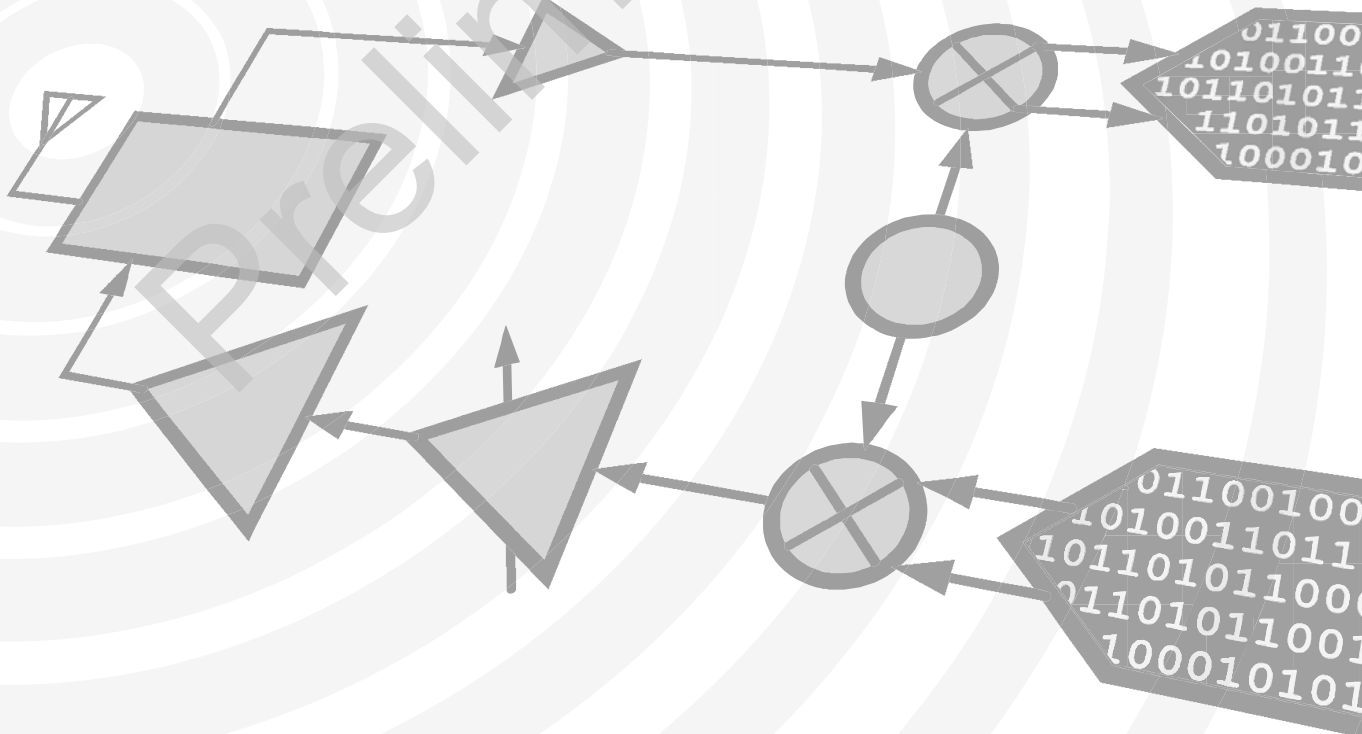


Analog Devices Welcomes Hittite Microwave Corporation



THIS PAGE INTENTIONALLY LEFT BLANK

Preliminary

GaAs MMIC DOUBLE-BALANCED MIXER, 18 - 32 GHz

Typical Applications

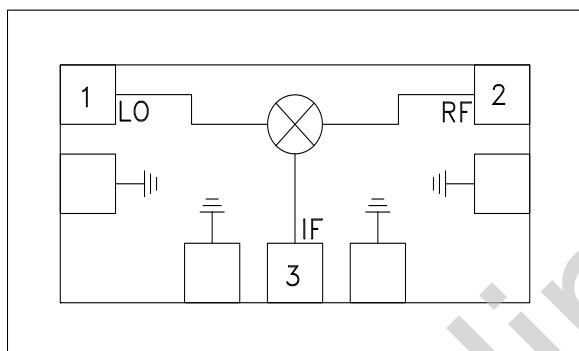
The HMC292A is ideal for:

- Microwave Point-to-Point Radios
- LMDS
- SATCOM

Features

Input IP3: +19 dBm
LO / RF Isolation: 38 dB
Passive: No DC Bias Required
Small Size: 1.04 x 0.58 x 0.1 mm

Functional Diagram



General Description

The HMC292A chip is a miniature passive GaAs MMIC double-balanced mixer which can be used as an upconverter or downconverter from 18 - 32 GHz in a small chip area of 0.66 mm². Excellent isolations are provided by on-chip baluns, which require no external components and no DC bias. All data is measured with the chip in a 50 ohm test fixture connected via 0.076 mm (3 mil) ribbon bonds of minimal length <0.31 mm (<12 mils).

Electrical Specifications, $T_A = +25^\circ\text{C}$

Parameter	LO = +13 dBm			LO = +13 dBm			Units
	Min.	Typ.	Max.	Min.	Typ.	Max.	
Frequency Range, RF & LO	20 - 30			18 - 32			GHz
Frequency Range, IF	DC - 8			DC - 8			GHz
Conversion Loss		7.5	9.5		9	11	dB
Noise Figure (SSB)		7.5	9.5		9	11	dB
LO to RF Isolation	30	38		30	38		dB
LO to IF Isolation	31	40		28	40		dB
RF to IF Isolation	20	24		17	24		dB
IP3 (Input)	17	19		15	19		dB
IP2 (Input)	45	50		42	50		dBm
1 dB Gain Compression (Input)	8	12		8	12		dBm

**GAAs MMIC DOUBLE-BALANCED
MIXER, 18 - 32 GHz**
Absolute Maximum Ratings

RF / LO Total Power	+24 dBm
IF Input	+16 dBm
Channel Temperature	150 °C
Continuous Pdiss (Ta=85 °C) (derate 4 mW/°C above 85 °C)	260 mW
Thermal Resistance (R _{TH}) (junction to die bottom)	250 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C
ESD Sensitivity (HBM)	Class 1C

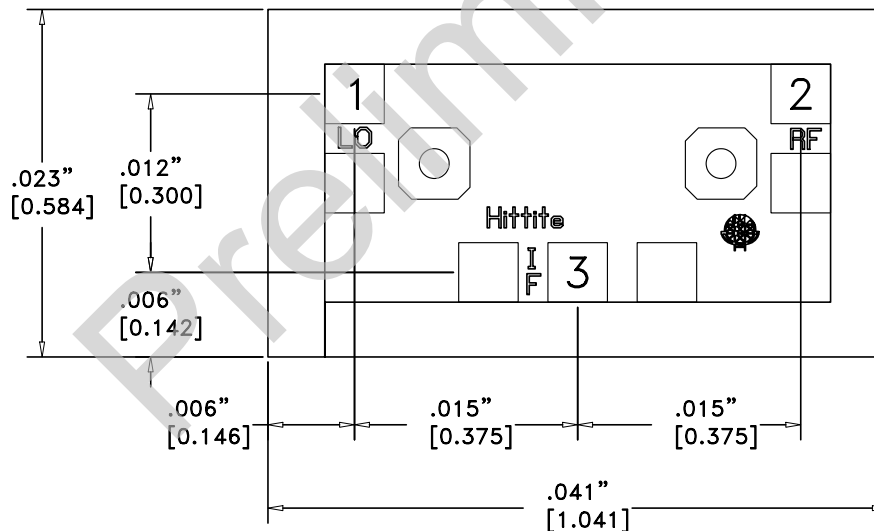
MxN Spurious Outputs

	nLO				
mRF	0	1	2	3	4
0	xx	11			
1	17	0	39		
2		70	77	76	
3			93	69	86
4			>110	>110	>110

RF = 21 GHz @ -10 dBm
LO = 22 GHz @ +13 dBm
All values in dBc below the IF power level.



**ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS**

Outline Drawing

NOTES:

1. ALL DIMENSIONS ARE IN INCHES [MM].
2. DIE THICKNESS IS .004".
3. TYPICAL BOND PAD IS .004" SQUARE.
4. BACKSIDE METALLIZATION: GOLD.
5. BOND PAD METALLIZATION: GOLD.
6. BACKSIDE METAL IS GROUND.
7. CONNECTION NOT REQUIRED FOR UNLABELED BOND PADS.