



# HMJ7

## High Dynamic Range FET Mixer

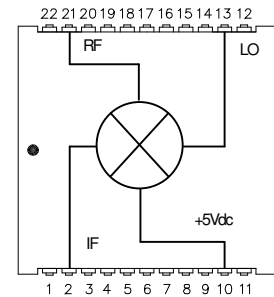
### Product Features

- +34 dBm IIP3
- 67 dBc 2x1 Spur Rejection in IF Band
- RF 1000 - 2000 MHz
- LO 1000 - 2000 MHz
- IF 10 - 1000 MHz
- +21 dBm LO Drive Level
- +5V Bias (40 mA)
- SMT J-Lead Package

### Product Description

The HMJ7 is a high dynamic range GaAs FET mixer. This active broadband mixer realizes a typical third order intercept point of +34 dBm at an LO drive level of +21 dBm. The HMJ7 also provides excellent suppression of spurious intermodulation products, greater than 60 dBc. The HMJ7 comes in a low cost, 22-pin J-Lead package. The combination of high dynamic range and spurious suppression makes the HMJ7 an ideal choice for CATV headend transmission equipment and other applications requiring a broadband mixer in the 1000 MHz to 2000 MHz frequency range.

### Functional Diagram



Function	Pin No.
IF	2
LO	13
RF	21
+5V	10
Ground	All other pins

### Applications

- CATV Head-End Equipment

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

Parameter	Units	Min	Typ	Max	Condition
RF Frequency Range	MHz		1000 – 2000		
LO Frequency Range	MHz		1000 – 2000		
IF Frequency Range	MHz		10 – 1000		
SSB Conversion Loss	dB		8.5	9.5	
Noise Figure	dB		10.5		
LO-RF Isolation	dB	21	24		
LO-IF Isolation	dB	24	30		
RF-IF Isolation	dB		24		
Input IP3	dBm	30	34		RF = 1018 MHz @ 0 dBm
RF Return Loss	dB		10		
LO Return Loss	dB		5		
IF Return Loss	dB		14		
Spurious Rejection <sup>(2)</sup>	dBc	60	67		
Input P1dB	dBm		+23		
LO Drive Level	dBm		+21		
DC Current at +5V Bias	mA		40	60	

1. Test conditions unless otherwise noted: 25 °C, RF = 1018.75 MHz @ 0 dBm, LO = 21 dBm, IF = 50, 650, 860 MHz in a high-side LO configuration.

2. The 2x1 spur is tested where the IM spur = 2 \* RF input – LO, where RF input = 1018.75 MHz @ -5 dBm, LO = 1568.75 & 1668.75 MHz @ 21 dBm, IM spur = output frequency. The IM spur level is specified in dBc with respect to the desired IF frequency calculated: IF output = LO - RF input.

### 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.

### Ordering Information

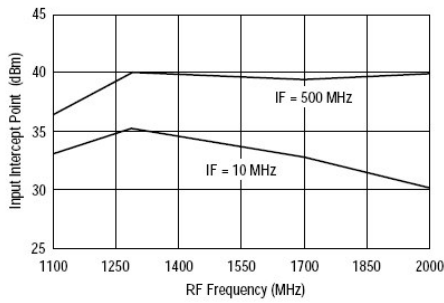
Part No.	Description
HMJ7	High Dynamic Range FET Mixer
HMJ7-PCB	Fully Assembled Application Circuit

Specifications and information are subject to change without notice

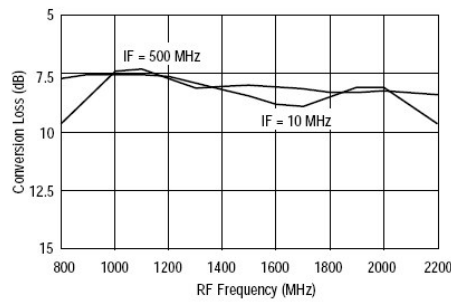


### Typical Performance Data

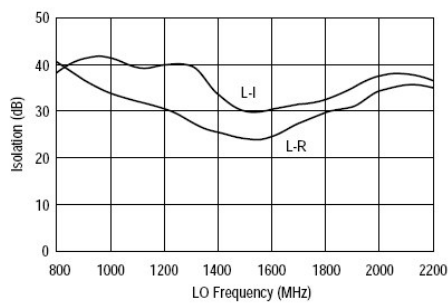
IIP3 vs. RF Frequency



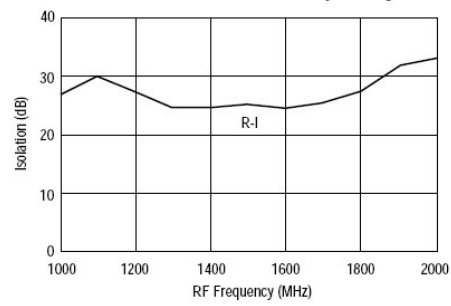
Conversion Loss vs. RF Frequency



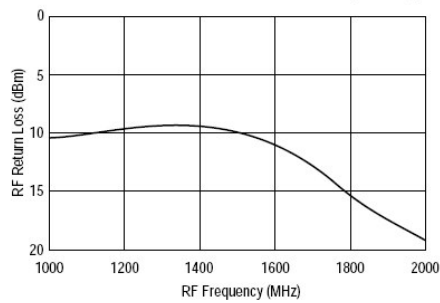
Isolation vs. LO Frequency



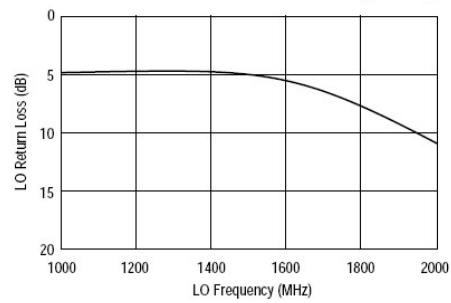
Isolation vs. RF Frequency



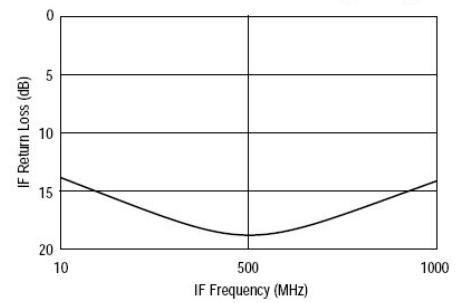
RF Return Loss vs. RF Frequency



LO Return Loss vs. LO Frequency



IF Return Loss vs. IF Frequency

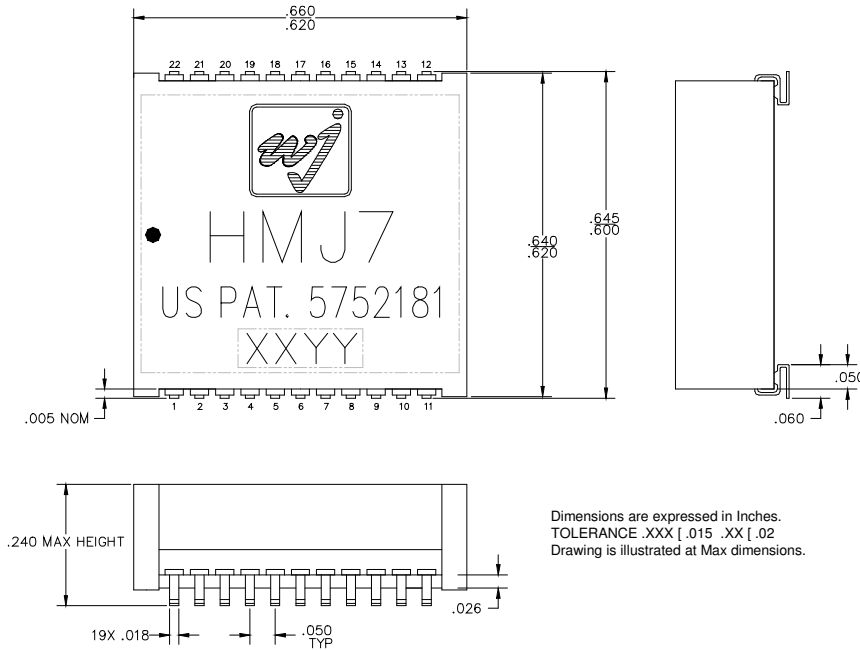




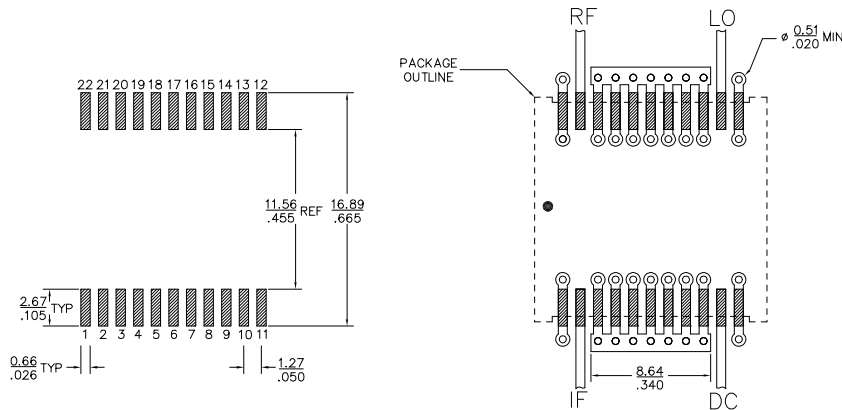
# HMJ7

## 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 date code XYY where XX refers to last two digits of the year and YY refers to week number within that year.

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 performance. Otherwise ground vias should be placed as close to the land pattern as possible.
4. Trace width depends on the PCB material.