

HIGH IP3 DOUBLE-BALANCED MIXER 0.7 - 1.1 GHz

FEBRUARY 2001

v00.1200

Features

CONVERSION LOSS: 9.5 dB

LO/IF ISOLATION: 35 dB

LO/RF ISOLATION: 40 dB

INPUT IP3: +26 dBm

INPUT IP2: +48 dBm



General Description

The HMC351S8 is a double balanced mixer in an 8 lead plastic surface mount package. 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. It is especially suited for cellular base station, cable modem, and fixed wireless access systems that operate between 700 and 1100 MHz. The mixer provides 9.5 dB conversion loss and +26 dBm IIP3 with LO drive levels of +19 dBm. The design was optimized for low cost high volume applications where high converter linearity is required. The high LO suppression of 40 dB yields excellent carrier suppression for modulator applications.

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Guaranteed Performance, LO Drive= +19 dBm, -40 to +85 deg C

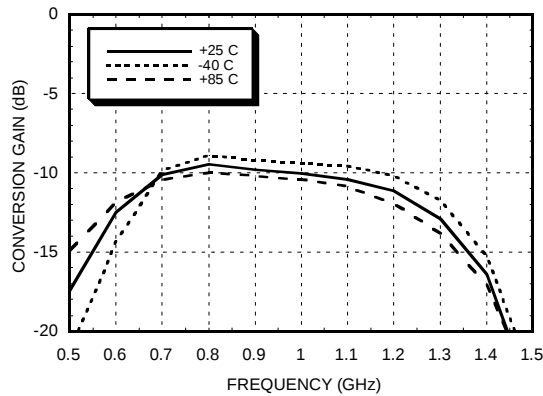
Parameter	LO = +19 dBm, IF = 100 MHz			Units
	Min.	Typ.	Max.	
Frequency Range, RF & LO		0.7 - 1.1		GHz
Frequency Range, IF		DC - 0.3		GHz
Conversion Loss		10	11.5	dB
Noise Figure (SSB)		10	11.5	dB
LO to RF Isolation	36	40		dB
LO to IF Isolation	31	35		dB
RF to IF Isolation	9	13		dB
IP3 (Input)	23	26		dBm
IP2 (Input)	40	48		dBm
1 dB Gain Compression (Input)	13	17		dBm
Local Oscillator Drive Level	19		21	dBm

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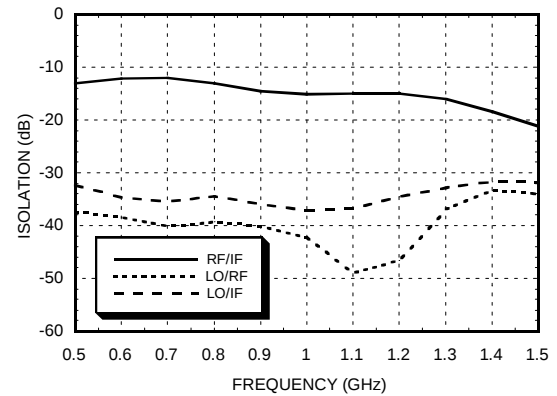
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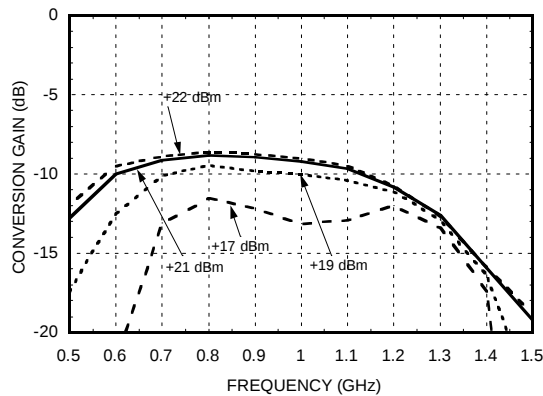
**Conversion Gain vs.
Temperature @ LO= +19 dBm**



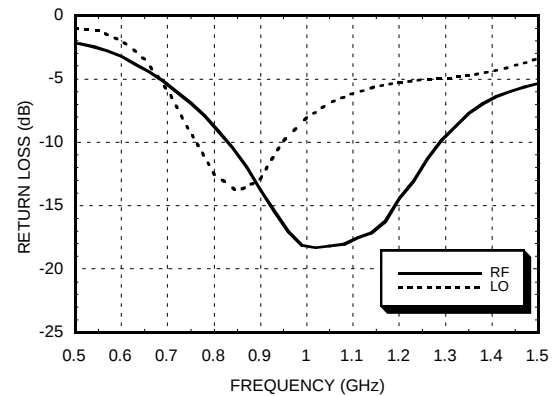
Isolation @ LO= +19 dBm



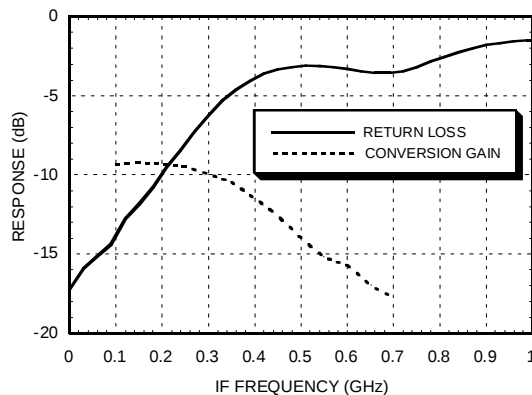
Conversion Gain vs. LO Drive



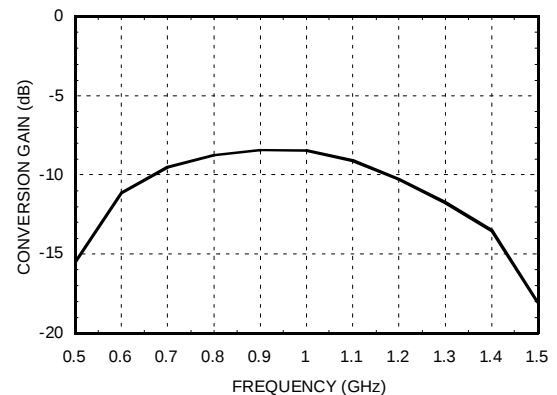
Return Loss @ LO= +19 dBm



IF Bandwidth @ LO= +19 dBm



**Upconverter Performance,
Conversion Gain @ LO= +19 dBm**



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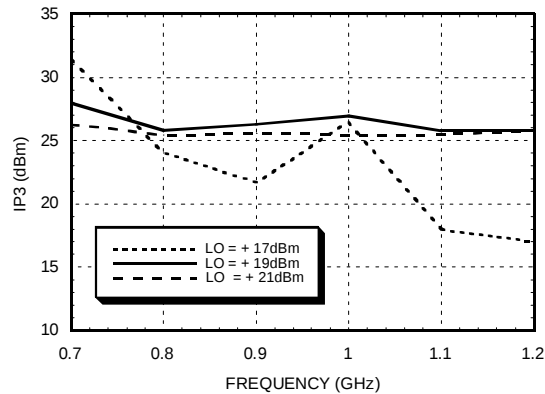


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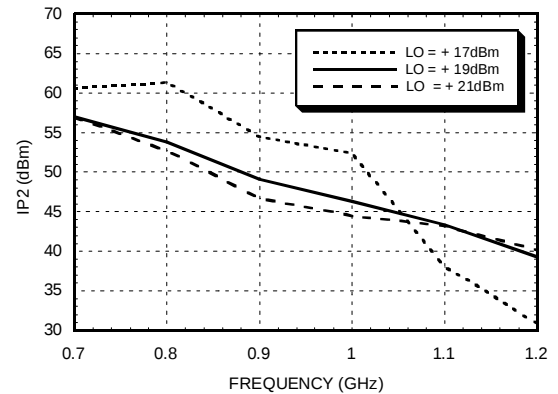
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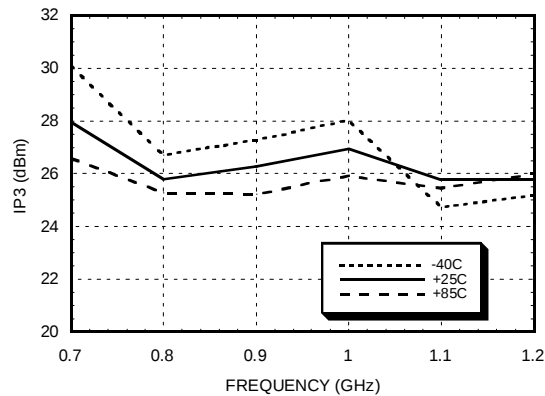
Input IP3 vs. LO Drive



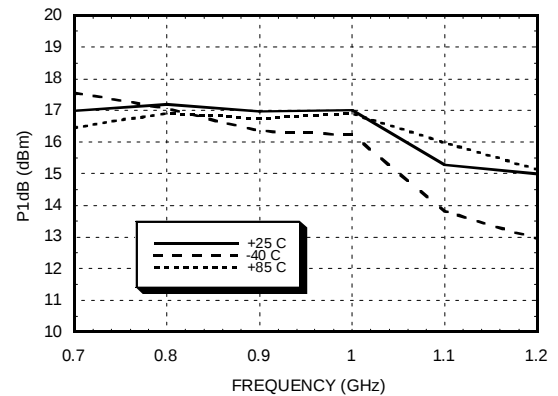
Input IP2 vs. LO Drive



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



P1dB vs. Temperature @ LO Drive = +19 dBm



MXN Spurious Outputs

mRF	nLO				
	0	1	2	3	4
0	xx	-3	19	25	44
1	5	0	19	48	58
2	79	70	75	76	83
3	106	102	91	87	92
4	114	113	110	108	102

RF= 1 GHz @ -10 dBm
LO= 0.9 GHz @ 19 dBm
All values in dBc relative to the IF output power level.

Harmonics of LO

LO Frequency (GHz)	nLO Spur at RF Port			
	1	2	3	4
0.6	37	42	61	89
0.75	40	48	58	75
0.9	40	51	53	89
1.05	43	61	59	95
1.2	50	79	69	105
1.35	35	58	75	89

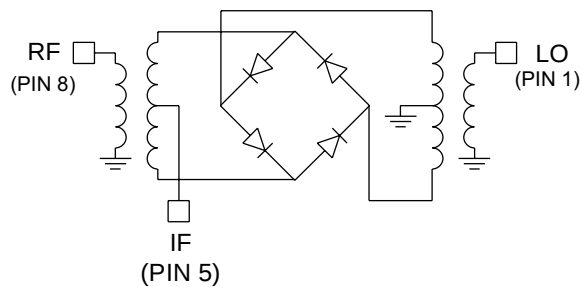
LO= +19 dBm
Values in dBc below input LO level measured at the RF port

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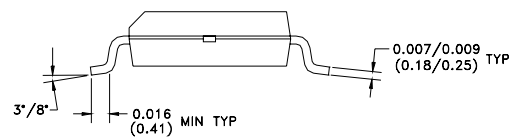
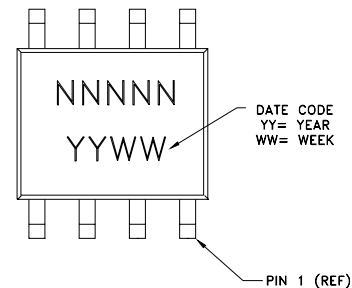
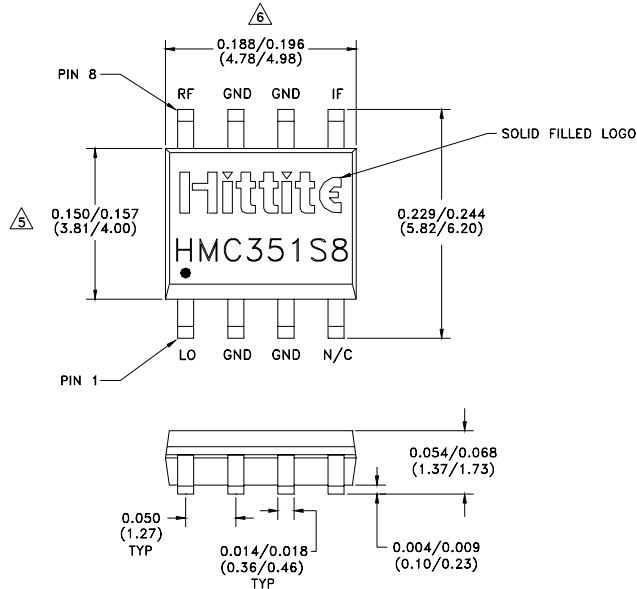
Schematic



Absolute Maximum Ratings

RF / IF Input	+27 dBm
LO Drive	+27 dBm
Storage Temperature	-65 to +150 deg C
Operating Temperature	-55 to +85 deg C
IF DC Current	±26 mA

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).

4. UNLESS OTHERWISE SPECIFIED ALL TOL. ARE ±0.005 (±0.13).
CHARACTERS TO BE HELVETICA MEDIUM, APPROX .030 HIGH WHITE INK, LOCATED APPROXIMATELY AS SHOWN.



5. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.15 MM PER SIDE
6. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.25 MM PER SIDE

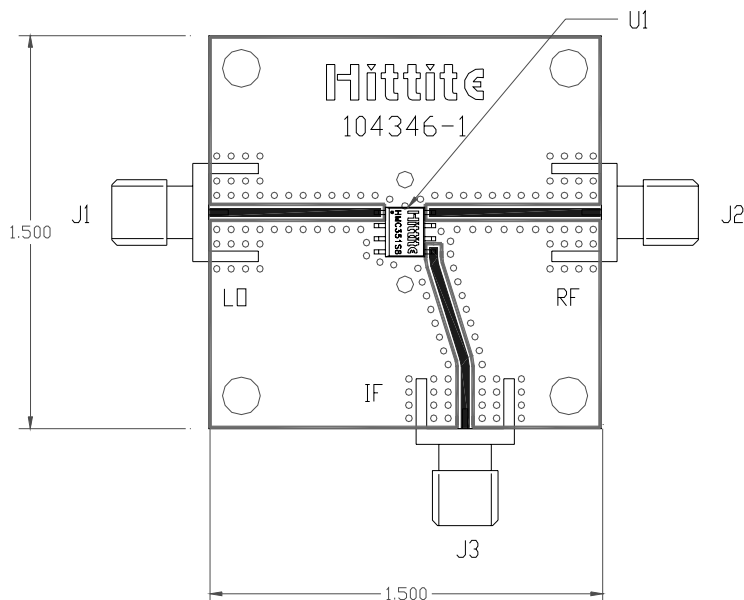


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Evaluation PCB for HMC351S8



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 as shown is available from Hittite upon request.

Evaluation Circuit Board

Item	Description
J1 - J3	PC Mount SMA RF Connector
U1	HMC351S8 Mixer
PCB*	104346 Eval Board
* Circuit Board Material: Rogers 4350	



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