GaAs MMIC SMT DOUBLE-BALANCED MIXER 5 - 12 GHz

FEBRUARY 2001

Features

LOW COST PLASTIC CONVERTER

FOR MICROWAVE RADIOS & VSAT

ULTRA SMALL PACKAGE: MSOP8

CONVERSION LOSS: 7.5 dB

WIDEBAND IF : DC - 4 GHz

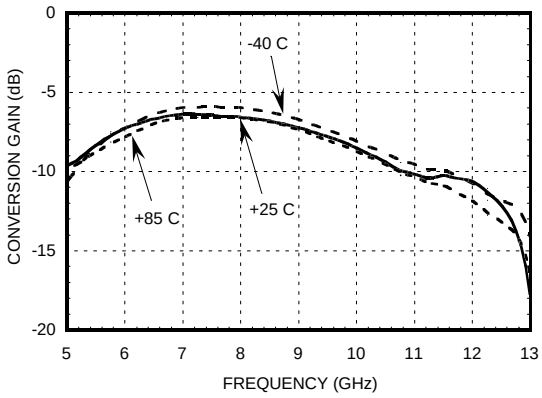
General Description

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 up or downconverter, bi-phase (de)modulator or phase comparator. It is especially suited for 5.9 to 11.7 GHz microwave radio and VSAT applications because of its high dynamic input signal range, small size, zero DC bias requirement and low cost. The consistent MMIC performance will improve system operation and assure regulatory compliance. The MSOP8 package is the smallest footprint available for a complete passive double-balanced mixer, 0.118" x 0.190" (3.0mm x 4.9mm). At a height of 0.040" (1.0mm) this is the *thinnest* mixer package available today.

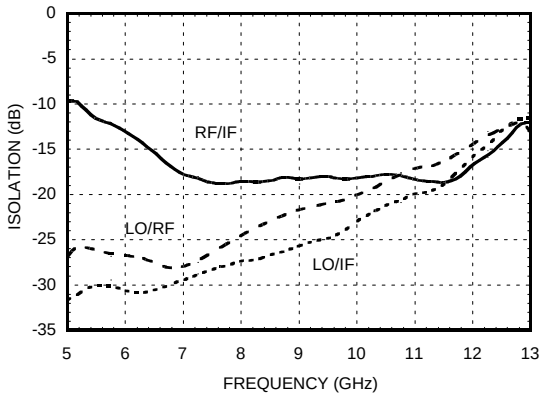
Guaranteed Performance, *As a Function of LO Drive, - 40 to + 85 deg. C*

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
Local Oscillator Drive Level			17			17			17	dBm

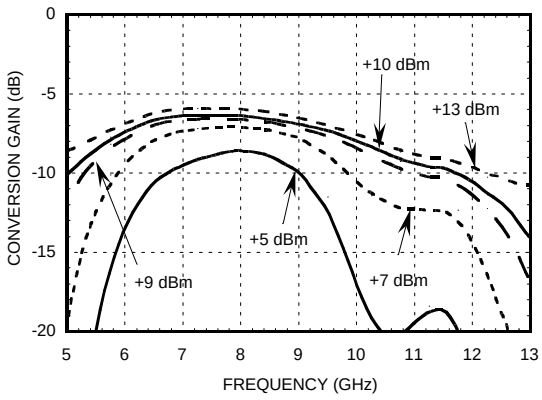
Conversion Gain vs. Temperature @ LO = +10 dBm



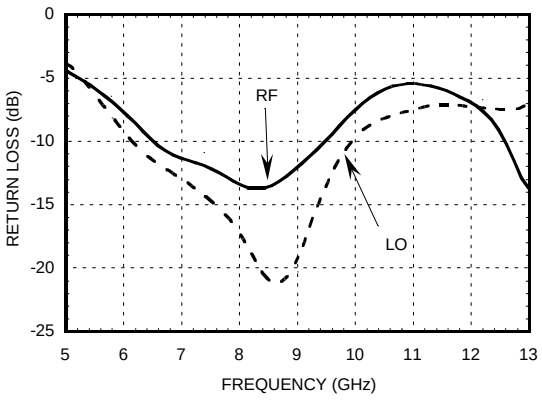
Isolation @ LO = +10 dBm



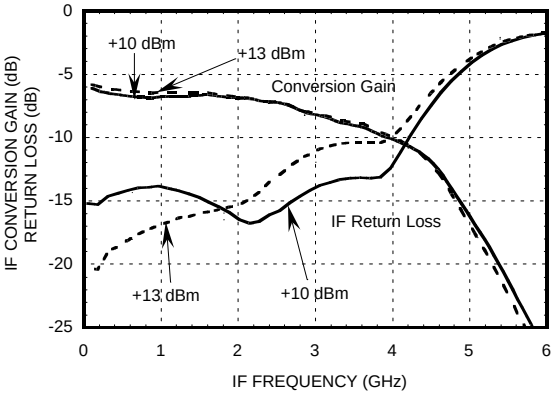
Conversion Gain vs. LO Drive



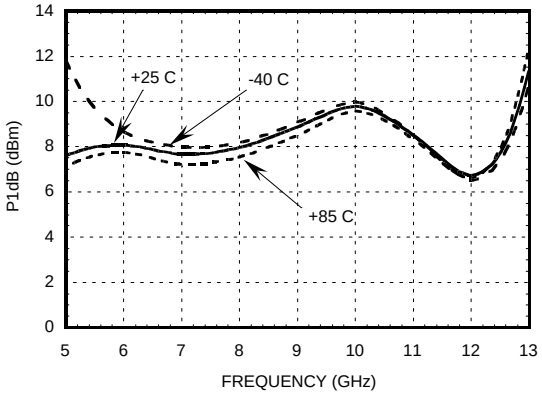
Return Loss @ LO = + 10dBm



IF Bandwidth vs LO Drive Conversion Gain and Return Loss



P1dB vs. Temperature @ LO = +10 dBm



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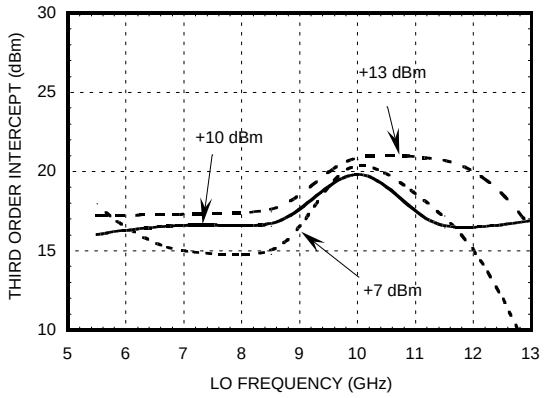
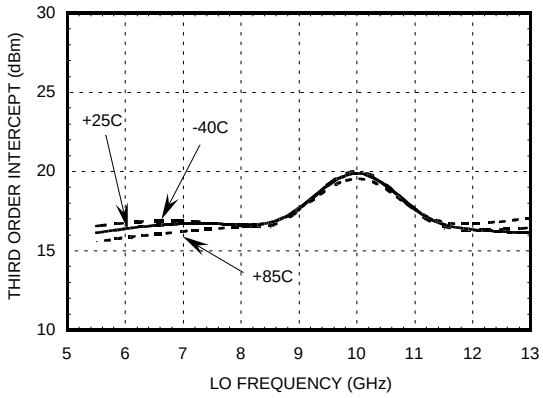
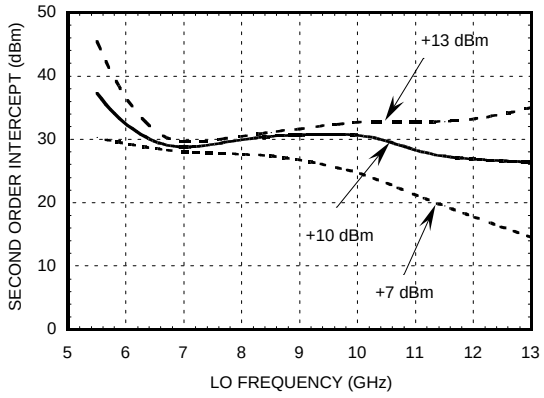
Input IP3 vs. LO Drive



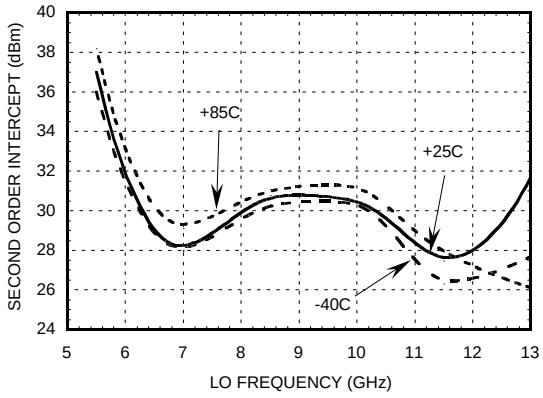
Input IP3 vs. Temperature @ LO = +10 dBm



Input IP2 vs. LO 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 @ -10dBm
LO= 7.6 @ 10dBm
All values in dBc below IF power level (-1RF + 1LO).

Harmonics of LO

	nLO Spur at RF Port			
LO Frequency (GHz)	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
All values in dBc below input LO level measured at the RF port

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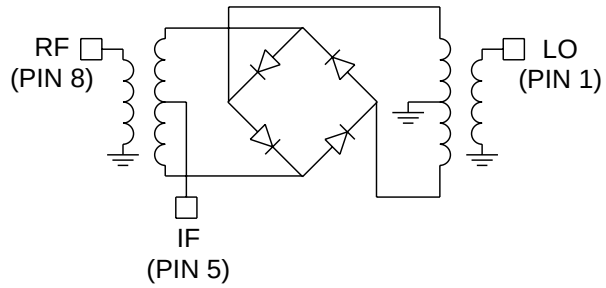
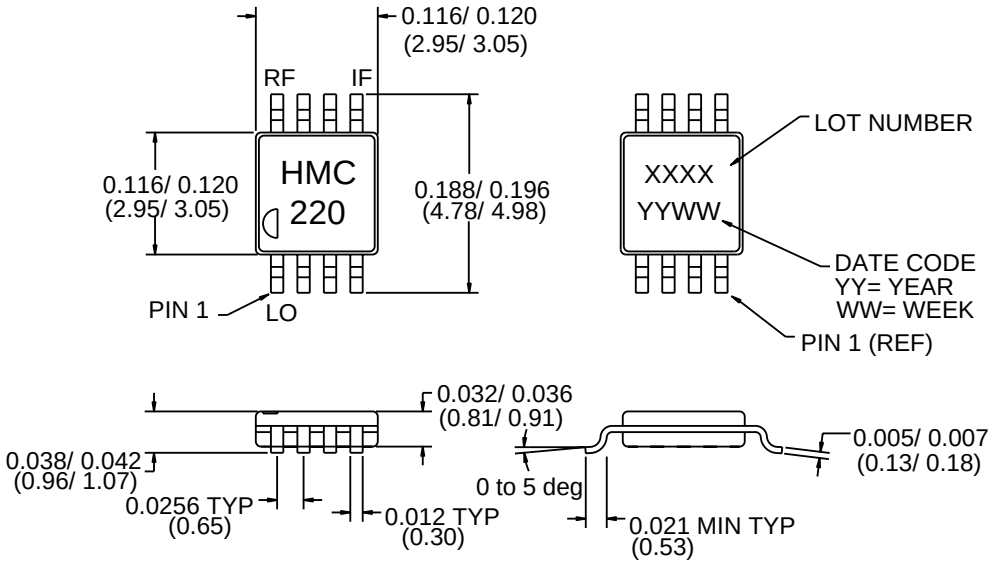
Schematic



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 ±0.005 (±0.13)
4. ALL UNLABELED LEADS ARE GROUND