



MH1

High Dynamic Range MMIC Mixer

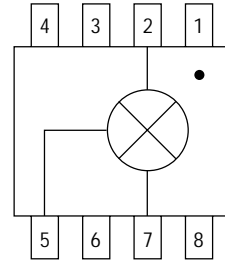
Product Features

- +30 dBm IIP3
- No External Matching Elements Required
- RF 1700-2000 MHz
- LO 1450-1950 MHz
- IF 50-250 MHz IF
- +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		
Noise Figure	dB		9.1		
Isolation:					
L-R	dB		26		
L-I	dB		38		
R-I	dB		18		
IIP3	dBm		30		RF = 1850 MHz (0 dBm)
Return Loss:					
RF Port	dB		15		
LO Port	dB		13		
IF Port	dB		13		
Input P1dB	dBm		18		
LO Drive Level	dBm		17		

Test conditions unless otherwise noted, RF = 1850 MHz (-10 dBm), LO = 1750 MHz (17 dBm), IF = 100 MHz and 25°C.

Data was taken using the application board detailed in Figure 1, a 50 Ω system, low side LO and downconverter application.

Absolute Maximum Ratings¹

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 exceed +23 dBm.

Ordering Information

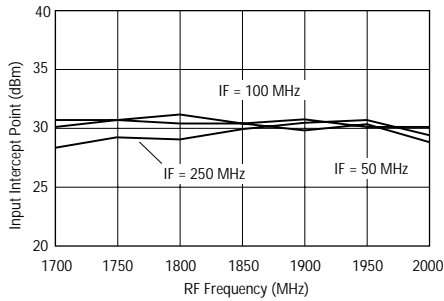
Part No.	Description
MH1	High Dynamic Range MMIC Mixer (Available in tape and reel)
MH1-PCB	Fully Assembled Application Circuit

MH1

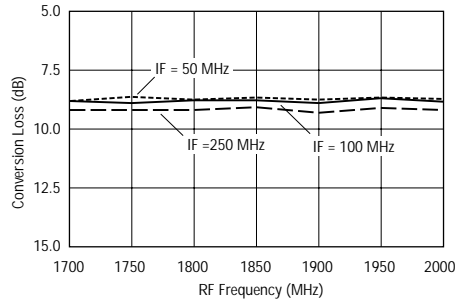
Advanced Product Information

Performance Charts

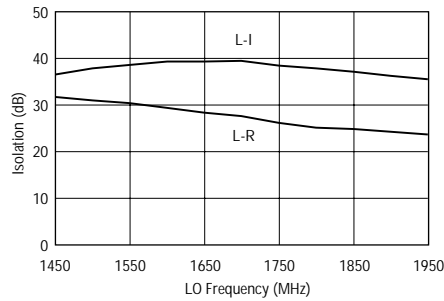
IIP3 vs. RF Frequency



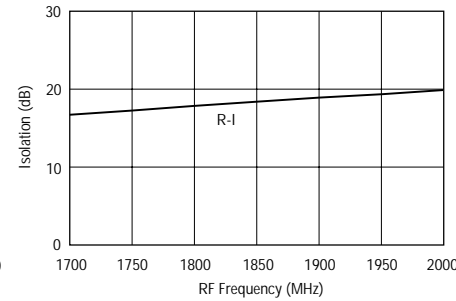
Conversion Loss vs. RF Frequency



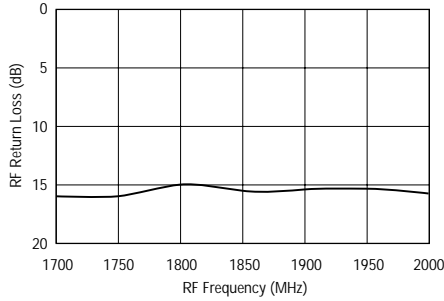
Isolation vs. LO Frequency



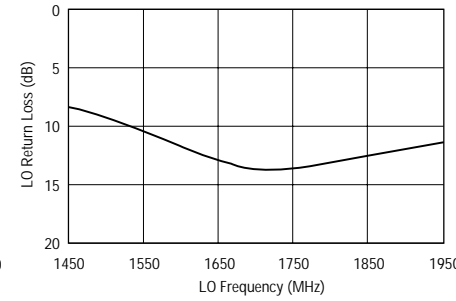
Isolation vs. RF Frequency



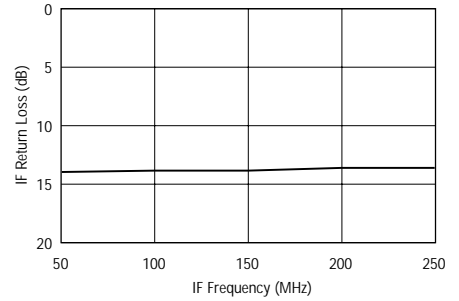
RF Return Loss vs. RF Frequency



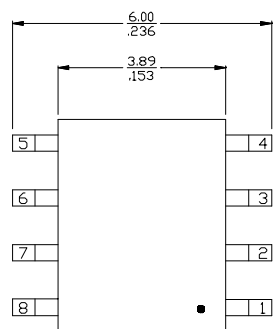
LO Return Loss vs. LO Frequency



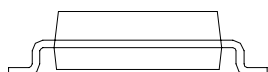
IF Return Loss vs. IF Frequency



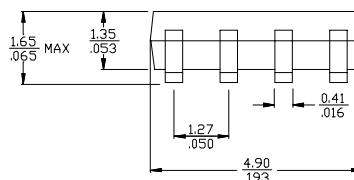
Outline Drawing



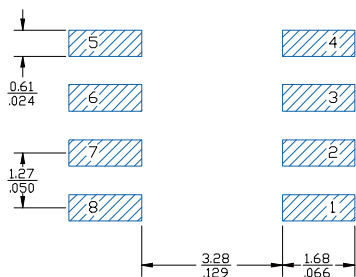
TOP VIEW



mm
inch

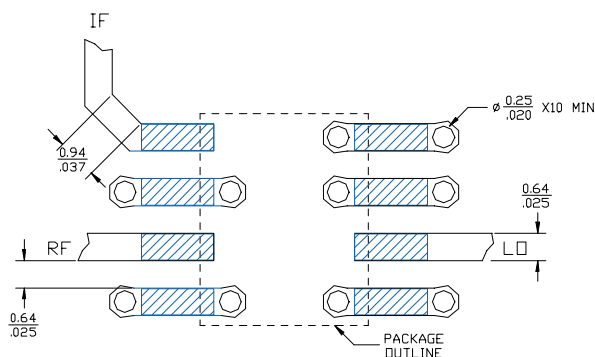


Land Pattern



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

Mounting Configuration



- 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.



