

# HMC218MS8

## GaAs MMIC SMT DOUBLE-BALANCED MIXER, 4.5 - 6 GHz

### Typical Applications

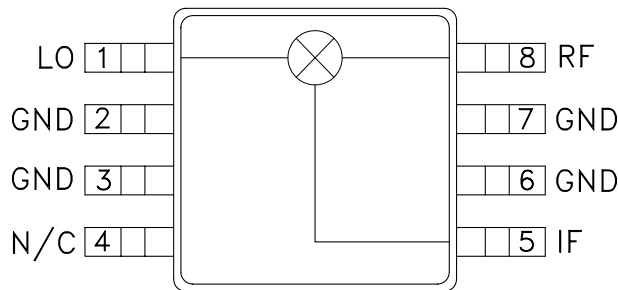
The HMC218MS8 is ideal for:

- UNII & HiperLAN
- Portable Wireless
- PCMCIA

### Features

- Ultra Small Package: <1 mm High
- IP3 (Input): +18 dBm
- Conversion Loss: 8 dB
- LO / RF Isolation: 30 dB

### Functional Diagram



### General Description

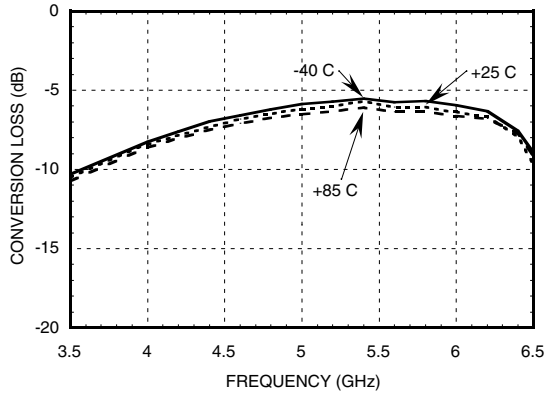
The HMC218MS8 is an ultra miniature double-balanced mixer in an 8 lead plastic surface mount package (MSOP). This passive MMIC mixer is constructed of GaAs Schottky diodes and novel planar transformer baluns on the chip. The device can be used as an upconverter, downconverter, bi-phase (de)modulator, or phase comparator. The consistent MMIC performance will improve system operation and assure regulatory compliance.

### Electrical Specifications, $T_A = +25^\circ C$ , As a Function of LO Drive

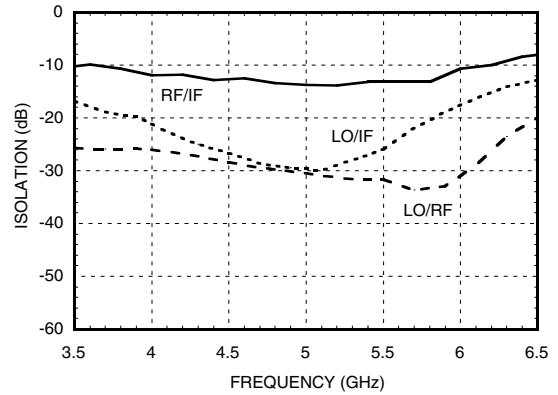
Parameter	LO = +13 dBm IF = 100 MHz			LO = +10 dBm IF = 100 MHz			LO = +7 dBm IF = 100 MHz			Units
	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
Frequency Range, RF & LO	4.5 - 6.0			4.5 - 6.0			4.7 - 5.9			GHz
Frequency Range, IF	DC - 1.6			DC - 1.6			DC - 1.5			GHz
Conversion Loss		6.5	8.5		8	9.5		8	9.5	dB
Noise Figure (SSB)		6.5	8.5		8	9.5		8	9.5	dB
LO to RF Isolation	25	30		25	30		23	28		dB
LO to IF Isolation	15	25		14	25		12	23		dB
IP3 (Input)	5.2 GHz	12	16	11	14		9	12		dBm
	5.8 GHz	15	18	13	17		10	13		
1 dB Gain Compression (Input)	7	10		5	9		4	7		dBm

## GaAs MMIC SMT DOUBLE-BALANCED MIXER, 4.5 - 6 GHz

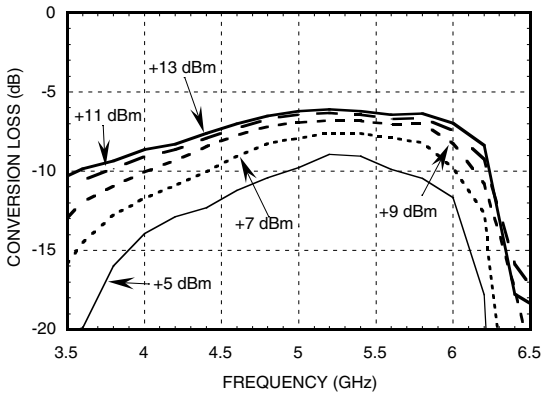
**Conversion Loss vs. Temperature @ LO = +13 dBm**



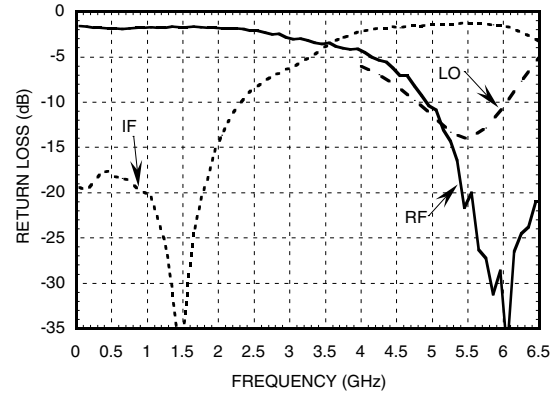
**Isolation @ LO = +13 dBm**



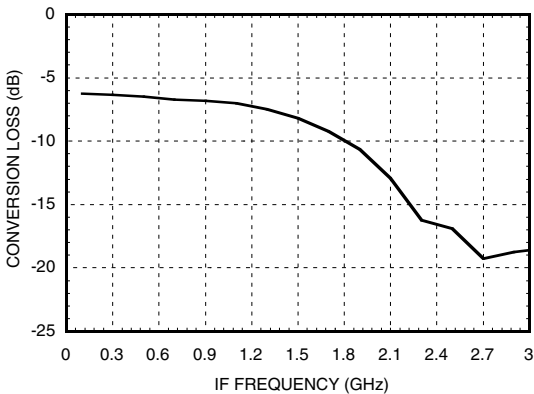
**Conversion Loss vs. LO Drive**



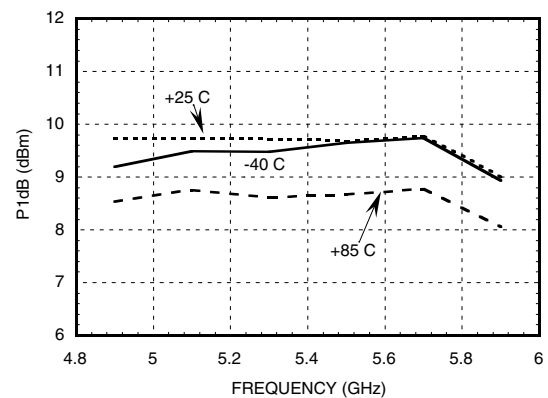
**Return Loss @ LO = +13 dBm**



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

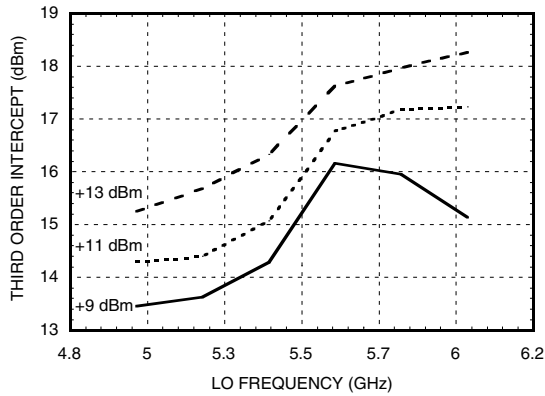


**P1dB vs. Temperature LO = +13 dBm**

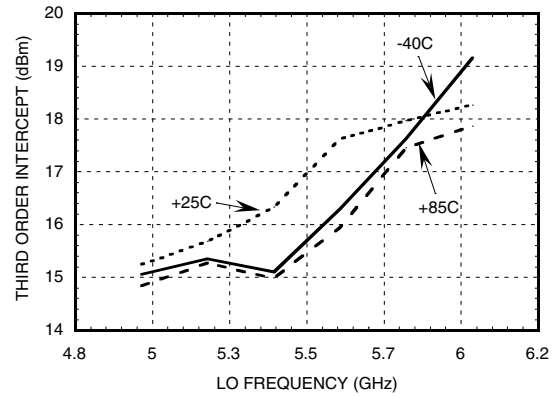


## GaAs MMIC SMT DOUBLE-BALANCED MIXER, 4.5 - 6 GHz

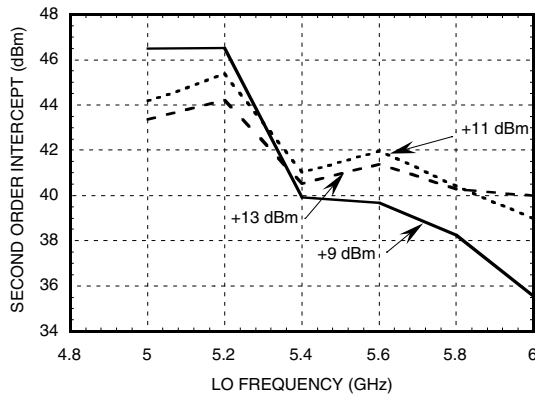
**Input IP3 vs. LO Drive**



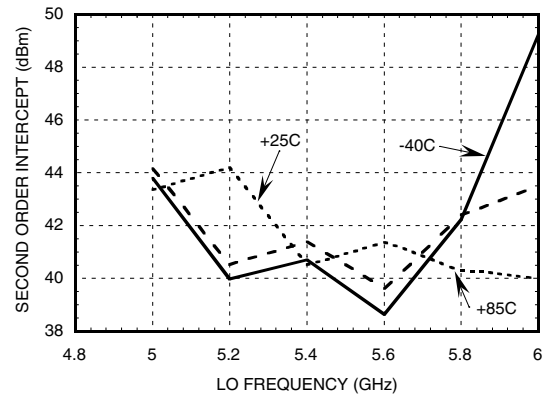
**Input IP3 vs. Temperature @ LO = +13 dBm**



**Input IP2 vs. Drive**



**Input IP2 vs. Temperature @ LO = +13 dBm**



**MxN Spurious Outputs**

mRF	nLO				
	0	1	2	3	4
0	xx	0	15	23	36
1	10	0	34	27	59
2	67	61	56	59	68
3	97	82	81	60	77
4	>105	>105	>105	>105	96

RF = 5.15 GHz @ -10 dBm  
 LO = 5.25 GHz @ +13 dBm  
 All values in dBc relative to the IF

**Harmonics of LO**

LO Freq. (GHz)	nLO Spur at RF Port			
	1	2	3	4
5.0	31	30	57	68
5.2	31	32	59	69
5.4	32	35	62	73
5.6	32	35	64	76
5.8	33	35	65	76
6.0	33	32	64	68

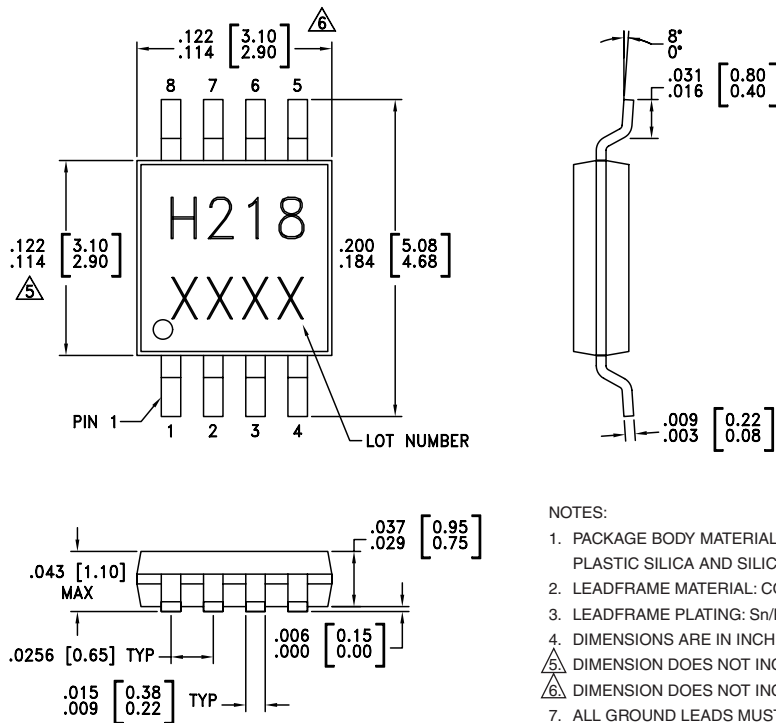
LO = +13 dBm  
 Values in dBc below input LO level measured at the RF port.

## GaAs MMIC SMT DOUBLE-BALANCED MIXER, 4.5 - 6 GHz



### 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

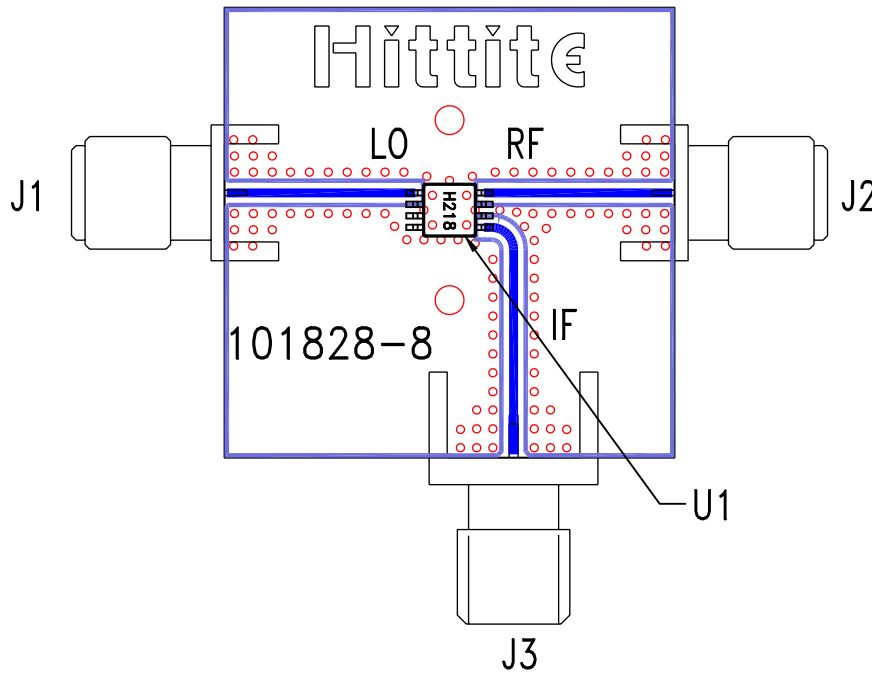


#### NOTES:

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, 4.5 - 6 GHz

### Evaluation Circuit Board



### List of Material

Item	Description
J1 - J3	PC Mount SMA RF Connector
U1	HMC218MS8 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.

## *GaAs MMIC SMT DOUBLE- BALANCED MIXER, 4.5 - 6 GHz*

**Notes:**