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Typical Applications

The HMC-C041 is ideal for:

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

Functional Diagram



GaAs MMIC I/Q MIXER MODULE 6 - 10 GHz

Features

Wide IF Bandwidth: DC - 3.5 GHz Image Rejection: 35 dB LO to RF Isolation: 45 dB High Input IP3: +25 dBm Hermetically Sealed Module Field Replaceable SMA Connectors -55 °C to +85 °C Operating Temperature

General Description

The HMC-C041 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, $T_A = +25^{\circ}$ C, IF= 100 MHz, LO = +19 dBm*

Parameter	Min.	Тур.	Max.	Units
Frequency Range, RF/LO	6 - 10			GHz
Frequency Range, IF	DC - 3.5			GHz
Conversion Loss (As IRM)		7.5	10	dB
Image Rejection	20	35		dB
1 dB Compression (Input)		+17		dBm
LO to RF Isolation	35	45		dB
LO to IF Isolation	20	25		dB
IP3 (Input)		+25		dBm
Amplitude Balance		0.5		dB
Phase Balance		5		Deg

* Unless otherwise noted, all measurements performed as downconverter.

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Data taken As IRM With External IF Hybrid Conversion Gain vs. Temperature



Conversion Gain vs. LO Drive



Input P1dB vs. Temperature





GaAs MMIC I/Q MIXER MODULE



Return Loss



Input IP3 vs. LO Drive



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ROHS V EARTH FRIENDLY

Quadrature Channel Data Taken Without IF Hybrid

Isolations



Amplitude Balance vs. LO Drive



Upconverter Performance Conversion Gain vs. LO Drive*



* Conversion gain data taken with external IF hybrid

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Phase Balance vs. LO Drive



Upconverter Performance Sideband Rejection vs. LO Drive*



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Harmonics of LO

	nLO Spur at RF Port			
LO Freq. (GHZ)	1	2	3	4
3.5	39	40	52	51
6.5	43	49	51	70
7.5	51	65	53	62
8.5	56	61	56	50
9.5	47	57	65	63
10.5	45	55	59	46
LO = +19 dBm Values in dBc below input LO level measured at RF Port.				

Absolute Maximum Ratings

RF / IF Input	+20 dBm
LO Drive	+27 dBm
Channel Temperature	150°C
Continuous Pdiss (T=85°C) (derate 7.8 mW/°C above 85°C)	507 mW
Thermal Resistance (R _{TH}) (junction to die bottom)	128 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C

GaAs MMIC I/Q MIXER MODULE 6 - 10 GHz

MxN Spurious Outputs

	nLO				
mRF	0	1	2	3	4
0	xx	-10	29	18	51
1	33	0	46	77	68
2	99	71	75	70	99
3	97	101	100	86	101
4	99	98	98	102	107

RF = 7.6 GHz @ -10 dBm

LO = 7.5 GHz @ +19 dBm

Data taken without IF hybrid

All values in dBc below IF power level



ELECTROSTATIC SENSITIVE DEVICE OBSERVE HANDLING PRECAUTIONS 5

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GaAs MMIC I/Q MIXER MODULE 6 - 10 GHz

Outline Drawing



VIEW SHOWN WITH CONNECTORS REMOVED

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

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

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

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