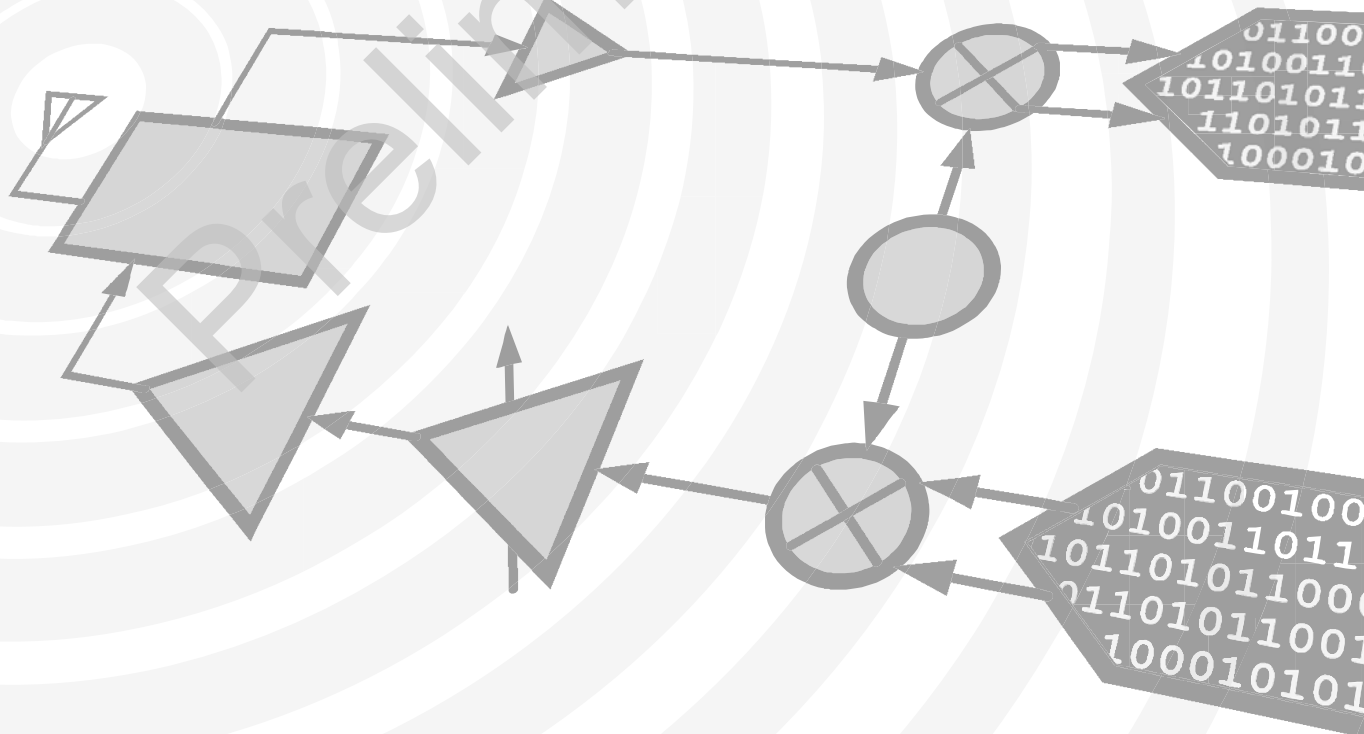


Analog Devices Welcomes Hittite Microwave Corporation



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Preliminary

GaAs MMIC SMT DOUBLE-BALANCED MIXER, 1.5 - 4.5 GHz

Typical Applications

The HMC213BMS8GE is ideal for:

- Base Stations
- PCMCIA Transceivers
- Wireless Local Loop

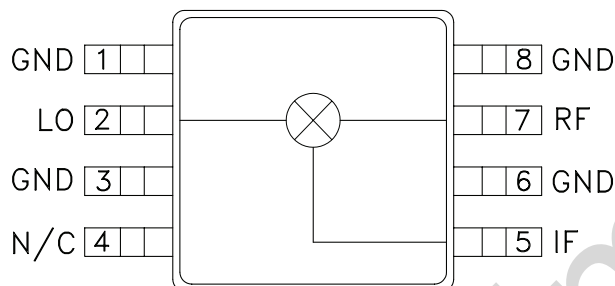
Features

Ultra Small Package: MSOP8

Conversion Loss: 8.5 dB

LO / RF Isolation: 40 dB

Functional Diagram



General Description

The HMC213BMS8GE 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, biphase (de)modulator, or phase comparator. The consistent MMIC performance will improve system operation and assure regulatory compliance.

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

Parameter	LO = +13 dBm IF = 100 MHz			LO = +10 dBm IF = 100 MHz			Units
	Min.	Typ.	Max.	Min.	Typ.	Max.	
Frequency Range, RF & LO	1.5 - 4.5			1.7 - 3.6			GHz
Frequency Range, IF	DC - 1.5			DC - 1.5			GHz
Conversion Loss		8.5	10		9	10.5	dB
Noise Figure (SSB)		8.5	10		9	10.5	dB
LO to RF Isolation	29	40		32	40		dB
LO to IF Isolation	27	35		26	35		dB
IP3 (Input)	16	19		14	18		dBm
1 dB Gain Compression (Input)	7	10		5	8		dBm

GaAs MMIC SMT DOUBLE-BALANCED MIXER, 1.5 - 4.5 GHz

MxN Spurious Outputs

mRF	nLO				
	0	1	2	3	4
0	xx	12.7	20.8	19.8	76.2
1	13.4	0	39.8	38.9	56.2
2	73.8	78.2	66.5	82.2	68.8
3	93.8	89.2	92.2	82.4	89.0
4	>105	>105	>105	>105	>105

RF = 3.5 GHz @ -10 dBm
 LO = 3.6 GHz @ +13 dBm
 All values in dBc below IF power level (-1RF + 1LO)

Harmonics of LO @ RF Port

LO Freq. (GHz)	nLO Spur			
	1	2	3	4
1.5	40	30	62	57
2.0	38	25	55	58
2.5	41	28	34	61
3.0	41	35	36	61
3.5	38	45	52	62
4.0	35	47	55	62
4.5	33	50	65	73
5.0	32	52	68	82

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

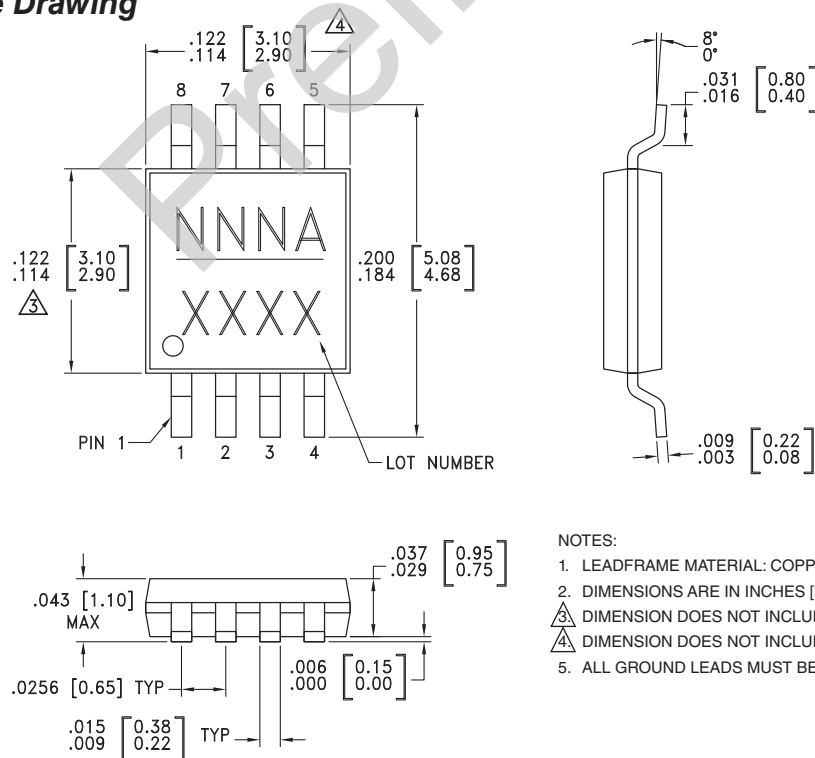
Absolute Maximum Ratings

RF / IF Input	+13 dBm
LO Drive	+27 dBm
Continuous Pdiss (T = 85 °C) (derate 10.6 mW/°C above 85 °C)	0.69 W
Thermal Resistance (Channel to package lead)	93.7 °C/W
Junction Temperature	150 °C
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C



ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Outline Drawing



NOTES:

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