

Electronics



AT-266

**V4** 

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

#### Features

- Single 10 dB Step
- Low Loss: 0.3 dB @ 900 MHz
- Low Cost SOT-25 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 fabricated using a mature GaAs MMIC process featuring full chip passivation for increased performance and reliability.

### **Ordering Information**

Part Number	Package		
AT-266	Bulk Packaging		
AT-266TR	1000 piece reel		

Note: Reference Application Note M513 for reel size information.

# Absolute Maximum Ratings <sup>1,2</sup>

Parameter	Absolute Maximum
Input Power 50 MHz 500 - 2000 MHz	+27 dBm +34 dBm
Control Voltage	-8.5 V <u>&lt;</u> Vc <u>&lt;</u> +8 V
Operating Temperature	-40°C to +85°C
Storing Temperature	-65°C to +150°C

1. Exceeding any one or combination of these limits may cause permanent damage to this device.

 M/A-COM does not recommend sustained operation near these survivability limits.

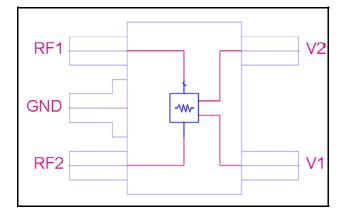
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#### **Functional Block Diagram**



## **Pin Configuration**

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

### Truth Table <sup>3,4,5</sup>

V1	V2	Attenuation State		
0	1	10 dB		
1	0	Insertion Loss		

3. For positive voltage control, external DC blocking capacitors are required on all RF ports (pins 1, 2 and 3).

- Differential voltage, V(state 1) V(state 0), must be +2.8 V minimum and less than 8 V.
- 5. 0 = -8 V to 0.2 V, 1 = -0.2 V to 8 V

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- Europe Tel: 44.1908.574.200 / Fax: 44.1908.574.300
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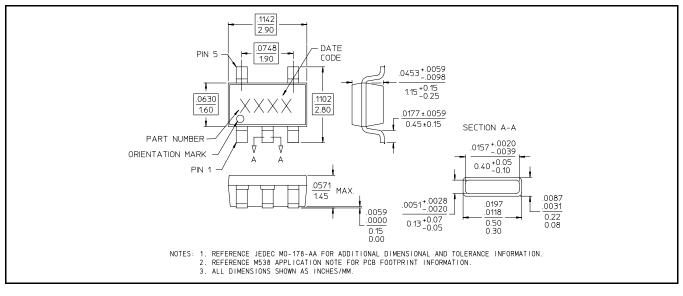
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### Electrical Specifications: $T_A = 25^{\circ}C$ , $V_C = 0 V / -3 V$ , $Z_0 = 50 \Omega$

Parameter	Test Conditions	Units	Min.	Тур.	Max.
Insertion Loss	0 - 1 GHz 1 - 2 GHz	dB dB	_	0.3 0.5	0.45 0.7
Attenuation	DC - 1 GHz 1 - 2 GHz	dB dB	9.6 9.5	10 10	10.4 10.5
VSWR	0 - 2 GHz	Ratio	—	1.4:1	1.5:1
IP <sub>3</sub>	2 Tone @ 0 dBm, 5 MHz spacing	dBm	42	50	—
P1dB	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
Control Current	Vc  = 3 V	μA	—	25	—

## SOT-25 Plastic Package



#### **Handling Procedures**

Please observe the following precautions to avoid damage:

#### **Static Sensitivity**

Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

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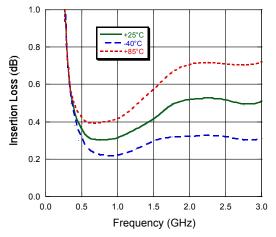


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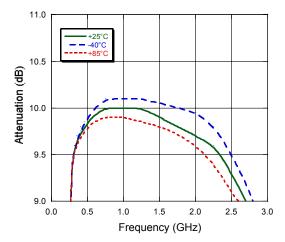
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## Typical Performance Curves (39 pF capacitors used for positive voltage control)

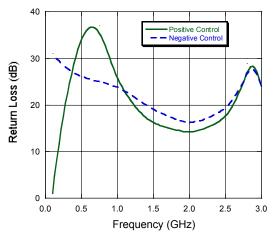
#### Insertion Loss (Positive Control)



Relative Attenuation (Positive Control)



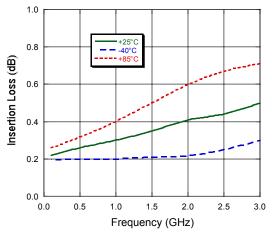
#### Return Loss (Reference State)



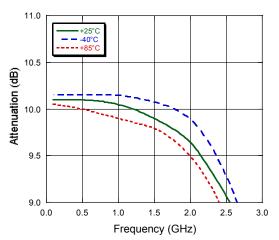
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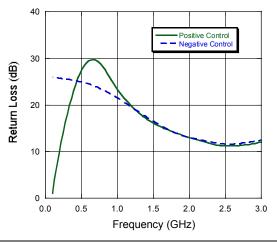
#### Insertion Loss (Negative Control)



**Relative Attenuation (Negative Control)** 



Return Loss (10 dB State)



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