Voltage Variable Absorptive Attenuator 40 dB, 0.5-3.0 GHz

MAAVSS0007 V1

Features

- Single Positive Voltage Control: 0 to +5 Volts
- 40 dB Attenuation Range at 900 MHz
- ± 2 dB Linearity from BSL
- Low DC Power Consumption
- Tape and Reel Packaging Available
- 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-108

Description

M/A-COM's MAAVSS0007 is a GaAs MESFET MMIC voltage variable absorptive attenuator in a lead-free SOIC-8 surface mount plastic package. The MAAVSS0007 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.

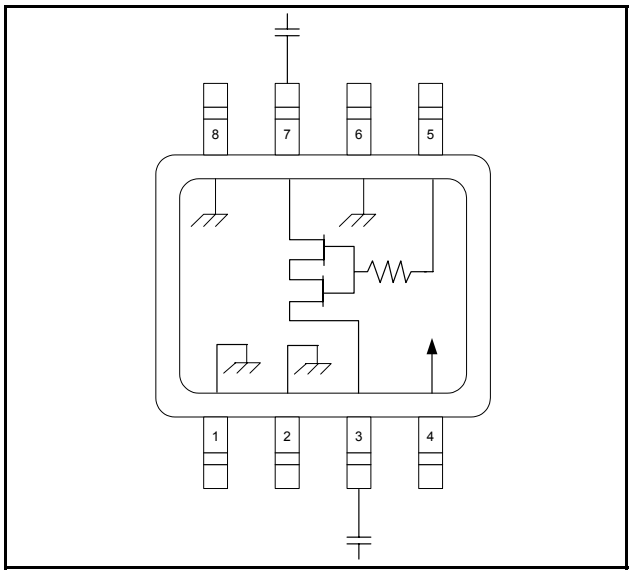
The MAAVSS0007 is fabricated with a monolithic GaAs MMIC using a mature 1-micron process. The process features full chip passivation for increased performance and reliability.

Ordering Information

Part Number	Package
MAAVSS0007	Bulk Packaging
MAAVSS0007TR	1000 piece reel

Note: Reference Application Note M513 for reel size information.

Functional Schematic [1,2,3,4]



1. V_{cc} = +5 VDC @ 50 µA maximum.
2. V_c = 0 VDC to +5 VDC @ 50 µA maximum.
3. External DC blocking capacitors are requirements on all RF ports.
4. 39 pF used for data measurements.

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 [5,6]

Parameter	Absolute Maximum
Input Power	+21 dBm
Supply Voltage V_{CC}	-1 V ≤ V_{CC} ≤ +8 V
Control Voltage V_C	-1 V ≤ V_C ≤ V_{CC} +0.5 V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

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

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

- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298

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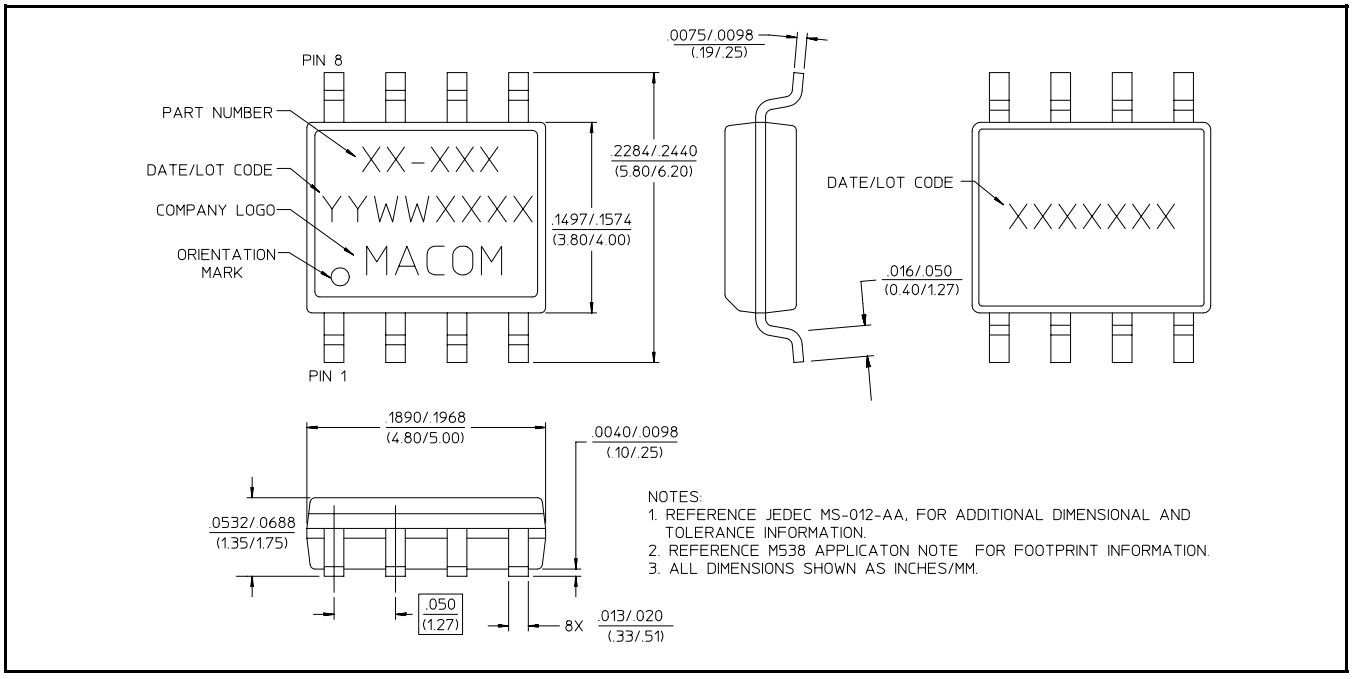
Electrical Specifications: T_A = 25°C, Z_0 = 50 Ω

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	0.5 - 1.0 GHz 1.0 - 3.0 GHz	dB dB	— —	2.5 2.6	— 3.5
Attenuation	0.5 - 1.0 GHz 1.0 - 2.0 GHz 2.0 - 3.0 GHz	dB dB dB	— 35 —	43 40 33	— — —
Flatness (peak-to-peak)	0.5 - 1.0 GHz 1.0 - 2.0 GHz 2.0 - 3.0 GHz	dB dB dB	— — —	± 0.5 ± 1.2 ± 1.5	— — —
VSWR	0.5 - 3.0 GHz	Ratio	—	2:1	—
Trise, Tfall	10% to 90% RF, 90% to 10% RF	µS	—	15	—
Ton, Toff	50% Control to 90% RF, 50% Control to 10% RF	µS	—	25	—
Transients	In-Band	mV	—	12	—

Lead-Free SOIC-8†



† Reference Application Note M538 for lead-free solder reflow recommendations.

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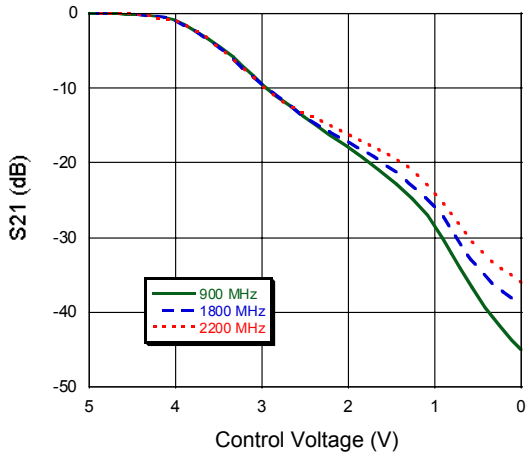
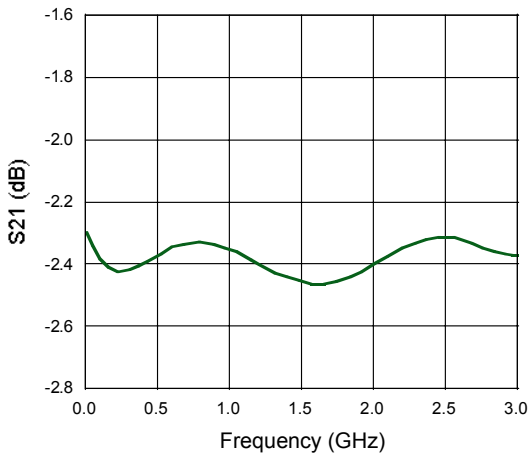
Typical Performance Curves @ 25°C

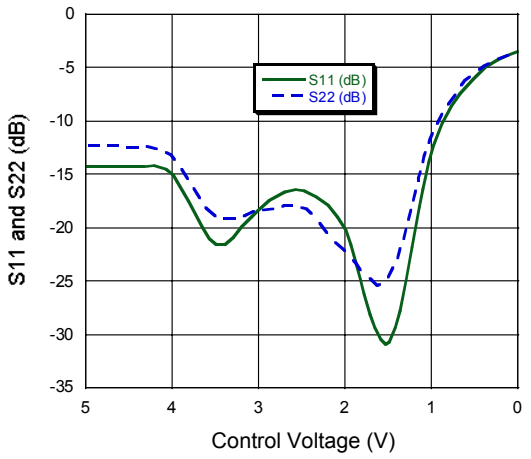
Attenuation vs. Control Voltage



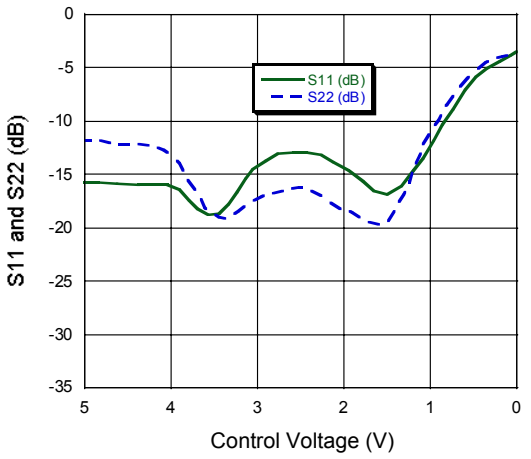
Insertion Loss vs. Frequency



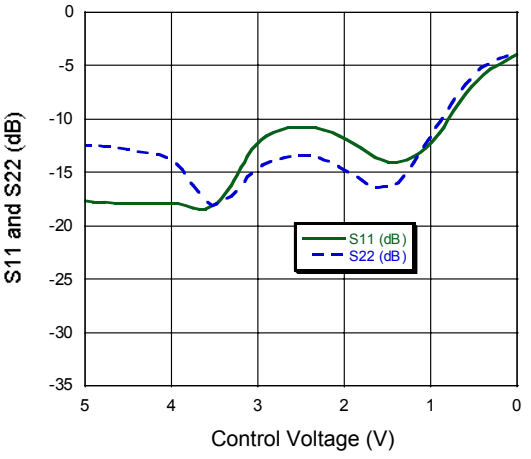
Return Loss vs. Control Voltage, F = 900 MHz



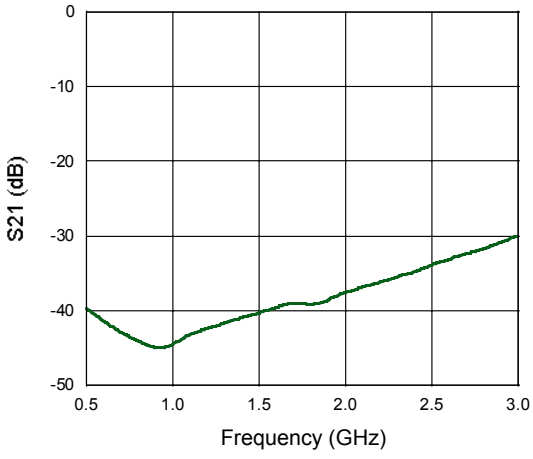
Return Loss vs. Control Voltage, F = 1800 MHz



Return Loss vs. Control Voltage, F = 2200 MHz



Maximum Attenuation vs. Frequency



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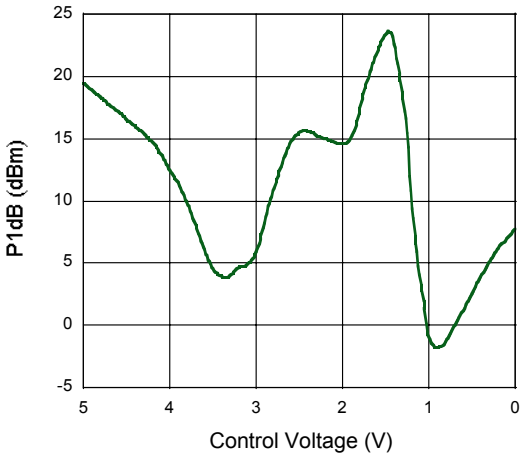
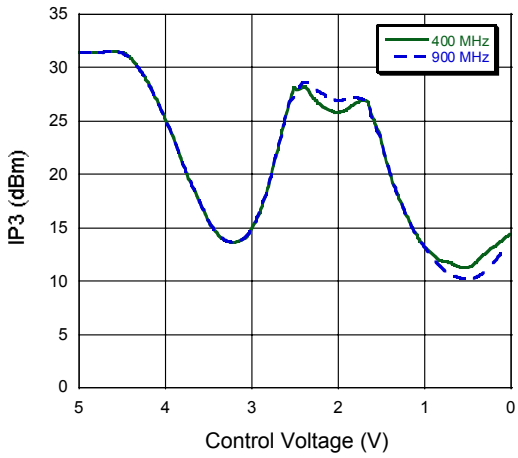
Typical Performance Curves @ 25°C

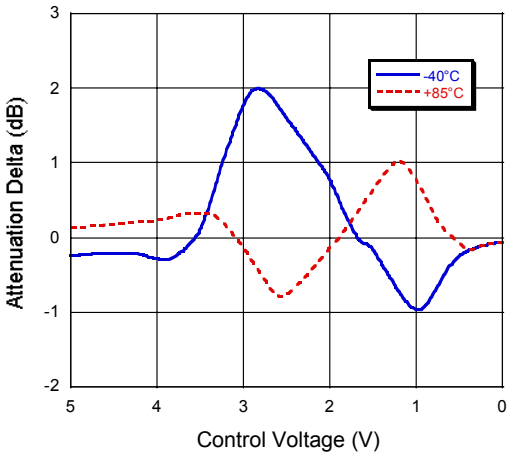
1 dB Compression vs. Control Voltage, F = 900 MHz



IP3 vs. Control Voltage



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



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