

# Digital Attenuator, 31 dB, 5-Bit DC – 2 GHz

**AT-260**

V 2.00

## Features

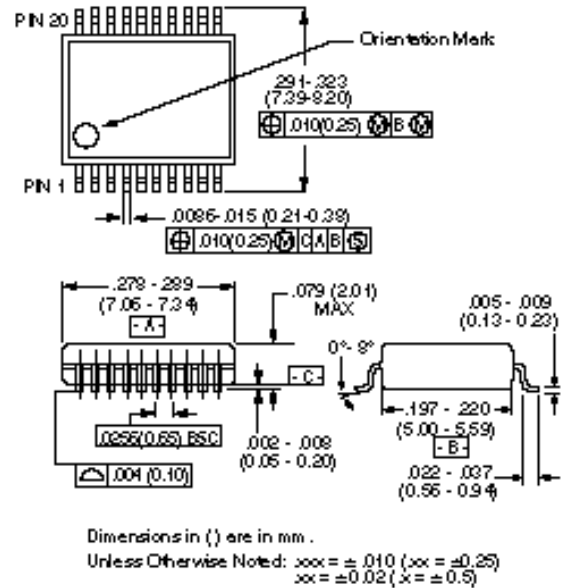
- Attenuation: 1-dB Steps to 31 dB
- Temperature Stability:  $\pm 0.15$  dB from  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  Typical
- Ultra Low DC Power Consumption
- Low Intermodulation Products:  $\text{IP}_3 = 50$  dBm
- Low Cost SSOP 20 Plastic Package
- Tape and Reel Packaging Available

## 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.

## SSOP-20



## Ordering Information

Part No.	Package
AT-260 PIN	SSOP 20-Lead
AT-260TR	Forward Tape & Reel*
AT-260RTR	Reverse Tape & Reel*

\* If specific reel size is required, consult factory for part number assignment.

## Electrical Specifications, $T_A = 25^{\circ}\text{C}$

Parameter	Test Conditions <sup>1</sup>	Unit	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 <sup>2</sup>	DC – 1.0 GHz DC – 2.0 GHz	$\pm (0.20 \text{ dB} + 3\% \text{ of Atten. Setting in dB})$ $\pm (0.30 \text{ dB} + 3\% \text{ of Atten. Setting in dB})$			
VSWR	(any state)			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	
One dB Compression	Input Power 0.05 GHz	dBm		20	
	Input Power 0.5-2.0 GHz	dBm		27	
$\text{IP}_2$	Measured Relative to Input Power 0.05 GHz	dBm		45	
	(for two-tone input power up to +5 dBm) 0.5-2.0 GHz	dBm		60	
$\text{IP}_3$	Measured Relative to Input Power 0.05 GHz	dBm		34	
	(for two-tone input power up to +5 dBm) 0.5-2.0 GHz	dBm		50	

1. All measurements at 1 GHz in a 50  $\Omega$  system, unless otherwise specified.

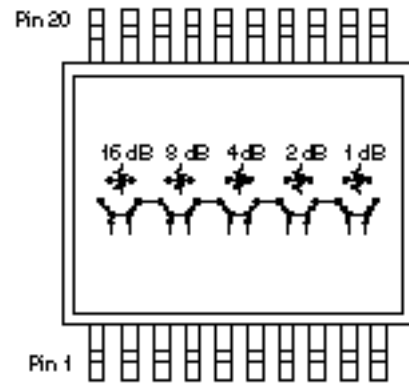
2. Attenuation accuracy specifications apply with negative bias control and low inductance grounding.

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

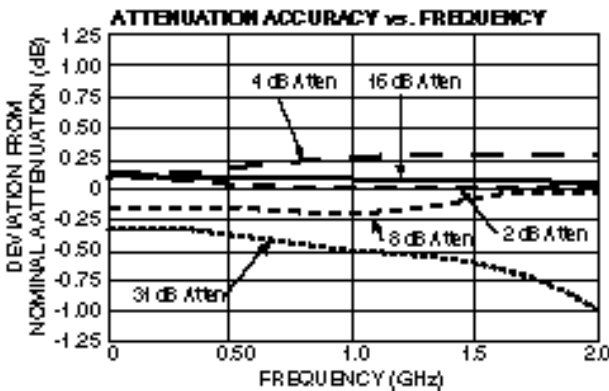
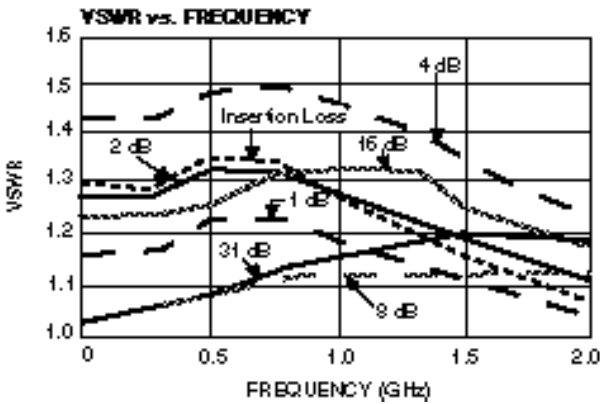
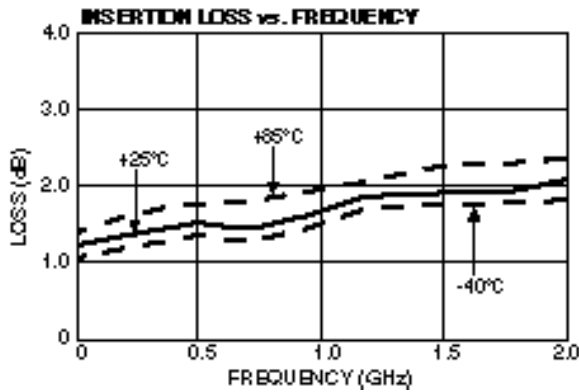
Parameter	Absolute Maximum
Max. Input Power	
0.05 GHz	+27 dBm
0.5–2.0 GHz	+34 dBm
Control Voltage	+5V, –8.5V
Operating Temperature	–40°C to +85°C
Storage Temperature	–65°C to +150°C

1. Operation of this device above any one of these parameters may cause permanent damage.

### Functional Schematic



### Typical Performance



### Pin Configuration

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

### Truth Table

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

0 = V<sub>IN</sub> Low = 0 V = 0 to -0.2 V @ 20 μA maximum

1 = V<sub>IN</sub> High = -5 V @ 20 μA typical to -8 V @ 200 μA maximum