

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

**AT-250  
V4**

**Features**

- 12 dB Voltage Variable Attenuation
- 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
- SOIC-8 Plastic Package
- Tape and Reel Packaging Available

**Description**

M/A-COM's AT-250 is a GaAs MMIC voltage variable absorptive attenuator in a low cost SOIC 8-lead surface mount plastic package. The AT-250 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.

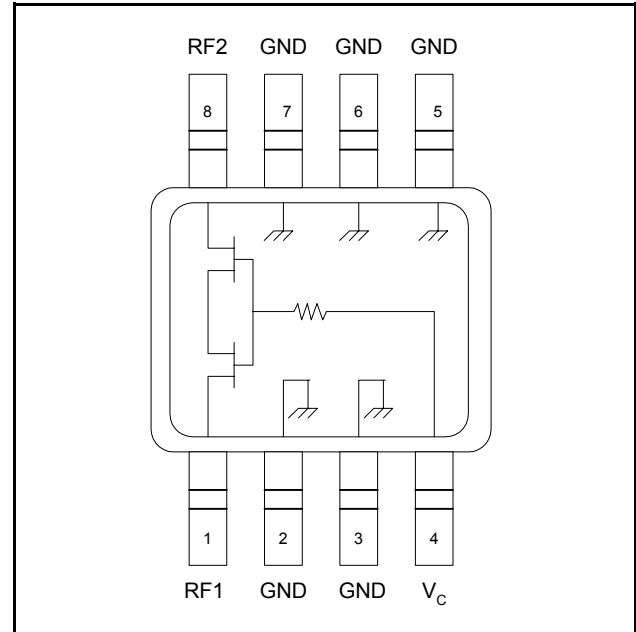
The AT-250 is fabricated with a monolithic GaAs MMIC using a mature 1-micron process. The process features full chip passivation for increased performance and reliability.

**Ordering Information**

Part Number	Package
AT-250	SOIC 8-Lead Plastic Package
AT-250TR	Forward Tape and Reel

Note: Reference Application Note M513 for reel size information.

**Functional Schematic**



**Pin Configuration**

Pin No.	Function	Pin No.	Function
1	RF1	5	Ground
2	Ground	6	Ground
3	Ground	7	Ground
4	V <sub>c</sub>	8	RF2

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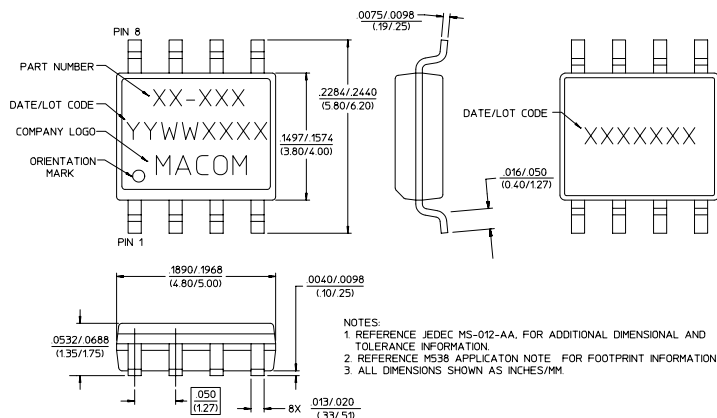
**Electrical Specifications:  $T_A = 25^\circ\text{C}$ ,  $Z_0 = 50 \Omega$**

Parameter	Test Conditions <sup>2</sup>	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)	DC - 0.1 GHz	dB	—	$\pm 0.1$	$\pm 0.3$
	DC - 0.5 GHz	dB	—	$\pm 0.2$	$\pm 0.4$
	DC - 1.0 GHz	dB	—	$\pm 0.5$	$\pm 0.8$
	DC - 2.0 GHz	dB	—	$\pm 1.2$	$\pm 1.5$
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>	0.05 GHz	dBm	28	34	—
	0.5 - 2.0 GHz Measured Relative to Input Power (For two-tone Input Power Up to +5 dBm)	dBm	40	47	—
IP <sub>3</sub>	0.05 GHz	dBm	18	31 <sup>3</sup>	—
	0.5 - 2.0 GHz Measured Relative to Input Power (For two-tone Input Power Up to +5 dBm)	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.

**SOIC-8**

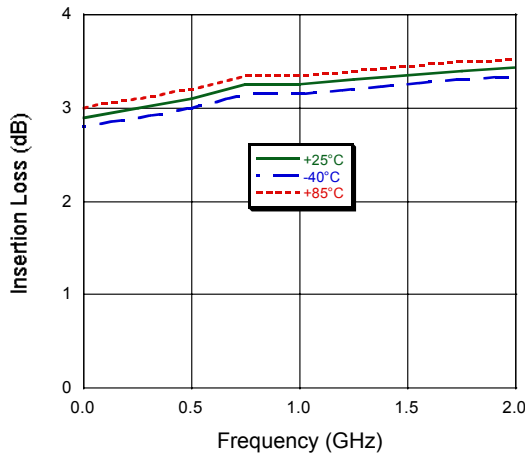


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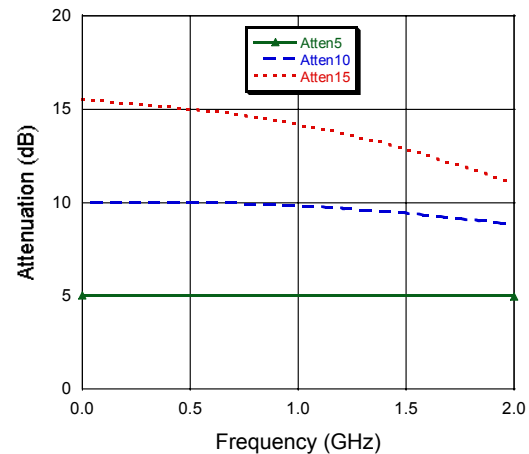
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**Typical Performance Curves**

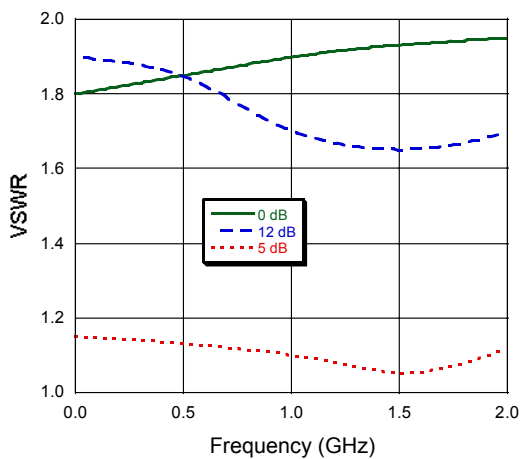
*Insertion Loss vs. Frequency*



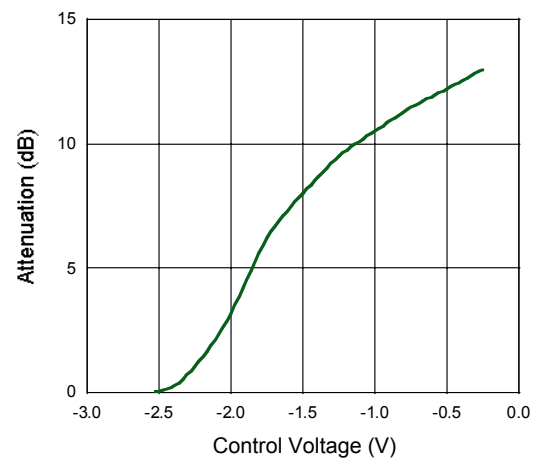
*Attenuation vs. Frequency*



*VSWR vs. Frequency*



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



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

