

High Dynamic Range LNA 1700 - 2400 MHz

MAALSS0045
V2

Features

- Ideal for Base Station Applications
- High Gain: 19 dB @ 2000 MHz
- Low Noise Figure: 1.4 dB
- High Input IP3: +13 dBm
- Lead-Free 3 mm 12-Lead PQFN Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- 260°C Reflow Compatible
- RoHS* Compliant Version of AM50-0012

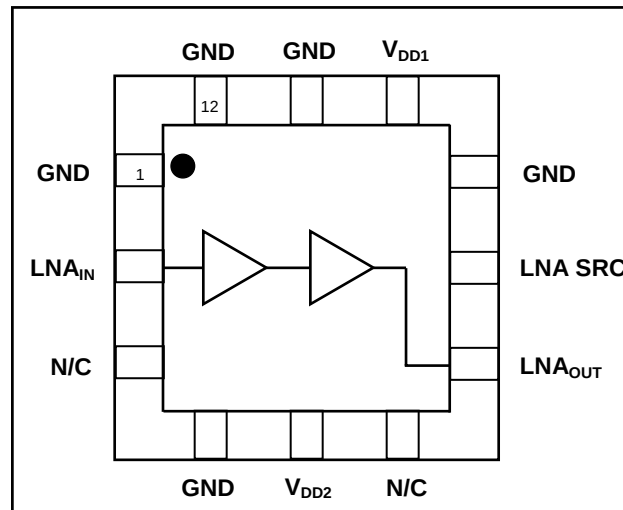
Description

M/A-COM's MAALSS0045 is a high dynamic range, GaAs MMIC, low noise amplifier in a lead-free 3 mm 12-lead PQFN package. It employs external matching to obtain optimum noise figure and intercept performance. The MAALSS0045 is operated with a supply voltage of +5V.

The MAALSS0045 is ideally suited for use where low noise figure, high gain, and high dynamic range are required. Typical applications included receiver front ends in TDMA, CDMA, and DCS base stations. It may also be used as an IF amplifier in certain other communication systems.

The MAALSS0045 is fabricated using a low-cost 0.5-micron gate E-D SAGFET GaAs process. This process features full passivation for increased reliability. The MAALSS0045 is 100% RF tested to ensure performance specification compliance.

Functional Block Diagram



Pin Configuration ²

Pin No.	Function	Pin No.	Function
1	Ground	7	LNA OUT
2	LNA IN	8	LNA SRC
3	No Connection	9	Ground
4	Ground	10	VDD1
5	VDD2	11	Ground
6	No Connection	12	Ground

2. The exposed pad centered on the package bottom must be connected to RF and DC Ground.

Ordering Information ¹

Part Number	Package
MAALSS0045TR-3000	3000 piece reel
MAALSS0045SMB	Units Mounted on Test Board

1. Reference Application Note M513 for reel size information.

Absolute Maximum Ratings ^{3,4}

Parameter	Absolute Maximum
Supply Voltage	7 V
RF Input Power	15 dBm
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.

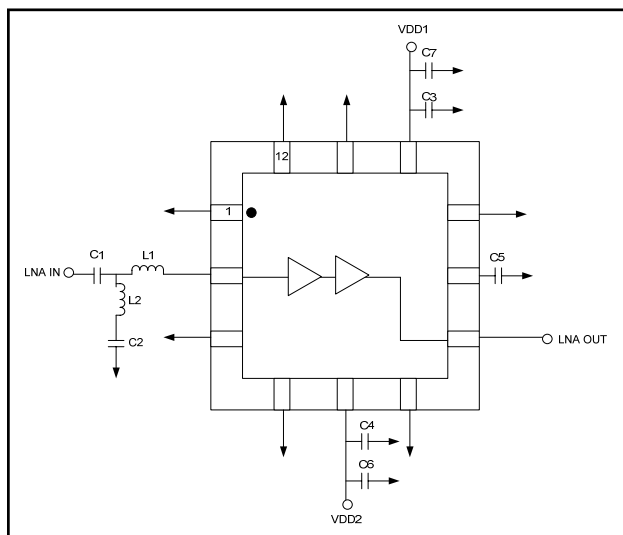
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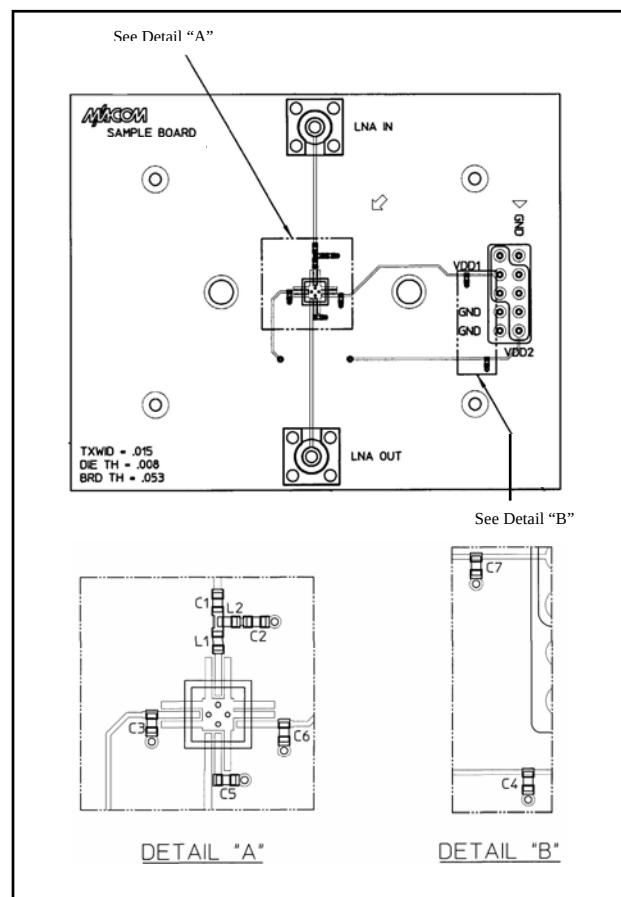
Electrical Specifications: $T_A = 25^\circ\text{C}$, $Z_0 = 50\ \Omega$, $F = 2000\ \text{MHz}$, $P_{IN} = -30\ \text{dBm}$

Parameter	Test Conditions	Units	Min	Typ	Max
Gain	5V	dB	18	19	21
Noise Figure	5V	dB	—	1.4	1.7
Output P1dB	5V	dBm	—	20	—
Input IP3	5V	dBm	11	13	—
Output IP3	5V	dBm	—	32	—
Input Return Loss	5V	dB	—	12	—
Output Return Loss	5V	dB	—	12	—
Drain Current	5V	mA	—	80	100

Sample Board Schematic



Recommended PCB Configuration



External Circuitry Parts List

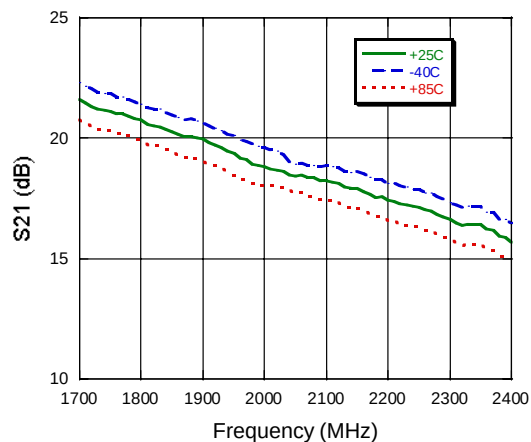
Ref. Designation	Value	Purpose
C1	3.3 pF	LNA Matching/DC Block
C2	0.1 μF	DC Block
C3, C4	1000 pF	RF Bypass
C5, C6, C7	0.1 μF	RF Bypass
L1	2 nH	LNA Matching
L2	2 nH	LNA Matching

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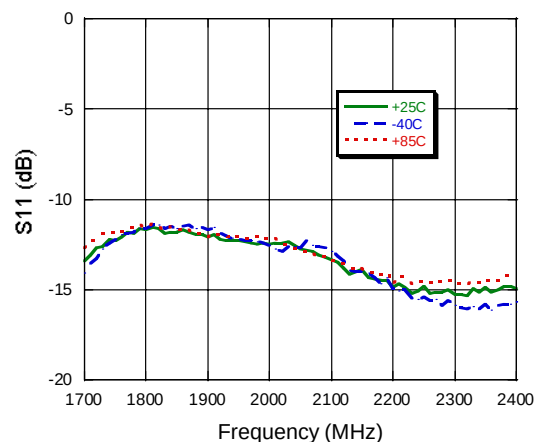
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Typical Performance Curves

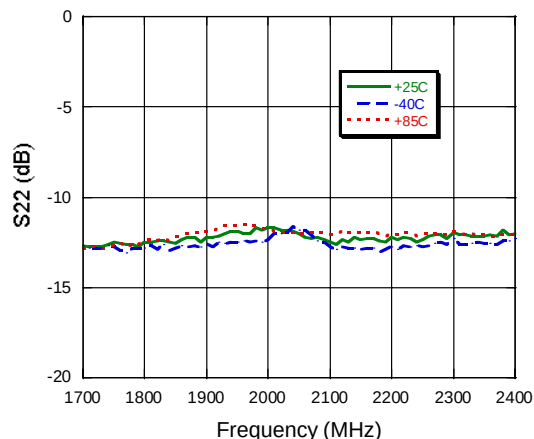
Gain



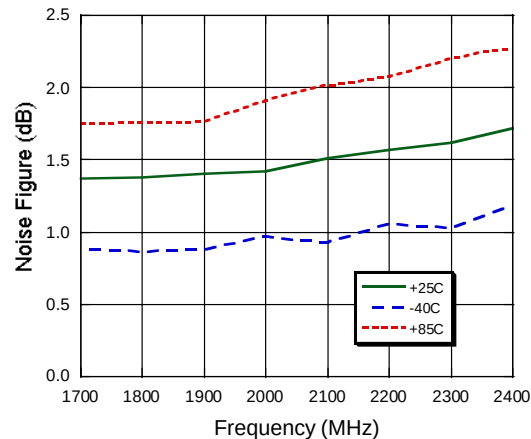
Input Return Loss



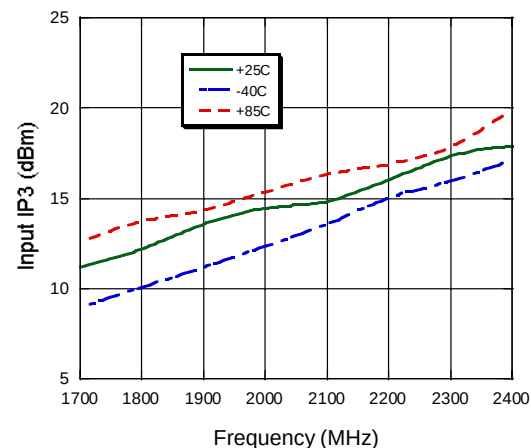
Output Return Loss



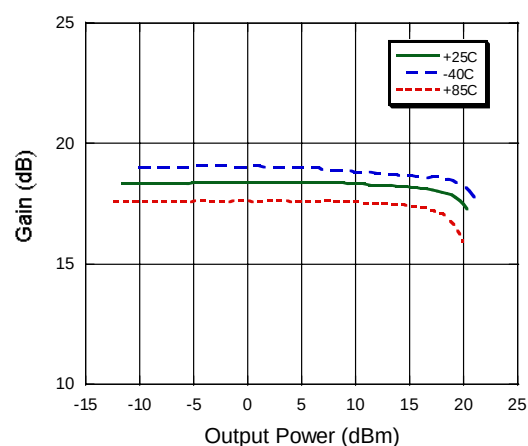
Noise Figure



Input IP3 (Pin = -15 dBm)



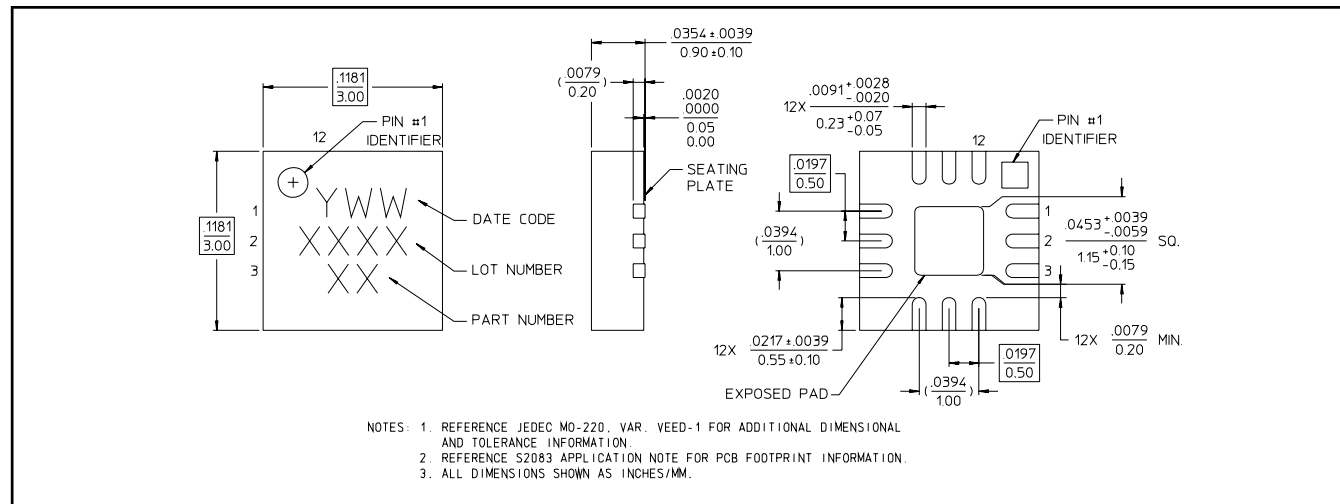
P1dB @ 2000 MHz



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Lead-Free 3 mm 12-Lead PQFN[†]



[†] Reference Application Note M538 for lead-free solder reflow recommendations.

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.