

The Company

Amphenol Canada Corp. a subsidiary of Amphenol Corporation, is an international leader in the manufacture of *Filtered Connectors* and *Specialty Interconnect Devices*, and has been pioneering EMI and EMP technologies for more than 40 years.

Located in Toronto, Canada, our ISO 9001 certified facility employs approximately 400 people. Our activities are dedicated to the design, development and manufacture of EMI/EMP filter

connector products which are used in Commercial, Industrial, Communications, Military and Aerospace applications worldwide. Our expertise in understanding and supporting our customers' filter interconnect needs has earned Amphenol Canada a reputation of quality and excellence among the world's leading users of electronic components.

What is a Filtered Connector?

A **filtered connector** is the combination of filter elements in a connector, forming one neat, compact interconnect device that can filter unwanted EMI. The most popular configuration is when

capacitors are mounted inside the connector between each of the contacts and the connector ground shell.

Benefits

Better EMI Control – With minimized lead inductances and short, direct paths to ground of the filter, performance will typically out perform the same filter components on a P.C.B. by a factor of three to one.

PCB Space Savings – Incorporating filter elements into the connector, enables simplification of the required filter schematic for the necessary performance plus a savings of 2-4 square inches.

Cost Savings – Filter elements, such as inductors and capacitors, must no longer be purchased, stocked, assembled or tested. Fewer components means greater reliability at lower cost.

Easy EMI/RFI Upgrade – These compact filtered connectors fit standard non-filtered connector footprints. For improved EMC performance, simply replace the existing connector with a filtered connector.

EMC Compliance & Immunity – EMI that is generated from the electronic device, radiated or conducted, will be re-directed to chassis ground through the connector shell. This same device will also protect the system from external EMI/RFI noise (such as radio transmitters, ESD, or natural phenomena such as lightning) in the same way.

Choosing the Right Capacitance for Your Filter Connector

- (1) Determine the highest frequency that the filter connector needs to pass unaffected.
- (2) Which frequencies are causing trouble, either with emissions or with immunity to interference?

- (3) Scan the Insertion Loss charts on page 2 to select a filter which provides little or no insertion loss (filtering) at the frequency determined from step 1, yet gives the greatest possible insertion loss at the frequencies determined in step 2.

Nominal Insertion Loss values described in this catalog are based on the Mil-STD-220 test method - a 50 ohm balanced load and source impedance. Different systems will differ from this and

hence, the filter connector may perform differently. The final decision will be determined from actual EMI/RFI testing of the equipment in question.

FCC17 & FCC57 Series

ELECTRICAL DATA

Contact Resistance: 15 milliohms maximum per MIL-STD-1344 Method 3002
Insulation Resistance: 3000 megohms minimum per MIL-STD-1344 Method 3003.1
Current Rating: 5 Amps DC maximum
2 Amps RF filtering maximum
FCC17 Combo: 20-40 Amps

Filter Performance:

Filter Capacitance (pF) @25°C, 1 kHz, 1.0 VRMS	50 ± 15%	180 ± 15%	330 ± 15%	470 ± 15%	820 ± 15%	1000 ± 15%	1200 ± 15%	2200 ± 15%	5600 ± 20%	47000 ± 20%
Dielectric Material: NPO or X7R										
Insertion Loss (dB) (per MIL-STD-220 @ 25°C)	.5 MHz								3	15
	1 MHz								1	5
	5 MHz		1	1	1	1		5	11	27
	10 MHz	1	2	3	3	4	8	16	32	32
	50 MHz	4	7	11	16	17	23	32	32	32
	100 MHz	2	12	15	22	30	30	32	32	32
	200 MHz	12	27	28	30	32	32	32	32	32
	1000 MHz	32	32	32	32	32	32	32	32	32
Working Voltage (VDC)	300	300	300	300	200	200	200	200	200	50
DWV (VDC) *	600	600	600	600	600	600	600	600	600	150

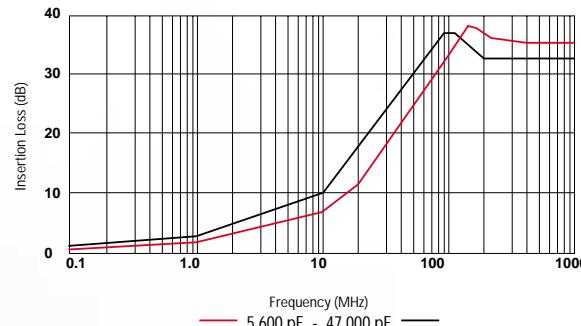
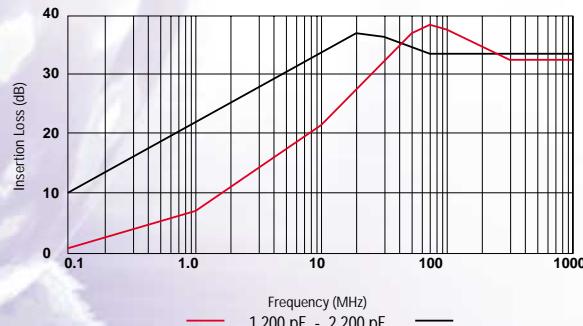
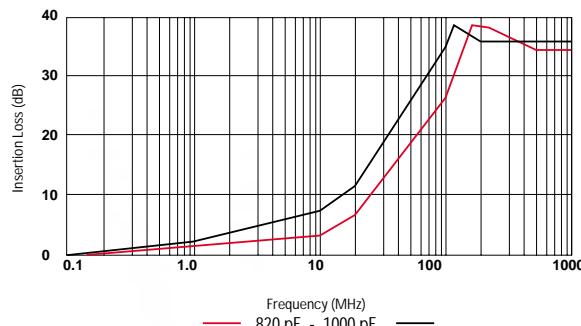
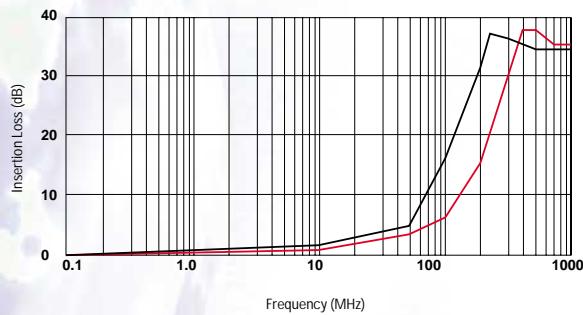
NOTE: A larger range of capacitors available - consult factory.

* FCC57 connectors can be specified to meet the requirements of FCC Docket 20780, Part 68, Subpart F (1000 VAC for one minute. Consult factory for details).

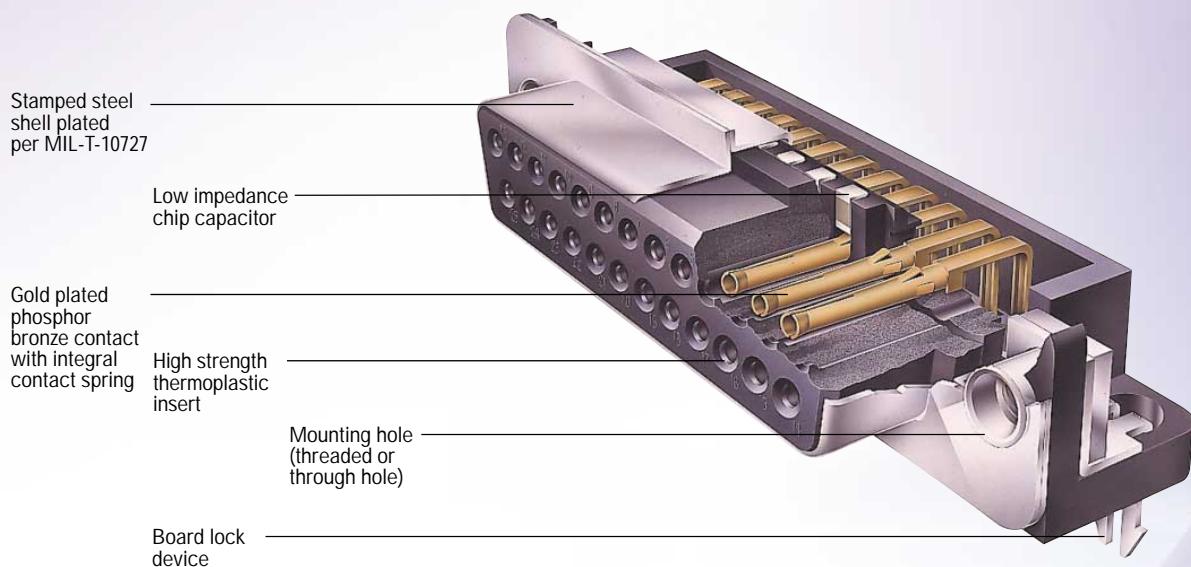
FCC17 and FCC57 connectors can withstand a transient voltage spike of 700 V with a rise time of 1 μ sec (500 V for 47000 pF).

FCC17 and FCC57 connectors can be specified to meet higher DWV and transient voltage requirement (consult factory).

Typical Insertion Loss Performance (dB) (Per MIL-STD-220, no load)



FCC17 Series Construction



FCC17 & FCC57 Mechanical & Environmental Data

MATERIALS

FCC17

Shell Stamped Steel; Tin Plated

Contacts Phosphor Bronze; 15 μ inches [0.38 microns] Au over Ni Optional 50 μ inches [1.27 microns] Au available

FCC17 Combo
Copper Alloy
30 μ inches [0.76 microns]
Au over Ni

Inserts High Strength Thermoplastic. Complies with UL flammability requirements of 94V-0 per UL-STD-94.

FCC57

Shell Stamped Steel, Zinc or Aluminum Diecast; Tin Plated

Contacts Phosphor Bronze; 30 μ inches [0.76 microns] Au over Ni Optional 50 μ inches [1.27 microns] Au available

Inserts High Strength Thermoplastic. Complies with UL flammability requirements of 94V-0 per UL-STD-94.

ENVIRONMENTAL

FCC17 & FCC57

OPERATING TEMPERATURE • -40°C to +85°C

TEMPERATURE CYCLING • To MIL-STD-1344, Method 1003, Test Cond. A

HUMIDITY • To MIL-STD-1344, Method 1002, Type I, Test Condition C

VIBRATION • To MIL-STD-1344, Method 2005, Test Cond. III

DURABILITY • 200 Cycles Minimum, to MIL-STD-1344, Method 2016

UL File # E135615
CSA File # LR68598

Specifications

Filter Characteristics: See Page 2

Electrical Data: See Page 2

Material and Finishes: See Page 3

Environmental Data: See Page 3

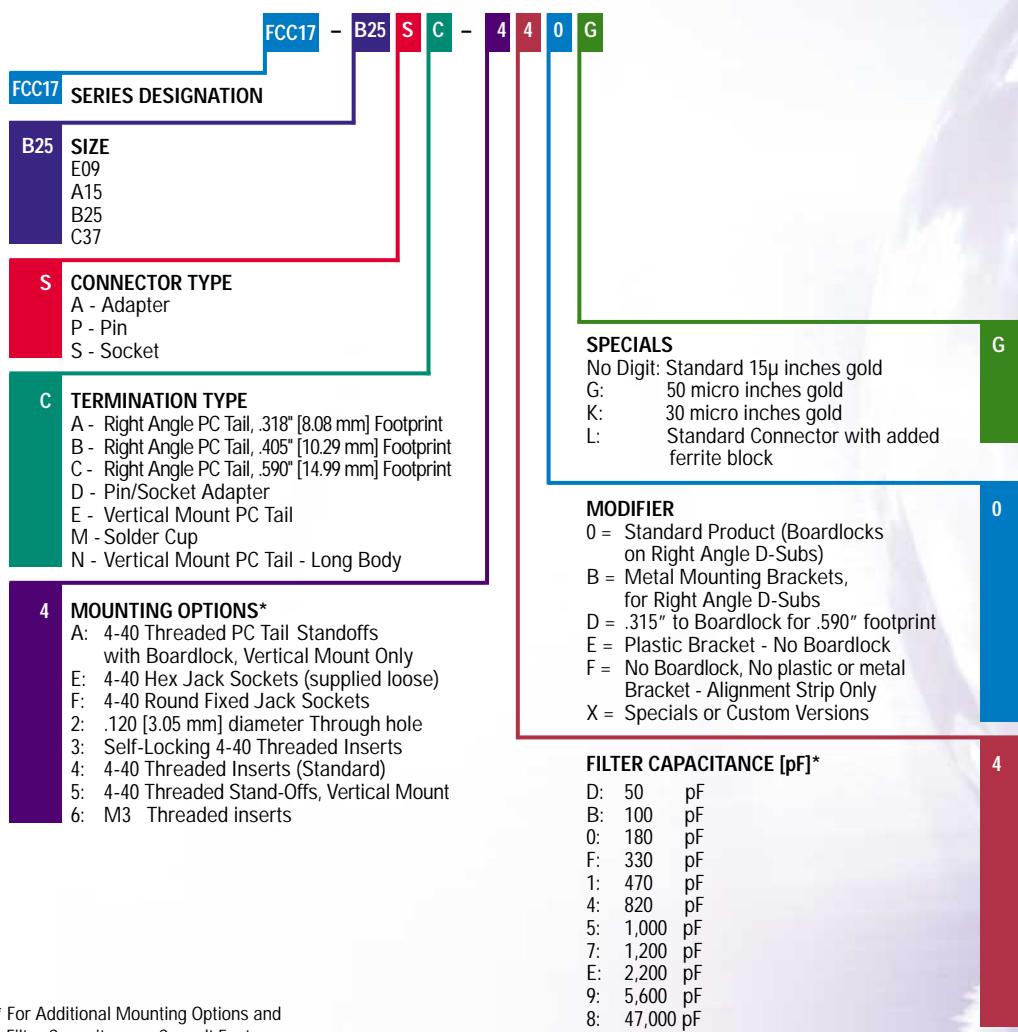
UL File # : E135615

CSA File # : LR68598



These products are protected by U.S. Patent # 4500159

Ordering Information – D-Sub

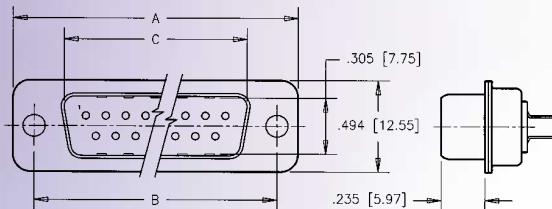


* For Additional Mounting Options and Filter Capacitance - Consult Factory

FCC17 Series

FILTERED D-SUB CONNECTORS

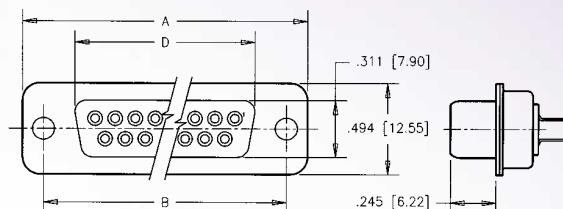
Pin



FRONT VIEW

END VIEW

Socket



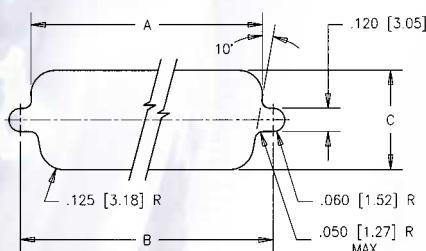
FRONT VIEW

END VIEW

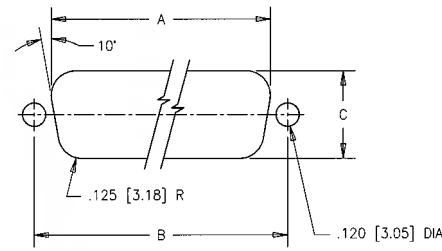
All Dimensions in Inches (mm)

Shell Size	Standard Number of Contacts	A	B	C (for pin connector)	D (for socket connector)
E	9	1.213 [30.81]	.984 [24.99]	.666 [16.92]	.643 [16.33]
A	15	1.541 [39.14]	1.312 [33.32]	.994 [25.25]	.971 [24.66]
B	25	2.088 [53.04]	1.852 [47.04]	1.534 [38.96]	1.511 [38.38]
C	37	2.729 [69.32]	2.500 [63.50]	2.182 [55.42]	2.159 [54.84]

Mounting Dimensions



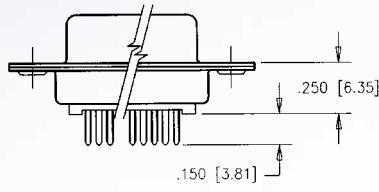
FRONT MOUNTING CUT-OUT



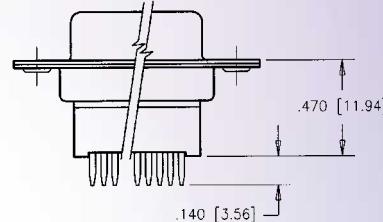
REAR MOUNTING CUT-OUT

Size	Mounting	A	B	C
9	Front	.875 [22.23]	.984 [24.99]	.512 [13.00]
	Rear	.807 [20.50]	.984 [24.99]	.449 [11.40]
15	Front	1.200 [30.48]	1.312 [33.32]	.512 [13.00]
	Rear	1.134 [28.80]	1.312 [33.32]	.449 [11.40]
25	Front	1.744 [44.30]	1.852 [47.04]	.512 [13.00]
	Rear	1.673 [42.49]	1.852 [47.04]	.449 [11.40]
37	Front	2.389 [60.68]	2.500 [63.50]	.512 [13.00]
	Rear	2.326 [59.08]	2.500 [63.50]	.449 [11.40]

Vertical Mount



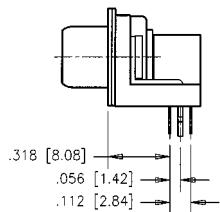
Termination Type E



Termination Type N

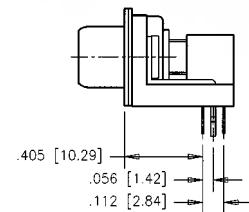
Right Angle, with Boardlocks & Plastic Mounting Brackets

.318" FOOTPRINT



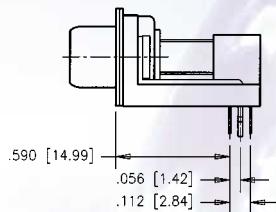
Termination Type A
with Modifier option O

.405" FOOTPRINT



Termination Type B
with Modifier option O

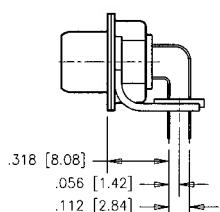
.590" FOOTPRINT



Termination Type C
with Modifier option O

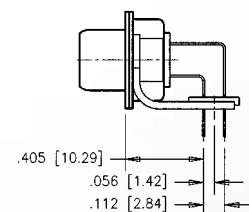
Right Angle, with Metal Mounting Brackets

.318" FOOTPRINT



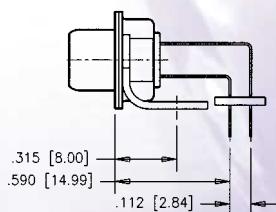
Termination Type A
with Modifier option B

.405" FOOTPRINT



Termination Type B
with Modifier option B

.590" FOOTPRINT



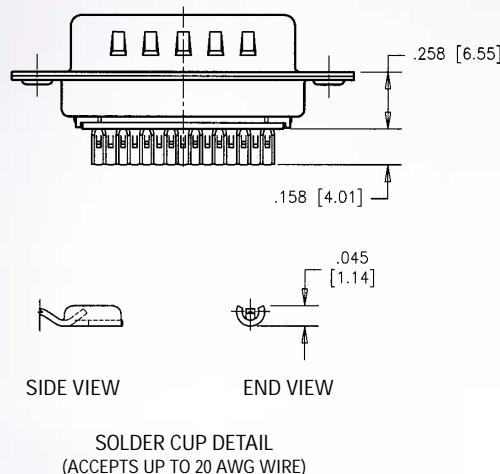
Termination Type C
with Modifier option B

FCC17 Series

FILTERED D-SUB CONNECTORS

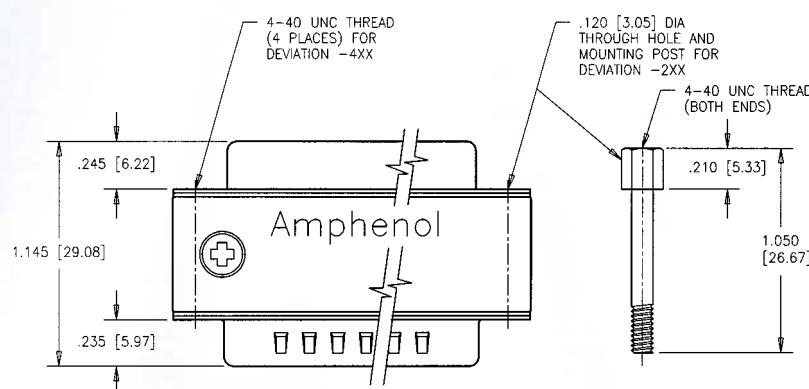
Solder Cup Termination

Termination type M



Pin-to-Socket Adapter

Termination type D



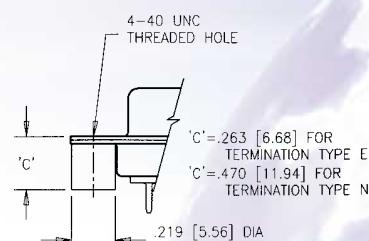
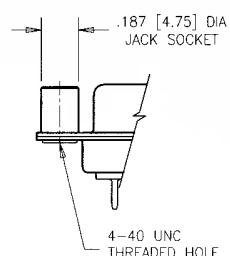
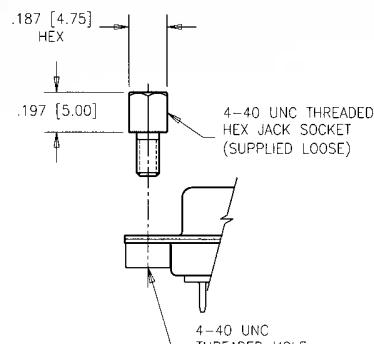
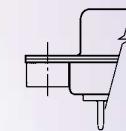
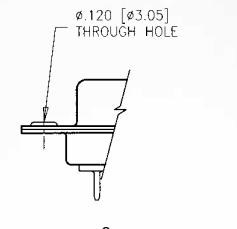
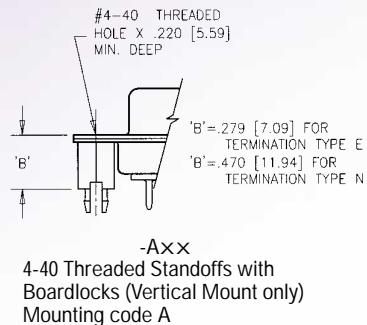
Mounting Options
Through Hole with Mounting Post
4-40 Threaded Inserts

Part No. Example
FCC17-B25AD-2x0
FCC17-B25AD-4x0

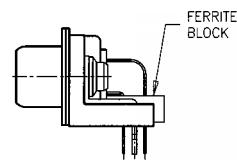
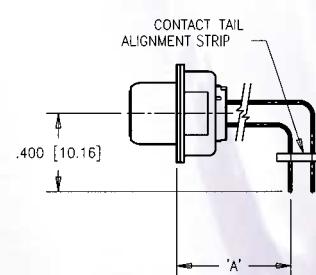
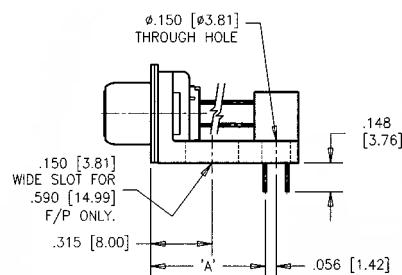
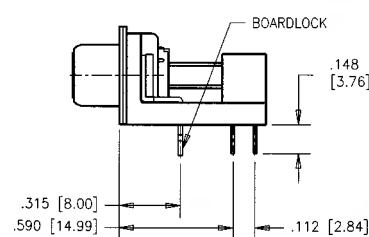
× = To complete the P/N, see page 5 to assign Filter Capacitance Code.
For electrical and mechanical specifications, see pages 2 and 3.

Mounting Options (on Flange)

Shown for Vertical Mount Connectors. Codes 2, 3, 4, 6, E and F also available on right angle connectors.



Bracket Options & Specials



Consult Factory for details

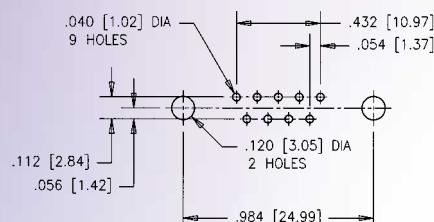
Termination Type	"A" Dimension
A	.318 (8.08)
B	.405 (10.29)
C	.590 (14.99)

FCC17 Series

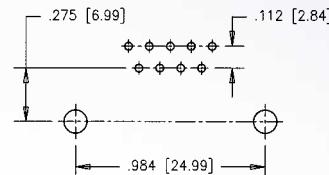
FILTERED D-SUB CONNECTORS

PCB Layout

9 SIZE

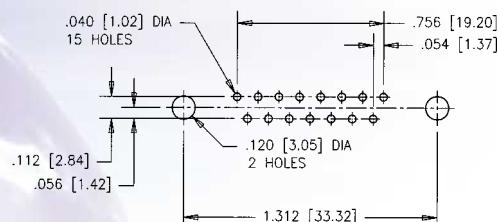


Standard PCB layout

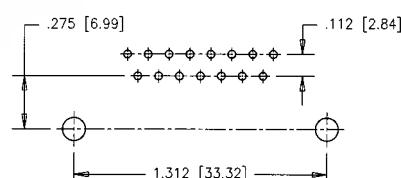


PCB layout for
.590" footprint with Modifier
Options B or D only

15 SIZE

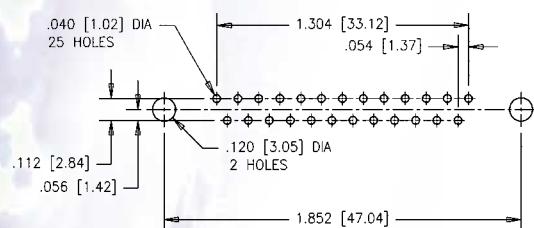


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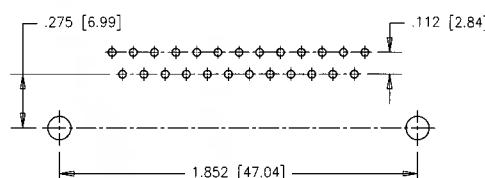


PCB layout for
.590" footprint with Modifier
Options B or D only

25 SIZE

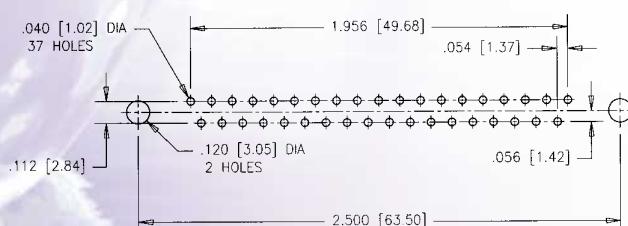


Standard PCB layout

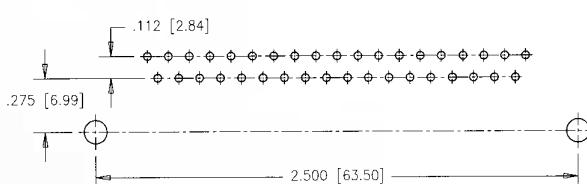


PCB layout for
.590" footprint with Modifier
Options B or D only

37 SIZE



Standard PCB layout



PCB layout for
.590" footprint with Modifier
Options B or D only