AT-113

3 Volt Voltage Variable Absorptive Attenuator 40 dB, 0.5 - 2.0 GHz

Rev. V6

Features

- Single Positive Voltage Control: 0 to +3 Volts
- 40 dB Attenuation Range at 0.9 GHz
- ± 2 dB Linearity from BSL
- Low DC Power Consumption
- SOIC-8 Plastic Package
- Tape and Reel Packaging Available

Description

M/A-COM's AT-113 is a GaAs MMIC voltage variable absorptive attenuator in a low-cost SOIC 8-lead surface mount plastic package. The AT-113 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.

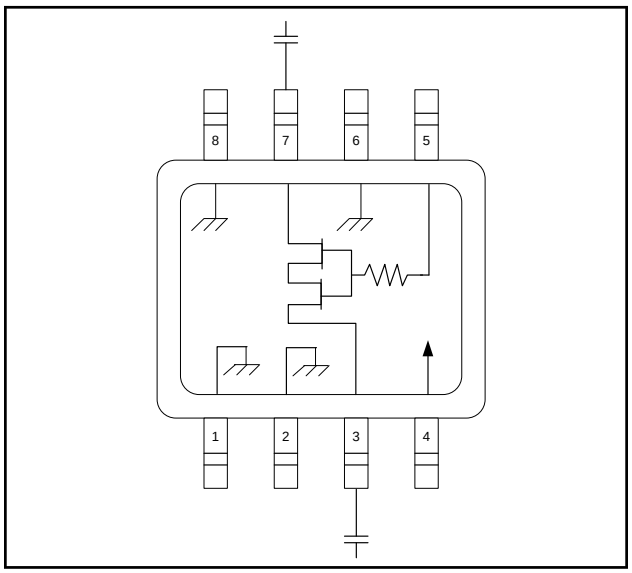
The AT-113 is fabricated with a monolithic GaAs MMIC using a mature 1-micron process. The process features full chip passivation for increased performance and reliability.

Ordering Information [1,2]

Part Number	Package
AT-113	Bulk Packaging
AT-113TR	Forward Tape and Reel
AT-113SMB	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. VCC = +3 VDC @ 50 µA maximum.
4. VC = 0 VDC to +3 VDC @ 50 µA maximum.
5. External DC blocking capacitors are required 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]

Parameter	Absolute Maximum
Input Power	+21 dBm
Supply Voltage V_{CC}	-1 V ≤ V_{CC} ≤ +8 V
Control Voltage V_C	-1 V ≤ V_C ≤ V_{CC} + 0.5 V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

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

- **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.

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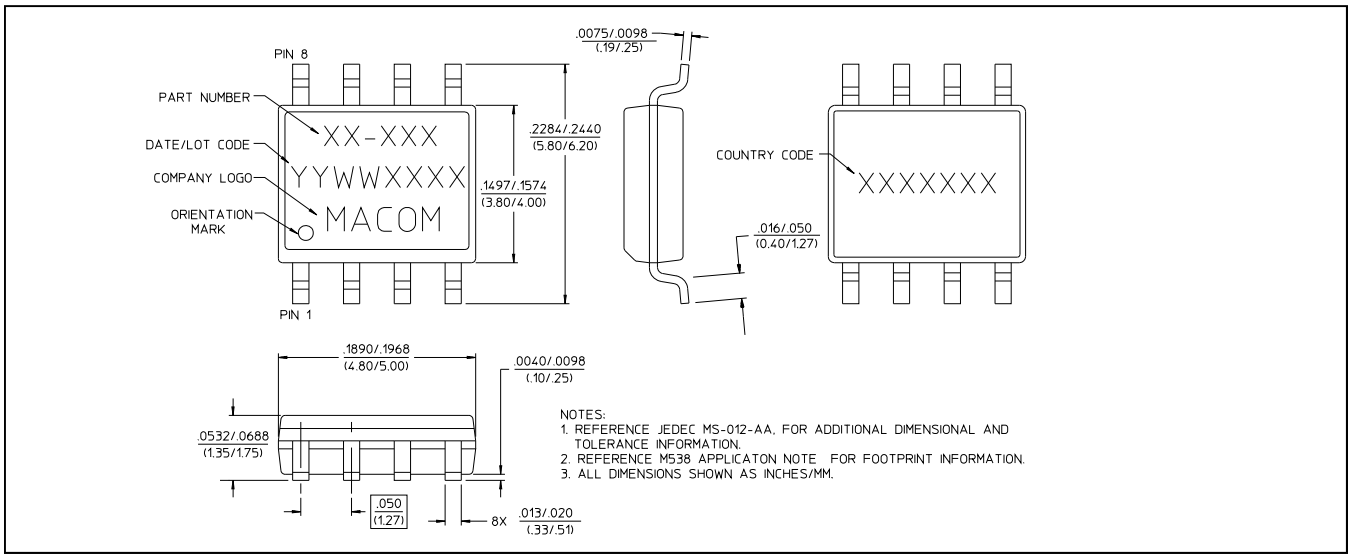
Electrical Specifications[8]: T_A = 25°C, Z_0 = 50 Ω

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

8. The RF ports must be blocked outside of the package from ground or any other voltage.

SOIC-8†



† Meets JEDEC moisture sensitivity level 1 requirements.

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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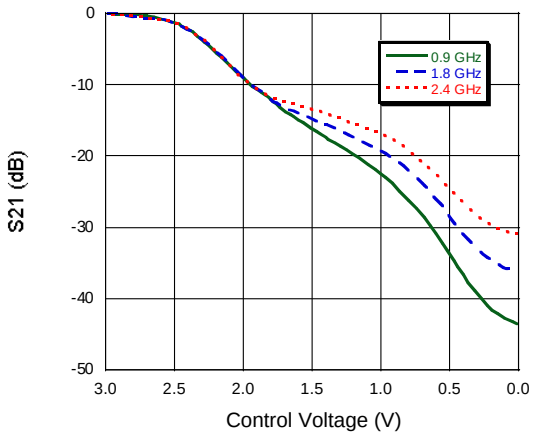
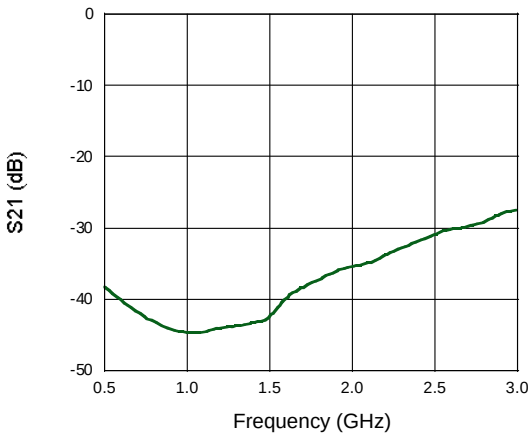
Typical Performance Curves @ 25°C

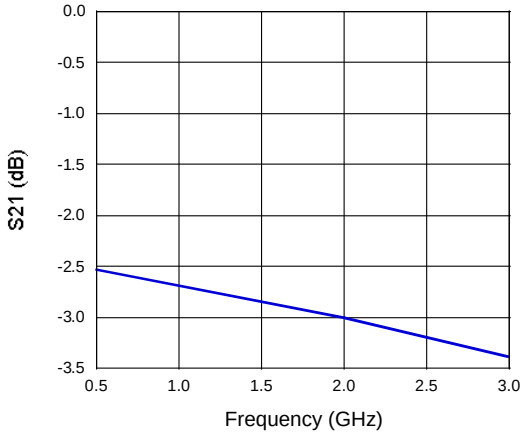
Attenuation vs. Control Voltage



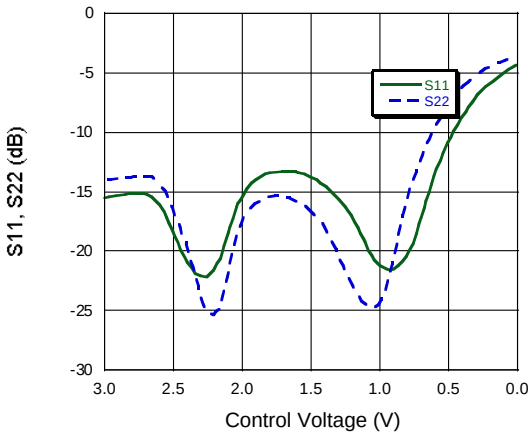
Attenuation vs. Frequency @ 0V



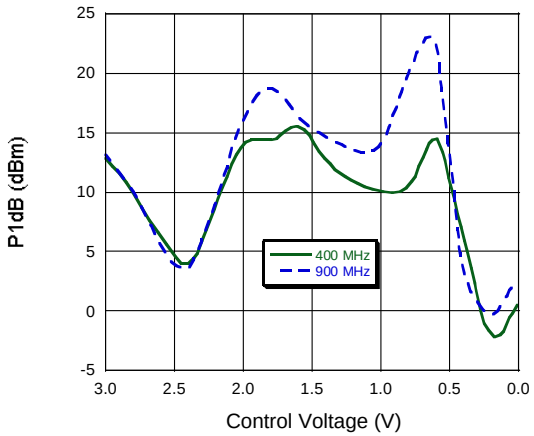
Insertion Loss vs. Frequency



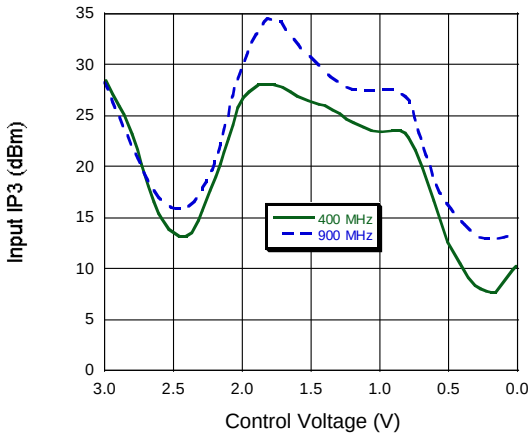
Return Loss vs. Control Voltage, F = 900 MHz



1 dB Compression vs. Control Voltage



IP3 vs. Control Voltage



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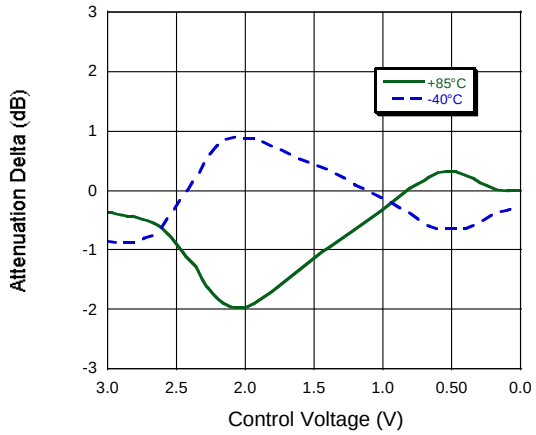
Typical Performance Curves

Attenuation vs. Temperature
Normalized @ 25°C, F = 900 MHz



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