

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.

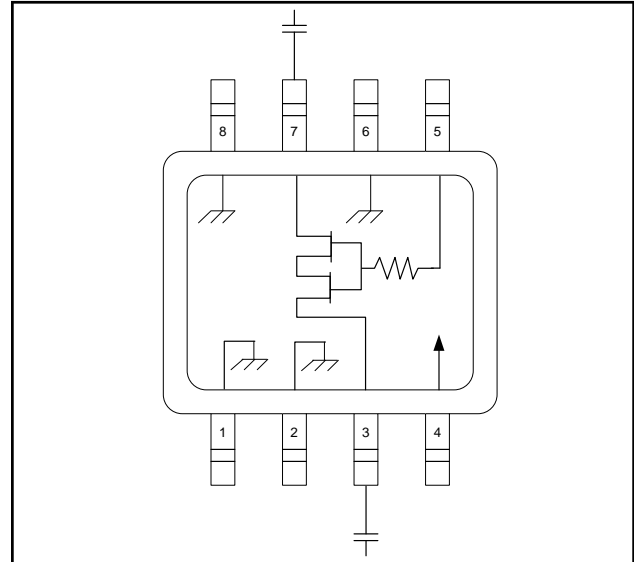
The AT-108 is fabricated with a monolithic GaAs MMIC using a mature 1-micron process. The process features full chip passivation for increased performance and reliability.

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.

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.

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.

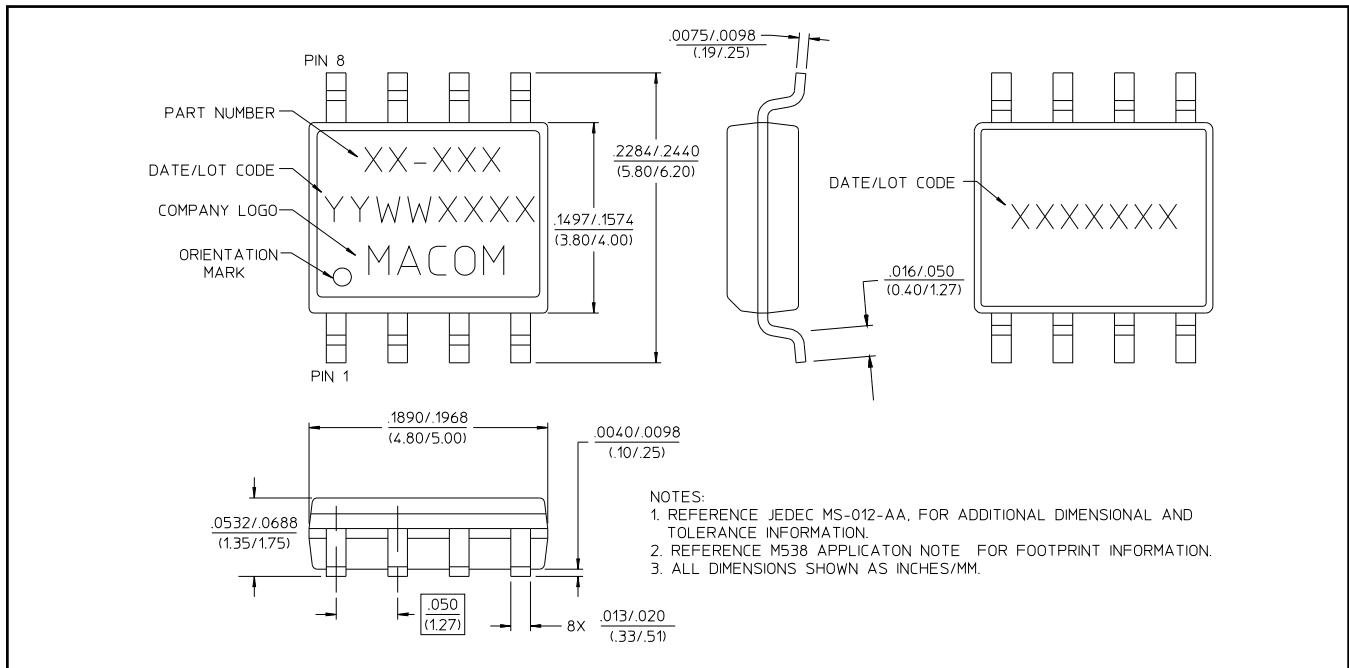
Voltage Variable Absorptive Attenuator 40 dB, 0.5 - 3.0 GHz

Rev. V7

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.

ADVANCED: Data Sheets contain information regarding a product M/A-COM Technology Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.
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.

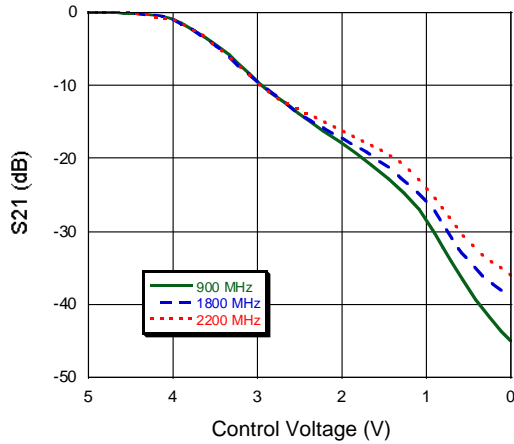
- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298

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

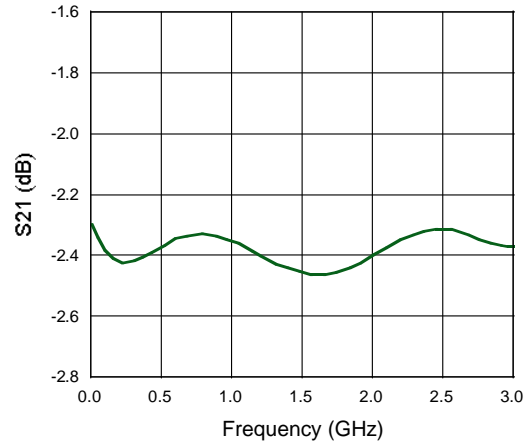
M/A-COM Technology Solutions Inc. and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.

Typical Performance Curves @ 25°C

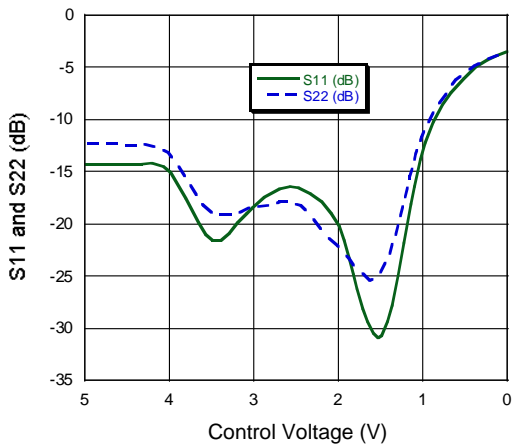
Attenuation vs. Control Voltage



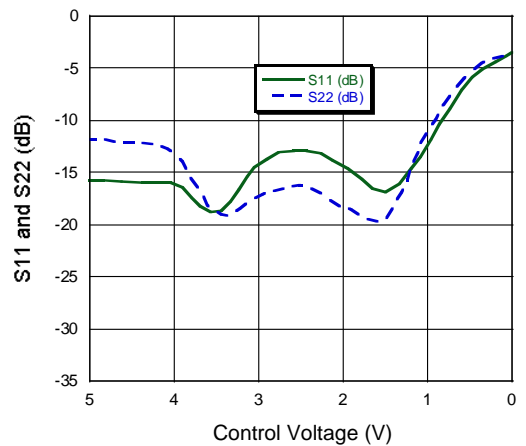
Insertion Loss vs. Frequency



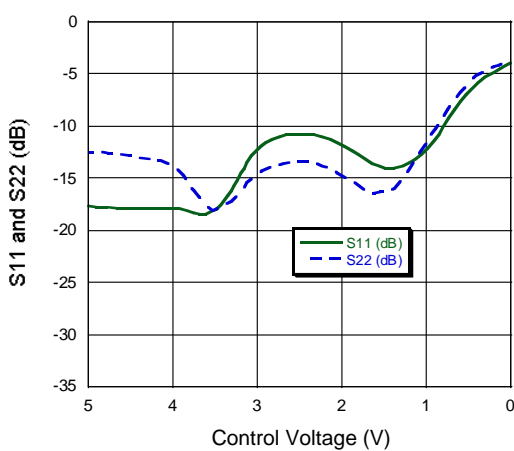
Return Loss vs. Control Voltage, F = 900 MHz



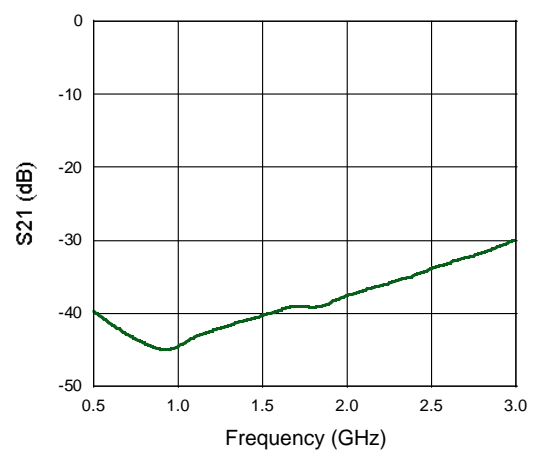
Return Loss vs. Control Voltage, F = 1800 MHz



Return Loss vs. Control Voltage, F = 2200 MHz

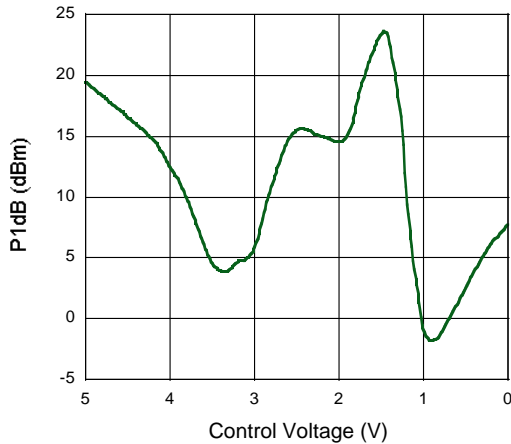


Maximum Attenuation vs. Frequency

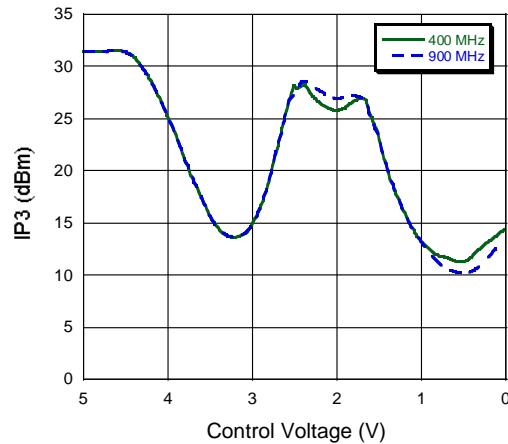


Typical Performance Curves @ 25°C

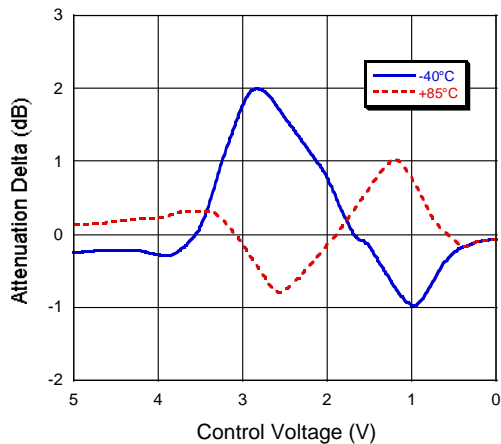
1 dB Compression vs. Control Voltage, F = 900 MHz



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.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[M/A-COM Technology Solutions:](#)

[AT10-0017TR](#) [AT-108TR](#)