GaAs MMIC SMT DOUBLE-BALANCED MIXER 6 - 15 GHz

FEBRUARY 2001

v01.0300

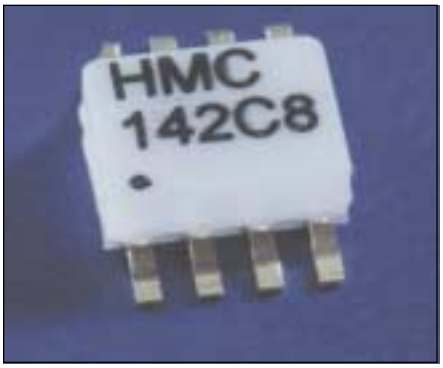
Features

INPUT IP3: +21 dBm

CONVERSION LOSS: 8.5 dB

LO TO RF AND IF ISOLATION: 33 to 43 dB

SURFACE MOUNT, NO THRU HOLES



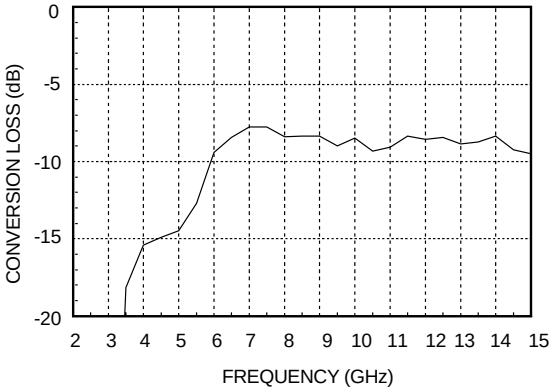
General Description

The HMC142C8 is a miniature double-balanced mixer in a non-hermetic ceramic surface mount package that can be used as an upconverter or downconverter. The device is a passive diode/balun type mixer with high dynamic range. 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 VSAT ground equipment where small size and surface mount compatibility are important. The HMC142C8 is a mirror image complement to the HMC141C8.

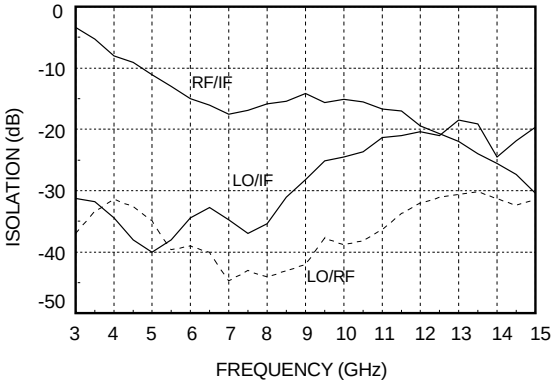
Guaranteed Performance *With LO Drive of +15 dBm, -55 to +85 deg C*

Parameter	Min.	Typ.	Max.	Units
Frequency Range, RF & LO (Note 1)		6-15		GHz
Frequency Range, IF		DC - 2		GHz
Conversion Loss		8.5	10	dB
Noise Figure (SSB)		8.5	10	dB
LO to RF Isolation	28	35		dB
LO to IF Isolation	17	25		dB
IP3 (Input)		20		dBm
IP2 (Input)		45		dBm
1 dB Gain Compression (Input)		10		dBm
Local Oscillator Drive Level	13	15	23	dBm
Note 1: Conversion Loss and Isolation bandwidth degrades to 7-14 GHz with a lower LO drive of +13dBm.				

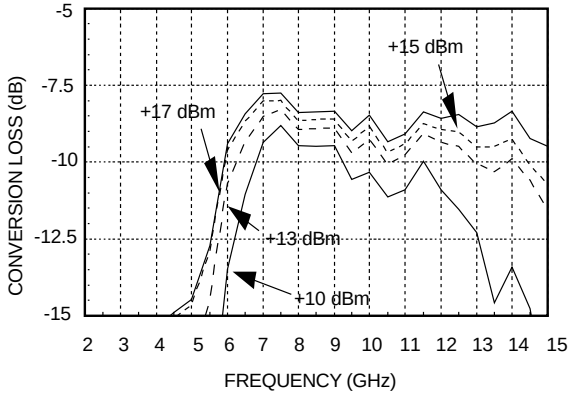
Conversion Loss



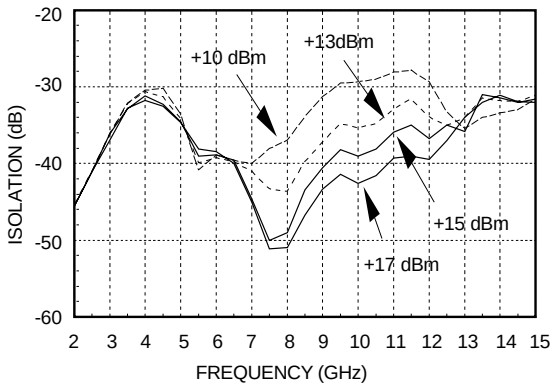
Isolation



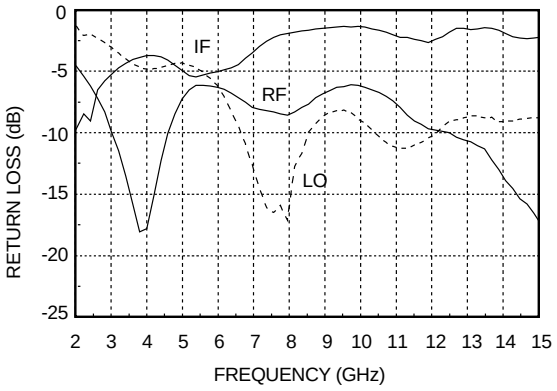
Conversion Loss vs. LO Drive Level



Isolation vs. LO Drive Level



Return Loss



Distortion and 1dB Compression versus LO Drive Level

	Distortion		
LO Drive	RF(f1) = 11.01 GHz RF(f2) = 11.00 GHz LO = 11.5 GHz RF Level = 0 dBm		1 dBm Compression
(dBm)	IP3 (dBm)	IP2 (dBm)	(dBm)
+13	18	42	7
+15	21	45	10
+17	21	45	10

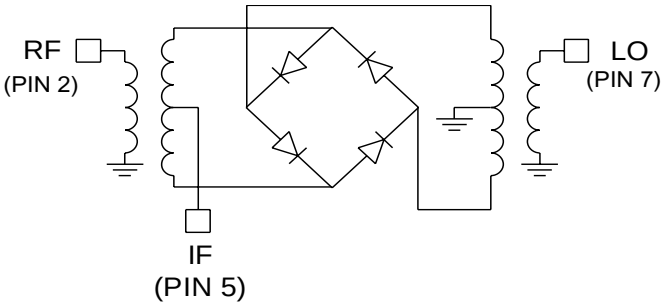
MICROWAVE CORPORATION

GaAs MMIC SMT DOUBLE-BALANCED MIXER 6 - 15 GHz

FEBRUARY 2001

v01.0300

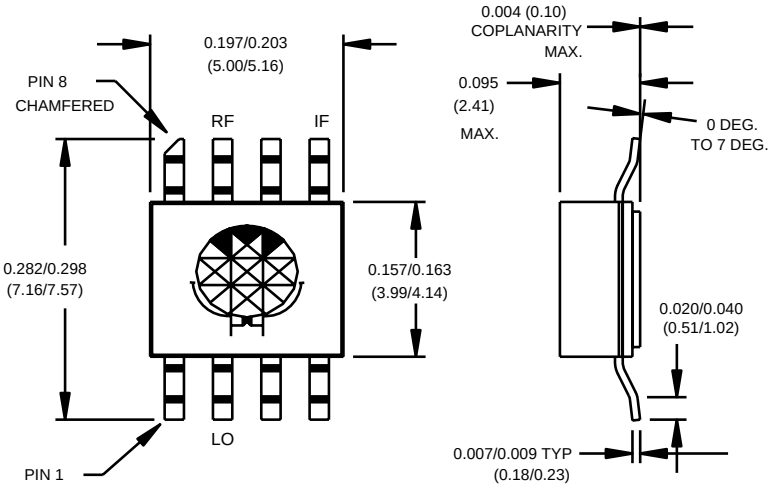
Schematic

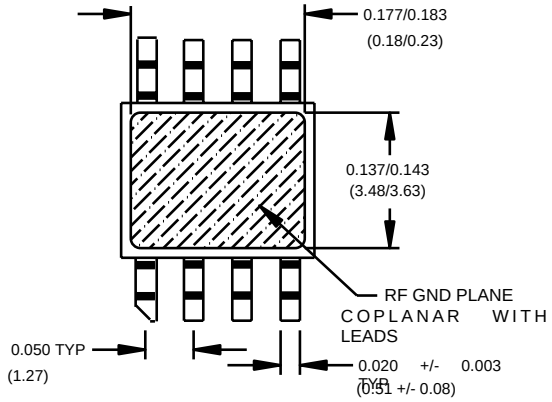


Absolute Maximum Ratings

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.

MICROWAVE CORPORATION

GaAs MMIC SMT DOUBLE-BALANCED MIXER 6 - 15 GHz

v01.0300

FEBRUARY 2001

NOTES: