HMC175MS8 / 175MS8E

GaAs MMIC SMT DOUBLE-BALANCED MIXER, 1.7 - 4.5 GHz

Typical Applications

The HMC175MS8 / HMC175MS8E is ideal for:

- Mini-Base Stations
- Portable Wireless
- PCMCIA

Features

Ultra Small Package: MSOP8

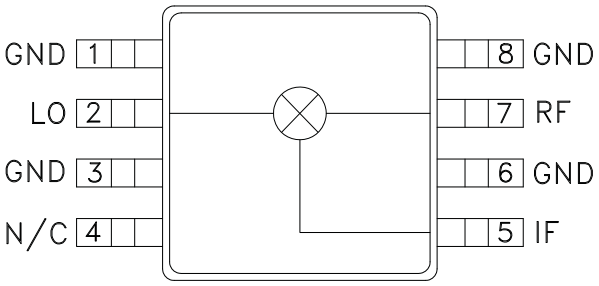
Conversion Loss: 8 dB

LO / IF Isolation: 32 dB

LO / RF Isolation: 30 dB

Input IP3: +18 dBm

Functional Diagram



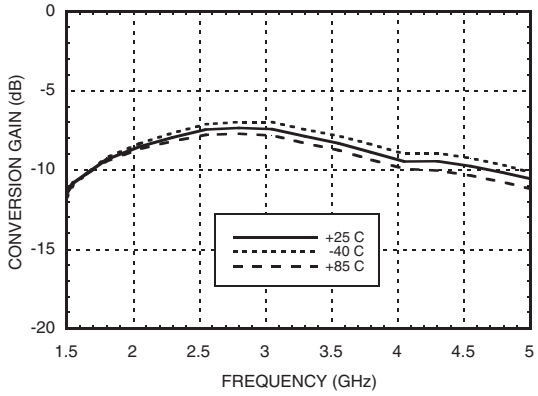
General Description

The HMC175MS8 & HMC175MS8E are miniature double-balanced mixers in 8-lead plastic surface mount Mini Small Outline Packages (MSOP). The device can be used as an upconverter or downconverter. The mixer provides exceptional isolation and Intermodulation performance for applications in high signal density environments. This device can also be used as a biphase modulator or demodulator. The MSOP8 is the smallest footprint available for a complete double-balanced mixer (0.118" x 0.190" x 0.040").

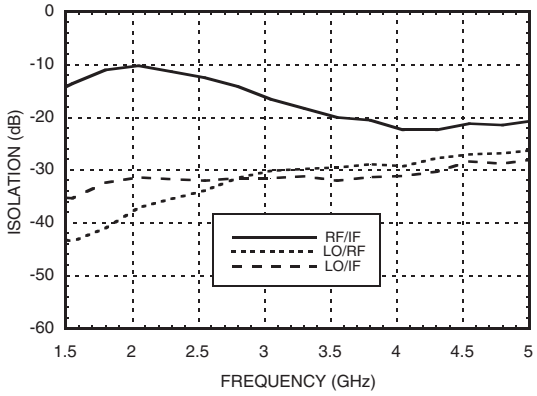
Electrical Specifications, T_A = +25° C, LO Drive = +13 dBm

Parameter	Broadband			PCS Band			ISM Band			Units
	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
Frequency Range, RF & LO	1.7 - 4.5			1.7 - 2.0			2.2 - 2.6			GHz
Frequency Range, IF	DC - 1.0			DC - 1.0			DC - 1.0			GHz
Conversion Loss		8	11		9	11		8	10	dB
Noise Figure (SSB)		8	11		9	11		8	10	dB
LO to RF Isolation	25	30		35	40		30	35		dB
LO to IF Isolation	27	32		28	32		28	32		dB
IP3 (Input)	15	20		15	18		15	18		dBm
1 dB Gain Compression (Input)	9	12		9	11		9	11		dBm

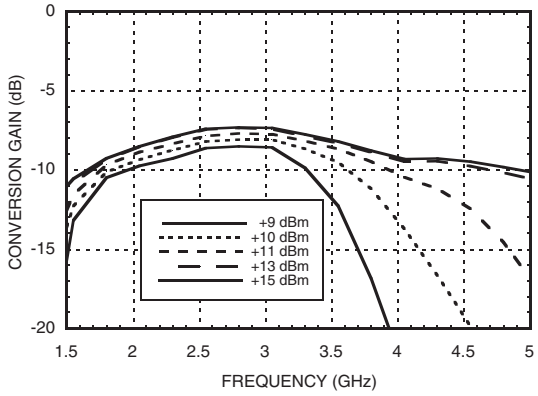
Conversion Gain vs Temperature @ LO = +13 dBm



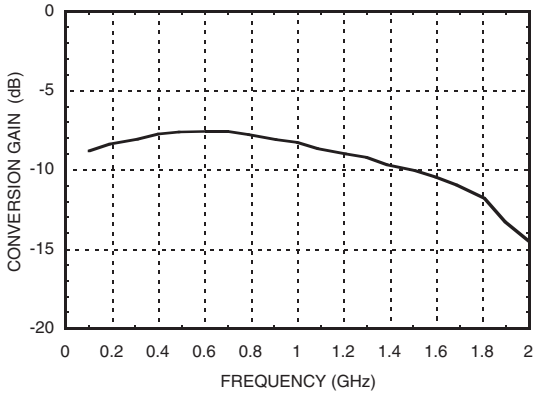
Isolation @ LO = +13 dBm



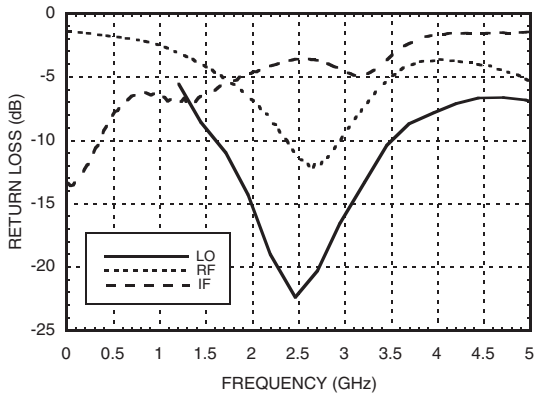
Conversion Gain vs LO Power



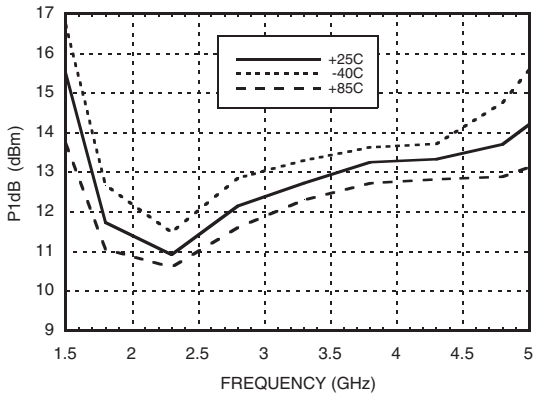
IF Bandwidth @ LO = +13 dBm



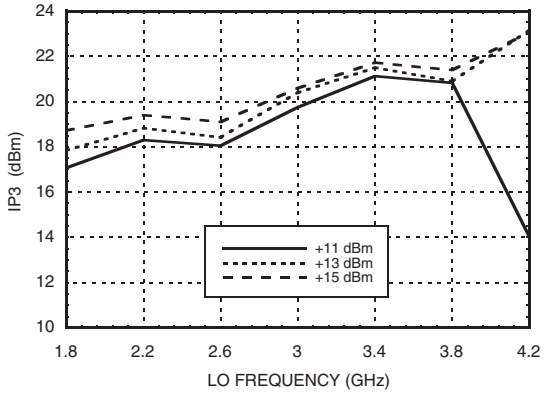
Return Loss @ LO = +13 dBm



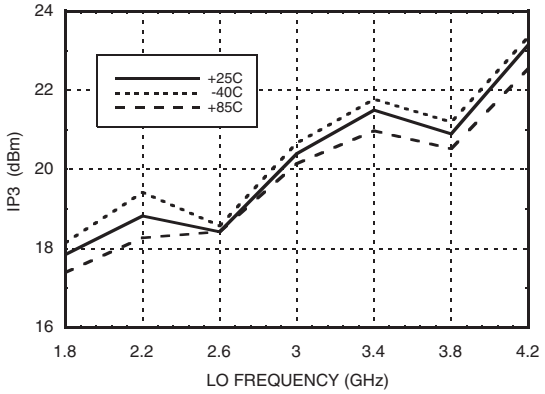
P1dB vs Temperature @ LO = +13 dBm



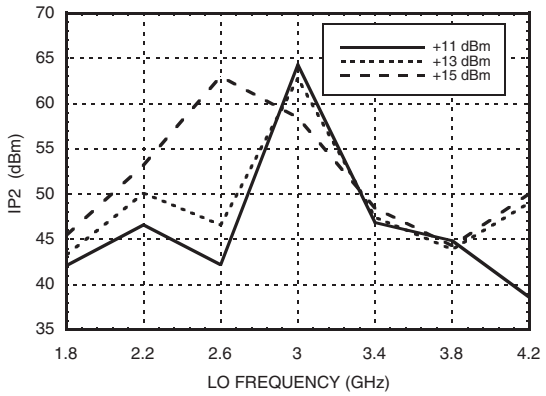
Input IP3 vs. LO Drive



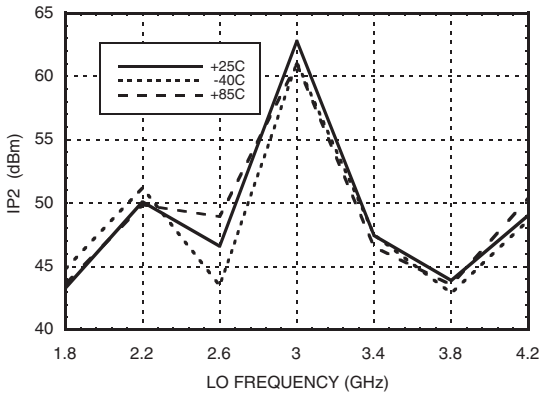
Input IP3 vs. Temperature @ LO = +13 dBm



Input IP2 vs. LO Drive



Input IP2 vs. Temperature @ LO = +13 dBm



MxN Spurious Outputs

RF Frequency = 2.3 GHz @ -10 dBm					
LO Frequency = 2.4 GHz @ 13 dBm					
	nLO				
mRF	0	1	2	3	4
0	xx	1	12	12	37
1	4	0	27	39	38
2	74	53	56	60	67
3	78	>105	73	72	79
4	>105	>105	>105	>105	>105
All values in dBc below IF power level.					

Harmonics of LO

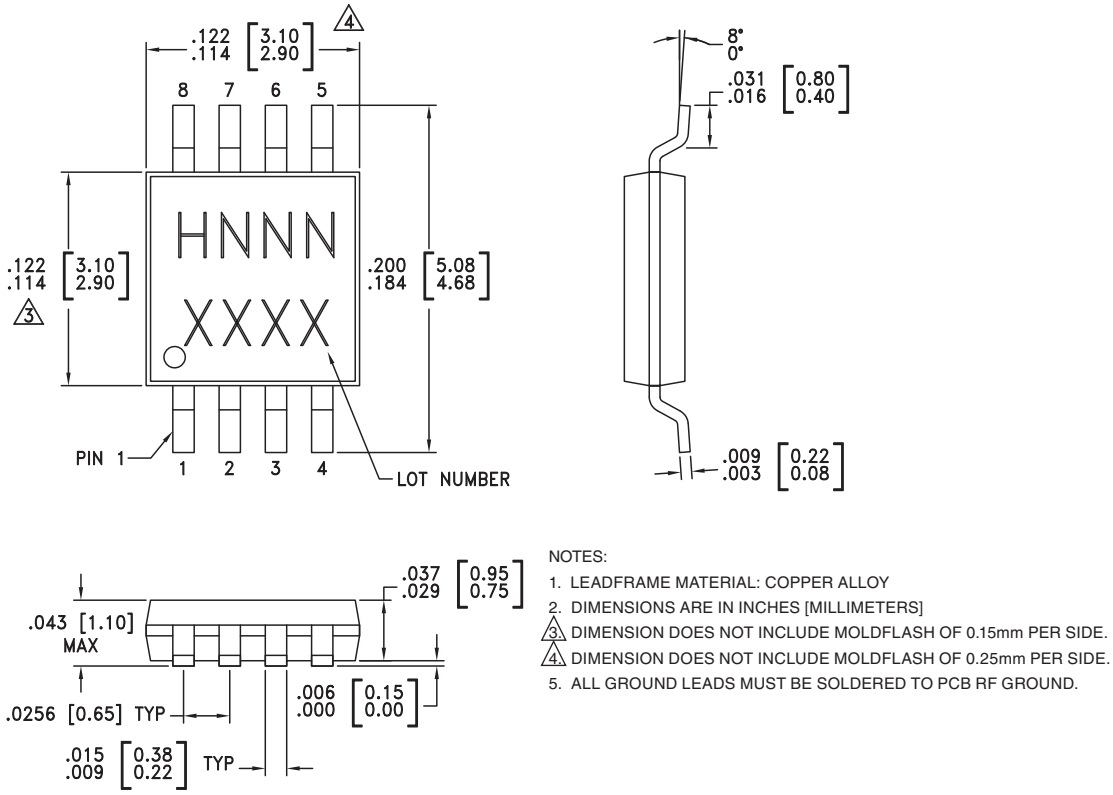
LO Freq. (GHz)	nLO Spur at RF Port			
	1	2	3	4
1.8	37	32	63	53
2.2	35	30	37	63
2.6	32	28	33	55
3	30	29	53	52
3.1	29	30	56	51
3.6	29	39	52	53
4.2	27	46	48	61
LO = +13 dBm Values in dBc below input LO level measured at RF Port.				

Absolute Maximum Ratings

RF / IF Input	+13 dBm
LO Drive	+27 dBm
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
ESD Sensitivity (HBM)	Class 1A

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Outline Drawing



NOTES:

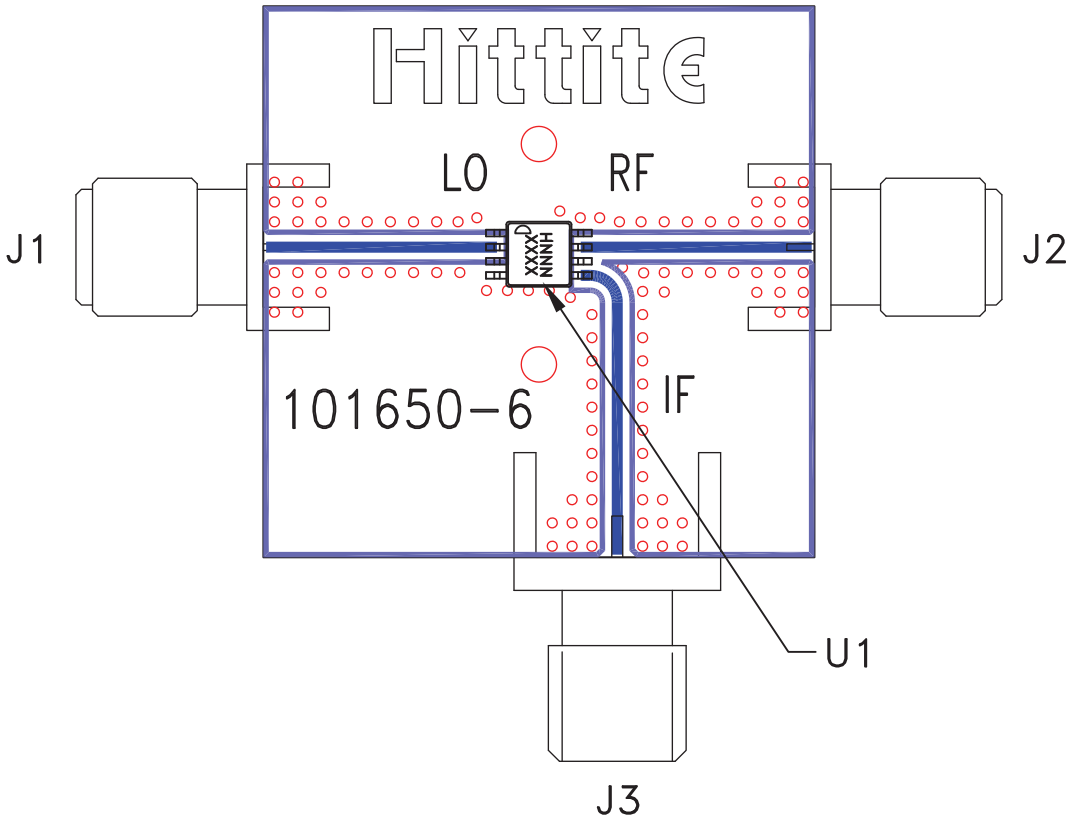
1. LEADFRAME MATERIAL: COPPER ALLOY
2. DIMENSIONS ARE IN INCHES [MILLIMETERS]
3. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.15mm PER SIDE.
4. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.25mm PER SIDE.
5. ALL GROUND LEADS MUST BE SOLDERED TO PCB RF GROUND.

Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking [3]
HMC175MS8	Low Stress Injection Molded Plastic	Sn/Pb Solder	MSL1 [1]	H175 XXXX
HMC175MS8E	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 [2]	H175 XXXX

[1] Max peak reflow temperature of 235 °C
[2] Max peak reflow temperature of 260 °C
[3] 4-Digit lot number XXXX

Evaluation Circuit Board



List of Materials for Evaluation PCB 103350 [1]

Item	Description
J1 - J3	PCB Mount SMA RF Connector
U1	HMC175MS8 / HMC175MS8E Mixer
PCB [2]	101650 Evaluation Board

[1] Reference this number when ordering complete evaluation PCB

[2] 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 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.

Notes: