



## Fixed Attenuator

50Ω 1 W 9 dB DC to 7 GHz

## FEATURES

- Wideband, DC to 7 GHz
- Excellent VSWR Through Entire Band
- Miniature Size
- Aqueous Washable

## APPLICATIONS

- Power Leveling
- Impedance Match Improvement



Generic photo used for illustration purposes only

CASE STYLE: AF320

**+RoHS Compliant**

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

## ELECTRICAL SPECIFICATIONS AT +25°C

| Parameter                          | Condition (GHz) | Min. | Typ.  | Max. | Unit |
|------------------------------------|-----------------|------|-------|------|------|
| Frequency Range                    |                 | DC   |       | 7    | GHz  |
| Attenuation, Nominal               |                 |      | 9±0.4 |      | dB   |
| Attenuation, Flatness <sup>1</sup> | DC - 1          |      |       | 0.4  | dB   |
|                                    | DC - 2.5        |      |       | 0.6  |      |
|                                    | DC - 7          |      |       | 1.7  |      |
| VSWR                               | DC - 1          |      |       | 1.3  | :1   |
|                                    | DC - 2.5        |      |       | 1.4  |      |
|                                    | DC - 7          |      |       | 1.5  |      |
| Input Power <sup>2</sup>           |                 |      |       | 1.0  | W    |

1. Flatness = variation over band divided by 2.

2. RF power at +25°C case temperature: 1 Watt. Derate linearly to 0.1 Watt at +100°C.

## ABSOLUTE MAXIMUM RATINGS

| Parameter             | Ratings         |
|-----------------------|-----------------|
| Operating Temperature | -55°C to +100°C |
| Storage Temperature   | -55°C to +100°C |

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



Mini-Circuits

MINIATURE CERAMIC

## Fixed Attenuator

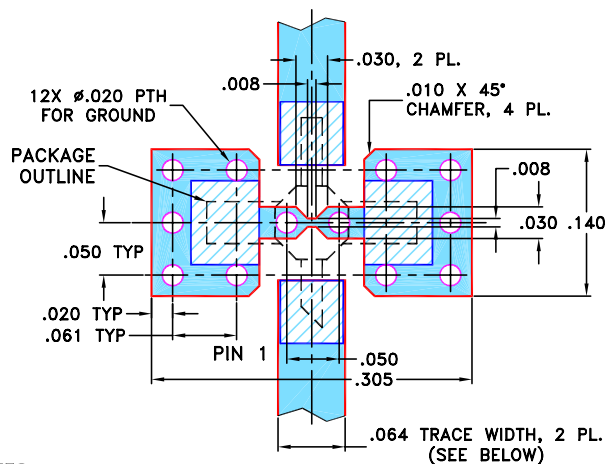
PAT-9+

50Ω 1 W 9 dB DC to 7 GHz

## PIN CONNECTIONS

|        |     |
|--------|-----|
| INPUT  | 1   |
| OUTPUT | 3   |
| GROUND | 2,4 |

DEMO BOARD MCL P/N: TB-319  
SUGGESTED PCB LAYOUT (PL-208)

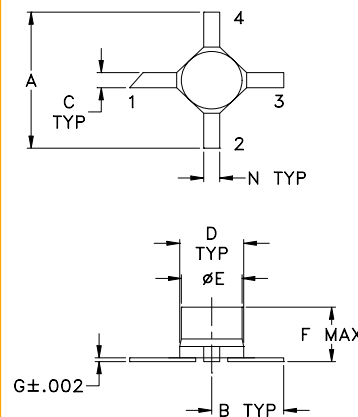


## NOTES:

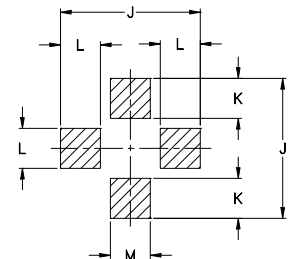
- TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS  $.030" \pm .002"$ ; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

## OUTLINE DRAWING



## PCB Land Pattern



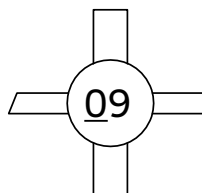
Suggested Layout,  
Tolerance to be within  $\pm .002$

## OUTLINE DIMENSIONS (Inch/mm)

| A    | B    | C    | D    | E    | F    | G     |
|------|------|------|------|------|------|-------|
| .200 | .100 | .020 | .070 | .068 | .057 | .005  |
| 5.08 | 2.54 | 0.51 | 1.78 | 1.73 | 1.45 | 0.13  |
| H    | J    | K    | L    | M    | N    | wt    |
| --   | .230 | .065 | .060 | .080 | .040 | grams |
| --   | 5.84 | 1.65 | 1.52 | 2.03 | 1.02 | 0.04  |

## TAPE &amp; REEL INFORMATION: F26

## PRODUCT MARKING



Marking may contain other features or characters for internal lot control

Mini-Circuits

www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

PAGE 2 OF 2

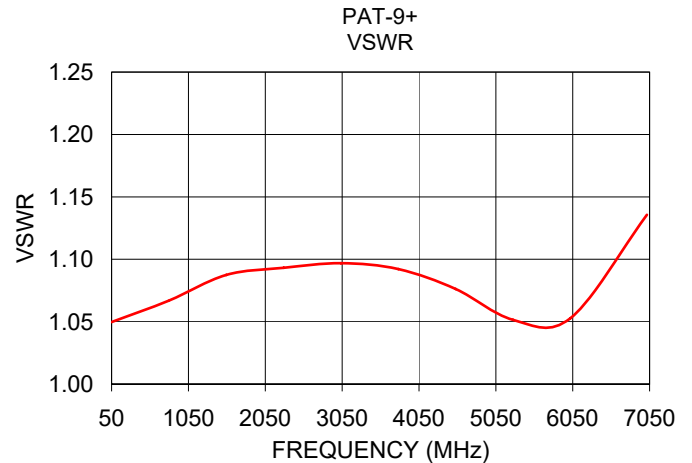
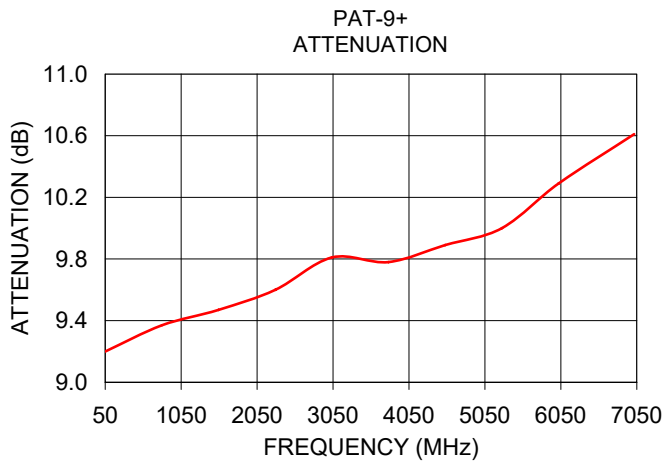


## Fixed Attenuator

50Ω 1 W 9 dB DC to 2.5 GHz

## TYPICAL PERFORMANCE DATA AND CHARTS

| Frequency (MHz) | Attenuation (dB) | VSWR (:1) |
|-----------------|------------------|-----------|
| 50.00           | 9.20             | 1.05      |
| 796.25          | 9.37             | 1.07      |
| 1542.50         | 9.47             | 1.09      |
| 2288.75         | 9.60             | 1.09      |
| 3035.00         | 9.81             | 1.10      |
| 3781.25         | 9.78             | 1.09      |
| 4527.50         | 9.89             | 1.08      |
| 5273.75         | 10.00            | 1.05      |
| 6020.00         | 10.29            | 1.05      |
| 7015.00         | 10.61            | 1.14      |



## 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-Circuits' 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/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)