M/A-COM

Digital Attenuator, 1 Bit, Variable Step 10 - 20 dB, DC - 3000 MHz

Features

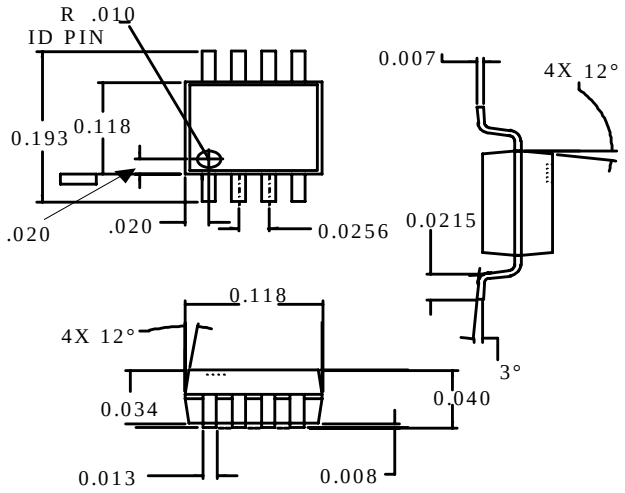
- Variable Step (10 - 20 dB) with an External Resistor
- Matched Input and Output
- Low Intermodulation Product: +53 dBm IP_3
- Low DC Power Consumption: 50 µW
- Low Cost, Low Profile MSOP 8 Plastic Package
- Tape and Reel Packaging Available

Description

M/A-COM's AT-246 is a GaAs MMIC matched 1 bit attenuator in a low cost plastic MSOP-8 package. It is designed to be a building block for a single step attenuator by placing a resistor across RF1-RF2. Attenuation levels of 10 to 20 dB with flat response are achievable from DC to 3 GHz. The AT-246 is ideally suited for circuits 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 LAN's, GPS equipment and other gain/level control circuits.

The AT-246 is fabricated using a mature 1-micron gate length GaAs MESFET process. The process features full chip passivation for increased performance and reliability.

MSOP-8[1]



1. Dimensions are in inches.

Ordering Information

Part Number	Package
AT-246 PIN	MSOP-8 Lead Plastic
AT-246TR	Forward Tape and Reel[1]

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

Electrical Specifications: T_A = +25°C[1, 2]

Parameter	Test Conditions		Units	Min.	Typ.	Max.
Reference Insertion Loss	DC - 3.0 GHz		dB		0.8	1.0
Attenuation Flatness	DC - 1.5 GHz		dB		±0.5	±1.0
	1.5 - 3.0 GHz		dB		±1.5	±2.0
VSWR	DC - 3.0 GHz				1.3:1	
1 dB Compression	Input Power	50 MHz	dBm		24	
	Input Power	500 MHz	dBm		30	
T_{rise}, T_{fall}	10% to 90% RF, 90% to 10% RF		µS		20	
T_{on}, T_{off}	50% Control to 90% RF, Control to 10% RF		µS		23	
Transients	In-band		mV		25	
IP_2	Measured Relative	50 MHz	dBm		54	
	to Input Power[2]	500 MHz	dBm		73	
IP_3	Measured Relative	50 MHz	dBm		45	
	to Input Power[2]	500 MHz	dBm		55	

1. All measurements in a 50Ω system unless otherwise specified. Loss varies at 0.003 dB/°C.
2. For two-tone Input Power up to +5 dBm.

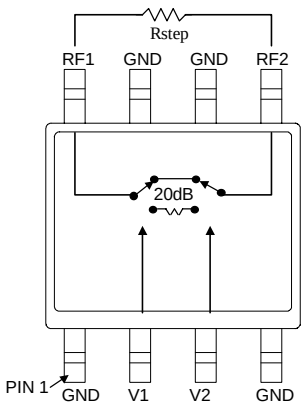
V2.00

Absolute Maximum Ratings[1]

Parameter	Absolute Maximum
Input Power	
50 MHz	+27 dBm
500 - 2000 MHz	+33 dBm
Control Voltage	+5V, -8.5V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

1. Exceeding any one or a combination of these limits may cause permanent damage.

Functional Schematic



Note:
Rstep value is selected for desired attenuation level. The usable range is 50Ω to OPEN to achieve 10 - 20 dB attenuation with >15 dB Return Loss.

PIN Configuration

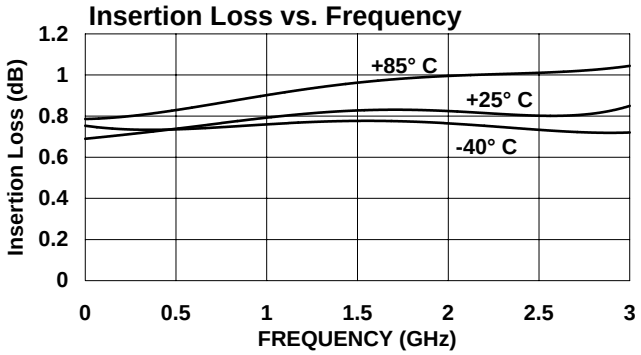
PIN No.	Function	Description
1	GND	RF Ground
2	V1	Bit Control
3	V2	Bit Control
4	GND	RF Ground
5	RF2	RF in/out
6	GND	RF Ground
7	GND	RF Ground
8	RF1	RF in/out

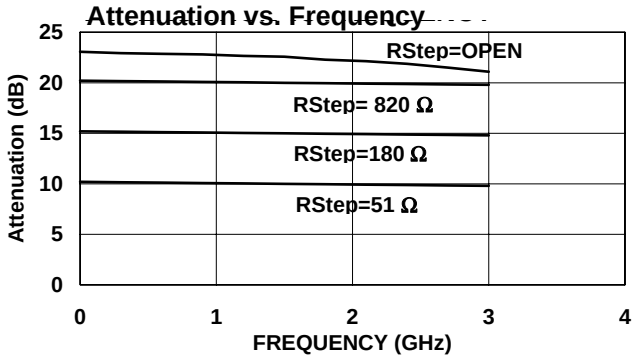
Truth Table

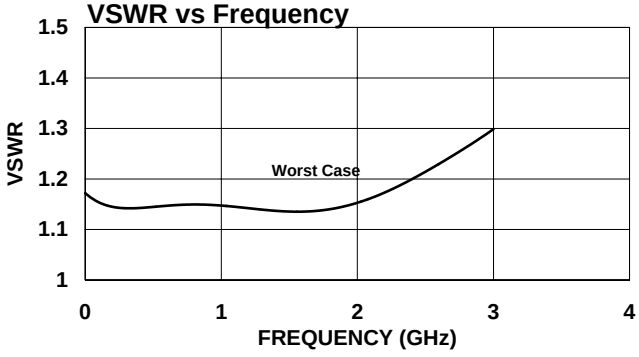
V1	V2	Attenuation (dB)
0	1	Reference I.L.
1	0	Step

"0" = 0 ±0.2V
"1" = -5 ±0.2V

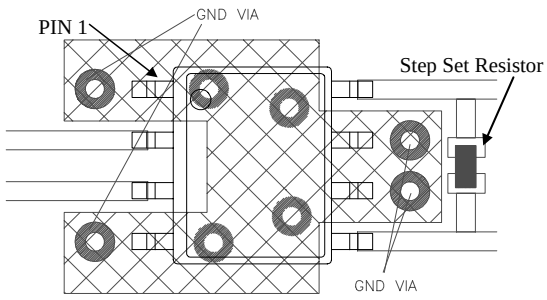
Typical Performance Curves







Recommended Layout



V2.00