*Coaxial*

# High Pass Filter

## ZFHP-1R2-S+

50Ω 1.2 to 800 MHz

*Generic photo used for illustration purposes only*

CASE STYLE: H16

## The Big Deal

- Low insertion loss
- High rejection
- Connectorized package

## Product Overview

ZFHP-1R2-S+ is a High pass filter in a connectorized package. This low frequency cut-off high pass filter eliminates noise that feed into RF / base band circuits from low frequency sources.

## Key Features

| Feature | Advantages |
|---|---|
| Low insertion loss | Can be used in high performance applications. |
| Excellent low frequency rejection | Filters out low frequency noise from sources such as electric motors and generators. SMDS noise filtering and IF noise filtering. |
| Connectorized package | The connectorized package is easy to interface with other devices and well suited for test setups. |

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# High Pass Filter

## ZFHP-1R2-S+

50Ω 1.2 to 800 MHz

*Generic photo used for illustration purposes only*

CASE STYLE: H16

| Connectors | Model |
|---|---|
| SMA-FEMALE | ZFHP-1R2-S+ |
| BRACKET (OPTION "B") | |

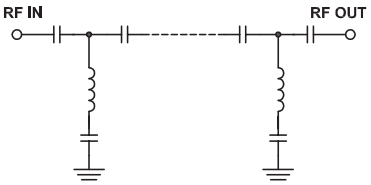
### Features

- Wide band, 1.2 MHz to 800 MHz
- High rejection
- Connectorized package

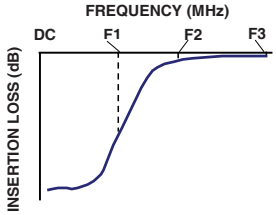
### Applications

- Wire-line broad band access
- Fiber optic networks
- Receivers \ transmitters
- Electrical equipment noise elimination

### Functional Schematic




### Typical Frequency Response




***+RoHS Compliant***

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

### Electrical Specifications at 25°C

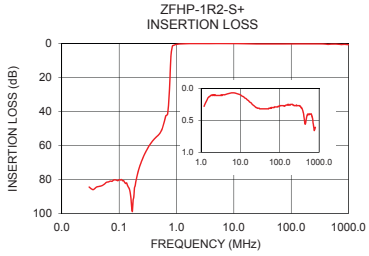
| Parameter | | F# | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| Stop Band | Rejection Loss | DC-F1 | DC-0.5 | 20 | 40 | - | dB |
| | VSWR | DC-F1 | DC-0.5 | - | 158 | - | :1 |
| Pass Band | Insertion Loss | F2-F3 | 1.2-800 | - | 0.8 | 2 | dB |
| | VSWR | F2-F3 | 1.2-800 | - | 1.5 | - | :1 |

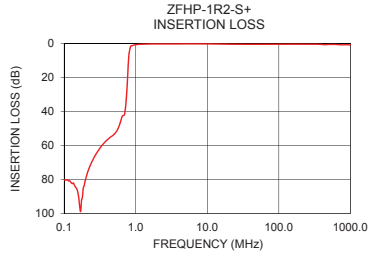
| Maximum Ratings | |
|---|---|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| RF Power Input | +5 dBm max. |

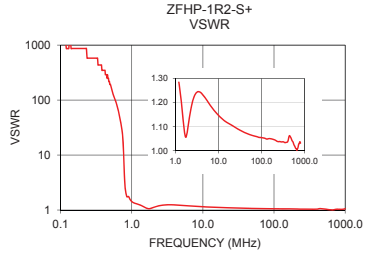
Permanent damage may occur if any of these limits are exceeded.

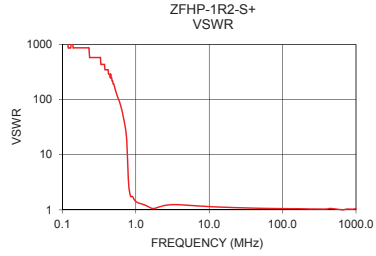
### Typical Performance Data at 25°C

| Frequency (MHz) | Insertion Loss (dB) | VSWR (:1) |
|---|---|---|
| 0.030 | 84.50 | 1737.18 |
| 0.250 | 68.73 | 579.06 |
| 0.500 | 53.36 | 193.02 |
| 0.600 | 47.28 | 91.43 |
| 0.700 | 41.48 | 38.61 |
| 0.750 | 28.71 | 19.54 |
| 0.800 | 7.51 | 2.84 |
| 0.850 | 1.53 | 1.76 |
| 0.900 | 1.10 | 1.76 |
| 0.950 | 0.74 | 1.54 |
| 1.000 | 0.55 | 1.43 |
| 1.200 | 0.28 | 1.29 |
| 1.500 | 0.15 | 1.13 |
| 5.000 | 0.08 | 1.22 |
| 50.000 | 0.32 | 1.07 |
| 250.000 | 0.27 | 1.04 |
| 500.000 | 0.42 | 1.05 |
| 600.000 | 0.40 | 1.02 |
| 700.000 | 0.54 | 1.01 |
| 800.000 | 0.61 | 1.03 |



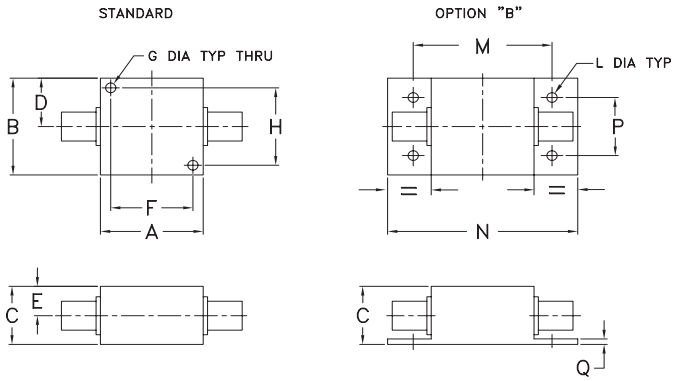

Notes

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

## Coaxial Connections

| | |
|---|---|
| PORT - 1 | SMA-Female |
| PORT - 2 | SMA-Female |

## Outline Drawing




## Outline Dimensions ( inch / mm )

| A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|
| 1.25 | 1.25 | .75 | .63 | .38 | 1.000 | .125 | 1.000 |
| 31.75 | 31.75 | 19.05 | 16.00 | 9.65 | 25.40 | 3.18 | 25.40 |

| J | K | L | M | N | P | Q | wt |
|---|---|---|---|---|---|---|---|
| -- | -- | .125 | 1.688 | 2.18 | .750 | .06 | grams |
| -- | -- | 3.18 | 42.88 | 55.37 | 19.05 | 1.52 | 70.0 |

*Note: Please refer to case style drawing for details*

# Coaxial High Pass Filter ZFHP-1R2-S+

*Typical Performance Data*

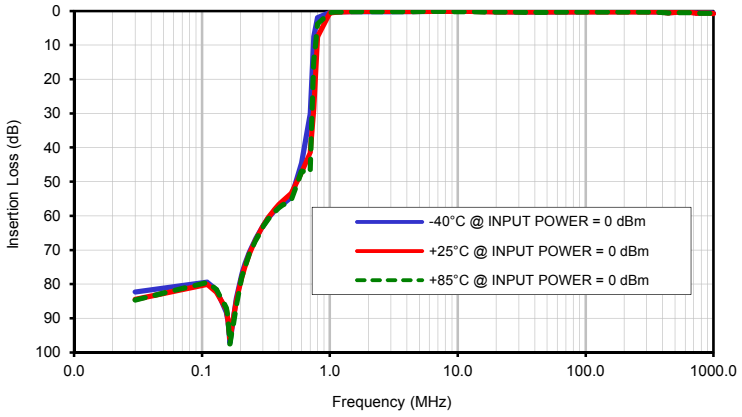
| FREQ. (MHz) | INSERTION LOSS (dB) | | | INPUT RETURN LOSS (dB) | | | OUTPUT RETURN LOSS (dB) | | |
|---|---|---|---|---|---|---|---|---|---|
| | @-40°C | @+25°C | @+85°C | @-40°C | @+25°C | @+85°C | @-40°C | @+25°C | @+85°C |
| 0.030 | 82.34 | 84.50 | 84.66 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 |
| 0.110 | 79.39 | 80.09 | 79.47 | 0.02 | 0.01 | 0.02 | 0.02 | 0.01 | 0.02 |
| 0.130 | 81.68 | 82.39 | 81.57 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.03 |
| 0.155 | 88.40 | 87.36 | 87.03 | 0.02 | 0.02 | 0.03 | 0.02 | 0.02 | 0.02 |
| 0.160 | 90.65 | 90.65 | 89.83 | 0.02 | 0.02 | 0.03 | 0.02 | 0.01 | 0.02 |
| 0.165 | 97.25 | 95.98 | 97.61 | 0.02 | 0.02 | 0.03 | 0.02 | 0.02 | 0.02 |
| 0.185 | 84.19 | 84.94 | 86.53 | 0.03 | 0.02 | 0.03 | 0.02 | 0.02 | 0.02 |
| 0.205 | 77.27 | 78.05 | 77.95 | 0.03 | 0.02 | 0.03 | 0.02 | 0.02 | 0.03 |
| 0.220 | 73.41 | 74.01 | 74.24 | 0.03 | 0.02 | 0.03 | 0.02 | 0.02 | 0.03 |
| 0.235 | 70.57 | 71.15 | 71.09 | 0.03 | 0.03 | 0.04 | 0.03 | 0.02 | 0.03 |
| 0.260 | 67.03 | 67.32 | 67.47 | 0.03 | 0.03 | 0.04 | 0.03 | 0.02 | 0.03 |
| 0.295 | 63.30 | 63.35 | 63.61 | 0.04 | 0.03 | 0.04 | 0.03 | 0.02 | 0.03 |
| 0.330 | 60.65 | 60.44 | 60.95 | 0.05 | 0.03 | 0.05 | 0.03 | 0.03 | 0.04 |
| 0.370 | 58.50 | 58.05 | 58.79 | 0.05 | 0.04 | 0.05 | 0.03 | 0.03 | 0.04 |
| 0.400 | 57.48 | 56.64 | 57.67 | 0.06 | 0.05 | 0.06 | 0.04 | 0.03 | 0.05 |
| 0.425 | 56.75 | 55.68 | 56.92 | 0.07 | 0.06 | 0.07 | 0.04 | 0.03 | 0.05 |
| 0.500 | 54.60 | 53.36 | 55.28 | 0.12 | 0.09 | 0.12 | 0.07 | 0.05 | 0.07 |
| 0.600 | 44.51 | 47.28 | 46.86 | 0.33 | 0.19 | 0.28 | 0.17 | 0.11 | 0.15 |
| 0.700 | 30.08 | 41.48 | 47.38 | 1.78 | 0.45 | 1.09 | 0.60 | 0.27 | 0.40 |
| 0.750 | 7.58 | 28.71 | 14.76 | 13.88 | 0.89 | 6.76 | 2.78 | 0.58 | 1.14 |
| 0.800 | 1.85 | 7.51 | 3.76 | 11.28 | 6.39 | 7.89 | 10.43 | 3.49 | 5.87 |
| 1.000 | 0.40 | 0.55 | 0.46 | 23.27 | 15.12 | 25.81 | 23.34 | 14.94 | 25.32 |
| 1.100 | 0.30 | 0.37 | 0.34 | 24.44 | 16.99 | 26.81 | 24.32 | 17.11 | 26.16 |
| 1.200 | 0.23 | 0.28 | 0.27 | 26.96 | 18.08 | 29.42 | 26.22 | 18.22 | 28.10 |
| 1.400 | 0.17 | 0.19 | 0.20 | 28.88 | 21.42 | 27.58 | 26.60 | 21.29 | 26.02 |
| 1.700 | 0.17 | 0.12 | 0.18 | 19.53 | 30.94 | 20.79 | 19.14 | 28.48 | 20.30 |
| 2.050 | 0.20 | 0.10 | 0.19 | 16.18 | 24.71 | 17.56 | 16.02 | 24.00 | 17.33 |
| 2.450 | 0.21 | 0.11 | 0.20 | 15.03 | 20.88 | 16.31 | 14.94 | 20.63 | 16.17 |
| 3.600 | 0.18 | 0.10 | 0.17 | 15.29 | 19.24 | 16.39 | 15.25 | 19.17 | 16.32 |
| 7.000 | 0.13 | 0.07 | 0.15 | 18.69 | 21.67 | 19.54 | 18.63 | 21.62 | 19.45 |
| 12.000 | 0.16 | 0.13 | 0.22 | 22.07 | 24.08 | 22.73 | 22.01 | 24.01 | 22.66 |
| 21.000 | 0.23 | 0.26 | 0.33 | 24.81 | 26.08 | 25.55 | 24.88 | 26.11 | 25.47 |
| 42.000 | 0.28 | 0.32 | 0.35 | 27.75 | 28.89 | 29.37 | 29.20 | 28.96 | 27.89 |
| 65.000 | 0.26 | 0.30 | 0.33 | 29.36 | 30.41 | 31.58 | 33.10 | 30.14 | 28.00 |
| 85.000 | 0.25 | 0.29 | 0.32 | 30.50 | 31.29 | 32.75 | 35.43 | 31.27 | 28.85 |
| 145.000 | 0.23 | 0.26 | 0.29 | 34.41 | 32.22 | 30.68 | 31.82 | 33.54 | 34.54 |
| 320.000 | 0.23 | 0.27 | 0.31 | 30.19 | 34.77 | 32.71 | 28.79 | 35.46 | 38.11 |
| 370.000 | 0.26 | 0.32 | 0.36 | 31.32 | 35.34 | 33.54 | 30.96 | 37.13 | 38.27 |
| 390.000 | 0.30 | 0.36 | 0.41 | 31.49 | 35.18 | 33.30 | 32.55 | 37.67 | 35.78 |
| 405.000 | 0.34 | 0.41 | 0.45 | 31.24 | 34.52 | 33.05 | 33.50 | 35.86 | 33.11 |
| 420.000 | 0.42 | 0.48 | 0.52 | 29.98 | 32.55 | 32.19 | 33.56 | 33.41 | 30.98 |
| 425.000 | 0.45 | 0.51 | 0.53 | 29.34 | 31.81 | 31.88 | 32.88 | 32.50 | 30.40 |
| 440.000 | 0.53 | 0.56 | 0.57 | 27.68 | 30.42 | 31.93 | 29.58 | 30.08 | 29.13 |
| 465.000 | 0.46 | 0.50 | 0.53 | 27.47 | 30.96 | 35.64 | 27.01 | 28.84 | 29.26 |
| 480.000 | 0.40 | 0.45 | 0.49 | 28.02 | 31.65 | 37.75 | 27.20 | 29.40 | 30.61 |
| 500.000 | 0.35 | 0.42 | 0.46 | 29.06 | 33.03 | 41.66 | 27.54 | 29.94 | 31.73 |
| 525.000 | 0.33 | 0.40 | 0.45 | 29.80 | 34.38 | 50.32 | 28.13 | 30.76 | 32.71 |
| 660.000 | 0.35 | 0.44 | 0.50 | 38.08 | 61.83 | 38.98 | 28.33 | 29.58 | 29.95 |
| 675.000 | 0.37 | 0.46 | 0.52 | 40.32 | 49.82 | 36.88 | 27.26 | 28.37 | 28.82 |
| 690.000 | 0.41 | 0.50 | 0.55 | 42.09 | 45.79 | 36.32 | 26.35 | 27.45 | 28.10 |
| 705.000 | 0.46 | 0.55 | 0.60 | 50.36 | 42.50 | 35.57 | 25.75 | 26.96 | 27.97 |
| 725.000 | 0.52 | 0.59 | 0.64 | 46.24 | 37.63 | 33.45 | 24.61 | 26.04 | 27.33 |
| 740.000 | 0.56 | 0.63 | 0.67 | 42.04 | 36.73 | 33.53 | 24.00 | 25.61 | 26.96 |
| 750.000 | 0.59 | 0.66 | 0.70 | 39.53 | 36.58 | 34.17 | 24.16 | 25.87 | 27.32 |
| 800.000 | 0.52 | 0.61 | 0.66 | 35.64 | 36.09 | 35.13 | 25.68 | 27.35 | 28.75 |
| 850.000 | 0.46 | 0.56 | 0.63 | 36.20 | 37.15 | 36.21 | 27.79 | 29.03 | 30.19 |
| 900.000 | 0.47 | 0.58 | 0.66 | 35.70 | 36.85 | 35.66 | 28.88 | 29.85 | 30.68 |
| 950.000 | 0.53 | 0.65 | 0.72 | 33.34 | 34.35 | 33.34 | 28.91 | 29.28 | 29.81 |
| 975.000 | 0.59 | 0.71 | 0.78 | 31.64 | 33.15 | 32.58 | 27.91 | 27.92 | 28.34 |
| 1000.000 | 0.65 | 0.76 | 0.83 | 29.43 | 31.05 | 30.52 | 26.80 | 26.69 | 27.21 |

*Typical Performance Data*

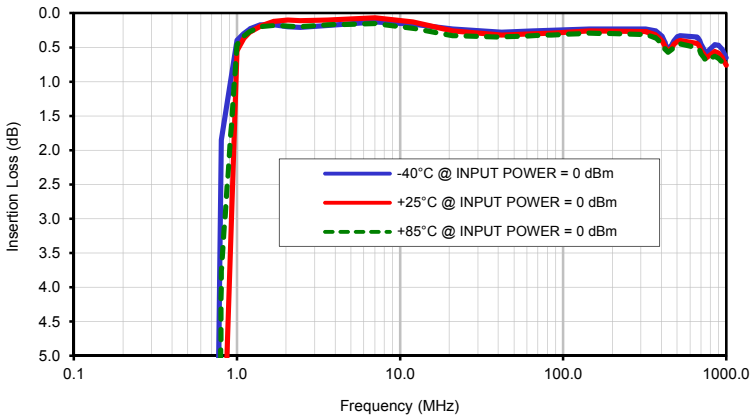
| FREQ. (MHz) | GROUP DELAY (nsec) | | |
|---|---|---|---|
| | @-40°C | @+25°C | @+85°C |
| 1.200 | 677.01 | 790.23 | 726.14 |
| 1.300 | 531.14 | 606.12 | 563.54 |
| 1.400 | 431.26 | 485.10 | 454.05 |
| 1.500 | 359.14 | 400.80 | 376.05 |
| 1.600 | 303.44 | 337.69 | 317.23 |
| 1.700 | 260.41 | 289.39 | 271.87 |
| 1.800 | 226.38 | 250.73 | 236.24 |
| 1.900 | 198.47 | 219.72 | 206.97 |
| 2.000 | 175.61 | 194.10 | 183.08 |
| 2.100 | 156.72 | 173.31 | 163.51 |
| 2.200 | 140.89 | 155.28 | 146.67 |
| 2.300 | 127.42 | 140.33 | 132.83 |
| 2.400 | 115.67 | 127.65 | 120.61 |
| 2.500 | 105.56 | 116.42 | 110.11 |
| 2.600 | 96.81 | 106.27 | 100.70 |
| 2.700 | 89.28 | 97.85 | 92.88 |
| 2.800 | 82.67 | 90.51 | 85.88 |
| 2.900 | 76.90 | 83.83 | 79.88 |
| 3.000 | 71.45 | 77.95 | 74.10 |
| 3.100 | 66.77 | 72.81 | 69.46 |
| 3.200 | 62.39 | 67.94 | 64.85 |
| 3.300 | 58.84 | 63.81 | 60.96 |
| 3.400 | 55.27 | 60.19 | 57.54 |
| 3.500 | 52.21 | 56.49 | 53.99 |
| 3.600 | 49.15 | 53.48 | 51.15 |
| 3.700 | 46.58 | 50.34 | 48.21 |
| 3.800 | 43.90 | 47.51 | 45.67 |
| 3.900 | 41.76 | 45.13 | 43.47 |
| 4.000 | 34.85 | 37.84 | 36.42 |
| 6.000 | 23.69 | 25.75 | 24.74 |
| 8.000 | 12.73 | 13.73 | 13.13 |
| 9.000 | 9.68 | 10.48 | 9.98 |
| 11.000 | 6.23 | 6.74 | 6.39 |
| 13.000 | 4.39 | 4.71 | 4.49 |
| 16.000 | 2.93 | 3.09 | 2.94 |
| 25.000 | 1.25 | 1.25 | 1.21 |
| 31.000 | 0.86 | 0.87 | 0.85 |
| 37.000 | 0.67 | 0.68 | 0.68 |
| 47.000 | 0.53 | 0.52 | 0.52 |
| 50.000 | 0.50 | 0.50 | 0.49 |
| 55.000 | 0.46 | 0.45 | 0.45 |
| 70.000 | 0.42 | 0.40 | 0.39 |
| 73.000 | 0.40 | 0.39 | 0.39 |
| 83.000 | 0.37 | 0.34 | 0.33 |
| 91.000 | 0.33 | 0.34 | 0.34 |
| 96.000 | 0.38 | 0.35 | 0.35 |
| 140.000 | 0.31 | 0.30 | 0.30 |
| 175.000 | 0.32 | 0.30 | 0.30 |
| 245.000 | 0.29 | 0.28 | 0.28 |
| 365.000 | 0.32 | 0.30 | 0.29 |
| 425.000 | 0.24 | 0.22 | 0.22 |
| 445.000 | 0.16 | 0.17 | 0.18 |
| 475.000 | 0.27 | 0.26 | 0.26 |
| 510.000 | 0.32 | 0.30 | 0.29 |
| 550.000 | 0.30 | 0.28 | 0.28 |
| 685.000 | 0.32 | 0.30 | 0.29 |
| 705.000 | 0.28 | 0.26 | 0.25 |
| 730.000 | 0.25 | 0.24 | 0.24 |
| 745.000 | 0.22 | 0.22 | 0.23 |
| 800.000 | 0.27 | 0.26 | 0.25 |

## *Typical Performance Curves*

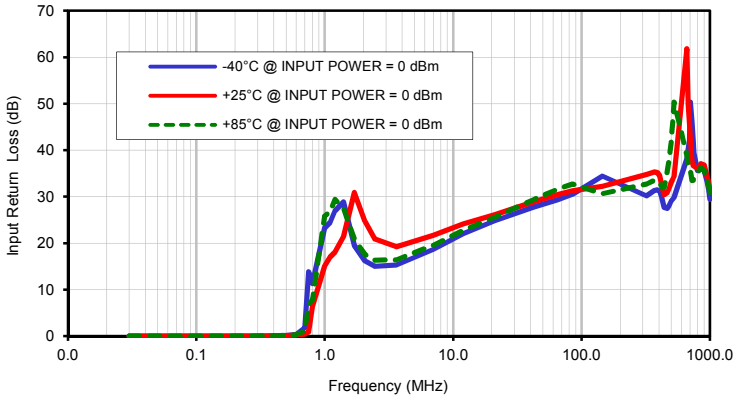
### Insertion Loss vs. Temperature



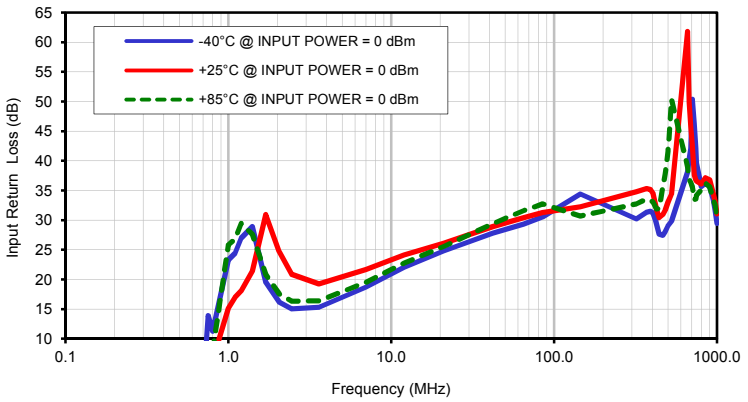

### Insertion Loss vs. Temperature



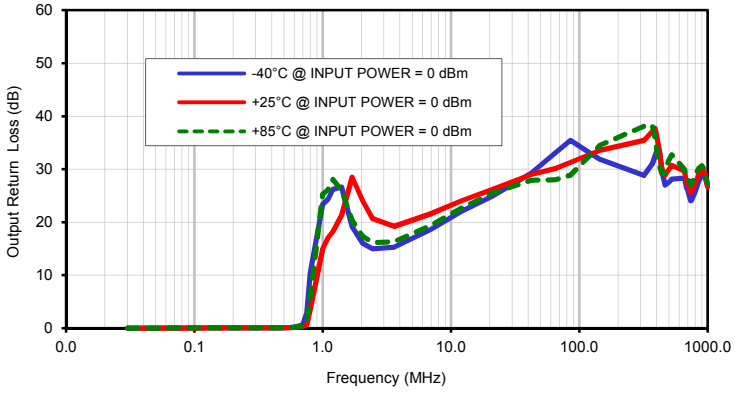

### Input Return Loss vs. Temperature



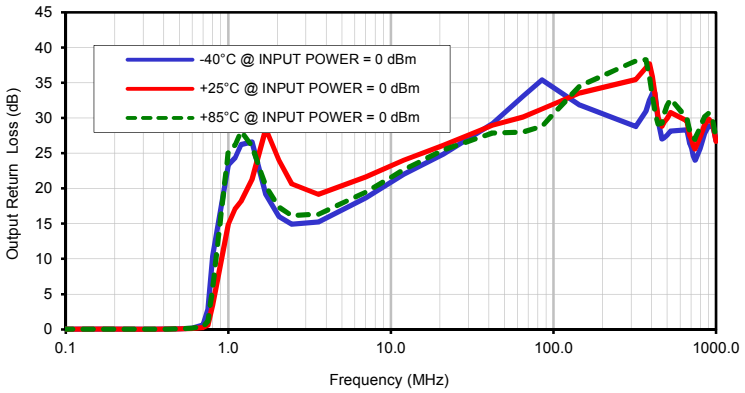

### Input Return Loss vs. Temperature



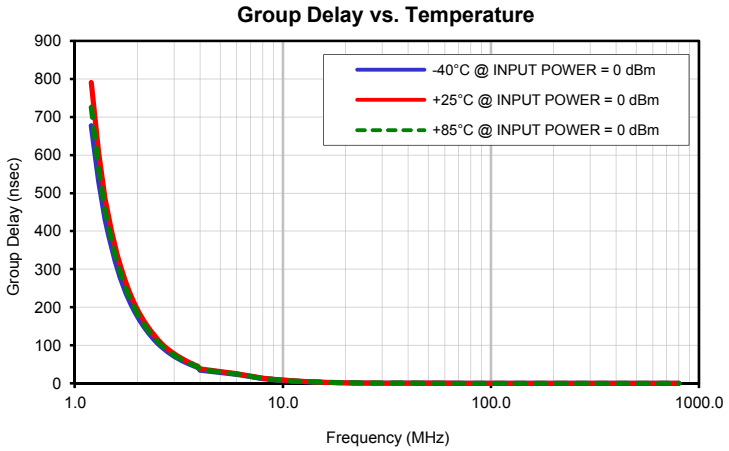

### Output Return Loss vs. Temperature




### Output Return Loss vs. Temperature



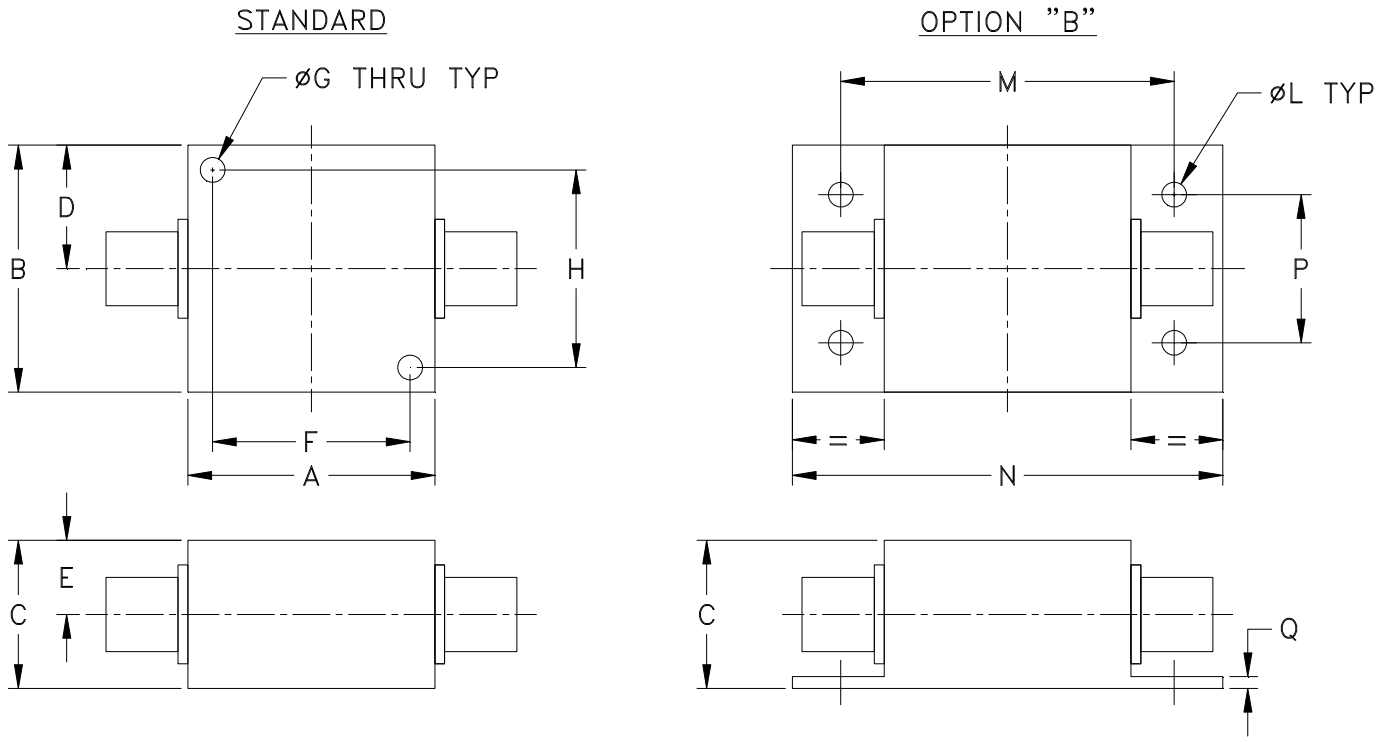
*Typical Performance Curves*



# Case Style H

## Outline Dimensions

**H16**




| CASE# | A | B | C | D | E | F | G | H | J | K | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H16 | 1.25 (31.75) | 1.25 (31.75) | .75 (19.05) | .63 (16.00) | .38 (9.65) | 1.000 (25.40) | .125 (3.18) | 1.000 (25.40) | -- | -- | .125 (3.18) | 1.688 (42.88) | 2.18 (55.37) |

| CASE# | P | Q | WT.GRAMS |
|---|---|---|---|
| H16 | .750 (19.05) | .06 (1.52) | 70 |

**Dimensions are in inches (mm). Tolerances: 2PL. ± .03; 3PL. ± .015**

### Notes:

1. Case material: Aluminum alloy.
2. Case finish:
   For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.
3. Mounting bracket available on request. Add suffix B to part number.
4. Bracket version, option B, dimension "C" changes from .75 to .94 inches when connectors are type N.
5. Refer to the individual model data sheet for the type of connectors available.

Mini-Circuits

# Environmental Specifications ENV46

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 | -55° to 100°C<br>Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -55° to 100° C<br>Ambient Environment | Individual Model Data Sheet |
| Humidity | 90 to 95% RH, 40°C, 96 hours;<br>Units may require bake-out after humidity to restore full performance. | MIL-STD-202, Method 103, Condintion B |
| Thermal Shock | -55° to 100°C, 100 cycles | MIL-STD-202, Method 107, Condition A-3, except +100°C |
| 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, 11ms half-sine, 3 shocks each direction 3 axes (total 18) | MIL-STD-202, Method 213, Condition A |