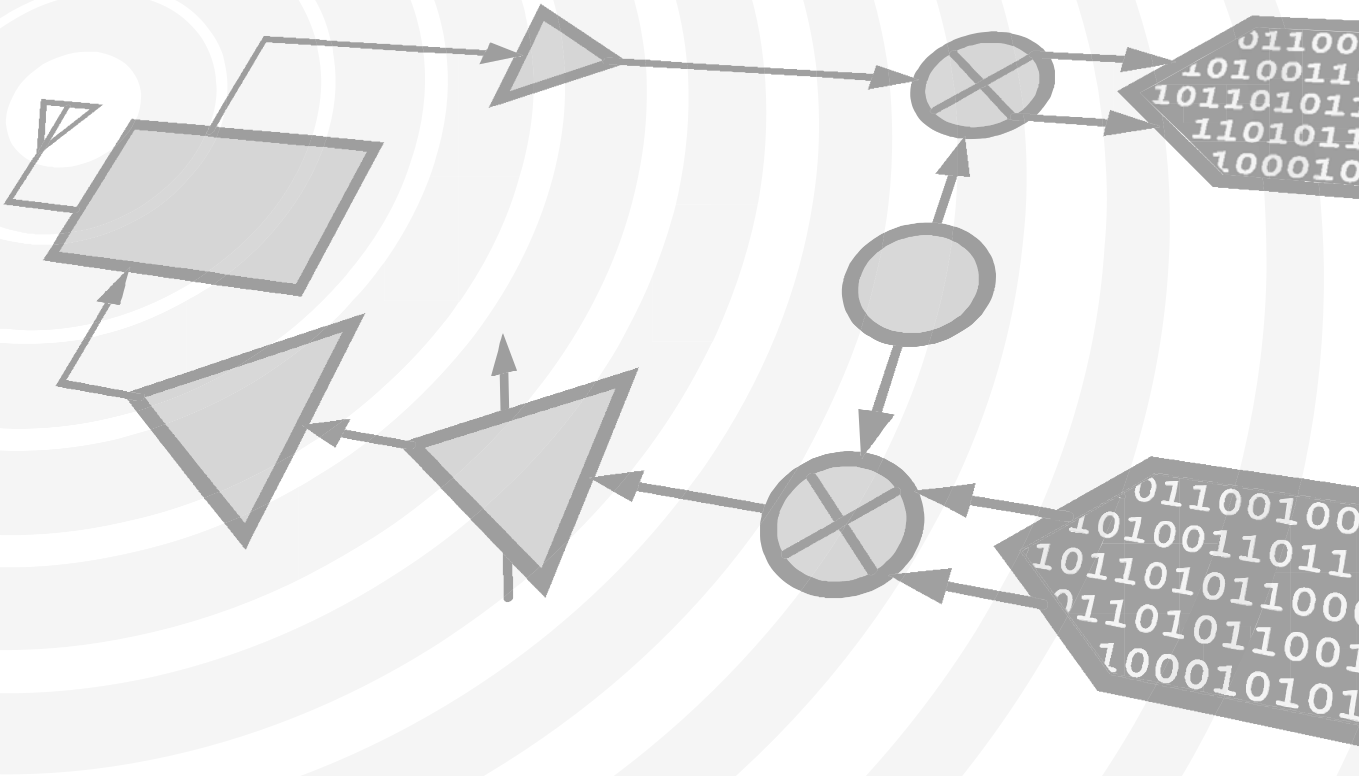
Analog Devices Welcomes Hittite Microwave Corporation



MICROWAVE CORPORATION

v03.0308

OBSOLETE PRODUCT

HMC350MS8 / 350MS8E

GaAs MMIC HIGH IP3 SINGLE-BALANCED MIXER, 0.6 - 1.2 GHz

Typical Applications

The HMC350MS8 / HMC350MS8E is ideal for:

- Cellular Basestations
- Cable Modems
- Fixed Wireless Access Systems

Features

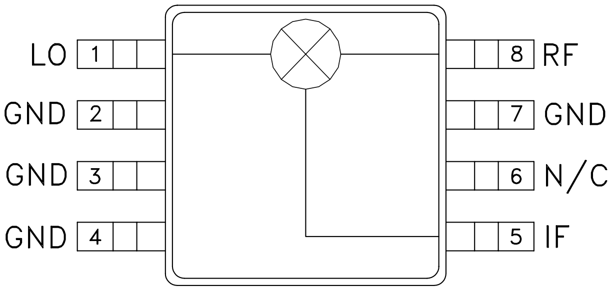
Conversion Loss: 8 dB

Input IP3: +27 dBm

Input IP2: +45 dBm

Input P1dB: +17 dBm

Functional Diagram



General Description

The HMC350MS8 & HMC350MS8E are miniature single balanced mixers in 8 lead plastic surface mount packages. The passive GaAs schottky diode mixer implements planar on chip baluns and requires no external components. The mixer can be used as an upconverter, down converter, or modulator. The mixer provides 7.5 dB conversion loss and +25 dBm IIP3 with LO drive levels of +19 dBm at mid-band. The design was optimized for low cost high volume applications where high converter linearity is required.

Electrical Specifications, $T_A = +25° C$

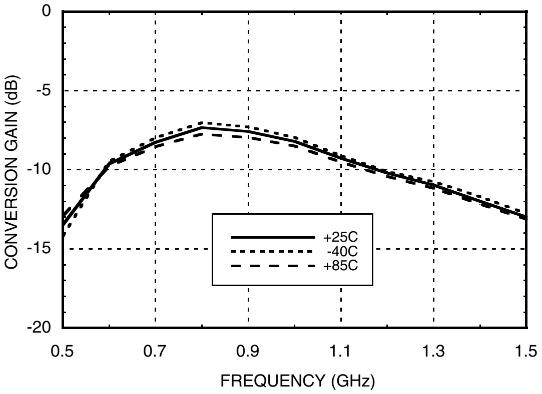
Parameter	LO = +19 dBm, IF = 100 MHz						Units
	Min.	Typ.	Max.	Min.	Typ.	Max.	
Frequency Range, RF & LO		0.6 - 1.2			0.8 - 1.0		GHz
Frequency Range, IF		DC - 0.3			DC - 0.3		GHz
Conversion Loss		8	12		7.5	10	dB
Noise Figure (SSB)		8	12		7.5	10	dB
LO to RF Isolation	19	22		19	22		dB
LO to IF Isolation	5	8		5	8		dB
RF to IF Isolation	14	18		15	20		dB
IP3 (Input)	23	27		23	27		dBm
IP2 (Input)	33	45		38	45		dBm
1 dB Compression (Input)	14	17		14	17		dBm

**Unless otherwise noted, all measurements performed as downconverter, IF= 100 MHz.*

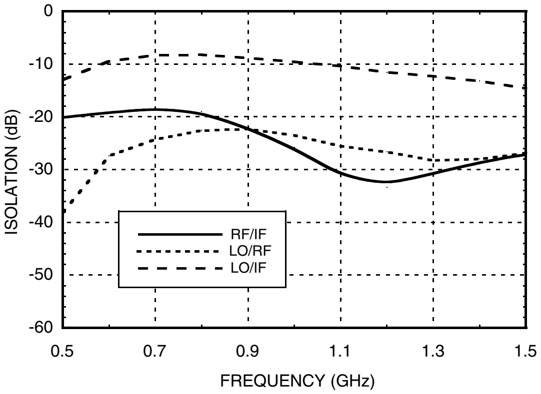
RoHS✓ EARTH FRIENDLY

GaAs MMIC HIGH IP3 SINGLE-BALANCED MIXER, 0.6 - 1.2 GHz

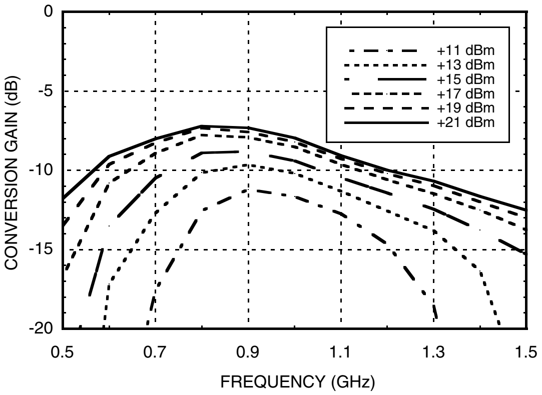
Conversion Gain vs. Temperature @ LO = +19 dBm



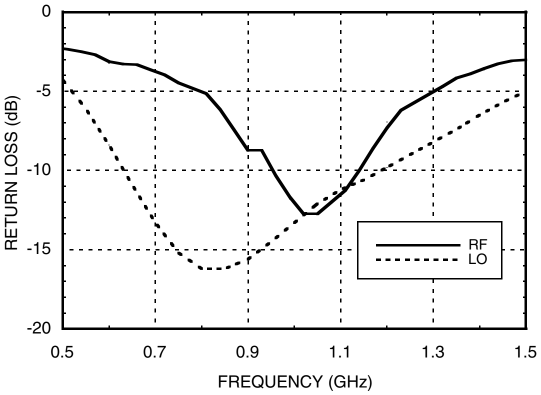
Isolation @ LO = +19 dBm



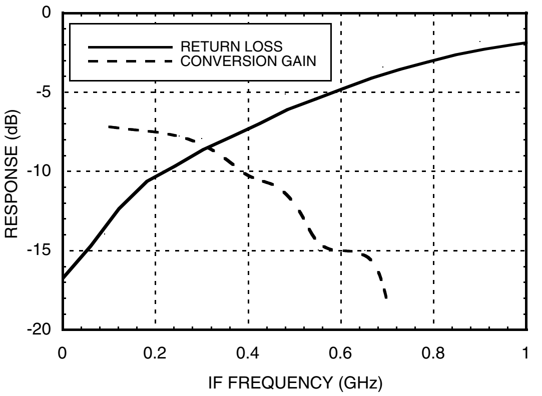
Conversion Gain vs. LO Drive



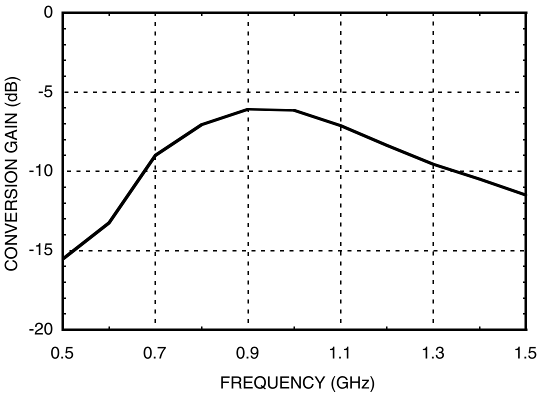
Return Loss @ LO = +19 dBm



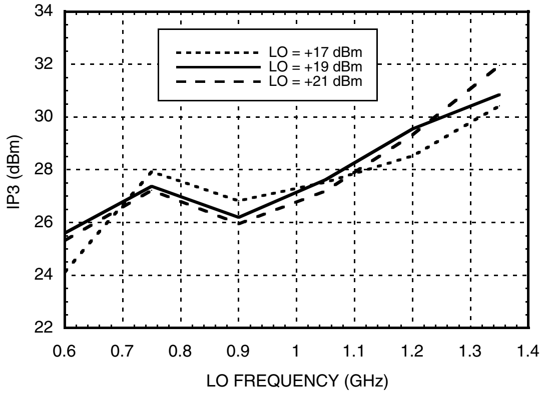
IF Bandwidth @ LO = +19 dBm



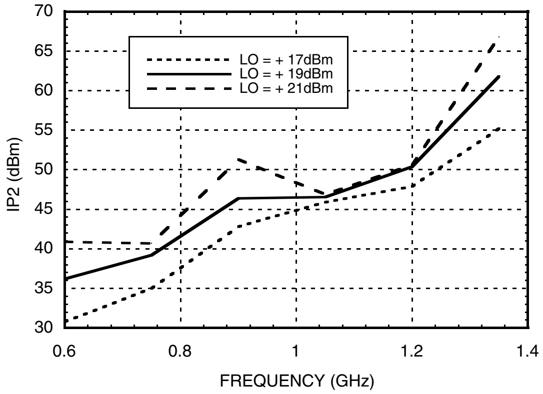
Upconverter Performance, Conversion Gain @ LO = +19 dBm



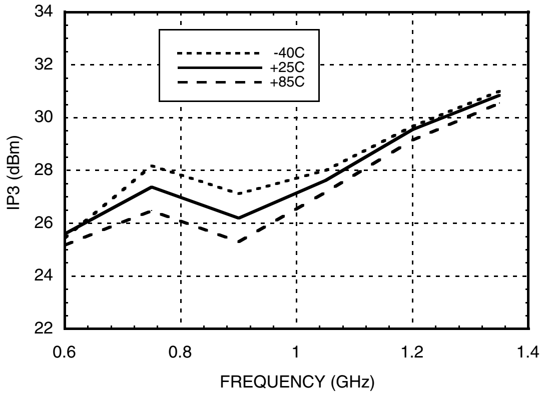
Input IP3 vs. LO Drive *



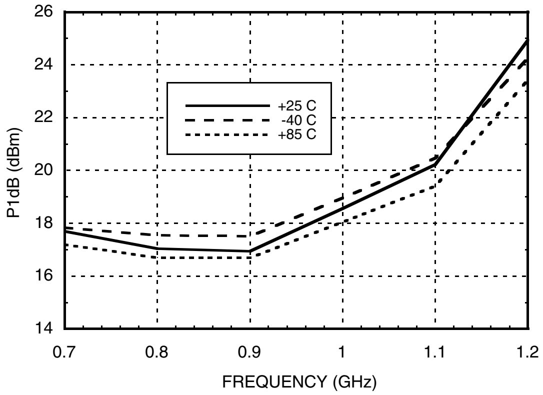
Input IP2 vs. LO Drive *



Input IP3 vs. Temperature * @ LO Drive = +19 dBm



P1dB vs. Temperature @ LO = +19 dBm



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* Two-tone input power = 0 dBm each tone, 1 MHz spacing.

MxN Spurious Outputs

	nLO				
mRF	0	1	2	3	4
0	xx	-28	-3	6	1
1	14	0	37	38	29
2	58	59	63	51	82
3	87	85	85	77	71
4	>94	>94	>94	>92	76

RF = 1.0 GHz @ -10 dBm
LO = 0.9 GHz @ +19 dBm
All values in dBc relative to the IF output power level.

Harmonics of LO

	nLO Spur at RF Port			
LO Frequency (GHz)	1	2	3	4
0.6	28	15	63	43
0.75	24	16	60	46
0.9	22	18	48	46
1.05	23	20	48	52
1.2	26	22	52	59
1.35	28	26	57	63

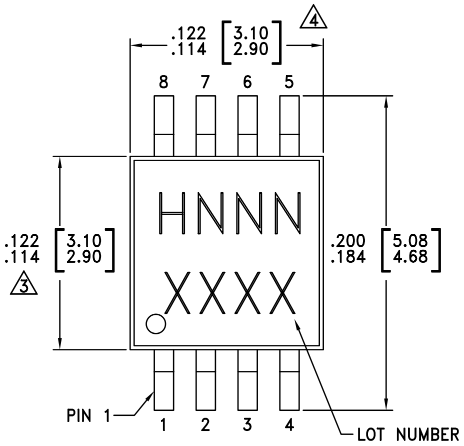
LO = +19 dBm
Values in dBc below input LO level measured at the RF port.

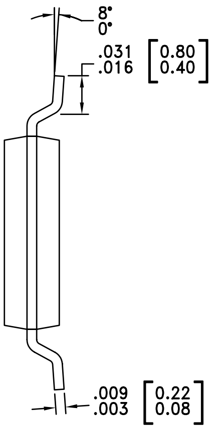
Absolute Maximum Ratings

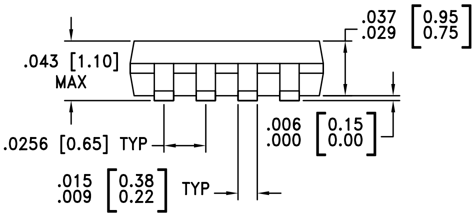
RF / IF Input	+27 dBm
LO Drive	+27 dBm
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
IF DC Current	±18 mA
ESD Sensitivity (HBM)	Class 1A

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Outline Drawing







NOTES:

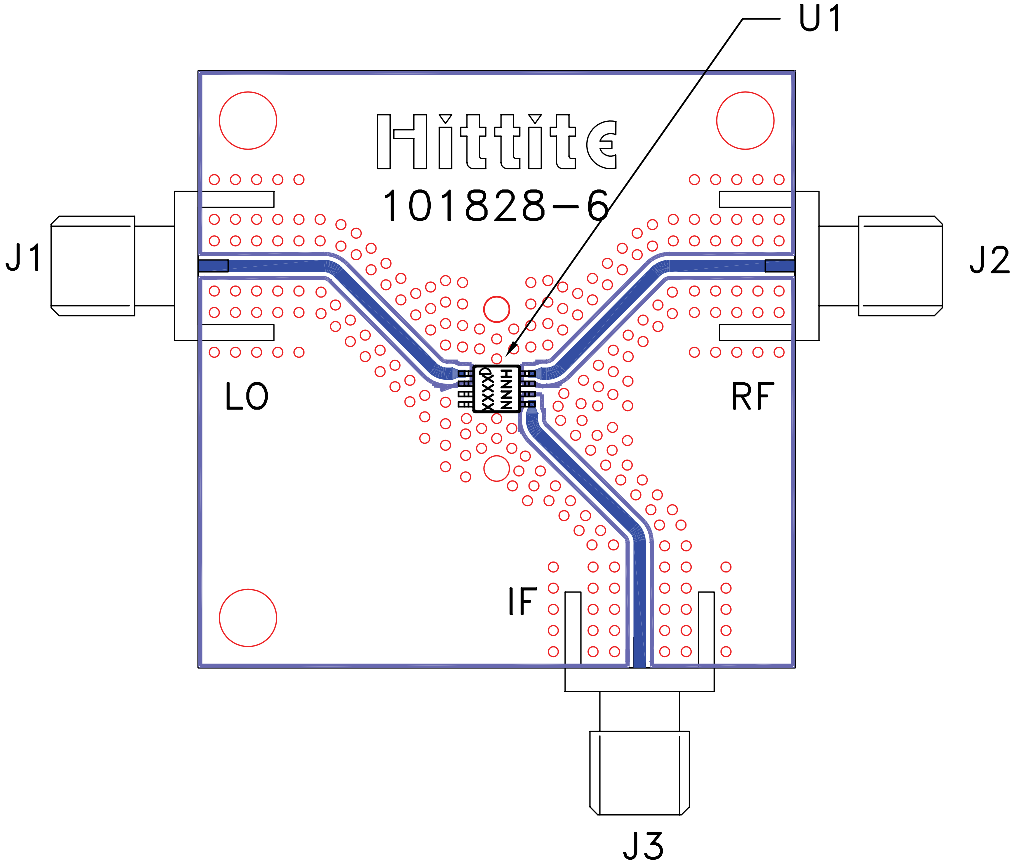
1. LEADFRAME MATERIAL: COPPER ALLOY
2. DIMENSIONS ARE IN INCHES [MILLIMETERS]
3. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.15mm PER SIDE.
4. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.25mm PER SIDE.
5. ALL GROUND LEADS MUST BE SOLDERED TO PCB RF GROUND.

Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking [3]
HMC350MS8	Low Stress Injection Molded Plastic	Sn/Pb Solder	MSL1 [1]	H350 XXXX
HMC350MS8E	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 [2]	H350 XXXX

[1] Max peak reflow temperature of 235 °C
[2] Max peak reflow temperature of 260 °C
[3] 4-Digit lot number XXXX

Evaluation PCB



List of Materials for Evaluation PCB 101830 [1]

Item	Description
J1, J2, J3	PCB Mount SMA RF Connector
U1	HMC350MS8 / HMC350MS8E Mixer
PCB [2]	101828 Eval Board

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Rogers 4350

The circuit board used in the 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 as shown is available from Hittite upon request.