



COAXIAL

# High Pass Filter

VHF-8400+

Mini-Circuits

50Ω 9000 to 13000 MHz

## THE BIG DEAL

- Rugged unibody construction, small size
- 5 sections
- Temperature stable
- Excellent power handling, 7W
- DC block in/out, breakdown voltage, 1kV typ
- Low cost



Generic photo used for illustration purposes only

|            |           |
|------------|-----------|
| Model No.  | VHF-8400+ |
| Case Style | FF704     |
| Connectors | SMA       |

## APPLICATIONS

- Sub-harmonic rejection and DC blocking
- Transmitters/Receivers
- Lab use
- Instrumentation
- Test equipment

### +RoHS Compliant

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

## PRODUCT OVERVIEW

VHF-8400+ is a 50Ω high pass filter built in rugged unibody construction. Covering a passband of 9000 to 13000 MHz, this model offers good matching within the passband and good rejection in the stopband. It can handle a high power of 7W with a wide operating temperature range from -55°C to 100°C.

## KEY FEATURES

| Feature               | Advantages                                                                                                               |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------|
| 7W power handling     | Supports a wide range of system power requirements.                                                                      |
| Low insertion loss    | Low insertion loss results in better SNR in receiver front end and better power delivery to antenna in transmitters.     |
| Connectorized package | The connectorized package is easy to interface with other devices and well suited for test and measurement applications. |

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VHF-8400+  
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## ELECTRICAL SPECIFICATIONS AT 25°C

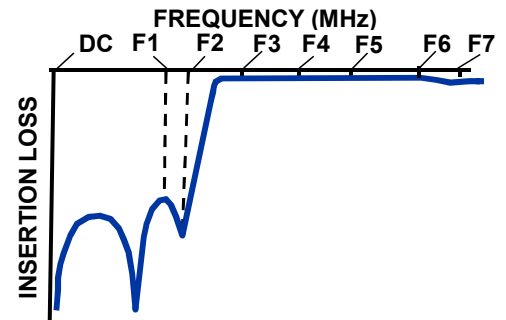
| Parameter       |                | F#      | Frequency (MHz) | Min. | Typ. | Max. | Units |
|-----------------|----------------|---------|-----------------|------|------|------|-------|
| Freq. cut-off   | Insertion Loss | Nom. F3 | 8400            | —    | 3    | —    | dB    |
| Stop Band       | Insertion Loss | DC-F1   | DC - 5700       | —    | 30   | —    | dB    |
|                 |                | DC-F2   | DC - 6000       | 20   | —    | —    | dB    |
| Passband        | Insertion Loss | F4-F5   | 9000 - 9500     | —    | —    | 3    | dB    |
|                 |                | F5-F6   | 9500 - 12500    | —    | —    | 2.5  | dB    |
|                 |                | F6-F7   | 12500 - 13000   | —    | —    | 3.5  | dB    |
|                 | Return Loss    | F3-F7   | 9000 - 13000    | —    | 14   | —    | dB    |
| No. of Sections | 5              |         |                 |      |      |      |       |

## MAXIMUM RATINGS

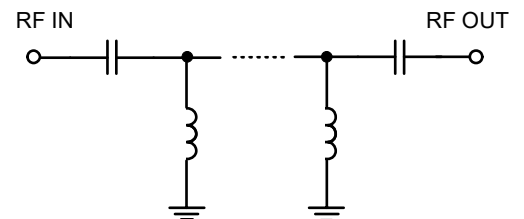
| Parameter             | Ratings         |
|-----------------------|-----------------|
| Operating temperature | -55°C to +100°C |
| Storage temperature   | -55°C to +100°C |
| RF Power Input*       | 7W max. at 25°C |

\*Passband rating, derate linearly to 3W at 100°C ambient  
Permanent damage may occur if any of these limits are exceeded.

## TYPICAL FREQUENCY RESPONSE



## FUNCTIONAL SCHEMATIC





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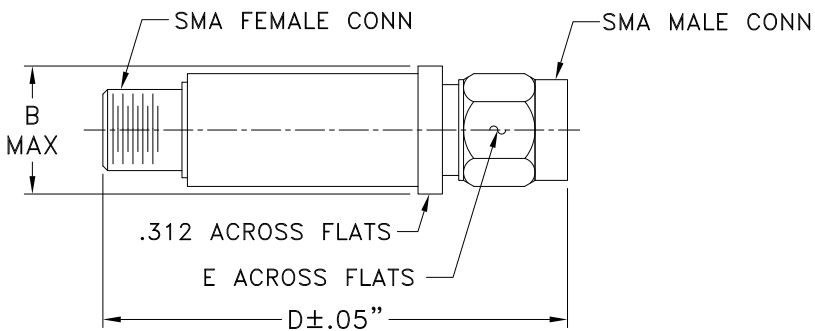
# High Pass Filter

VHF-8400+

## COAXIAL CONNECTIONS

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

## OUTLINE DRAWING



## OUTLINE DIMENSIONS (Inches mm)

| B     | D     | E    | wt    |
|-------|-------|------|-------|
| .410  | 1.43  | .312 | grams |
| 10.41 | 36.32 | 7.92 | 10.0  |

Note. Please refer to case style drawing for details





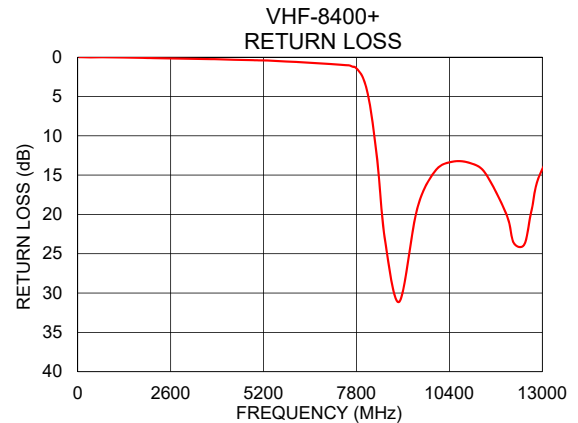
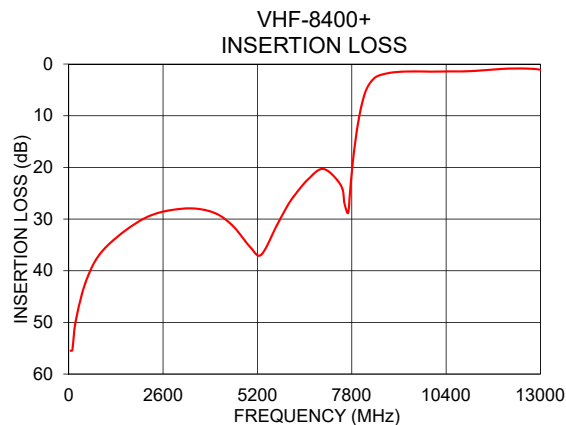
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## High Pass Filter

VHF-8400+

## TYPICAL PERFORMANCE DATA AT 25°C

| Frequency (MHz) | Insertion Loss (dB) | Return Loss (dB) |
|-----------------|---------------------|------------------|
| 50              | 55.48               | 0.01             |
| 500             | 41.57               | 0.02             |
| 4500            | 31.17               | 0.35             |
| 5700            | 31.70               | 0.52             |
| 6000            | 27.78               | 0.59             |
| 7500            | 23.46               | 1.02             |
| 8020            | 9.65                | 3.09             |
| 8400            | 2.88                | 13.93            |
| 8600            | 2.11                | 23.31            |
| 9000            | 1.57                | 31.10            |
| 9500            | 1.43                | 19.26            |
| 10000           | 1.47                | 14.49            |
| 12000           | 0.92                | 20.02            |
| 12500           | 0.86                | 23.80            |
| 13000           | 1.10                | 14.24            |



## 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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# Coaxial High Pass Filter

## VHF-8400+

### Typical Performance Data

| FREQUENCY<br>(MHz) | INSERTION LOSS @ +25° C<br>(dB) | INPUT RETURN LOSS @ +25° C<br>(dB) | OUTPUT RETURNLOSS @ +25° C<br>(dB) |
|--------------------|---------------------------------|------------------------------------|------------------------------------|
| 38                 | 59.86                           | 0.08                               | 0.01                               |
| 50                 | 58.86                           | 0.01                               | 0.03                               |
| 290                | 46.41                           | 0.03                               | 0.01                               |
| 500                | 41.63                           | 0.03                               | 0.04                               |
| 1000               | 35.89                           | 0.03                               | 0.04                               |
| 1500               | 32.69                           | 0.07                               | 0.05                               |
| 2000               | 30.76                           | 0.13                               | 0.09                               |
| 2500               | 29.68                           | 0.15                               | 0.13                               |
| 3000               | 29.37                           | 0.16                               | 0.17                               |
| 3500               | 29.92                           | 0.24                               | 0.19                               |
| 4000               | 31.45                           | 0.26                               | 0.22                               |
| 4500               | 34.99                           | 0.25                               | 0.26                               |
| 5000               | 46.58                           | 0.25                               | 0.22                               |
| 5700               | 32.89                           | 0.38                               | 0.32                               |
| 6000               | 28.58                           | 0.43                               | 0.32                               |
| 6500               | 23.87                           | 0.58                               | 0.39                               |
| 7500               | 27.70                           | 0.99                               | 0.72                               |
| 8020               | 9.25                            | 2.83                               | 2.32                               |
| 8400               | 2.32                            | 10.31                              | 9.35                               |
| 8600               | 1.43                            | 15.25                              | 14.22                              |
| 9000               | 0.97                            | 18.26                              | 18.80                              |
| 9500               | 0.86                            | 15.18                              | 15.68                              |
| 10000              | 0.89                            | 13.06                              | 13.30                              |
| 10500              | 0.84                            | 12.94                              | 13.15                              |
| 11000              | 0.80                            | 14.48                              | 14.63                              |
| 11500              | 0.66                            | 19.01                              | 18.03                              |
| 12000              | 0.62                            | 28.36                              | 21.73                              |
| 12500              | 0.72                            | 17.03                              | 16.06                              |
| 13000              | 1.12                            | 10.91                              | 10.70                              |
| 13500              | 1.75                            | 7.12                               | 7.23                               |
| 14000              | 2.56                            | 4.90                               | 4.92                               |
| 14500              | 3.32                            | 3.73                               | 3.92                               |
| 15000              | 3.92                            | 3.02                               | 3.14                               |
| 15500              | 4.20                            | 2.80                               | 2.84                               |
| 16000              | 4.17                            | 2.93                               | 2.95                               |
| 16500              | 3.68                            | 3.46                               | 3.48                               |
| 17000              | 2.83                            | 4.87                               | 4.85                               |
| 17500              | 1.73                            | 8.35                               | 8.38                               |
| 18000              | 1.17                            | 23.58                              | 18.38                              |
| 18500              | 1.96                            | 9.50                               | 8.51                               |
| 19300              | 5.31                            | 3.12                               | 2.82                               |

REV. X1  
VHF-8400+  
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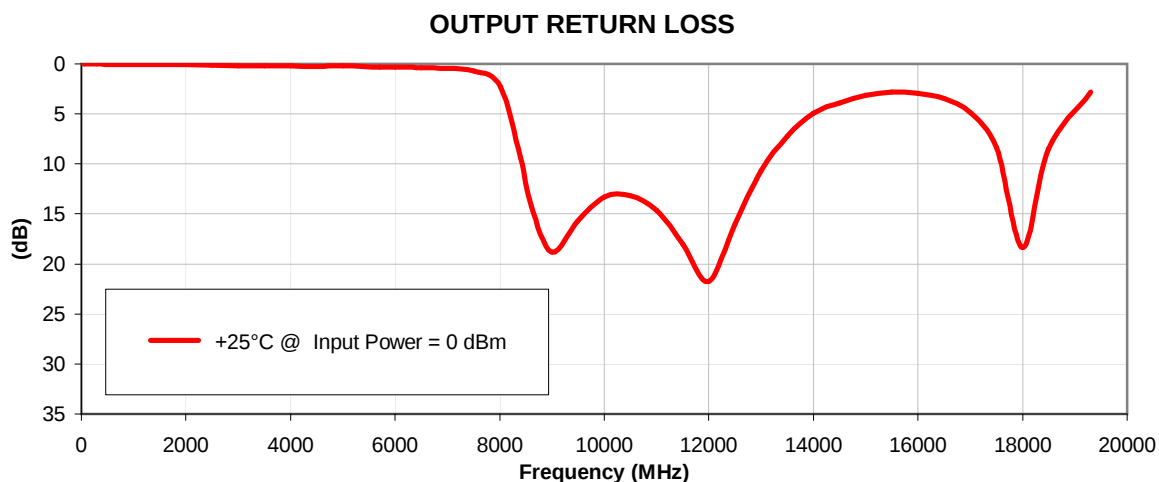
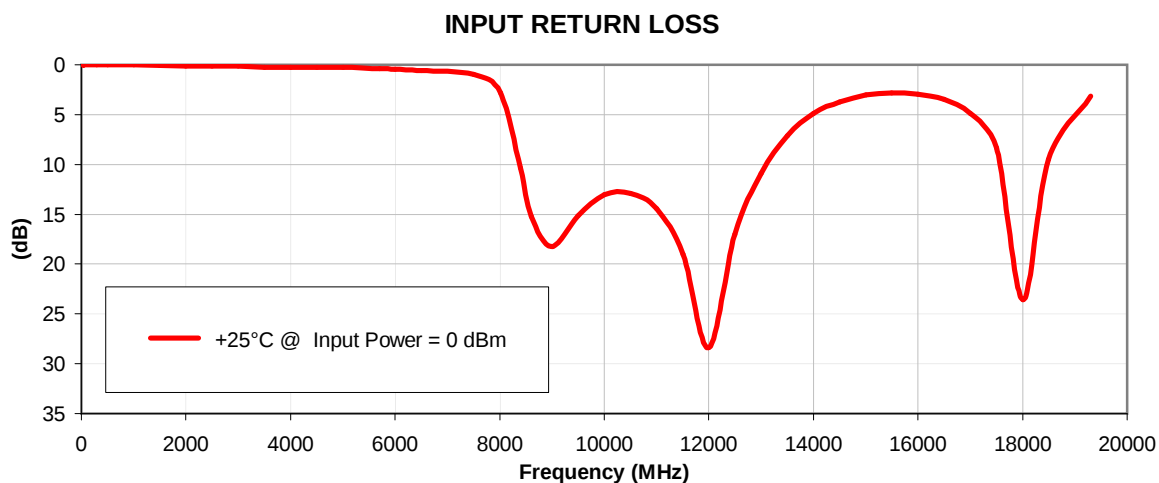
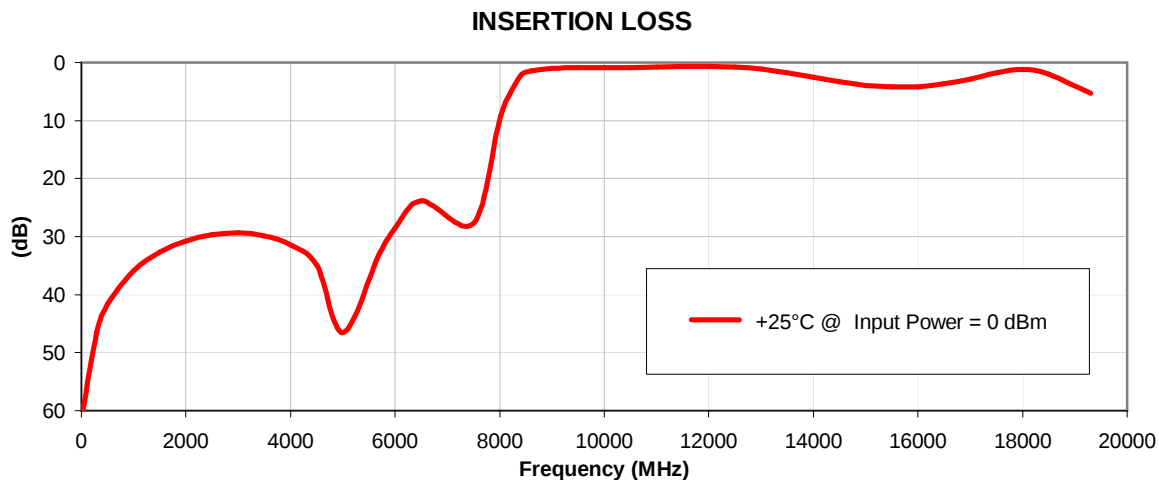
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# Coaxial High Pass Filter

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## Typical Performance Curves



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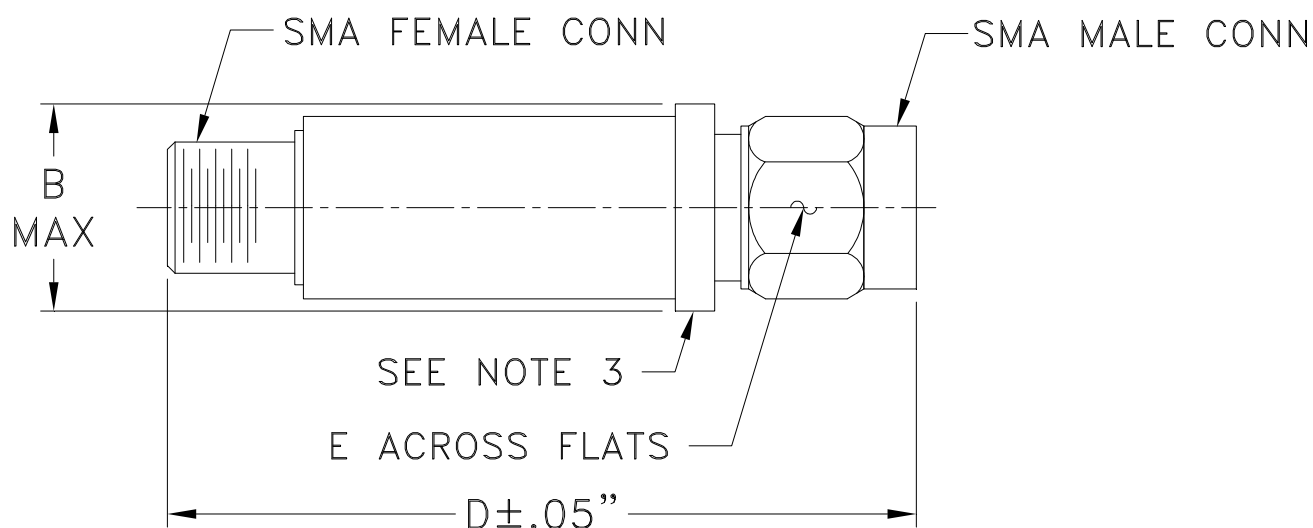
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### Outline Dimensions



| 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.



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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          |
| Barometric Pressure        | 100,000 Feet                                                                           | MIL-STD-202, Method 105, Condition D |
| Humidity                   | 90% RH, 65°C<br>Units may require bake-out after humidity to restore full performance. | MIL-STD-202, Method 103              |
| Thermal Shock              | -65° to 125°C, 5 cycles                                                                | MIL-STD-202, Method 107, Condition B |
| 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           | 100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)                          | MIL-STD-202, Method 213, Condition I |