MAAVSS0004

Voltage Variable Absorptive Attenuator
35 dB, DC - 2.0 GHz

Rev. V1

Features

- 35 dB Voltage Variable Attenuation at 1 GHz
- Single Voltage Control: 0 to -4 Volts
- Low DC Power Consumption
- Nanosecond Switching Speed
- Temperature Range: -40°C to +85°C
- Lead-Free SOIC-14 Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- 260°C Reflow Compatible
- RoHS* Compliant Version of AT-635
- Tape and Reel Packaging Available

Description

M/A-COM's MAAVSS0004 is a GaAs MMIC voltage variable absorptive attenuator in a low cost SOIC 14-lead surface mount plastic package. The MAAVSS0004 is ideally suited for use where attenuation fine tuning, fast switching and very low power consumption are required.

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

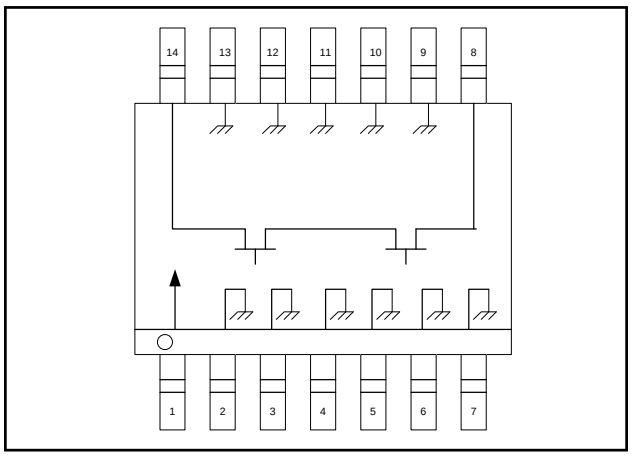
The MAAVSS0004 is fabricated with a monolithic GaAs MMIC using a mature 1-micron process. The process features full chip passivation for increased performance and reliability.

Ordering Information[1]

Part Number	Package
MAAVSS0004	Bulk packaging
MAAVSS0004TR-3000	3000 piece reel

1. Reference Application Note M513 for reel size information.

Functional Schematic



Pin Configuration

Pin No.	Function	Pin No.	Function
1	V_C	8	RF2
2	Ground	9	Ground
3	Ground	10	Ground
4	Ground	11	Ground
5	Ground	12	Ground
6	Ground	13	Ground
7	Ground	14	RF1

Absolute Maximum Ratings [2,3]

Parameter	Absolute Maximum
Input Power	+21 dBm
Control Voltage	-8.5 V $\leq V_C \leq$ +5 V
Operating Temperature	-40°C to +85°C
Storing Temperature	-65°C to +150°C

2. Exceeding any one or combination of these limits may cause permanent damage to this device.
3. 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

Visit www.macomtech.com for additional data sheets and product information.

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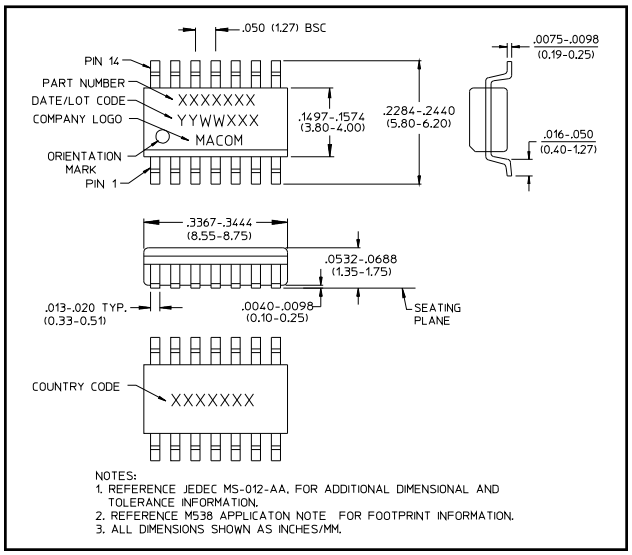
Electrical Specifications: T_A = 25°C, Z_0 = 50 Ω

Parameter	Test Conditions[4]	Units	Min.	Typ.	Max.
Insertion Loss	DC - 0.5 GHz 0.5 - 1.0 GHz 1.0 - 2.0 GHz	dB dB dB	— — —	6.7 7.2 7.5	7.0 7.4 7.8
Flatness (Peak to Peak)	10 dB Attenuation – DC - 2.0 GHz 20 dB Attenuation – DC - 2.0 GHz 30 dB Attenuation – DC - 2.0 GHz	dB dB dB	— — —	± 1.0 ± 1.2 ± 1.2	— — —
VSWR		Ratio	—	2.0:1	—
Trise, Tfall	10% to 90% RF, 90% to 10% RF	nS	—	2	—
Ton, Toff	50% Control to 90% RF, 50% Control to 10% RF	nS	—	4	—
Transients	In Band	mV	—	30	—
Power Handling	Linear Operation Absolute maximum Input Power	dBm dBm	— —	— —	13 21
IP_2	0.05 GHz 0.5 - 2.0 GHz Measured Relative to Input Power (For two-tone Input Power Up to +5 dBm)	dBm dBm	— —	34 47	— —
IP_3	0.05 GHz 0.5 - 2.0 GHz Measured Relative to Input Power (For two-tone Input Power Up to +5 dBm)	dBm dBm	18 18.5	31 [5] 36 [5]	— —

4. Control voltage: 0 to -4 volts @ 20 µA typical.
5. For levels above 6 dB attenuation. For levels below 6 dB, the minimum specification numbers apply.

Lead-Free SOIC-14†



† Reference Application Note M538 for lead-free solder reflow recommendations.
Meets JEDEC moisture sensitivity level 1 requirements.

Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity

Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

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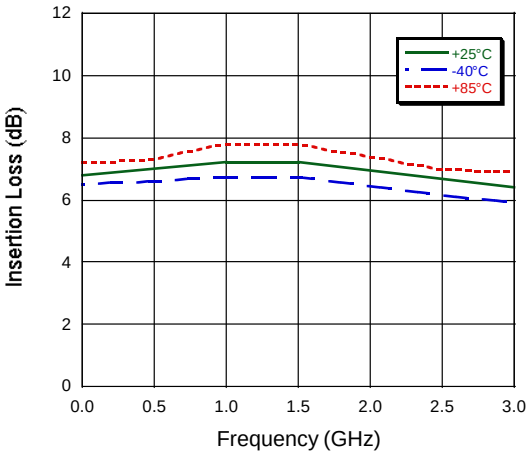
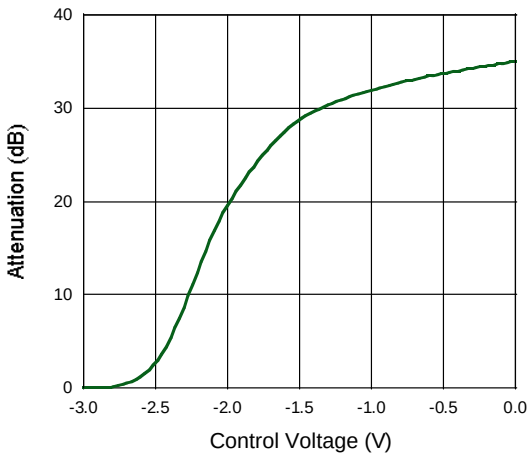
Typical Performance Curves

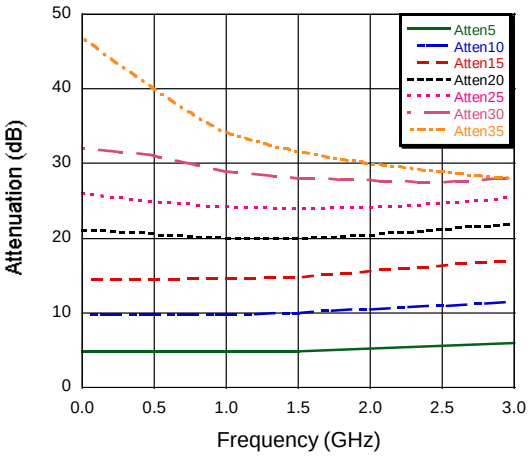
Insertion Loss vs. Frequency



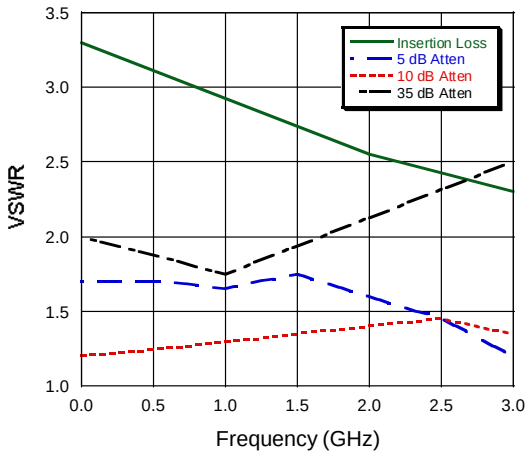
Attenuation vs. Control Voltage, F = 1 GHz



Attenuation vs. Frequency



VSWR vs. Frequency



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