

Digital Attenuator, 15.5 dB, 5-Bit DC - 2 GHz

AT-280

V 2.00

Features

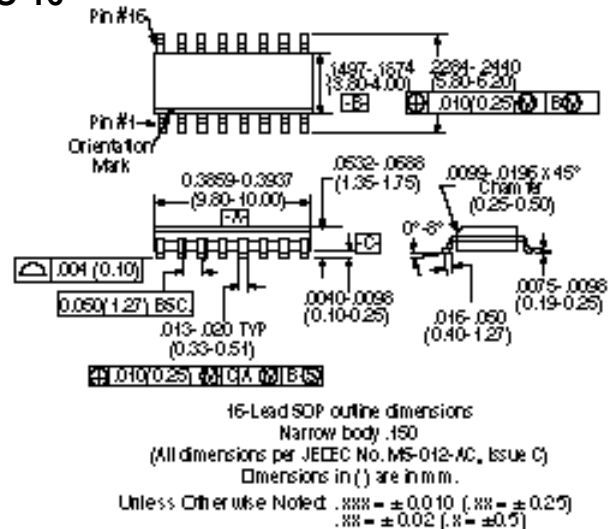
- Attenuation: 0.5-dB Steps to 15.5 dB
- Temperature Stability: ± 0.15 dB from -40°C to $+85^{\circ}\text{C}$ Typical
- Ultra Low DC Power Consumption
- Low Intermodulation Products, IP_3 : 45 dBm
- Tape and Reel Packaging Available

Description

M/A-COM's AT-280 is a 5-bit, 0.5 dB-step GaAs MMIC digital attenuator in a low cost SOIC 16-lead surface mount plastic package. The AT-280 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-280 is fabricated with a monolithic GaAs MMIC using a mature 1-micron process. The process features full chip passivation for increased performance and reliability.

SO-16



Ordering Information

Part Number	Package
AT-280 PIN	SOIC 16-Lead
AT-280TR	Forward Tape & Reel*
AT-280RTR	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 ²	Unit	Min.	Typ.	Max
Reference Insertion Loss	DC – 0.1 GHz	dB		1.1	1.3
	DC – 0.5 GHz	dB		1.3	1.5
	DC – 1.0 GHz	dB		1.5	1.8
	DC – 2.0 GHz	dB		1.8	2.0
Attenuation Accuracy ²	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	1.8:1	
Trise, Tfall Ton, Toff Transients	10% to 90% RF, 90% to 10% RF 50% Control to 90% RF, 50% Control to 10% RF In Band	nS nS mV		12 18 30	
One dB Compression	Input Power 0.05 GHz	dBm		22	
	Input Power 0.5 – 2.0 GHz	dBm		27	
IP_2	Measured Relative 0.05 GHz	dBm		53	
	to Input Power 0.5 – 2.0 GHz (for two-tone input power up to +5 dBm)	dBm		68	
IP_3	Measured Relative 0.05 GHz	dBm		40	
	to Input Power 0.5 – 2.0 GHz (for two-tone input power up to +5 dBm)	dBm		45	

1. All measurements at 1 GHz in a 50 Ω system, unless otherwise specified.

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

Absolute Maximum Ratings¹

Parameter	Absolute Maximum ¹
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

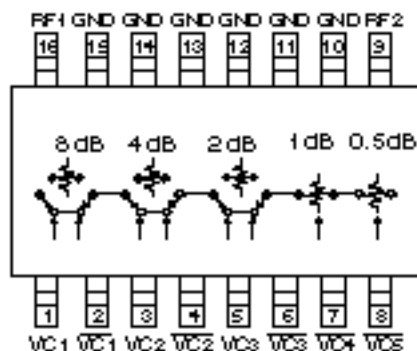
1.Operation of this device above any one of these parameters may cause permanent damage.

Truth Table

Control Inputs								Attenuation (dB)
$\overline{VC5}$	$\overline{VC4}$	$\overline{VC3}$	VC3	$\overline{VC2}$	VC2	$\overline{VC1}$	VC1	
1	1	1	0	1	0	1	0	Reference
0	1	1	0	1	0	1	0	0.5 dB
1	0	1	0	1	0	1	0	1 dB
1	1	0	1	1	0	1	0	2 dB
1	1	1	0	0	1	1	0	4 dB
1	1	1	0	1	0	0	1	8 dB
0	0	0	1	0	1	0	1	15.5 dB

0 = VinLow = 0 V = 0 to –0.2 V @ 20 A maximum

Functional Schematic



Typical Performance

