

Cavity Bandpass Filters

50Ω DC to 15 GHz



The Big Deal

- Very low insertion loss with excellent power handling
- Very fast roll-off with wide stopband
- Passbands up to 15 GHz
- Stopbands up to 20 GHz

Product Overview

Mini-Circuits' cavity filters are designed by implementing resonant structures with very high Q and are ideal for narrow-band, high-selectivity applications. These designs can provide bandwidths as narrow as 1% with very high selectivity and excellent low noise floor. Low insertion loss combined with excellent power handling makes them well-suited for transmitter and receiver front end. Advanced filter design and construction enables stopband width greater than 3x the center frequency.

Mini-Circuits' cavity filters feature a special protective assembly to prevent accidental de-tuning that would otherwise require expensive replacement or return to factory for re-tuning. Custom integrated assembly with LNA and bias tees results in greatly simplifying system integration. Precise machining allows realization of cavity filters with small form factors for applications where size is critical. Excellent repeatability across units is achieved through precise tuning and process control.

Key Features

| Feature | Advantages |
|---------------------|---|
| Low insertion loss | Low signal loss results in better SNR in receiver front end and better power delivery to antenna in transmitter |
| Fast roll-off | Higher selectivity results in better adjacent channel rejection and dynamic range |
| Wide stopband | Wide spur free band results in better receiver sensitivity |
| High power handling | Well suited for transmitter application |
| Protective assembly | Prevents accidental de-tuning of precisely tuned resonant circuit |

Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp



Cavity Bandpass Filter

ZVBP-3875-S+

50Ω 3845 to 3905 MHz



Generic photo used for illustration purposes only

CASE STYLE: QZ2439

Connectors SMA-F Model ZVBP-3875-S+

Features

- Low insertion loss, 0.6 dB typical
- Good VSWR, 1.3:1 typical
- High rejection
- Broad stopband performance up to 8.5 GHz
- Fast roll-off

Applications

- Fixed and mobile communication network
- Satellite communication

Electrical Specifications at 25°C

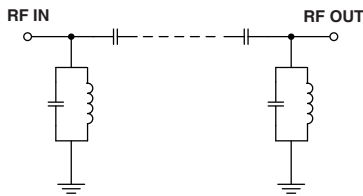
| Parameter | F# | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|------------------|------------------|-----------------|-----------|------|------|------|
| Pass Band | Center Frequency | - | - | 3875 | - | MHz |
| | Insertion Loss | F1-F2 | 3845-3905 | 0.6 | 1.2 | dB |
| | VSWR | F1-F2 | 3845-3905 | 1.3 | 1.43 | :1 |
| Stop Band, Lower | Insertion Loss | DC-F3 | DC - 3785 | 37 | 43 | dB |
| | VSWR | DC-F3 | DC - 3785 | 20 | - | :1 |
| Stop Band, Upper | Insertion Loss | F4-F5 | 3970-8500 | 37 | 43 | dB |
| | VSWR | F4-F5 | 3970-8500 | 20 | - | :1 |

Maximum Ratings

| | |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| RF Power Input | 10 W |

Permanent damage may occur if any of these limits are exceeded.

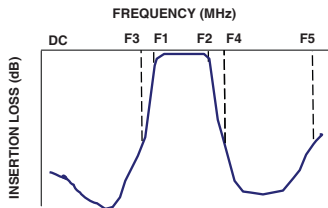
Functional Schematic



Typical Performance Data at 25°C

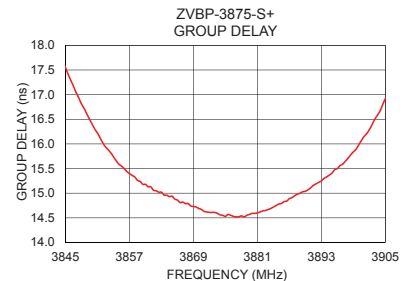
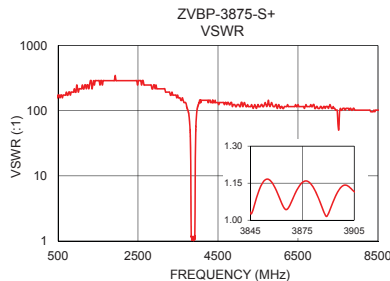
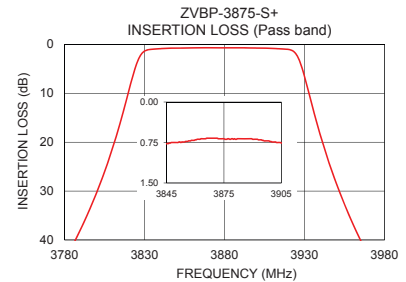
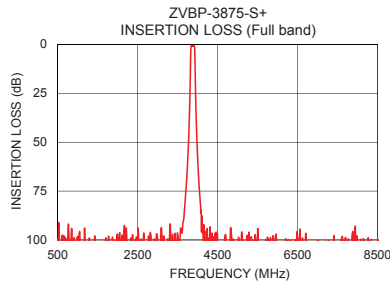
| Frequency (MHz) | Insertion Loss (dB) | VSWR (:1) | Frequency (MHz) | Group Delay (nsec) |
|-----------------|---------------------|-----------|-----------------|--------------------|
| 100 | 94.38 | 386.04 | 3845 | 17.55 |
| 1510 | 104.51 | 289.53 | 3850 | 16.40 |
| 3785 | 41.16 | 72.39 | 3855 | 15.59 |
| 3800 | 30.36 | 54.29 | 3858 | 15.33 |
| 3810 | 21.23 | 36.97 | 3860 | 15.18 |
| 3815 | 15.78 | 25.19 | 3863 | 15.02 |
| 3820 | 9.70 | 12.26 | 3865 | 14.94 |
| 3826 | 3.17 | 3.14 | 3870 | 14.69 |
| 3845 | 0.77 | 1.03 | 3875 | 14.53 |
| 3875 | 0.68 | 1.15 | 3880 | 14.59 |
| 3905 | 0.76 | 1.12 | 3882 | 14.64 |
| 3927 | 3.45 | 3.47 | 3883 | 14.67 |
| 3935 | 12.81 | 19.98 | 3885 | 14.78 |
| 3942 | 20.85 | 41.37 | 3888 | 14.95 |
| 3955 | 32.74 | 72.39 | 3890 | 15.04 |
| 3970 | 43.31 | 96.51 | 3895 | 15.41 |
| 4000 | 59.04 | 115.81 | 3898 | 15.71 |
| 5000 | 103.31 | 124.09 | 3900 | 15.98 |
| 7500 | 103.48 | 62.05 | 3903 | 16.50 |
| 8500 | 99.62 | 102.19 | 3905 | 16.92 |

Typical Frequency Response



+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications



Notes

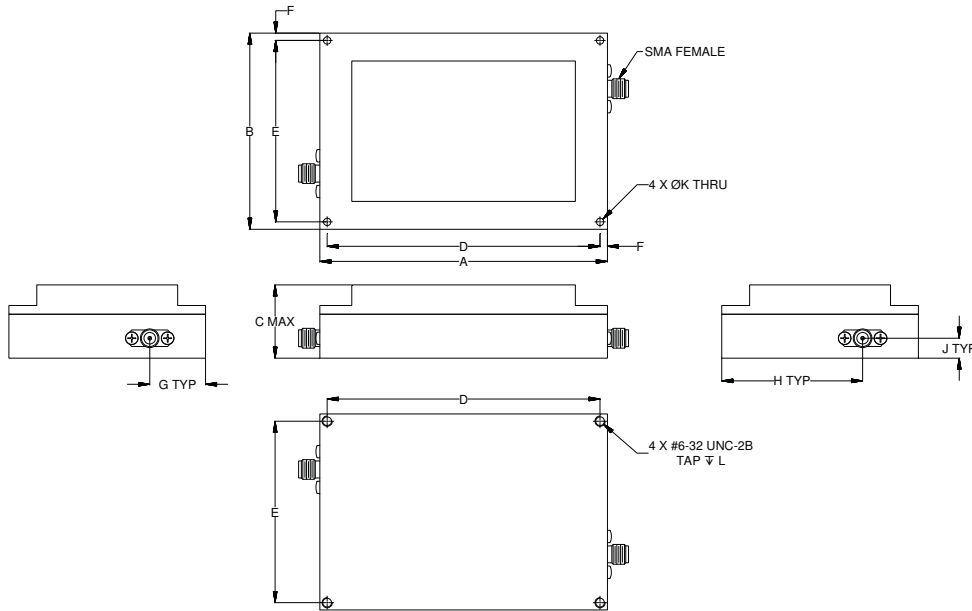
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Coaxial Connections

| | |
|----------|------------|
| PORT - 1 | SMA-FEMALE |
| PORT - 2 | SMA-FEMALE |

Outline Drawing



Outline Dimensions (inch / mm)

| A | B | C | D | E | F | G | H |
|-------|-------|-------|-------|-------|------|-------|-------|
| 3.86 | 2.64 | .98 | 3.66 | 2.44 | .10 | .75 | 1.89 |
| 98.00 | 67.00 | 25.00 | 93.00 | 62.00 | 2.50 | 19.00 | 48.00 |
| J | K | L | | | | Wt. | |
| .27 | .100 | .24 | | | | grams | |
| 6.80 | 2.54 | 6.00 | | | | 240 | |

Note: Please refer to case style drawing for details

Notes

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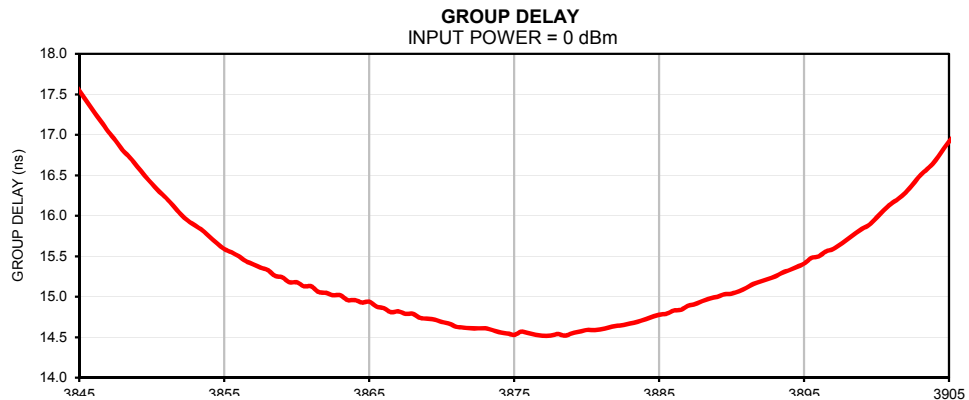
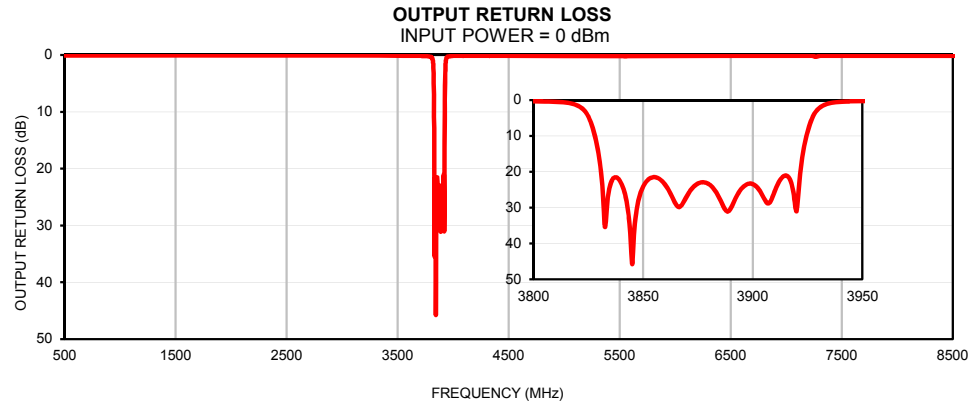
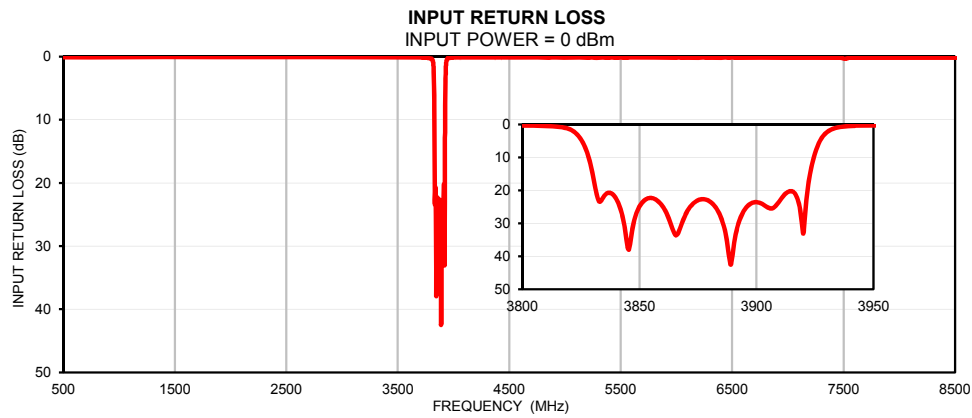
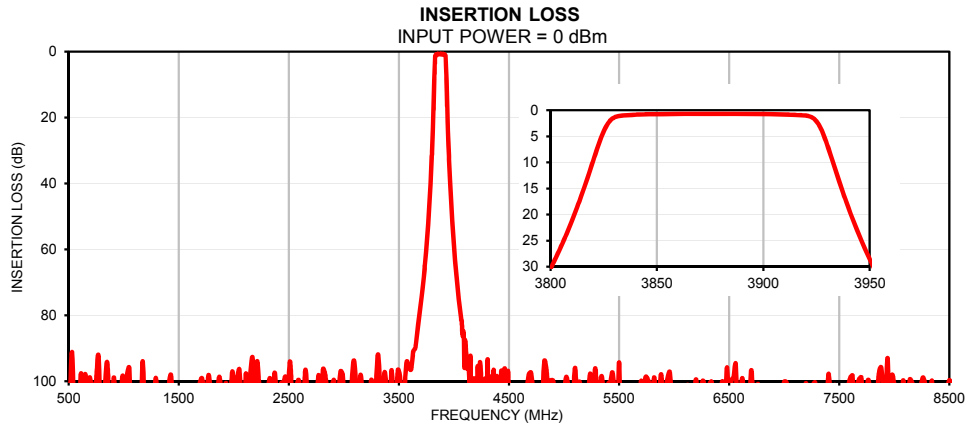
Cavity Band Pass Filter

ZVBP-3875-S+

Typical Performance Data

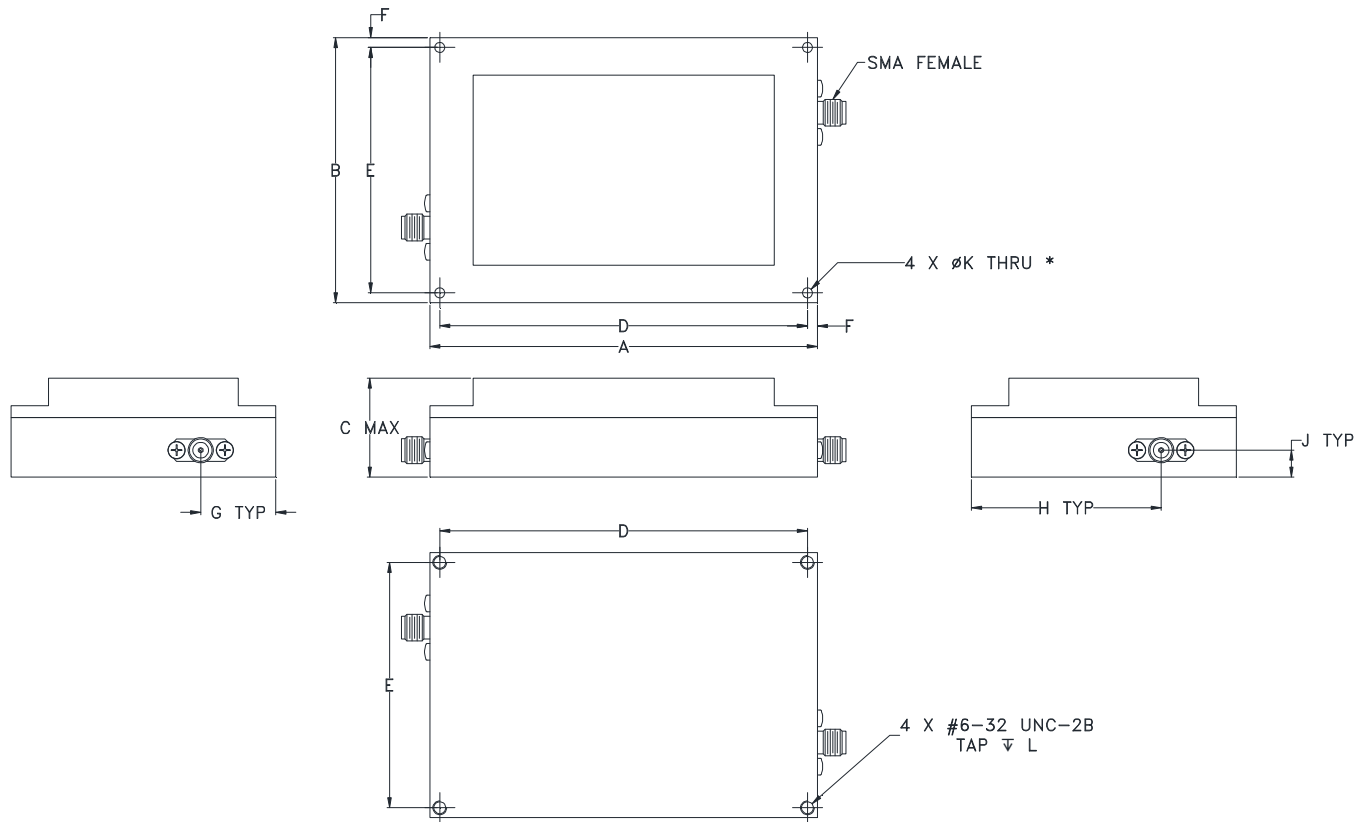
| FREQ. | Insertion Loss | Input Return Loss | Output Return Loss | FREQ. | Group Delay |
|-------|----------------|-------------------|--------------------|-------|-------------|
| (MHz) | (dB) | (dB) | (dB) | (MHz) | (ns) |
| 10 | 73.86 | 0.01 | 0.00 | 3845 | 17.55 |
| 50 | 78.10 | 0.03 | 0.01 | 3846 | 17.29 |
| 150 | 98.18 | 0.06 | 0.04 | 3847 | 17.04 |
| 250 | 88.95 | 0.08 | 0.07 | 3848 | 16.81 |
| 750 | 99.26 | 0.10 | 0.09 | 3849 | 16.61 |
| 1250 | 103.98 | 0.07 | 0.06 | 3850 | 16.40 |
| 2010 | 120.30 | 0.06 | 0.05 | 3851 | 16.22 |
| 2510 | 93.94 | 0.06 | 0.06 | 3852 | 16.02 |
| 2750 | 107.99 | 0.07 | 0.07 | 3853 | 15.88 |
| 3010 | 110.85 | 0.08 | 0.08 | 3854 | 15.74 |
| 3510 | 98.74 | 0.11 | 0.12 | 3855 | 15.59 |
| 3750 | 59.09 | 0.17 | 0.18 | 3856 | 15.50 |
| 3770 | 49.79 | 0.19 | 0.21 | 3857 | 15.40 |
| 3780 | 44.22 | 0.22 | 0.24 | 3858 | 15.33 |
| 3785 | 41.16 | 0.24 | 0.26 | 3859 | 15.24 |
| 3790 | 37.85 | 0.26 | 0.27 | 3860 | 15.18 |
| 3800 | 30.36 | 0.32 | 0.34 | 3861 | 15.13 |
| 3810 | 21.23 | 0.47 | 0.51 | 3862 | 15.05 |
| 3820 | 9.70 | 1.42 | 1.51 | 3863 | 15.02 |
| 3825 | 4.01 | 4.45 | 4.67 | 3864 | 14.96 |
| 3826 | 3.17 | 5.74 | 6.03 | 3865 | 14.94 |
| 3827 | 2.49 | 7.40 | 7.79 | 3866 | 14.86 |
| 3830 | 1.36 | 15.03 | 16.49 | 3867 | 14.82 |
| 3845 | 0.77 | 37.50 | 45.76 | 3868 | 14.79 |
| 3875 | 0.68 | 22.98 | 23.27 | 3869 | 14.73 |
| 3905 | 0.76 | 25.22 | 27.26 | 3870 | 14.69 |
| 3910 | 0.81 | 23.07 | 25.48 | 3871 | 14.63 |
| 3920 | 1.02 | 33.07 | 30.98 | 3872 | 14.61 |
| 3925 | 2.12 | 8.74 | 8.79 | 3873 | 14.61 |
| 3927 | 3.45 | 5.16 | 5.22 | 3874 | 14.56 |
| 3930 | 6.57 | 2.37 | 2.43 | 3875 | 14.53 |
| 3940 | 18.69 | 0.49 | 0.53 | 3876 | 14.55 |
| 3942 | 20.85 | 0.42 | 0.45 | 3877 | 14.52 |
| 3945 | 23.91 | 0.35 | 0.38 | 3878 | 14.54 |
| 3950 | 28.55 | 0.28 | 0.31 | 3879 | 14.55 |
| 3955 | 32.74 | 0.24 | 0.26 | 3880 | 14.59 |
| 3960 | 36.56 | 0.22 | 0.23 | 3881 | 14.60 |
| 3970 | 43.31 | 0.18 | 0.20 | 3882 | 14.64 |
| 3975 | 46.35 | 0.17 | 0.18 | 3883 | 14.67 |
| 3980 | 49.18 | 0.16 | 0.18 | 3884 | 14.72 |
| 3985 | 51.86 | 0.16 | 0.17 | 3885 | 14.78 |
| 3990 | 54.41 | 0.15 | 0.16 | 3886 | 14.83 |
| 3995 | 56.81 | 0.15 | 0.16 | 3887 | 14.89 |
| 4000 | 59.04 | 0.15 | 0.15 | 3888 | 14.95 |
| 4025 | 68.96 | 0.13 | 0.14 | 3889 | 15.00 |
| 4050 | 77.23 | 0.13 | 0.14 | 3890 | 15.04 |
| 4100 | 87.69 | 0.12 | 0.13 | 3891 | 15.11 |
| 4250 | 104.47 | 0.13 | 0.13 | 3892 | 15.19 |
| 4500 | 100.92 | 0.13 | 0.14 | 3893 | 15.25 |
| 5000 | 103.31 | 0.14 | 0.15 | 3894 | 15.33 |
| 5500 | 94.27 | 0.14 | 0.17 | 3895 | 15.41 |
| 5800 | 104.83 | 0.15 | 0.17 | 3896 | 15.50 |
| 6000 | 109.45 | 0.15 | 0.16 | 3897 | 15.59 |
| 6200 | 99.49 | 0.15 | 0.16 | 3898 | 15.71 |
| 6400 | 107.96 | 0.15 | 0.13 | 3900 | 15.98 |
| 6500 | 109.92 | 0.14 | 0.14 | 3901 | 16.15 |
| 7500 | 103.48 | 0.28 | 0.13 | 3902 | 16.29 |
| 7500 | 103.48 | 0.28 | 0.13 | 3903 | 16.50 |
| 8000 | 101.18 | 0.17 | 0.14 | 3904 | 16.67 |
| 8500 | 99.62 | 0.17 | 0.15 | 3905 | 16.92 |

Typical Performance Curves



Outline Dimensions

QZ2439



| CASE# | A | B | C | D | E | F | G |
|--------|-----------------|-----------------|----------------|-----------------|-----------------|--------------|----------------|
| QZ2439 | 3.86 (98.00) | 2.64 (67.00) | .98 (25.00) | 3.66 (93.00) | 2.44 (62.00) | .1 (2.50) | .75 (19.00) |

| CASE# | H | J | K* | L | WT. GRAMS |
|--------|-----------------|---------------|----------------|---------------|-----------|
| QZ2439 | 1.89 (48.00) | .27 (6.80) | .100 (2.54) | .24 (6.00) | 240 |

Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm .100$; 3 Pl. $\pm .015$

* Optional Feature for Mounting.

Notes:

1. Case material: Brass & Aluminum alloy.
2. Case finish: Powder coated.
3. Refer to the individual model data sheet for the type of connectors available.



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification | Test/Inspection Condition | Reference/Spec |
|--------------------------------|---|--|
| Operating Temperature | -40° to 85°C Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -55° to 100° C Ambient Environment | Individual Model Data Sheet |
| Humidity | 90 to 95% RH, 240 hours, 50°C | MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours |
| Thermal Shock | -55° to 100°C, 100 cycles | MIL-STD-202, Method 107, Condition A-3, except +100°C |
| Solder Reflow Heat | Sn-Pb Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak | J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1 |
| Solderability | 10X Magnification | J-STD-002, 95% Coverage |
| Vibration (High Frequency) | 20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36) | MIL-STD-202, Method 204, Condition D |
| Mechanical Shock | 50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes | MIL-STD-202, Method 213, Condition A |
| Marking Resistance to Solvents | Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215 |