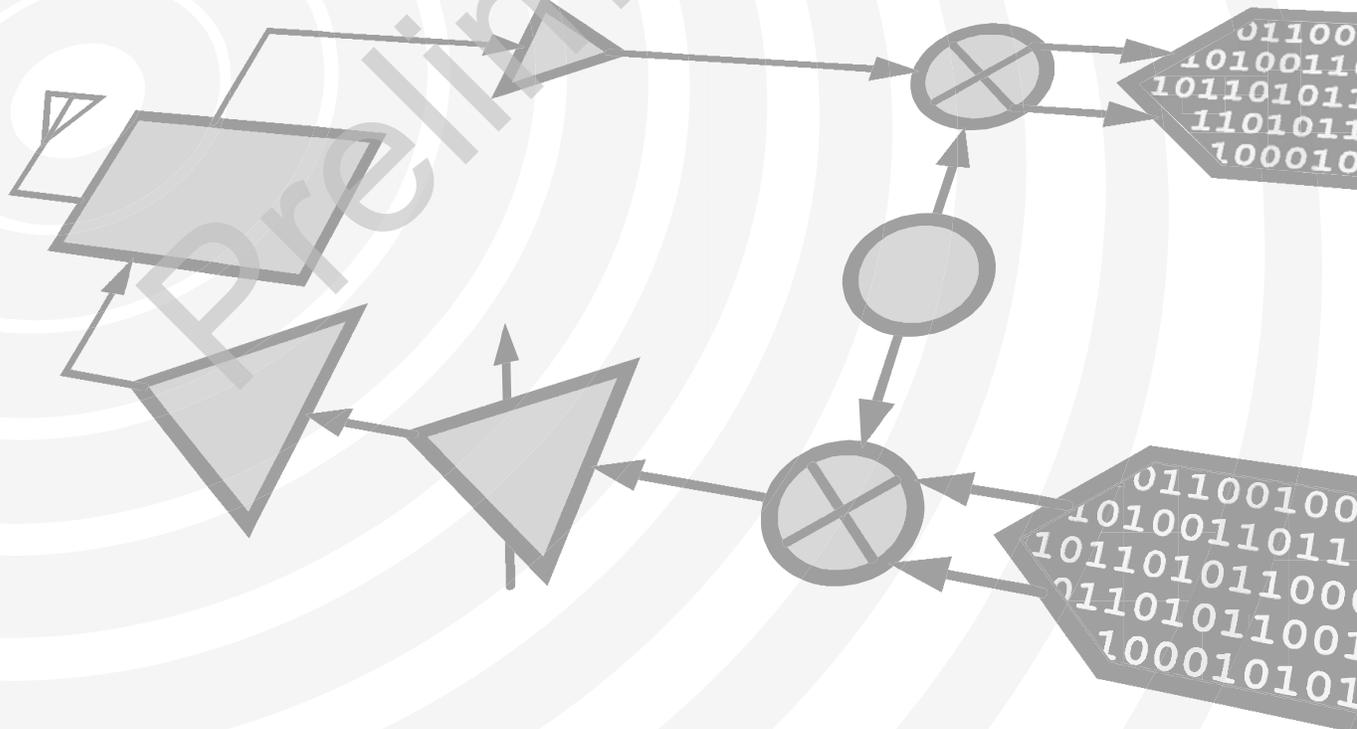


# Analog Devices Welcomes Hittite Microwave Corporation



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Preliminary

## GaAs MMIC FUNDAMENTAL MIXER, 7 - 14 GHz

### Typical Applications

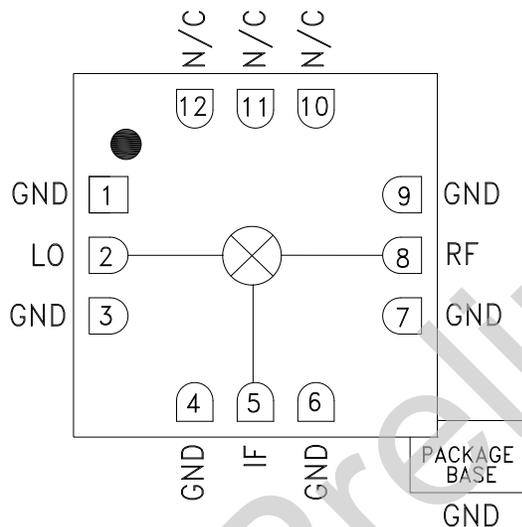
The HMC553ALC3B is ideal for:

- Point-to-Point Radios
- Point-to-Multi-Point Radios
- Test Equipment & Sensors
- Military End-Use

### Features

- Passive Double Balanced Topology
- High LO/RF Isolation: 50 dB
- Low Conversion Loss: 7 dB
- Wide IF Bandwidth: DC - 5 GHz
- Robust 1,000V ESD, Class 1C
- 12 Lead Ceramic 3x3mm SMT Package: 9mm<sup>2</sup>

### Functional Diagram



### General Description

The HMC553ALC3B is a general purpose double balanced mixer in a leadless RoHS compliant SMT package that can be used as an upconverter or downconverter between 7 and 14 GHz. This mixer is fabricated in a GaAs MESFET process, and requires no external components or matching circuitry. The HMC553ALC3B provides excellent LO to RF and LO to IF isolation due to optimized balun structures and operates with LO drive levels as low as +9 dBm. The RoHS compliant HMC553ALC3B eliminates the need for wire bonding, and is compatible with high volume surface mount manufacturing techniques.

### Electrical Specifications, $T_A = +25^\circ\text{C}$ , $IF = 100\text{ MHz}$ , $LO = +13\text{ dBm}$ \*

Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range, RF & LO	7 - 11		11 - 14				GHz
Frequency Range, IF	DC - 5		DC - 5				GHz
Conversion Loss		7	9.5		8	10	dB
Noise Figure (SSB)		7	9.5		8	10	dB
LO to RF Isolation	40	50		35	45		dB
LO to IF Isolation	28	34		30	36		dB
RF to IF Isolation	15	22		25	30		dB
IP3 (Input)		18			22		dBm
IP2 (Input)		48			48		dBm
1 dB Gain Compression (Input)		10			11.5		dBm

\*Unless otherwise noted, all measurements performed as downconverter,  $IF = 100\text{ MHz}$ .

## GaAs MMIC FUNDAMENTAL MIXER, 7 - 14 GHz

### Absolute Maximum Ratings

RF / IF Input	+25 dBm
LO Drive	+25 dBm
Channel Temperature	150 °C
Continuous Pdiss (T = 85 °C) (derate 2.75 mW/°C above 85 °C)	178 mW
Thermal Resistance (channel to ground paddle)	364 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
ESD Sensitivity (HBM)	Class 1C

### MxN Spurious Outputs

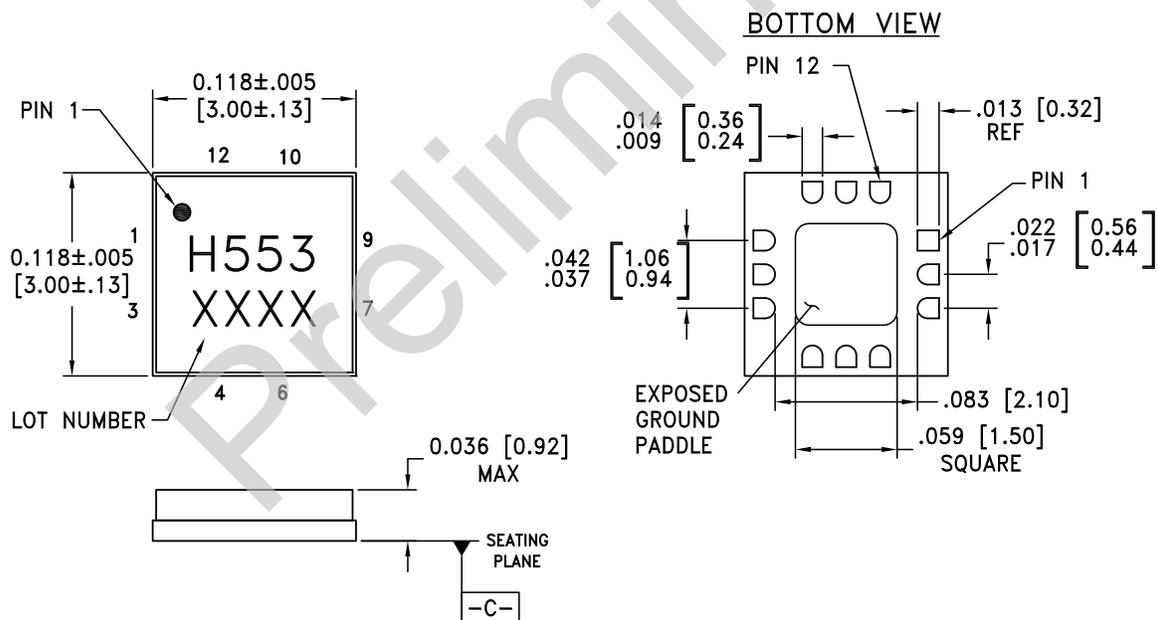
mRF	nLO				
	0	1	2	3	4
0	xx	7	50	38	58
1	22	0	41	53	65
2	100	72	62	73	102
3	103	100	96	71	90
4	xx	105	101	104	111

RF = 10.1 GHz @ -10 dBm  
LO = 10 GHz @ +13 dBm  
All values in dBc below the IF output power level.



ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS

### Outline Drawing



#### NOTES:

- PACKAGE BODY MATERIAL: ALUMINA.
- LEAD AND GROUND PADDLE PLATING:  
30-80 MICROINCHES GOLD OVER 50 MICROINCHES MINIMUM NICKEL.
- DIMENSIONS ARE IN INCHES (MILLIMETERS).
- LEAD SPACING TOLERANCE IS NON-CUMULATIVE.
- CHARACTERS TO BE HELVETICA MEDIUM, .025 HIGH, BLACK INK, OR LASER MARK LOCATED APPROX. AS SHOWN.
- PACKAGE WARP SHALL NOT EXCEED 0.05MM DATUM - C -
- ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND.