ANALOG DEVICES

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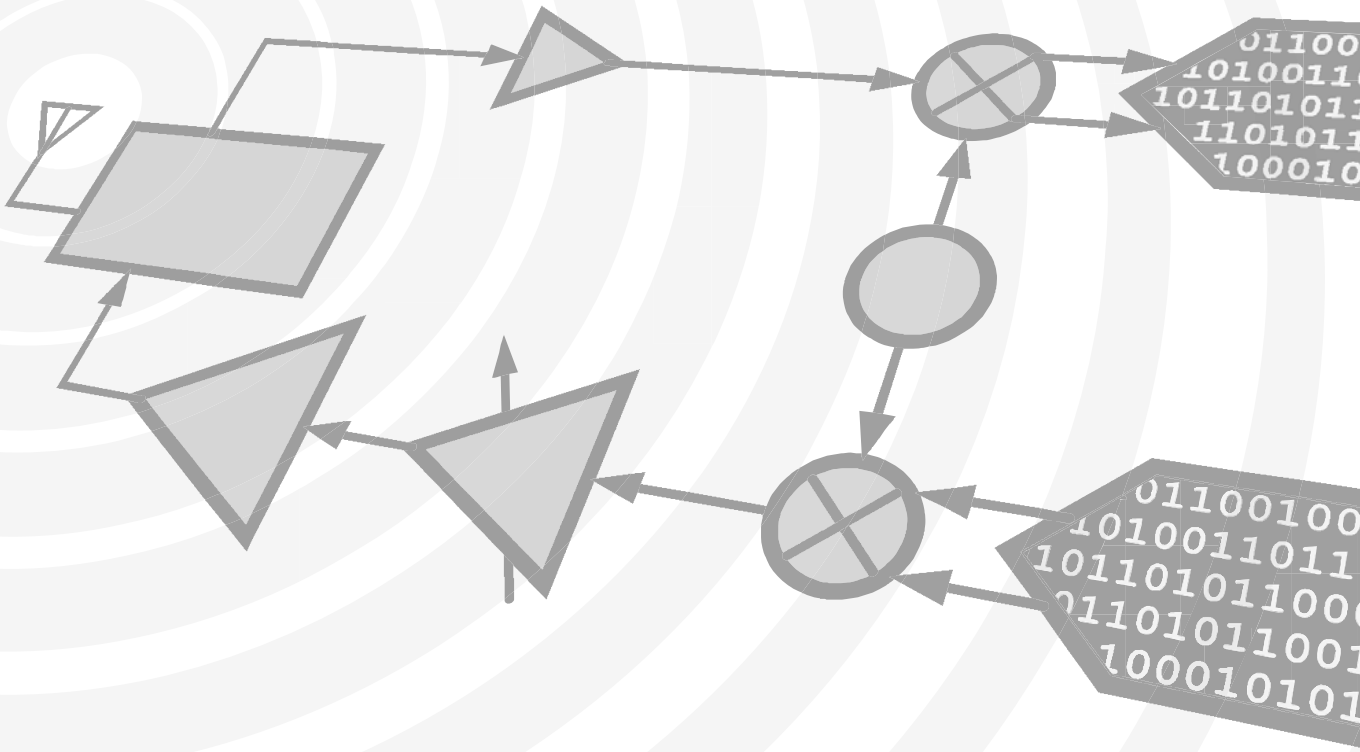

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HMC128G8

GaAs MMIC SMT DOUBLE-BALANCED MIXER, 1.8 - 5 GHz

Typical Applications

The HMC128G8 is ideal for:

- Base Station
- MMDS
- WirelessLAN
- Wireless Local Loop

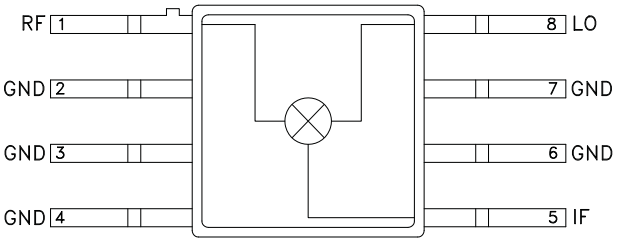
Features

Conversion Loss: 10 dB

LO to RF and IF Isolation: >30 dB

High Third-Order Intercept: +18 dB

Functional Diagram



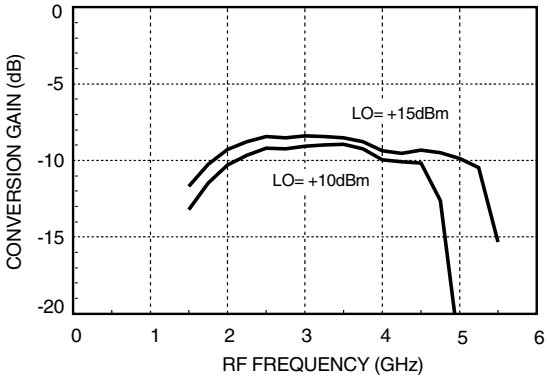
General Description

The HMC128G8 is a miniature double-balanced mixer in a hermetic 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. 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.

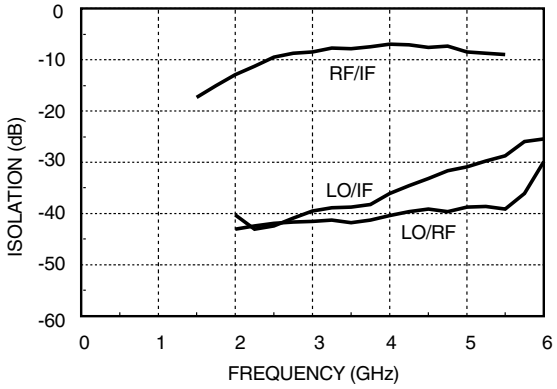
Electrical Specifications, T_A = +25° C, LO Drive = +15 dBm

Parameter	Min.	Typ.	Max.	Units
Frequency Range, RF & LO		1.8 - 5.0		GHz
Frequency Range, IF		DC - 2		GHz
Conversion Loss		10	12	dB
Noise Figure (SSB)		10	12	dB
LO to RF Isolation	28	40		dB
LO to IF Isolation	20	30		dB
IP3 (Input)	13	18		dBm
IP2 (Input)	35	40		dBm
1 dB Gain Compression (Input)	5	10		dBm

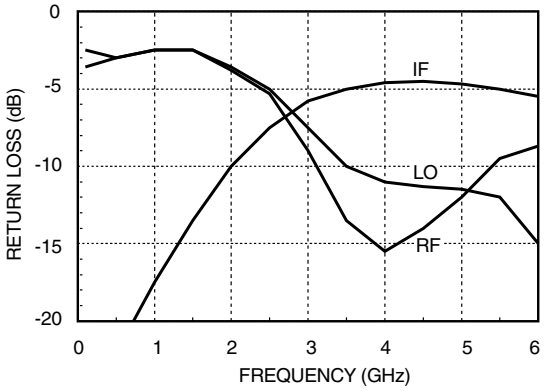
Conversion Gain



Isolation



Return Loss



Distortion and 1dB Compression vs. LO Drive Level

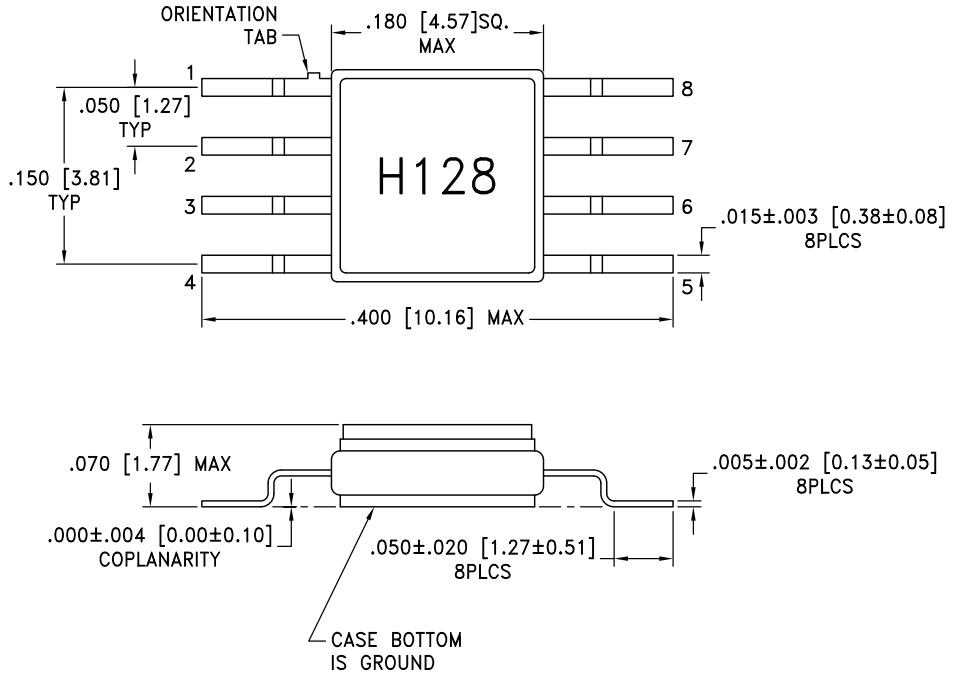
	Distortion		
LO Drive	RF(f1) = 3.01 GHz RF(f2) = 3.00 GHz LO = 3.5 GHz RF Level = 0 dBm		1 dB Compression
(dBm)	IP3 (dBm)	IP2 (dBm)	P1dB (dBm)
+10	16	38	8
+13	18	40	10
+15	18	40	10

Absolute Maximum Ratings

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

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

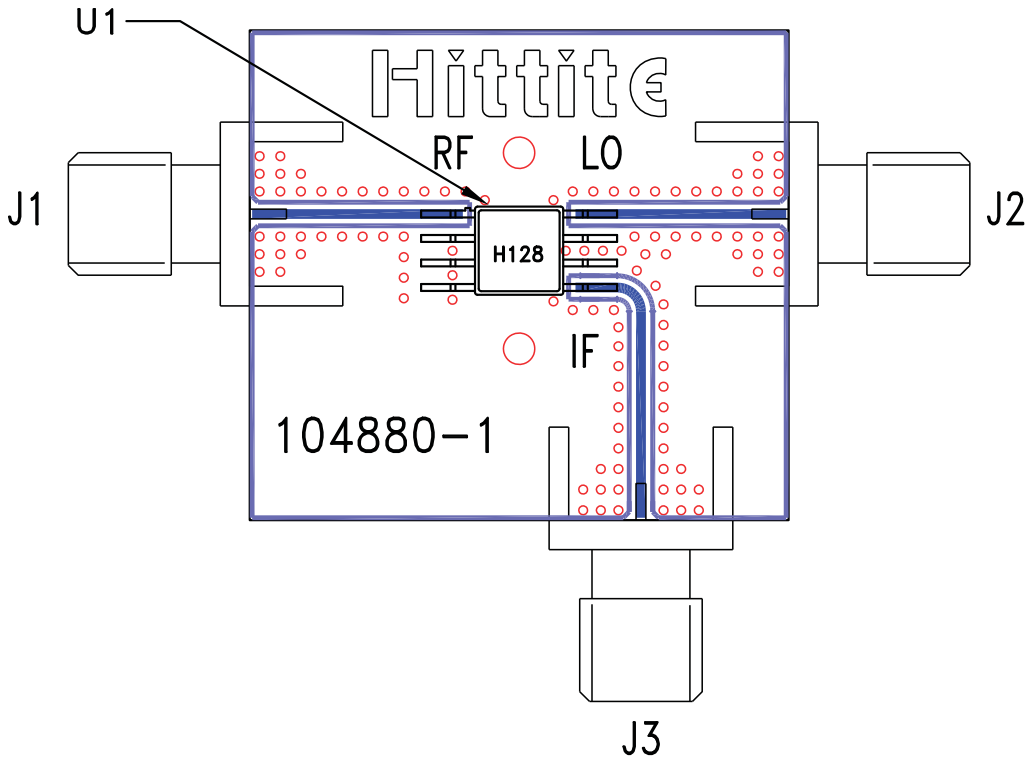
Outline Drawing



NOTES:

1. PACKAGE MATERIAL: ALUMINA LOADED BOROSILICATE GLASS.
2. LEAD, BASE, COVER MATERIAL: KOVAR™ (#7052 CORNING).
3. PLATING: ELECTROLYTIC GOLD 50 MICROINCHES MIN., OVER ELECTROLYTIC NICKEL 50 MICROINCHES MIN.
4. DIMENSIONS ARE IN INCHES [MILLIMETERS].
5. TOLERANCES: ±.005 [0.13] UNLESS OTHERWISE SPECIFIED.
6. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND.

Evaluation PCB



List of Materials for Evaluation PCB 104882 [1]

Item	Description
J1 - J3	PCB Mount SMA RF Connector
U1	HMC128G8 Mixer
PCB [2]	104880 Evaluation Board

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Rogers 4350

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 and exposed paddle 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 shown is available from Hittite upon request.