

## Broadband CATV Amplifier 50 - 1000 MHz

Rev. V2

### Features

- 75  $\Omega$  Input / Output Match
- 3.8 dB Noise Figure
- 9 dB Gain
- Lead-Free SOT-89 Package
- Halogen-Free “Green” Mold Compound
- RoHS\* Compliant and 260°C Reflow Compatible

### Description

M/A-COM’s MAAM-007807 CATV amplifier is a GaAs MMIC which exhibits low distortion in a miniature lead-free surface mount package. The MAAM-007807 employs a monolithic single stage design featuring a convenient 75  $\Omega$  input/output impedance that minimizes the number of external components required.

The MAAM-007807 provides low noise and high linearity. It is ideally suited for set top boxes, home gateways and other broadband internet based appliances.

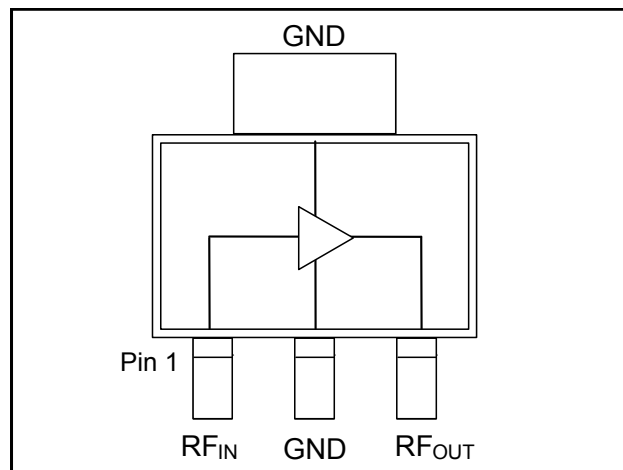
The MAAM-007807 is fabricated using M/A-COM’s pHEMT process to realize low noise and low distortion. The process features full passivation for robust performance and reliability.

### Ordering Information <sup>1,2</sup>

Part Number	Package
MAAM-007807-TR1000	1000 piece reel
MAAM-007807-TR3000	3000 piece reel
MAAM-007807-000SMB	Sample Test Board

1. Reference Application Note M513 for reel size information.
2. All sample boards include 5 loose parts.

### Functional Schematic



### Pin Configuration

Pin No.	Pin Name	Description
1	RF <sub>IN</sub>	RF Input
2	GND	Ground
3	RF <sub>OUT</sub>	RF Output / Drain Supply

### Absolute Maximum Ratings <sup>3,4,5</sup>

Parameter	Absolute Maximum
RF Input Power	8 dBm
Voltage	8.0 volts
Operating Temperature	-40°C to +85°C
Junction Temperature <sup>6</sup>	+150°C
Storage Temperature	-65°C to +150°C

3. Exceeding any one or combination of these limits may cause permanent damage to this device.
4. M/A-COM does not recommend sustained operation near these survivability limits.
5. These operating conditions will ensure MTTF > 1 x 10<sup>6</sup> hours.
6. Junction Temperature ( $T_J$ ) =  $T_C + \Theta_{jc} * (V * I)$   
Typical thermal resistance ( $\Theta_{jc}$ ) = 86° C/W.  
a) For  $T_C = 25^\circ\text{C}$ ,  
 $T_J = 51^\circ\text{C} @ 5\text{ V}, 60\text{ mA}$   
b) For  $T_C = 85^\circ\text{C}$ ,  
 $T_J = 109^\circ\text{C} @ 5\text{ V}, 55\text{ mA}$

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

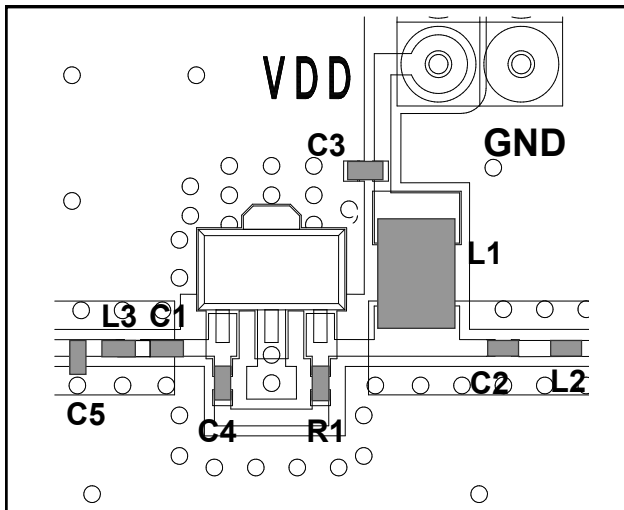
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**Electrical Specifications:**  $T_A = 25^\circ\text{C}$ , Freq: 50 - 1000 MHz,  $V_{DD} = 5\text{ Volts}$ ,  $Z_0 = 75\ \Omega$

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Gain	—	dB	8	9	10
Gain Flatness	—	dB	—	0.4	0.8
Noise Figure	—	dB	—	3.8	4.8
Input Return Loss	—	dB	—	18	—
Output Return Loss	—	dB	—	18	—
Output IP3	6 MHz Spacing, +4 dBm output per tone	dBm	—	35	—
Composite Triple Beat, CTB	132 channels, +15 dBmV / channel at the input.	dBc	—	-75	—
Composite Second Order, CSO	132 channels, +15 dBmV / channel at the input.	dBc	—	-65	—
P1dB	—	dBm	—	17	—
$I_{DD}$	5 Volts	mA	50	60	70

### Recommended Board Layout



### Off-Chip Component Values

Component	Value	Package
C1 - C4	0.01 $\mu\text{F}$	0402
C5	0.8 pF	0402
L1 <sup>7</sup>	1 $\mu\text{H}$	1210
L2	3.3 nH	0402
L3	6.8 nH	0402
R1	300 $\Omega$	0402

7. L1 supplied from EPCOS, part number B82422A1102K100

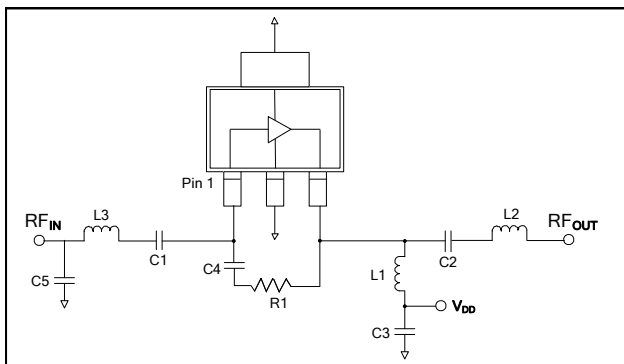
### Handling Procedures

Please observe the following precautions to avoid damage:

### Static Sensitivity

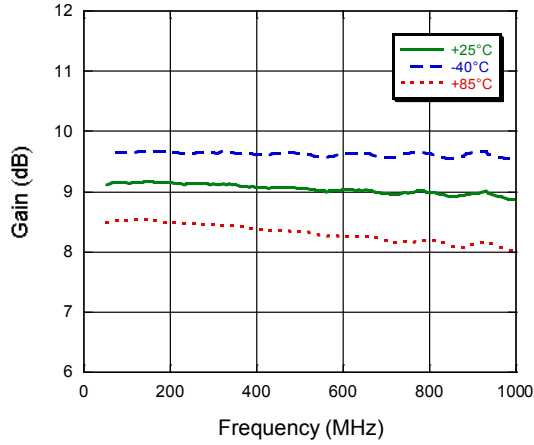
Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by electricity. Proper ESD control techniques should be used when handling these devices.

### Schematic Including Off-Chip Components

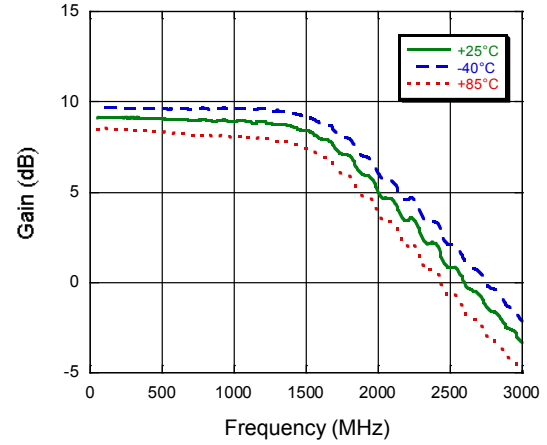


## Typical Performance Curves

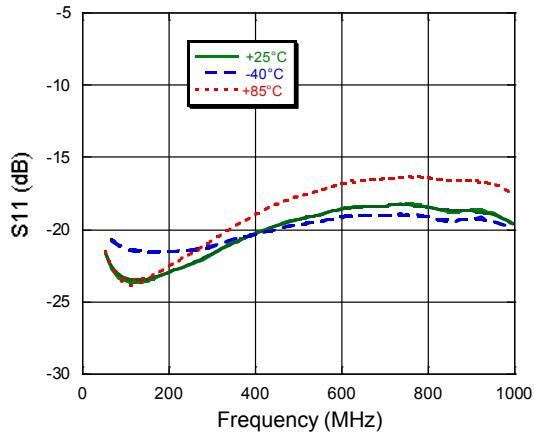
**Gain vs. Frequency over Temperature**



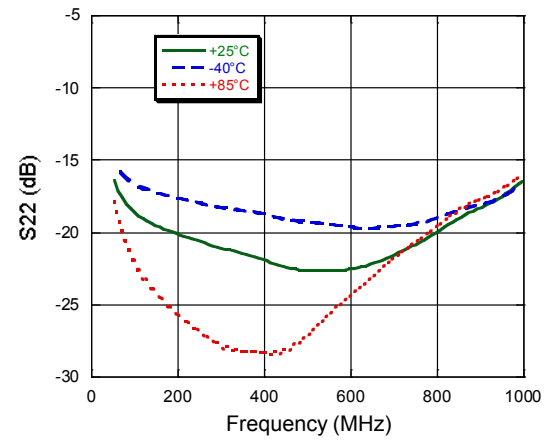
**Gain vs. Frequency over Temperature to 3 GHz**



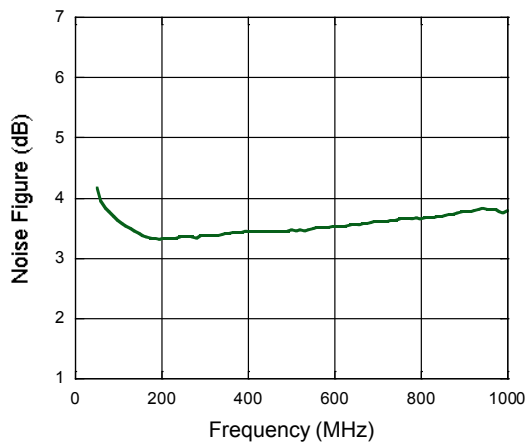
**S11 vs. Frequency over Temperature**



**S22**



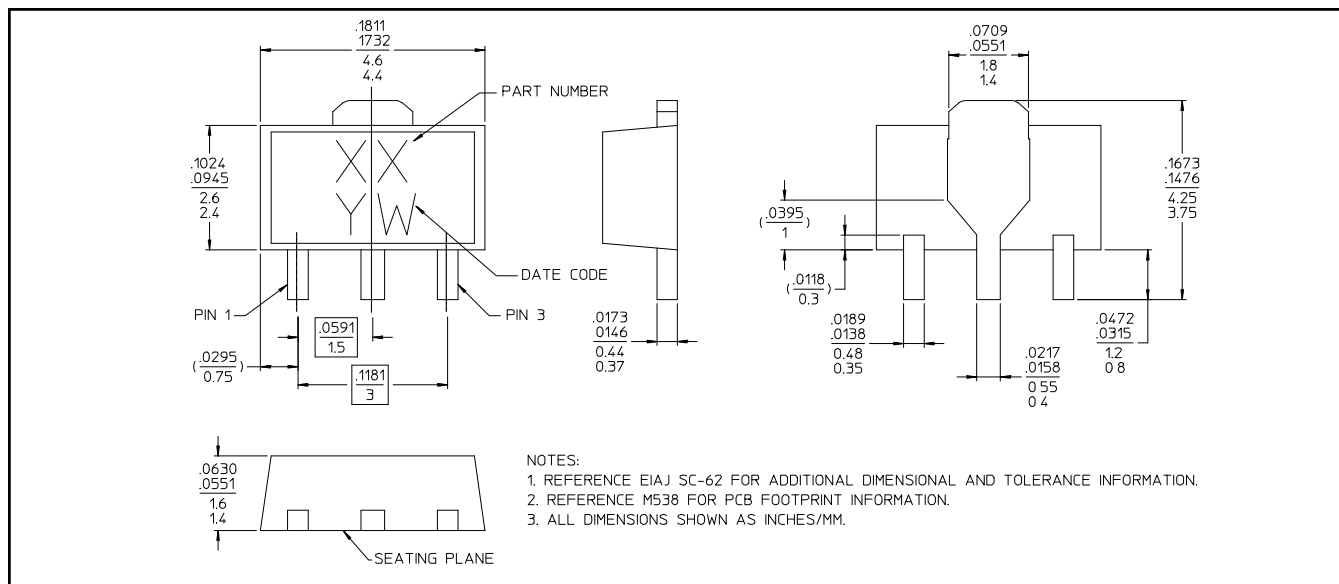
**Noise Figure @ +25° C**



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### Lead-Free SOT-89 Plastic Package<sup>†</sup>



<sup>†</sup> Reference Application Note M538 for lead-free solder reflow recommendations.  
Meets JEDEC moisture sensitivity level 1 requirements.  
Plating is 100% matte tin over copper.

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