

## Features

- 12 dB Voltage Variable Attenuation
- Low Intermodulation Products
- Low DC Power Consumption: 50  $\mu$ W
- Single Voltage Control: 0 to -4 Volts
- Nanosecond Switching Speed
- Temperature Range: -40°C to +85°C
- Lead-Free SOIC-8 Plastic Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- 260°C Reflow Compatible
- RoHS\* Compliant Version of AT-250

## Description

M/A-COM's MAAV-007941 is a GaAs MMIC voltage variable absorptive attenuator in a low cost lead-free SOIC 8-lead surface mount plastic package. The MAAV-007941 is ideally suited for use where attenuation fine tuning, fast switching and very low power consumption are required.

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

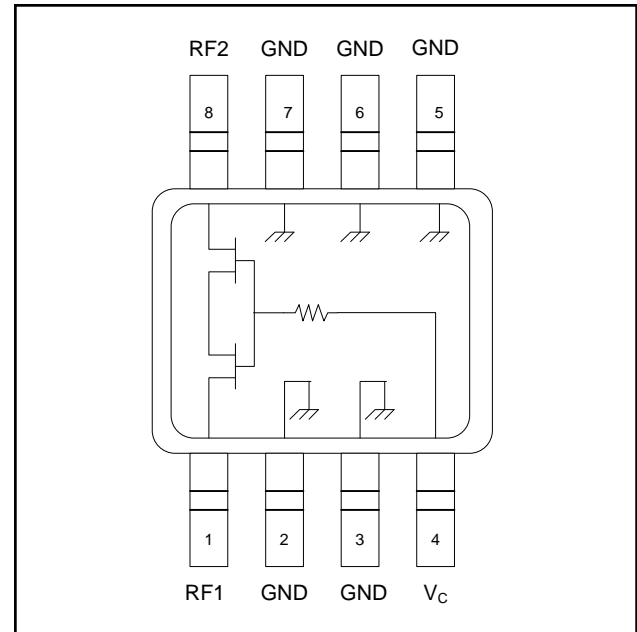
The MAAV-007941 is fabricated with a monolithic GaAs MMIC using a mature 1-micron process. The process features full chip passivation for increased performance and reliability.

## Ordering Information <sup>1</sup>

| Part Number        | Package         |
|--------------------|-----------------|
| MAAV-007941-000000 | Bulk Packaging  |
| MAAV-007941-TR3000 | 3000 piece reel |

1. Reference Application Note M513 for reel size information.

## Functional Schematic



## Pin Configuration

| Pin No. | Function       | Pin No. | Function |
|---------|----------------|---------|----------|
| 1       | RF1            | 5       | Ground   |
| 2       | Ground         | 6       | Ground   |
| 3       | Ground         | 7       | Ground   |
| 4       | V <sub>c</sub> | 8       | RF2      |

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

| Parameter             | Absolute Maximum |
|-----------------------|------------------|
| Input Power           | +21 dBm          |
| Control Voltage       | +5V, -8.5V       |
| Operating Temperature | -40°C to +85°C   |
| Storing Temperature   | -65°C to +150°C  |

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

\* Restrictions on Hazardous Substances, European Directive 2002/95/EC.

## Voltage Variable Absorptive Attenuator 12 dB, DC - 2.0 GHz

Rev. V1

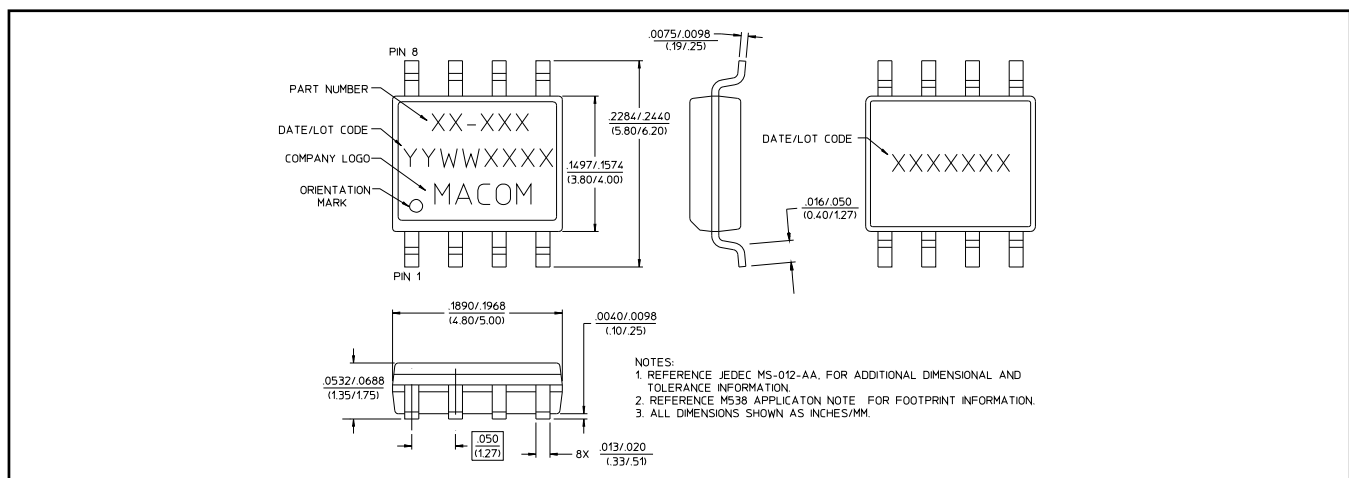
### Electrical Specifications: $T_A = 25^\circ\text{C}$ , $Z_0 = 50 \Omega$

| Parameter                    | Test Conditions <sup>3</sup>   | Units | Min. | Typ.      | Max.      |
|------------------------------|--|-------|------|-----------|-----------|
| Insertion Loss               | DC - 0.1 GHz   | dB    | —    | 2.9       | 3.1       |
|                              | DC - 0.5 GHz   | dB    | —    | 3.0       | 3.2       |
|                              | DC - 1.0 GHz   | dB    | —    | 3.2       | 3.5       |
|                              | DC - 2.0 GHz   | dB    | —    | 3.4       | 3.8       |
| Flatness<br>(Peak to Peak)   | DC - 0.1 GHz   | dB    | —    | $\pm 0.1$ | $\pm 0.3$ |
|                              | DC - 0.5 GHz   | dB    | —    | $\pm 0.2$ | $\pm 0.4$ |
|                              | DC - 1.0 GHz   | dB    | —    | $\pm 0.5$ | $\pm 0.8$ |
|                              | DC - 2.0 GHz   | dB    | —    | $\pm 1.2$ | $\pm 1.5$ |
| VSWR                         |  | Ratio | —    | 2.1:1     | —         |
| Trise, Tfall                 | 10% to 90% RF, 90% to 10% RF   | nS    | —    | 3         | —         |
| Ton, Toff                    | 50% Control to 90% RF,<br>50% Control to 10% RF  | nS    | —    | 5         | —         |
| Transients                   | In Band  | mV    | —    | 10        | —         |
| Power Handling               | Linear Operation   | dBm   | —    | 13        | —         |
|                              | Absolute Maximum Input Power   | dBm   | —    | 21        | —         |
| IP <sub>2</sub>              | 0.05 GHz   | dBm   | 28   | 34        | —         |
|                              | 0.5 - 2.0 GHz<br>Measured Relative to Input Power<br>(For two-tone Input Power Up to +5 dBm) | dBm   | 40   | 47        | —         |
| IP <sub>3</sub> <sup>4</sup> | 0.05 GHz   | dBm   | 18   | 31        | —         |
|                              | 0.5 - 2.0 GHz<br>Measured Relative to Input Power<br>(For two-tone Input Power Up to +5 dBm) | dBm   | 18.5 | 36        | —         |

3. Control voltage: 0 to -4 volts @ 20  $\mu\text{A}$  typical.

4. Typical readings are for levels above 6 dB attenuation. For levels below 6 dB, the minimum specification numbers apply.

### Lead-Free SOIC-8<sup>†</sup>



<sup>†</sup> Reference Application Note M538 for lead-free solder reflow recommendations.  
Meets JEDEC moisture sensitivity level 1 requirements.

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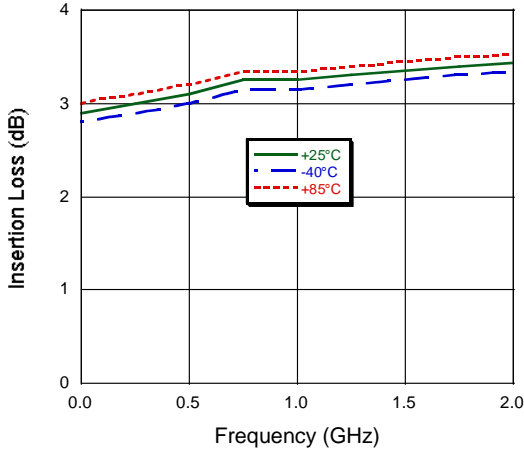
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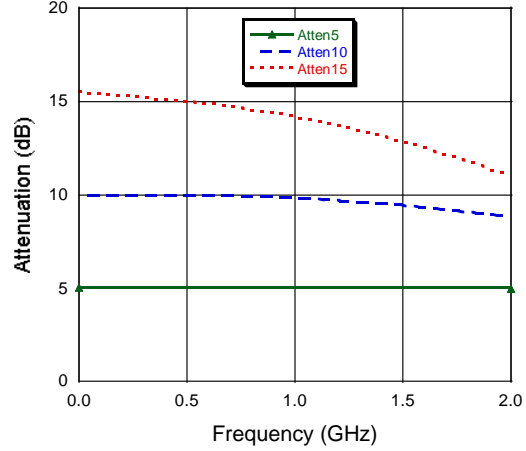
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## Typical Performance Curves

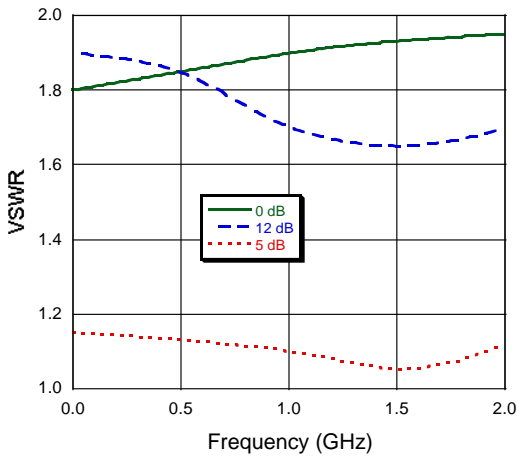
**Insertion Loss vs. Frequency**



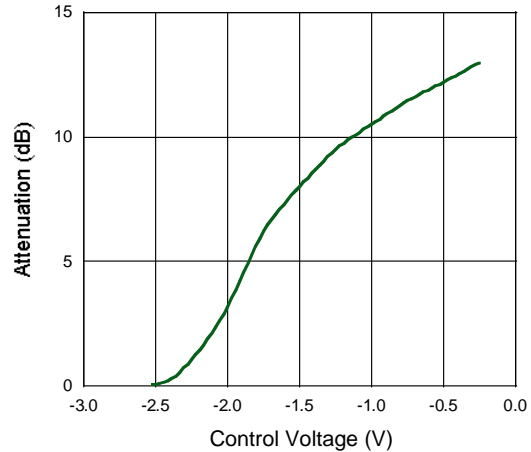
**Attenuation vs. Frequency**



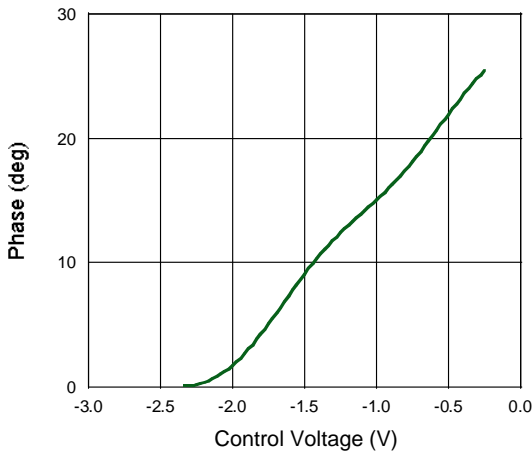
**VSWR vs. Frequency**



**Attenuation vs. Control Voltage, F = 950 MHz**



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## 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.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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