

Digital Attenuator, 1-Bit DC - 1 GHz

AT-225

V 2.00

Features

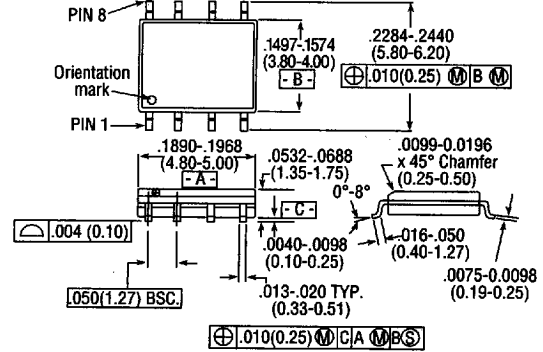
- Variable Step (15 to 30 dB) With an External Resistor
- Matched Input and Output
- Low Distortion 50 dBm IP_3 @ 100 MHz
- Low Power Consumption -3 to -5V < 20 μ A Typ.
- Low Cost Plastic SOIC 8-Lead Package

Description

The AT-225 is a GaAs MMIC matched 1-bit Attenuator in a low cost plastic SOIC 8-lead package. It is designed to be a building block for a single step Attenuator by placing a resistor across RF1-RF2. Attenuation levels of 15 to 30 dB with flat response are achievable to 400 MHz and 15 to 25 dB to 1 GHz. The AT-225 is ideally suited where fast switching, very low power consumption and low intermodulation products are required. Typical applications include Gain, Level and Sensitivity Control in radio and cellular equipment, wireless LANs, GPS equipment and other Gain/Level Control circuits.

The AT-225 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-8



8-Lead SOP outline dimensions

Narrow body .150

(All dimensions per JEDEC No. MS-012-AA, Issue C)

Dimensions in () are in mm. Unless Otherwise Noted: .xx = +/- 0.010 (.xx = +/- 0.25)
.xx = +/- 0.02 (.x = +/- 0.5)

Ordering Information

Part No.	Package
AT-225 PIN	SOIC 8-Lead
AT-225TR	Forward Tape & Reel*
AT-225RTR	Reverse Tape & Reel*

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

Electrical Specifications, $T_A = +25^\circ\text{C}$, $Z_0 = 50 \Omega$

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	DC - 1 GHz	dB		0.7	1.0
Isolation	DC - 0.4 GHz	dB	30		
	0.4 - 1.0 GHz	dB	25		
VSWR	DC - 1.0 GHz			1.15:1	1.2:1
Trise, Tfall	10% - 90%	nS		8	
Ton, Toff	50% Control to 90% RF; 50% Control to 10% RF	nS		12	
Transient	In-band	mV		20	
1 dB Compression	>100 MHz, $V_{ctl} = -5$ V	dBm		24	
	>50 MHz, $V_{ctl} = -5$ V	dBm		18	
	>100 MHz, $V_{ctl} = -3$ V	dBm		12	
	>50 MHz, $V_{ctl} = -3$ V	dBm		5	
Input IP_3	>100 MHz, $V_{ctl} = -5$ V	dBm		52	
	<100 MHz, $V_{ctl} = -5$ V	dBm		49	
	>100 MHz, $V_{ctl} = -3$ V	dBm		40	
	<100 MHz, $V_{ctl} = -3$ V	dBm		35	
Input IP_2	>100 MHz, $V_{ctl} = -5$ V	dBm		82	
	<100 MHz, $V_{ctl} = -5$ V	dBm		60	
	>100 MHz, $V_{ctl} = -3$ V	dBm		55	
	<100 MHz, $V_{ctl} = -3$ V	dBm		40	

Specifications Subject to Change Without Notice.

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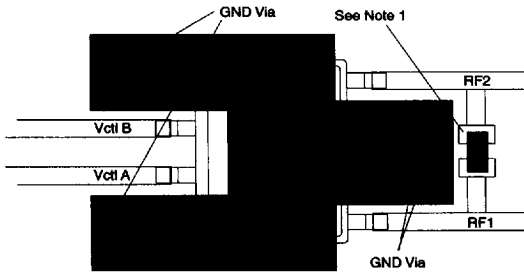
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Absolute Maximum Ratings¹

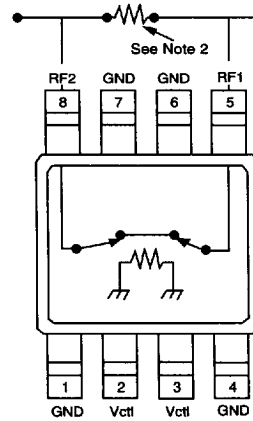
Parameter	Absolute Maximum
RF Input Power	+30 dBm
Max. Control Voltage	-8 VDC
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

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

Recommended Board Layout



Functional Schematic

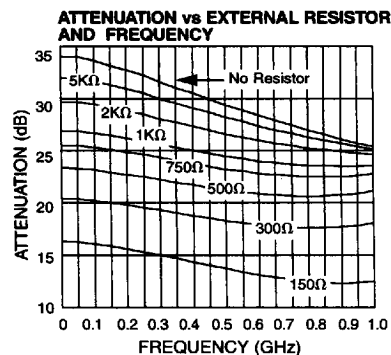
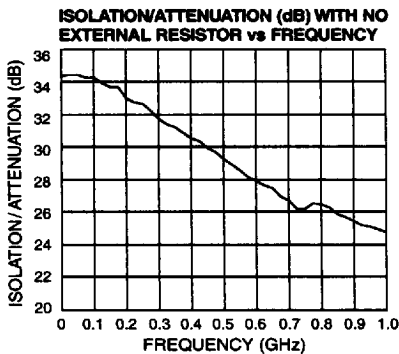
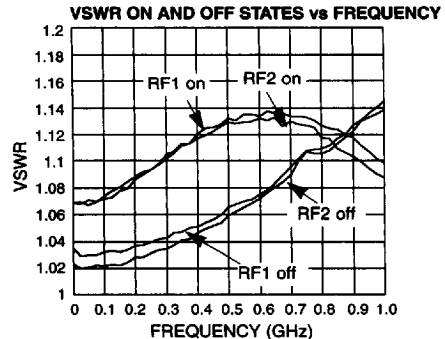
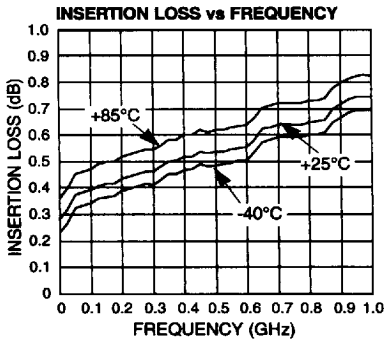


2. Chip Resistor value is selected for desired attenuation level. The usable range is 150Ω to 5000Ω to achieve 15 to 30 dB attenuation with >15 dB return loss. See Attenuation vs. External Resistor chart below.

Truth Table

Control Input		
A	B	RF1-RF2
0	-5V	Insertion Loss
-5V	0	Attenuation

Typical Performance @ 25°C



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