

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

Functional Diagram



Features

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

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

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	Input = +10 dBm			Input = +15 dBm			Input = +20 dBm			
Parameter	Min.	Тур.	Max.	Min.	Тур.	Max.	Min.	Тур.	Max.	Units
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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Isolation @ +15 dBm Drive Level*



Input Return Loss vs. Drive Level



-10 4 FO -20 **ISOLATION (dB)** -30 -40 -50 -60 -70 0 2 10 12 4 6 8 FREQUENCY (GHz)

*With respect to input level

Output Return Loss for Several Input Frequencies



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For price, delivery, and to place orders, please contact Hittite Microwave Corporation: 12 Elizabeth Drive, Chelmsford, MA 01824 Phone: 978-250-3343 Fax: 978-250-3373 Order Online at www.hittite.com

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Conversion Gain @ +15 dBm Drive Level



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Conversion Gain @ -40°C vs. Drive Level



Conversion Gain @ +85°C vs. Drive Level



Output Return Loss with 1 GHz Input



Output Return Loss with 1.75 GHz Input



Output Return Loss with 2.5 GHz Input



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Conversion Gain @ 25°C vs. Drive Level

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8° 0'

.031 0 .016 0

Absolute Maximum Ratings

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

Outline Drawing







- 1. PACKAGE BODY MATERIAL: LOW STRESS INJECTION MOLDED PLASTIC SILICA AND SILICON IMPREGNATED.
- 2. LEADFRAME MATERIAL: COPPER ALLOY
- 3. LEADFRAME PLATING: Sn/Pb SOLDER
- 4. DIMENSIONS ARE IN INCHES [MILLIMETERS].
- 5. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.15 mm PER SIDE.
- (b) DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.15 mm PER SIDE.
- 7. ALL GROUND LEADS MUST BE SOLDERED TO PCB PF GROUND.

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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.

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Notes:

FREQ. MULTIPLIERS - SMT

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