



# MH101

High Dynamic Range MMIC Mixer

The Communications Edge™

Product Information

## Product Features

- +30 dBm Input IP3
- No External Matching Elements Required
- RF 1900-2200 MHz
- LO 1700-2150 MHz
- IF 50-200 MHz
- +17 dBm Drive Level
- Low Cost SOIC-8 Package
- No External Bias Required

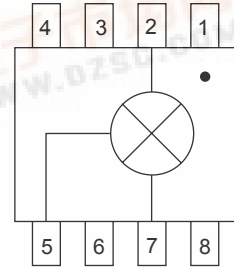
## Product Description

The MH101 is a passive GaAs MESFET mixer that provides high dynamic range performance in a low cost SOIC-8 package. WJ's MH101 uses patented techniques to realize greater than +30 dBm Input IP3 at an LO drive level of +17 dBm.

This single monolithic integrated circuit does not require any external baluns, bias, matching, or decoupling elements. The on-chip diplexer affords good matching on the RF and IF ports.

Typical applications include frequency up/down conversion, modulation and demodulation for receivers and transmitters used in 3G UMTS systems.

## Functional Diagram



Function	Pin No.
RF	7
LO	2
IF	5
Ground	1,3,4,6,8

## Specifications

Parameter	Units	Minimum	Typical	Maximum	Condition
Frequency Range:					
RF	MHz	1900		2200	
LO	MHz	1700		2150	
IF	MHz	50		200	
SSB Conversion Loss	dB		9.0	10.5	
Noise Figure	dB		9.5		
Input IP3	dBm	+28	+30		
Input P1dB	dBm		+16		
Isolation:					
L-R	dB	21	28		
L-I	dB	27	37		
R-I	dB	12	18		
Return Loss:					
RF Port	dB		15		
LO Port	dB		12		
IF Port	dB		20		
LO Drive Level	dBm		+17		

Test conditions unless otherwise noted: RF / IF = 1900 / 50, 1900 / 200, 2200 / 50 and 2200 / 200 MHz with a low-side LO at +17 dBm in a downconverting application at 25°C. Input IP3 was measured with two tones with an input power of +2 dBm/tone separated by 10 MHz.

## Absolute Maximum Ratings<sup>1</sup>

Parameter	Rating
Operating Case Temperature	-40 to +85°C
Storage Temperature	-65 to +100°C
Maximum Input LO Power <sup>2</sup>	+21 dBm

1. Operation of this device above any of these parameters may cause permanent damage.  
2. Total sum of LO port and RF port power should not to exceed +23 dBm.

## Ordering Information

Part No.	Description
MH101	High Dynamic Range MMIC Mixer (Available in tape and reel)
MH101-PCB	Fully Assembled Application Circuit





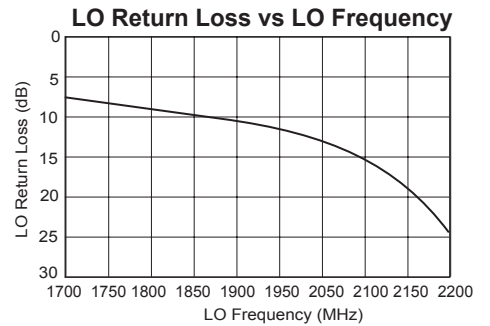
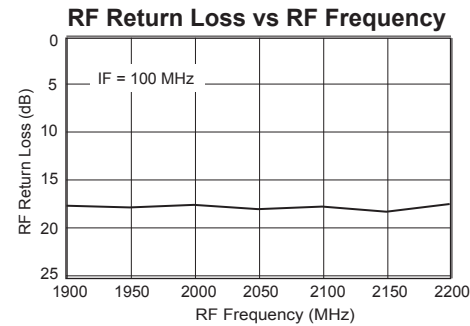
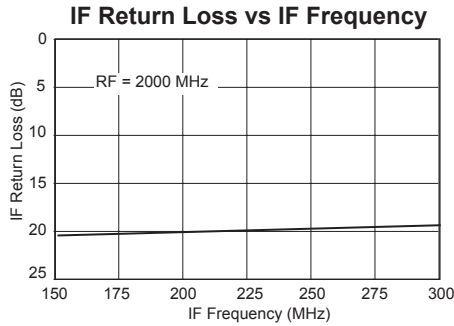
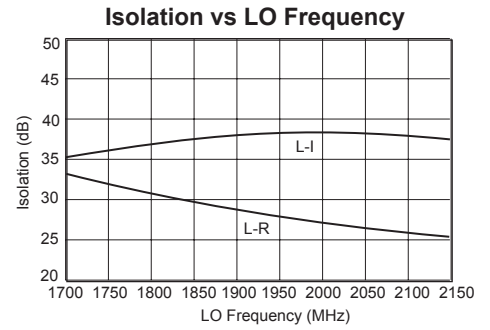
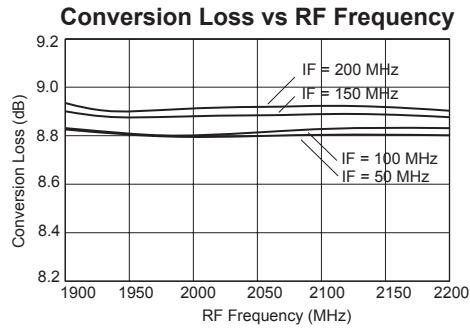
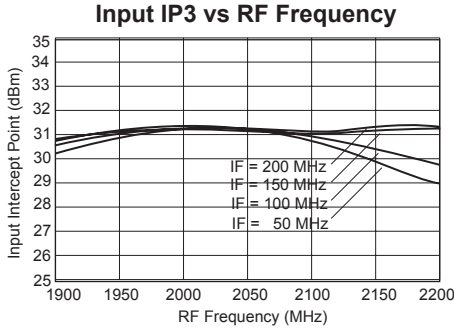
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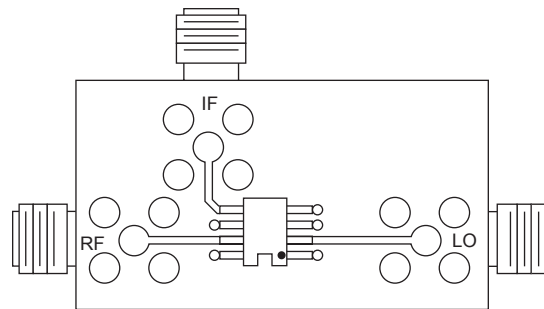
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## Performance Charts



Data was taken using the application board in a 50 W system, with a low side LO at +17 dBm in a downconverting application at 25°C. Input IP3 was measured with two tones with an input power of +5 dBm/tone separated by 1 MHz.

## Application Circuit





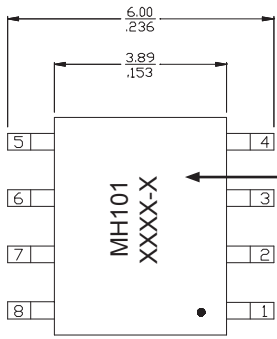
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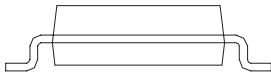
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Product Information

## Outline Drawing

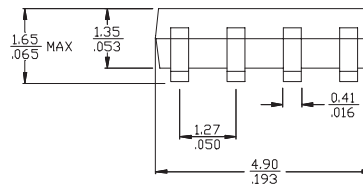


TOP VIEW



'MH101' = Part Designation  
'XXXX-X' = Lot Code

mm  
inch



## MSL / ESD Rating



Caution! ESD sensitive device.

ESD Rating: Class 0

Value: Passes between 150V and 200V

Test: Human Body Model (HBM)

Standard: JEDEC Standard JESD22-A114

ESD Rating: Class II

Value: Passes between 250V and 500V

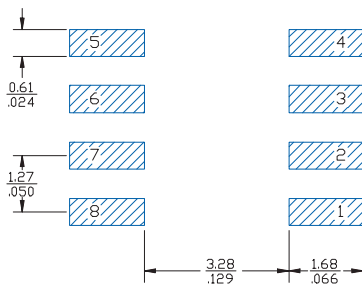
Test: Charged Device Model (CDM)

Standard: JEDEC Standard JESD22-C101

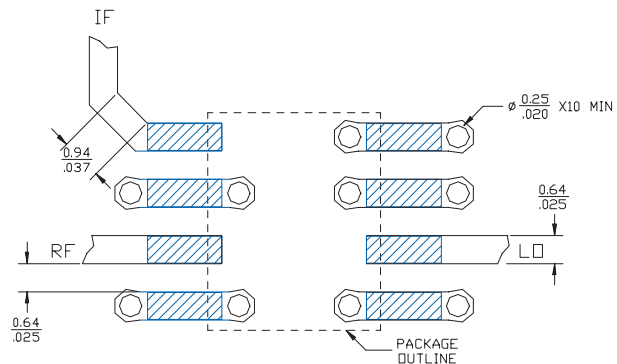
MSL Rating: Level 3

Standard: JEDEC Standard J-STD-020A

## Land Pattern



## Mounting Configuration



FUNCTION	PIN NO.
GROUND	1
LD	2
GROUND	3-4
IF	5
GROUND	6
RF	7
GROUND	8

- Notes: 1. Ground vias are critical for thermal and RF grounding considerations.  
 2. A minimum of 10 ground vias are required for 14 mil and 28 mil FR4 board.  
 3. If your PCB design rules allow, ground vias should be placed under the land pattern for better RF and thermal performance. Otherwise ground vias should be placed as close to land pattern as possible.  
 4. Trace width depends on PC board.