



**GaAs MMIC I/Q MIXER
11 - 16 GHz**

Data Taken As IRM With External IF Hybrid

Conversion Gain vs. Temperature

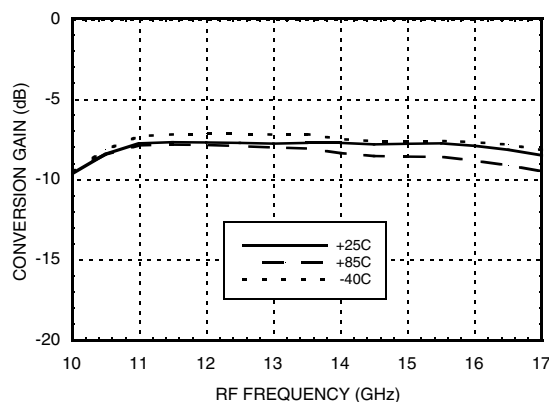
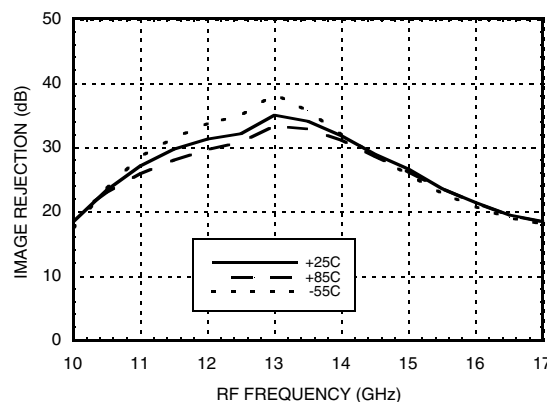
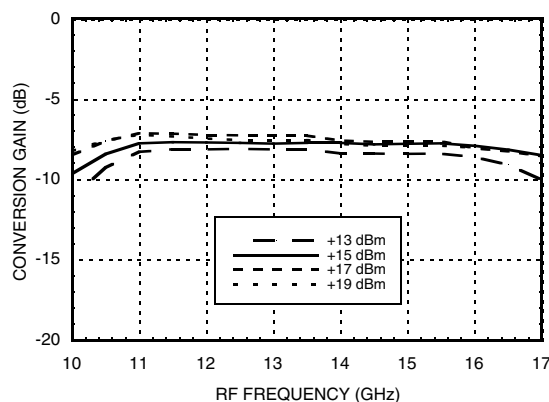


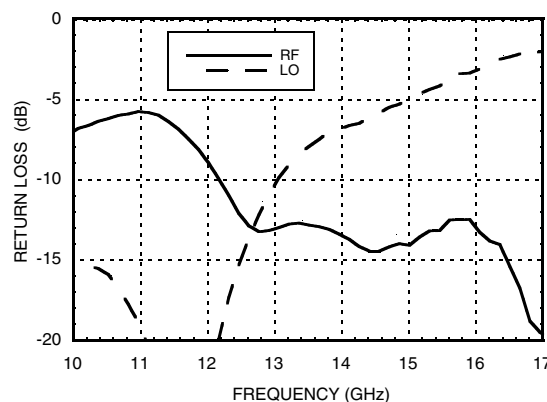
Image Rejection vs. Temperature



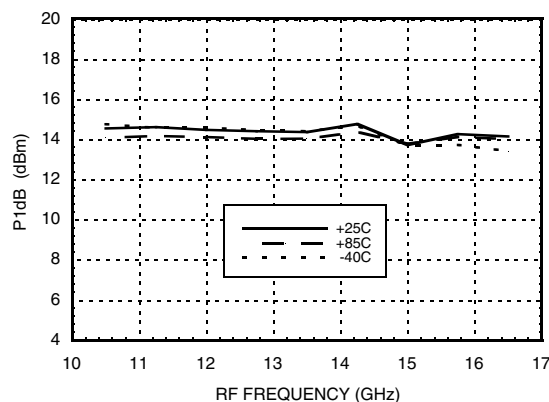
Conversion Gain vs. LO Drive



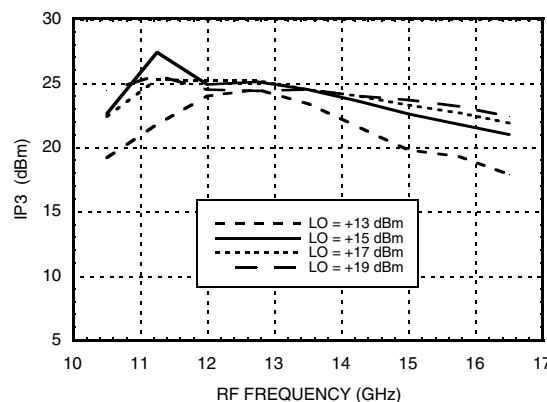
Return Loss

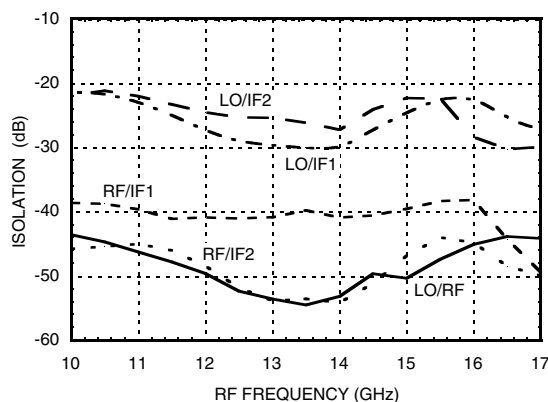
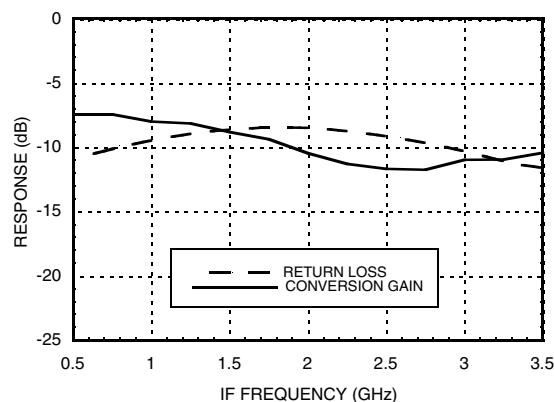
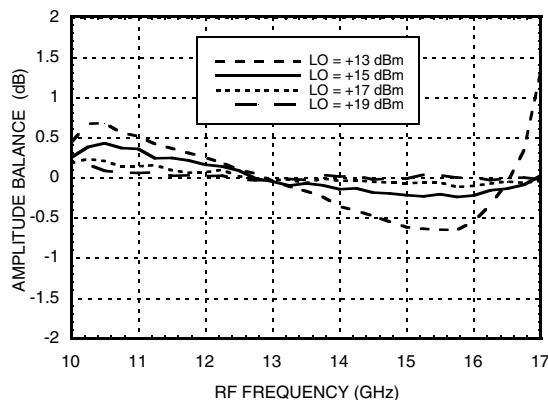
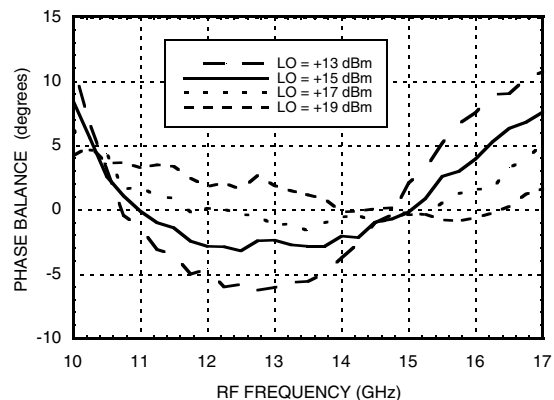
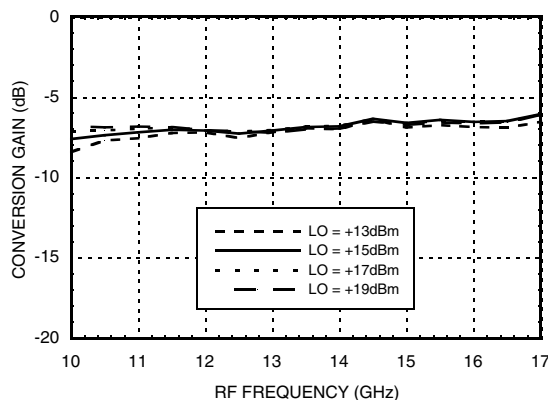
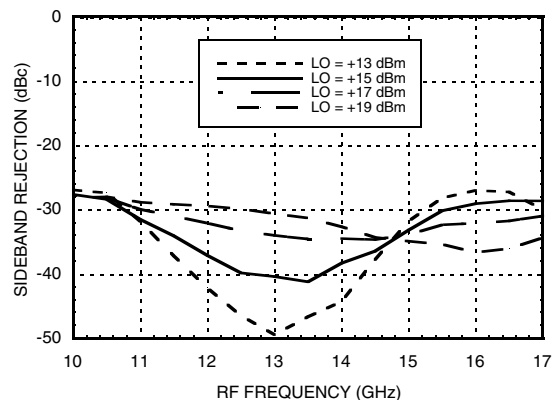


Input P1dB vs. Temperature



Input IP3 vs. LO Drive




**GaAs MMIC I/Q MIXER
11 - 16 GHz**
Quadrature Channel Data Taken Without IF Hybrid
Isolations

IF Bandwidth*

Amplitude Balance vs. LO Drive

Phase Balance vs. LO Drive

Upconverter Performance Conversion Gain vs. LO Drive

Upconverter Performance Sideband Rejection vs. LO Drive


* Conversion gain data taken with external IF hybrid

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**GaAs MMIC I/Q MIXER
11 - 16 GHz**
Harmonics of LO

LO Freq. (GHz)	nLO Spur at RF Port			
	1	2	3	4
10.5	43	46	52	80
11.5	48	49	61	76
12.5	48	51	63	61
13.5	44	60	67	xx
14.5	44	58	82	xx
15.5	43	51	75	xx

LO = +15 dBm
Values in dBc below input LO level measured at RF Port.

Absolute Maximum Ratings

RF / IF Input	+20 dBm
LO Drive	+27 dBm
Channel Temperature	150°C
Continuous P _{diss} (T=85°C) (derate 6.9 mW/°C above 85°C)	452 mW
Thermal Resistance (R _{TH}) (junction to package bottom)	150 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C

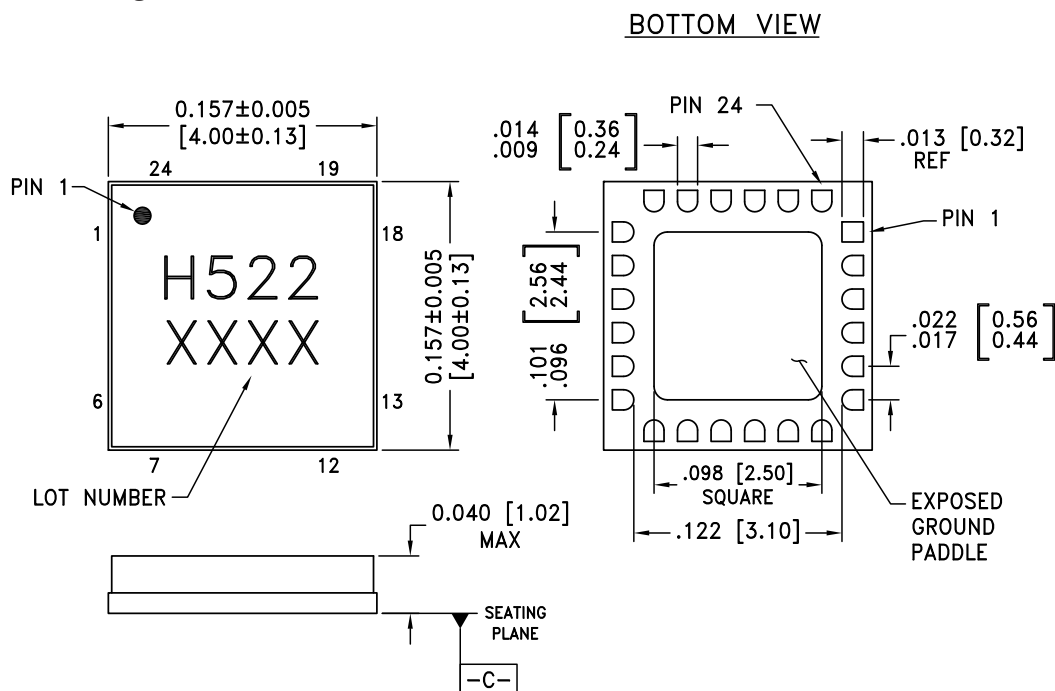
MxN Spurious Outputs

mRF	nLO				
	0	1	2	3	4
0	xx	-4	18	18	xx
1	27	0	54	57	64
2	83	69	70	77	91
3	85	93	93	81	93
4	xx	86	93	92	93

RF = 13.6 GHz @ -10 dBm
LO = 13.5 GHz @ +15 dBm
Data taken without IF hybrid
All values in dBc below IF power level



**ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS**


GaAs MMIC I/Q MIXER
11 - 16 GHz
Outline Drawing

NOTES:

1. PACKAGE BODY MATERIAL: ALUMINA
2. LEAD AND GROUND PADDLE PLATING: 30 - 80 MICROINCHES GOLD OVER 50 MICROINCHES MINIMUM NICKLE
3. DIMENSIONS ARE IN INCHES [MILLIMETERS]
4. LEAD SPACING TOLERANCE IS NON-CUMULATIVE
5. PACKAGE WARP SHALL NOT EXCEED 0.05mm DATUM
6. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND


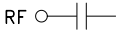
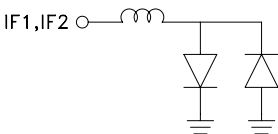
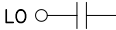
Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking ^[2]
HMC522LC4	Alumina, White	Gold over Nickel	MSL3 ^[1]	H522 XXXX

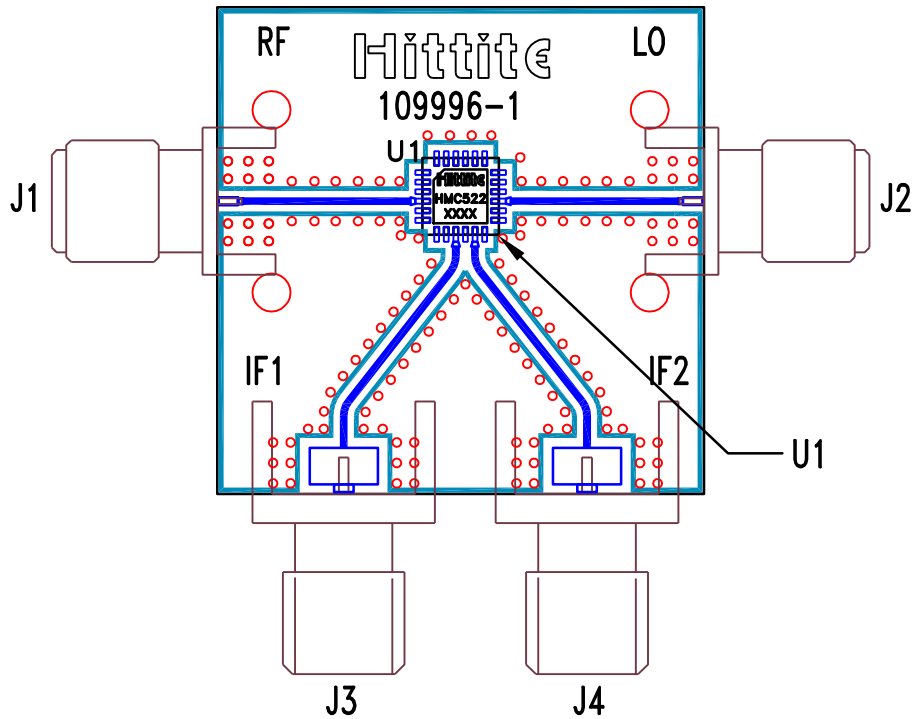
[1] Max peak reflow temperature of 260 °C

[2] 4-Digit lot number XXXX

Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1, 2, 6 - 8, 10, 13, 17 - 24	N/C	No connection required. These pins may be connected to RF/DC ground without affecting performance.	
3, 5, 12, 14, 16	GND	These pins and package bottom must be connected to RF/DC ground.	
4	RF	This pin is AC coupled and matched to 50 Ohms from 11 to 16 GHz.	
9	IF1	This pin is DC coupled. For applications not requiring operation to DC, this port should be DC blocked externally using a series capacitor whose value has been chosen to pass the necessary IF frequency range. For operation to DC, this pin must not source/sink more than 3mA of current or part non-function and possible part failure will result.	
11	IF2		
15	LO	This pin is AC coupled and matched to 50 Ohms from 11 to 16 GHz.	

Evaluation PCB



List of Materials for Evaluation PCB 109998 ^[1]

Item	Description
J1, J2	PCB Mount K RF Connector, SRI
J3 - J4	PCB Mount SMA Connector, Johnson
U1	HMC522LC4
PCB ^[2]	109996 Evaluation Board

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Rogers 4350

The circuit board used in the application should use RF circuit design techniques. Signal lines should have 50 Ohm impedance while the package ground leads and exposed paddle should be connected directly to the ground plane similar to that shown. A sufficient number of via holes should be used to connect the top and bottom ground planes. The evaluation circuit board shown is available from Hittite upon request.

