MAAM-007807

Broadband CATV Amplifier
50 - 1000 MHz

Rev. V2

Features

- 75 Ω 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 Ω 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.

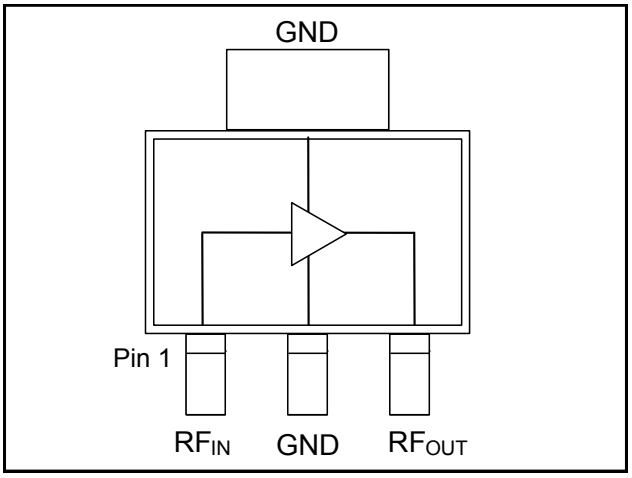
The MAAM-007807 is fabricated using M/A-COM's pHEMT process to realize low noise and low distortion. The process features full passivation for robust performance and reliability.

Ordering Information [1,2]

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_{IN}	RF Input
2	GND	Ground
3	RF_{OUT}	RF Output / Drain Supply

Absolute Maximum Ratings [3,4,5]

Parameter	Absolute Maximum
RF Input Power	8 dBm
Voltage	8.0 volts
Operating Temperature	-40°C to +85°C
Junction Temperature[6]	+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 10^6 hours.
6. Junction Temperature (T_J) = T_C + Θjc * (V * I)
   Typical thermal resistance (Θjc) = 86° C/W.
   a) For T_C = 25°C,
   T_J = 51°C @ 5 V, 60 mA
   b) For T_C = 85°C,
   T_J = 109°C @ 5 V, 55 mA

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

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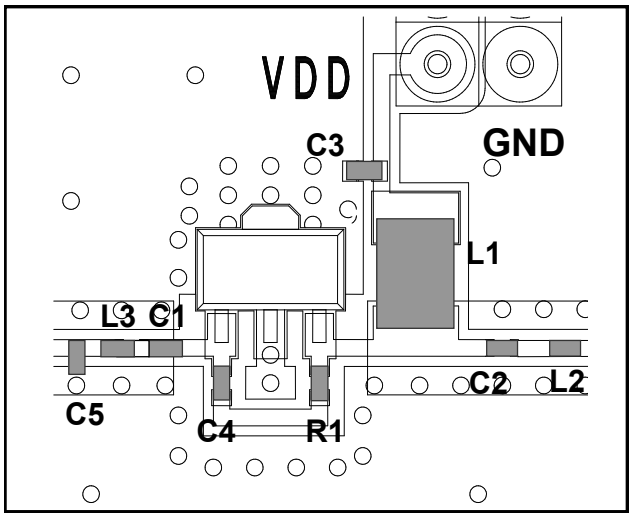
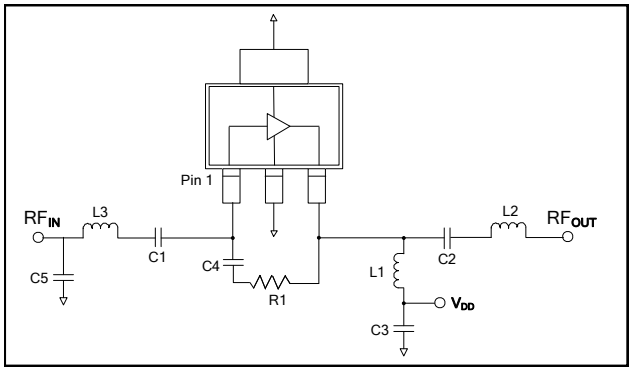
Electrical Specifications: T_A = 25°C, Freq: 50 - 1000 MHz, V_{DD} = 5 Volts, Z_0 = 75 Ω

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



Schematic Including Off-Chip Components



Off-Chip Component Values

Component	Value	Package
C1 - C4	0.01 µF	0402
C5	0.8 pF	0402
L1[7]	1 µH	1210
L2	3.3 nH	0402
L3	6.8 nH	0402
R1	300 Ω	0402

7. L1 supplied from EPCOS, part number B82422A1102K100

Handling Procedures

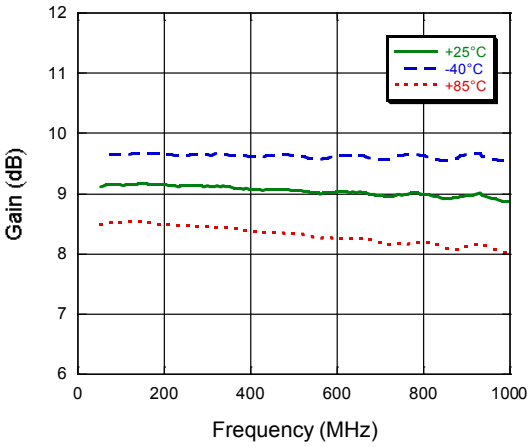
Please observe the following precautions to avoid damage:

Static Sensitivity

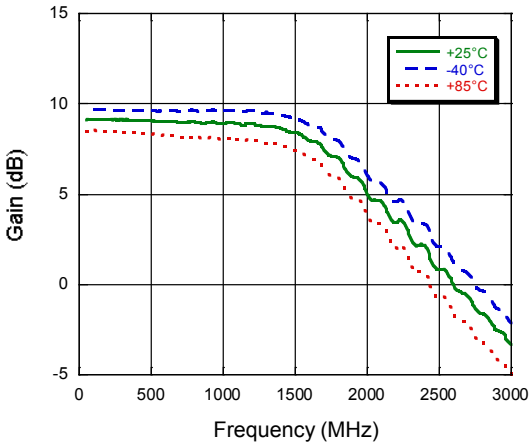
Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by electricity. Proper ESD control techniques should be used when handling these devices.

Typical Performance Curves

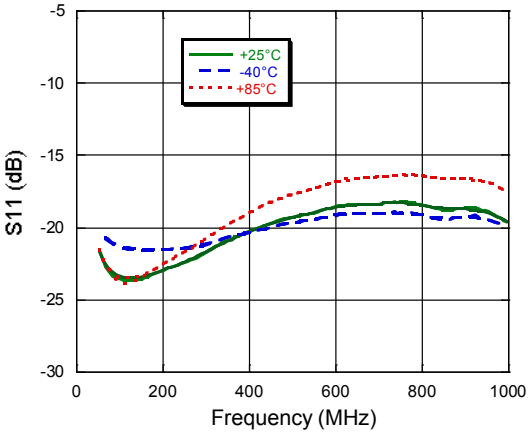
Gain vs. Frequency over Temperature



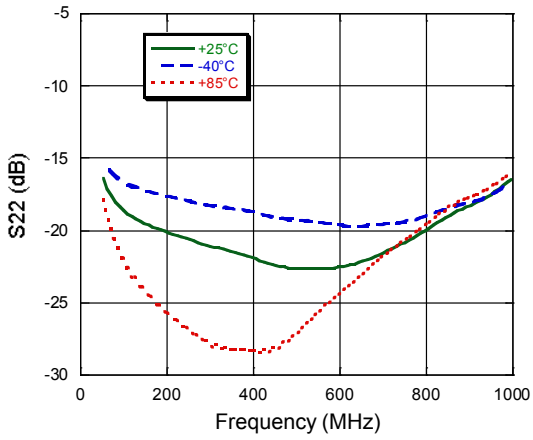
Gain vs. Frequency over Temperature to 3 GHz



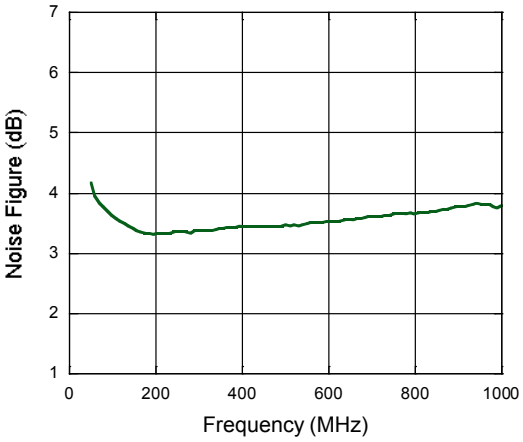
S11 vs. Frequency over Temperature



S22



Noise Figure @ +25° C



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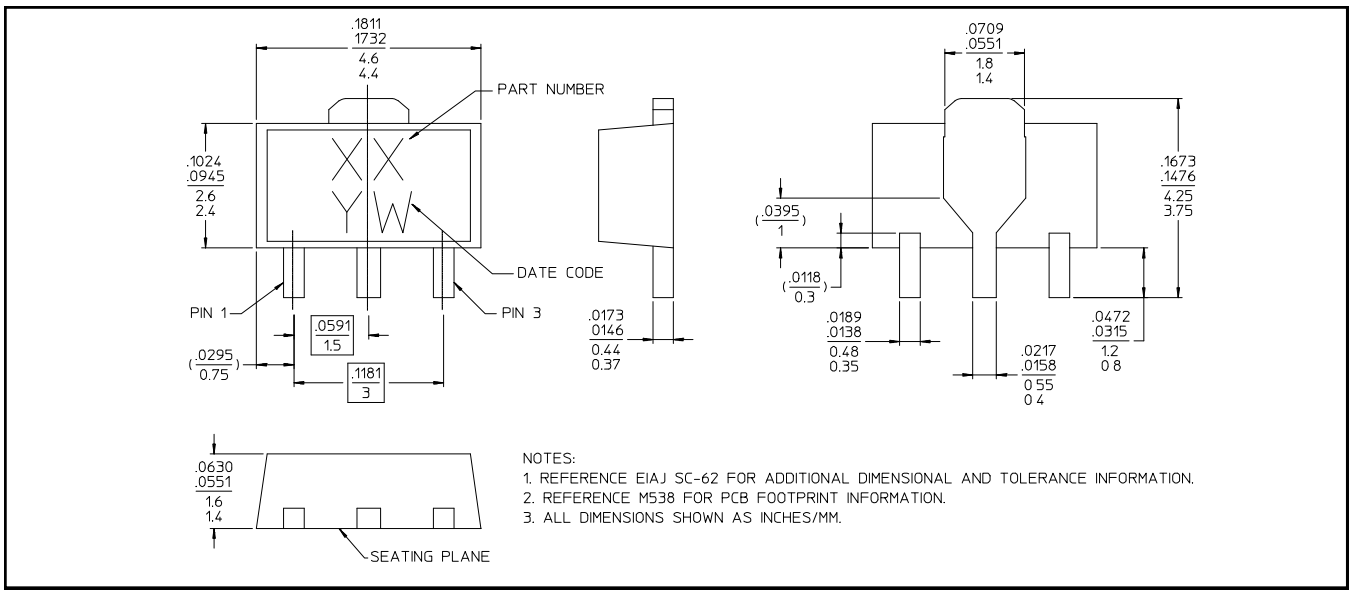
Lead-Free SOT-89 Plastic Package†



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