

Digital Attenuator, 1 Bit, 10 dB Step DC - 2.0 GHz



Features

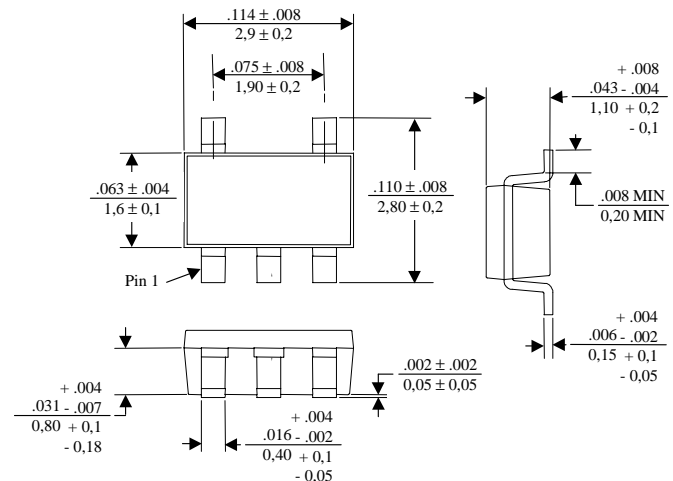
- Single 10 dB Step
- Low Loss 0.3dB Typ. @ 900 MHz
- Low Cost Plastic SOT25 Package

Description

M/A-COM's AT-266 is a 1 bit, 10 dB step GaAs MMIC Digital Attenuator in a low cost SOT-25 surface mount plastic package. The AT-266 is ideally suited for use where high accuracy, very low power consumption and low intermodulation products are required. Typical applications include radio, wireless LANs, GPS equipment and other gain/level control circuits.

The AT-266 is a GaAs MMIC using a mature 1 micron process. The process features full chip passivation for increased performance and reliability.

SOT-25 Plastic Package



Pin Configuration

PIN No.	Function	Description
1	RF1 ¹	RF In/Out
2	GND ¹	RF Ground
3	RF2 ¹	RF In/Out
4	V1	Control Voltage
5	V2	Control Voltage

1. Series Capacitors on PINs1, 3 and 5, Shunt Capacitor on PIN 2 are required for Postive Control. 39pF capacitors used for positive control performance curves.

Truth Table

MODE (Control)	V1	V2	Atten.
Postive ¹	0 ± 0.2V	+3 to +8V	10 dB
	+3 to +8V	0 ± 0.2V	IL
Postive / Negative ^{1,2}	-V _C ± 0.2 V	+V _C	10 dB
	+ V _C	-V _C ± 0.2V	IL
Negative ³	0 ± 0.2V	-3V to -8V	IL
	-3V to -8V	0 ± 0.2V	10 dB

1. External DC blocking capacitors are required as noted¹
2. $|-V_C| + V_C \leq 8$ V.
3. If negative control is used, DC blocking capacitors are not required on RF Ports.

Electrical Specifications T_A = 25°C¹

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	0 - 1 GHz	dB		0.3	0.45
Insertion Loss	1 - 2 GHz	dB		0.5	0.7
Attenuation	0 - 1 GHz	dB		10	±0.4
	1 - 2 GHz	dB		10	±0.5
VSWR	0 - 2 GHz			1.4:1	1.5:1
IP ₃	2 Tone @ 0 dBm, 5 MHz spacing	dBm	42	50	
P _{1dB}	1 GHz	dBm	23	28	
Trise, Tfall	10% to 90% RF, 90% to 10% RF	ns		5	20
Ton, Toff	50% Control to 90% RF, 50% Control to 10% RF	ns		10	25
Transients	In Band	mV		6	10

1. All measurements at 1.0 GHz, -3 Volts control unless otherwise specified.

V2.00

Ordering Information

Part Number	Package
AT-266	SOT-25 Plastic Package
AT-266TR	Forward Tape and Reel ¹
AT-266RTR	Reverse Tape and Reel ¹

1. Refer to Application Note M513 for reel size information.

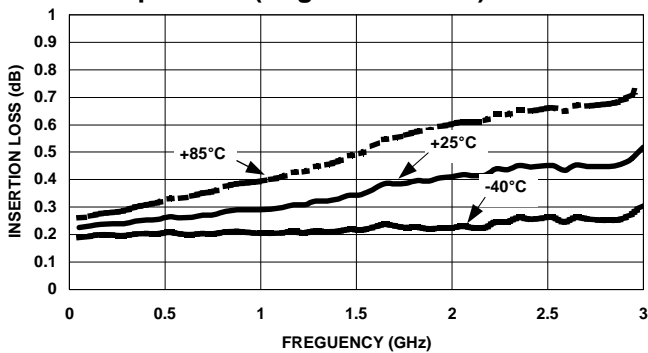
Absolute Maximum Ratings¹

Parameter	Absolute Maximum
Max. Input Power	
50 MHz	+27 dBm
500 - 2000 MHz	+34 dBm
Control Voltage	+5V, -8.5V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

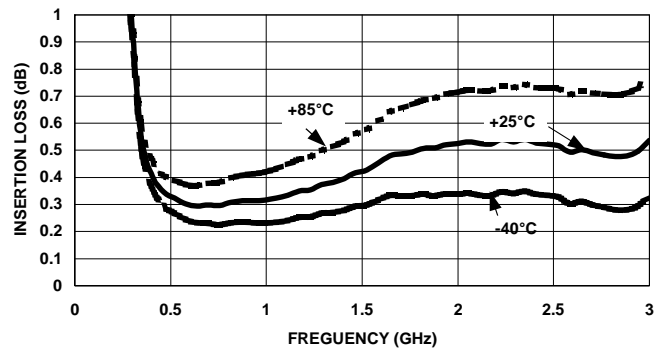
1. Operation of this device above any one of these parameters may cause permanent damage.

Typical Performance Curves

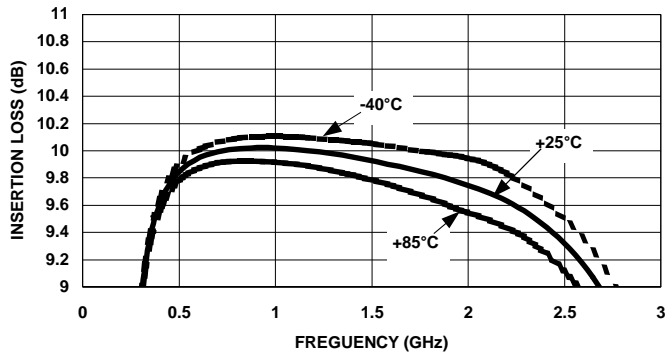
Insertion Loss vs. Frequency Over Temperature (Negative Control)



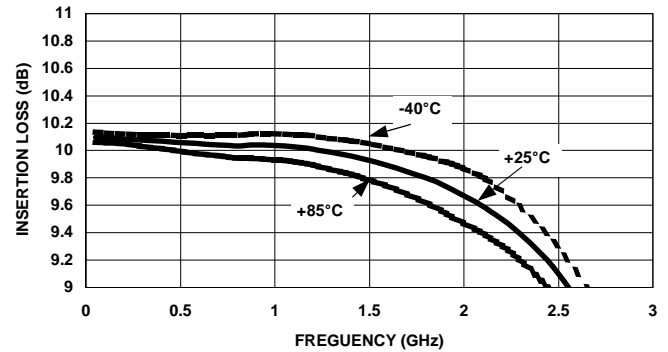
Insertion Loss vs. Frequency Over Temperature (Positive Control)



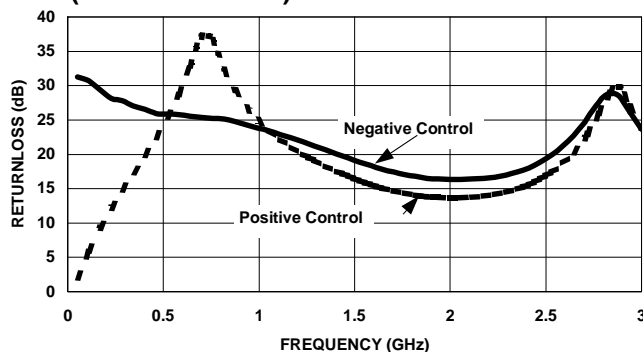
Relative Attenuation vs. Frequency Over Temperature (Positive Control)



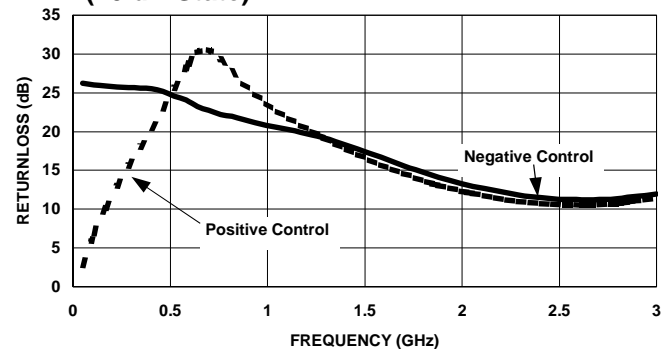
Relative Attenuation vs. Frequency Over Temperature (Negative Control)



Return Loss vs. Frequency (Reference State)



Return Loss vs. Frequency (10 dB State)



V2.00