HMC-C051

v04.1211

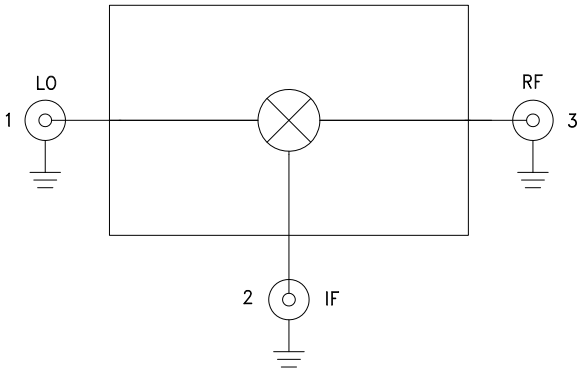
GaAs MMIC FUNDAMENTAL MIXER MODULE, 11 - 20 GHz

Typical Applications

The HMC-C051 is ideal for:

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

Functional Diagram



Features

High LO/RF Isolation: 43 dB

Passive Double Balanced Topology

Low Conversion Loss: 7 dB

Wide IF Bandwidth: DC - 6 GHz

Robust 1,000V ESD, Class 1C

Hermetically Sealed Module

Field Replaceable 2.92 mm (RF and LO) and SMA (IF) Connectors

-55 to +85 °C Operating Temperature

General Description

The HMC-C051 is a general purpose double balanced mixer housed in a miniature hermetic module 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 HMC-C051 provides excellent LO to RF and LO to IF isolation due to optimized balun structures. The module features removable 2.92 mm (RF and LO) and SMA (IF) 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° C, IF= 100 MHz, LO= +13 dBm*

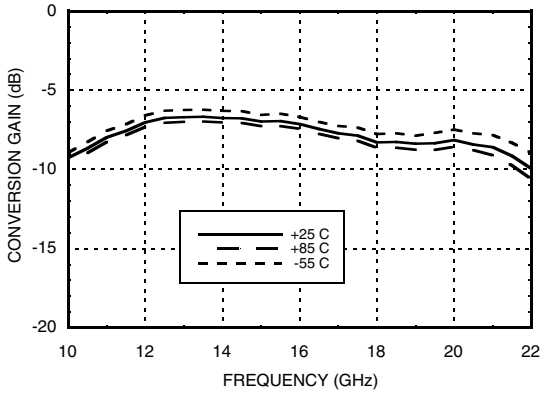
Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range, RF & LO		12 - 16			11 - 20		GHz
Frequency Range, IF		DC - 6			DC - 6		GHz
Conversion Loss		7	9		8	11	dB
Noise Figure (SSB)		6			7.5		dB
LO to RF Isolation	38	44		32	43		dB
LO to IF Isolation	36	40		36	41		dB
RF to IF Isolation	19	28		19	29		dB
IP3 (Input)		17			18		dBm
IP2 (Input)		44			41		dBm
1 dB Gain Compression (Input)		10			11		dBm

Unless otherwise noted, all measurements performed as downconverter, IF= 100 MHz.

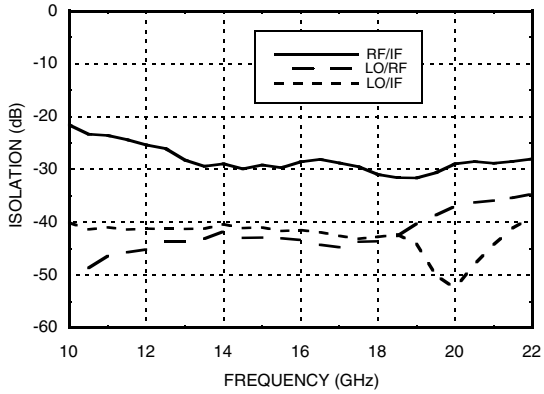
For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

GaAs MMIC FUNDAMENTAL MIXER MODULE, 11 - 20 GHz

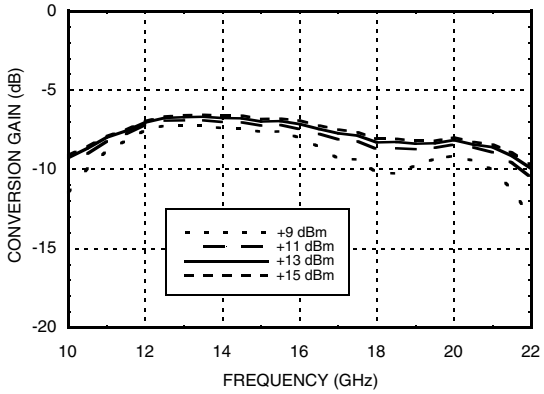
Conversion Gain vs. Temperature @ LO = +13 dBm



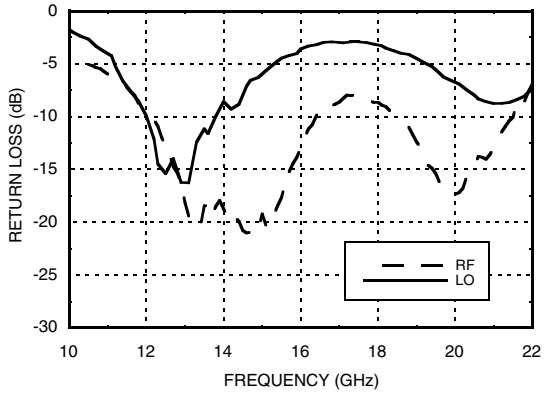
Isolation @ LO = +13 dBm



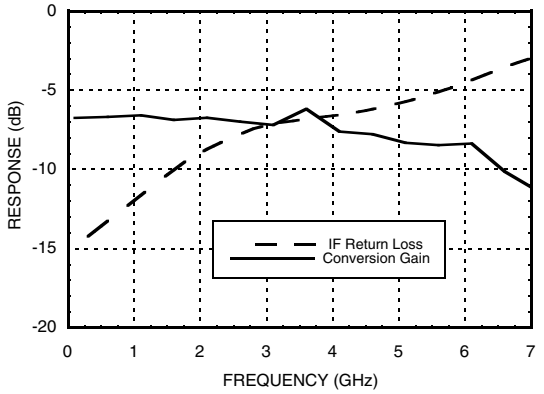
Conversion Gain vs. LO Drive



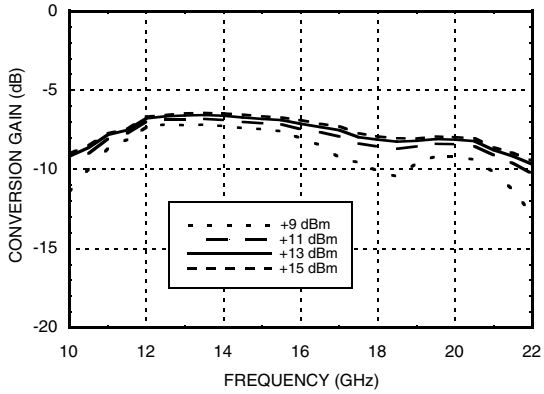
Return Loss @ LO = +13 dBm



IF Bandwidth @ LO = +13 dBm



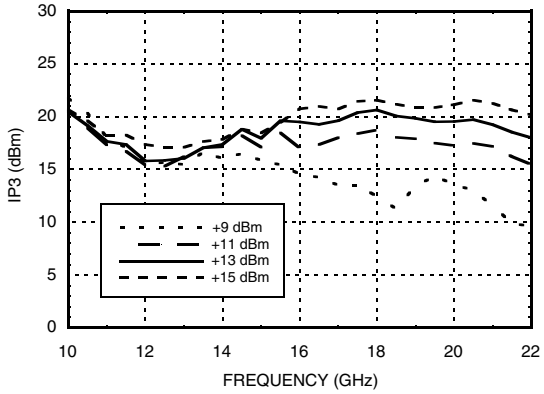
Upconverter Performance Conversion Gain vs. LO Drive



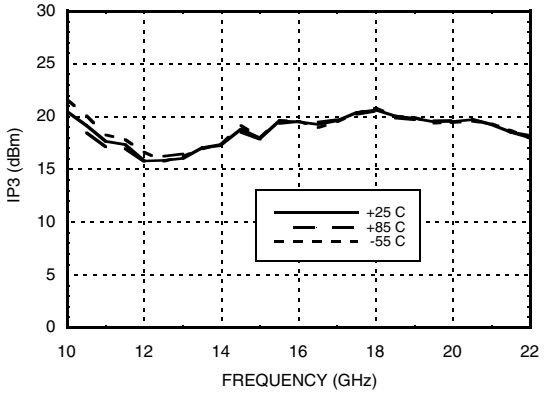
For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

GaAs MMIC FUNDAMENTAL MIXER MODULE, 11 - 20 GHz

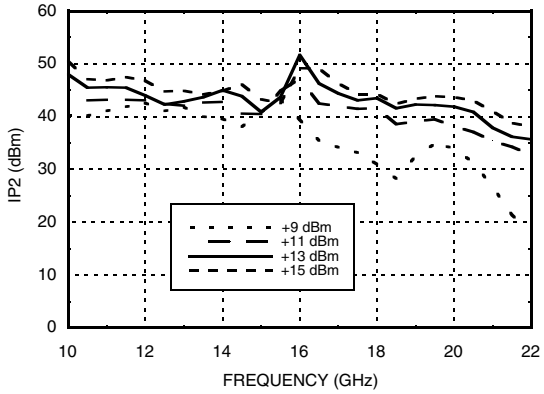
Input IP3 vs. LO Drive *



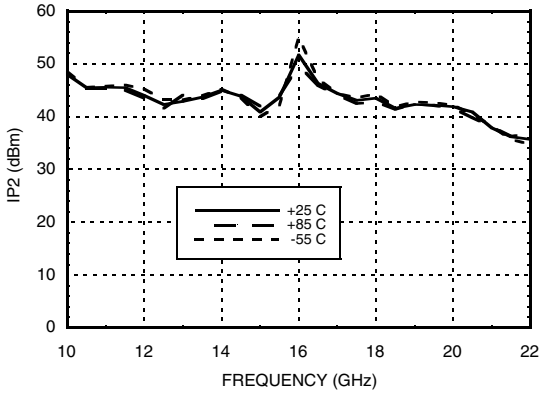
Input IP3 vs. Temperature @ LO = +13 dBm*



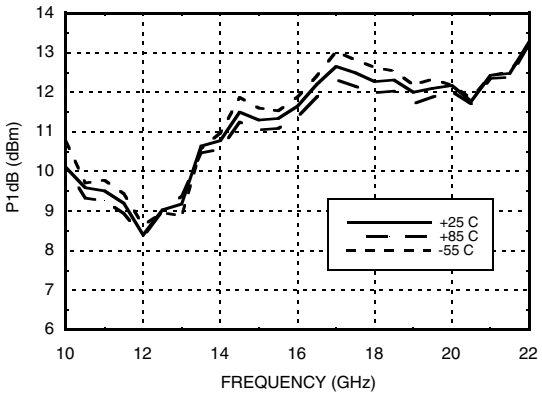
Input IP2 vs. LO Drive *



Input IP2 vs. Temperature @ LO = +13 dBm*



Input P1dB vs. Temperature @ LO = +13 dBm



** Two-tone input power = -10 dBm each tone, 1 MHz spacing.*

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

Absolute Maximum Ratings

RF / IF Input	+25 dBm
LO Drive	+25 dBm
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C
ESD Sensitivity (HBM)	Class 1C

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

MxN Spurious Outputs

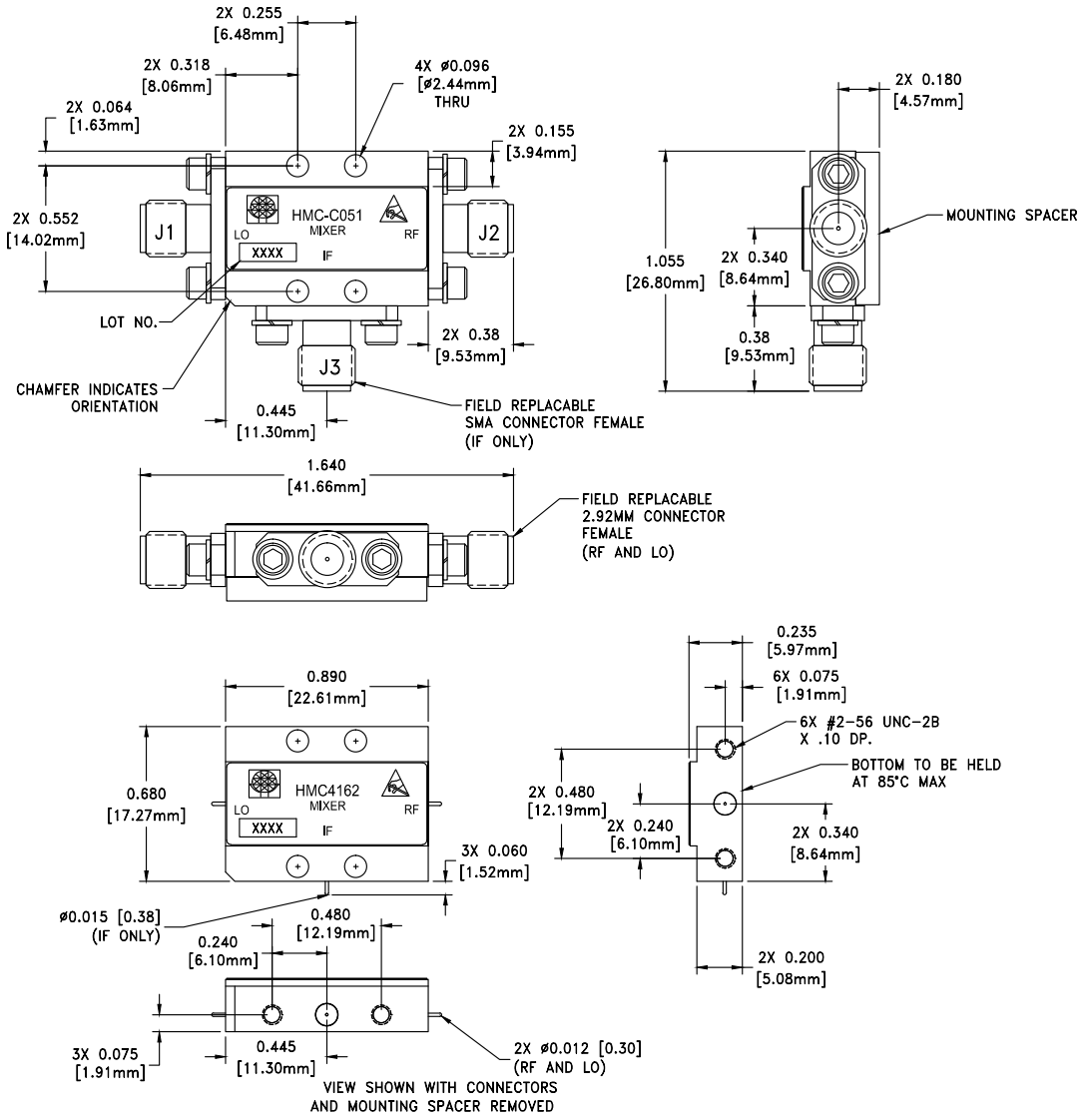
	nLO				
mRF	0	1	2	3	4
0	xx	15	34	32	xx
1	26	0	43	47	61
2	77	74	60	72	99
3	95	94	98	72	92
4	xx	108	108	103	106

RF Frequency= 15 GHz @ -10 dBm
LO Frequency= 14.9 GHz @ +13 dBm
All values in dBc below IF power level (1RF - 1LO).

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

GaAs MMIC FUNDAMENTAL MIXER MODULE, 11 - 20 GHz

Outline Drawing



Package Information

Package Type	C-11
Package Weight [1]	20 gms (Typ.)
Spacer Weight	2.6 gms (Typ.)

[1] Package weight includes the connectors

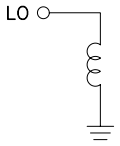
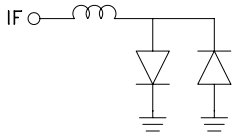
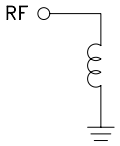
[2] ±1 gms Tolerance

NOTES:

1. PACKAGE, LEADS, COVER MATERIAL: KOVAR™
2. PLATING: GOLD PLATE OVER NICKEL PLATE.
3. MOUNTING SPACER: NICKEL PLATED ALUMINUM.
4. ALL DIMENSIONS ARE IN INCHES [MILLIMETERS].
5. TOLERANCES: ±0.010 [0.23] UNLESS OTHERWISE SPECIFIED
6. FIELD REPLACEABLE 2.92mm CONNECTORS.
   TENSOLITE 231CCSF OR EQUIVALENT.

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1	LO	This pin is DC coupled and matched to 50 Ohms.	
2	IF	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 or sink more than 2 mA of current or part non-function and possible part failure will result.	
3	RF	This pin is DC coupled and matched to 50 Ohms.	

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D