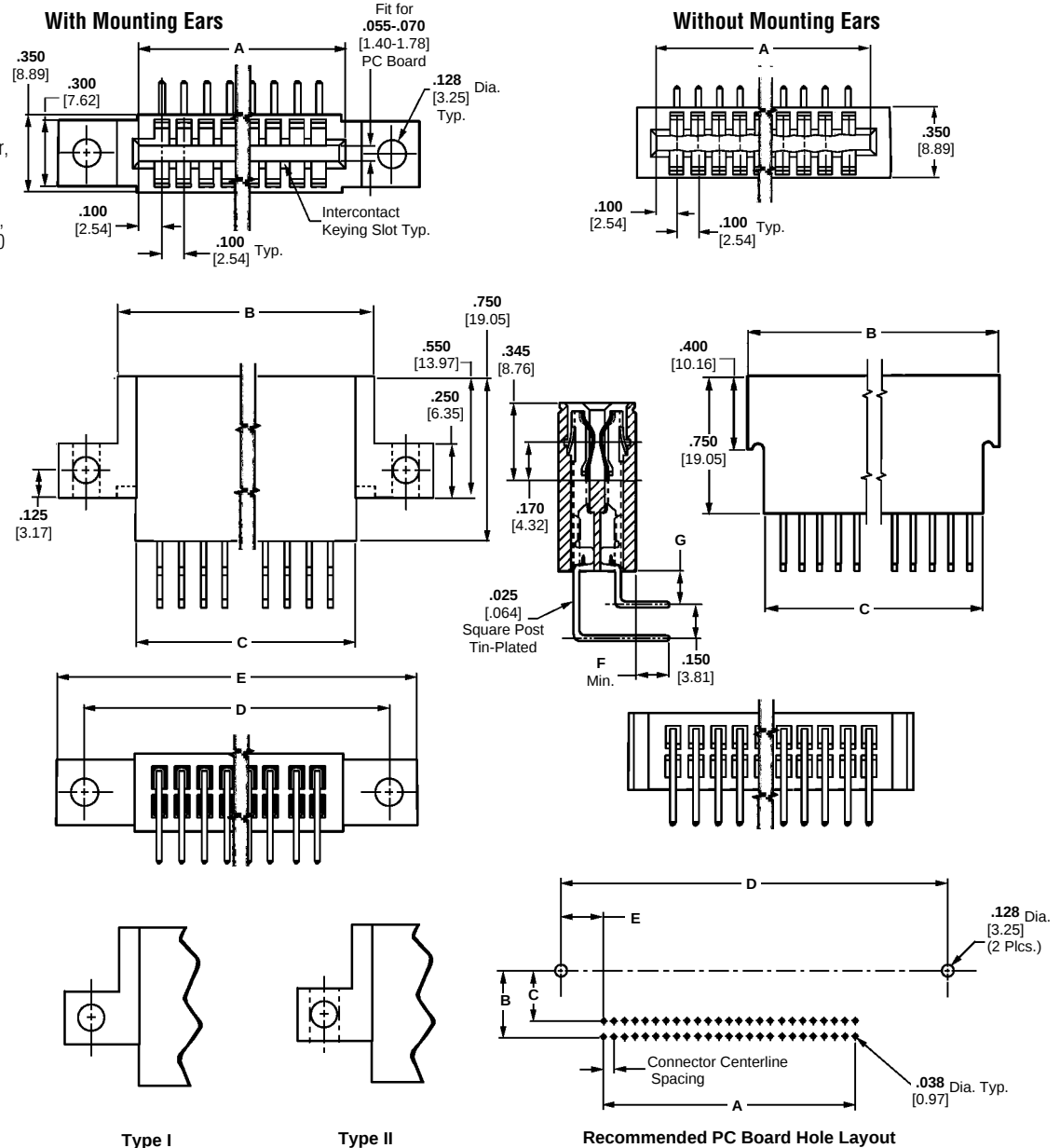
**Technical Documents:**

(pages 186, 187):

Product Specification  
108-9031

Application Specification  
114-9004

Instruction Sheet 408-7527



| No. of Dual Pos. | Dimensions      |                 |                 |                 |                 |              |              | Posted Assembly Part Numbers        |                                        |
|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|--------------|--------------|-------------------------------------|----------------------------------------|
|                  | A               | B               | C               | D               | E               | F            | G            | Right-Angle Post With Mounting Ears | Right-Angle Post Without Mounting Ears |
|                  | Type I          | Type II         |                 |                 |                 |              |              |                                     |                                        |
| 10               | 1.100<br>27.94  | 1.300<br>33.02  | 1.120<br>28.49  | 1.575<br>40.01  | 1.830<br>46.48  | —            | —            | 583900-5                            | —                                      |
| 17               | 1.800<br>45.72  | 2.000<br>50.80  | 1.820<br>46.23  | —               | —               | .090<br>2.29 | .150<br>3.81 | —                                   | 530218-5                               |
| 22               | 2.300<br>58.42  | 2.500<br>63.50  | 2.320<br>58.93  | 2.900<br>73.66  | 3.300<br>83.82  | .090<br>2.29 | .150<br>3.81 | 1-583900-3                          | 530218-9                               |
| 25               | 2.600<br>66.04  | 2.800<br>71.12  | 2.620<br>66.55  | 3.200<br>81.28  | 3.600<br>91.44  | .090<br>2.29 | .150<br>3.81 | 583900-1                            | 530218-1                               |
| 28               | 2.900<br>73.66  | 3.100<br>78.74  | 2.920<br>74.16  | 3.375<br>85.72  | 3.630<br>92.20  | .090<br>2.29 | .150<br>3.81 | 583900-6                            | —                                      |
| 30               | 3.100<br>78.74  | 3.200<br>81.28  | 3.120<br>79.25  | 3.700<br>93.98  | 4.100<br>104.14 | .090<br>2.29 | .150<br>3.81 | 583900-4                            | 530218-6                               |
| 50               | 5.100<br>129.54 | 5.300<br>134.62 | 5.120<br>130.05 | 5.575<br>141.61 | 5.830<br>148.08 | —            | —            | 583900-3                            | —                                      |

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

## Crimp Snap Twin Leaf Connectors, .125 [3.18] Centerline

### Housings

**Material:** Black glass-filled polyester  
94V-0 rated

#### Related Product Data:

**Performance Specifications**—  
page 154

**Contacts**—pages 155, 156

**Accessories**—page 162

**PCB Edge Pattern**—page 163

#### Technical Documents:

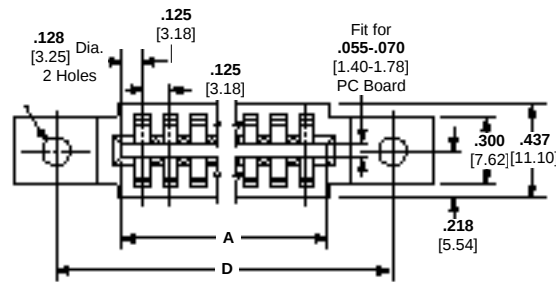
(pages 186, 187):

Product Specification  
108-9031

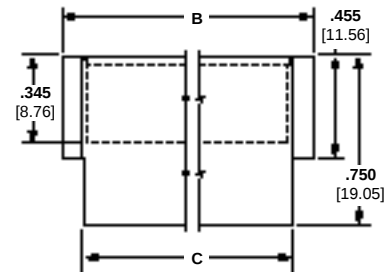
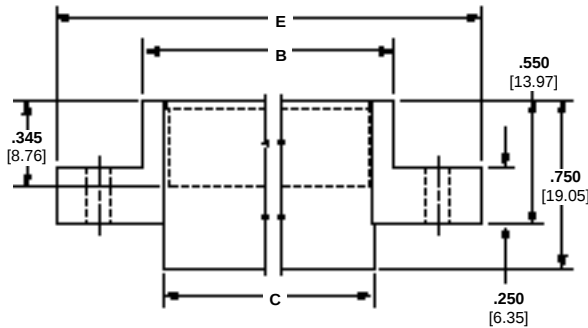
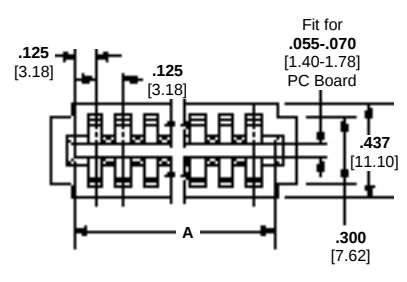
Application Specification  
114-9004

Instruction Sheet 408-7527

### With Mounting Ears



### Without Mounting Ears



| No. of<br>Dual<br>Positions | Dimensions      |                 |                 |                 |                 | Part Numbers             |                       |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|--------------------------|-----------------------|
|                             | A               | B               | C               | D               | E               | Without<br>Mounting Ears | With<br>Mounting Ears |
| 6                           | .875<br>22.23   | 1.035<br>26.29  | .845<br>21.46   | 1.295<br>32.89  | 1.555<br>39.50  | 583873-1                 | 583864-1              |
| 10                          | 1.375<br>34.93  | 1.535<br>38.99  | 1.345<br>34.16  | 1.795<br>45.59  | 2.055<br>52.20  | —                        | 583864-3              |
| 15                          | 2.000<br>50.80  | 2.160<br>54.86  | 1.970<br>50.04  | 2.420<br>61.47  | 2.680<br>68.07  | 583873-5                 | —                     |
| 22                          | 2.875<br>73.03  | 3.035<br>77.09  | 2.845<br>72.26  | 3.295<br>83.69  | 3.555<br>90.30  | 583873-9                 | 583864-9              |
| 25                          | 3.250<br>82.55  | 3.410<br>86.61  | 3.220<br>81.79  | 3.670<br>93.22  | 3.930<br>99.82  | —                        | —                     |
| 28                          | 3.625<br>92.08  | 3.785<br>96.14  | 3.595<br>91.31  | 4.045<br>102.74 | 4.305<br>109.35 | —                        | 1-583864-3            |
| 30                          | 3.875<br>98.43  | 4.035<br>102.49 | 3.845<br>97.66  | 4.295<br>109.09 | 4.555<br>115.70 | —                        | 2-583864-1            |
| 40                          | 5.125<br>130.17 | 5.285<br>134.23 | 5.095<br>129.41 | 5.545<br>140.84 | 5.805<br>147.44 | —                        | 1-583864-7            |
| 44                          | 5.625<br>142.88 | 5.785<br>146.94 | 5.595<br>142.11 | 6.045<br>153.54 | 6.305<br>160.15 | 1-583873-9               | —                     |

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**Crimp Snap Twin Leaf Connectors, .125 [3.18] Centerline** (Continued)

**Housings Preloaded with Right-Angle Posts**

**Material and Finish:**

**Housing**—Black glass-filled polyester, 94V-0 rated

**Contacts**—Phosphor bronze, plated .000030 [0.00076] gold in mating area, with entire contact underplated .000030 [0.00076] nickel

**Posts**—Phosphor bronze, tin-plated

**Related Product Data:**

**Performance Specifications**—page 154

**Accessories**—page 162

**PCB Edge Pattern and Hole Layout**—page 163

**Technical Documents:**

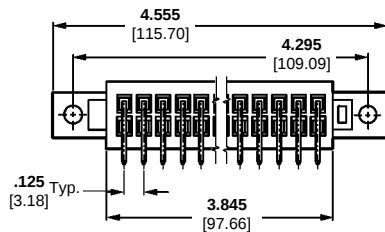
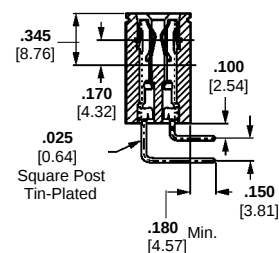
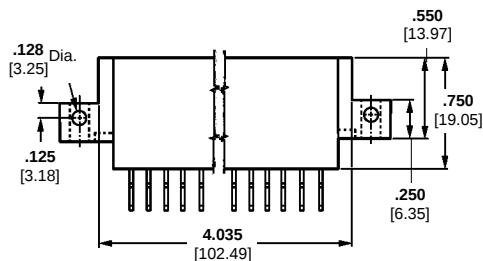
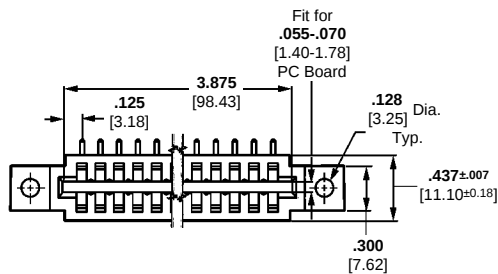
(pages 186, 187):

Product Specification  
108-9031

Application Specification  
114-9004

Instruction Sheet 408-7527

**With Mounting Ears**



**30 Dual Positions,  
Part No. 530238-8**

## Crimp Snap Twin Leaf Connectors, .156 [3.96] Centerline

### Housings

**Material:** Black glass-filled polyester, 94V-0 rated

#### Related Product Data:

**Performance Specifications**—page 154

**Contacts**—pages 155, 156

**Accessories**—page 162

**PCB Edge Pattern**—page 163

#### Technical Documents:

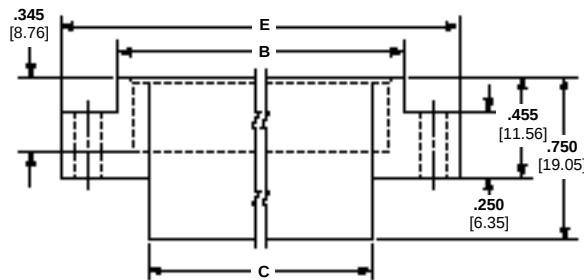
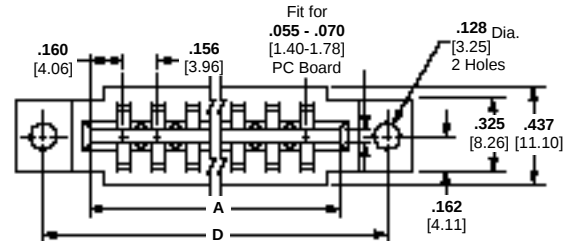
(pages 186, 187):

Product Specification  
108-9031

Application Specification  
114-9004

Instruction Sheet 408-7527

### With Mounting Ears



| No. of Dual Positions | Dimensions      |                 |                 |                 |                 | Part Numbers<br>Mounting Ears |
|-----------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------------------|
|                       | A               | B               | C               | D               | E               |                               |
| 6                     | 1.100<br>27.94  | 1.264<br>32.11  | .976<br>24.79   | 1.535<br>38.99  | 1.785<br>45.34  | 1-583859-3                    |
| 8                     | 1.412<br>35.86  | 1.576<br>40.03  | 1.288<br>32.72  | 1.847<br>46.91  | 2.097<br>53.26  | 2-583859-1                    |
| 10                    | 1.724<br>43.79  | 1.888<br>47.96  | 1.600<br>40.64  | 2.159<br>54.84  | 2.409<br>61.19  | 583859-9                      |
| 12                    | 2.036<br>51.71  | 2.200<br>55.88  | 1.912<br>48.56  | 2.471<br>62.76  | 2.721<br>69.11  | 1-583859-5                    |
| 15                    | 2.504<br>63.60  | 2.668<br>67.77  | 2.380<br>60.45  | 2.939<br>74.65  | 3.189<br>81.00  | 583859-7                      |
| 18                    | 2.972<br>75.49  | 3.136<br>79.55  | 2.848<br>72.34  | 3.407<br>86.54  | 3.657<br>92.89  | 583859-5                      |
| 22                    | 3.596<br>91.34  | 3.760<br>95.50  | 3.472<br>88.19  | 4.031<br>102.39 | 4.281<br>108.74 | 583859-3                      |
| 28                    | 4.532<br>115.11 | 4.696<br>119.28 | 4.408<br>111.96 | 4.967<br>126.16 | 5.217<br>132.51 | 583859-1                      |
| 36                    | 5.780<br>146.81 | 5.944<br>150.96 | 5.656<br>143.66 | 6.215<br>157.86 | 6.465<br>164.21 | 2-583859-3                    |

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

### Dummy Contacts

**Material:** Phosphor bronze

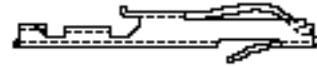
### Related Product Data:

The dummy contact is used in sparsely loaded housings to balance contact pressure. For specific recommendations, consult Tyco Electronics.

### Technical Documents

(pages 186, 187):

Instruction Sheet 408-7527



Tin Plated — **Part No. 583857-5**  
.000030 [0.00076] Nickel Plated — **Part No. 583857-6**  
Gold Flash-Over-Nickel Plate — **Part No. 583857-7**

### Retaining Spring

**Material:** Stainless steel

### Related Product Data:

Retaining springs are used for single sided PC board applications. Use one spring per 6 empty cavities.

### Technical Documents

(pages 186, 187):

Instruction Sheet 408-7527



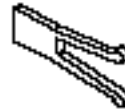
Unplated — **Part No. 583691-2**  
Gold Flash-Over-Nickel Plate — **Part No. 583691-3**

### Keying Plugs

### Technical Documents

(pages 186, 187):

Instruction Sheet 408-7527



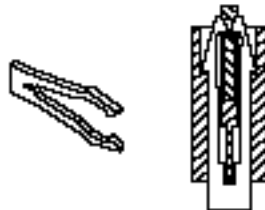
**On-Contact Plug**  
Natural Nylon — **Part No. 583764-1**



**Intercontact Plug**  
Natural Nylon — **Part No. 583274-1**  
Glass-Filled Polyester — **Part No. 583274-3**

### Locking Key

**Material:** Nylon



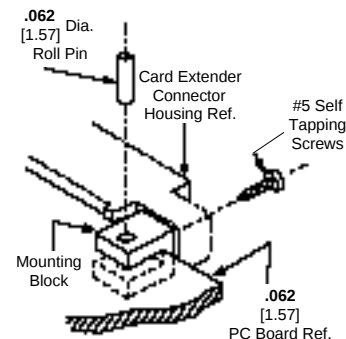
**On-Contact Clip**  
**Part No. 530213-1**

### Mounting Block

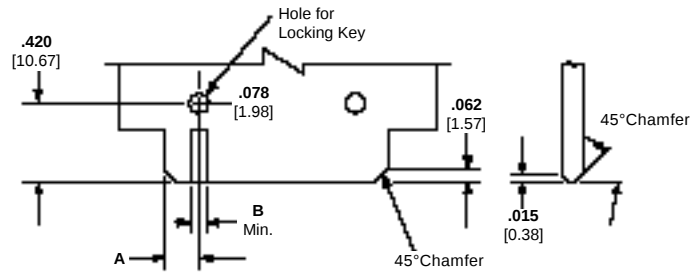
**Material:** Natural color nylon

### Kit Part No. 531250-4

Each kit includes 2 mounting blocks  
2 self tapping screws,  
#5 x .437 [11.10]  
2 roll pins  
.075 x .250 [1.57 x 6.35]

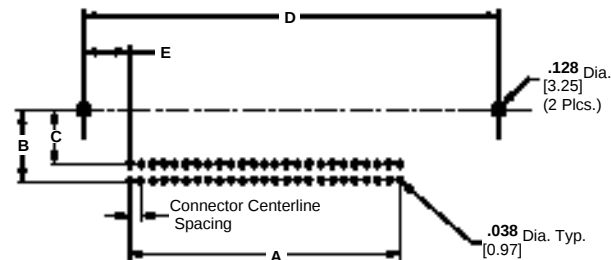


**Recommended PC Board  
Edge Pattern**



| Connector<br>Centerline<br>Spacing | Dimensions   |              |
|------------------------------------|--------------|--------------|
|                                    | A            | B            |
| .100<br>2.54                       | .093<br>2.36 | .052<br>1.32 |
| .125<br>3.18                       | .118<br>3.00 | .078<br>1.98 |
| .156<br>3.96                       | .153<br>3.89 | .094<br>2.39 |

**Recommended PC Board  
Hole Layout**



**Connector Centerline Spacing: .100 [2.54]**

| No. of<br>Dual<br>Positions | Dimensions      |               |               |                 |               |
|-----------------------------|-----------------|---------------|---------------|-----------------|---------------|
|                             | A               | B             | C             | D               | E             |
| 10                          | .900<br>22.86   | .625<br>15.88 | .475<br>12.07 | 1.575<br>40.01  | .400<br>10.16 |
| 17                          | 1.600<br>40.64  | —             | —             | —               | —             |
| 20                          | 1.900<br>48.26  | .625<br>15.88 | .375<br>9.53  | 2.575<br>65.41  | .337<br>8.56  |
| 22                          | 2.100<br>53.34  | .625<br>15.88 | 4.75<br>12.07 | 2.900<br>73.66  | .337<br>8.56  |
| 25                          | 2.400<br>60.96  | .625<br>15.88 | .475<br>12.07 | 3.200<br>81.28  | .400<br>10.16 |
| 30                          | 2.900<br>73.66  | —             | —             | 3.700<br>93.98  | .400<br>10.16 |
| 50                          | 4.900<br>124.46 | .525<br>13.34 | .375<br>9.53  | 5.575<br>141.61 | .337<br>8.56  |

**Connector Centerline Spacing: .125 [3.18]**

| No. of<br>Dual<br>Positions | Dimensions     |   |   |                 |              |
|-----------------------------|----------------|---|---|-----------------|--------------|
|                             | A              | B | C | D               | E            |
| 30                          | 3.625<br>92.08 | — | — | 4.295<br>109.09 | .350<br>8.89 |

**AMP-LEAF Connectors**
**Product Facts**

- Contacts on .156 [3.96] centers
- Glass-filled polyester, phenolic or diallyl phthalate housings
- Closed card entry design helps prevent overstressing of contacts
- Gold-over-nickel plated contacts
- Locking lance permits easy contact replacement
- Keying
- Contacts maintain exact pressures on the circuit paths, despite repeated insertions and extractions
- Recognized under the Component Program of Underwriters Laboratories Inc. File No. E28476 
- Certified by Canadian Standards Association\*\*, File No. LR 7189 

\*\*CSA certification pending for certain products, as noted.

**Performance Specifications**
**Contact Current Rating\*:**

5.0 amperes, max.

**Contact Engaging Force:**

16 oz. [4.4 N], max.

**Contact Separation Force:**

2 oz. [0.6 N], min.

**Vibration:**

MIL-STD-202, Method 201

**Operating Temperature:**

Contacts -40°C to +85°C

**Storage Temperature:**

-40°C to +85°C

**Housings:**

Glass-Filled Polyester, -55°C to +105°C

Glass-Filled Phenolic, -65°C to +125°C

Diallyl Phthalate, -65°C to +125°C

\*Consult Tyco Electronics engineering when paralleling contacts for power applications.



AMP-LEAF Connectors are available with crimp, snap-in contacts or preloaded with right-angle posted contacts.

The crimp type printed circuit connector is supplied with the housing unloaded—the user buys only enough contacts to satisfy circuit requirements. This feature, when coupled with the Tyco Electronics matched tooling, contributes substantially to lower installed costs.

Right-angle posted connectors are supplied in various sizes, with preloaded contacts on one or both sides.

The solder-type posts are formed 90° from the housing to permit right-angle interfacing between mother and daughter boards.

**AMP-LEAF Connectors** (Continued)

**Crimp, Snap-In Contacts**

**Material and Finish:**

Phosphor bronze, plated as follows:

**Plating A**—.000100-.000200  
[0.00254-0.00508] tin (lubricant must  
be used)

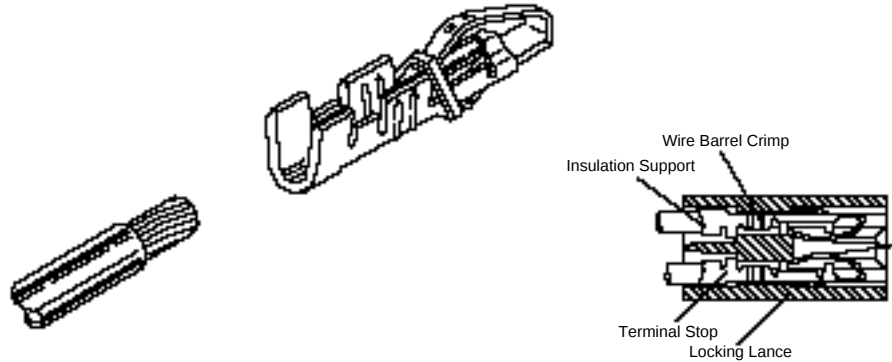
**Plating B**—.000030 [0.00076] min.  
gold in mating area, gold flash on  
remainder of contact, with entire contact  
underplated .000050 [0.00127] min.  
nickel

**Plating C**—.000015 [0.00038] min.  
gold in mating area, gold flash on  
remainder of contact, with entire contact  
underplated .000050 [0.00127] min.  
nickel

**Plating D**—.000030 [0.00076] min.  
gold over .000050 [0.00127] min. nickel  
in mating area, remainder of contact  
gold flash over .000015 [0.00038] min.  
nickel

**Plating E**—.000030 [0.00076] min.  
gold in mating area, with entire contact  
underplated .000050 [0.00127] min.  
nickel

**Plating F**—.000015 [0.00038] min.  
gold in mating area, with entire contact  
underplated .000050 [0.00127] min.  
nickel



| Wire<br>Range<br>AWG/mm <sup>2</sup> | Insulation Range              |                               | Contact<br>Part Numbers |               | Contact<br>Finish | Applicator for<br>AMP-O-LETRIC<br>Machine* | Hand<br>Tool                                             |
|--------------------------------------|-------------------------------|-------------------------------|-------------------------|---------------|-------------------|--------------------------------------------|----------------------------------------------------------|
|                                      | Single<br>Wire                | Double<br>Wire                | Loose<br>Piece          | Strip<br>Form |                   |                                            |                                                          |
| <b>26-22</b><br>0.12-0.4             | <b>.050-.064</b><br>1.27-1.63 | —                             | 583990-3                | 583204-2      | B                 | 466366-2                                   | 90028-3                                                  |
|                                      |                               |                               | —                       | 343371-1      | D                 |                                            |                                                          |
| <b>22-18</b><br>0.3-0.9              | <b>.055-.080</b><br>1.40-2.03 | <b>.120</b><br>3.05<br>Max.   | —                       | 583361-2      | A                 | 466367-2                                   | 90017-3 (1 #22-20)<br>90028-3 (2 #22)<br>90101-3 (1 #20) |
|                                      |                               |                               | 583989-3                | 583361-3      | B                 |                                            |                                                          |
|                                      |                               |                               | 583989-4                | 583361-4      | C                 |                                            |                                                          |
|                                      |                               |                               | —                       | 583555-4      | E                 |                                            |                                                          |
|                                      |                               |                               | —                       | 583555-6      | F                 |                                            |                                                          |
| <b>16</b><br>1.25-1.40               | <b>.108</b><br>2.74<br>Max.   | <b>.080-.160</b><br>2.03-4.06 | 583991-3                | 60151-6       | B                 | 466368-2                                   | 90031-8 (2 #18)<br>90101-3 (2 #20)<br>90101-3 (1 #16)    |

\*Applicators are for AMP-O-LETRIC Model "K" machines. Consult Tyco Electronics for applicators for other bench machines and lead-making machines.

**Notes:** 1. Shorting contacts are available, consult Tyco Electronics.  
2. Contacts and housings to accommodate .093 [2.36] thick PC boards can be made available, consult Tyco Electronics.

**Related Product Data:**

**Performance Specifications**—  
page 164

**Connector Housings**—  
pages 167-169

**Application Tooling**—  
pages 184, 185

**Technical Documents:**

(pages 186, 187):

Product Specifications  
108-9013, 108-9043

Application Specification  
114-9003

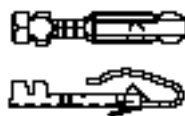
Instruction Sheets  
408-6591, 408-7045, 408-7622,  
408-7623, 408-7624, 408-7625,  
408-7626

Crimp Inspection Sheet  
CI 8050-33

**Dummy Contact**

**Material:**

Phosphor bronze



Plain Finish—  
**Part No. 66084-1**  
Tin Finish—  
**Part No. 66084-2**  
Gold Finish—  
**Part No. 66084-3**

**Hand Crimping Tool**



**Contact Extraction Tool**



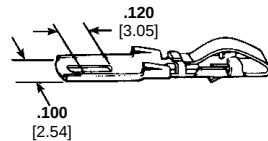
| Extraction<br>Tool<br>Number | Used with<br>Housings |
|------------------------------|-----------------------|
| 465195-1                     | 480110-2, -5          |
|                              | 480142-2, -3          |
|                              | 582140-5              |
|                              | 582147-5              |
|                              | 582264-2              |
|                              | 582500-2              |
|                              | 582963-2              |
|                              | 583167-3              |
|                              | 583280-1              |
|                              | 583617-1              |
|                              | 583680-1              |
|                              | 583685-1              |
|                              | 583722-1              |
|                              | 583723-1              |
|                              | 583724-1              |
| 465195-2                     | 583725-1              |
|                              | 583726-1              |
| 465195-2                     | 480133-2              |

**AMP-LEAF Connectors** (Continued)

**Solder Eyelet Contact**

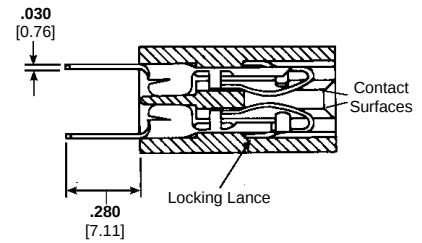
**Material and Finish:**

Phosphor bronze, plated .000015  
[0.00038] min. gold in contact area,  
gold flash on remainder of contact, with  
entire contact underplated .000050  
[0.00127] min. nickel



**Standard Eyelet Type Contact**  
Part No. 66067-5  
(For .055-.070 [1.4-1.78]  
Thick PC Boards)

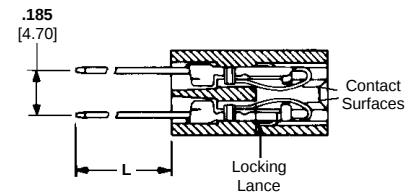
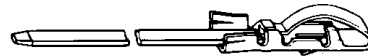
**Note:** Solder tab will accommodate a maximum of two 16 AWG [1.25-1.4 mm<sup>2</sup>] solid wires, or two 18 AWG [0.8-0.9 mm<sup>2</sup>] stranded wires.



**Post Type Contacts**

**Material and Finish:**

Phosphor bronze, plated .000015  
[0.00038] min. gold in contact area, tin  
on post, with entire contact underplated  
.000050 [0.00127] min. nickel



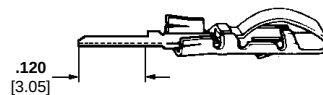
| Post Length<br>L | Loose Piece Contact Part No.<br>(.045 x .045<br>[1.14 x 1.14]<br>Post) |
|------------------|------------------------------------------------------------------------|
| .960<br>24.38    | 1-582355-3                                                             |
| .560<br>14.22    | 1-582355-5                                                             |

**Note:** Post type contacts are for .055-.070 [1.4-1.78] thick PC boards.

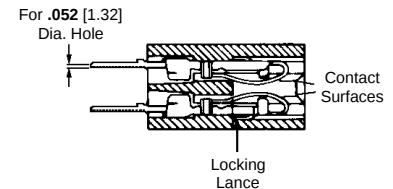
**Solder Dip Contacts**

**Material and Finish:**

Phosphor bronze, plated .000015  
[0.00038] min. gold in contact area or,  
plated .000030 [0.00076] min. gold in  
contact area, tin on post, with entire  
contact underplated .000050 [0.00127]  
min. nickel



**Solder Dip Contact**  
Part No. 583294-2 (.000015)  
Part No. 583294-1 (.000030)  
(For .062 [1.57]  
Thick PC Board)



**AMP-LEAF Connectors, .156 [3.96] Centerline**

**Glass-Filled Polyester Housings**

**Material:** Glass-filled polyester

**Related Product Data:**

**Card Guide Assembly**—page 171

**PC Board Thickness**—.055-.070  
[1.40-1.78]

**Performance Specifications**—  
page 164

**Contacts**—pages 165, 166

**Accessories**—page 171

**PC Board Layout**—page 172

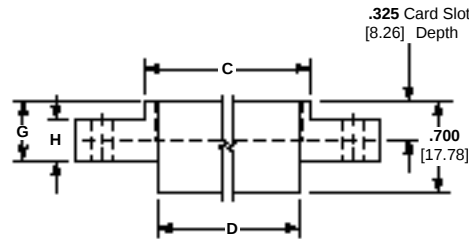
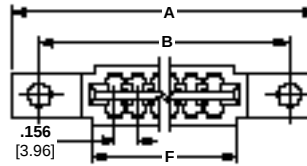
**Technical Documents:**

(pages 186, 187):

Product Specifications  
108-9013, 108-9043

Application Specification  
114-9003

Instruction Sheet 408-7037



| No. of<br>Dual<br>Positions | Dimensions      |                 |                 |                 |              |                 |               |              |              |               | Housing<br>Part<br>Numbers |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|--------------|-----------------|---------------|--------------|--------------|---------------|----------------------------|
|                             | A               | B               | C               | D               | E            | F               | G             | H            | J            | K             |                            |
| 6                           | 1.785<br>45.34  | 1.535<br>38.99  | 1.264<br>32.11  | .976<br>24.79   | .125<br>3.18 | 1.100<br>27.94  | .456<br>11.58 | .250<br>6.35 | .300<br>7.62 | .350<br>8.89  | 583722-1                   |
| 10                          | 2.409<br>61.19  | 2.159<br>54.84  | 1.888<br>47.96  | 1.600<br>40.64  | .125<br>3.18 | 1.724<br>43.79  | .456<br>11.58 | .250<br>6.35 | .300<br>7.62 | .350<br>8.89  | 583723-1                   |
| 12                          | 2.721<br>69.11  | 2.471<br>62.76  | 2.200<br>55.88  | 1.912<br>48.56  | .125<br>3.18 | 2.036<br>51.71  | .456<br>11.58 | .250<br>6.35 | .300<br>7.62 | .350<br>8.89  | 583724-1*                  |
| 15                          | 3.189<br>81.00  | 2.939<br>74.65  | 2.668<br>67.77  | 2.380<br>60.45  | .128<br>3.25 | 2.504<br>63.60  | .456<br>11.58 | .250<br>6.35 | .300<br>7.62 | .350<br>8.89  | 583680-1                   |
| 18                          | 3.657<br>92.89  | 3.407<br>86.54  | 3.136<br>79.65  | 2.848<br>72.34  | .125<br>3.18 | 2.972<br>75.49  | .456<br>11.58 | .250<br>6.35 | .300<br>7.62 | .350<br>8.89  | 583725-1                   |
| 18                          | 3.657<br>92.89  | 3.407<br>86.54  | 3.136<br>79.65  | 2.848<br>72.34  | .156<br>3.96 | 2.972<br>75.49  | .456<br>11.58 | .250<br>6.35 | .300<br>7.62 | .350<br>8.89  | 583725-3                   |
| 22                          | 4.281<br>108.74 | 4.031<br>102.39 | 3.760<br>95.50  | 3.472<br>88.19  | .125<br>3.18 | 3.596<br>91.34  | .456<br>11.58 | .250<br>6.35 | .300<br>7.62 | .350<br>8.89  | 583617-1                   |
| 22                          | 4.281<br>108.74 | 4.031<br>102.39 | 3.760<br>95.50  | 3.472<br>88.19  | .156<br>3.96 | 3.596<br>91.34  | .456<br>11.58 | .250<br>6.35 | .300<br>7.62 | .350<br>8.89  | 583617-3                   |
| 25                          | 4.749<br>120.62 | 4.499<br>114.27 | 4.228<br>107.39 | 3.940<br>100.01 | .125<br>3.18 | 4.064<br>103.23 | .456<br>11.58 | .250<br>6.35 | .300<br>7.62 | .350<br>8.89  | 583726-1                   |
| 30                          | 5.529<br>140.44 | 5.279<br>134.09 | 5.008<br>127.20 | 4.720<br>119.89 | .125<br>3.18 | 4.844<br>123.04 | .456<br>11.58 | .250<br>6.35 | .300<br>7.62 | .350<br>8.89  | 583685-1                   |
| 36                          | 7.015<br>178.18 | 6.578<br>167.08 | 5.942<br>150.92 | 5.722<br>145.33 | .156<br>3.96 | 5.782<br>146.86 | .455<br>11.55 | .290<br>7.36 | .325<br>8.25 | .437<br>11.10 | 583552-1                   |

\*CSA certification pending.

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**AMP-LEAF Connectors, .156 [3.96] Centerline** (Continued)

**Glass-Filled Phenolic Housings**

**Material:** Glass-filled phenolic  
per MIL-M-14F

**Related Product Data:**

**Card Guide Assembly**—page 171

**Performance Specifications**—  
page 164

**Contacts**—pages 165, 166

**Accessories**—page 171

**PC Board Layout**—page 172

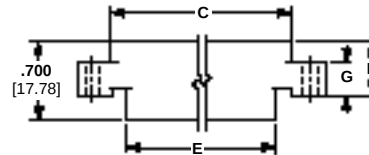
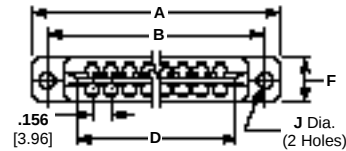
**Technical Documents:**

(pages 186, 187):

Product Specifications  
108-9013, 108-9043

Application Specification  
114-9003

Instruction Sheet 408-7037



| No. of<br>Dual<br>Positions | Dimensions |        |        |        |        |       |      |       |      | Board<br>Thickness | Housing<br>Part<br>Numbers |
|-----------------------------|------------|--------|--------|--------|--------|-------|------|-------|------|--------------------|----------------------------|
|                             | A          | B      | C      | D      | E      | F     | G    | H     | J    |                    |                            |
| 8                           | 1.982      | 1.767  | 1.550  | 1.410  | 1.288  | .340  | .250 | .458  | .125 | .055-.070          | 582140-5                   |
|                             | 50.34      | 44.88  | 39.37  | 35.81  | 32.72  | 8.64  | 6.35 | 11.63 | 3.18 | 1.40-1.78          |                            |
| 10                          | 2.407      | 2.157  | 1.866  | 1.722  | 1.598  | .360  | .250 | .456  | .128 | .055-.070          | 582963-2*                  |
|                             | 61.14      | 54.79  | 47.90  | 43.74  | 40.59  | 9.14  | 6.35 | 11.58 | 3.25 | 1.40-1.78          |                            |
| 10                          | —          | —      | 1.886  | 1.722  | 1.598  | .360  | —    | —     | —    | .055-.070          | 583280-1 <sup>1</sup>      |
|                             |            |        | 47.90  | 43.74  | 40.59  | 9.14  |      |       |      | 1.40-1.78          |                            |
| 15                          | 3.182      | 2.854  | 2.621  | 2.506  | 2.376  | .350  | .250 | .466  | .187 | .055-.070          | 480110-5                   |
|                             | 80.82      | 72.49  | 66.57  | 63.65  | 60.35  | 8.89  | 6.35 | 11.84 | 4.75 | 1.40-1.78          |                            |
| 15                          | 3.182      | 2.854  | 2.621  | 2.506  | 2.376  | .350  | .250 | .466  | .125 | .055-.070          | 1-582147-5*                |
|                             | 80.82      | 72.49  | 66.57  | 63.65  | 60.35  | 8.89  | 6.35 | 11.84 | 3.18 | 1.40-1.78          |                            |
| 15                          | 3.182      | 2.933  | 2.621  | 2.506  | 2.376  | .350  | .250 | .466  | .128 | .055-.070          | 582500-5                   |
|                             | 80.82      | 74.49  | 66.57  | 63.65  | 60.35  | 8.89  | 6.35 | 11.84 | 3.25 | 1.40-1.78          |                            |
| 18                          | 3.650      | 3.400  | 3.088  | 2.948  | 2.843  | .375  | .155 | .406  | .156 | .055-.070          | 480133-5                   |
|                             | 92.71      | 86.36  | 78.43  | 74.87  | 72.21  | 9.52  | 3.93 | 10.31 | 3.96 | 1.40-1.78          |                            |
| 22                          | 4.274      | 4.025  | 3.754  | 3.591  | 3.466  | .350  | .250 | .456  | .125 | .055-.070          | 480142-3                   |
|                             | 108.56     | 102.24 | 95.35  | 91.21  | 88.04  | 8.89  | 6.35 | 11.58 | 3.18 | 1.40-1.78          |                            |
| 25                          | 4.741      | 4.493  | 4.221  | 4.058  | 3.933  | .350  | .250 | .456  | .125 | .055-.070          | 583167-3*                  |
|                             | 120.42     | 114.12 | 107.21 | 103.07 | 99.90  | 8.89  | 6.35 | 11.58 | 3.18 | 1.40-1.78          |                            |
| 32                          | 6.365      | 5.928  | 5.292  | 5.132  | 5.072  | .485  | .290 | .455  | .187 | .084-.104          | 582264-2 <sup>2,3</sup>    |
|                             | 161.67     | 150.57 | 134.42 | 130.35 | 128.83 | 12.32 | 7.37 | 11.56 | 4.75 | 2.13-2.64          |                            |

\*CSA certification pending.

<sup>1</sup>Housing without mounting ears.

<sup>2</sup>Housing does not accommodate intercontact keying plug.

<sup>3</sup>For .086 to .104 [2.18 to 2.64] thick PC boards (special contacts required).

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**AMP-LEAF Connectors, .156 [3.96] Centerline** (Continued)

**Diallyl Phthalate Housings**

**Material:** Diallyl phthalate  
per MIL-M-14F

**Related Product Data:**

**Card Guide Assembly**—page 171

**Performance Specifications**—  
page 164

**Contacts**—pages 165, 166

**Accessories**—page 171

**PC Board Layout**—page 172

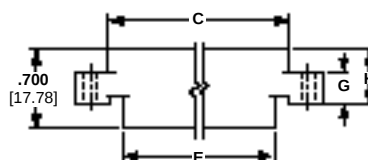
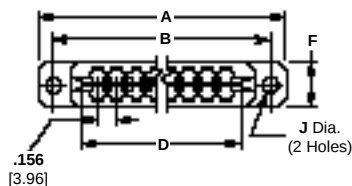
**Technical Documents:**

(pages 186, 187):

Product Specifications  
108-9013, 108-9043

Application Specification  
114-9003

Instruction Sheet 408-7037



Single Slot Housing

| No. of<br>Dual<br>Positions | Dimensions      |                 |                |                |                |              |              |               |              | Board<br>Thickness     | Housing<br>Part<br>Numbers |
|-----------------------------|-----------------|-----------------|----------------|----------------|----------------|--------------|--------------|---------------|--------------|------------------------|----------------------------|
|                             | A               | B               | C              | D              | E              | F            | G            | H             | J            |                        |                            |
| 15                          | 3.187<br>80.95  | 2.859<br>72.62  | 2.625<br>66.68 | 2.510<br>63.75 | 2.380<br>60.45 | .350<br>8.89 | .250<br>6.35 | .466<br>11.84 | .187<br>4.15 | .055-.070<br>1.40-1.78 | 480110-2                   |
| 15                          | 3.187<br>80.95  | 2.938<br>74.63  | 2.625<br>66.68 | 2.510<br>63.75 | 2.380<br>60.45 | .350<br>8.89 | .250<br>6.35 | .466<br>11.84 | .128<br>3.25 | .055-.070<br>1.40-1.78 | 582500-2                   |
| 18                          | 3.656<br>92.86  | 3.406<br>86.51  | 3.093<br>78.56 | 2.953<br>75.01 | 2.848<br>72.34 | .375<br>9.53 | .155<br>3.94 | .406<br>10.31 | .156<br>3.96 | .055-.070<br>1.40-1.78 | 480133-2                   |
| 22                          | 4.281<br>108.74 | 4.031<br>102.39 | 3.760<br>95.90 | 3.596<br>91.34 | 3.472<br>88.19 | .350<br>8.89 | .250<br>6.35 | .456<br>11.58 | .125<br>3.18 | .055-.070<br>1.40-1.78 | 480142-2                   |

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**AMP-LEAF Connectors, .156 [3.96] Centerline** (Continued)

**Housings Preloaded with Right-Angle Post Contacts**

**Material and Finish:**

**Housing**—See chart below

**Contacts**—Phosphor bronze, plated  
.000015 [0.00038] min. gold in mating  
area, with entire contact underplated  
.000050 [0.00127] min. nickel

**Post**—Phosphor bronze, tin plated

**Retaining Spring**—Stainless steel

**Related Product Data:**

**Card Guide Assembly**—page 171

**Performance Specifications**—  
page 164

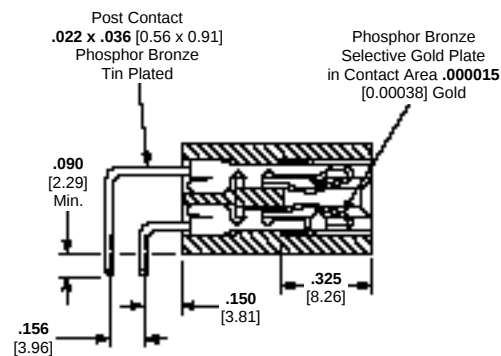
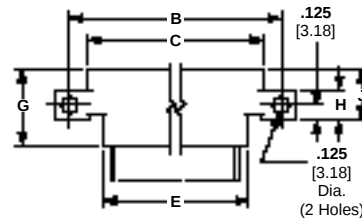
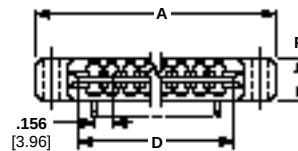
**Accessories**—page 171

**PC Board Layout**—page 172

**Technical Documents:**

(pages 186, 187):

Product Specification  
108-9013



| No. of Dual Positions | Dimensions |        |        |        |        |      |       |      |       | Part Numbers | Housing Material       |                        |
|-----------------------|------------|--------|--------|--------|--------|------|-------|------|-------|--------------|------------------------|------------------------|
|                       | A          | B      | C      | D      | E      | F    | G     | H    | J     |              |                        |                        |
| 10                    | 2.407      | 2.157  | 1.886  | 1.722  | 1.598  | .360 | .700  | .250 | .456  | 583599-1*    | Glass-Filled Phenolic  |                        |
|                       | 61.14      | 54.79  | 47.9   | 43.74  | 40.59  | 9.14 | 17.78 | 6.35 | 11.58 |              |                        |                        |
| 15                    | 3.182      | 2.933  | 2.621  | 2.506  | 2.376  | .350 | .700  | .250 | .466  | 583545-1*    |                        |                        |
|                       | 80.82      | 74.5   | 66.57  | 63.65  | 60.35  | 8.89 | 17.78 | 6.35 | 11.84 |              |                        |                        |
| 18                    | 3.650      | 3.400  | 3.088  | 2.948  | 2.843  | .375 | .700  | .250 | .406  | 583544-1*    |                        |                        |
|                       | 92.71      | 86.36  | 78.44  | 74.88  | 72.21  | 9.53 | 17.78 | 6.35 | 10.31 |              |                        |                        |
| 22                    | 3.657      | 3.457  | 3.136  | 2.972  | 2.848  | .350 | .700  | .250 | .456  | 530851-1     |                        | Glass-Filled Polyester |
|                       | 92.89      | 86.54  | 79.65  | 75.49  | 72.34  | 8.89 | 17.78 | 6.35 | 11.58 |              |                        |                        |
| 28                    | 4.274      | 4.025  | 3.754  | 3.591  | 3.466  | .350 | .700  | .250 | .456  | 583458-2*    | Glass-Filled Phenolic  |                        |
|                       | 108.56     | 102.24 | 95.35  | 91.21  | 88.04  | 8.89 | 17.78 | 6.35 | 11.58 |              |                        |                        |
| 32                    | 4.281      | 4.031  | 3.760  | 3.596  | 3.472  | .350 | .700  | .250 | .456  | 583975-1*    | Glass-Filled Polyester |                        |
|                       | 108.74     | 102.39 | 95.50  | 91.34  | 88.19  | 8.89 | 17.78 | 6.35 | 11.58 |              |                        |                        |
| 36                    | 5.270      | 4.961  | 4.680  | 4.527  | 4.402  | .350 | .700  | .250 | .456  | 530061-1*    | Glass-Filled Phenolic  |                        |
|                       | 133.86     | 126.01 | 118.87 | 114.99 | 111.81 | 8.89 | 17.78 | 6.35 | 11.58 |              |                        |                        |

\*CSA certification pending.

**Notes:** 1. Other connector sizes can be made available, consult Tyco Electronics.  
2. Finished hole size is .048-.054 [1.22-1.37] diameter.

**AMP-LEAF Connector Accessories**

**Keying Plugs**

**Material:** Nylon

**Technical Documents:**

(pages 186, 187):

Instruction Sheets 408-7036,  
408-7037, 408-7068, 408-7339

**Commoning Springs**

**Material and Finish:**

Beryllium copper, gold plated

**Technical Documents:**

(pages 186, 187):

Instruction Sheet 408-7419

**Retaining Springs**

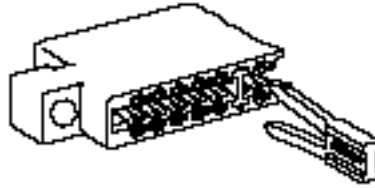
**Material:** Stainless steel

**Technical Documents:**

(pages 186, 187):

Instruction Sheets 408-7035,  
408-7037

**On-Contact Keying Plug**

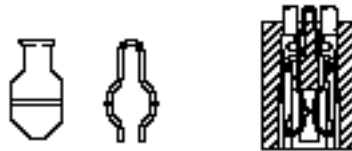


.055-.070 [1.4-1.78] Board Thickness—**Part No. 480143-1**

**Intercontact Keying Plugs**



.040 [1.02] Wide—**Part No. 582501-1**  
.025 [0.64] Wide—**Part No. 583274-1**



.055-.070 [1.4-1.78] thk. PC  
board—**Part No. 66092-1**

.055-.070 [1.4-1.78] and  
.084-.104 [2.13-2.64] thk. PC  
board with locking latches—  
**Part No. 583454-1**



Nickel Finish—**Part No. 42973-1**  
Plain Finish—**Part No. 42973-2**  
Gold Finish—**Part No. 42973-3**

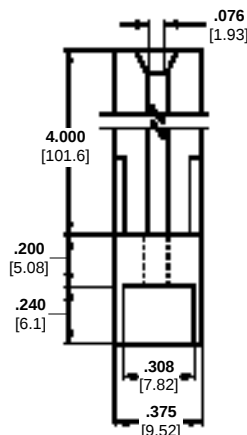
**Card Guides**

**Material:** Glass-filled nylon, black

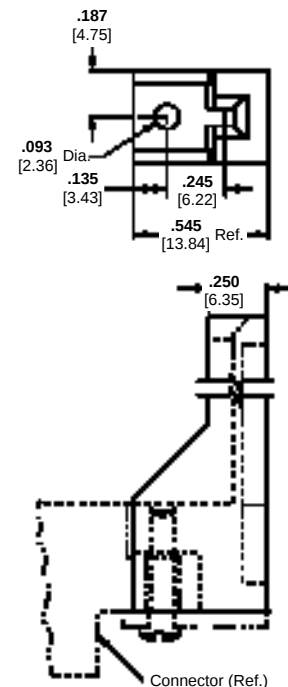
**Technical Documents:**

(pages 186, 187):

Instruction Sheets 408-7557,  
408-7565



**Card Guide Part Number 583760-1**



**Note:** Card guides may be used with all connector housings having mounting ears.

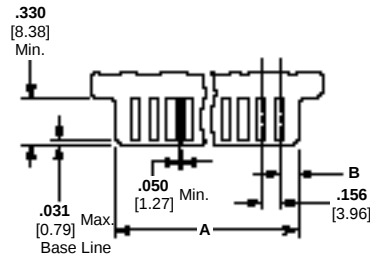
## AMP-LEAF Connector PC Board Layouts

### Recommended PC Board Layouts

#### Technical Documents:

(pages 186, 187):

Instruction Sheet 408-7037



**Note:** Slot for intercontact keying may be located between any two pads (except the first two and last two pads).

| No. of Positions | Housing Material | Dimensions   |             |
|------------------|------------------|--------------|-------------|
|                  |                  | A            | B           |
| 8                | P                | <b>1.396</b> | <b>.152</b> |
|                  |                  | 35.46        | 3.86        |
| 10               | P                | <b>1.709</b> | <b>.151</b> |
|                  |                  | 43.40        | 3.84        |
| 15               | DP               | <b>2.491</b> | <b>.153</b> |
|                  |                  | 63.27        | 3.89        |
| 15               | P                | <b>2.487</b> | <b>.152</b> |
|                  |                  | 63.17        | 3.86        |
| 18               | DP               | <b>2.940</b> | <b>.144</b> |
|                  |                  | 74.68        | 3.66        |
| 22               | DP               | <b>3.583</b> | <b>.153</b> |
|                  |                  | 91.00        | 3.89        |
| 22               | P                | <b>3.578</b> | <b>.151</b> |
|                  |                  | 90.88        | 3.84        |
| 25               | P                | <b>4.043</b> | <b>.150</b> |
|                  |                  | 102.69       | 3.81        |
| 32               | P                | <b>5.117</b> | <b>.140</b> |
|                  |                  | 129.97       | 3.56        |

DP = Diallyl Phthalate

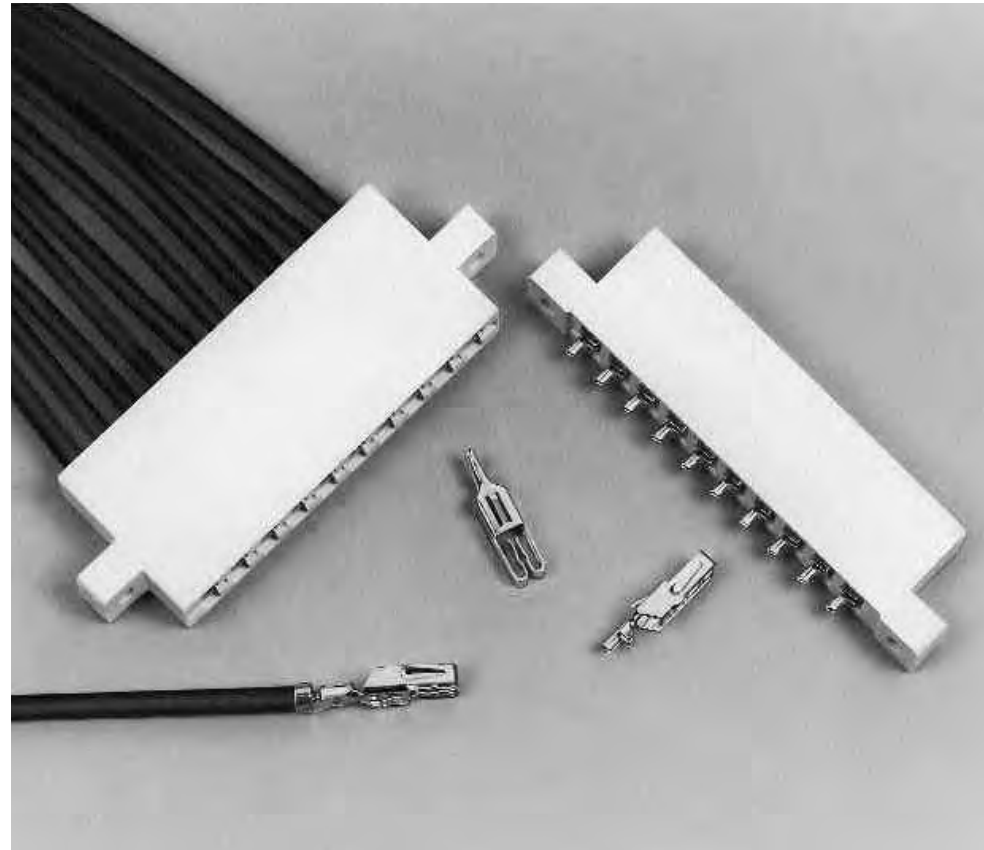
P = Phenolic

**Note:** Board thickness **.055-.070** [1.4-1.78] all positions except 32 position—.084-.104 [2.13-2.64].

## High Current Connectors

### Product Facts

- High current capability up to 30 amperes\*
- UL rated 94V-0 glass-filled thermoplastic housings
- Choice of wire-to-board and board-to-board (solder tail) connector configurations in 3, 4, 8, 9, 10 and 12 contact sizes
- Heavy duty contacts made of high conductivity copper alloy with tin-over-nickel plating
- Contacts on .312 [7.92] centers
- Large redundant areas of contact provide excellent electrical continuity
- Connectors available for mating with .062 [1.57], .093 [2.36] and .125 [3.18] thick double-sided PC boards
- Contacts furnished in strip form for automatic machine termination and loose form for hand tool application
- Recognized under the Component Program of Underwriters Laboratories Inc. File No. E28476
- Certified by Canadian Standards Association File No. LR 7189



AMP High Current Edge Connectors are an economical answer to the costly issue of interconnecting high current printed circuitry. Designed for a current capability of up to 30 amperes\*, these connectors feature UL rated 94V-0, rugged glass-filled thermoplastic housings and high conductivity copper alloy contacts with bright tin-over-nickel plating. Contacts are on .312 [7.92] centers.

Connectors are available in 3, 4, 8, 9, 10 and 12 contact positions and in a choice of two styles for board-to-board and wire-to-board applications.

The board-to-board connectors are supplied preloaded with solder tail contacts and are designed to mate with .062 [1.57] thick double-sided daughter boards.

Wire-to-board housings are available with and without mounting ears and with capabilities of mating with .062 [1.57], .093 [2.36] and .125 [3.18] thick double-sided daughter boards. These housings are designed to accept crimp, snap-in contacts which can accommodate a wire size range of 16-10 AWG [1.25-6 mm<sup>2</sup>]. Contacts are furnished in strip form for automatic machine termination and in loose form for hand tool application.

While the basic contact is designed to carry 30 amperes\* of current, the actual number of contacts in a connector carrying 30 amperes is limited by the "T" rise of the connector and the PC board.

### Performance Specifications

**Contact Current Rating\*:**  
30 amperes, max.

**Dielectric Withstanding Voltage (Sea Level):**  
1800 VAC

**Operating Voltage:**  
250 VAC, max.

**Insulation Resistance:**  
1000 megohms, min.

**Contact Resistance @ 30 amperes:**  
2 milliohms, max.

**Operating Temperature:**  
-40°C to +95°C

**Contact Engagement Force:**  
40 oz. [11.12 N], max.

**\*When used with a .180 [4.57] wide double-sided PC board with 5 oz. [0.14 Kg] min. copper each side. Consult Tyco Electronics engineering when paralleling contacts for power applications.**

## High Current Connectors (Continued)

### Crimp, Snap-In Contacts

#### Material and Finish:

**A**—Copper alloy CDA-195 plated  
.000150 [0.00381] bright tin over  
.000030 [0.00076] nickel  
**B**—Copper alloy CDA-195 plated  
.000150 [0.00381] silver all over

#### Related Product Data:

**Performance Specifications**—  
page 173

**Connector Housings**—page 175

**Application Tooling**—pages 184, 185

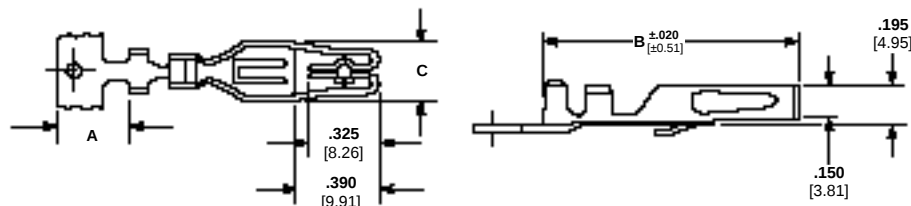
#### Technical Documents:

(pages 186, 187):

Product Specification  
108-9045

Application Specification  
114-9005

Instruction Sheets 408-7782,  
408-7783, 408-7802



| Plating | Wire Size Range |                 | Ins. Dia. Range | Dimensions |       |      | Mateable Daughter Board Thickness | Contact Part Numbers |            | Applicator for AMP-O-ELECTRIC Machine | Hand Tool 69710-1 Die Insert |
|---------|-----------------|-----------------|-----------------|------------|-------|------|-----------------------------------|----------------------|------------|---------------------------------------|------------------------------|
|         | AWG             | mm <sup>2</sup> |                 | A          | B     | C    |                                   | Loose Piece          | Strip Form |                                       |                              |
| A       | 16-14           | 1.25-2          | .090-.145       | .260       | 1.160 | .285 | .062                              | 530518-1             | 530517-2   | 466439-2                              | 90333-1                      |
|         |                 |                 | 2.29-3.68       | 6.60       | 29.46 | 7.24 | 1.57                              |                      |            |                                       |                              |
| A       | 12-10           | 3-6             | .160-.210       | .190       | 1.230 | .285 | .062                              | 530520-1             | 530519-2   | 466438-2                              | 90332-1                      |
|         |                 |                 | 4.06-5.33       | 4.83       | 31.24 | 7.24 | 1.57                              |                      |            |                                       |                              |
| B       | 12-10           | 3-6             | .160-.210       | .190       | 1.230 | .285 | .062                              | —                    | 530519-3   | 466438-2                              | 90332-1                      |
|         |                 |                 | 4.06-5.33       | 4.83       | 31.24 | 7.24 | 1.57                              |                      |            |                                       |                              |
| A       | 12-10           | 3-6             | .160-.210       | .190       | 1.230 | .347 | .093                              | —                    | 531373-2   | 466438-2                              | 90332-1                      |
|         |                 |                 | 4.06-5.33       | 4.83       | 31.24 | 8.81 | 2.36                              |                      |            |                                       |                              |

\*Applicators are for AMP-O-ELECTRIC Model "K" machines. Consult Tyco Electronics for applicators for other bench machines and lead-making machines.



Hand Crimping Tool  
69710-1



Extraction Tool  
91116-1

## High Current Connectors, .312 [7.92] Centerline

### Housings

**Material:** White glass-filled polyester,  
94V-0 rated

#### Related Product Data:

**Performance Specifications**—  
page 173

**Contacts**—page 174

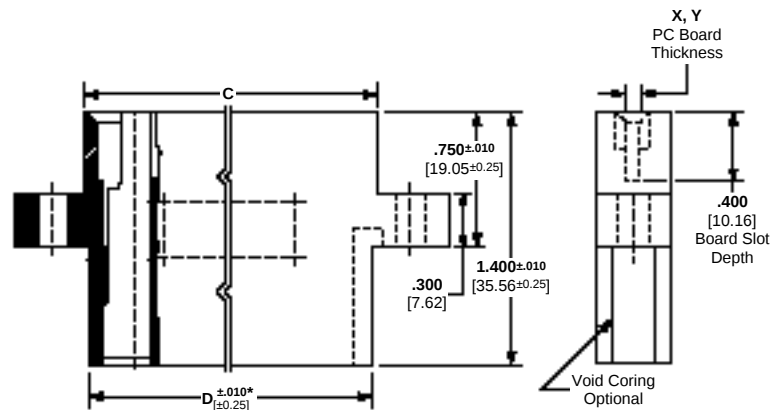
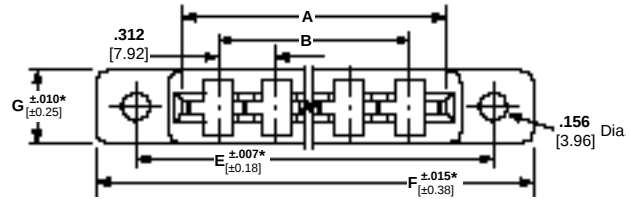
#### Technical Documents:

(pages 186, 187):

Product Specification  
108-9045

Instruction Sheet 408-9123

### With Mounting Ears



| No.<br>of<br>Pos. | Dimensions     |                |                |                |                 |                 |               | Housing Part Numbers                 |                                      |
|-------------------|----------------|----------------|----------------|----------------|-----------------|-----------------|---------------|--------------------------------------|--------------------------------------|
|                   | A              | B              | C              | D              | E               | F               | G             | X = .062 [1.57]<br>With<br>Mtg. Ears | Y = .093 [2.36]<br>With<br>Mtg. Ears |
| 3                 | 1.024<br>26.01 | .624<br>15.85  | 1.164<br>29.57 | 1.114<br>28.3  | 1.538<br>39.07  | 1.972<br>50.09  | .500<br>12.70 | —                                    | 531370-2                             |
| 4                 | 1.336<br>33.93 | .936<br>23.77  | 1.476<br>37.49 | 1.426<br>36.22 | 1.850<br>46.99  | 2.284<br>58.01  | .437<br>11.10 | 530521-3                             | —                                    |
| 8                 | 2.584<br>65.63 | 2.184<br>55.47 | 2.724<br>69.19 | 2.674<br>67.92 | 3.098<br>78.69  | 3.532<br>89.71  | .437<br>11.10 | 530521-6                             | —                                    |
| 9                 | 2.896<br>73.56 | 2.496<br>63.40 | 3.036<br>77.11 | 2.986<br>75.84 | 3.410<br>86.61  | 3.844<br>97.64  | .437<br>11.10 | 530521-7                             | —                                    |
| 12                | 3.832<br>97.33 | 3.432<br>87.17 | 3.972<br>10.89 | 3.922<br>99.62 | 4.346<br>110.39 | 4.780<br>121.41 | .437<br>11.10 | 530521-9                             | —                                    |

- Notes:**
1. X Housings designed to accept .055-.070 [1.4-1.78] thick daughter boards; use intercontact Keying Plug No. 530533-1.
  2. Y Housings designed to accept .084-.102 [2.13-2.59] thick daughter boards; use intercontact Keying Plug No. 531369-1. + Contact 531373-2.
  3. Use Extraction Tool No. 91116-1 to remove contacts. (Refer to Instruction Sheet 408-7782).
  4. Other connector sizes can be made available, consult Tyco Electronics.

**High Current Connectors .312 [7.92] Centerline** (Continued)

**Housings Preloaded with Solder Tail Contacts**

**Material and Finish:**

**Housing**—White glass-filled polyester, 94V-0 rated

**Contacts—**

**A**—Copper alloy CDA-195 plated .000150 [0.00381] bright tin over .000030 [0.00076] nickel

**B**—Copper alloy CDA-195 plated .000150 [0.00381] silver plate over .000030 [0.00076] thk. nickel

**C**—Copper alloy CDA-195 plated .000030 [0.00076] gold in contact area, .000150 [0.00381] tin-lead solder post, over .000030 [0.00076] nickel

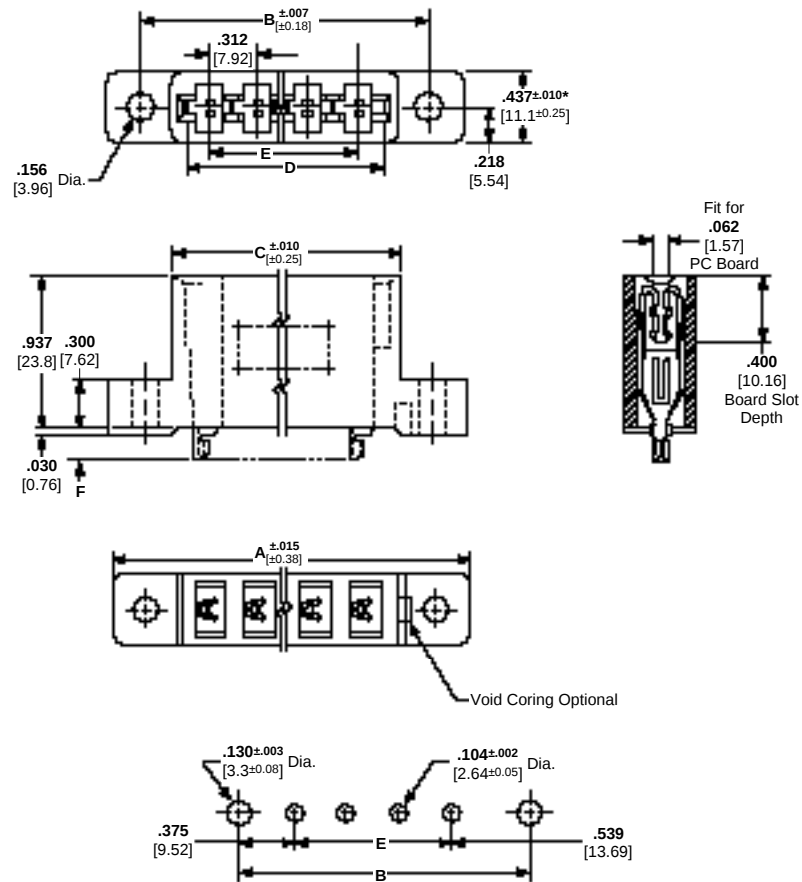
**Related Product Data:**

**Performance Specifications—**  
page 173

**Technical Documents:**

(pages 186, 187):

Product Specification  
108-9045



PC Board Thickness: .062 [1.57]

**Recommended PC Board Hole Layout**

\*May go to .020 [0.51] over nominal at top center of housing.

| No. of Positions | Dimensions      |                 |                 |                |                |              | Plating | Connector Part Numbers |
|------------------|-----------------|-----------------|-----------------|----------------|----------------|--------------|---------|------------------------|
|                  | A               | B               | C               | D              | E              | F            |         |                        |
| 3                | 1.972<br>50.09  | 1.538<br>39.07  | 1.164<br>29.57  | 1.024<br>26.01 | .624<br>15.85  | .180<br>4.57 | A       | 531353-2               |
| 4                | 2.284<br>58.01  | 1.850<br>46.99  | 1.476<br>37.49  | 1.336<br>33.93 | .936<br>23.77  | .180<br>4.57 | A       | 531353-3               |
| 5                | 2.593<br>65.86  | 2.162<br>54.91  | 1.788<br>45.42  | 1.648<br>41.86 | 1.248<br>31.70 | .180<br>4.57 | A       | 531353-4               |
| 6                | 2.908<br>73.86  | 2.474<br>62.84  | 2.100<br>53.35  | 1.960<br>49.78 | 1.560<br>39.62 | .180<br>4.57 | A       | 531353-5               |
| 8                | 3.532<br>89.71  | 3.098<br>78.69  | 2.724<br>69.19  | 2.584<br>66.63 | 2.184<br>55.47 | .180<br>4.57 | A       | 531353-6               |
|                  |                 |                 |                 |                |                | .283<br>7.19 | B       | 145116-3<br>146912-2   |
| 9                | 3.844<br>97.64  | 3.410<br>86.61  | 3.036<br>77.11  | 2.896<br>73.56 | 2.496<br>63.40 | .180<br>4.57 | A       | 531353-7               |
| 10               | 4.156<br>105.56 | 3.722<br>94.54  | 3.348<br>85.04  | 3.208<br>81.48 | 2.808<br>71.32 | .180<br>4.57 | A       | 531353-8               |
|                  |                 |                 |                 |                |                | .283<br>7.19 | B       | 145116-1<br>146912-3   |
| 12               | 4.780<br>121.41 | 4.346<br>110.39 | 3.972<br>100.89 | 3.832<br>97.33 | 3.432<br>87.17 | .180<br>4.57 | A       | 531353-9               |
|                  |                 |                 |                 |                |                | .180<br>4.57 | B       | 145116-2               |
|                  |                 |                 |                 |                |                | .283<br>7.19 | C       | 645200-3               |
|                  |                 |                 |                 |                |                |              | B       | 146912-1               |

**Notes:** 1. A .062 [1.57] thick dummy PC board should be inserted into the connector during soldering to a mother board.  
2. Other connector sizes can be made available, consult Tyco Electronics.

## DUO-TYNE Flag Connectors

### Product Facts

- Right angle design permits cabling in close quarters
- Recessed contacts help prevent arcing
- Sizes and configurations available with or without mounting ears
- Lowest installed costs achieved through high-speed compression crimping with AMP matched tooling
- Meets quality and reliability requirements for appliance controls, vending machine subassemblies and business machines
- Recognized under the Component Program of Underwriters Laboratories Inc.  
File No. E28476 
- Certified by Canadian Standards Association  
File No. LR 7189 



This flag-type connector is designed to meet the quality and reliability of such equipment as appliance controls, vending machine subassemblies, television, stereo, business machines and other applications with similar control needs.

Among its assembly-saving features is a right-angle design which permits cabling in close quarters, where it does not require frame mounting to attach

the keyed housing to the card cutout and double locking of the contacts when a PC board is inserted. In addition, contacts are recessed to prevent arcing. All sizes and configurations are available with or without mounting ears. Added to low initial cost, lowest installed costs are achieved through high-speed compression crimping with Tyco Electronics matched tooling.

### Performance Specifications

**Contact Rating\*:**  
5 amperes

**High Potential:**  
2200 VAC, rms

**Operating Temperature:**  
-40°C to +105°C

**Vibration:**  
10 to 55 cps per MIL-STD-1344, Method 202

\*Consult Tyco Electronics engineering when paralleling contacts for power applications.

**DUO-TYNE Flag Connectors** (Continued)

**Tapered Beam Crimp,  
Snap-In Contacts**

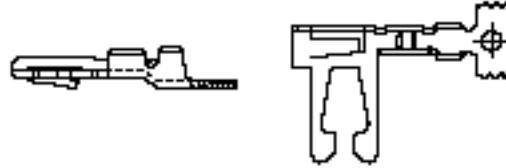
**Material and Finish:**

Beryllium copper or phosphor bronze  
(see chart) plated as follows:

**Plating A**—.000030 [0.00076] gold in  
mating area, with entire contact under-  
plated .000050 [0.00127] nickel

**Plating B**—.000015 [0.00127] gold in  
mating area, with entire contact under-  
plated .000050 [0.00127] nickel

**Plating C**—.000150 [0.00381] tin



**Related Product Data:**

**Performance Specifications**—  
page 177

**Connector Housings**—page 179

**Application Tooling**—pages 184, 185

**Technical Documents:**

(pages 186, 187):

Product Specification  
108-9038

Application Specification  
114-9002

Instruction Sheets 408-7047,  
408-7780, 408-7848, 408-7849

| Wire Size Range |                 | Insulation<br>Dia. Range | Material            | Contact<br>Finish<br>(Plating) | Contact Part Numbers |            | Applicator for<br>AMP-O-ELECTRIC<br>Machine* | Hand Tool |
|-----------------|-----------------|--------------------------|---------------------|--------------------------------|----------------------|------------|----------------------------------------------|-----------|
| AWG             | mm <sup>2</sup> |                          |                     |                                | Loose Piece          | Strip Form |                                              |           |
| 26-22           | 0.12-0.4        | .035-.055<br>0.89-1.40   | Beryllium<br>Copper | A                              | 530005-3             | 530004-6   | 466586-2                                     | 90094-4   |
|                 |                 |                          |                     | B                              | —                    | 530004-7   |                                              |           |
| 22-18           | 0.3-0.9         | .060-.090<br>1.52-2.29   | Phosphor<br>Bronze  | B                              | —                    | 530002-7   | 466424-2                                     | 90027-4   |
|                 |                 |                          |                     | C                              | —                    | 530002-5   |                                              |           |
|                 |                 |                          | Beryllium<br>Copper | A                              | —                    | 530002-3   |                                              |           |
|                 |                 |                          |                     | C                              | —                    | 530006-5   |                                              |           |
|                 |                 |                          |                     | A                              | —                    | 530006-6   |                                              |           |
|                 |                 |                          |                     | B                              | 530007-3             | —          |                                              |           |
| 18-16           | 0.8-1.4         | .090-.130<br>2.29-3.30   | Phosphor<br>Bronze  | C                              | —                    | 530006-2   | 466413-2                                     | —         |
|                 |                 |                          |                     | C                              | —                    | 530505-5   |                                              |           |

\*Applicators are for AMP-O-ELECTRIC Model "K" machines. Consult Tyco Electronics for applicators for other bench machines and lead-making machines.

**Hand Crimping Tool**



**Contact Extraction Tool  
810992-1**



## Housings, With and Without Mounting Ears

**Material:** Natural nylon

### Related Product Data:

**Performance Specifications—**  
page 177

**Contacts—**page 178

**PC Board Layout—**page 181

### Technical Documents:

(pages 186, 187):

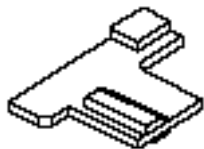
Product Specification  
108-9038

Application Specification  
114-9002

Instruction Sheet 408-7047

## On-Contact Keying Plug

**Material:** Nylon



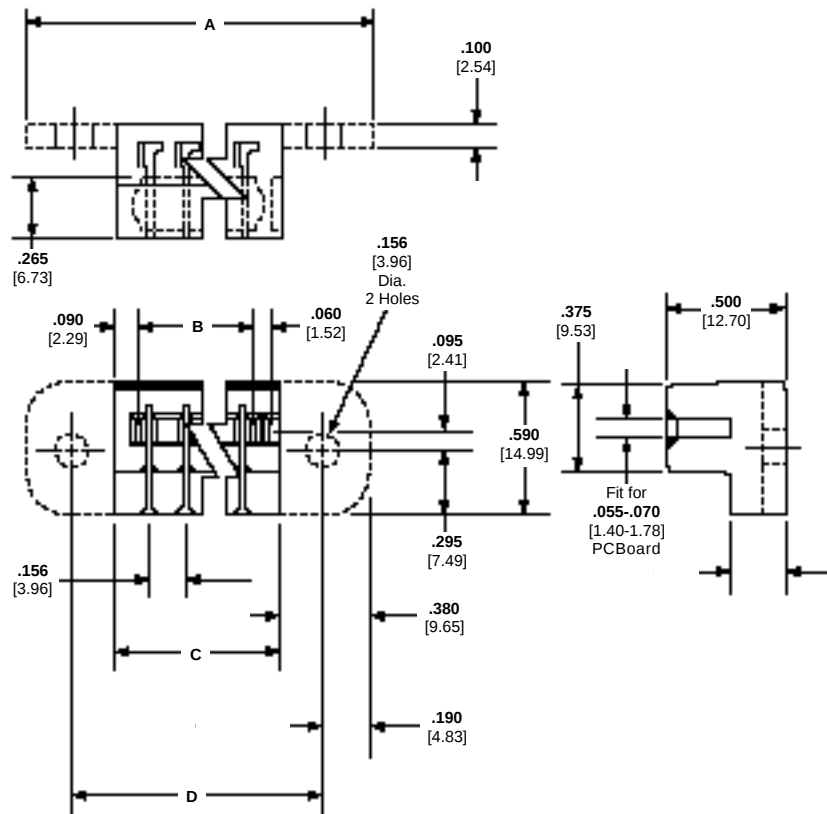
**Part Number 583661-1**

### Technical Documents:

(pages 186, 187):

Instruction Sheet 408-7486

## DUO-TYNE Flag Connectors (Continued)



| No. of Pos. | Dimensions      |                |                |                 | Part Numbers             |                          |                          |                          |
|-------------|-----------------|----------------|----------------|-----------------|--------------------------|--------------------------|--------------------------|--------------------------|
|             |                 |                |                |                 | With Mounting Ears       |                          | Without Mounting Ears    |                          |
|             | A               | B              | C              | D               | For Ins. Dia. Range      | For Ins. Dia. Range      | For Ins. Dia. Range      | For Ins. Dia. Range      |
|             |                 |                |                |                 | .035-.090<br>[0.89-2.29] | .090-.130<br>[2.29-3.30] | .035-.090<br>[0.89-2.29] | .090-.130<br>[2.29-3.30] |
| 3           | 1.384<br>35.15  | .414<br>10.52  | .624<br>15.85  | 1.004<br>25.50  | 582380-9                 | —                        | —                        | —                        |
| 5           | —               | .736<br>22.40  | .936<br>27.74  | —               | —                        | —                        | 582370-9                 | 530853-2                 |
| 6           | 1.852<br>47.04  | .882<br>22.40  | 1.092<br>27.74 | 1.472<br>37.39  | 582382-9                 | 530509-1                 | 582371-9                 | 530853-3                 |
| 9           | 2.320<br>58.93  | 1.350<br>34.29 | 1.560<br>39.62 | 1.940<br>49.28  | 582383-9                 | 530509-2                 | 582375-9                 | —                        |
| 12          | 2.788<br>70.82  | 1.818<br>46.18 | 2.028<br>51.51 | 2.408<br>61.16  | 582384-9                 | 530509-6                 | 582376-9                 | 530853-5                 |
| 14          | 3.100<br>78.74  | 2.130<br>54.10 | 2.340<br>59.44 | 2.720<br>69.09  | 582385-9                 | 530509-7                 | 582372-9                 | 530853-6                 |
| 15          | 3.256<br>82.70  | 2.286<br>58.06 | 2.496<br>63.40 | 2.876<br>73.05  | 582386-9                 | 530509-3                 | 582377-9                 | —                        |
| 18          | 3.724<br>94.59  | 2.754<br>69.95 | 2.964<br>75.29 | 3.344<br>84.94  | 582387-9                 | 530509-8                 | 582378-9                 | 530853-8                 |
| 22          | 4.348<br>110.44 | 3.378<br>85.80 | 3.588<br>91.14 | 3.968<br>100.79 | 582388-9                 | 530509-9                 | 582379-9                 | —                        |

**Note:** Other connector sizes can be made available, consult Tyco Electronics.

**DUO-TYNE Flag Connectors** (Continued)

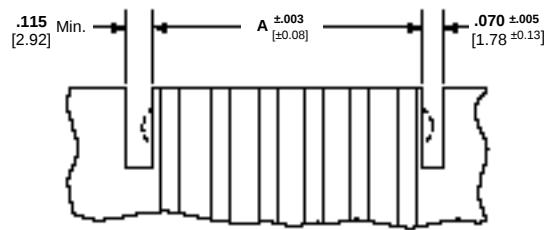
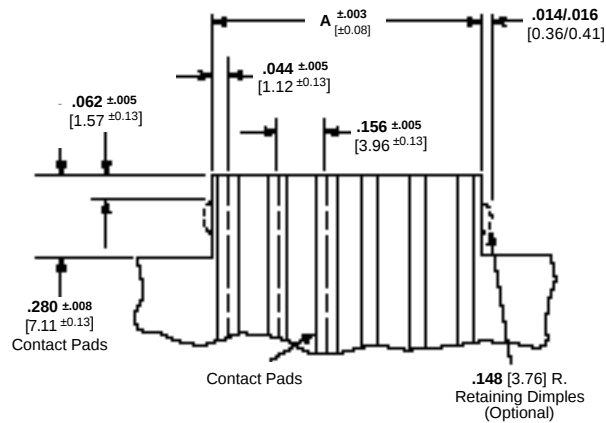
**Recommended PC Board Layouts**

**Related PC Board Data:**

**Recommended Board Thickness—**  
.055-.070 [1.40-1.78]

**Recommended Chamfer of Mating  
Edge of Boards—**.015 [0.38] x 45°

**Recommended Pad Plating—**Tin  
.000150-.000400 [0.00381-0.01016]  
thick

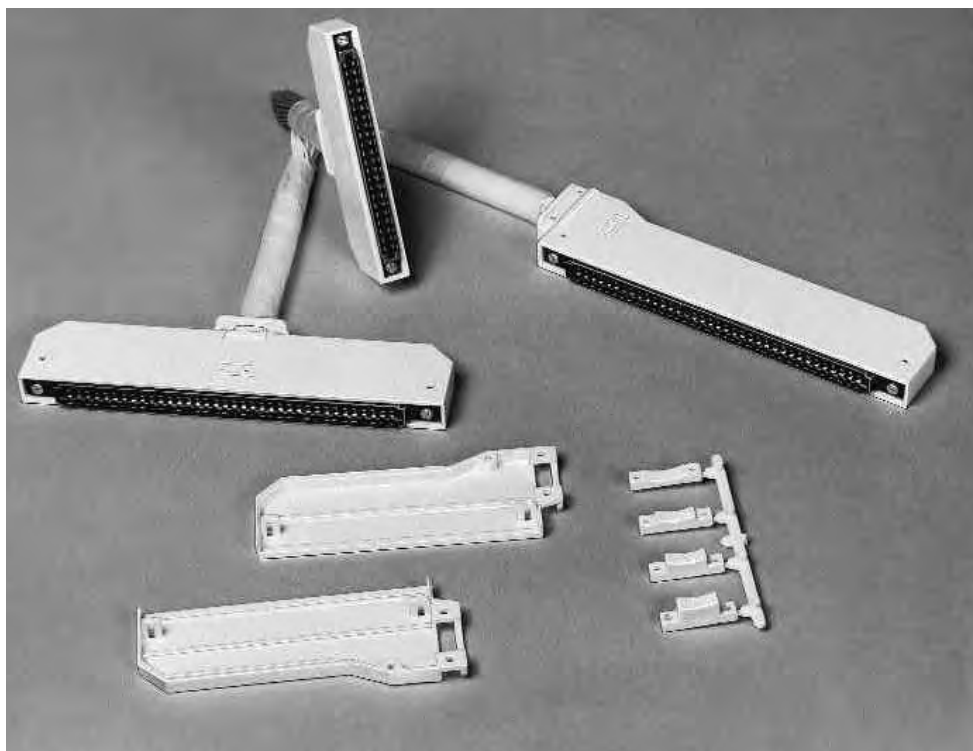


| No. of Positions | Dimension A    |
|------------------|----------------|
| 3                | .400<br>10.16  |
| 5                | .712<br>18.09  |
| 6                | .868<br>22.05  |
| 9                | 1.337<br>33.96 |
| 12               | 1.805<br>45.85 |
| 14               | 2.117<br>53.77 |
| 15               | 2.272<br>57.71 |
| 18               | 2.741<br>69.62 |
| 22               | 3.365<br>85.47 |

## Printed Circuit Board Connector Hood Assemblies

### Product Facts

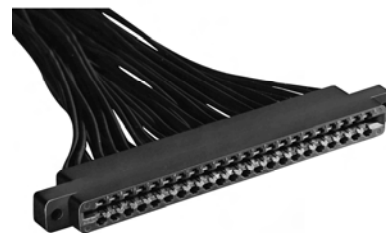
- Can be used with the highly versatile AMP-LEAF and Crimp Snap Twin Leaf printed circuit edge connectors
- Clamping capabilities for wire bundles to .550 [13.97] maximum diameter
- Available with 90° or 180° cable outlet
- All plastic construction—thermoplastic material UL rated 94V-0 for electrical and mechanical applications up to + 105°C
- Thermoplastic material has excellent resistance to common commercial cleaners when used at moderate temperatures
- Separate hood assembly halves permit easy cable dressing
- Furnished in convenient kit form—each kit includes four cable clamp sizes



For use with the following connectors:



**Crimp Snap Twin Leaf Connectors**  
(Pages 154-163)



**AMP-LEAF Connectors**  
(Pages 164-172)

90° Cable Outlet

Material: Natural color thermoplastic

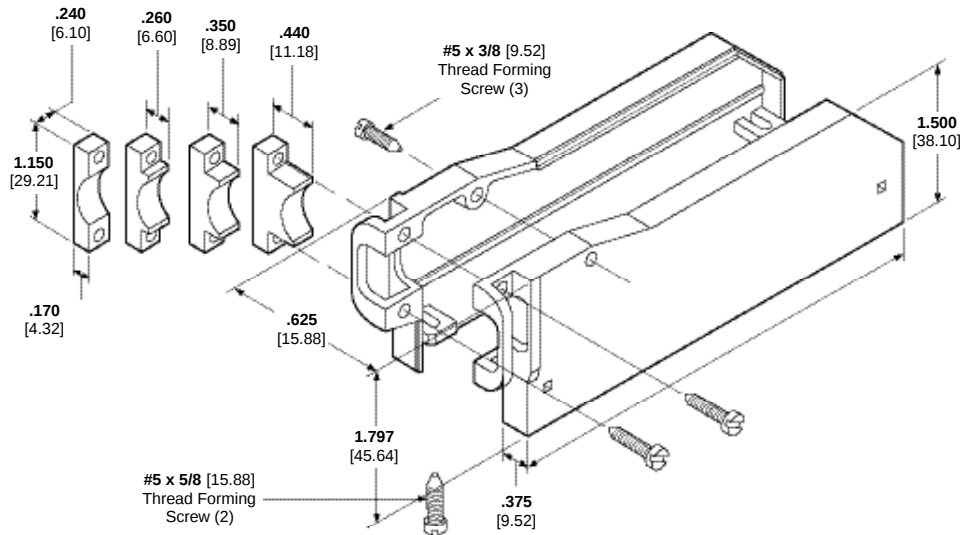
Related Product Data:

Crimp Snap Twin Leaf  
Connectors—pages 154-163

AMP-LEAF Connectors—  
pages 164-172

Technical Documents:  
(pages 186, 187):

Instruction Sheet 408-7719



| Connector Size |                    |                      |                  | Hood<br>L Dim.<br>(Max.) | Connector Width .380 [9.65] Max. |                                 | Connector Width .437 [11.10] |                                 |
|----------------|--------------------|----------------------|------------------|--------------------------|----------------------------------|---------------------------------|------------------------------|---------------------------------|
| No. of<br>Pos. | Contact<br>Centers | Mtg. Hole<br>Centers | Length<br>(Max.) |                          | AMP<br>Connector<br>Family       | Hood<br>Assembly<br>Kit Number* | AMP<br>Connector<br>Family   | Hood<br>Assembly<br>Kit Number* |
| 18             | 1.56<br>3.96       | 3.406<br>86.51       | 3.685<br>93.60   | 3.826<br>97.18           | AMP-LEAF                         | 530088-3                        | —                            | —                               |
| 22             | .156<br>3.96       | 4.031<br>102.39      | 4.296<br>109.12  | 4.451<br>113.06          | —                                | —                               | Crimp Snap<br>Twin Leaf      | 1-530088-4                      |

\*All screws and four sizes of cable clamps are supplied with each kit.

Note: Other hood sizes can be made available, consult Tyco Electronics.

**Printed Circuit Board Connector Hood Assemblies (Continued)**

**180° Cable Outlet**

**Material:** Natural color thermoplastic

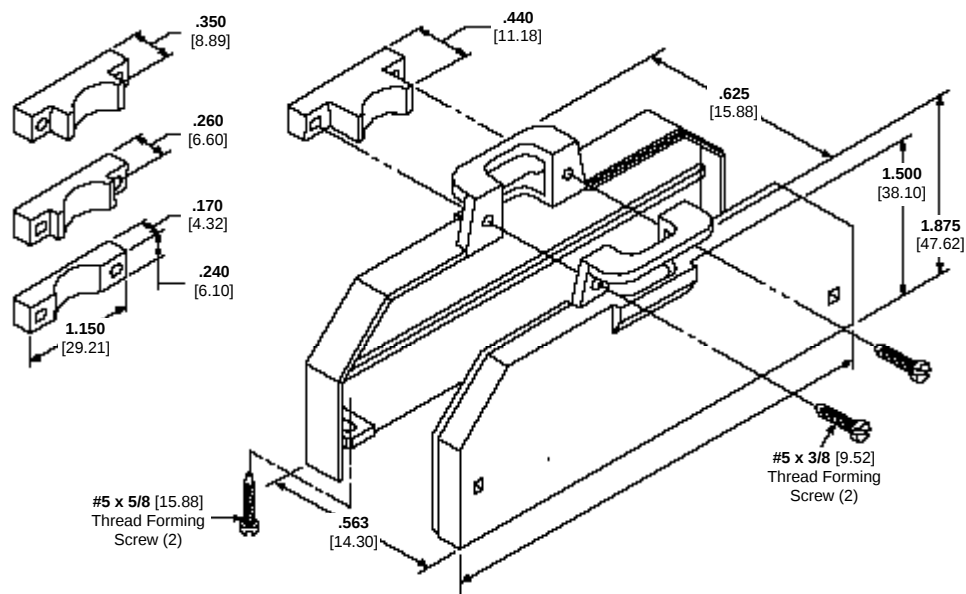
**Related Product Data:**

**AMP-LEAF Connectors**—  
pages 164-172

**Technical Documents:**

(pages 186, 187):

Instruction Sheet 408-7719



| No. of Pos. | Connector Size  |                   |                 | Hood L Dim. (Max.) | Connector Width .380 [9.65] Max. |                           |
|-------------|-----------------|-------------------|-----------------|--------------------|----------------------------------|---------------------------|
|             | Contact Centers | Mtg. Hole Centers | Length (Max.)   |                    | AMP Connector Family             | Hood Assembly Kit Number* |
| 22          | .156<br>3.96    | 4.031<br>102.39   | 4.321<br>109.76 | 4.451<br>113.06    | AMP-LEAF                         | 530087-4                  |

\*All screws and four sizes of cable clamps are supplied with each kit.

**Note:** Other hood sizes can be made available, consult Tyco Electronics.

## Application Tooling for Wire Crimp Contacts

Tooling shown on this page is designed to terminate wire crimp contacts used in various wire-to-board connectors.

### AMP-O-LECTRIC Model "G" Terminating Machine (Shown with Optional Crimp Quality Monitor)



The AMP-O-LECTRIC Model "G" is a semi-automatic bench-top machine for terminating wire using reeled terminals and contacts. It features a quiet and reliable direct motor drive, micro-processor controls for ease of setup and operation, and guarding and lighting designed for operator convenience and safety. Three versions are available: with

automatic precision adjust and machine-mounted sensors, or with manual precision adjust with or without sensors. All versions will accept existing Tyco Electronics ministyle applicators with minor modifications.

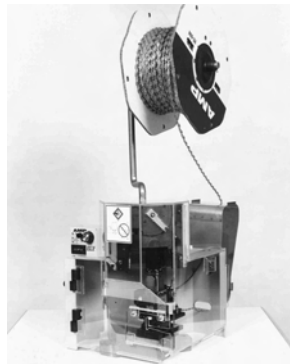
For further details, request Tyco Electronics Catalog 65828.

### AMP-O-MATIC Model II Stripper/Crimper Machine (Shown with Optional Crimp Quality Monitor)



This machine also strips wire, and is therefore used to terminate jacketed cable. It features manual precision adjust, keyed strip blades for faster, more accurate setups, and an efficient scrap removal system. Applicators are interchangeable. All adjustments can be made from the front of the machine without special tools.

### Entry Level Terminator (ELT), 1338600-(x)

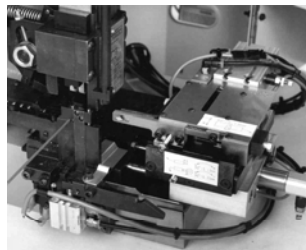


Semiautomatic Bench Terminator for side- and end-feed reeled terminals and contacts. The ELT uses a DC motor with gear box drive. The result is a small-footprint design that is fast and quiet. Cycle time is less than 0.400 sec. with an operation sound level of 76dBa. With a crimp force capacity of 3,000 pounds, the ELT is available for all

but the highest crimp force applications. Optional equipment is also available to meet your specific application requirements.

For more information, request catalog 1308382.

### Optional Stripping Module for the ELT and AMP-O-LECTRIC Model G



The combination of the Stripping Module with the AMP-O-LECTRIC Model G Terminator or the Entry Level Terminator provides an economical, proficient method of stripping wire and crimping terminals on the same machine. Wires are stripped moments before crimping, meaning there is virtually no chance

of damaging wire conductors during handling or storage. Once the wire is fed into the start sensor the Stripping Module does the rest, improving placement accuracy.

For more information, request catalog 1309085.

## Application Tooling for Wire Crimp Contacts (Continued)

### AMPOMATOR CLS IV+ Lead-Making Machines, 356500-1, -2



Fully-automatic machines that measure, cut, strip and terminate single leads. Microprocessor-controlled, and programmed and operated using an easy-to-follow, menu-driven touchscreen. Features include direct-drive terminating units with precision crimp height adjustment, fully programmable setups,

wire runout and splice detection, and motorized pre-feed with wire straightener. Crimp quality monitoring is also available.

For more information, request catalog 124324.

### Crimp Quality Monitor (CQM), 1320420-1, -2



This unique system provides 100% on-the-fly crimp inspection. It measures the crimp height of each termination, and evaluates the quality of each crimp. If a crimp is questionable, the monitor alerts the operator with both visual and audible alarms. It also provides ports for printing and networking. When used with

AMP-O-LECTRIC Model "G" Termination Machines, the monitor is mounted to the machine. When used with AMPOMATOR CLS IV Lead-Making Machines, it is integrated into the machine's operating system.

For more information, request catalog 82275.

### CERTI-CRIMP Straight Action Hand Tools (SAHT)



Premium grade hand tools. Feature ratchet control to provide complete crimp cycle. Die sets close in a straight line. Include a contact locator and wire stop, plus an insulation crimp adjustment lever, when applicable. Approximate weight 1.3 lb [0.59 kg].

For more information, request catalog 65780.

### 626 Pneumatic Tool System



Lightweight, air-operated modular tooling system. Accepts a wide variety of interchangeable heads for crimping various types of contacts, terminals and splices onto wires ranging 6-26 AWG [13-0.12 mm<sup>2</sup>], plus coaxial and fiber optic cable. Available with either hand- or foot-actuation switch. Optional ratchet

control available to provide complete crimp cycle.

For more information, request catalog 124208.

The following is a list of technical documents covering the application, performance and maintenance of the AMP Card Edge Connectors presented in this catalog.

**Product Specifications** describe technical performance characteristics and verification tests. They are intended for the Design, Component and Quality Engineer.

**Application Specifications** describe requirements for using the product in its intended application and/or crimping information. They are intended for the Packaging and Design Engineer and the Setup person.

**Instruction Sheets** provide instructions for assembling or applying the product. They are intended for the Manufacturing Assembler or Operator.

### Solder Type Board-to-Board Connectors

#### Standard Edge .050 Series PCI Connectors

**Product Specification:**

**108-14034** Standard Edge .050 Series PCI Connector

**Application Specification:**

**114-26012** Standard Edge .050 Series PCI Connector

#### Standard Edge .050 Series Connectors

**Product Specification:**

**108-14034** Standard Edge .050 Series Connector

**Application Specification:**

**114-26012** Standard Edge .050 Series Connector

#### Standard Edge II Connectors

**Product Specification:**

**108-9039** Standard Edge II Connector

#### Low Profile Connectors

**Product Specification:**

**108-9044** Low Profile Edge Connector

**Instruction Sheet:**

**408-7772** Contact Replacement, Low Profile Edge Connector

#### Twin Leaf Mother Board Connectors

**Product Specification:**

**108-9027** Twin Leaf Mother Board Connector

**Instruction Sheets:**

**408-7479** Keying Plugs, Twin Leaf Mother Board Connector

**408-7498** Connector Layout, Twin Leaf Mother Board Connector

**408-7506** Card Guides, Twin Leaf Mother Board Connector

#### Rotary Cam ZIF Connectors

**Product Specification:**

**108-9048** Rotary Cam PC Board Edge Connector

**Instruction Sheet:**

**408-7911** Rotary Cam ZIF Connectors

#### Linear ZIF Connectors

**Product Specifications:**

**108-14015** Linear ZIF PC Board Edge Connector, .100 [2.54] Centerline

**108-26003** ACTION PIN Contacts

**Application Specification:**

**114-26003** Linear ZIF PC Board Edge Connector, .100 [2.54] Centerline

**Instruction Sheets:**

**408-2665** Linear ZIF, Carrier Removal Tool Series 265924

**408-2995** Linear ZIF, Housing Wing Removal and Replacement Tool 266233-1

**408-2999** Linear ZIF, T-Bar Insertion Tool Series 266267

**408-6915** Linear ZIF, Housing Assembly Insertion Tool Series 313136

**408-6916** Linear ZIF, T-Bar Insertion Tool Series 313139

### Press-Fit Board-to-Board Connectors

#### AMP PACE Connectors

**Product Specifications:**

**108-14019** AMP PACE Connector, .125 x .250 [3.18 x 6.35] Centerline

**108-26003** ACTION PIN Contacts

**Application Specification:**

**114-26002** AMP PACE Connector

**Instruction Sheets:**

**408-2933** Contact Replacement Tool .100 x .200 [2.54 x 5.08] and .125 x .250 [3.18 x 6.35], AMP PACE Connector

**408-2978** Seating Tool Ground Module, AMP PACE Connector

**408-2979** Seating Tool Power Module, AMP PACE Connector

**408-6726** Seating Tool, .156 x .200 [3.96 x 5.08] Part No. 59955, AMP PACE Connector

**408-6727** Seating Tool, .125 x .125 [3.18 x 3.18] Part No. 59953, AMP PACE Connector

**408-6881** Contact Replacement Tool .100 x .100 [2.54 x 2.54] with and without Scoops AMP PACE Connector

**408-9058** Seating Tool .100 x .200 [2.54 x 5.08] with Card Scoops, Part No. 58150, AMP PACE Connector

**408-9063** Seating Tool .125 x .250 [3.18 x 6.35] Part No. 58142, AMP PACE Connector

**408-9067** Seating Tool .100 x .200 [2.54 x 5.08] Part No. 58140, AMP PACE Connector

**408-9091** Accessories and Tooling, .100 x .200 [2.54 x 5.08] AMP PACE Connector

**408-9119** Seating Tool, .125 x .250 [3.18 x 6.35] with Card Scoops, Part No. 58184, AMP PACE Connector

**408-9186** Contact Replacement Tool; .100 x .200 [2.54 x 5.08], .125 x .125 [3.18 x 3.18], .125 x .250 [3.18 x 6.35] with Scoops, .156 x .200 [3.96 x 5.08], AMP PACE Connector

**408-9188** Seating Tool .100 x .100 [2.54 x 2.54] Part No. 58200, AMP PACE Connector

#### ECONOMATE Connectors

**Product Specification:**

**108-26002** ECONOMATE Connector

**Instruction Sheet:**

**408-9091** Accessories and Tooling, .100 x .200 [2.54 x 5.08] AMP PACE Connector

## Wire-to-Board Connectors

### Crimp Snap Twin Leaf Connectors

**Product Specification:**

**108-9031** Crimp Snap Twin Leaf Connector  
(Bifurcated Contacts)

**Application Specification:**

**114-9004** Contact, Twin Leaf Connector

**Instruction Sheets:**

**408-7527** Accessories and Contacts, Crimp Snap Twin Leaf Connector  
**408-7529** Extraction Tool 91073-1  
**408-7531** Hand Tool 90268-1, Single Crimp, 28-24 AWG [0.08-0.2 mm<sup>2</sup>] Wire  
**408-7551** Hand Tool 90264-1, Double Crimp, 22-20 AWG [0.3-0.6 mm<sup>2</sup>] and 18 AWG [0.8-0.9 mm<sup>2</sup>] Wire  
**408-7583** Hand Tool 90285-1, Double Crimp, 20-18 AWG [0.5-0.9 mm<sup>2</sup>] and 16 AWG [1.25-1.4 mm<sup>2</sup>] Wire  
**408-8547** CERTI-CRIMP II Straight Action Hand Tools

### AMP-LEAF Connectors

**Product Specifications:**

**108-9013** AMP-LEAF Connector  
**108-9043** AMP-LEAF Connector, Tin Plated Contacts

**Application Specification:**

**114-9003** Contact, AMP-LEAF Connector

**Instruction Sheets:**

**408-6951** Lubricant for tin plating, fretting, corrosion  
**408-7035** Retaining Spring 42973  
**408-7036** On-Contact Keying Plugs 480143 and 582756  
**408-7037** Accessories and Contacts, AMP-LEAF Connector  
**408-7045** Extraction Tool 465195  
**408-7068** Intercontact Keying Plug 582501  
**408-7339** Intercontact Keying Plug 583274  
**408-7419** Commoning Springs  
**408-7622** Hand Tool 90017-3, 22-20 AWG [0.3-0.6 mm<sup>2</sup>], Two 22 AWG [0.3-0.4 mm<sup>2</sup>] or One 18 AWG [0.8-0.9 mm<sup>2</sup>] Wire  
**408-7623** Hand Tool 90028-3, 26-22 AWG [0.12-0.4 mm<sup>2</sup>], Two 22 AWG [0.3-0.4 mm<sup>2</sup>] Wires  
**408-7624** Hand Tool 90031-8, Two 18 AWG [0.8-0.9 mm<sup>2</sup>] Wires  
**408-7626** Hand Tool 90101-3, 20 AWG [0.5-0.6 mm<sup>2</sup>] or Two 20 AWG [0.5-0.6 mm<sup>2</sup>] Wires

## High Current Connectors

**Product Specification:**

**108-9045** High Current Edge Connector

**Application Specification:**

**114-9005** Contact, High Current Edge Connector

**Instruction Sheets:**

**408-7782** Extraction Tool 91116-1, High Current Connector  
**408-7783** Die Inserts 90332-1 and 90332-2  
**408-7802** Die Inserts 90333-1 and 90333-2  
**408-9123** High Current Connectors

## DUO-TYNE Flag Connectors

**Product Specification:**

**108-9038** DUO-TYNE Flag Connector, Tapered Beam Contact

**Application Specification:**

**114-9002** Contact, DUO-TYNE Flag Connector

**Instruction Sheets:**

**408-7047** DUO-TYNE Flag Right-Angle Connector  
**408-7486** On-Contact Keying Plug 583661  
**408-7780** Hand Tool 90335-1, 18-16 AWG [0.8-1.4 mm<sup>2</sup>] Wire  
**408-7848** Hand Tool 90027-4, 22-18 AWG [0.3-0.9 mm<sup>2</sup>] Wire  
**408-7849** Hand Tool 90094-4, 26-22 AWG [0.12-0.4 mm<sup>2</sup>] Wire

## Printed Circuit Board Connector Hood Assemblies

**Instruction Sheet:**

**408-7719** Printed Circuit Board Connector Hood Assemblies

## Part Number Cross Reference—Tyco Part Number to Acquired Part Number

All Tyco Electronic Part Numbers without a corresponding acquired Part Number are listed as base part numbers only. Complete part numbers (with prefixes and/or suffixes) are shown on the page(s) indicated.  
Contact Engineering if no corresponding Tyco Number is available.

| Tyco Part Number | Acquired Part Number | Page Number                                 |
|------------------|----------------------|---------------------------------------------|
| 11299            | —                    | 9                                           |
| 42973            | —                    | 171                                         |
| 58084            | —                    | 117                                         |
| 58140            | —                    | 115                                         |
| 58142            | —                    | 115                                         |
| 58143            | —                    | 115                                         |
| 58150            | —                    | 115                                         |
| 58184            | —                    | 115                                         |
| 58200            | —                    | 115                                         |
| 58210            | —                    | 115                                         |
| 58218            | —                    | 115                                         |
| 59881            | —                    | 112                                         |
| 60151            | —                    | 165                                         |
| 66067            | —                    | 166                                         |
| 66084            | —                    | 165                                         |
| 66092            | —                    | 171                                         |
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| 145167           | —                    | 9                                  |
| 145168           | —                    | 10                                 |
| 145169           | —                    | 8                                  |
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| 531353           | —                    | 176          | 583724           | —                    | 165,167                        | 0-1437261-5      | C8D50PF29033         | 138         |
| 531369           | —                    | 175          | 583725           | —                    | 165,167                        | 0-1437261-6      | C8D50PF29043         | 140         |
| 531370           | —                    | 175          | 583726           | —                    | 165,167                        | 0-1437262-4      | C6D06PF29013         | 148         |
| 531373           | —                    | 174,175      | 583752           | —                    | 72                             | 0-1437262-5      | C6D06PF29043         | 148         |
| 531395           | —                    | 75           | 583753           | —                    | 72                             | 0-1437262-6      | C6D10PF29022         | 146         |
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| 531396           | —                    | 75           | 583755           | —                    | 72                             | 0-1437262-9      | C6D15PF29022         | 146         |
| 531414           | —                    | 76           | 583760           | —                    | 171                            | 0-1437263-7      | C7D06PF29023         | 142         |
| 531433           | —                    | 62           | 583764           | —                    | 162                            | 0-1437263-8      | C7D06PF29043         | 144         |
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| 531477           | —                    | 155          | 583854           | —                    | 156                            | 0-1437264-6      | C1D20PF29015         | 131         |
| 531478           | —                    | 155          | 583857           | —                    | 162                            | 0-1437264-7      | C1D20PF29043         | 131         |
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| 532563           | —                    | 79           | 583864           | —                    | 159                            | 0-1437267-6      | A6D10DS29A2          | 54          |
| 532600           | —                    | 23           | 583873           | —                    | 159                            | 0-1437267-7      | A6D10DS29C2          | 54          |
| 536128           | —                    | 25           | 583875           | —                    | 155                            | 0-1437267-8      | A6D10DS29C3          | 54          |
| 582140           | —                    | 165,168      | 583879           | —                    | 156                            | 0-1437267-9      | A6D10RA29A           | 56          |
| 582147           | —                    | 165,168      | 583884           | —                    | 156                            | 0-1437268-4      | A7D06DS29C2          | 49          |
| 582264           | —                    | 165,168      | 583900           | —                    | 158                            | 0-1437268-5      | A7D06RA29C           | 52          |
| 582355           | —                    | 166          | 583975           | —                    | 170                            | 0-1437268-6      | A7D06RA29E           | 52          |
| 582370           | —                    | 179          | 583989           | —                    | 165                            | 0-1437268-7      | A7D10DS29C2          | 49          |
| 582371           | —                    | 179          | 583990           | —                    | 165                            | 0-1437268-8      | A7D10RA29AM231       | 51          |
| 582372           | —                    | 179          | 583991           | —                    | 165                            | 0-1437268-9      | A7D10WW29A3          | 49          |
| 582375           | —                    | 179          | 645115           | —                    | 87                             | 0-1437270-1      | A8D31DS29B3          | 43          |
| 582376           | —                    | 179          | 645116           | —                    | 91                             | 0-1437270-2      | A8D31DS29C2          | 43          |
| 582377           | —                    | 179          | 645135           | —                    | 84                             | 0-1437270-3      | A8D31DS29D2          | 43          |
| 582378           | —                    | 179          | 645142           | —                    | 92                             | 0-1437270-4      | A8D31RA29A           | 46          |
| 582379           | —                    | 179          | 645145           | —                    | 85                             | 0-1437270-6      | A8D31RA29C           | 46          |
| 582380           | —                    | 179          | 645146           | —                    | 89                             | 0-1437270-7      | A8D31RA29CM233       | 47          |
| 582382           | —                    | 179          | 645147           | —                    | 86                             | 0-1437270-8      | A8D31RA29E           | 46          |
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| 582384           | —                    | 179          | 645155           | —                    | 66                             | 0-1437274-3      | C7D06DS29C1          | 36          |
| 582385           | —                    | 179          | 645169           | —                    | 25                             | 0-1437274-5      | C7D15DS29C1          | 36          |
| 582386           | —                    | 179          | 645200           | —                    | 176                            | 0-1437274-7      | C7D15DS29C3          | 36          |
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| 582500           | —                    | 165,168, 169 | 645384           | —                    | 23                             | 0-1437276-2      | C8D31DS29A3          | 32          |
| 582501           | —                    | 171          | 645394           | —                    | 105                            | 0-1437276-3      | C8D31DS29C1          | 31          |
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| 583204           | —                    | 165          |                  |                      |                                | 0-1437276-8      | C8D31DS29D1          | 31          |
| 583274           | —                    | 162,171      |                  |                      |                                | 0-1437276-9      | C8D31DS29D3          | 32          |
| 583280           | —                    | 165,168      | 650059           | —                    | 109                            | 1-1437260-4      | C8D06PF29013         | 140         |
| 583294           | —                    | 166          | 650083           | —                    | 79                             | 1-1437260-5      | C8D06PF29043         | 140         |
| 583361           | —                    | 165          | 650090           | —                    | 12                             | 1-1437261-1      | C8D06PF29023         | 138         |
| 583407           | —                    | 66,72        | 650091           | —                    | 13                             | 1-1437262-0      | C6D15PF29023         | 146         |
| 583425           | —                    | 71           | 650092           | —                    | 12                             | 1-1437262-3      | C6D18PF29013         | 148         |
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| 583458           | —                    | 170          | 650122           | —                    | 103                            | 1-1437262-8      | C6D22PF29013         | 148         |
| 583485           | —                    | 66,72        | 650123           | —                    | 103                            | 1-1437262-9      | C6D22PF29023         | 146         |
| 583486           | —                    | 66,72        | 650124           | —                    | 103                            | 1-1437263-4      | C7D18PF29012         | 144         |
| 583533           | —                    | 66,72        | 650148           | —                    | 117                            | 1-1437263-5      | C7D18PF29013         | 144         |
| 583544           | —                    | 170          | 650149           | —                    | 117                            | 1-1437263-6      | C7D18PF29022         | 142         |
| 583545           | —                    | 170          | 650150           | —                    | 117                            | 1-1437263-7      | C7D18PF29023         | 142         |
| 583552           | —                    | 167          | 650181           | —                    | 12                             | 1-1437263-8      | C7D18PF29043         | 144         |
| 583555           | —                    | 165          | 650187           | —                    | 23                             | 1-1437263-9      | C7D20PF29012         | 144         |
| 583599           | —                    | 170          | 650207           | —                    | 18                             | 1-1437264-0      | C1D25PF29015         | 131         |
| 583616           | —                    | 155          | 650263           | —                    | 17                             | 1-1437264-5      | C1D35PF29013         | 131         |
| 583617           | —                    | 165,167      | 650281           | —                    | 117                            | 1-1437264-6      | C1D35PF29015         | 131         |
| 583649           | —                    | 155          | 650297           | —                    | 103                            | 1-1437265-0      | W8D18PF29063         | 136         |
| 583660           | —                    | 68,72        | 650616           | —                    | 25                             | 1-1437265-2      | W8D22PF29043         | 134         |
| 583661           | —                    | 179          | 650718           | —                    | 20                             | 1-1437265-3      | W8D25PF29013         | 134         |
| 583671           | —                    | 70           | 650719           | —                    | 14                             | 1-1437265-4      | W8D25PF29063         | 136         |
| 583679           | —                    | 68,72        | 650728           | —                    | 19                             | 1-1437265-5      | W8D25PF29093         | 136         |
| 583680           | —                    | 165,167      | 678034           | —                    | 107                            | 1-1437265-6      | W8D28PF29013         | 134         |
| 583685           | —                    | 165,167      | 678035           | —                    | 111                            | 1-1437265-7      | W8D28PF29093         | 136         |
| 583691           | —                    | 162          | 687775           | —                    | 155                            | 1-1437266-0      | 98230                | 150         |
| 583692           | —                    | 68,72        | 810992           | —                    | 178                            | 1-1437266-1      | 98231                | 150         |
| 583694           | —                    | 66           | 1320420          | —                    | 185                            | 1-1437266-6      | 98236                | 150         |
| 583714           | —                    | 72           | 1338600          | —                    | 184                            | 1-1437266-8      | 98238                | 150         |
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| 583718           | —                    | 157          | 1490563          | —                    | 150                            | 1-1437267-2      | A6D10RA29E           | 56          |
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| C6D31PF29022         | —                | 146         |
| C6D31PF29023         | —                | 146         |
| C6D31PF29032         | —                | 146         |
| C6D31PF29033         | —                | 146         |
| C6D31PF29042         | —                | 148         |
| C6D31PF29043         | —                | 148         |
| C6D31PF29132         | —                | 148         |
| C6D31PF29133         | —                | 148         |
| C6D31PF29142         | —                | 146         |
| C6D31PF29143         | —                | 146         |
| C6D35DS29A1          | —                | 39          |
| C6D35DS29A3          | —                | 39          |
| C6D35DS29A4          | —                | 40          |
| C6D35DS29B1          | —                | 39          |
| C6D35DS29B3          | —                | 39          |

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| C6D35DS29C1          | —                | 39          |
| C6D35DS29C3          | —                | 39          |
| C6D35DS29C4          | —                | 40          |
| C6D35DS29D1          | —                | 39          |
| C6D35DS29D3          | —                | 39          |
| C6D35DS29D4          | —                | 40          |
| C6D35DS29E1          | —                | 39          |
| C6D35DS29E3          | —                | 39          |
| C6D35DS29E4          | —                | 40          |
| C6D35PF29012         | —                | 148         |
| C6D35PF29013         | —                | 148         |
| C6D35PF29022         | —                | 146         |
| C6D35PF29023         | —                | 146         |
| C6D35PF29033         | —                | 146         |
| C6D35PF29042         | —                | 148         |
| C6D35PF29043         | —                | 148         |
| C6D35PF29132         | —                | 148         |
| C6D35PF29133         | —                | 148         |
| C6D35PF29142         | —                | 146         |
| C6D35PF29143         | —                | 146         |
| C6D36DS29A1          | —                | 39          |
| C6D36DS29A3          | 5-1437273-3      | 39          |
| C6D36DS29A4          | —                | 40          |
| C6D36DS29B1          | —                | 39          |
| C6D36DS29B3          | —                | 39          |
| C6D36DS29B4          | —                | 40          |
| C6D36DS29C1          | 5-1437273-4      | 39          |
| C6D36DS29C3          | 3-1437264-3      | 39          |
| C6D36DS29C4          | —                | 40          |
| C6D36DS29D1          | 5-1437273-5      | 39          |
| C6D36DS29D3          | —                | 39          |
| C6D36DS29D4          | 5-1437273-6      | 40          |
| C6D36DS29E1          | —                | 39          |
| C6D36DS29E3          | —                | 39          |
| C6D36DS29E4          | 5-1437273-7      | 40          |
| C6D36PF29012         | —                | 148         |
| C6D36PF29013         | 3-1437262-3      | 148         |
| C6D36PF29022         | —                | 146         |
| C6D36PF29023         | 3-1437262-4      | 146         |
| C6D36PF29032         | —                | 146         |
| C6D36PF29033         | —                | 146         |
| C6D36PF29042         | —                | 148         |
| C6D36PF29043         | —                | 148         |
| C6D36PF29132         | —                | 148         |
| C6D36PF29133         | —                | 148         |
| C6D36PF29142         | —                | 146         |
| C6D36PF29143         | —                | 146         |
| C6D40DS29A1          | —                | 39          |
| C6D40DS29A3          | —                | 39          |
| C6D40DS29A4          | —                | 40          |
| C6D40DS29B1          | —                | 39          |
| C6D40DS29B3          | 5-1437273-8      | 39          |
| C6D40DS29B4          | —                | 40          |
| C6D40DS29C1          | —                | 39          |
| C6D40DS29C3          | —                | 39          |
| C6D40DS29C4          | —                | 40          |
| C6D40PF29012         | —                | 148         |
| C6D40PF29013         | —                | 148         |
| C6D40PF29022         | —                | 146         |
| C6D40PF29023         | —                | 146         |
| C6D40PF29032         | —                | 146         |
| C6D40PF29033         | —                | 146         |
| C6D40PF29042         | —                | 148         |
| C6D40PF29043         | —                | 148         |
| C6D40PF29132         | —                | 148         |
| C6D40PF29133         | —                | 148         |
| C6D40PF29142         | —                | 146         |
| C6D40PF29143         | —                | 146         |
| C6D43DS29A1          | 5-1437273-9      | 39          |
| C6D43DS29A3          | —                | 39          |
| C6D43DS29A4          | 6-1437273-0      | 40          |
| C6D43DS29B1          | 6-1437273-1      | 39          |
| C6D43DS29B3          | —                | 39          |
| C6D43DS29B4          | —                | 40          |
| C6D43DS29C1          | 6-1437273-2      | 39          |
| C6D43DS29C3          | 6-1437273-4      | 39          |
| C6D43DS29C4          | —                | 40          |
| C6D43DS29D1          | —                | 39          |
| C6D43DS29D3          | 6-1437273-6      | 39          |
| C6D43DS29D4          | —                | 40          |

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| C6D43PF29012         | —                | 148         |
| C6D43PF29013         | 3-1437262-6      | 148         |
| C6D43PF29022         | 3-1437262-8      | 146         |
| C6D43PF29023         | 3-1437262-9      | 146         |
| C6D43PF29032         | —                | 146         |
| C6D43PF29033         | —                | 146         |
| C6D43PF29042         | —                | 148         |
| C6D43PF29043         | 4-1437262-0      | 148         |
| C6D43PF29132         | —                | 148         |
| C6D43PF29133         | —                | 148         |
| C6D43PF29142         | —                | 146         |
| C6D43PF29143         | —                | 146         |
| C6D50DS29A1          | —                | 39          |
| C6D50DS29A3          | —                | 39          |
| C6D50DS29A4          | —                | 40          |
| C6D50DS29B1          | —                | 39          |
| C6D50DS29B3          | —                | 39          |
| C6D50DS29B4          | —                | 40          |
| C6D50DS29C1          | —                | 39          |
| C6D50DS29C3          | —                | 39          |
| C6D50DS29C4          | —                | 40          |
| C6D50DS29D1          | —                | 39          |
| C6D50DS29D3          | —                | 39          |
| C6D50DS29D4          | —                | 40          |
| C6D50DS29E1          | —                | 39          |
| C6D50DS29E3          | —                | 39          |
| C6D50DS29E4          | —                | 40          |
| C7D06DS29A1          | —                | 36          |
| C7D06DS29A3          | —                | 36          |
| C7D06DS29A4          | —                | 37          |
| C7D06DS29B1          | —                | 36          |
| C7D06DS29B3          | —                | 36          |
| C7D06DS29B4          | —                | 37          |
| C7D06DS29C1          | 0-1437274-3      | 36          |
| C7D06DS29C3          | —                | 36          |
| C7D06DS29C4          | —                | 37          |
| C7D06DS29D1          | —                | 36          |
| C7D06DS29D3          | —                | 36          |
| C7D06DS29D4          | —                | 37          |
| C7D06DS29E1          | —                | 36          |
| C7D06DS29E3          | —                | 36          |
| C7D06DS29E4          | —                | 37          |
| C7D06PF29012         | —                | 144         |
| C7D06PF29013         | —                | 144         |
| C7D06PF29022         | —                | 142         |
| C7D06PF29023         | 0-1437263-7      | 142         |
| C7D06PF29032         | —                | 142         |
| C7D06PF29033         | —                | 142         |
| C7D06PF29042         | —                | 144         |
| C7D06PF29043         | 0-1437263-8      | 144         |
| C7D06PF29132         | —                | 144         |
| C7D06PF29133         | —                | 144         |
| C7D06PF29142         | —                | 142         |
| C7D06PF29143         | —                | 142         |
| C7D10DS29A1          | —                | 36          |
| C7D10DS29A3          | —                | 36          |
| C7D10DS29A4          | —                | 37          |
| C7D10DS29B1          | —                | 36          |
| C7D10DS29B3          | —                | 36          |
| C7D10DS29B4          | —                | 37          |
| C7D10DS29C1          | —                | 36          |
| C7D10DS29C3          | —                | 36          |
| C7D10DS29C4          | —                | 37          |
| C7D10DS29D1          | —                | 36          |
| C7D10DS29D3          | —                | 36          |
| C7D10DS29D4          | —                | 37          |
| C7D10DS29E1          | —                | 36          |
| C7D10DS29E3          | —                | 36          |
| C7D10DS29E4          | —                | 37          |
| C7D10PF29012         | —                | 144         |
| C7D10PF29013         | —                | 144         |
| C7D10PF29022         | —                | 142         |
| C7D10PF29023         | —                | 142         |
| C7D10PF29032         | —                | 142         |
| C7D10PF29033         | —                | 142         |
| C7D10PF29042         | —                | 144         |
| C7D10PF29043         | —                | 144         |
| C7D10PF29132         | —                | 144         |
| C7D10PF29133         | —                | 144         |
| C7D10PF29142         | —                | 142         |
| C7D10PF29143         | —                | 142         |
| C7D12PF29012         | —                | 144         |
| C7D12PF29013         | —                | 144         |
| C7D12PF29022         | —                | 142         |
| C7D12PF29023         | —                | 142         |

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| C7D12PF29042         | —                | 144         |
| C7D12PF29043         | —                | 144         |
| C7D12PF29132         | —                | 144         |
| C7D12PF29133         | —                | 144         |
| C7D12PF29142         | —                | 142         |
| C7D12PF29143         | —                | 142         |
| C7D15DS29A1          | —                | 36          |
| C7D15DS29A3          | —                | 36          |
| C7D15DS29A4          | —                | 37          |
| C7D15DS29B1          | —                | 36          |
| C7D15DS29B3          | —                | 36          |
| C7D15DS29B4          | —                | 37          |
| C7D15DS29C1          | 0-1437274-5      | 36          |
| C7D15DS29C3          | 0-1437274-7      | 36          |
| C7D15DS29C4          | —                | 37          |
| C7D15DS29D1          | —                | 36          |
| C7D15DS29D3          | —                | 36          |
| C7D15DS29D4          | —                | 37          |
| C7D15DS29E1          | —                | 36          |
| C7D15DS29E3          | —                | 36          |
| C7D15DS29E4          | —                | 37          |
| C7D15PF29012         | —                | 144         |
| C7D15PF29013         | —                | 144         |
| C7D15PF29022         | —                | 142         |
| C7D15PF29023         | —                | 142         |
| C7D15PF29032         | —                | 142         |
| C7D15PF29033         | —                | 142         |
| C7D15PF29042         | —                | 144         |
| C7D15PF29043         | —                | 144         |
| C7D15PF29132         | —                | 144         |
| C7D15PF29133         | —                | 144         |
| C7D15PF29142         | —                | 142         |
| C7D15PF29143         | —                | 142         |
| C7D18DS29A1          | —                | 36          |
| C7D18DS29A3          | —                | 36          |
| C7D18DS29A4          | —                | 37          |
| C7D18DS29B1          | —                | 36          |
| C7D18DS29B3          | —                | 36          |
| C7D18DS29B4          | —                | 37          |
| C7D18DS29C1          | —                | 36          |
| C7D18DS29C3          | 0-1437274-8      | 36          |
| C7D18DS29C4          | —                | 37          |
| C7D18DS29D1          | —                | 36          |
| C7D18DS29D3          | —                | 36          |
| C7D18DS29D4          | —                | 37          |
| C7D18DS29E1          | —                | 36          |
| C7D18DS29E3          | —                | 36          |
| C7D18DS29E4          | —                | 37          |
| C7D18PF29012         | 1-1437263-4      | 144         |
| C7D18PF29013         | 1-1437263-5      | 144         |
| C7D18PF29022         | 1-1437263-6      | 142         |
| C7D18PF29023         | 1-1437263-7      | 142         |
| C7D18PF29032         | —                | 142         |
| C7D18PF29033         | —                | 142         |
| C7D18PF29042         | —                | 144         |
| C7D18PF29043         | 1-1437263-8      | 144         |
| C7D18PF29132         | —                | 144         |
| C7D18PF29133         | —                | 144         |
| C7D18PF29142         | —                | 142         |
| C7D18PF29143         | —                | 142         |
| C7D20PF29012         | 1-1437263-9      | 144         |
| C7D20PF29013         | 2-1437263-0      | 144         |
| C7D20PF29022         | —                | 142         |
| C7D20PF29023         | 2-1437263-1      | 142         |
| C7D20PF29032         | —                | 142         |
| C7D20PF29033         | —                | 142         |
| C7D20PF29042         | —                | 144         |
| C7D20PF29043         | —                | 144         |
| C7D20PF29132         | —                | 144         |
| C7D20PF29133         | —                | 144         |
| C7D20PF29142         | —                | 142         |
| C7D20PF29143         | —                | 142         |
| C7D22DS29A1          | —                | 36          |
| C7D22DS29A3          | —                | 36          |
| C7D22DS29A4          | —                | 37          |
| C7D22DS29B1          | —                | 36          |
| C7D22DS29B3          | —                | 36          |
| C7D22DS29B4          | —                | 37          |
| C7D22DS29C1          | 0-1437274-9      | 36          |
| C7D22DS29C3          | —                | 36          |
| C7D22DS29C4          | —                | 37          |
| C7D22DS29D1          | —                | 36          |
| C7D22DS29D3          | 1-1437274-0      | 36          |
| C7D22DS29D4          | —                | 37          |
| C7D22DS29E1          | —                | 36          |
| C7D22DS29E3          | —                | 36          |

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| C7D22PF29022         | —                | 142         |
| C7D22PF29023         | 2-1437263-4      | 142         |
| C7D22PF29032         | —                | 142         |
| C7D22PF29033         | —                | 142         |
| C7D22PF29042         | —                | 144         |
| C7D22PF29043         | —                | 144         |
| C7D22PF29132         | —                | 144         |
| C7D22PF29133         | —                | 144         |
| C7D22PF29142         | —                | 142         |
| C7D22PF29143         | —                | 142         |
| C7D25DS29A1          | —                | 36          |
| C7D25DS29A3          | —                | 36          |
| C7D25DS29A4          | —                | 37          |
| C7D25DS29B1          | —                | 36          |
| C7D25DS29B3          | —                | 36          |
| C7D25DS29B4          | —                | 37          |
| C7D25DS29C1          | 1-1437274-1      | 36          |
| C7D25DS29C3          | —                | 36          |
| C7D25DS29C4          | —                | 37          |
| C7D25DS29D1          | —                | 36          |
| C7D25DS29D3          | —                | 36          |
| C7D25DS29D4          | —                | 37          |
| C7D25DS29E1          | —                | 36          |
| C7D25DS29E3          | —                | 36          |
| C7D25DS29E4          | —                | 37          |
| C7D25PF29012         | —                | 144         |
| C7D25PF29013         | —                | 144         |
| C7D25PF29022         | —                | 142         |
| C7D25PF29023         | —                | 142         |
| C7D25PF29032         | —                | 142         |
| C7D25PF29033         | —                | 142         |
| C7D25PF29042         | —                | 144         |
| C7D25PF29043         | —                | 144         |
| C7D25PF29132         | —                | 144         |
| C7D25PF29133         | —                | 144         |
| C7D25PF29142         | —                | 142         |
| C7D25PF29143         | —                | 142         |
| C7D28DS29A1          | 1-1437274-3      | 36          |
| C7D28DS29A3          | 1-1437274-4      | 36          |
| C7D28DS29A4          | —                | 37          |
| C7D28DS29B1          | —                | 36          |
| C7D28DS29B3          | 1-1437274-6      | 36          |
| C7D28DS29B4          | —                | 37          |
| C7D28DS29C1          | 1-1437274-7      | 36          |
| C7D28DS29C3          | 1-1437274-8      | 36          |
| C7D28DS29C4          | —                | 37          |
| C7D28DS29D1          | 1-1437274-9      | 36          |
| C7D28DS29D3          | 2-1437274-0      | 36          |
| C7D28DS29D4          | —                | 37          |
| C7D28DS29E1          | —                | 36          |
| C7D28DS29E3          | 2-1437274-2      | 36          |
| C7D28DS29E4          | —                | 37          |
| C7D28PF29012         | 2-1437263-7      | 144         |
| C7D28PF29013         | 2-1437263-8      | 144         |
| C7D28PF29022         | —                | 142         |
| C7D28PF29023         | 2-1437263-9      | 142         |
| C7D28PF29032         | 2-1437274-3      | 142         |
| C7D28PF29033         | —                | 142         |
| C7D28PF29042         | —                | 144         |
| C7D28PF29043         | —                | 144         |
| C7D28PF29132         | —                | 144         |
| C7D28PF29133         | —                | 144         |
| C7D28PF29142         | —                | 142         |
| C7D28PF29143         | —                | 142         |
| C7D30DS29A1          | —                | 36          |
| C7D30DS29A3          | 2-1437274-4      | 36          |
| C7D30DS29A4          | —                | 37          |
| C7D30DS29B1          | —                | 36          |
| C7D30DS29B3          | —                | 36          |
| C7D30DS29B4          | —                | 37          |
| C7D30DS29C1          | —                | 36          |
| C7D30DS29C3          | 2-1437274-5      | 36          |
| C7D30DS29C4          | 2-1437274-6      | 37          |
| C7D30DS29D1          | —                | 36          |
| C7D30DS29D3          | —                | 36          |
| C7D30DS29D4          | —                | 37          |
| C7D30DS29E1          | —                | 36          |
| C7D30DS29E3          | —                | 36          |
| C7D30DS29E4          | —                | 37          |
| C7D30PF29012         | —                | 144         |
| C7D30PF29013         | 3-1437263-1      | 144         |
| C7D30PF29022         | —                | 142         |
| C7D30PF29023         | 3-1437263-2      | 142         |
| C7D30PF29032         | 2-1437274-7      | 142         |
| C7D30PF29033         | —                | 142         |

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| C7D30PF29043         | 3-1437263-3      | 144         |
| C7D30PF29132         | —                | 144         |
| C7D30PF29133         | —                | 144         |
| C7D30PF29142         | —                | 142         |
| C7D30PF29143         | —                | 142         |
| C7D31DS29A1          | —                | 36          |
| C7D31DS29A3          | 2-1437274-8      | 36          |
| C7D31DS29A4          | —                | 37          |
| C7D31DS29B1          | —                | 36          |
| C7D31DS29B3          | —                | 36          |
| C7D31DS29B4          | —                | 37          |
| C7D31DS29C1          | —                | 36          |
| C7D31DS29C3          | 2-1437274-9      | 36          |
| C7D31DS29C4          | —                | 37          |
| C7D31DS29D1          | —                | 36          |
| C7D31DS29D3          | 3-1437274-0      | 36          |
| C7D31DS29D4          | —                | 37          |
| C7D31DS29E1          | —                | 36          |
| C7D31DS29E3          | —                | 36          |
| C7D31DS29E4          | —                | 37          |
| C7D31PF29012         | —                | 144         |
| C7D31PF29013         | —                | 144         |
| C7D31PF29022         | —                | 142         |
| C7D31PF29023         | —                | 142         |
| C7D31PF29032         | —                | 142         |
| C7D31PF29033         | —                | 142         |
| C7D31PF29042         | —                | 144         |
| C7D31PF29043         | —                | 144         |
| C7D31PF29132         | —                | 144         |
| C7D31PF29142         | —                | 142         |
| C7D31PF29143         | —                | 142         |
| C7D35DS29A1          | —                | 36          |
| C7D35DS29A3          | —                | 36          |
| C7D35DS29A4          | —                | 37          |
| C7D35DS29B1          | —                | 36          |
| C7D35DS29B3          | —                | 36          |
| C7D35DS29B4          | —                | 37          |
| C7D35DS29C1          | 3-1437274-1      | 36          |
| C7D35DS29C3          | —                | 36          |
| C7D35DS29C4          | —                | 37          |
| C7D35DS29D1          | —                | 36          |
| C7D35DS29D3          | —                | 36          |
| C7D35DS29D4          | —                | 37          |
| C7D35DS29E1          | —                | 36          |
| C7D35DS29E3          | —                | 36          |
| C7D35DS29E4          | —                | 37          |
| C7D35PF29012         | 3-1437263-9      | 144         |
| C7D35PF29013         | 4-1437263-0      | 144         |
| C7D35PF29022         | —                | 142         |
| C7D35PF29023         | —                | 142         |
| C7D35PF29032         | —                | 142         |
| C7D35PF29033         | —                | 142         |
| C7D35PF29042         | —                | 144         |
| C7D35PF29043         | —                | 144         |
| C7D35PF29132         | —                | 144         |
| C7D35PF29142         | —                | 142         |
| C7D35PF29143         | —                | 142         |
| C7D36DS29A1          | —                | 36          |
| C7D36DS29A3          | —                | 36          |
| C7D36DS29A4          | —                | 37          |
| C7D36DS29B1          | —                | 36          |
| C7D36DS29B3          | —                | 36          |
| C7D36DS29B4          | —                | 37          |
| C7D36DS29C1          | 3-1437274-2      | 36          |
| C7D36DS29C3          | 3-1437274-3      | 36          |
| C7D36DS29C4          | —                | 37          |
| C7D36DS29D1          | —                | 36          |
| C7D36DS29D3          | 3-1437274-4      | 36          |
| C7D36DS29D4          | —                | 37          |
| C7D36DS29E1          | —                | 36          |
| C7D36DS29E3          | —                | 36          |
| C7D36DS29E4          | —                | 37          |
| C7D36PF29012         | 4-1437263-1      | 144         |
| C7D36PF29013         | 4-1437263-2      | 144         |
| C7D36PF29022         | —                | 142         |
| C7D36PF29023         | —                | 142         |
| C7D36PF29032         | —                | 142         |
| C7D36PF29033         | 4-1437263-3      | 142         |
| C7D36PF29042         | —                | 144         |
| C7D36PF29043         | —                | 144         |
| C7D36PF29132         | —                | 144         |
| C7D36PF29133         | —                | 144         |
| C7D36PF29142         | —                | 142         |
| C7D36PF29143         | —                | 142         |
| C7D40DS29A1          | —                | 36          |

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| C7D40DS29B1          | —                | 36          |
| C7D40DS29B3          | —                | 36          |
| C7D40DS29B4          | —                | 37          |
| C7D40DS29C1          | 3-1437274-6      | 36          |
| C7D40DS29C3          | 3-1437274-7      | 36          |
| C7D40DS29C4          | —                | 37          |
| C7D40DS29D1          | —                | 36          |
| C7D40DS29D3          | 3-1437274-8      | 36          |
| C7D40DS29D4          | —                | 37          |
| C7D40DS29E1          | —                | 36          |
| C7D40DS29E3          | —                | 36          |
| C7D40DS29E4          | —                | 37          |
| C7D40PF29012         | 4-1437263-4      | 144         |
| C7D40PF29013         | 4-1437263-5      | 144         |
| C7D40PF29022         | —                | 142         |
| C7D40PF29023         | 4-1437263-6      | 142         |
| C7D40PF29032         | 4-1437263-7      | 142         |
| C7D40PF29033         | —                | 142         |
| C7D40PF29042         | —                | 144         |
| C7D40PF29043         | 4-1437263-8      | 144         |
| C7D40PF29132         | —                | 144         |
| C7D40PF29133         | —                | 144         |
| C7D40PF29142         | —                | 142         |
| C7D40PF29143         | —                | 142         |
| C7D43DS29A1          | —                | 36          |
| C7D43DS29A3          | —                | 36          |
| C7D43DS29A4          | —                | 37          |
| C7D43DS29B1          | —                | 36          |
| C7D43DS29B3          | —                | 36          |
| C7D43DS29B4          | —                | 37          |
| C7D43DS29C1          | 3-1437274-9      | 36          |
| C7D43DS29C3          | 4-1437274-0      | 36          |
| C7D43DS29C4          | —                | 37          |
| C7D43DS29D1          | —                | 36          |
| C7D43DS29D3          | —                | 36          |
| C7D43DS29D4          | 4-1437274-1      | 37          |
| C7D43DS29E1          | —                | 36          |
| C7D43DS29E3          | —                | 36          |
| C7D43DS29E4          | —                | 37          |
| C7D43PF29012         | —                | 144         |
| C7D43PF29013         | 5-1437263-0      | 144         |
| C7D43PF29022         | —                | 142         |
| C7D43PF29023         | —                | 142         |
| C7D43PF29032         | —                | 142         |
| C7D43PF29033         | —                | 142         |
| C7D43PF29042         | —                | 144         |
| C7D43PF29043         | —                | 144         |
| C7D43PF29132         | —                | 144         |
| C7D43PF29133         | —                | 144         |
| C7D43PF29142         | —                | 142         |
| C7D43PF29143         | —                | 142         |
| C7D50DS29A1          | —                | 36          |
| C7D50DS29A3          | 4-1437274-3      | 36          |
| C7D50DS29A4          | —                | 37          |
| C7D50DS29B1          | —                | 36          |
| C7D50DS29B3          | 5-1437263-1      | 36          |
| C7D50DS29B4          | —                | 37          |
| C7D50DS29C1          | 4-1437274-4      | 36          |
| C7D50DS29C3          | 4-1437274-5      | 36          |
| C7D50DS29C4          | 4-1437274-6      | 37          |
| C7D50DS29D1          | —                | 36          |
| C7D50DS29D3          | 4-1437274-8      | 36          |
| C7D50DS29D4          | —                | 37          |
| C7D50DS29E1          | 5-1437274-0      | 36          |
| C7D50DS29E3          | —                | 36          |
| C7D50DS29E4          | —                | 37          |
| C7D50PF29012         | —                | 144         |
| C7D50PF29013         | 5-1437263-2      | 144         |
| C7D50PF29022         | —                | 142         |
| C7D50PF29023         | —                | 142         |
| C7D50PF29032         | —                | 142         |
| C7D50PF29033         | 5-1437263-3      | 142         |
| C7D50PF29042         | —                | 144         |
| C7D50PF29043         | 5-1437263-4      | 144         |
| C7D50PF29132         | —                | 144         |
| C7D50PF29133         | —                | 144         |
| C7D50PF29142         | —                | 142         |
| C7D50PF29143         | 5-1437263-7      | 142         |
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| C8D06DS29A2          | —                | 31          |
| C8D06DS29A3          | —                | 32          |
| C8D06DS29B1          | —                | 31          |
| C8D06DS29B2          | —                | 31          |
| C8D06DS29B3          | —                | 32          |
| C8D06DS29C1          | 2-1437275-9      | 31          |
| C8D06DS29C2          | 3-1437275-0      | 31          |

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| C8D06DS29D1          | —                | 31          |
| C8D06DS29D2          | —                | 31          |
| C8D06DS29D3          | —                | 32          |
| C8D06DS29E1          | 3-1437275-2      | 31          |
| C8D06DS29E2          | —                | 31          |
| C8D06DS29E3          | —                | 32          |
| C8D06PF29012         | —                | 140         |
| C8D06PF29013         | 1-1437260-4      | 140         |
| C8D06PF29022         | —                | 138         |
| C8D06PF29023         | —                | 138         |
| C8D06PF29032         | —                | 138         |
| C8D06PF29033         | —                | 138         |
| C8D06PF29042         | —                | 140         |
| C8D06PF29043         | 1-1437260-5      | 140         |
| C8D06PF29132         | —                | 140         |
| C8D06PF29133         | —                | 140         |
| C8D06PF29142         | —                | 138         |
| C8D06PF29143         | —                | 138         |
| C8D10DS29A1          | —                | 31          |
| C8D10DS29A2          | —                | 31          |
| C8D10DS29A3          | 3-1437275-5      | 32          |
| C8D10DS29B1          | —                | 31          |
| C8D10DS29B2          | —                | 31          |
| C8D10DS29B3          | —                | 32          |
| C8D10DS29C1          | 3-1437275-6      | 31          |
| C8D10DS29C2          | 3-1437275-8      | 31          |
| C8D10DS29C3          | 3-1437275-9      | 32          |
| C8D10DS29A2          | 4-1437275-0      | 31          |
| C8D10DS29D2          | —                | 31          |
| C8D10DS29D3          | 4-1437275-1      | 32          |
| C8D10DS29E1          | —                | 31          |
| C8D10DS29E2          | —                | 31          |
| C8D10DS29E3          | —                | 32          |
| C8D10PF29012         | —                | 140         |
| C8D10PF29013         | 2-1437260-0      | 140         |
| C8D10PF29022         | —                | 138         |
| C8D10PF29023         | 2-1437260-2      | 138         |
| C8D10PF29032         | —                | 138         |
| C8D10PF29033         | —                | 138         |
| C8D10PF29042         | —                | 140         |
| C8D10PF29043         | 2-1437260-3      | 140         |
| C8D10PF29132         | —                | 140         |
| C8D10PF29133         | —                | 140         |
| C8D10PF29142         | —                | 138         |
| C8D10PF29143         | —                | 138         |
| C8D12DS29A1          | —                | 31          |
| C8D12DS29A2          | —                | 31          |
| C8D12DS29A3          | —                | 32          |
| C8D12DS29B1          | —                | 31          |
| C8D12DS29B2          | —                | 31          |
| C8D12DS29B3          | —                | 32          |
| C8D12DS29C1          | 4-1437275-5      | 31          |
| C8D12DS29C2          | —                | 31          |
| C8D12DS29C3          | 4-1437275-7      | 32          |
| C8D12DS29D1          | 4-1437275-8      | 31          |
| C8D12DS29D2          | —                | 31          |
| C8D12DS29D3          | —                | 32          |
| C8D12DS29E1          | 5-1437274-1      | 31          |
| C8D12DS29E2          | —                | 31          |
| C8D12DS29E3          | —                | 32          |
| C8D12PF29012         | —                | 140         |
| C8D12PF29013         | 2-1437260-4      | 140         |
| C8D12PF29022         | —                | 138         |
| C8D12PF29023         | 2-1437260-5      | 138         |
| C8D12PF29032         | —                | 138         |
| C8D12PF29033         | —                | 138         |
| C8D12PF29042         | —                | 140         |
| C8D12PF29043         | 2-1437260-6      | 140         |
| C8D12PF29132         | —                | 140         |
| C8D12PF29133         | —                | 140         |
| C8D12PF29142         | —                | 138         |
| C8D12PF29143         | —                | 138         |
| C8D15DS29A1          | —                | 31          |
| C8D15DS29A2          | —                | 31          |
| C8D15DS29A3          | —                | 32          |
| C8D15DS29B1          | —                | 31          |
| C8D15DS29B2          | —                | 31          |
| C8D15DS29B3          | 5-1437275-1      | 32          |
| C8D15DS29C1          | 5-1437275-2      | 31          |
| C8D15DS29C2          | —                | 31          |
| C8D15DS29C3          | 5-1437275-4      | 32          |
| C8D15DS29D1          | 5-1437275-5      | 31          |
| C8D15DS29D2          | 5-1437275-6      | 31          |
| C8D15DS29D3          | —                | 32          |
| C8D15DS29E1          | —                | 31          |
| C8D15DS29E2          | —                | 31          |
| C8D15DS29E3          | —                | 32          |

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| C8D15PF29013         | 2-1437260-7      | 140         |
| C8D15PF29022         | —                | 138         |
| C8D15PF29023         | 2-1437260-9      | 138         |
| C8D15PF29032         | —                | 138         |
| C8D15PF29033         | —                | 138         |
| C8D15PF29042         | —                | 140         |
| C8D15PF29043         | 3-1437260-0      | 140         |
| C8D15PF29132         | —                | 140         |
| C8D15PF29133         | —                | 140         |
| C8D15PF29142         | —                | 138         |
| C8D15PF29143         | —                | 138         |
| C8D18DS29A1          | —                | 31          |
| C8D18DS29A2          | —                | 31          |
| C8D18DS29A3          | —                | 32          |
| C8D18DS29B1          | —                | 31          |
| C8D18DS29B2          | —                | 31          |
| C8D18DS29B3          | —                | 32          |
| C8D18DS29C1          | 5-1437275-9      | 31          |
| C8D18DS29C2          | —                | 31          |
| C8D18DS29C3          | 6-1437275-1      | 32          |
| C8D18DS29D1          | 6-1437275-2      | 31          |
| C8D18DS29D2          | —                | 31          |
| C8D18DS29D3          | 6-1437275-3      | 32          |
| C8D18DS29E1          | 6-1437275-4      | 31          |
| C8D18DS29E2          | —                | 31          |
| C8D18DS29E3          | —                | 32          |
| C8D20DS29A1          | —                | 31          |
| C8D20DS29A2          | —                | 31          |
| C8D20DS29A3          | —                | 32          |
| C8D20DS29B1          | —                | 31          |
| C8D20DS29B2          | —                | 31          |
| C8D20DS29B3          | —                | 32          |
| C8D20DS29C1          | 6-1437275-6      | 31          |
| C8D20DS29C2          | —                | 31          |
| C8D20DS29C3          | 6-1437275-8      | 32          |
| C8D20DS29D1          | 6-1437275-9      | 31          |
| C8D20DS29D2          | —                | 31          |
| C8D20DS29D3          | 7-1437275-0      | 32          |
| C8D20DS29E1          | —                | 31          |
| C8D20DS29E2          | —                | 31          |
| C8D20DS29E3          | —                | 32          |
| C8D20PF29012         | —                | 140         |
| C8D20PF29013         | —                | 140         |
| C8D20PF29022         | —                | 138         |
| C8D20PF29023         | 3-1437260-5      | 138         |
| C8D20PF29032         | —                | 138         |
| C8D20PF29033         | —                | 138         |
| C8D20PF29042         | —                | 140         |
| C8D20PF29043         | 3-1437260-6      | 140         |
| C8D20PF29132         | —                | 140         |
| C8D20PF29133         | —                | 140         |
| C8D20PF29142         | —                | 138         |
| C8D20PF29143         | —                | 138         |
| C8D22DS29A1          | 7-1437275-1      | 31          |
| C8D22DS29A2          | —                | 31          |
| C8D22DS29A3          | 7-1437275-2      | 32          |
| C8D22DS29B1          | 7-1437275-3      | 31          |
| C8D22DS29B2          | —                | 31          |
| C8D22DS29B3          | —                | 32          |
| C8D22DS29C1          | 7-1437275-4      | 31          |
| C8D22DS29C2          | —                | 31          |
| C8D22DS29C3          | 7-1437275-6      | 32          |
| C8D22DS29D1          | 7-1437275-7      | 31          |
| C8D22DS29D2          | —                | 31          |
| C8D22DS29D3          | —                | 32          |
| C8D22DS29E1          | —                | 31          |
| C8D22DS29E2          | —                | 31          |
| C8D22DS29E3          | —                | 32          |
| C8D22PF29012         | —                | 140         |
| C8D22PF29013         | 3-1437260-8      | 140         |
| C8D22PF29022         | —                | 138         |
| C8D22PF29023         | 4-1437260-0      | 138         |
| C8D22PF29032         | —                | 138         |
| C8D22PF29033         | —                | 138         |
| C8D22PF29042         | —                | 140         |
| C8D22PF29043         | 4-1437260-1      | 140         |
| C8D22PF29132         | —                | 140         |
| C8D22PF29133         | —                | 140         |
| C8D22PF29142         | —                | 138         |
| C8D22PF29143         | —                | 138         |
| C8D25DS29A1          | 7-1437275-8      | 31          |
| C8D25DS29A2          | —                | 31          |
| C8D25DS29A3          | 7-1437275-9      | 32          |
| C8D25DS29B1          | —                | 31          |
| C8D25DS29B2          | —                | 31          |
| C8D25DS29B3          | —                | 32          |
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| C8D25DS29C3          | 8-1437275-2      | 32          |
| C8D25DS29D1          | 8-1437275-3      | 31          |
| C8D25DS29D2          | —                | 31          |
| C8D25DS29D3          | 8-1437275-4      | 32          |
| C8D25DS29E1          | —                | 31          |
| C8D25DS29E2          | —                | 31          |
| C8D25DS29E3          | —                | 32          |
| C8D25PF29012         | —                | 140         |
| C8D25PF29013         | 4-1437260-5      | 140         |
| C8D25PF29022         | —                | 138         |
| C8D25PF29023         | 4-1437260-8      | 138         |
| C8D25PF29032         | —                | 138         |
| C8D25PF29033         | 4-1437260-9      | 138         |
| C8D25PF29042         | —                | 140         |
| C8D25PF29043         | —                | 140         |
| C8D25PF29132         | —                | 140         |
| C8D25PF29133         | —                | 140         |
| C8D25PF29142         | —                | 138         |
| C8D25PF29143         | —                | 138         |
| C8D28DS29A1          | —                | 31          |
| C8D28DS29A2          | —                | 31          |
| C8D28DS29A3          | —                | 32          |
| C8D28DS29B1          | —                | 31          |
| C8D28DS29B2          | —                | 31          |
| C8D28DS29B3          | —                | 32          |
| C8D28DS29C1          | 8-1437275-5      | 31          |
| C8D28DS29C2          | —                | 31          |
| C8D28DS29C3          | 8-1437275-8      | 32          |
| C8D28DS29D1          | 8-1437275-9      | 31          |
| C8D28DS29D2          | —                | 31          |
| C8D28DS29D3          | 9-1437275-0      | 32          |
| C8D28DS29E1          | —                | 31          |
| C8D28DS29E2          | —                | 31          |
| C8D28DS29E3          | —                | 32          |
| C8D28PF29012         | 9-1437275-1      | 140         |
| C8D28PF29013         | —                | 140         |
| C8D28PF29022         | —                | 138         |
| C8D28PF29023         | 5-1437260-5      | 138         |
| C8D28PF29032         | —                | 138         |
| C8D28PF29033         | —                | 138         |
| C8D28PF29042         | —                | 140         |
| C8D28PF29043         | —                | 140         |
| C8D28PF29132         | —                | 140         |
| C8D28PF29133         | —                | 140         |
| C8D28PF29142         | —                | 138         |
| C8D28PF29143         | —                | 138         |
| C8D30DS29A1          | —                | 31          |
| C8D30DS29A2          | —                | 31          |
| C8D30DS29A3          | —                | 32          |
| C8D30DS29B1          | —                | 31          |
| C8D30DS29B2          | —                | 31          |
| C8D30DS29B3          | —                | 32          |
| C8D30DS29C1          | 9-1437275-3      | 31          |
| C8D30DS29C2          | —                | 31          |
| C8D30DS29C3          | 9-1437275-5      | 32          |
| C8D30DS29D1          | 9-1437275-6      | 31          |
| C8D30DS29D2          | —                | 31          |
| C8D30DS29D3          | 9-1437275-7      | 32          |
| C8D30DS29E1          | 9-1437275-8      | 31          |
| C8D30DS29E2          | —                | 31          |
| C8D30DS29E3          | 9-1437275-9      | 32          |
| C8D30PF29012         | —                | 140         |
| C8D30PF29013         | 5-1437260-6      | 140         |
| C8D30PF29022         | —                | 138         |
| C8D30PF29023         | 5-1437260-8      | 138         |
| C8D30PF29032         | —                | 138         |
| C8D30PF29033         | —                | 138         |
| C8D30PF29042         | —                | 140         |
| C8D30PF29043         | 6-1437260-1      | 140         |
| C8D30PF29132         | —                | 140         |
| C8D30PF29133         | 6-1437260-4      | 140         |
| C8D30PF29142         | —                | 138         |
| C8D30PF29143         | —                | 138         |
| C8D31DS29A1          | —                | 31          |
| C8D31DS29A2          | —                | 31          |
| C8D31DS29A3          | 0-1437276-2      | 32          |
| C8D31DS29B1          | —                | 31          |
| C8D31DS29B2          | —                | 31          |
| C8D31DS29B3          | —                | 32          |
| C8D31DS29C1          | 0-1437276-3      | 31          |
| C8D31DS29C2          | 0-1437276-5      | 31          |
| C8D31DS29C3          | 0-1437276-6      | 32          |
| C8D31DS29D1          | 0-1437276-8      | 31          |
| C8D31DS29D2          | —                | 31          |
| C8D31DS29D3          | 0-1437276-9      | 32          |
| C8D31DS29E1          | —                | 31          |
| C8D31DS29E2          | —                | 31          |

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| C8D31DS29E3          | —                | 32          |
| C8D31PF29012         | —                | 140         |
| C8D31PF29013         | 6-1437260-5      | 140         |
| C8D31PF29022         | —                | 138         |
| C8D31PF29023         | 6-1437260-6      | 138         |
| C8D31PF29032         | —                | 138         |
| C8D31PF29033         | —                | 138         |
| C8D31PF29042         | —                | 140         |
| C8D31PF29043         | 6-1437260-7      | 140         |
| C8D31PF29132         | 6-1437260-8      | 140         |
| C8D31PF29133         | 6-1437260-9      | 140         |
| C8D31PF29142         | —                | 138         |
| C8D31PF29143         | —                | 138         |
| C8D35DS29A1          | 1-1437276-0      | 31          |
| C8D35DS29A2          | —                | 31          |
| C8D35DS29A3          | 1-1437276-1      | 32          |
| C8D35DS29B1          | —                | 31          |
| C8D35DS29B2          | —                | 31          |
| C8D35DS29B3          | —                | 32          |
| C8D35DS29C1          | —                | 31          |
| C8D35DS29C2          | —                | 31          |
| C8D35DS29C3          | 1-1437276-3      | 32          |
| C8D35DS29D1          | —                | 31          |
| C8D35DS29D2          | —                | 31          |
| C8D35DS29D3          | —                | 32          |
| C8D35DS29E1          | —                | 31          |
| C8D35DS29E2          | —                | 31          |
| C8D35DS29E3          | 1-1437276-4      | 32          |
| C8D35PF29012         | —                | 140         |
| C8D35PF29013         | —                | 140         |
| C8D35PF29022         | —                | 138         |
| C8D35PF29023         | 7-1437260-3      | 138         |
| C8D35PF29032         | —                | 138         |
| C8D35PF29033         | —                | 138         |
| C8D35PF29042         | —                | 140         |
| C8D35PF29043         | —                | 140         |
| C8D35PF29132         | —                | 140         |
| C8D35PF29133         | —                | 140         |
| C8D35PF29142         | —                | 138         |
| C8D35PF29143         | —                | 138         |
| C8D36DS29A1          | —                | 31          |
| C8D36DS29A2          | —                | 31          |
| C8D36DS29A3          | 1-1437276-5      | 32          |
| C8D36DS29B1          | —                | 31          |
| C8D36DS29B2          | —                | 31          |
| C8D36DS29B3          | —                | 32          |
| C8D36DS29C1          | 1-1437276-6      | 31          |
| C8D36DS29C2          | 1-1437276-8      | 31          |
| C8D36DS29C3          | 1-1437276-9      | 32          |
| C8D36DS29D1          | 2-1437276-0      | 31          |
| C8D36DS29D2          | 2-1437276-1      | 31          |
| C8D36DS29D3          | 2-1437276-2      | 32          |
| C8D36DS29E1          | —                | 31          |
| C8D36DS29E2          | —                | 31          |
| C8D36DS29E3          | 2-1437276-3      | 32          |
| C8D36PF29012         | —                | 140         |
| C8D36PF29013         | 7-1437260-7      | 140         |
| C8D36PF29022         | 7-1437260-9      | 138         |
| C8D36PF29023         | 8-1437260-0      | 138         |
| C8D36PF29032         | —                | 138         |
| C8D36PF29033         | 8-1437260-1      | 138         |
| C8D36PF29042         | —                | 140         |
| C8D36PF29043         | 8-1437260-2      | 140         |
| C8D36PF29132         | —                | 140         |
| C8D36PF29133         | —                | 140         |
| C8D36PF29142         | —                | 138         |
| C8D36PF29143         | —                | 138         |
| C8D40DS29A1          | 2-1437276-5      | 31          |
| C8D40DS29A2          | —                | 31          |
| C8D40DS29A3          | 2-1437276-6      | 32          |
| C8D40DS29B1          | —                | 31          |
| C8D40DS29B2          | —                | 31          |
| C8D40DS29B3          | —                | 32          |
| C8D40DS29C1          | 2-1437276-7      | 31          |
| C8D40DS29C2          | —                | 31          |
| C8D40DS29C3          | 2-1437276-9      | 32          |
| C8D40DS29D1          | 3-1437276-0      | 31          |
| C8D40DS29D2          | —                | 31          |
| C8D40DS29D3          | 3-1437276-1      | 32          |
| C8D40DS29E1          | —                | 31          |
| C8D40DS29E2          | —                | 31          |
| C8D40DS29E3          | —                | 32          |
| C8D40PF29012         | —                | 140         |
| C8D40PF29013         | —                | 140         |
| C8D40PF29022         | —                | 138         |
| C8D40PF29023         | 8-1437260-4      | 138         |
| C8D40PF29032         | —                | 138         |
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| C8D40PF29042         | —                | 140         |
| C8D40PF29043         | 8-1437260-6      | 140         |
| C8D40PF29132         | —                | 140         |
| C8D40PF29133         | —                | 140         |
| C8D40PF29142         | —                | 138         |
| C8D40PF29143         | —                | 138         |
| C8D43DS29A1          | —                | 31          |
| C8D43DS29A2          | —                | 31          |
| C8D43DS29A3          | —                | 32          |
| C8D43DS29B1          | —                | 31          |
| C8D43DS29B2          | —                | 31          |
| C8D43DS29B3          | —                | 32          |
| C8D43DS29C1          | 3-1437276-2      | 31          |
| C8D43DS29C2          | —                | 31          |
| C8D43DS29C3          | 3-1437276-3      | 32          |
| C8D43DS29D1          | —                | 31          |
| C8D43DS29D2          | —                | 31          |
| C8D43DS29D3          | 3-1437276-4      | 32          |
| C8D43DS29E1          | 3-1437276-5      | 31          |
| C8D43DS29E2          | —                | 31          |
| C8D43DS29E3          | —                | 32          |
| C8D43PF29012         | 8-1437260-9      | 140         |
| C8D43PF29013         | 9-1437260-0      | 140         |
| C8D43PF29022         | 9-1437260-2      | 138         |
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| C8D43PF29032         | —                | 138         |
| C8D43PF29033         | —                | 138         |
| C8D43PF29042         | —                | 140         |
| C8D43PF29043         | —                | 140         |
| C8D43PF29132         | —                | 140         |
| C8D43PF29142         | —                | 138         |
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| C8D50DS29A1          | 3-1437276-8      | 31          |
| C8D50DS29A2          | —                | 32          |
| C8D50DS29A3          | 3-1437276-9      | 32          |
| C8D50DS29B1          | —                | 31          |
| C8D50DS29B2          | —                | 32          |
| C8D50DS29B3          | —                | 32          |
| C8D50DS29C1          | 4-1437276-0      | 31          |
| C8D50DS29C2          | —                | 32          |
| C8D50DS29C3          | 4-1437276-2      | 32          |
| C8D50DS29D1          | 4-1437276-3      | 31          |
| C8D50DS29D2          | —                | 32          |
| C8D50DS29D3          | —                | 32          |
| C8D50DS29E1          | —                | 31          |
| C8D50DS29E2          | —                | 32          |
| C8D50DS29E3          | —                | 32          |
| C8D50PF29012         | —                | 140         |
| C8D50PF29013         | 9-1437260-9      | 140         |
| C8D50PF29022         | —                | 138         |
| C8D50PF29023         | 0-1437261-2      | 138         |
| C8D50PF29032         | —                | 138         |
| C8D50PF29033         | 0-1437261-5      | 138         |
| C8D50PF29042         | —                | 140         |
| C8D50PF29043         | 0-1437261-6      | 140         |
| C8D50PF29132         | —                | 140         |
| C8D50PF29133         | —                | 140         |
| C8D50PF29142         | —                | 138         |
| C8D50PF29143         | —                | 138         |
| C8D52DS29C1M191      | 4-1437276-6      | 29          |
| C8D52DS29C1M195      | 4-1437276-7      | 29          |
| C8D60DS29A1          | 5-1437276-1      | 31          |
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| C8D60DS29A3          | 5-1437276-2      | 32          |
| C8D60DS29B1          | —                | 31          |
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| C8D60DS29C1          | 5-1437276-4      | 31          |
| C8D60DS29C2          | —                | 32          |
| C8D60DS29C3          | —                | 32          |
| C8D60DS29D1          | 5-1437276-7      | 31          |
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| C8D60DS29E1          | —                | 31          |
| C8D60DS29E2          | —                | 32          |
| C8D60DS29E3          | —                | 32          |
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| C8D60PF29023         | 1-1437261-1      | 138         |
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| C8D60PF29133         | —                | 140         |
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| C9D030PF60048        | 3-1437264-5      | 129         |
| C9D040PF60048        | —                | 129         |
| C9D050PF60048        | —                | 129         |
| C9D060PF60048        | 3-1437264-6      | 129         |
| W8D18DS29063         | —                | 34          |
| W8D18DS29093         | —                | 34          |
| W8D18PF29012         | —                | 134         |
| W8D18PF29013         | —                | 134         |
| W8D18PF29042         | —                | 134         |
| W8D18PF29043         | —                | 134         |
| W8D18PF29062         | —                | 136         |
| W8D18PF29063         | 1-1437265-0      | 136         |
| W8D18PF29092         | —                | 136         |
| W8D18PF29093         | —                | 136         |
| W8D20DS29063         | —                | 34          |
| W8D20DS29093         | —                | 34          |
| W8D20PF29012         | —                | 134         |
| W8D20PF29013         | —                | 134         |
| W8D20PF29042         | —                | 134         |
| W8D20PF29043         | —                | 134         |
| W8D20PF29062         | —                | 136         |
| W8D20PF29063         | —                | 136         |
| W8D20PF29092         | —                | 136         |
| W8D20PF29093         | —                | 136         |
| W8D22DS29063         | —                | 34          |
| W8D22DS29093         | —                | 34          |
| W8D22PF29012         | —                | 134         |
| W8D22PF29013         | —                | 134         |
| W8D22PF29042         | —                | 134         |
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| W8D25DS29063         | —                | 34          |
| W8D25DS29093         | —                | 34          |
| W8D25PF29012         | —                | 134         |
| W8D25PF29013         | 1-1437265-3      | 134         |
| W8D25PF29042         | —                | 134         |
| W8D25PF29043         | —                | 134         |
| W8D25PF29062         | —                | 136         |
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| W8D28DS29063         | —                | 34          |
| W8D28DS29093         | —                | 34          |
| W8D28PF29012         | —                | 134         |
| W8D28PF29013         | 1-1437265-6      | 134         |
| W8D28PF29042         | —                | 134         |
| W8D28PF29043         | —                | 134         |
| W8D28PF29062         | —                | 136         |
| W8D28PF29063         | —                | 136         |
| W8D28PF29092         | —                | 136         |
| W8D28PF29093         | 1-1437265-7      | 136         |
| W8D30DS29063         | —                | 34          |
| W8D30DS29093         | —                | 34          |
| W8D30PF29012         | —                | 134         |
| W8D30PF29013         | 2-1437265-0      | 134         |
| W8D30PF29042         | —                | 134         |
| W8D30PF29043         | 2-1437265-1      | 134         |
| W8D30PF29062         | —                | 136         |
| W8D30PF29063         | —                | 136         |
| W8D30PF29092         | —                | 136         |
| W8D30PF29093         | —                | 136         |
| W8D35DS29063         | —                | 34          |
| W8D35DS29093         | —                | 34          |
| W8D35PF29012         | —                | 134         |
| W8D35PF29013         | 2-1437265-3      | 134         |
| W8D35PF29042         | —                | 134         |
| W8D35PF29043         | —                | 134         |
| W8D35PF29062         | —                | 136         |
| W8D35PF29063         | 2-1437265-5      | 136         |
| W8D35PF29092         | —                | 136         |
| W8D35PF29093         | —                | 136         |
| W8D36DS29063         | —                | 34          |
| W8D36DS29093         | —                | 34          |
| W8D36PF29012         | —                | 134         |
| W8D36PF29013         | 2-1437265-6      | 134         |
| W8D36PF29042         | —                | 134         |
| W8D36PF29043         | 2-1437265-7      | 134         |
| W8D36PF29062         | —                | 136         |
| W8D36PF29063         | —                | 136         |
| W8D36PF29092         | —                | 136         |
| W8D36PF29093         | 2-1437265-8      | 136         |
| W8D40DS29063         | —                | 34          |
| W8D40DS29093         | —                | 34          |

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| W8D40PF29013         | 3-1437265-0      | 134         |
| W8D40PF29042         | —                | 134         |
| W8D40PF29043         | —                | 134         |
| W8D40PF29062         | —                | 136         |
| W8D40PF29063         | —                | 136         |
| W8D40PF29092         | —                | 136         |
| W8D40PF29093         | —                | 136         |
| W8D43DS29063         | —                | 34          |
| W8D43DS29093         | —                | 34          |
| W8D43PF29012         | —                | 134         |
| W8D43PF29013         | —                | 134         |
| W8D43PF29042         | —                | 134         |
| W8D43PF29043         | —                | 134         |
| W8D43PF29062         | —                | 136         |
| W8D43PF29063         | —                | 136         |
| W8D43PF29092         | —                | 136         |
| W8D43PF29093         | —                | 136         |
| W8D45DS29063         | —                | 34          |
| W8D45DS29093         | —                | 34          |
| W8D45PF29012         | —                | 134         |
| W8D45PF29013         | —                | 134         |
| W8D45PF29042         | —                | 134         |
| W8D45PF29043         | —                | 134         |
| W8D45PF29062         | —                | 136         |
| W8D45PF29063         | —                | 136         |
| W8D45PF29092         | —                | 136         |
| W8D45PF29093         | —                | 136         |
| W8D50DS29063         | —                | 34          |
| W8D50DS29093         | —                | 34          |
| W8D50PF29012         | 3-1437265-4      | 134         |
| W8D50PF29013         | 3-1437265-5      | 134         |
| W8D50PF29042         | —                | 134         |
| W8D50PF29043         | 3-1437265-6      | 134         |
| W8D50PF29062         | 3-1437265-7      | 136         |
| W8D50PF29063         | —                | 136         |
| W8D50PF29092         | —                | 136         |
| W8D50PF29093         | —                | 136         |
| W8D60DS29063         | —                | 34          |
| W8D60DS29093         | —                | 34          |
| W8D60PF29012         | —                | 134         |
| W8D60PF29013         | 3-1437265-9      | 134         |
| W8D60PF29042         | —                | 134         |
| W8D60PF29043         | —                | 134         |
| W8D60PF29062         | —                | 136         |
| W8D60PF29063         | —                | 136         |
| W8D60PF29092         | —                | 136         |
| W8D60PF29093         | —                | 136         |

For additional component solutions for Industrial Machinery, Instrumentation, Security, and related applications, request the following brochures:

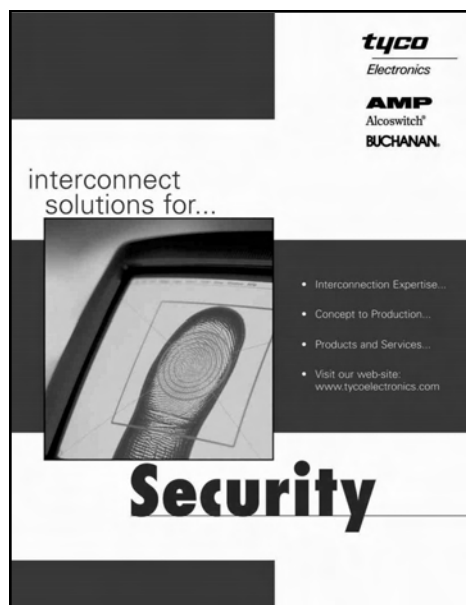
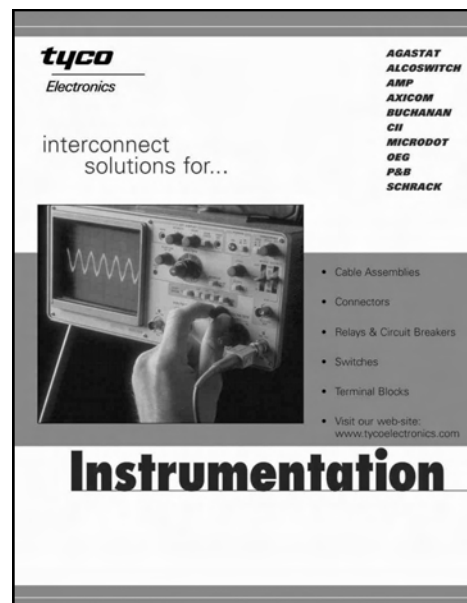
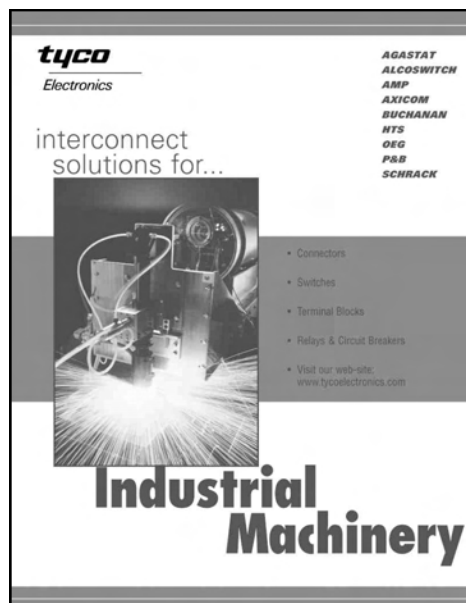
Brochure No. 889439 – Industrial Machinery

Brochure No. 1307285 – Instrumentation

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