



# HMJ5

## High Dynamic Range FET Mixer

The Communications Edge™

Product Information

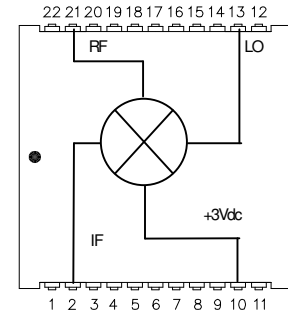
### Product Features

- +35 dBm IIP3
- No external matching element Required
- RF 40 - 1000 MHz
- LO 30 - 900 MHz
- IF 5 - 250 MHz
- +17 dBm LO Drive Level
- +3V at 35mA DC Power Supply
- Low Cost Surface Mount J-Lead Package

### Product Description

The HMJ5 is a high dynamic range GaAs FET mixer. This active FET mixer realizes a typical third order intercept point of +35 dBm at an LO drive level of +17 dBm. The HMJ5 comes in a low cost, J-Lead package. Typical applications include frequency up/down conversion, modulation and demodulation for receivers and transmitters used in communications systems.

### Functional Diagram



Function	Pin No.
IF	2
LO	13
RF	21
+3V	10
Ground	All other pins

### Specifications <sup>(1)</sup>

Parameter	Units	Min	Typ	Max	Condition
RF Frequency Range	MHz		40 – 1000		
LO Frequency Range	MHz		30 – 900		
IF Frequency Range	MHz		5 – 250		
SSB Conversion Loss	dB		7.5	9.0	
Noise Figure	dB		9.5		
LO-RF Isolation	dB	20	28		
LO-IF Isolation	dB	24	30		
Input IP3	dBm	31	35		RF = 900 MHz @ 0 dBm
RF Return Loss	dB		11.7		
LO Return Loss	dB		6.0		
IF Return Loss	dB		10.9		
Input P1dB	dBm		+23		
LO Drive Level	dBm		+17		
DC Current at +3V Bias	mA		35	60	

Notes:

1. Test conditions unless otherwise noted: 25 °C, RF = 905 MHz @ -10 dBm, LO = 900MHz @ +17 dBm, IF = 5 MHz.
2. Measured in a 50-Ohm system with nominal LO drive in a downconverter application only, unless otherwise specified.
3. LO frequency must be separated from IF frequency by a minimum of 2 MHz (i.e., |F<sub>LO</sub> - F<sub>IF</sub>| ≥ 2 MHz).

### Absolute Maximum Rating

Parameters	Rating
Operating Case Temperature	-40 to +85 °C
Storage Temperature	-65 to +100 °C
Maximum Input Power	+25 dBm

Operation of this device above any of these parameters may cause permanent damage.  
Total sum of LO port and RF port power should not exceed 25 dBm.

### Ordering Information

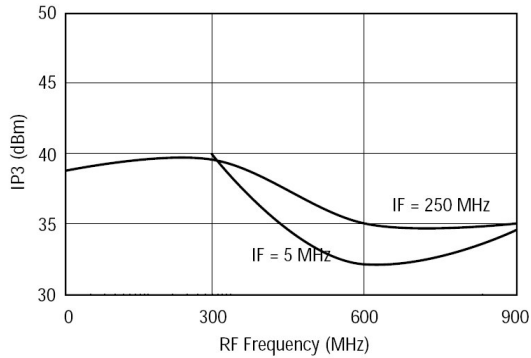
Part No.	Description
HMJ5	High Dynamic Range FET Mixer
HMJ5-PCB	Fully Assembled Application Circuit

Specifications and information are subject to change without notice

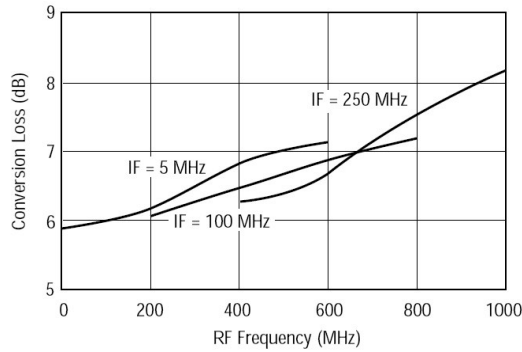


### Typical Performance Data

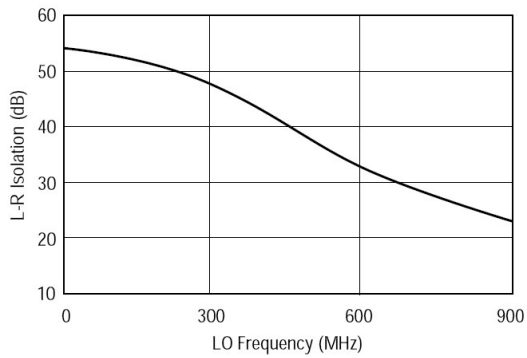
#### IP3 vs. RF Frequency



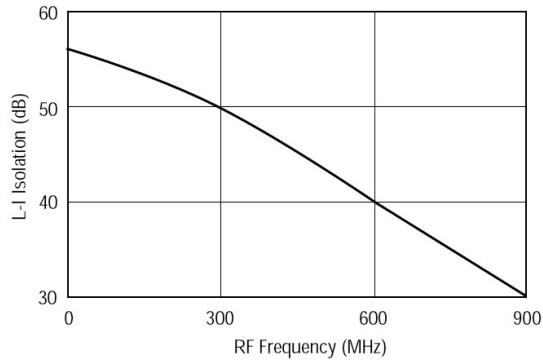
#### Conversion Loss vs. RF Frequency



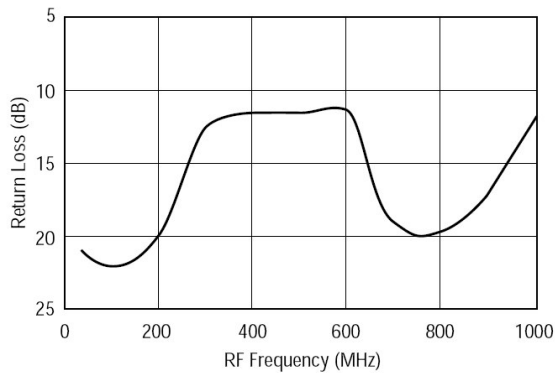
#### LO to RF Isolation



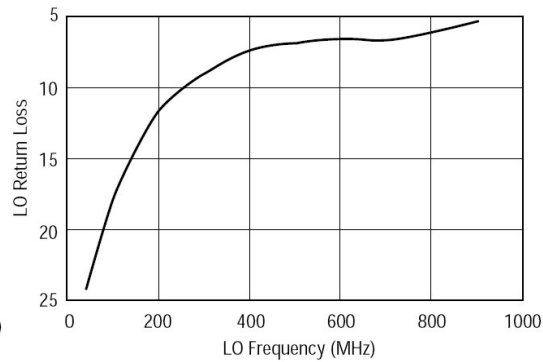
#### LO to IF Isolation



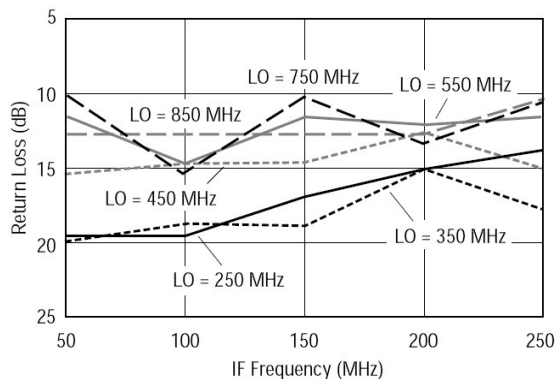
#### RF Port Return Loss



#### LO Port Return Loss vs. LO Freq



#### IF Return Loss vs. IF Frequency

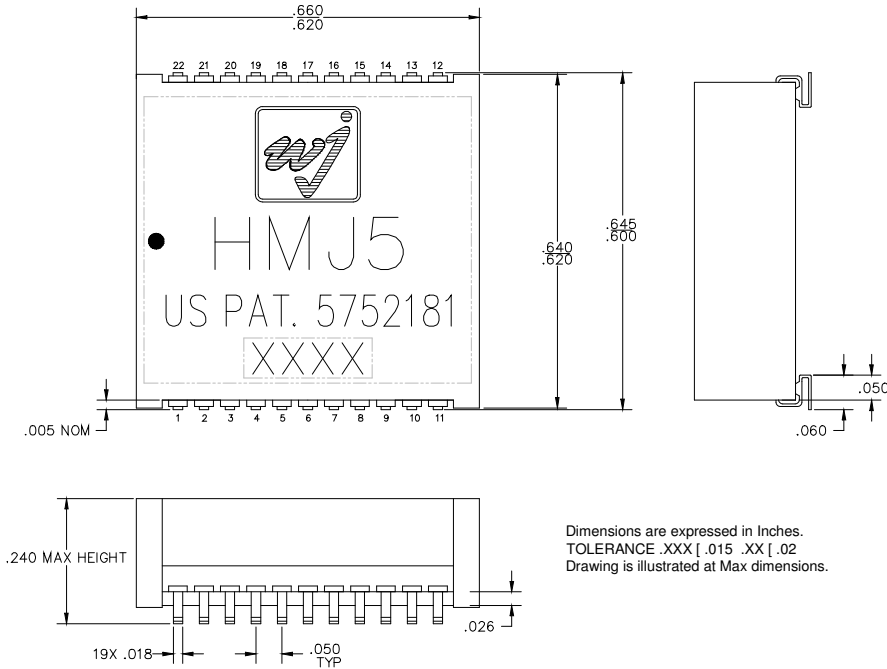




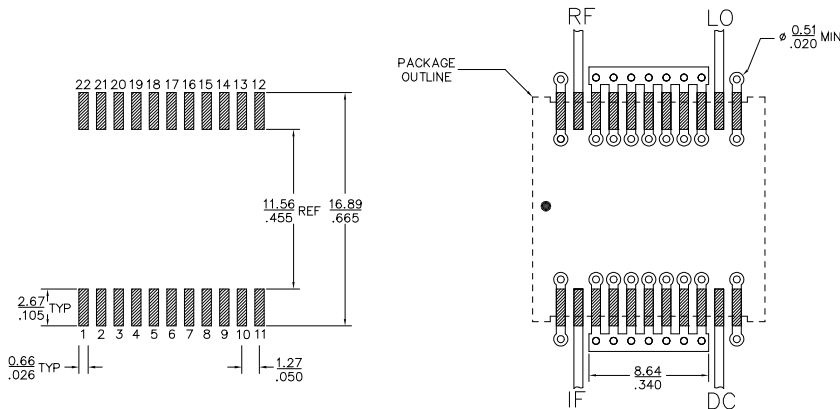
# HMJ5

## High Dynamic Range FET Mixer

### Outline Drawing



### Land Pattern / Mounting Configuration



FUNCTION	PIN NO.	FUNCTION	PIN NO.
GROUND	1	GROUND	12
IF	2	LO	13
GROUND	3-9	GROUND	14-20
DC	10	RF	21
GROUND	11	GROUND	22

### Product Marking

The component will be marked with an "HMJ7" designator with a four-digit alphanumeric lot number XXXX.

Tape and reel specifications for this part are located on the website in the "Application Notes" section.

### ESD Information



Caution! ESD sensitive device.

ESD Rating: Class 2  
 Value: Passes at 2000 V  
 Test: Human Body Model (HBM)  
 Standard: JEDEC Standard JESD22-A114

ESD Rating: Class IV  
 Value: Passes at 2000 V  
 Test: Charged Device Model (CDM)  
 Standard: JEDEC Standard JESD22-C101

### Mounting Config. Notes

1. Ground vias are critical for thermal and RF grounding considerations.
2. A minimum of 36 ground vias are required for 14 mil FR4 boards.
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 the land pattern as possible.
4. Trace width depends on the PCB material.