

### Typical Applications

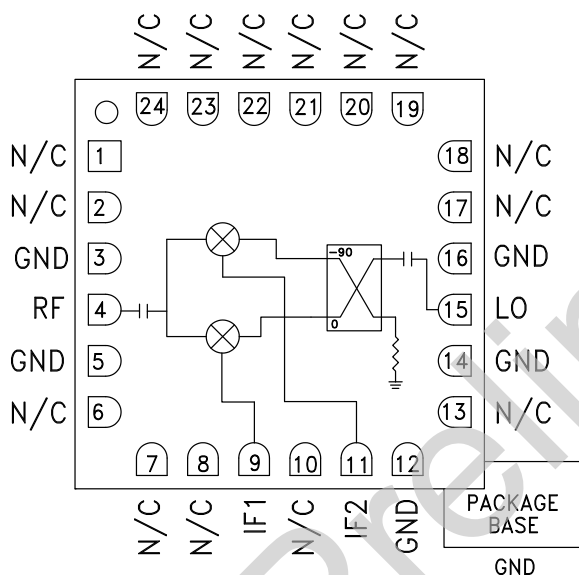
The HMC521ALC4 is ideal for:

- Point-to-Point and Point-to-Multi-Point Radio
- Military Radar

### Features

- Wide IF Bandwidth: DC - 3.5 GHz
- Image Rejection: 38 dB
- LO to RF Isolation: 50 dB
- High Input IP3: +23 dBm
- 24 Lead 4x4mm SMT Package: 16mm<sup>2</sup>

### Functional Diagram



### General Description

The HMC521ALC4 is a compact I/Q MMIC mixer in a leadless "Pb free" RoHS compliant SMT package, which can be used as either an Image Reject Mixer or a Single Sideband Upconverter. The mixer utilizes two standard Hittite double balanced mixer cells and a 90 degree hybrid fabricated in a GaAs MESFET process. A low frequency quadrature hybrid was used to produce a 100 MHz USB IF output. This product is a much smaller alternative to hybrid style Image Reject Mixers and Single Sideband Upconverter assemblies. The HMC521ALC4 eliminates the need for wire bonding allowing use of surface mount manufacturing techniques.

### Electrical Specifications, $T_A = +25\text{ }^\circ\text{C}$ , $IF = 100\text{ MHz}$ , $LO = +15\text{ dBm}$ \*

Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range, RF/LO		8.5 - 13.5		10.5 - 11.7			GHz
Frequency Range, IF		DC - 3.5		DC - 3.5			GHz
Conversion Loss (As IRM)		8	10		7.5	9.5	dB
Image Rejection	20	30		30	38		dB
1 dB Compression (Input)		+14			+15		dBm
LO to RF Isolation	35	45		45	55		dB
LO to IF Isolation	18	22		20	24		dB
IP3 (Input)		+23			+24		dBm
Amplitude Balance		0.3			0.1		dB
Phase Balance		4			4		Deg

\* Unless otherwise noted, all measurements performed as downconverter.

# HMC521A\* PRODUCT PAGE QUICK LINKS

Last Content Update: 02/23/2017

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## COMPARABLE PARTS

View a parametric search of comparable parts.

## DOCUMENTATION

### Data Sheet

- HMC521A: GaAs MMIC I/Q MIXER 8.5 - 13.5 GHz Data Sheet

## DESIGN RESOURCES

- HMC521A Material Declaration
- PCN-PDN Information
- Quality And Reliability
- Symbols and Footprints

## DISCUSSIONS

View all HMC521A EngineerZone Discussions.

## SAMPLE AND BUY

Visit the product page to see pricing options.

## TECHNICAL SUPPORT

Submit a technical question or find your regional support number.

## DOCUMENT FEEDBACK

Submit feedback for this data sheet.

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## GaAs MMIC I/Q MIXER 8.5 - 13.5 GHz

### Harmonics of LO

LO Freq. (GHz)	nLO Spur at RF Port			
	1	2	3	4
8.5	42	44	44	70
9.5	50	53	59	77
10.5	51	54	63	xx
11.5	47	58	66	xx
12.5	45	59	70	xx
13.5	45	57	xx	xx

LO = + 15 dBm  
Values in dBc below input LO level measured at RF Port.

### MxN Spurious Outputs

mRF	nLO				
	0	1	2	3	4
0	xx	-5	29	23	52
1	27	0	51	59	81
2	92	85	76	82	92
3	92	92	92	92	92
4	92	92	92	92	92

RF = 10.6 GHz @ -10 dBm  
LO = 10.5 GHz @ +15 dBm  
Data taken without IF hybrid  
All values in dBc below IF power level

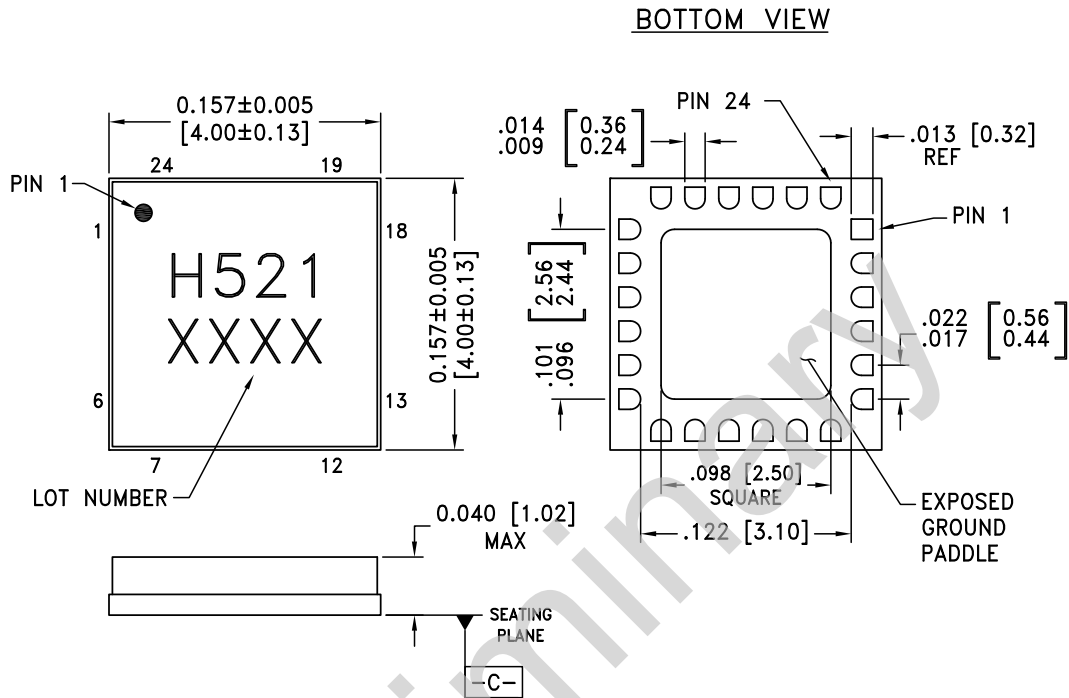
### Absolute Maximum Ratings

RF / IF Input	+20 dBm
LO Drive	+ 27 dBm
Channel Temperature	150°C
Continuous P <sub>diss</sub> (T=85°C) (derate 6.9 mW/°C above 85°C)	460 mW
Thermal Resistance (R <sub>TH</sub> ) (junction to package bottom)	141.4 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C



**ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS**

### Outline Drawing



**NOTES:**

1. PACKAGE BODY MATERIAL: ALUMINA
2. LEAD AND GROUND PADDLE PLATING: 30 - 80 MICROINCHES GOLD OVER 50 MICROINCHES MINIMUM NICKLE
3. DIMENSIONS ARE IN INCHES [MILLIMETERS]
4. LEAD SPACING TOLERANCE IS NON-CUMULATIVE
5. PACKAGE WARP SHALL NOT EXCEED 0.05mm DATUM
6. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND