

Voltage Variable Absorptive Attenuator 12 dB, DC - 2.0 GHz

Rev. V5

Features

- Attenuation: 12 dB at 1 GHz
- Low Intermodulation Products
- Low DC Power Consumption: 50 μ W
- Single Voltage Control: 0 to -4 Volts
- Nanosecond Switching Speed
- Temperature Range: -40°C to +85°C
- SOT-143 Plastic Package
- Tape and Reel Packaging Available

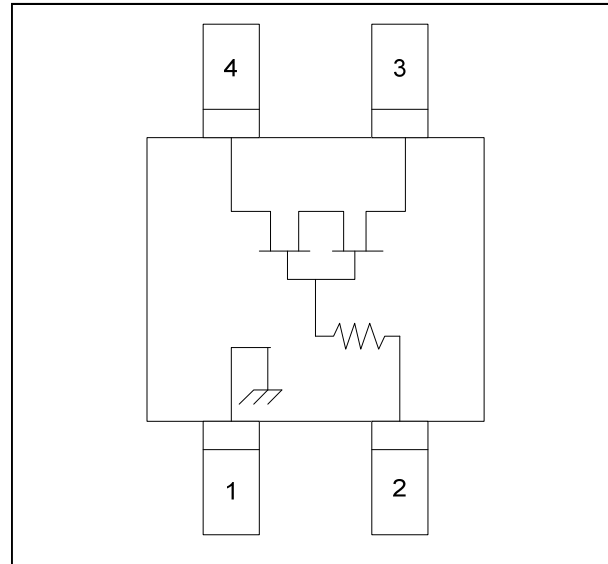
Description

M/A-COM's AT-259 is a GaAs MMIC voltage variable absorptive attenuator in a low cost SOT-143 4-Lead surface mount plastic package. The AT-259 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 AT-259 is fabricated with a monolithic GaAs MMIC using a mature 1 micron process. The process features full chip passivation for increased performance and reliability.

Functional Schematic



Pin Configuration

Pin No.	Function	Pin No.	Function
1	Ground	3	RF2
2	V _C	4	RF1

Ordering Information ^{1,2}

Part Number	Package
AT-259	Bulk Packaging
AT-259TR	Forward Tape and Reel
AT-259SMB	Sample Board

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

Absolute Maximum Ratings ³

Parameter	Absolute Maximum
Input Power	+21 dBm
Control Voltage	+5V, -8.5V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

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

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

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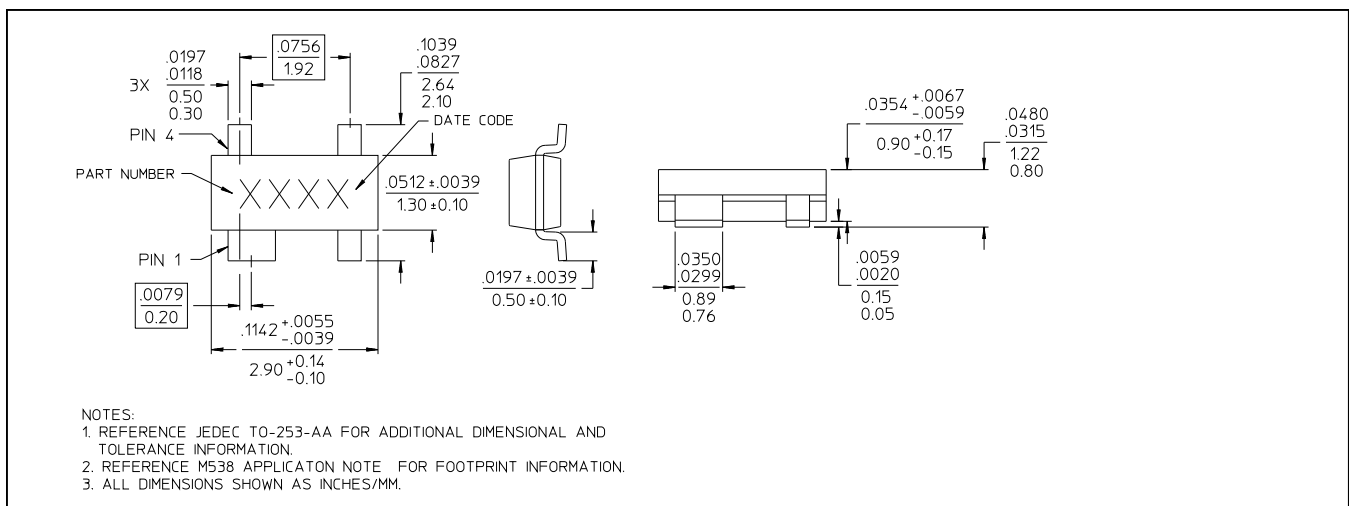
Electrical Specifications: $T_A = 25^\circ\text{C}$, $Z_0 = 50 \Omega$

Parameter	Test Conditions ⁴	Frequency	Units	Min.	Typ.	Max.
Insertion Loss	—	DC - 0.1 GHz	dB	—	2.9	3.1
		DC - 0.5 GHz	dB	—	3.0	3.2
		DC - 1.0 GHz	dB	—	3.2	3.5
		DC - 2.0 GHz	dB	—	3.4	3.8
Flatness (Peak to Peak)	5 dB Attenuation	DC - 2.0 GHz	dB	—	± 0.2	± 0.4
	10 dB Attenuation	DC - 2.0 GHz	dB	—	± 2.3	± 2.5
	15 dB Attenuation	DC - 2.0 GHz	dB	—	± 7.0	± 7.5
Output Impedance	—	—	Ohms	—	50	—
VSWR	—	—	Ratio	—	2.1:1	—
Trise, Tfall	10% to 90% RF, 90% to 10% RF	—	nS	—	3	—
Ton, Toff	50% Control to 90% RF, 50% Control to 10% RF	—	nS	—	5	—
Transients	In Band	—	mV	—	10	—
Power Handling	Linear Operation Absolute maximum Input Power	—	dBm	—	—	13
		—	dBm	—	—	21
IP ₂	Measured Relative to Input Power (For two-tone Input Power Up to +5 dBm)	0.05 GHz	dBm	—	34	—
		0.5 - 2.0 GHz	dBm	—	47	—
IP ₃	Measured Relative to Input Power (For two-tone Input Power Up to +5 dBm)	0.05 GHz	dBm	18	31 ⁵	—
		0.5 - 2.0 GHz	dBm	18.5	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.

SOT-143[†]



[†] Meets JEDEC moisture sensitivity level 1 requirements.

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ADVANCED: Data Sheets contain information regarding a product M/A-COM Technology Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.

PRELIMINARY: Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

• **North America** Tel: 800.366.2266 / Fax: 978.366.2266

• **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300

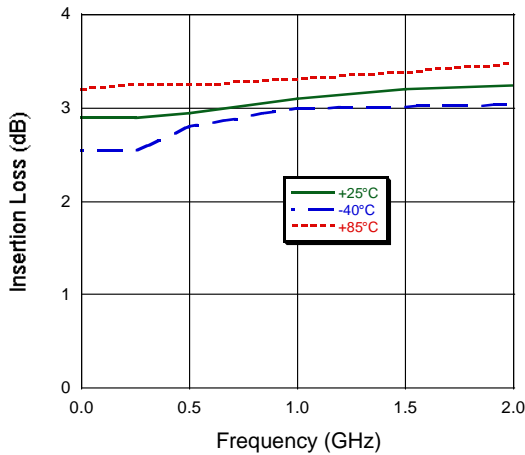
• **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298

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

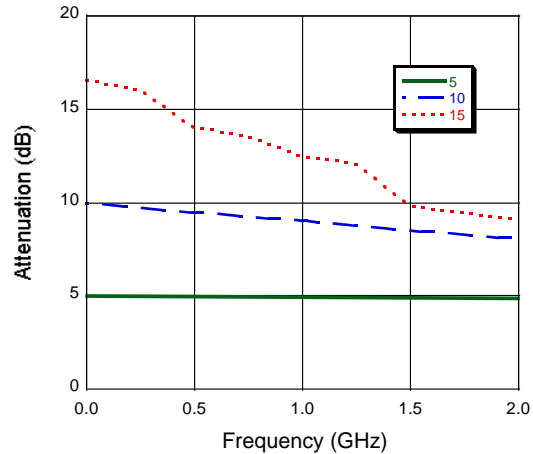
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Typical Performance Curves

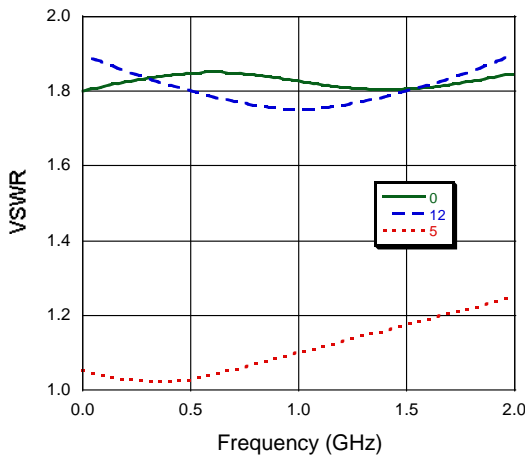
Insertion Loss vs. Frequency



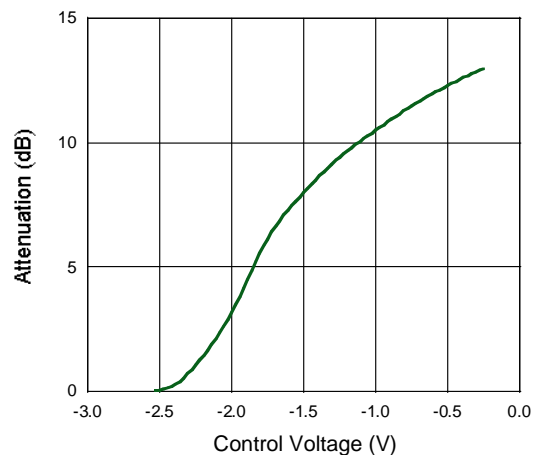
Attenuation vs. Frequency



VSWR vs. Frequency



Attenuation vs. Control Voltage, F = 950 MHz



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.