

## Voltage Variable Absorptive Attenuator 12 dB, DC-2.0 GHz

AT-259  
V4

### Features

- Attenuation: 12 dB at 1 GHz
- Low Intermodulation Products
- Low DC Power Consumption: 50  $\mu$ 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.

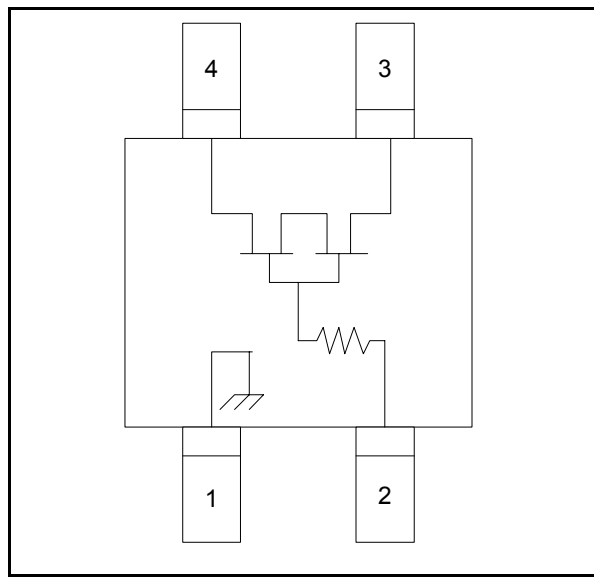
The AT-259 is fabricated with a monolithic GaAs MMIC using a mature 1 micron process. The process features full chip passivation for increased performance and reliability.

### Ordering Information

Part Number	Package
AT-259	SOT 4-Lead Plastic Package
AT-259TR	Forward Tape and Reel

Note: Reference Application Note M513 for reel size information.

### Functional Schematic



### Pin Configuration

Pin No.	Function	Pin No.	Function
1	Ground	3	RF2
2	V <sub>c</sub>	4	RF1

### Absolute Maximum Ratings <sup>1</sup>

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

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

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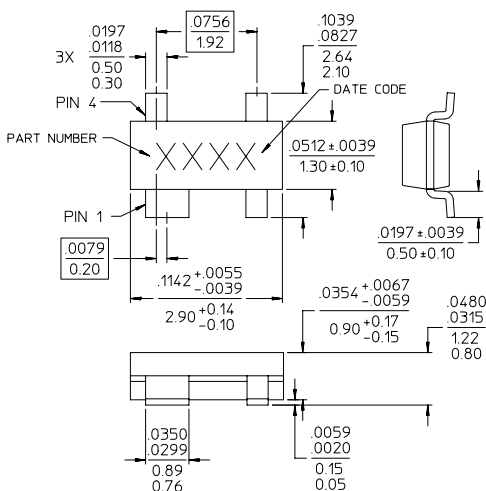
**Electrical Specifications:  $T_A = 25^\circ\text{C}$ ,  $Z_0 = 50 \Omega$**

Parameter	Test Conditions <sup>2</sup>	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	—	dBm	—	—	13
	Absolute maximum Input Power	—	dBm	—	—	21
IP <sub>2</sub>	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 <sub>3</sub>	Measured Relative to Input Power (For two-tone Input Power Up to +5 dBm)	0.05 GHz	dBm	18	31 <sup>3</sup>	—
		0.5 - 2.0 GHz	dBm	18.5	36 <sup>3</sup>	—

2. Control voltage: 0 to -4 volts @ 20  $\mu\text{A}$  typical.

3. For levels above 6 dB attenuation. For levels below 6 dB, the minimum specification numbers apply.

**SOT-143**



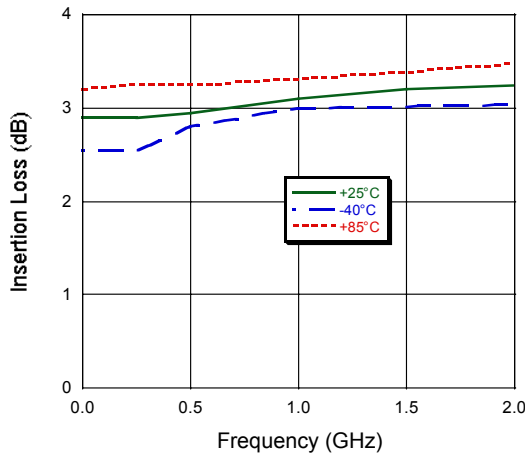
- NOTES:  
1. REFERENCE JEDEC TO-253-AA FOR ADDITIONAL DIMENSIONAL AND TOLERANCE INFORMATION.  
2. REFERENCE M538 APPLICATION NOTE FOR FOOTPRINT INFORMATION.  
3. ALL DIMENSIONS SHOWN AS INCHES/MM.

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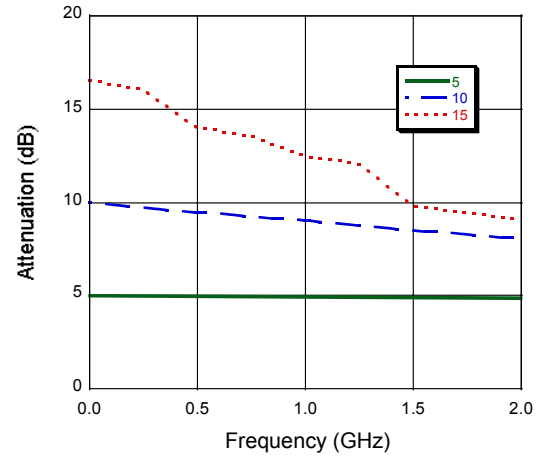
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**Typical Performance Curves**

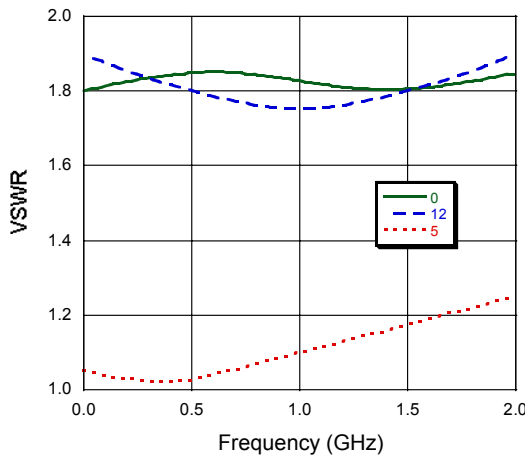
*Insertion Loss vs. Frequency*



*Attenuation vs. Frequency*



*VSWR vs. Frequency*



*Attenuation vs. Control Voltage, F = 950 MHz*

