



GaAs MMIC I/Q MIXER MODULE 8.5 - 13.5 GHz



Features

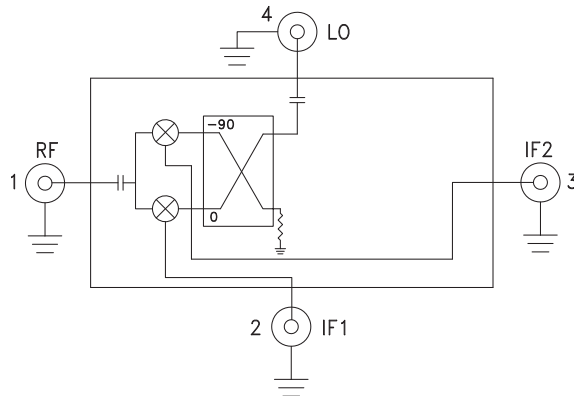
- Wide IF Bandwidth: DC - 2 GHz
- Image Rejection: 28 dB
- LO to RF Isolation: 38 dB
- High Input IP3: +25 dBm
- Hermetically Sealed Module
- Field Replaceable SMA Connectors
- 55 to +85 °C Operating Temperature

Typical Applications

The HMC-C042 is ideal for:

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

Functional Diagram



General Description

The HMC-C042 is a passive I/Q MMIC mixer housed in a miniature hermetic module which can be used as either an Image Reject Mixer or a Single Sideband Upconverter. The module utilizes two standard Hittite double balanced mixer cells and a 90 degree hybrid fabricated on a GaAs MESFET process. A low frequency quadrature hybrid was used to produce a 100 MHz USB IF output. This MMIC based module is a more reliable and consistent alternative to hybrid style I/Q Mixers and Single Sideband Converter assemblies. The module features removable SMA connectors which can be detached to allow direct connection of the I/O pins to a microstrip or coplanar circuit.

Electrical Specifications, $T_A = +25^\circ\text{C}$, $IF = 100\text{ MHz}$, $LO = +19\text{ dBm}^*$

Parameter	Min.	Typ.	Max.	Units
Frequency Range, RF/LO	8.5 - 13.5			GHz
Frequency Range, IF	DC - 2			GHz
Conversion Loss (As IRM)		8	10	dB
Image Rejection	17	28		dB
1 dB Compression (Input)		+17		dBm
LO to RF Isolation	35	38		dB
LO to IF Isolation	20	25		dB
IP3 (Input)		+25		dBm
Amplitude Balance		0.6		dB
Phase Balance		6		Deg

* Unless otherwise noted, all measurements performed as downconverter.

HMC-C042* PRODUCT PAGE QUICK LINKS

Last Content Update: 02/23/2017

COMPARABLE PARTS

View a parametric search of comparable parts.

DOCUMENTATION

Data Sheet

- HMC-C042 Data Sheet

DESIGN RESOURCES

- HMC-C042 Material Declaration
- PCN-PDN Information
- Quality And Reliability
- Symbols and Footprints

DISCUSSIONS

View all HMC-C042 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.



Data taken As IRM With External IF Hybrid

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Conversion Gain vs. Temperature

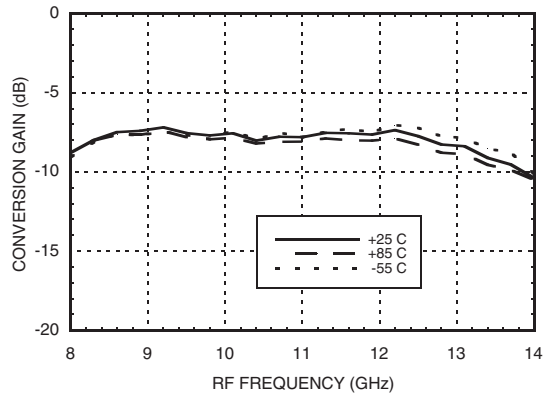
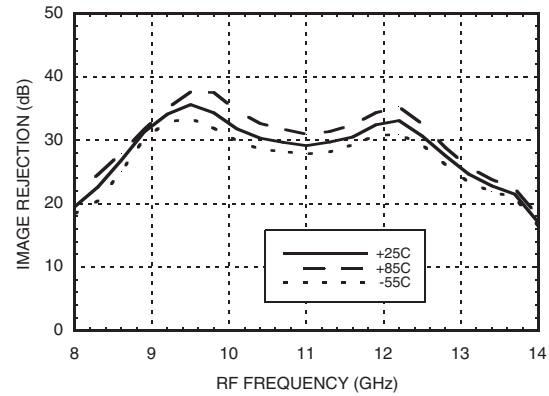
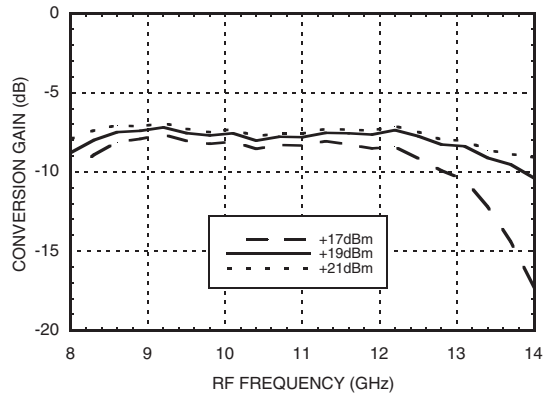


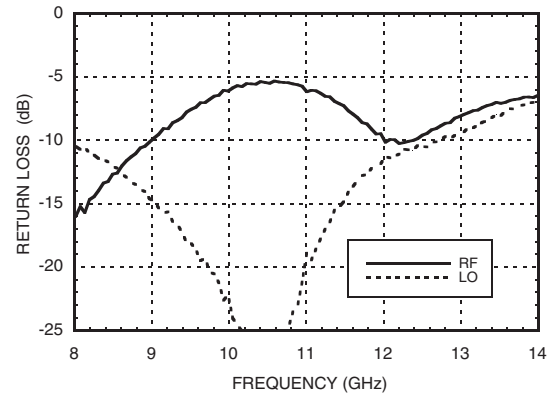
Image Rejection vs. Temperature



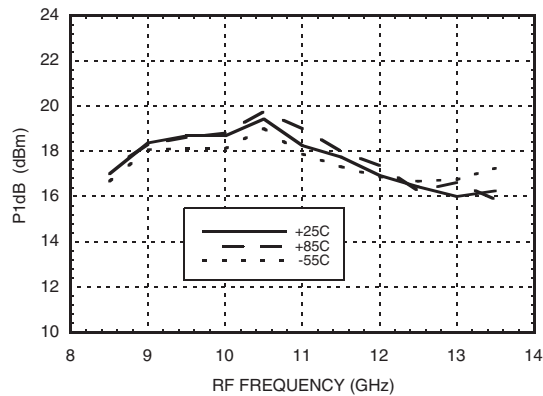
Conversion Gain vs. LO Drive



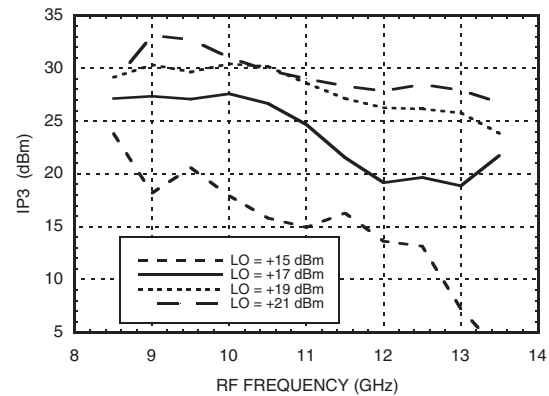
Return Loss



Input P1dB vs. Temperature

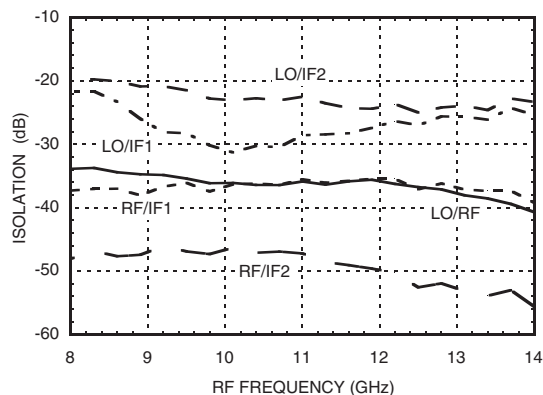
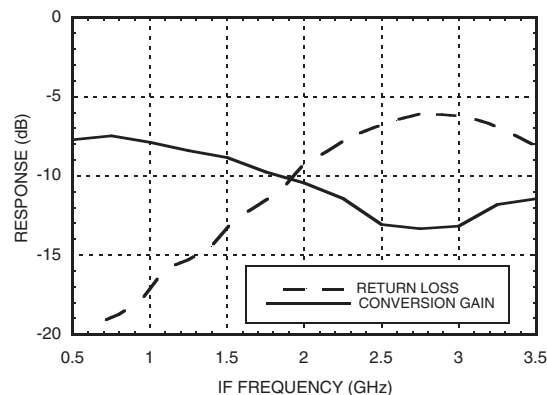
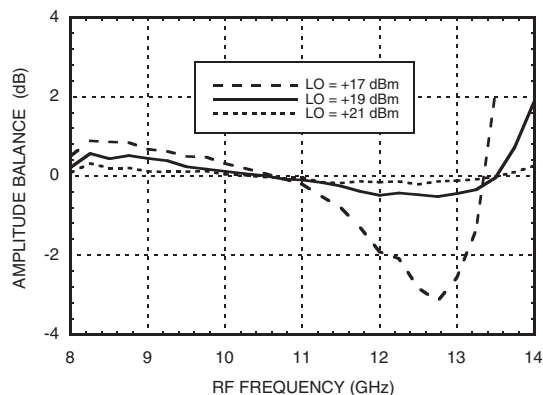
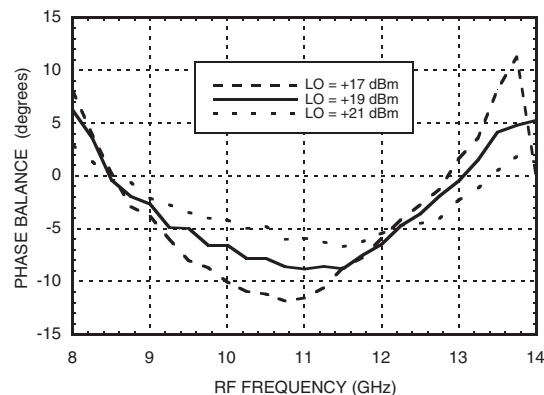
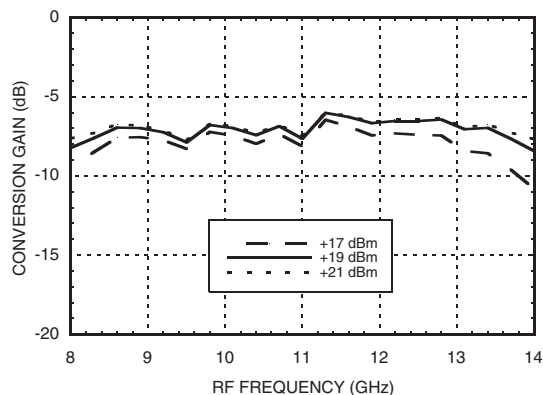
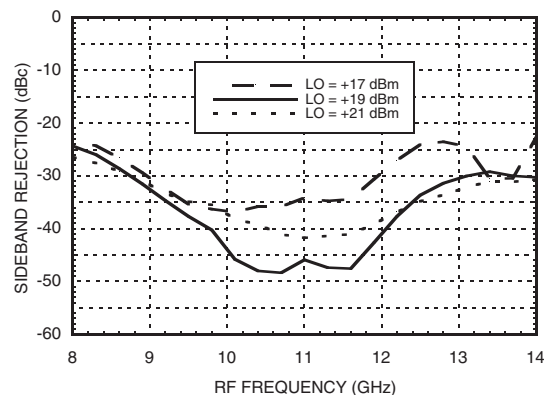


Input IP3 vs. LO Drive




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Quadrature Channel Data Taken Without IF Hybrid

Isolations

IF Bandwidth*

Amplitude Balance vs. LO Drive

Phase Balance vs. LO Drive

Upconverter Performance Conversion Gain vs. LO Drive*

Upconverter Performance Sideband Rejection vs. LO Drive*


* Conversion gain data taken with external IF hybrid

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**GaAs MMIC I/Q MIXER MODULE
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Harmonics of LO

LO Freq. (GHz)	nLO Spur at RF Port			
	1	2	3	4
8.5	34	48	50	77
9.5	35	47	57	64
10.5	36	51	62	53
11.5	35	57	67	45
12.5	36	52	67	47
13.5	38	51	64	xx

LO = +19 dBm
Values in dBc below input LO level measured at RF Port.

MxN Spurious Outputs

mRF	nLO				
	0	1	2	3	4
0	xx	-11	16	22	38
1	33	0	53	62	95
2	86	77	76	78	94
3	96	95	101	91	102
4	89	94	96	101	107

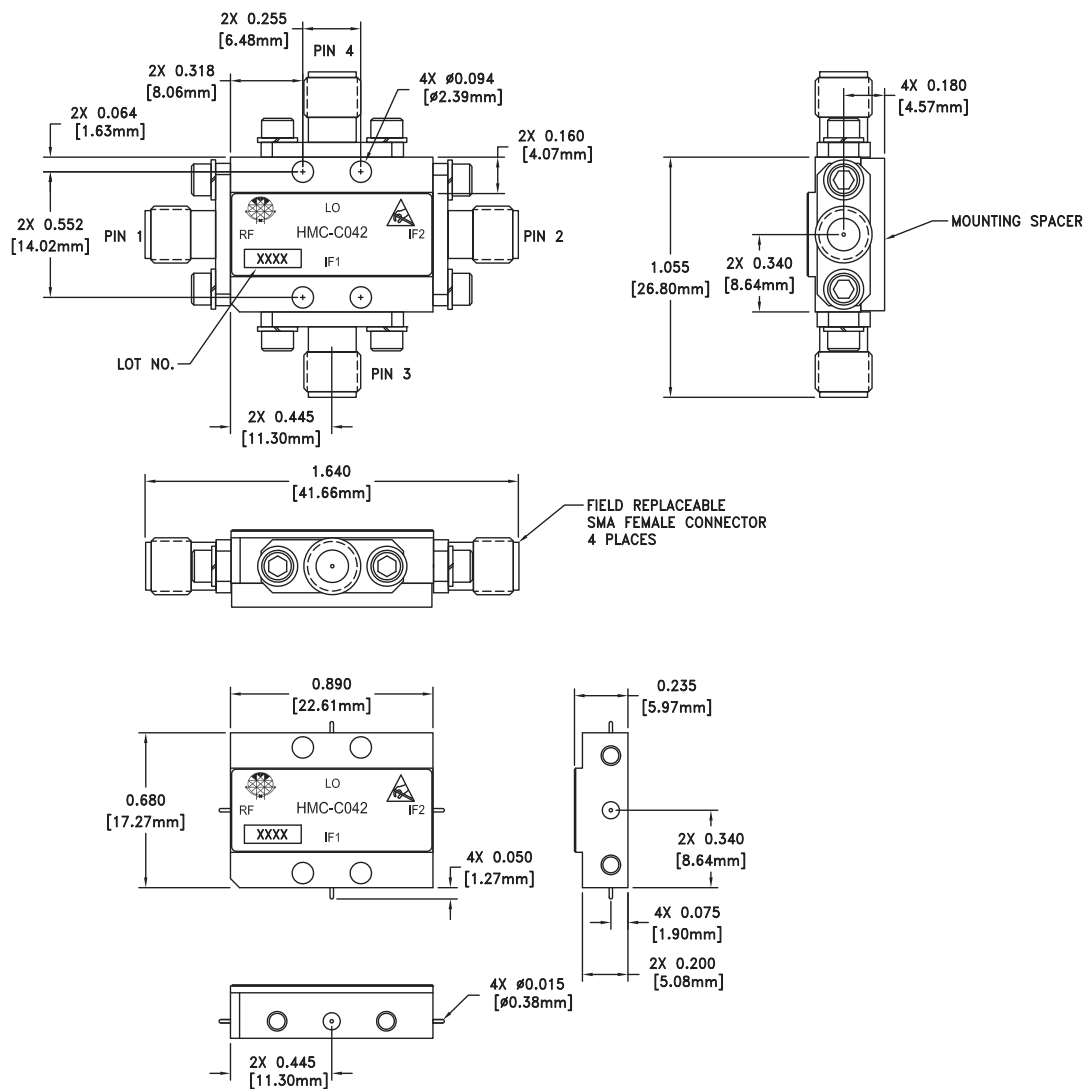
RF = 10.6 GHz @ -10 dBm
LO = 10.5 GHz @ +19 dBm
Data taken without IF hybrid
All values in dBc below IF power level



**ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS**

Absolute Maximum Ratings

RF / IF Input	+20 dBm
LO Drive	+27 dBm
Channel Temperature	150°C
Continuous Pdiss (T=85°C) (derate 7.1 mW/°C above 85°C)	460 mW
Thermal Resistance (R _{TH}) (junction to die bottom)	140 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C


**GaAs MMIC I/Q MIXER MODULE
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Outline Drawing


VIEW SHOWN WITH CONNECTORS REMOVED

NOTES:

1. PACKAGE, LEADS, COVER MATERIAL: KOVAR™
2. FINISH: GOLD PLATE OVER NICKEL PLATE
3. MOUNTING SPACER: NICKEL PLATED ALUMINUM
4. ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]
5. TOLERANCES:
 - 5.1 .XX = ±0.02
 - 5.2 .XXX = ±0.010
6. FIELD REPLACEABLE SMA CONNECTORS
TENSOLITE 5602 - 5CCSF OR EQUIVALENT
7. TO MOUNT MODULE TO SYSTEM PLATFORM REPLACE 0 -80
HARDWARE WITH DESIRED MOUNTING SCREWS

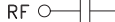
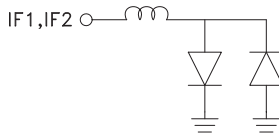
Package Information

Package Type	C-4
Package Weight ^[1]	20 gms ^[2]
Spacer Weight	2.6 gms ^[2]

^[1] Includes the connectors

^[2] ±1 gms Tolerance

Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1	RF	This pin is AC coupled and matched to 50 Ohms.	RF 
2	IF1	This pin is DC coupled. For applications not requiring operation to DC, this port should be DC blocked externally using a series capacitor whose value has been chosen to pass the necessary IF frequency range. For operation to DC, this pin must not source/sink more than 3 mA of current or part non-function and possible part failure will result.	IF1, IF2 
3	IF2		
4	LO	This pin is AC coupled and matched to 50 Ohms.	LO 

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