

# Low Cost MMIC Mixer, 2.1 – 2.7 GHz

V 1.0

MD54-0007

## Features

- MMDS and WLAN Applications
- +18 dBm Input 1 dB Compression Point
- Greater than 20 dB LO to RF Isolation
- +13 dBm LO Drive Level
- No DC Bias Required
- Ultra-Miniature SOT-25 Plastic Package

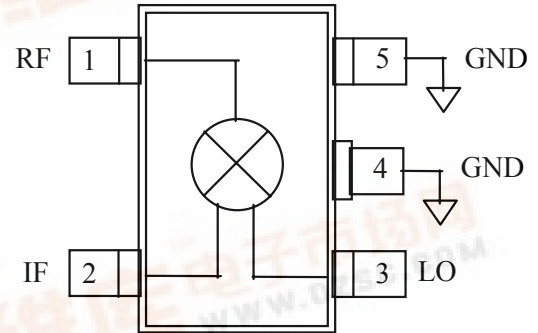
## Description

M/A-COM's MD54-0007 is a passive mixer that achieves the performance of a double balanced diode mixer in an ultra-miniature SOT-25 package. The MD54-0007 is ideally suited for use where high level RF signals and very wide dynamic range are required. Typical applications include frequency up/down conversion, modulation, and demodulation in receivers and transmitters for basestation and portable systems.

The MD54-0007 employs GaAs FETs as mixing elements to achieve a very wide dynamic range in a low cost plastic package. The mixer operates with LO drive levels of +13 dBm to +18 dBm. The LO port may be externally tuned for operation in various frequency bands.

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

## Functional Schematic



## Pin Configuration

| Pin | Function | Description    |
|-----|----------|----------------|
| 1   | RF       | RF Input Port  |
| 2   | IF       | IF Output Port |
| 3   | LO       | LO Input Port  |
| 4   | GND      | Ground         |
| 5   | GND      | Ground         |

## Ordering Information

| Part Number      | Description              |
|------------------|--------------------------|
| MD54-0007TR      | 7 inch, 1000 piece reel  |
| MD54-0007TR-3000 | 13 inch, 3000 piece reel |
| MD54-0007SMB     | Sample Test Board        |

Specifications subject to change without notice.

- North America: Tel. (800) 366-2266
- Asia/Pacific: Tel.+81-44-844-8296, Fax +81-44-844-8298
- Europe: Tel. +44 (1344) 869 595, Fax+44 (1344) 300 020

tyco Electronics

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**Electrical Specifications:  $T_A = 25\text{ }^\circ\text{C}$ ,  $Z_0 = 50\ \Omega$** <sup>1,2</sup>

| Parameter       | Test Conditions  | Units | Min | Typ   | Max |
|-----------------|--|-------|-----|-------|-----|
| RF Frequency    |  | GHz   | 2.1 |       | 2.7 |
| Conversion Loss |  | dB    |     | 8.0   | 9.0 |
| Isolation       | LO to RF   | dB    | 15  | 25    |     |
|                 | LO to IF   | dB    |     | 18    |     |
|                 | RF to IF   | dB    |     | 18    |     |
| VSWR            | RF Port  |       |     | 2.0:1 |     |
|                 | LO Port  |       |     | 2.0:1 |     |
|                 | IF Port  |       |     | 2.0:1 |     |
| P1dB            |  | dBm   |     | 18    |     |
| Two-Tone IMR    | Two tones each at 0 dBm, tone spacing = 300 KHz,<br>IF = 150 MHz | dBc   | 45  | 50    |     |

1. RF signal is 2428 MHz at 0 dBm, LO signal is 2278 MHz at +13 dBm and IF signal is 150 MHz unless otherwise specified.
2. With external LO port matching. See application schematic.

**Absolute Maximum Ratings**<sup>1,2</sup>

| Parameter             | Absolute Maximum |
|-----------------------|------------------|
| Max RF Input Power    | +27 dBm          |
| Max LO Drive Level    | +27 dBm          |
| Operating Temperature | -40°C to +85°C   |
| Channel Temperature   | +150°C           |
| Storage Temperature   | -40°C to +150°C  |

1. Exceeding any one or combination of these limits may cause permanent damage.
2. Ambient Temperature, +25°C.

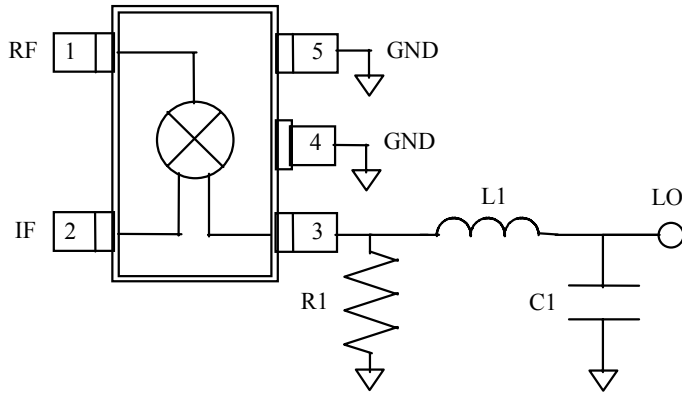
**Application Information****Static Sensitivity**

Gallium arsenide integrated circuits are ESD sensitive and can be damaged by static electricity. Use proper ESD precautions when handling these devices.

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Application Schematic

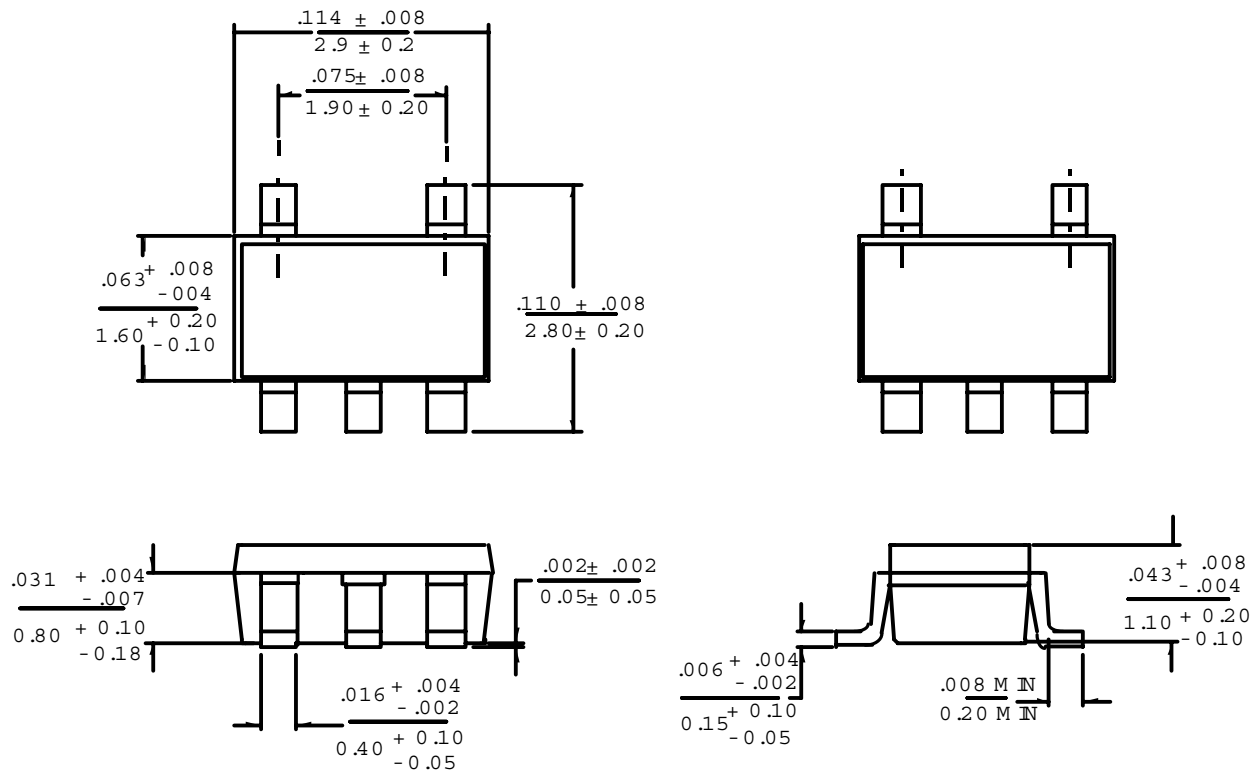


External Circuitry Parts List

| Part | LO = 2278 MHz |
|------|---------------|
| R1   | 1.0 KΩ        |
| L1   | 2.7 nH        |
| C1   | 2.2 pF        |

All off-chip components are low-cost surface mount components obtainable from multiple sources. (.060 in. x .030 in. or .080 in. x .050 in. )

SOT-25 Package



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