

### Low Cost MMIC Mixer 2.1 - 2.7 GHz

Rev. V4

#### **Features**

- MMDS and WLAN Applications
- Input Power @ 1 dB Compression: +18 dBm
- LO to RF Isolation: > 20 dB
- +13 LO Drive Level
- Does not require DC bias
- 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 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 MD54-0007 is fabricated using a mature 0.5 micron gate length GaAs MESFET process. The process features full passivation for increased performance and reliability.

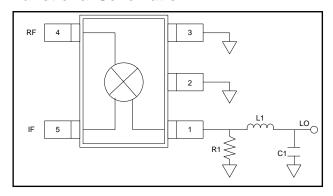
## Ordering Information <sup>1</sup>

Commitment to produce in volume is not guaranteed.

Part Number	Package
MD54-0007TR	1000 piece reel
MD54-0007TR-3000	3000 piece reel
MD54-0007SMB	Sample Test Board

1. Reference Application Note M513 for reel size information.

#### **Functional Schematic**



### **Pin Configuration**

Pin No.	Pin Name	Description	
1	LO Port	LO Input	
2	GND	Ground	
3	GND	Ground	
4	RF Port	RF Port RF Input	
5	IF Port	IF Output	

### **External Circuitry Parts List**

Part	LO = 2278 MHz
R1	1.0 ΚΩ
L1	2.7 nH
C1	2.2 pF

2. All off-chip components are low-cost surface mount components obtainable from multiple sources (0.060 in. x 0.030 in. or 0.080 in. x 0.050 in).

typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available.



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# Electrical Specifications: $T_A = 25$ °C, $ZO = 50 \Omega^{3,4}$ , RF Frequency: 2.1 - 2.7 GHz

Parameter	Test Conditions	Units	Min	Тур	Max
Conversion Loss	_	dB	_	8.0	9.0
Isolation	LO to RF LO to IF RF to IF	dB dB dB	15 — —	25 18 18	_ _ _
VSWR	RF Port LO Port IF Port	Ratio Ratio Ratio	_ _ _	2.0:1 2.0:1 2.0:1	
P1dB	_	dBm	_	18	_
Two-Tone IMR	Two Tones at 0 dBm each, Tone spacing = 300 KHz, IF = 150 MHz	dBc	45	50	_

<sup>3.</sup> RF signal is 2428 MHz at 0 dB, LO signal is 2278 MHz at +13 dBm and IF signal is 150 MHz unless otherwise specified.

### Absolute Maximum Ratings 5

Parameter	Absolute Maximum		
RF Input Power <sup>6</sup>	+27 dBm		
LO Drive Power <sup>6</sup>	+27 dBm		
Operating Temperature	-40°C to +85°C		
Storage Temperature	-40°C to +150°C		
Channel Temperature	+150°C		

<sup>5.</sup> Exceeding any one or combination of these limits may cause permanent damage to this device.

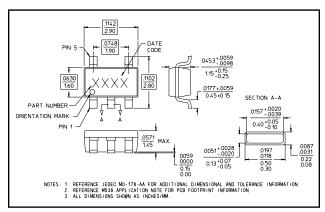
# **Handling Procedures**

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.

#### **SOT-25**



<sup>4.</sup> With external LO port matching. See functional schematic.

<sup>6.</sup> Ambient Temperature  $(T_A) = +25$ °C

Visit www.macomtech.com for additional data sheets and product information.