

Features

- Broadband Operation
- Output Intercept Point: +38.5 dBm @ 250 MHz
- Output P1dB: +19 dBm
- High Efficiency
- 50 Ω Input/Output Match
- Gain: 18 dB @ 250 MHz
- Lead-Free SOT-89 Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- 260°C Reflow Compatible
- RoHS* Compliant Version of MAAMSS0017

Description

M/A-COM's MAAMSS0046 driver amplifier is a GaAs MMIC which exhibits high OIP3 as well as high gain and low power consumption in a lead-free SOT-89 surface mount plastic package.

The MAAMSS0046 employs a monolithic single stage design featuring a convenient 50 Ω input / output impedance that minimizes the number of external components required. The device runs off a single +5 volt supply and draws 70 mA typically.

The MAAMSS0046 is fabricated using M/A-COM's iHBT process to realize low current and high power functionality. The process features full passivation for increased performance and reliability.

Ordering Information ^{1,2}

Part Number	Package
MAAMSS0046TR-3000	3000 piece reel
MAAMSS0046SMB	Sample Board

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

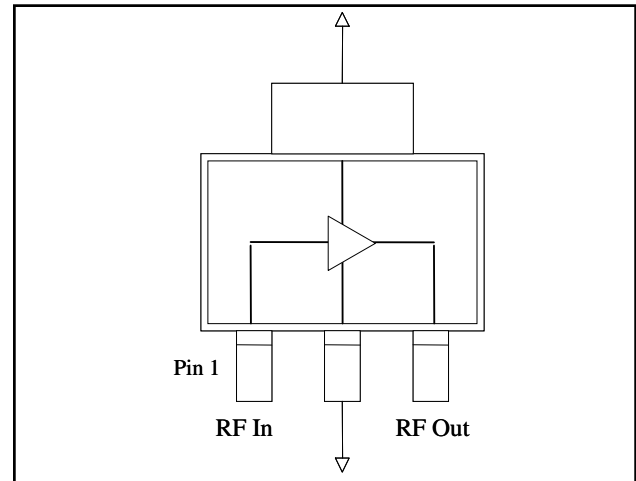
Maximum Operating Conditions ³

Parameter	Maximum Operating Conditions
Junction Temperature	125°C
RF Input Power	14 dBm

3. Operating at or within these conditions will ensure MTF > 1 x 10⁶ hours.

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

Functional Schematic



Pin Configuration

Pin No.	Function	Pin No.	Function
1	RF Input	3	RF Output/Bias
2	Ground		

Absolute Maximum Ratings ^{4,5}

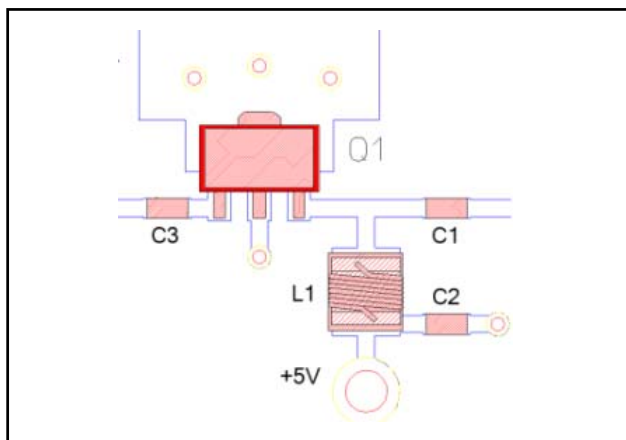
Parameter	Absolute Maximum
RF Input Power ⁶	15 dBm
Voltage	6 Volts
Junction Temperature ⁷	+150°C
Operating Temperature	-40 °C to +85 °C
Storage Temperature	-65 °C to +150 °C

4. Exceeding any one or combination of these limits may cause permanent damage to this device.
5. M/A-COM does not recommend sustained operation near these survivability limits.
6. The MAAMSS0046 is designed to operate optimally at 10 dB backed off from its output P1dB. Driving the device at higher power levels could degrade performance.
7. Thermal Resistance = 110°C/W.

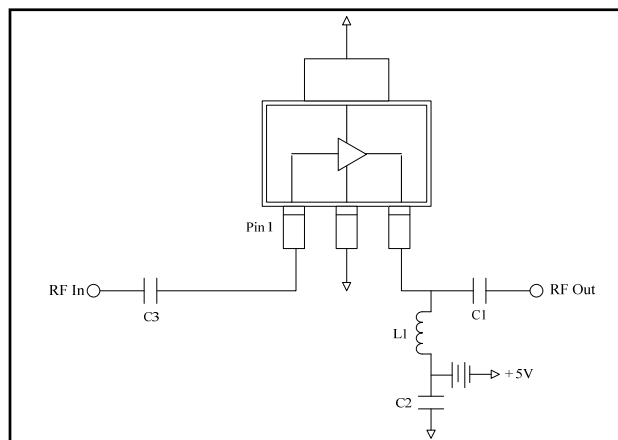
Electrical Specifications: $T_A = 25^\circ\text{C}$, $V_{CC} = 5\text{ V}$, $Z_0 = 50\ \Omega$, $P_{IN} \leq -10\text{ dBm}$

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Gain	250 MHz	dB	15.5	18	19.5
	50 - 600 MHz	dB	—	17	—
	600 - 1500 MHz	dB	—	12.5	—
	1500 - 2000 MHz	dB	—	10.5	—
	2000 - 2500 MHz	dB	—	8	—
Noise Figure	50 - 600 MHz	dB	—	4.8	—
	600 - 1500 MHz	dB	—	5.1	—
	1500 - 2500 MHz	dB	—	5.3	—
Input Return Loss	50 - 600 MHz	dB	—	10	—
	600 - 2500 MHz	dB	—	13	—
Output Return Loss	50 - 600 MHz	dB	—	10	—
	600 - 1500 MHz	dB	—	13	—
	1500 - 2500 MHz	dB	—	10	—
Output 1dB Compression	50 - 600 MHz	dBm	—	20	—
	600 - 2500 MHz	dBm	—	19	—
Output IP3	Two tone, $P_{IN} / \text{Tone} = -13\text{ dBm}$, Tone spacing = 10 MHz				
	250 MHz	dBm	35	38.5	—
	50 - 600 MHz	dBm	—	37	—
Current	600 - 2500 MHz	dBm	—	34	—
	—	mA	—	70	100

PCB Configuration



Schematic Including Off-Chip Components



Component List

Part	Value	Package	Manufacturer
C1	150 pF	0603	Murata
C2	0.1 μF	0603	Murata
C3	1000 pF	0603	Murata
L1	180 nH	1008	Coilcraft

Operating the MAAMSS0046

The MAAMSS0046 can be damaged by electrostatic discharge (ESD). Use proper ESD control techniques when handling this device. To operate the MAAMSS0046, follow these steps.

1. Apply V_{CC} (5.0 V).
2. Set P_{IN} .
3. Turn off in reverse order.

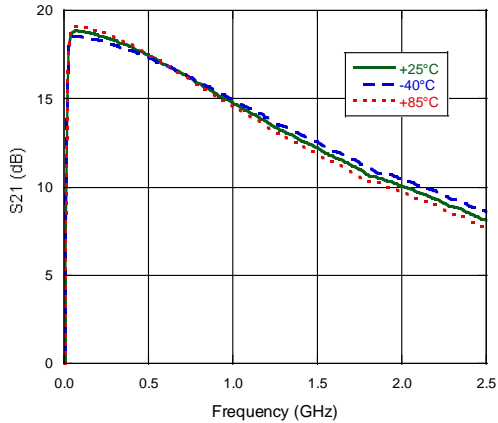
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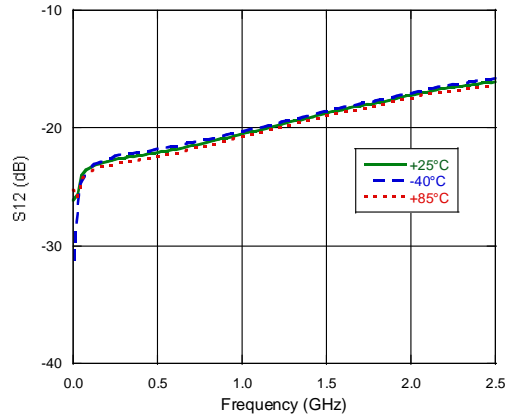
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Typical Performance Curves

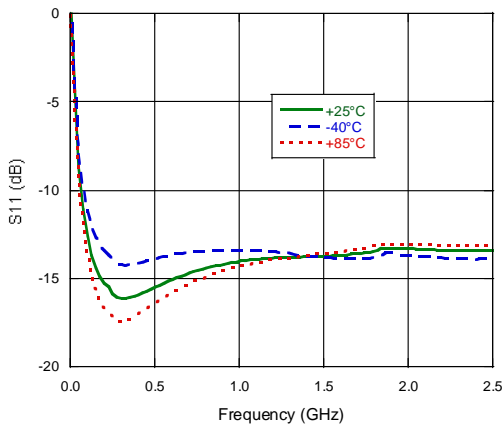
Gain



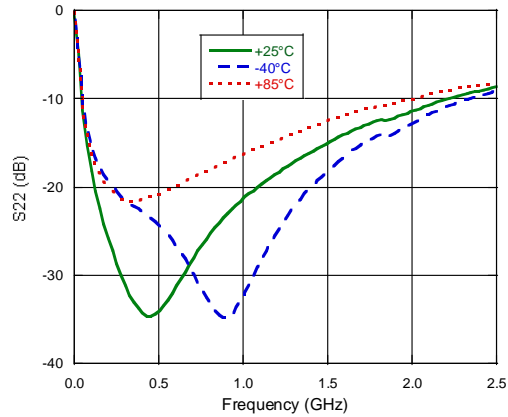
Reverse Isolation



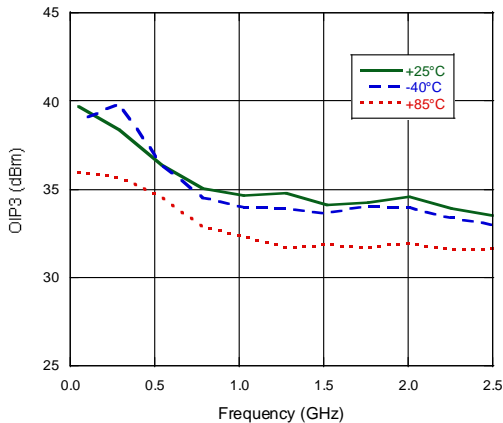
Input Return Loss



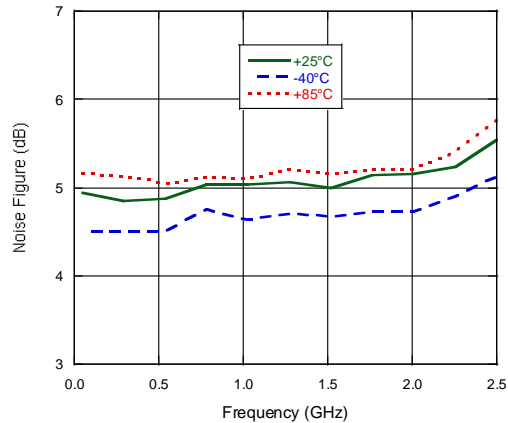
Output Return Loss



OIP3 ($P_{IN} = -13$ dBm / tone)



Noise Figure



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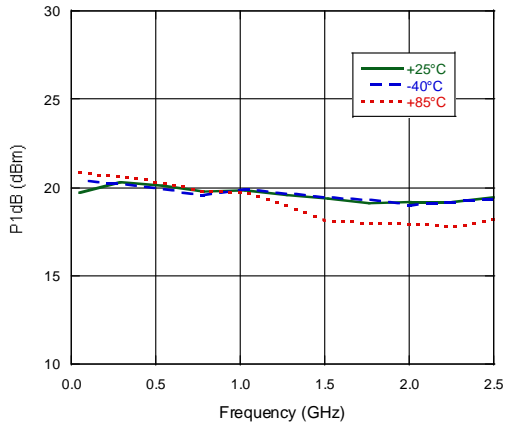
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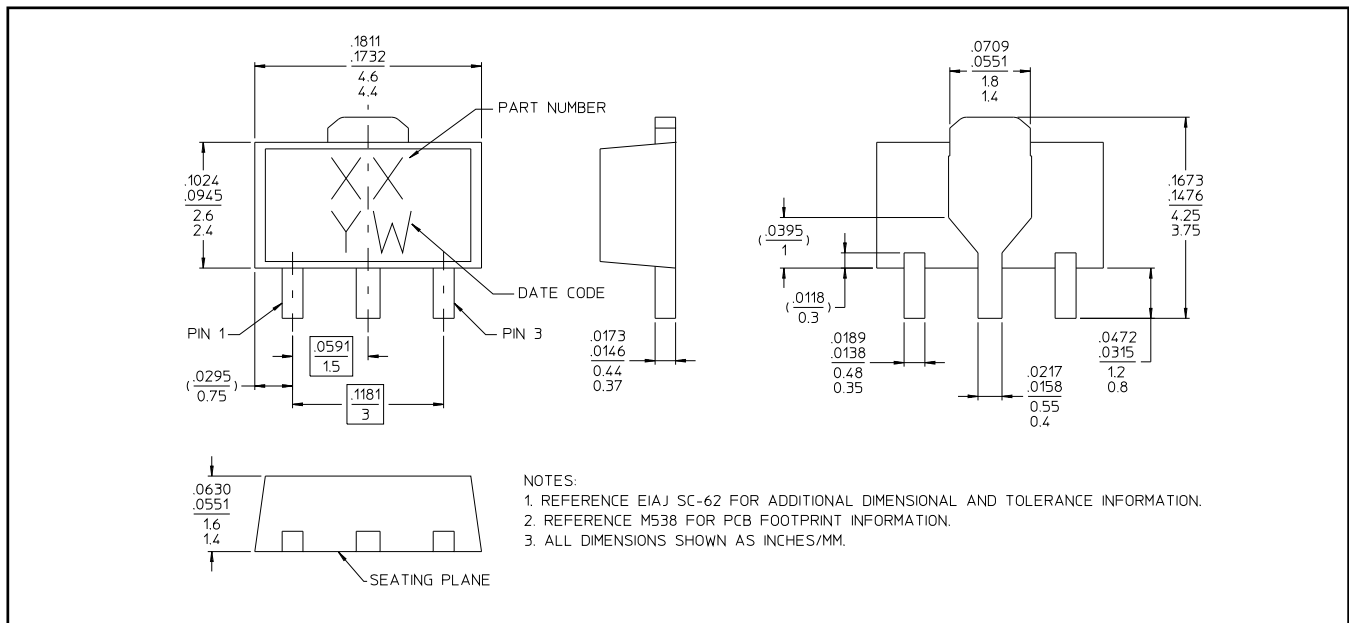
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Typical Performance Curves

P1dB



Lead-Free SOT-89 Plastic Package[†]



[†] Reference Application Note M538 for lead-free solder reflow recommendations.
Meets JEDEC moisture sensitivity level 1 requirements.