



Digital Attenuator, 31 dB, 5-Bit DC - 2.0 GHz

AT-260 **V5**

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°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.

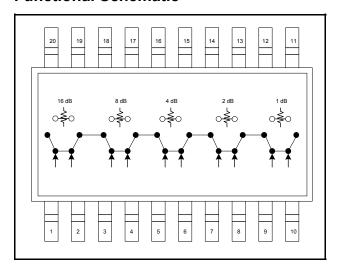
The AT-260 is fabricated with a monolithic GaAs MMIC using a mature 1-micron process. The process features full chip passivation for increased performance and reliability.

Ordering Information

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

Note: Reference Application Note M513 for reel size information

Functional Schematic



Pin Configuration

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

Absolute Maximum Ratings 1,2

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°C			
Storage Temperature	-65°C to +150°C			

- 1. Exceeding any one or combination of these limits may cause permanent damage to this device.
- 2. M/A-COM does not recommend sustained operation near these survivability limits.
- 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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Electrical Specifications: $T_A = 25^{\circ}C$, $Z_0 = 50 \Omega$

Parameter	Test Conditions	Units	Min.	Тур.	Max.
Reference Insertion Loss	DC - 0.1 GHz DC - 0.5 GHz DC - 1.0 GHz DC - 2.0 GHz	dB dB dB dB	dB — dB —		1.8 1.9 2.2 2.5
Attenuation Accuracy ³	DC - 1.0 GHz DC - 2.0 GHz	± (0.20 dB · ± (0.30 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	nS —		_
Transients	In Band	mV	_	2	_
1 dB Compression	Input Power 0.05 GHz 0.5 - 2.0 GHz	dBm dBm	_	20 27	_
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	·-··		_
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			_

^{3.} Attenuation accuracy specifications apply with negative bias control and low inductance grounding.

Truth Table⁴

Control Inputs									
VC5	VC4	VC4	VC3	VC3	VC2	VC2	VC1	VC1	Atten (dB)
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

^{4. 0 =} Vin Low = 0 V = 0 to -0.2 V @ 20 μ A maximum. 1 = Vin High = -5 V @ 20 μ A typical to -8 V @ 200 μ A 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.

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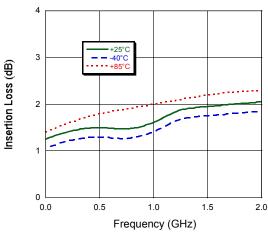


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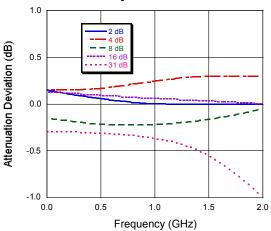
AT-260 V5

Typical Performance Curves

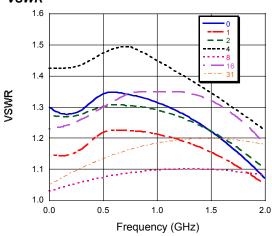
Insertion Loss



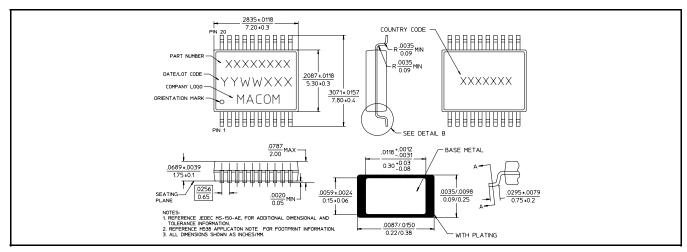
Attenuation Accuracy



VSWR



SSOP-20



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