

Voltage Variable Absorptive Attenuator 30 dB, 0.5 - 2.0 GHz

Rev. V1

Features

- Single Positive Voltage Control: 0 to +5 Volts
- 30 dB Voltage Variable Attenuation
- ± 2 dB Linearity from BSL
- Low DC Power Consumption
- Temperature Range: -40°C to +85°C
- SOIC-8 Plastic Package
- · Tape and Reel Packaging Available
- · Fast Switching Speed

Description

M/A-COM's AT-110-2 is a GaAs MMIC voltage variable absorptive attenuator in a low-cost SOIC 8-lead surface mount plastic package. The AT-110-2 has a faster switching speed than the AT-108 or AT-109. The AT-110-2 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.

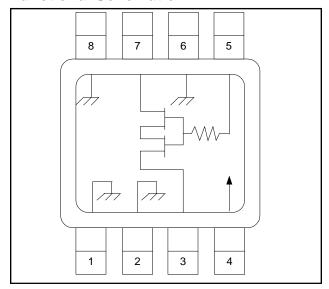
The AT-110-2 is fabricated with a monolithic GaAs MMIC using a mature 1-micron process. The process features full chip passivation for increased performance and reliability.

Ordering Information ¹

| Part Number | Package | | |
|-------------|-----------------------------|--|--|
| AT-110-2 | SOIC 8-Lead Plastic Package | | |
| AT-110-2TR | Forward Tape and Reel | | |

1. Reference Application Note M513 for reel size information.

Functional Schematic ^{2,3,4}



- 2. V_{CC} = +5 VDC ± 0.5 VDC @ 300 μ A maximum.
- 3. $V_C = 0$ VDC to +5 VDC @ 6 mA maximum.
- 4. External DC blocking capacitors are required on all RF ports.

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 5,6

| 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 | | |

- 5. 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.

• 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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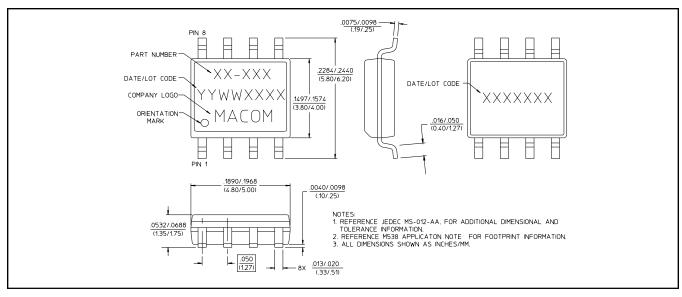
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Electrical Specifications ⁷: $T_A = 25$ °C, $Z_0 = 50 \Omega$

| Parameter | Test Conditions | Units | Min. | Тур. | Max. |
|----------------------------|--|----------|------------|----------------|----------------|
| Insertion Loss | 0.5 - 1.0 GHz 1.0 - 2.0 GHz | dB dB | | 2.8 3.3 | 3.0 3.6 |
| Attenuation | 1.0 GHz 1.0 - 2.0 GHz | dB dB | 37.5 25 | _ | _ |
| 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 | _ | 0.2 | _ |
| Ton, Toff | 50% Control to 90% RF, 50% Control to 10% RF | μS | _ | 0.2 | _ |
| Transients | In-band | mV | _ | 70 | _ |

^{7.} The RF ports must be blocked outside of the package from ground or any other voltage.

SOIC-8



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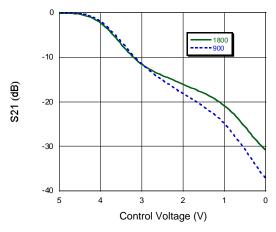


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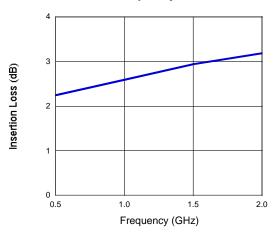
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Typical Performance Curves @ 25°C

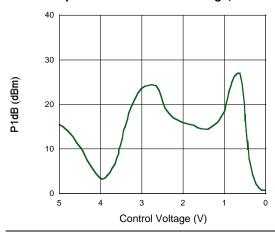
Attenuation vs. Control Voltage, F = 900, 1800 MHz



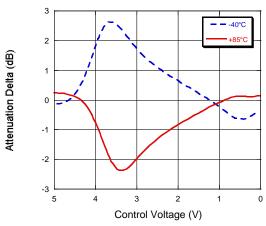
Insertion Loss vs. Frequency



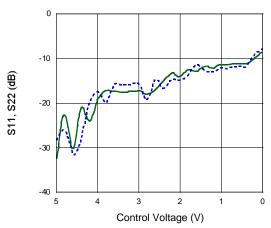
1 dB Compression vs. Control Voltage, F = 900 MHz



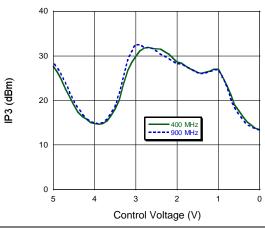
Attenuation vs. Temperature Normalized to $+25^{\circ}$ C, F = 900 MHz



Return Loss vs. Control Voltage, F = 900 MHz



IP3 vs. Control Voltage



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