

### Typical Applications

The HMC156C8 is suitable for:

- Wireless Local Loop
- LMDS, VSAT, and Point-to-Point Radios
- UNII & HiperLAN
- Test Equipment

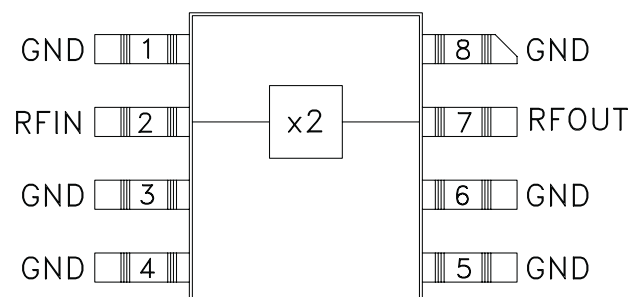
### Features

Conversion Loss: 15 dB

Fo, 3Fo, 4Fo Isolation: 38 dB

Input Drive Level: 10 to 20 dBm

### Functional Diagram



### General Description

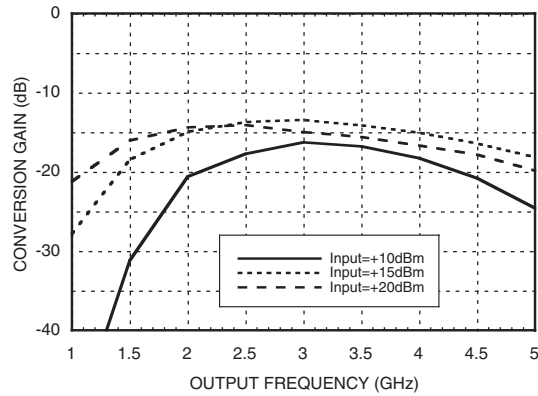
The HMC156C8 is a miniature frequency doubler in a non-hermetic ceramic surface mount package. Suppression of undesired fundamental and higher order harmonics is 38 dB typical with respect to input signal levels. The doubler uses the same diode/balun technology used in Hittite MMIC mixers, features small size and requires no DC bias.

### Electrical Specifications, $T_A = +25^\circ \text{C}$ , As a Function of Drive Level

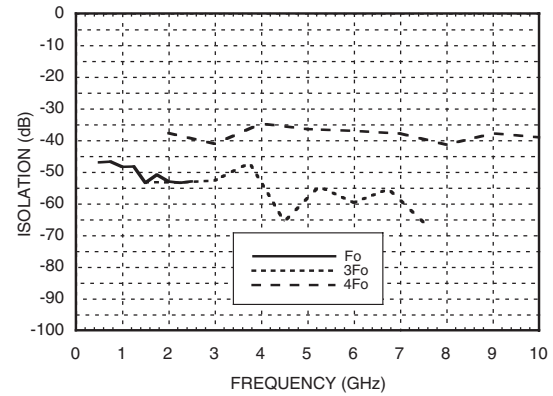
| Parameter                                      | Input = +10 dBm |      |      | Input = +15 dBm |      |      | Input = +20 dBm |      |      | Units |
|------------------------------------------------|-----------------|------|------|-----------------|------|------|-----------------|------|------|-------|
|                                                | Min.            | Typ. | Max. | Min.            | Typ. | Max. | Min.            | Typ. | Max. |       |
| Frequency Range, Input                         | 1.1 - 2.1       |      |      | 0.8 - 2.4       |      |      | 0.7 - 2.3       |      |      | GHz   |
| Frequency Range, Output                        | 2.2 - 4.2       |      |      | 1.6 - 4.8       |      |      | 1.4 - 4.6       |      |      | GHz   |
| Conversion Loss                                |                 | 17   | 22   |                 | 15   | 20   |                 | 15   | 20   | dB    |
| FO Isolation<br>(with respect to input level)  | 42              | 47   |      | 43              | 47   |      | 27              | 35   |      | dB    |
| 3FO Isolation<br>(with respect to input level) | 45              | 55   |      | 44              | 55   |      | 29              | 40   |      | dB    |
| 4FO Isolation<br>(with respect to input level) | 28              | 38   |      | 31              | 38   |      | 25              | 35   |      | dB    |

## GaAs MMIC SMT PASSIVE FREQUENCY DOUBLER, 0.7 - 2.4 GHz INPUT

**Conversion Gain vs. Drive Level**

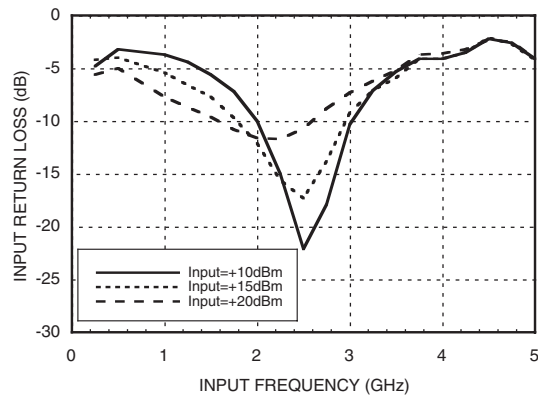


**Isolation @ +15 dBm Drive Level\***

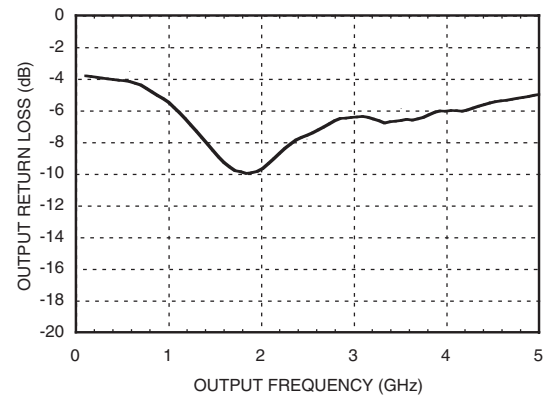


\*With respect to input level

**Input Return Loss vs. Drive Level**



**Output Return Loss @ +15 Drive Level**





|                       |                |
|-----------------------|----------------|
| Input Drive           | +27 dBm        |
| Storage Temperature   | -65 to +150 °C |
| Operating Temperature | -40 to +85 °C  |



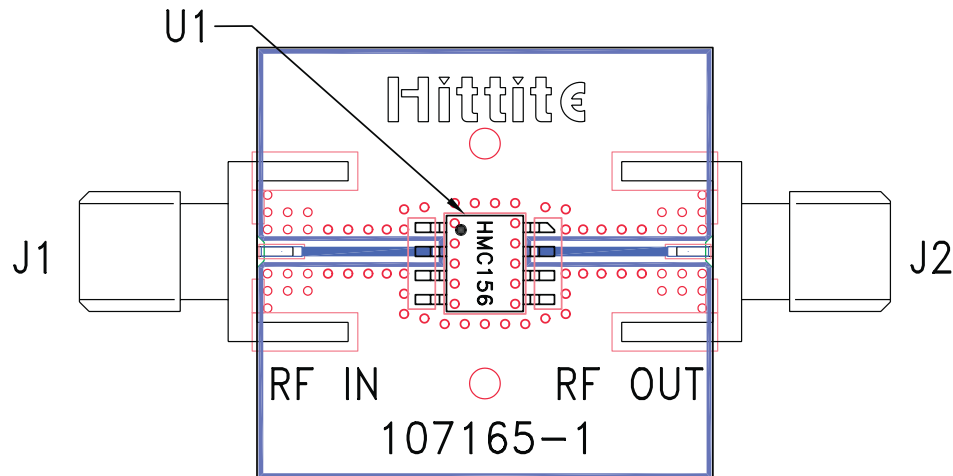
ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS

The mechanical drawing illustrates the HMCXXX package in three views: top, side, and end. The top view shows a rectangular package with a central circular feature and eight pins on each long side. Dimensions include a total width of .205 [5.21] inches, a pin pitch of .025 [0.64] inches, and a pin 8 chamfered lead. The side view shows a package height of .095 [2.41] inches maximum, with a lead height of .009 [0.23] inches and a lead angle of 7°. The end view shows a package thickness of .040 [1.02] inches and a pin width of .020 [0.51] inches. The package is labeled HMCXXX.

NOTES:

1. PACKAGE BODY MATERIAL: WHITE ALUMINA 92%
2. LEAD, PACKAGE BOTTOM MATERIAL: COPPER
3. PLATING: ELECTROLYTIC GOLD 100 - 200 MICROINCHES OVER ELECTROLYTIC NICKEL 100 TO 200 MICROINCHES.
4. DIMENSIONS ARE IN INCHES [MILLIMETERS].
5. PACKAGE LENGTH AND WIDTH DIMENSIONS DO NOT INCLUDE LID SEAL PROTRUSION .005 PER SIDE.
6. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB PF GROUND.

**Evaluation PCB**



**List of Materials for Evaluation PCB 107196 <sup>[1]</sup>**

| Item    | Description             |
|---------|-------------------------|
| J1, J2  | PCB Mount SMA Connector |
| U1      | HMC156C8, Doubler       |
| PCB [2] | 107165 Eval Board       |

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Rogers 4350

The circuit board used in the final application should be generated with proper RF circuit design techniques. Signal lines should have 50 ohm impedance while the package ground leads and exposed paddle should be connected directly to the ground plane similar to that shown. The evaluation circuit board shown is available from Hittite upon request.