

Typical Applications

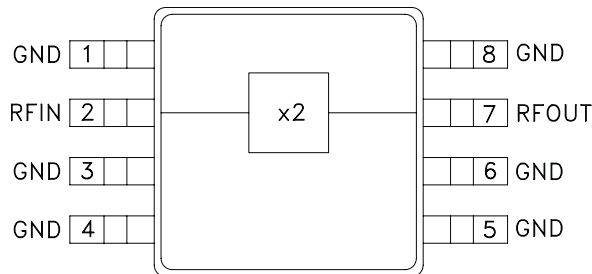
The HMC187MS8 / HMC187MS8E is suitable for:

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

Features

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

Functional Diagram

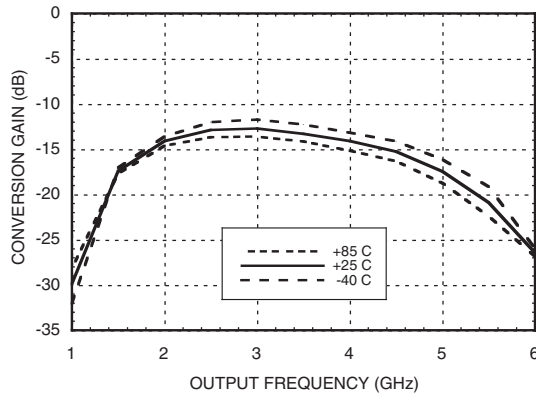
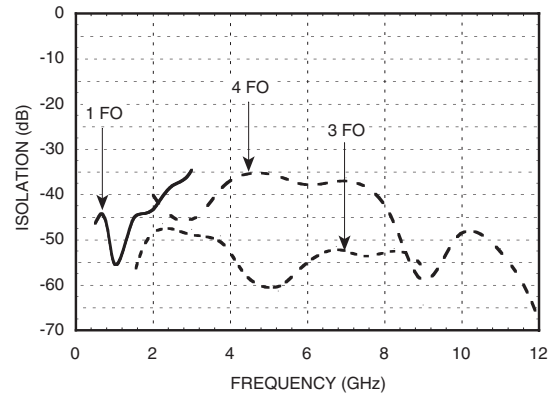


General Description

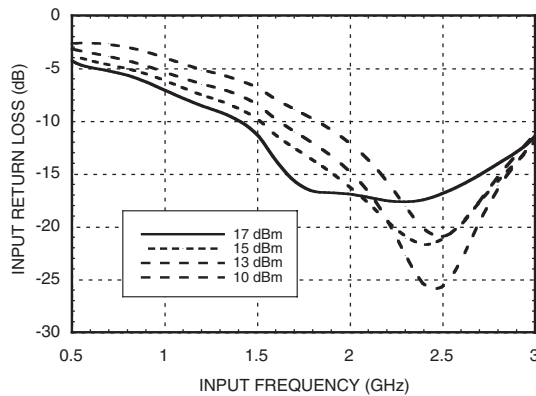
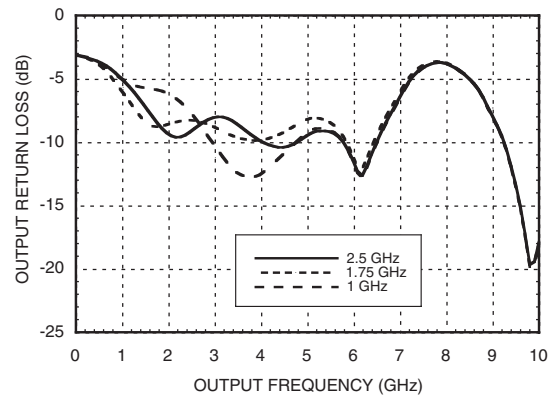
The HMC187MS8 & HMC187MS8E are miniature frequency doubler MMICs in plastic 8-lead MSOP packages. The suppression of undesired fundamental and higher order harmonics is 40 dB typical with respect to input signal levels. The doubler uses the same diode/balun technology used in Hittite MMIC mixers. The 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

GaAs MMIC SMT PASSIVE FREQUENCY DOUBLER, 0.85 - 2.0 GHz INPUT
Conversion Gain @ +15 dBm Drive Level

Isolation @ +15 dBm Drive Level*


*With respect to input level

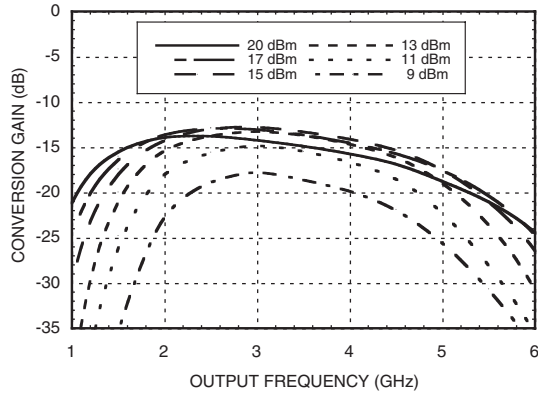
Input Return Loss vs. Drive Level

Output Return Loss for Several Input Frequencies


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

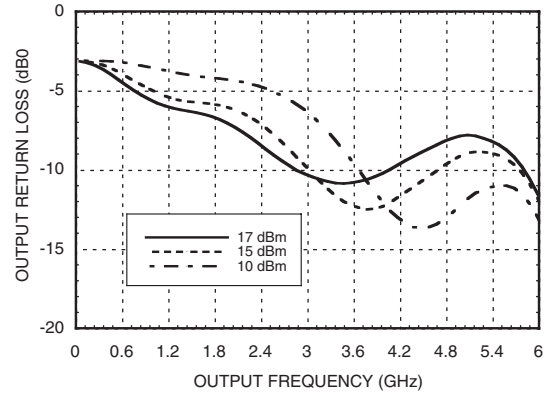
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FREQUENCY MULTIPLIERS - SMT

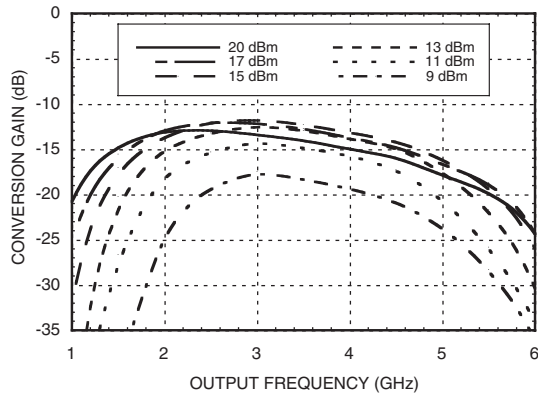
Conversion Gain @ 25°C vs. Drive Level



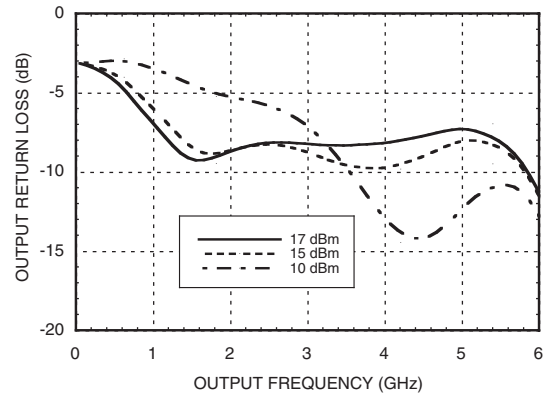
Output Return Loss with 1 GHz Input



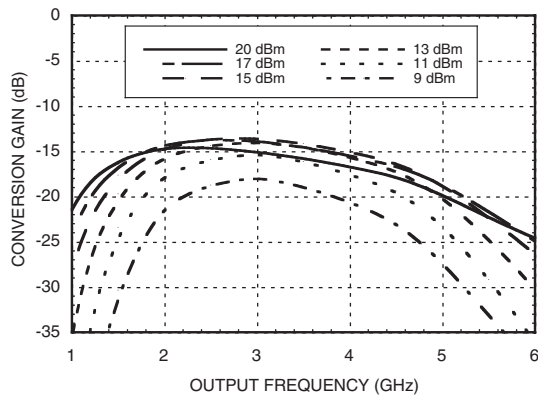
Conversion Gain @ -40°C vs. Drive Level



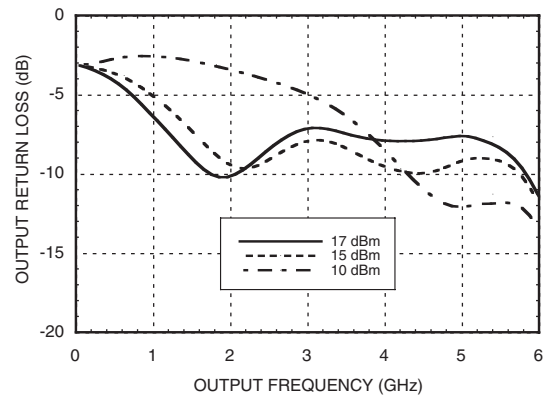
Output Return Loss with 1.75 GHz Input



Conversion Gain @ +85°C vs. Drive Level



Output Return Loss with 2.5 GHz Input



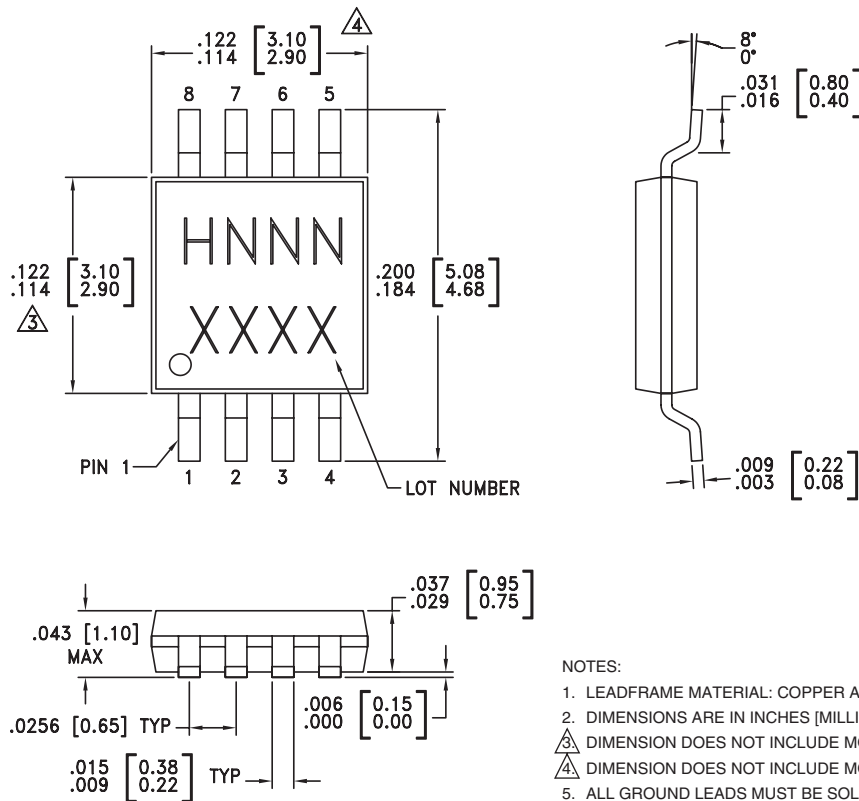
Absolute Maximum Ratings

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



ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Outline Drawing



Package Information

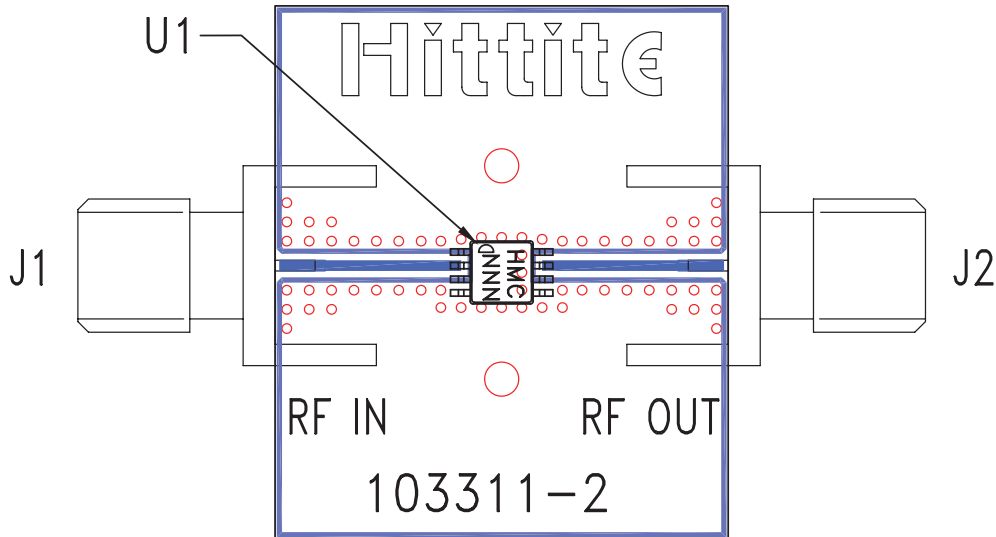
Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking ^[3]
HMC187MS8	Low Stress Injection Molded Plastic	Sn/Pb Solder	MSL1 ^[1]	H187 XXXX
HMC187MS8E	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 ^[2]	H187 XXXX

[1] Max peak reflow temperature of 235 °C

[2] Max peak reflow temperature of 260 °C

[3] 4-Digit lot number XXXX

Evaluation PCB



List of Materials for Evaluation PCB 103313 [1]

Item	Description
J1, J2	PCB Mount SMA Connector
U1	HMC187MS8 / HMC187MS8E Doubler
PCB [2]	103311 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.



MICROWAVE CORPORATION v04.0505



HMC187MS8 / 187MS8E

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

Notes:

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FREQUENCY MULTIPLIERS - SMT