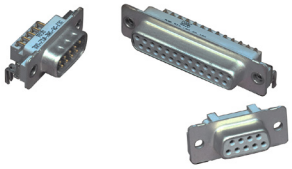
EMI Filtered D-Sub Connectors

From performance to board space, to cost, APITech offers many reasons and options for managing EMI at the signal and power I/O.

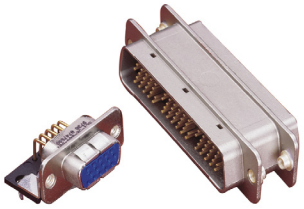
Advantages of a Filtered Connector

- **Low ground impedance:** Full ground plate and metallic shell provide minimal impedance and superior performance compared to on-board filter with high impedance
- **Eliminate re-radiation:** Filtered connector at interface leaves no path for bypassing the filter
- **Ground plane shielding:** APITech's filtered connector ground planes shield the box even at the connector port
- **Efficient space utilization:** Filters located in the connectors provide additional space on PCB board
- **Consistent performance:** Filtered connectors provide more consistent pin to pin performance
- **Fewer components:** Filtered connectors reduce component count creating cost savings
- **Reliability:** APITech tests 100% of filters, on-board filters are usually spot tested

Series F Ferrite Filtered Connects



Series 500 Low-Profile Feedthrough Connectors



Series 600 High-Density Filtered Connectors

Series 700 High Performance Connectors

Filtered Combo D-Sub Connectors

Micro D Series Connectors

Advantages of API Filtered Connectors

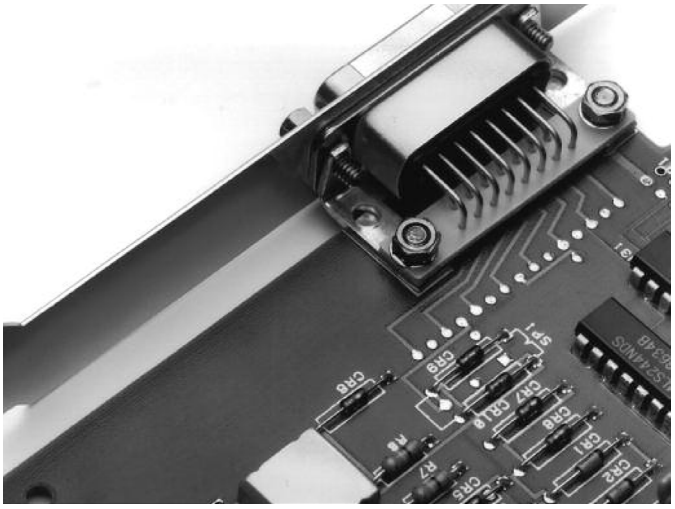
APITechs' offers the industry's most complete line of filtered D-subminiature connectors. Our connectors are available in shell sizes from 9 to 50, and come in many termination types, such as PC mount, wire wrap, solder cup, and 90° PCB. In addition, APITech offers a wide range of filtering options, allowing you to find the right balance between performance and economy.

EMI filter options include our Pi filter configuration, which provides 45-60 dB per decade slope to insertion loss curve, our capacitive-only C filters that provide cost-effective EMI attenuation, ferrite filtered series F connectors (designed for filtering in situations that do not tolerate capacitive loading of circuit), as well as our series 500 connectors, with small .318" footprints.

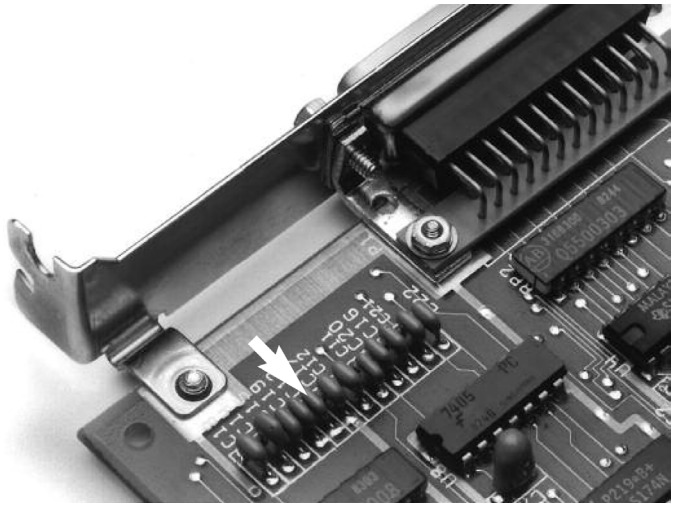
The construction of our high performance Series 600 and 700 connectors features a one-piece zinc diecast shell, which is subsequently nickel-plated. Each filter is constructed with 360° grounding with ground plate, and our patented coaxial springs ensure ground continuity. And with APITech's advanced in-house ceramic tube design, you'll get a reliable, high performance filter from start to finish.

Advantages of an API Filtered Connector

- **Low ground impedance:** Full ground plate and metallic shell provide minimal impedance and superior performance compared to on-board filter with high impedance
- **Eliminate re-radiation:** Filtered connector at interface leaves no path for bypassing the filter
- **Ground plane shielding:** APITech's filtered connector ground planes shield the box even at the connector port
- **Efficient space utilization:** Filters located in the connectors provide additional space on PCB board
- **Consistent performance:** Filtered connectors provide more consistent pin to pin performance
- **Fewer components:** Filtered connectors reduce component count creating cost savings
- **Reliability:** APITech tests 100% of filters, on-board filters are usually spot tested



D-Subminiature Connectors



On-Board Filters

Series F Ferrite Filtered Connectors

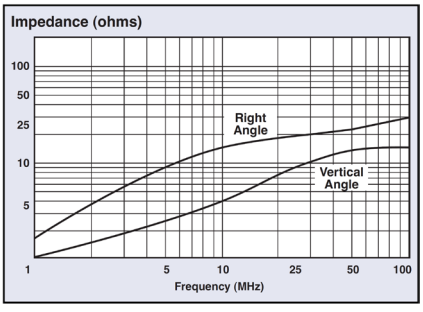
The Series F EMI filtered D-subminiature connectors incorporate a solid slab of ferrite material as the filtering element. This rugged one-piece design provides a compact connector that is a drop-in replacement for standard connectors. The ferrite material has been chosen for optimum filtering performance in the 10 to 300 MHz range.

Series F Applications

- Personal computers, microcomputer-applied products, and peripheral/terminal equipment
- Eliminates common-mode noise along data lines in data communication terminals and digital equipment

Features

- Low cost, high performance ferrite filter
- No distortion of wave forms
- Replaces individual ferrite bead filters, saving cost, and space
- Provides both pin to ground and pin to pin filtering
- Effective in helping meet requirements of FCC, VDE, EN55022, and Japan's VCCI
- Short, space saving .318" footprint
- Interchangeable with standard D-subminiature connectors
- Can be installed directly over PCB trace pattern with no shorting
- 4–40 UNC locking insert eliminates loose hardware
- Metal shielding front shell
- Gold plated contacts
- RoHS compliant versions available (replace 56- with 56F)



Mechanical Specifications

Front Shell	Steel (Tin plated)
Housing	UL 94V-0 Rated thermoplastic, black
Contacts	Phosphor bronze (sockets) or brass (pins)
Contact Plating	Gold Flash (<10µ in.) over nickel
Operating Temperature	10C to +105C

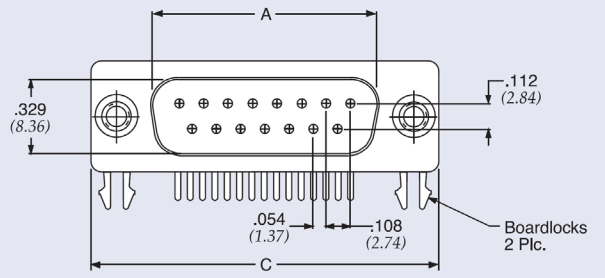
Electrical Specifications

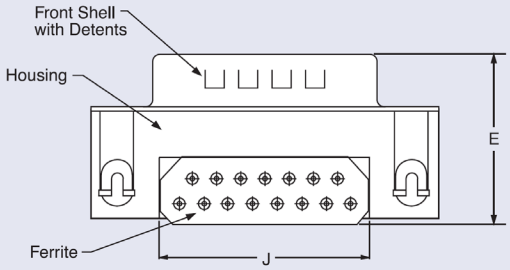
Frequency (MHz)	Impedance (Ohms)	
	Right Angle	Vertical
1	2	1
10	15	6
30	20	10
50	23	12
100	27	15

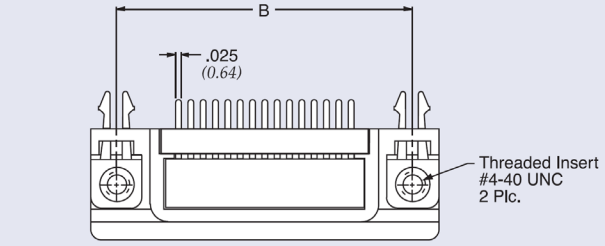
Frequency Range	10 -300MHz
Current Rating	5 Amps
Dielectric Withstand Voltage	1000 VAC for one minute
Insulation Resistance	1000 megohms Min. @ 500VDC

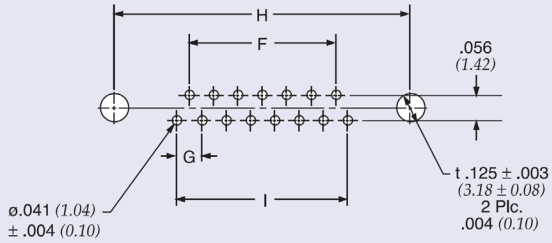
Series F Ferrite Filtered Connectors

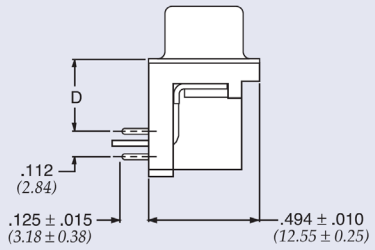
Pin Contact – Right Angle Mount











PC Board Mounting Dimensions

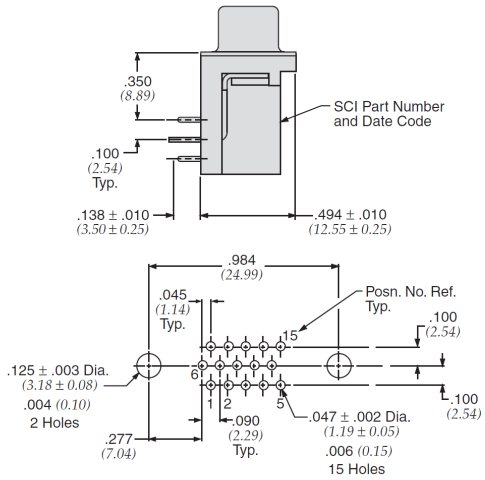
Part Number	Description	Typ. Impedance (Ohms)		Frequency Range	A+/- 0.010 (0.25)	B +/- 0.005 (0.13)	C +/- 0.015 (0.38)	D +/- 0.010 (0.25)	E +/- 0.015 (0.38)	F +/- 0.005 (0.13)	G +/- 0.004 (0.10)	H +/- 0.005 (0.13)	I +/- 0.005 (0.13)	J +/- 0.005 (0.13)
		30 MHz	100 MHz											
€ 56-402-001	D-Sub 9 pin	20	27	10 MHz to 300 MHz	0.666 (16.92)	0.984 (25.00)	1.213 (30.81)	0.318 (8.08)	0.751 (19.10)	0.324 (8.22)	0.108 (2.74)	0.984 (25.00)	0.432 (10.98)	0.606 (15.40)
€ 56-412-001	D-Sub 15 pin				0.994 (25.25)	1.312 (33.32)	1.541 (39.14)	0.318 (8.08)	0.751 (19.10)	0.648 (16.46)	0.108 (2.74)	1.312 (33.32)	0.756 (19.20)	0.929 (23.60)
€ 56-422-001	D-Sub 25 pin				1.534 (38.96)	1.852 (47.04)	2.088 (53.04)	0.318 (8.08)	0.751 (19.10)	1.196 (30.36)	0.110 (2.76)	1.852 (47.04)	1.304 (31.12)	1.476 (37.50)

€ Also available through APITech's authorized European distributors/agents.

Dimensions in inches (mm)

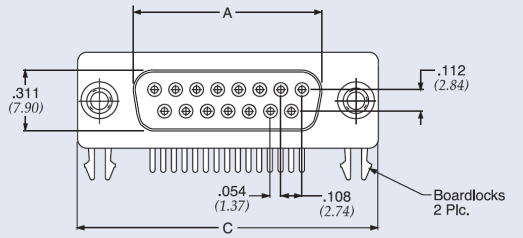
Series F Ferrite Filtered Connectors

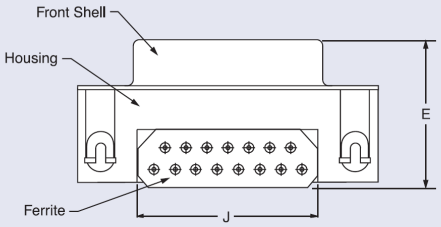
*High-Density

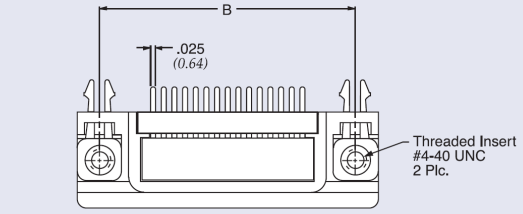


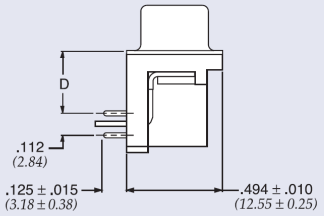
PC Board Mounting Dimensions

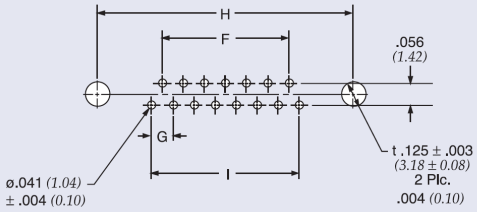
Socket Contact – Right Angle Mount











PC Board Mounting Dimensions

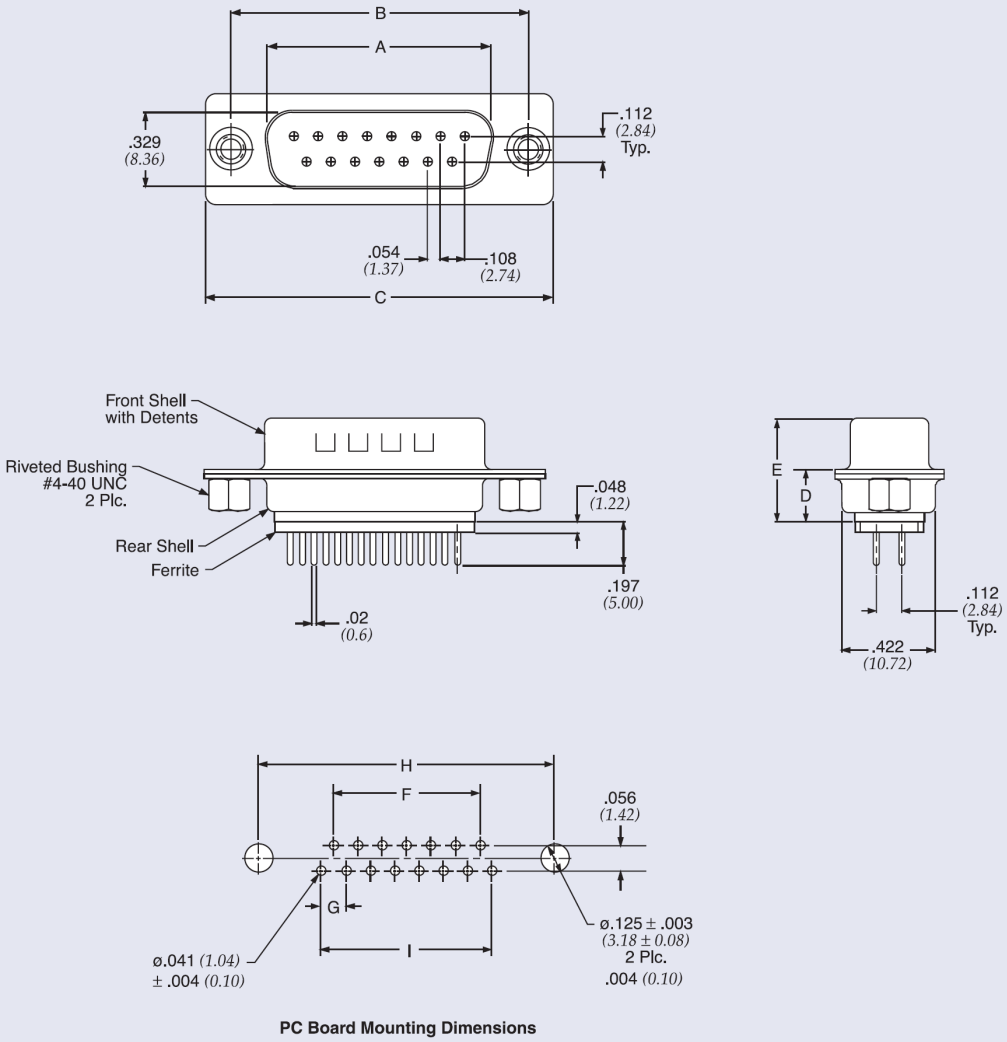
Part Number	Description	Typ. Impedance (Ohms) 30 MHz	Typ. Impedance (Ohms) 100 MHz	Frequency Range	A+/- 0.010 (0.25)	B +/- 0.005 (0.13)	C +/- 0.015 (0.38)	D +/- 0.010 (0.25)	E +/- 0.015 (0.38)	F +/- 0.005 (0.13)	G +/- 0.004 (0.10)	H +/- 0.005 (0.13)	I +/- 0.005 (0.13)	J +/- 0.005 (0.13)
€ 56-404-001	D-Sub 9 socket	20	27	10 MHz to 300 MHz	0.643 (16.33)	0.984 (25.00)	1.213 (30.81)	0.318 (8.08)	0.755 (19.20)	0.324 (8.22)	0.108 (2.74)	0.984 (25.00)	0.432 (10.98)	0.606 (15.40)
€ 56-414-001	D-Sub 15 socket				0.971 (24.66)	1.312 (33.32)	1.541 (39.14)	0.318 (8.08)	0.755 (19.20)	0.648 (16.46)	0.108 (2.74)	1.312 (33.32)	0.756 (19.20)	0.929 (23.60)
€ 56-424-001	D-Sub 25 socket				1.511 (38.38)	1.852 (47.04)	2.088 (53.04)	0.318 (8.08)	0.755 (19.20)	1.196 (30.36)	0.110 (2.76)	1.852 (47.04)	1.304 (31.12)	1.476 (37.50)
€ 56-414-001-HD	Hi-Density 15 socket	16	26		0.643 (16.33)	0.984 (25.00)	1.213 (30.81)	★ See inset drawing						

€ Also available through APITech's authorized European distributors/agents.

Dimensions in inches (mm)

Series F Ferrite Filtered Connectors

Pin Contact – Vertical Mount



PC Board Mounting Dimensions

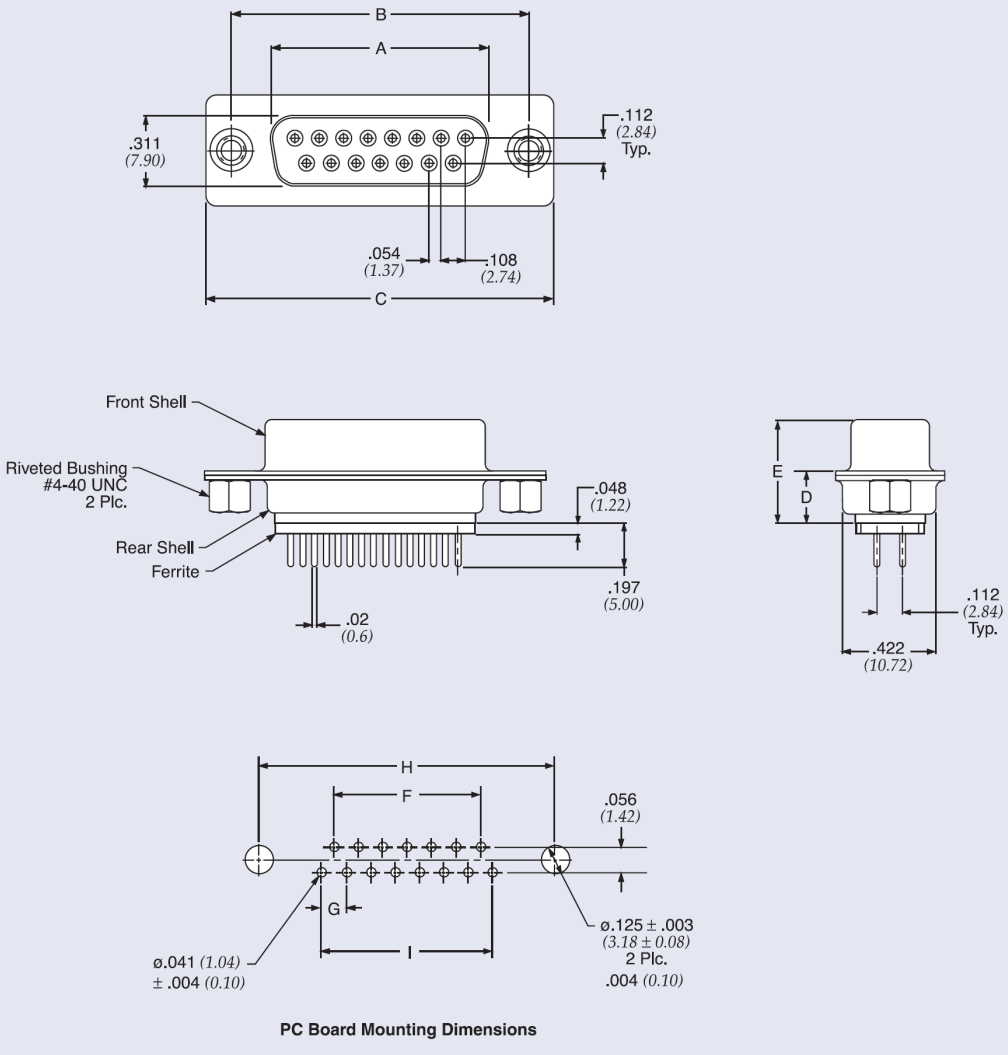
Part Number	Description	Typ. Impedance (Ohms)		Frequency Range	A+/- 0.010 (0.25)	B +/- 0.005 (0.13)	C +/- 0.015 (0.38)	D +/- 0.010 (0.25)	E +/- 0.015 (0.38)	F +/- 0.005 (0.13)	G +/- 0.004 (0.10)	H +/- 0.005 (0.13)	I +/- 0.005 (0.13)
		30 MHz	100 MHz										
56-407-001	D-Sub 9 pin	10	15	10 MHz to 300 MHz	0.666 (16.92)	0.984 (25.00)	1.213 (30.81)	0.236 (5.99)	0.468 (11.88)	0.324 (8.22)	0.108 (2.74)	0.984 (25.00)	0.432 (10.98)
56-417-001	D-Sub 15 pin				.994 (25.25)	1.312 (33.32)	1.541 (39.14)	0.236 (5.99)	0.468 (11.88)	0.648 (16.46)	0.108 (2.74)	1.312 (33.32)	0.756 (19.20)
56-427-001	D-Sub 25 pin				1.534 (38.96)	1.852 (47.04)	2.088 (53.04)	0.236 (5.99)	0.468 (11.88)	1.196 (30.36)	0.110 (2.76)	1.852 (47.04)	1.304 (31.12)

€ Also available through APITech's authorized European distributors/agents.

Dimensions in inches (mm)

Series F Ferrite Filtered Connectors

Socket Contact – Vertical Mount



PC Board Mounting Dimensions

Part Number	Description	Typ. Impedance (Ohms)		Frequency Range	A+/- 0.010 (0.25)	B +/- 0.005 (0.13)	C +/- 0.015 (0.38)	D +/- 0.010 (0.25)	E +/- 0.015 (0.38)	F +/- 0.005 (0.13)	G +/- 0.004 (0.10)	H +/- 0.005 (0.13)	I +/- 0.005 (0.13)
		30 MHz	100 MHz										
56-403-001	D-Sub 9 socket	10	15	10 MHz to 300 MHz	0.643 (16.33)	0.984 (25.00)	1.213 (30.81)	0.236 (5.99)	0.472 (11.98)	0.324 (8.22)	0.108 (2.74)	0.984 (25.00)	0.432 (10.98)
56-413-001	D-Sub 15 socket				.971 (24.66)	1.312 (33.32)	1.541 (39.14)	0.236 (5.99)	0.472 (11.98)	0.648 (16.46)	0.108 (2.74)	1.312 (33.32)	0.756 (19.20)
56-423-001	D-Sub 25 socket				1.511 (38.38)	1.852 (47.04)	2.088 (53.04)	0.236 (5.99)	0.472 (11.98)	1.196 (30.36)	0.110 (2.76)	1.852 (47.04)	1.304 (31.12)

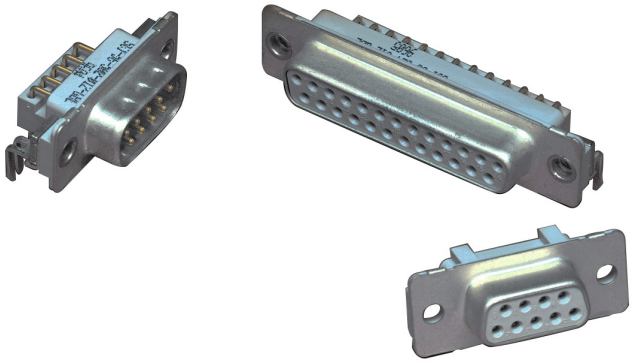
Dimensions in inches (mm)

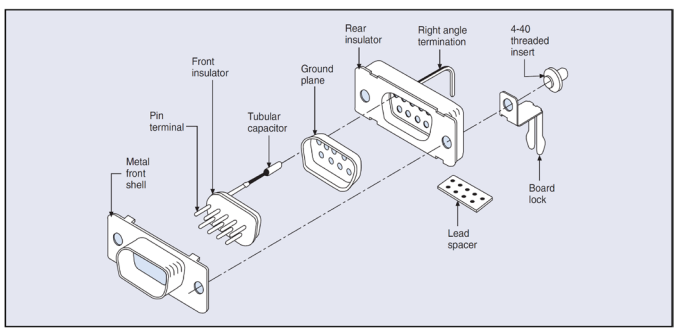
Series 500 High Performance Filtered Connectors

APITech's Series 500 are cost effective, highly reliable EMI filtered D-subminiature connectors that feature a .318" footprint for 90 degree PCB connectors and a low profile housing on straight PCB connectors. Series 500 filtered D-subs are "drop-in" replacements for standard unfiltered D-sub connectors.

The ability of these connectors to achieve EMI filtering within the smaller footprint is the result of technical advances in ceramic capacitors. Series 500 connectors use tubular capacitors for high performance EMI filtering. Quality features for these connectors include board lock mounting, metal front shells, and gold plated contacts.

Series 500 capacitive filtered D-sub connectors are an ideal solution to FCC/EC/VCCI emissions problems. These connectors are designed to protect equipment from external EMI noise and eliminate system glitches.





Series 500 Applications

- Personal computers
- Industrial process equipment
- Graphics workstations
- PBX telecommunications equipment
- Cellular base stations and medical electronics

Features

- "Drop-in" replacements for unfiltered D-subminiatures
- Compact design, featuring .318" footprint
- Tubular feedthrough capacitors provide filtering superior to on-board components
- Ground plane design provides EMI shielding
- Full interchangeability; based on MIL-C-24308
- Each connector position is tested 100% for critical electrical parameters to ensure consistent performance
- Insulators are UL recognized UL94-V0 flammability rated
- 9, 15, and 25 shell sizes
- Available with board lock feature and 4-40 mounting threads
- Selective filtering available
- UL/CSA approved
- Greater than 40 dB filtering up through 1 GHz without resonances
- Bi-directional control of EMI at the I/O ports

Series 500 Low Profile Filtered Connectors

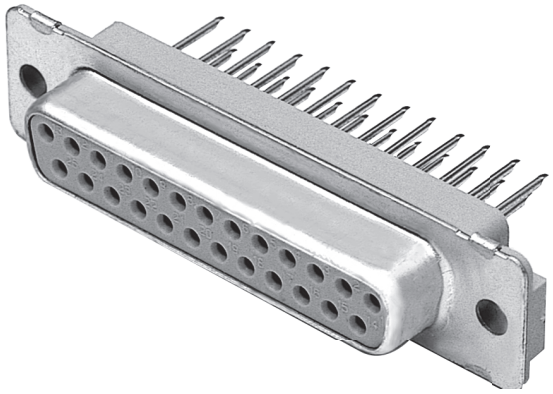
Mechanical Specifications

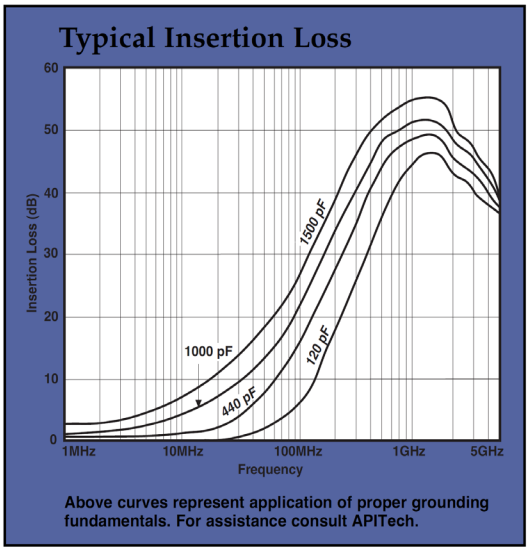
Shell	Steel, tin plated
Insulators	Glass-filled polyester, flammability UL94V-O
Pin Contacts	Copper alloy CA725, 15 microinch *(0.38 µm)* gold plated* over nickel
Socket Contacts	Copper alloy CA725, 30 microinch *(0.76 µm)* gold plated* over nickel *Heavier gold plating available upon request.
Ground Plane	Phosphor bronze, nickel plated
Operating Temperature	-40°C to +125°C
Capacitors	Proprietary barium titanate ceramic formulations

Other environmental tests such as shock, vibration, humidity, etc. are performed as detailed in our filtered connector performance specifications on page 5.

Electrical Specifications

Current Rating	5 Amps
R.F. Current Rating	0.3 Amps
Contact Resistance	10 milliohms maximum
Capacitance	120, 440, 840, 1000, 1500 pF ±30%
Working Voltage	100 VDC
Dielectric Withstanding Voltage	300 VDC
Insulation Resistance	1 Gohm minimum
UL Recognized	Under category of communication circuit accessories, File #E149046





840 pF is typically within 2 dB of 1000 pF curve.

Filter Performance

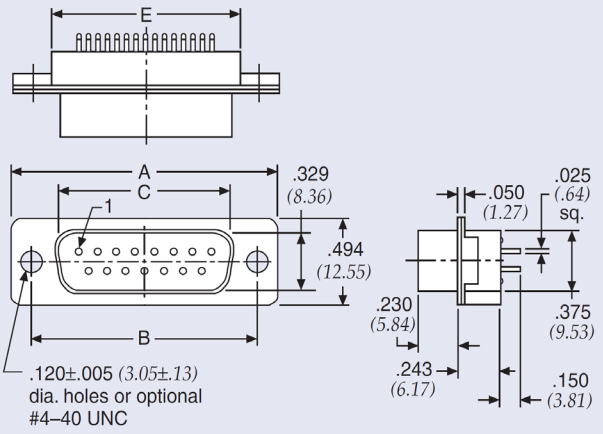
Cap. (pF) Value ±30%	3 dB Cut-off Freq. (MHz)	Insertion Loss (dB)					
		20 MHz	100 MHz	500 MHz	1 GHz	2 GHz	5 GHz
120	40	–	4	21	26	26	20
440	11	3	15	27	33	32	25
840	6	6	19	32	38	37	25
1000	3	8	21	35	41	38	25
1500	2	10	25	40	47	42	25

Insertion loss measured per MIL-STD-220, no load, 50 ohm source and load. Above data represents guaranteed minimum.

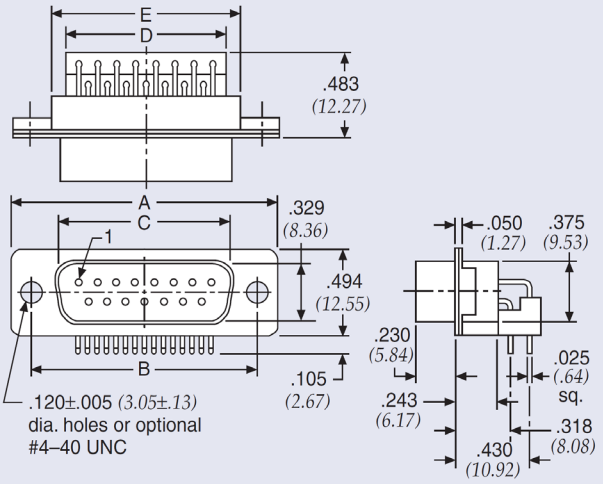
Series 500 Low Profile Filtered Connectors

Pin Contact *(plug)*

Straight PC Mount



90° PC Mount



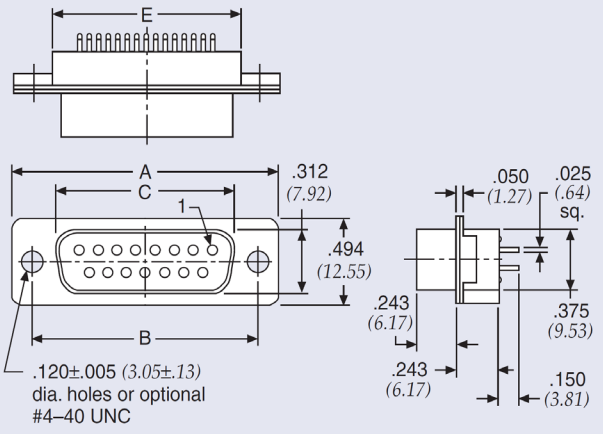
Size	A	B	C	D	E
9	1.213 *(30.81)*	0.984 *(24.99)*	0.666 *(16.92)*	0.540 *(13.72)*	0.748 *(19.00)*
15	1.541 *(39.14)*	1.312 *(33.32)*	0.994 *(25.25)*	0.867 *(22.02)*	1.076 *(27.33)*
25	2.088 *(53.04)*	1.852 *(47.04)*	1.534 *(38.96)*	1.412 *(35.86)*	1.616 *(41.05)*

Standard Tolerance = ±.015 *(0.38)*

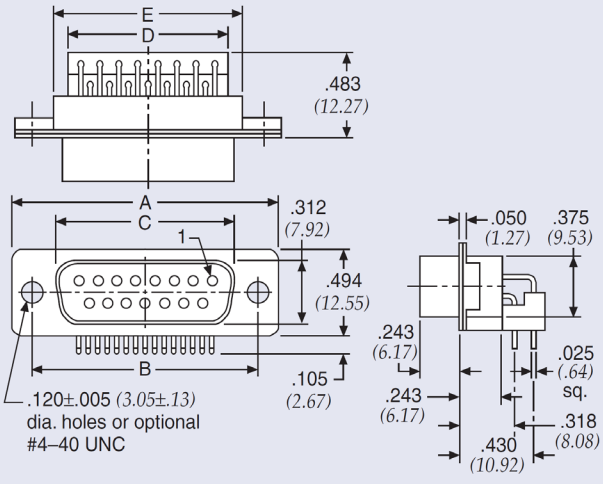
Dimensions in inches (mm)

Socket Contact *(receptacle)*

Straight PC Mount



90° PC Mount



Size	A	B	C	D	E
9	1.213 *(30.81)*	0.984 *(24.99)*	0.642 *(16.31)*	0.540 *(13.72)*	0.748 *(19.00)*
15	1.541 *(39.14)*	1.312 *(33.32)*	0.970 *(24.64)*	0.867 *(22.02)*	1.076 *(27.33)*
25	2.088 *(53.04)*	1.852 *(47.04)*	1.510 *(38.35)*	1.412 *(35.86)*	1.616 *(41.05)*

Standard Tolerance = ±.015 *(0.38)*

Dimensions in inches (mm)

Series 500 Low Profile Filtered Connectors

Ordering Information

Example: **56-524-013-GBL**

56 – **5** **2** **4** – **013** – **GBL**

56 – **Filtered D-sub Connectors**

5 – **Series 500 Connectors**

2 – **Shell Size/ Number of Contacts**
- **0** - 9 size
- **1** - 15 size
- **2** - 25 size

– -Standard connector
F -RoHS compliant version

4 – **Contact Type/Termination**
- **2** - Pin to 90° PCB mount
- **3** - Socket to straight PCB mount
- **4** - Socket to 90° PCB mount
- **7** - Pin to straight PCB mount

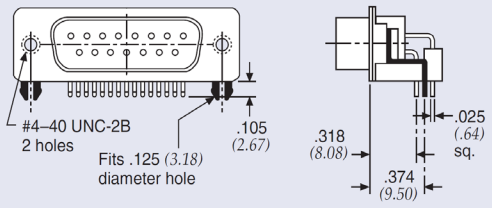
013 – **Capacitance Value**
- **010** - 120 pF
- **011** - 440 pF
- **012** - 840 pF
- **013** - 1000 pF
- 014 - 1500 pF

GBL – **Mounting or Hardware Options**
- **TI** - 4-40 threads on mounting flange (.120" (3.05 mm) hole if not selected)
- **GBL** - Grounded board lock, includes 4-40 threads (available only on 90° PCB
- **GBLF** - Grounded board lock and ferrite slab, provides the enhanced performance of an (LC) filter (available only on 90° PCB

This part number represents a Series 500 filtered D-sub connector with 25 contacts, socket to 90° PCB mount configuration. The filter has a capacitance value of 1000 pF and the connector includes a grounded board lock.

For special needs or combinations of features, contact APITech engineering.

GBL Option

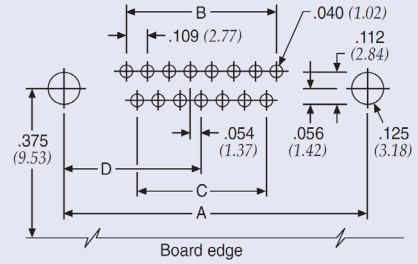


Features
- Snap-in retention to PC board, requires no hardware
- Ensures low ground impedance for superior filtering
- 4-40 threads on mounting flange eliminate loose hardware

Dimensions in inches (mm)

Board Layout

Typical Layout for .318" (8.08) Footprint



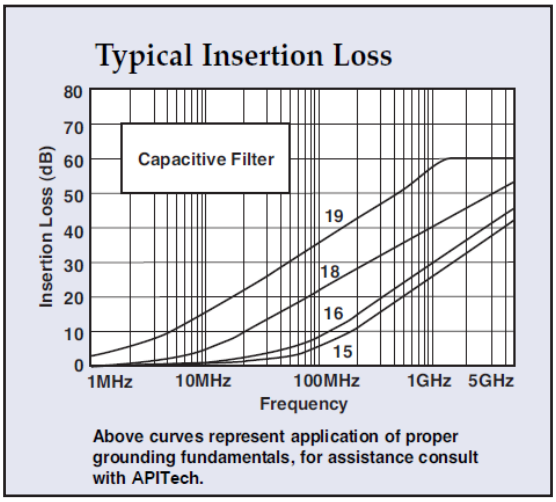
Shell Size	A	B	C	D
9	.984 (24.99)	.436 = 4 x .109 (11.07 = 4 x 2.77)	.327 = 3 x .109 (8.31 = 3 x 2.77)	.492 (12.50)
15	1.312 (33.32)	.763 = 7 x .109 (19.38 = 7 x 2.77)	.654 = 6 x .109 (16.61 = 6 x 2.77)	.656 (16.66)
25	1.852 (47.04)	1.308 = 12 x .109 (33.22 = 12 x 2.77)	1.199 = 11 x .109 (30.45 = 11 x 2.77)	.926 (23.52)

Dimensions in inches (mm)

Series 600 High Density

Filtered Connectors

The miniaturization of electronic systems and sub-systems is pushing designers to increase circuit densities within smaller packages. To address this growing need, APITech has developed a line of filtered High-Density D-subminiature connectors. This new line of connectors incorporates the high performance and reliable filtering of APITech's standard D-subs in the High-Density format.



Insertion loss measured per MIL-STD-220, no load, 50 ohm source and load.

Features

- Connectors designed to MIL-C-24308
- Capacitance values from 85 pF to 4000 pF
- Filter type feedthrough C
- Selectively specify and filter each contact position
- Available in feedthrough capacitive configurations

Mechanical Specifications

Same as Series 700. See page 2 of Series 700 High Performance Connectors data sheet.

Electrical Specifications

Current Rating	3 Amps
RF Current Rating	0.3 Amps
Contact Resistance	15 milliohms maximum
UL Recognized	Under category of communication circuit accessories, File #E149046

Electrical Specifications: High-Density Connectors

Filter Designations	Filter Circuits	Capacitance Value	Capacitance Tol.	3 dB Cut-off Frequency Max. (MHz)	Dielectric Withstanding Voltage	Working Voltage DC -55°C to +125°C	Minimum Insertion Loss - Decibels (dB) 5 MHz	10 MHz	20 MHz	50 MHz	100 MHz	200 MHz	500 MHz	1 GHz	2 GHz	5 GHz
15	C	85 pF	±25%	60	300V	100V	—	—	—	—	1	6	16	21	22	20
16		180 pF	±25%	28	300V	100V	—	—	—	1	8	10	18	25	26	24
18		1000 pF	±25%	5.1	300V	100V	—	3	8	14	20	25	32	35	41	39
19		4000 pF	±25%	1.3	300V	100V	8	13	19	26	31	37	45	48	52	47

Filter designation "G" for grounded contacts, "I" for insulated (not filtered) contacts.
Filter designation "O" for omitted contact and no hole in ground plane.
Above data represents guaranteed minimum.

This part number represents a Series 600 High-Density filtered D-Sub connector with 15 contacts, pin-socket adapter configuration. The FT filters have a capacitance value of 85 pF and the connector includes 4-40 locking inserts.

Ordering Information

Example: **56-605-015-LI**

56 – **6** **0** **5** – **0** **15** – **LI**

D-Sub Connector

Hi-Density
- Standard connector
F - RoHS compliant version

* Required on right angle parts
** Some shell sizes require minimum order quantity. Consult APITech for details.
Note: VGA adapters also available. Consult APITech.

Shell Size**
0 = 15
1 = 26
2 = 44
3 = 62
4 = 78

Contact Type/Termination
1 - Pin to solder cup
2 - Pin to 90 PCB mount*
3 - Socket to PCB mount
4 - Socket to 90 PCB* mount
5 - Pin-socket adapter
7 - Pin to PCB mount

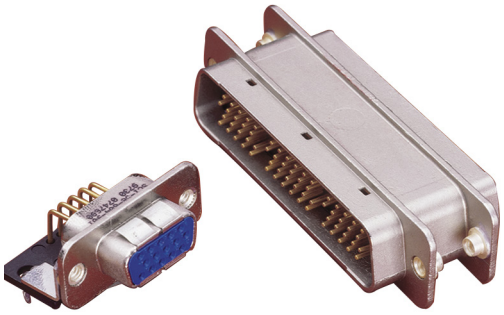
Special
0 = All positions same
9 = Special loading

Filter Designation
15 - 85 pF FT
16 - 180 pF FT
18 - 1,000 pF FT
19 - 4,000 pF FT
20 - Insulated contact

Options
LI = 4-40 inserts
S = Solder dip tails
50G = µ gold
GBL = Grounding board lock

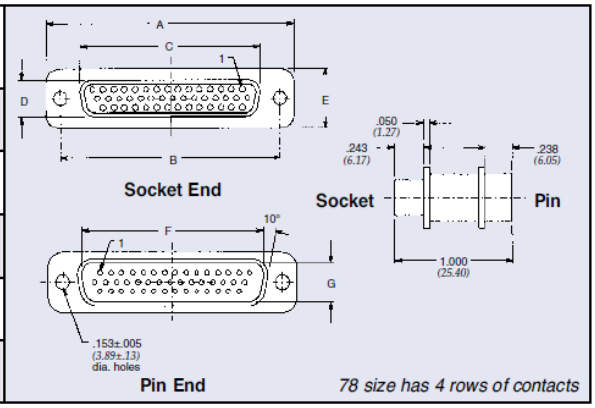
Series 600 High Density

Filtered Connectors



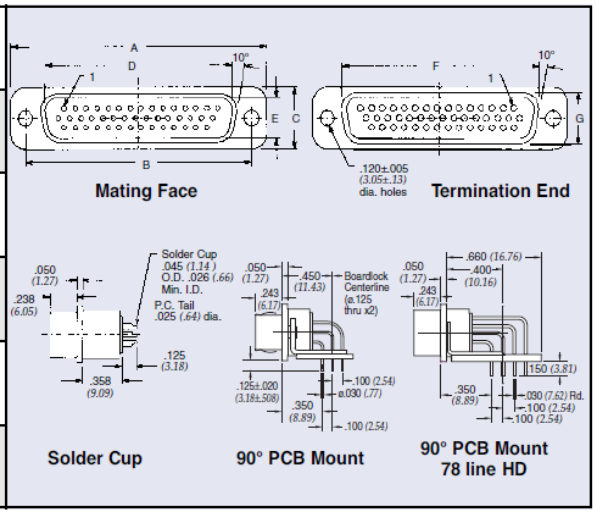
Pin/Socket Adapter

Size	A	B	C	D	E	F	G
15	1.213 (30.81)	.984 (24.99)	.640 (16.26)	.304 (7.72)	.505 (12.83)	.666 (16.92)	.333 (8.46)
26	1.541 (39.14)	1.312 (33.32)	.968 (24.59)	.304 (7.72)	.505 (12.83)	.994 (25.25)	.333 (8.46)
44	2.088 (53.04)	1.852 (47.04)	1.508 (38.30)	.304 (7.72)	.505 (12.83)	1.534 (38.96)	.333 (8.46)
62	2.729 (69.32)	2.500 (63.50)	2.156 (54.76)	.304 (7.72)	.505 (12.83)	2.182 (55.42)	.333 (8.46)
78	2.635 (66.93)	2.406 (61.11)	2.062 (52.37)	.416 (10.57)	.615 (15.62)	2.079 (52.81)	.420 (11.18)



Pin or Socket to Solder Cup, PCB Mount and 90° PCB Mount

Size	A	B	C	D	E	F	G
15	1.213 (30.81)	.984 (24.99)	.505 (12.83)	.666 (16.92)	.333 (8.46)	.757 (19.23)	.420 (10.67)
26	1.541 (39.14)	1.312 (33.32)	.505 (12.83)	.994 (25.25)	.333 (8.46)	1.085 (27.56)	.420 (10.67)
44	2.088 (53.04)	1.852 (47.04)	.505 (12.83)	1.534 (38.96)	.333 (8.46)	1.625 (41.28)	.420 (10.67)
62	2.729 (69.32)	2.500 (63.50)	.505 (12.83)	2.182 (55.42)	.333 (8.46)	2.273 (57.73)	.420 (10.67)
78	2.635 (66.93)	2.406 (61.11)	.615 (15.62)	2.079 (52.81)	.440 (11.18)	2.170 (55.12)	.527 (13.39)



Dimensions in inches (mm)

High-Density Filtered Adapter for Telecommunications

Within the telecommunications industry, it has been standard practice to use an adapter (male/female) type of EMI filtered connector as the interface between the switching system electronics and the premise wiring. These filtered adapters provide effective containment of EMI compared to either D-subminiature or 50-position "ribbon" contact type connectors.

The following several factors have mandated the development of a new generation of filtered adapters.

Special Requirements

- Higher density wiring
- The need for more contacts, usually a multiple of 16
- Higher reliability contact geometries
- Bellcore TR-NWT-001089 requirements
  - 1000 volts AC withstand for one minute
  - 2500 volts spike surge testing
- Improved flammable resistant plastic insulators

APITech's, in response to these unique requirements of the telecommunication industry, has developed a new high-density filtered adapter.

Features

- New ceramic technology and filter element construction to accept higher voltages
- Improved reliability compared to "ribbon" type connectors
- Integral ground plane and one-piece diecast housing for the highest level of EMI integrity
- More contacts/wires per square inch of panel space through high-density arrangements
- 64 contact positions standard, with 78 positions available by request in any filter combination

Mechanical Specifications

Shell	Zinc or aluminum diecast, nickel plated 150 µ inches *(3.81 µm)* min.
Insulators	Thermoplastic, UL94V-0
Contacts	One-piece, screw machined Copper alloy, contact area plated 50 µ inches *(1.27 µm)* gold over 50 µ inches *(1.27 µm)* nickel
Ground Plane	Brass, solder plated
Ground Springs	Beryllium copper, tin plated per MIL-T-10727
Operating Temperature	-55°C to +125°C
Capacitor	High performance ceramic feedthrough utilizing ultra low ESR design

Electrical Specifications

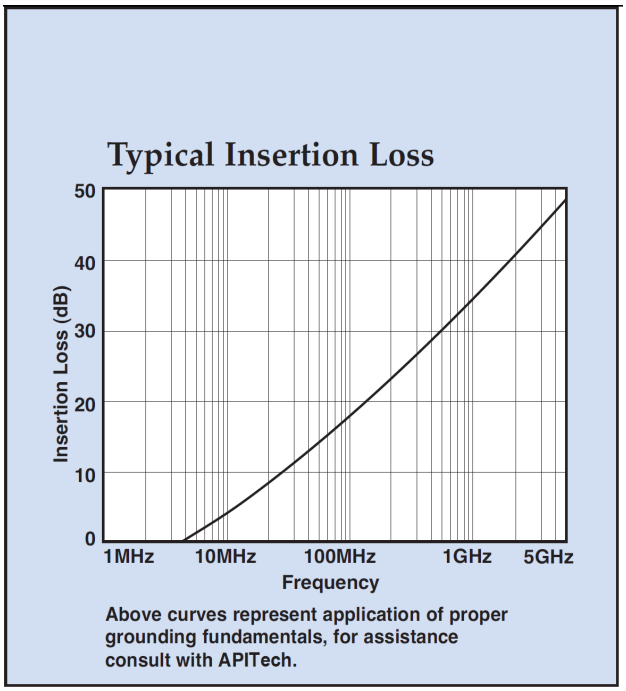
Rated Voltage	100 VDC
Current Rating	3 Amps
DC Resistance	15 milliohm max
Dielectric Withstanding Voltage	1000 VRMS (FCC Part 68 test)
Capacitance	1000pF, ±25%
Voltage Surge	Meets 2500 volts surge (10/1000) (See Wave form figure on next page)

High-Density Filtered Adapter for Telecommunications

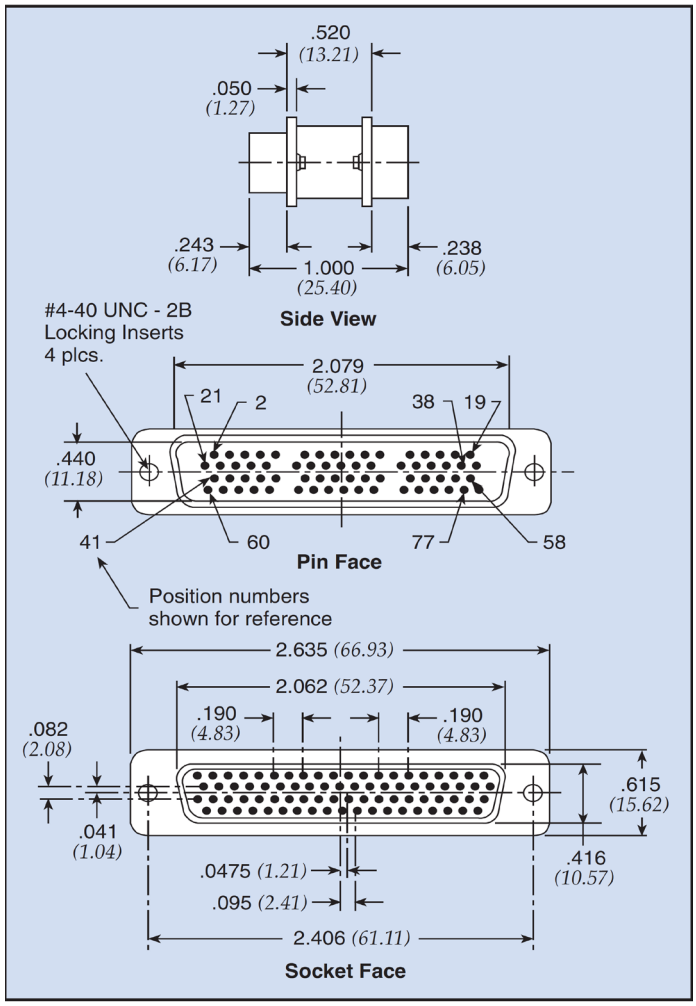
Filter Performance

Minimum Insertion Loss	
20 MHz	7 dB
50 MHz	14 dB
100 MHz	20 dB
500 MHz	32 dB
1 GHz	35 dB
2 GHz	41 dB
5 GHz	39 dB

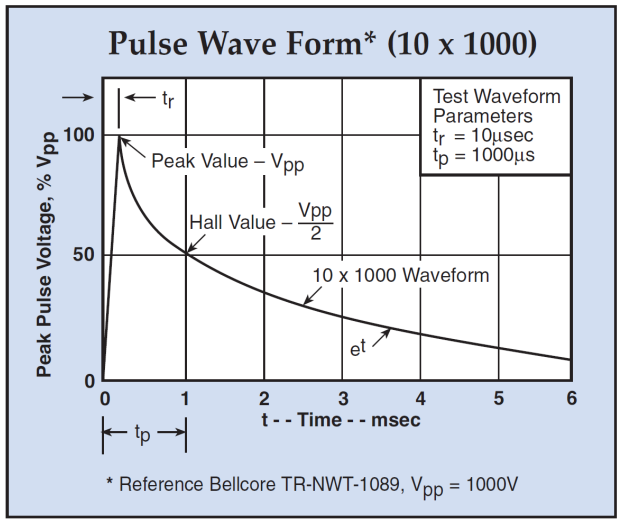
Insertion loss measured per MIL-STD-220, no load, 50 ohm source and load. Above data represents guaranteed minimum.



Part Number for Ordering: #56-645-002



Dimensions in inches (mm)



Series 700 High Performance Filtered Connectors

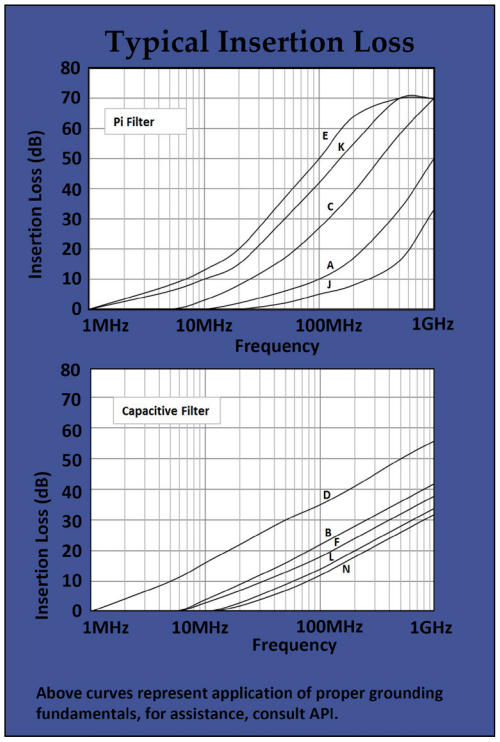
Filter Selection

APITech's Series 700 connectors offer the highest performance filtering for all types of professional applications.

Features

- Available in 9, 15, 25, 37, and 50 shell sizes
- Variety of termination configurations including right angle and straight PCB for both pin and socket contact and as an adapter
- Capacitive and Pi type filters in a full range of capacitance values

The catalog data for this series is presented in order of shell size, and grouped by pin and socket contacts. Part numbers must be selected from the tables within the series section.



Insertion loss measured per MIL-STD-220, no load, 50ohm source and load.

Electrical Specifications: High Performance Connectors

Filter Designations	Filter Circuits	Capacitance		3 dB Cut-off Frequency Max. (MHz)	Dielectric Withstanding Voltage	Working Voltage DC -55°C to +125°C	Minimum Insertion Loss - Decibels (dB)									
		Value	Tol.				5 MHz	10 MHz	20 MHz	50 MHz	100 MHz	200 MHz	500 MHz	1 GHz		
J	Pi	100 pF	+100 -0%	32	300V	100V	—	—	—	2	5	8	16	33		
A		310 pF	±25%	15.9	300V	100V	—	—	2	6	10	17	33	50		
C		1000 pF	+150 -0%	3.2	300V	100V	—	3	8	17	27	39	58	70		
K		2500 pF	+100 -0%	1.3	150V	50V	6	10	15	30	42	55	70	70		
E		4000 pF	+100 -0%	0.8	150V	50V	8	13	20	37	50	64	70	70		
N	C	375 pF	±25%	13.7	600V	200V	—	—	2	7	12	18	26	32		
L		500 pF	±25%	10.2	600V	200V	—	—	3	9	14	20	28	34		
F		830 pF	±25%	6.1	600V	200V	—	3	7	13	18	24	32	38		
B		1000 pF	+100 -0%	3.2	600V	200V	—	4	9	16	22	28	36	42		
D		5000 pF	+100 -0%	0.64	300V	100V	10	16	22	30	35	41	50	56		

Filter designation "G" for grounded contacts, "I" for insulated (not filtered) contacts.
Filter designation "O" for omitted contact and no hole in ground plane.

Above data represents guaranteed minimum.

Series 700 High Performance Filtered Connectors

Specifications and Connector Ordering

Mechanical Specifications

Shell	Zinc or aluminum diecast, nickel plated 150 µ inches (3.81 µm) min.
Insulators	Glass-filled polyester, flammability UL94V-0
Pin Contacts	Copper alloy, 15 µ inches (0.38 µm) gold plated * over nickel
Socket Contacts	Copper alloy, 30 µ inches (0.76 µm) gold plated * over nickel * Heavier gold plating available upon request. See pg. 24: Connector Options
Terminations	Gold flash for PCB mount and solder cups. Solder dipped also available.
Ground Plane	Brass, solder plated
Grounding Springs	Beryllium copper, tin plated per MIL-T-10727
Operating Temperature	-55°C to +125°C
Capacitors	Proprietary barium titanate ceramic formulations

Electrical Specifications

Current Rating	5 Amps
R.F. Current Rating	0.3 Amps
Contact Resistance	10 milliohms maximum
UL Recognized	Under category of communication circuit accessories, File #E149046
Inductance on PI Filters	~ 860 nH between 100 kHz and 1 MHz

Solder cups accept up to a 20 gauge wire.

Ordering Your Connector

Step 1: Selecting the Filter

- Using the insertion loss graphs on page 1 determine which filters provide the required attenuation at the troublesome frequency, while not affecting the signal frequency by more than 3 to 6 dB.
- Choose the filter type, either feedthrough capacitor or Pi. Pi is generally considered better due to its superior high frequency performance and steeper curve. The feedthrough capacitor is lower cost.
- Select capacitance value.
- Note the APITech letter designation for the filter chosen from the table on page 1.

Step 2: Selecting the Connector

- Turn to the appropriate size section (9, 15, 25, 37, 50).
- Choose either pin contacts (plug) or socket contacts (receptacle).
- Choose the required termination type.
- From the table on the appropriate connector page, using the filter letter designation chosen in step 1 above, select the part number.

Step 3: Specifying Options

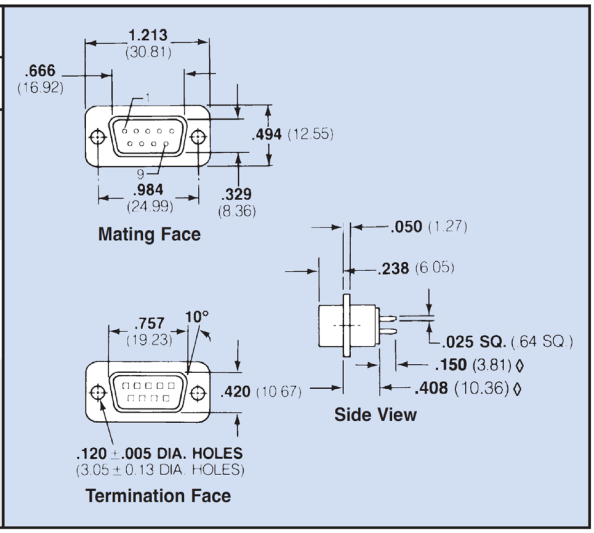
- Refer to page 24 for special options including heavy gold plating, 4-40 mounting threads, grounding brackets, hardware, and others.
- Most options are available within the standard lead times.
- Some options require a part number suffix, while other combinations may require factory assistance for part number assignment. If a suffix is shown, add it to your selected part number. If more than one option is needed, contact APITech for part number assignment.

Series 700 Pin Contact

9 Shell Size

Printed Circuit Board Mount

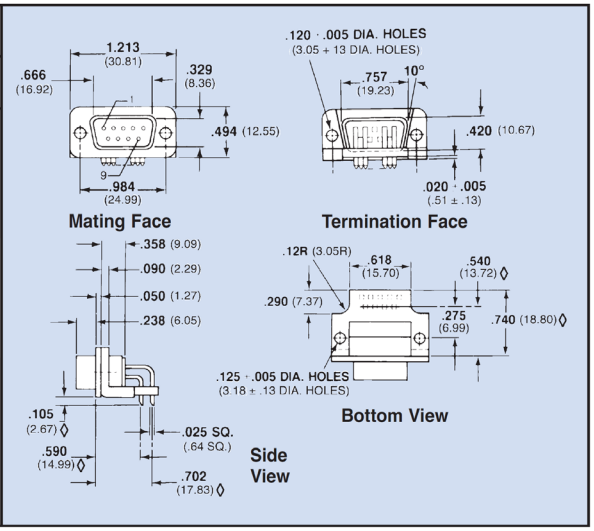
APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
56-701-001	A	310 pF Pi
56-701-002	B	1000 pF C
56-701-003	C	1000 pF Pi
56-701-004	D	5000 pF C
56-701-005	E	4000 pF Pi
56-701-028	F	830 pF C
56-701-029	J	100 pF Pi
56-701-030	K	2500 pF Pi
56-701-047	N	375 pF C
56-701-086	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Printed Circuit Board Mount

APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
* 56-702-001	A	310 pF Pi
56-702-002	B	1000 pF C
* 56-702-003	C	1000 pF Pi
56-702-004	D	5000 pF C
* 56-702-005	E	4000 pF Pi
56-702-007	F	830 pF C
56-702-008	J	100 pF Pi
56-702-009	K	2500 pF Pi
56-702-013	N	375 pF C
* 56-702-033	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Dimensions in inches (mm)

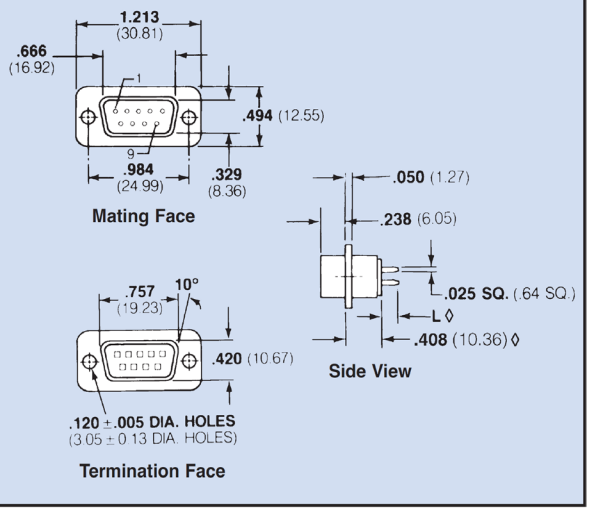
Standard Tolerance = ±.005 except where noted, ◊ = ±.015

Series 700 Pin Contact

9 Shell Size

Solderless Wire Wrap

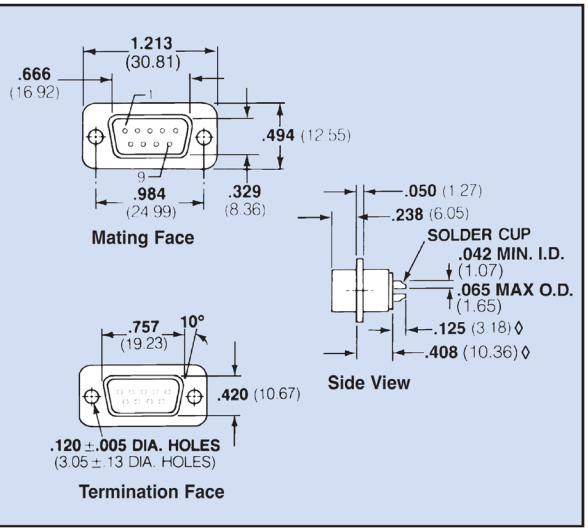
APITech Part Number (Select one)				EMI Filter	
	L .500	L .375	L .250	Filter Desig.**	Cap. Value
56-701	-006	-022	-017	A	310 pF Pi
56-701	-007	-023	-018	B	1000 pF C
56-701	-008	-024	-019	C	1000 pF Pi
56-701	-009	-025	-020	D	5000 pF C
56-701	-010	-026	-021	E	4000 pF Pi
56-701	-037	-034	-031	F	830 pF C
56-701	-038	-035	-032	J	100 pF Pi
56-701	-039	-036	-033	K	2500 pF Pi
56-701	-050	-049	-048	N	375 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Solder Cup Termination

APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
* 56-701-011	A	310 pF Pi
* 56-701-012	B	1000 pF C
* 56-701-013	C	1000 pF Pi
* 56-701-014	D	5000 pF C
* 56-701-015	E	4000 pF Pi
* 56-701-040	F	830 pF C
56-701-041	J	100 pF Pi
56-701-042	K	2500 pF Pi
56-701-081	N	375 pF C
56-701-087	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Dimensions in inches (mm)

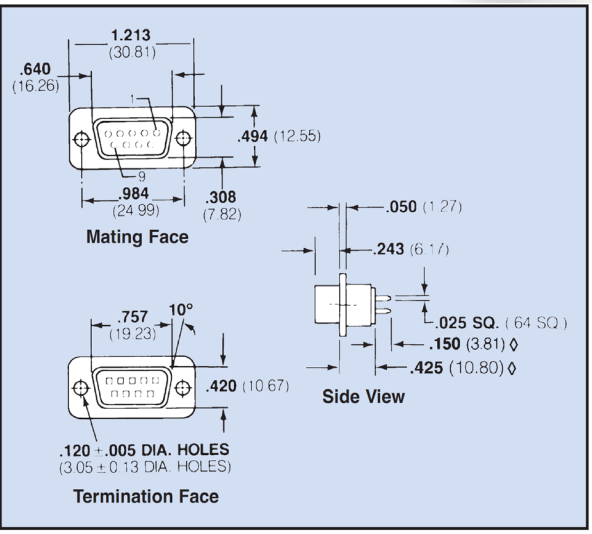
Standard Tolerance = ±.005 except where noted, ◊ = ±.015

Series 700 Socket Contact

9 Shell Size

Printed Circuit Board Mount

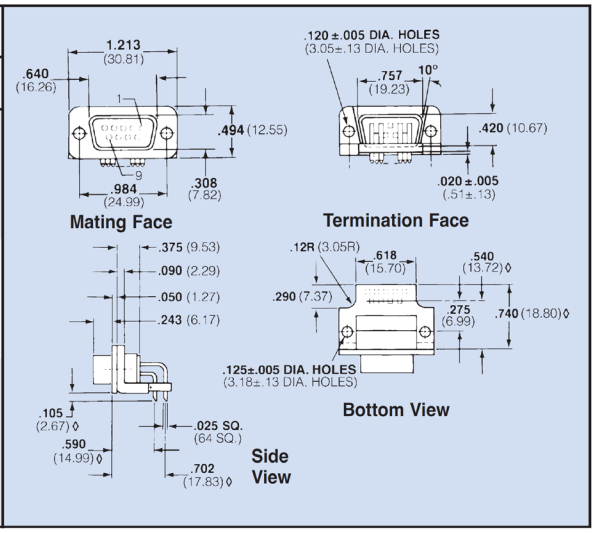
APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
56-703-001	A	310 pF Pi
56-703-002	B	1000 pF C
56-703-003	C	1000 pF Pi
56-703-004	D	5000 pF C
56-703-005	E	4000 pF Pi
56-703-022	F	830 pF C
56-703-023	J	100 pF Pi
56-703-024	K	2500 pF Pi
56-703-036	N	375 pF C
56-703-047	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Printed Circuit Board Right Angle Mount

APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
56-704-001	A	310 pF Pi
56-704-002	B	1000 pF C
* 56-704-003	C	1000 pF Pi
56-704-004	D	5000 pF C
* 56-704-005	E	4000 pF Pi
56-704-007	F	830 pF C
56-704-008	J	100 pF Pi
56-704-009	K	2500 pF Pi
56-704-018	N	375 pF C
56-704-035	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Dimensions in inches (mm)

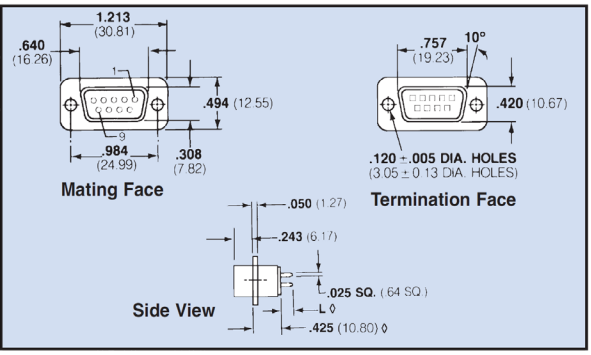
Standard Tolerance = ±.005 except where noted, ◊ = ±.015

Series 700 Socket Contact & Pin/Socket Adapter

9 Shell Size

Solderless Wire Wrap

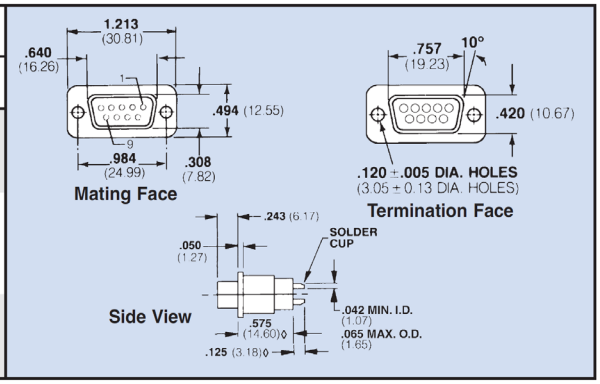
APITech Part Number (Select one)				EMI Filter	
	L .500	L .375	L .250	Filter Desig.**	Cap. Value
56-703	-006	-016	-011	A	310 pF Pi
56-703	-007	-017	-012	B	1000 pF C
56-703	-008	-018	-013	C	1000 pF Pi
56-703	-009	-019	-014	D	5000 pF C
* 56-703	-010	-020	* -015	E	4000 pF Pi
56-703	-031	-028	-025	F	830 pF C
56-703	-032	-029	-026	J	100 pF Pi
56-703	-033	-030	-027	K	2500 pF Pi
56-703	-039	-038	-037	N	375 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Solder Cup Termination

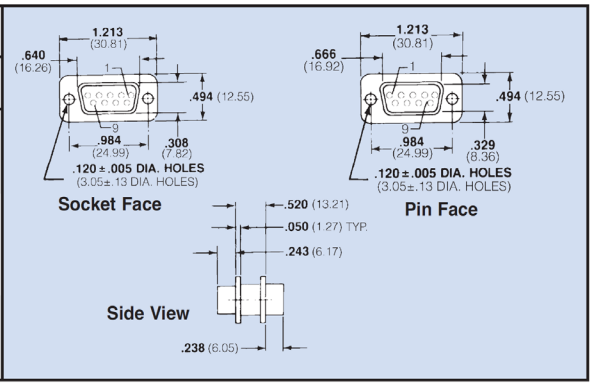
APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
* 56-706-001	A	310 pF Pi
56-706-002	B	1000 pF C
* 56-706-003	C	1000 pF Pi
56-706-004	D	5000 pF C
* 56-706-005	E	4000 pF Pi
56-706-006	F	830 pF C
56-706-007	J	100 pF Pi
* 56-706-008	K	2500 pF Pi
56-706-009	N	375 pF C
56-706-017	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Solderless Wire Wrap

APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
* 56-705-001	A	310 pF Pi
56-705-002	B	1000 pF C
* 56-705-003 €	C	1000 pF Pi
56-705-004	D	5000 pF C
* 56-705-005 €	E	4000 pF Pi
* 56-705-008	F	830 pF C
56-705-009	J	100 pF Pi
56-705-010	K	2500 pF Pi
56-705-026	N	375 pF C
56-705-049	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Dimensions in inches (mm)

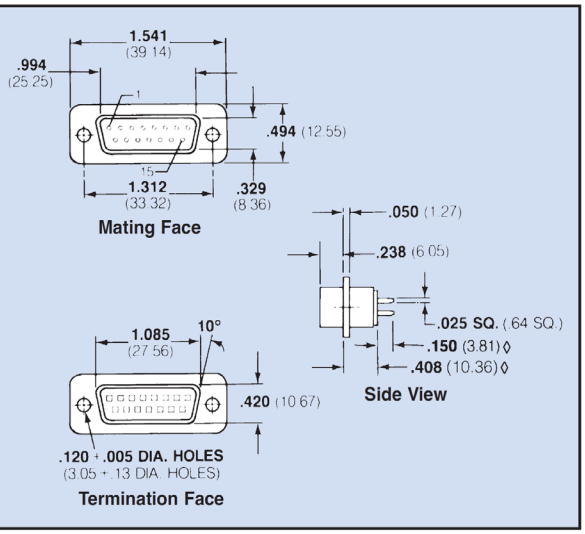
Standard Tolerance = ±.005 except where noted, ◊ = ±.015

Series 700 Pin Contact

15 Shell Size

Printed Circuit Board Mount

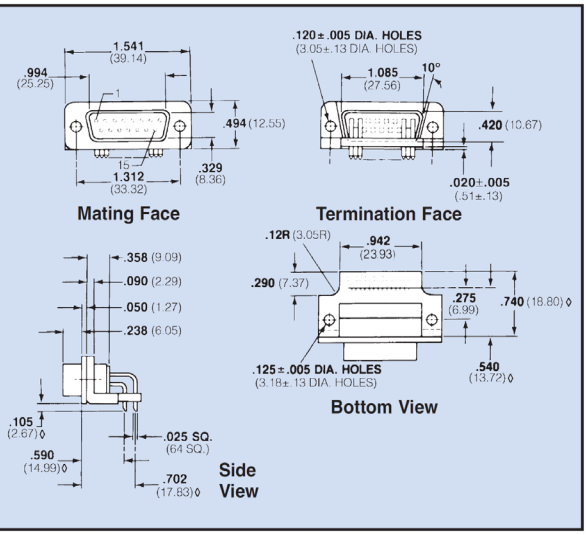
APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
56-711-001	A	310 pF Pi
56-711-002	B	1000 pF C
56-711-003	C	1000 pF Pi
56-711-004	D	5000 pF C
56-711-005	E	4000 pF Pi
56-711-028	F	830 pF C
56-711-029	J	100 pF Pi
56-711-030	K	2500 pF Pi
56-711-048	N	375 pF C
56-711-088	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Printed Circuit Board Right Angle Mount

APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
* 56-712-001	A	310 pF Pi
56-712-002	B	1000 pF C
* 56-712-003	C	1000 pF Pi
56-712-004	D	5000 pF C
* 56-712-005	E	4000 pF Pi
* 56-712-007	F	830 pF C
56-712-008	J	100 pF Pi
56-712-009	K	2500 pF Pi
56-712-017	N	375 pF C
56-712-039	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Dimensions in inches (mm)

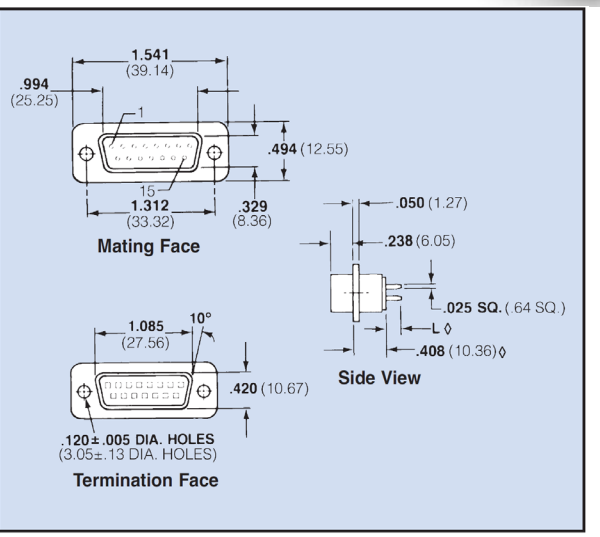
Standard Tolerance = ±.005 except where noted, ◊ = ±.015

Series 700 Pin Contact

15 Shell Size

Solderless Wire Wrap

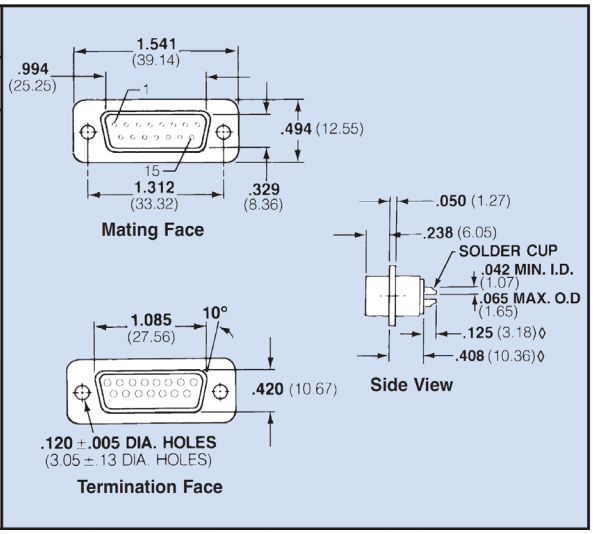
APITech Part Number *Select one*				EMI Filter	
	L .500	L .375	L .250	Filter Desig.**	Cap. Value
56-711	-006	-023	-018	A	310 pF Pi
56-711	-007	-024	-019	B	1000 pF C
56-711	-008	-025	-020	C	1000 pF Pi
56-711	-009	-026	-021	D	5000 pF C
56-711	-010	-027	-022	E	4000 pF Pi
56-711	-037	-034	-031	F	830 pF C
56-711	-038	-035	-032	J	100 pF Pi
56-711	-039	-036	-033	K	2500 pF Pi
56-711	-051	-050	-049	N	375 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Solder Cup Termination

APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
* 56-711-011	A	310 pF Pi
56-711-012	B	1000 pF C
* 56-711-013	C	1000 pF Pi
56-711-014	D	5000 pF C
* 56-711-015	E	4000 pF Pi
* 56-711-040	F	830 pF C
56-711-041	J	100 pF Pi
56-711-042	K	2500 pF Pi
56-711-085	N	375 pF C
56-711-086	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

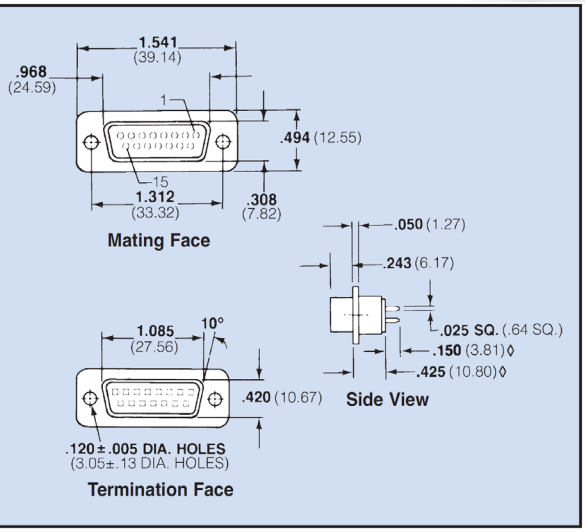
Dimensions in inches (mm)

Series 700 Socket Contact

15 Shell Size

Printed Circuit Board Mount

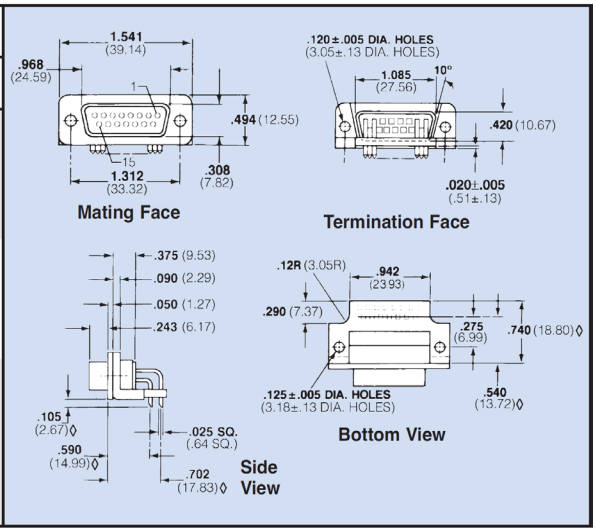
APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
56-713-001	A	310 pF Pi
56-713-002	B	1000 pF C
56-713-003	C	1000 pF Pi
56-713-004	D	5000 pF C
56-713-005	E	4000 pF Pi
56-713-021	F	830 pF C
56-713-022	J	100 pF Pi
56-713-023	K	2500 pF Pi
56-713-037	N	375 pF C
56-713-045	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Printed Circuit Board Right Angle Mount

APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
* 56-714-001	A	310 pF Pi
56-714-002	B	1000 pF C
* 56-714-003	C	1000 pF Pi
56-714-004	D	5000 pF C
* 56-714-005	E	4000 pF Pi
* 56-714-006	F	830 pF C
56-714-007	J	100 pF Pi
56-714-008	K	2500 pF Pi
56-714-017	N	375 pF C
56-714-031	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Dimensions in inches (mm)

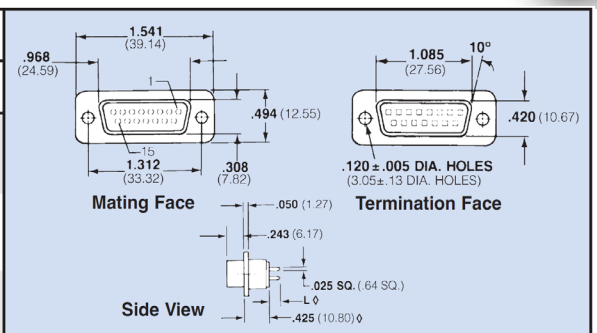
Standard Tolerance = ±.005 except where noted, ◊ = ±.015

Series 700 Socket Contact & Pin/Socket Adapter

15 Shell Size

Solderless Wire Wrap

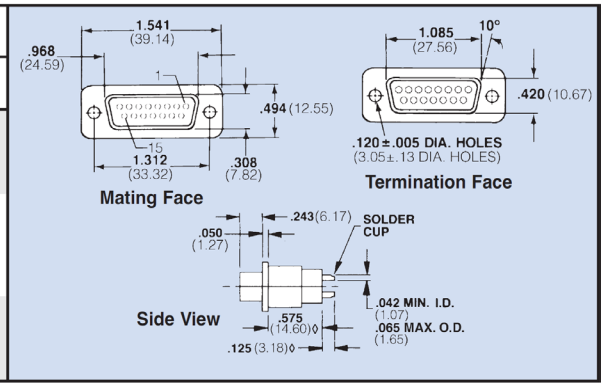
APITech Part Number (Select one)				EMI Filter	
	L .500	L .375	L .250	Filter Desig.**	Cap. Value
56-713	-006	-016	-011	A	310 pF Pi
56-713	-007	-017	-012	B	1000 pF C
56-713	-008	-018	-013	C	1000 pF Pi
56-713	-009	-019	-014	D	5000 pF C
56-713	-010	-020	-015	E	4000 pF Pi
56-713	-030	-027	-024	F	830 pF C
56-713	-031	-028	-025	J	100 pF Pi
56-713	-032	-029	-026	K	2500 pF Pi
56-713	-040	-039	-038	N	375 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Solder Cup Termination

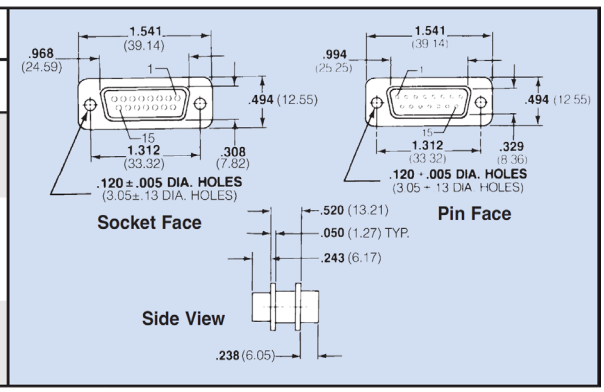
APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
* 56-716-001	A	310 pF Pi
56-716-002	B	1000 pF C
* 56-716-003	C	1000 pF Pi
56-716-004	D	5000 pF C
* 56-716-005	E	4000 pF Pi
56-716-006	F	830 pF C
56-716-007	J	100 pF Pi
* 56-716-008	K	2500 pF Pi
56-716-009	N	375 pF C
56-716-013	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Pin/Socket Adapter

APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
* 56-715-001	A	310 pF Pi
56-715-002	B	1000 pF C
* 56-715-003 €	C	1000 pF Pi
56-715-004	D	5000 pF C
* 56-715-005 €	E	4000 pF Pi
56-715-007	F	830 pF C
56-715-008	J	100 pF Pi
56-715-009	K	2500 pF Pi
56-715-015	N	375 pF C
56-715-040	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Dimensions in inches (mm)

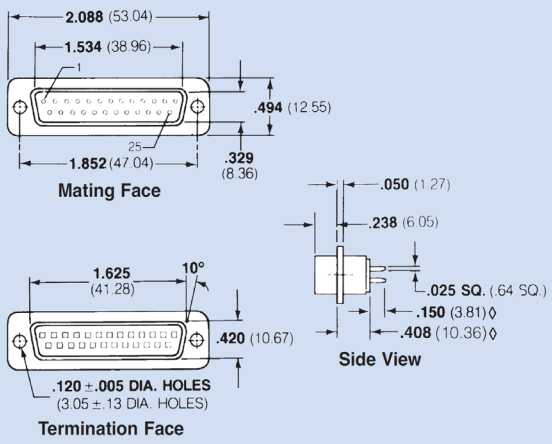
Standard Tolerance = ±.005 except where noted, ◊ = ±.015

Series 700 Pin Contact

25 Shell Size

Printed Circuit Board Mount

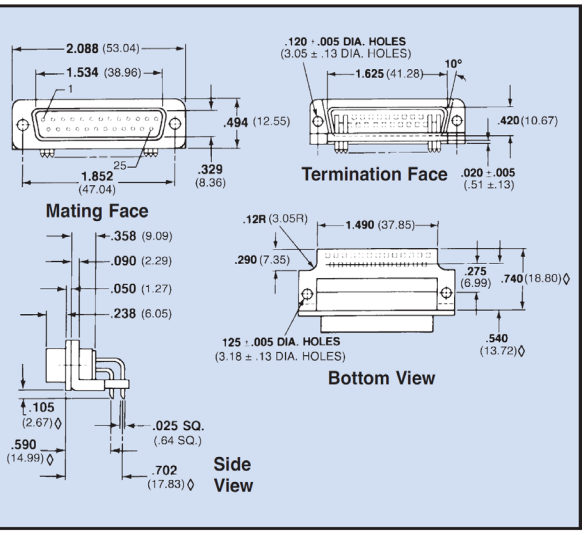
APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
56-721-001	A	310 pF Pi
56-721-002	B	1000 pF C
56-721-003	C	1000 pF Pi
56-721-004	D	5000 pF C
56-721-005	E	4000 pF Pi
56-721-033	F	830 pF C
56-721-034	J	100 pF Pi
56-721-035	K	2500 pF Pi
56-721-063	N	375 pF C
56-721-111	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Printed Circuit Board Right Angle Mount

APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
* 56-722-001	A	310 pF Pi
56-722-002	B	1000 pF C
* 56-722-003	C	1000 pF Pi
56-722-004	D	5000 pF C
* 56-722-005	E	4000 pF Pi
* 56-722-008	F	830 pF C
56-722-009	J	100 pF Pi
56-722-010	K	2500 pF Pi
56-722-027	N	375 pF C
56-722-060	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Dimensions in inches (mm)

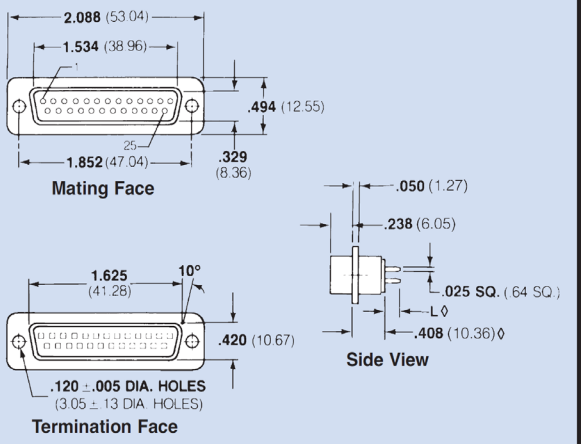
Standard Tolerance = ±.005 except where noted, ◊ = ±.015

Series 700 Pin Contact

25 Shell Size

Solderless Wire Wrap

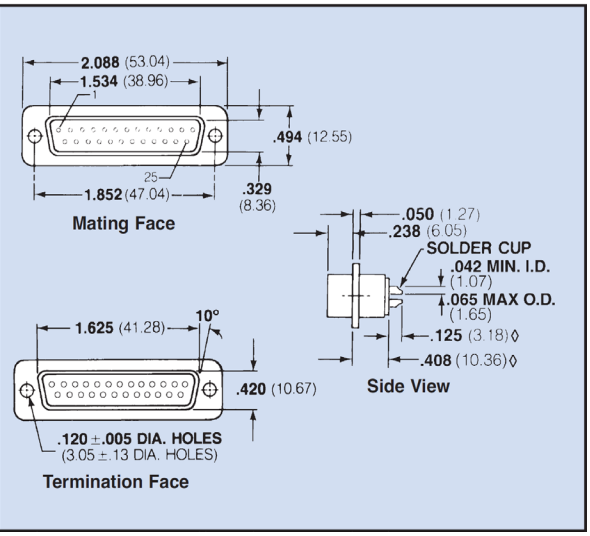
APITech Part Number (Select one)				EMI Filter	
	L .500	L .375	L .250	Filter Desig.**	Cap. Value
56-721	-006	-028	-024	A	310 pF Pi
56-721	-007	-029	-025	B	1000 pF C
56-721	-008	-030	-026	C	1000 pF Pi
56-721	-009	-031	-022	D	5000 pF C
56-721	-010	-032	-027	E	4000 pF Pi
56-721	-042	-039	-036	F	830 pF C
56-721	-043	-040	-037	J	100 pF Pi
56-721	-044	-041	-038	K	2500 pF Pi
56-721	-066	-065	-064	N	375 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Solder Cup Termination

APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
* 56-721-011	A	310 pF Pi
* 56-721-012	B	1000 pF C
* 56-721-013	C	1000 pF Pi
56-721-014	D	5000 pF C
* 56-721-015	E	4000 pF Pi
* 56-721-045	F	830 pF C
56-721-046	J	100 pF Pi
56-721-047	K	2500 pF Pi
56-721-070	N	375 pF C
56-721-112	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Dimensions in inches (mm)

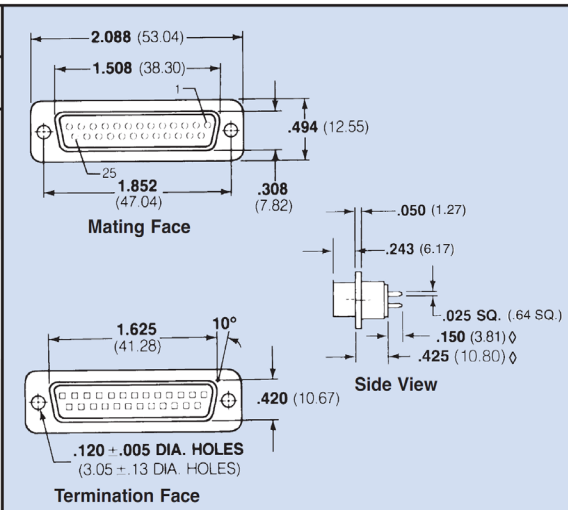
Standard Tolerance = ±.005 except where noted, ◊ = ±.015

Series 700 Socket Contact

25 Shell Size

Printed Circuit Board Mount

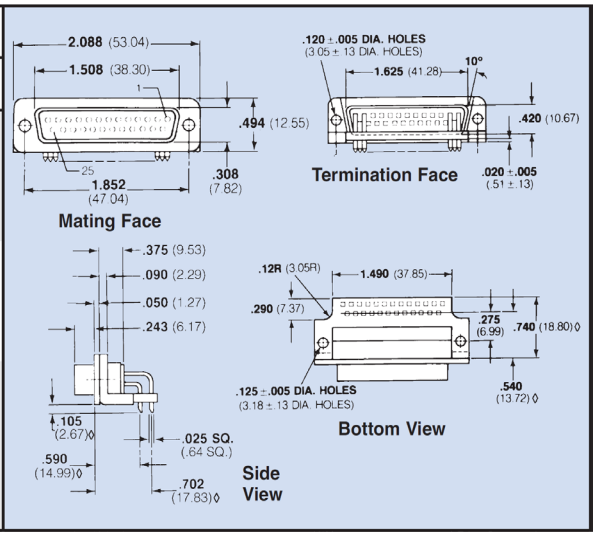
APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
56-723-001	A	310 pF Pi
56-723-002	B	1000 pF C
56-723-003	C	1000 pF Pi
56-723-004	D	5000 pF C
56-723-005	E	4000 pF Pi
56-723-023	F	830 pF C
56-723-024	J	100 pF Pi
56-723-025	K	2500 pF Pi
56-723-045	N	375 pF C
56-723-069	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Printed Circuit Board Right Angle Mount

APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
* 56-724-001	A	310 pF Pi
56-724-002	B	1000 pF C
* 56-724-003	C	1000 pF Pi
56-724-004	D	5000 pF C
* 56-724-005	E	4000 pF Pi
* 56-724-008	F	830 pF C
56-724-009	J	100 pF Pi
56-724-010	K	2500 pF Pi
56-724-021	N	375 pF C
56-724-046	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Dimensions in inches (mm)

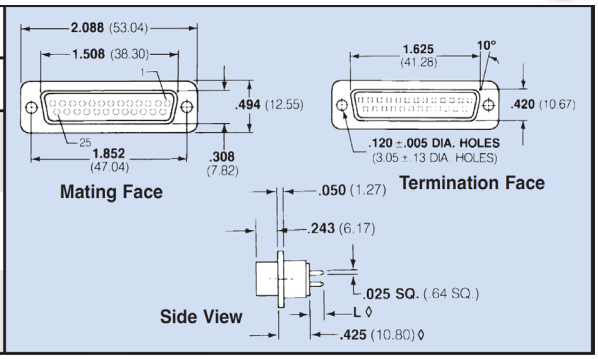
Standard Tolerance = ±.005 except where noted, ◊ = ±.015

Series 700 Socket Contact & Pin/Socket Adapter

25 Shell Size

Solderless Wire Wrap

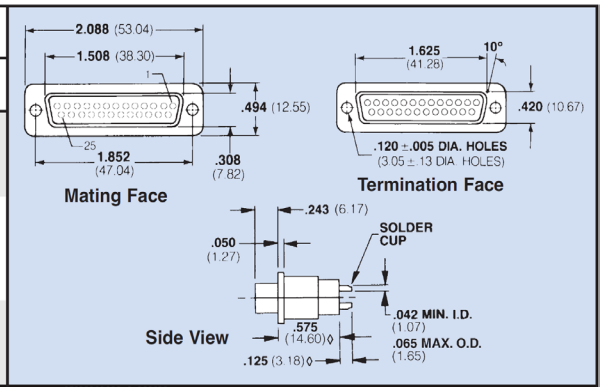
APITech Part Number *Select one*				EMI Filter	
	L .500	L .375	L .250	Filter Desig.**	Cap. Value
* 56-723	-006	-017	* -012	A	310 pF Pi
56-723	-007	-018	-013	B	1000 pF C
* 56-723	-008	-019	* -014	C	1000 pF Pi
56-723	-009	-020	-015	D	5000 pF C
* 56-723	-010	-021	* -016	E	4000 pF Pi
* 56-723	-032	-029	* -026	F	830 pF C
56-723	-033	-030	-027	J	100 pF Pi
56-723	-034	-031	-028	K	2500 pF Pi
56-723	-048	-047	-046	N	375 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Solder Cup Termination

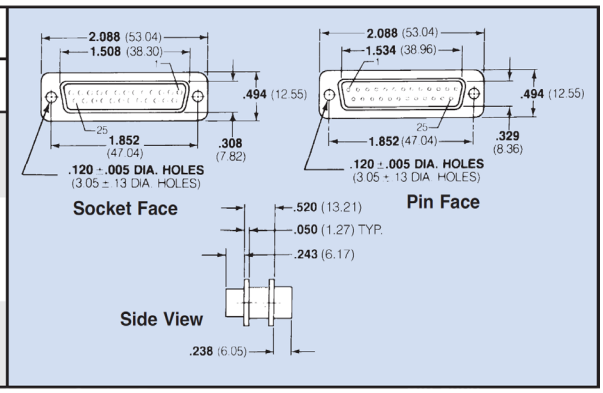
APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
* 56-726-001	A	310 pF Pi
56-726-002	B	1000 pF C
* 56-726-003	C	1000 pF Pi
56-726-004	D	5000 pF C
* 56-726-005	E	4000 pF Pi
56-726-006	F	830 pF C
56-726-007	J	100 pF Pi
* 56-726-008	K	2500 pF Pi
56-726-009	N	375 pF C
56-726-021	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Pin/Socket Adapter

APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
* 56-725-001	A	310 pF Pi
56-725-002	B	1000 pF C
* 56-725-003 €	C	1000 pF Pi
56-725-004	D	5000 pF C
* 56-725-005 €	E	4000 pF Pi
* 56-725-019	F	830 pF C
56-725-020	J	100 pF Pi
* 56-725-021	K	2500 pF Pi
56-725-064	N	375 pF C
56-725-073	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Dimensions in inches (mm)

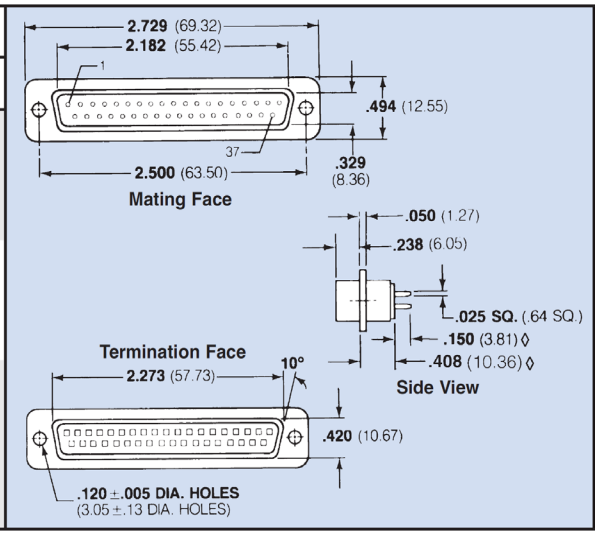
Standard Tolerance = ±.005 except where noted, ◊ = ±.015

Series 700 Pin Contact

37 Shell Size

Printed Circuit Board Mount

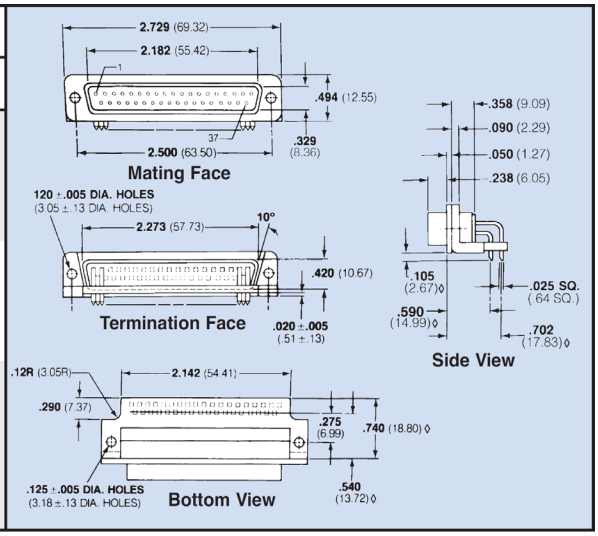
APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
56-731-001	A	310 pF Pi
56-731-002	B	1000 pF C
56-731-003	C	1000 pF Pi
56-731-004	D	5000 pF C
56-731-005	E	4000 pF Pi
56-731-028	F	830 pF C
56-731-029	J	100 pF Pi
56-731-030	K	2500 pF Pi
56-731-048	N	375 pF C
56-731-076	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Printed Circuit Board Right Angle Mount

APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
56-732-001	A	310 pF Pi
56-732-002	B	1000 pF C
* 56-732-003	C	1000 pF Pi
56-732-004	D	5000 pF C
* 56-732-005	E	4000 pF Pi
56-732-006	F	830 pF C
56-732-007	J	100 pF Pi
56-732-008	K	2500 pF Pi
56-732-009	N	375 pF C
56-732-023	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Dimensions in inches (mm)

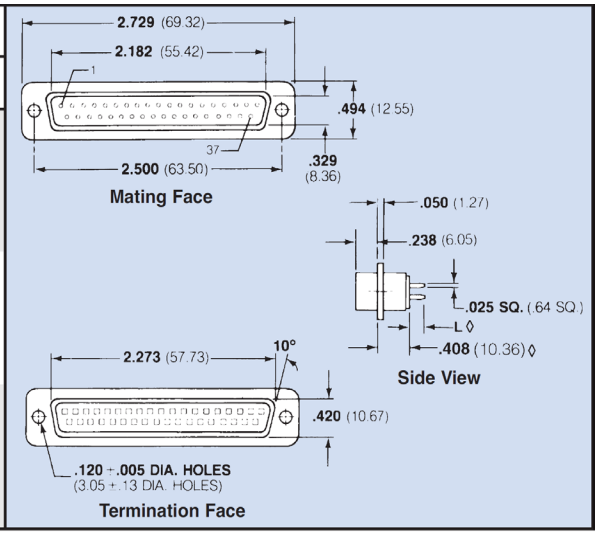
Standard Tolerance = ±.005 except where noted, ◊ = ±.015

Series 700 Pin Contact

37 Shell Size

Solderless Wire Wrap

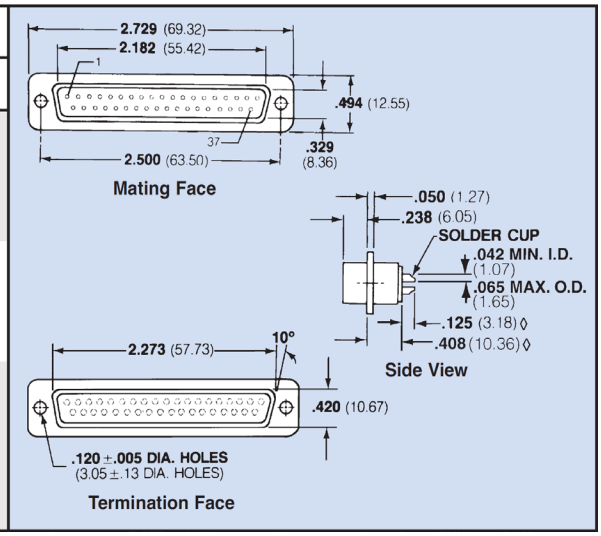
APITech Part Number (Select one)				EMI Filter	
	L .500	L .375	L .250	Filter Desig.**	Cap. Value
56-731	-006	-023	-018	A	310 pF Pi
56-731	-007	-024	-019	B	1000 pF C
56-731	-008	-025	-020	C	1000 pF Pi
56-731	-009	-026	-021	D	5000 pF C
56-731	-010	-027	-022	E	4000 pF Pi
56-731	-037	-034	-031	F	830 pF C
56-731	-038	-035	-032	J	100 pF Pi
56-731	-039	-036	-033	K	2500 pF Pi
56-731	-051	-050	-049	N	375 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Solder Cup Termination

APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
* 56-731-011	A	310 pF Pi
56-731-012	B	1000 pF C
* 56-731-013	C	1000 pF Pi
56-731-014	D	5000 pF C
* 56-731-015	E	4000 pF Pi
* 56-731-040	F	830 pF C
56-731-041	J	100 pF Pi
56-731-042	K	2500 pF Pi
56-731-060	N	375 pF C
56-731-077	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Dimensions in inches (mm)

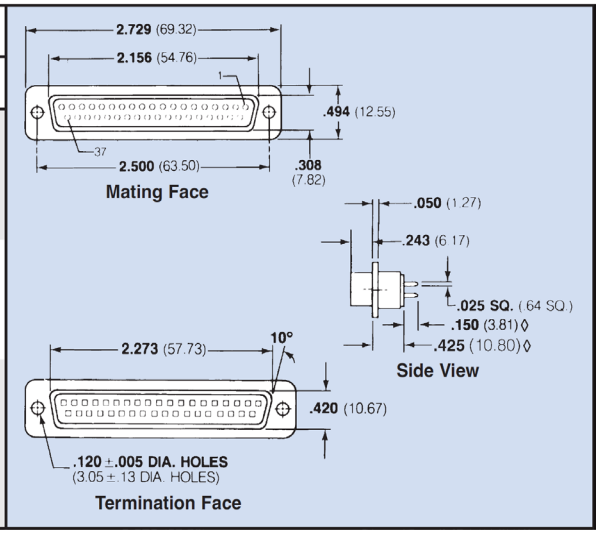
Standard Tolerance = ±.005 except where noted, ◊ = ±.015

Series 700 Socket Contact

37 Shell Size

Printed Circuit Board Mount

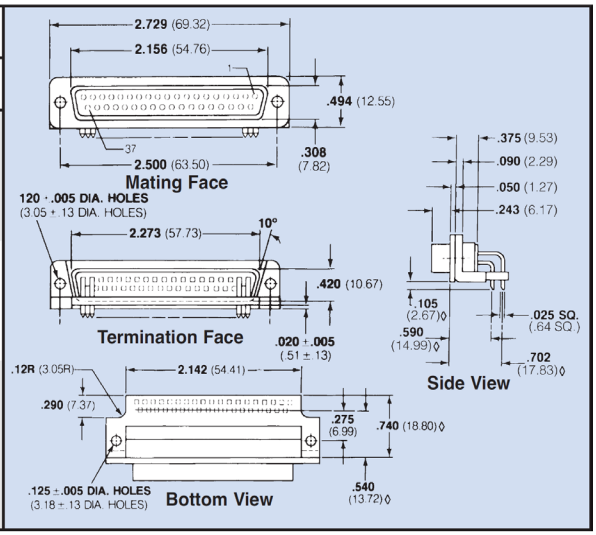
APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
56-733-001	A	310 pF Pi
56-733-002	B	1000 pF C
56-733-003	C	1000 pF Pi
56-733-004	D	5000 pF C
56-733-005	E	4000 pF Pi
56-733-021	F	830 pF C
56-733-022	J	100 pF Pi
56-733-023	K	2500 pF Pi
56-733-035	N	375 pF C
56-733-046	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Printed Circuit Board Right Angle Mount

APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
56-734-001	A	310 pF Pi
56-734-002	B	1000 pF C
56-734-003	C	1000 pF Pi
56-734-004	D	5000 pF C
56-734-005	E	4000 pF Pi
56-734-006	F	830 pF C
56-734-007	J	100 pF Pi
56-734-008	K	2500 pF Pi
56-734-012	N	375 pF C
56-734-021	L	500 pF C



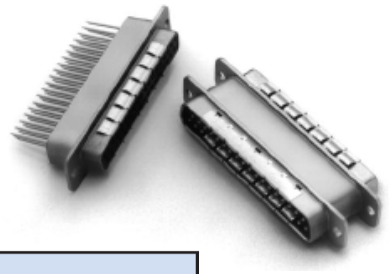
**Replace "56-" with "56F" to indicate RoHS compliant*

Dimensions in inches (mm)

Standard Tolerance = ±.005 except where noted, ◊ = ±.015

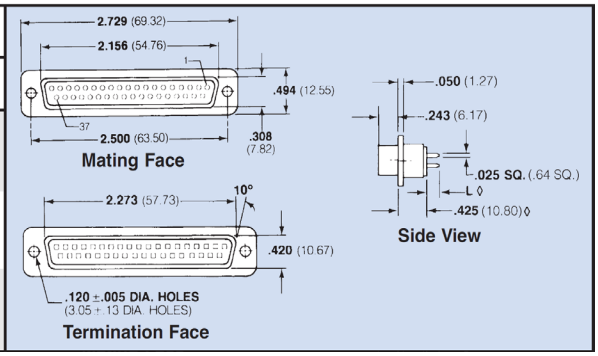
Series 700 Socket Contact & Pin/Socket Adapter

37 Shell Size



Solderless Wire Wrap

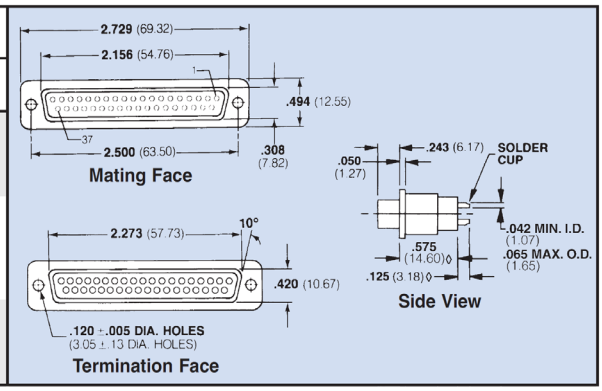
APITech Part Number *Select one*				EMI Filter	
	L .500	L .375	L .250	Filter Desig.**	Cap. Value
* 56-733	-006	-016	* -011	A	310 pF Pi
56-733	-007	-017	-012	B	1000 pF C
56-733	-008	-018	-013	C	1000 pF Pi
56-733	-009	-019	-014	D	5000 pF C
56-733	-010	-020	-015	E	4000 pF Pi
56-733	-030	-027	-024	F	830 pF C
56-733	-031	-028	-025	J	100 pF Pi
56-733	-032	-029	-026	K	2500 pF Pi
56-733	-038	-037	-036	N	375 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Solder Cup Termination

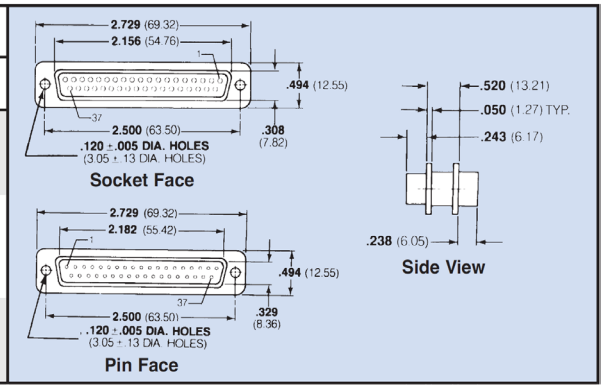
APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
* 56-736-001	A	310 pF Pi
56-736-002	B	1000 pF C
* 56-736-003	C	1000 pF Pi
56-736-004	D	5000 pF C
* 56-736-005	E	4000 pF Pi
56-736-006	F	830 pF C
56-736-007	J	100 pF Pi
* 56-736-008	K	2500 pF Pi
56-736-009	N	375 pF C
56-736-015	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Pin/Socket Adapter

APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
* 56-735-001	A	310 pF Pi
56-735-002	B	1000 pF C
* 56-735-003 €	C	1000 pF Pi
56-735-004	D	5000 pF C
* 56-735-005 €	E	4000 pF Pi
* 56-735-008	F	830 pF C
56-735-009	J	100 pF Pi
56-735-010	K	2500 pF Pi
56-735-025	N	375 pF C
56-735-034	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Dimensions in inches (mm)

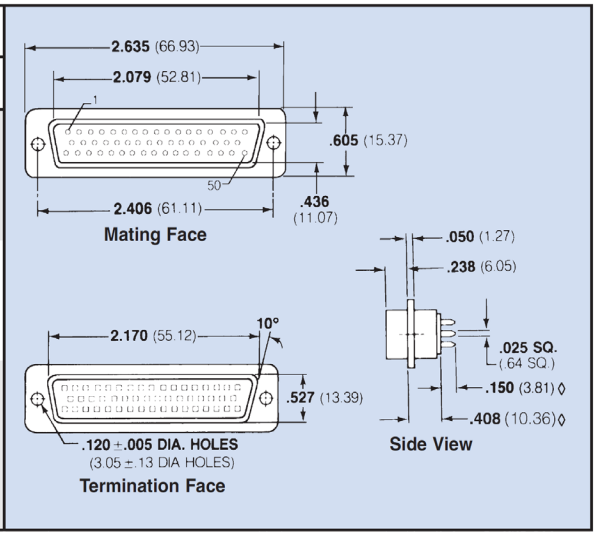
Standard Tolerance = ±.005 except where noted, ◊ = ±.015

Series 700 Pin Contact

50 Shell Size

Printed Circuit Board Mount

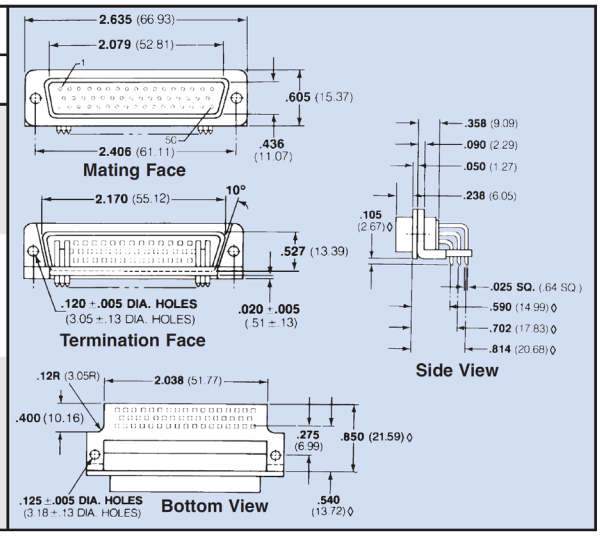
APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
56-741-001	A	310 pF Pi
56-741-002	B	1000 pF C
56-741-003	C	1000 pF Pi
56-741-004	D	5000 pF C
56-741-005	E	4000 pF Pi
56-741-027	F	830 pF C
56-741-028	J	100 pF Pi
56-741-029	K	2500 pF Pi
56-741-042	N	375 pF C
56-741-066	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Printed Circuit Board Right Angle Mount

APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
56-742-001	A	310 pF Pi
56-742-002	B	1000 pF C
56-742-003	C	1000 pF Pi
56-742-004	D	5000 pF C
56-742-005	E	4000 pF Pi
56-742-006	F	830 pF C
56-742-007	J	100 pF Pi
56-742-008	K	2500 pF Pi
56-742-009	N	375 pF C
56-742-022	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Dimensions in inches (mm)

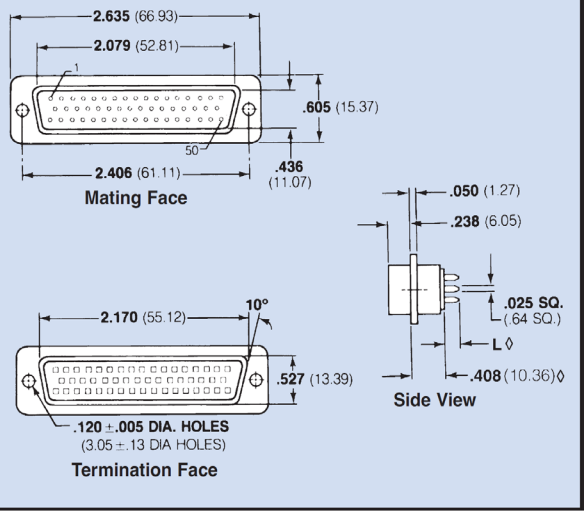
Standard Tolerance = ±.005 except where noted, ◊ = ±.015

Series 700 Pin Contact

50 Shell Size

Solderless Wire Wrap

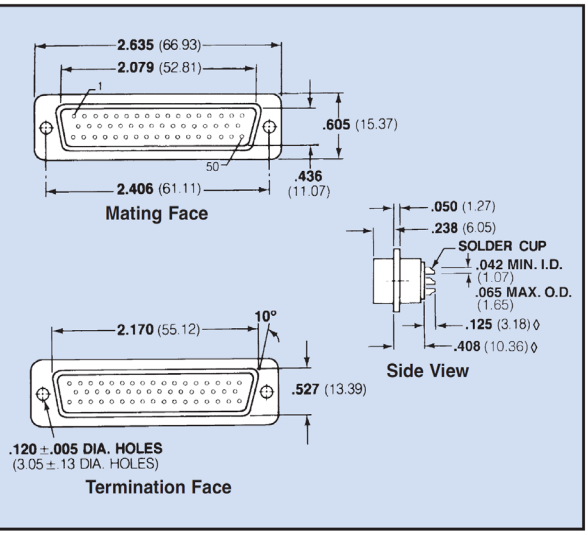
APITech Part Number (Select one)				EMI Filter	
	L .500	L .375	L .250	Filter Desig.**	Cap. Value
56-741	-006	-022	-017	A	310 pF Pi
56-741	-007	-023	-018	B	1000 pF C
56-741	-008	-024	-019	C	1000 pF Pi
56-741	-009	-025	-020	D	5000 pF C
56-741	-010	-026	-021	E	4000 pF Pi
56-741	-036	-033	-030	F	830 pF C
56-741	-037	-034	-031	J	100 pF Pi
56-741	-038	-035	-032	K	2500 pF Pi
56-741	-045	-044	-043	N	375 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Solder Cup Termination

APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
* 56-741-011	A	310 pF Pi
* 56-741-012	B	1000 pF C
* 56-741-013	C	1000 pF Pi
* 56-741-014	D	5000 pF C
* 56-741-015	E	4000 pF Pi
56-741-039	F	830 pF C
56-741-040	J	100 pF Pi
56-741-041	K	2500 pF Pi
56-741-063	N	375 pF C
56-741-067	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Dimensions in inches (mm)

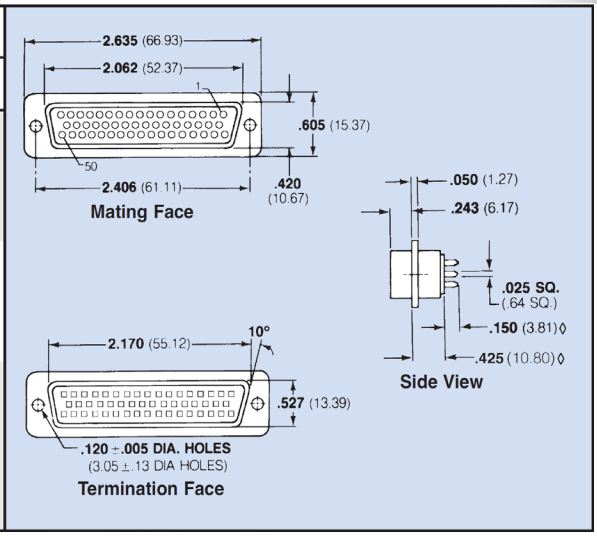
Standard Tolerance = ±.005 except where noted, ◊ = ±.015

Series 700 Socket Contact

50 Shell Size

Printed Circuit Board Mount

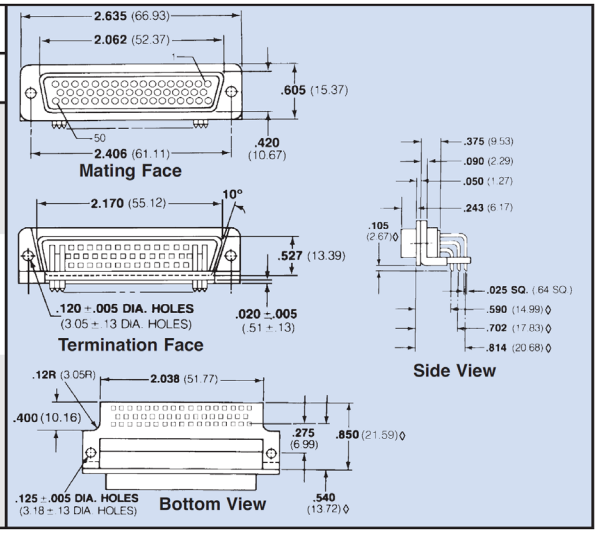
APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
56-743-001	A	310 pF Pi
56-743-002	B	1000 pF C
56-743-003	C	1000 pF Pi
56-743-004	D	5000 pF C
56-743-005	E	4000 pF Pi
56-743-021	F	830 pF C
56-743-022	J	100 pF Pi
56-743-023	K	2500 pF Pi
56-743-033	N	375 pF C
56-743-043	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Printed Circuit Board Right Angle Mount

APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
56-744-001	A	310 pF Pi
56-744-002	B	1000 pF C
56-744-003	C	1000 pF Pi
56-744-004	D	5000 pF C
56-744-005	E	4000 pF Pi
56-744-006	F	830 pF C
56-744-007	J	100 pF Pi
56-744-008	K	2500 pF Pi
56-744-009	N	375 pF C
56-744-012	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Dimensions in inches (mm)

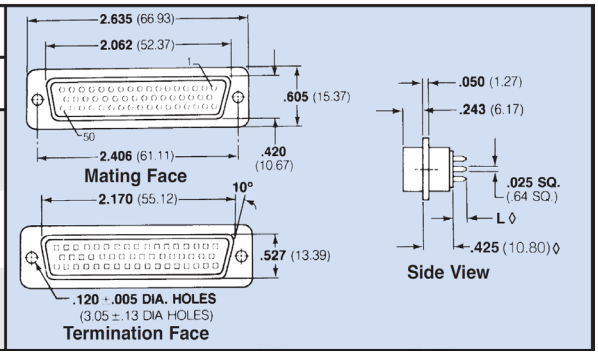
Standard Tolerance = ±.005 except where noted, ◊ = ±.015

Series 700 Socket Contact & Pin/Socket Adapter

50 Shell Size

Solderless Wire Wrap

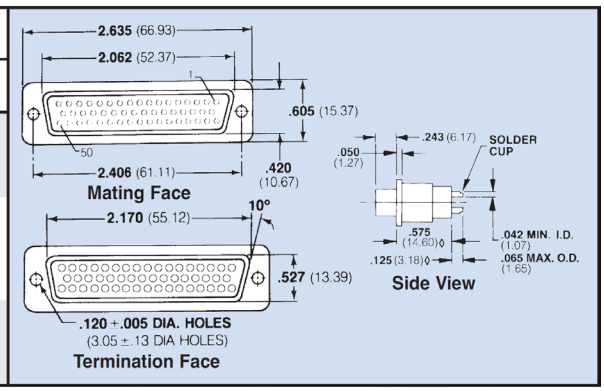
APITech Part Number (Select one)				EMI Filter	
	L .500	L .375	L .250	Filter Desig.**	Cap. Value
56-743	-006	-016	-011	A	310 pF Pi
56-743	-007	-017	-012	B	1000 pF C
56-743	-008	-018	-013	C	1000 pF Pi
56-743	-009	-019	-014	D	5000 pF C
56-743	-010	-020	-015	E	4000 pF Pi
56-743	-030	-027	-024	F	830 pF C
56-743	-031	-028	-025	J	100 pF Pi
56-743	-032	-029	-026	K	2500 pF Pi
56-743	-036	-035	-034	N	375 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Solder Cup Termination

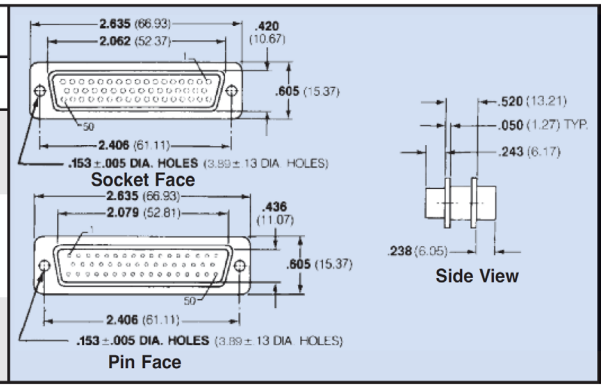
APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
56-746-001	A	310 pF Pi
56-746-002	B	1000 pF C
56-746-003	C	1000 pF Pi
56-746-004	D	5000 pF C
56-746-005	E	4000 pF Pi
56-746-006	F	830 pF C
56-746-007	J	100 pF Pi
56-746-008	K	2500 pF Pi
56-746-009	N	375 pF C
56-746-018	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Pin/Socket Adapter

APITech Part Number	EMI Filter	
	Filter Designation**	Cap. Value
* 56-745-001	A	310 pF Pi
56-745-002	B	1000 pF C
* 56-745-003	C	1000 pF Pi
56-745-004	D	5000 pF C
* 56-745-005	E	4000 pF Pi
56-745-006	F	830 pF C
56-745-007	J	100 pF Pi
56-745-008	K	2500 pF Pi
56-745-019	N	375 pF C
56-745-027	L	500 pF C



**Replace "56-" with "56F" to indicate RoHS compliant*

Dimensions in inches (mm)

Standard Tolerance = ±.005 except where noted, ◊ = ±.015

D-Subminiature Part Numbering System

Ordering Information

Example: **56-513-012-TI**

56 – **5** **1** **3** – **0** **12** – **TI**

Filtered D-Subminiature Connector
- Standard connector
F - RoHS compliant version

Product Series
4 = Series F Ferrite
5 = Series 500 Low Profile
6 = Series 600 Hi-Density
7 = Series 700 High Performance

Shell Size
Series 400 & 500
0 = 9 Contacts
1 = 15 Contacts
2 = 25 Contacts
3 = 37 Contacts

Series 600 Hi-Density
0 = 15 Contacts
1 = 26 Contacts
2 = 44 Contacts
3 = 62 Contacts
4 = 78 Contacts

Series 700
0 = 9 Contacts
1 = 15 Contacts
2 = 25 Contacts
3 = 37 Contacts
4 = 50 Contacts

Contact Type/Termination
1 = Pin to solder cup
2 = Pin to 90° PCB mount
3 = Socket to straight PCB mount
4 = Socket to 90° PCB mount
5 = Pin-socket adapter
6 = Socket to solder cup
7 = Pin to straight PCB mount

Styles available for:
Series 400 only 2,3,4,7
Series 500 only 2,3,4, 7
Series 600 only 1,2,3,4,5
Seriess 700 1 thru 700

Note: 1 can be Pin to solder cup or Pin to PCB for Series 700. See chart pages 3-22.

Line Filtering
0 = All positions same
9 = Special loading (Series 600 only)

Capacitance Value
Series 400
01 = Always

Series 500
10 = 120 pF
11 = 440 pF
12 = 840 pF
13 = 1000 pF
14 = 1500 pF

Series 600
15 = 85 pF FT
16 = 180 pF FT
18 = 1000 pF FT
19 = 4000 pF FT
20 = Insulated contact

Series 600
See filter specifications chart on page 1 and select part numbers from Series 700 charts pages 3-22.

Options
See options descriptions on page 24 add suffix ending.
Series F
HD = Hi-Density (15 socket only)
Series 500
TI = 4-40 threads on mounting flange. (.125" hole is not selected)
GBL = Grounded board lock includes 4-40 threads. (Available only on 90° PCB)
GBLF = Grounded board lock and ferrite slab provides enhanced LC performance. (Available only on 90° PCB
Series 600 Hi-Density
LI = 4-40 UNC inserts
S = Solder dipped tails
50G = 50µ (1.27µm) gold
GBL = Ground board lock
Series 700
LI = 4-40 UNC inserts
LIM = Metric M3.0 self-locking threads
GB = Metal bracket provides ground connection, includes 4-40 self-locking threads (for right angle mount only)
GBL = Grounded board lock (right angle)
GBL6 = For .062" boards (Straight PCB mount) (1.57mm)
GBL9 = For .093" boards (Straight PCB mount) (2.36mm)
50G = 50µ (1.27µm) gold plating
S = Solder dipped tails
JS = Jackscrew mounting
For option combinations, consult factory.

To assist your efforts in selecting the correct Filtered Connector to meet your needs, we have developed a part numbering system. All of the standard products are shown in their respective catalog pages.

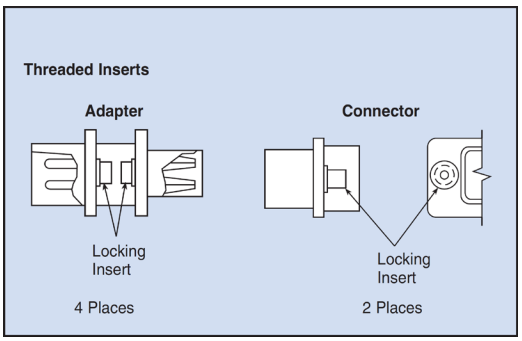
Part number ***56-513-012-TI*** *represents a Series 500 connector with 15 contacts in a socket to straight PCB mount configuration. All connector positions have a capacitance value of 840 pF and there are 4-40 threads on mounting flange.*

D-Subminiature Connector Options

Threaded Inserts

Available on Series 500, 600 & 700.

- #4-40 UNC or metric M3.0 threaded inserts in mounting flanges.
- Allows ease of panel-assembly.
- Plated steel inserts with last thread upset for torque.



Grounding Bracket

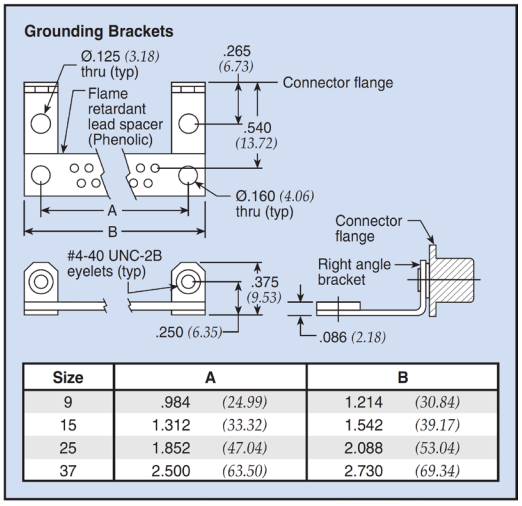
For right angle mount PCB connectors, available on Series 700.

- Metal bracket in place of plastic.
- Provides ground connection direct from circuit board.
- Allows shell grounding to board.
- Includes 4-40 threads.

Stand-off with Board Lock Feature

For straight PCB connectors, available on Series 700.

- Allows shell grounding to board.
- Eliminates stress on filter temperature.
- Tin plated brass stand-off with snap-in feature.
- Available for .062" (1.57mm) or .093" (2.36mm).

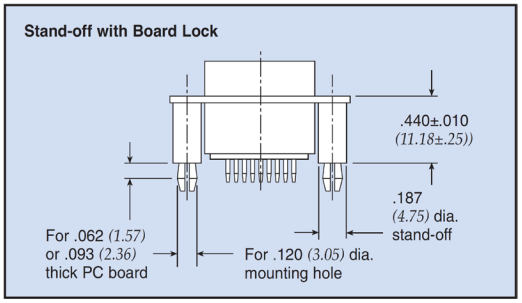


Size	A		B	
9	.984	(24.99)	1.214	(30.84)
15	1.312	(33.32)	1.542	(39.17)
25	1.852	(47.04)	2.088	(53.04)
37	2.500	(63.50)	2.730	(69.34)

Grounding Bracket with Board Lock

For right angle mount PCB connectors, available on Series 500 & 700.

- Metal bracket provides grounding.
- Snap-in, no hardware needed, 4-40 threads included.
- For use on .062" (1.57mm) thick boards.



Gold Plating

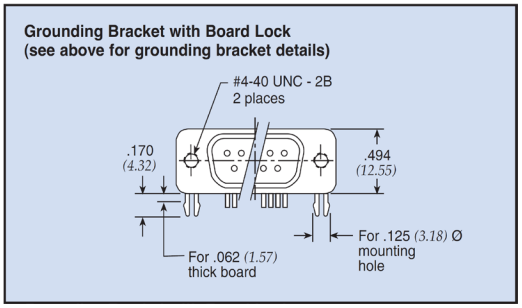
Available on Series 600 & 700.

- High reliability applications, 50µ" (1.27µm) gold over 50µ" nickel.

Solder Dipped Tails

Available on Series 600 & 700 connectors.

- Solder dipped tails added standard gold flash.



Water Block

Consult APITech engineers for specifics.

- Internally sealed in accordance with NEMA Standard Rain Test section 6.4 (also UL50 part 28 ram test submersion, section 6.10.1.

Dimensions in inches (mm)

Filtered Combo D-Subminiature Connectors

APITech's line of EMI filtered combo D-subs provide high insertion loss with capacitive filtering. These connectors are available with 20 Amp power contacts or 40 Amp power contacts. Configurations include male and female versions with straight PC terminals, right angle PC terminals, or solder cup terminals. Standard D-sub shell sizes provide intermateability with unfiltered connectors. High strength epoxy potting protects ceramic elements.

Capacitive filtering is available in 470, 820, 1000, and 1500 pF. Additional capacitance ranges and configurations can be provided upon request. Please contact APITech for additional information.

Applications

- Telecommunications base station equipment
- Switching and transmission equipment
- Power supplies
- Industrial equipment
- Computer work stations

Mechanical Specifications

Shell	Steel, tin plated
Power Contacts	Brass, gold plated .000030 in. *(0.762 µm)* minimum
Signal Contacts	Pin: brass, gold plated .000015 in. *(0.762 µm)* min. Socket: copper alloy, gold plated .000030 in. *(0.762 µm)* min.
Insulator	Glass-filled polyester, flammability UL94V-0
Operating Temperature	-55°C to +125°C
Capacitors	MLCC

Electrical Specifications

Operating Voltage	200 VDC
*Current Rating**	40 Amp power/ 5 Amp signal
Insulation Resistance	1 Gohm at 100 VDC
Capacitance	See below for MLCC values. For other capacitance values contact factory
Dielectric Withstanding Voltage	600 VDC

*** 30 Amp available. Consult APITech.**

Ordering Information

56	*	3	A	03W3	101	GBL9

A: Pin - PCB Power
B: Pin - Right Angle Power
C: Pin - Solder Cup Power
G: Socket - PCB Power
H: Socket - Right Angle Power
J: Socket - Solder Cup Power
N: Custom Combination
* Insert "F" for RoHS compliant

Contact Arrangement
03W3 = 3W3
05W5 = 5W5
09W4 = 9W4
24W7 = 24W7

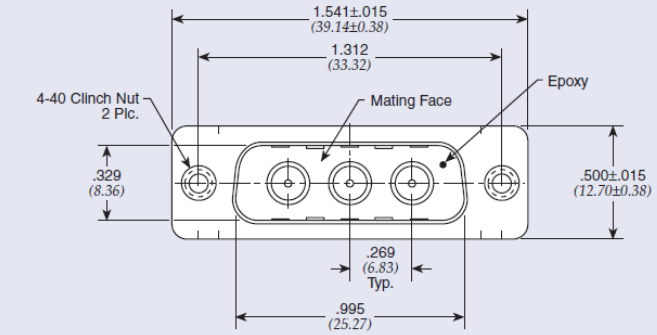
Capacitance Value
101 = 470 pF
102 = 820 pF
103 = 1000 pF
104 = 1500 pF

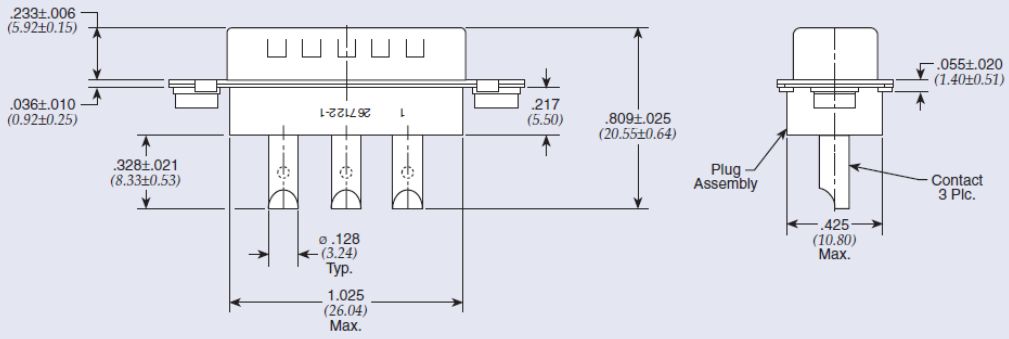
Options
See options descriptions on page 24 add suffix ending
LI = 4-40 UNC inserts
LIM = Metric M3.0 self-locking threads
GB = Metal bracket provides ground connection, includes 4-40 self-locking threads (for right angle mount only)
GBL = Grounded board lock (right angle)
GBL6 = for .062" boards (straight PCB mount)
GBL9 = for .093" boards (straight PCB mount)
50G = 50 µ (1.27 µm) gold plating
S = Solder dipped tails
JS = Jackscrew mounting
For option combinations, consult APITech.

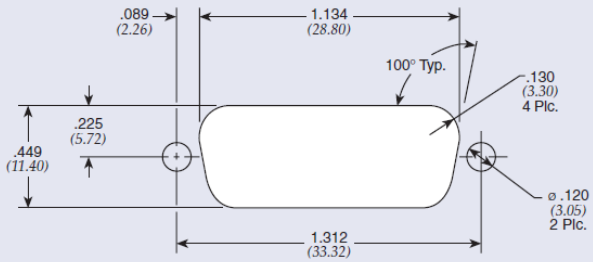
Filtered Combo D-Subminiature Connectors

3W3

Plug - Solder Cup







Recommended Panel Cutout

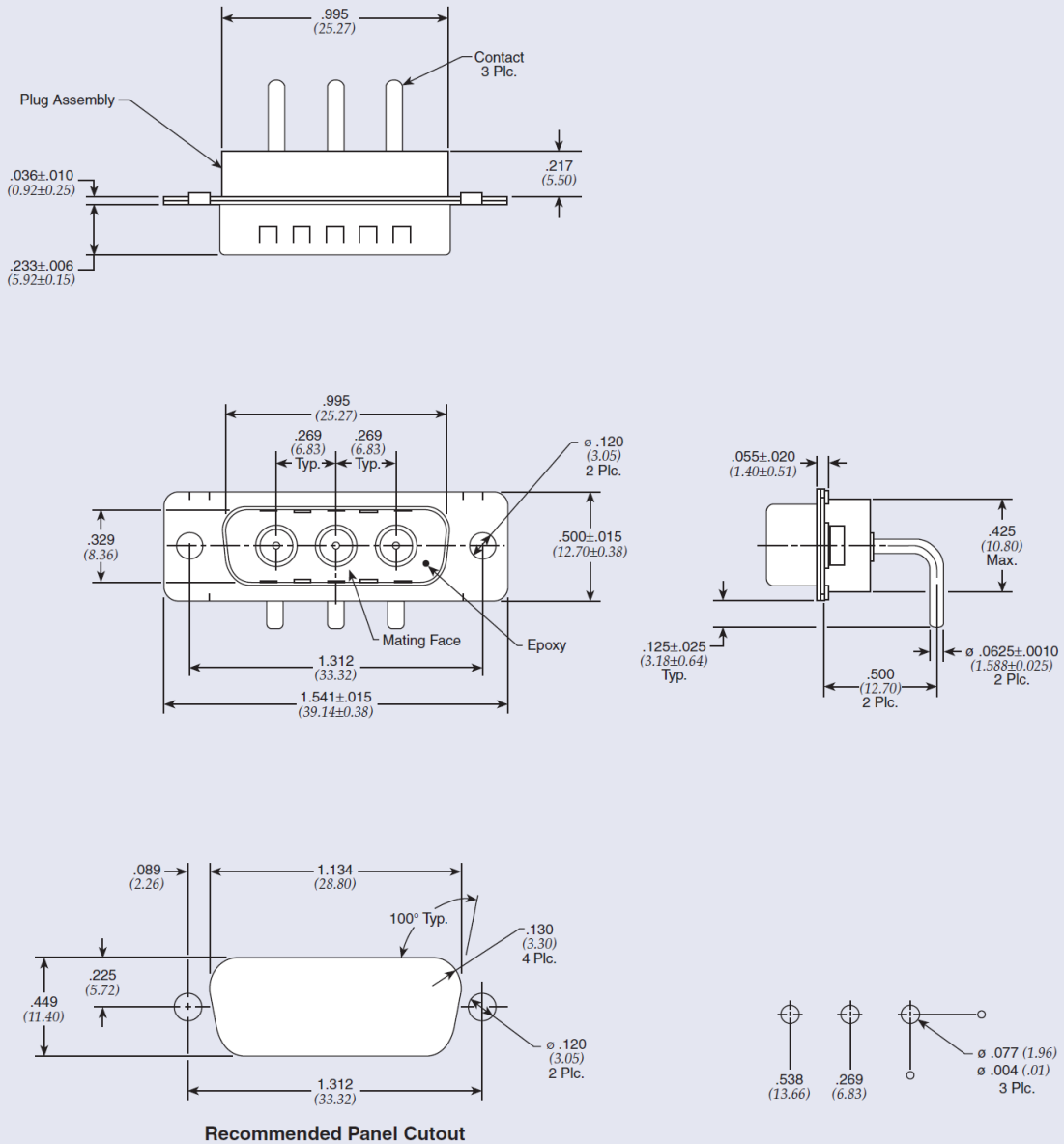
Only represents a few of our available configurations. Consult factory for more information.

Dimensions in inches *(mm)*

Filtered Combo D-Subminiature Connectors

3W3

Plug - Right Angle



Recommended Panel Cutout

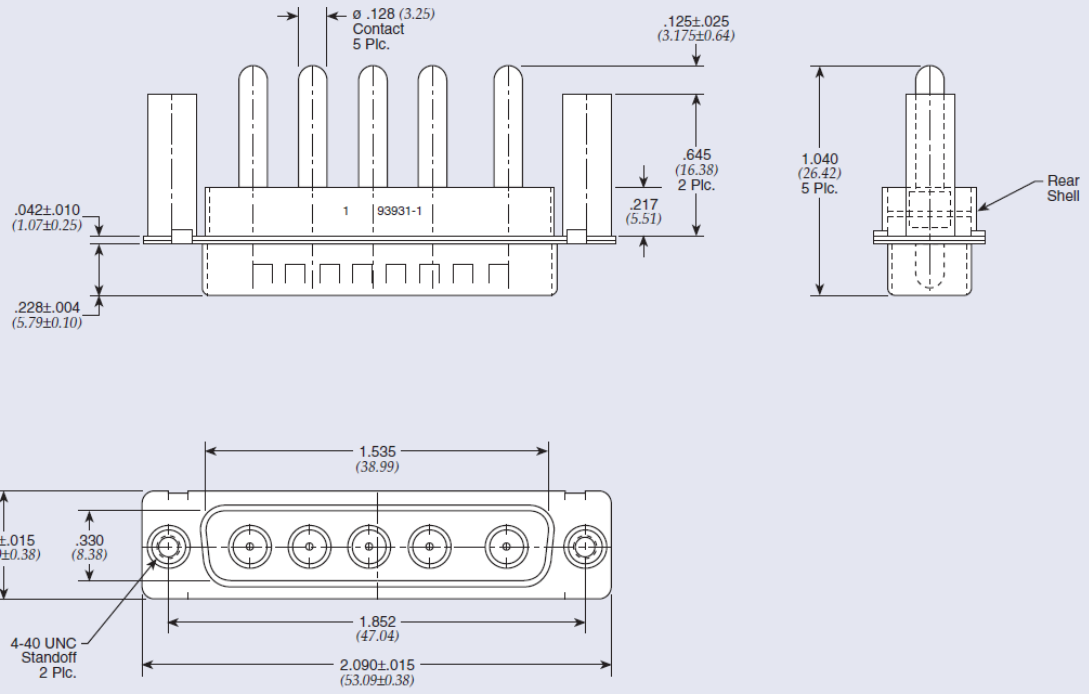
Only represents a few of our available configurations. Consult factory for more information.

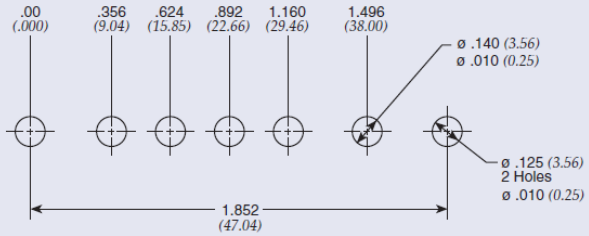
Dimensions in inches *(mm)*

Filtered Combo D-Subminiature Connectors

5W5

Plug - Vertical





Recommended PCB Layout

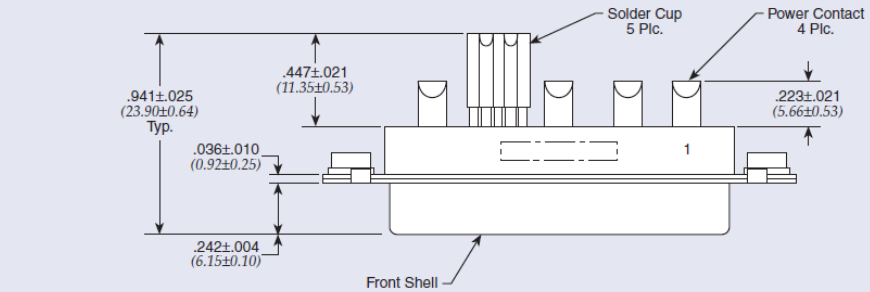
Only represents a few of our available configurations. Consult factory for more information.

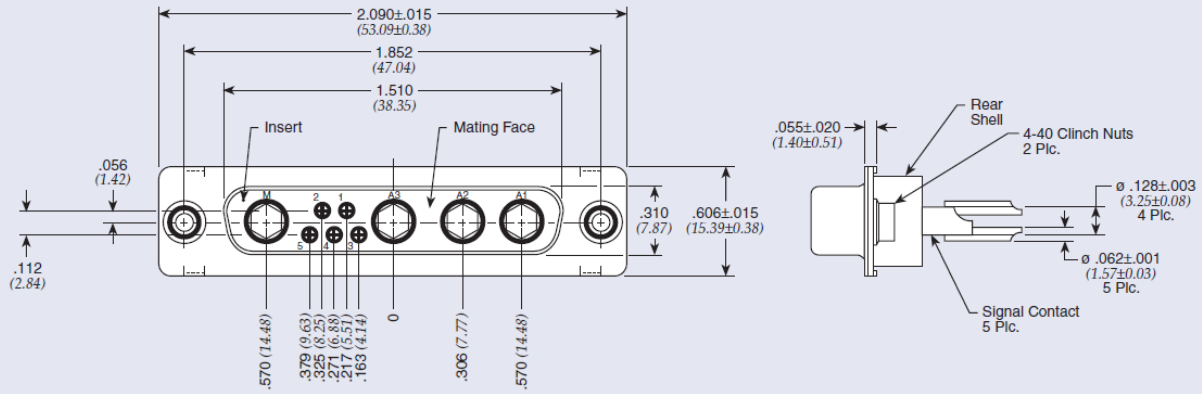
Dimensions in inches *(mm)*

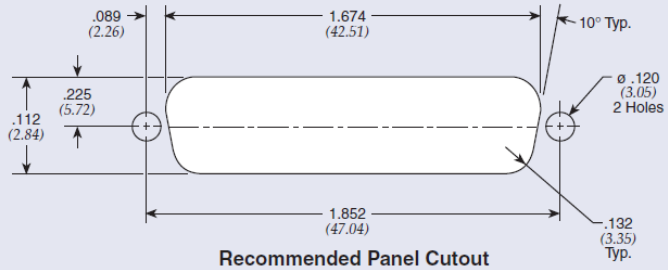
Filtered Combo D-Subminiature Connectors

9W4

Socket - Solder Cup







Recommended Panel Cutout

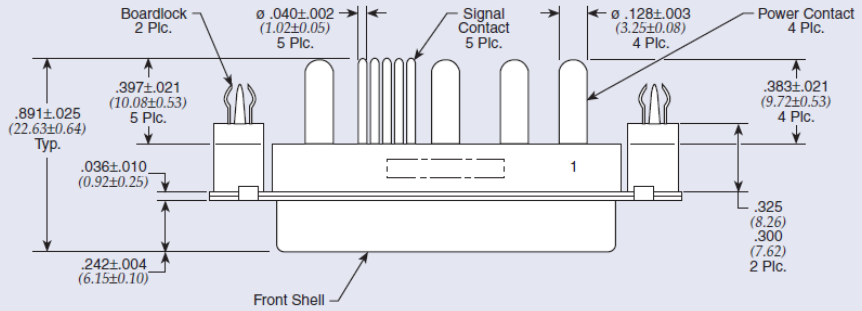
Only represents a few of our available configurations. Consult factory for more information.

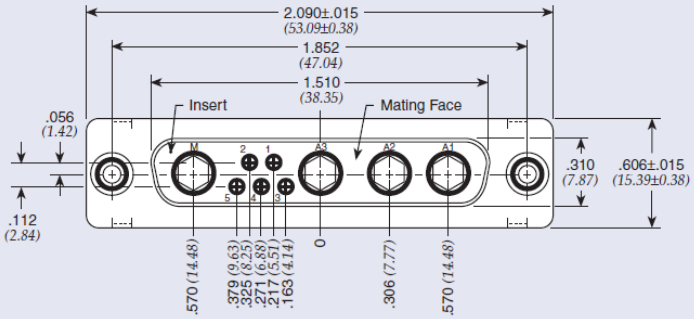
Dimensions in inches *(mm)*

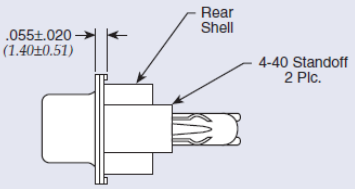
Filtered Combo D-Subminiature Connectors

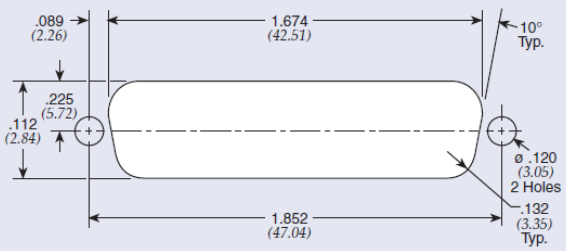
9W4

Socket - Vertical

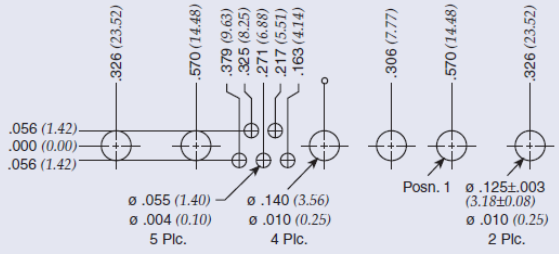








Recommended Panel Cutout



Recommended PC Board Mounting Dimensions

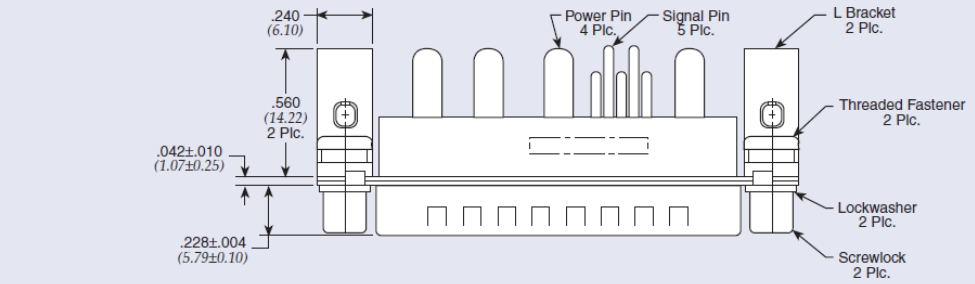
Only represents a few of our available configurations. Consult factory for more information.

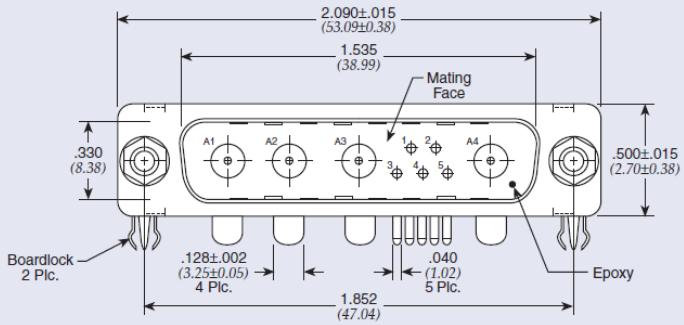
Dimensions in inches *(mm)*

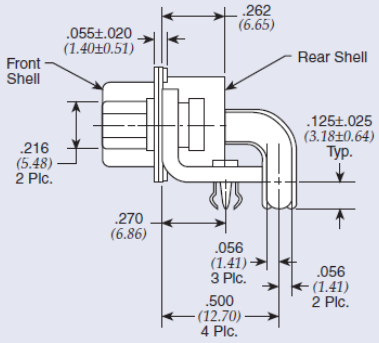
Filtered Combo D-Subminiature Connectors

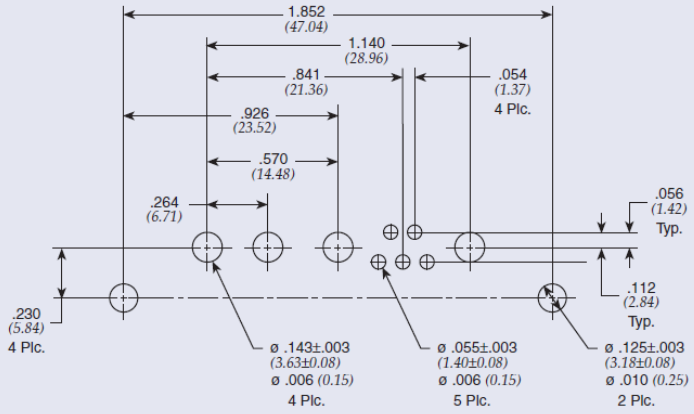
9W4

Plug - Right Angle









Recommended PC Board Mounting Dimensions

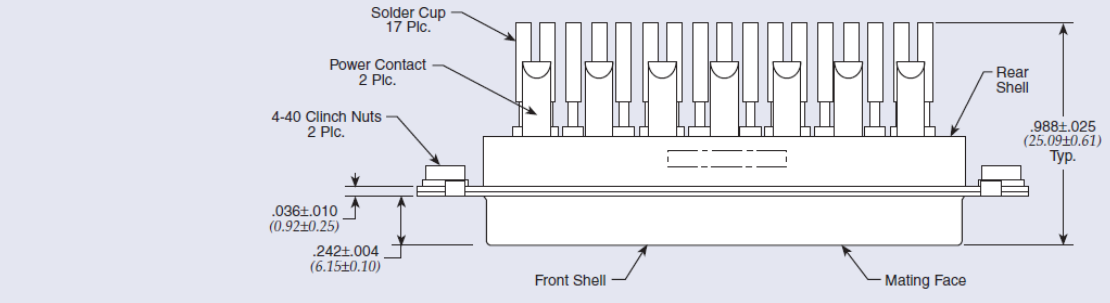
Only represents a few of our available configurations. Consult factory for more information.

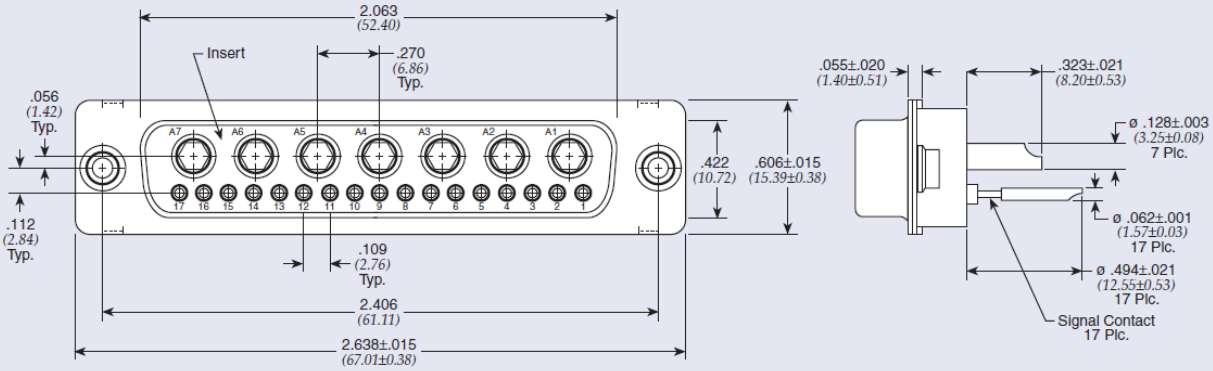
Dimensions in inches *(mm)*

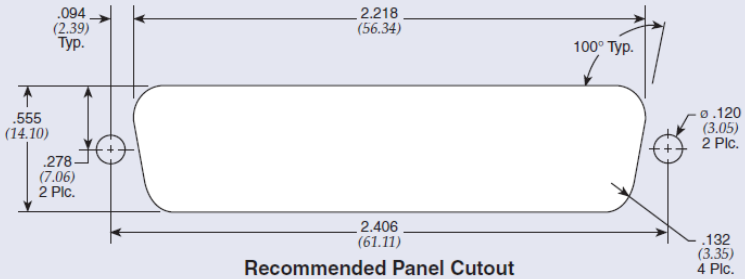
Filtered Combo D-Subminiature Connectors

24W7

Socket - Solder Cup







Recommended Panel Cutout

Only represents a few of our available configurations. Consult factory for more information.

Dimensions in inches *(mm)*

D-Subminiature Adapter Test Kit & Hardware

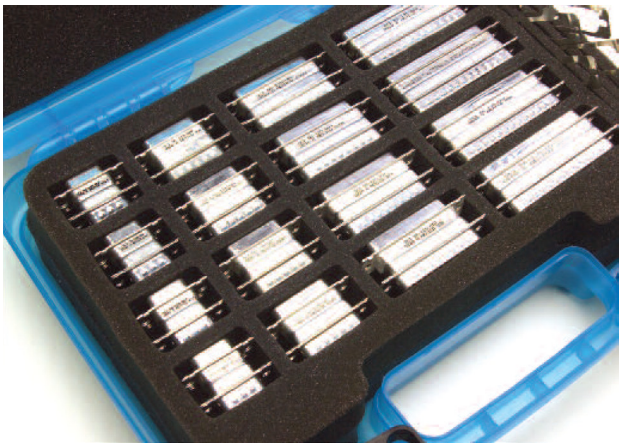
Adapter Test Kit

Specially designed for EMI evaluation process.

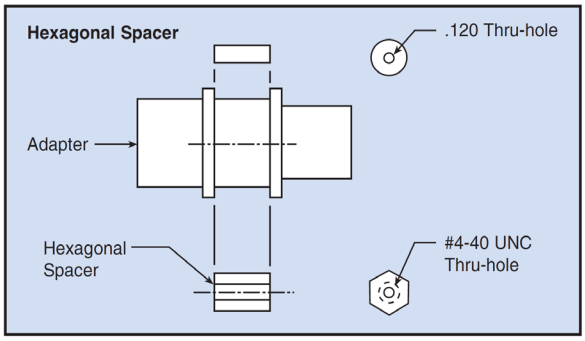
- Male/female adapter part
- Easily plugged into equipment under testing conditions
- Ideal for new products and retrofitting
- Each adapter test kit includes:
  - 20 filtered adapters
  - Four shell sizes 9, 15, 25, and 37
  - Four filter ranges:

    Series 700

    - 310 pF Pi
    - 830 pF FT
    - 1000 pF Pi
    - 4000 pF Pi



Adapter Test Kit



Ordering Information

Description	APITech Part Number
Adapter test kit	56-700-002
Adapter test kit with Jackscrew *Includes 40 pcs. 56-201-006*	56-700-002-JS
Hexagonal Spacer	56-201-001 (1 per)
Jackscrew Mounting Hardware *For .312" (7.92 mm) length*	56-201-004 (1 per)
Jackscrew Mounting Hardware *For .688" (17.47 mm) length*	56-201-006 (2 per)
Tubular Spacer	56-201-003 (1 per)

Hardware

Designed to provide simple and effective mounting.

Hexagonal Spacer

- Tapped spacer fits between flanges
- Provide retrofit of 4-40" threads
- Two spacers per adapter required, packaged in bulk

Jackscrew Mounting Hardware

- Male/female jackscrews
- Standard 4-40 threads for compatibility
- Two male thread lengths available
- Two screws per adapter required
- Lockwasher included, packaged in bulk

Micro D Series Filtered Connectors

For designs that require even smaller connector packages, APITech's brand has designed a line of EMI filtered Micro D-Subminiature connectors. This line of connectors offers a range of reliable filtering options, including capacitive, ESD versions, several sizes, and termination options. APITech has a Micro D-sub connector to satisfy your smallest space constraints.

Feature

- Light weight
- Compact size
- Environmentally sealed contact area when mated
- Corrosion resistant
- Durable (500 cycles min.)
- Superior electrical performance
- RoHS compliant

Mechanical Specifications

Shell	Aluminum, electroless nickel plated 500 µ in (12.7 µm) minimum
Insulator	High temperature plastic, flammability UL94V-0
Contacts	Copper alloy, gold plated 50 µ in (1.27 µm) minimum
Potting	Flammability UL94V-0
Interfacial Seal	Silicon

Electrical Specifications

Operating Voltage	100 VDC
Dielectric Withstanding Voltage	300 VDC
Current Rating	3 Amps
Insulationg Resistance	5G ohms @ 100 VDC

Ordering Information

Example: **56-F011-110-JP**

This part number represents a micro D-sub connector with a shell size of 15 and a pin to solder cup configuration. All lines are filtered with same capacitance value, which is 100 pF COB. The connector includes an optional #2-56 jack post.

56 **F** **0** **1** **1** – **1** **10** – **JP**

Filtered Connectors

RoHS Compliant

Micro D

Line Filtering
1 - All positions same
2 - Select load

Shell Size/Number of Contact
0 - 9 contacts
1 - 15 contacts
2 - 21 contacts
3 - 25 contacts
4 - 31 contacts
5 - 37 contacts

Contact Type/Termination
1 - Pin to solder cup
2 - Pin to right angle*
3 - Socket to PC tail*
4 - Socket to right angle*
6 - Socket to solder cup
7 - Pin to PC tail*
8 - Pin to pigtail
9 - Socket to pigtail

Capacitance Value/Type
High Performance
01 - 100 pF FT
02 - 470 pF FT
03 - 820 pF FT
04 - 1500 pF FT
05 - 4700 pF FT
Standard Performance
10 - 100 pF COB
11 - 470 pF COB
12 - 820 pF COB
13 - 1500 pF COB
14 - 4700 pF COB

Options
JP - #2-56 jack post
JS - #2-56 jackscrew
TI - Threaded insert
JT - Jack post and threaded insert
GBL6 - Grounding Bracket

** Right angle and PC tail length is 0.109. Other lengths available, consult APITech.*

All capacitance values ±20% @ 25°C.

Micro D Series Filtered Connectors

High Performance

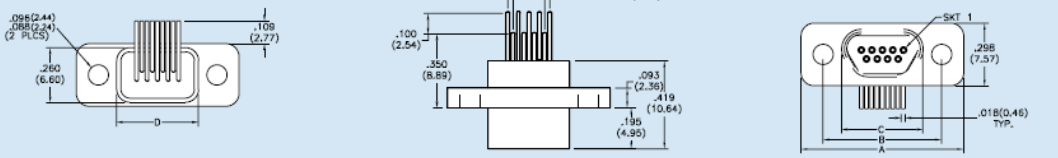
Filter Designation	Type	Capacitance		Dielectric Withstanding Voltage	Working Voltage DC -55°C to +125°C	Minimum Insertion Loss - Decibels (dB) 50 ohm system per MIL-STD-220 (no load)							
		Value	Tolerance			5 MHz	10 MHz	20 MHz	50 MHz	100 MHz	200 MHz	500 MHz	1 GHz
01	FT	100 pF	±20%	300V	100V	—	—	—	—	1	6	14	20
02	FT	470 pF	±20%	300V	100V	—	—	2	8	14	20	28	34
03	FT	820 pF	±20%	300V	100V	—	2	6	13	19	25	33	39
04	FT	1500 pF	±20%	300V	100V	—	5	10	18	24	30	38	44
05	FT	4700 pF	±20%	300V	100V	8	14	20	28	34	40	48	54

Standard Performance

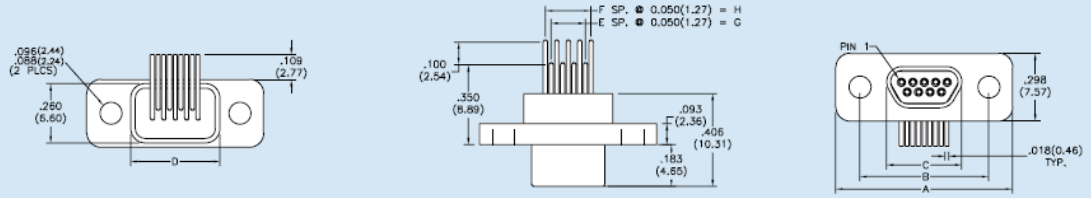
Filter Designation	Type	Capacitance		Dielectric Withstanding Voltage	Working Voltage DC -55°C to +125°C	Minimum Insertion Loss - Decibels (dB) 50 ohm system per MIL-STD-220 (no load)							
		Value	Tolerance			5 MHz	10 MHz	20 MHz	50 MHz	100 MHz	200 MHz	500 MHz	1 GHz
10	COB	100 pF	±20%	300V	100V	—	—	—	—	1	6	14	20
11	COB	470 pF	±20%	300V	100V	—	—	2	8	14	20	28	32
12	COB	820 pF	±20%	300V	100V	—	2	6	13	19	25	32	32
13	COB	1500 pF	±20%	300V	100V	—	5	10	18	24	30	32	32
14	COB	4700 pF	±20%	300V	100V	8	14	20	28	32	32	32	32

Right Angle PCB

Receptacle



Plug



Size	A	B	C (RCPT)	C (Plug)	D	E	F	G	H
9	.775 (19.69)	.565 (14.35)	.388 (9.86)	.330 (8.38)	.390 (9.91)	4	5	.200 (5.08)	.250 (6.35)
15	.925 (23.50)	.715 (18.16)	.538 (13.67)	.480 (12.19)	.540 (13.72)	7	8	.350 (8.89)	.400 (10.16)
21	1.075 (27.31)	.865 (21.97)	.688 (17.48)	.630 (16.00)	.690 (17.53)	10	11	.500 (12.70)	.550 (13.97)
25	1.175 (29.85)	.965 (24.51)	.788 (20.02)	.730 (18.54)	.790 (20.07)	12	13	.600 (15.24)	.650 (16.51)
31	1.325 (33.66)	1.115 (28.32)	.938 (23.83)	.880 (22.35)	.940 (23.88)	15	16	.750 (19.05)	.800 (20.32)
37	1.475 (37.47)	1.265 (32.13)	1.088 (27.64)	1.030 (26.16)	.1.090 (27.69)	18	19	.900 (22.86)	.950 (24.13)

Dimensions in inches *(mm)*

Micro D Series Filtered Connectors

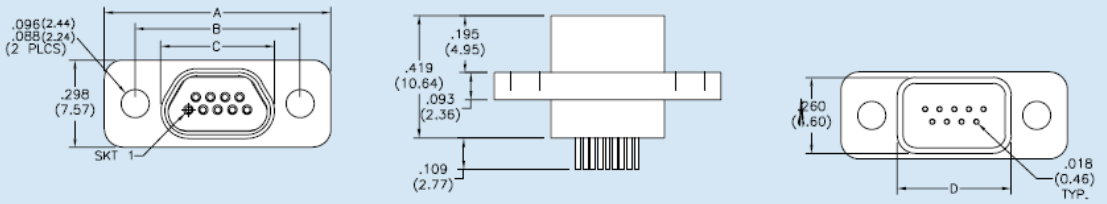
Filtered Connectors

Size	A	B	C (RCPT)	C (Plug)	D
9	.775 (19.69)	.565 (14.35)	.388 (9.86)	.330 (8.38)	.390 (9.91)
15	.925 (23.50)	.715 (18.16)	.538 (13.67)	.480 (12.19)	.540 (13.72)
21	1.075 (27.31)	.865 (21.97)	.688 (17.48)	.630 (16.00)	.690 (17.53)
25	1.175 (29.85)	.965 (24.51)	.788 (20.02)	.730 (18.54)	.790 (20.07)
31	1.325 (33.66)	1.115 (28.32)	.938 (23.83)	.880 (22.35)	.940 (23.88)
37	1.475 (37.47)	1.265 (32.13)	1.088 (27.64)	1.030 (26.16)	.1.090 (27.69)

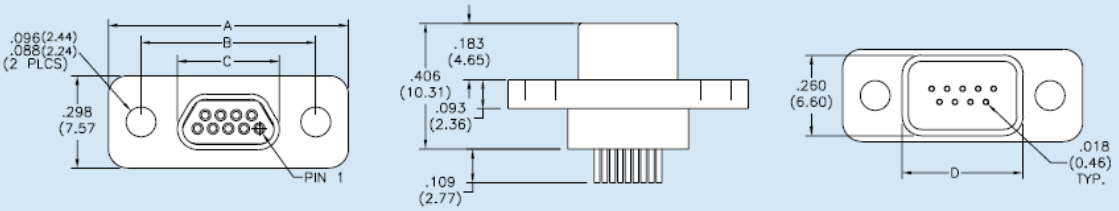
Dimensions in inches *(mm)*

Vertical PCB

Receptacle

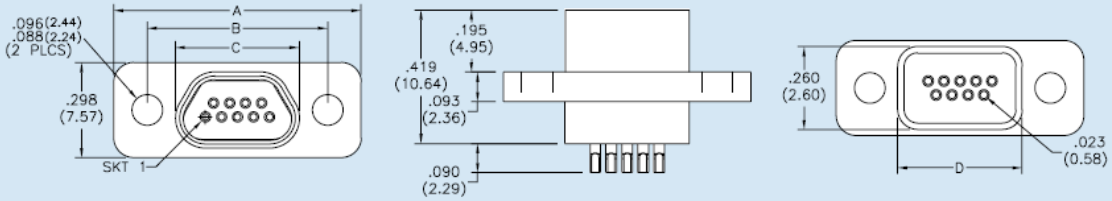


Plug

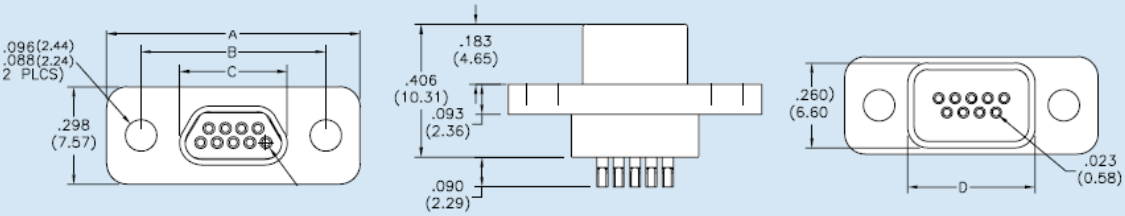


Solder Cup

Receptacle



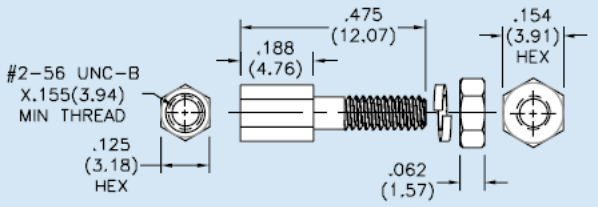
Plug



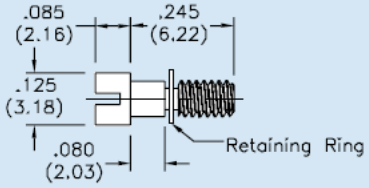
Micro D Series Filtered Connectors

Options

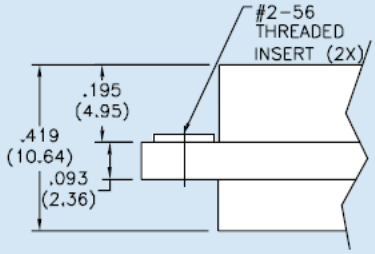
JP - #2-56 Jack Post M83513/05-07



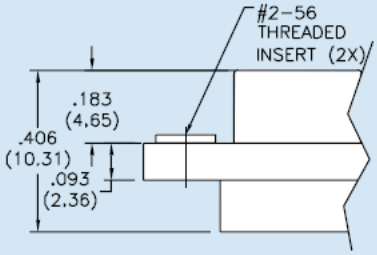
JS - #2-56 Jack Screw M83513/05-05



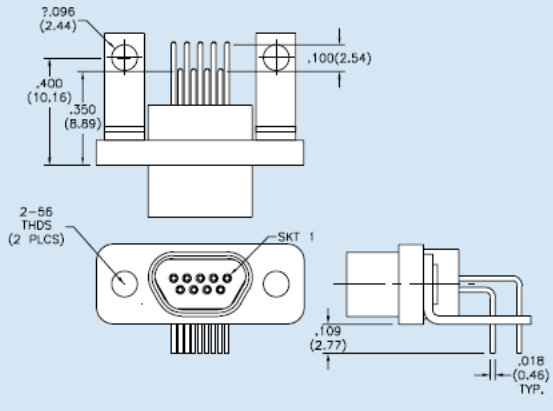
TI - Threaded Insert Receptacle



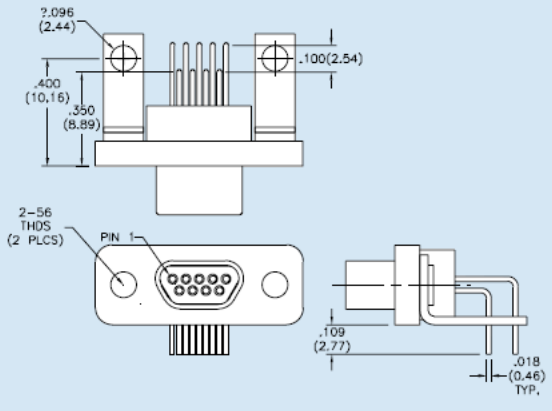
TI - Threaded Insert Plug



GB - Ground Bracket Receptacle



GB - Ground Bracket Plug



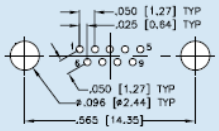
Micro D Series Filtered Connectors

Board and Panel Cutouts

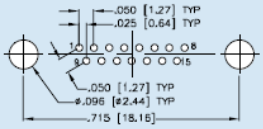
Vertical PCB Layouts

Pin Connector Shown

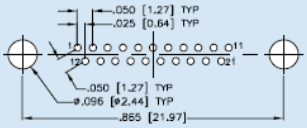
9 Contacts



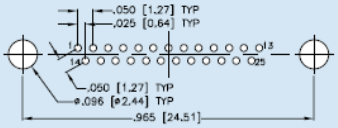
15 Contacts



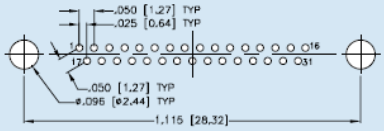
21 Contacts



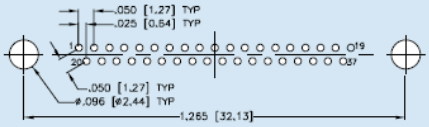
25 Contacts



31 Contacts



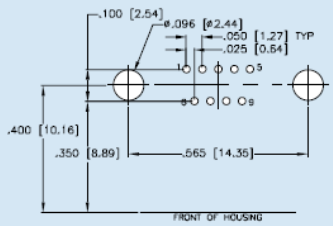
37 Contacts



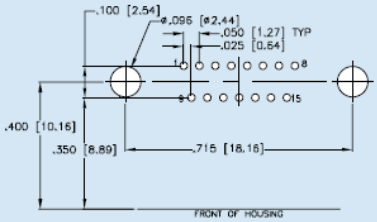
Right Angle PCB Layouts

Pin Connector Shown

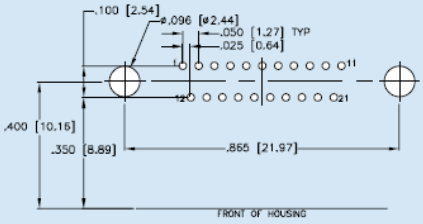
9 Contacts



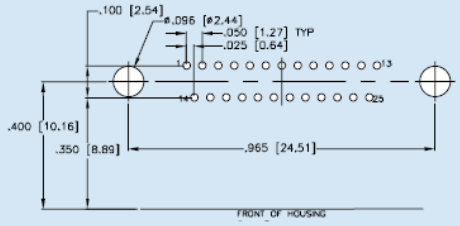
15 Contacts



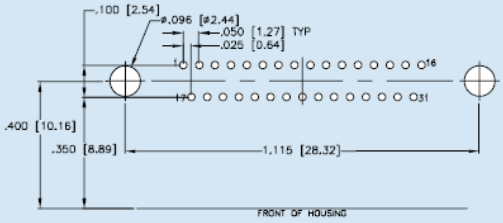
21 Contacts



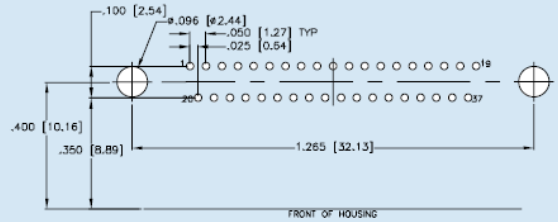
25 Contacts



31 Contacts



37 Contacts



NOTES: PC Tail Diameter 0.018 ±0.002 (0.46 ±0.05) Contact numbers shown are pin connector.

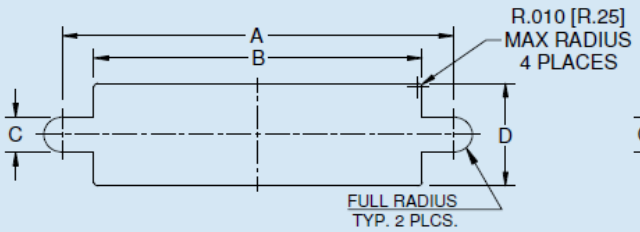
Reverse for socket. Patterns shown are for connector mounting side of PC board.

Micro D Series Filtered Connectors

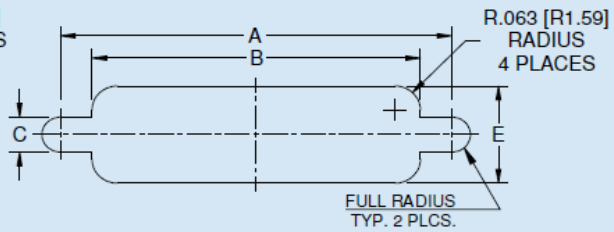
Board and Panel Cutouts

Panel Cutout

Front Panel Mount



Rear Panel Mount



Dimensions in inches *(mm)*

Layout	A ±0.003 (±0.08)	B ±0.002 (±0.05)	C ±0.002 (±0.05)	D ±0.002 (±0.05)	E ±0.005 (±0.13)
9	0.565 (14.35)	0.410 (10.41)	0.092 (2.34)	0.270 (6.86)	0.256 (6.50)
15	0.715 (18.16)	0.560 (14.22)	0.092 (2.34)	0.270 (6.86)	0.256 (6.50)
21	0.865 (21.97)	0.710 (18.03)	0.092 (2.34)	0.270 (6.86)	0.256 (6.50)
25	0.965 (24.51)	0.810 (20.57)	0.092 (2.34)	0.270 (6.86)	0.256 (6.50)
31	1.115 (28.32)	0.960 (24.38)	0.092 (2.34)	0.270 (6.86)	0.256 (6.50)
37	1.265 (32.13)	1.110 (28.19)	0.092 (2.34)	0.270 (6.86)	0.256 (6.50)

Custom Engineered Solutions

Despite the breadth of our filtered connector product line, there exist certain applications which demand a custom EMC solution. Our engineering staff will work with your design team to provide a custom filtered connector which meets your individual requirements Examples of custom projects are shown below.

Special Mounting Flanges

Housings can be designed to be integrated into the customer's equipment. The housings are constructed of machined materials or precision diecast zinc.

Value-added Assemblies

APITech's capabilities extend beyond just supplying filtered connectors. Additional operations such as sourcing and assembling flexible circuits, adding flying leads, or making connector to connector assemblies, all can be provided in conjunction with the filter connector.

Custom Filter Arrangements

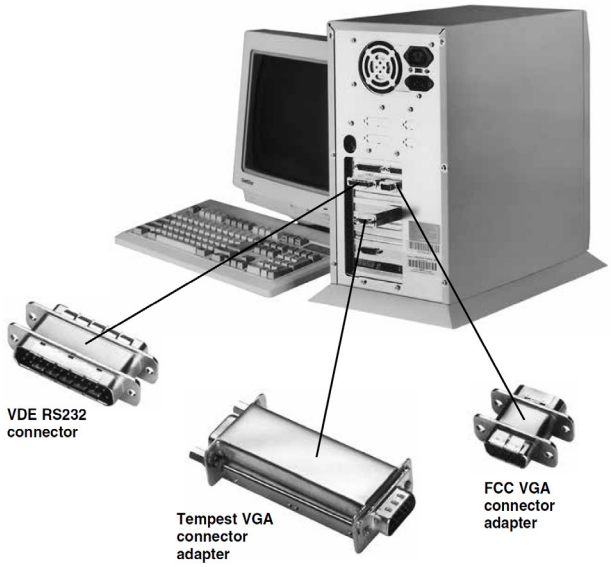
Complex filters involving unbalanced Pi types, LC types with large inductive components, special pin-in to pin-out translations, and overvoltage protective devices such as diodes and varistors can be packaged within the connector.

Other Connector Formats

Manufacturer specific connectors also can be filtered. Our involvement ranges from complete design to implementing minor modifications to include the addition of the filter components. Medical equipment and hand-held devices are examples of excellent applications for these connectors.

Special Mounting Flanges & Value-added

Custom Filter Arrangements & Connectors



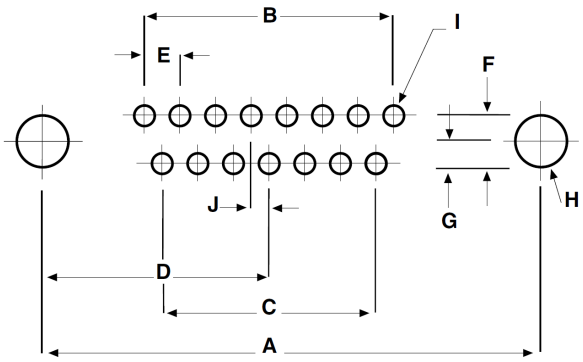
Filtered Connector Performance Specifications

Filtered D-subminiature connectors shown in this catalog have been designed and tested to the following test plan.

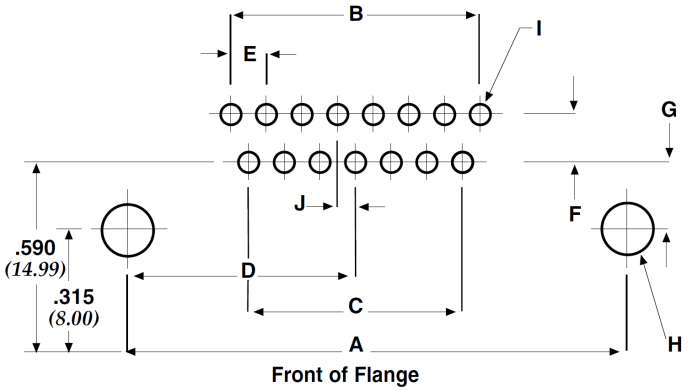
The information shown can be used as a basis for your filtered connector specifications. (Contact APITech for additional details.)

Test Group	Order of Test	Examination of Test	Test Method	Post Test Requirements
I	1	Visual and Mechanical Examination		In accordance with applicable requirements.
	2	Materials, Designs Construction and Workmanship		
	3	Physical Dimensions and Marking		
	4	Capacitance	MIL-STD-202 Method 305 1 KHz, 1VRMS max. 25°C	WIthin specified tolerance.
	5	Dielectric Withstanding Voltage	MIL-STD-202 Method 301	No breakdown or damage.
	6	Insulation Resistance	MIL-STD-202 Method 302, test condition at rated voltage	5000 megohm minimum.
	7	Insertion Loss	MIL-STD-220 No load	In accordance with applicable requirements.
II	1	Contact Engagement and Separation	MIL-C-24308, Para. 3.5.10	Maximum engagement force 18.0 oz., minimum separation force 0.7 oz.
	2	Mating and Unmating Force	MIL-C-24308, Para. 3.5.4	MIL-C-24308, Para. 3.5.4 Table II Limits: Shell size 1-5, class G only.
	3	Durability	MIL-C-24308, Para. 3.5.16, 4.7.18, except 100 cycles	MIL-C-24308, Para. 3.5.9 Contact resistance at 1 amp. 20 millohms max.
	4	Thermal Shock	MIL-STD-202 Method 107, Test condition B, -55°C to +125°C	No evidence of damage. Insulation resistance not less than 2500 megohms.
	5	Solderability	MIL-STD-202; Method 208, RMA-Flux	Terminals shall meet solderability requirements.
	6	Moisture Resistance	MIL-STD-202 Method 106, less step seven	Insulation resistance not less than 500 megohms. Meet dielectric withstanding voltage requirements.
	7	Resistance to Soldering Heat	MIL-STD-202 Method 210, Test condition D	Insulation resistance not less than 500 megohms. Meet dielectric withstanding voltage requirements.
III	1	Vibration	MIL-STD-202 Method 204, Test condition D, 100 mA, current	No interruption of current flow longer than 1 microsecond. Insulation resistance greater than 5000 megohms.
	2	Shock	MIL-STD-202 Method 213. Test Condition G, 100 mA, current	No interruptions of current flow longer than 1 microsecond.
				Contact resistance at 1 amp. 15 millohms max.
				Capacitance within specified limits.
				Insulation resistance greater than 2500 megohms.
	3	Mounting Inserts a. Prevailing torque (locking) b. Installation torque (locking) c. Push-out Force	IFI-100	a. 3 inch-pounds max. b. 6 inch-pounds without damage c. 10 pounds axial force without loosening insert
IV	1	Life	MIL-STD-202 Method 108, Test condition D, within 125% of rated voltage at the maximum operating temperature.	Filter shall meet all initial requirements except insulation resistance shall not be less than 500 megohms.

Board & Panel Cutouts



Printed Circuit
Vertical Board Mount (standard density)



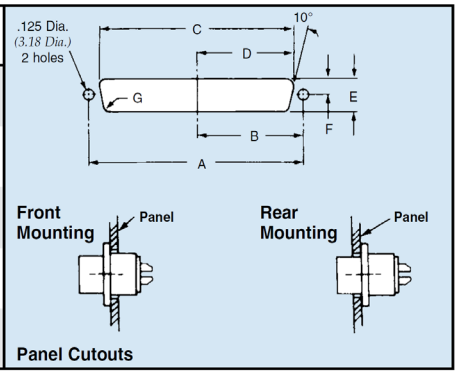
Printed Circuit
Vertical Board Mount (standard density)

Board Layout (Pin and Socket Contact) for Standard D-Sub Connectors

Shell Size	A	B	C	D	E	F	G	H	I (Dia.)	J
9 (0)	.984 (25.00)	.436 = 4 x .109 (11.07) (2.77)	.327 = 3 x .109 (8.31) (2.77)	.492 (12.50)	.109 (2.77)	.112 (2.84)	PCB Mount .056 (1.42)	.125 (3.18)	.045 (1.14)	.054 (1.37)
15 (1)	1.312 (33.32)	.763 = 7 x .109 (19.38) (2.77)	.654 = 6 x .109 (16.61) (2.77)	.656 (16.66)						
25 (2)	1.852 (47.04)	1.308 = 12 x .109 (33.22) (2.77)	1.199 = 11 x .109 (30.45) (2.77)	.926 (23.52)			PCB Mount Rt Angle .275 (6.99)			
37 (3)	2.500 (63.50)	1.962 = 18 x .109 (49.83) (2.77)	1.853 = 17 x .109 (47.07) (2.77)	1.250 (31.75)			0.112 2 rows			
50 (4)	2.406 (61.11)	1.744 = 16 x .109 (44.30) (2.77) 2 rows	1.635 = 15 x .109 (41.35) (2.77) 1 row	1.203 (30.56)			0.00 1 row			

Panel Cutouts (Front or Rear Mounting) for Standard and High-Density D-Sub Connectors

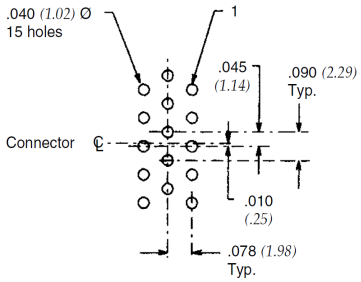
Shell Size	A ±.015 (.38)	B ±.015 (.38)	C ±.015 (.38)	D ±.015 (.38)	E ±.003 (.08)	F ±.005 (.13)	G ±.002 (.05)
9 (0)	.984 (24.99)	.492 (12.49)	.777 (19.74)	.388 (9.87)	.440 (11.18)	.220 (5.59)	.150 (3.81)
15 (1)	1.312 (33.32)	.656 (16.66)	1.105 (28.07)	.552 (14.03)	.440 (11.18)	.220 (5.59)	.150 (3.81)
25 (2)	1.852 (47.04)	.926 (23.52)	1.645 (41.78)	.822 (20.89)	.440 (11.18)	.220 (5.59)	.150 (3.81)
37 (3)	2.500 (63.50)	1.250 (31.75)	2.293 (58.24)	1.146 (29.12)	.440 (11.18)	.220 (5.59)	.150 (3.81)
50 (4)	2.406 (61.11)	1.203 (30.55)	2.190 (55.63)	1.095 (27.81)	.550 (13.97)	.275 (6.98)	.150 (3.81)



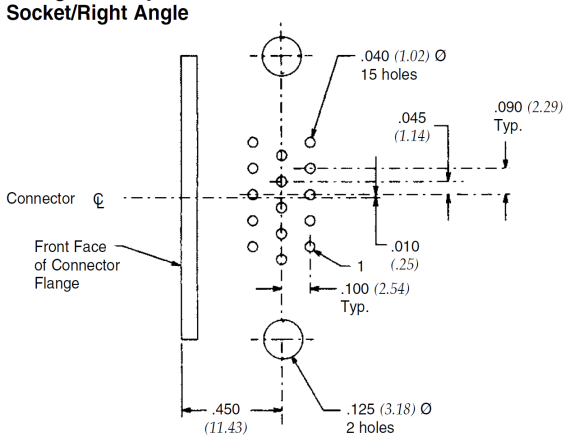
Dimensions in inches (mm)

Board & Panel Cutouts

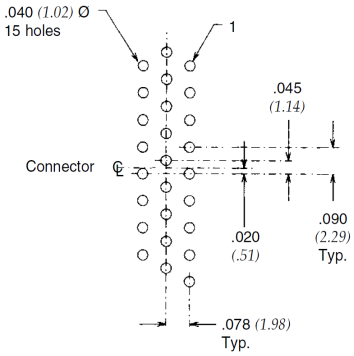
15 High-Density Pin/PCB



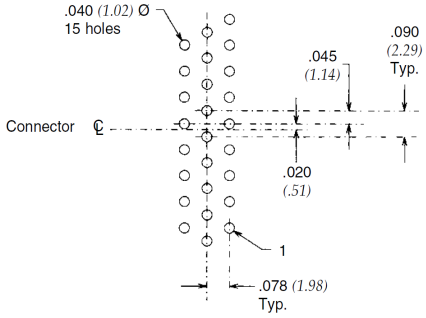
15 High-Density Socket/Right Angle



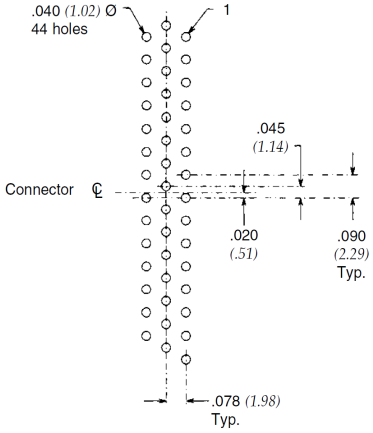
26 High-Density Pin/PCB



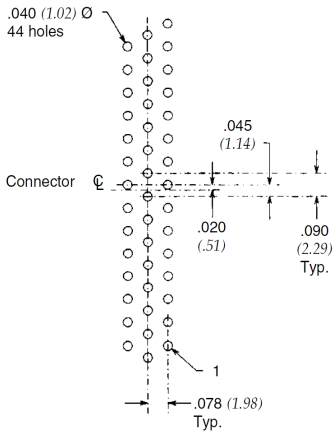
26 High-Density Socket/PCB



44 High-Density Pin/PCB



44 High-Density Socket/PCB



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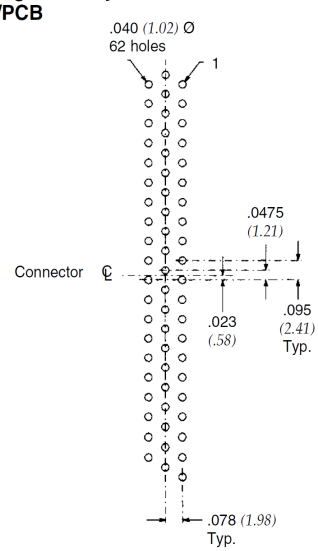
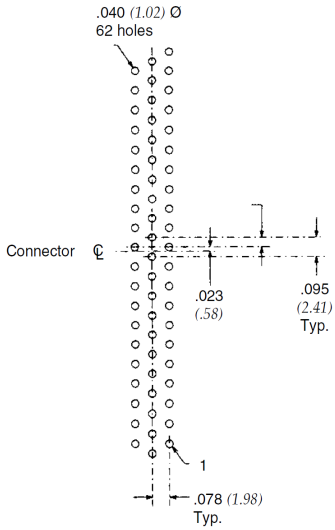
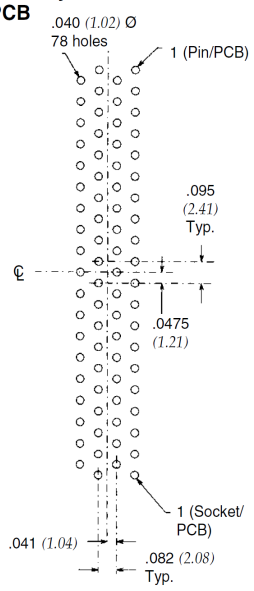


62 High-Density Socket/PCB



78 High-Density Socket/PCB Pin/PCB



Dimensions in inches (mm)