



HMJ9

High Dynamic Range FET Mixer

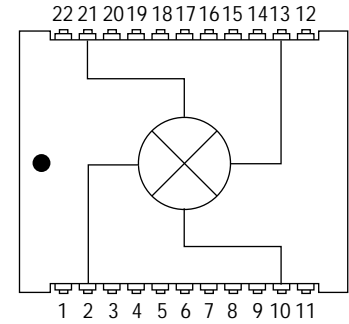
Product Features

- +35 dBm IIP3
- No External Matching Elements Required
- RF 860-900 MHz
- LO 1140-1160 MHz
- IF 250-280 MHz
- +17 dBm Drive Level
- +3V Bias (23 mA)
- Low Cost Surface Mount J-Lead Package

Product Description

The HMJ9 is a high dynamic range, GaAs FET mixer. As an upconverter, this active FET mixer realizes a typical third order intercept point of +35 dBm at an LO drive level of +17 dBm. The HMJ9 comes in a low cost, J-lead package. Typical applications include frequency up/down conversion for receivers and transmitters used in cellular communications systems.

Functional Diagram



Function	Pin No.	Function	Pin No.
Ground	1	Ground	12
IF	2	LO	13
Ground	3-9	Ground	14-20
+3V DC	10	RF	21
Ground	11	Ground	22

Specifications

Parameter	Units	Minimum	Typical	Maximum	Condition
Frequency Range:					
RF	MHz	860		900	
LO	MHz	1140		1160	
IF	MHz	250		280	
SSB Conversion Loss	dB		8.5	9.3	
Noise Figure	dB		11		
Isolation:					
LO-RF	dB	18	20		
LO-IF	dB	40	50		
IF-RF	dB		25		
IIP3	dBm	32	35		RF = 900 MHz (0dBm)
Return Loss:					
RF Port	dB		10		
LO Port	dB		9		
IF Port	dB		15		
Input P1dB	dBm		23		
LO Drive Level	dBm		17		
DC Current at +3V Bias	mA		23	35	

Test conditions unless otherwise stated: RF = 900 MHz (-10 dBm), LO = 830 MHz (17 dBm), IF = 70 MHz and 25°C.

Absolute Maximum Ratings

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

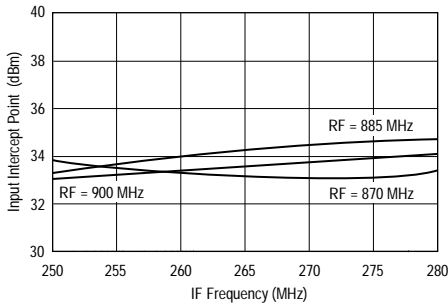
1. Operation of this device above any of these parameters may cause permanent damage.
2. Total sum of LO port and RF port power should not exceed 25 dBm.

Ordering Information

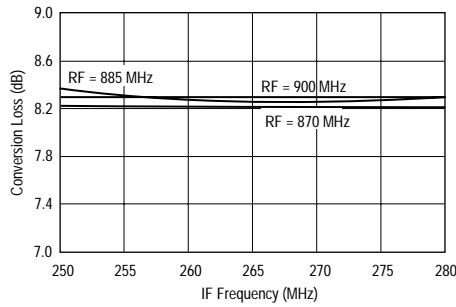
Part No.	Description
HMJ9	High Dynamic Range FET Mixer (Available in tape and reel)
HMJ9-PCB	Fully Assembled Application Circuit

Performance Charts

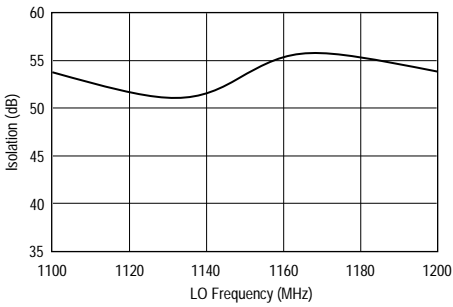
IIP3 vs. IF Frequency



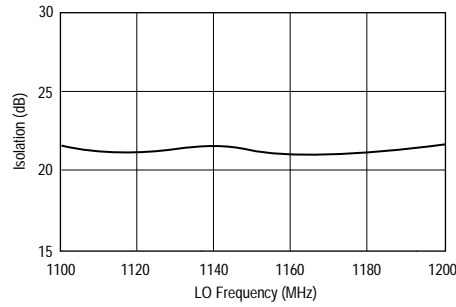
Conversion Loss vs. Input IF Frequency



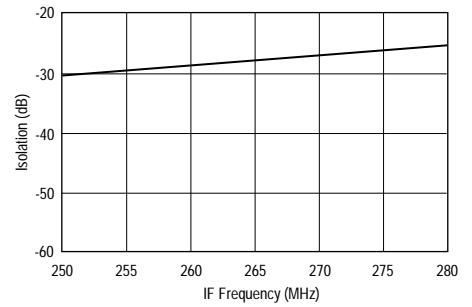
L-I Isolation vs. LO Frequency



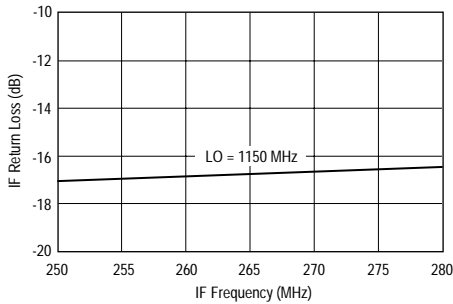
L-R Isolation vs. LO Frequency



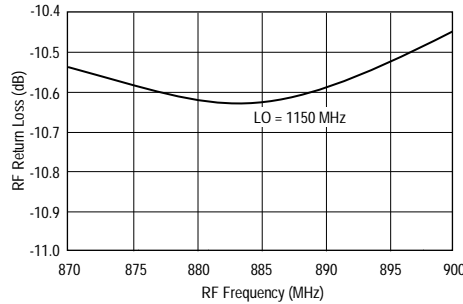
I-R Isolation vs. IF Frequency



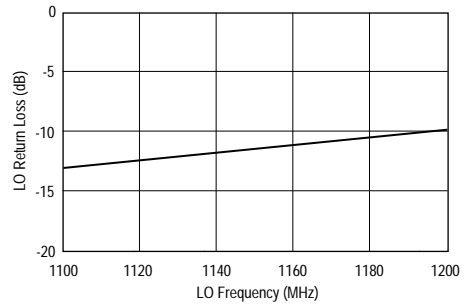
IF Return Loss vs. IF Frequency



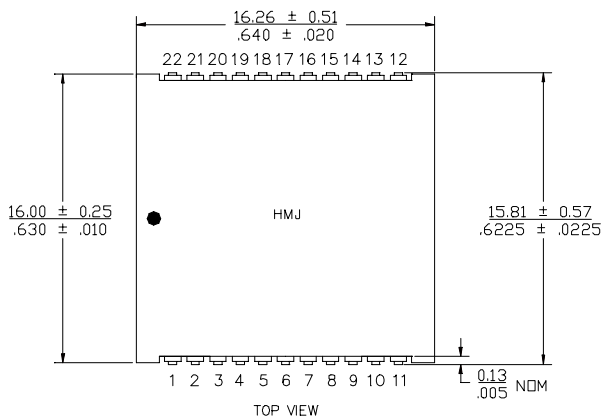
RF Return Loss vs. RF Frequency



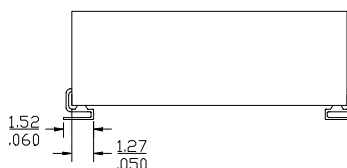
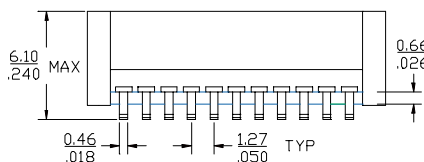
LO Return Loss vs. LO Frequency



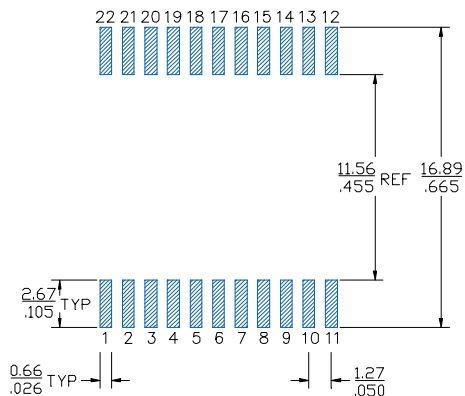
Outline Drawing



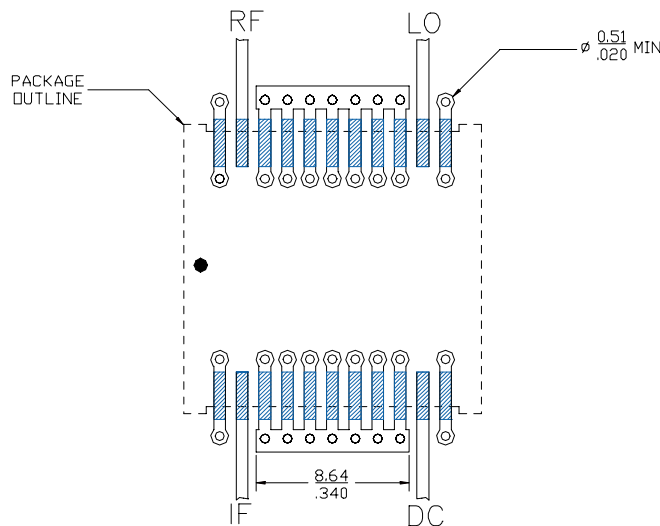
mm
inch



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

- 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 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.

