

Voltage Variable Absorptive Attenuator

40 dB, 0.5 - 3.0 GHz

Rev. V7

Features

- Single Positive Voltage Control: 0 to +5 Volts
- 40 dB Attenuation Range at 900 MHz
- ± 2 dB Linearity from BSL
- Low DC Power Consumption
- SOIC-8 Plastic Package
- Tape and Reel Packaging Available

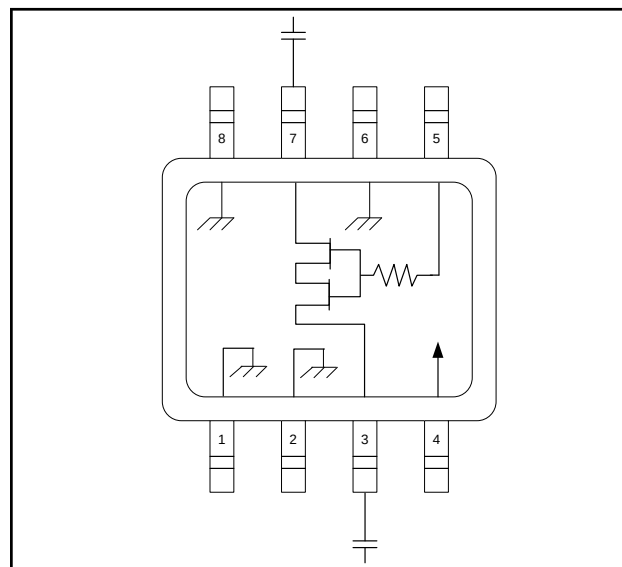
Description

M/A-COM's AT-108 is a GaAs MESFET MMIC voltage variable absorptive attenuator in a low cost SOIC-8 surface mount plastic package. The AT-108 is ideally suited for use where linear attenuation, fine tuning and very low power consumption are required.

Typical applications include radio, cellular, GPS equipment and automatic gain/level control circuits.

The AT-108 is fabricated with a monolithic GaAs MMIC using a mature 1-micron process. The process features full chip passivation for increased performance and reliability.

Functional Schematic ^{3,4,5,6}



3. $V_{cc} = +5$ VDC @ 50 μ A maximum.
4. $V_c = 0$ VDC to +5 VDC @ 50 μ A maximum.
5. External DC blocking capacitors are requirements on all RF ports.
6. 39 pF used for data measurements.

Ordering Information ^{1,2}

Part Number	Package
AT-108	Bulk Packaging
AT-108TR	1000 piece reel
AT-108SMB	Sample Board

1. Reference Application Note M513 for reel size information.
2. All sample boards include 5 loose parts.

Pin Configuration

Pin No.	Function	Pin No.	Function
1	Ground	5	V_c
2	Ground	6	Ground
3	RF Port	7	RF Port
4	V_{cc}	8	Ground

Absolute Maximum Ratings ^{7,8}

Parameter	Absolute Maximum
Input Power	+21 dBm
Supply Voltage V_{cc}	$-1 \text{ V} \leq V_{cc} \leq +8 \text{ V}$
Control Voltage V_c	$-1 \text{ V} \leq V_c \leq V_{cc} + 0.5 \text{ V}$
Operating Temperature	-40°C to $+85^\circ\text{C}$
Storage Temperature	-65°C to $+150^\circ\text{C}$

7. Exceeding any one or combination of these limits may cause permanent damage to this device.
8. M/A-COM does not recommend sustained operation near these survivability limits.

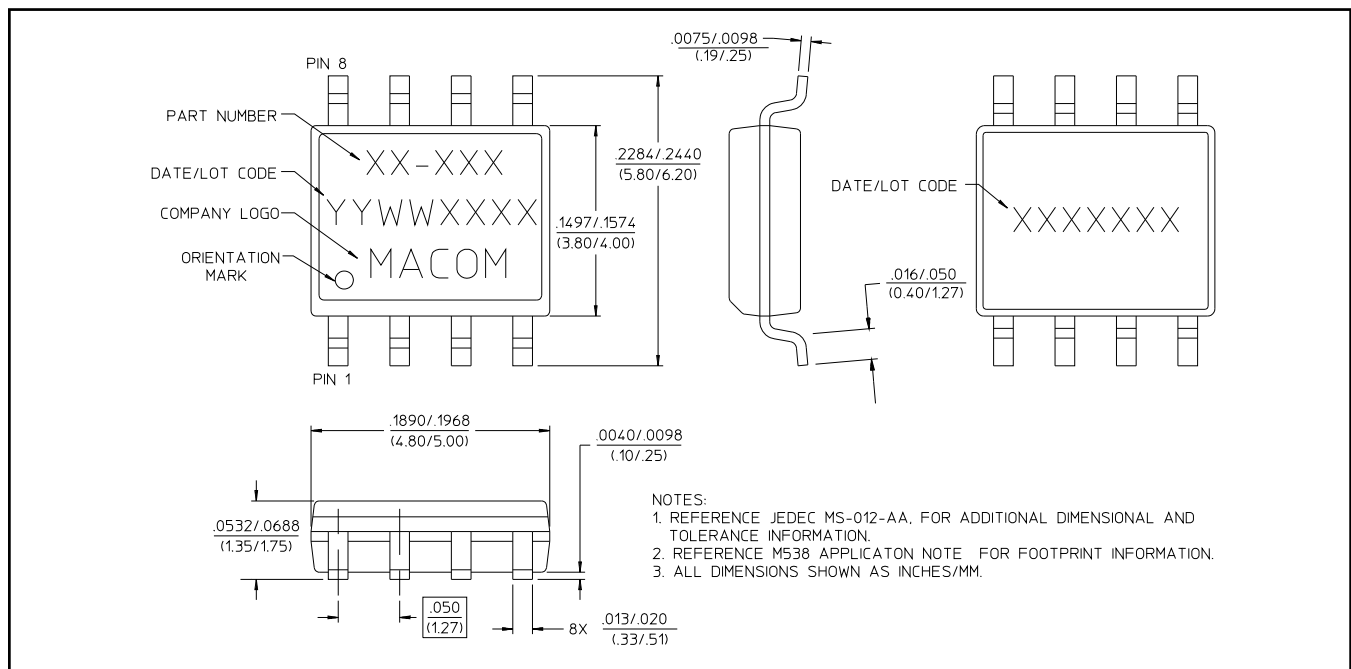
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Electrical Specifications: $T_A = 25^\circ\text{C}$, $Z_0 = 50\ \Omega$

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	0.5 - 1.0 GHz	dB	—	2.5	2.7
	1.0 - 3.0 GHz	dB	—	3.2	3.5
Attenuation	0.5 - 1.0 GHz	dB	40	—	—
	1.0 - 2.0 GHz	dB	35	—	—
	2.0 - 3.0 GHz	dB	28	—	—
Flatness (peak-to-peak)	0.5 - 1.0 GHz	dB	—	± 0.5	± 0.8
	1.0 - 2.0 GHz	dB	—	± 1.2	± 1.5
	2.0 - 3.0 GHz	dB	—	± 1.5	± 1.8
VSWR	0.5 - 3.0 GHz	Ratio	—	2:1	—
Trise, Tfall	10% to 90% RF, 90% to 10% RF	μS	—	15	—
Ton, Toff	50% Control to 90% RF, 50% Control to 10% RF	μS	—	25	—
Transients	In-Band	mV	—	12	—

SOIC-8[†]



[†] Meets JEDEC moisture sensitivity level 1 requirements.

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PRELIMINARY: Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

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Visit www.macontech.com for additional data sheets and product information.

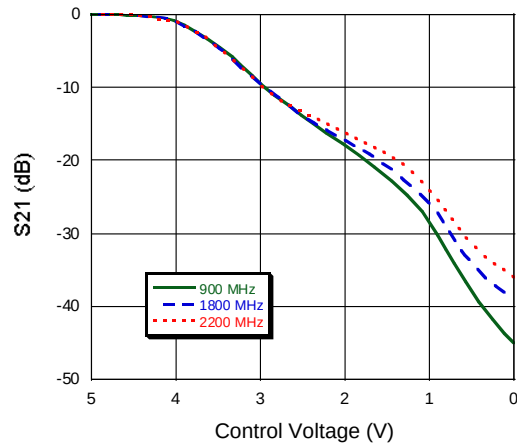
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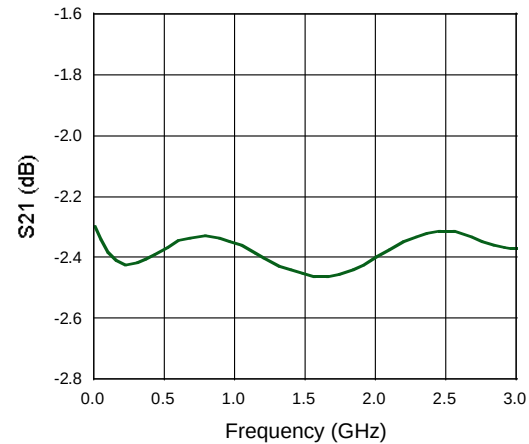
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Typical Performance Curves @ 25°C

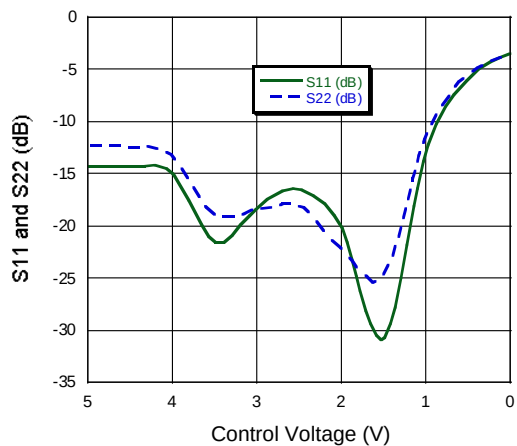
Attenuation vs. Control Voltage



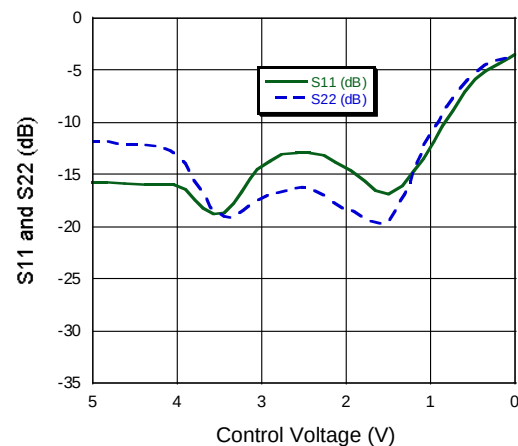
Insertion Loss vs. Frequency



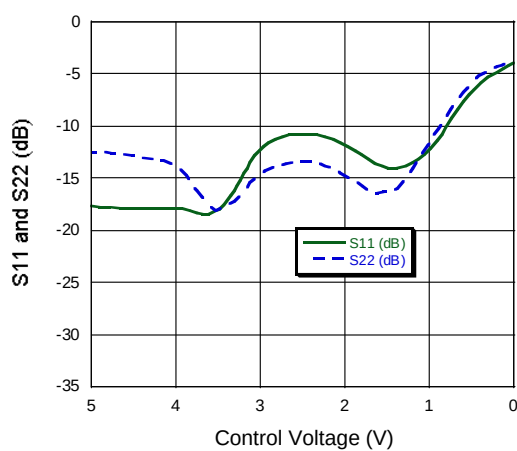
Return Loss vs. Control Voltage, F = 900 MHz



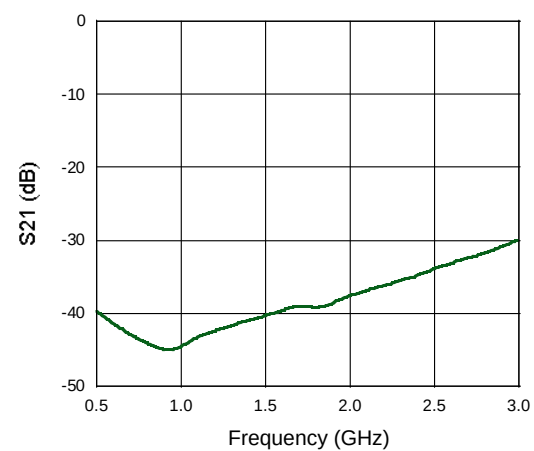
Return Loss vs. Control Voltage, F = 1800 MHz



Return Loss vs. Control Voltage, F = 2200 MHz



Maximum Attenuation vs. Frequency



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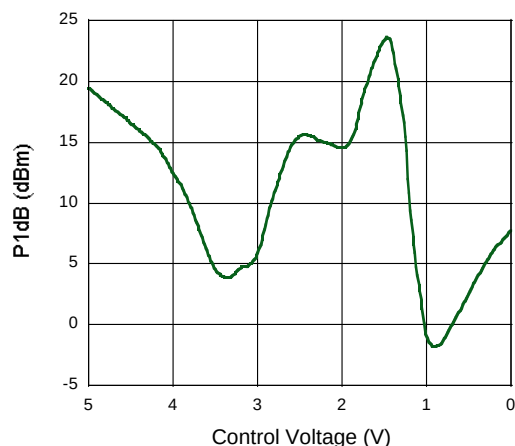
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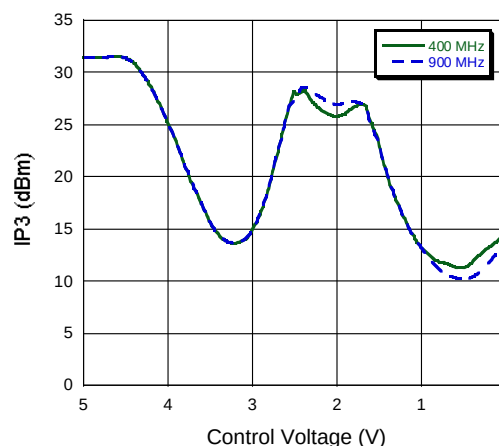
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Typical Performance Curves @ 25°C

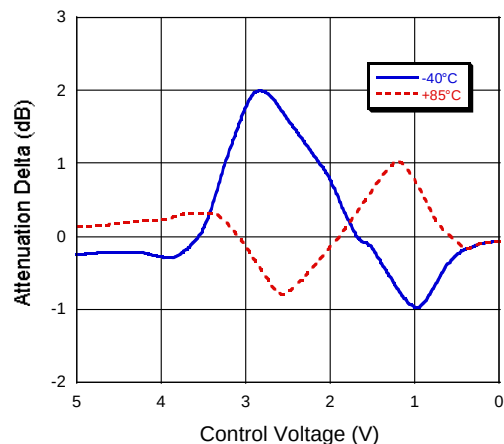
1 dB Compression vs. Control Voltage, $F = 900$ MHz



IP3 vs. Control Voltage



**Attenuation vs. Temperature
Normalized to 25°C, $F = 900$ MHz**



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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