# High Dynamic Range LNA
# 1700 - 2400 MHz

**AM50-0012**
**V2**

## Features

- Ideal for Base Station Applications
- High Gain: 19 dB @ 2000 MHz
- Low Noise Figure: 1.4 dB
- High Input IP3: +13 dBm
- Small Footprint 3 mm 12 Lead PQFN Package

## Description

M/A-COM's AM50-0012 is a high dynamic range, GaAs MMIC, low noise amplifier in a low-cost small footprint 3 mm 12-lead PQFN package. It employs external matching to obtain optimum noise figure and intercept performance. The AM50-0012 is operated with a supply voltage of +5V.

The AM50-0012 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.

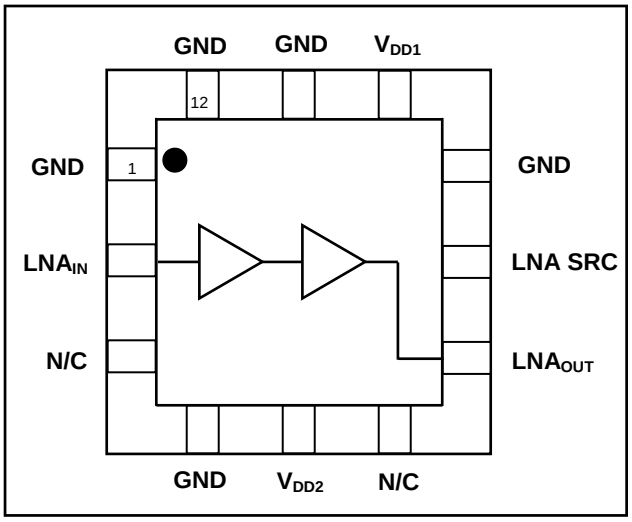
The AM50-0012 is fabricated using a low-cost 0.5-micron gate E-D SAGFET GaAs process. This process features full passivation for increased reliability. The AM50-0012 is 100% RF tested to ensure performance specification compliance.

## Ordering Information [1]

| Part Number | Package |
|---|---|
| AM50-0012TR | 1000 piece reel |
| AM50-0012TR-3000 | 3000 piece reel |
| AM50-0012SMB | Units Mounted on Test Board |

1. Reference Application Note M513 for reel size information.

## Functional Block Diagram




## Pin Configuration [2]

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

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

## Absolute Maximum Ratings [3]

| Parameter | Absolute Maximum |
|---|---|
| Supply Voltage | 7V |
| 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.



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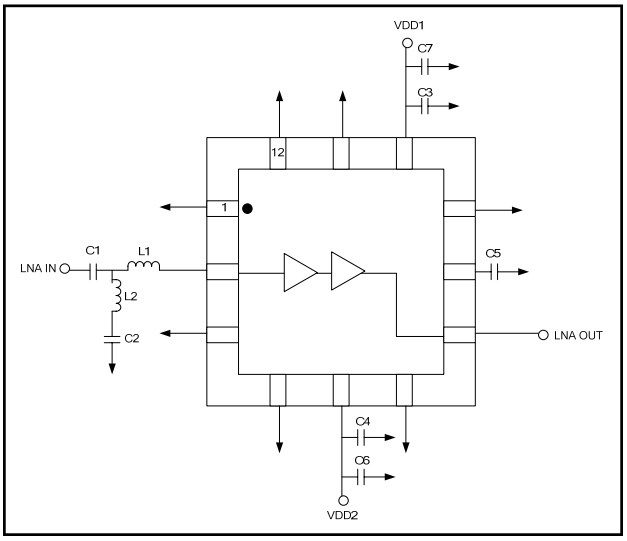
## Electrical Specifications: $T_A$ = 25°C, $Z_0$ = 50 Ohm, F = 2000 MHz, $P_{IN}$ = -30 dBm

| 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 |

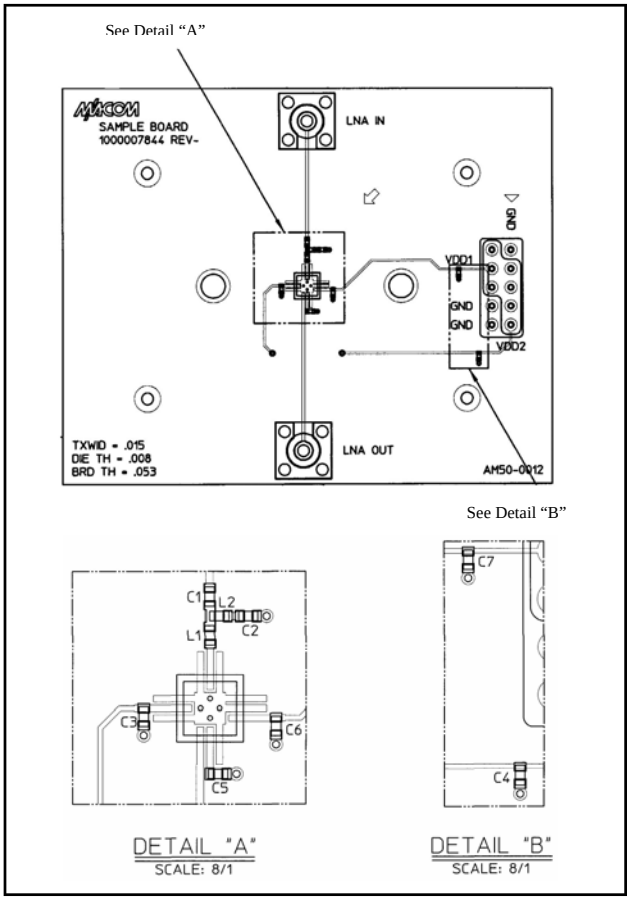
## Sample Board Schematic




## 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 |

## Recommended PCB Configuration



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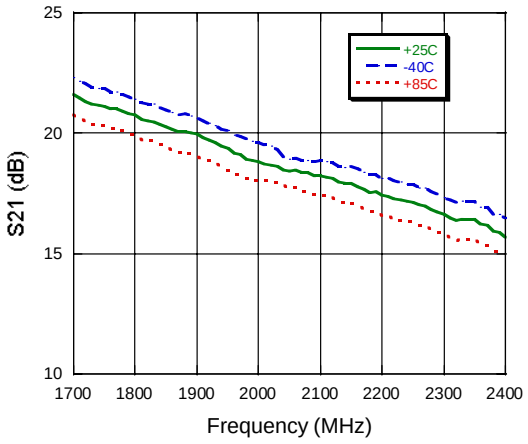
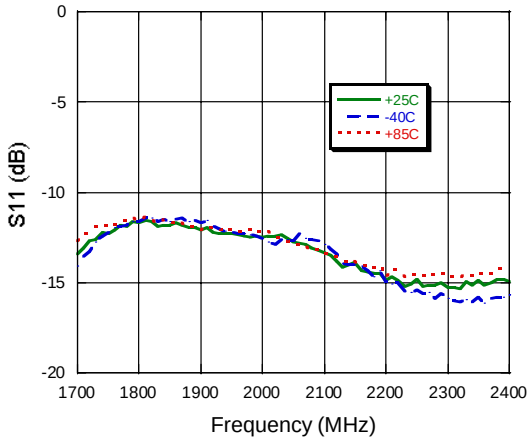
## Typical Performance Curves

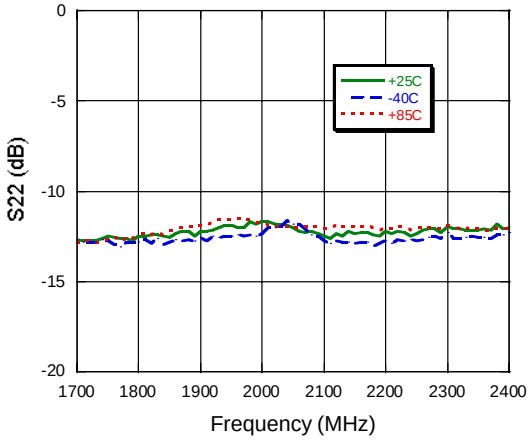
***Gain***



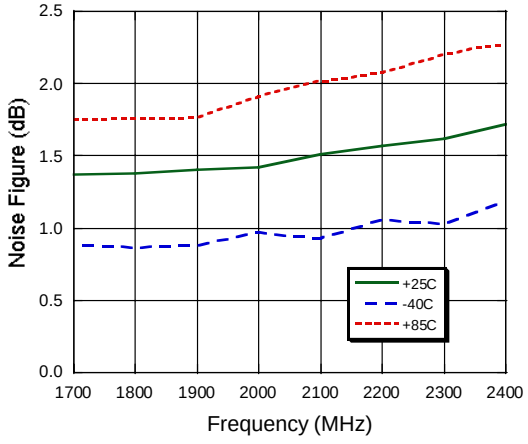

***Input Return Loss***



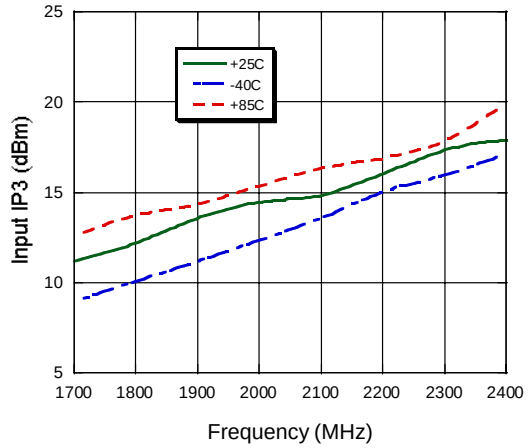

***Output Return Loss***



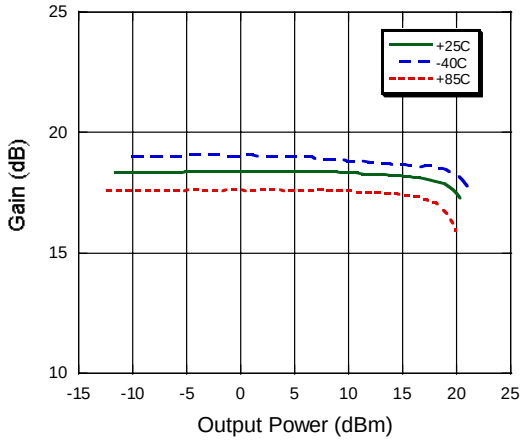

***Noise Figure***




***Input IP3 (Pin = -15 dBm)***




***P1dB @ 2000 MHz***



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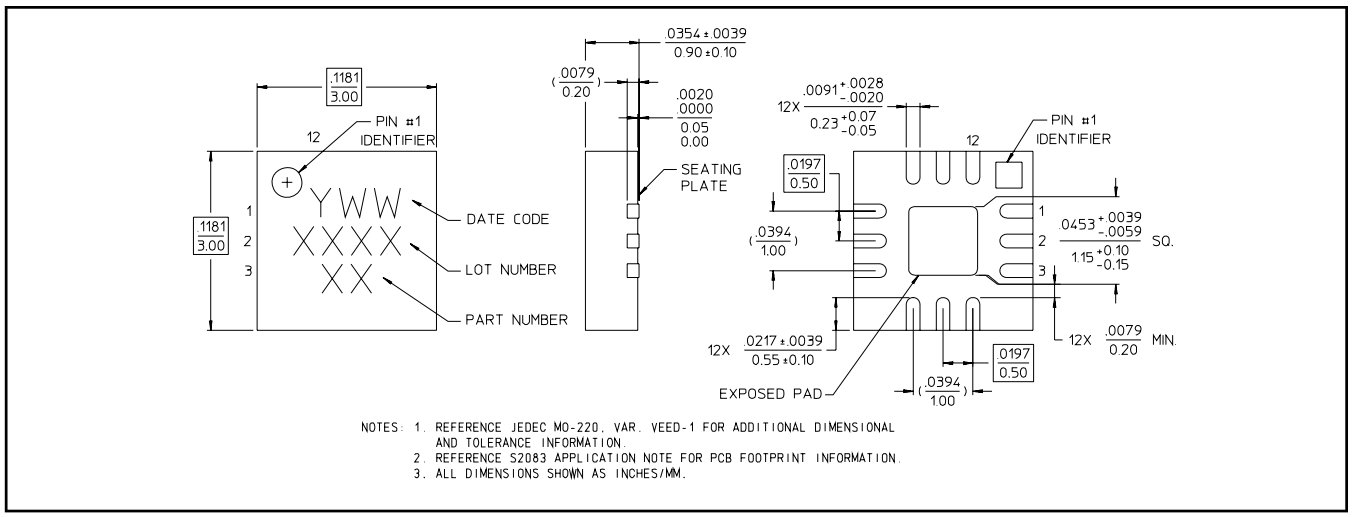
## 3 mm 12-Lead PQFN




## 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.



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