

Features

- 1-dB Attenuation Steps to 31 dB
- Ultra Low DC Power Consumption
- Low Intermodulation Products: IP3 = 50 dBm
- SSOP-20 Plastic Package
- Tape and Reel Packaging Available
- Temperature Stability: ± 0.15 dB from -40°C to $+85^{\circ}\text{C}$

Description

M/A-COM's AT-260 is a 5-bit, 1-dB step GaAs MMIC digital attenuator in a low cost SSOP-20 surface mount plastic package. The AT-260 is ideally suited for use where high accuracy, fast switching, very low power consumption and low intermodulation products are required at a low cost.

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

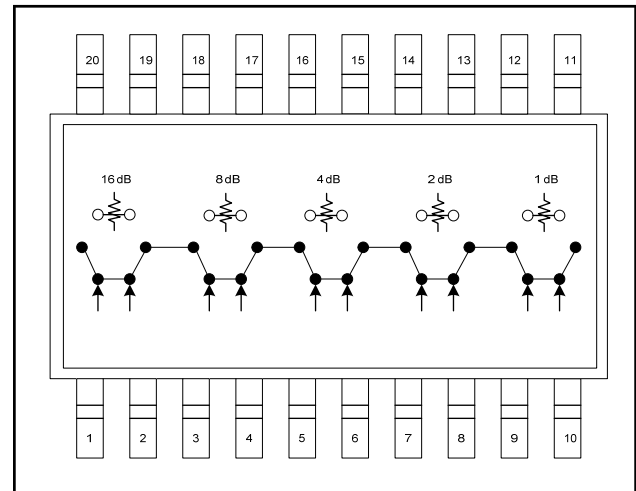
The AT-260 is fabricated with a monolithic GaAs MMIC using a mature 1-micron process. The process features full chip passivation for increased performance and reliability.

Ordering Information ¹

Part Number	Package
AT-260	SSOP 20-Lead
AT-260TR	Forward Tape and Reel

1. Reference Application Note M513 for reel size information.

Functional Schematic



Pin Configuration

Pin No.	Function	Pin No.	Function
1	VC1	11	RF1
2	$\overline{\text{VC1}}$	12	Ground
3	VC2	13	Ground
4	$\overline{\text{VC2}}$	14	Ground
5	VC3	15	Ground
6	$\overline{\text{VC3}}$	16	Ground
7	VC4	17	Ground
8	$\overline{\text{VC4}}$	18	Ground
9	No Connection	19	Ground
10	$\overline{\text{VC5}}$	20	RF2

Absolute Maximum Ratings ^{2,3}

Parameter	Absolute Maximum
Input Power: 0.05 GHz 0.5 - 2.0 GHz	+27 dBm +34 dBm
Control Voltage	+5V, -8.5V
Operating Temperature	-40°C to $+85^{\circ}\text{C}$
Storage Temperature	-65°C to $+150^{\circ}\text{C}$

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.

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

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Reference Insertion Loss	DC - 0.1 GHz	dB	—	1.6	1.8
	DC - 0.5 GHz	dB	—	1.7	1.9
	DC - 1.0 GHz	dB	—	1.9	2.2
	DC - 2.0 GHz	dB	—	2.2	2.5
Attenuation Accuracy ⁴	DC - 1.0 GHz DC - 2.0 GHz	$\pm (0.20 \text{ dB} + 3\% \text{ of Atten Setting in dB}) \text{ dB}$ $\pm (0.30 \text{ dB} + 3\% \text{ of Atten Setting in dB}) \text{ dB}$			
VSWR	(Any state)	Ratio	—	1.5:1	—
Trise, Tfall	10% to 90% RF, 90% to 10% RF	nS	—	8	—
Ton, Toff	50% Control to 90% RF, 50% Control to 10% RF	nS	—	15	—
Transients	In Band	mV	—	2	—
1 dB Compression	Input Power 0.05 GHz	dBm	—	20	—
	0.5 - 2.0 GHz	dBm	—	27	—
IP ₂	0.05 GHz	dBm	—	45	—
	0.5 - 2.0 GHz Measured Relative to Input Power (for two-tone input power up to +5 dBm)	dBm	—	60	—
IP ₃	0.05 GHz	dBm	—	34	—
	0.5 - 2.0 GHz Measured Relative to Input Power (for two-tone input power up to +5 dBm)	dBm	—	50	—

4. Attenuation accuracy specifications apply with negative bias control and low inductance grounding.

Truth Table ⁵

Control Inputs									Atten (dB)
$\overline{\text{VC}}_5$	$\overline{\text{VC}}_4$	VC ₄	$\overline{\text{VC}}_3$	VC ₃	$\overline{\text{VC}}_2$	VC ₂	$\overline{\text{VC}}_1$	VC ₁	
1	1	0	1	0	1	0	1	0	Reference
0	1	0	1	0	1	0	1	0	1 dB
1	0	1	1	0	1	0	1	0	2 dB
1	1	0	0	1	1	0	1	0	4 dB
1	1	0	1	0	0	1	1	0	8 dB
1	1	0	1	0	1	0	0	1	16 dB
0	0	1	0	1	0	1	0	1	31 dB

5. 0 = Vin Low = 0 V = 0 to -0.2 V @ 20 μA maximum.
1 = Vin High = -5 V @ 20 μA typical to -8 V @ 200 μA maximum.

Handling Procedures

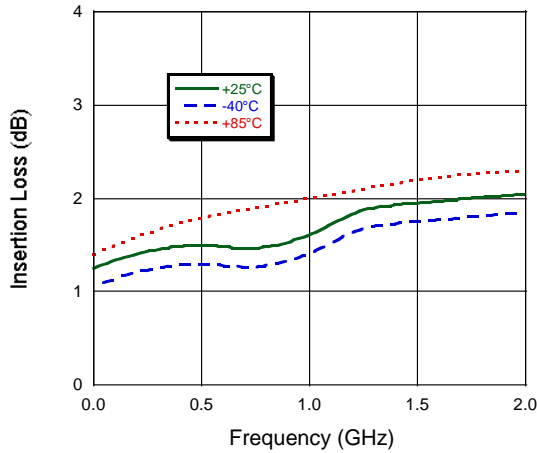
Please observe the following precautions to avoid damage:

Static Sensitivity

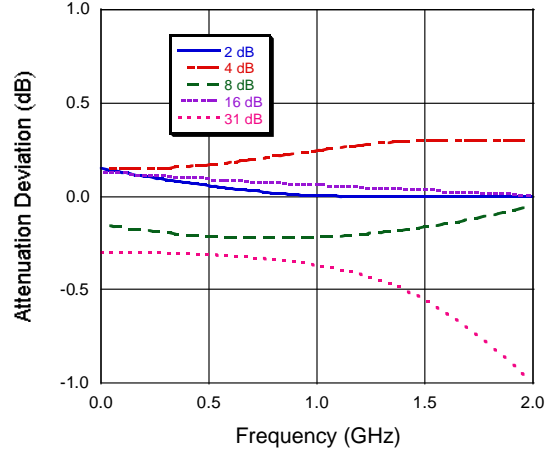
Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

Typical Performance Curves

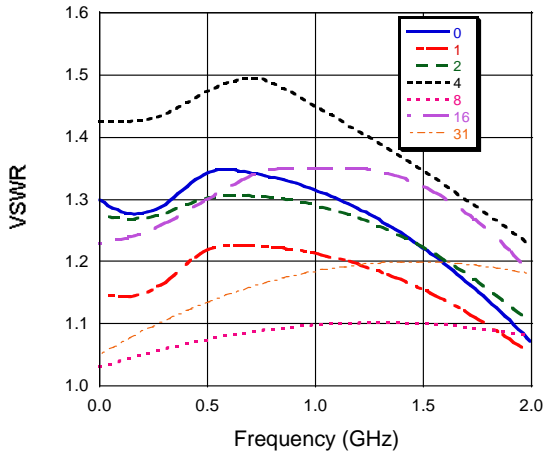
Insertion Loss



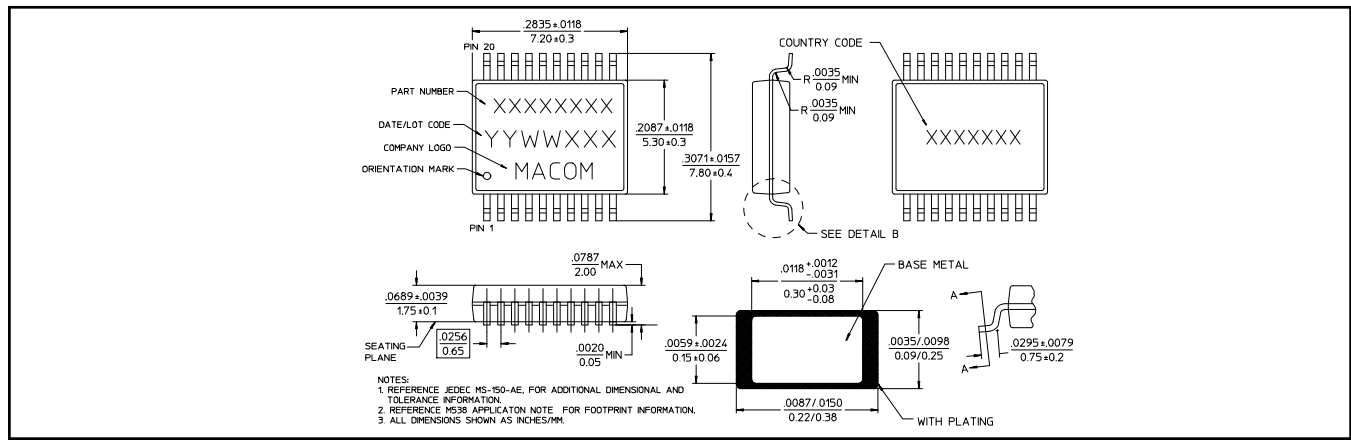
Attenuation Accuracy



VSWR



SSOP-20



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- **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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