

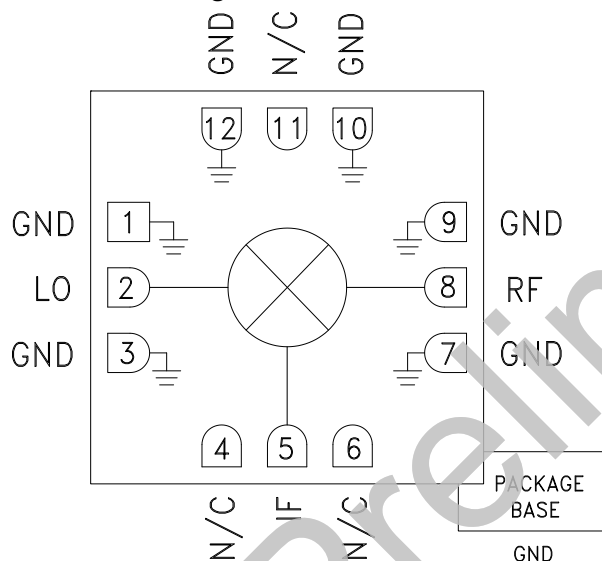
GaAs MMIC DOUBLE-BALANCED MIXER, 2 - 18 GHz

Typical Application

The HMC1048ALC3B is ideal for:

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

Functional Diagram



Features

Passive: No DC Bias Required

High Input IP3: 23 dBm

LO/RF Isolation: 38 dB

LO/IF Isolation: 28 dB

RF/IF Isolation: 15 dB

IF Bandwidth: DC - 4 GHz

Downconverter Applications

12 Lead Ceramic 3 x 3 mm SMT Package: 9 mm²

General Description

The HMC1048ALC3B is a general purpose double balanced mixer that can be used as a downconverter with DC to 4 GHz at the IF port and 2 to 18 GHz at the RF port. This mixer requires no external components or matching circuitry. The HMC1048ALC3B provides excellent LO/RF, LO/IF and RF/IF isolation. The mixer operates with LO drive levels from +9 dBm to +17 dBm. The HMC1048ALC3B eliminates the need for wire bonding and allows the use of surface mount manufacturing techniques.

Electrical Specifications, $T_A = +25^\circ\text{C}$, Downconverter, IF = 100 MHz, LO = +13 dBm^[1]

| Parameter | Min. | Typ. | Max. | Min. | Typ. | Max. | Units |
|-----------------------------------|--------|------|------|---------|------|------|-------|
| Frequency Range, RF & LO | 2 - 12 | | | 12 - 18 | | | GHz |
| Frequency Range, IF | DC - 4 | | | DC - 4 | | | GHz |
| Conversion Loss | | 9 | 12 | | 11 | 13 | dB |
| LO to RF Isolation ^[2] | 28 | 38 | | 28 | 35 | | dB |
| LO to IF Isolation ^[2] | 15 | 20 | | 18 | 28 | | dB |
| RF to IF Isolation | 8 | 15 | | 6 | 12 | | dB |
| IP3 (Input) | | 20 | | | 23 | | dBm |
| 1 dB Gain Compression (Input) | | 10 | | | 13 | | dBm |

[1] Unless otherwise noted all measurements performed as an Downconverter.

[2] Fixed IF = 100 MHz.

HMC1048A* PRODUCT PAGE QUICK LINKS

Last Content Update: 02/23/2017

COMPARABLE PARTS

View a parametric search of comparable parts.

DOCUMENTATION

Data Sheet

- HMC1048ALC3B: GaAs MMIC Double-Balanced Mixer, 2 - 18 GHz Preliminary Data Sheet

DESIGN RESOURCES

- HMC1048A Material Declaration
- PCN-PDN Information
- Quality And Reliability
- Symbols and Footprints

DISCUSSIONS

View all HMC1048A 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.

**GaAs MMIC DOUBLE-BALANCED
MIXER, 2 - 18 GHz**
**MxN Spurious Outputs,
Downconverter**

| mRF | nLO | | | | |
|-----|------|------|------|------|------|
| | 0 | 1 | 2 | 3 | 4 |
| 0 | x | -0.5 | 26.8 | -2.4 | 29.6 |
| 1 | 7.5 | 0 | 16.2 | 18.8 | 28.5 |
| 2 | 62.2 | 55.2 | 55.5 | 48.1 | 58.3 |
| 3 | 65 | 63.7 | 63.6 | 67.7 | 67.3 |
| 4 | 63.5 | 67.1 | 65.3 | 68.9 | 69.3 |

RF = 2 GHz @ -10 dBm

LO = 2.1 GHz @ +13 dBm

All values in dBc below IF power level

**MxN Spurious Outputs,
Upconverter**

| mIF | nLO | | | | |
|-----|------|-------|------|------|------|
| | 0 | 1 | 2 | 3 | 4 |
| 0 | x | -10.3 | 16.6 | 15.2 | 29.5 |
| 1 | 5.4 | 0 | 26.7 | 24 | 36.3 |
| 2 | 55.6 | 39.6 | 52.2 | 39.9 | 52 |
| 3 | 65.4 | 60.1 | 57.7 | 63.8 | 64.5 |
| 4 | 64.6 | 66.7 | 67.1 | 69.8 | 71.7 |

RF = 4 GHz @ -10 dBm

LO = 4.1 GHz @ +13 dBm

All values in dBc below RF power level

Harmonics of LO

| LO Freq. (GHz) | nLO Spur at RF Port | | | |
|----------------|---------------------|-------|-------|-------|
| | 1 | 2 | 3 | 4 |
| 2 | 60.76 | 45.98 | 58.15 | 56.06 |
| 4 | 39.86 | 31.63 | 49.77 | 43.87 |
| 6 | 43.29 | 31.08 | 51.66 | 58.58 |
| 10 | 39.12 | 31.05 | 62.34 | 64.12 |
| 12 | 32.53 | 42.18 | 32.52 | 70.08 |
| 14 | 45.01 | 53.44 | 41.58 | NA |

LO = +13 dBm

Values in dBc below LO level measured at RF Port.

**GaAs MMIC DOUBLE-BALANCED
MIXER, 2 - 18 GHz**
Absolute Maximum Ratings

| | |
|-----------------------------------------------------------------------|----------------|
| RF / IF Input(LO = +18 dBm) | +15.5 dBm |
| LO Drive | +20 dBm |
| Max Junction Temperature @ 85°C w/ 19 dBm | 116 °C |
| Continuous Pdiss (T = 85 °C) (derate 2.5 mW/°C above 85 °C) | 165 mW |
| Thermal Resistance (R _{TH}) (junction to package bottom) | 392 °C/W |
| Storage Temperature | -65 to +150 °C |
| Operating Temperature | -55 to +85 °C |
| ESD Sensitivity (HBM) | Class 1A |



**ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS**

Outline Drawing
