

## GaAs MMIC SMT PASSIVE FREQUENCY DOUBLER, 0.85 - 2.0 GHz INPUT

### Typical Applications

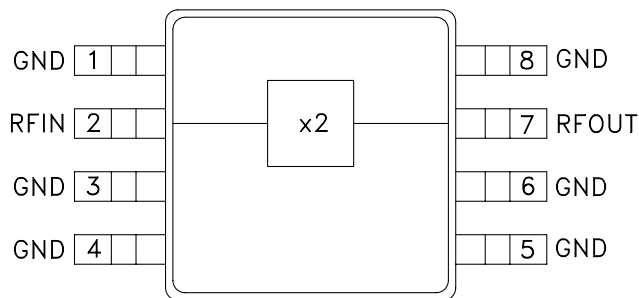
The HMC187MS8 is suitable for:

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

### Features

- Conversion Loss: 15 dB
- Fo, 3Fo, 4Fo Isolation: 40 dB
- Input Drive Level: 10 to 20 dBm

### Functional Diagram



### General Description

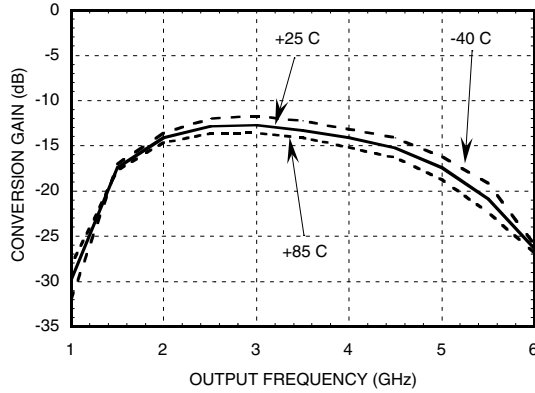
The HMC187MS8 is a miniature frequency doubler MMIC in a plastic 8-lead MSOP package. The suppression of undesired fundamental and higher order harmonics is 40 dB typical with respect to input signal levels. The doubler uses the same diode/balun technology used in Hittite MMIC mixers. The doubler is ideal for high volume applications where frequency doubling of a lower frequency is more economical than directly generating a higher frequency. The passive Schottky diode doubler technology contributes no measurable additive phase noise onto the multiplied signal.

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

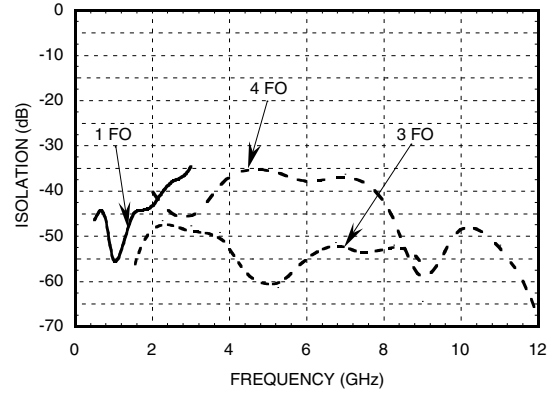
Parameter	Input = +10 dBm			Input = +15 dBm			Input = +20 dBm			Units
	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
Frequency Range, Input	1.25 - 1.75			1.0 - 1.75			0.85 - 2.0			GHz
Frequency Range, Output	2.5 - 3.5			2.0 - 3.5			1.7 - 4.0			GHz
Conversion Loss		18	22		14	17		15	18	dB
FO Isolation (with respect to input level)				35	45					dB
3FO Isolation (with respect to input level)				46	52					dB
4FO Isolation (with respect to input level)				33	40					dB

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**Conversion Gain @ +15 dBm Drive Level**

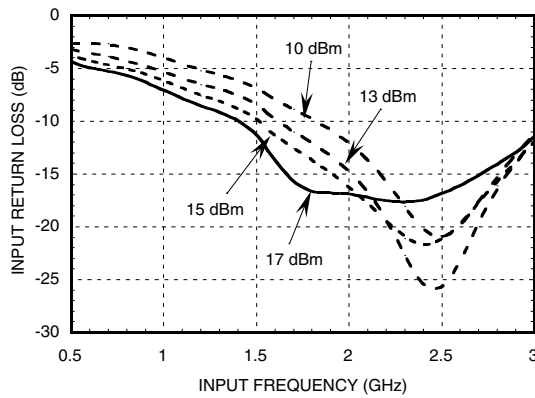


**Isolation @ +15 dBm Drive Level\***

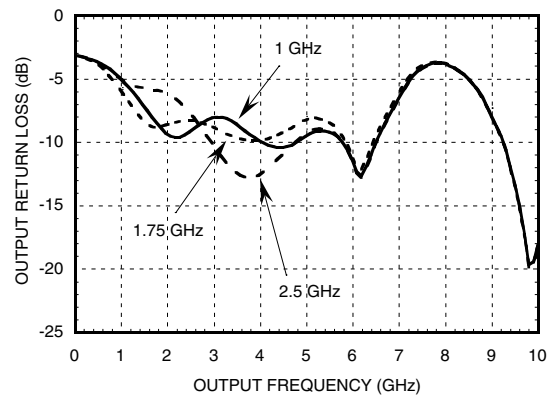


\*With respect to input level

**Input Return Loss vs. Drive Level**

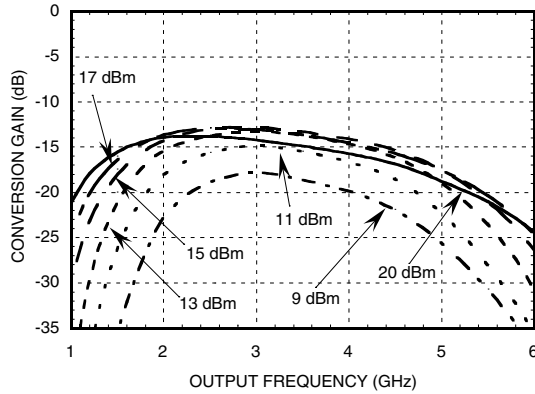


**Output Return Loss for Several Input Frequencies**

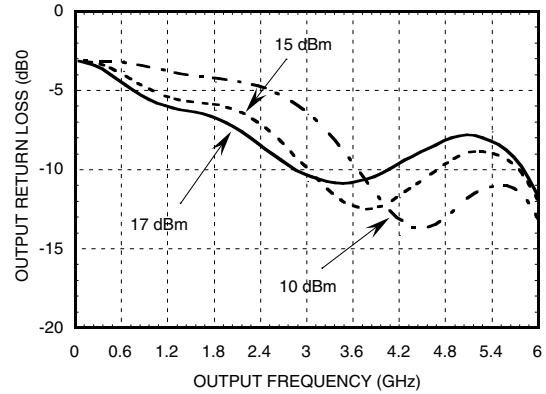


## GaAs MMIC SMT FREQUENCY DOUBLER, 0.85 - 2.0 GHz INPUT

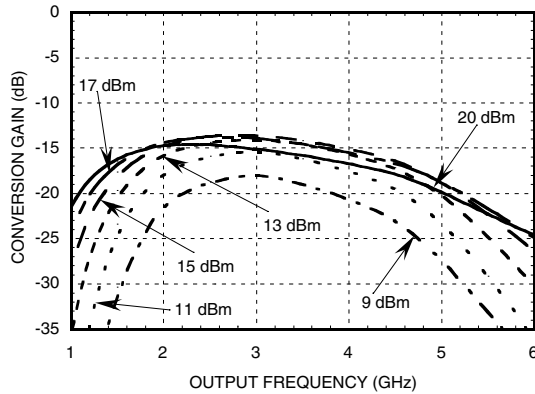
**Conversion Gain @ 25°C vs. Drive Level**



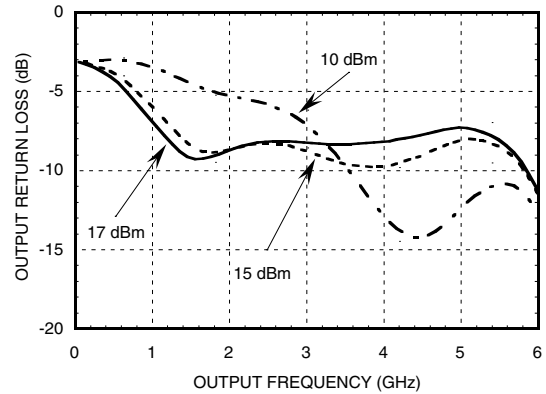
**Output Return Loss with 1 GHz Input**



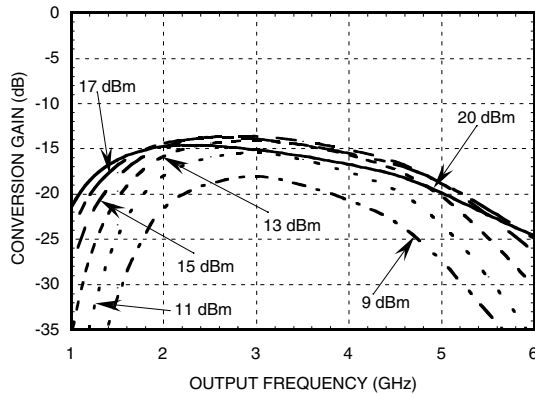
**Conversion Gain @ -40°C vs. Drive Level**



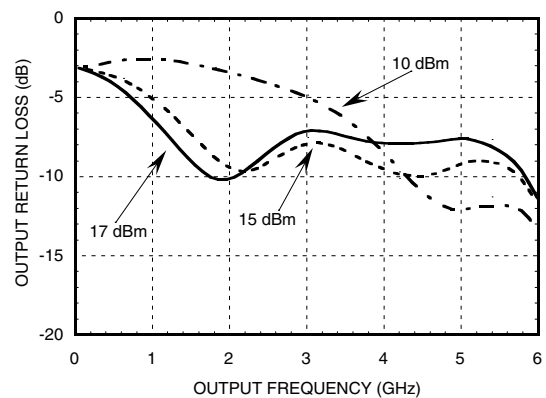
**Output Return Loss with 1.75 GHz Input**



**Conversion Gain @ +85°C vs. Drive Level**



**Output Return Loss with 2.5 GHz Input**

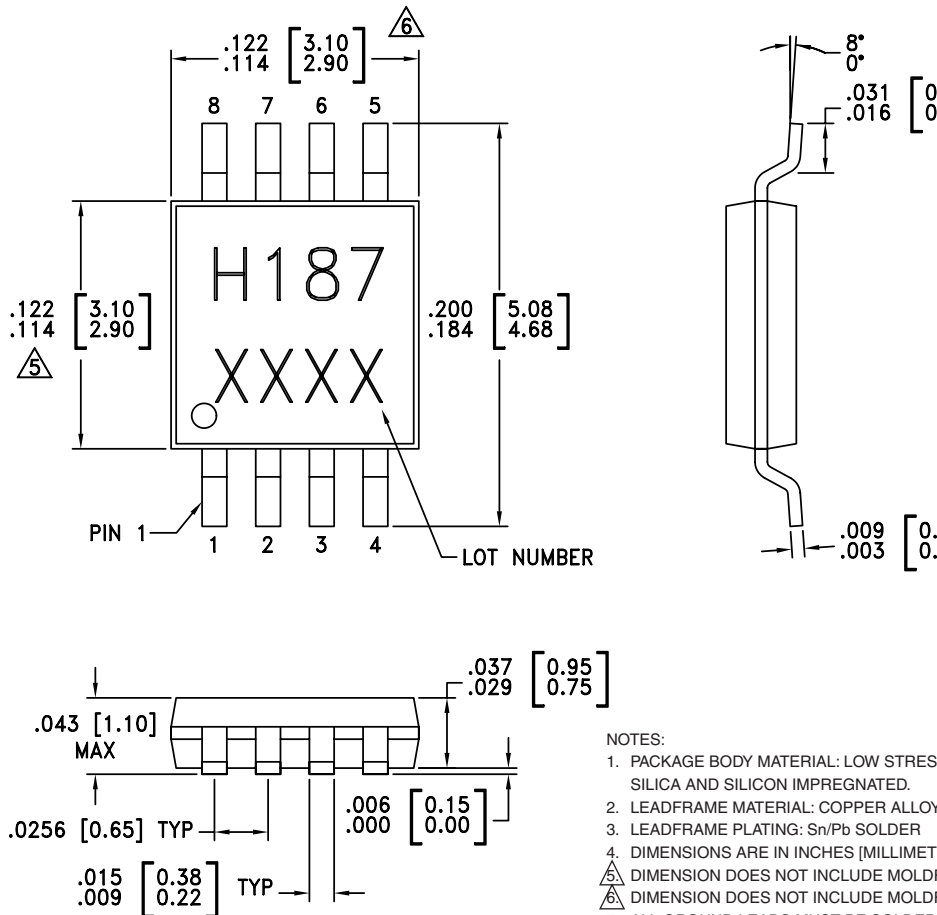


## GaAs MMIC SMT FREQUENCY DOUBLER, 0.85 - 2.0 GHz INPUT

### Absolute Maximum Ratings

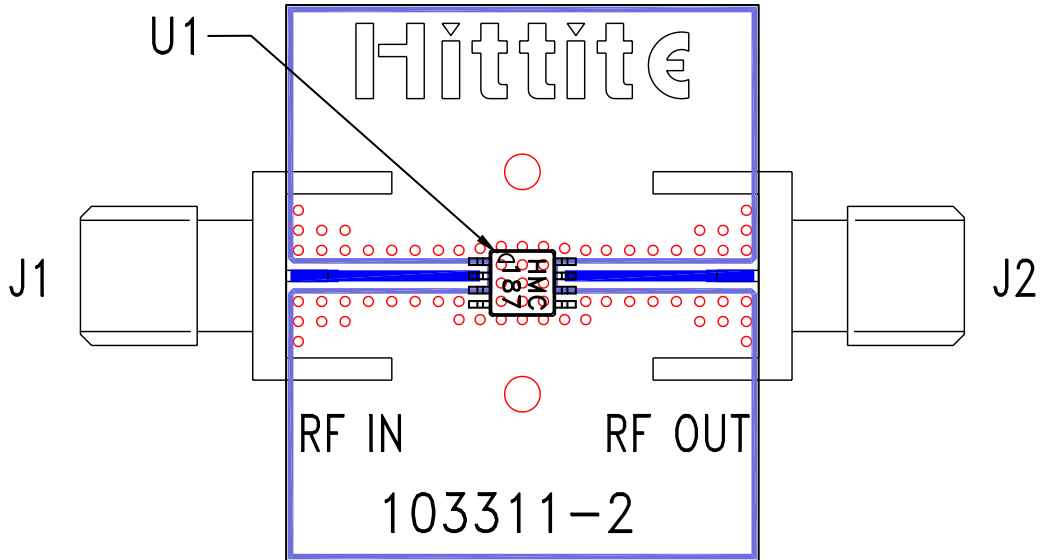
Input Drive	+27 dBm
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C

### Outline Drawing



## GaAs MMIC SMT FREQUENCY DOUBLER, 0.85 - 2.0 GHz INPUT

### Evaluation PCB



### List of Materials

Item	Description
J1, J2	PC Mount SMA Connector
U1	HMC187MS8, Doubler
PCB*	103311 Eval Board
* 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.

## *GaAs MMIC SMT FREQUENCY DOUBLER, 0.85 - 2.0 GHz INPUT*

**Notes:**