

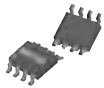


MH102

High Dynamic Range UMTS MMIC Mixer

Product Features

- +32 dBm Input IP3
- No External Matching Elements or External Bias Required
- RF 1900-2200 MHz
- IF 150-300 MHz
- Low Cost SOIC-8 Package
- UMTS Up/Down Converter
- 1930-1990 MHz Up Converter



Actual Size

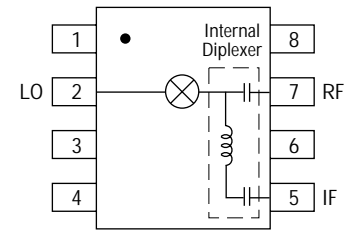
Product Description

The MH102 is a passive GaAs MESFET mixer that provides high dynamic range performance in a low cost SOIC-8 package. WJ's MH102 uses patented techniques to realize +32 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 or 1930-1990 MHz PCS band mobile infrastructure.

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	
IF	MHz	150		300	
SSB Conversion Loss	dB		9.0	10.5	
Noise Figure	dB		9.5		
Input IP3	dBm	+28	+32		
Input P1dB	dBm		+16		
Isolation:					
L-R	dB		27		
L-I	dB		35		
R-I	dB		18		
Return Loss:					
RF Port	dB		15		
LO Port	dB		12		
IF Port	dB		20		
LO Drive Level	dBm		+17		

Data was taken using the application board in a 50 Ω 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 10 MHz.

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 to exceed +23 dBm.

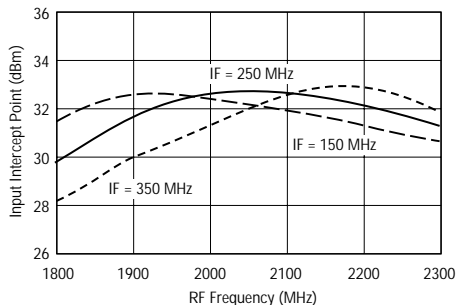
Ordering Information

Part No.	Description
MH102	High Dynamic Range MMIC Mixer (Available in tape and reel)
MH102-PCB	Fully Assembled Application Circuit

Performance Charts

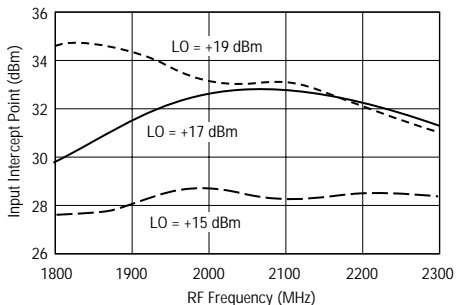
Input IP3 vs RF Frequency

Low-side Downconversion, LO = +17 dBm, 25°C



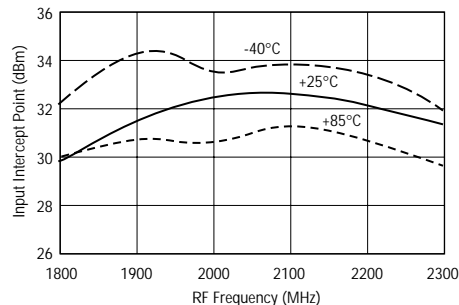
Input IP3 vs RF Frequency

Low-side Downconversion, IF = 250 MHz, 25°C



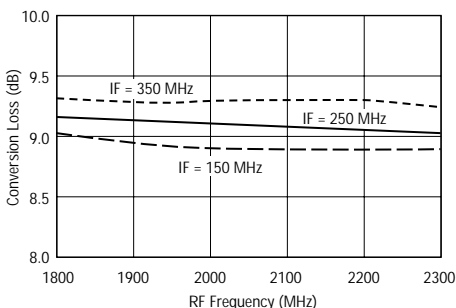
Input IP3 vs RF Frequency

Low-side Downconversion, IF = 250 MHz



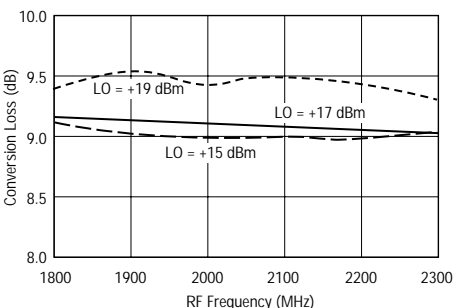
Conversion Loss vs RF Frequency

Low-side Downconversion, LO = +17 dBm, 25°C



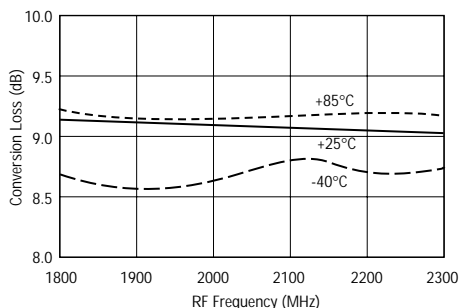
Conversion Loss vs RF Frequency

Low-side Downconversion, IF = 250 MHz, 25°C



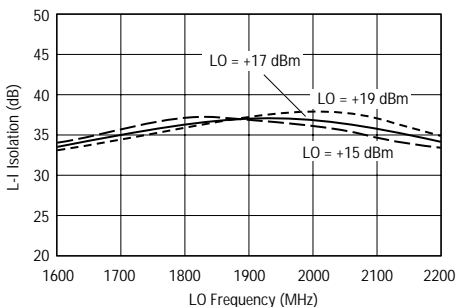
Conversion Loss vs RF Frequency

Low-side Downconversion, IF = 250 MHz



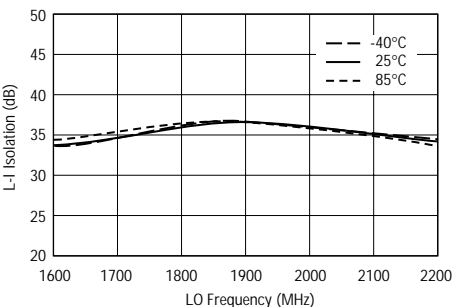
L-I Isolation vs LO Frequency

Low-side Downconversion, 25°C



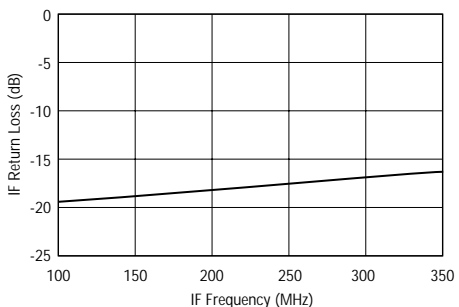
L-I Isolation vs LO Frequency

Low-side Downconversion



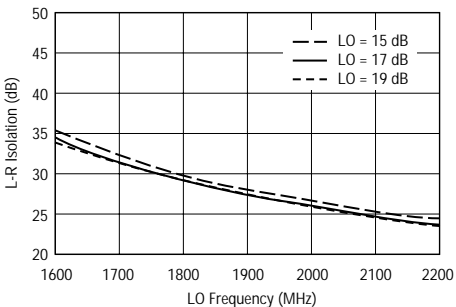
IF Return Loss vs IF Frequency

RF = 2000 MHz, LO = +17 dBm, 25°C



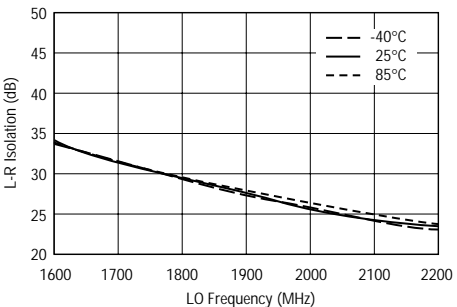
L-R Isolation vs LO Frequency

Low-side Downconversion



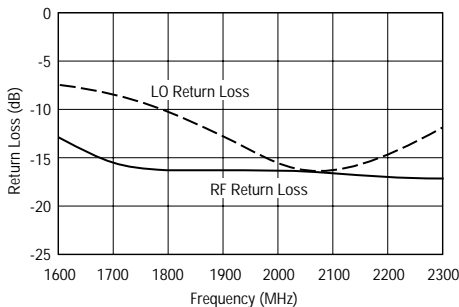
L-R Isolation vs LO Frequency

Low-side Downconversion

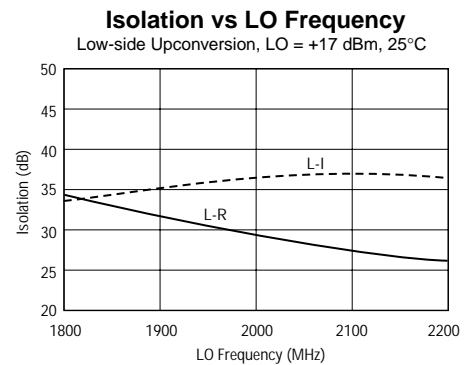
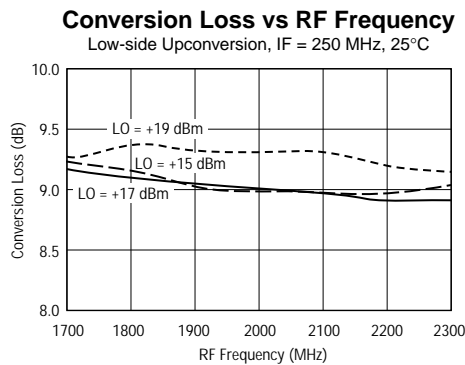
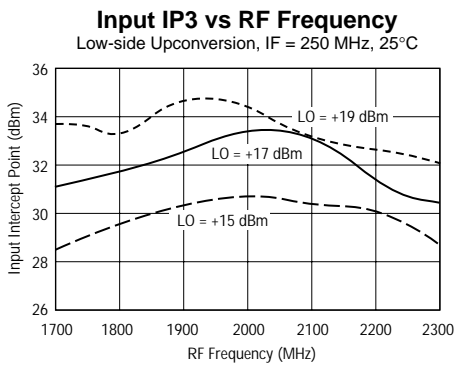
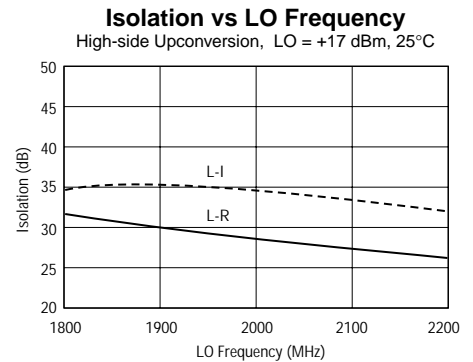
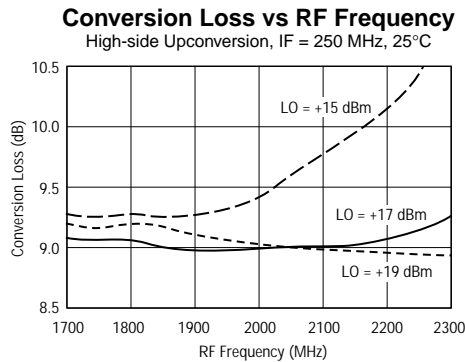
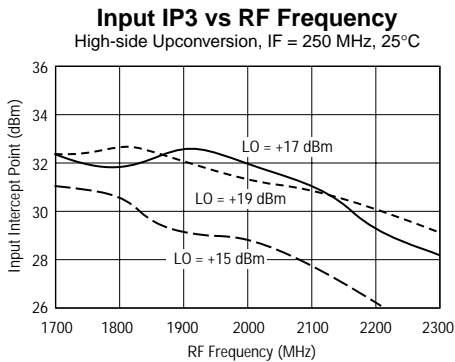
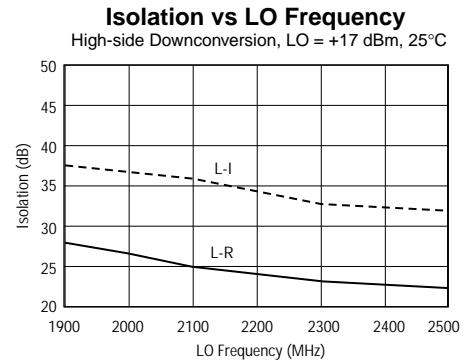
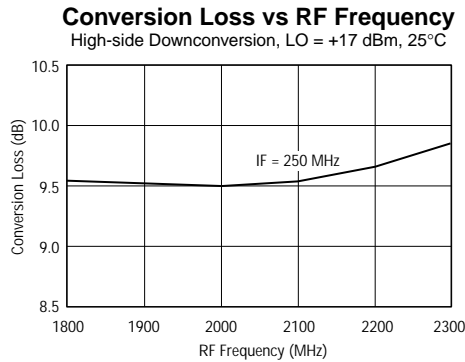
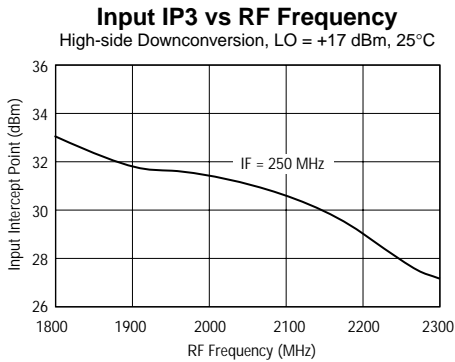


LO/RF Return Loss vs Frequency

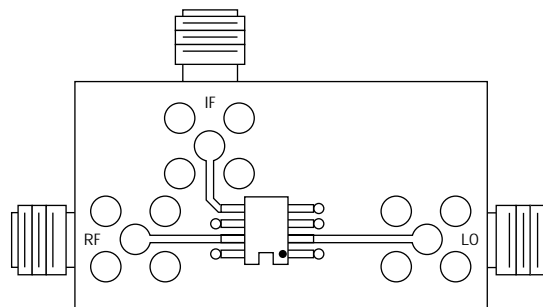
LO = +17 dBm, 25°C



Performance Charts

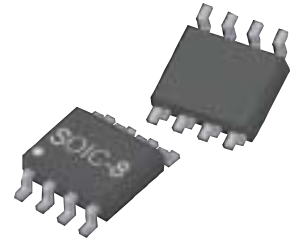
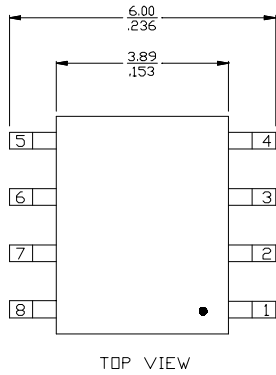


Application Circuit

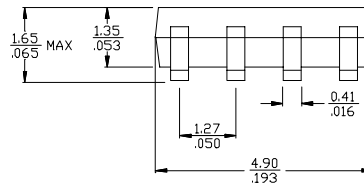
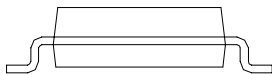


MH102

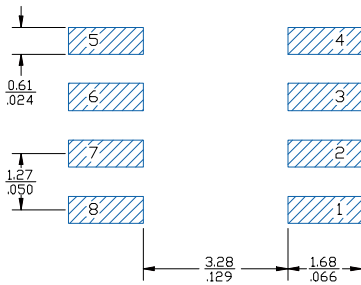
Outline Drawing



mm
inch

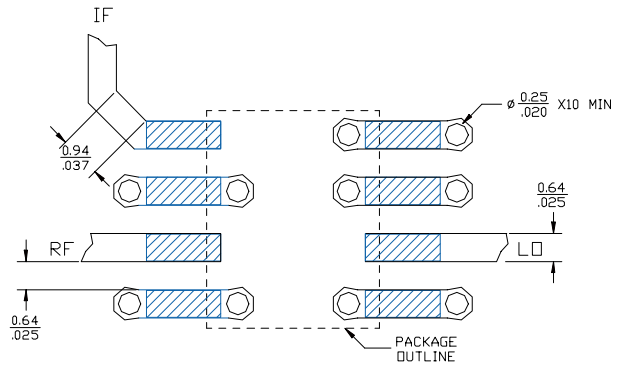


Land Pattern



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.

This document contains information on a new product. Specifications and information are subject to change without notice.



Caution! ESD sensitive device.