

## Features

- Single 15 dB Step
- Low Loss, 0.3 dB Typical @ 900 MHz
- 2.7 to 5.0 Volt Operation
- Insertion Loss, Attenuation insensitive to Control Voltage
- Low Cost SOT-25 Plastic Package
- Tape and Reel Packaging Available

## Description

M/A-COM's AT-267 is a 1 bit, 15 dB step GaAs MMIC digital attenuator in a low cost SOT-25 5 lead surface mount plastic package. The AT-267 is ideally suited for use where high accuracy, very low power consumption and low intermodulation products are required.

Typical applications include wireless handsets, base stations, wireless LAN equipment, GPS receivers and any RF applications with automatic gain/level control circuits.

The AT-267 is fabricated as a monolithic GaAs integrated circuit using a proven self-aligned gate process. The process features full chip passivation for performance and reliability.

## Truth Table <sup>1, 2, 3</sup>

Mode (Control)	V1	V2	Atten
Positive <sup>1</sup>	0 ± 0.2 V +2.5 V to +5 V	+2.5 V to +5 V 0 ± 0.2 V	15 dB IL
Positive/ Negative <sup>1,2</sup>	-Vc ± 0.2 V +Vc	+Vc -Vc ± 0.2 V	15 dB IL
Negative <sup>3</sup>	0 ± 0.2 V -2.5 V to -5 V	-2.5 V to -5 V 0 ± 0.2 V	IL 15 dB

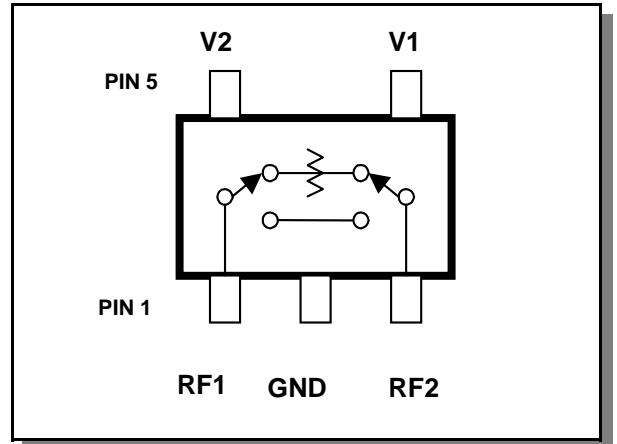
1. External DC blocking capacitors are required as noted\*
2.  $| -Vc | + Vc \leq 8 \text{ V}$
3. If negative control is used, DC blocking capacitors are not required on RF Ports and Ground.

## Absolute Maximum Ratings<sup>1</sup>

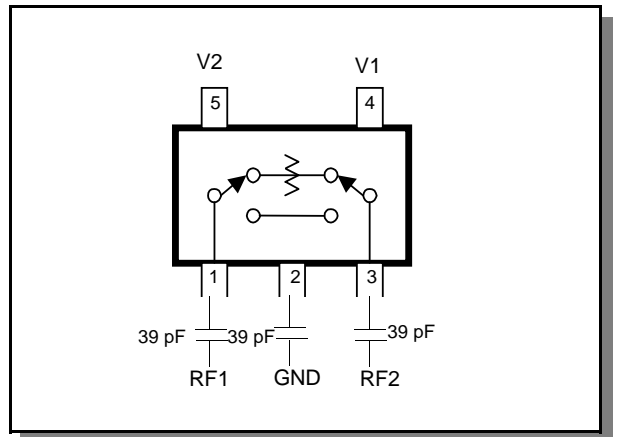
Parameter	Absolute Maximum
Maximum Input Power	+21 dBm
Control Voltage $V_{CTL}$	-8 V
Operating Temperature	-40° C to +85° C
Storage Temperature	-65° C to +150° C

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

## Functional Schematic



## Positive Control Voltage



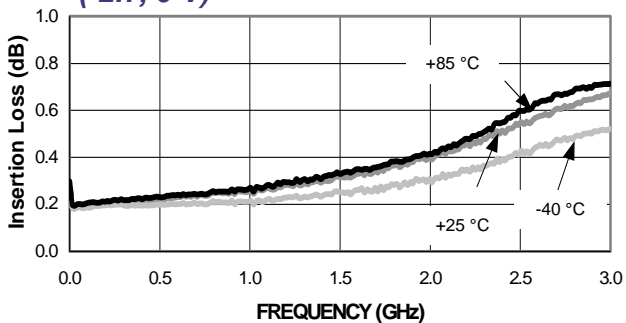
**Electrical Specifications:  $T_A = +25\text{ }^\circ\text{C}$ ,  $V_{CTRL} = +2.7\text{ Volts}^1$**

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	1.0 GHz	dB		0.3	0.4
	2.0 GHz	dB		0.4	0.5
Attenuation	1.0 GHz	dB	15	15.5	16
	2.0 GHz	dB	14	14.5	15
$V_{SWR}$	1.0 GHz				1.2:1
	2.0 GHz				1.3:1
Input $IP_3$	1.0 GHz (0 dBm), Attenuator OFF	dBm	40	43	
	Attenuator ON		40	45	
$P_{1dB}$	1 GHz, Attenuator OFF	dBm	19	22	
	Attenuator ON		13	17	
Leakage Current		$\mu\text{A}$			10
$T_{rise}$ , $T_{fall}$	10% to 90% RF, 90% to 10% RF	nS		150	
$T_{on}$ , $T_{off}$	50% Control to 90% RF, Control to 10% RF	nS		150	
Transients	In Band	mV		10	

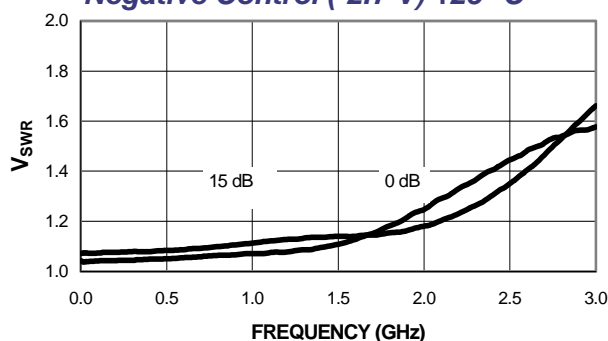
1. All measurements in a 50- $\Omega$  system unless otherwise specified. The RF ports must be blocked out side of the package from ground or any other voltage.

**Typical Performance Curves**

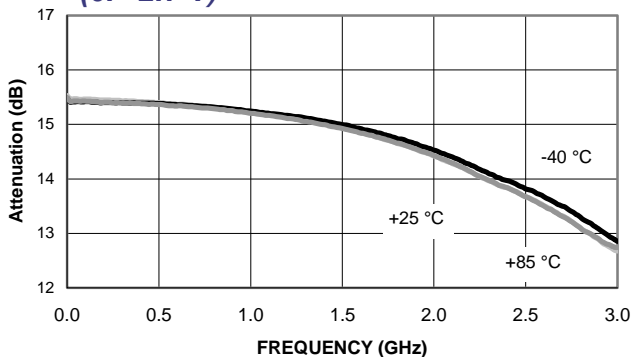
**Insertion Loss with Negative Control (-2.7, 0 V)**



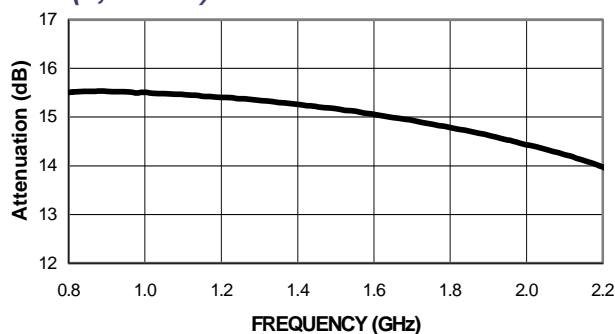
**VSWR, 0 and 15 dB States with Negative Control (-2.7 V) +25 °C**



**Attenuation with Negative Control (0, -2.7 V)**



**Attenuation with Positive Control (0, +2.7 V)**



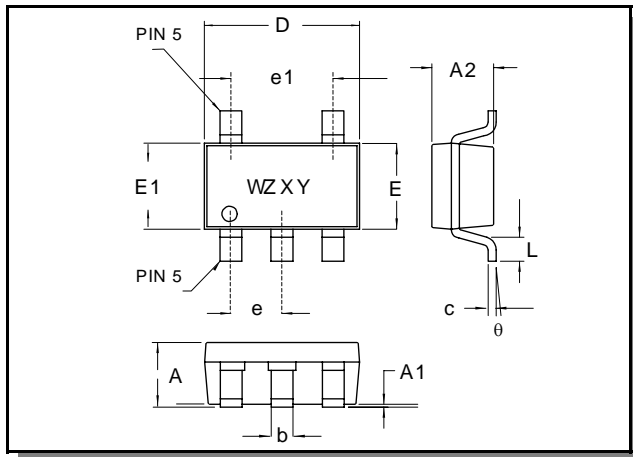
Specifications subject to change without notice.

- North America: Tel. (800) 366-2266
- Asia/Pacific: Tel.+81-44-844-8296, Fax +81-44-844-8298
- Europe: Tel. +44 (1344) 869 595, Fax+44 (1344) 300 020

Visit [www.macom.com](http://www.macom.com) for additional data sheets and product information.



**SOT-25 Package Outline <sup>1,2</sup>**



1. Dimensions do not include mold flash, protrusion or gate burrs which shall not exceed 0.0098 in (0.25mm) per side.
2. Lead Coplanarity is 0.003 (0.08) max.

**SOT-25 Dimensions**

DIM	MEASUREMENT (mm)		
	MIN	NOM	MAX
A	-	-	1.45
A1	-	-	0.15
A2	0.90	1.15	1.30
b	0.30	-	0.50
c	0.08	-	0.22
D	-	2.90 basic	-
e	-	0.95 basic	-
e1	-	1.90 basic	-
E	-	2.80 basic	-
E1	-	1.60 basic	-
L	0.30	0.60	0.45
θ	0°	4°	8°

Note: See JEDEC MO-178 VAR AA for additional dimensions and tolerances.

**Ordering Information**

Part Number	Package
AT-267TR	Forward Tape and Reel <sup>1</sup>
AT-267TR-3000	3000 Piece Tape and Reel
AT-267SMB	Sample Board

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

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