GaAs MMIC SMT DOUBLE-BALANCED MIXER 4.5 - 8 GHz

FEBRUARY 2001

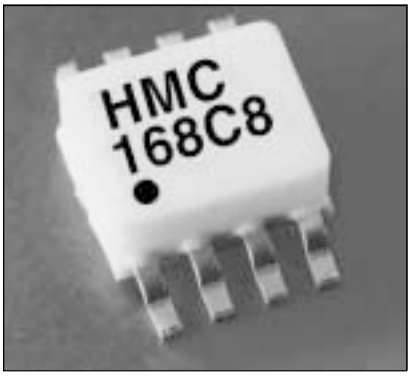
Features

CONVERSION LOSS: 8.2 dB

LO TO RF AND IF ISOLATION: > 33 dB

SURFACE MOUNT

SMALL SIZE, NO DC BIAS REQUIRED



General Description

The HMC168C8 is a miniature double-balanced mixer in a non- hermetic ceramic surface mount package that can be used as an upconverter, downconverter or biphase modulator. The device is a passive diode/ balun type mixer with high dynamic range. Noise figure is essentially equal to the conversion loss. The mixer can handle larger signal levels than most active mixers due to the high third order intercept. MMIC implementation provides exceptional balance in the circuit resulting in high LO/RF and LO/IF isolations and unit-to-unit consistency. This mixer has applications in point-to-point microwave radios and 5.8GHz ISM band circuits where small size and surface mount compatibility are important.

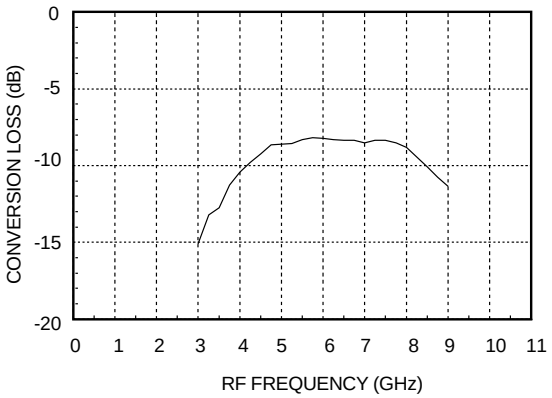
Guaranteed Performance *With LO Drive of +10 dBm, -55 to +85 deg C*

Parameter	Min.	Typ.	Max.	Units
Frequency Range, RF & LO (Note 1)		4.5 - 8.0		GHz
Frequency Range, IF		DC - 2		GHz
Conversion Loss		8.2	10	dB
Noise Figure (SSB)		8.2	10	dB
LO to RF Isolation	29	35		dB
LO to IF Isolation	30	34		dB
IP3 (Input)	12	16		dBm
IP2 (Input)	55	62		dBm
1 dB Gain Compression (Input)	7	10		dBm
Local Oscillator Drive Level	7	10	20	dBm
Note 1: Conversion Loss and Isolation bandwidth improves to 4.0-8.5 GHz with a higher LO drive of +13dBm.				

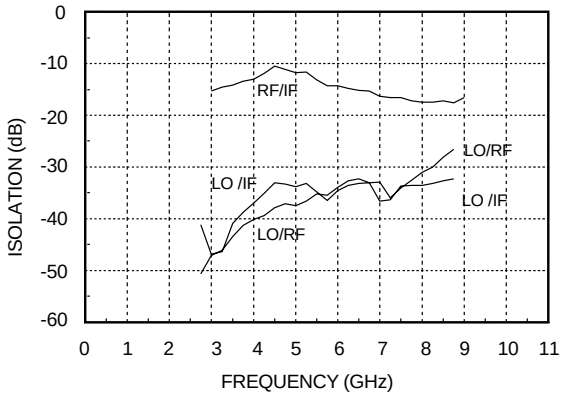
GaAs MMIC SMT DOUBLE-BALANCED MIXER 4.5 - 8 GHz

FEBRUARY 2001

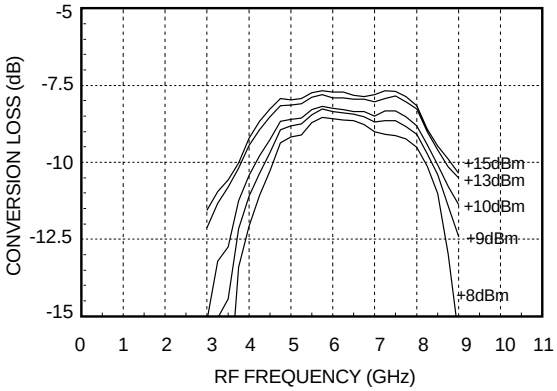
Conversion Loss



Isolation



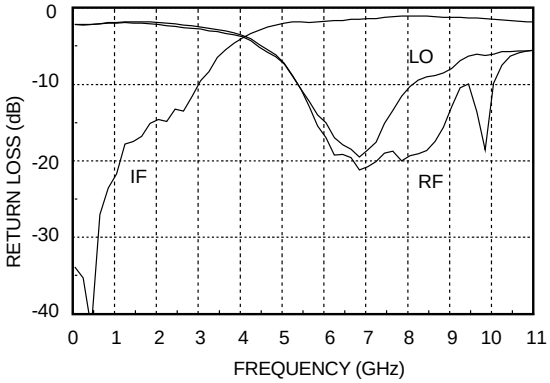
Conversion Loss vs. Lo Drive



Distortion and 1dB Compression versus LO Drive Level

	Distortion		
LO Drive	RF(f1) = 6.01 GHz RF(f2) = 6.00 GHz LO = 6.5 GHz RF Level = 0 dBm		1 dBm Compression
(dBm)	IP3 (dBm)	IP2 (dBm)	(dBm)
+7	14	59	8.5
+10	16	62	10
+13	18	65	11
+15	19	65	11

Return Loss



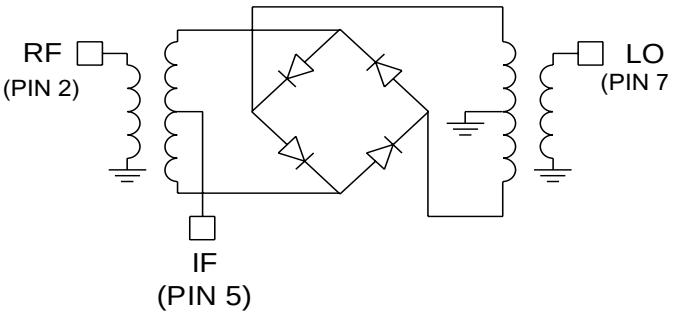
S - Parameters for the RF, LO, IF Ports are Available On-Line at ***www.hittite.com***

MICROWAVE CORPORATION

GaAs MMIC SMT DOUBLE-BALANCED MIXER 4.5 - 8 GHz

FEBRUARY 2001

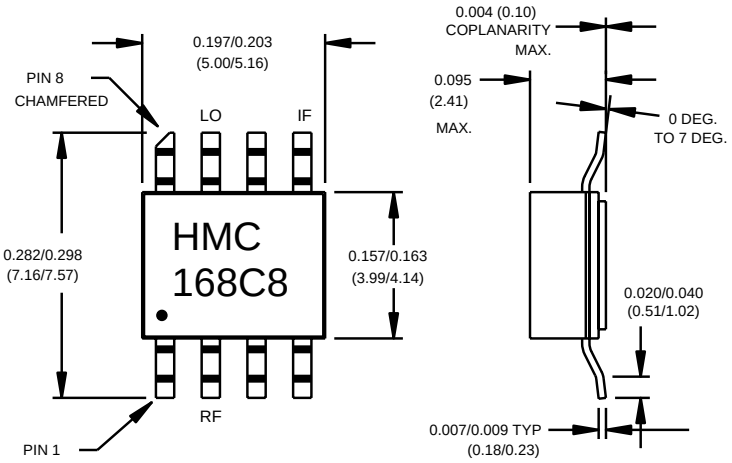
Schematic

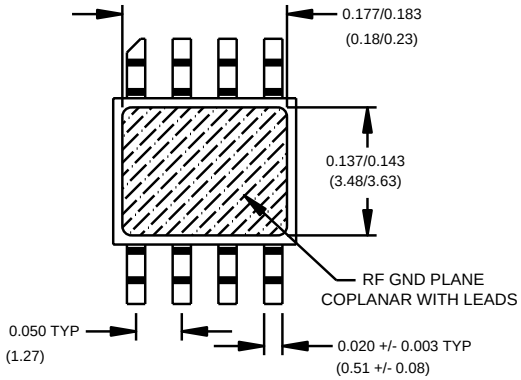


Absolute Maximum Ratings

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

Outline Drawing





1. MATERIAL:
   A) PACKAGE BODY & COVER : WHITE ALUMINA (92%)
   B) LEADS & PACKAGE BOTTOM: COPPER
2. PLATING : ELECTROLYTIC GOLD 100 - 200 MICROINCHES OVER ELECTROLYTIC NICKEL 100 TO 200 MICROINCHES.
3. DIMENSIONS ARE IN INCHES (MILLIMETERS). UNLESS OTHERWISE SPECIFIED TOL. ARE ±0.005(±0.13).
4. ALL UNLABELED LEADS ARE GROUND. THESE LEADS ARE CONNECTED INTERNALLY TO THE PACKAGED BOTTOM GROUND. THE PACKAGE BOTTOM RF GROUND **MUST** BE SOLDERED TO THE PCB RF GROUND.
5. PACKAGE LENGTH AND WIDTH DIMENSIONS SHOWN DO NOT INCLUDE LID SEAL PROTRUSION. ALLOWABLE PROTRUSION SHALL BE 0.005 (0.127MM) PER SIDE.

GaAs MMIC SMT DOUBLE-BALANCED MIXER 4.5 - 8 GHz

FEBRUARY 2001

NOTES: