

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

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 Information¹

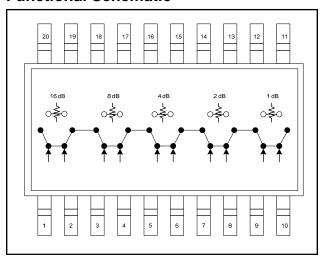
Commitment to produce in volume is not guaranteed.

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	VC1	12	Ground
3	VC2	13	Ground
4	VC2	14	Ground
5	VC3	15	Ground
6	VC3	16	Ground
7	VC4	17	Ground
8	VC4	18	Ground
9	No Connection	19	Ground
10	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°C				
Storage Temperature	-65°C to +150°C				
Creating any and ar combination of these limits may source					

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

 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

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.

ineering tests. Specifications are and/or test data may be available. *MA-COM Technology Solutions Inc. and its affiliates reserve the right to make* changes to the product(s) or information contained herein without notice.

Rev. V5

www.BDTIC.com/MACOM



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

Rev. V5

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		1.6 1.7 1.9 2.2	1.8 1.9 2.2 2.5	
Attenuation Accuracy ⁴	DC - 1.0 GHz DC - 2.0 GHz		+3% of Atten Setting in dB) dl +3% of Atten Setting in dB) dl — 1.5:1 — — 8 — — 15 —			
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 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 —		45 60	_	
IP ₃	0.05 GHz 0.5 - 2.0 GHz Measured Relative to Input Power (for two-tone input power up to +5 dBm)	0 GHz dBm — /e to Input Power dBm —		34 50		

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

Truth Table ⁵

Control Inputs									
VC 5	VC 4	VC 4	VC 3	VC 3	VC 2	VC 2	VC 1	VC 1	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

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.

2

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.

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.

- 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.

M/A-COM Technology Solutions Inc. and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.

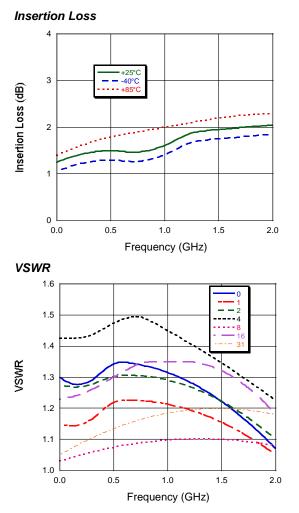
www.BDTIC.com/MACOM



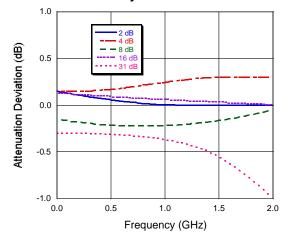
Digital Attenuator, 31 dB, 5-Bit DC - 2.0 GHz

Rev. V5

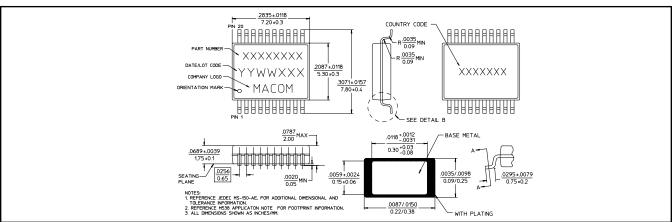
Typical Performance Curves



Attenuation Accuracy



SSOP-20



3

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.

M/A-COM Technology Solutions Inc. and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.

www.BDTIC.com/MACOM