

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

### Typical Applications

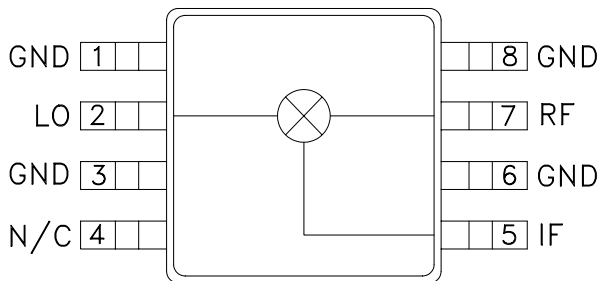
The HMC175MS8 is ideal for:

- 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
- IP3 (Input): +18 dBm

### Functional Diagram



### General Description

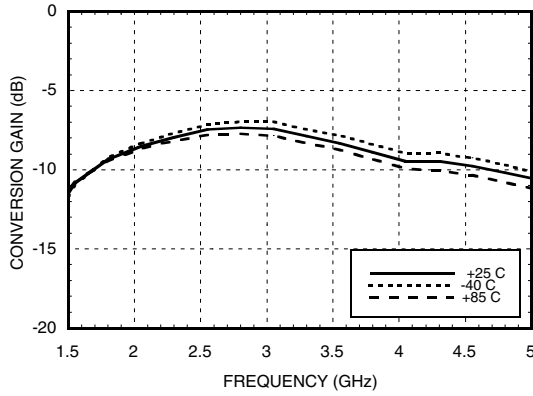
The HMC175MS8 is a miniature double-balanced mixer in an 8-lead plastic surface mount Mini Small Outline Package (MSOP). The device can be used as an upconverter or downconverter. The mixer provides exceptional isolation and Intermodulation performance for applications in high signal density environments. This device can also be used as a biphaser 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, $T_A = +25^\circ C$ , LO Drive = +13 dBm

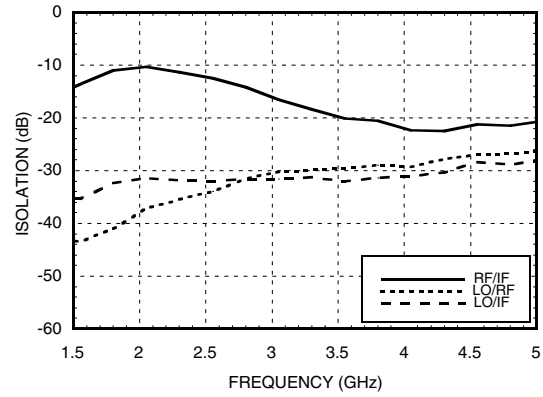
Parameter	Broadband			PCS Band			ISM Band			Units
	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
Frequency Range, RF & LO	1.7 - 4.5			1.7 - 2.0			2.2 - 2.6			GHz
Frequency Range, IF	DC - 1.0			DC - 1.0			DC - 1.0			GHz
Conversion Loss		8	11		9	11		8	10	dB
Noise Figure (SSB)		8	11		9	11		8	10	dB
LO to 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

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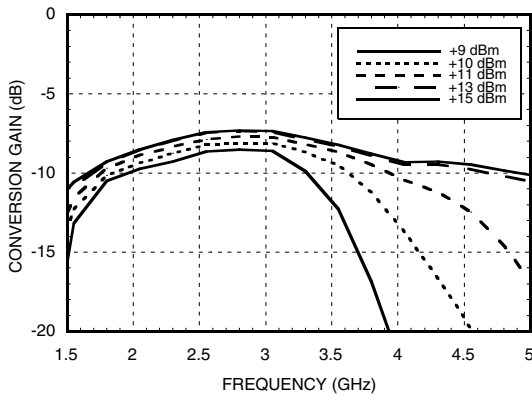
**Conversion Gain vs Temperature @ LO = +13 dBm**



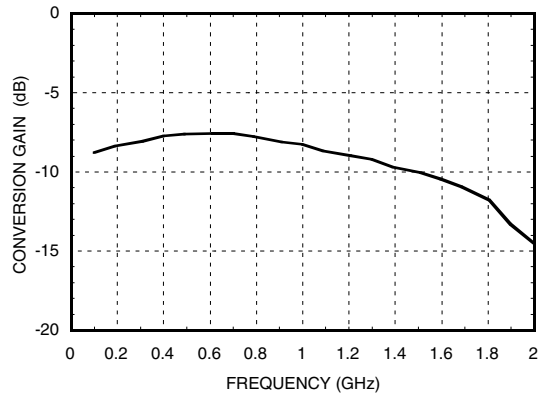
**Isolation @ LO = +13 dBm**



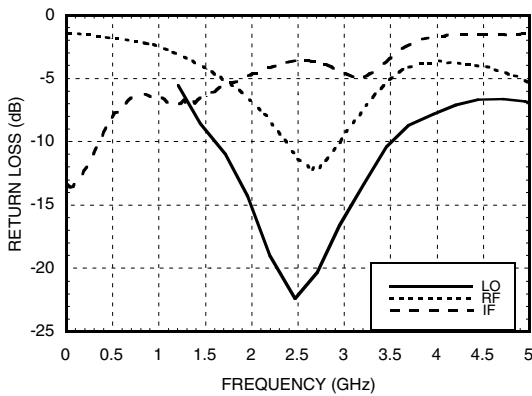
**Conversion Gain vs LO Power**



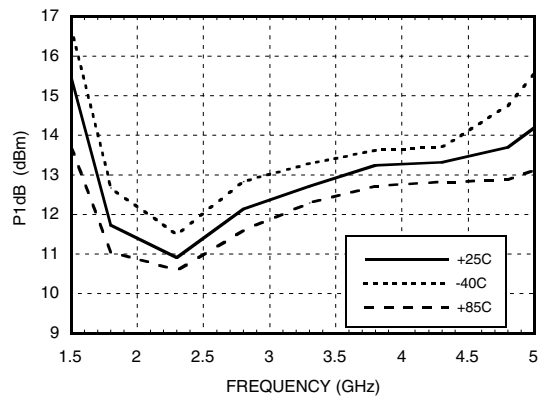
**IF Bandwidth @ LO = +13 dBm**



**Return Loss @ LO = +13 dBm**



**P1dB vs Temperature @ LO = +13 dBm**

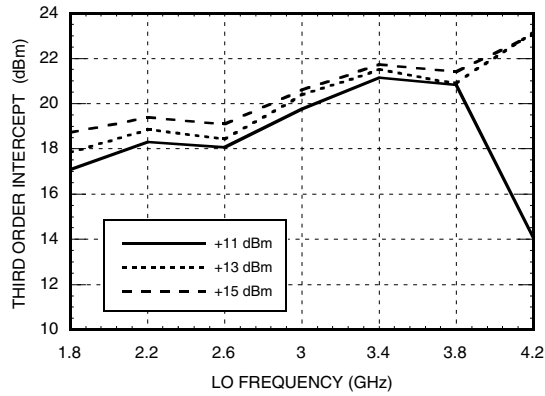


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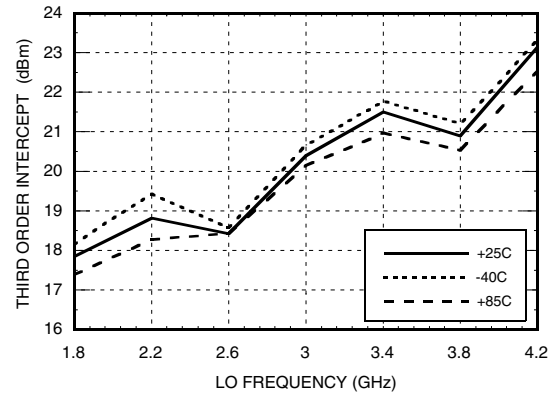
MIXERS - SMT

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

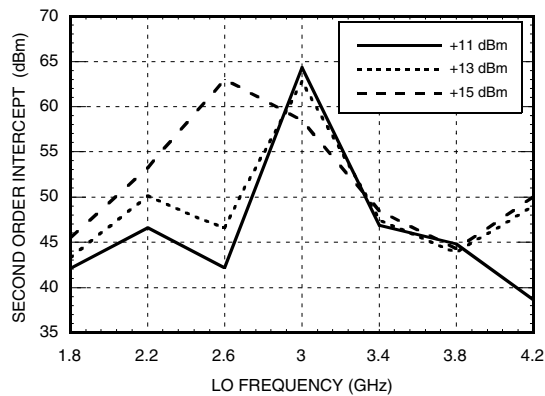
**Input IP3 vs. LO Drive**



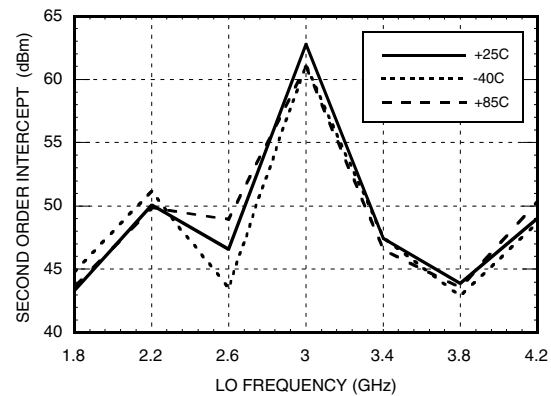
**Input IP3 vs. Temperature @ LO = +13 dBm**



**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					
mRF	nLO				
	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

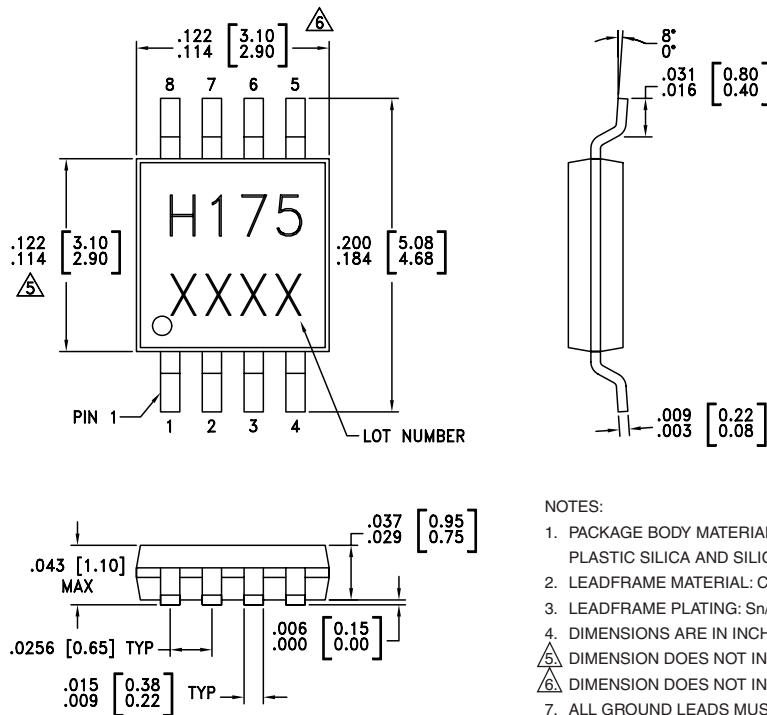
LO = +13 dBm  
Values in dBc below input LO level measured at RF Port.

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### 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

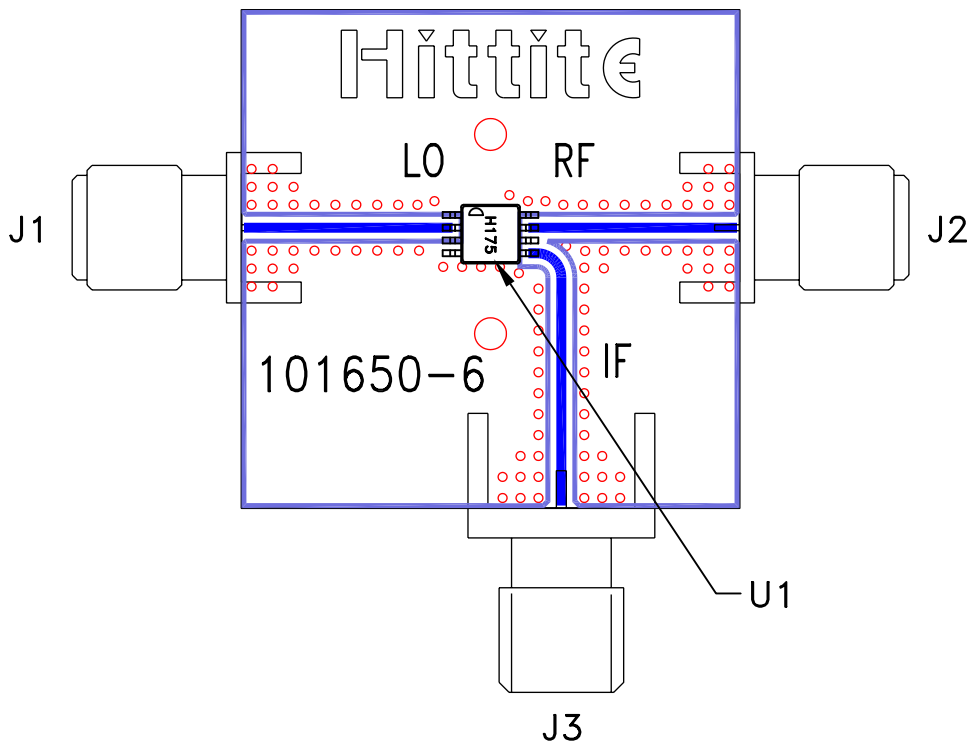


#### NOTES:

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.

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

### Evaluation Circuit Board



### List of Material

Item	Description
J1 - J3	PC Mount SMA RF Connector
U1	HMC175MS8 Mixer
PCB*	101650 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 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.

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

**Notes:**