

GaAs MMIC FUNDAMENTAL MIXER, 11 - 20 GHz

Typical Applications

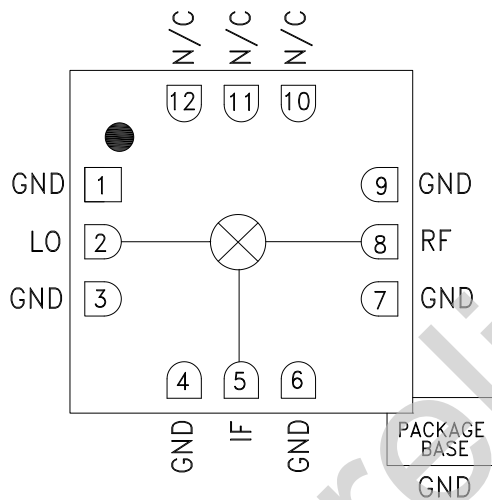
The HMC554ALC3B is ideal for:

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

Features

- High LO/RF Isolation: 46 dB
- Passive Double Balanced Topology
- Low Conversion Loss: 7 dB
- Wide IF Bandwidth: DC - 6 GHz
- Robust 1,000V ESD, Class 1C
- 12 Lead Ceramic 3x3mm SMT Package: 9mm²

Functional Diagram



General Description

The HMC554ALC3B is a general purpose double balanced mixer in a leadless RoHS compliant SMT package that can be used as an upconverter or downconverter between 11 and 20 GHz. This mixer is fabricated in a GaAs MESFET process, and requires no external components or matching circuitry. The HMC554ALC3B provides excellent LO to RF and LO to IF isolation due to optimized balun structures. The RoHS compliant HMC554ALC3B 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		12 - 16		11 - 20			GHz
Frequency Range, IF		DC - 6		DC - 6			GHz
Conversion Loss		7	9		8	11	dB
Noise Figure (SSB)		7	9		8	11	dB
LO to RF Isolation	40	46		40	46		dB
LO to IF Isolation	34	40		30	40		dB
RF to IF Isolation	18	25		15	25		dB
IP3 (Input)		18			18		dBm
IP2 (Input)		48			45		dBm
1 dB Gain Compression (Input)		11			11		dBm

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

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Absolute Maximum Ratings

RF / IF Input	+25 dBm
LO Drive	+25 dBm
Channel Temperature	150 °C
Continuous P _{diss} (T= 85 °C) (derate 2.32 mW/°C above 85 °C)	150 mW
Thermal Resistance (channel to ground paddle)	431 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
ESD Sensitivity (HBM)	Class 1C

MxN Spurious Outputs

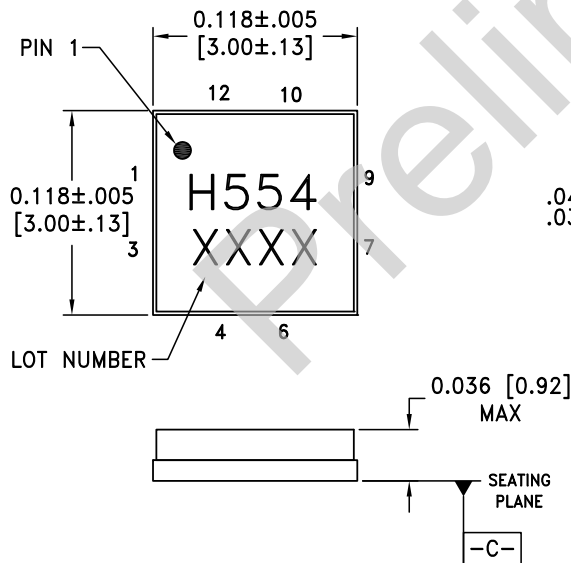
mRF	nLO				
	0	1	2	3	4
0	xx	19	25	xx	xx
1	29	0	51	55	xx
2	81	85	60	88	104
3	xx	97	98	76	99
4	xx	xx	105	98	105

RF = 15.1 GHz @ -10 dBm
LO = 15.0 GHz @ +13 dBm
All values in dBc below the IF output power level.

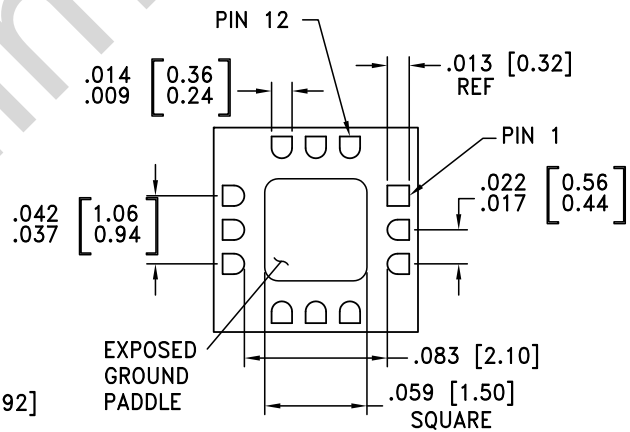


**ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS**

Outline Drawing



BOTTOM VIEW



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.