

Voltage Variable Absorptive Attenuator 30 dB, 0.5 - 2.0 GHz

Rev. V3

Features

- Single Positive Voltage Control: 0 to +5 Volts
- 30 dB Voltage Variable Attenuation
- ± 2 dB Linearity from BSL
- Low DC Power Consumption
- Temperature Range: -40°C to $+85^{\circ}\text{C}$
- Fast Switching Speed
- Lead-Free SOIC-8 Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- 260°C Reflow Compatible
- RoHS* Compliant Version of AT-110-2

Description

M/A-COM's MAAVSS0008 is a GaAs MMIC voltage variable absorptive attenuator in a lead-free SOIC-8 surface mount plastic package. The MAAVSS0008 is ideally suited for use where linear attenuation fine tuning and very low power consumption are required.

Typical applications include radio, cellular, GPS equipment and automatic gain/level control circuits.

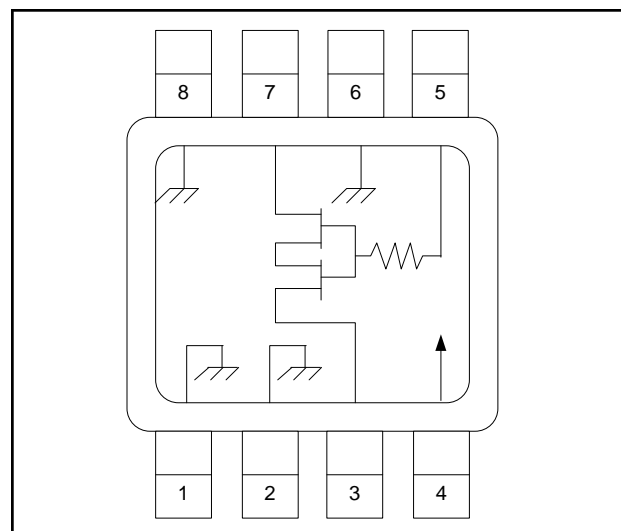
The MAAVSS0008 is fabricated with a monolithic GaAs MMIC using a mature 1-micron process. The process features full chip passivation for increased performance and reliability.

Ordering Information ^{1,2}

| Part Number | Package |
|---------------|-----------------|
| MAAVSS0008 | Bulk Packaging |
| MAAVSS0008TR | 1000 piece reel |
| MAAVSS0008SMB | Sample Board |

1. Reference Application Note M513 for reel size information.
2. All sample boards include 5 loose parts.

Functional Schematic ^{3,4,5}



3. $V_{CC} = +5 \text{ VDC} \pm 0.5 \text{ VDC}$ @ 300 μA maximum.
4. $V_C = 0 \text{ VDC}$ to $+5 \text{ VDC}$ @ 6.6 mA maximum.
5. External DC blocking capacitors are required on all RF ports.

Pin Configuration

| Pin No. | Function | Pin No. | Function |
|---------|----------|---------|----------|
| 1 | Ground | 5 | V_C |
| 2 | Ground | 6 | Ground |
| 3 | RF Port | 7 | RF Port |
| 4 | V_{CC} | 8 | Ground |

Absolute Maximum Ratings ^{6,7}

| Parameter | Absolute Maximum |
|-------------------------|---|
| Input Power | +21 dBm |
| Supply Voltage V_{CC} | $-1 \text{ V} \leq V_{CC} \leq +8 \text{ V}$ |
| Control Voltage V_C | $-1 \text{ V} \leq V_C \leq V_{CC} + 0.5 \text{ V}$ |
| Operating Temperature | -40°C to $+85^{\circ}\text{C}$ |
| Storage Temperature | -65°C to $+150^{\circ}\text{C}$ |

6. Exceeding any one or combination of these limits may cause permanent damage to this device.
7. M/A-COM does not recommend sustained operation near these survivability limits.

* Restrictions on Hazardous Substances, European Directive 2002/95/EC.

Rev. V3

| Parameter | Test Conditions | Units | Min. | Typ. | Max. |
|----------------------------|--|-------|------|-------|-------|
| Insertion Loss | 0.5 - 1.0 GHz | dB | — | 2.8 | 3.0 |
| | 1.0 - 2.0 GHz | dB | — | 3.3 | 3.6 |
| Attenuation | 1.0 GHz | dB | 37.5 | — | — |
| | 1.0 - 2.0 GHz | dB | 25 | — | — |
| Flatness (Peak to Peak) | 0.5 - 1.0 GHz | dB | — | ± 0.5 | ± 0.8 |
| | 1.0 - 2.0 GHz | dB | — | ± 1.2 | ± 1.5 |
| VSWR | — | Ratio | — | 2:1 | — |
| Trise, Tfall | 10% to 90% RF, 90% to 10% RF | µS | — | 0.2 | — |
| Ton, Toff | 50% Control to 90% RF, 50% Control to 10% RF | µS | — | 0.2 | — |
| Transients | In-band | mV | — | 70 | — |

The drawing illustrates the mechanical specifications of the MACOM 2284/2440 package. It includes three views: a top view, a side view, and a bottom view.

Top View: Shows a rectangular package with a central label area. The label contains the part number "2284/2440", the date/lot code "XX-XXX", the company logo "YYWWXXXX", and the manufacturer name "MACOM". The package has 8 pins on the top edge (PIN 8 at the left, PIN 1 at the right) and 8 pins on the bottom edge. Dimensions include a width of 0.0075/0.0098 (0.197/2.5) and a height of 0.1497/0.1574 (3.80/4.00).

Side View: Shows the package's profile with a thickness of 0.016/0.050 (0.40/1.27).

Bottom View: Shows the underside of the package with dimensions for the pin pitch (0.0532/0.0688 (1.35/1.75)) and the overall width (0.1890/0.1968 (4.80/5.00)). The distance from the bottom edge to the center of the pins is 0.0040/0.0098 (0.10/2.5). The package is 8X long.

Notes:

1. REFERENCE JEDEC MS-012-AA, FOR ADDITIONAL DIMENSIONAL AND TOLERANCE INFORMATION.
2. REFERENCE M538 APPLICATION NOTE FOR FOOTPRINT INFORMATION.
3. ALL DIMENSIONS SHOWN AS INCHES/MM.

• **North America** Tel: 800.366.2266 / Fax: 978.366.2266
 • **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
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 Visit www.macomtech.com for additional data sheets and product information.

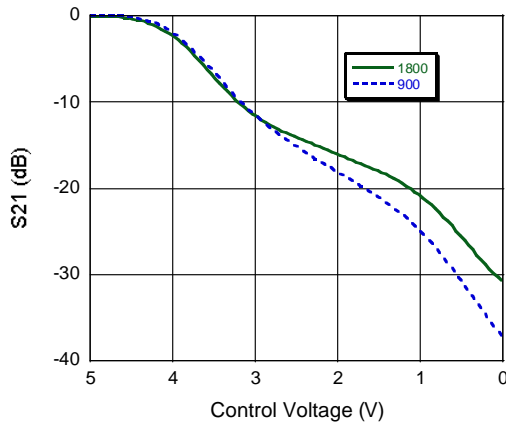
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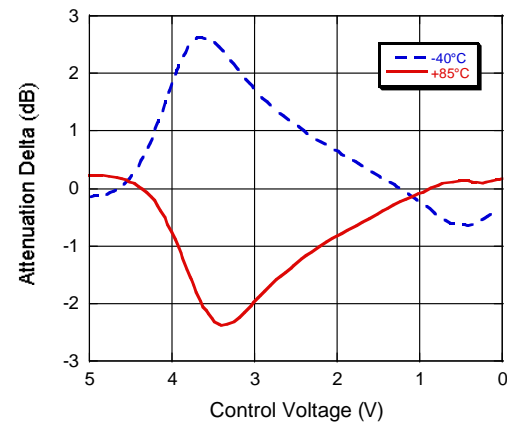
Rev. V3

Typical Performance Curves @ 25°C

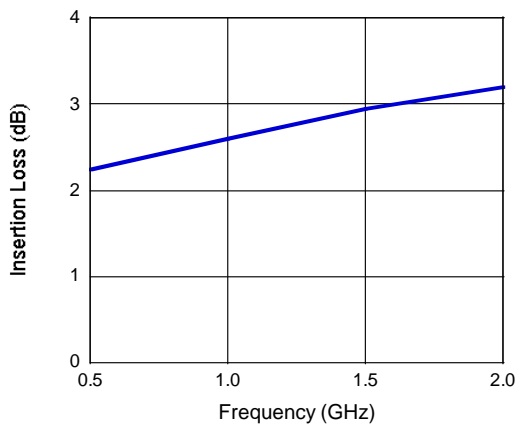
Attenuation vs. Control Voltage, $F = 900, 1800$ MHz



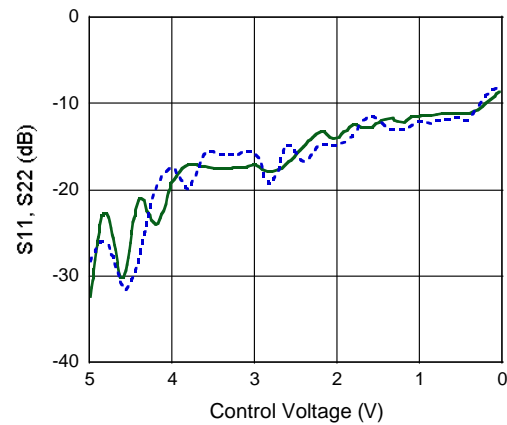
**Attenuation vs. Temperature
Normalized to +25°C, $F = 900$ MHz**



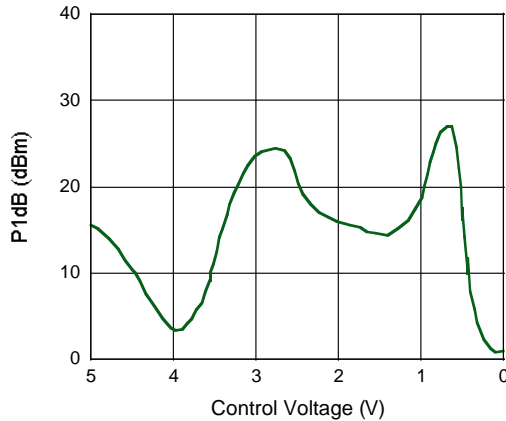
Insertion Loss vs. Frequency



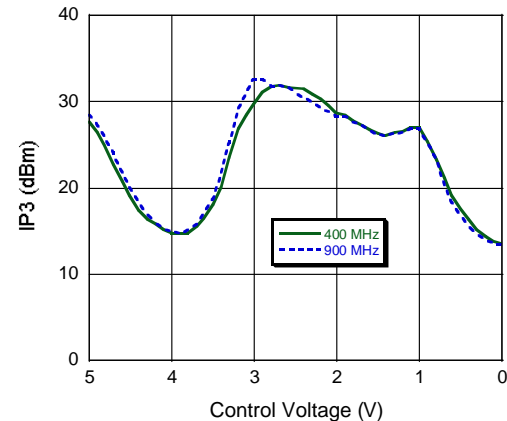
Return Loss vs. Control Voltage, $F = 900$ MHz



1 dB Compression vs. Control Voltage, $F = 900$ MHz



IP3 vs. Control Voltage



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