

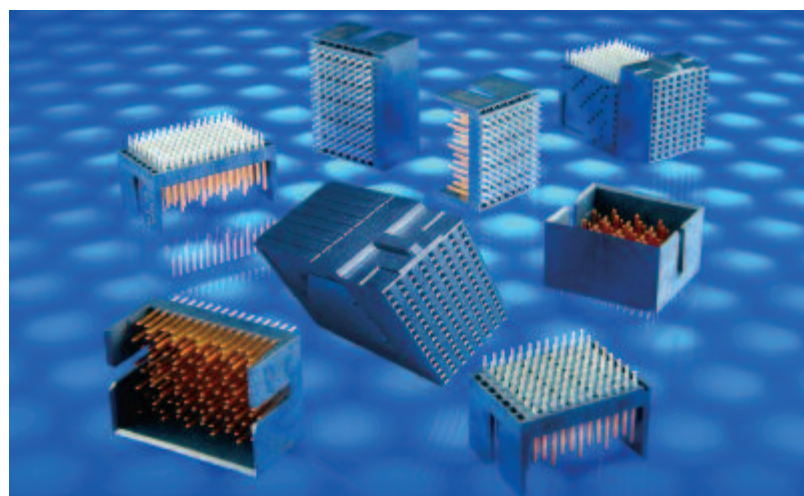
## Introduction

### Product Facts

- 10+ Gbps performance
- 100 ohm Impedance for Differential Pair configuration
- 5 pair version offers 26 pairs/10mm [66 differential pairs/inch] fitting within a 25.40 [1.00] card slot pitch
- 4 pair version offers 21 pairs/10mm [53 differential pairs/inch] fitting within a 20.30 [.800] card slot pitch
- 3 pair version offering 16 pairs/10mm [40 differential pairs/inch] fitting within a 16.25 [.625] card slot pitch
- Right angle pin headers (coplanar) in 3 pair, 4 pair, and 5 pair versions
- Reliable, redundant contact design on every signal contact
- Modular system offered in various column versions
- Meets Industry reliability requirements of Bellcore/Telcordia
- Sequencing for ground and signal contacts
- RoHS Compliant

### Future Product Extensions

- Vertical receptacles
- High speed cable assemblies and hardware



The Z-PACK TinMan backplane connector family is a cost-effective solution for customers searching for a high density, high performance backplane interconnect system.

The Z-PACK TinMan connector design follows proven industry backplane convention by offering a fully protected right-angle receptacle for use on daughter-cards where handling damage can be a concern when mating to a vertical male header. This connector permits field repairability at either the module or single pin levels.

Ground contacts positioned within each column of the connector, combined with unique contact lead frame arrangements, enable the Z-PACK TinMan connector to achieve low crosstalk and high through-put performance levels. Reliability is provided with a dual point of contact mating interface and compliant pin interface to the printed circuit board.

### Industry Applications

Ideally designed for cost pressured, high signal density applications requiring interconnection between two printed circuit boards, such as those typically found in server, storage, switch, router, and similar applications. The Z-PACK TinMan connector product family is suited to meet the demands of today's modular system designs by offering a variety of configurations. The product family includes configurations to fit 20.32 [.800] and 25.40 [1.00] card slot spacing.

### Technical Documents

**Product Specification** 108-2303

**Application Specification** 114-13202

**Routing Guide Report** #27GC001-1

### Material and Finish

**Signal Contact** — High Strength Copper Alloy

**Ground Contact** — High Strength Copper Alloy

**Housing** — Liquid Crystal Polymer

**Platings** — Telcordia compliant interface, Nickel underplate

**Compliant Pin Plating** — RoHS Compliant

### Ratings

**Temperature Range** — -65°C to +90°C

**Current Rating** — 0.5 A/contact @ < 30°C T-Rise

**Durability** — 200 cycles

**Dielectric Withstanding Voltage** — 560 VAC

**Operating Voltage** — 250 VAC max.

### Signal Integrity

**Characteristic Impedance** — Differential @ 100 ohms  $\pm 10\%$

**Crosstalk** — Multi-pair differential crosstalk: 2.1% @ 50ps

**Insertion Loss** — -2 dB @ 10 GHz



For additional information visit:  
<http://www.tycoelectronics.com/zpacktinman>

## Introduction (Continued)

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- Technical support
- Catalogs
- Technical Documents
- Product Samples
- Authorized Distributor Locations

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At Tyco Electronics, we're ready to support your RoHS requirements. We've assessed more than 1.5 million end items/components for RoHS compliance, and issued new part numbers where any change was required to eliminate the restricted materials. Part numbers in this catalog are identified as:

**RoHS Compliant** — Part numbers in this catalog are RoHS Compliant, unless marked otherwise. These products comply with European Union Directive 2002/95/EC as amended 1 January 2006 that restricts the use of lead, mercury, cadmium, hexavalent chromium, PBB, and PBDE in certain electrical and electronic products sold into the EU as of 1 July 2006.

NOTE: For purposes of this Catalog, included within the definition of RoHS Compliant are products that are clearly "Out of Scope" of the RoHS Directive such as hand tools and other non-electrical accessories.

NOTE: Information regarding RoHS compliance is provided based on reasonable inquiry of our suppliers and represents our current actual knowledge based on the information provided by our suppliers. This information is subject to change. For latest compliance status, refer to our website referenced at right.

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- Cross-Reference from Non-compliant to Compliant Products
- Ability to browse RoHS Compliant Products in our on-line catalog
- Downloadable Technical Data Customer Information Presentation
- More detailed information regarding the definitions used above
- So whatever your questions when it comes to RoHS, we've got the answers at [www.tycoelectronics.com/leadfree](http://www.tycoelectronics.com/leadfree)

**RoHS**  
Customer  
Support  
Center 

## Introduction (Continued)

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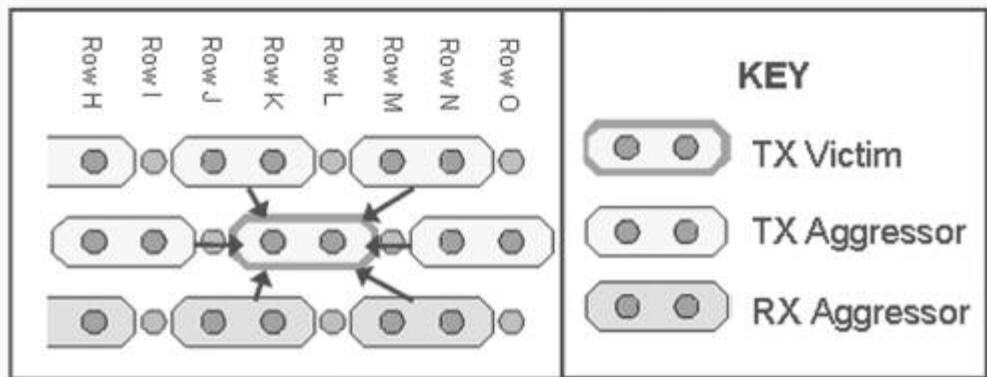
## Introduction (Continued)

### Noise Table

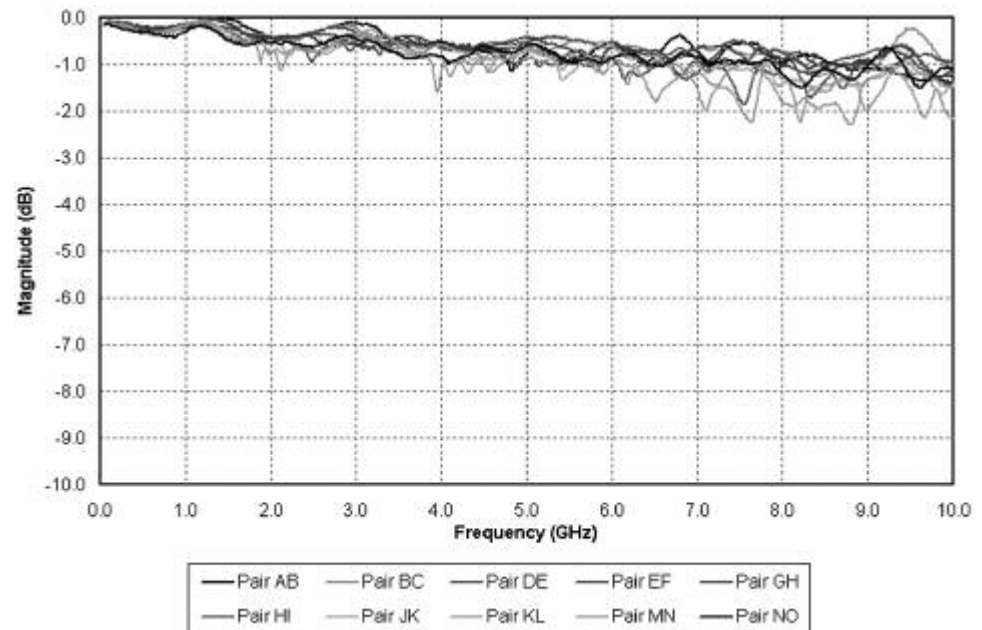
#### ■ Maximum, multiple source crosstalk

| Victim Pair | Total Peak Receiver Noise for Recommended Pin-Out |
|-------------|---------------------------------------------------|
| AB9         | 0.8%                                              |
| BC8         | 1.6%                                              |
| DE9         | 1.9%                                              |
| EF8         | 1.9%                                              |
| GH9         | 2.0%                                              |
| HI8         | 2.0%                                              |
| JG9         | 2.0%                                              |
| KL8         | 2.1%                                              |
| MN9         | 1.7%                                              |
| NO8         | 0.8%                                              |

**Note:** Data includes PCB vias of both backplane and daughtercard connectors. Single mated connector pair 50 ps (20-80%) edge rate



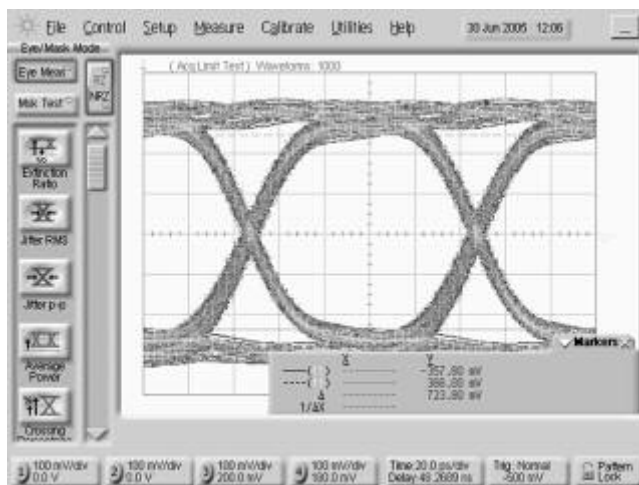
### Insertion Loss Plot



## Introduction (Continued)

### Representative Eye Pattern

- 10.0 Gbps data rate
- 2<sup>7</sup>-1 PRBS
- Unequalized Signal



### Customer Connector Evaluation Kit

- Connector characterization
- Available for loan — contact your local Tyco Electronics Sales Engineer
- Time and frequency domain testable
- Testable to 18+ GHz (25+ Gb/s)
- Multiple calibration options
- Convenient SMA interface



### Customer System Evaluation Kit

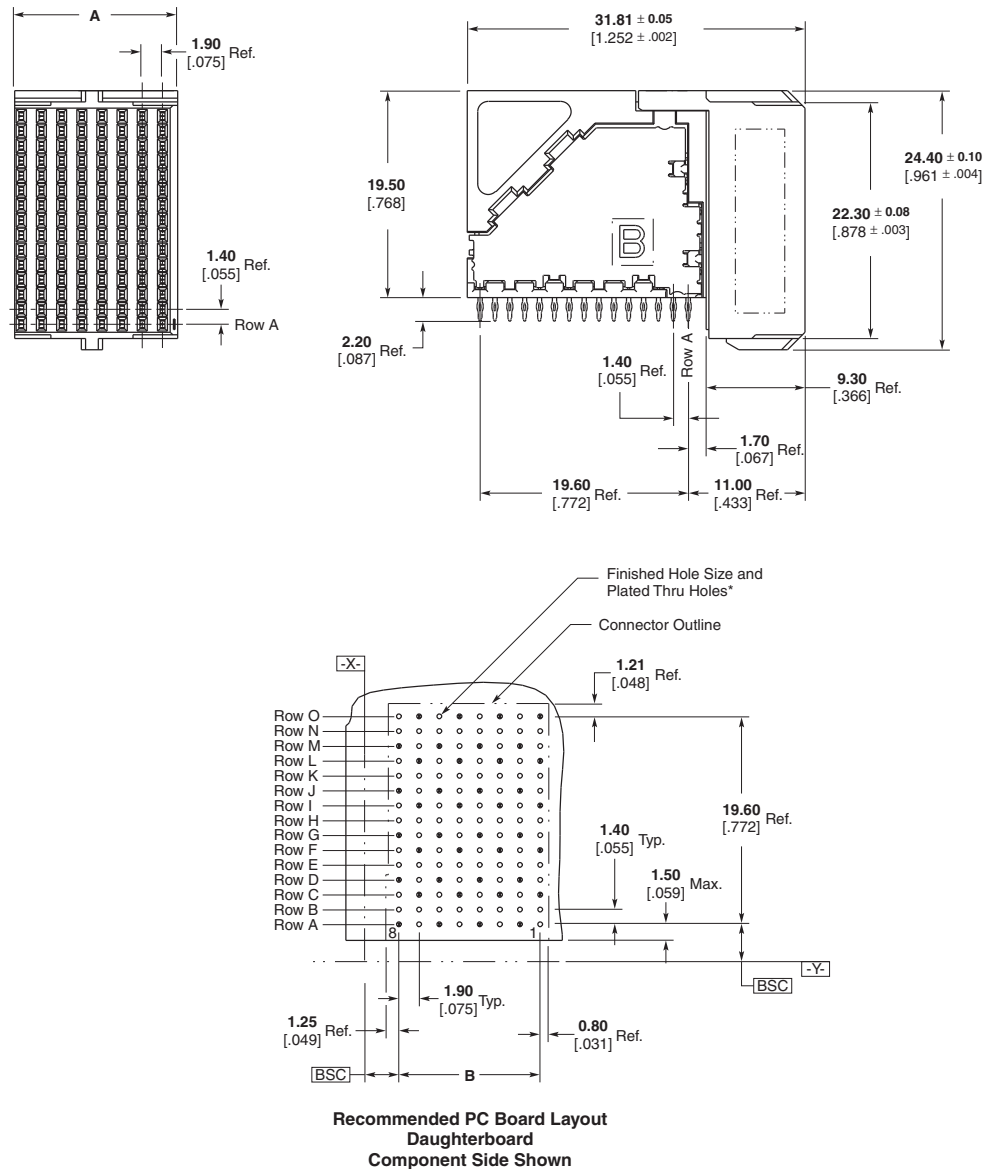
- System characterization
- Available for loan — contact your local Tyco Electronics Sales Engineer
- Time and frequency domain testable
- Testable to 18+ GHz (25+ Gb/s)
- Multiple system lengths
- Convenient SMA interface



## 5 Pair Right Angle Receptacle Assemblies

| Column | Part Number | Dimension      |                | Application Tooling | Mates With                                                                |
|--------|-------------|----------------|----------------|---------------------|---------------------------------------------------------------------------|
|        |             | A              | B              |                     |                                                                           |
| 8      | 1934218-1   | 15.35<br>.604  | 13.30<br>.524  | *                   | 1934269-1,(R) 1934272-1,(L) 1934273-1,<br>1934271-1, 1934349-1, 1934350-1 |
| 16     | 1934221-1   | 30.55<br>1.203 | 28.50<br>1.122 | *                   | 1934331-1, 1934334-1, 1934333-1,<br>1934332-1, 1934347-1, 1934348-1       |

\* Custom tooling not required. Utilizes flat-rock insertion tooling. Reference Application Specification 114-13202.



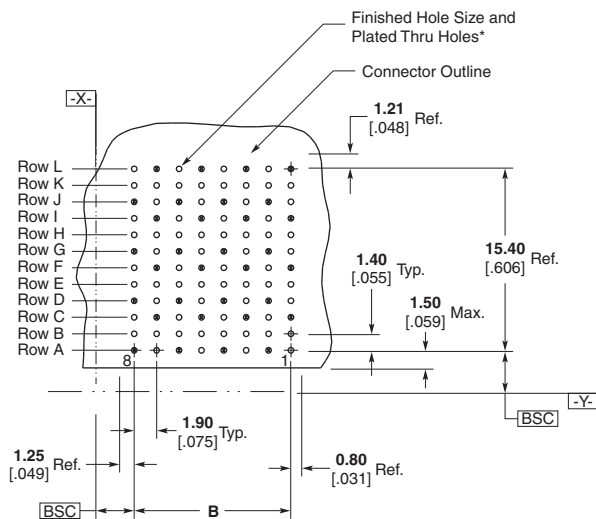
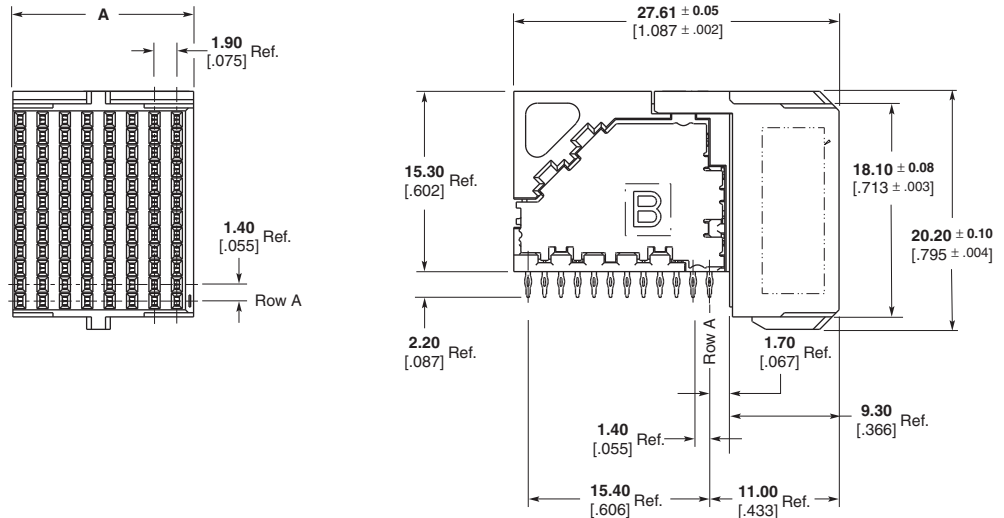
**Note:** For additional information on pcb routing guidelines, reference the Z-PACK TinMan Connector Routing Guide Report #27GC001-1.

\* Finished Hole Diameter =  $0.46 \pm^{0.05}_{.018 \pm^{0.002}_{.001}}$   
Drilled Hole Diameter =  $0.55 \pm^{0.02}_{.022 \pm^{0.001}_{.0005}}$   
Copper Thickness =  $0.038 \pm^{0.013}_{.0015 \pm^{0.0005}_{.0002}}$   
Tin-Lead Thickness =  $0.008 \pm^{0.004}_{.0003 \pm^{0.0002}_{.0001}}$   
Finishes other than Tin-Lead, See Appl. Spec. 114-13202

## 4 Pair Right Angle Receptacle Assemblies

| Column | Part Number | Dimension      |                | Application Tooling | Mates With                                                           |
|--------|-------------|----------------|----------------|---------------------|----------------------------------------------------------------------|
|        |             | A              | B              |                     |                                                                      |
| 8      | 1934222-1   | 15.35<br>.604  | 13.30<br>.524  | *                   | 1934226-1, 1934304-1, 1934303-1,<br>1934306-1, 1934225-1, 1934354-1, |
| 16     | 1934225-1   | 30.55<br>1.203 | 28.50<br>1.122 | *                   | 1934315-1, 1934318-1, 1934317-1,<br>1934316-1, 1934351-1, 1934352-1, |

\* Custom tooling not required. Utilizes flat-rock insertion tooling. Reference Application Specification 114-13202.



**Recommended PC Board Layout  
Daughterboard  
Component Side Shown**

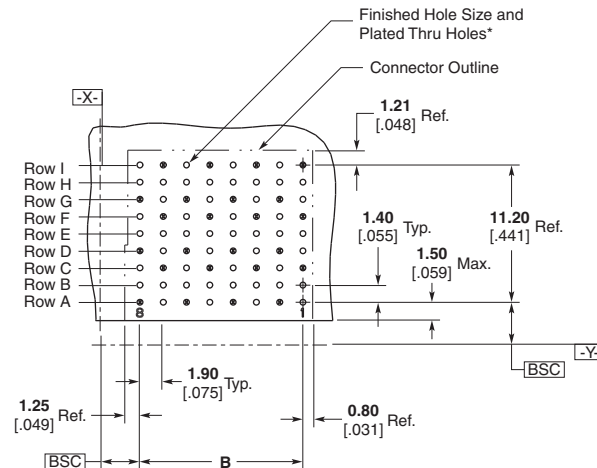
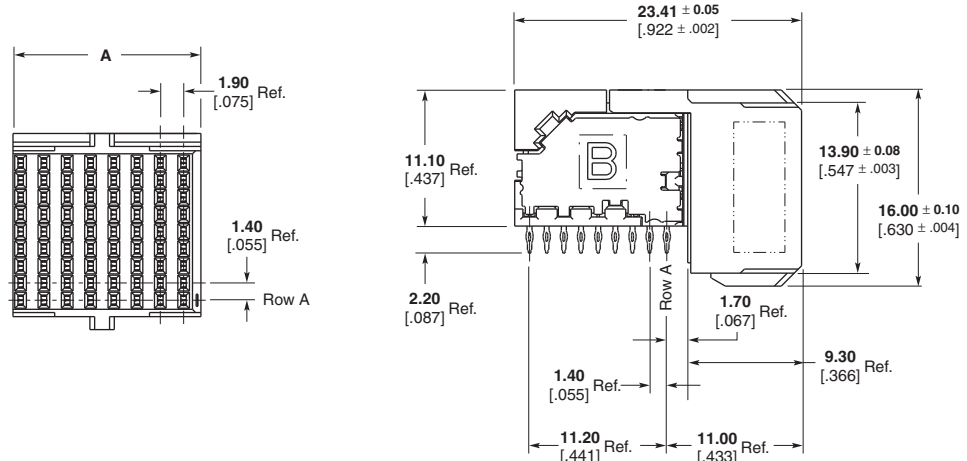
**Note:** For additional information on pcb routing guidelines, reference the Z-PACK TinMan Connector Routing Guide Report #27GC001-1.

\* Finished Hole Diameter =  $0.46 \pm 0.05$  [0.018 ± .002]  
Drilled Hole Diameter =  $0.55 \pm 0.02$  [0.022 ± .001]  
Copper Thickness =  $0.038 \pm 0.013$  [0.0015 ± .0005]  
Tin-Lead Thickness =  $0.008 \pm 0.004$  [0.0003 ± .0002]  
Finishes other than Tin-Lead, See Appl. Spec. 114-13202

### 3 Pair Right Angle Receptacle Assemblies

| Column | Part Number | Dimension      |                | Application Tooling | Mates With                                                           |
|--------|-------------|----------------|----------------|---------------------|----------------------------------------------------------------------|
|        |             | A              | B              |                     |                                                                      |
| 8      | 1934226-1   | 15.35<br>.604  | 13.30<br>.524  | *                   | 1934299-1, 1934300-1, 1934301-1,<br>1934302-1, 1934359-1, 1934360-1, |
| 10     | 1934228-1   | 19.15<br>.754  | 17.10<br>.673  | *                   | 1934339-1, 1934341-1, 1934340-1,<br>1934342-1, 1934357-1, 1934358-1, |
| 16     | 1934229-1   | 30.55<br>1.203 | 28.50<br>1.122 | *                   | 1934339-1, 1934340-1, 1934345-1,<br>1934346-1, 1934355-1, 1934356-1, |

\* Custom tooling not required. Utilizes flat-rock insertion tooling. Reference Application Specification 114-13202.



**Recommended PC Board Layout  
Daughterboard  
Component Side Shown**

**Note:** For additional information on pcb routing guidelines, reference the Z-PACK TinMan Connector Routing Guide Report #27GC001-1.

\* Finished Hole Diameter =  $0.46 \pm 0.05$  [ $0.018 \pm 0.002$ ]  
Drilled Hole Diameter =  $0.55 \pm 0.02$  [ $0.022 \pm 0.001$ ]  
Copper Thickness =  $0.038 \pm 0.013$  [ $0.0015 \pm 0.0005$ ]  
Tin-Lead Thickness =  $0.008 \pm 0.004$  [ $0.0003 \pm 0.0002$ ]  
Finishes other than Tin-Lead, See Appl. Spec. 114-13202

| Column | Part Number | Dimension      |                | Application Tooling* | Mates With |
|--------|-------------|----------------|----------------|----------------------|------------|
|        |             | A              | B              |                      |            |
| 8      | 1934269-1   | 15.35<br>.604  | 13.30<br>.524  | 1-1804791-1          | 1934218-1  |
| 16     | 1934331-1   | 30.55<br>1.203 | 28.50<br>1.122 | 1-1804791-2          | 1934221-1  |

Technical drawing of a 16x16 array of microvias on a rectangular substrate. The drawing includes top and side views with detailed dimensions in millimeters and inches.

**Top View Dimensions:**

- Overall Width:  $A$
- Overall Height:  $B$
- Microvia Diameter:  $1.90 \pm 0.075$  [Ref.]
- Microvia Depth:  $1.425 \pm 0.056$  [Ref.]
- Microvia Spacing (Center-to-Center):  $1.40 \pm 0.055$  [Ref.]
- Microvia Diameter (Bottom):  $2.38 \pm 0.094$  [Ref.]

**Side View Dimensions:**

- Microvia Depth:  $4.50 \pm 0.15$  [ $0.177 \pm .006$ ]
- Microvia Diameter (Top):  $6.00 \pm 0.15$  [ $0.236 \pm .006$ ]
- Microvia Diameter (Bottom):  $11.80 \pm 0.10$  [ $0.465 \pm .004$ ]
- Microvia Spacing (Center-to-Center):  $22.60 \pm 0.08$  [ $0.890 \pm .003$ ]
- Microvia Diameter (Bottom):  $2.80 \pm 0.05$  [ $0.110 \pm .002$ ]
- Microvia Diameter (Bottom):  $2.50 \pm 0.098$  [Ref.]
- Microvia Diameter (Bottom):  $2.40 \pm 0.094$  [Ref.]
- Microvia Diameter (Bottom):  $1.40 \pm 0.055$  [Ref.]

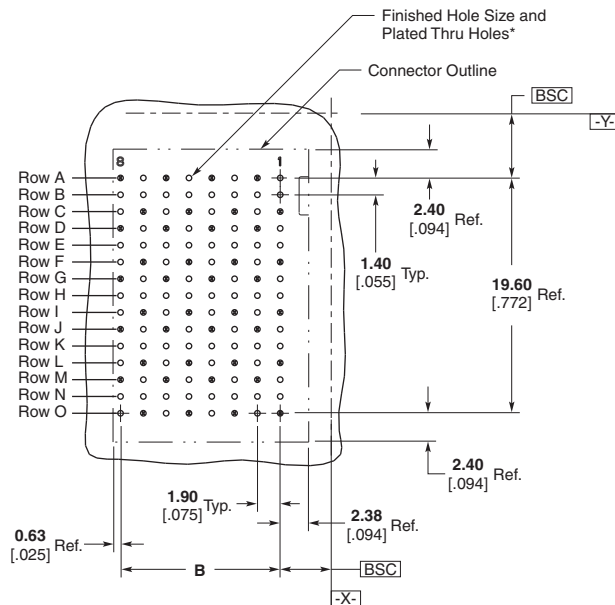
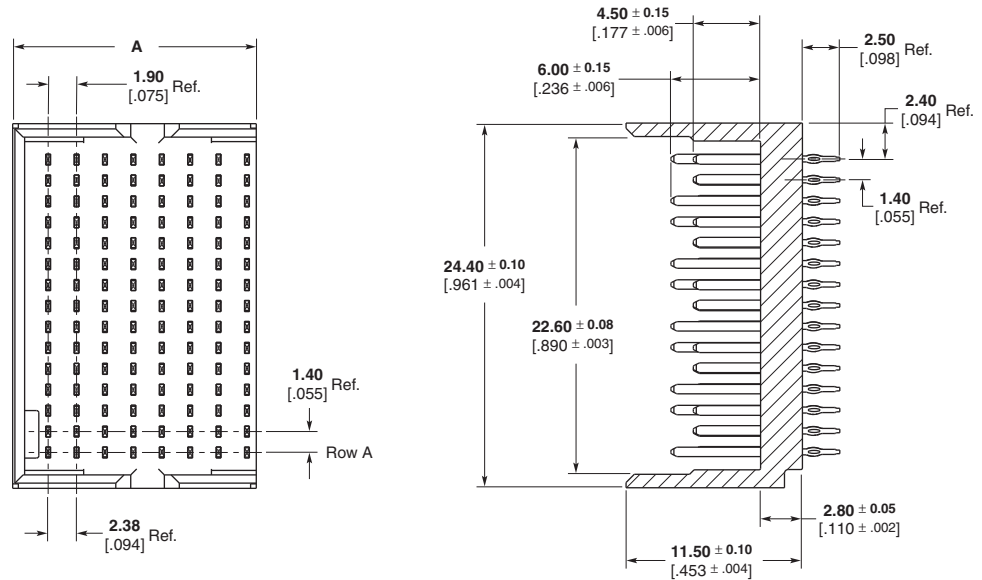


\* Finished Hole Diameter =  $0.46 \pm^{+0.05}_{-0.02}$  [018  $\pm^{+0.002}_{-0.001}$ ]  
 Drilled Hole Diameter =  $0.55 \pm^{+0.02}_{-0.01}$  [022  $\pm^{+0.001}_{-0.001}$ ]  
 Copper Thickness =  $0.038 \pm^{+0.013}_{-0.005}$  [0015  $\pm^{+0.005}_{-0.005}$ ]  
 Tin-Lead Thickness =  $0.008 \pm^{+0.004}_{-0.002}$  [0003  $\pm^{+0.002}_{-0.002}$ ]  
 Finishes other than Tin-Lead. See Appl. Spec. 114-13202

## 5 Pair Vertical Header Assemblies — Left End Wall

| Column | Part Number | Dimension      |                | Application Tooling* | Mates With |
|--------|-------------|----------------|----------------|----------------------|------------|
|        |             | A              | B              |                      |            |
| 8      | 1934272-1   | 16.30<br>.642  | 13.30<br>.524  | 1-1804791-1          | 1934218-1  |
| 16     | 1934333-1   | 31.50<br>1.240 | 28.50<br>1.122 | 1-1804791-2          | 1934221-1  |

\* Reference Application Specification 114-13202.



**Recommended PC Board Layout  
Backplane  
Component Side Shown**

**Note:** For additional information on pcb routing guidelines, reference the Z-PACK TinMan Connector Routing Guide Report #27GC001-1.

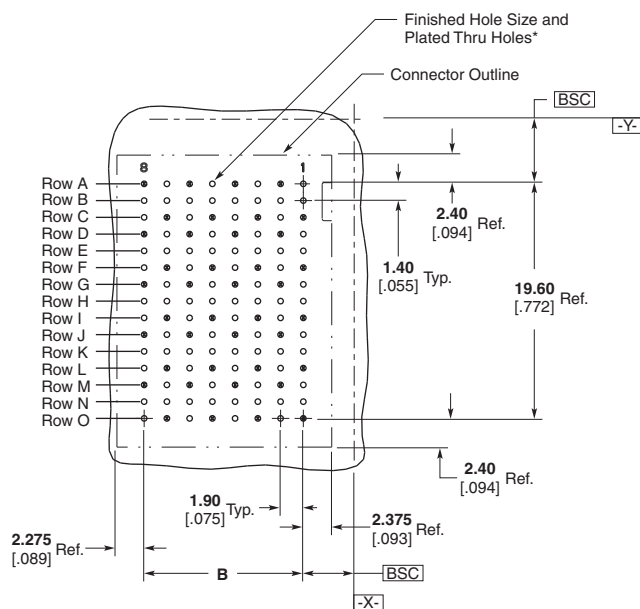
\* Finished Hole Diameter =  $0.46 \pm 0.05$  [0.018 ± 0.002]  
Drilled Hole Diameter =  $0.55 \pm 0.02$  [0.022 ± 0.001]  
Copper Thickness =  $0.038 \pm 0.013$  [0.0015 ± 0.0005]  
Tin-Lead Thickness =  $0.008 \pm 0.004$  [0.0003 ± 0.0002]  
Finishes other than Tin-Lead, See Appl. Spec. 114-13202

| Column | Part Number | Dimension             |                       | Application Tooling* | Mates With |
|--------|-------------|-----------------------|-----------------------|----------------------|------------|
|        |             | A                     | B                     |                      |            |
| 8      | 1934273-1   | <b>17.00</b><br>.669  | <b>13.30</b><br>.524  | 1-1804791-1          | 1934218-1  |
| 16     | 1934334-1   | <b>32.20</b><br>1.268 | <b>28.50</b><br>1.122 | 1-1804791-2          | 1934221-1  |



\* Finished Hole Diameter =  $0.46 \pm^{+0.05}_{-0.02}$  [018  $\pm^{+0.002}_{-0.001}$ ]  
 Drilled Hole Diameter =  $0.55 \pm^{+0.02}_{-0.01}$  [022  $\pm^{+0.001}_{-0.0005}$ ]  
 Copper Thickness =  $0.038 \pm^{+0.013}_{-0.005}$  [0015  $\pm^{+0.0005}_{-0.0002}$ ]  
 Tin-Lead Thickness =  $0.008 \pm^{+0.004}_{-0.003}$  [0003  $\pm^{+0.0002}_{-0.0001}$ ]  
 Finishes other than Tin-Lead. See App. Spec. 114-13202

| Column | Part Number | Dimension             |                       | Application Tooling* | Mates With |
|--------|-------------|-----------------------|-----------------------|----------------------|------------|
|        |             | A                     | B                     |                      |            |
| 8      | 1934271-1   | <b>17.95</b><br>.707  | <b>13.30</b><br>.524  | 1-1804791-1          | 1934218-1  |
| 16     | 1934332-1   | <b>33.15</b><br>1.305 | <b>28.50</b><br>1.122 | 1-1804791-2          | 1934221-1  |

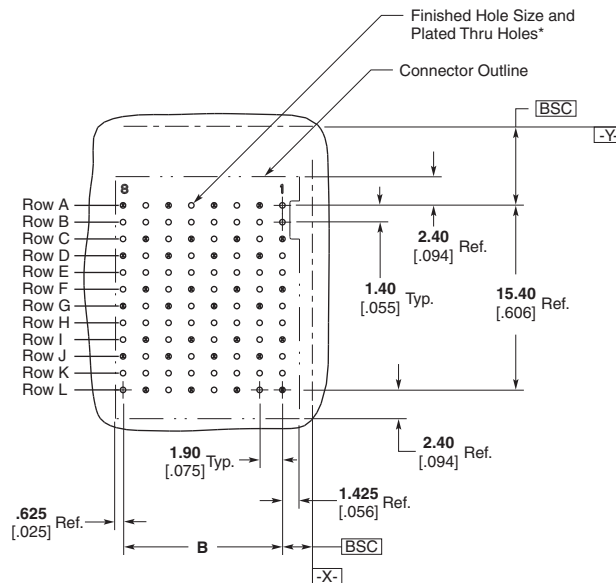
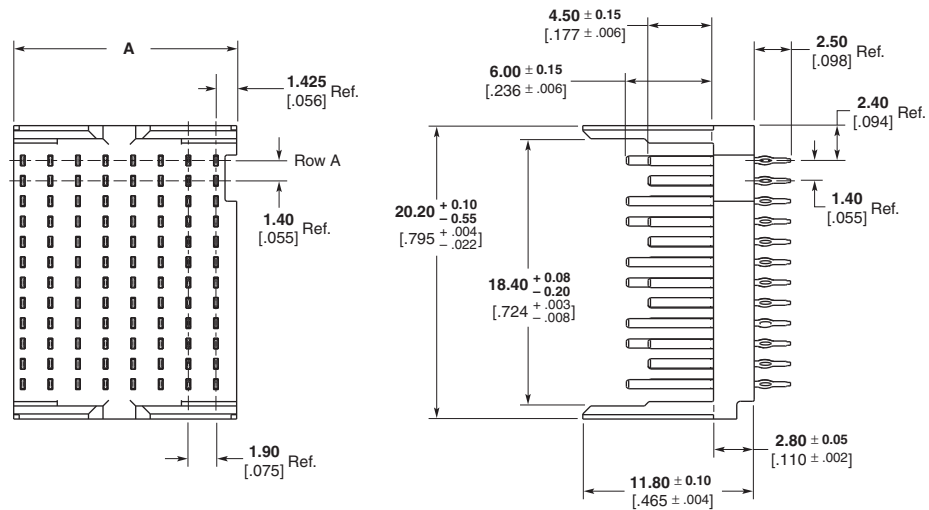


\* Finished Hole Diameter =  $0.46 \pm^{+0.05}_{-0.01}$  [0.018  $\pm^{+0.002}_{-0.001}$ ]  
 Drilled Hole Diameter =  $0.55 \pm^{+0.02}_{-0.01}$  [0.022  $\pm^{+0.001}_{-0.001}$ ]  
 Copper Thickness =  $0.038 \pm^{+0.013}_{-0.005}$  [0.015  $\pm^{+0.005}_{-0.005}$ ]  
 Tin-Lead Thickness =  $0.008 \pm^{+0.004}_{-0.003}$  [0.0003  $\pm^{+0.0002}_{-0.0002}$ ]  
 Finishes other than Tin-Lead. See Appl. Spec. 114-13202

## 4 Pair Vertical Header Assemblies

| Column | Part Number | Dimension      |                | Application Tooling* | Mates With |
|--------|-------------|----------------|----------------|----------------------|------------|
|        |             | A              | B              |                      |            |
| 8      | 1934305-1   | 15.35<br>.604  | 13.30<br>.524  | 1-1804790-1          | 1934222-1  |
| 16     | 1934315-1   | 30.55<br>1.202 | 28.50<br>1.122 | 1-1804790-3          | 1934225-1  |

\* Reference Application Specification 114-13202.



Recommended PC Board Layout  
Backplane  
Component Side Shown

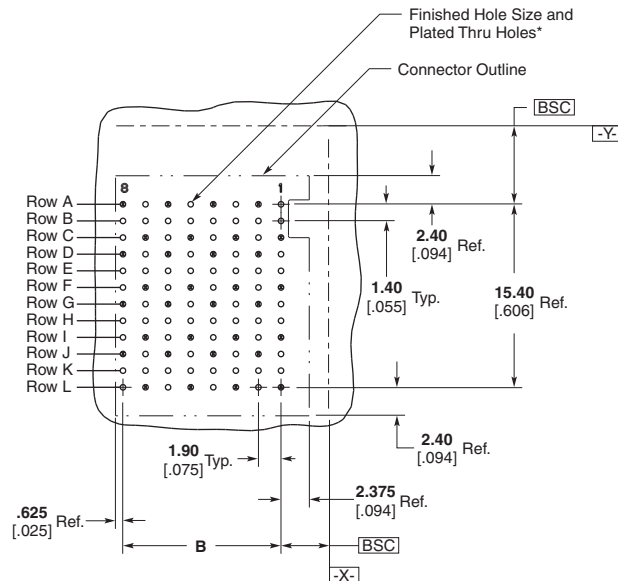
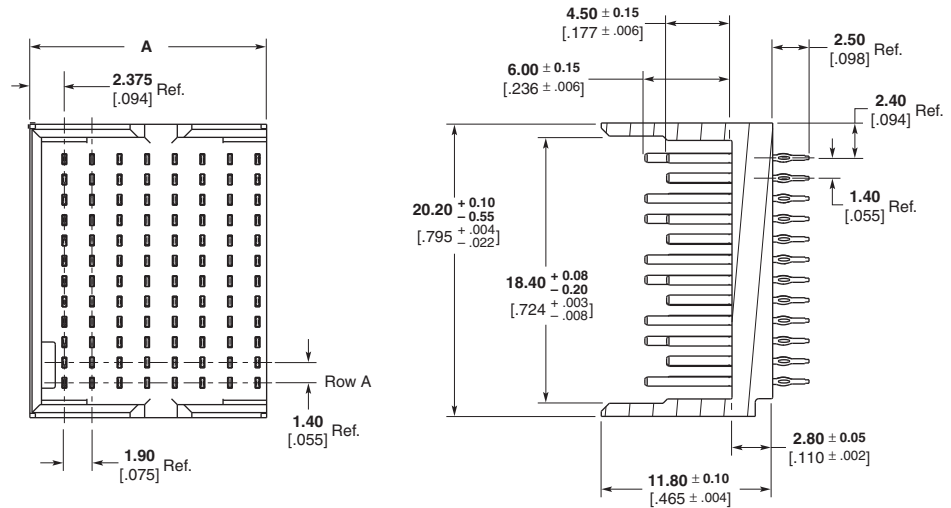
**Note:** For additional information on pcb routing guidelines, reference the Z-PACK TinMan Connector Routing Guide Report #27GC001-1.

\* Finished Hole Diameter =  $0.46 \pm 0.05$  [.018  $\pm$  .002]  
Drilled Hole Diameter =  $0.55 \pm 0.02$  [.022  $\pm$  .001]  
Copper Thickness =  $0.038 \pm 0.013$  [.0015  $\pm$  .0005]  
Tin-Lead Thickness =  $0.008 \pm 0.004$  [.0003  $\pm$  .0002]  
Finishes other than Tin-Lead, See Appl. Spec. 114-13202

## 4 Pair Vertical Header Assemblies — Left End Wall

| Column | Part Number | Dimension      |                | Application Tooling* | Mates With |
|--------|-------------|----------------|----------------|----------------------|------------|
|        |             | A              | B              |                      |            |
| 8      | 1934303-1   | 17.00<br>.669  | 13.30<br>.524  | 1-1804790-1          | 1934222-1  |
| 16     | 1934317-1   | 31.50<br>1.240 | 28.50<br>1.122 | 1-1804790-3          | 1934225-1  |

\* Reference Application Specification 114-13202.



**Recommended PC Board Layout  
Backplane  
Component Side Shown**

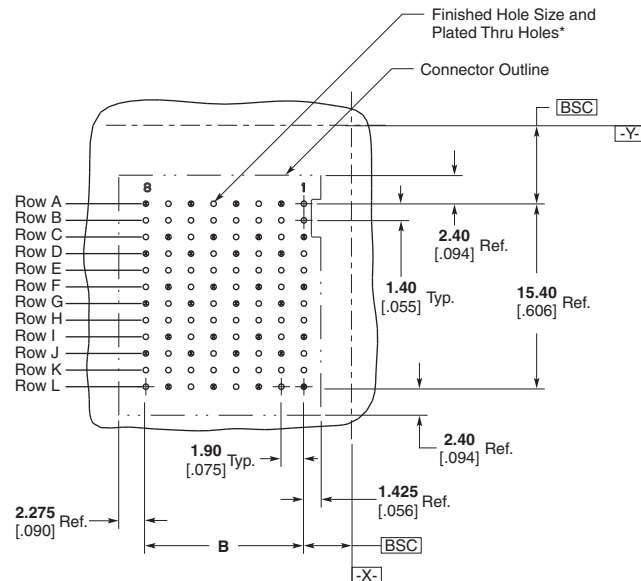
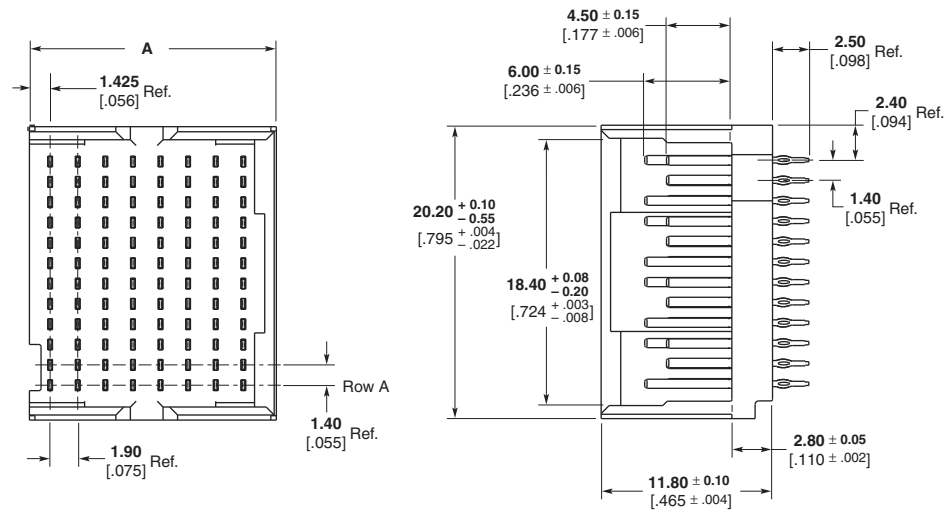
**Note:** For additional information on pcb routing guidelines, reference the Z-PACK TinMan Connector Routing Guide Report #27GC001-1.

\* Finished Hole Diameter =  $0.46 \pm 0.05$  [.018  $\pm$  .002]  
Drilled Hole Diameter =  $0.55 \pm 0.02$  [.022  $\pm$  .001]  
Copper Thickness =  $0.038 \pm 0.013$  [.0015  $\pm$  .0005]  
Tin-Lead Thickness =  $0.008 \pm 0.004$  [.0003  $\pm$  .0002]  
Finishes other than Tin-Lead, See Appl. Spec. 114-13202

## 4 Pair Vertical Header Assemblies — Right End Wall

| Column | Part Number | Dimension      |                | Application Tooling* | Mates With |
|--------|-------------|----------------|----------------|----------------------|------------|
|        |             | A              | B              |                      |            |
| 8      | 1934304-1   | 16.30<br>.642  | 13.30<br>.524  | 1-1804790-1          | 1934222-1  |
| 16     | 1934318-1   | 32.20<br>1.268 | 28.50<br>1.122 | 1-1804790-3          | 1934225-1  |

\* Reference Application Specification 114-13202.



Recommended PC Board Layout  
Backplane  
Component Side Shown

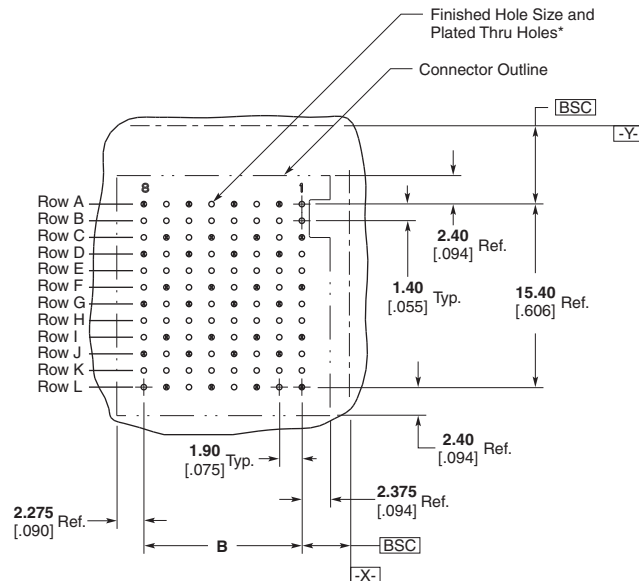
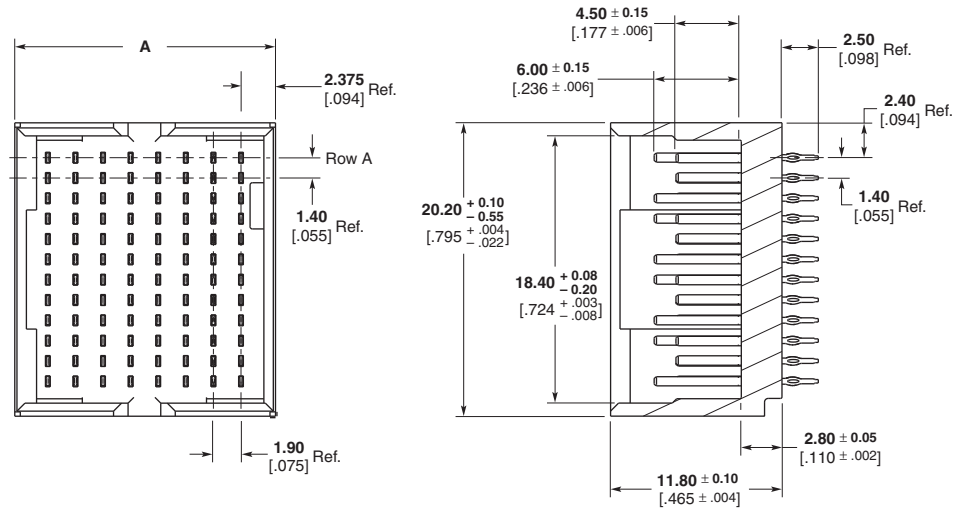
**Note:** For additional information on pcb routing guidelines, reference the Z-PACK TinMan Connector Routing Guide Report #27GC001-1.

\* Finished Hole Diameter =  $0.46 \pm 0.05$  [.018 ± .002]  
Drilled Hole Diameter =  $0.55 \pm 0.02$  [.022 ± .001]  
Copper Thickness =  $0.038 \pm 0.013$  [.0015 ± .0005]  
Tin-Lead Thickness =  $0.008 \pm 0.004$  [.0003 ± .0002]  
Finishes other than Tin-Lead, See Appl. Spec. 114-13202

## 4 Pair Vertical Header Assemblies — Double End Walls

| Column | Part Number | Dimension      |                | Application Tooling* | Mates With |
|--------|-------------|----------------|----------------|----------------------|------------|
|        |             | A              | B              |                      |            |
| 8      | 1934306-1   | 17.95<br>.707  | 13.30<br>.524  | 1-1804790-1          | 1934222-1  |
| 16     | 1934316-1   | 33.15<br>1.305 | 28.50<br>1.122 | 1-1804790-3          | 1934225-1  |

\* Reference Application Specification 114-13202.



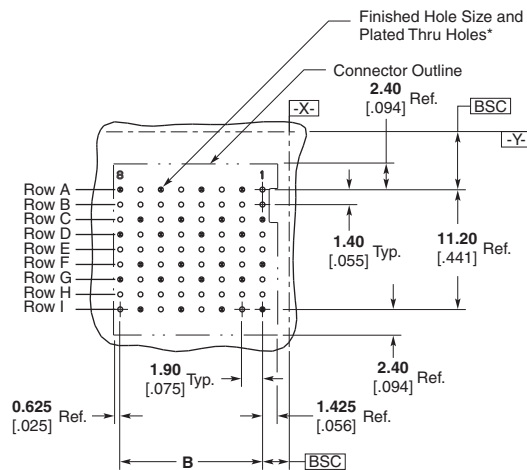
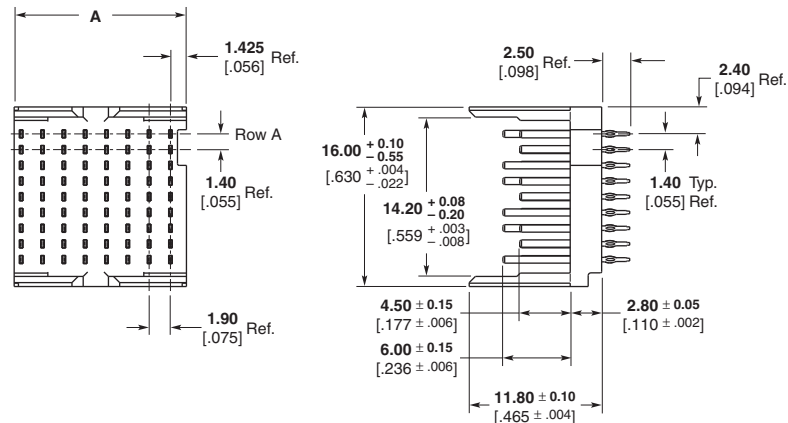
**Note:** For additional information on pcb routing guidelines, reference the Z-PACK TinMan Connector Routing Guide Report #27GC001-1.

\* Finished Hole Diameter =  $0.46 \pm 0.05$  [.018  $\pm$  .002]  
 Drilled Hole Diameter =  $0.55 \pm 0.02$  [.022  $\pm$  .001]  
 Copper Thickness =  $0.038 \pm 0.013$  [.0015  $\pm$  .0005]  
 Tin-Lead Thickness =  $0.008 \pm 0.004$  [.0003  $\pm$  .0002]  
 Finishes other than Tin-Lead, See Appl. Spec. 114-13202

### 3 Pair Vertical Header Assemblies

| Column | Part Number | Dimension      |                | Application Tooling* | Mates With |
|--------|-------------|----------------|----------------|----------------------|------------|
|        |             | A              | B              |                      |            |
| 8      | 1934299-1   | 15.53<br>.611  | 13.30<br>.524  | 1-1901457-1          | 1934226-1  |
| 10     | 1934339-1   | 19.15<br>.754  | 17.10<br>.673  | 1-1901457-2          | 1934228-1  |
| 16     | 1934343-1   | 30.55<br>1.203 | 28.50<br>1.122 | 1-1901457-3          | 1934229-1  |

\* Reference Application Specification 114-13202.



Recommended PC Board Layout  
Component Side Shown

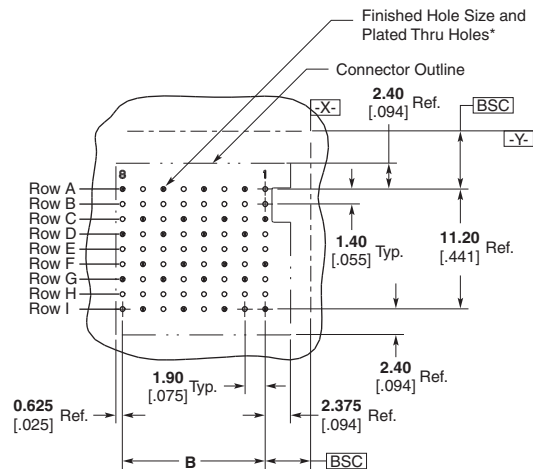
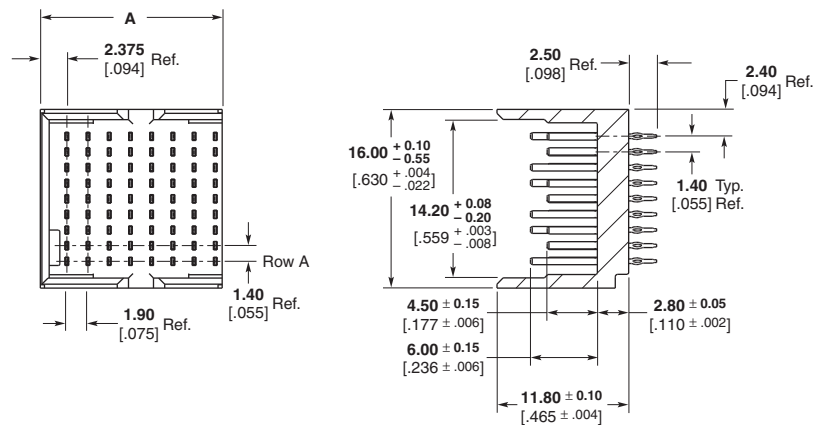
**Note:** For additional information on pcb routing guidelines, reference the Z-PACK TinMan Connector Routing Guide Report #27GC001-1.

\* Finished Hole Diameter =  $0.46 \pm 0.05$  [0.018 ± 0.002]  
Drilled Hole Diameter =  $0.55 \pm 0.02$  [0.022 ± 0.001]  
Copper Thickness =  $0.038 \pm 0.013$  [0.0015 ± 0.0005]  
Tin-Lead Thickness =  $0.008 \pm 0.004$  [0.0003 ± 0.0002]  
Finishes other than Tin-Lead, See Appl. Spec. 114-13202

### 3 Pair Vertical Header Assemblies — Left End Wall

| Column | Part Number | Dimension      |                | Application Tooling* | Mates With |
|--------|-------------|----------------|----------------|----------------------|------------|
|        |             | A              | B              |                      |            |
| 8      | 1934300-1   | 16.30<br>.642  | 13.30<br>.524  | 1-1901457-1          | 1934226-1  |
| 10     | 1934340-1   | 20.10<br>.791  | 17.10<br>.673  | 1-1901457-2          | 1934228-1  |
| 16     | 1934344-1   | 31.50<br>1.240 | 28.50<br>1.122 | 1-1901457-3          | 1934229-1  |

\* Reference Application Specification 114-13202.



Recommended PC Board Layout  
Component Side Shown

**Note:** For additional information on pcb routing guidelines, reference the Z-PACK TinMan Connector Routing Guide Report #27GC001-1.

\* Finished Hole Diameter =  $0.46 \pm 0.05$  [0.018  $\pm 0.002$ ]  
Drilled Hole Diameter =  $0.55 \pm 0.02$  [0.022  $\pm 0.001$ ]  
Copper Thickness =  $0.038 \pm 0.013$  [0.0015  $\pm 0.0005$ ]  
Tin-Lead Thickness =  $0.008 \pm 0.004$  [0.0003  $\pm 0.0002$ ]  
Finishes other than Tin-Lead, See Appl. Spec. 114-13202

| Column | Part Number | Dimension      |                | Application Tooling* | Mates With |
|--------|-------------|----------------|----------------|----------------------|------------|
|        |             | A              | B              |                      |            |
| 8      | 1934301-1   | 17.00<br>.669  | 13.30<br>.524  | 1-1901457-1          | 1934226-1  |
| 10     | 1934341-1   | 20.08<br>.791  | 17.10<br>.673  | 1-1901457-2          | 1934228-1  |
| 16     | 1934345-1   | 32.20<br>1.268 | 28.50<br>1.122 | 1-1901457-3          | 1934229-1  |

Technical drawing of a 16-pin connector showing top and side views with dimensions in inches and millimeters.

**Top View Dimensions:**

- Overall width:  $1.425 \pm .006$  [36.19 ± .15] Ref.
- Pin pitch (center-to-center):  $1.90 \pm .005$  [48.26 ± .13] Ref.
- Pin width:  $1.40 \pm .005$  [35.56 ± .13] Ref.
- Pin spacing from edge:  $1.40 \pm .005$  [35.56 ± .13] Ref.

**Side View Dimensions:**

- Overall height:  $16.00 \pm 0.10$  [406.40 ± 2.54] [630 ± .022]
- Pin height:  $14.20 \pm 0.08$  [360.64 ± 2.03] [559 ± .008]
- Pin thickness:  $2.50 \pm .008$  [63.50 ± .20] Ref.
- Pin spacing from edge:  $2.40 \pm .004$  [61.0 ± .10] Ref.
- Pin width:  $1.40 \pm .005$  [35.56 ± .13] Typ.
- Pin thickness:  $4.50 \pm 0.15$  [114.30 ± 3.81] [177 ± .006]
- Pin thickness:  $6.00 \pm 0.15$  [152.40 ± 3.81] [236 ± .006]
- Pin thickness:  $11.80 \pm 0.10$  [299.72 ± 2.54] [465 ± .004]
- Pin thickness:  $2.80 \pm 0.05$  [71.12 ± 1.27] [110 ± .002]



\* Finished Hole Diameter =  $0.46 \pm^{+0.05}_{-0.02}$  [018  $\pm^{+0.002}_{-0.001}$ ]  
 Drilled Hole Diameter =  $0.55 \pm^{+0.02}_{-0.01}$  [022  $\pm^{+0.001}_{-0.0005}$ ]  
 Copper Thickness =  $0.038 \pm^{+0.013}_{-0.005}$  [0015  $\pm^{+0.0005}_{-0.0002}$ ]  
 Tin-Lead Thickness =  $0.008 \pm^{+0.004}_{-0.0003}$  [0003  $\pm^{+0.0002}_{-0.0001}$ ]  
 Finishes other than Tin-Lead. See Appl. Spec. 114-13202

| Column | Part Number | Dimension      |                | Application Tooling* | Mates With |
|--------|-------------|----------------|----------------|----------------------|------------|
|        |             | A              | B              |                      |            |
| 8      | 1934302-1   | 17.95<br>.707  | 13.30<br>.524  | 1-1901457-1          | 1934226-1  |
| 10     | 1934342-1   | 21.75<br>.856  | 17.10<br>.673  | 1-1901457-2          | 1934228-1  |
| 16     | 1934346-1   | 33.15<br>1.305 | 28.50<br>1.122 | 1-1901457-3          | 1934229-1  |

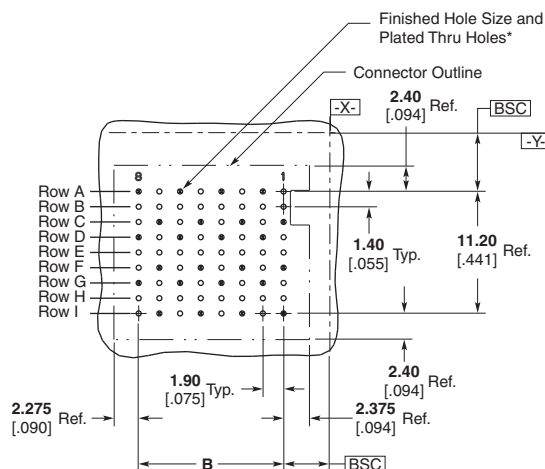
Technical drawing of a 16-pin connector showing front and side views with dimensions in inches and millimeters.

**Front View Dimensions:**

- Overall width:  $A$
- Pin pitch (center-to-center):  $2.375$  [Ref.]
- Pin diameter:  $1.40$  [Ref.]
- Pin length:  $1.90$  [Ref.]

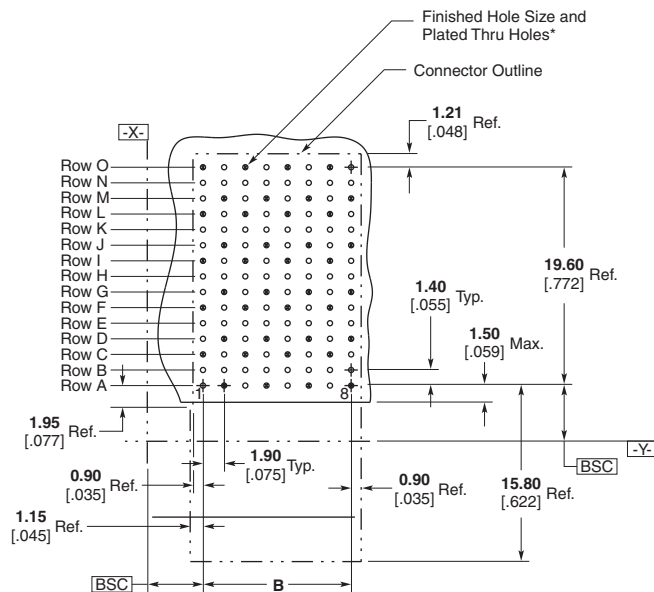
**Side View Dimensions:**

- Pin pitch (center-to-center):  $2.50$  [Ref.]
- Pin diameter:  $2.40$  [Ref.]
- Pin length:  $1.40$  Typ. [Ref.]
- Pin diameter:  $1.40$  Typ. [Ref.]
- Pin length:  $4.50 \pm 0.15$  [Ref.]
- Pin diameter:  $2.80 \pm 0.05$  [Ref.]
- Pin length:  $6.00 \pm 0.15$  [Ref.]
- Pin diameter:  $11.80 \pm 0.10$  [Ref.]



\* Finished Hole Diameter =  $0.46 \pm^{+0.05}_{-0.02}$  [018  $\pm^{+0.002}_{-0.001}$ ]  
 Drilled Hole Diameter =  $0.55 \pm^{+0.02}_{-0.01}$  [022  $\pm^{+0.001}_{-0.001}$ ]  
 Copper Thickness =  $0.038 \pm^{+0.013}_{-0.005}$  [0015  $\pm^{+0.005}_{-0.005}$ ]  
 Tin-Lead Thickness =  $0.008 \pm^{+0.004}_{-0.002}$  [0003  $\pm^{+0.002}_{-0.002}$ ]  
 Finishes other than Tin-Lead. See Appl. Spec. 114-13202

| Column | Part Number | Dimension      |                | Application Tooling | Mates With |
|--------|-------------|----------------|----------------|---------------------|------------|
|        |             | A              | B              |                     |            |
| 8      | 1934349-1   | 15.35<br>.604  | 13.30<br>.524  | *                   | 1934218-1  |
| 16     | 1934347-1   | 30.55<br>1.203 | 28.50<br>1.122 | *                   | 1934221-1  |

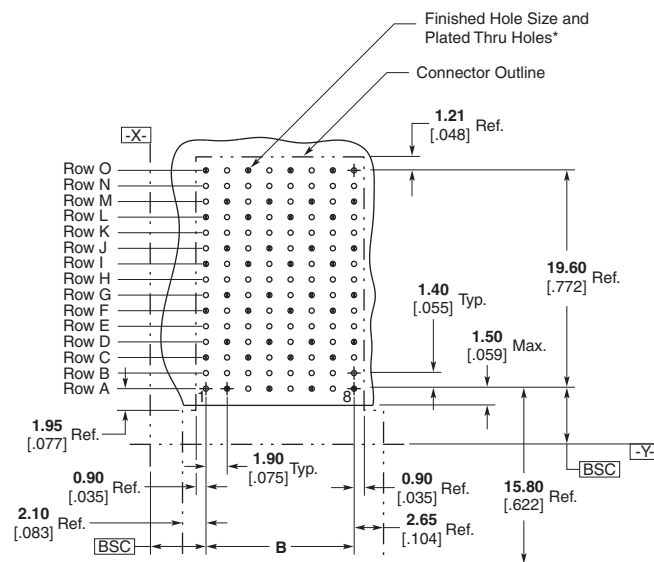
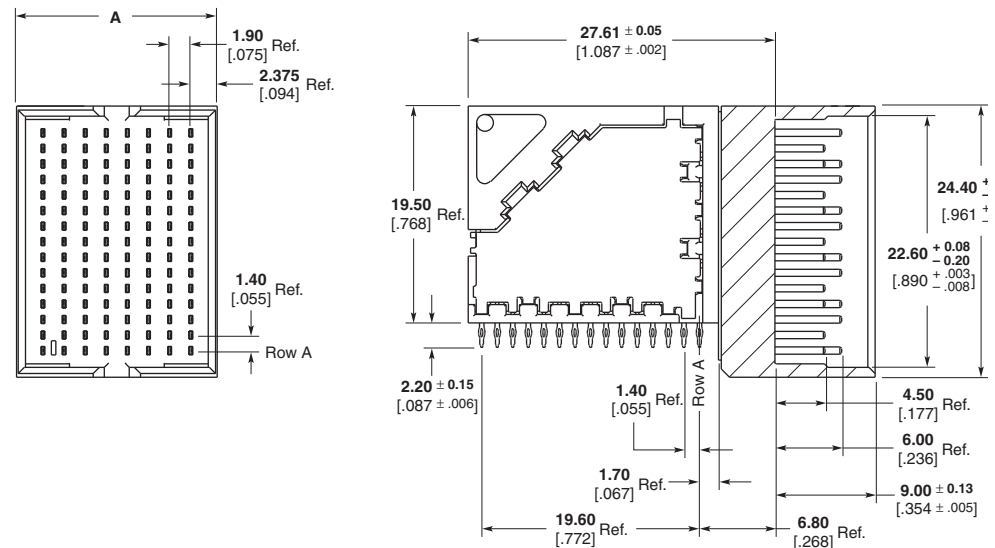


\* Finished Hole Diameter =  $0.46 \pm^{+0.05}_{-0.02}$  [018 ±<sup>+002</sup>]  
 Drilled Hole Diameter =  $0.55 \pm^{+0.02}_{-0.01}$  [022 ±<sup>+001</sup>]  
 Copper Thickness =  $0.038 \pm^{+0.013}_{-0.005}$  [0015 ±<sup>+0005</sup>]  
 Tin-Lead Thickness =  $0.008 \pm^{+0.004}_{-0.003}$  [0003 ±<sup>+0002</sup>]  
 Finishes other than Tin-Lead. See App. Spec. 114-13202

## 5 Pair Right Angle Pin Header Assemblies — Double End Walls

| Column | Part Number | Dimension       |                | Application Tooling | Mates With |
|--------|-------------|-----------------|----------------|---------------------|------------|
|        |             | A               | B              |                     |            |
| 8      | 1934350-1   | 18.05<br>[.711] | 13.30<br>.524  | *                   | 1934218-1  |
| 16     | 1934348-1   | 33.25<br>1.309  | 28.50<br>1.122 | *                   | 1934221-1  |

\* Custom tooling not required. Utilizes flat-rock insertion tooling.  
Reference Application Specification 114-13202.



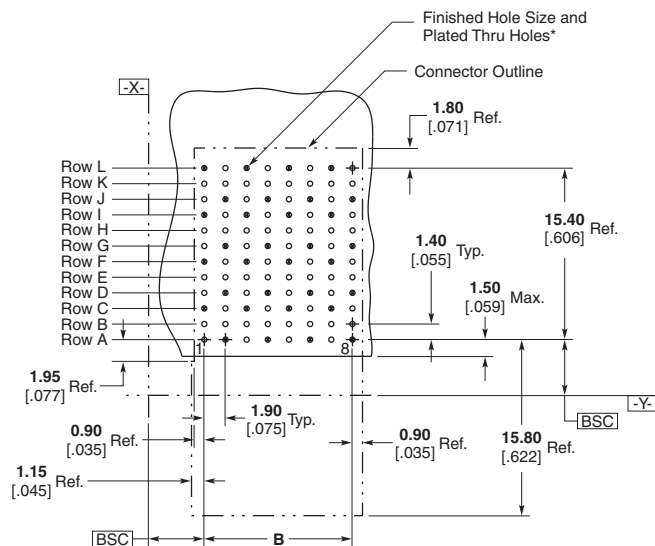
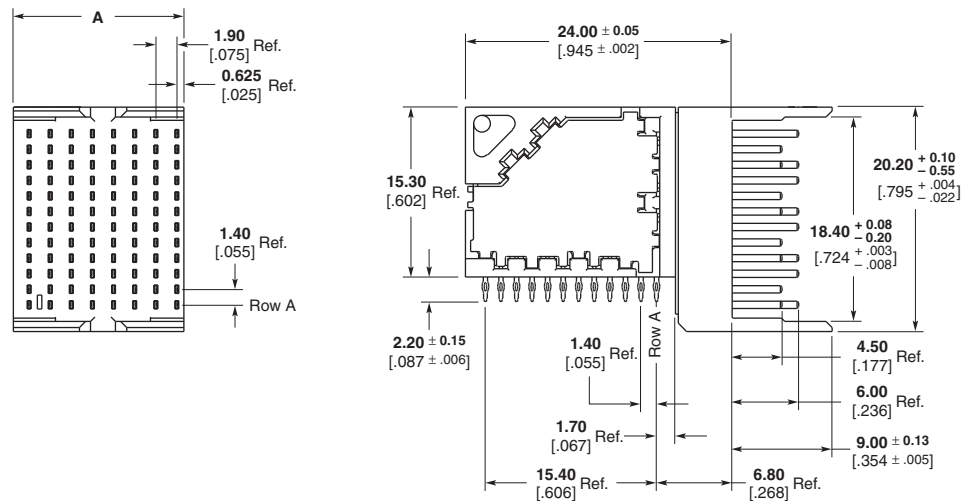
**Note:** For additional information on pcb routing guidelines, reference the Z-PACK TinMan Connector Routing Guide Report #27GC001-1.

\* Finished Hole Diameter =  $0.46 \pm 0.05$  [.018 ± .002]  
Drilled Hole Diameter =  $0.55 \pm 0.02$  [.022 ± .001]  
Copper Thickness =  $0.038 \pm 0.013$  [.0015 ± .0005]  
Tin-Lead Thickness =  $0.008 \pm 0.004$  [.0003 ± .0002]  
Finishes other than Tin-Lead, See Appl. Spec. 114-13202

## 4 Pair Right Angle Pin Header Assemblies

| Column | Part Number | Dimension      |                | Application Tooling | Mates With |
|--------|-------------|----------------|----------------|---------------------|------------|
|        |             | A              | B              |                     |            |
| 8      | 1934353-1   | 15.35<br>.604  | 13.30<br>.524  | *                   | 1934222-1  |
| 16     | 1934351-1   | 30.55<br>1.203 | 28.50<br>1.122 | *                   | 1934225-1  |

\* Custom tooling not required. Utilizes flat-rock insertion tooling.  
Reference Application Specification 114-13202.

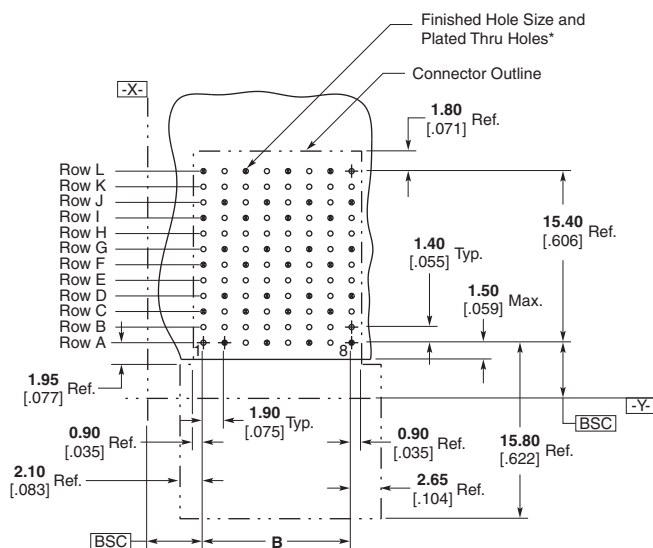


Recommended PC Board Layout  
Component Side Shown

**Note:** For additional information on pcb routing guidelines, reference the Z-PACK TinMan Connector Routing Guide Report #27GC001-1.

\* Finished Hole Diameter =  $0.46 \pm 0.05$  [.018 ± .002]  
Drilled Hole Diameter =  $0.55 \pm 0.02$  [.022 ± .001]  
Copper Thickness =  $0.038 \pm 0.013$  [.0015 ± .0005]  
Tin-Lead Thickness =  $0.008 \pm 0.004$  [.0003 ± .0002]  
Finishes other than Tin-Lead, See Appl. Spec. 114-13202

| Column | Part Number | Dimension      |                | Application Tooling | Mates With |
|--------|-------------|----------------|----------------|---------------------|------------|
|        |             | A              | B              |                     |            |
| 8      | 1934354-1   | 18.05<br>.711  | 13.30<br>.524  | *                   | 1934222-1  |
| 16     | 1934352-1   | 33.25<br>1.309 | 28.50<br>1.122 | *                   | 1934225-1  |

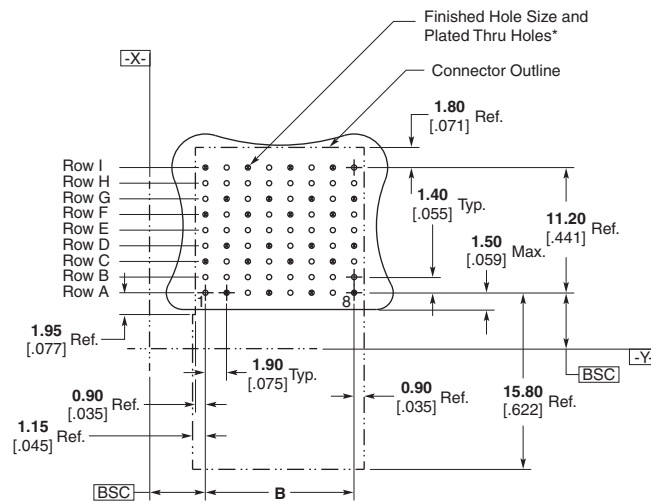
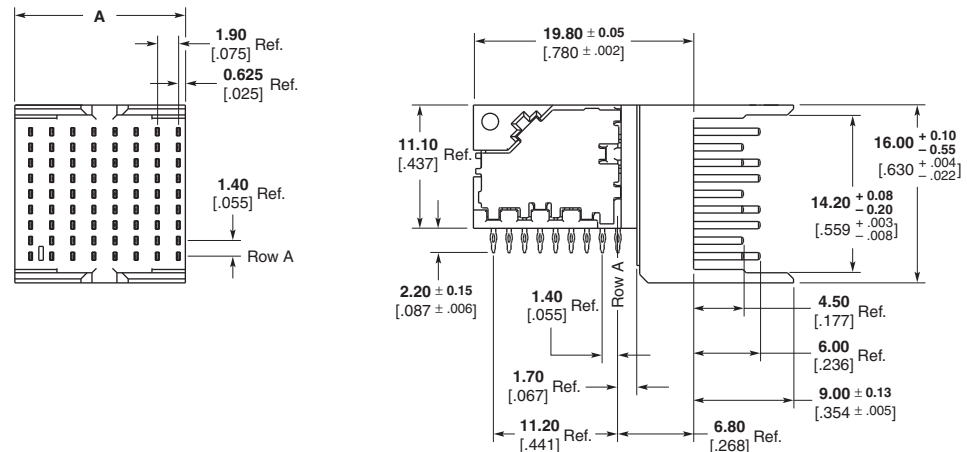


\* Finished Hole Diameter =  $0.46 \pm^{+0.05}_{-0.01}$  [0.018  $\pm^{+0.002}_{-0.001}$ ]  
 Drilled Hole Diameter =  $0.55 \pm^{+0.02}_{-0.01}$  [0.022  $\pm^{+0.001}_{-0.001}$ ]  
 Copper Thickness =  $0.038 \pm^{+0.013}_{-0.005}$  [0.015  $\pm^{+0.005}_{-0.005}$ ]  
 Tin-Lead Thickness =  $0.008 \pm^{+0.004}_{-0.003}$  [0.0003  $\pm^{+0.0002}_{-0.0002}$ ]  
 Finishes other than Tin-Lead. See Appl. Spec. 114-13202

### 3 Pair Right Angle Pin Header Assemblies

| Column | Part Number | Dimension      |                | Application Tooling | Mates With |
|--------|-------------|----------------|----------------|---------------------|------------|
|        |             | A              | B              |                     |            |
| 8      | 1934359-1   | 15.35<br>.604  | 13.30<br>.524  | *                   | 1934226-1  |
| 10     | 1934357-1   | 19.15<br>.754  | 17.10<br>.673  | *                   | 1934228-1  |
| 16     | 1934355-1   | 30.55<br>1.203 | 28.50<br>1.122 | *                   | 1934229-1  |

\* Custom tooling not required. Utilizes flat-rock insertion tooling.  
Reference Application Specification 114-13202.



**Recommended PC Board Layout**  
Component Side Shown

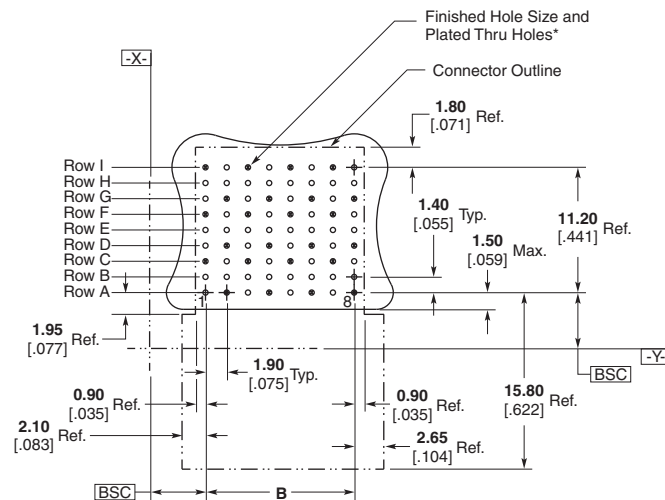
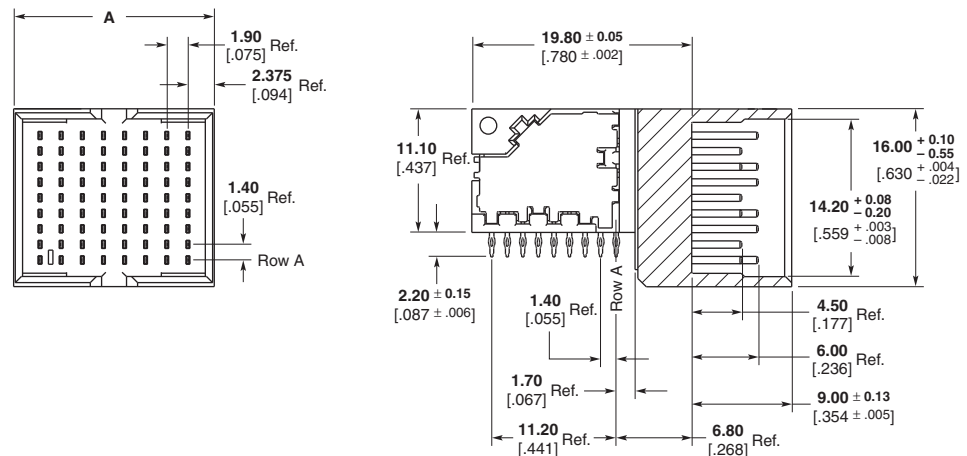
**Note:** For additional information on pcb routing guidelines, reference the Z-PACK TinMan Connector Routing Guide Report #27GC001-1.

\* Finished Hole Diameter =  $0.46 \pm 0.05$  [.018 ± .002]  
Drilled Hole Diameter =  $0.55 \pm 0.02$  [.022 ± .001]  
Copper Thickness =  $0.038 \pm 0.013$  [.0015 ± .0005]  
Tin-Lead Thickness =  $0.008 \pm 0.004$  [.0003 ± .0002]  
Finishes other than Tin-Lead, See Appl. Spec. 114-13202

### 3 Pair Right Angle Pin Header Assemblies — Double End Walls

| Column | Part Number | Dimension       |                | Application Tooling | Mates With |
|--------|-------------|-----------------|----------------|---------------------|------------|
|        |             | A               | B              |                     |            |
| 8      | 1934360-1   | 18.05<br>[.711] | 13.30<br>.524  | *                   | 1934226-1  |
| 10     | 1934358-1   | 21.85<br>.860   | 17.10<br>.673  | *                   | 1934228-1  |
| 16     | 1934356-1   | 33.25<br>1.309  | 28.50<br>1.122 | *                   | 19343229-1 |

\* Custom tooling not required. Utilizes flat-rock insertion tooling.  
Reference Application Specification 114-13202.



Recommended PC Board Layout  
Component Side Shown

**Note:** For additional information  
on pcb routing guidelines,  
reference the Z-PACK TinMan  
Connector Routing Guide  
Report #27GC001-1.

\* Finished Hole Diameter =  $0.46 \pm 0.05$  [.018  $\pm$  .002]  
Drilled Hole Diameter =  $0.55 \pm 0.02$  [.022  $\pm$  .001]  
Copper Thickness =  $0.038 \pm 0.013$  [.0015  $\pm$  .0005]  
Tin-Lead Thickness =  $0.008 \pm 0.004$  [.0003  $\pm$  .0002]  
Finishes other than Tin-Lead, See Appl. Spec. 114-13202

## Z-PACK TinMan Mid-Plane (Orthogonal) Connector Overview

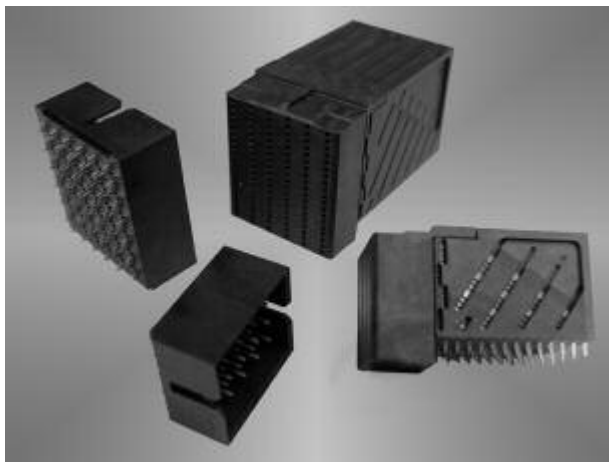
### Product Facts

- Scalable to 25 Gbps
- 100 ohm impedance for differential pair configuration
- Very low noise
- Outstanding insertion loss through 2 connectors and vias
- Skewless differential pair in a 2-connector system
- Utilizes the same header and receptacle part on both sides of the mid-plane
- Compatible with standard Z-PACK TinMan connectors and accessories
- 4 pair x 4 pair and 6 pair x 6 pair modules available
- Reliable, redundant contact design on all contacts
- Reliable press-fit style termination to PCB
- RoHS compliant

### Applications

**The Z-PACK TinMan Mid-plane (orthogonal) connector is ideally designed for very demanding applications involving data rates in excess of 10 Gbps with many interconnections required. Such applications would include the following Telecom/Datacom equipment:**

- Switches
- Servers
- Routers
- Storage



The Z-PACK TinMan mid-plane (orthogonal) connector is an extension of the Z-PACK TinMan connector product line, which includes perpendicular and coplanar interconnect solutions in 3 pair, 4 pair, and 5 pair versions.

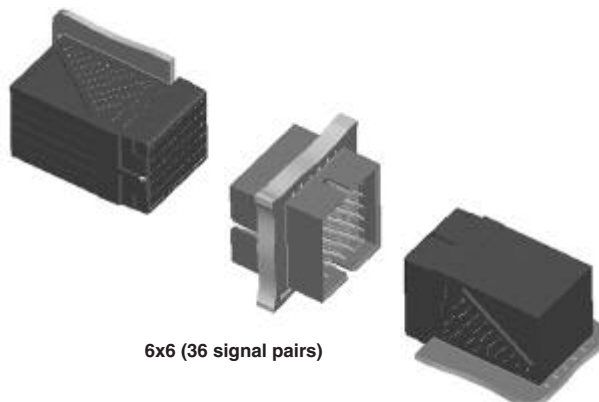
This connector system is commonly referred to as an orthogonal connector system due to the orthogonal (perpendicular) orientation of the two system boards being connected on the front and rear side. It is built on the same technology and design approach as standard Z-PACK TinMan connectors with the same mating interface and lead-frame geometry.

Superior electrical performance is achieved for several reasons. The front board to

rear board connection through the mid-plane makes the plated through hole (PTH) part of the signal transmission path eliminating the detrimental effects of via stubs. This construction also eliminates the need to route all the high speed signal lines along the backplane minimizing signal loss and significantly improving signal throughput. The wide column spacing establishes a connector footprint with improved impedance and reduced electrical noise. The in-line footprint version also provides ease of trace routing with wide channels and a connector interface compatible with the orthogonal receptacle. This permits the use of the same daughtercard in both mid-plane and backplane configurations.

The benefits are not limited to just signal integrity performance. The thinner mid-plane with fewer layers and significantly less complex routing is inherently less expensive. With trace routing typically limited to power distribution, low speed lines and potentially very few high speed links, the board can be fabricated from a cost effective material without the need to utilize techniques such as counter-boring or back-drilling.

All of this permits the implementation of small to large scale full mesh interconnects with significantly reduced complexity at a lower cost and with improved signal integrity.



6x6 (36 signal pairs)

For additional information visit:  
<http://www.tycoelectronics.com/zpacktinman>

## Z-PACK TinMan Mid-Plane (Orthogonal) Connector Overview (Continued)

### Noise Table

- Maximum, multiple source crosstalk

### Technical Documents

**Product Specification** 108-2303

**Application Specification**  
114-13202

**Routing Guide Report** #27GC002

### Material and Finish

**Signal Contact** — High Strength  
Copper Alloy

**Ground Contact** — High Strength  
Copper Alloy

**Housing** — Liquid Crystal Polymer

**Platings** — Telcordia compliant interface, Nickel underplate

**Compliant Pin Plating** —  
RoHS Compliant

### Ratings

**Temperature Range** —  
-65°C to +90°C

**Current Rating** — 0.5 A/contact @  
< 30°C T-Rise

**Durability** — 200 cycles

**Dielectric Withstanding Voltage** —  
560 VAC

**Operating Voltage** — 250 VAC max.

### Signal Integrity

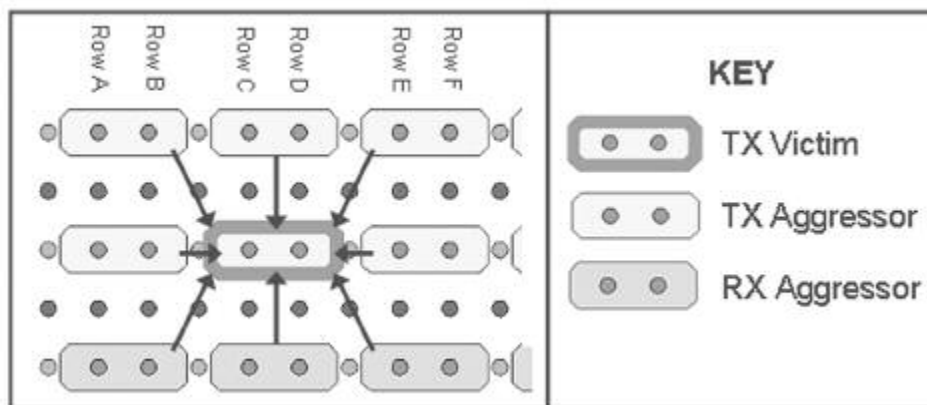
**Characteristic Impedance** —  
Differential @ 100 ohms  $\pm 10\%$

**Crosstalk** — Multi-pair differential  
crosstalk: 1.0% @ 50ps

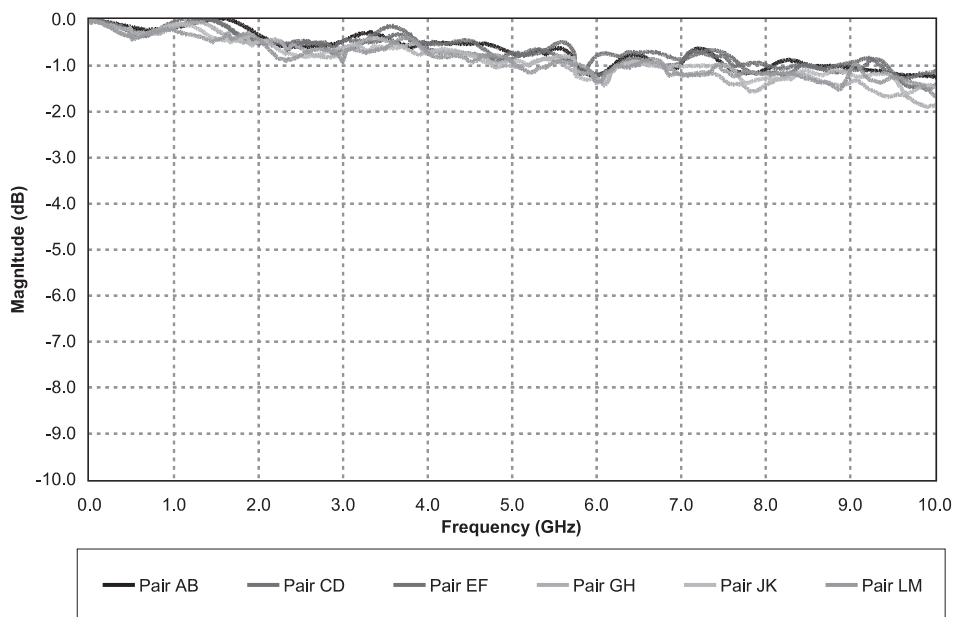
**Insertion Loss** — -2 dB @ 10 GHz

| VICTIM | Total Peak Receiver Noise<br>for Recommended Pin-Out |
|--------|------------------------------------------------------|
| AB3    | 0.50%                                                |
| CD3    | 1.00%                                                |
| EF3    | 0.90%                                                |
| GH3    | 0.80%                                                |
| JK3    | 0.90%                                                |
| LM3    | 0.60%                                                |

**Note:** Data includes PCB vias of both backplane and daughtercard connectors.  
Single mated connector pair.  
50 ps (20-80%) edge rate.



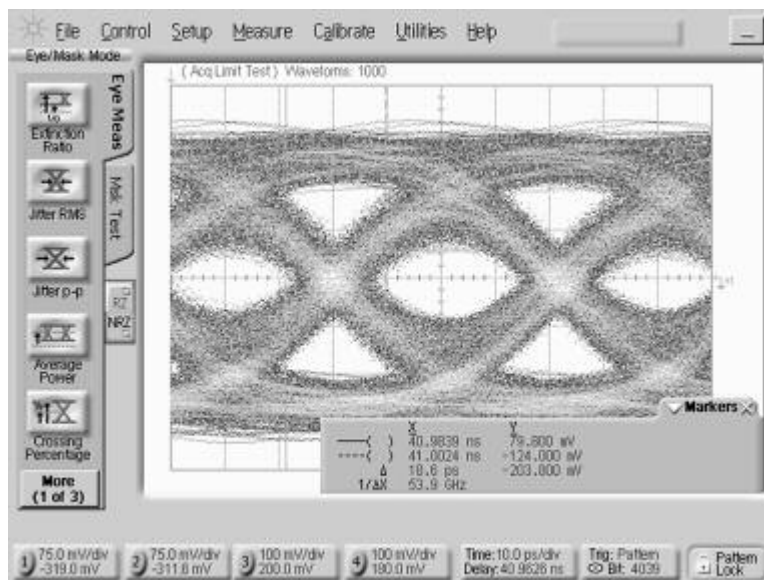
### Insertion Loss Plot



## Z-PACK TinMan Mid-Plane (Orthogonal) Connector Overview (Continued)

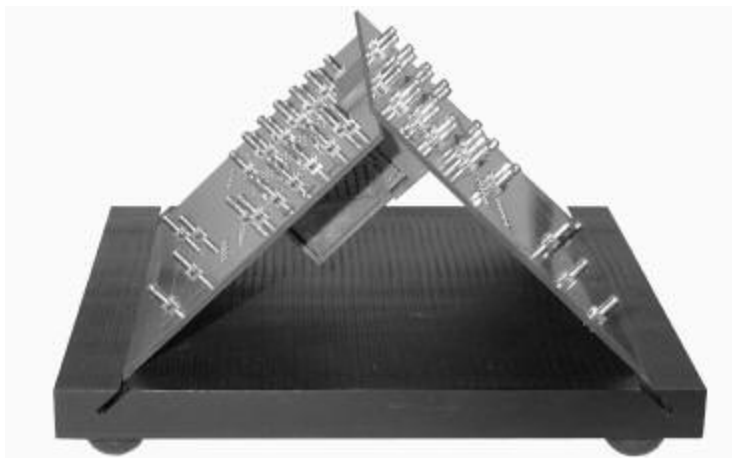
### Representative Eye Pattern

- 10.0 Gbps data rate
- 2<sup>-1</sup> -1 PRBS
- Unequalized Signal



### Customer Connector Evaluation Kit

- Connector characterization
- Available for loan — contact your local Tyco Electronics Sales Engineer
- Time and frequency domain testable
- Testable to 18+ GHz (25+ Gb/s)
- Multiple calibration options
- Convenient SMA interface



### Customer System Evaluation Kit

- System characterization
- Available for loan — contact your local Tyco Electronics Sales Engineer
- Time and frequency domain testable
- Testable to 18+ GHz (25+ Gb/s)
- Multiple calibration options
- Convenient SMA interface



## 6 Pair Mid-Plane Assemblies

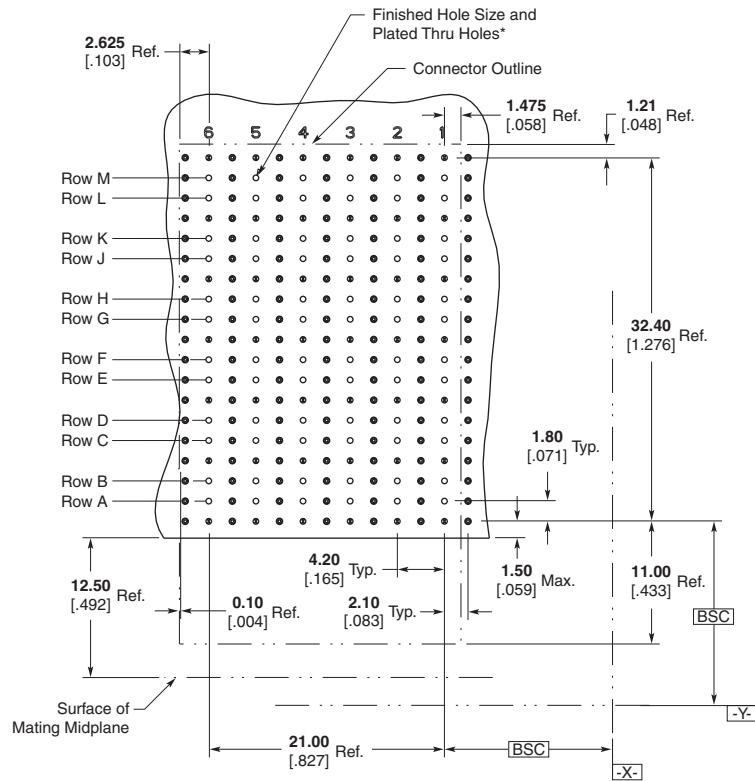
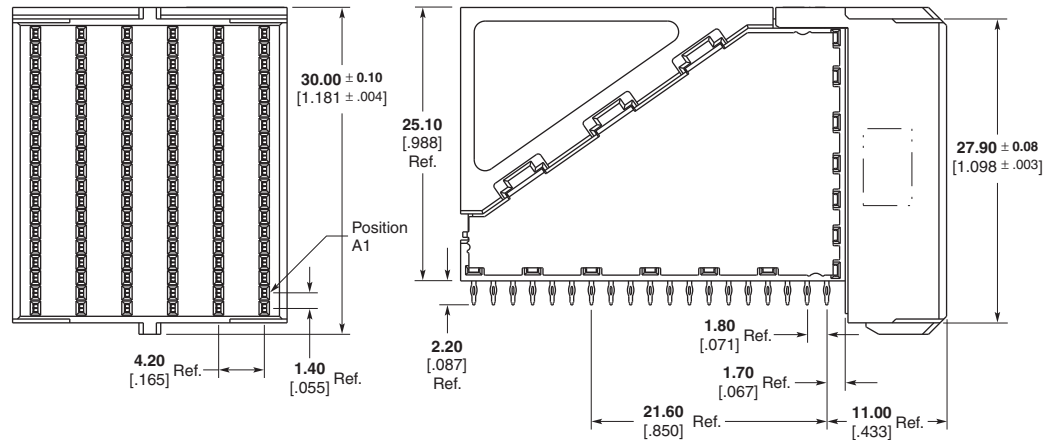
### 6 Pair Right Angle Receptacle Assembly

Part Number: 1934231-1

Custom tooling not required.  
Utilizes flat-rock insertion  
tooling.

Reference Application  
Specification  
114-13202

Mates with: 1934364-1,  
1934363-1



Recommended PC Board Layout  
Component Side Shown

**Note:** For additional information  
on pcb routing guidelines,  
reference the Z-PACK TinMan  
Connector Routing Guide  
Report #27GC002.

\* Finished Hole Diameter =  $0.46 \pm 0.05$  [.018 ± .002]  
Drilled Hole Diameter =  $0.55 \pm 0.02$  [.022 ± .001]  
Copper Thickness =  $0.038 \pm 0.013$  [.0015 ± .0005]  
Tin-Lead Thickness =  $0.008 \pm 0.004$  [.0003 ± .0002]  
Finishes other than Tin-Lead, See Appl. Spec. 114-13202

## 6 Pair Mid-Plane Assemblies (Continued)

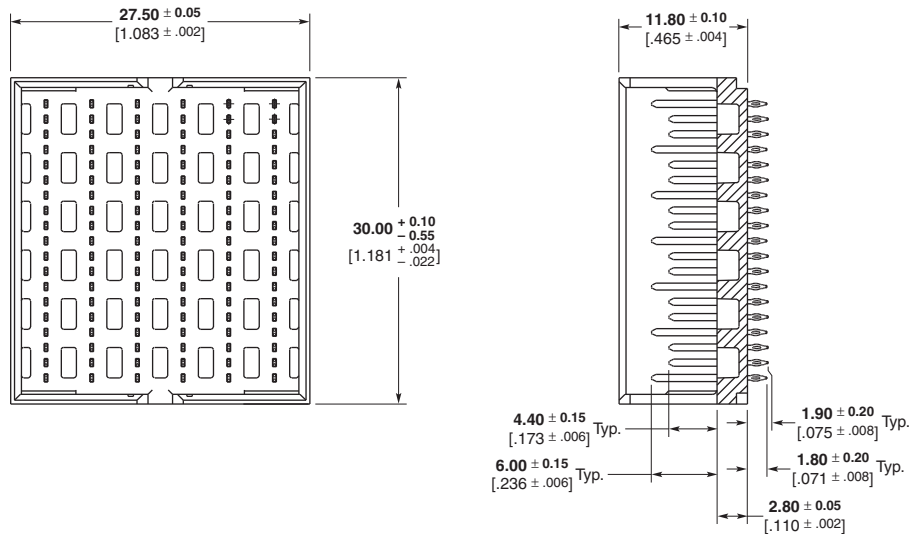
### 6 Pair Vertical Header Assembly

Part Number: 1934364-1

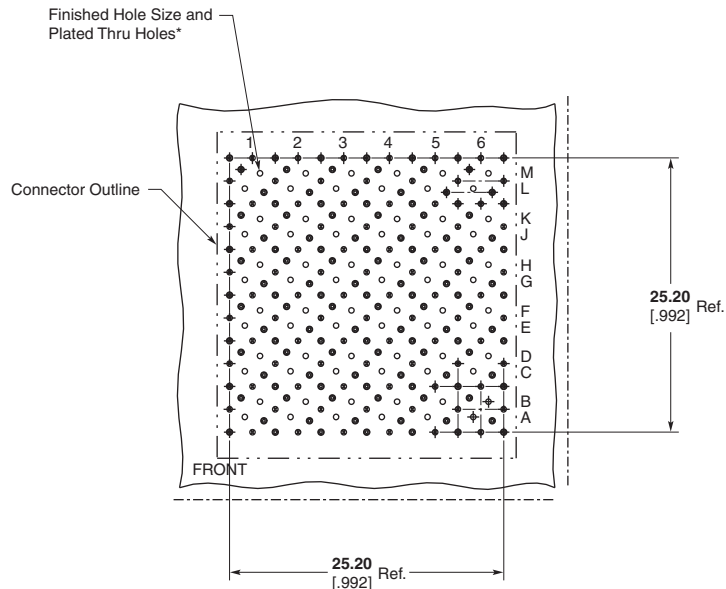
Insertion Tooling:  
Contact Tyco Electronics

Reference Application  
Specification 114-13202

Mates with: 1934231-1



Footprint shown for reference  
only. Contact Tyco Electronics  
engineering for details.



**Recommended PC Board Layout**  
**Component Side Shown**

**Note:** For additional information  
on pcb routing guidelines,  
reference the Z-PACK TinMan  
Connector Routing Guide  
Report #27GC002.

\* Finished Hole Diameter =  $0.46 \pm 0.05$  [0.018 ± .002]  
Drilled Hole Diameter =  $0.55 \pm 0.02$  [0.022 ± .001]  
Copper Thickness =  $0.038 \pm 0.013$  [0.0015 ± .0005]  
Tin-Lead Thickness =  $0.008 \pm 0.004$  [0.0003 ± .0002]  
Finishes other than Tin-Lead, See Appl. Spec. 114-13202

## 6 Pair Mid-Plane Assemblies (Continued)

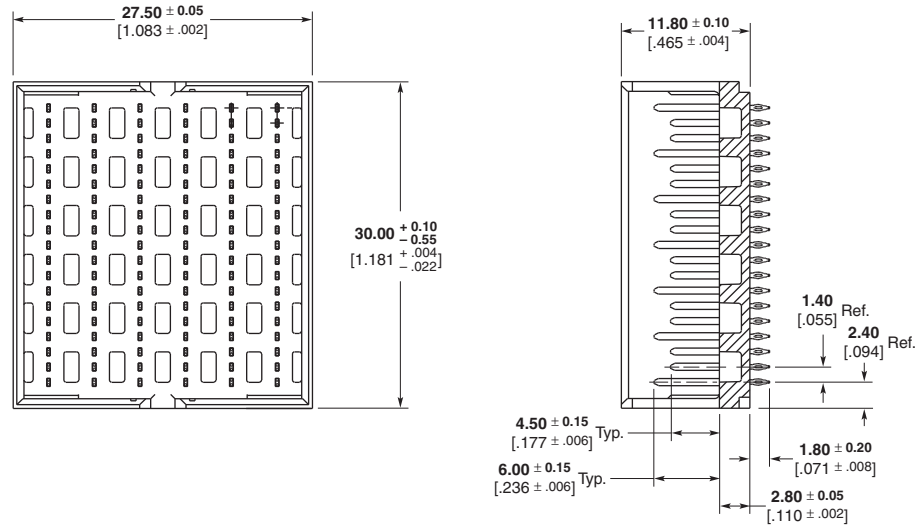
### 6 Pair Vertical Header Assembly — In Line Footprint

Part Number: 1934363-1

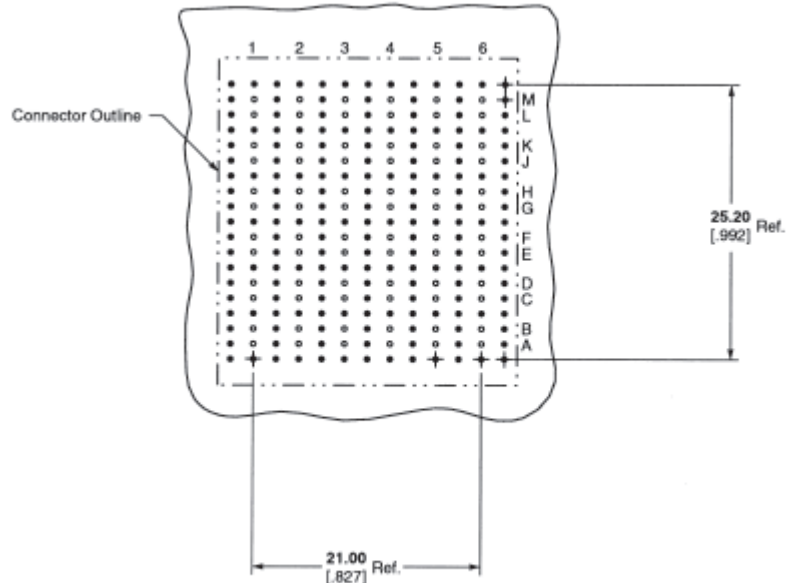
Insertion Tooling:  
Contact Tyco Electronics

Reference Application  
Specification 114-13202

Mates with: 1934231-1



Footprint shown for reference  
only. Contact Tyco Electronics  
engineering for details.



Recommended PC Board Layout  
Component Side Shown

**Note:** For additional information  
on pcb routing guidelines,  
reference the Z-PACK TinMan  
Connector Routing Guide Report  
#27GC002.

\* Finished Hole Diameter =  $0.46 \pm 0.05$  [ $.018 \pm .002$ ]  
Drilled Hole Diameter =  $0.55 \pm 0.02$  [ $.022 \pm .001$ ]  
Copper Thickness =  $0.038 \pm 0.013$  [ $.0015 \pm .0005$ ]  
Tin-Lead Thickness =  $0.008 \pm 0.004$  [ $.0003 \pm .0002$ ]  
Finishes other than Tin-Lead, See Appl. Spec. 114-13202

## 4 Pair Mid-Plane Assemblies

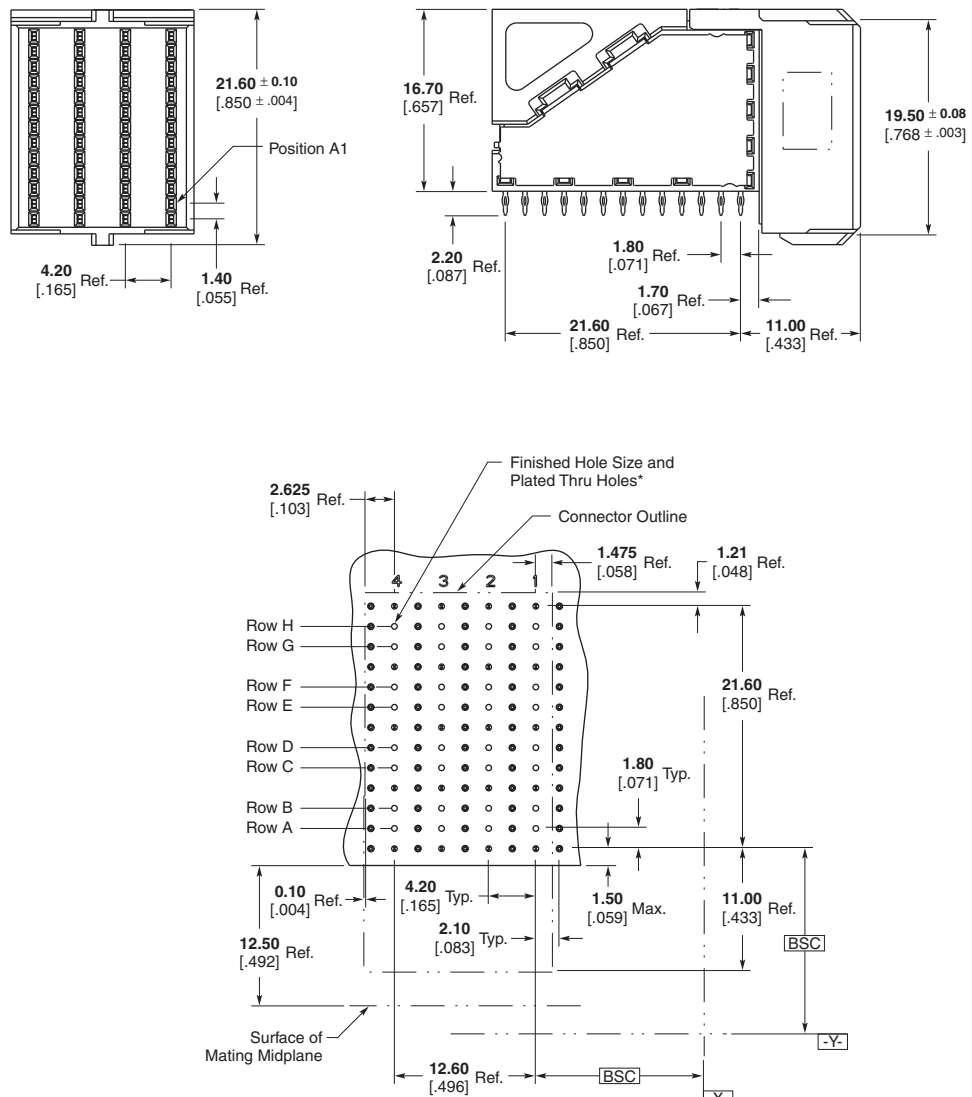
### 4 Pair Right Angle Receptacle Assembly

Part Number: 1934230-1

Custom tooling not required.  
Utilizes flat-rock insertion  
tooling.

Reference Application  
Specification 114-13202

Mates with: 1934362-1,  
1934361-1



Recommended PC Board Layout  
Component Side Shown

**Note:** For additional information  
on pcb routing guidelines,  
reference the Z-PACK TinMan  
Connector Routing Guide  
Report #27GC002.

\* Finished Hole Diameter =  $0.46 \pm 0.05$  [0.18  $\pm$  .002]  
Drilled Hole Diameter =  $0.55 \pm 0.02$  [0.22  $\pm$  .001]  
Copper Thickness =  $0.038 \pm 0.013$  [0.015  $\pm$  .0005]  
Tin-Lead Thickness =  $0.008 \pm 0.004$  [0.003  $\pm$  .0002]  
Finishes other than Tin-Lead, See Appl. Spec. 114-13202

## 4 Pair Mid-Plane Assemblies (Continued)

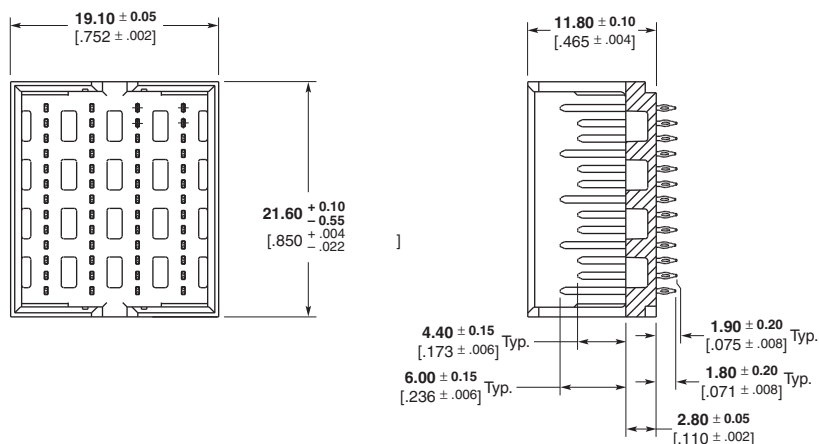
### 4 Pair Vertical Header Assembly

Part Number: 1934362-1

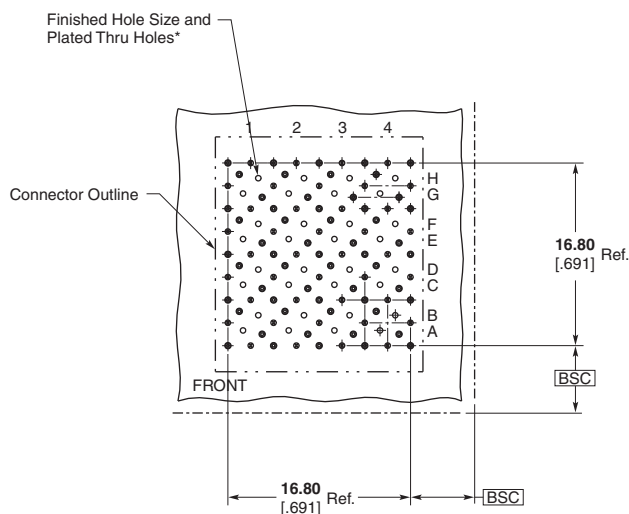
Insertion Tooling:  
Contact Tyco Electronics

Reference Application  
Specification 114-13202

Mates with: 1934230-1



Footprint shown for reference only. Contact Tyco Electronics engineering for details.



Recommended PC Board Layout  
Component Side Shown

**Note:** For additional information on pcb routing guidelines, reference the Z-PACK TinMan Connector Routing Guide Report #27GC002.

\* Finished Hole Diameter =  $0.46 \pm 0.05$  [ $.018 \pm .002$ ]  
Drilled Hole Diameter =  $0.55 \pm 0.02$  [ $.022 \pm .001$ ]  
Copper Thickness =  $0.038 \pm 0.013$  [ $.0015 \pm .0005$ ]  
Tin-Lead Thickness =  $0.008 \pm 0.004$  [ $.0003 \pm .0002$ ]  
Finishes other than Tin-Lead, See Appl. Spec. 114-13202

## 4 Pair Mid-Plane Assemblies (Continued)

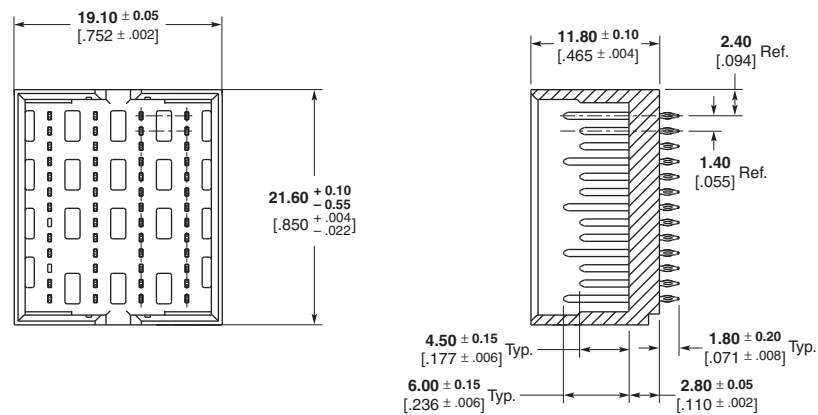
### 4 Pair Vertical Header Assembly — In Line Footprint

Part Number: 1934361-1

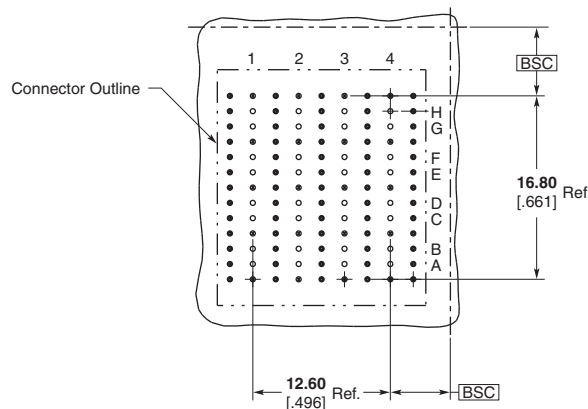
Insertion Tooling:  
Contact Tyco Electronics

Reference Application  
Specification 114-13202

Mates with: 1934230-1



Footprint shown for reference  
only. Contact Tyco Electronics  
engineering for details.



Recommended PC Board Layout  
Component Side Shown

**Note:** For additional information  
on pcb routing guidelines,  
reference the Z-PACK TinMan  
Connector Routing Guide  
Report #27GC002.

\* Finished Hole Diameter =  $0.46 \pm 0.05$  [0.018 ± .002]  
Drilled Hole Diameter =  $0.55 \pm 0.02$  [0.022 ± .001]  
Copper Thickness =  $0.038 \pm 0.013$  [0.0015 ± .0005]  
Tin-Lead Thickness =  $0.008 \pm 0.004$  [0.0003 ± .0002]  
Finishes other than Tin-Lead, See Appl. Spec. 114-13202

## Z-PACK TinMan Product Mating Sequence Chart



| Product Family                                          | Dim. C       | Dim. A Fully Mated | Contact                   | Dim B.        |                       | Fully Mated Wipe Length |
|---------------------------------------------------------|--------------|--------------------|---------------------------|---------------|-----------------------|-------------------------|
|                                                         |              |                    |                           | Reliable Mate | First Mate Last Break |                         |
| Z-PACK HM-Zd Product                                    | 1.50<br>.059 | 12.50<br>.492      | Ground Shield             | 16.78 [.661]  | 17.55 [.691]          | 4.28 [.169]             |
|                                                         |              |                    | Signal Level 2            | 15.41 [.607]  | 15.85 [.624]          | 2.91 [.115]             |
|                                                         |              |                    | Signal Level 1            | 13.91 [.548]  | 14.35 [.565]          | 1.41 [.056]             |
| Z-PACK HM-Zd Guide Hardware                             | 3.00<br>.118 | 12.50<br>.492      | 24.0 mm Pin               | 27.50 [1.083] | 33.40 [1.315]         | N/A                     |
|                                                         |              |                    | 22.2 mm Pin               | 25.70 [1.012] | 31.60 [1.244]         | N/A                     |
|                                                         |              |                    | Key Blocking Point        | N/A           | 22.03 [.867]          | N/A                     |
|                                                         |              |                    |                           |               |                       |                         |
| Z-PACK TinMan Product                                   | 1.50<br>.059 | 12.50<br>.492      | Ground Pins               | 16.44 [.647]  | 17.13 [.674]          | 3.94 [.155]             |
|                                                         |              |                    | Signal Level 2            | 14.94 [.588]  | 15.63 [.615]          | 2.44 [.096]             |
|                                                         |              |                    | Signal Level 1            | N/A           | N/A                   | N/A                     |
| Z-PACK 2mm HM Product                                   | 1.50<br>.059 | 12.50<br>.492      | Signal Level 3            | 18.27 [.719]  | 18.84 [.742]          | 5.77 [.227]             |
|                                                         |              |                    | Signal Level 2            | 16.77 [.660]  | 17.34 [.683]          | 4.27 [.168]             |
|                                                         |              |                    | Signal Level 1            | 15.27 [.601]  | 15.84 [.624]          | 2.77 [.109]             |
|                                                         |              |                    |                           |               |                       |                         |
| MULTIGIG RT T1 Product                                  | 2.50<br>.098 | 12.50<br>.492      | Ground                    | 18.00 [.709]  | —                     | 5.50 [.217]             |
|                                                         |              |                    | Signal Level 3            | 18.00 [.709]  | —                     | 5.50 [.217]             |
|                                                         |              |                    | Signal Level 2            | 16.50 [.650]  | —                     | 4.00 [.157]             |
|                                                         |              |                    | Signal Level 1            | 15.00 [.591]  | —                     | 2.50 [.098]             |
| MULTIGIG RT T2 Product                                  | 2.25<br>.089 | 12.50<br>.492      | Ground                    | 18.00 [.709]  | —                     | 5.50 [.217]             |
|                                                         |              |                    | Signal Level 3            | 18.00 [.709]  | —                     | 5.50 [.217]             |
|                                                         |              |                    | Signal Level 2            | 16.50 [.650]  | —                     | 4.00 [.157]             |
|                                                         |              |                    | Signal Level 1            | 15.00 [.591]  | —                     | 2.50 [.098]             |
| MULTIGIG RT T3 Product                                  | 2.25<br>.089 | 12.50<br>.492      | Ground                    | 16.50 [.650]  | —                     | 4.00 [.157]             |
|                                                         |              |                    | Signal Level 1            | 15.00 [.591]  | —                     | 2.50 [.098]             |
|                                                         |              |                    |                           |               |                       |                         |
| MULTIGIG RT Power Module                                | 5.50<br>.217 | 12.50<br>.492      | Power Level 3             | 23.75 [.935]  | —                     | 11.25 [.443]            |
|                                                         |              |                    | Power Level 2             | 22.25 [.876]  | —                     | 9.75 [.384]             |
|                                                         |              |                    | Power Level 1             | 20.75 [.817]  | —                     | 8.25 [.325]             |
| MULTIGIG RT Guide Hardware                              | N/A          | 12.50<br>.492      | Guide Pin Key             | 33.25 [1.309] | N/A                   | 20.75 [.817]            |
|                                                         |              |                    | Guide ESD Contact         | 30.75 [1.211] | —                     | 18.25 [.719]            |
| Z-PACK HS3 Product                                      | 1.50<br>.059 | 12.50<br>.492      | Ground                    | 17.08 [.672]  | 17.60 [.693]          | 4.78 [.188]             |
|                                                         |              |                    | Signal Level 2            | 16.05 [.632]  | 16.47 [.648]          | 3.75 [.148]             |
|                                                         |              |                    | Signal Level 1            | 14.55 [.573]  | 14.97 [.589]          | 2.25 [.089]             |
|                                                         |              |                    |                           |               |                       |                         |
| UPM                                                     | 3.50<br>.138 | 12.50<br>.492      | Power Level 3             | 20.25 [.797]  | 20.95 [.825]          | 8.10 [.319]             |
|                                                         |              |                    | Power Level 2             | 18.65 [.734]  | 19.35 [.762]          | 6.50 [.256]             |
|                                                         |              |                    | Power Level 1             | 17.03 [.670]  | 17.73 [.698]          | 4.88 [.192]             |
| UPM Guide Hardware                                      | 5.75<br>.226 | 12.50<br>.492      | Guide Pin Key             | 31.39 [1.236] | 36.16 [1.424]         | N/A                     |
|                                                         |              |                    | Keyed Guide Pin           | 31.39 [1.236] | 36.16 [1.424]         | N/A                     |
|                                                         |              |                    | Keyed Guide Pin           | 35.23 [1.387] | 40.00 [1.575]         | N/A                     |
|                                                         |              |                    |                           |               |                       |                         |
| MULTI-BEAM XL Right Angle Header to Vertical Receptacle | 5.08<br>.200 | 14.73<br>.580      | PreMate Power — Level 1   | —             | 16.84 [.663]          | 5.61 [.221] Min.        |
|                                                         |              |                    | PostMate Power — Level 2  | —             | 17.81 [.701]          | 4.34 [.171] Min.        |
|                                                         |              |                    | PreMate Signal — Level 2  | —             | 18.26 [.719]          | 3.81 [.150] Min.        |
|                                                         |              |                    | PostMate Signal — Level 3 | —             | 19.53 [.769]          | 2.54 [.100] Min.        |
| MULTI-BEAM XL Right Angle Receptacle to Vertical Header | 3.81<br>.150 | 13.21<br>.520      | PreMate Power — Level 1   | —             | 15.32 [.603]          | 5.61 [.221] Min.        |
|                                                         |              |                    | PostMate Power — Level 2  | —             | 16.28 [.641]          | 4.34 [.171] Min.        |
|                                                         |              |                    | PreMate Signal — Level 2  | —             | 16.74 [.659]          | 3.81 [.150] Min.        |
|                                                         |              |                    | PostMate Signal — Level 3 | —             | 18.01 [.709]          | 2.54 [.100] Min.        |

## Z-PACK MAX Connector to Z-PACK TinMan Connector Base Part Number Cross Reference\*

| Z-PACK MAX<br>Connector Base<br>Part Number | Z-PACK TinMan<br>Connector Base<br>Part Number | Description                                                |
|---------------------------------------------|------------------------------------------------|------------------------------------------------------------|
| 1469659                                     | 1934218                                        | Receptacle Assembly, 5 pair, Standard, 8 Column            |
| 1469660                                     | 1934269                                        | Header Assembly, Open Ended, 5 Pair 8 Column               |
| 1469680                                     | 1934272                                        | Header Assembly, Left Wall, 5 Pair 8 Column                |
| 1469680                                     | 1934273                                        | Header Assembly, Right Wall, 5 Pair 8 Column               |
| 1469681                                     | 1934271                                        | Header Assembly, Double Wall, 5 Pair 8 Column              |
| 1469687                                     | 1934315                                        | Header Assembly, Open Ended, 4 Pair 16 Column              |
| 1469693                                     | 1934225                                        | Receptacle Assembly, 4 pair, Standard, 16 Column           |
| 1469702                                     | 1934303                                        | Header Assembly, Left Wall, 4 Pair 8 Column                |
| 1469702                                     | 1934304                                        | Header Assembly, Right Wall, 4 Pair 8 Column               |
| 1469703                                     | 1934317                                        | Header Assembly, Left Wall, 4 Pair 16 Column               |
| 1469703                                     | 1934318                                        | Header Assembly, Right Wall, 4 Pair 16 Column              |
| 1469706                                     | 1934306                                        | Header Assembly, Double Wall, 4 Pair 8 Column              |
| 1469707                                     | 1934316                                        | Header Assembly, Double Wall, 4 Pair 16 Column             |
| 1469716                                     | 1934305                                        | Header Assembly, Open Ended, 4 Pair 8 Column               |
| 1469717                                     | 1934222                                        | Receptacle Assembly, 4 pair, Standard, 8 Column            |
| 1469735                                     | 1934349                                        | Right Angle Header Assembly, Open Ended, 5 Pair 8 Column   |
| 1469737                                     | 1934350                                        | Right Angle Header Assembly, Double Wall, 5 Pair 8 Column  |
| 1469753                                     | 1934331                                        | Header Assembly, Open Ended, 5 Pair 16 Column              |
| 1469754                                     | 1934221                                        | Receptacle Assembly, 5 pair, Standard, 16 Column           |
| 1469755                                     | 1934333                                        | Header Assembly, Left Wall, 5 Pair 16 Column               |
| 1469755                                     | 1934334                                        | Header Assembly, Right Wall, 5 Pair 16 Column              |
| 1469756                                     | 1934332                                        | Header Assembly, Double Wall, 5 Pair 16 Column             |
| 1469768                                     | 1934305                                        | Header Assembly, Open Ended, 4 Pair 8 Column               |
| 1469769                                     | 1934222                                        | Receptacle Assembly, 4 pair, Standard, 8 Column            |
| 1469774                                     | 1934311                                        | Header Assembly, Open Ended, 4 Pair 10 Column              |
| 1469775                                     | 1934224                                        | Receptacle Assembly, 4 pair, Standard, 10 Column           |
| 1469784                                     | 1934362                                        | 4x4 Orthogonal Offset Header Assembly, Double Wall         |
| 1469785                                     | 1934230                                        | Receptacle Assembly, 4x4, Orthogonal                       |
| 1469786                                     | 1934364                                        | 6x6 Orthogonal Offset Header Assembly, Double Wall         |
| 1469787                                     | 1934231                                        | Receptacle Assembly, 6x6, Orthogonal                       |
| 1469788                                     | 1934311                                        | Header Assembly, Open Ended, 4 Pair 10 Column              |
| 1469789                                     | 1934224                                        | Receptacle Assembly, 4 pair, Standard, 10 Column           |
| 1469793                                     | 1934353                                        | Right Angle Header Assembly, Open Ended, 4 Pair 8 Column   |
| 1469795                                     | 1934354                                        | Right Angle Header Assembly, Double Wall, 4 Pair 8 Column  |
| 1469807                                     | 1934339                                        | Header Assembly, Open Ended, 3 Pair 10 Column              |
| 1469809                                     | 1934228                                        | Receptacle Assembly, 3 pair, Standard, 10 Column           |
| 1469827                                     | 1934339                                        | Header Assembly, Open Ended, 3 Pair 10 Column              |
| 1469828                                     | 1934228                                        | Receptacle Assembly, 3 pair, Standard, 10 Column           |
| 1469829                                     | 1934299                                        | Header Assembly, Open Ended, 3 Pair 8 Column               |
| 1469831                                     | 1934226                                        | Receptacle Assembly, 3 pair, Standard, 8 Column            |
| 1469853                                     | 1934335                                        | Header Assembly, Open Ended, 3 Pair 6 Column               |
| 1469854                                     | 1934227                                        | Receptacle Assembly, 3 pair, Standard, 6 Column            |
| 1469867                                     | 1934340                                        | Header Assembly, Left Wall, 3 Pair 10 Column               |
| 1469867                                     | 1934341                                        | Header Assembly, Right Wall, 3 Pair 10 Column              |
| 1469871                                     | 1934357                                        | Right Angle Header Assembly, Open Ended, 3 Pair 10 Column  |
| 1469874                                     | 1934358                                        | Right Angle Header Assembly, Double Wall, 3 Pair 10 Column |
| 1469935                                     | 1934342                                        | Header Assembly, Double Wall, 3 Pair 10 Column             |
| 1469945                                     | 1934300                                        | Header Assembly, Left Wall, 3 Pair 8 Column                |
| 1469945                                     | 1934301                                        | Header Assembly, Right Wall, 3 Pair 8 Column               |
| 1469946                                     | 1934302                                        | Header Assembly, Double Wall, 3 Pair 8 Column              |
| 1469949                                     | 1934343                                        | Header Assembly, Open Ended, 3 Pair 16 Column              |
| 1469950                                     | 1934344                                        | Header Assembly, Left Wall, 3 Pair 16 Column               |
| 1469950                                     | 1934345                                        | Header Assembly, Right Wall, 3 Pair 16 Column              |
| 1469951                                     | 1934346                                        | Header Assembly, Double Wall, 3 Pair 16 Column             |
| 1469955                                     | 1934229                                        | Receptacle Assembly, 3 pair, Standard, 16 Column           |
| 1469960                                     | 1934335                                        | Header Assembly, Open Ended, 3 Pair 6 Column               |

\*As announced on 6/20/07, Tyco Electronics now offers the Z-PACK TinMan product line as a form, fit and function replacement to the Z-PACK MAX product line. This chart will assist in finding the Z-PACK TinMan connector part number if you have a Z-PACK MAX connector part number.

## Z-PACK MAX Connector to Z-PACK TinMan Connector Base Part Number Cross Reference\* (Continued)

| Z-PACK MAX<br>Connector Base<br>Part Number | Z-PACK TinMan<br>Connector Base<br>Part Number | Description                                                |
|---------------------------------------------|------------------------------------------------|------------------------------------------------------------|
| 1469961                                     | 1934336                                        | Header Assembly, Left Wall, 3 Pair 6 Column                |
| 1469961                                     | 1934337                                        | Header Assembly, Right Wall, 3 Pair 6 Column               |
| 1469962                                     | 1934338                                        | Header Assembly, Double Wall, 3 Pair 6 Column              |
| 1469966                                     | 1934227                                        | Receptacle Assembly, 3 pair, Standard, 6 Column            |
| 1469974                                     | 1934359                                        | Right Angle Header Assembly, Open Ended, 3 Pair 8 Column   |
| 1469977                                     | 1934360                                        | Right Angle Header Assembly, Double Wall, 3 Pair 8 Column  |
| 1934007                                     | 1934321                                        | Header Assembly, Open Ended, 5 Pair 6 Column               |
| 1934008                                     | 1934323                                        | Header Assembly, Left Wall, 5 Pair 6 Column                |
| 1934008                                     | 1934324                                        | Header Assembly, Right Wall, 5 Pair 6 Column               |
| 1934009                                     | 1934322                                        | Header Assembly, Double Wall, 5 Pair 6 Column              |
| 1934010                                     | 1934219                                        | Receptacle Assembly, 5 pair, Standard, 6 Column            |
| 1934018                                     | 1934347                                        | Right Angle Header Assembly, Open Ended, 5 Pair 16 Column  |
| 1934021                                     | 1934348                                        | Right Angle Header Assembly, Double Wall, 5 Pair 16 Column |
| 1934026                                     | 1934351                                        | Right Angle Header Assembly, Open Ended, 4 Pair 16 Column  |
| 1934029                                     | 1934352                                        | Right Angle Header Assembly, Double Wall, 4 Pair 16 Column |
| 1934034                                     | 1934355                                        | Right Angle Header Assembly, Open Ended, 3 Pair 16 Column  |
| 1934037                                     | 1934356                                        | Right Angle Header Assembly, Double Wall, 3 Pair 16 Column |
| 1934106                                     | 1934313                                        | Header Assembly, Left Wall, 4 Pair 10 Column               |
| 1934106                                     | 1934314                                        | Header Assembly, Right Wall, 4 Pair 10 Column              |
| 1934107                                     | 1934312                                        | Header Assembly, Double Wall, 4 Pair 10 Column             |
| 1934121                                     | 1934364                                        | 6x6 Orthogonal Offset Header Assembly, Double Wall         |
| 1934122                                     | 1934231                                        | Receptacle Assembly, 6x6, Orthogonal                       |
| 1934127                                     | 1934220                                        | Receptacle Assembly, 5 pair, Standard, 10 Column           |
| 1934136                                     | 1934315                                        | Header Assembly, Open Ended, 4 Pair 16 Column              |
| 1934137                                     | 1934317                                        | Header Assembly, Left Wall, 4 Pair 16 Column               |
| 1934137                                     | 1934318                                        | Header Assembly, Right Wall, 4 Pair 16 Column              |
| 1934141                                     | 1934363                                        | 6x6 Orthogonal In-Line Header Assembly, Double Wall        |
| 1934165                                     | 1934361                                        | 4x4 Orthogonal In-Line Header Assembly, Double Wall        |
| 1934171                                     | 1934275                                        | Receptacle Assembly, 4 pair, Standard, 14 Column           |
| 1934194                                     | 1934325                                        | Header Assembly, Open Ended, 5 Pair 10 Column              |
| 1934208                                     | 1934326                                        | Header Assembly, Double Wall, 5 Pair 10 Column             |
| 1934210                                     | 1934327                                        | Header Assembly, Left Wall, 5 Pair 10 Column               |
| 1934210                                     | 1934328                                        | Header Assembly, Right Wall, 5 Pair 10 Column              |
| N/A                                         | 1934223                                        | Receptacle Assembly, 4 pair, Standard, 6 Column            |
| N/A                                         | 1934274                                        | Header Assembly 5 Pair Open Ended 8 Column Notched Wall    |
| N/A                                         | 1934276                                        | Receptacle Assembly, 5 pair, Standard, 14 Column           |
| N/A                                         | 1934287                                        | Header Assembly, Open Ended, 5 Pair 14 Column              |
| N/A                                         | 1934288                                        | Header Assembly, Open Ended, 4 Pair 14 Column              |
| N/A                                         | 1934289                                        | Header Assembly, Double Wall, 5 Pair 14 Column             |
| N/A                                         | 1934290                                        | Header Assembly, Double Wall, 4 Pair 14 Column             |
| N/A                                         | 1934307                                        | Header Assembly, Open Ended, 4 Pair 6 Column               |
| N/A                                         | 1934308                                        | Header Assembly, Double Wall, 4 Pair 6 Column              |
| N/A                                         | 1934309                                        | Header Assembly, Left Wall, 4 Pair 6 Column                |
| N/A                                         | 1934310                                        | Header Assembly, Right Wall, 4 Pair 6 Column               |
| N/A                                         | 1934319                                        | Header Assembly, Left Wall, 4 Pair 14 Column               |
| N/A                                         | 1934320                                        | Header Assembly, Right Wall, 4 Pair 14 Column              |
| N/A                                         | 1934329                                        | Header Assembly, Left Wall, 5 Pair 14 Column               |
| N/A                                         | 1934330                                        | Header Assembly, Right Wall, 5 Pair 14 Column              |

\*As announced on 6/20/07, Tyco Electronics now offers the Z-PACK TinMan product line as a form, fit and function replacement to the Z-PACK MAX product line. This chart will assist in finding the Z-PACK TinMan connector part number if you have a Z-PACK MAX connector part number.

## Part Number Index

**Note:** This index lists all cataloged parts by base no. only. Complete part nos. (with prefixes and/or suffixes) are shown on the page(s) indicated.

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| 1934225  | 7    | 1934316  | 16   | 1934351  | 23   |
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| 1934272  | 10   | 1934340  | 18   | 1934359  | 25   |
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