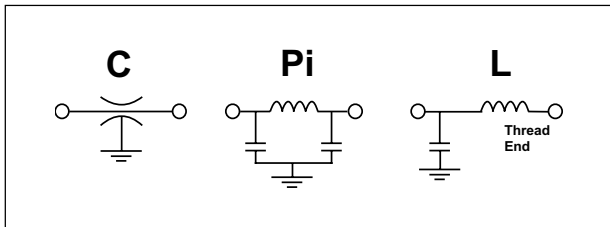


## Manufacturing

CTS utilizes more than 120,000 square feet (11,150 square meters) of manufacturing space, dedicated to providing high quality EMI/RFI products.

In addition to the standard catalog items, CTS has numerous variations of these designs and can custom design a part to meet your particular specifications. CTS maintains a staff of highly skilled Customer Engineers to assist our customers in the design of custom products.

## Circuits Available in this Catalog



## Quality Objective

The timely delivery of quality products which exceed our customers' expectations through the use of effective teamwork and the process of continuous improvement.

## Meeting Customer Requirements

CTS is devoted to bringing the company's broad product line to an ever expanding world market.

CTS has more than five decades of efficient manufacturing expertise in its corporate heritage, and utilizes sophisticated equipment to provide customers with attractive pricing and full value for the products they purchase.



## Quality

Quality is the key ingredient in all our products with approval to MIL-PRF-15733, MIL-PRF-81 and MIL-C-11015. CTS maintains a fully approved Quality Assurance laboratory and relies heavily on Statistical Process Control to monitor critical operations.

The products listed in this catalog are only a few of the thousands of variations that CTS produces. For custom component design, please contact the factory direct.  
component design, please contact the factory direct.

## Providing Excellence in EMI/RFI Filtering Components...

**CTS** manufactures thousands of EMC

Products featuring  
an extensive line of EMI/RFI  
Filters and Capacitors.

We combine Technology,  
Expertise, Versatility and  
Innovation to produce the  
industry's most complete line  
of ceramic EMI/RFI Filters.

CTS draws upon its 50+  
years of manufacturing  
expertise and an accumu-  
lated base of ceramic dielec-  
tric technology to provide an  
ever expanding line of EMI/  
RFI Filters and Capacitors.

CTS products not only set  
the industry standard but lead the way in the develop-  
ment of tomorrow's EMI Technology.



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### How to use this Catalog

This Catalog identifies standard parts produced by CTS. Part numbers are listed in sections by mounting style (Solder Mount or Bushing Mount). Bushing parts are listed by circuit configuration and arranged in ascending order with respect to voltage rating at 125°C and then capacitance value.

### FILTERS

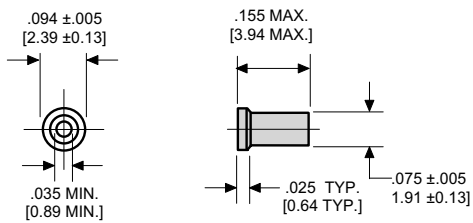
Filters are assigned a four digit style number followed by a three digit variation number. (Example: 4100-003)

### FEED-THRU CAPACITORS

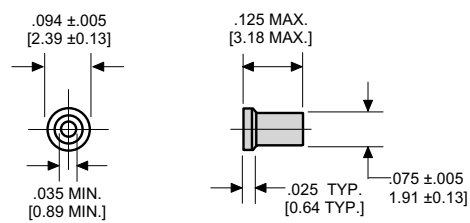
Feed-thru capacitors are assigned a three or four digit style number followed by a three digit variation number, then the EIA Code for temperature characteristic, capacitance and tolerance. (Example: 2482-012-X5U0-272M)

For additional EIA Codes and Tolerances, please see page 25.

# Solder Mount Feed-Thru Capacitors

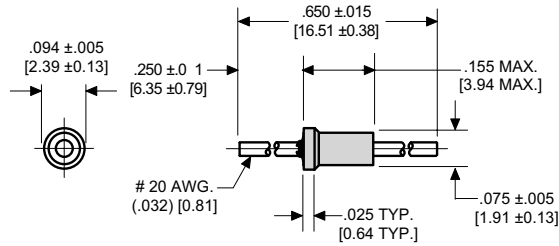


**STYLE 1**

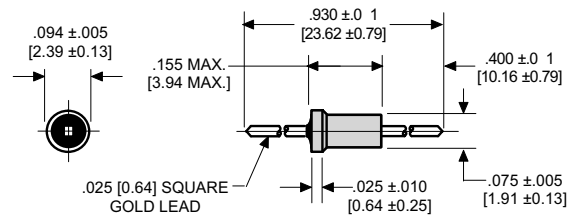


**STYLE 2**

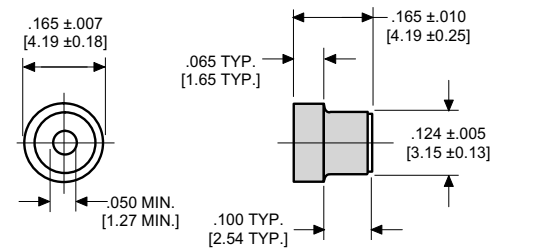
inches  
[mm]



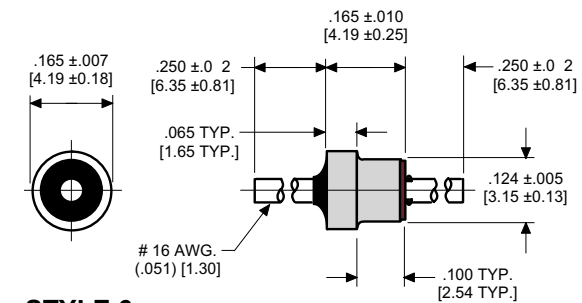
**STYLE 3**



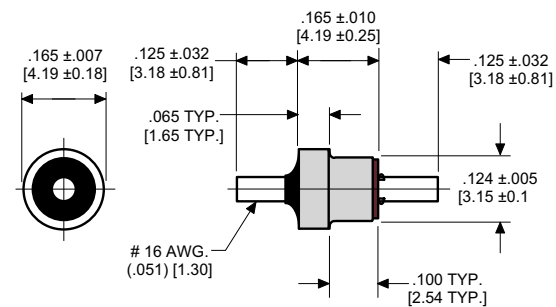
**STYLE 4**



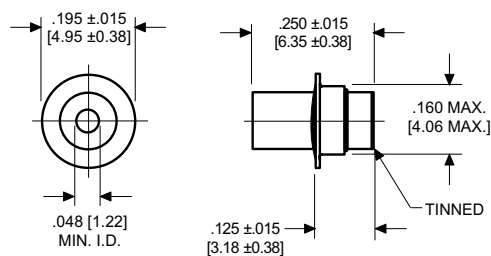
**STYLE 5**



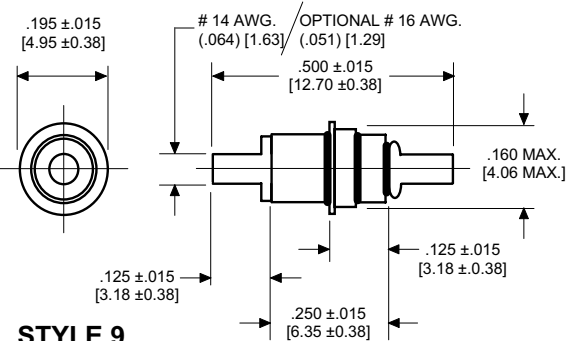
**STYLE 6**



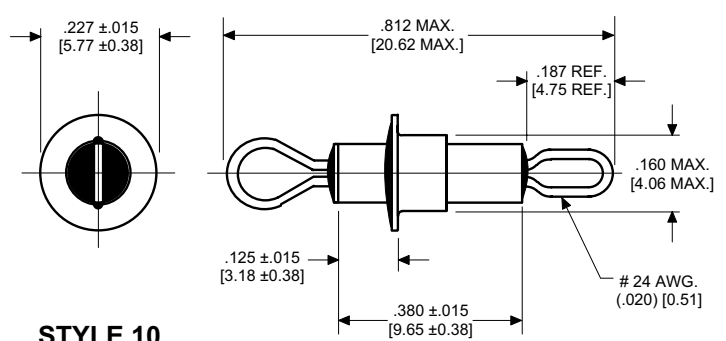
**STYLE 7**



**STYLE 8**



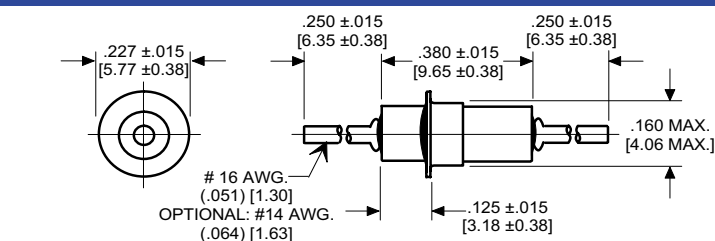
**STYLE 9**



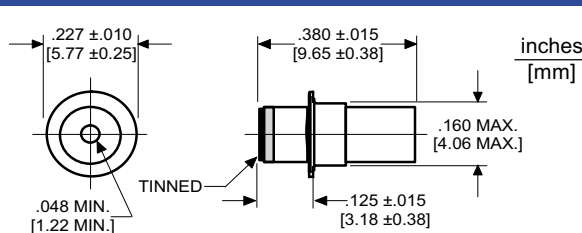
**STYLE 10**

The products listed in this catalog are only a few of the thousands of variations that CTS produces. For custom component design, please contact the factory direct.

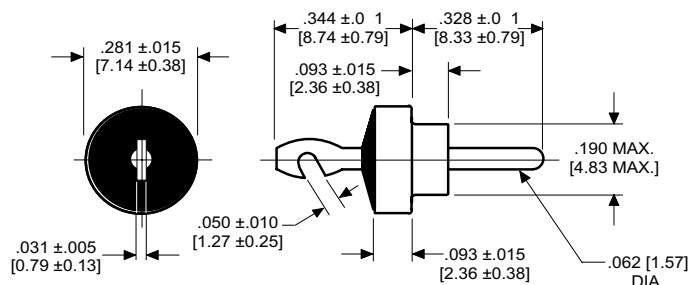
## Solder Mount Feed-Thru Capacitors



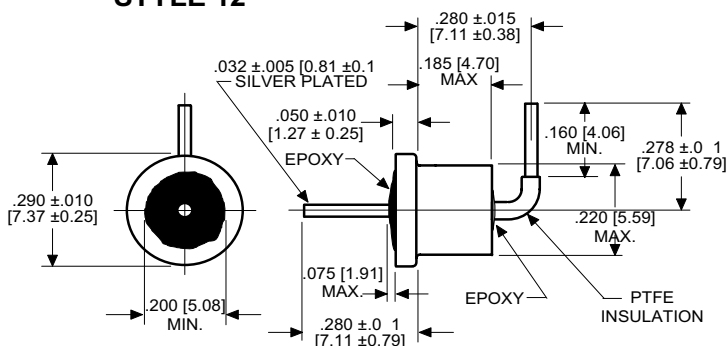
**STYLE 11**



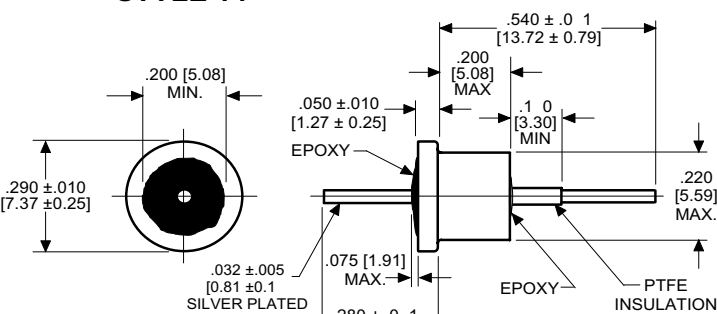
**STYLE 12**



**STYLE 13**



**STYLE 14**



**STYLE 15**

Drawings not to scale.

| Series Number | Temperature Range | WVDC  | MAX. CAP. Nominal (pF) |
|---------------|-------------------|-------|------------------------|
| 2404          | Z5, Y5, X5        | 500   | 7000                   |
|               | X7                | 250   | 7000                   |
| 2482          | Z5, Y5, X5        | 300   | 4000                   |
|               | X7                | 150   | 4000                   |
| 2450          | Z5, Y5, X5        | 500   | 1800                   |
|               | X7                | 250   | 1800                   |
| 2461          | Z5, Y5, X5        | 200   | 1000                   |
|               | X7                | 100   | 1000                   |
| 2463          | Z5, Y5, X5        | 200   | 2000                   |
|               | X7                | 100   | 2000                   |
| 2470          | Z5, Y5, X5        | 250AC | 2000                   |

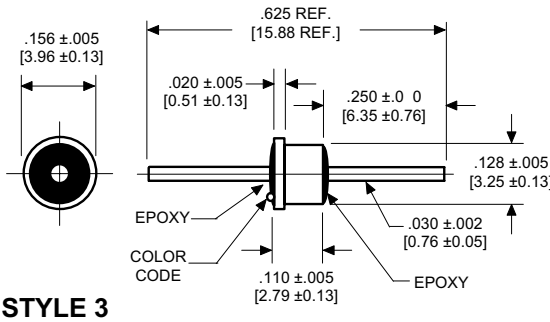
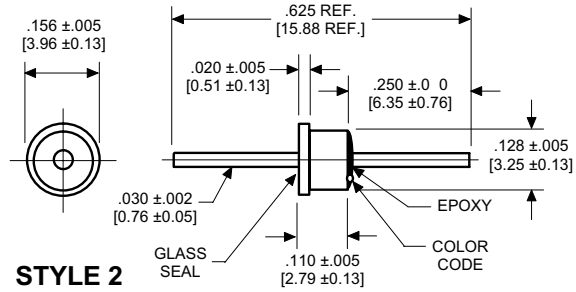
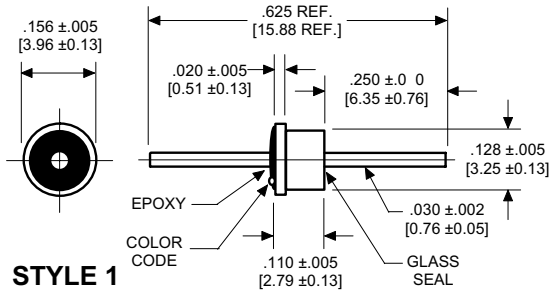
Please see temperature Characteristics and EIA Codes on page 25.

●UL Recognized to UL standard 1283; UL File No. E201344

| TUSONIX<br>Part<br>Number | Style | Notes | Circuit | Working<br>Voltage<br>(dc) |       | Capacitance<br>(pF) | Capacitance<br>Tolerance | Current<br>(A) | Typical No-Load Insertion Loss<br>(dB) at 25°C per MIL-Std-220 |       |        |      |       |  |
|---------------------------|-------|-------|---------|----------------------------|-------|---------------------|--------------------------|----------------|----------------------------------------------------------------|-------|--------|------|-------|--|
|                           |       |       |         | 85°C                       | 125°C |                     |                          |                | 1MHz                                                           | 10MHz | 100MHz | 1GHz | 10GHz |  |
|                           |       |       |         |                            |       |                     |                          |                |                                                                |       |        |      |       |  |
| C Configuration           |       |       |         |                            |       |                     |                          |                |                                                                |       |        |      |       |  |
| 2463-001-X5S0-471M        | 2     | --    | C       | 200                        | --    | 470                 | ±20%                     | --             | --                                                             | --    | 12     | 27   | 27    |  |
| 2463-002-X5S0-471M        | 3     | --    | C       | 200                        | --    | 470                 | ±20%                     | 10             | --                                                             | --    | 12     | 27   | 27    |  |
| 2463-003-X5U0-471P        | 4     | --    | C       | 200                        | --    | 470                 | +100-0%                  | 10             | --                                                             | --    | 12     | 27   | 27    |  |
| 2461-000-X7V0-102P        | 5     | --    | C       | --                         | 100   | 1000                | +100-0%                  | --             | --                                                             | 3     | 20     | 35   | 40    |  |
| 2461-001-X7V0-102AA       | 6     | --    | C       | --                         | 100   | 1000                | GMV                      | 20             | --                                                             | 3     | 20     | 35   | 40    |  |
| 2461-002-X7V0-102M        | 7     | --    | C       | --                         | 100   | 1000                | ±20%                     | 20             | --                                                             | 3     | 20     | 35   | 40    |  |
| 2463-000-X7U0-152P        | 1     | --    | C       | --                         | 100   | 1500                | +100-0%                  | --             | --                                                             | 5     | 22     | 35   | 40    |  |
| 2463-002-X5U0-152P        | 3     | --    | C       | 200                        | --    | 1500                | +100-0%                  | 10             | --                                                             | 5     | 22     | 35   | 40    |  |
| 2463-003-X5U0-152P        | 4     | --    | C       | 200                        | --    | 1500                | +100-0%                  | 10             | --                                                             | 5     | 22     | 35   | 40    |  |
| 2482-001-X5U0-471M        | 9     | --    | C       | 300                        | --    | 470                 | ±20%                     | 20             | --                                                             | --    | 12     | 27   | 27    |  |
| 2482-012-X5U0-102M        | 8     | --    | C       | 300                        | --    | 1000                | ±20%                     | --             | --                                                             | 3     | 20     | 35   | 40    |  |
| 2482-001-X5U0-102M        | 9     | --    | C       | 300                        | --    | 1000                | ±20%                     | 20             | --                                                             | 3     | 20     | 35   | 40    |  |
| 2450-001-X5R0-101K        | 13    | --    | C       | 500                        | --    | 100                 | ±10%                     | 20             | --                                                             | --    | 3      | 20   | 28    |  |
| 2450-001-X5R0-471M        | 13    | --    | C       | 500                        | --    | 470                 | ±20%                     | 20             | --                                                             | --    | 12     | 27   | 27    |  |
| 2404-000-X7R0-471M        | 11    | --    | C       | --                         | 250   | 470                 | ±20%                     | 20             | --                                                             | --    | 12     | 27   | 27    |  |
| 2450-001-X5U0-102P        | 13    | --    | C       | 500                        | --    | 1000                | +100-0%                  | 20             | --                                                             | 3     | 20     | 35   | 40    |  |
| 2404-000-X5U0-102P        | 11    | --    | C       | 500                        | --    | 1000                | +100-0%                  | 20             | --                                                             | 3     | 20     | 35   | 40    |  |
| 2404-014-X5U0-102P        | 12    | --    | C       | 500                        | --    | 1000                | +100-0%                  | --             | --                                                             | 3     | 20     | 35   | 40    |  |
| 2404-014-X5W0-502M        | 12    | --    | C       | 500                        | --    | 5000                | ±20%                     | --             | --                                                             | 15    | 30     | 45   | 50    |  |
| 2404-000-X5W0-502Z        | 11    | --    | C       | 500                        | --    | 5000                | +80-20%                  | 20             | --                                                             | 15    | 30     | 45   | 50    |  |
| 2404-007-X5W0-502Z        | 10    | --    | C       | 500                        | --    | 5000                | +80-20%                  | 15             | --                                                             | 15    | 30     | 45   | 50    |  |
| 2470-500●                 | 14    | --    | C       | 250AC                      | --    | 1000                | +100-0%                  | 10             | --                                                             | 3     | 20     | 35   | 40    |  |
| 2470-501●                 | 15    | --    | C       | 250AC                      | --    | 1000                | +100-0%                  | 10             | --                                                             | 3     | 20     | 35   | 40    |  |

## Solder Mount C Filters

### 4300 Series Miniature EMI Filter MICROWAVE APPLICATIONS:



- Oscillators
- Attenuators
- Low Noise Amplifiers
- Microwave Filters

inches  
[mm]

| TUSONIX<br>Part<br>Number | Style | Circuit | Working<br>Voltage<br>(dc)                     |       | Capacitance<br>(pF) | Capacitance<br>Tolerance | Current<br>(A) | Minimum No-Load Insertion Loss<br>(dB) at 25°C per MIL-Std-220 |       |        |      |       | Color<br>Code |
|---------------------------|-------|---------|------------------------------------------------|-------|---------------------|--------------------------|----------------|----------------------------------------------------------------|-------|--------|------|-------|---------------|
|                           |       |         | 85°C                                           | 125°C |                     |                          |                | 1MHz                                                           | 10MHz | 100MHz | 1GHz | 10GHz |               |
|                           |       |         | Epoxy Sealed Top (flange)/ Glass Sealed Bottom |       |                     |                          |                |                                                                |       |        |      |       |               |
| 4300-005                  | 1     | C       | 70                                             | 50    | 10,000              | GMV                      | 5              | 4                                                              | 21    | 35     | 50   | 60    | BLACK         |
| 4300-055                  | 1     | C       | 70                                             | 50    | 10,000              | ±20%                     | 5              | 4                                                              | 21    | 35     | 50   | 60    | BLK-GOLD      |
| 4300-006                  | 1     | C       | 70                                             | 50    | 15,000              | GMV                      | 5              | 7                                                              | 20    | 35     | 55   | 60    | ORANGE        |
| 4300-013                  | 1     | C       | 70                                             | 50    | 27,000              | GMV                      | 5              | 10                                                             | 28    | 42     | 65   | 65    | RED-RED       |
| 4300-014                  | 1     | C       | 50                                             | 50    | 50,000              | GMV                      | 5              | 15                                                             | 35    | 45     | 70   | --    | BLU-BLU       |
| 4300-003                  | 1     | C       | 150                                            | 100   | 2700                | GMV                      | 5              | --                                                             | 10    | 25     | 40   | 50    | RED           |
| 4300-053                  | 1     | C       | 150                                            | 100   | 2700                | ±20%                     | 5              | --                                                             | 10    | 25     | 40   | 50    | RED-GOLD      |
| 4300-004                  | 1     | C       | 150                                            | 100   | 5000                | GMV                      | 5              | --                                                             | 15    | 30     | 45   | 55    | YELLOW        |
| 4300-054                  | 1     | C       | 150                                            | 100   | 5000                | ±20%                     | 5              | --                                                             | 15    | 30     | 45   | 55    | YEL-GOLD      |
| 4300-680                  | 1     | C       | 300                                            | 200   | 5                   | MAX                      | 5              | --                                                             | --    | --     | --   | --    | BLK-BLK       |
| 4300-008                  | 1     | C       | 300                                            | 200   | 10                  | GMV                      | 5              | --                                                             | --    | --     | 5    | 20    | VIOLET        |
| 4300-009                  | 1     | C       | 300                                            | 200   | 25                  | GMV                      | 5              | --                                                             | --    | --     | 10   | 25    | BLUE          |
| 4300-000                  | 1     | C       | 300                                            | 200   | 100                 | GMV                      | 5              | --                                                             | --    | 3      | 20   | 28    | GREEN         |
| 4300-050                  | 1     | C       | 300                                            | 200   | 100                 | ±20%                     | 5              | --                                                             | --    | 3      | 20   | 28    | GRN-GOLD      |
| 4300-001                  | 1     | C       | 300                                            | 200   | 500                 | GMV                      | 5              | --                                                             | --    | 15     | 35   | 40    | BROWN         |
| 4300-051                  | 1     | C       | 300                                            | 200   | 500                 | ±20%                     | 5              | --                                                             | --    | 15     | 35   | 40    | BRWN-GOLD     |
| 4300-007                  | 1     | C       | 300                                            | 200   | 1000                | GMV                      | 5              | --                                                             | 5     | 20     | 35   | 45    | GRAY          |
| 4300-002                  | 1     | C       | 300                                            | 200   | 1200                | GMV                      | 5              | --                                                             | 5     | 20     | 35   | 45    | WHITE         |
| 4300-052                  | 1     | C       | 300                                            | 200   | 1200                | ±20%                     | 5              | --                                                             | 5     | 20     | 35   | 45    | WHT-GOLD      |

Drawings not to scale.

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component design, please contact the factory direct.

## Solder Mount C Filters

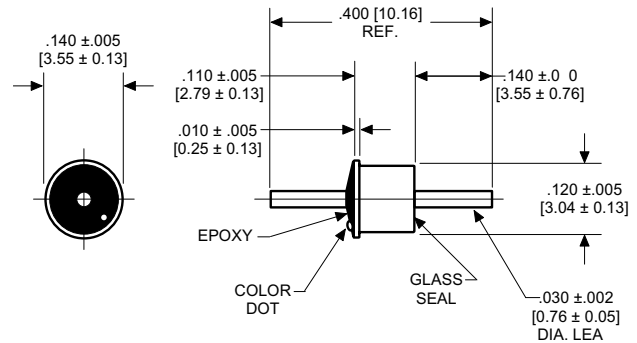
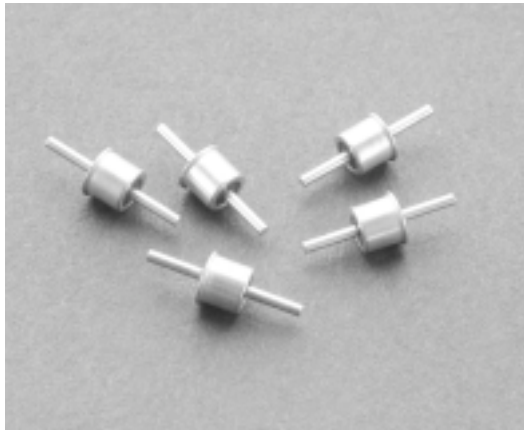
### TUSONIX 4300 Series Miniature EMI Filters

These filters are ideal for applications where small size and high performance are critical. These C configured filters can be glass sealed on either one of the ends for optimal sealing between system compartments or components.

The gold plating on the leads offers excellent conductivity and connective ability using common gold bonding methods. The small package and large range of electrical characteristics of the 4300 Series make it an effective solution for a variety of microwave applications.



| TUSONIX<br>Part<br>Number                      | Style | Circuit | Working<br>Voltage<br>(dc) |       | Capacitance<br>(pF) | Capacitance<br>Tolerance | Current<br>(A) | Minimum No-Load Insertion Loss<br>(dB) at 25°C per MIL-Std-220 |       |        |      |       | Color<br>Code |
|------------------------------------------------|-------|---------|----------------------------|-------|---------------------|--------------------------|----------------|----------------------------------------------------------------|-------|--------|------|-------|---------------|
|                                                |       |         | 85°C                       | 125°C |                     |                          |                | 1MHz                                                           | 10MHz | 100MHz | 1GHz | 10GHz |               |
|                                                |       |         |                            |       |                     |                          |                |                                                                |       |        |      |       |               |
| Glass Sealed Top (flange)/ Epoxy Sealed Bottom |       |         |                            |       |                     |                          |                |                                                                |       |        |      |       |               |
| 4300-025                                       | 2     | C       | 70                         | 50    | 10,000              | GMV                      | 5              | 4                                                              | 21    | 35     | 50   | 60    | BLACK         |
| 4300-065                                       | 2     | C       | 70                         | 50    | 10,000              | ±20%                     | 5              | 4                                                              | 21    | 35     | 50   | 60    | BLK-GOLD      |
| 4300-026                                       | 2     | C       | 70                         | 50    | 15,000              | GMV                      | 5              | 7                                                              | 20    | 35     | 55   | 60    | ORANGE        |
| 4300-031                                       | 2     | C       | 70                         | 50    | 27,000              | GMV                      | 5              | 10                                                             | 28    | 42     | 65   | 65    | RED-RED       |
| 4300-034                                       | 2     | C       | 50                         | 50    | 50,000              | GMV                      | 5              | 15                                                             | 35    | 45     | 70   | --    | BLU-BLU       |
| 4300-023                                       | 2     | C       | 150                        | 100   | 2700                | GMV                      | 5              | --                                                             | 10    | 25     | 40   | 50    | RED           |
| 4300-063                                       | 2     | C       | 150                        | 100   | 2700                | ±20%                     | 5              | --                                                             | 10    | 25     | 40   | 50    | RED-GOLD      |
| 4300-024                                       | 2     | C       | 150                        | 100   | 5000                | GMV                      | 5              | --                                                             | 15    | 30     | 45   | 55    | YELLOW        |
| 4300-064                                       | 2     | C       | 150                        | 100   | 5000                | ±20%                     | 5              | --                                                             | 15    | 30     | 45   | 55    | YEL-GOLD      |
| 4300-681                                       | 2     | C       | 300                        | 200   | 5                   | MAX                      | 5              | --                                                             | --    | --     | --   | --    | BLK-BLK       |
| 4300-028                                       | 2     | C       | 300                        | 200   | 10                  | GMV                      | 5              | --                                                             | --    | --     | 5    | 20    | VIOLET        |
| 4300-029                                       | 2     | C       | 300                        | 200   | 25                  | GMV                      | 5              | --                                                             | --    | --     | 10   | 25    | BLUE          |
| 4300-020                                       | 2     | C       | 300                        | 200   | 100                 | GMV                      | 5              | --                                                             | --    | 3      | 20   | 28    | GREEN         |
| 4300-060                                       | 2     | C       | 300                        | 200   | 100                 | ±20%                     | 5              | --                                                             | --    | 3      | 20   | 28    | GRN-GOLD      |
| 4300-021                                       | 2     | C       | 300                        | 200   | 500                 | GMV                      | 5              | --                                                             | --    | 15     | 35   | 40    | BROWN         |
| 4300-061                                       | 2     | C       | 300                        | 200   | 500                 | ±20%                     | 5              | --                                                             | --    | 15     | 35   | 40    | BRWN-GOLD     |
| 4300-027                                       | 2     | C       | 300                        | 200   | 1000                | GMV                      | 5              | --                                                             | 5     | 20     | 35   | 45    | GRAY          |
| 4300-022                                       | 2     | C       | 300                        | 200   | 1200                | GMV                      | 5              | --                                                             | 5     | 20     | 35   | 45    | WHITE         |
| 4300-062                                       | 2     | C       | 300                        | 200   | 1200                | ±20%                     | 5              | --                                                             | 5     | 20     | 35   | 45    | WHT-GOLD      |
| Epoxy Sealed Top (flange)/ Epoxy Sealed Bottom |       |         |                            |       |                     |                          |                |                                                                |       |        |      |       |               |
| 4302-005                                       | 3     | C       | 70                         | 50    | 10,000              | GMV                      | 10             | 4                                                              | 21    | 35     | 50   | 60    | BLACK         |
| 4302-006                                       | 3     | C       | 70                         | 50    | 15,000              | GMV                      | 10             | 7                                                              | 20    | 35     | 55   | 60    | ORANGE        |
| 4302-013                                       | 3     | C       | 70                         | 50    | 27,000              | GMV                      | 10             | 10                                                             | 28    | 42     | 65   | 65    | RED-RED       |
| 4302-014                                       | 3     | C       | 50                         | 50    | 50,000              | GMV                      | 10             | 15                                                             | 35    | 45     | 70   | --    | BLU-BLU       |
| 4302-003                                       | 3     | C       | 150                        | 100   | 2700                | GMV                      | 10             | --                                                             | 10    | 25     | 40   | 50    | RED           |
| 4302-004                                       | 3     | C       | 150                        | 100   | 5000                | GMV                      | 10             | --                                                             | 15    | 30     | 45   | 55    | YELLOW        |
| 4302-680                                       | 3     | C       | 300                        | 200   | 5                   | MAX                      | 10             | --                                                             | --    | --     | --   | --    | BLK-BLK       |
| 4302-008                                       | 3     | C       | 300                        | 200   | 10                  | GMV                      | 10             | --                                                             | --    | --     | 5    | 20    | VIOLET        |
| 4302-009                                       | 3     | C       | 300                        | 200   | 25                  | GMV                      | 10             | --                                                             | --    | --     | 10   | 25    | BLUE          |
| 4302-000                                       | 3     | C       | 300                        | 200   | 100                 | GMV                      | 10             | --                                                             | --    | 3      | 20   | 28    | GREEN         |
| 4302-001                                       | 3     | C       | 300                        | 200   | 500                 | GMV                      | 10             | --                                                             | --    | 15     | 35   | 40    | BROWN         |
| 4302-007                                       | 3     | C       | 300                        | 200   | 1000                | GMV                      | 10             | --                                                             | 5     | 20     | 35   | 45    | GRAY          |
| 4302-002                                       | 3     | C       | 300                        | 200   | 1200                | GMV                      | 10             | --                                                             | 5     | 20     | 35   | 45    | WHITE         |

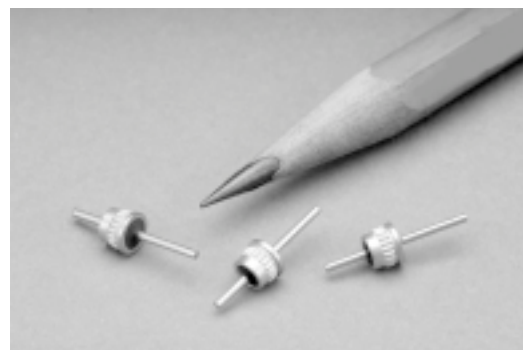
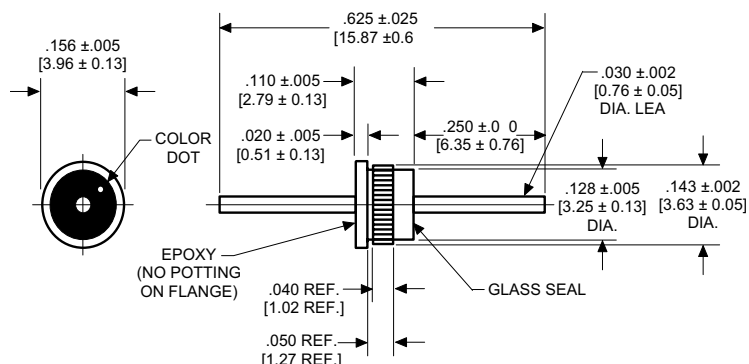


| TUSONIX<br>Part<br>Number | Circuit | Working<br>Voltage<br>(dc)                     |       | Capacitance<br>(pF) | Capacitance<br>Tolerance | Current<br>(A) | Minimum No-Load Insertion Loss<br>(dB) at 25°C per MIL-Std-220 |       |        |      |       | Color<br>Code |
|---------------------------|---------|------------------------------------------------|-------|---------------------|--------------------------|----------------|----------------------------------------------------------------|-------|--------|------|-------|---------------|
|                           |         | 85°C                                           | 125°C |                     |                          |                | 1MHz                                                           | 10MHz | 100MHz | 1GHz | 10GHz |               |
|                           |         | Epoxy Sealed Top (flange)/ Glass Sealed Bottom |       |                     |                          |                |                                                                |       |        |      |       |               |
| 4305-000                  | C       | 300                                            | 200   | 50                  | +100-0%                  | 5              | --                                                             | --    | --     | 10   | 25    | BRWN-BROWN    |
| 4305-001                  | C       | 300                                            | 200   | 100                 | +100-0%                  | 5              | --                                                             | --    | 3      | 20   | 28    | GREEN         |
| 4305-002                  | C       | 300                                            | 200   | 500                 | +100-0%                  | 5              | --                                                             | --    | --     | 35   | 40    | BROWN         |
| 4305-003                  | C       | 150                                            | 100   | 2700                | +100-0%                  | 5              | --                                                             | 10    | 25     | 40   | 50    | RED           |
| 4305-004                  | C       | 150                                            | 100   | 5000                | +100-0%                  | 5              | --                                                             | 15    | 25     | 45   | 55    | YELLOW        |
| 4305-005                  | C       | 300                                            | 200   | 10                  | +100-0%                  | 5              | --                                                             | --    | --     | 5    | 20    | VIOLET        |
| 4305-006                  | C       | 300                                            | 200   | 25                  | +100-0%                  | 5              | --                                                             | --    | --     | 10   | 25    | BLUE          |
| 4305-007                  | C       | 300                                            | 200   | 250                 | +100-0%                  | 5              | --                                                             | --    | 5      | 22   | 30    | YEL-YELLOW    |
| 4305-008                  | C       | 300                                            | 200   | 1000                | +100-0%                  | 5              | --                                                             | 5     | 20     | 35   | 45    | GRAY          |
| 4305-009                  | C       | 300                                            | 200   | 1500                | +100-0%                  | 5              | --                                                             | 5     | 22     | 35   | 45    | GREEN-GREEN   |
| 4305-010                  | C       | 70                                             | 50    | 10,000              | +100-0%                  | 5              | 4                                                              | 21    | 35     | 50   | 60    | BLACK         |
| 4305-011                  | C       | 70                                             | 50    | 27,000              | +100-0%                  | 5              | 10                                                             | 28    | 45     | 65   | 70    | RED-RED       |
| 4305-012                  | C       | 300                                            | 200   | 5                   | +100-0%                  | 5              | --                                                             | --    | --     | --   | 5     | BLUE-BLUE     |
| 4305-680                  | C       | 300                                            | 200   | 5                   | MAX                      | 5              | --                                                             | --    | --     | --   | --    | BLACK-BLACK   |

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component design, please contact the factory direct.

## No Solder/Press-In C Filters

## 4304 Series - C Filters



Tusonix Press-In Ceramic EMI filters suppress unwanted EMI and allow a fast, mechanical bonding that is free from soldering. And, by offering an excellent alternative to the traditional soldering installation, these finely designed, knurled filters significantly reduce assembly costs.

These EMI filters cover a variety of voltage, attenuation and capacitance ranges in a press-in mounting style.

Product installation recommendations (X-2656/9) are provided with parts to prevent damage to the component during installation.



### Installation tool

| Tool Part No. | Item No. | Filter Type |
|---------------|----------|-------------|
| 4300-314      | 1        | 4304        |

(Ordering Example for 4304 filter tool: 4300-314-1)

Installation Tool: Ordering Information to right.

| TUSONIX<br>Part<br>Number | Circuit | Working<br>Voltage<br>(dc)                     |       | Capacitance<br>(pF) | Capacitance<br>Tolerance | Current<br>(A) | Minimum No-Load Insertion Loss<br>(dB) at 25°C per MIL-Std-220 |       |        |      |       | Color<br>Code |
|---------------------------|---------|------------------------------------------------|-------|---------------------|--------------------------|----------------|----------------------------------------------------------------|-------|--------|------|-------|---------------|
|                           |         | 85°C                                           | 125°C |                     |                          |                | 1MHz                                                           | 10MHz | 100MHz | 1GHz | 10GHz |               |
|                           |         | Epoxy Sealed Top (flange)/ Glass Sealed Bottom |       |                     |                          |                |                                                                |       |        |      |       |               |
| 4304-000                  | C       | 300                                            | 200   | 10                  | +100-0%                  | 5              | --                                                             | --    | --     | 5    | 20    | VIOLET        |
| 4304-001                  | C       | 300                                            | 200   | 25                  | +100-0%                  | 5              | --                                                             | --    | --     | 10   | 25    | BLUE          |
| 4304-002                  | C       | 300                                            | 200   | 500                 | +100-0%                  | 5              | --                                                             | --    | 15     | 35   | 40    | BROWN         |
| 4304-003                  | C       | 300                                            | 200   | 100                 | +100-0%                  | 5              | --                                                             | --    | 3      | 20   | 28    | GREEN         |
| 4304-004                  | C       | 300                                            | 200   | 1000                | +100-0%                  | 5              | --                                                             | 5     | 20     | 35   | 45    | GRAY          |
| 4304-005                  | C       | 300                                            | 200   | 1200                | +100-0%                  | 5              | --                                                             | 5     | 20     | 35   | 45    | WHITE         |
| 4304-006                  | C       | 150                                            | 100   | 2700                | +100-0%                  | 5              | --                                                             | 10    | 25     | 40   | 50    | RED           |
| 4304-007                  | C       | 150                                            | 100   | 5000                | +100-0%                  | 5              | --                                                             | 15    | 25     | 45   | 55    | YELLOW        |
| 4304-008                  | C       | 70                                             | 50    | 10000               | +100-0%                  | 5              | 4                                                              | 21    | 35     | 50   | 60    | BLACK         |
| 4304-009                  | C       | 70                                             | 50    | 15000               | +100-0%                  | 5              | 7                                                              | 20    | 35     | 55   | 60    | ORANGE        |
| 4304-010                  | C       | 70                                             | 50    | 27000               | +100-0%                  | 5              | 10                                                             | 28    | 45     | 65   | 65    | RED-RED       |
| 4304-011                  | C       | 50                                             | 50    | 50000               | +100-0%                  | 5              | 15                                                             | 35    | 45     | 70   | --    | BLUE-BLUE     |
| 4304-680                  | C       | 300                                            | 200   | 5                   | MAX                      | 5              | --                                                             | --    | --     | --   | --    | BLACK-BLACK   |

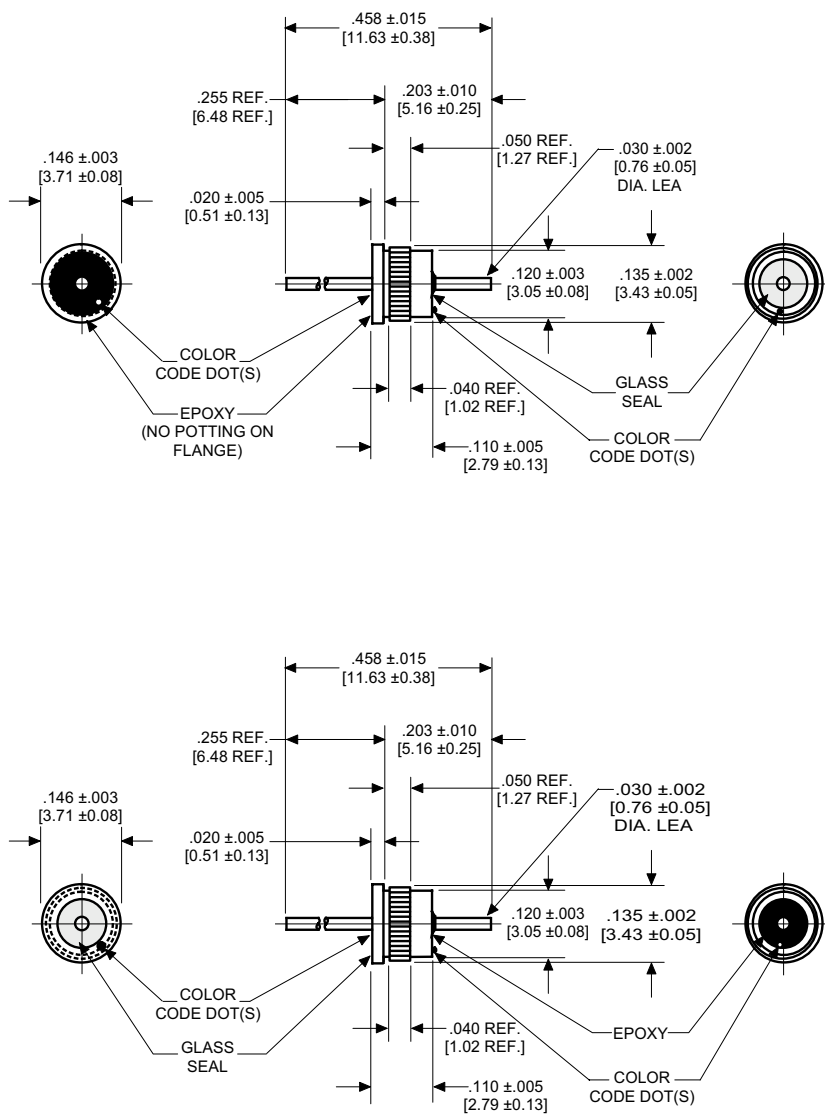


### Installation tool

## Installation tool

| Tool Part No. | Item No. | Filter Type |
|---------------|----------|-------------|
| 4300-314      | 2        | 4306        |

*(Ordering Example for 4306 filter tool: 4300-314-2)*



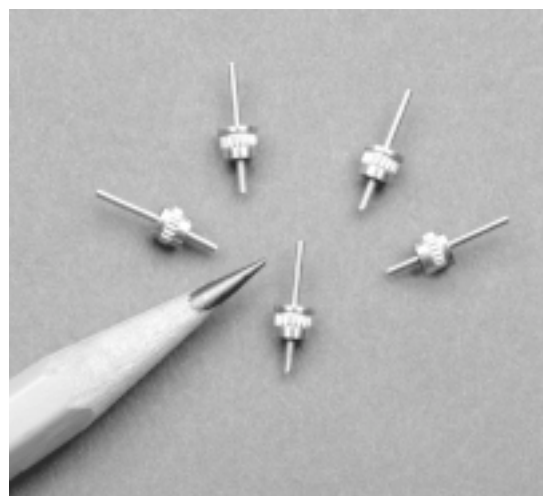
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## 4306 Series - C Filters

## No Solder/Press-In C Filters

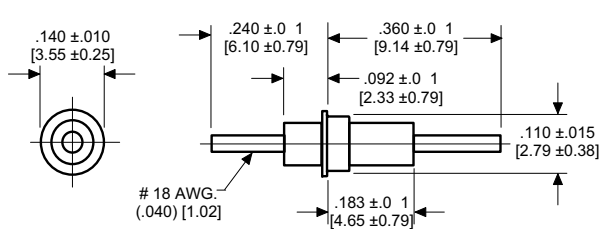
TUSONIX's Press-In EMI filters are excellent for a variety of microwave and RF applications that include:

- attenuators
- oscillators
- synthesizers
- combiners

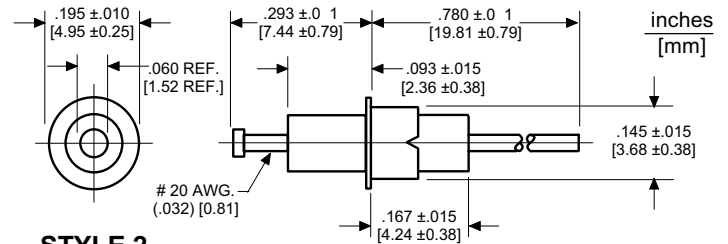


| TUSONIX<br>Part<br>Number                      | Style | Circuit | Working<br>Voltage<br>(dc) |       | Capacitance<br>(pF) | Capacitance<br>Tolerance | Current<br>(A) | Minimum No-Load Insertion Loss<br>(dB) at 25°C per MIL-Std-220 |       |        |      |       | Color<br>Code |
|------------------------------------------------|-------|---------|----------------------------|-------|---------------------|--------------------------|----------------|----------------------------------------------------------------|-------|--------|------|-------|---------------|
|                                                |       |         | 85°C                       | 125°C |                     |                          |                | 1MHz                                                           | 10MHz | 100MHz | 1GHz | 10GHz |               |
|                                                |       |         |                            |       |                     |                          |                |                                                                |       |        |      |       |               |
| Epoxy Sealed Top (flange)/ Glass Sealed Bottom |       |         |                            |       |                     |                          |                |                                                                |       |        |      |       |               |
| 4306-010                                       | 1     | C       | 70                         | 50    | 10000               | +100-0%                  | 5              | 10                                                             | 21    | 35     | 50   | 60    | BLACK         |
| 4306-011                                       | 1     | C       | 70                         | 50    | 27000               | +100-0%                  | 5              | --                                                             | 28    | 45     | 65   | 70    | RED-RED       |
| 4306-030                                       | 1     | C       | 150                        | 100   | 2700                | +100-0%                  | 5              | --                                                             | 10    | 25     | 40   | 50    | RED           |
| 4306-004                                       | 1     | C       | 150                        | 100   | 5000                | +100-0%                  | 5              | --                                                             | 15    | 25     | 45   | 55    | YELLOW        |
| 4306-012                                       | 1     | C       | 300                        | 200   | 5                   | +100-0%                  | 5              | --                                                             | --    | --     | --   | 5     | BLUE-BLUE     |
| 4306-680                                       | 1     | C       | 300                        | 200   | 5                   | MAX                      | 5              | --                                                             | --    | --     | --   | --    | BLACK-BLACK   |
| 4306-028                                       | 1     | C       | 300                        | 200   | 10                  | +100-0%                  | 5              | --                                                             | --    | --     | 5    | 20    | VIOLET        |
| 4306-006                                       | 1     | C       | 300                        | 200   | 25                  | +100-0%                  | 5              | --                                                             | --    | --     | 10   | 25    | BLUE          |
| 4306-005                                       | 1     | C       | 300                        | 200   | 50                  | +100-0%                  | 5              | --                                                             | --    | --     | 10   | 25    | BROWN-BROWN   |
| 4306-029                                       | 1     | C       | 300                        | 200   | 100                 | +100-0%                  | 5              | --                                                             | --    | 3      | 20   | 28    | GREEN         |
| 4306-007                                       | 1     | C       | 300                        | 200   | 250                 | +100-0%                  | 5              | --                                                             | --    | 5      | 22   | 30    | YELLOW-YELLOW |
| 4306-003                                       | 1     | C       | 300                        | 200   | 500                 | +100-0%                  | 5              | --                                                             | --    | --     | 35   | 40    | BROWN         |
| 4306-008                                       | 1     | C       | 300                        | 200   | 1000                | +100-0%                  | 5              | --                                                             | 5     | 20     | 35   | 45    | GRAY          |
| 4306-009                                       | 1     | C       | 300                        | 200   | 1500                | +100-0%                  | 5              | 4                                                              | 5     | 22     | 35   | 45    | GREEN-GREEN   |
| Glass Sealed Top (flange)/ Epoxy Sealed Bottom |       |         |                            |       |                     |                          |                |                                                                |       |        |      |       |               |
| 4306-023                                       | 2     | C       | 70                         | 50    | 10000               | +100-0%                  | 5              | 4                                                              | 21    | 35     | 50   | 60    | BLACK         |
| 4306-024                                       | 2     | C       | 70                         | 50    | 27000               | +100-0%                  | 5              | 10                                                             | 28    | 45     | 65   | 70    | RED-RED       |
| 4306-015                                       | 2     | C       | 150                        | 100   | 2700                | +100-0%                  | 5              | --                                                             | 10    | 25     | 40   | 50    | RED           |
| 4306-017                                       | 2     | C       | 150                        | 100   | 5000                | +100-0%                  | 5              | --                                                             | 15    | 25     | 45   | 55    | YELLOW        |
| 4306-025                                       | 2     | C       | 300                        | 200   | 5                   | +100-0%                  | 5              | --                                                             | --    | --     | --   | 5     | BLUE-BLUE     |
| 4306-681                                       | 2     | C       | 300                        | 200   | 5                   | MAX                      | 5              | --                                                             | --    | --     | --   | --    | BLACK-BLACK   |
| 4306-013                                       | 2     | C       | 300                        | 200   | 10                  | +100-0%                  | 5              | --                                                             | --    | --     | 5    | 20    | VIOLET        |
| 4306-019                                       | 2     | C       | 300                        | 200   | 25                  | +100-0%                  | 5              | --                                                             | --    | --     | 10   | 25    | BLUE          |
| 4306-018                                       | 2     | C       | 300                        | 200   | 50                  | +100-0%                  | 5              | --                                                             | --    | --     | 10   | 25    | BROWN-BROWN   |
| 4306-014                                       | 2     | C       | 300                        | 200   | 100                 | +100-0%                  | 5              | --                                                             | --    | 3      | 20   | 28    | GREEN         |
| 4306-020                                       | 2     | C       | 300                        | 200   | 250                 | +100-0%                  | 5              | --                                                             | --    | 5      | 22   | 30    | YELLOW-YELLOW |
| 4306-016                                       | 2     | C       | 300                        | 200   | 500                 | +100-0%                  | 5              | --                                                             | --    | --     | 35   | 40    | BROWN         |
| 4306-021                                       | 2     | C       | 300                        | 200   | 1000                | +100-0%                  | 5              | --                                                             | 5     | 20     | 35   | 45    | GRAY          |
| 4306-022                                       | 2     | C       | 300                        | 200   | 1500                | +100-0%                  | 5              | --                                                             | 6     | 22     | 35   | 45    | GREEN-GREEN   |

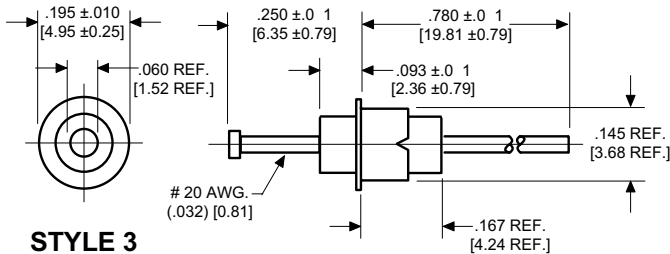
# Solder Mount Pi Filters



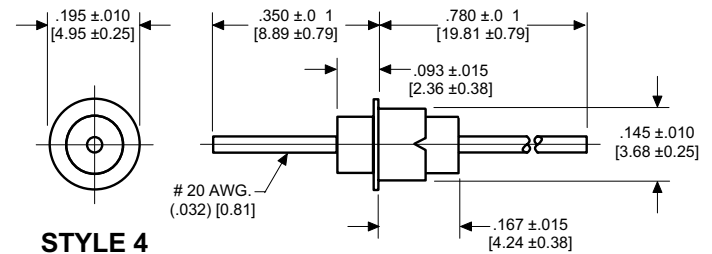
**STYLE 1**



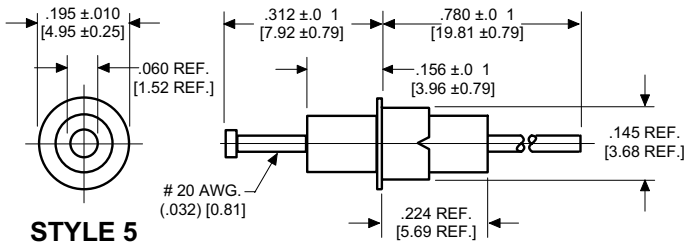
**STYLE 2**



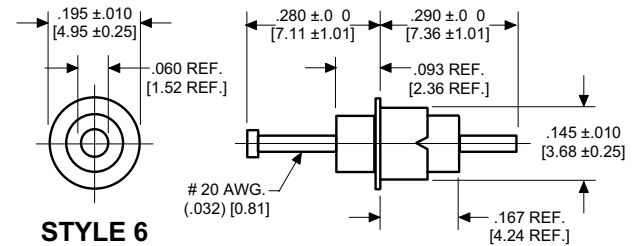
**STYLE 3**



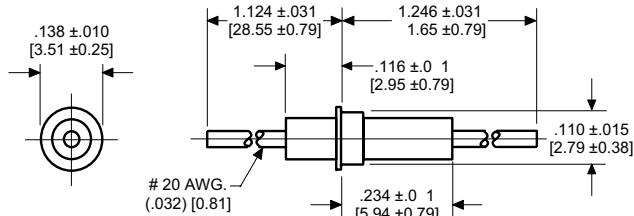
**STYLE 4**



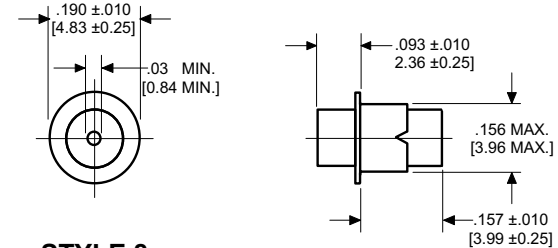
**STYLE 5**



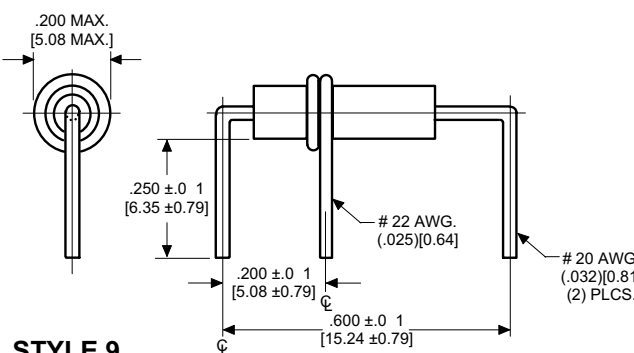
**STYLE 6**



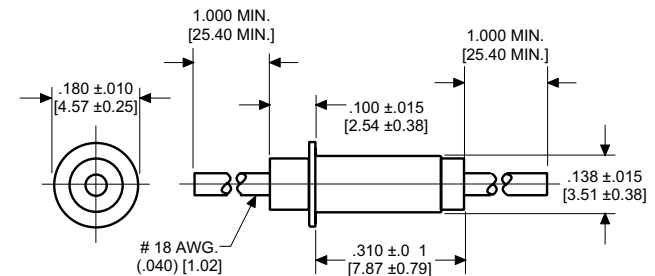
**STYLE 7**



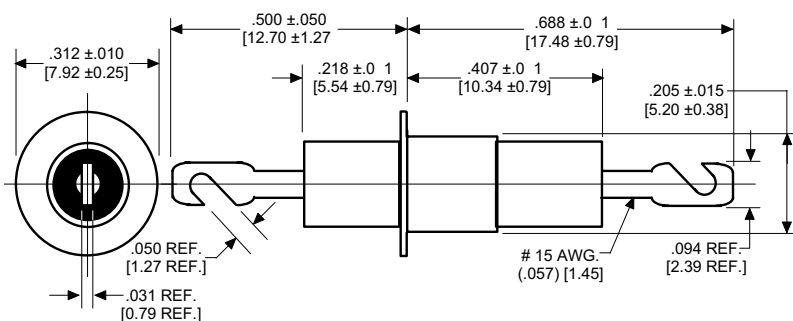
**STYLE 8**



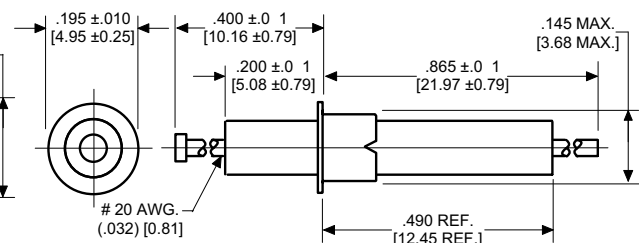
**STYLE 9**



**STYLE 10**



**STYLE 11**

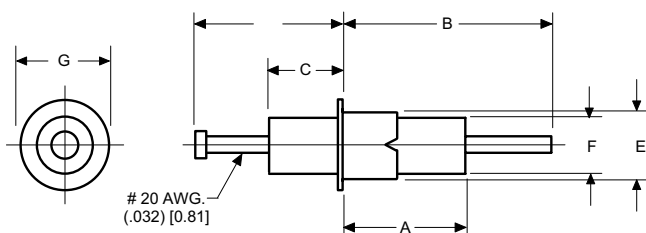


**STYLE 12**

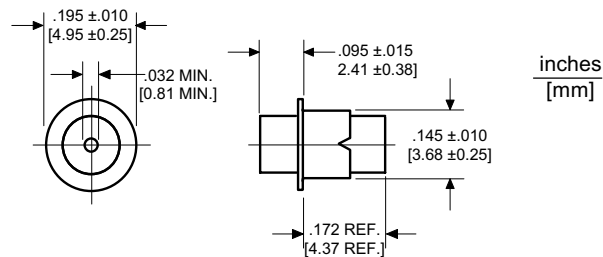
Drawings not to scale.

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component design, please contact the factory direct.

## Solder Mount Pi Filters



STYLE 13 THROUGH 19



STYLE 20

| DIMENSIONS FOR STYLES 13 THROUGH 19 |                       |                              |                                |                              |                                |                              |                              |                              |
|-------------------------------------|-----------------------|------------------------------|--------------------------------|------------------------------|--------------------------------|------------------------------|------------------------------|------------------------------|
| Style Number                        | MIL-PRF-15733         | DIM. A                       | DIM. B                         | DIM. C                       | DIM. D                         | DIM. E                       | DIM. F                       | DIM. G                       |
| 13                                  | /62-0003              | .272 ± .025<br>[6.91 ± 0.64] | .438 ± .062<br>[11.13 ± 1.57]  | .156 ± .015<br>[3.96 ± 0.38] | .312 ± .031<br>[7.92 ± 0.79]   | .145 ± .015<br>[3.68 ± 0.38] | ----                         | .190 ± .015<br>[4.83 ± 0.38] |
| 14                                  | /62-0004              | .151 ± .031<br>[3.84 ± 0.79] | .780 ± .031<br>[19.81 ± 0.79]  | .093 ± .031<br>[2.36 ± 0.79] | .273 ± .031<br>[6.93 ± 0.79]   | .145 ± .015<br>[3.68 ± 0.38] | ----                         | .196 ± .007<br>[4.98 ± 0.18] |
| 15                                  | /51-0002              | .226 ± .022<br>[5.74 ± 0.56] | .780 ± .031<br>[19.81 ± 0.79]  | .164 ± .022<br>[4.16 ± 0.56] | .312 ± .031<br>[7.92 ± 0.79]   | .145 ± .015<br>[3.68 ± 0.38] | ----                         | .203 ± .015<br>[5.16 ± 0.38] |
| 16                                  | /33-0001<br>/33-0002♦ | .170 ± .027<br>[4.32 ± 0.69] | .780 ± .031<br>[19.81 ± 0.79]  | .093 ± .015<br>[2.36 ± 0.38] | .288 ± .015<br>[7.32 ± 0.38]   | ----                         | .125 MAX<br>[3.18 MAX]       | .190 ± .015<br>[4.83 ± 0.38] |
| 17                                  | /62-0001              | .250 ± .031<br>[6.35 ± 0.79] | .406 ± .031<br>[10.31 ± 0.79]  | .156 ± .031<br>[3.96 ± 0.79] | .312 ± .031<br>[7.92 ± 0.79]   | .145 ± .015<br>[3.68 ± 0.38] | .125 ± .015<br>[3.18 ± 0.38] | .190 ± .015<br>[4.83 ± 0.38] |
| 18                                  | /62-0002♦             | .231 ± .046<br>[5.87 ± 1.17] | 1.231 ± .077<br>[31.27 ± 1.96] | .109 ± .031<br>[2.77 ± 0.79] | 1.109 ± .062<br>[28.17 ± 1.57] | .110 ± .015<br>[2.79 ± 0.38] | ----                         | .143 ± .010<br>[3.63 ± 0.25] |
| 19                                  | /51-0001              | .250 ± .031<br>[6.35 ± 0.79] | .406 ± .031<br>[10.31 ± 0.79]  | .156 ± .031<br>[3.96 ± 0.79] | .312 ± .031<br>[7.92 ± 0.79]   | .142 ± .007<br>[3.61 ± 0.18] | .122 ± .017<br>[3.10 ± 0.43] | .195 ± .010<br>[4.95 ± 0.25] |

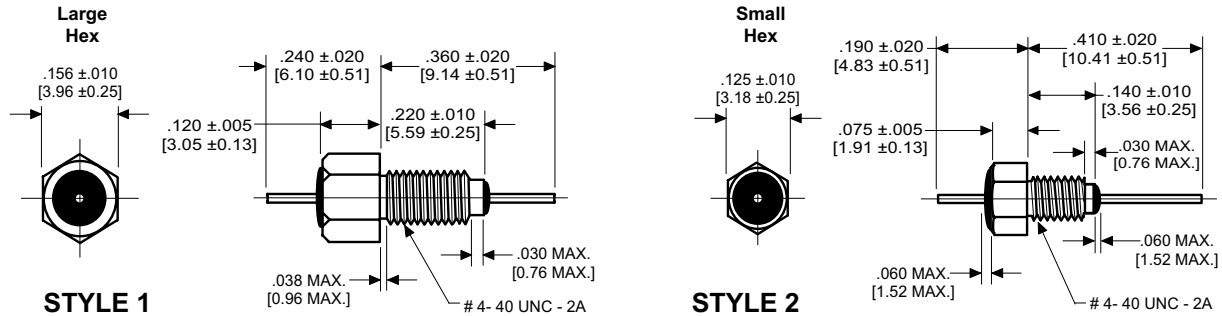
### Notes:

♦  Straight Lead

| TUSONIX<br>Part<br>Number | MIL-PRF-<br>15733<br>Number | Style | Notes | Circuit | Working<br>Voltage<br>(dc) |                | Capacitance<br>(pF) | Capacitance<br>Tolerance | Current<br>(A) | Minimum No-Load Insertion Loss<br>(dB) at 25°C per MIL-Std-220 |       |        |      |       |  |
|---------------------------|-----------------------------|-------|-------|---------|----------------------------|----------------|---------------------|--------------------------|----------------|----------------------------------------------------------------|-------|--------|------|-------|--|
|                           |                             |       |       |         | 85°C                       | 125°C          |                     |                          |                | 1MHz                                                           | 10MHz | 100MHz | 1GHz | 10GHz |  |
|                           |                             |       |       |         |                            |                |                     |                          |                |                                                                |       |        |      |       |  |
| PI Configuration          |                             |       |       |         |                            |                |                     |                          |                |                                                                |       |        |      |       |  |
| 4100-003                  | --                          | 1     | --    | Pi      | 125                        | 50             | 3000                | GMV                      | 15             | --                                                             | 7     | 50     | 65   | 60    |  |
| 4101-505                  | /62-0003                    | 13    | --    | Pi      | --                         | 70             | 1500                | GMV                      | 10             | --                                                             | --    | 50     | 65   | 65    |  |
| 4151-000                  | --                          | 3     | --    | Pi      | 100                        | 70             | 12,000              | GMV                      | 10             | --                                                             | 25    | 70     | 65   | 65    |  |
| 4151-500                  | /62-0004                    | 14    | --    | Pi      | --                         | 70             | 12,000              | GMV                      | 10             | --                                                             | 22    | 70     | --   | 65    |  |
| 4151-001                  | --                          | 5     | --    | Pi      | 100                        | 70             | 22,000              | GMV                      | 10             | --                                                             | 35    | 70     | 70   | 70    |  |
| 4151-501                  | /51-0002                    | 15    | --    | Pi      | --                         | 70             | 22,000              | GMV                      | 10             | --                                                             | 25    | 70     | 70   | 70    |  |
| 4151-003                  | --                          | 12    | --    | Pi      | 100                        | 70             | 60,000              | GMV                      | 10             | --                                                             | 60    | 75     | 75   | 75    |  |
| 4100-000                  | --                          | 7     | --    | Pi      | 250                        | 125            | 1500                | GMV                      | 10             | --                                                             | 6     | 45     | 60   | 60    |  |
| 4101-000                  | --                          | 20    | --    | Pi      | 250                        | 125            | 1750                | GMV                      | 10             | --                                                             | 5     | 35     | 50   | 50    |  |
| 4101-002                  | --                          | 2     | --    | Pi      | 250                        | 125            | 1750                | GMV                      | 10             | --                                                             | 5     | 50     | 60   | 60    |  |
| 4101-003                  | --                          | 4     | --    | Pi      | 250                        | 125            | 1750                | GMV                      | 10             | --                                                             | 5     | 50     | 60   | 60    |  |
| 4101-004                  | --                          | 6     | --    | Pi      | 250                        | 125            | 1750                | GMV                      | 10             | --                                                             | 5     | 50     | 60   | 60    |  |
| 4101-502                  | /33-0001                    | 16    | --    | Pi      | --                         | 125            | 1750                | GMV                      | 10             | --                                                             | --    | 50     | 60   | 60    |  |
| 4101-503                  | /33-0002                    | 16    | ◆     | Pi      | --                         | 125            | 1750                | GMV                      | 10             | --                                                             | --    | 50     | 60   | 60    |  |
| 4101-500                  | /66-0001                    | 8     | --    | Pi      | --                         | 125            | 1750                | GMV                      | 10             | --                                                             | 5     | 35     | 50   | 50    |  |
| 4100-056                  | --                          | 9     | --    | Pi      | 250ac                      | 200dc          | 1000                | ±20%                     | 10             | --                                                             | 3     | 20     | 55   | --    |  |
| 4100-002                  | --                          | 1     | --    | Pi      | 350                        | 200            | 1500                | GMV                      | 15             | --                                                             | 5     | 25     | 60   | 60    |  |
| 4101-001                  | --                          | 17    | --    | Pi      | 350                        | 200            | 1500                | GMV                      | 10             | --                                                             | 3     | 45     | 70   | 70    |  |
| 4101-501                  | /62-0001                    | 17    | --    | Pi      | --                         | 200            | 1500                | GMV                      | 10             | --                                                             | 3     | 45     | 70   | 70    |  |
| 4100-500                  | /62-0002                    | 18    | ◆     | Pi      | --                         | 200            | 1500                | GMV                      | 10             | --                                                             | 5     | 45     | 70   | --    |  |
| 4100-057                  | --                          | 9     | --    | Pi      | 250ac                      | 200dc          | 1500                | GMV                      | 10             | --                                                             | 5     | 45     | 70   | --    |  |
| 4102-000                  | --                          | 10    | --    | Pi      | 350                        | 200            | 3000                | GMV                      | 10             | --                                                             | 8     | 55     | 65   | 65    |  |
| 4100-053                  | --                          | 9     | --    | Pi      | 250ac                      | 200dc          | 5000                | GMV                      | 10             | --                                                             | 18    | 60     | 70   | --    |  |
| 4101-504                  | /51-0001                    | 19    | --    | Pi      | 200                        | --             | 5500                | GMV                      | 10             | --                                                             | 15    | 55     | 70   | 70    |  |
| 4106-000                  | --                          | 11    | --    | Pi      | 500dc<br>350ac             | 500dc<br>350ac | 3000                | GMV                      | 25             | --                                                             | --    | 50     | 50   | 50    |  |
| 4106-001                  | --                          | 11    | --    | Pi      | 1000                       | 500            | 4500                | GMV                      | 25             | --                                                             | 8     | 50     | 70   | 70    |  |

Drawings not to scale.

## #4-40 UNC-2A Pi & C Filters



inches  
[mm]

| TUSONIX<br>Part<br>Number | Style | Lead<br>Dia. | Circuit | Working<br>Voltage<br>(dc) |       | Capacitance<br>(pF) | Capacitance<br>Tolerance | Current<br>(A) | Minimum No-Load Insertion Loss<br>(dB) at 25°C per MIL-Std-220 |       |        |      |       |
|---------------------------|-------|--------------|---------|----------------------------|-------|---------------------|--------------------------|----------------|----------------------------------------------------------------|-------|--------|------|-------|
|                           |       |              |         | 85°C                       | 125°C |                     |                          |                | 1MHz                                                           | 10MHz | 100MHz | 1GHz | 10GHz |
|                           |       |              |         | Pi Configuration           |       |                     |                          |                |                                                                |       |        |      |       |
| 4261-001                  | 1     | .018 [.46]   | Pi      | --                         | 50    | 5500                | GMV                      | 3              | --                                                             | 14    | 55     | 70   | --    |
| 4200-012                  | 1     | .018 [.46]   | Pi      | --                         | 200   | 1500                | -0,+100%                 | 3              | --                                                             | 5     | 42     | 70   | --    |
| C Configuration           |       |              |         |                            |       |                     |                          |                |                                                                |       |        |      |       |
| 4403-035                  | 2     | .030 [.76]   | C       | 70                         | 50    | 10,000              | GMV                      | 10             | 4                                                              | 20    | 35     | 50   | 50    |
| 4400-005                  | 1     | .020 [.51]   | C       | 70                         | 50    | 10,000              | GMV                      | 10             | 4                                                              | 20    | 35     | 50   | 50    |
| 4400-035                  | 1     | .030 [.76]   | C       | 70                         | 50    | 10,000              | GMV                      | 10             | 4                                                              | 20    | 35     | 50   | 50    |
| 4403-005                  | 2     | .020 [.51]   | C       | 70                         | 50    | 10,000              | GMV                      | 10             | 4                                                              | 20    | 35     | 50   | 50    |
| 4400-006                  | 1     | .020 [.51]   | C       | 70                         | 50    | 15,000              | GMV                      | 10             | 7                                                              | 20    | 35     | 50   | 60    |
| 4400-036                  | 1     | .030 [.76]   | C       | 70                         | 50    | 15,000              | GMV                      | 10             | 7                                                              | 20    | 35     | 50   | 60    |
| 4403-006                  | 2     | .020 [.51]   | C       | 70                         | 50    | 15,000              | GMV                      | 10             | 7                                                              | 20    | 35     | 50   | 60    |
| 4403-036                  | 2     | .030 [.76]   | C       | 70                         | 50    | 15,000              | GMV                      | 10             | 7                                                              | 20    | 35     | 50   | 60    |
| 4400-010                  | 1     | .020 [.51]   | C       | 70                         | 50    | 27,000              | GMV                      | 10             | 10                                                             | 28    | 42     | 65   | 65    |
| 4400-040                  | 1     | .030 [.76]   | C       | 70                         | 50    | 27,000              | GMV                      | 10             | 10                                                             | 28    | 42     | 65   | 65    |
| 4403-010                  | 2     | .020 [.51]   | C       | 70                         | 50    | 27,000              | GMV                      | 10             | 10                                                             | 28    | 42     | 65   | 65    |
| 4403-040                  | 2     | .030 [.76]   | C       | 70                         | 50    | 27,000              | GMV                      | 10             | 10                                                             | 28    | 42     | 65   | 65    |
| 4400-016                  | 1     | .020 [.51]   | C       | 50                         | 50    | 50,000              | GMV                      | 10             | 15                                                             | 35    | 45     | 70   | --    |
| 4400-041                  | 1     | .030 [.76]   | C       | 50                         | 50    | 50,000              | GMV                      | 10             | 15                                                             | 35    | 45     | 70   | --    |
| 4400-003                  | 1     | .020 [.51]   | C       | 150                        | 100   | 2700                | GMV                      | 10             | --                                                             | 10    | 25     | 40   | 50    |
| 4400-033                  | 1     | .030 [.76]   | C       | 150                        | 100   | 2700                | GMV                      | 10             | --                                                             | 10    | 25     | 40   | 50    |
| 4403-003                  | 2     | .020 [.51]   | C       | 150                        | 100   | 2700                | GMV                      | 10             | --                                                             | 10    | 25     | 40   | 50    |
| 4403-033                  | 2     | .030 [.76]   | C       | 150                        | 100   | 2700                | GMV                      | 10             | --                                                             | 10    | 25     | 40   | 50    |
| 4400-004                  | 1     | .020 [.51]   | C       | 150                        | 100   | 5000                | GMV                      | 10             | --                                                             | 15    | 30     | 45   | 55    |
| 4400-034                  | 1     | .030 [.76]   | C       | 150                        | 100   | 5000                | GMV                      | 10             | --                                                             | 15    | 30     | 45   | 55    |
| 4403-004                  | 2     | .020 [.51]   | C       | 150                        | 100   | 5000                | GMV                      | 10             | --                                                             | 15    | 30     | 45   | 55    |
| 4403-034                  | 2     | .030 [.76]   | C       | 150                        | 100   | 5000                | GMV                      | 10             | --                                                             | 15    | 30     | 45   | 55    |
| 4400-680                  | 1     | .030 [.76]   | C       | 300                        | 200   | 5                   | MAX                      | 10             | --                                                             | --    | --     | --   | --    |
| 4403-680                  | 2     | .030 [.76]   | C       | 300                        | 200   | 5                   | MAX                      | 10             | --                                                             | --    | --     | --   | --    |
| 4400-008                  | 1     | .020 [.51]   | C       | 300                        | 200   | 10                  | GMV                      | 10             | --                                                             | --    | --     | 5    | 20    |
| 4400-038                  | 1     | .030 [.76]   | C       | 300                        | 200   | 10                  | GMV                      | 10             | --                                                             | --    | --     | 5    | 20    |
| 4403-008                  | 2     | .020 [.51]   | C       | 300                        | 200   | 10                  | GMV                      | 10             | --                                                             | --    | --     | 5    | 20    |
| 4403-038                  | 2     | .030 [.76]   | C       | 300                        | 200   | 10                  | GMV                      | 10             | --                                                             | --    | --     | 5    | 20    |

Drawings not to scale.

All bushing style filters include hex nut and lock washer unless otherwise noted.

The products listed in this catalog are only a few of the thousands of variations that CTS produces. For custom component design, please contact the factory direct.  
component design, please contact the factory direct.

## #4-40 UNC-2A C & L Filters

### TUSONIX 4400 Series Miniature EMI Filters

These filters are ideal for applications where small size and high performance are critical and a threaded mounting technique is desired.

These C and L configured filters are available in two physical configurations and can be supplied with either unified or metric thread (see page 18 for metric). The small package and large range of electrical characteristics of the 4400 Series make it an effective solution for a variety of micro-wave applications.

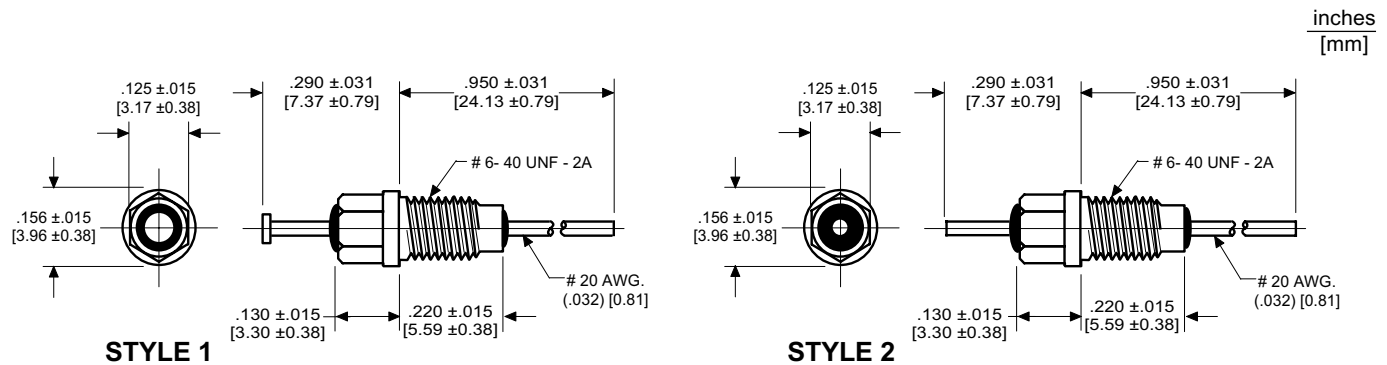


| TUSONIX<br>Part<br>Number | Style | Lead<br>Dia. | Circuit | Working<br>Voltage<br>(dc)               |       | Capacitance<br>(pF) | Capacitance<br>Tolerance | Current<br>(A) | Minimum No-Load Insertion Loss<br>(dB) at 25°C per MIL-Std-220 |       |        |      |       |
|---------------------------|-------|--------------|---------|------------------------------------------|-------|---------------------|--------------------------|----------------|----------------------------------------------------------------|-------|--------|------|-------|
|                           |       |              |         | 85°C                                     | 125°C |                     |                          |                | 1MHz                                                           | 10MHz | 100MHz | 1GHz | 10GHz |
|                           |       |              |         | C Configuration (Continued from page 13) |       |                     |                          |                |                                                                |       |        |      |       |
| 4400-009                  | 1     | .020 [.51]   | C       | 300                                      | 200   | 25                  | GMV                      | 10             | --                                                             | --    | --     | 10   | 25    |
| 4400-039                  | 1     | .030 [.76]   | C       | 300                                      | 200   | 25                  | GMV                      | 10             | --                                                             | --    | --     | 10   | 25    |
| 4403-009                  | 2     | .020 [.51]   | C       | 300                                      | 200   | 25                  | GMV                      | 10             | --                                                             | --    | --     | 10   | 25    |
| 4403-039                  | 2     | .030 [.76]   | C       | 300                                      | 200   | 25                  | GMV                      | 10             | --                                                             | --    | --     | 10   | 25    |
| 4400-000                  | 1     | .020 [.51]   | C       | 300                                      | 200   | 100                 | GMV                      | 10             | --                                                             | --    | 3      | 20   | 28    |
| 4400-030                  | 1     | .030 [.76]   | C       | 300                                      | 200   | 100                 | GMV                      | 10             | --                                                             | --    | 3      | 20   | 28    |
| 4403-000                  | 2     | .020 [.51]   | C       | 300                                      | 200   | 100                 | GMV                      | 10             | --                                                             | --    | 3      | 20   | 28    |
| 4403-030                  | 2     | .030 [.76]   | C       | 300                                      | 200   | 100                 | GMV                      | 10             | --                                                             | --    | 3      | 20   | 28    |
| 4400-001                  | 1     | .020 [.51]   | C       | 300                                      | 200   | 500                 | GMV                      | 10             | --                                                             | --    | 15     | 35   | 40    |
| 4400-031                  | 1     | .030 [.76]   | C       | 300                                      | 200   | 500                 | GMV                      | 10             | --                                                             | --    | 15     | 35   | 40    |
| 4403-001                  | 2     | .020 [.51]   | C       | 300                                      | 200   | 500                 | GMV                      | 10             | --                                                             | --    | 15     | 35   | 40    |
| 4403-031                  | 2     | .030 [.76]   | C       | 300                                      | 200   | 500                 | GMV                      | 10             | --                                                             | --    | 15     | 35   | 40    |
| 4400-007                  | 1     | .020 [.51]   | C       | 300                                      | 200   | 1000                | GMV                      | 10             | --                                                             | 5     | 20     | 35   | 45    |
| 4400-037                  | 1     | .030 [.76]   | C       | 300                                      | 200   | 1000                | GMV                      | 10             | --                                                             | 5     | 20     | 35   | 45    |
| 4403-007                  | 2     | .020 [.51]   | C       | 300                                      | 200   | 1000                | GMV                      | 10             | --                                                             | 5     | 20     | 35   | 45    |
| 4403-037                  | 2     | .030 [.76]   | C       | 300                                      | 200   | 1000                | GMV                      | 10             | --                                                             | 5     | 20     | 35   | 45    |
| 4400-002                  | 1     | .020 [.51]   | C       | 300                                      | 200   | 1200                | GMV                      | 10             | --                                                             | 5     | 20     | 35   | 45    |
| 4400-032                  | 1     | .030 [.76]   | C       | 300                                      | 200   | 1200                | GMV                      | 10             | --                                                             | 5     | 20     | 35   | 45    |
| 4403-002                  | 2     | .020 [.51]   | C       | 300                                      | 200   | 1200                | GMV                      | 10             | --                                                             | 5     | 20     | 35   | 45    |
| 4403-032                  | 2     | .030 [.76]   | C       | 300                                      | 200   | 1200                | GMV                      | 10             | --                                                             | 5     | 20     | 35   | 45    |
| L Configuration           |       |              |         |                                          |       |                     |                          |                |                                                                |       |        |      |       |
| 4400-055                  | 1     | .020 [.51]   | L       | 70                                       | 50    | 10,000              | GMV                      | 10             | 4                                                              | 21    | 35     | 55   | 70    |
| 4400-056                  | 1     | .020 [.51]   | L       | 70                                       | 50    | 15,000              | GMV                      | 10             | 7                                                              | 25    | 40     | 60   | 60    |
| 4400-060                  | 1     | .020 [.51]   | L       | 70                                       | 50    | 27,000              | GMV                      | 10             | 10                                                             | 28    | 45     | 65   | 70    |
| 4400-057                  | 1     | .020 [.51]   | L       | 50                                       | 50    | 50,000              | GMV                      | 10             | 15                                                             | 35    | 52     | 70   | --    |
| 4400-053                  | 1     | .020 [.51]   | L       | 150                                      | 100   | 2700                | GMV                      | 10             | --                                                             | 10    | 25     | 40   | 55    |
| 4400-054                  | 1     | .020 [.51]   | L       | 150                                      | 100   | 5000                | GMV                      | 10             | --                                                             | 15    | 30     | 45   | 60    |
| 4400-050                  | 1     | .020 [.51]   | L       | 300                                      | 200   | 100                 | GMV                      | 10             | --                                                             | --    | 3      | 20   | 33    |
| 4400-051                  | 1     | .020 [.51]   | L       | 300                                      | 200   | 500                 | GMV                      | 10             | --                                                             | --    | 15     | 35   | 45    |
| 4400-052                  | 1     | .020 [.51]   | L       | 300                                      | 200   | 1200                | GMV                      | 10             | --                                                             | 5     | 20     | 35   | 50    |

Drawings not to scale.

**Please Note:** All bushing style filters include hex nut and lock washer unless otherwise noted.

## #6-40 UNF-2A EMI Pi Filters



| TUSONIX<br>Part<br>Number | Style | Circuit | Working<br>Voltage<br>(dc) |       | Capacitance<br>(pF) | Capacitance<br>Tolerance | Current<br>(A) | Minimum No-Load Insertion Loss<br>(dB) at 25°C per MIL-Std-220 |        |      |       |
|---------------------------|-------|---------|----------------------------|-------|---------------------|--------------------------|----------------|----------------------------------------------------------------|--------|------|-------|
|                           |       |         | 85°C                       | 125°C |                     |                          |                | 10MHz                                                          | 100MHz | 1GHz | 10GHz |
|                           |       |         | PI Configuration           |       |                     |                          |                |                                                                |        |      |       |
| 4200-000                  | 1     | Pi      | 300                        | 200   | 1500                | GMV                      | 10             | 5                                                              | 40     | 60   | 60    |
| 4200-002                  | 2     | Pi      | 300                        | 200   | 1500                | GMV                      | 10             | 5                                                              | 40     | 60   | 60    |
| 4200-005                  | 1     | Pi      | 300                        | 200   | 3000                | GMV                      | 10             | 8                                                              | 50     | 70   | 70    |

Drawings not to scale.

**Please Note:** All bushing style filters include hex nut and lock washer unless otherwise noted.

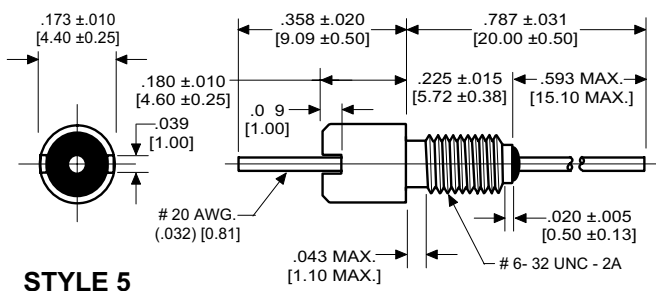
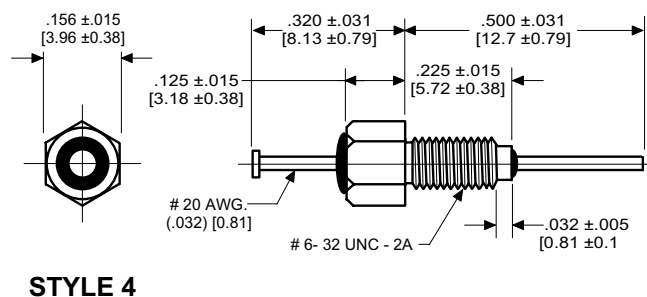
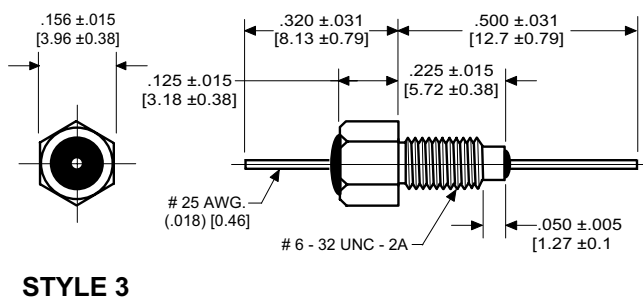
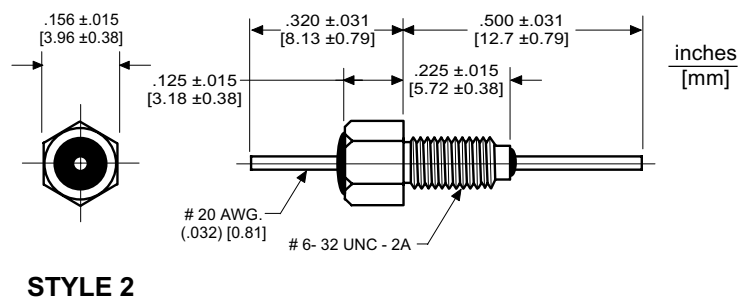
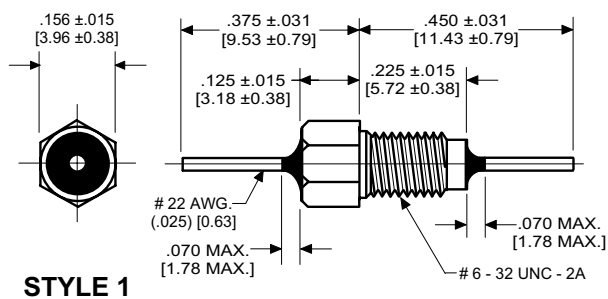
## MIL PARTS CROSS REFERENCE

| MIL-PRF-15733 | TUSONIX No. | Page No. ❖ | MIL-PRF-15733 | TUSONIX No. | Page No. ❖ |
|---------------|-------------|------------|---------------|-------------|------------|
| /28-0001      | 4201-501    | 18         | /61-0001      | 4204-500    | 19         |
| /28-0002      | 4201-503    | 18         | /61-0002      | 4202-501    | 20         |
| /28-0003      | 4251-503    | NS         | /61-0003      | 4206-502    | 21         |
| /33-0001      | 4101-502    | 12         | /61-0004      | 4206-501    | 21         |
| /33-0002      | 4101-503    | 12         | /61-0005      | 4203-502    | NS         |
| /38-0004      | 4601-503    | NS         | /61-0006      | 4203-501    | 20         |
| /38-0005      | 4601-504    | NS         | /61-0007      | 4203-552    | 20         |
| /43-0001      | 4204-501    | 19         | /61-0008      | 4201-502    | 18         |
| /43-0002      | 4201-506    | NS         | /61-0009      | 4253-500    | NS         |
| /44-0001      | 4251-500    | NS         | /61-0010      | 4203-553    | 20         |
| /44-0002      | 4205-500    | NS         | /61-0011      | 4203-551    | 20         |
| /44-0003      | 4205-501    | NS         | /61-0012      | 4253-501    | NS         |
| /46-0001      | 4207-500    | NS         | /61-0013      | 4251-502    | NS         |
| /49-0001      | 4601-502    | NS         | /61-0014      | 4251-501    | NS         |
| /49-0006      | 4601-501    | NS         | /62-0001      | 4101-501    | 12         |
| /49-0007      | 4601-500    | NS         | /62-0002      | 4100-500    | 12         |
| /51-0001      | 4101-504    | 12         | /62-0003      | 4101-505    | 12         |
| /51-0002      | 4151-501    | 12         | /62-0004      | 4151-500    | 12         |
|               |             |            | /66-0001      | 4101-500    | 12         |

❖ NS indicates a part that is not shown in this catalog.

The products listed in this catalog are only a few of the thousands of variations that CTS produces. For custom component design, please contact the factory direct.

## #6-32 UNC-2A Pi, C & L Filters and Feed-thru Capacitors



| TUSONIX Part Number | Temperature Range | WVDC | MAX. CAP. (Nominal) (pF) |
|---------------------|-------------------|------|--------------------------|
| 2430                | Z5, Y5, X5        | 200  | 1500                     |
|                     | X7                | 100  | 1500                     |

### Notes:

- Typical Insertion Loss
- ▽ No Hex Nut or Lock Washer

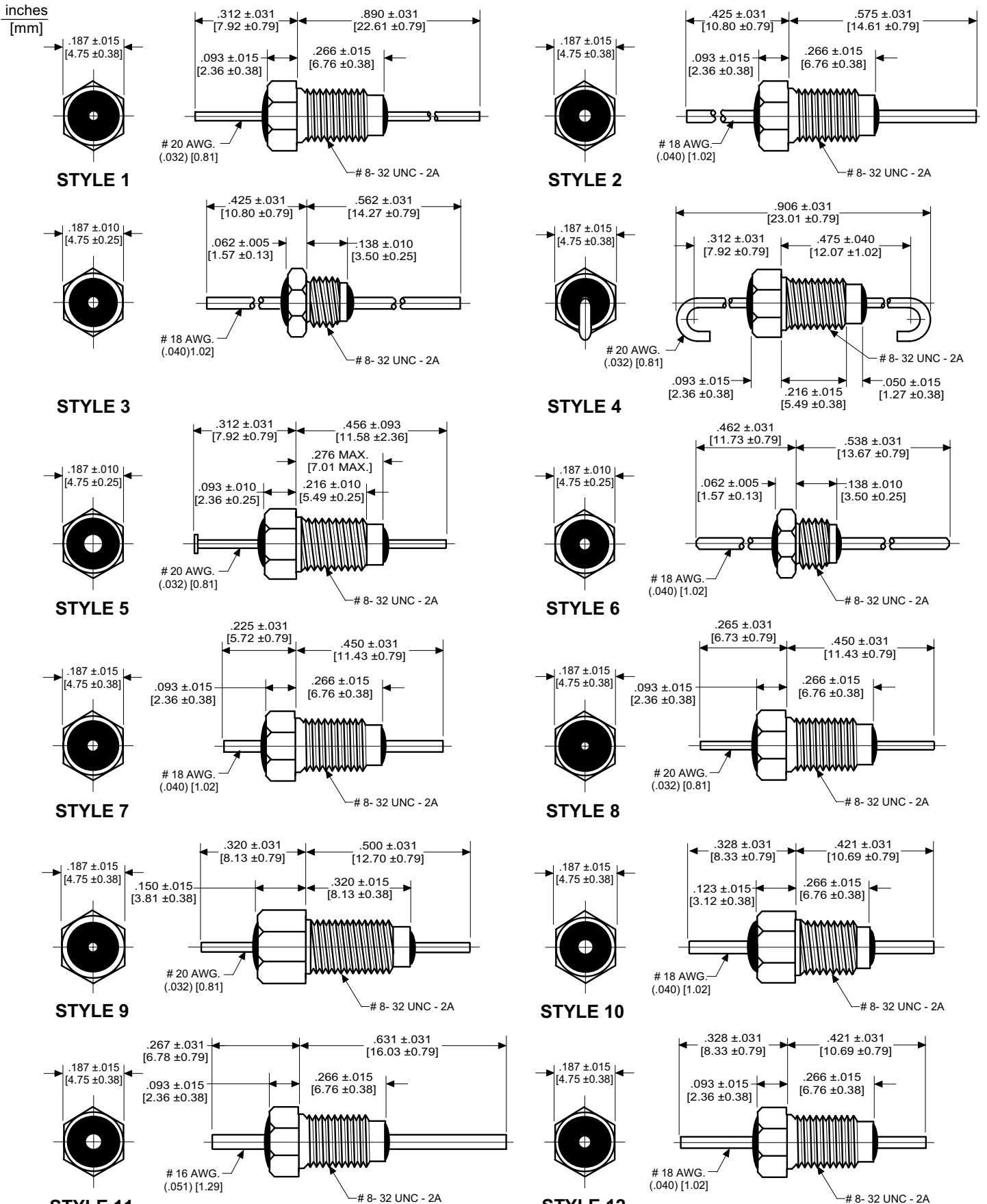
Please see Temperature Characteristics and EIA Codes on page 25.

| TUSONIX<br>Part<br>Number | Style | Notes | Circuit | Working<br>Voltage<br>(dc) |       | Capacitance<br>(pF) | Capacitance<br>Tolerance | Current<br>(A) | Minimum No-Load Insertion Loss<br>(dB) at 25°C per MIL-Std-220 |       |        |      |       |
|---------------------------|-------|-------|---------|----------------------------|-------|---------------------|--------------------------|----------------|----------------------------------------------------------------|-------|--------|------|-------|
|                           |       |       |         | 85°C                       | 125°C |                     |                          |                | 1MHz                                                           | 10MHz | 100MHz | 1GHz | 10GHz |
|                           |       |       |         |                            |       |                     |                          |                |                                                                |       |        |      |       |
| PI Configuration          |       |       |         |                            |       |                     |                          |                |                                                                |       |        |      |       |
| 4260-001                  | 3     | --    | Pi      | --                         | 50    | 5500                | GMV                      | 3              | --                                                             | 14    | 55     | 70   | --    |
| 4260-002                  | 3     | --    | Pi      | --                         | 50    | 7500                | GMV                      | 3              | --                                                             | 18    | 65     | 70   | --    |
| 4260-000                  | 3     | --    | Pi      | 400                        | 200   | 2000                | GMV                      | 3              | --                                                             | 5     | 42     | 70   | --    |
| C Configuration           |       |       |         |                            |       |                     |                          |                |                                                                |       |        |      |       |
| 4402-016                  | 2     | --    | C       | 50                         | 50    | 50,000              | GMV                      | 10             | 15                                                             | 35    | 45     | 70   | --    |
| 4402-005                  | 2     | --    | C       | 100                        | 100   | 10,000              | GMV                      | 10             | 4                                                              | 21    | 35     | 50   | --    |
| 4402-018                  | 2     | --    | C       | 50                         | 50    | 100,000             | GMV                      | 10             | 22                                                             | 40    | 47     | 65   | 65    |
| 4402-680                  | 5     | ▽     | C       | 300                        | 200   | 5                   | MAX                      | 10             | --                                                             | --    | --     | --   | --    |
| 2430-003-X5F0-101M        | 1     | ••    | C       | 200                        | 100   | 100                 | ±20%                     | 5              | --                                                             | --    | 3      | 20   | 28    |
| 2430-003-X5F0-102Z        | 1     | ••    | C       | 200                        | 100   | 1000                | +80-20%                  | 5              | --                                                             | 3     | 20     | 35   | 40    |
| L Configuration           |       |       |         |                            |       |                     |                          |                |                                                                |       |        |      |       |
| 4402-063                  | 5     | ▽     | L       | 200                        | 100   | 4700                | +80-20                   | 10             | --                                                             | 15    | 30     | 45   | 55    |
| 4402-060                  | 4     | --    | L       | 100                        | 100   | 27,000              | GMV                      | 10             | 10                                                             | 28    | 45     | 65   | --    |

Drawings not to scale.

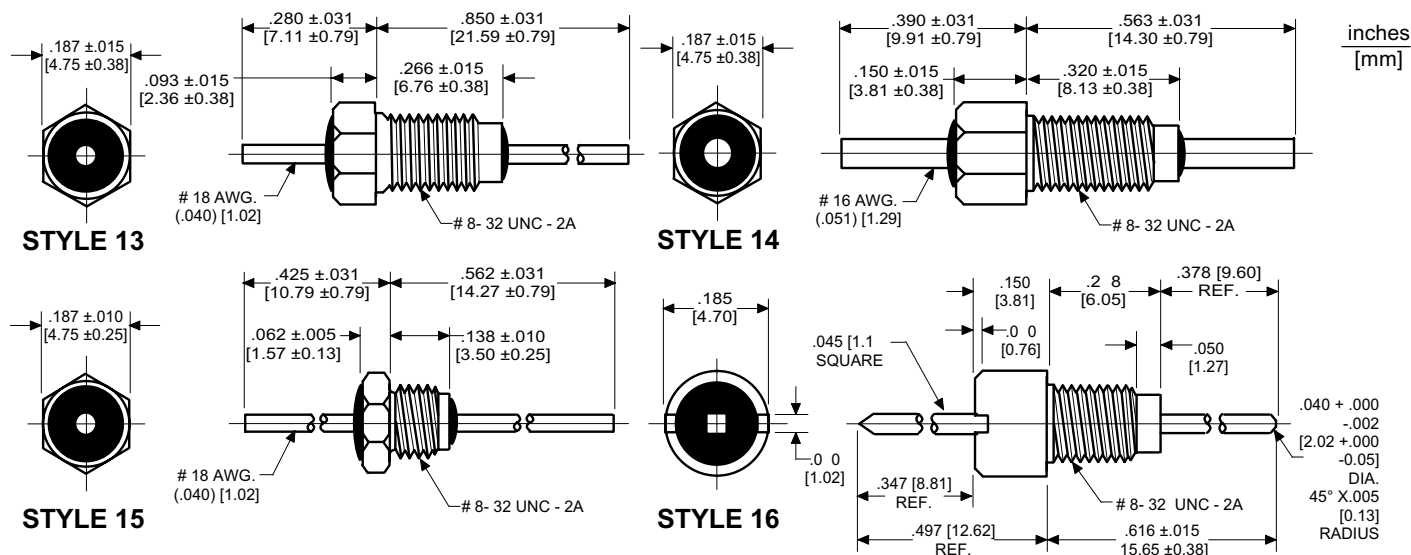
**Please Note:** All bushing style filters include hex nut and lock washer unless otherwise noted.

## #8-32 UNC-2A Pi, C & L Filters and Feed-Thru Capacitors



The products listed in this catalog are only a few of the thousands of variations that CTS produces. For custom component design, please contact the factory direct.

## #8-32 UNC-2A Pi, C & L Filters and Feed-Thru Capacitors



| Series Number | Temperature Range | WVdc | MAX. Cap. (Nominal) (pF) |
|---------------|-------------------|------|--------------------------|
| 2425          | Z5, Y5, X5        | 200  | 10,000                   |
|               | X7                | 100  | 10,000                   |

Please see Temperature Characteristics and EIA Codes on page 25.

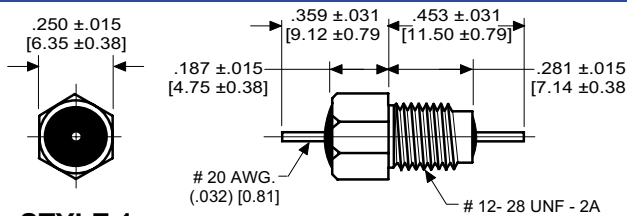
| Notes: |                         |
|--------|-------------------------|
| ◆      | Turret Lead             |
| ▽      | #18 AWG Lead 0.040 Dia. |
| ••     | Typical Insertion Loss  |

| TUSONIX<br>Part<br>Number | MIL-PRF-<br>15733<br>Number | Style | Notes | Circuit | Working<br>Voltage<br>(dc) |       | Capacitance<br>(pF) | Capacitance<br>Tolerance | Current<br>(A) | Minimum No-Load Insertion Loss<br>(dB) at 25°C per MIL-Std-220 |       |        |      |       |
|---------------------------|-----------------------------|-------|-------|---------|----------------------------|-------|---------------------|--------------------------|----------------|----------------------------------------------------------------|-------|--------|------|-------|
|                           |                             |       |       |         | 85°C                       | 125°C |                     |                          |                | 1MHz                                                           | 10MHz | 100MHz | 1GHz | 10GHz |
| Pi Configuration          |                             |       |       |         |                            |       |                     |                          |                |                                                                |       |        |      |       |
| 4251-001                  | --                          | 8     | --    | Pi      | --                         | 50    | 15,000              | GMV                      | 10             | 5                                                              | 18    | 65     | 70   | --    |
| 4201-048                  | --                          | 16    | --    | Pi      | 200                        | 100   | 100                 | GMV                      | 15             | --                                                             | --    | 5      | 32   | --    |
| 4201-047                  | --                          | 16    | --    | Pi      | 200                        | 100   | 1000                | GMV                      | 15             | --                                                             | 4     | 37     | 60   | --    |
| 4201-502                  | /61-0008                    | 5     | --    | Pi      | --                         | 100   | 1000                | GMV                      | 10             | --                                                             | --    | 65     | 70   | 70    |
| 4201-000                  | --                          | 1     | --    | Pi      | 200                        | 100   | 1500                | GMV                      | 10             | --                                                             | 5     | 45     | 65   | 70    |
| 4201-001                  | --                          | 1     | ◆     | Pi      | 200                        | 100   | 1500                | GMV                      | 10             | --                                                             | 5     | 45     | 65   | 70    |
| 4201-004                  | --                          | 1     | ▽     | Pi      | 200                        | 100   | 1500                | GMV                      | 15             | --                                                             | 5     | 38     | 63   | 70    |
| 4201-006                  | --                          | 1     | ◆▽    | Pi      | 200                        | 100   | 1500                | GMV                      | 15             | --                                                             | 5     | 38     | 63   | 70    |
| 4201-501                  | /28-0001                    | 1     | ◆     | Pi      | --                         | 100   | 1500                | GMV                      | 10             | --                                                             | --    | 45     | 60   | 60    |
| 4201-503                  | /28-0002                    | 4     | --    | Pi      | --                         | 100   | 1500                | GMV                      | 10             | --                                                             | --    | 45     | 60   | 60    |
| 4201-003                  | --                          | 2     | --    | Pi      | 200                        | 100   | 2000                | GMV                      | 15             | --                                                             | 5     | 38     | 63   | 70    |
| 4201-050                  | --                          | 1     | --    | Pi      | 200                        | 100   | 5500                | GMV                      | 10             | --                                                             | 14    | 55     | 70   | 70    |
| 4201-051                  | --                          | 1     | ◆     | Pi      | 200                        | 100   | 5500                | GMV                      | 10             | --                                                             | 14    | 55     | 70   | 70    |
| 4201-053                  | --                          | 1     | ◆▽    | Pi      | 200                        | 100   | 5500                | GMV                      | 15             | --                                                             | 14    | 55     | 65   | 65    |
| 4201-083                  | --                          | 9     | --    | Pi      | 200                        | 100   | 10,000              | +80-20%                  | 10             | --                                                             | 18    | 65     | 70   | 70    |
| 4251-004                  | --                          | 9     | --    | Pi      | 100                        | 100   | 28,000              | GMV                      | 10             | 10                                                             | 38    | 75     | 75   | 75    |
| 4205-002                  | --                          | 3     | --    | Pi      | 250                        | 125   | 65                  | +100 -0%                 | 15             | --                                                             | --    | 3      | 16   | 45    |
| 4205-018                  | --                          | 6     | --    | Pi      | 250                        | 125   | 65                  | +100 -0%                 | 15             | --                                                             | --    | 3      | 16   | 45    |
| 4205-017                  | --                          | 6     | --    | Pi      | 250                        | 125   | 1500                | GMV                      | 15             | --                                                             | 5     | 35     | 60   | 60    |
| 4205-001                  | --                          | 15    | --    | Pi      | 250                        | 125   | 1500                | GMV                      | 15             | --                                                             | 5     | 35     | 60   | 60    |
| 4251-000                  | --                          | 7     | --    | Pi      | 185                        | 125   | 3000                | +100 -0%                 | 15             | --                                                             | 10    | 30     | 65   | 65    |
| 4251-002                  | --                          | 9     | --    | Pi      | 200                        | 125   | 12,000              | GMV                      | 10             | 5                                                              | 28    | 65     | 70   | 70    |
| C Configuration           |                             |       |       |         |                            |       |                     |                          |                |                                                                |       |        |      |       |
| 2425-018-X5U0-101M        | --                          | 11    | ◆◆◆   | C       | 200                        | 100   | 100                 | ±20%                     | 20             | --                                                             | --    | 3      | 20   | 28    |
| 2425-544-X7R0-101M        | --                          | 11    | ◆◆    | C       | 200                        | 100   | 100                 | ±20%                     | 20             | --                                                             | --    | 3      | 20   | 28    |
| 2425-018-X5U0-102M        | --                          | 11    | ◆◆◆   | C       | 200                        | 100   | 1000                | ±20%                     | 20             | --                                                             | 3     | 20     | 35   | 40    |
| 2425-544-X7R0-102P        | --                          | 11    | ◆◆    | C       | 200                        | 100   | 1000                | +100 -0%                 | 20             | --                                                             | 3     | 20     | 35   | 40    |
| 2425-018-X5W0-502M        | --                          | 11    | ◆◆◆   | C       | 200                        | 100   | 5000                | ±20%                     | 20             | --                                                             | 15    | 30     | 45   | 50    |
| 2425-601-X5W0-103Z        | --                          | 14    | ◆◆    | C       | 200                        | 100   | 10,000              | +80-20%                  | 20             | --                                                             | 20    | 35     | 50   | 55    |
| 4404-001                  | --                          | 1     | ◆     | C       | 100                        | 100   | 27,000              | GMV                      | 10             | 10                                                             | 30    | 45     | 55   | --    |
| 4404-002                  | --                          | 12    | --    | C       | 140                        | 100   | 50,000              | GMV                      | 10             | 15                                                             | 34    | 45     | 60   | --    |
| 4404-003                  | --                          | 10    | --    | C       | --                         | 100   | 100,000             | GMV                      | 10             | 20                                                             | 38    | 47     | 65   | --    |
| L Configuration           |                             |       |       |         |                            |       |                     |                          |                |                                                                |       |        |      |       |
| 4404-050                  | --                          | 13    | --    | L       | --                         | 100   | 22,000              | GMV                      | 10             | 7                                                              | 27    | 43     | 60   | --    |

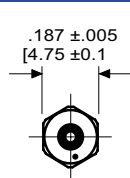
Drawings not to scale.

Please Note: All bushing style filters include hex nut and lock washer unless otherwise noted.

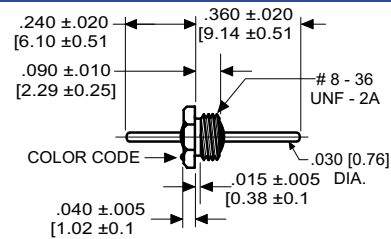
## #8-36 UNF-2A and #12-28 UNF-2A Pi & C Filters and Feed-Thru Capacitors



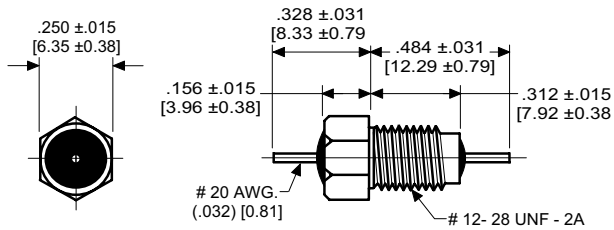
STYLE 1



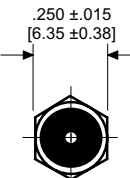
STYLE 2



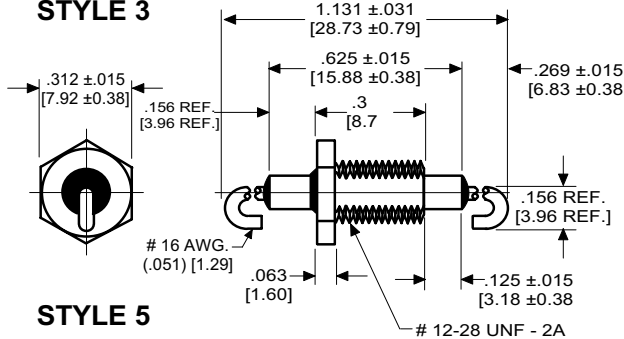
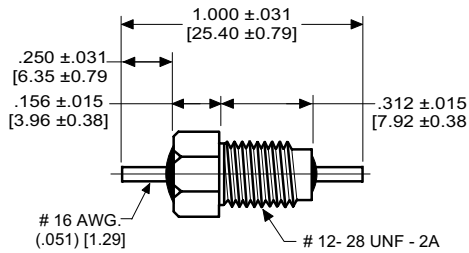
inches  
[mm]



STYLE 3



STYLE 4



STYLE 5

| Series Number | Temperature Range | WVDC | MAX. CAP. Nominal (pF) |
|---------------|-------------------|------|------------------------|
| 2499          | Z5, Y5, X5        | 500  | 10,000                 |
|               | X7                | 250  | 10,000                 |
| 357           | Z5, Y5, X5        | 500  | 10,000                 |
|               | X7                | 250  | 10,000                 |

### Notes:

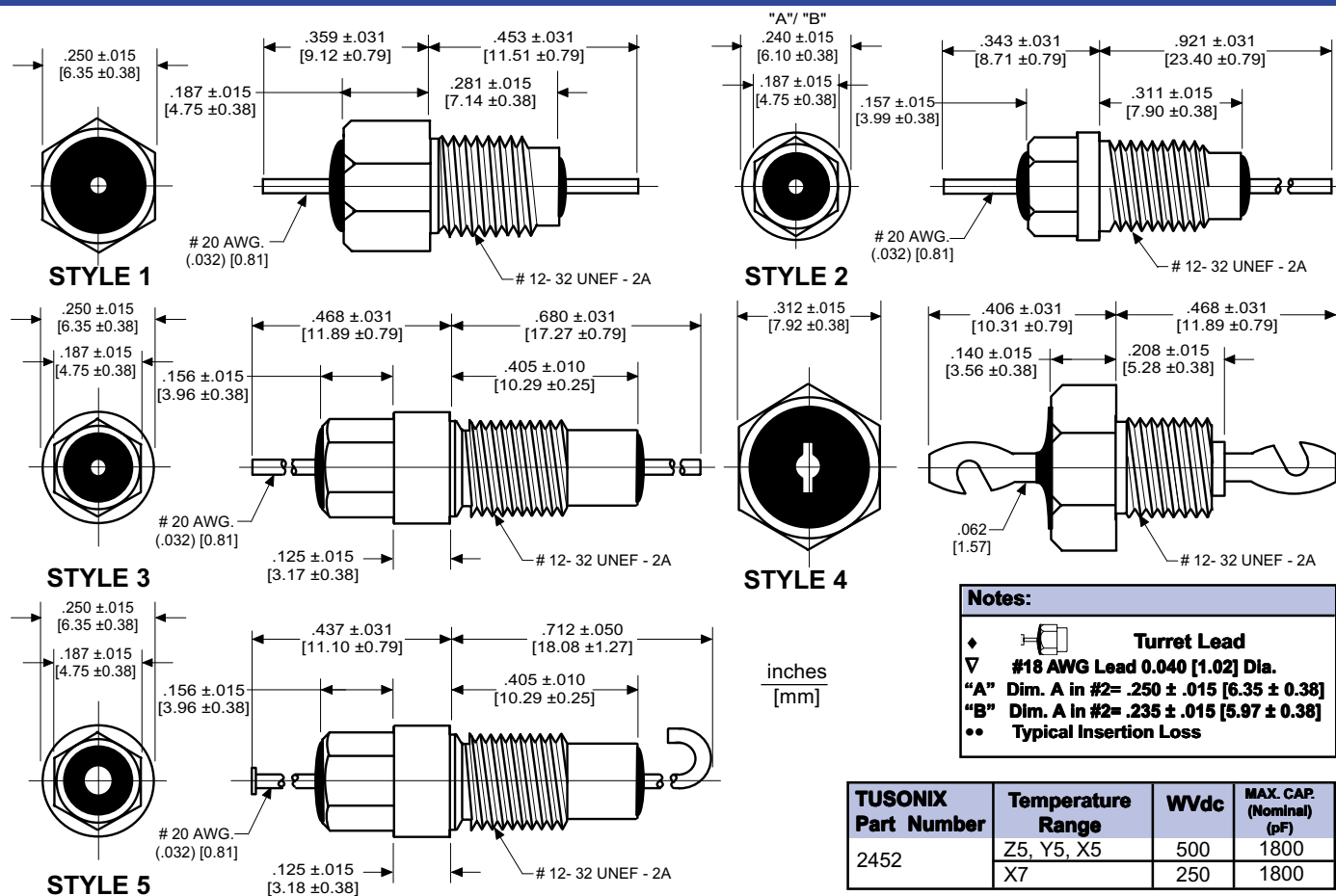
- ◆ Turret Lead
- Typical Insertion Loss
- ▽ No Hex Nut Included

Please see Temperature Characteristics and EIA Codes on Page 25.

| TUSONIX<br>Part<br>Number | MIL-PRF-<br>15733<br>Number | Style | Notes | Circuit | Working<br>Voltage<br>(dc) |                | Capacitance<br>(pF) | Capacitance<br>Tolerance | Current<br>(A) | Minimum No-Load Insertion Loss<br>(dB) at 25°C per MIL-Std-220 |       |        |      |       |
|---------------------------|-----------------------------|-------|-------|---------|----------------------------|----------------|---------------------|--------------------------|----------------|----------------------------------------------------------------|-------|--------|------|-------|
|                           |                             |       |       |         | 85°C                       | 125°C          |                     |                          |                | 1MHz                                                           | 10MHz | 100MHz | 1GHz | 10GHz |
| C Configuration           |                             |       |       |         |                            |                |                     |                          |                |                                                                |       |        |      |       |
| 4401-005                  | --                          | 2     | ▽     | C       | 70                         | 50             | 10,000              | GMV                      | 10             | 4                                                              | 21    | 35     | 50   | 60    |
| 4401-006                  | --                          | 2     | ▽     | C       | 70                         | 50             | 15,000              | GMV                      | 10             | 7                                                              | 20    | 35     | 55   | 60    |
| 4401-010                  | --                          | 2     | ▽     | C       | 70                         | 50             | 27,000              | GMV                      | 10             | 10                                                             | 28    | 42     | 65   | 65    |
| 4401-011                  | --                          | 2     | ▽     | C       | 50                         | 50             | 50,000              | GMV                      | 10             | 15                                                             | 35    | 45     | 70   | --    |
| 4401-003                  | --                          | 2     | ▽     | C       | 150                        | 100            | 2700                | GMV                      | 10             | --                                                             | 10    | 25     | 40   | 50    |
| 4401-004                  | --                          | 2     | ▽     | C       | 150                        | 100            | 5000                | GMV                      | 10             | --                                                             | 15    | 30     | 45   | 55    |
| 4401-680                  | --                          | 2     | ▽     | C       | 300                        | 200            | 5                   | MAX                      | 10             | --                                                             | --    | --     | --   | --    |
| 4401-008                  | --                          | 2     | ▽     | C       | 300                        | 200            | 10                  | GMV                      | 10             | --                                                             | --    | --     | 5    | 20    |
| 4401-009                  | --                          | 2     | ▽     | C       | 300                        | 200            | 25                  | GMV                      | 10             | --                                                             | --    | --     | 10   | 25    |
| 4401-000                  | --                          | 2     | ▽     | C       | 300                        | 200            | 100                 | GMV                      | 10             | --                                                             | --    | 3      | 20   | 28    |
| 4401-001                  | --                          | 2     | ▽     | C       | 300                        | 200            | 500                 | GMV                      | 10             | --                                                             | --    | 15     | 35   | 40    |
| 4401-007                  | --                          | 2     | ▽     | C       | 300                        | 200            | 1000                | GMV                      | 10             | --                                                             | 5     | 20     | 35   | 45    |
| 4401-002                  | --                          | 2     | ▽     | C       | 300                        | 200            | 1200                | GMV                      | 10             | --                                                             | 5     | 20     | 35   | 45    |
| Pi Configuration          |                             |       |       |         |                            |                |                     |                          |                |                                                                |       |        |      |       |
| 4202-053                  | --                          | 3     | --    | Pi      | 200                        | 100            | 5000                | GMV                      | 10             | --                                                             | 20    | 65     | 70   | 70    |
| 4202-054                  | --                          | 3     | ◆     | Pi      | 200                        | 100            | 5000                | GMV                      | 10             | --                                                             | 20    | 65     | 70   | 70    |
| 4204-050                  | --                          | 1     | --    | Pi      | 200                        | 100            | 5000                | GMV                      | 10             | --                                                             | 20    | 65     | 70   | 70    |
| 4204-051                  | --                          | 1     | ◆     | Pi      | 200                        | 100            | 5000                | GMV                      | 10             | --                                                             | 20    | 65     | 70   | 70    |
| 4202-020                  | --                          | 3     | --    | Pi      | 350                        | 200            | 1500                | GMV                      | 10             | --                                                             | 5     | 45     | 70   | 70    |
| 4202-021                  | --                          | 3     | ◆     | Pi      | 350                        | 200            | 1500                | GMV                      | 10             | --                                                             | 5     | 45     | 70   | 70    |
| 4204-000                  | --                          | 1     | --    | Pi      | 350                        | 200            | 1500                | GMV                      | 10             | --                                                             | 5     | 45     | 70   | 70    |
| 4204-001                  | --                          | 1     | ◆     | Pi      | 350                        | 200            | 1500                | GMV                      | 10             | --                                                             | 5     | 45     | 70   | 70    |
| 4204-500                  | /61-0001                    | 1     | --    | Pi      | --                         | 200dc<br>140ac | 1500                | GMV                      | 10ac           | --                                                             | --    | 45     | 70   | 70    |
| 4204-501                  | /43-0001                    | 1     | ◆     | Pi      | --                         | 200dc<br>140ac | 1500                | GMV                      | 10ac           | --                                                             | --    | --     | 45   | 45    |
| C Configuration           |                             |       |       |         |                            |                |                     |                          |                |                                                                |       |        |      |       |
| 2499-003-X5U0-102P        | --                          | 4     | ●●    | C       | 500                        | 250            | 1000                | +100-0%                  | 20             | --                                                             | 3     | 20     | 35   | 40    |
| 2499-003-X5W0-502P        | --                          | 4     | ●●    | C       | 500                        | 250            | 5000                | +100-0%                  | 20             | --                                                             | 15    | 30     | 45   | 50    |
| 2499-003-X5W0-103Z        | --                          | 4     | ●●    | C       | 500                        | 250            | 10,000              | +80-20%                  | 20             | --                                                             | 20    | 35     | 50   | 55    |
| 357-001-X5W0-103Z         | --                          | 5     | ●●    | C       | 500                        | 250            | 10,000              | +80-20%                  | 20             | --                                                             | 20    | 35     | 50   | 55    |

The products listed in this catalog are only a few of the thousands of variations that CTS produces. For custom component design, please contact the factory direct.

## #12-32 UNEF-2A Pi, & C Filters



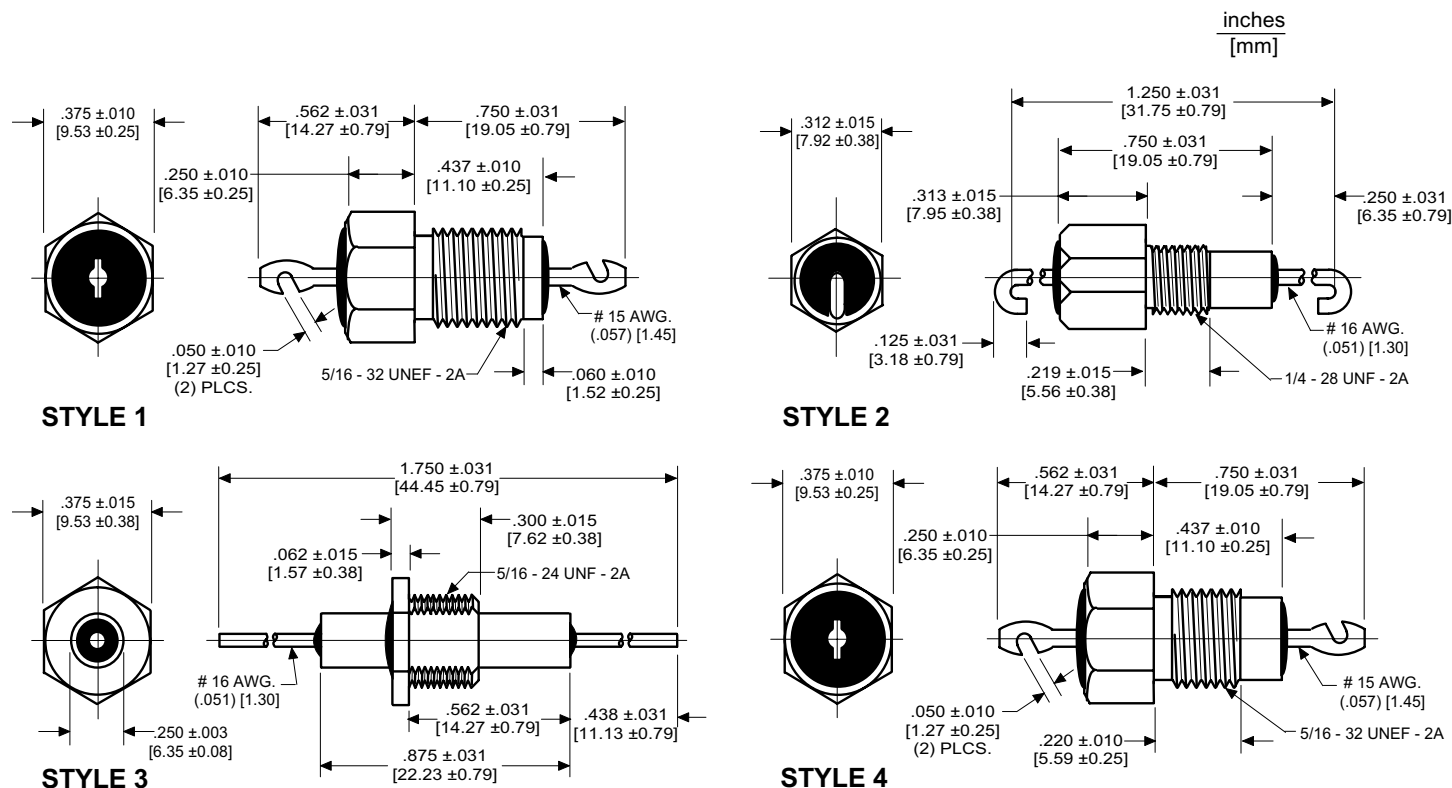
Please see Temperature Characteristics and EIA Codes on page 25.

| TUSONIX<br>Part<br>Number | MIL-PRF-<br>15733<br>Number | Style | Notes | Circuit | Working<br>Voltage<br>(dc) |       | Capacitance<br>(pF) | Capacitance<br>Tolerance | Current<br>(A) | Minimum No-Load Insertion Loss<br>(dB) at 25°C per MIL-Std-220 |        |      |       |  |
|---------------------------|-----------------------------|-------|-------|---------|----------------------------|-------|---------------------|--------------------------|----------------|----------------------------------------------------------------|--------|------|-------|--|
|                           |                             |       |       |         | 85°C                       | 125°C |                     |                          |                | 10MHz                                                          | 100MHz | 1GHz | 10GHz |  |
|                           |                             |       |       |         |                            |       |                     |                          |                |                                                                |        |      |       |  |
| PI Configuration          |                             |       |       |         |                            |       |                     |                          |                |                                                                |        |      |       |  |
| 4207-003                  | --                          | 3     | --    | Pi      | 100                        | 70    | 12,000              | GMV                      | 10             | 45                                                             | 70     | 70   | 70    |  |
| 4253-002                  | --                          | 3     | --    | Pi      | 100                        | 70    | 50,000              | GMV                      | 10             | 60                                                             | 75     | 75   | 75    |  |
| 4202-050                  | --                          | 1     | --    | Pi      | 200                        | 100   | 5000                | GMV                      | 10             | 20                                                             | 65     | 70   | 70    |  |
| 4202-051                  | --                          | 1     | ◆     | Pi      | 200                        | 100   | 5000                | GMV                      | 10             | 20                                                             | 65     | 70   | 70    |  |
| 4203-050                  | --                          | 2     | --    | Pi      | 200                        | 100   | 5000                | GMV                      | 10             | 20                                                             | 65     | 70   | 70    |  |
| 4203-051                  | --                          | 2     | ◆     | Pi      | 200                        | 100   | 5000                | GMV                      | 10             | 20                                                             | 65     | 70   | 70    |  |
| 4203-053                  | --                          | 2     | ◆A    | Pi      | 200                        | 100   | 5000                | GMV                      | 10             | 20                                                             | 65     | 70   | 70    |  |
| 4203-551                  | /61-0011                    | 2     | ◆B    | Pi      | --                         | 100dc | 5000                | GMV                      | 10ac           | --                                                             | 65     | 70   | 70    |  |
| 4203-553                  | /61-0010                    | 2     | ◆A    | Pi      | --                         | 100dc | 5000                | GMV                      | 10ac           | --                                                             | 65     | 70   | 70    |  |
| 4253-001                  | --                          | 2     | ◆     | Pi      | --                         | 100   | 25,000              | GMV                      | 10             | 30                                                             | 65     | 70   | 70    |  |
| 4253-000                  | --                          | 3     | --    | Pi      | --                         | 140   | 22,000              | GMV                      | 10             | 45                                                             | 75     | 75   | 75    |  |
| 4202-000                  | --                          | 1     | --    | Pi      | 350                        | 200   | 1500                | GMV                      | 10             | 5                                                              | 45     | 70   | 70    |  |
| 4203-000                  | --                          | 2     | --    | Pi      | 350                        | 200   | 1500                | GMV                      | 10             | 5                                                              | 45     | 70   | 70    |  |
| 4202-001                  | --                          | 1     | ◆     | Pi      | 350                        | 200   | 1500                | GMV                      | 10             | 5                                                              | 45     | 70   | 70    |  |
| 4202-501                  | /61-0002                    | 1     | ◆     | Pi      | --                         | 200dc | 1500                | GMV                      | 10ac           | --                                                             | 45     | 70   | 70    |  |
| 4203-003                  | --                          | 2     | ◆A    | Pi      | 350                        | 200   | 1500                | GMV                      | 10             | 5                                                              | 45     | 70   | 70    |  |
| 4203-501                  | /61-0006                    | 2     | ◆B    | Pi      | --                         | 200dc | 1500                | GMV                      | 10ac           | --                                                             | 45     | 70   | 70    |  |
| 4203-552                  | /61-0007                    | 2     | ◆A    | Pi      | --                         | 100dc | 5000                | GMV                      | 10ac           | --                                                             | 65     | 70   | 70    |  |
| 4207-000                  | --                          | 5     | --    | Pi      | 500                        | 300   | 1200                | GMV                      | 10             | 5                                                              | 43     | 55   | 55    |  |
| 4207-001                  | --                          | 5     | --    | Pi      | 500                        | 300   | 4000                | GMV                      | 10             | 15                                                             | 55     | 60   | 60    |  |
| 4202-004                  | --                          | 1     | ▽     | Pi      | 500                        | 350   | 2500                | GMV                      | 15             | 5                                                              | 50     | 70   | 70    |  |
| C Configuration           |                             |       |       |         |                            |       |                     |                          |                |                                                                |        |      |       |  |
| 2452-000-X7R0-101M        | --                          | 4     | ●●    | C       | 500                        | 250   | 100                 | ±20%                     | 20             | --                                                             | 3      | 20   | 28    |  |
| 2452-000-X7R0-471M        | --                          | 4     | ●●    | C       | 500                        | 250   | 470                 | ±20%                     | 20             | --                                                             | 12     | 27   | 27    |  |
| 2452-000-X5U0-102P        | --                          | 4     | ●●    | C       | 500                        | 250   | 1000                | +100-0%                  | 20             | 3                                                              | 20     | 35   | 40    |  |

Drawings not to scale.

**Please note:** All bushing style filters include hex nut and lock washer unless otherwise specified.

# 1/4-28 and 5/16-24 UNF-2A and 5/16-32 UNEF-2A Pi Filters and Feed-Thru Capacitors



| TUSONIX Part Number | Temperature Range | WVDC | MAX. CAP. (Nominal) (pF) |
|---------------------|-------------------|------|--------------------------|
| 327                 | Z5, Y5, X5        | 500  | 10,000                   |
|                     | X7                | 250  | 10,000                   |
| 2432                | Z5, Y5, X5        | 2000 | 7,000                    |
|                     | X7                | 1000 | 7,000                    |

## Notes:

- ▽ 5/16-24 UNF-2A Thread
- Typical Insertion Loss

Please see Temperature Characteristics and EIA Codes on page 25.

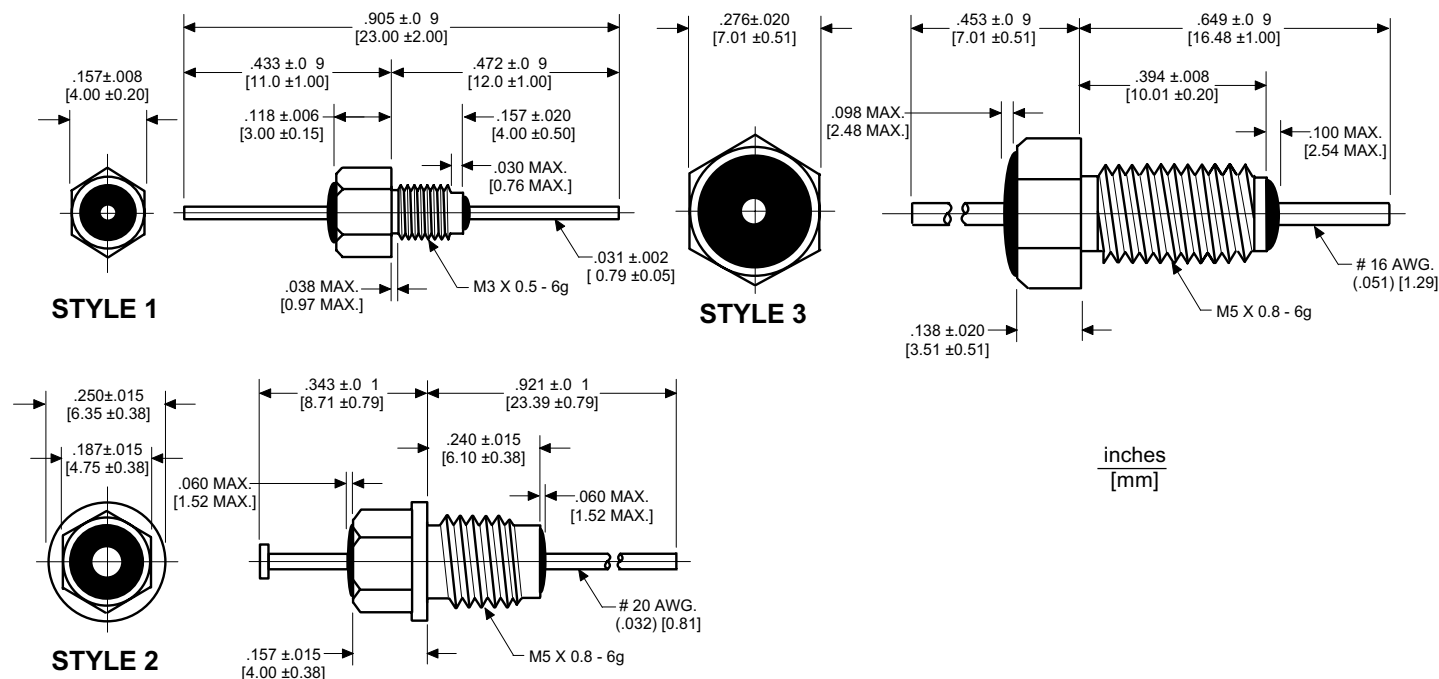
| TUSONIX<br>Part<br>Number | MIL-PRF-<br>15733<br>Number | Style | Notes | Circuit | Working<br>Voltage<br>(dc) |                | Capacitance<br>(pF) | Capacitance<br>Tolerance | Current<br>(A) | Minimum No-Load Insertion Loss<br>(dB) at 25°C per MIL-Std-220 |        |      |       |
|---------------------------|-----------------------------|-------|-------|---------|----------------------------|----------------|---------------------|--------------------------|----------------|----------------------------------------------------------------|--------|------|-------|
|                           |                             |       |       |         | 85°C                       | 125°C          |                     |                          |                | 10MHz                                                          | 100MHz | 1GHz | 10GHz |
|                           |                             |       |       |         | C Configuration            |                |                     |                          |                |                                                                |        |      |       |
| 327-010-X5U0-102M         | --                          | 2     | ••    | C       | 500                        | 250            | 1000                | ±20%                     | 20             | 3                                                              | 20     | 35   | 40    |
| 327-010-X5U0-152M         | --                          | 2     | ••    | C       | 500                        | 250            | 1500                | ±20%                     | 20             | 5                                                              | 22     | 35   | 40    |
| 327-010-X5U0-502P         | --                          | 2     | ••    | C       | 500                        | 250            | 5000                | +100-0%                  | 20             | 15                                                             | 30     | 45   | 50    |
| 327-010-X7W0-103Z         | --                          | 2     | ••    | C       | 500                        | 250            | 10,000              | +80-20%                  | 20             | 20                                                             | 35     | 50   | 55    |
| C Configuration           |                             |       |       |         |                            |                |                     |                          |                |                                                                |        |      |       |
| 2432-002-X5R0-101M        | --                          | 3     | ••    | C       | 2000                       | 1000           | 100                 | ±20%                     | 20             | --                                                             | 3      | 20   | 27    |
| 2432-002-X5S0-471M        | --                          | 3     | ••    | C       | 2000                       | 1000           | 470                 | ±20%                     | 20             | --                                                             | 12     | 27   | 27    |
| 2432-002-X5U0-502M        | --                          | 3     | ••    | C       | 2000                       | 1000           | 5000                | ±20%                     | 20             | 15                                                             | 30     | 45   | 50    |
| 2432-002-X5W0-752Z        | --                          | 3     | ••    | C       | 2000                       | 1000           | 7500                | +80-20%                  | 20             | 15                                                             | 30     | 45   | 50    |
| 2432-002-X7R0-102M        | --                          | 3     | ••    | C       | 2000                       | 1000           | 1000                | ±20%                     | 20             | 3                                                              | 20     | 35   | 40    |
| PI Configuration          |                             |       |       |         |                            |                |                     |                          |                |                                                                |        |      |       |
| 4206-016                  | --                          | 1     | --    | Pi      | 1000                       | --             | 1000                | GMV                      | 25             | 3                                                              | 35     | 65   | 65    |
| 4206-501                  | /61-0004                    | 4     | --    | Pi      | --                         | 500dc<br>350ac | 2000                | GMV                      | 25ac           | --                                                             | 55     | 70   | 70    |
| 4206-502                  | /61-0003                    | 4     | ▽     | Pi      | --                         | 500dc<br>350ac | 2000                | GMV                      | 25ac           | --                                                             | 55     | 70   | 70    |
| 4206-006                  | --                          | 1     | --    | Pi      | 1000                       | 500            | 3000                | GMV                      | 25             | 10                                                             | 55     | 70   | 70    |

Drawings not to scale.

**Please note:** All bushing style filters include hex nut and lock washer unless otherwise specified.

The products listed in this catalog are only a few of the thousands of variations that CTS produces. For custom component design, please contact the factory direct.  
component design, please contact the factory direct.

## Metric Bushing Filters



| Series Number | Temperature Range | WVdc | MAX. CAP. Nominal (pF) |
|---------------|-------------------|------|------------------------|
| 2499          | Z5, Y5, X5        | 500  | 5000                   |
|               | X7                | 250  | 5000                   |

Please see Temperature Characteristics and EIA Codes on page 25.

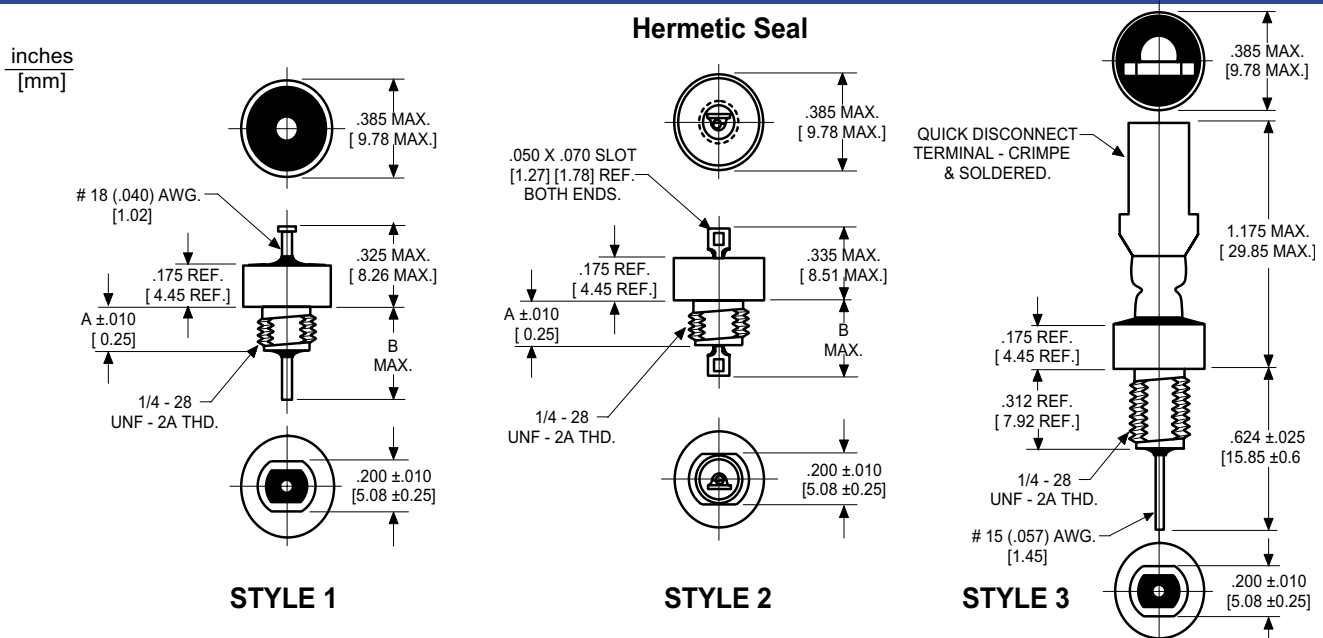
| Notes:                    |
|---------------------------|
| •• Typical Insertion Loss |

| TUSONIX<br>Part<br>Number | Style | Notes | Circuit | Working<br>Voltage<br>(dc) |       | Capacitance<br>(pF) | Capacitance<br>Tolerance | Current<br>(A) | Minimum No-Load Insertion Loss<br>(dB) at 25°C per MIL-Std-220 |       |        |      |       |
|---------------------------|-------|-------|---------|----------------------------|-------|---------------------|--------------------------|----------------|----------------------------------------------------------------|-------|--------|------|-------|
|                           |       |       |         | 85°C                       | 125°C |                     |                          |                | 1MHz                                                           | 10MHz | 100MHz | 1GHz | 10GHz |
|                           |       |       |         |                            |       |                     |                          |                |                                                                |       |        |      |       |
| M3 Thread                 |       |       |         |                            |       |                     |                          |                |                                                                |       |        |      |       |
| 4400-093                  | 1     | --    | C       | 70                         | 50    | 10,000              | +80-20%                  | 10             | 4                                                              | 20    | 35     | 50   | 50    |
| 4400-098                  | 1     | --    | C       | 70                         | 50    | 27,000              | GMV                      | 10             | 10                                                             | 28    | 42     | 55   | 60    |
| 4400-099                  | 1     | --    | C       | 50                         | 50    | 50,000              | GMV                      | 10             | 15                                                             | 35    | 45     | 70   | --    |
| 4400-094                  | 1     | --    | C       | 150                        | 100   | 4700                | GMV                      | 10             | --                                                             | 15    | 30     | 45   | 55    |
| 4400-095                  | 1     | --    | C       | 300                        | 200   | 1000                | GMV                      | 10             | --                                                             | 5     | 20     | 35   | 45    |
| 4400-683                  | 1     | --    | C       | 300                        | 200   | 5                   | MAX                      | 10             | --                                                             | --    | --     | --   | --    |
| 4400-076                  | 1     | --    | C       | 300                        | 200   | 100                 | GMV                      | 10             | --                                                             | --    | 3      | 20   | 28    |
| 4400-096                  | 1     | --    | C       | 300                        | 200   | 470                 | GMV                      | 10             | --                                                             | --    | 15     | 35   | 40    |
| 4400-097                  | 1     | --    | C       | 150                        | 100   | 2700                | GMV                      | 10             | --                                                             | 10    | 25     | 40   | 50    |
| M5 Thread                 |       |       |         |                            |       |                     |                          |                |                                                                |       |        |      |       |
| 4209-053                  | 2     | --    | Pi      | 350                        | 100   | 5500                | GMV                      | 10             | --                                                             | 20    | 65     | 70   | 70    |
| 4209-003                  | 2     | --    | Pi      | 350                        | 200   | 1500                | GMV                      | 10             | --                                                             | 5     | 45     | 70   | 70    |
| 2499-523-Y5R0-102P        | 3     | ••    | C       | 500                        | 250   | 1000                | +100-0%                  | 20             | --                                                             | 3     | 20     | 35   | 40    |

Drawings not to scale.

**Please note:** All bushing style filters include hex nut and lock washer unless otherwise specified.

# Coaxial Broadband Filter 1/4-28 UNF-2A



| TUSONIX<br>Part<br>Number      | Style | Dim.<br>A<br>inch<br>[mm] | Dim.<br>B<br>inch<br>[mm] | Circuit | Working<br>Voltage<br>(dc) |                | Capacitance<br>(pF) | Current<br>(A) | Minimum No-Load Insertion Loss<br>(dB) at 25°C per MIL-Std-220 |      |       |      |    |    |
|--------------------------------|-------|---------------------------|---------------------------|---------|----------------------------|----------------|---------------------|----------------|----------------------------------------------------------------|------|-------|------|----|----|
|                                |       | 85°C                      | 125°C                     |         | 30KHz                      | 100KHz         |                     |                | 300KHz                                                         | 1MHz | 10MHz | 1GHz |    |    |
| X7W Temperature Characteristic |       |                           |                           |         |                            |                |                     |                |                                                                |      |       |      |    |    |
| 4601-009                       | 2     | .187 [4.75]               | .350 [8.89]               | C       | 100                        | 70             | 10pF Max            | 15             | --                                                             | --   | --    | --   | -- | -- |
| 4600-005                       | 1     | .187 [4.75]               | .367 [9.32]               | C       | 100                        | 70             | 0.7 µF              | 15             | 9                                                              | 20   | 29    | 39   | 52 | 70 |
| 4600-006                       | 1     | .312 [7.93]               | .492 [12.50]              | C       | 100                        | 70             | 0.7 µF              | 15             | 9                                                              | 20   | 29    | 39   | 52 | 70 |
| 4601-005                       | 2     | .187 [4.75]               | .350 [8.89]               | C       | 100                        | 70             | 0.7 µF              | 15             | 9                                                              | 20   | 29    | 39   | 52 | 70 |
| 4601-006                       | 2     | .312 [7.93]               | .475 [12.07]              | C       | 100                        | 70             | 0.7 µF              | 15             | 9                                                              | 20   | 29    | 39   | 52 | 70 |
| 4600-000                       | 1     | .187 [4.75]               | .367 [9.32]               | C       | 100                        | 70             | 1.4 µF              | 15             | 15                                                             | 25   | 34    | 44   | 60 | 70 |
| 4600-002                       | 1     | .312 [7.93]               | .492 [12.50]              | C       | 100                        | 70             | 1.4 µF              | 15             | 15                                                             | 25   | 34    | 44   | 60 | 70 |
| 4601-000                       | 2     | .187 [4.75]               | .350 [8.89]               | C       | 100                        | 70             | 1.4 µF              | 15             | 15                                                             | 25   | 34    | 44   | 60 | 70 |
| 4601-002                       | 2     | .312 [7.93]               | .475 [12.07]              | C       | 100                        | 70             | 1.4 µF              | 15             | 15                                                             | 25   | 34    | 44   | 60 | 70 |
| 4600-055                       | 1     | .187 [4.75]               | .367 [9.32]               | L       | 100                        | 70             | 0.7 µF              | 15             | 9                                                              | 20   | 29    | 39   | 52 | 70 |
| 4600-056                       | 1     | .312 [7.93]               | .492 [12.50]              | L       | 100                        | 70             | 0.7 µF              | 15             | 9                                                              | 20   | 29    | 39   | 52 | 70 |
| 4601-055                       | 2     | .187 [4.75]               | .350 [8.89]               | L       | 100                        | 70             | 0.7 µF              | 15             | 9                                                              | 20   | 29    | 39   | 52 | 70 |
| 4601-056                       | 2     | .312 [7.93]               | .475 [12.07]              | L       | 100                        | 70             | 0.7 µF              | 15             | 9                                                              | 20   | 29    | 39   | 52 | 70 |
| 4600-050                       | 1     | .187 [4.75]               | .367 [9.32]               | L       | 100                        | 70             | 1.4 µF              | 15             | 15                                                             | 25   | 34    | 44   | 60 | 70 |
| 4600-052                       | 1     | .312 [7.93]               | .492 [12.50]              | L       | 100                        | 70             | 1.4 µF              | 15             | 15                                                             | 25   | 34    | 44   | 60 | 70 |
| 4601-050                       | 2     | .187 [4.75]               | .350 [8.89]               | L       | 100                        | 70             | 1.4 µF              | 15             | 15                                                             | 25   | 34    | 44   | 60 | 70 |
| 4601-052                       | 2     | .312 [7.93]               | .475 [12.07]              | L       | 100                        | 70             | 1.4 µF              | 15             | 15                                                             | 25   | 34    | 44   | 60 | 70 |
| X7R Temperature Characteristic |       |                           |                           |         |                            |                |                     |                |                                                                |      |       |      |    |    |
| 4600-007                       | 1     | .187 [4.75]               | .367 [9.32]               | C       | 100                        | 70             | 0.7 µF              | 15             | 9                                                              | 20   | 29    | 39   | 52 | 70 |
| 4600-008                       | 1     | .312 [7.93]               | .492 [12.50]              | C       | 100                        | 70             | 0.7 µF              | 15             | 9                                                              | 20   | 29    | 39   | 52 | 70 |
| 4601-007                       | 2     | .187 [4.75]               | .350 [8.89]               | C       | 100                        | 70             | 0.7 µF              | 15             | 9                                                              | 20   | 29    | 39   | 52 | 70 |
| 4601-008                       | 2     | .312 [7.93]               | .475 [12.07]              | C       | 100                        | 70             | 0.7 µF              | 15             | 9                                                              | 20   | 29    | 39   | 52 | 70 |
| 4600-003                       | 1     | .187 [4.75]               | .367 [9.32]               | C       | 100                        | 50             | 1.4 µF              | 15             | 15                                                             | 25   | 34    | 44   | 60 | 70 |
| 4600-004                       | 1     | .312 [7.93]               | .492 [12.50]              | C       | 100                        | 70             | 1.4 µF              | 15             | 15                                                             | 25   | 34    | 44   | 60 | 70 |
| 4601-003                       | 2     | .187 [4.75]               | .350 [8.89]               | C       | 100                        | 50             | 1.4 µF              | 15             | 15                                                             | 25   | 34    | 44   | 60 | 70 |
| 4601-004                       | 2     | .312 [7.93]               | .475 [12.07]              | C       | 100                        | 50             | 1.4 µF              | 15             | 15                                                             | 25   | 34    | 44   | 60 | 70 |
| 4600-009                       | 1     | .187 [4.75]               | .367 [9.32]               | C       | 280                        | 200dc<br>125ac | .15 µF              | 15             | --                                                             | 7    | 15    | 25   | 40 | 60 |
| 4601-010                       | 2     | .187 [4.75]               | .350 [8.89]               | C       | 280                        | 200dc<br>125ac | .15 µF              | 15             | --                                                             | 7    | 15    | 25   | 40 | 60 |
| 4600-057                       | 1     | .187 [4.75]               | .367 [9.32]               | L       | 100                        | 70             | 0.7 µF              | 15             | 9                                                              | 20   | 29    | 39   | 52 | 70 |
| 4600-058                       | 1     | .312 [7.93]               | .492 [12.50]              | L       | 100                        | 70             | 0.7 µF              | 15             | 9                                                              | 20   | 29    | 39   | 52 | 70 |
| 4601-057                       | 2     | .187 [4.75]               | .350 [8.89]               | L       | 100                        | 70             | 0.7 µF              | 15             | 9                                                              | 20   | 29    | 39   | 52 | 70 |
| 4601-058                       | 2     | .312 [7.93]               | .475 [12.07]              | L       | 100                        | 70             | 0.7 µF              | 15             | 9                                                              | 20   | 29    | 39   | 52 | 70 |
| 4600-053                       | 1     | .187 [4.75]               | .367 [9.32]               | L       | 100                        | 50             | 1.4 µF              | 15             | 15                                                             | 25   | 34    | 44   | 60 | 70 |
| 4600-054                       | 1     | .312 [7.93]               | .492 [12.50]              | L       | 100                        | 50             | 1.4 µF              | 15             | 15                                                             | 25   | 34    | 44   | 60 | 70 |
| 4601-053                       | 2     | .187 [4.75]               | .350 [8.89]               | L       | 100                        | 50             | 1.4 µF              | 15             | 15                                                             | 25   | 34    | 44   | 60 | 70 |
| 4601-054                       | 2     | .312 [7.93]               | .475 [12.07]              | L       | 100                        | 50             | 1.4 µF              | 15             | 15                                                             | 25   | 34    | 44   | 60 | 70 |
| 4600-059                       | 1     | .187 [4.75]               | .367 [9.32]               | L       | 280                        | 200dc<br>125ac | .15 µF              | 15             | --                                                             | 7    | 15    | 25   | 40 | 60 |
| 4601-059                       | 2     | .187 [4.75]               | .350 [8.89]               | L       | 280                        | 200dc<br>125ac | .15 µF              | 15             | --                                                             | 7    | 15    | 25   | 40 | 60 |

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component design, please contact the factory direct.

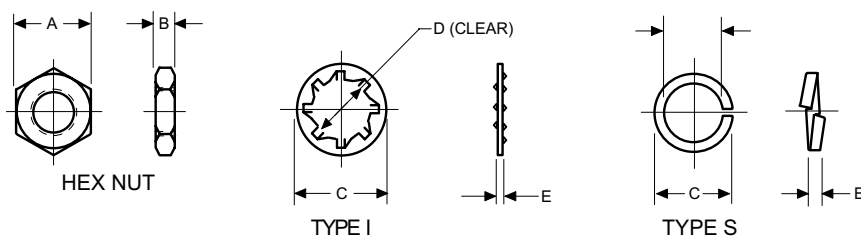
## Coaxial Broadband Filter 1/4-28 UNF-2A and Standard Hardware Dimensions

### Notes:

▲ 12 AWG .081[2.06] Lead and X7R Temp. Characteristic

| TUSONIX<br>Part<br>Number      | Style | Notes | Dim.<br>A<br>inch<br>[mm] | Dim.<br>B<br>inch<br>[mm] | Circuit | Working<br>Voltage<br>(dc) |                | Capacitance<br>(pF) | Current<br>(A) | Minimum No-Load Insertion Loss<br>(dB) at 25°C per MIL-Std-220 |        |        |      |       |      |  |
|--------------------------------|-------|-------|---------------------------|---------------------------|---------|----------------------------|----------------|---------------------|----------------|----------------------------------------------------------------|--------|--------|------|-------|------|--|
|                                |       |       |                           |                           |         | 85°C                       | 125°C          |                     |                | 30KHz                                                          | 100KHz | 300KHz | 1MHz | 10MHz | 1GHz |  |
|                                |       |       |                           |                           |         |                            |                |                     |                |                                                                |        |        |      |       |      |  |
| X7R Temperature Characteristic |       |       |                           |                           |         |                            |                |                     |                |                                                                |        |        |      |       |      |  |
| 4600-014                       | 3     | --    | --                        | --                        | C       | 100                        | 70             | 0.7 μF              | 20             | 9                                                              | 20     | 29     | 39   | 52    | 70   |  |
| 4600-015                       | 3     | --    | --                        | --                        | C       | 100                        | 50             | 1.4 μF              | 20             | 15                                                             | 25     | 34     | 44   | 60    | 70   |  |
| 4600-016                       | 3     | --    | --                        | --                        | C       | 280                        | 200dc<br>125ac | .15 μF              | 20             | --                                                             | 7      | 15     | 25   | 40    | 60   |  |
| 4600-070                       | 3     | --    | --                        | --                        | L       | 100                        | 70             | 0.7 μF              | 20             | 9                                                              | 20     | 29     | 39   | 40    | 70   |  |
| 4600-067                       | 3     | ▲     | --                        | --                        | L       | 100                        | 70             | 1.2 μF              | 30             | 15                                                             | 25     | 34     | 44   | 52    | 70   |  |
| 4600-071                       | 3     | --    | --                        | --                        | L       | 100                        | 50             | 1.4 μF              | 20             | 15                                                             | 25     | 34     | 44   | 60    | 70   |  |
| 4600-072                       | 3     | --    | --                        | --                        | L       | 280                        | 200dc<br>125ac | .15 uF              | 20             | --                                                             | 7      | 15     | 25   | 60    | 60   |  |

## STANDARD HARDWARE DIMENSIONS



| NUT<br>THREAD<br>SIZE | MOUNTING<br>TORQUE<br>LIMITS | HEX NUT                      |                              | TYPE | LOCK WASHER  |             |             |
|-----------------------|------------------------------|------------------------------|------------------------------|------|--------------|-------------|-------------|
|                       |                              | A                            | B                            |      | C            | D           | E           |
| 4-40 UNC              | 2 lb.in.<br>[.226 N-m]       | .187 [4.75]                  | .062 [1.57]                  | I    | .220 [5.59]  | .120 [3.05] | .015 [0.38] |
| 6-32 UNC              | 2 lb.in.<br>[.226 N-m]       | .187 [4.75]                  | .062 [1.57]                  | I    | .283 [7.19]  | .146 [3.71] | .017 [0.43] |
| 6-40 UNF              | 3 lb.in.<br>[.339 N-m]       | .187 [4.75]                  | .062 [1.57]                  | I    | .283 [7.19]  | .146 [3.71] | .017 [0.43] |
| 8-32 UNC              | 5 lb.in.<br>[.565 N-m]       | .250 [6.35]                  | .075 [1.91]                  | I    | .283 [7.19]  | .167 [4.24] | .018 [0.46] |
| 8-36 UNF              | 1 lb.in.<br>[.113 N-m]       | --                           | --                           | I    | .283 [7.19]  | .167 [4.24] | .015 [0.38] |
| 12-28 UNF             | 8 lb.in.<br>[.904 N-m]       | .250 [6.35]                  | .075 [1.91]                  | I    | .387 [9.83]  | .220 [5.59] | .022 [0.56] |
| 12-32 UNEF            | 8 lb.in.<br>[.904 N-m]       | .250 [6.35]                  | .075 [1.91]                  | I    | .387 [9.83]  | .220 [5.59] | .022 [0.56] |
| 1/4-28 UNF            | 8 lb.in.<br>[.904 N-m]       | .313 ± .015<br>[7.95 ± 0.38] | .125 ± .015<br>[3.18 ± 0.38] | I    | .387 [9.83]  | .220 [5.59] | .022 [0.56] |
| 5/16-24 UNF           | 9 lb.in.<br>[1.02 N-m]       | .375 ± .010<br>[9.53 ± 0.25] | .090 [2.29]                  | I    | .420 [10.6]  | .262 [6.65] | .025 [0.63] |
| 5/16-32 UNEF          | 9 lb.in.<br>[1.02 N-m]       | .375 ± .010<br>[9.53 ± 0.25] | .090 [2.29]                  | I    | .430 [10.92] | .318 [8.08] | .022 [0.56] |
| 3/8-32 UNEF           | 9 lb.in.<br>[1.02 N-m]       | .500 ± .010<br>[12.7 ± 0.25] | .090 [2.29]                  | I    | .430 [10.92] | .318 [8.08] | .022 [0.56] |
| M3 X 0.5              | 2 lb.in.<br>[.226 N-m]       | .187 ± .010<br>[4.75 ± 0.25] | .062 [1.57]                  | I    | .500 [12.70] | .384 [9.75] | .022 [0.56] |
| M5 X 0.8 6g           | 7 lb.in.<br>[.790 N-m]       | .250 [6.35]                  | .075 [1.91]                  | S    | .192 [4.88]  | .118 [2.99] | .025 [0.63] |
|                       |                              |                              |                              | S    | .277 [7.04]  | .172 [4.37] | .034 [0.86] |
|                       |                              |                              |                              | S    | .361 [9.17]  | .225 [5.72] | .050 [1.27] |

### Characteristics

- Dimensions: Inches [metric]  
Dimensional Tolerance:  
± .005 [0.13], thread tolerance class 2.
- Standard finish: Silver
- Nut material: Brass  
Washer material: Phosphor Bronze
- When mounting filter without hardware, into tapped hole, the mounting torque applied to the filter body must be no more than 1/2 the torque limits listed on the chart to the left.

## Product Installation Recommendations and EIA codes

### PRODUCT INSTALLATION RECOMMENDATIONS

The components in this catalog are manufactured with ceramic dielectrics. To minimize possible damage to the components during installation, the recommendations below should be followed. For information concerning other installation requirements and/or component modifications, contact us.

#### General Recommendations

- Handling:** Excessive force or direct impact to the component may result in breakage. Lead bending or cutting, if necessary, should be done with a support for the lead to prevent mechanical stress to the component. Components with required lead modifications are available.
- Lead Soldering:** Use a temperature controlled soldering iron with SN60 or SN63 RMA Flux core wire. Maximum soldering temperature to be 500°F (260°C) with a dwell time of 3 seconds maximum. The use of a heat sink between the component body and the solder joint is highly recommended.
- Flux Removal:** Optimum flux removal can be achieved by vapor degreasing the components immediately after the soldering operation. Total immersion of the components is not recommended.

#### Solder Mount Recommendations

- Mounting:** Use a convection or infrared oven and SN60 or SN63 solder paste, or solder preforms, with RMA Flux. The oven profile should slowly heat the entire assembly to a reflow temperature of 430°F (221°C), with a rate of change not to exceed 5°F, 3°C/Sec. and a dwell time as short as possible.
- Internal Electrode Soldering:** Use a temperature controlled soldering iron with SN62 silver bearing (2%) RMA Flux core solder wire. The components should be preheated to 300°F (150°C), then soldered with a maximum temperature of 500°F (260°C) and a dwell of 3 seconds maximum.

#### Bushing Mount Recommendations

*For Mounting Torque, please see standard hardware dimensions table on page 24.*

### EIA/Tusonix Tolerance Codes

| TEMPERATURE CHARACTERISTICS |                     |
|-----------------------------|---------------------|
| EIA Code                    | Temperature Range   |
| Z5                          | +10°C to +85°C      |
| Y5                          | -30°C to +85°C      |
| X5                          | -55°C to +85°C      |
| X7                          | -55°C to +125°C     |
| EIA Code                    | Maximum Cap. Change |
| D                           | ± 3.3%              |
| E                           | ± 4.7%              |
| F                           | ± 7.5%              |
| P                           | ± 10%               |
| R                           | ± 15%               |
| S                           | ± 22%               |
| T                           | + 22% -33%          |
| U                           | + 22% -56%          |
| V                           | + 22% -82%          |
| W                           | + 22% -90%          |

| CAPACITANCE TOLERANCE                |      |                                   |
|--------------------------------------|------|-----------------------------------|
| Nominal Capacitance<br>10 pF or Less | Code | Nominal Capacitance<br>over 10 pF |
| GMV◆                                 | AA   | GMV◆                              |
| ± 0.1 pF                             | A    | +50% -20%                         |
| ± 0.25 pF                            | B    | ± 0.10%                           |
| ± 0.5 pF                             | C    | ± 0.25%                           |
| ± 0.3 pF                             | D    | ± 0.50%                           |
| ± 1 pF                               | E    | +70% -30%                         |
| ± 2 pF                               | F    | ± 1%                              |
| ± 3%                                 | G    | ± 2%                              |
|                                      | H    | ± 3%                              |
|                                      | I    | +60% -40%                         |
| ± 5%                                 | J    | ± 5%                              |
| ± 10%                                | K    | ± 10%                             |
| ± 2%                                 | L    | +100% -40%                        |

| CAPACITANCE TOLERANCE (Cont.)        |      |                                   |
|--------------------------------------|------|-----------------------------------|
| Nominal Capacitance<br>10 pF or Less | Code | Nominal Capacitance<br>over 10 pF |
| ± 20%                                | M    | ± 20%                             |
| ± 0.4 pF                             | N    | ± 30%                             |
|                                      | P    | +100% -0%                         |
| ± 0.2 pF                             | Q    | ± 15%                             |
|                                      | R    | ± 2.5%                            |
|                                      | S    | +50% -15%                         |
|                                      | T    | +30% -20%                         |
|                                      | U    | +80% -0%                          |
|                                      | V    | ± 7%                              |
|                                      | W    | +50% -30%                         |
| MAX.                                 | X    | +40% -10%                         |
|                                      | Y    | +50% -0%                          |
|                                      | Z    | +80% -20%                         |

◆GMV: TUSONIX Code: Guaranteed Minimum Value

**Please note:** Maximum Capacitance for each part number is determined by the required operating temperature range and maximum capacitance change.

The products listed in this catalog are only a few of the thousands of variations that CTS produces. For custom component design, please contact the factory direct.  
component design, please contact the factory direct.

## General Test Specifications

The Components shown in this catalog have been designed and subjected to the following test plan, as is applicable for the individual components. The information shown can be used as a basis for component specifications. For additional information, please contact CTS.

Filters governed by MIL-PRF-15733 shall be inspected and tested to the requirements of the specification and the applicable specification (slash) sheet.

| LOT ACCEPTANCE INSPECTION:                      |                                                                                                    |                                                                   |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| INSPECTION OR TEST                              | TEST METHOD PER MIL-STD-202 EXCEPT AS NOTED                                                        | POST TEST REQUIREMENTS                                            |
| Visual and Mechanical                           |                                                                                                    | In accordance with applicable requirements                        |
| Materials, Design, Construction and Workmanship |                                                                                                    |                                                                   |
| Physical Dimensions & Marking                   |                                                                                                    |                                                                   |
| Seal (4601 Style Only)                          | Method 112, condition A                                                                            | No leaks                                                          |
| Capacitance                                     | Method 305, 1KHz, 1±0.2 VRMS max. +25°C                                                            | Within specified tolerance                                        |
| Dissipation Factor (1/Q)                        | Method 306, 1KHz, 1±0.2 VRMS max. +25°C                                                            | 4.0% max                                                          |
| Dielectric Withstanding Voltage                 | Method 301, 2 seconds, 50 mA max. surge current, 2 times WVDC.                                     | No evidence of damage or break down.                              |
| Insulation Resistance                           | Method 302, 50 mA max. charging current, 100VDC, 2 minutes or as specified by individual variation | Greater than 10,000 Megohms or 100 Ohm-Farads, whichever is less. |
| Insertion Loss                                  | MIL-STD-220, 50 Ohms, +25°C, no load                                                               | Per application requirements.                                     |
| DC Resistance (4601 Style Only)                 | MIL-PRF-15733                                                                                      | 0.01 Ohms max.                                                    |
| Solderability (5pcs)                            | Method 208                                                                                         | Per applicable requirements.                                      |

### PERIODIC QUALITY CONFORMANCE INSPECTION:

A periodic quality conformance inspection program consisting of environmental and reliability testing is in place to ensure that product integrity is consistently maintained.

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