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

AT-260

V 2.00

Features

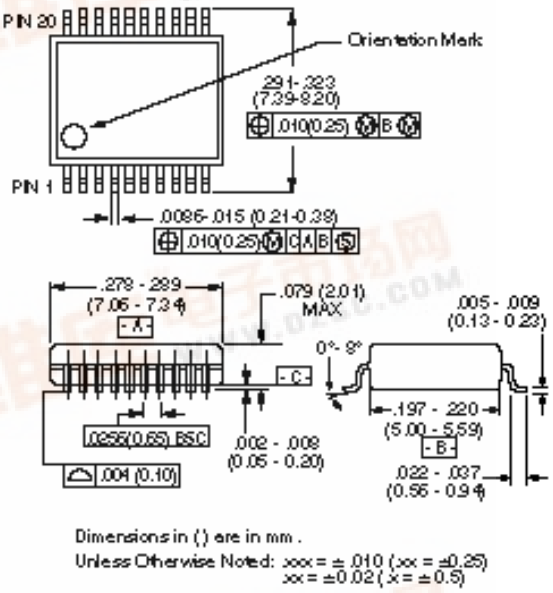
- Attenuation: 1-dB Steps to 31 dB
- Temperature Stability: ± 0.15 dB from -40°C to +85°C Typical
- Ultra Low DC Power Consumption
- Low Intermodulation Products: IP_3 = 50 dBm
- Low Cost SSOP 20 Plastic Package
- Tape and Reel Packaging Available

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°C

Parameter	Test Conditions[1]		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[2]		DC – 1.0 GHz	± (0.20 dB + 3% of Atten. Setting in dB) dB			
		DC – 2.0 GHz	± (0.30 dB + 3% of Atten.Setting in dB) 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	
IP_2	Measured Relative to Input Power (for two-tone input power up to +5 dBm)	0.05 GHz	dBm		45	
		0.5-2.0 GHz	dBm		60	
IP_3	Measured Relative to Input Power (for two-tone input power up to +5 dBm)	0.05 GHz	dBm		34	
		0.5-2.0 GHz	dBm		50	

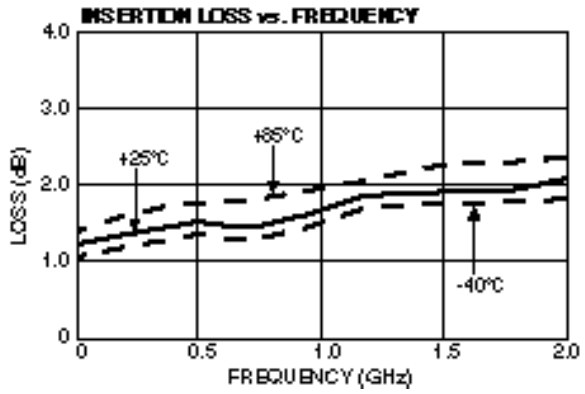
1. All measurements at 1 GHz in a 50Ω system, unless otherwise specified.
2. Attenuation accuracy specifications apply with negative bias control and low inductance grounding.

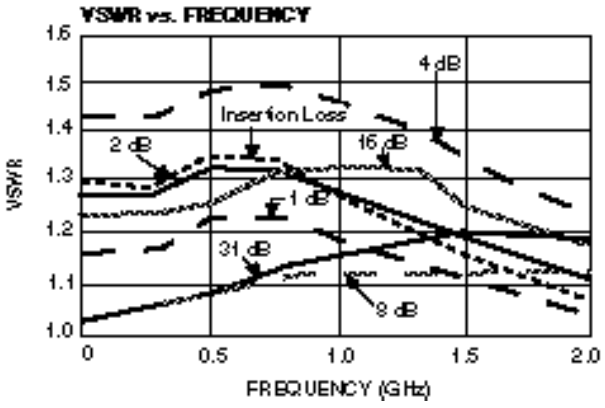
Absolute Maximum Ratings[1]

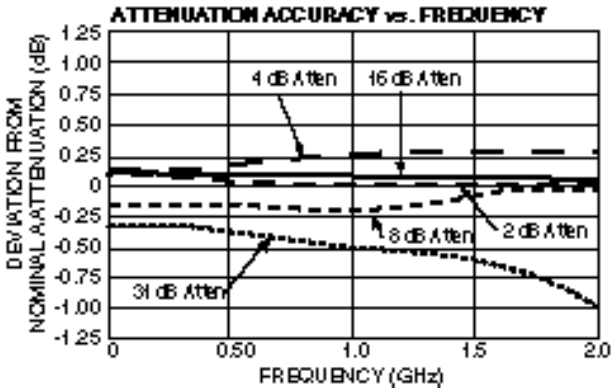
Parameter	Absolute Maximum
Max. Input Power	
0.05 GHz	+27 dBm
0.5–2.0 GHz	+34 dBm
Control Voltage	+5V, –8.5V
Operating Temperature	–40˚C to +85°C
Storage Temperature	–65˚C to +150˚C

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

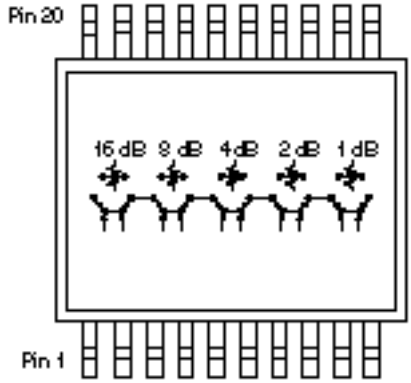
Typical Performance







Functional Schematic



Pin Configuration

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

Truth Table

Control Inputs									
$\overline{VC5}$	$\overline{VC4}$	VC4	$\overline{VC3}$	VC3	$\overline{VC2}$	VC2	$\overline{VC1}$	VC1	**Attenuation (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

0 = V_{IN} Low = 0 V = 0 to -0.2 V @ 20 µA maximum

1 = V_{IN} High = -5 V @ 20 µA typical to -8 V @ 200 µA maximum