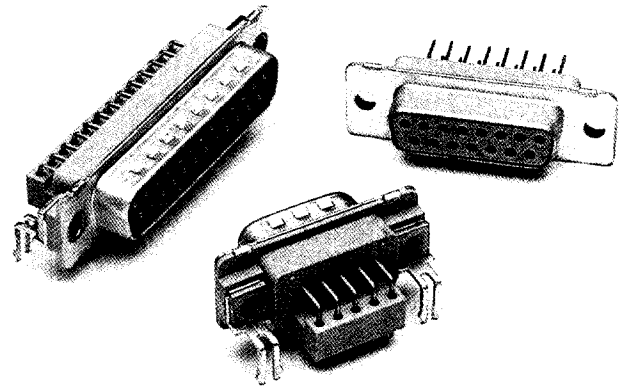




# Series 500 Low Profile Filtered Connectors



Spectrum Control'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-sub 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.

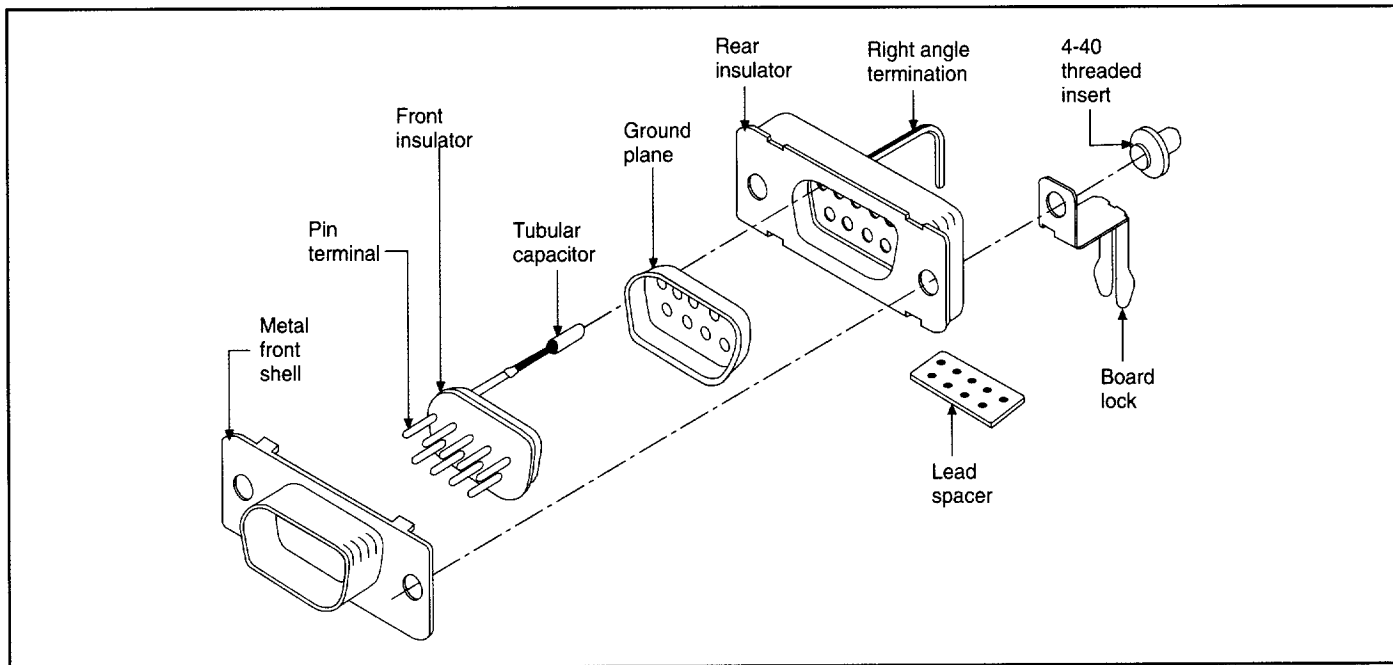
## Series 500 Applications

- 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 feed-thru 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-VO flammability rated
- 9, 15 and 25 shell sizes
- Available with board lock feature and 4-40 mounting threads
- Selective filtering available
- UL/CSA approval pending
- 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 D-Subminiature Filtered Connectors





# Series 500 Low Profile Filtered Connectors

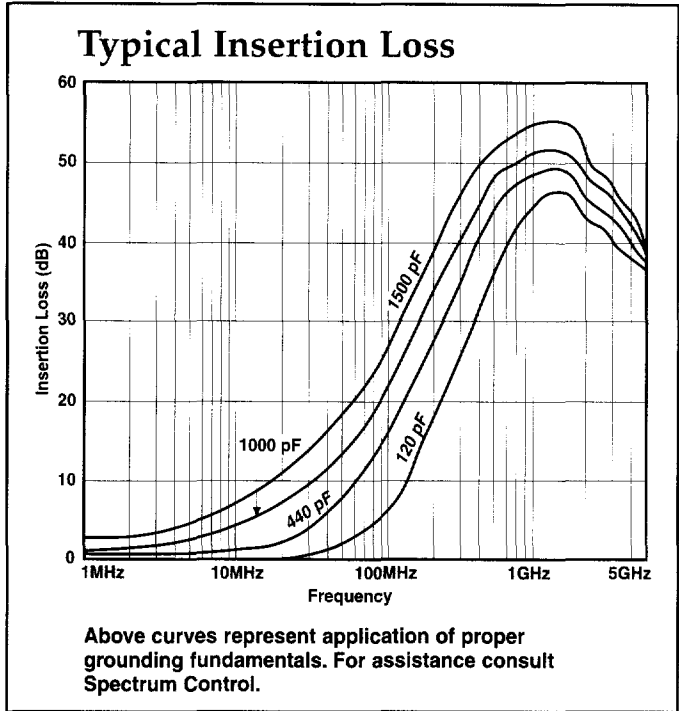
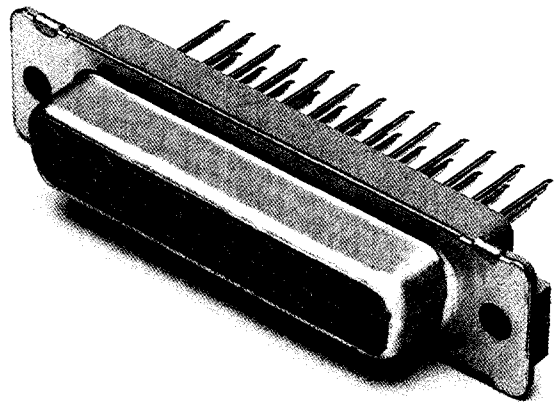
## Mechanical Specifications

- Shell . . . . . Steel, tin plated
- Insulators . . . . . Glass-filled polyester, flammability UL94V-O
- Pin Contacts . . . . . Copper alloy CA725, 15 microinch (0.38 mm) gold plated\* over nickel
- Socket Contacts . . . . . Copper alloy CA725, 30 microinch (0.76 mm) 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 162.

## Electrical Specifications

- Current Rating . . . . . 5 Amps
- RF 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.

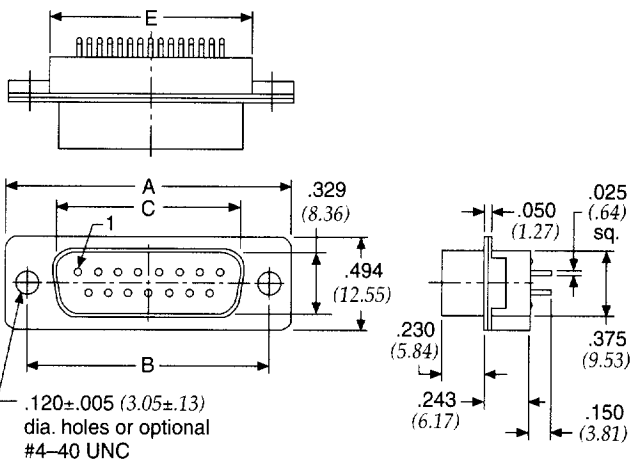
Series 500 Low Profile D-Subminiature Filtered Connectors



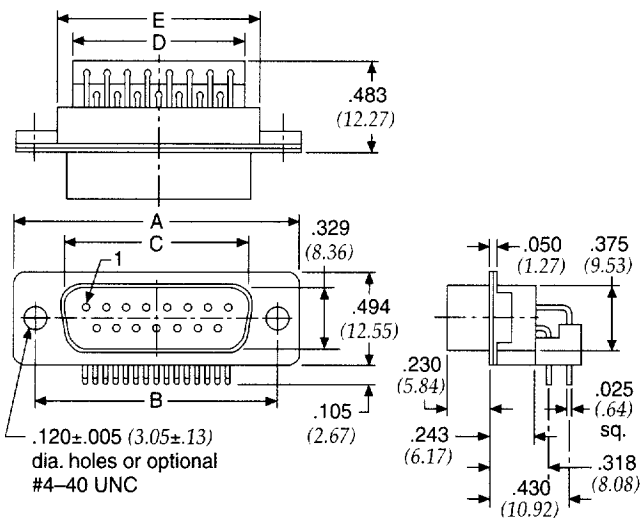
# Series 500 Low Profile Filtered Connectors

Series 500 Low Profile D-Subminiature Filtered Connectors

## Pin Contact (plug) Straight PC Mount



## 90° PC Mount

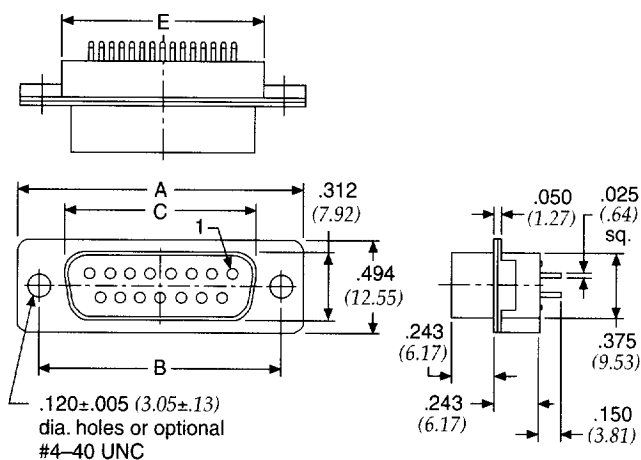


Size	A	B	C	D	E
9	1.213 (30.81)	0.984 (24.99)	0.666 (16.92)	0.540 (13.72)	0.748 (19.00)
15	1.541 (39.14)	1.312 (33.32)	0.994 (25.25)	0.867 (22.02)	1.076 (27.33)
25	2.088 (53.04)	1.852 (47.04)	1.534 (38.96)	1.412 (35.86)	1.616 (41.05)

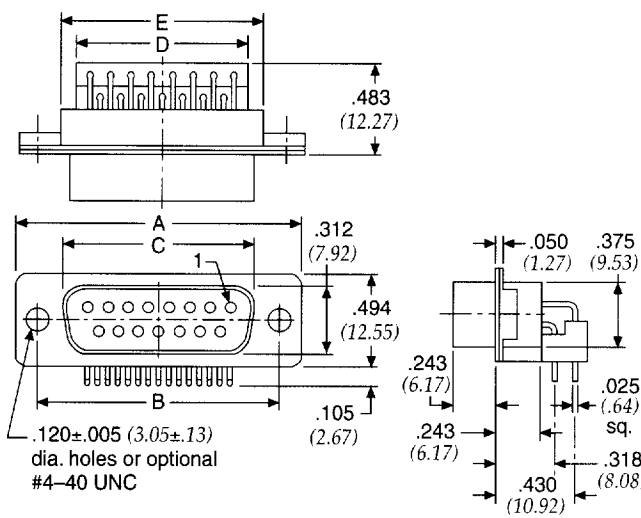
Standard Tolerance = ±.015 (0.38)

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** - Series 500 Connectors

**5** - Filtered D-sub Connectors

**2** - Shell Size/Number of Contacts

**4** - Contact Type/Termination

**013** - Capacitance Value

**GBL** - Mounting or Hardware Options

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 Spectrum Control engineering.

**Capacitance Value**

010 - 120 pF

011 - 440 pF

012 - 840 pF

013 - 1000 pF

014 - 1500 pF

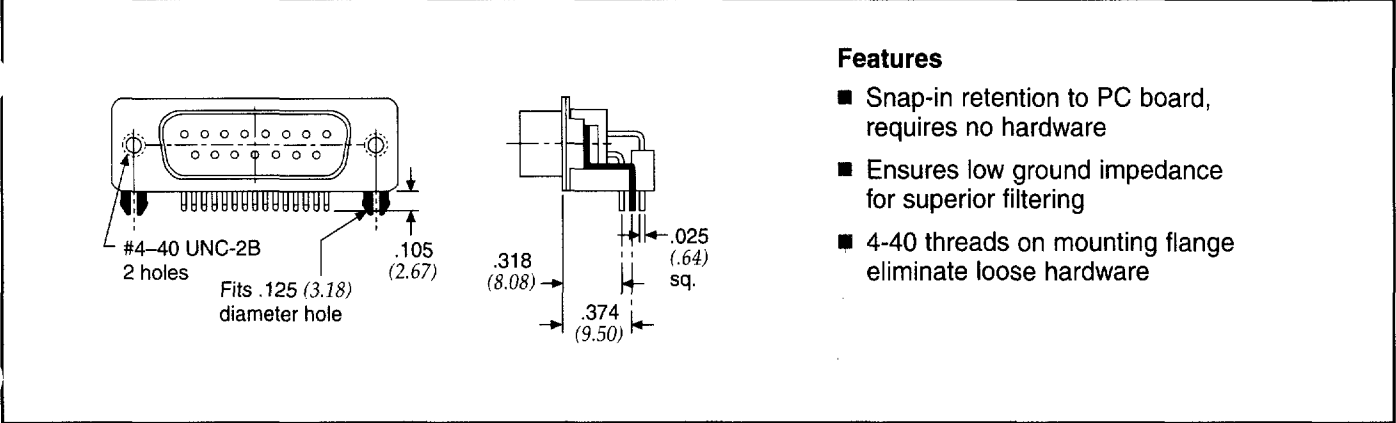
**Mounting or Hardware Options**

**TI** - 4-40 threads on mounting flange (.120" (3.05mm) 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)

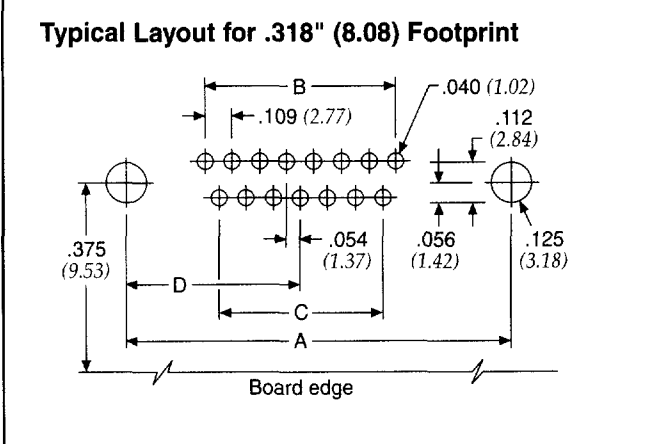
## GBL Option



**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

## Board Layout



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)

Dimensions in inches (mm)

Series 500 Low Profile D-Subminiature Filtered Connectors



# Series 600 Hi-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, Spectrum Control has developed a line of filtered Hi-Density D-subminiature connectors. This new line of connectors incorporates the high performance and reliable filtering of Spectrum's standard D-subs in the Hi-Density format.

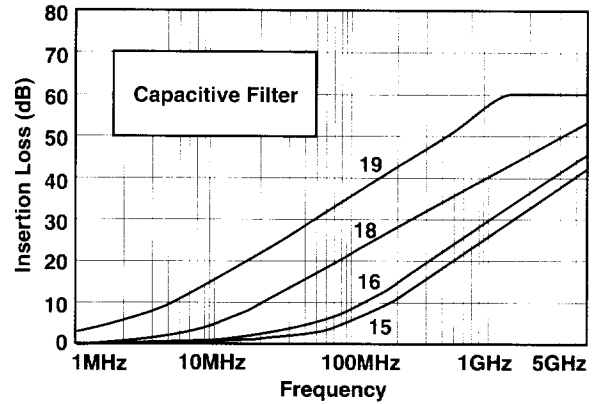
## Features

- Connectors designed to MIL-C-24308
- Capacitance values from 75 pF to 4000 pF
- Filter type feed-thru C
- Selectively specify and filter each contact position
- Available in feed-thru capacitive configurations

## Mechanical Specifications:

Same as Series 700 connectors, page 115.

## Typical Insertion Loss



Above curves represent application of proper grounding fundamentals, for assistance consult with Spectrum Control.

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

## Electrical Specifications: Hi-Density Connectors

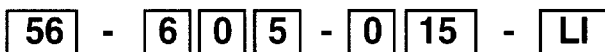
Filter Designations	Filter Circuits	Capacitance		3 dB Cut-off Frequency Max. (MHz)	Dielectric With-standing Voltage	Working Voltage DC -55°C to +125°C	Minimum Insertion Loss - Decibels (dB)									
		Value	Tol.				5 MHz	10 MHz	20 MHz	50 MHz	100 MHz	200 MHz	500 MHz	1 GHz	2 GHz	5 GHz
15	C	85 pF	±25%	60	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.

## Ordering Information

Example: 56-605-015-LI



<b>D-Sub Connector</b>	<b>Shell Size**</b>	<b>Contact/Termination</b>	<b>Special</b>	<b>Filter Designation</b>	<b>Options</b>
Hi-Density	0 = 15 1 = 25 2 = 44 3 = 62 4 = 78	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	0 = All positions same 9 = Special loading  Some shell sizes require minimum order quantity. Consult Spectrum Control for details.	15 - 85 pF FT 16 - 180 pF FT 18 - 1,000 pF FT 19 - 4,000 pF FT 20 - Insulated contact	LI = 4-40 inserts S = Solder dip tails 50G = μ gold

This part number represents a Series 600 Hi-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.