

## Series 500 Low Profile Filtered Connectors

API's Spectrum Control brand of 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 for 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.

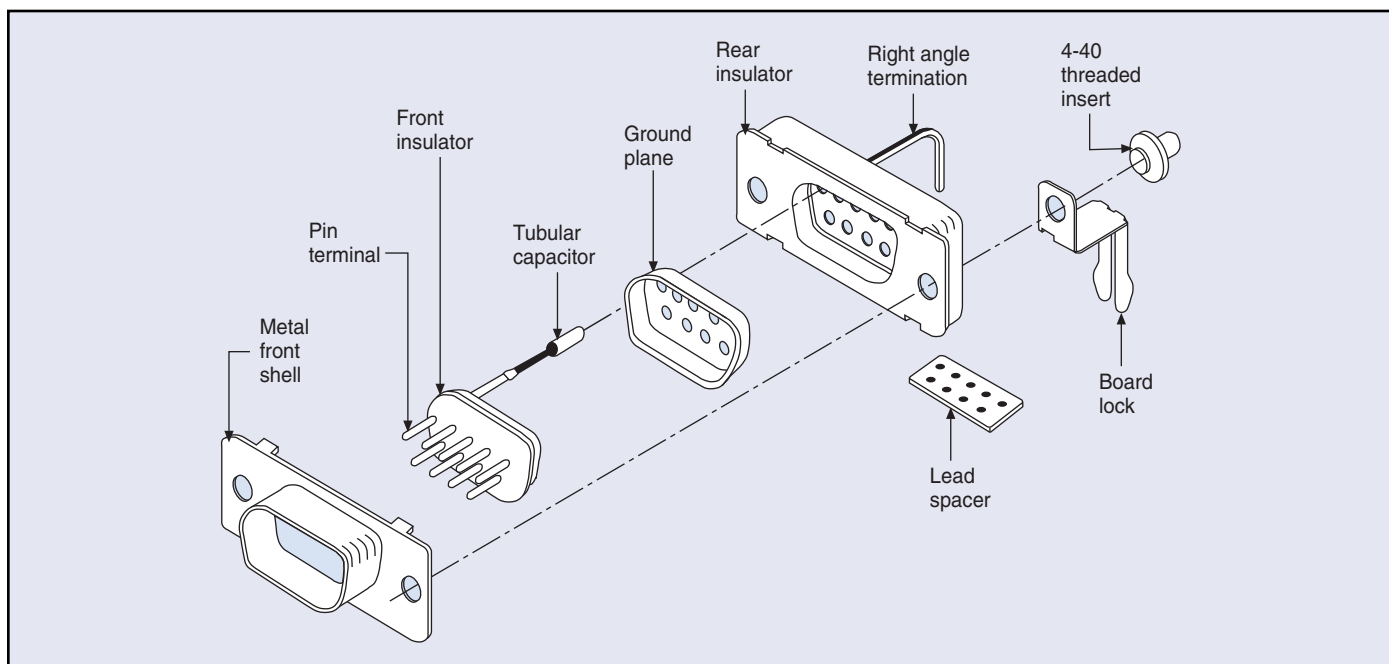
### Series 500 Applications

- 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-through 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

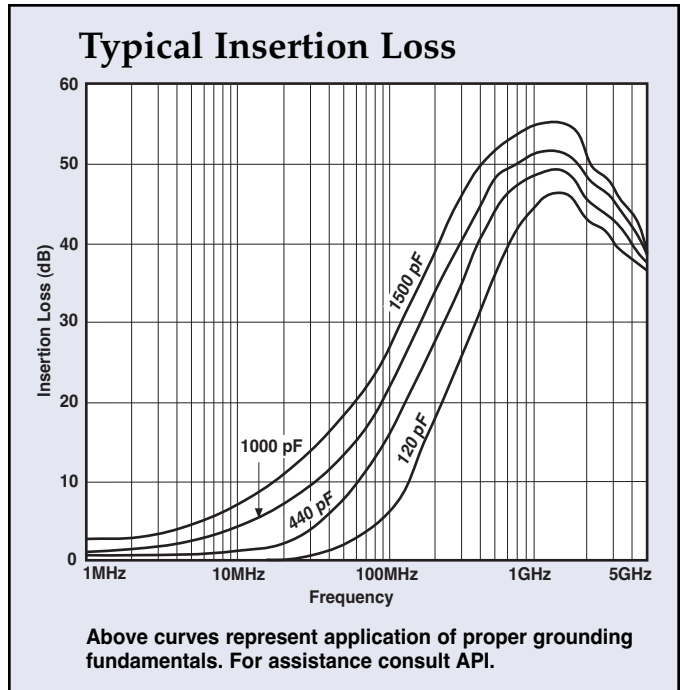
## Mechanical Specifications

- Shell . . . . . Steel, tin plated
- Insulators . . . . . Glass-filled polyester, flammability UL94V-O
- Pin Contacts . . . . . Copper alloy CA725, 15 microinch (0.38  $\mu\text{m}$ ) gold plated\* over nickel
- Socket Contacts . . . . . Copper alloy CA725, 30 microinch (0.76  $\mu\text{m}$ ) 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 FC81.

## Electrical Specifications

- Current Rating . . . . . 5 Amps
- RF Current Rating . . . . . 0.3 Amps
- Contact Resistance . . . . . 10 milliohms maximum
- Capacitance . . . . . 120, 440, 840, 1000, 1500 pF  $\pm 30\%$
- 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.

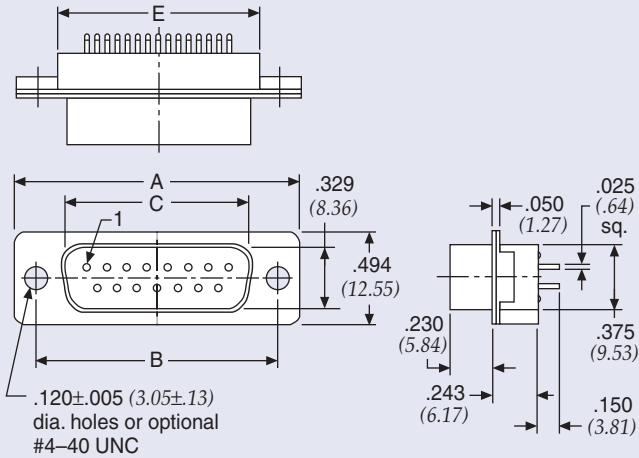
## Filter Performance

| Cap. (pF) Value $\pm 30\%$ | 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    |

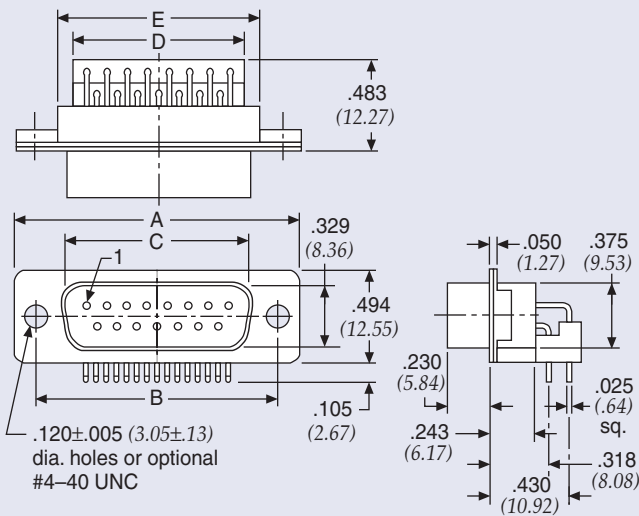
Insertion loss measured per MIL-STD-220, no load, 50 ohm source and load. Above data represents guaranteed minimum.

# Series 500 Low Profile Filtered Connectors

## Pin Contact (*plug*) Straight PC Mount



## 90° PC Mount

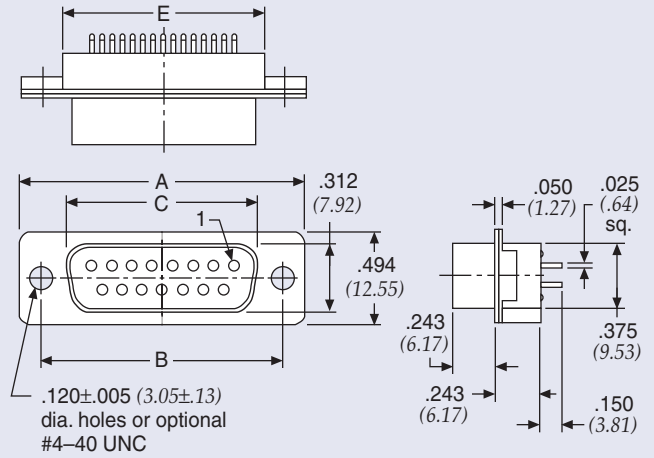


| Size | A                | B                | C                | D                | E                |
|------|------------------|------------------|------------------|------------------|------------------|
| 9    | 1.213<br>(30.81) | 0.984<br>(24.99) | 0.666<br>(16.92) | 0.540<br>(13.72) | 0.748<br>(19.00)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

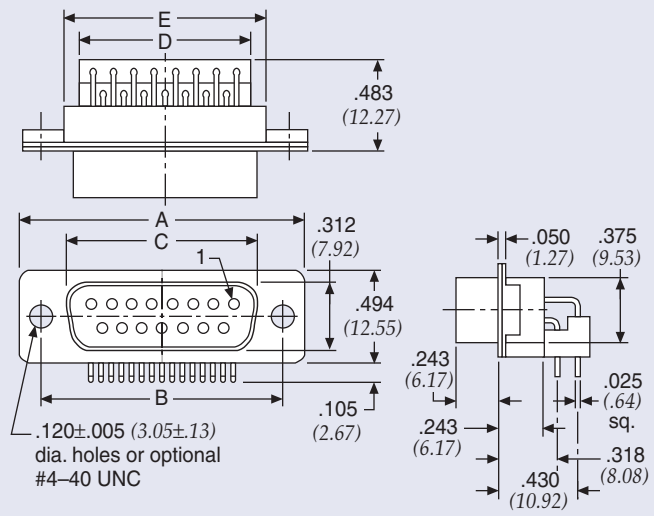
Standard Tolerance = ±.015 (0.38)

Dimensions in inches (mm)

## Socket Contact (*receptacle*) Straight PC Mount



## 90° PC Mount



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

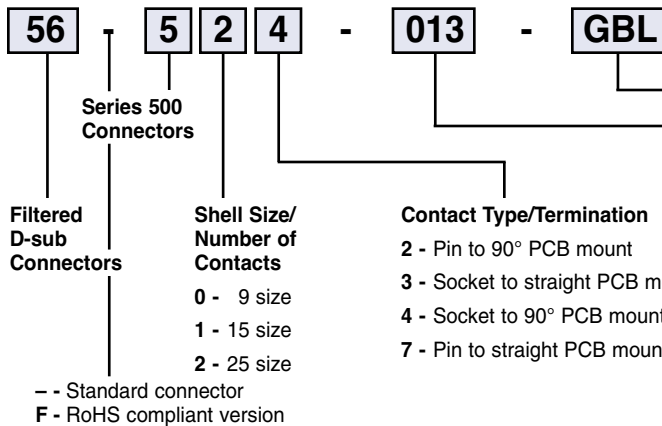
Standard Tolerance = ±.015 (0.38)

Dimensions in inches (mm)

# Series 500 Low Profile Filtered Connectors

## Ordering Information

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



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 API 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

Dimensions in inches (mm)

## Board Layout

| Typical Layout for .318" (8.08) Footprint |           | Shell Size       | A  | B  | C               | D |
|---|-----------|------------------|--|--|-----------------|---|
|   | <b>9</b>  | .984<br>(24.99)  | .436 = 4 x .109<br>(11.07 = 4 x 2.77)    | .327 = 3 x .109<br>(8.31 = 3 x 2.77)     | .492<br>(12.50) |   |
|   | <b>15</b> | 1.312<br>(33.32) | .763 = 7 x .109<br>(19.38 = 7 x 2.77)    | .654 = 6 x .109<br>(16.61 = 6 x 2.77)    | .656<br>(16.66) |   |
|   | <b>25</b> | 1.852<br>(47.04) | 1.308 = 12 x .109<br>(33.22 = 12 x 2.77) | 1.199 = 11 x .109<br>(30.45 = 11 x 2.77) | .926<br>(23.52) |   |

Dimensions in inches (mm)

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