HMC220MS8

GaAs MMIC SMT DOUBLE-BALANCED MIXER, 5 - 12 GHz

Typical Applications

The HMC220MS8 is ideal for:

- Microwave Radios
- VSAT

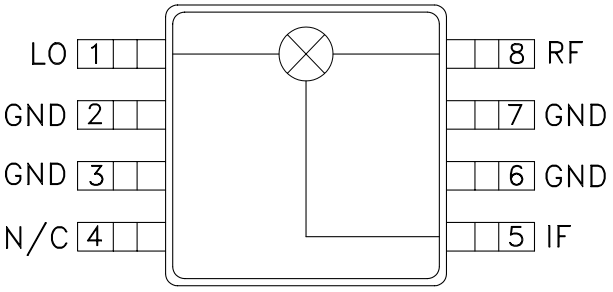
Features

Ultra Small Package: MSOP8

Conversion Loss: 8.5 dB

Wideband IF: DC - 4 GHz

Functional Diagram



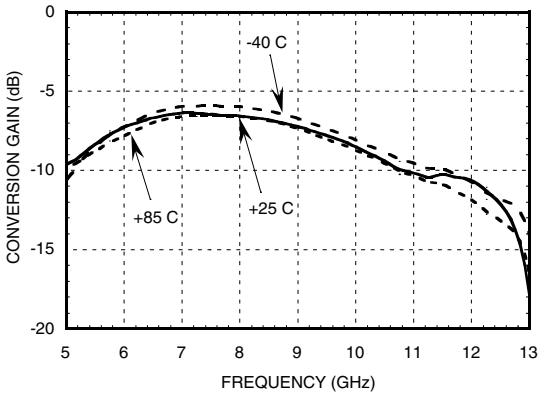
General Description

The HMC220MS8 is an ultra miniature double-balanced mixer in an 8 lead plastic surface mount package (MSOP). This passive MMIC mixer is constructed of GaAs Schottky diodes and novel planar transformer baluns on the chip. The device can be used as an upconverter, downconverter, bi-phase (de)modulator, or phase comparator. The consistent MMIC performance will improve system operation and assure regulatory compliance.

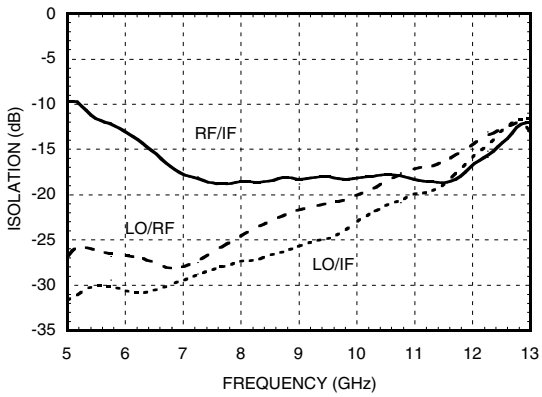
Electrical Specifications, T_A = +25° C, As a Function of LO Drive

Parameter	LO = +13 dBm IF = 100 MHz			LO = +13 dBm IF = 100 MHz			LO = +10 dBm IF = 100 MHz			Units
	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
Frequency Range, RF & LO	5 - 10			10 - 12			5.9 - 10			GHz
Frequency Range, IF	DC - 4			DC - 4			DC - 3.5			GHz
Conversion Loss		7.0	10		8.5	10.5		7.5	10	dB
Noise Figure (SSB)		7.0	10		8.5	10.5		7.5	10	dB
LO to RF Isolation	17	25		13	18		17	25		dB
LO to IF Isolation	20	28		14	20		20	28		dB
IP3 (Input)	14	17		16	21		13	16		dBm
1 dB Gain Compression (Input)	4	8		4	8		5	8		dBm

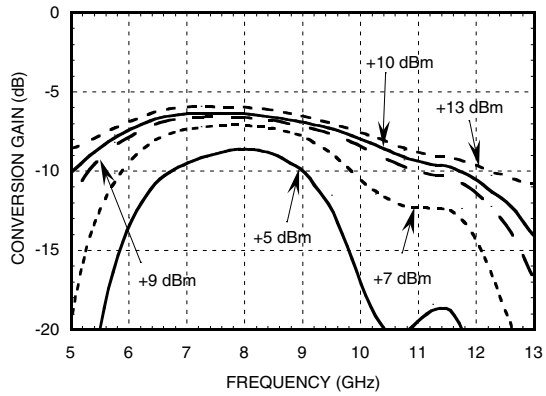
Conversion Gain vs Temperature @ LO = +10 dBm



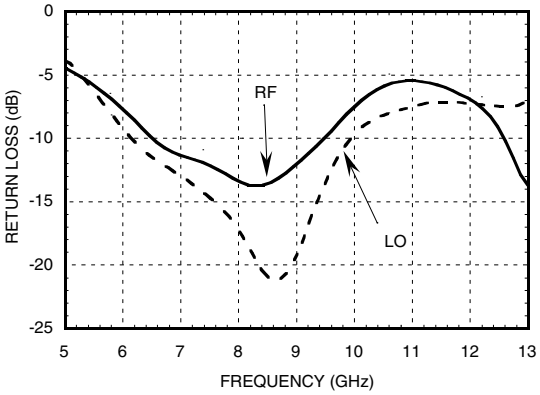
Isolation @ LO = +10 dBm



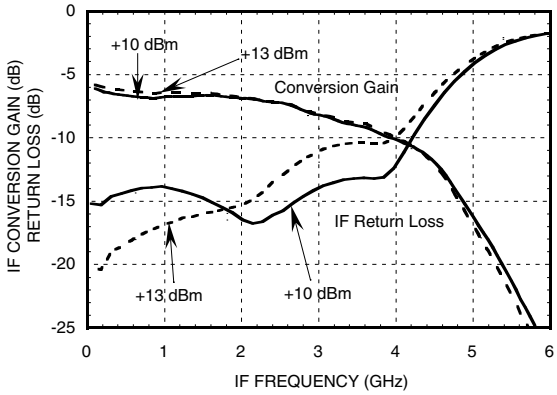
Conversion Gain vs. LO Drive



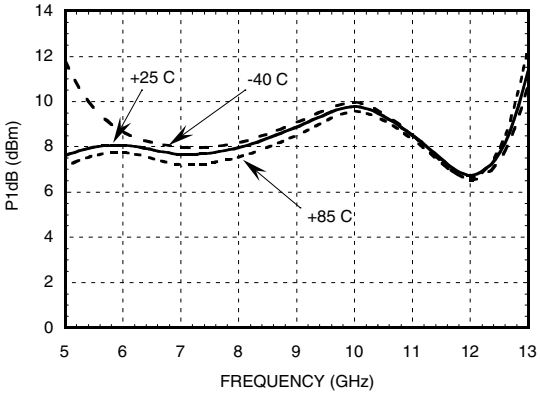
Return Loss @ LO = +10 dBm



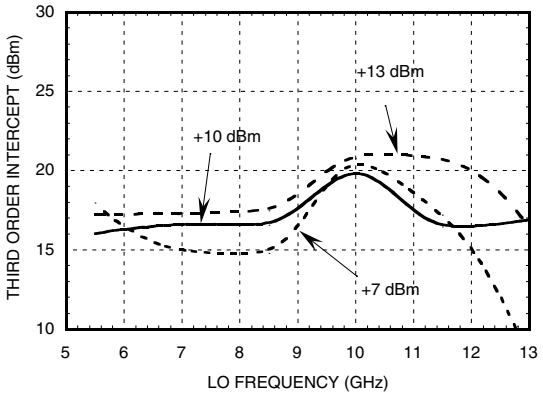
IF Bandwidth vs LO Drive Conversion Gain and Return Loss



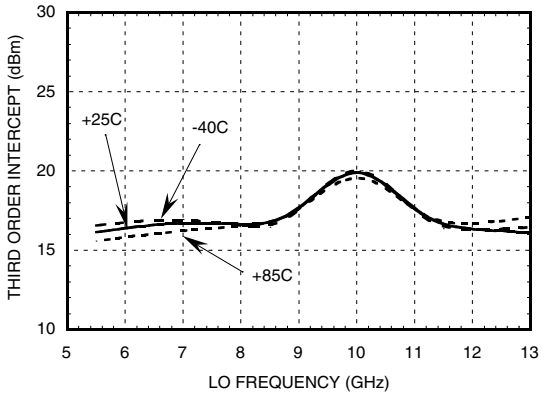
P1dB vs. Temperature LO = +10 dBm



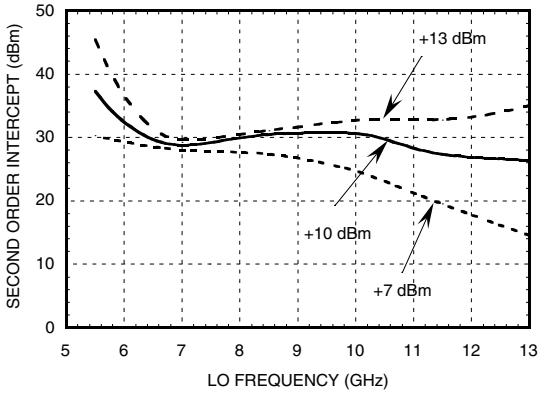
Input IP3 vs. LO Drive



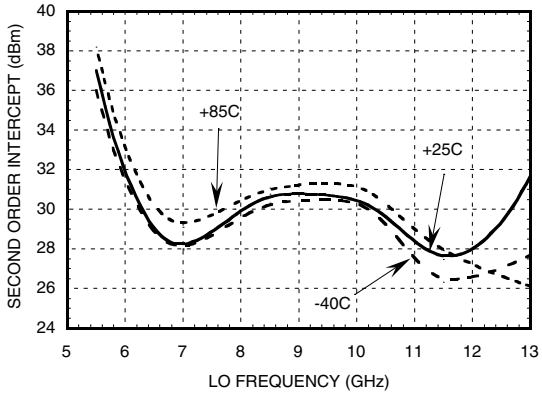
Input IP3 vs. Temperature @ LO = +10 dBm



Input IP2 vs. Drive



Input IP2 vs. Temperature @ LO = +10 dBm



MxN Spurious Outputs

	nLO				
mRF	0	1	2	3	4
0	xx	5	10	22	35
1	14	0	28	38	38
2	57	56	47	60	58
3	74	80	78	62	72
4	108	104	97	99	84

RF = 7.5 GHz @ -10 dBm
LO = 7.6 GHz @ +10 dBm
All values in dBc below the IF power level (-1RF + 1LO)

Harmonics of LO

LO Freq. (GHz)	nLO Spur at RF Port			
	1	2	3	4
5.5	27	29	35	67
7	29	25	38	58
8.5	24	30	60	58
10	22	44	63	60
11.5	16	49	51	xx
13	14	58	50	xx

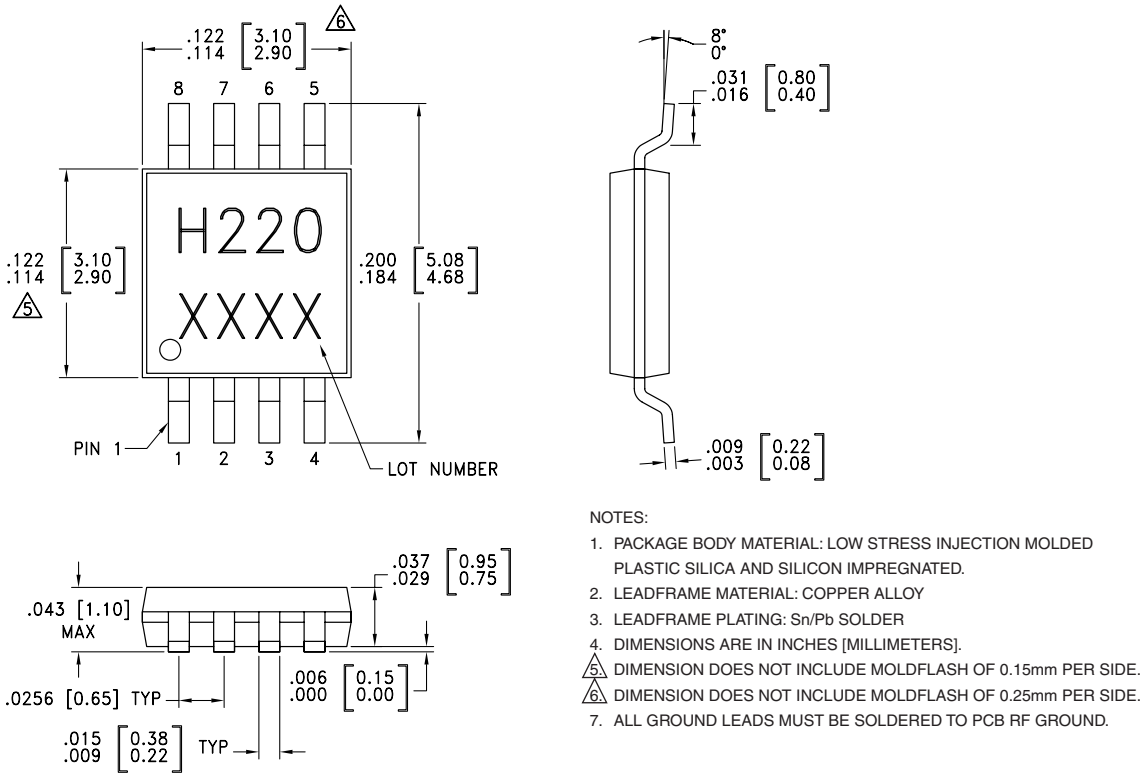
LO = +10 dBm
Values in dBc below input LO level measured at the RF port.

For price, delivery, and to place orders, please contact Hittite Microwave Corporation:
12 Elizabeth Drive, Chelmsford, MA 01824 Phone: 978-250-3343 Fax: 978-250-3373
Order Online at www.hittite.com

Absolute Maximum Ratings

RF / IF Input	+13 dBm
LO Drive	+27 dBm
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C

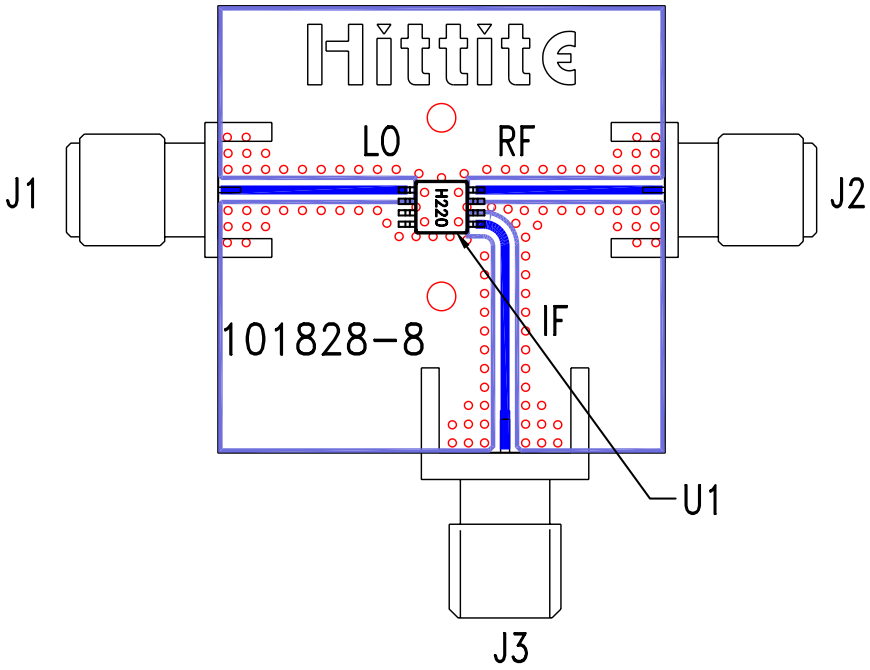
Outline Drawing



NOTES:

1. PACKAGE BODY MATERIAL: LOW STRESS INJECTION MOLDED PLASTIC SILICA AND SILICON IMPREGNATED.
2. LEADFRAME MATERIAL: COPPER ALLOY
3. LEADFRAME PLATING: Sn/Pb SOLDER
4. DIMENSIONS ARE IN INCHES [MILLIMETERS].
5. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.15mm PER SIDE.
6. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.25mm PER SIDE.
7. ALL GROUND LEADS MUST BE SOLDERED TO PCB RF GROUND.

Evaluation Circuit Board



List of Material

Item	Description
J1 - J3	PC Mount SMA RF Connector
U1	HMC220MS8 Mixer
PCB*	101828 Evaluation Board
* Circuit Board Material: Rogers 4350	

The circuit board used in the final application should use RF circuit design techniques. Signal lines should have 50 ohm impedance while the package ground leads 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.

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Notes: