

## GaAs MMIC SMT DOUBLE-BALANCED MIXER 0.7 - 2.0 GHz

FEBRUARY 2001

### Features

CONVERSION LOSS: 7.5 dB

LO/IF ISOLATION: 48 dB

LO/RF ISOLATION: >50 dB

IP3 (INPUT) : +17 dBm

### General Description

The HMC207S8 is a miniature double-balanced mixer in an 8 lead plastic surface mount Small Outline IC (SOIC) package. This passive MMIC mixer is constructed of GaAs Schottky diodes and novel planar transformer baluns on the chip. The device can be used as a up, or downconverter, bi-phase modulator (de)modulator or phase comparator for 900, 1500, or 1900 MHz applications. It is especially suited for miniature base stations, cable modems, and portable wireless applications because of its high dynamic input signal range, and zero DC bias requirement. The consistent MMIC performance will improve system operation and assure regulatory compliance. The high LO suppression of 45 to 50 dB yields excellent carrier suppression for modulator applications.



4

MIXERS

SMT



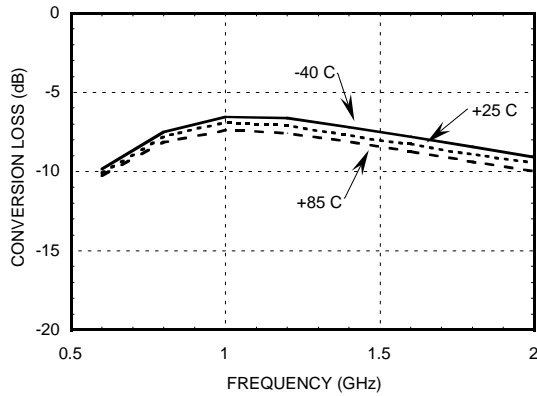
### Guaranteed Performance As a Function of LO Drive , -40 to +85 deg C

Parameter	LO = +13 dBm IF = 70 MHz			LO = +10 dBm IF = 70 MHz			Units
	Min.	Typ.	Max.	Min.	Typ.	Max.	
Frequency Range, RF & LO		0.7 - 2.0			0.8 - 1.2		GHz
Frequency Range, IF		DC - 0.3			DC - 0.3		GHz
Conversion Loss		<9	10.5		7.5	10	dB
Noise Figure (SSB)		<9	10.5		7.5	10	dB
LO to RF Isolation	32	40		40	45		dB
LO to IF Isolation	38	45		40	45		dB
RF to IF Isolation	17	23		18	22		dB
IP3 (Input)	14	17		12	15		dBm
1 dB Gain Compression (Input)	8	11		7	10		dBm
Local Oscillator Drive Level	8		17	8		17	dBm

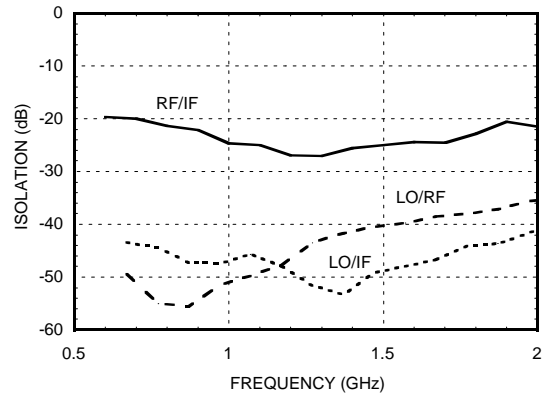
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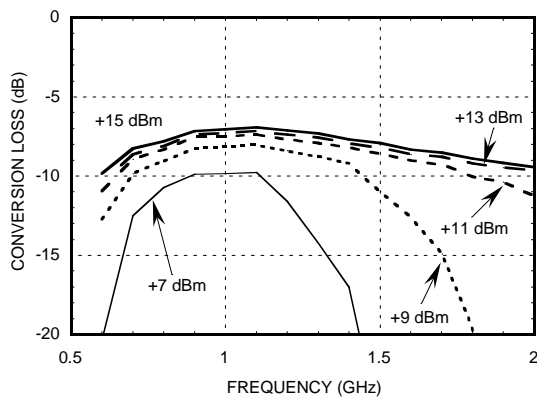
**Conversion Loss vs. Temperature @ LO = +13 dBm**



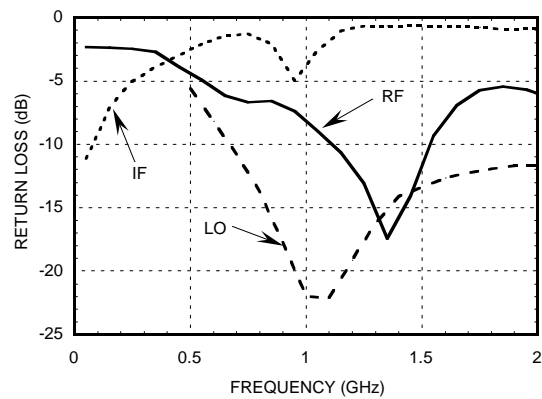
**Isolation @ LO = +13 dBm**



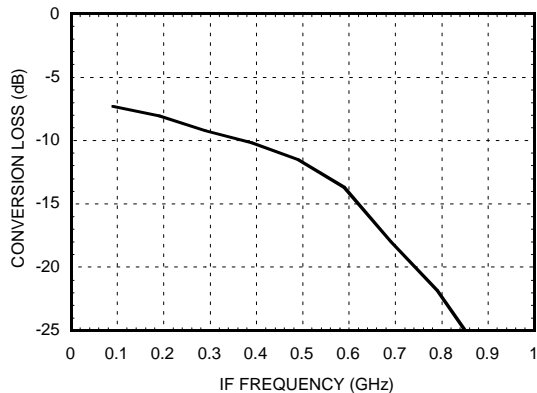
**Conversion Loss vs. LO Drive**



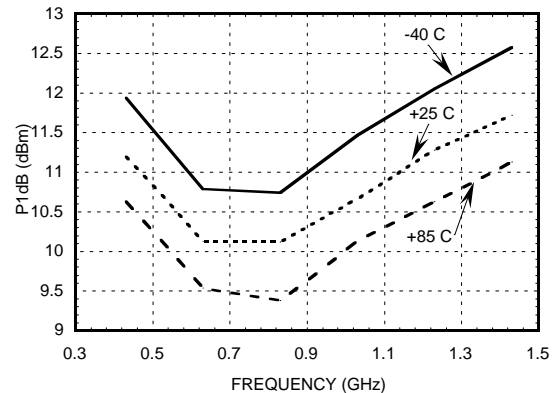
**Return Loss @ LO = +13 dBm**



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



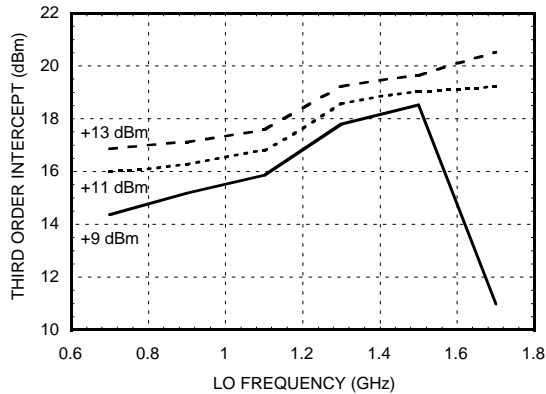
**P1 dB vs. Temperature @ LO = +13 dBm**



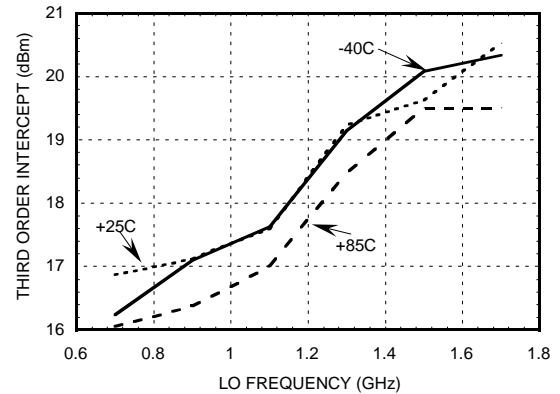
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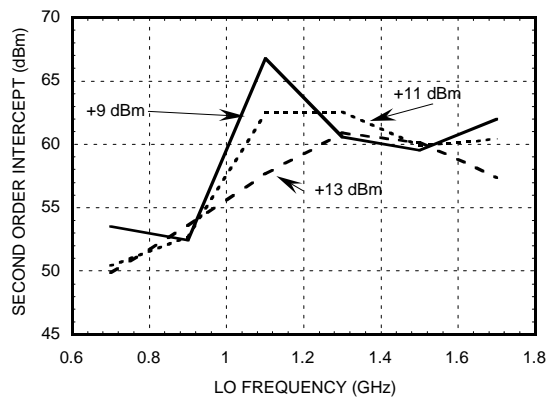
### Input IP3 vs. LO Drive



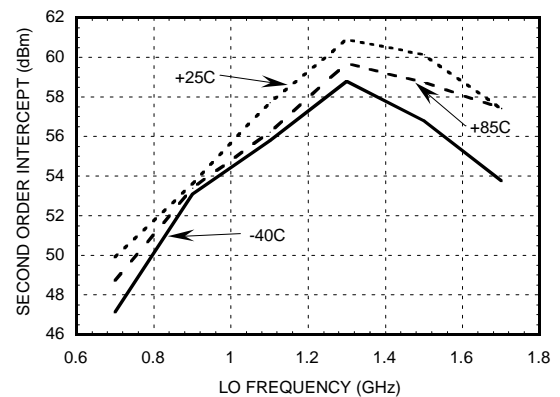
### Input IP3 vs. Temperature @ LO Drive = +13 dBm



### Input IP2 vs. LO Drive



### Input IP2 vs. Temperature @ LO Drive = +13 dBm



### MXN Spurious Outputs

mRF	nLO				
	0	1	2	3	4
0	xx	19	27	20	36
1	17	0	43	43	39
2	64	66	63	74	75
3	91	94	92	65	86
4	>105	>105	>105	97	97

RF= 0.9 GHz @ -10 dBm  
 LO= 0.97 GHz @ +13 dBm  
 All values in dBc relative to the IF

### Harmonics of LO

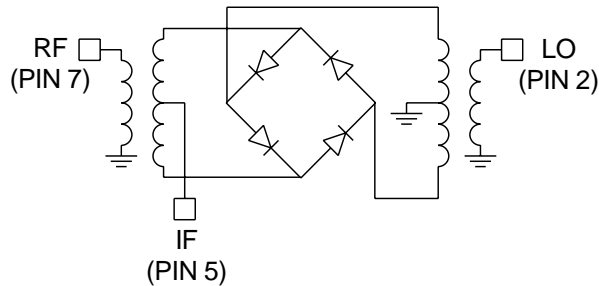
LO Frequency (GHz)	nLO Spur at RF Port			
	1	2	3	4
0.7	49	38	54	50
0.9	54	35	53	59
1.1	49	34	53	57
1.3	42	34	46	56
1.5	40	36	43	58
1.7	38	42	40	61

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

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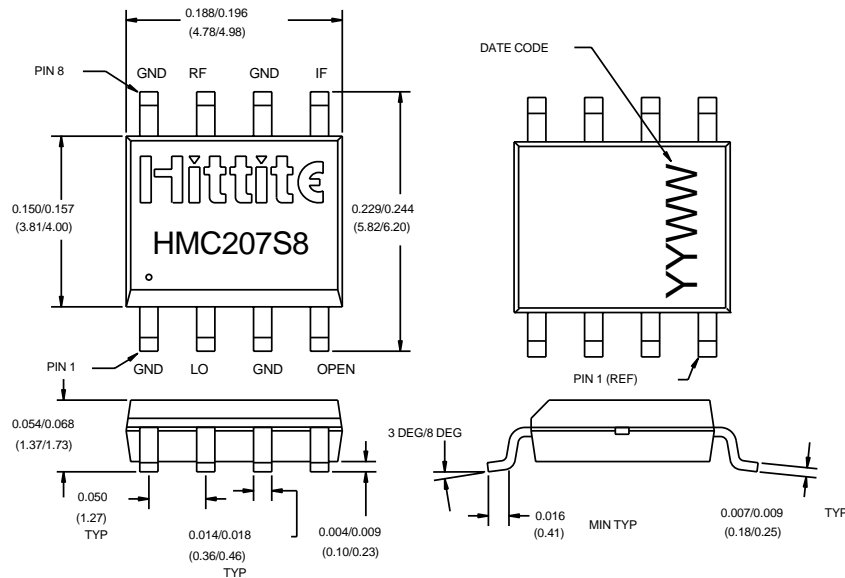
### Schematic



### Absolute Maximum Ratings

RF / IF Input	+13 dBm
LO Drive	+27 dBm
Storage Temperature	-65 to +150 deg C
Operating Temperature	-55 to +85 deg C

### Outline Drawing



1. MATERIAL:
  - A) PACKAGE BODY - LOW STRESS INJECTION-MOLDED PLASTIC, SILICA & SILICONE IMPREGNATED.
  - B) LEADFRAME MATERIAL: COPPER ALLOY
2. PLATING: LEAD-TIN SOLDER PLATE
3. DIMENSIONS ARE IN INCHES (MILLIMETERS), UNLESS OTHERWISE SPECIFIED TOL. ARE  $\pm 0.005$  ( $\pm 0.13$ )