

# Coaxial Low Pass Filter

## VLFG-3800+

50Ω

DC to 3900 MHz



Generic photo used for illustration purposes only

CASE STYLE: FF704

### The Big Deal

- Excellent power handling, 4.5W
- Temperature stable
- Rugged unibody construction
- Good rejection, 42 dB typical

### Product Overview

VLFG-3800+ is a 50Ω low pass filter built in rugged unibody construction. Covering DC-3900 MHz bandwidth, these units offer good matching within the passband and good rejection in stopband. VLFG-3800+ offer low insertion loss, and excellent power handling capability. It handles up to 4.5W RF input power and provides a wide operating temperature range from -55°C to 125°C.

### Key Features

| Feature                     | Advantages                                                                                         |
|-----------------------------|----------------------------------------------------------------------------------------------------|
| Low passband insertion loss | Suitable for high performance application.                                                         |
| 4.5W Power handling         | Supports a range of system power requirements.                                                     |
| Connectorized package       | The connectorized package is easy to interface with other devices and well suited for test setups. |

#### 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.  
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+RoHS Compliant

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

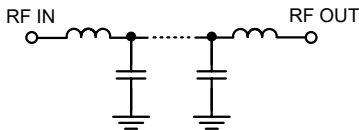
## Features

- Low loss, 1.3 dB typical
- Good rejection 42 dB typical
- Excellent power handling, 4.5W
- Temperature stable
- Connectorized package
- Rugged unibody construction

## Applications

- Military radar applications
- Test and measurement
- Telecommunication and broadband wireless applications

## Functional Schematic



## Electrical Specifications at 25°C

| Parameter |                | F#    | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|-----------|----------------|-------|-----------------|------|------|------|------|
| Pass Band | Insertion Loss | DC-F1 | DC - 3900       | —    | 1.3  | 1.8  | dB   |
|           | Freq. Cut-Off  | F2*   | 5000            | —    | 3.0  | —    | dB   |
|           | Return Loss    | DC-F1 | DC - 3900       | —    | 14   | —    | dB   |
| Stop Band | Rejection Loss | F3-F4 | 5800 - 6200     | 20   | 40   | —    | dB   |
|           |                | F4-F5 | 6200 - 8400     | 33   | 42   | —    | dB   |
|           |                | F5-F6 | 8400 - 12000    | 25   | 33   | —    | dB   |
|           |                | F6-F7 | 12000 - 18000   | —    | 20   | —    | dB   |

In Application where DC voltage is present at either input or output port, DC blocks are required.  
\* Typically, a ±5% frequency deviation from the stated value may occur on a unit-to-unit basis.

### Maximum Ratings

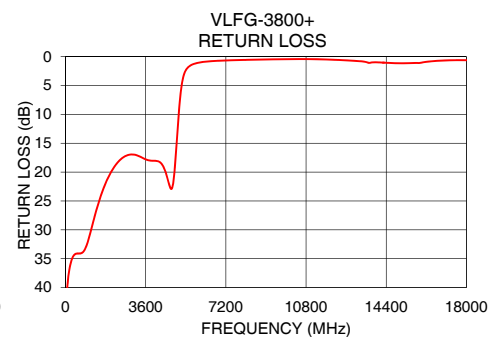
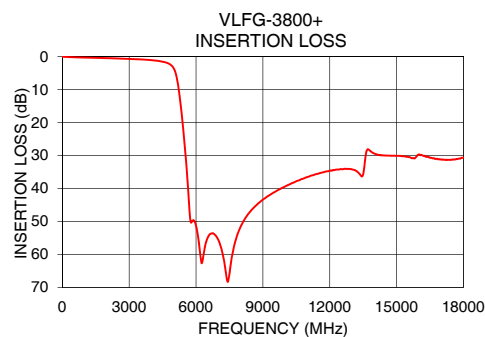
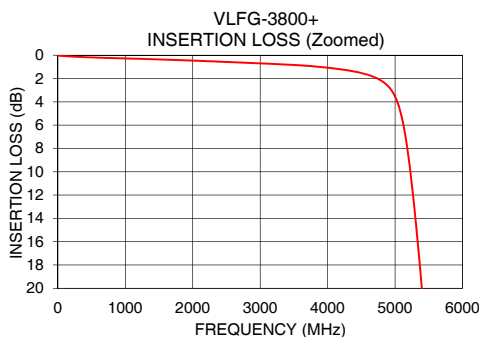
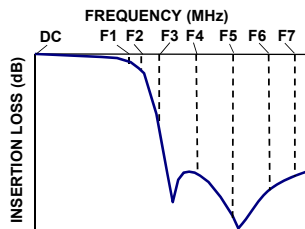
|                       |                  |
|-----------------------|------------------|
| Operating Temperature | -55°C to 125°C   |
| Storage Temperature   | -55°C to 125°C   |
| RF Power Input*       | 4.5W max. @ 25°C |

\*Passband rating, derate linearly to 1W at 125°C ambient  
Permanent damage may occur if any of these limits are exceeded.

## Typical Performance Data at 25°C

| Frequency (MHz) | Insertion Loss (dB) | Return Loss (dB) |
|-----------------|---------------------|------------------|
| 10              | 0.03                | 47.33            |
| 100             | 0.08                | 39.16            |
| 1000            | 0.27                | 32.11            |
| 1400            | 0.34                | 26.41            |
| 1800            | 0.42                | 21.93            |
| 3000            | 0.70                | 16.95            |
| 3900            | 1.01                | 18.04            |
| 5000            | 3.54                | 14.49            |
| 5300            | 13.93               | 3.34             |
| 5400            | 20.23               | 2.36             |
| 5600            | 35.78               | 1.55             |
| 5800            | 50.26               | 1.21             |
| 6200            | 60.50               | 0.90             |
| 8000            | 51.61               | 0.57             |
| 8400            | 47.25               | 0.53             |
| 10000           | 39.35               | 0.43             |
| 11000           | 36.50               | 0.43             |
| 12000           | 34.61               | 0.53             |
| 15000           | 30.10               | 1.15             |
| 18000           | 30.64               | 0.61             |

## Typical Frequency Response



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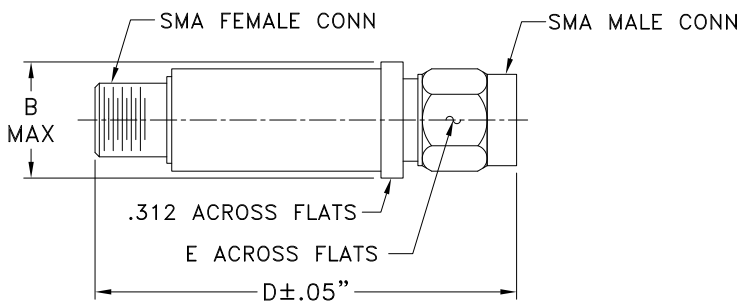


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Coaxial Connections

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

Outline Drawing



Outline Dimensions ( inch mm )

| B     | D     | E    | wt.   |
|-------|-------|------|-------|
| .410  | 1.43  | .312 | grams |
| 10.41 | 36.32 | 7.92 | 10    |

Note: Please refer to case style drawing for details

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## Typical Performance Data

| FREQ. | INSERTION LOSS |        |         | INPUT RETURN LOSS |        |         | OUTPUT RETURN LOSS |        |         |
|-------|----------------|--------|---------|-------------------|--------|---------|--------------------|--------|---------|
| (MHz) | (dB)           |        |         | (dB)              |        |         | (dB)               |        |         |
|       | @-55°C         | @+25°C | @+100°C | @-55°C            | @+25°C | @+100°C | @-55°C             | @+25°C | @+100°C |
| 10    | 0.07           | 0.09   | 0.11    | 54.58             | 46.99  | 40.91   | 52.65              | 48.61  | 38.83   |
| 40    | 0.07           | 0.10   | 0.11    | 47.99             | 41.51  | 39.18   | 45.57              | 40.92  | 39.48   |
| 100   | 0.07           | 0.12   | 0.14    | 47.89             | 39.94  | 36.95   | 41.09              | 38.82  | 37.97   |
| 400   | 0.07           | 0.17   | 0.19    | 36.66             | 38.17  | 41.27   | 32.31              | 31.98  | 31.00   |
| 700   | 0.08           | 0.21   | 0.24    | 38.14             | 42.38  | 55.50   | 28.55              | 28.25  | 27.73   |
| 1000  | 0.09           | 0.25   | 0.30    | 32.24             | 32.99  | 33.13   | 25.52              | 24.98  | 24.47   |
| 1300  | 0.12           | 0.30   | 0.35    | 25.46             | 26.19  | 26.67   | 21.99              | 21.95  | 21.79   |
| 1600  | 0.15           | 0.35   | 0.41    | 21.96             | 22.34  | 22.65   | 20.12              | 19.99  | 19.79   |
| 1900  | 0.19           | 0.41   | 0.48    | 19.29             | 19.68  | 19.79   | 18.61              | 18.55  | 18.23   |
| 2200  | 0.24           | 0.47   | 0.56    | 17.45             | 17.91  | 18.17   | 17.40              | 17.47  | 17.27   |
| 2500  | 0.28           | 0.53   | 0.63    | 16.32             | 16.54  | 16.76   | 16.84              | 16.73  | 16.59   |
| 2800  | 0.32           | 0.59   | 0.70    | 15.95             | 16.24  | 16.39   | 16.78              | 16.78  | 16.62   |
| 3100  | 0.36           | 0.65   | 0.76    | 16.13             | 16.65  | 16.82   | 17.04              | 17.47  | 17.61   |
| 3400  | 0.39           | 0.70   | 0.83    | 17.86             | 18.43  | 18.75   | 19.11              | 19.98  | 20.91   |
| 3800  | 0.46           | 0.82   | 0.98    | 22.71             | 22.72  | 22.18   | 27.78              | 31.30  | 34.31   |
| 3900  | 0.50           | 0.87   | 1.04    | 23.08             | 22.44  | 21.60   | 30.44              | 31.37  | 29.54   |
| 4000  | 0.55           | 0.93   | 1.11    | 22.10             | 21.31  | 20.48   | 27.71              | 26.74  | 24.98   |
| 4600  | 1.15           | 1.64   | 1.90    | 15.74             | 16.09  | 16.61   | 15.70              | 16.15  | 16.61   |
| 4900  | 1.95           | 2.70   | 3.19    | 15.17             | 14.82  | 14.90   | 14.85              | 15.77  | 16.91   |
| 5000  | 2.54           | 3.58   | 4.38    | 13.03             | 11.97  | 11.26   | 15.13              | 15.84  | 16.27   |
| 5380  | 15.79          | 20.59  | 24.29   | 2.23              | 2.19   | 2.14    | 3.05               | 2.87   | 2.64    |
| 5490  | 24.46          | 30.36  | 34.90   | 1.44              | 1.61   | 1.64    | 1.72               | 1.91   | 1.87    |
| 5800  | 39.69          | 39.45  | 39.64   | 0.61              | 0.86   | 0.93    | 0.55               | 0.94   | 1.01    |
| 6000  | 41.08          | 42.37  | 43.36   | 0.40              | 0.66   | 0.73    | 0.28               | 0.71   | 0.83    |
| 6100  | 43.24          | 45.02  | 46.28   | 0.31              | 0.57   | 0.62    | 0.20               | 0.65   | 0.76    |
| 6200  | 46.16          | 48.44  | 50.06   | 0.27              | 0.53   | 0.58    | 0.12               | 0.58   | 0.71    |
| 6500  | 60.36          | 61.78  | 60.35   | 0.16              | 0.42   | 0.47    | 0.01               | 0.48   | 0.67    |
| 7000  | 52.85          | 52.98  | 52.60   | 0.07              | 0.35   | 0.41    | 0.10               | 0.43   | 0.68    |
| 7500  | 54.03          | 55.42  | 55.06   | 0.06              | 0.36   | 0.46    | 0.10               | 0.46   | 0.77    |
| 8000  | 58.14          | 59.93  | 56.67   | 0.10              | 0.42   | 0.56    | 0.09               | 0.50   | 0.83    |
| 8400  | 52.47          | 53.65  | 52.55   | 0.15              | 0.49   | 0.65    | 0.05               | 0.57   | 0.91    |
| 8800  | 48.31          | 50.82  | 49.79   | 0.25              | 0.59   | 0.81    | 0.07               | 0.57   | 0.90    |
| 9000  | 44.97          | 46.61  | 46.98   | 0.29              | 0.64   | 0.87    | 0.05               | 0.60   | 0.94    |
| 9400  | 45.27          | 43.93  | 44.62   | 0.33              | 0.72   | 0.97    | 0.13               | 0.57   | 0.89    |
| 9700  | 42.20          | 43.03  | 42.64   | 0.36              | 0.77   | 1.07    | 0.16               | 0.54   | 0.86    |
| 10000 | 41.19          | 40.21  | 42.51   | 0.39              | 0.83   | 1.10    | 0.22               | 0.50   | 0.75    |
| 10300 | 38.93          | 40.45  | 40.70   | 0.41              | 0.85   | 1.19    | 0.18               | 0.48   | 0.80    |
| 10600 | 38.94          | 37.63  | 38.22   | 0.37              | 0.86   | 1.16    | 0.26               | 0.41   | 0.63    |
| 10900 | 35.61          | 36.79  | 37.12   | 0.41              | 0.90   | 1.20    | 0.24               | 0.37   | 0.62    |
| 11000 | 36.71          | 36.97  | 36.80   | 0.41              | 0.88   | 1.20    | 0.21               | 0.38   | 0.60    |
| 11500 | 34.03          | 34.99  | 34.48   | 0.36              | 0.83   | 1.11    | 0.25               | 0.29   | 0.48    |
| 11800 | 32.64          | 33.01  | 33.72   | 0.32              | 0.78   | 1.06    | 0.28               | 0.30   | 0.45    |
| 12000 | 33.31          | 33.47  | 33.87   | 0.29              | 0.74   | 0.99    | 0.35               | 0.23   | 0.40    |
| 12400 | 32.01          | 32.22  | 33.81   | 0.26              | 0.68   | 0.90    | 0.37               | 0.28   | 0.45    |
| 12700 | 31.27          | 32.39  | 32.72   | 0.20              | 0.61   | 0.78    | 0.49               | 0.23   | 0.45    |
| 13000 | 31.06          | 31.59  | 31.55   | 0.17              | 0.54   | 0.74    | 0.53               | 0.29   | 0.54    |
| 13300 | 30.45          | 30.93  | 31.31   | 0.14              | 0.58   | 0.76    | 0.63               | 0.27   | 0.62    |
| 13600 | 30.86          | 34.46  | 34.42   | 0.27              | 0.52   | 0.59    | 0.59               | 0.35   | 0.76    |
| 13900 | 32.76          | 32.48  | 32.96   | 0.04              | 0.42   | 0.50    | 0.66               | 0.32   | 0.81    |
| 14000 | 32.63          | 32.61  | 32.86   | 0.00              | 0.39   | 0.51    | 0.67               | 0.29   | 0.82    |
| 14500 | 31.40          | 31.92  | 32.02   | 0.08              | 0.38   | 0.49    | 0.60               | 0.37   | 1.01    |
| 14800 | 31.57          | 31.92  | 32.20   | 0.11              | 0.41   | 0.54    | 0.57               | 0.35   | 1.06    |
| 15000 | 31.39          | 31.92  | 32.13   | 0.16              | 0.37   | 0.57    | 0.57               | 0.35   | 1.08    |
| 15400 | 31.72          | 30.01  | 29.53   | 0.08              | 0.47   | 0.69    | 0.40               | 0.51   | 1.18    |
| 15700 | 29.33          | 30.10  | 30.34   | 0.05              | 0.48   | 0.86    | 0.44               | 0.36   | 0.96    |
| 16000 | 29.97          | 30.59  | 30.67   | 0.01              | 0.57   | 0.93    | 0.50               | 0.29   | 0.92    |
| 16300 | 30.27          | 30.69  | 31.10   | 0.08              | 0.62   | 1.06    | 0.53               | 0.31   | 0.84    |
| 16000 | 29.97          | 30.59  | 30.67   | 0.01              | 0.57   | 0.93    | 0.50               | 0.29   | 0.92    |
| 17000 | 30.19          | 30.84  | 31.49   | 0.25              | 0.78   | 1.22    | 0.72               | 0.21   | 0.65    |
| 18000 | 28.64          | 29.42  | 30.03   | 0.21              | 0.77   | 1.22    | 0.75               | 0.30   | 0.67    |

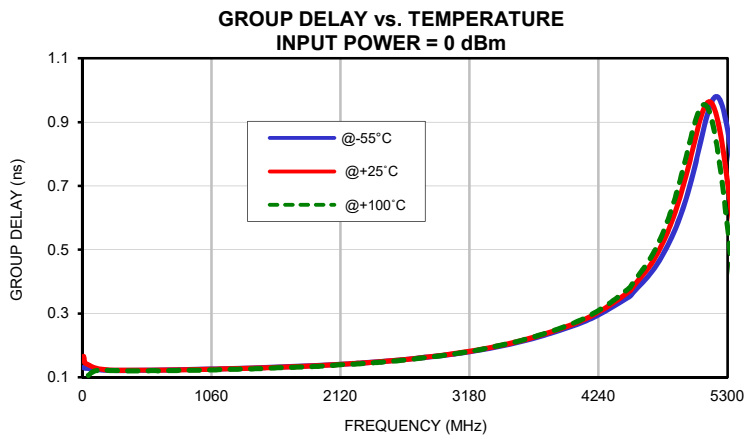
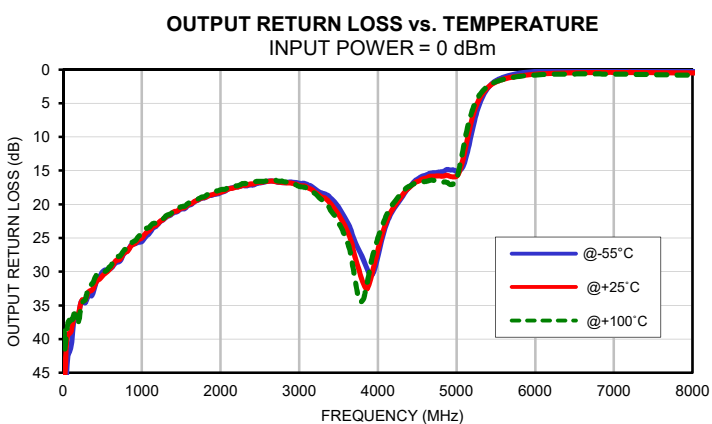
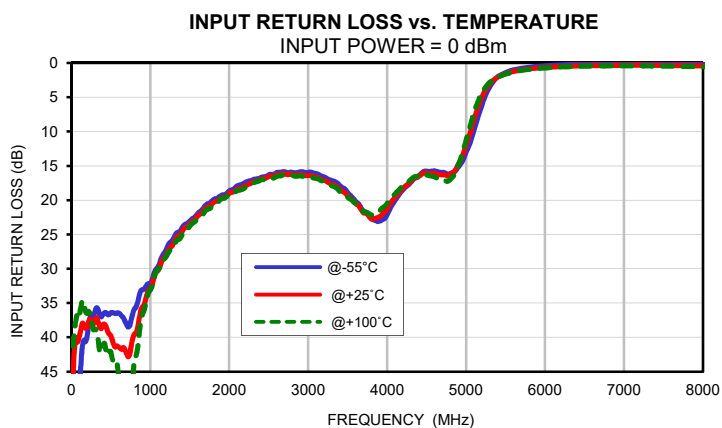
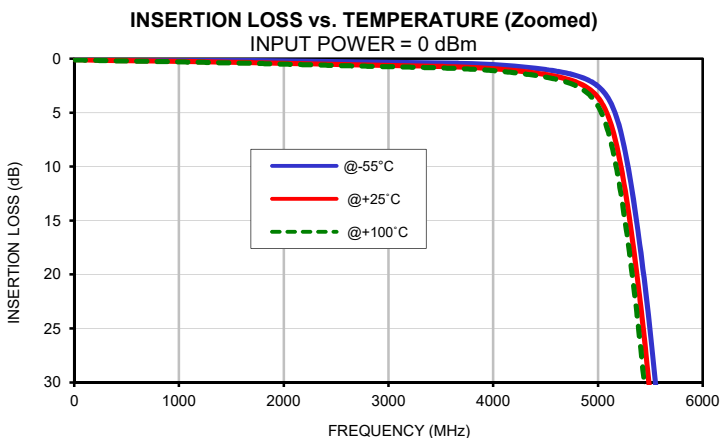
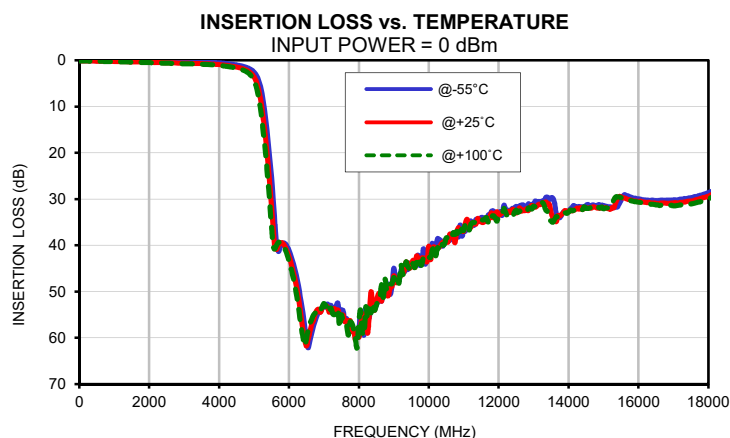
\*Temperature test data was based on the underlying chip.

*Typical Performance Data*

| FREQ. | GROUP DELAY |        |         |
|-------|-------------|--------|---------|
| (MHz) | (nsec)      |        |         |
|       | @-55°C      | @+25°C | @+100°C |
| 10    | 0.13        | 0.17   | 0.05    |
| 20    | 0.13        | 0.15   | 0.09    |
| 100   | 0.12        | 0.13   | 0.12    |
| 200   | 0.12        | 0.12   | 0.12    |
| 300   | 0.12        | 0.12   | 0.12    |
| 400   | 0.12        | 0.12   | 0.12    |
| 500   | 0.12        | 0.12   | 0.12    |
| 600   | 0.12        | 0.12   | 0.12    |
| 700   | 0.12        | 0.12   | 0.12    |
| 800   | 0.12        | 0.12   | 0.12    |
| 900   | 0.12        | 0.12   | 0.12    |
| 1000  | 0.13        | 0.12   | 0.12    |
| 1100  | 0.13        | 0.13   | 0.12    |
| 1200  | 0.13        | 0.13   | 0.12    |
| 1300  | 0.13        | 0.13   | 0.13    |
| 1400  | 0.13        | 0.13   | 0.13    |
| 1500  | 0.13        | 0.13   | 0.13    |
| 1600  | 0.13        | 0.13   | 0.13    |
| 1700  | 0.13        | 0.13   | 0.13    |
| 1800  | 0.13        | 0.13   | 0.13    |
| 1900  | 0.14        | 0.14   | 0.13    |
| 2000  | 0.14        | 0.14   | 0.14    |
| 2100  | 0.14        | 0.14   | 0.14    |
| 2200  | 0.14        | 0.14   | 0.14    |
| 2300  | 0.14        | 0.14   | 0.14    |
| 2400  | 0.15        | 0.15   | 0.15    |
| 2500  | 0.15        | 0.15   | 0.15    |
| 2600  | 0.15        | 0.15   | 0.15    |
| 2700  | 0.16        | 0.16   | 0.16    |
| 2800  | 0.16        | 0.16   | 0.16    |
| 2900  | 0.17        | 0.17   | 0.17    |
| 3000  | 0.17        | 0.17   | 0.17    |
| 3100  | 0.18        | 0.18   | 0.18    |
| 3200  | 0.18        | 0.18   | 0.18    |
| 3300  | 0.19        | 0.19   | 0.19    |
| 3400  | 0.19        | 0.20   | 0.20    |
| 3500  | 0.20        | 0.21   | 0.21    |
| 3600  | 0.21        | 0.21   | 0.21    |
| 3700  | 0.22        | 0.22   | 0.23    |
| 3760  | 0.23        | 0.23   | 0.23    |
| 3800  | 0.23        | 0.24   | 0.24    |

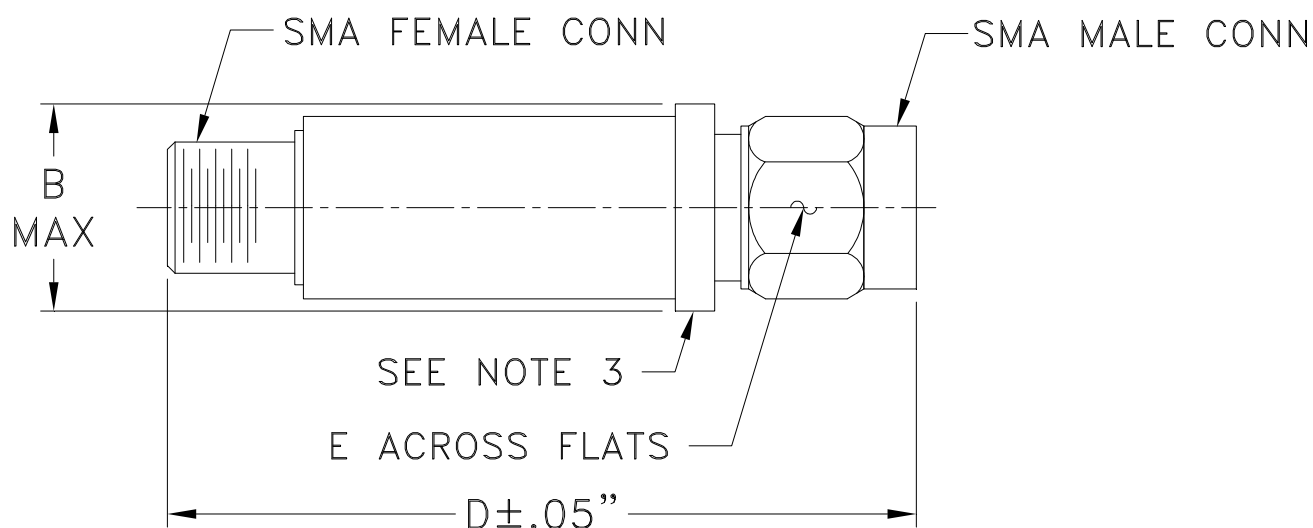
\*Temperature test data was based on the underlying chip.

## Typical Performance Curves



\*Temperature test data was based on the underlying chip.

### Outline Dimensions



| CASE #. | A  | B               | C  | D               | E              | WT GRAMS |
|---------|----|-----------------|----|-----------------|----------------|----------|
| FF704   | -- | .410<br>(10.41) | -- | 1.43<br>(36.32) | .312<br>(7.92) | 10.0     |

Dimensions are in inches (mm). Tolerances: 2Pl. ± .04; 3Pl. ± .030

#### Notes:

1. Case material: Stainless steel.
2. Case finish: Gold plated.
3. Round Flange may have .312 Across Flats in some models.



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



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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      | -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, 240 hours, 50°C                                                       | MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours |
| 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                                                                 |
| Thermal Shock              | -55° to 100°C, 5 cycles                                                             | MIL-STD-202, Method 107, Condition A, Except +100°C                                                  |