GaAs MMIC DOUBLE-BALANCED MIXER 1.0 - 2.0 GHz

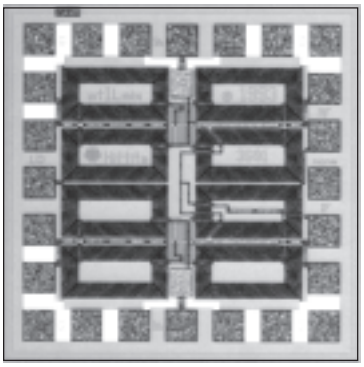
SEPTEMBER 1999

Features

CONVERSION LOSS: 10 dB

LO TO RF ISOLATION: 40 dB

PASSIVE : NO DC BIAS REQ'D



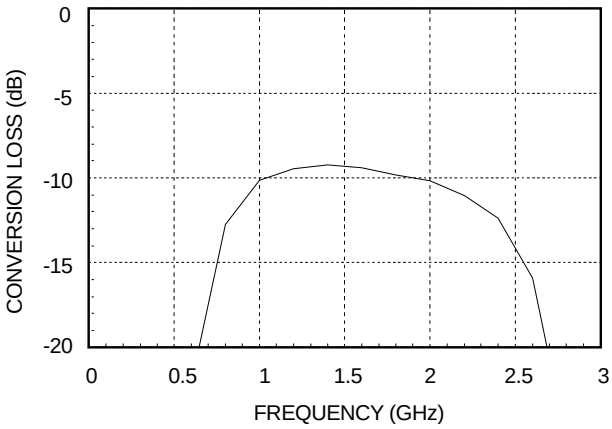
General Description

The HMC140 chip is a miniature double-balanced mixer which can be used as an upconverter or downconverter. The chip is especially suitable for Telecom and EW / ECM applications because of its small size and consistent IC performance. The chip can be integrated directly into hybrid MICs without DC bias or external baluns to provide an extremely compact mixer.

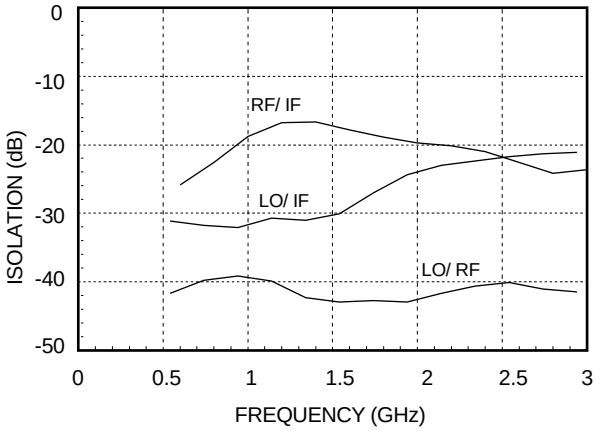
Guaranteed Performance *With LO Drive of +13 dBm, -55 to +85 deg C*

Parameter	Min.	Typ.	Max.	Units
Frequency Range, RF & LO		1.0 - 2.0		GHz
Frequency Range, IF		DC - 1		GHz
Conversion Loss		10	12	dB
Noise Figure (SSB)		10	12	dB
LO to RF Isolation	35	40		dB
LO to IF Isolation	20	25		dB
IP3 (Input)	13	18		dBm
IP2 (Input)	30	40		dBm
1 dB Gain Compression (Input)	5	10		dBm
Local Oscillator Drive Level	10	13	20	dBm

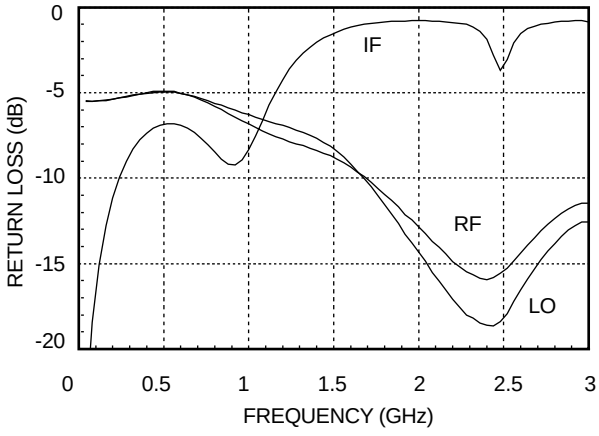
Conversion Loss



Isolation



Return Loss



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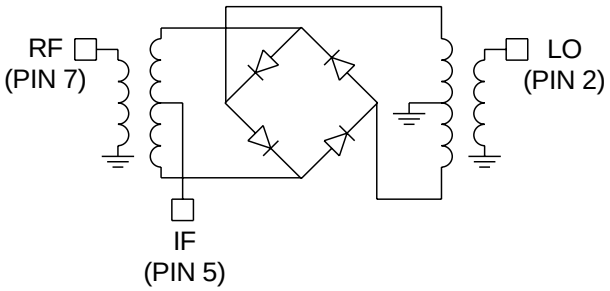
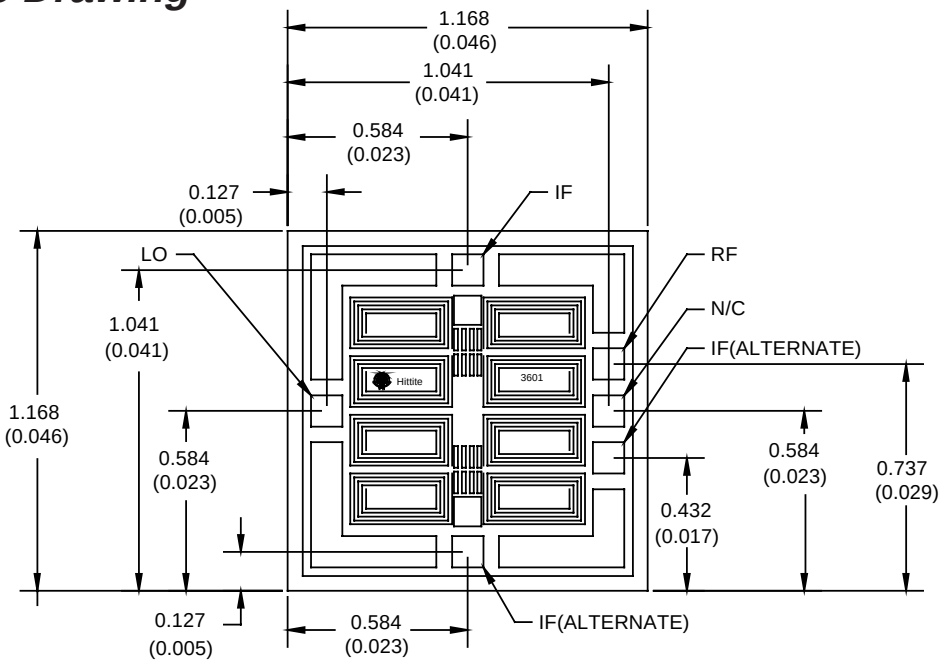
Schematic



Absolute Maximum Ratings

LO Drive	+27 dBm
Storage Temperature	-65 to +150 deg C
Operating Temperature	-55 to +125 deg C

Outline Drawing



DIE THICKNESS IS 0.180 (0.007) BACKSIDE IS GROUND
BOND PADS ARE 0.100 (0.004) SQUARE
ALL DIMENSION IN MILLIMETERS (INCHES(
ALL TOLERANCES ARE ± 0.025 (±0.001)
BOND PAD METALLIZATION : GOLD
BACKSIDE METALLIZATION: NONE

Handling Precautions

Follow these precautions to avoid permanent damage.
Cleanliness: Handle the chips in a clean environment. DO NOT attempt to clean the chip using liquid cleaning systems.
Static Sensitivity: Follow ESD precautions to protect against ≥ ± 250V ESD strikes (*see page 8 - 2*).
Transients: Suppress instrument and bias supply transients while bias is applied. Use shielded signal and bias cables to minimize inductive pick-up.
General Handling: Handle the chip along the edges with a vacuum collet or with a sharp pair of bent tweezers. The surface of the chip has fragile air bridges and should not be touched with vacuum collet, tweezers, or fingers.

Mounting

The chip is not back-metallized and can be die mounted with electrically conductive epoxy only. The mounting surface should be clean and flat.

Epoxy Die Attach:
Apply a minimum amount of epoxy to the mounting surface so that a thin epoxy fillet is observed around the perimeter of the chip once it is placed into position.
Cure epoxy per the manufacturer's schedule.

Wire Bonding

Ball or wedge bond with 1.0 diameter pure gold wire. Thermosonic wirebonding with a nominal stage temperature of 150 deg. C and a ball bonding force of 40 to 50 grams or wedge bonding force of 18 to 22 grams is recommended. Use the minimum level of ultrasonic energy to achieve reliable wirebonds. Wirebonds should be started on the chip and terminated on the package. RF bonds should be as short as possible.