

Features

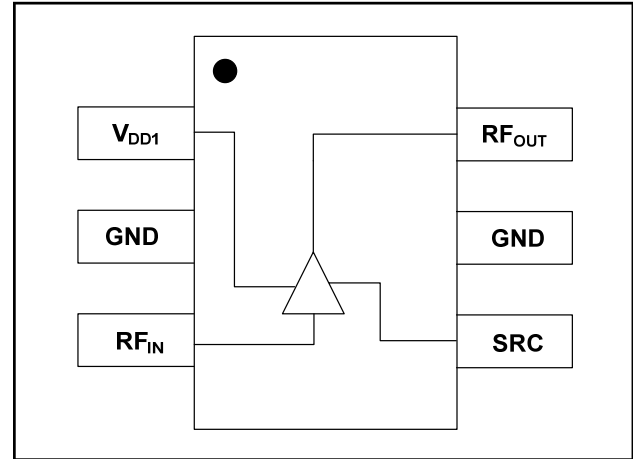
- Low Noise Figure: 0.75 dB at 2.3 GHz
- Single +3 to +5 V Supply Voltage
- Low Current: 7.5 mA typical
- Lead-Free SC70-6LD
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- RoHS* Compliant and 260°C Reflow Compatible

Description

M/A-COM's MAAL-008550 low noise amplifier is a GaAs MMIC amplifier in a lead-free SC70 surface mount plastic package. The MAAL-008550 employs a monolithic single stage design and can be biased from a single 3.0 volt supply. Any voltage between 3.0 and 5.0 volts can be used, depending on system requirements. Its low noise design provides usable performance from 0.5 to 3.0 GHz.

M/A-COM fabricates the MAAL-008550 using a low noise PHEMT process to realize low noise and high gain. The process features full passivation for performance and reliability.

Functional Schematic



Pin Configuration

Pin No.	Pin Name	Description
1	V _{DD1}	First stage positive supply voltage
2	GND	RF and DC Ground
3	RF _{IN}	RF Input of the amplifier
4	SRC	Source
5	GND	RF and DC Ground
6	RF _{OUT}	RF Output of the amplifier

Ordering Information ^{1,2}

Part Number	Package
MAAL-008550-000000	Bulk Packaging
MAAL-008550-TR3000	3000 piece reel
MAAL-008550-001SMB	Sample Board, 2.3 - 2.5 GHz Tuning

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

Absolute Maximum Ratings ^{3,4}

Parameter	Absolute Maximum
RF Input Power	0 dBm
Voltage	6.0 volts
Operating Temperature	-40 °C to +85 °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.

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

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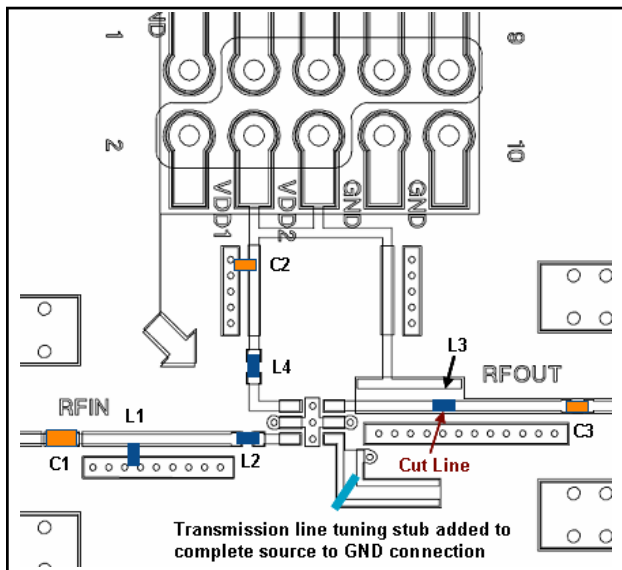
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Electrical Specifications: $V_{DD} = +3\text{ V}$, $T_A = 25\text{ }^\circ\text{C}$, $Z_0 = 50\text{ }\Omega$

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Gain	F = 2.3 GHz	dB	11.5	12.5	14.5
Noise Figure	F = 2.3 GHz	dB	—	0.75	0.9
Input Return Loss	F = 2.3 GHz	dB	—	14	—
Output Return Loss	F = 2.3 GHz	dB	—	17	—
Output P1dB	500 – 3000 MHz	dBm	—	1	—
Output IP ₃	500 – 3000 MHz	dBm	—	16.5	—
Current	—	mA	—	7.5	10.0

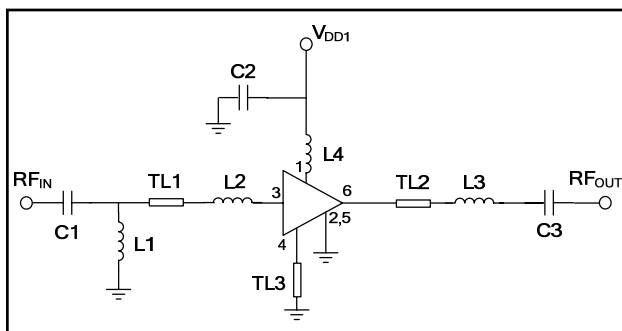
Recommended PCB Configuration



Parts List

Component	Value	Foot Print	Manufacturer
C1	8.2 pF	0603	ATC
C2	100 pF	0402	Murata
C3	0.1 μ F	0402	Murata
L1	2.4 nH	0402	Coilcraft
L2, L3	3.9 nH	0402	Toko
L4	3.9 nH	0402	Coilcraft
TL1	50 Ω , 21.5° @ 2.3 GHz		
TL2	50 Ω , 21° @ 2.3 GHz		
TL3	61.6 Ω , 25.3° @ 2.3 GHz		

Evaluation Board Schematic



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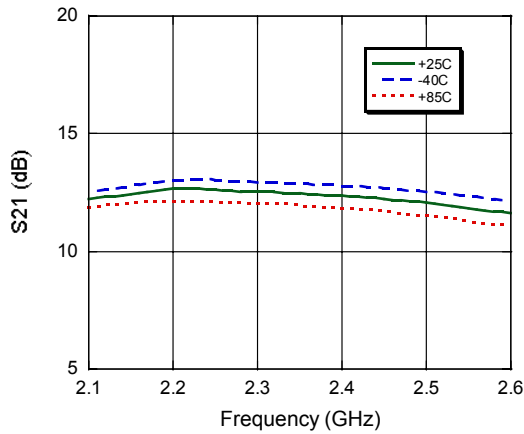
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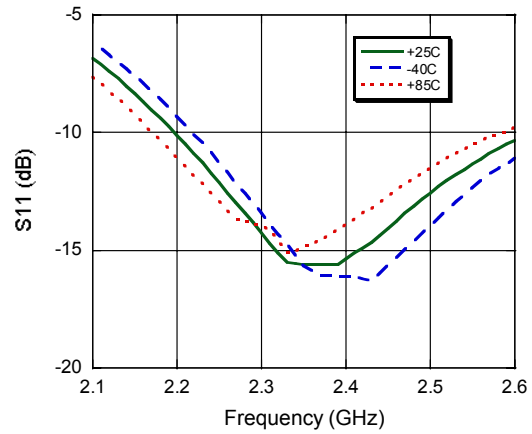
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Typical Performance Curves

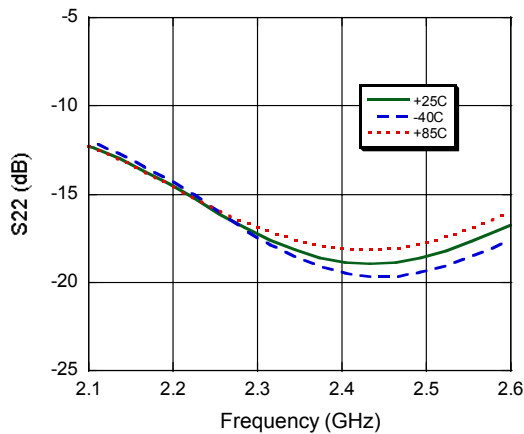
Gain



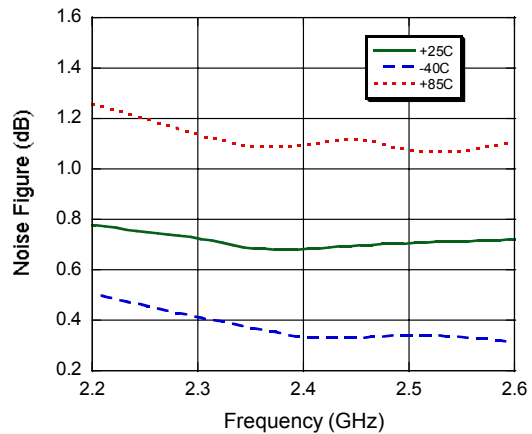
Input Return Loss



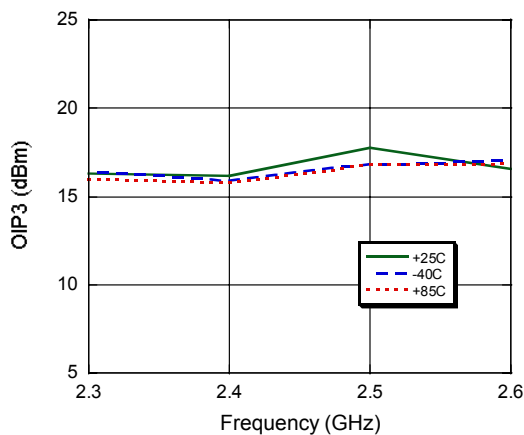
Output Return Loss



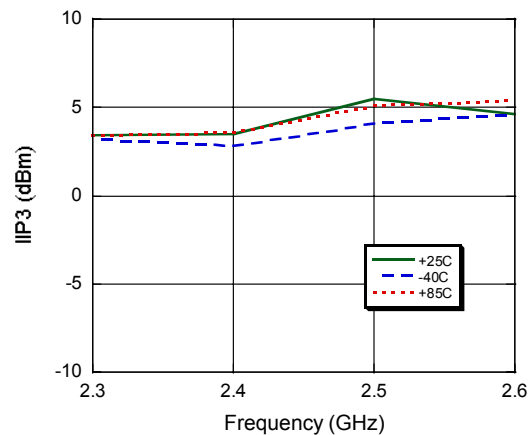
Noise Figure



Output IP3



Input IP3



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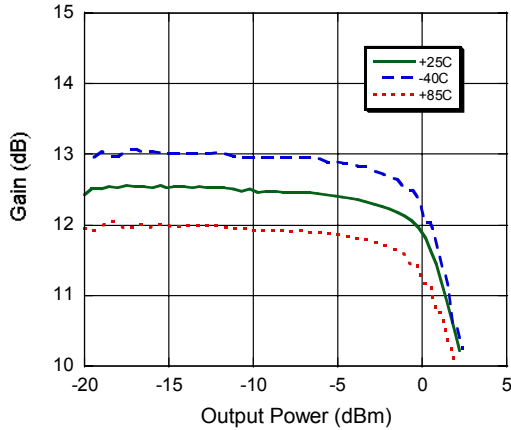
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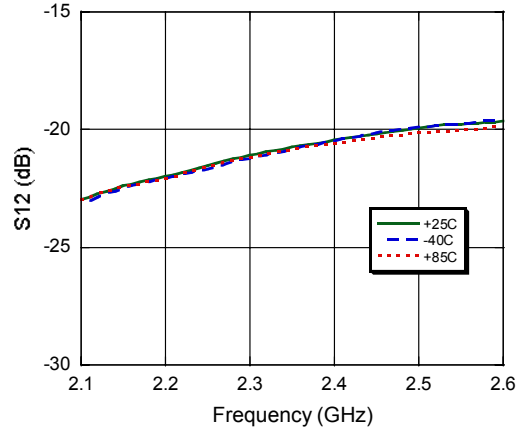
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Typical Performance Curves

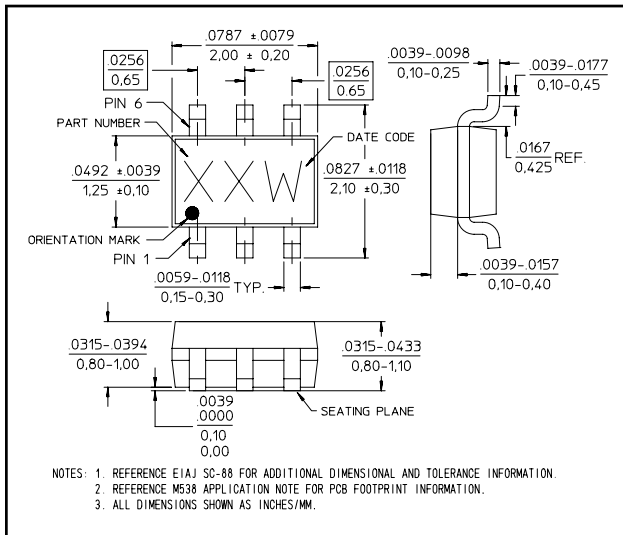
P1dB



Reverse Isolation



Lead-Free SC70-6LD†



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

Handling Procedures

Please observe the following precautions to avoid damage:

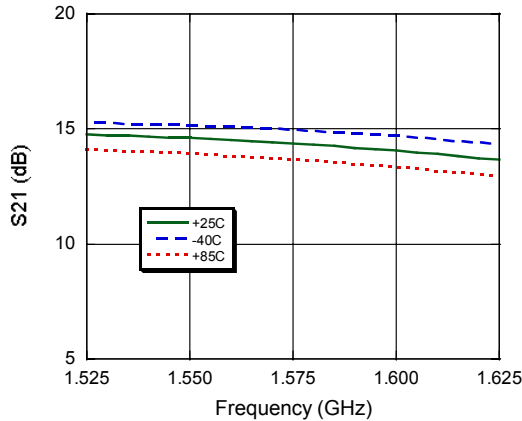
Static Sensitivity

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.

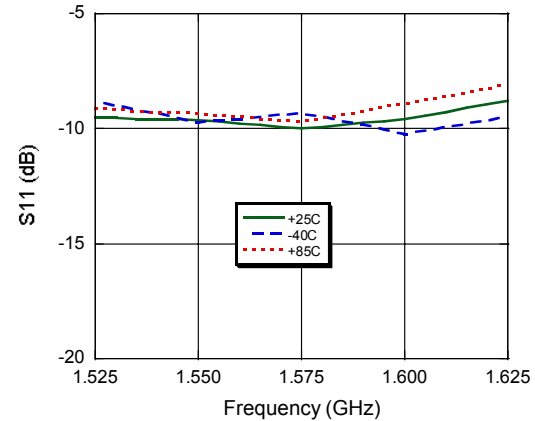
Applications Section

Typical Performance Curves, 1575 MHz Configuration

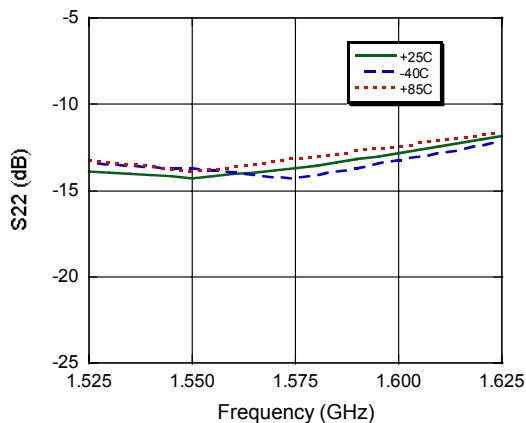
Gain



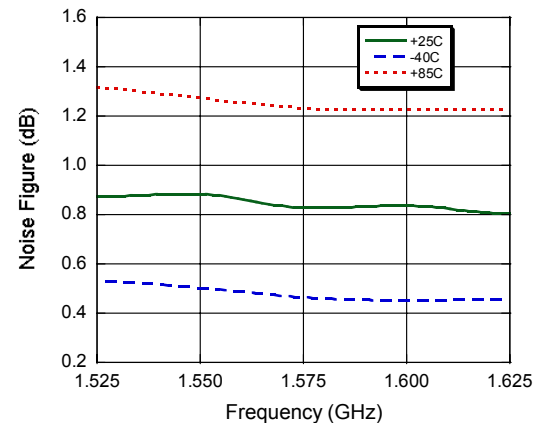
Input Return Loss



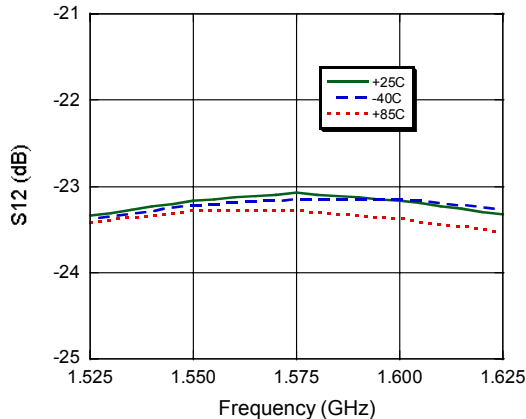
Output Return Loss



Noise Figure



Reverse Isolation



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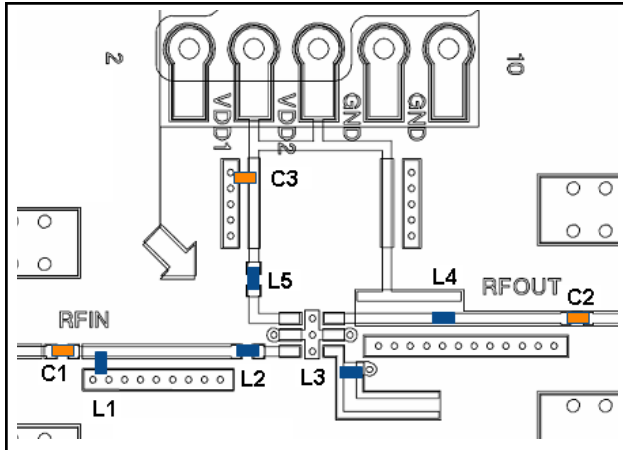
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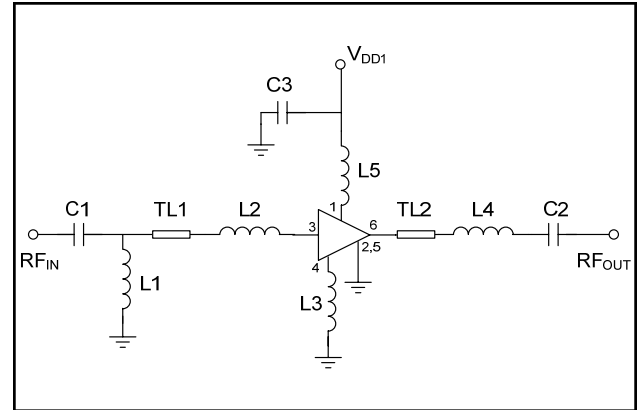
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Applications Section

1575 MHz PCB Layout



1575 MHz Schematic



1575 MHz Parts List

Component	Value	Footprint	Manufacturer
C1, C2	6.8 pF	0603	ATC
C3	0.1 μ F	0402	Murata
L1	3.6 nH	0402	Coilcraft
L2	10 nH	0402	Toko
L3	1.5 nH	0402	Toko
L4	8.2 nH	0402	Toko
L5	4.7 nH	0402	Toko
TL1	50 Ω , 19.0° @ 1.575 GHz		
TL2	50 Ω , 13.0° @ 1.575 GHz		