

**3 Volt Voltage Variable Attenuator  
25 dB, DC-2.5 GHz**

**AT-255  
V7**

**Features**

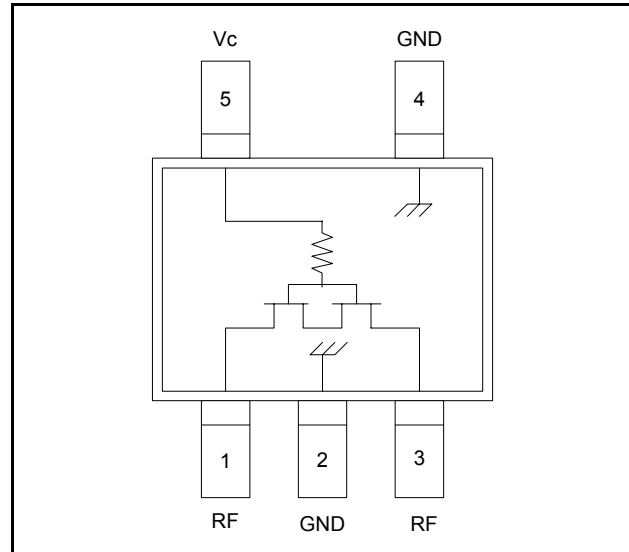
- Single Voltage Control: 0 to -3 Volts
- 25 dB Attenuation Range at 0.9 GHz
- Low DC Power Consumption
- SOT-25 Plastic Package
- Tape and Reel Packaging Available

**Description**

M/A-COM's AT-255 is a GaAs MMIC voltage variable absorptive attenuator in a low cost SOT-25 surface mount plastic package. The AT-255 is ideally suited for use where variable 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-255 is fabricated using a mature 1-micron GaAs MESFET process. The process features full chip passivation for increased performance and reliability.

**Functional Schematic <sup>1</sup>**



1.  $V_c = -3\text{ V to }0\text{ V @ }25\ \mu\text{A maximum.}$

**Pin Configuration**

| Pin No. | Function | Pin No. | Function |
|---------|----------|---------|----------|
| 1       | RF Port  | 4       | Ground   |
| 2       | Ground   | 5       | $V_c$    |
| 3       | RF Port  |         |          |

**Ordering Information**

| Part Number | Package         |
|-------------|-----------------|
| AT-255      | SOT-25 Plastic  |
| AT-255TR    | 1000 piece reel |

Note: Reference Application Note M513 for reel size information.

**Absolute Maximum Ratings <sup>2</sup>**

| Parameter             | Absolute Maximum |
|-----------------------|------------------|
| Input Power           | +21 dBm          |
| Control Voltage $V_c$ | -8 V to +0.5 V   |
| Operating Temperature | -40°C to +85°C   |
| Storage Temperature   | -65°C to +150°C  |

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

1

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Visit [www.macom.com](http://www.macom.com) for additional data sheets and product information.

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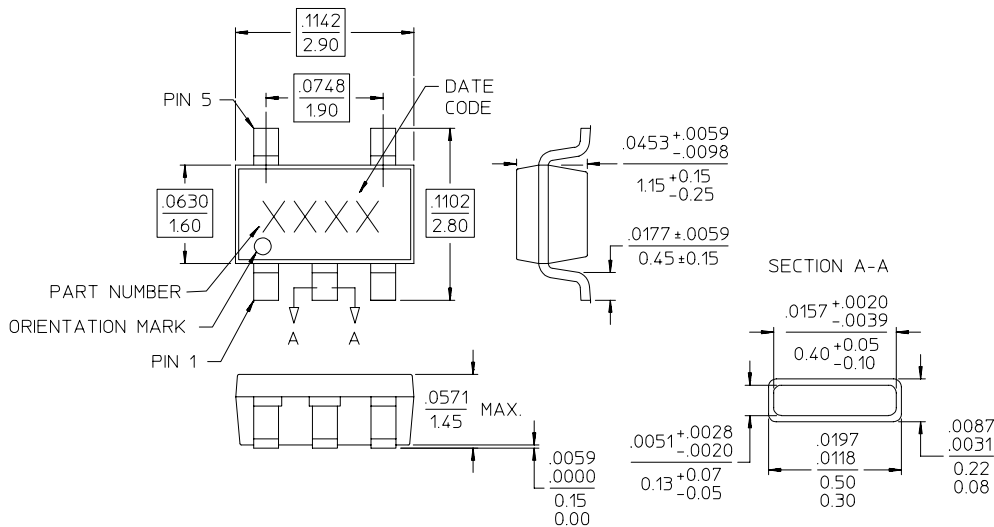
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**Electrical Specifications:  $T_A = 25^\circ\text{C}$ ,  $Z_0 = 50 \Omega$**

| Parameter                   | Test Conditions                                 | Units | Min | Typ     | Max      |
|-----------------------------|---|-------|-----|---------|----------|
| Insertion Loss <sup>3</sup> | DC—2.0 GHz                                      | dB    | —   | 3.6     | 4.2      |
| Attenuation                 | DC—1.0 GHz                                      | dB    | 23  | 25      | —        |
|                             | 1.0—2.0 GHz                                     | dB    | 18  | 20      | —        |
| Flatness<br>(Peak-to-Peak)  | 0.5—1.0 GHz                                     | dB    | —   | $\pm 7$ | $\pm 10$ |
|                             | 1.0—2.0 GHz                                     | dB    | —   | $\pm 5$ | $\pm 8$  |
| VSWR                        | DC—2.0 GHz                                      | Ratio | —   | 3:1     | —        |
| Trise, Tfall                | 10% to 90% RF, 90% to 10% RF                    | nS    | —   | 10      | —        |
| Ton, Toff                   | 50% Control to 90% RF,<br>50% Control to 10% RF | nS    | —   | 20      | —        |
| Transients                  | In Band   | mV    | —   | 10      | —        |

3. Insertion loss varies 0.003 dB/°C.

**SOT-25**



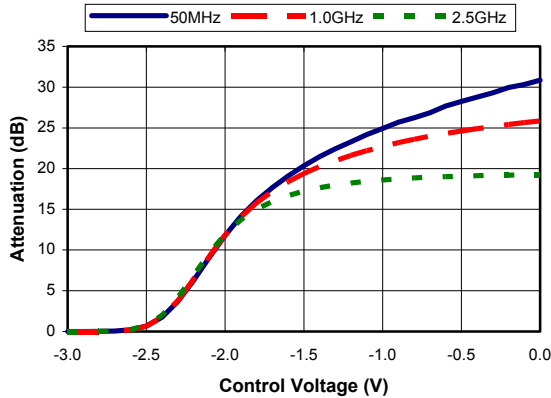
- NOTES: 1. REFERENCE JEDEC MO-178-AA FOR ADDITIONAL DIMENSIONAL AND TOLERANCE INFORMATION.  
2. REFERENCE M538 APPLICATION NOTE FOR PCB FOOTPRINT INFORMATION.  
3. ALL DIMENSIONS SHOWN AS INCHES/MM.

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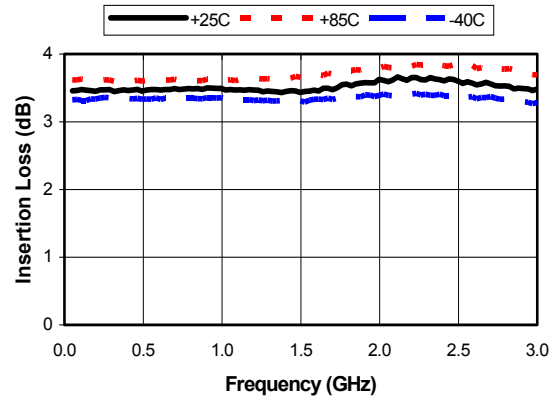
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**Typical Performance Curves**

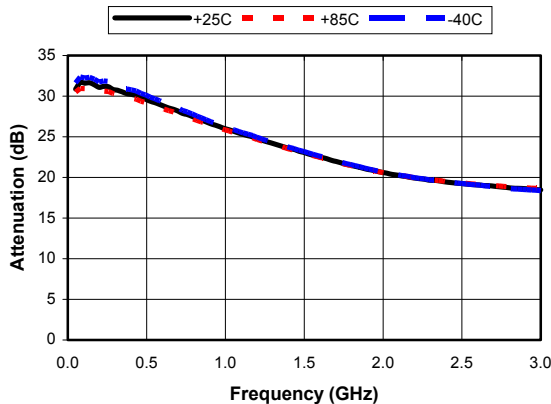
**Relative Attenuation vs. Control Voltage**



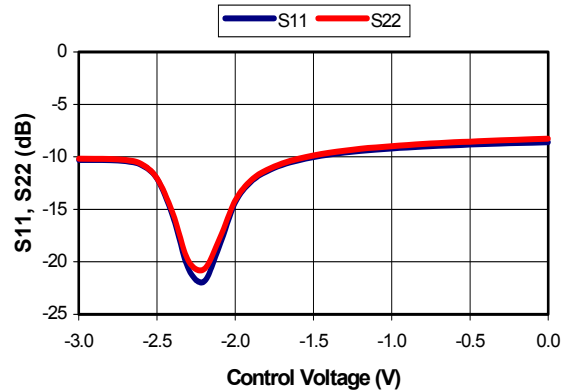
**Insertion Loss vs. Frequency**



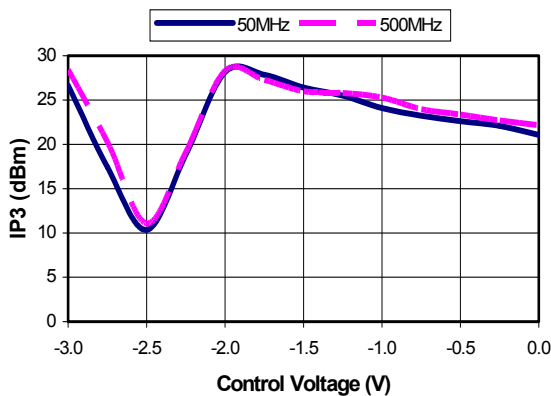
**Maximum Relative Attenuation vs. Frequency**



**Return Loss vs. Control Voltage @ 900 MHz**



**Input IP3 vs. Control Voltage**



**Input P1dB vs. Control Voltage**

