

Coaxial

## Fixed Attenuator

50Ω 1W 4dB DC to 2000 MHz

HAT-4+



Generic photo used for illustration purposes only

CASE STYLE: FF747

| Connectors          | Model  |
|---------------------|--------|
| BNC Male-BNC Female | HAT-4+ |

**+RoHS Compliant**

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

## Maximum Ratings

|                                                                 |                |
|-----------------------------------------------------------------|----------------|
| Operating Temperature                                           | -45°C to 100°C |
| Storage Temperature                                             | -55°C to 100°C |
| Permanent damage may occur if any of these limits are exceeded. |                |

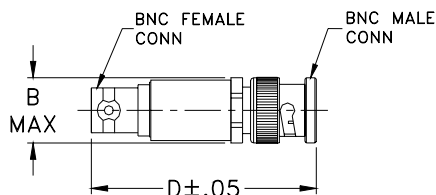
## Features

- excellent VSWR, 1.05:1 typ.
- excellent flatness, 0.15 dB typ. to 2000 MHz
- usable to 4000 MHz

## Applications

- PCS
- instrumentation
- cellular

## Outline Drawing



## Outline Dimensions (inch/mm)

| B     | D     | wt    |
|-------|-------|-------|
| .62   | 1.94  | grams |
| 15.75 | 49.28 | 30.0  |

## Electrical Specifications

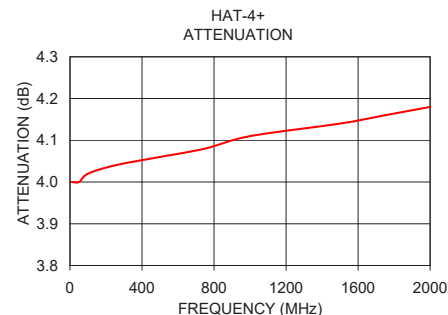
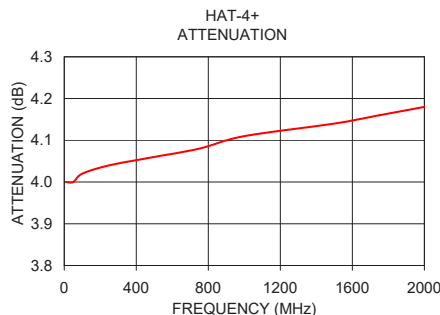
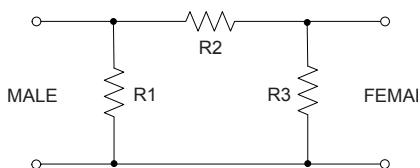
| FREQ.<br>RANGE<br>(MHz) | ATTENUATION<br>(dB)<br>Flatness* |               |             |             |                       | VSWR<br>(:1)  |             |             | MAX.<br>INPUT<br>POWER<br>(W) |
|-------------------------|----------------------------------|---------------|-------------|-------------|-----------------------|---------------|-------------|-------------|-------------------------------|
|                         |                                  | DC-0.5<br>GHz | DC-1<br>GHz | DC-2<br>GHz | Total<br>Band<br>Typ. | DC-0.5<br>GHz | DC-1<br>GHz | DC-2<br>GHz |                               |
|                         | $f_L-f_U$                        | Nom.<br>Typ.  | Typ.        | Typ.        |                       | Typ.          | Typ.        | Typ.        |                               |
| DC-2000                 | 4±0.2                            | 0.05          | 0.10        | 0.15        | 0.25                  | 1.05          | 1.10        | 1.10        | 1.0                           |

\* Flatness = variation over band divided by 2.

## Typical Performance Data

| Frequency (MHz) | Attenuation (dB) | VSWR (:1) |
|-----------------|------------------|-----------|
| 10.00           | 4.00             | 1.00      |
| 50.00           | 4.00             | 1.00      |
| 100.00          | 4.02             | 1.01      |
| 250.00          | 4.04             | 1.02      |
| 500.00          | 4.06             | 1.04      |
| 750.00          | 4.08             | 1.06      |
| 1000.00         | 4.11             | 1.07      |
| 1500.00         | 4.14             | 1.06      |
| 1750.00         | 4.16             | 1.05      |
| 2000.00         | 4.18             | 1.04      |

## Electrical Schematic



## 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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 REV. G  
 M151107  
 EDR-5087/5  
 HAT-4+  
 RVN/LC/CP/AM  
 200520

## Typical Performance Data

| FREQUENCY<br>(MHz) | ATTENUATION<br>(dB) | RETURN LOSS<br>(dB) |
|--------------------|---------------------|---------------------|
| 10.00              | 4.00                | 65.92               |
| 50.00              | 4.00                | 53.08               |
| 100.00             | 4.02                | 46.30               |
| 250.00             | 4.04                | 38.66               |
| 500.00             | 4.06                | 34.21               |
| 750.00             | 4.08                | 31.18               |
| 1000.00            | 4.11                | 30.04               |
| 1500.00            | 4.14                | 30.05               |
| 1750.00            | 4.16                | 31.99               |
| 2000.00            | 4.18                | 33.30               |

REV. X1

HAT-4+

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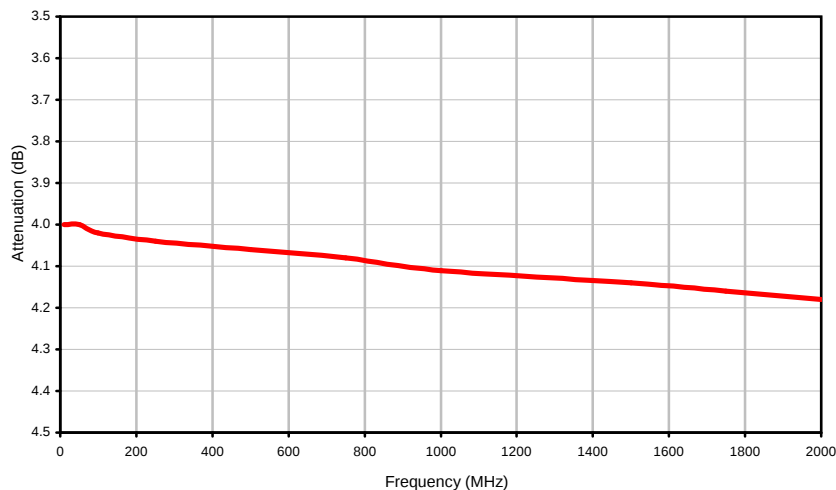


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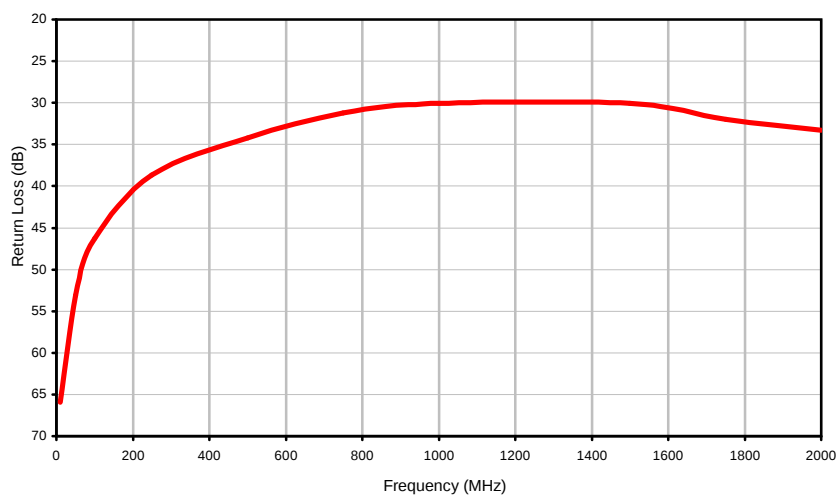


## Typical Performance Curves

Attenuation



Return Loss



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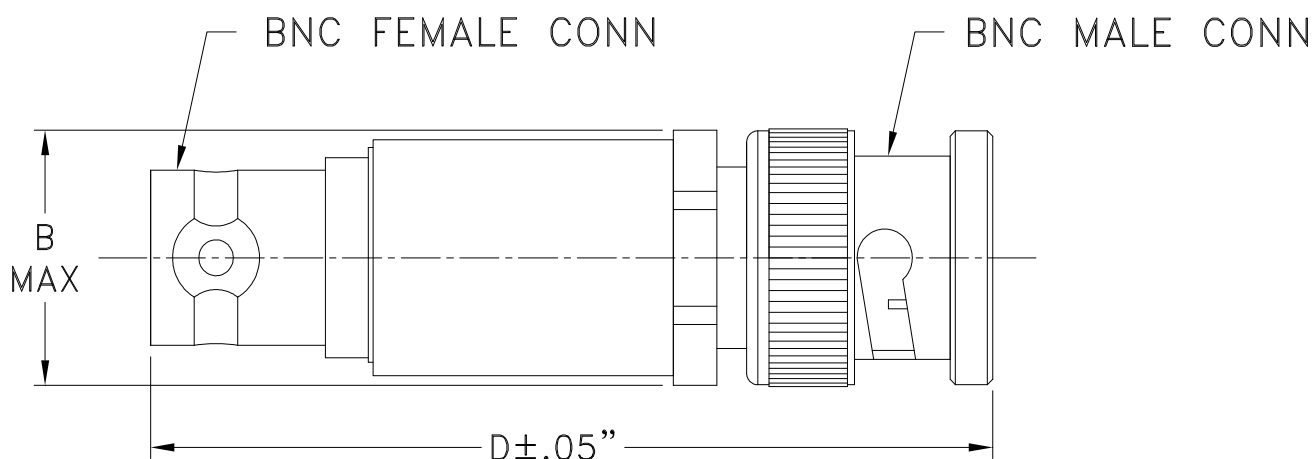
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# Case Style

# FF

## Outline Dimensions

**FF747**

| CASE #. | A  | B              | C  | D               | E  | WT GRAMS |
|---------|----|----------------|----|-----------------|----|----------|
| FF747   | -- | .62<br>(15.75) | -- | 1.94<br>(49.28) | -- | 30.0     |

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

### Notes:

1. Case material: Brass.
2. Case finish: Nickel plate.



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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      | -45° 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 |