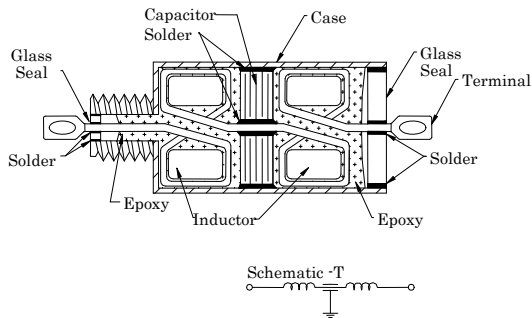


# BROADBAND

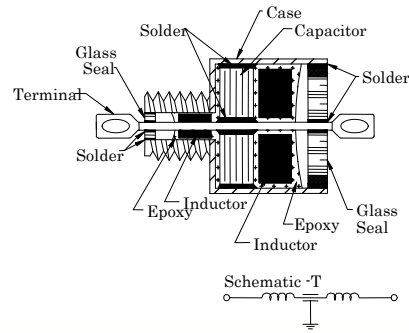
# EMI FILTERS

## “T” TYPE

### Hermetic Low Current T-Broadband



### Hermetic High Current T-Broadband



#### FEATURES:

- Designed to meet MIL-F-28861 requirements.
- Hermetically sealed components.
- Variety of capacitance and inductance values.
- Voltage ratings 50 VDC through 240 VAC.
- Excellent insertion loss performance.
- Operating temperature range -55°C to +125°C.

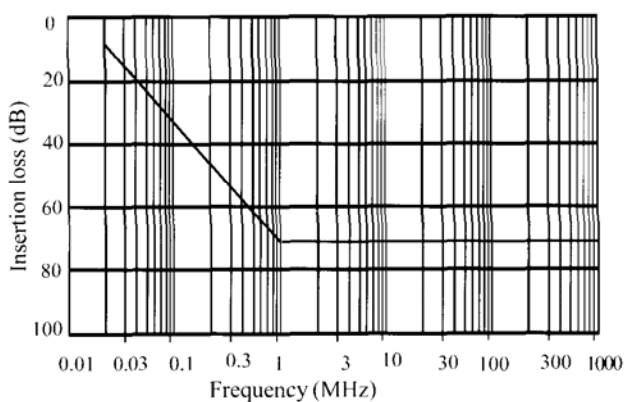
#### APPLICATIONS:

The “T” section filter is another three element device that consists of two inductors one at either end and a capacitive element between them. It will provide the user with 60 dB per decade roll-off beyond the cut-off frequency which is typically around 30 KHz. The insertion loss across the frequency range is similar to that of the PI filter with approximately half of the capacitance value of the PIs. It is applicable for use in relatively high speed pulse transmission lines where minimum filter capacitance is required in order to prevent wave shaping of digital signals.

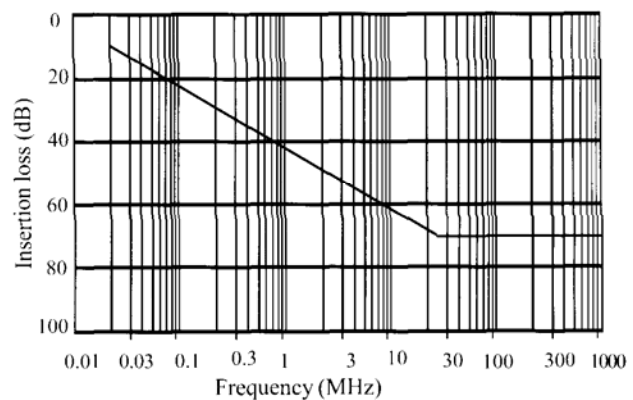
Its relatively high input and output impedance makes it best suited for systems with low source and load impedances.

Typical of this application would be AC power lines which are also prone to destructive voltage transients and high current surges either from atmospheric sources or man-made equipment. The inductor at each end tends to protect the capacitor by slowing down transient rise time, limiting the capacitor charging current and lowering the peak voltage levels.

TYPICAL INSERTION LOSS 1.4 $\mu$ F, 1 AMP



TYPICAL INSERTION LOSS 1.4 $\mu$ F, 10 AMP



# EMI FILTERS “T” TYPE

# BROADBAND

## GENERAL SPECIFICATIONS:

|                                  |  |
|----------------------------------|--|
| Capacitance / Tolerance:         | Measured @ 1 KHz and .1-1 Vrms, 25°C / -0% +100%   |
| Dissipation Factor:              | 2.5% max @ 1 KHz and .1-1 Vrms, 25°C   |
| Insulation Resistance:           | 10 GW min or 1000 MW -mF, whichever is less @ 25°C, WVDC   |
| Working Voltage:                 | 50 VDC to 240 VAC  |
| Dielectric Withstanding Voltage: | 250 % of WVDC min. @ 25°C for 5±1 sec, 50 mA max chg. Current  |
| Volt-Temperature Limit:          | +10% -30% @ WVDC and -55°C to +125°C   |
| Current Rating:                  | 1 Amp through 10 Amp   |
| DC Resistance:                   | .005W through 1W   |
| Insertion Loss:                  | Measured per Mil-STD-220, IL between any two adjacent specified frequencies shall be that of the lower of the two frequencies in order to accommodate resonant dips. |
| Operating Temperature:           | -55°C to +125°C  |
| Storage Temperature:             | -65°C to +160°C  |
| Materials: Case                  | Brass, ½ hard per QQ-B-626 (composition #22)   |
| Terminals                        | Iron-nickel alloy (alloy 52) per ASTM F-30   |
| Finish: Case                     | Tin/Lead per MIL-T-10727 / Gold or Silver Optional   |
| Terminals                        | Tin/Lead per MIL-T-10727 / Gold or Silver Optional   |
| Applicable MIL Specifications:   | Mil-F-28861 / Mil-F-15733  |
| Environmental Test Spec:         | Mil-STD-202  |
| Thermal Shock:                   | Method 107, Condition A except step 3 @ 125°C  |
| Immersion:                       | Method 104, Condition A  |
| Salt Spray:                      | Method 101, Condition B  |
| Moisture Resistance:             | Method 106   |
| Barometric Pressure:             | Method 105, Condition B  |
| Resistance to Soldering Heat:    | Method 210, Condition B  |
| Seal:                            | Method 112, Condition A  |
| Vibration:                       | Method 204, Condition D  |
| Shock:                           | Method 213, Condition I  |
| Terminal Strength:               | Method 211, Condition A  |
| Solderability:                   | Method 208   |
| Life:                            | Method 108, Condition D  |

Marking per Mil-STD-130

Filter body size permitting:

PA&E logo  
PA&E part number  
Date code

## INSTALLATION GUIDE

Although PA&E filters are rugged with excellent resistance to physical damage, good working practices should be utilized in the installation process to avoid possible post-installation problems.

1) Maximum recommended mounting torque should be applied to the nut only and observed as follows:

|              |           |           |            |              |              |              |              |
|--------------|-----------|-----------|------------|--------------|--------------|--------------|--------------|
| Thread size  | 0-80      | 2-56      | 4-40 UNC   | 8-32 UNC     | 12-32 UNC    | 1/4-28 UNF   | 5/16-24 UNF  |
| Mount torque | 10 in oz. | 18 in oz. | 3 in. lbs. | 3-5 in. lbs. | 6-8 in. lbs. | 7-9 in. lbs. | 7-9 in. lbs. |

2) Avoid bending or flexing terminals at the point of exit from the glass or epoxy seal to preserve the integrity of the seal and/or ceramic capacitor.

3) Solder connections to the terminals should be performed with temperatures not exceeding 230°C, placing a heat sink between soldering point and filter body whenever possible.

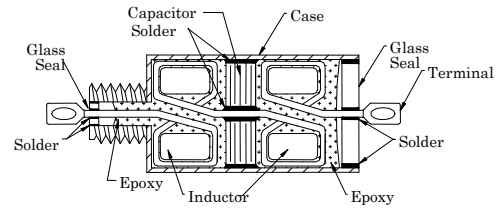
# BROADBAND



# EMI FILTERS

## “T” TYPE

### Hermetic Low Current T-Section Broadband Filter



Schematic -T

| PA&E FILTERS PART NUMBER | L MAX (in.) | WORKING VOLTAGE (VDC) | I <sub>dc</sub> (A) | MIN CAP (μF) | MIN IR (MΩ) | MAX Rdc (Ω) | MINIMUM INSERTION LOSS (dB) |         |         |         |       |        |         |       |
|--------------------------|-------------|-----------------------|---------------------|--------------|-------------|-------------|-----------------------------|---------|---------|---------|-------|--------|---------|-------|
|                          |             |                       |                     |              |             |             | Per Mil-STD-220             |         |         |         |       |        |         |       |
|                          |             |                       |                     |              |             |             | 30 KHz                      | 100 KHz | 150 KHz | 300 KHz | 1 MHz | 10 MHz | 100 MHz | 1 GHz |
| 3512-7R63-145**          | 1.273       | 50                    | .5                  | 1.4          | 500         | 1           | 17                          | 40      | 50      | 50      | 80    | 80     | 80      | 80    |
| 3513-7R63-145**          | 1.273       | 50                    | 1                   | 1.4          | 500         | .5          | 16                          | 32      | 40      | 54      | 70    | 70     | 70      | 70    |
| 3519-7R63-145**          | 1.273       | 50                    | 2                   | 1.4          | 500         | .09         | 15                          | 25      | 29      | 36      | 60    | 70     | 70      | 70    |
| 351Y-7R63-145**          | 1.273       | 50                    | 4                   | 1.4          | 500         | .03         | 15                          | 25      | 28      | 33      | 46    | 70     | 70      | 70    |
| 3516-7R63-145**          | 1.273       | 50                    | 10                  | 1.4          | 500         | .005        | 15                          | 25      | 28      | 33      | 43    | 60     | 70      | 70    |
| 3522-7R63-754**          | 1.273       | 100                   | .5                  | .75          | 1000        | 1           | 12                          | 36      | 45      | 60      | 80    | 80     | 80      | 80    |
| 3523-7R63-754**          | 1.273       | 100                   | 1                   | .75          | 1000        | .5          | 10                          | 25      | 32      | 49      | 70    | 70     | 70      | 70    |
| 3529-7R63-754**          | 1.273       | 100                   | 2                   | .75          | 1000        | .09         | 9                           | 19      | 23      | 32      | 55    | 70     | 70      | 70    |
| 352Y-7R63-754**          | 1.273       | 100                   | 4                   | .75          | 1000        | .03         | 9                           | 19      | 22      | 29      | 42    | 70     | 70      | 70    |
| 3526-7R63-754**          | 1.273       | 100                   | 10                  | .75          | 1000        | .005        | 9                           | 19      | 21      | 28      | 39    | 58     | 70      | 70    |
| 3532-7R63-334**          | 1.273       | 200                   | .5                  | .33          | 200         | 1           | 4                           | 28      | 38      | 55      | 80    | 80     | 80      | 80    |
| 3533-7R63-334**          | 1.273       | 200                   | 1                   | .33          | 2000        | .5          | 3                           | 15      | 20      | 40      | 67    | 70     | 70      | 70    |
| 3539-7R63-334**          | 1.273       | 200                   | 2                   | .33          | 2000        | .09         | -                           | 10      | 14      | 22      | 46    | 70     | 70      | 70    |
| 353Y-7R63-334**          | 1.273       | 200                   | 4                   | .33          | 2000        | .03         | -                           | 10      | 14      | 19      | 32    | 70     | 70      | 70    |
| 3536-7R63-334**          | 1.273       | 200                   | 10                  | .33          | 2000        | .005        | 3                           | 10      | 14      | 19      | 30    | 50     | 70      | 70    |
| 3542-7R63-154**          | 1.273       | 125VAC                | .5                  | .15          | 3000        | 1           | -                           | 20      | 30      | 50      | 75    | 80     | 80      | 80    |
| 3543-7R63-154**          | 1.273       | 125VAC                | 1                   | .15          | 3000        | .5          | -                           | 6       | 12      | 29      | 61    | 70     | 70      | 70    |
| 3549-7R63-154**          | 1.273       | 125VAC                | 2                   | .15          | 3000        | .09         | -                           | -       | 8       | 16      | 39    | 70     | 70      | 70    |
| 354Y-7R63-154**          | 1.273       | 125VAC                | 4                   | .15          | 3000        | .03         | -                           | -       | -       | 9       | 25    | 65     | 70      | 70    |
| 3546-7R63-154**          | 1.273       | 125VAC                | 10                  | .15          | 3000        | .005        | -                           | 4       | 7       | 10      | 20    | 40     | 70      | 70    |

Details subject to change without notice.

**\*\* PART NUMBERS ARE INCOMPLETE. PLEASE SEE PAGE 49 TO COMPLETE THE NUMBERS.**

**NOTE:** For case style Figure 1, use 7 in the fifth place of the part number.

For case style Figure 2, use 8 in the fifth place of the part number.

\* For L1 circuit, substitute 2 for 3 in the second digit of the part number.

\*\* For .312 thread length, substitute 7 for 6 in the seventh digit of the part number.

Tolerances: ± .10 and as noted.

Hermetic Low Current T-Section Broadband Filter

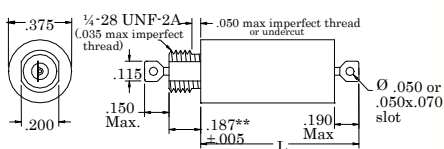


Figure 1

Hermetic Low Current T-Section Broadband Filter

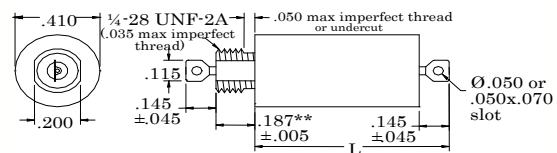
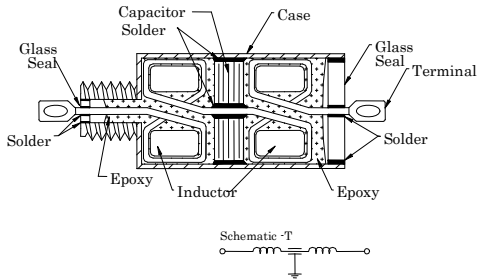


Figure 2

# EMI FILTERS "T" TYPE

# BROADBAND

Hermetic Low Current T-Section  
Broadband Filter



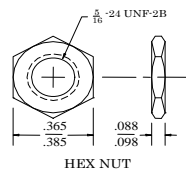
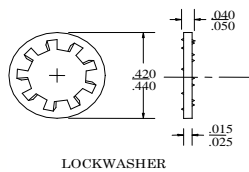
| PA&E FILTERS PART NUMBER | L MAX (in.) | WORKING VOLTAGE (VDC) | I <sub>dc</sub> (A) | MIN CAP (μF) | MIN IR (MΩ) | MAX Rdc (Ω) | MINIMUM INSERTION LOSS (dB)<br>Per Mil-STD-220 |         |         |         |       |        |         |       |
|--------------------------|-------------|-----------------------|---------------------|--------------|-------------|-------------|--|---------|---------|---------|-------|--------|---------|-------|
|                          |             |                       |                     |              |             |             | 30 KHz   | 100 KHz | 150 KHz | 300 KHz | 1 MHz | 10 MHz | 100 MHz | 1 GHz |
| 3522-9R83-145**          | 1.400       | 100                   | .5                  | 1.4          | 500         | 1           | 28   | 55      | 65      | 80      | 80    | 80     | 80      | 80    |
| 3523-9R83-145**          | 1.400       | 100                   | 1                   | 1.4          | 500         | .5          | 20   | 46      | 55      | 70      | 70    | 70     | 70      | 70    |
| 3529-9R83-145**          | 1.400       | 100                   | 2                   | 1.4          | 500         | .09         | 15   | 25      | 31      | 43      | 67    | 70     | 70      | 70    |
| 352Y-9R83-145**          | 1.400       | 100                   | 4                   | 1.4          | 500         | .03         | 15   | 25      | 28      | 35      | 50    | 70     | 70      | 70    |
| 3526-9R83-145**          | 1.400       | 100                   | 10                  | 1.4          | 500         | .005        | 14   | 25      | 28      | 34      | 44    | 57     | 70      | 70    |
| 3532-9R83-704**          | 1.400       | 200                   | .5                  | .7           | 1000        | 1           | 20   | 50      | 62      | 75      | 80    | 80     | 80      | 80    |
| 3533-9R83-704**          | 1.400       | 200                   | 1                   | .7           | 1000        | .5          | 13   | 40      | 48      | 66      | 70    | 70     | 70      | 70    |
| 3539-9R83-704**          | 1.400       | 200                   | 2                   | .7           | 1000        | .09         | 8  | 20      | 25      | 35      | 63    | 70     | 70      | 70    |
| 353Y-9R83-704**          | 1.400       | 200                   | 4                   | .7           | 1000        | .03         | 8  | 18      | 22      | 29      | 45    | 70     | 70      | 70    |
| 3536-9R83-704**          | 1.400       | 200                   | 10                  | .7           | 1000        | .005        | 8  | 18      | 21      | 28      | 39    | 58     | 70      | 70    |
| 3542-9R83-704**          | 1.400       | 125VAC                | .5                  | .3           | 2000        | 1           | 12   | 44      | 55      | 70      | 80    | 80     | 80      | 80    |
| 3543-9R83-304**          | 1.400       | 125VAC                | 1                   | .3           | 2000        | .052        | -  | 11      | 16      | 28      | 56    | 70     | 70      | 70    |
| 3549-9R83-304**          | 1.400       | 125VAC                | 2                   | .3           | 2000        | .038        | -  | 10      | 14      | 22      | 46    | 70     | 70      | 70    |
| 354Y-9R83-304**          | 1.400       | 125VAC                | 4                   | .3           | 2000        | .026        | -  | 10      | 14      | 20      | 35    | 70     | 70      | 70    |
| 3552-9R83-154**          | 1.400       | 240VAC                | .5                  | .15          | 3000        | 1           | 4  | 38      | 48      | 65      | 80    | 80     | 80      | 80    |
| 3553-9R83-154**          | 1.400       | 240VAC                | 1                   | .15          | 3000        | .052        | -  | 4       | 10      | 23      | 52    | 70     | 70      | 70    |
| 3559-9R83-154**          | 1.400       | 240VAC                | 2                   | .15          | 3000        | .038        | -  | 4       | 8       | 16      | 39    | 70     | 70      | 70    |
| 355Y-9R83-154**          | 1.400       | 240VAC                | 4                   | .15          | 3000        | .026        | -  | 4       | 8       | 14      | 29    | 70     | 70      | 70    |

Details subject to change without notice.

\*\* PART NUMBERS ARE INCOMPLETE. PLEASE SEE PAGE 49 TO COMPLETE THE NUMBERS.

Tolerances: ± .10 and as noted.

MOUNTING HARDWARE



Hermetic Low Current T-Section  
Broadband Filter

