HMJ1

High Dynamic Range FET Mixer

TriQuint SEMICONDUCTOR

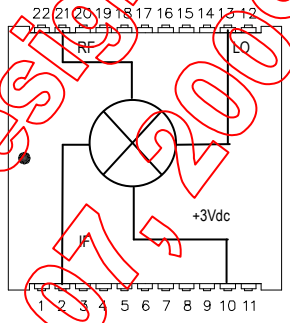
Product Features

- +39 dBm IIP3
- No external matching element Required
- RF 750 - 1000 MHz
- LO 680 - 980 MHz
- IF 20 - 100 MHz
- +17 dBm LO Drive Level
- +3V at 23mA DC Power Supply
- Low Cost Surface Mount J-Lead Package

Product Description

The HMJ1 is a high dynamic range GaAs FET mixer. This active FET mixer realizes a typical third order intercept point of +39 dBm at an LO drive level of +17 dBm. The HMJ1 comes in a low cost, J-Lead package. Typical applications include frequency up/down conversion, modulation and demodulation for transmitters and receivers used in communications systems.

Functional Diagram



Function	Pin No.
IF	2
LO	11
RF	17
+3V	8
Ground	All other pins

Specifications (1,2)

Parameter	Units	Min	Typ	Max	Condition
RF Frequency Range	MHz		750 – 1000		
LO Frequency Range	MHz		680 – 980		
IF Frequency Range	MHz		20 – 100		
SSB Conversion Loss	dB		7.7	9.3	
Noise Figure	dB		9.2		
LO-RF Isolation	dB	20	29		
LO-IF Isolation	dB	30	40		
RF-IF Isolation	dB		24		
Input IP3	dBm	33	39		RF = 900 MHz @ 0 dBm
RF Return Loss	dB		8		
LO Return Loss	dB		13		
IF Return Loss	dB		19		
Input P1dB	dBm		+23		
LO Drive Level	dBm		+17		
DC Current at +3V Bias	mA		23	35	

Notes:
1. Test conditions unless otherwise noted: 25 °C, RF = 900 MHz @ -10 dBm, LO = 830 MHz @ +17 dBm, IF = 70 MHz.
2. Measured in a 50-Ohm system with nominal LO drive in a downconverter application only, unless otherwise specified.

Absolute Maximum Rating

Parameters	Rating
Operating Case Temperature	-40 to +85 °C
Storage Temperature	-55 to +120 °C
Maximum Input Power	+25 dBm

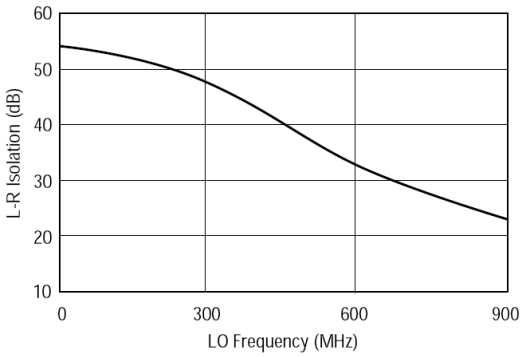
Operation of this device above any of these parameters may cause permanent damage.
Total sum of LO port and RF port power should not exceed +25 dBm.

Ordering Information

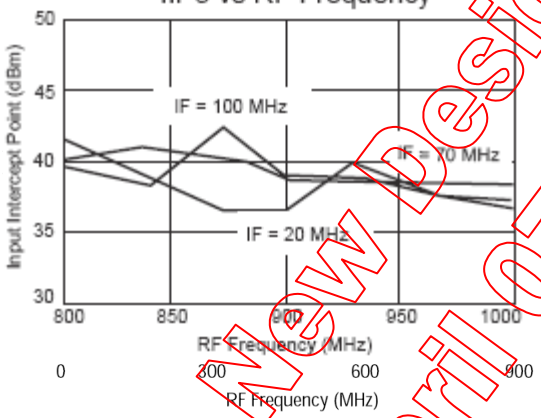
Part No.	Description
HMJ1	High Dynamic Range FET Mixer

Typical Performance Data

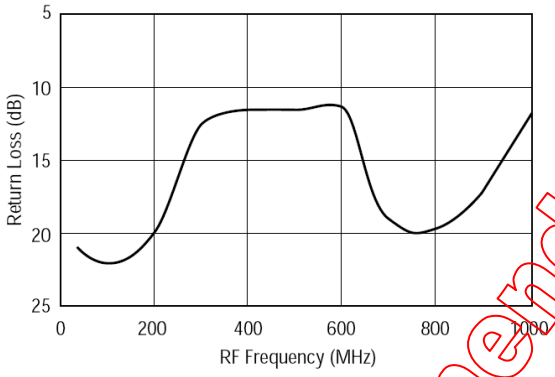
LO to RF Isolation



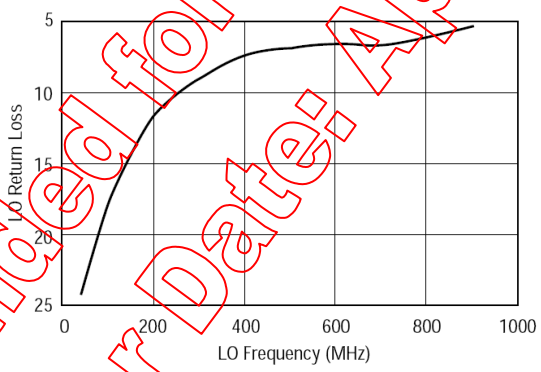
IIP3 vs RF Frequency



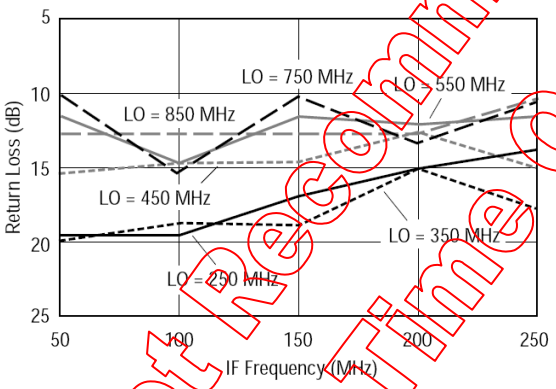
RF Port Return Loss



LO Port Return Loss vs. LO Freq



IF Return Loss vs. IF Frequency



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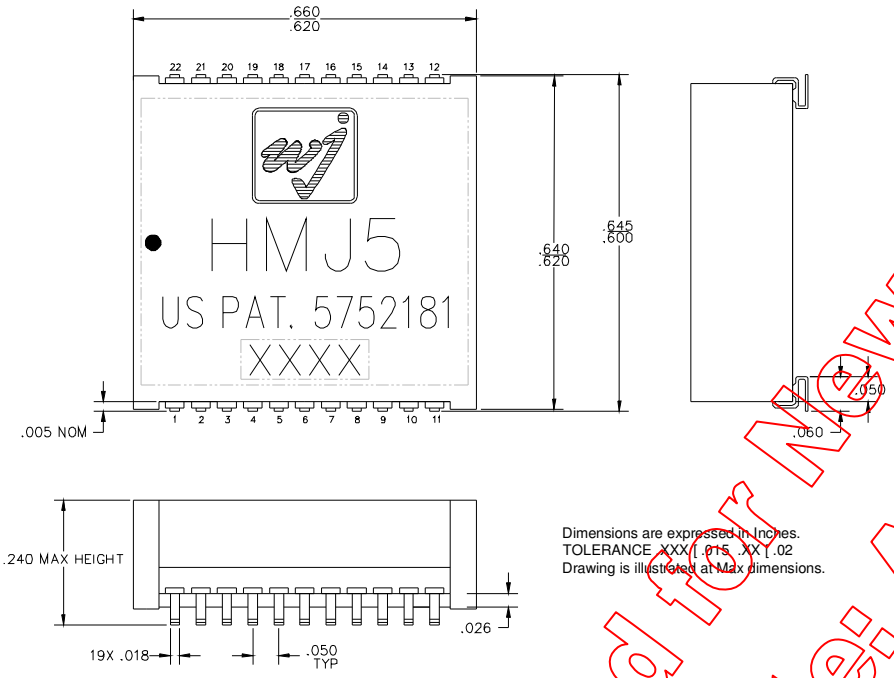
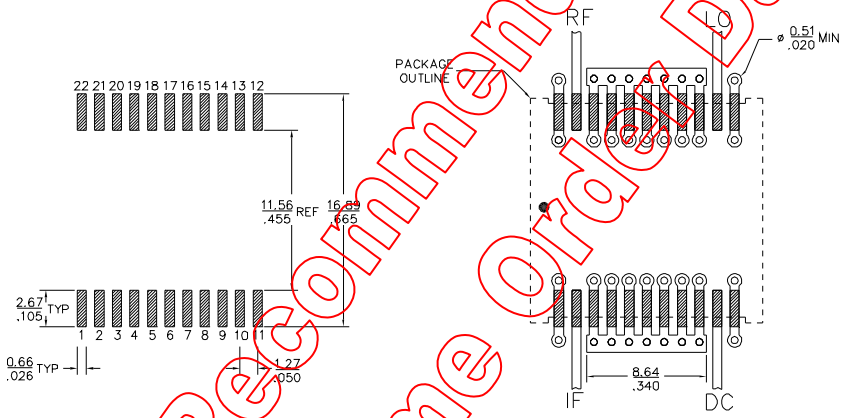
Outline Drawing



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.