MH1

High Dynamic Range MMIC Mixer

The Communications Edge™

Product Information

Product Features

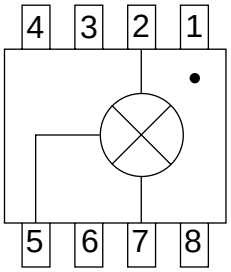
- +30 dBm Input IP3
- No External Matching Elements Required
- RF 1700-2000 MHz
- LO 1450-1950 MHz
- IF 50-250 MHz
- +17 dBm Drive Level
- Low Cost SOIC-8 Package
- No External Bias Required

Product Description

The MH1 is a passive FET mixer that provides high dynamic range performance in a low-cost SOIC-8 package. WJ's FET based MH1 uses patented techniques to realize +30 dBm IIP3 at an LO drive level of +17 dBm. The product is fully self contained and does not require any external bias, matching or decoupling elements.

Typical applications include frequency up/down conversion, modulation and demodulation for receivers and transmitters used in PCS, DCS1800 and PHS 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	1700		2000	
LO	MHz	1450		1950	
IF	MHz	50		250	
SSB Conversion Loss	dB		8.8	10.5	
Noise Figure	dB		9.1		
Isolation:					
L-R	dB	21	35		
L-I	dB	27	38		
R-I	dB	12	18		
IIP3	dBm	+28	+30		
Return Loss:					
RF Port	dB		16		
LO Port	dB		13		
IF Port	dB		13		
Input P1dB	dBm		18		
LO Drive Level	dBm		+17		

Test conditions unless otherwise noted, RF / IF = 1900 / 150, 2000 / 50, and 2000 / 250 MHz with a low-side LO at 17 dBm in a downconverting application at 25°C.
Input IP3 is measured with two tones with an input power of +5 dBm/tone separated by 10 MHz.

Absolute Maximum Ratings[1]

Parameter	Rating
Operating Case Temperature	-40 to +85°C
Storage Temperature	-65 to +100°C
Maximum Input LO Power[2]	+21 dBm

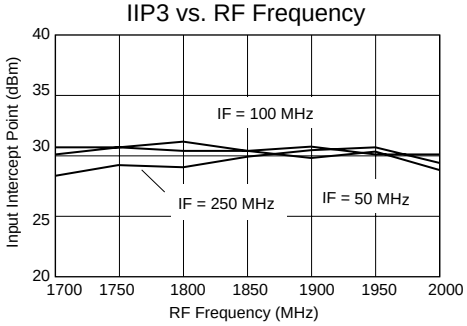
1. Operation of this device above any of these parameters may cause permanent damage.
2. Total sum of LO port and RF port power should not to exceed +23 dBm.

Ordering Information

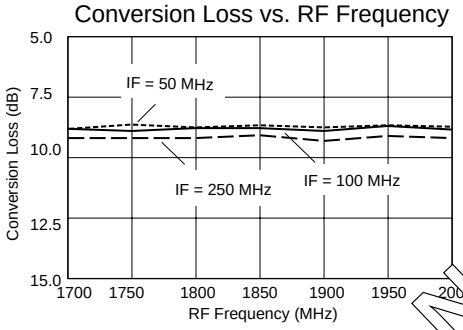
Part No.	Description
MH1	High Dynamic Range MMIC Mixer (Available in tape and reel)
MH1-PCB	Fully Assembled Application Circuit

Performance Charts

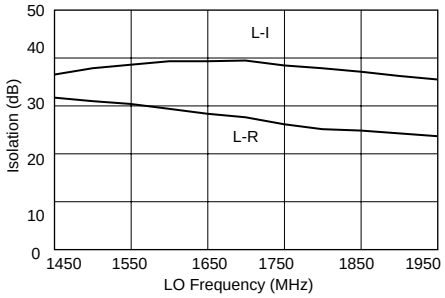
IIP3 vs. RF Frequency



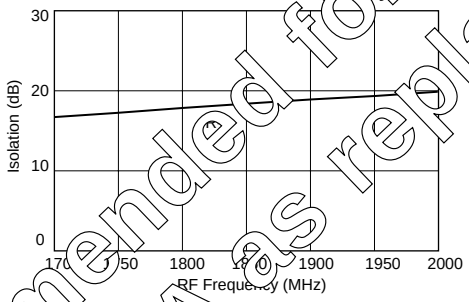
Conversion Loss vs. RF Frequency



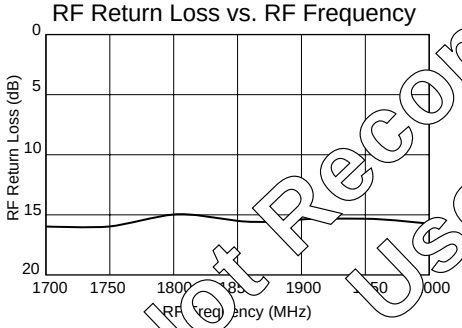
Isolation vs. LO Frequency



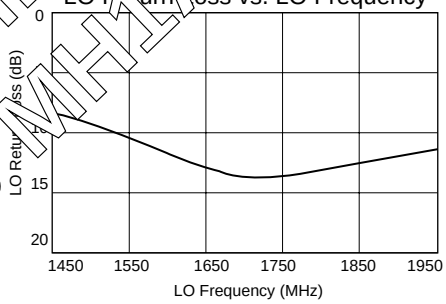
Isolation vs. RF Frequency



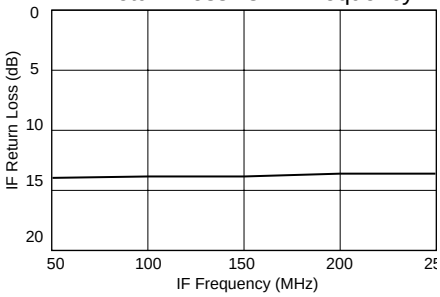
RF Return Loss vs. RF Frequency



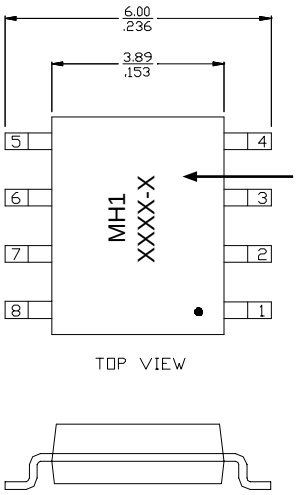
LO Return Loss vs. LO Frequency



IF Return Loss vs. IF Frequency



Outline Drawing



MSL / ESD Rating

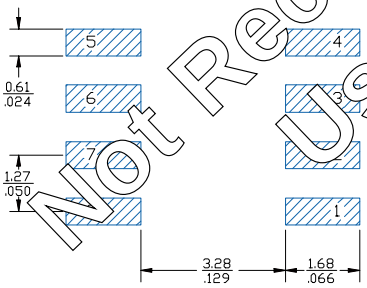
Caution: ESD sensitive device.

ESD Rating: Class 0
Value: Passes between 150V and 200V
Test: Human Body Model (HBM)
Standard: JEDEC Standard JESD22-A114

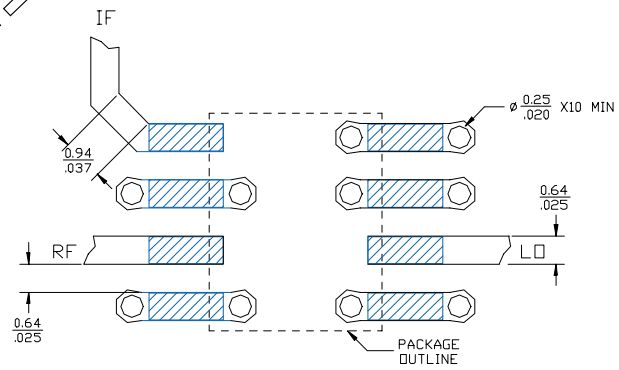
ESD Rating: Class II
Value: Passes between 250V and 500V
Test: Charged Device Model (CDM)
Standard: JEDEC Standard JESD22-C101

MSL Rating: Level 3
Standard: JEDEC Standard J-STD-020A

Land Pattern



Mounting Configuration



FUNCTION	PIN NO.
GROUND	1
LO	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 minimun 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.