Low Cost MMIC Mixer 2.1 - 2.7 GHz

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.

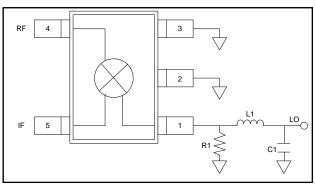
M/A-COM's MD54-0007 is fabricated using a mature 0.5 micron gate length GaAs MESFET process. The process features full passivation for increased performance and reliability.

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

Ordering Information¹

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 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).

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India Tel: +91.80.43537383
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Visit www.macomtech.com for additional data sheets and product information.

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Rev. V4





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Rev. V4

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

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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	—

3. 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.

4. With external LO port matching. See functional schematic.

Absolute Maximum Ratings ⁵

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

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

6. Ambient Temperature $(T_A) = +25^{\circ}C$

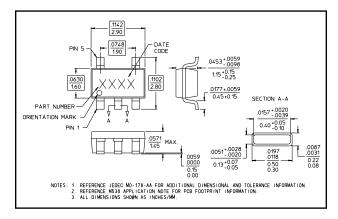
Handling Procedures

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



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