

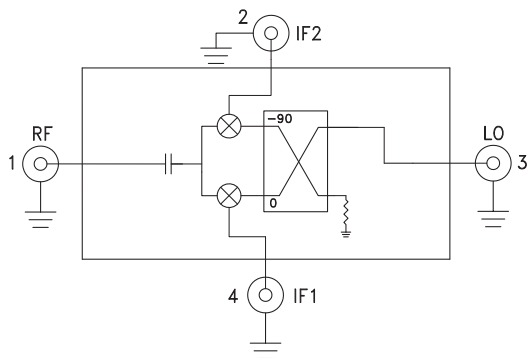


### Typical Applications

The HMC-C046 is ideal for:

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

### Functional Diagram



### Features

- Wide IF Bandwidth: DC - 4.5 GHz
- Image Rejection: 24 dB
- LO to RF Isolation: 42 dB
- High Input IP3: 22.5 dBm
- Hermetically Sealed Module
- Field Replaceable SMA Connectors
- 55 to +85 °C Operating Temperature

### General Description

The HMC-C046 is a passive I/Q MMIC mixer housed in a miniature hermetic module which can be used as either an Image Reject Mixer (IRM) 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 Upper Side Band (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, $T_A = +25^\circ \text{C}$ , $IF = 100 \text{ MHz}$ , $LO = +17 \text{ dBm}^*$

Parameter	Min.	Typ.	Max.	Units
Frequency Range, RF/LO	20 - 31			GHz
Frequency Range, IF	DC - 4.5			GHz
Conversion Loss (As IRM)		10	15	dB
Image Rejection	17	24		dB
1 dB Compression (Input)		17		dBm
LO to RF Isolation	29	42		dB
LO to IF Isolation	18	30		dB
IP3 (Input)		22.5		dBm
Amplitude Balance		0.3		dB
Phase Balance		4		Deg

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



Data taken As IRM With External IF 90° Hybrid  
Conversion Gain vs. Temperature

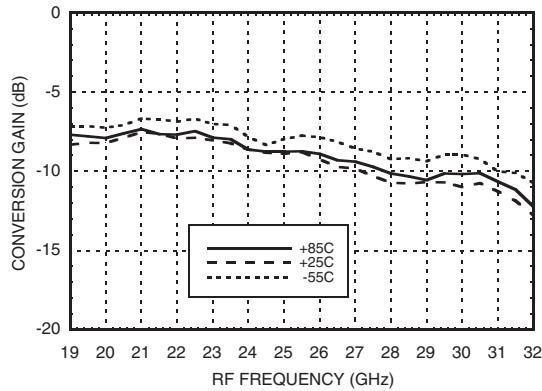
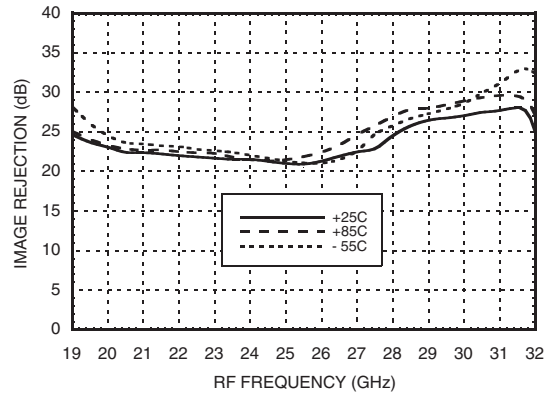
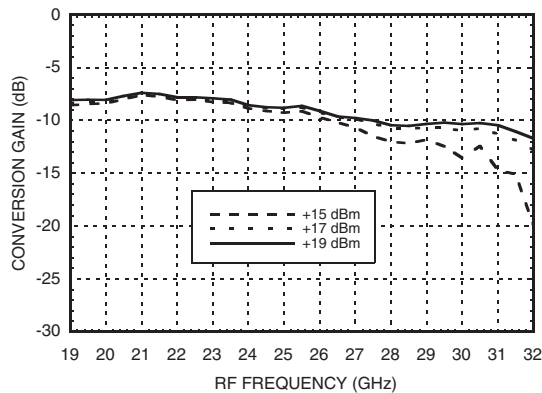


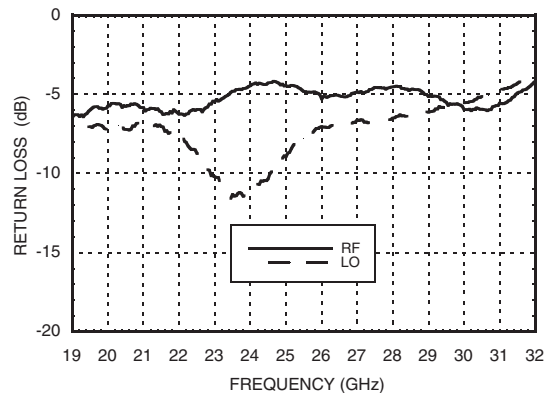
Image Rejection vs. Temperature



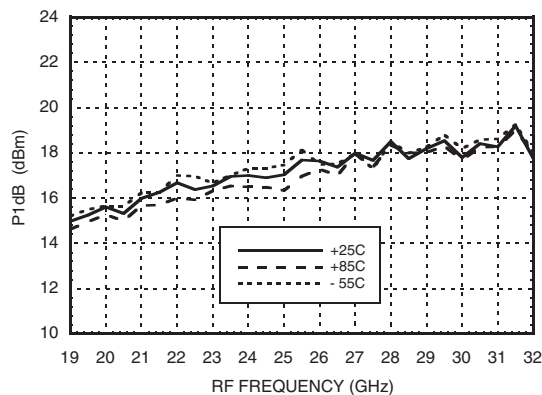
Conversion Gain vs. LO Drive



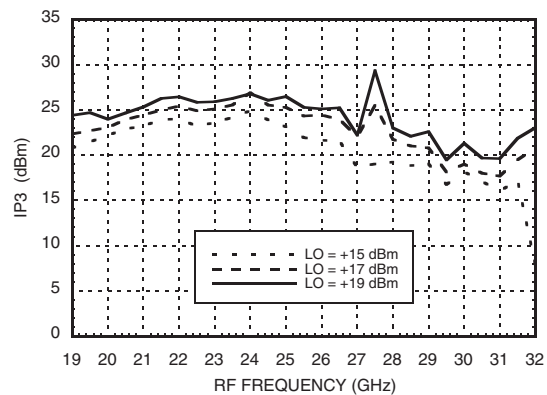
Return Loss



Input P1dB vs. Temperature



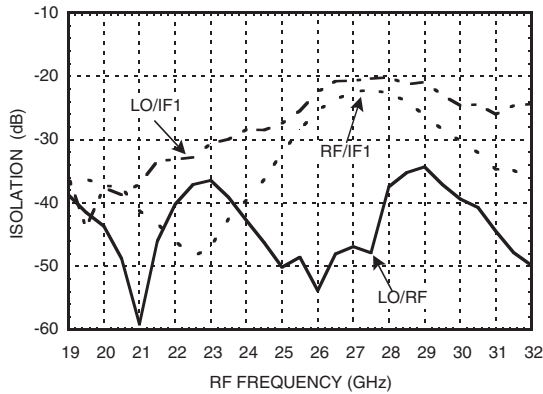
Input IP3 vs. LO Drive



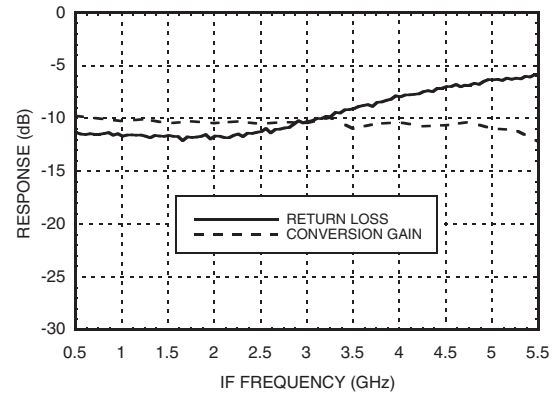


## IF1 & IF2 Port Characteristics

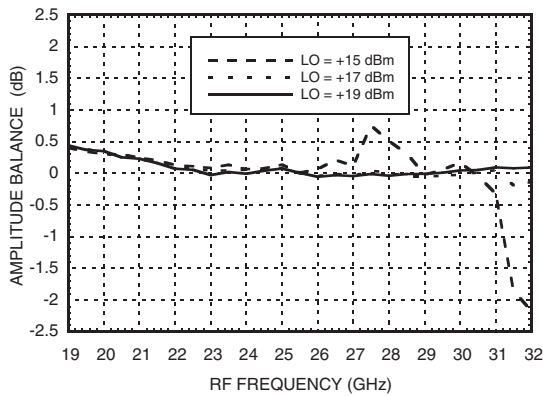
### Isolations



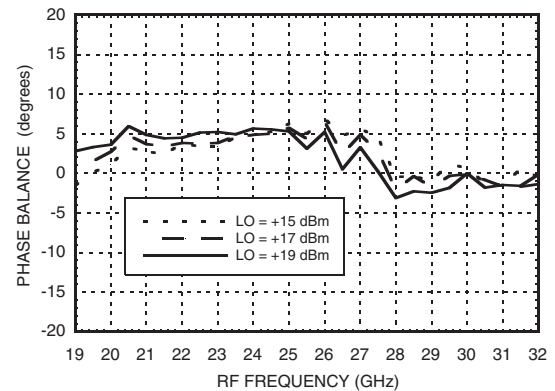
### IF Bandwidth\*



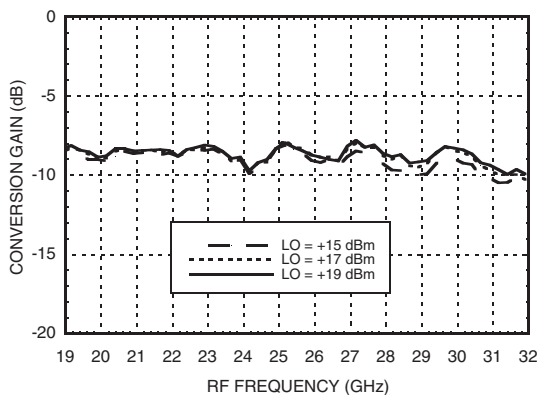
### Amplitude Balance vs. LO Drive



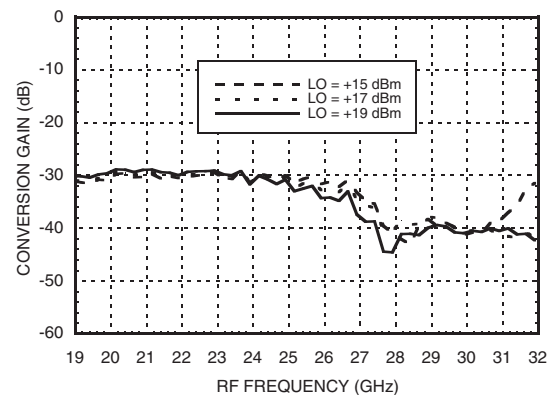
### Phase Balance vs. LO Drive



### Upconverter Performance Conversion Gain vs. LO Drive\*



### Upconverter Performance Sideband Rejection vs. LO Drive\*



\* Conversion gain data taken with external IF hybrid


**Absolute Maximum Ratings**

RF / IF Input	13 dBm
LO Drive	27 dBm
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C

**MxN Spurious Outputs**

mRF	nLO				
	0	1	2	3	4
0	xx	-13	27	xx	xx
1	18	0	35	52	xx
2	76	74	87	74	82
3	xx	83	87	77	87
4	xx	xx	82	87	87

RF = 24.5 GHz @ -10 dBm  
 LO = 24.4 GHz @ +17 dBm  
 Data taken without IF 90° hybrid  
 All values in dBc with reference to output power at IF= 100 MHz

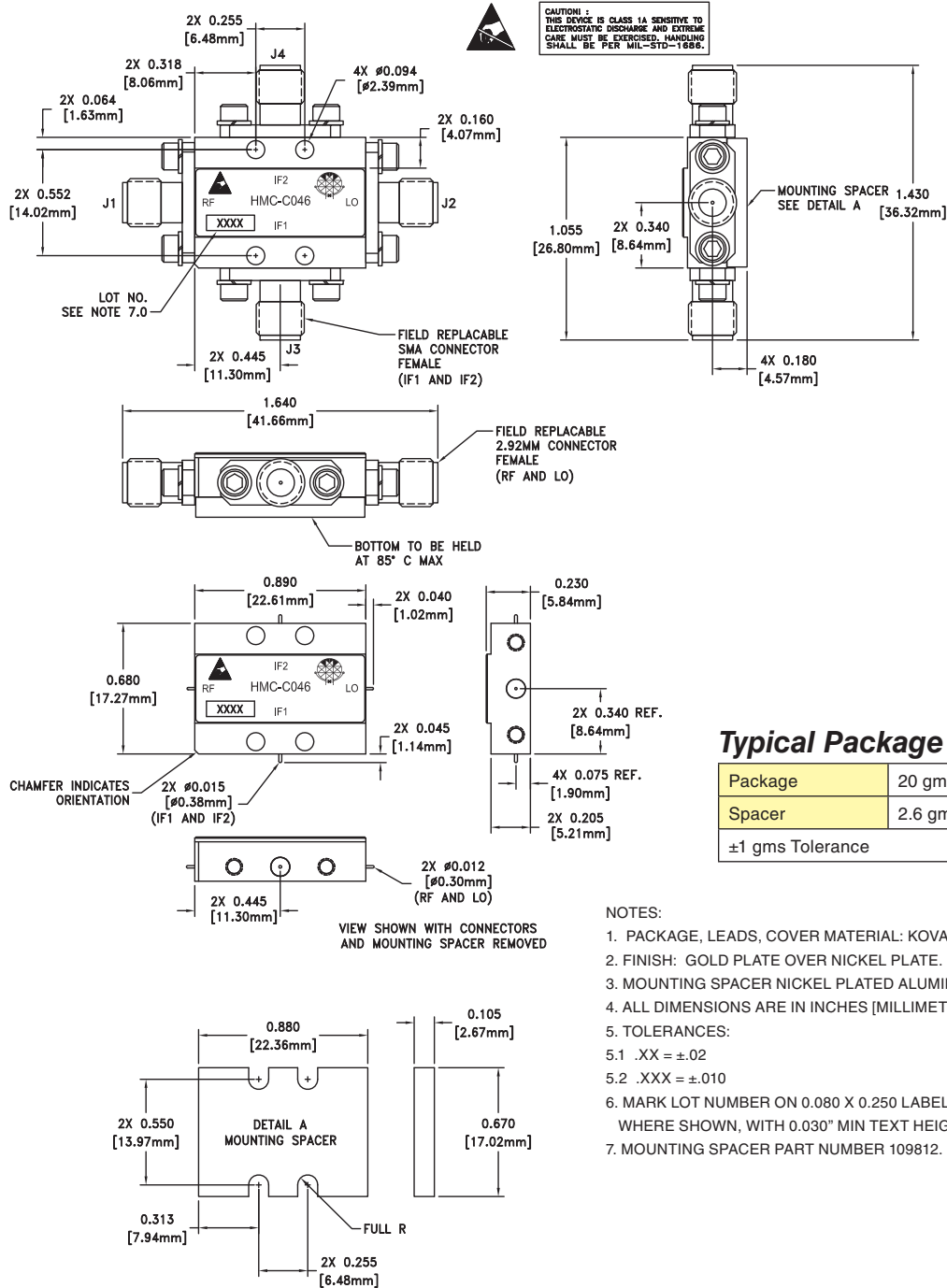


**ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS**



## GaAs MMIC I/Q MIXER MODULE 20 - 31 GHz

### Outline Drawing



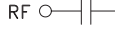
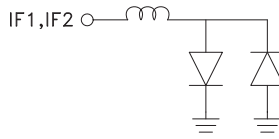
### Typical Package Weight

Package	20 gms
Spacer	2.6 gms
±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 = ±.02
  - 5.2 .XXX = ±.010
6. MARK LOT NUMBER ON 0.080 X 0.250 LABEL WHERE SHOWN, WITH 0.030" MIN TEXT HEIGHT.
7. MOUNTING SPACER PART NUMBER 109812.


**Pin Descriptions**

Pin Number	Function	Description	Interface Schematic
1	RF	This pin is AC coupled and matched to 50 Ohms.	
2	IF2	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 3mA of current or part non-function and possible part failure will result.	
4	IF1		
3	LO	This pin is DC coupled and matched to 50 Ohms.	