

Low Noise Amplifier

1.575 GHz

AM50-0002

V 2.00

Features

- Low Noise Figure: 1.15 dB
- High Gain: 27 dB
- Low Power Consumption: 3 to 5 V, 20 mA
- High Dynamic Range
- Low Cost SOIC 8 Plastic Package

Description

M/A-COM's AM50-0002 is a high performance GaAs MMIC low noise amplifier in a low cost SOIC 8-lead surface mount plastic package. The AM50-0002 employs a monolithic 3-stage self-bias design and a simple external matching network to obtain minimum noise figure. It can be biased using 3- or 5-volt supplies.

The AM50-0002 is ideally suited for use where low noise figure, high gain, high dynamic range and low power consumption are required. Typical applications include receiver front ends in the Global Positioning System (GPS) market, as well as standard gain blocks, buffer amps, driver amps and IF amps in both fixed and portable systems.

M/A-COM's AM50-0002 is fabricated using a mature 0.5-micron gate length GaAs process. The process features full passivation for increased performance reliability.

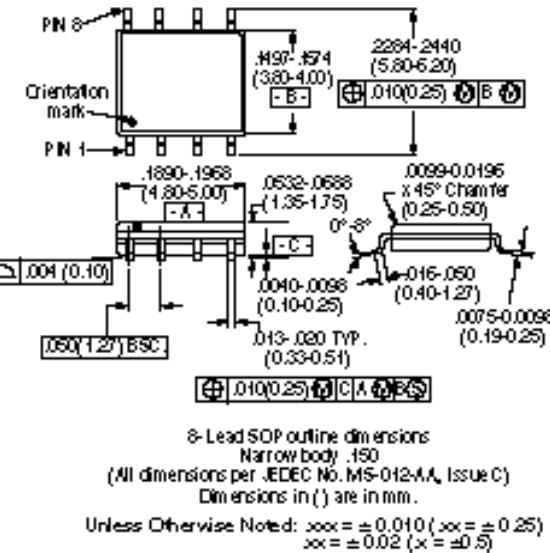
Electrical Specifications¹

$T_A = +25^\circ\text{C}$, $Z_0 = 50\Omega$, $V_{DD} = +5\text{V}$, $P_{IN} = -35 \text{ dBm}$, $f = 1.575 \text{ GHz}$

| Parameter | Units | Min. | Typ. | Max. |
|------------------------|-------|------|-------|------|
| Gain | dB | 25 | 27 | 29 |
| Noise Figure | dB | | 1.15 | 1.4 |
| Input VSWR | | | 2.0:1 | |
| Output VSWR | | | 1.5:1 | |
| Output1 dB Compression | dBm | | 1 | |
| Input IP ₃ | dBm | | -14 | |
| Reverse Isolation | dB | | 48 | |
| Bias Current | mA | 15 | 20 | 25 |

1. See following pages for 3-volt data.

SO-8



Ordering Information

| Part Number | Package |
|--------------|------------------------|
| AM50-0002 | SOIC 8-Lead Plastic |
| AM50-0002TR | Forward Tape and Reel* |
| AM50-0002RTR | Reverse Tape and Reel* |
| AM50-0002SMB | Designer's Kit |

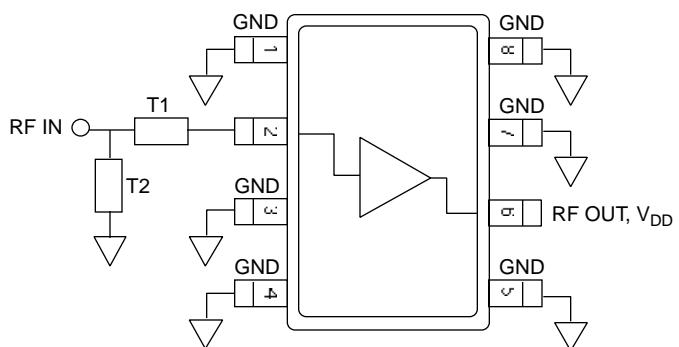
* If specific reel size is required, consult factory for part number assignment.

Absolute Maximum Ratings¹

| Parameter | Absolute Maximum |
|----------------------------------|------------------|
| V_{DD} | +10 VDC |
| Input Power | +17 dBm |
| Channel Temperature ² | +150°C |
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -65°C to 150°C |

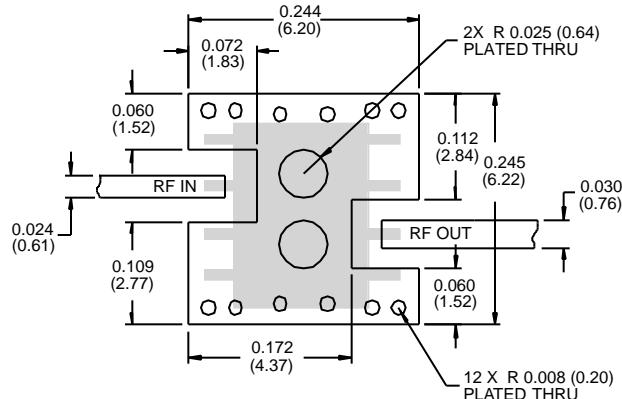
1. Operation of this device outside these limits may cause permanent damage.
2. Typical thermal resistance (θ_{JC}) = +165°C/W

Functional Diagram



Recommended PCB Configuration

Dimensions in inches (mm)

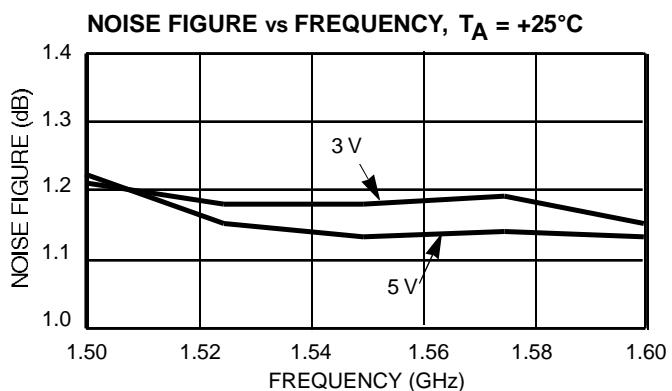
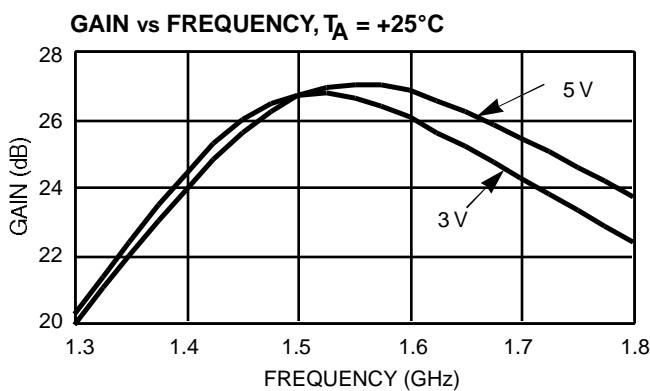


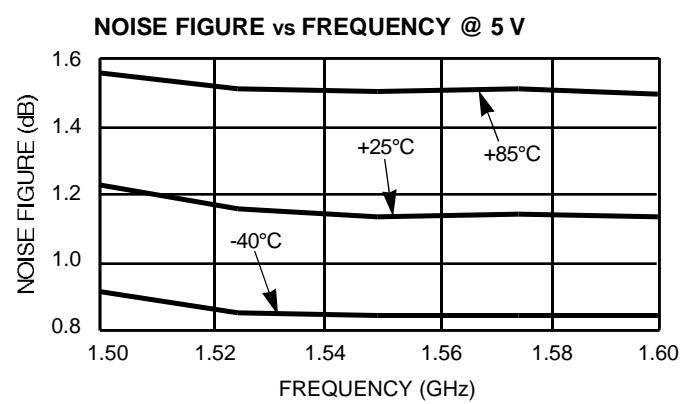
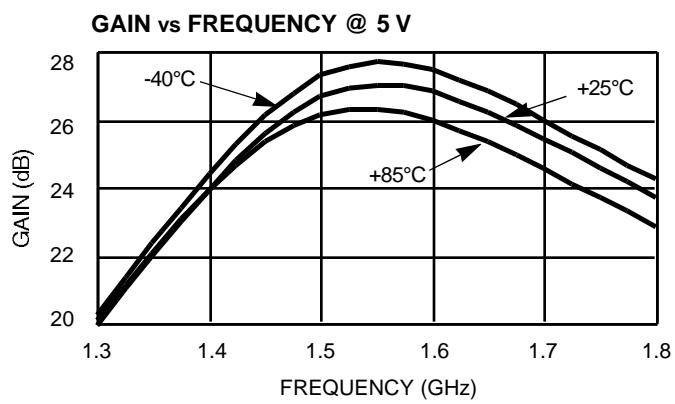
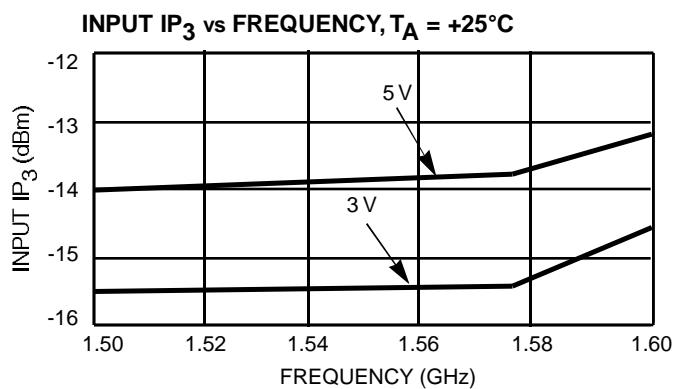
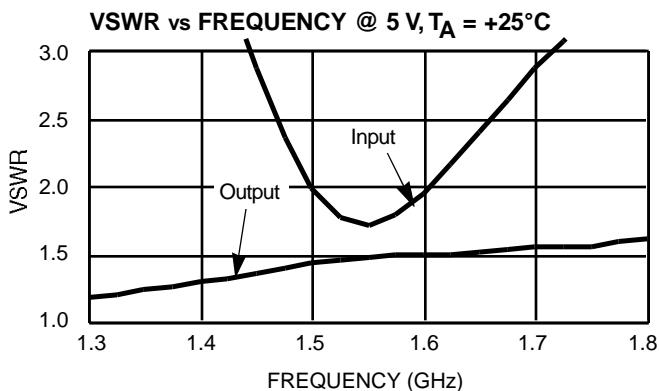
FR-4 circuit board, thickness = 0.016 inches (0.41)

| Frequency = 1.575 GHz | | |
|-----------------------|-----------|-------------------|
| | Impedance | Electrical Length |
| T1 | 57.2 Ω | 36.0° |
| T2 | 82.7 Ω | 16.2° |

3. Pins 1, 3, 4, 5, 7 and 8 must be RF and DC grounded as shown.
4. Pin 2 is the RF input and must be connected to the simple matching network shown.
5. Pin 6 is the RF output. V_{DD} is also applied on pin 6.

Typical Performance





Additional information is available in Application Note M540,
"M/A-COM GaAs MMIC LNA SOIC-8 Platform."