

## GaAs MMIC FREQUENCY DOUBLER 12 - 18 GHz INPUT

FEBRUARY 2001

V00.1100

### Features

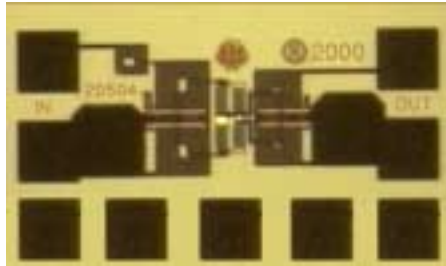
Conversion Loss: 14 to 18 dB

Fo, 3Fo, 4Fo Isolation: 41 to 60 dB

Passive: No Bias Required

### General Description

The HMC331 is a passive miniature frequency doubler MMIC. Suppression of undesired fundamental and higher order harmonics is 40 to 60 dB with respect to input signal level and 24 to 42 dB with respect to the output level. The doubler utilizes the same GaAs Schottky diode/balun technology found in Hittite MMIC mixers. It features small size, requires no DC bias, and adds no measurable additive phase noise onto the multiplied signal. Applications include commercial point to multi-point radios, and other microwave frequency generation subsystems as well as communication systems.



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MULTIPLIERS

DIE



### Guaranteed Performance, 50 Ohm system -55 to +85 deg C

Performance vs. Drive Level				
	11	13	15	dBm
Input Frequency Range	13 - 18	12 - 18	12 - 18	GHz
Output Frequency Range	26 - 36	24 - 36	24 - 36	GHz
Conversion Loss (Max)	<18	<18	<17	dB

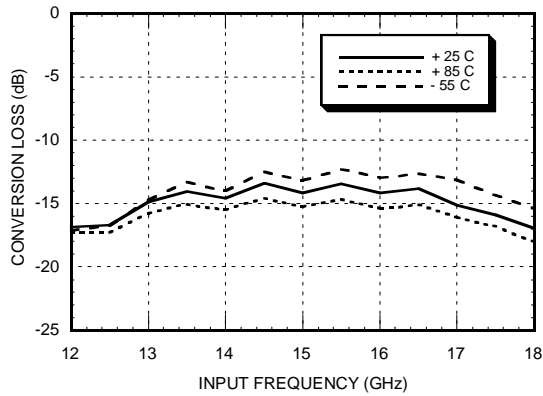
Performance for Input Signals in the 12 - 18 GHz Band (+15 dBm Drive)				
	Min.	Typ.	Max.	
Fo Isolation (with respect to input level)	41	50		dB
3Fo Isolation (with respect to input level)	47	60		dB
4Fo Isolation (with respect to input level)	50	60		dB

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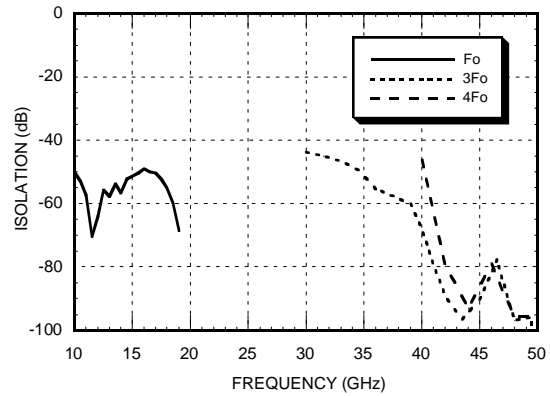
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**Conversion Loss vs. Temperature  
@ +15 dBm Drive Level**

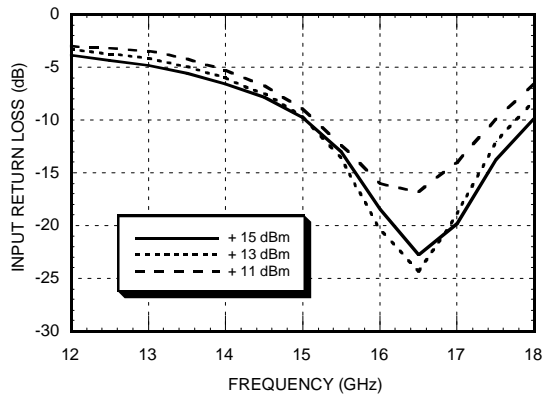


**Isolation @ +15 dBm Drive Level \***

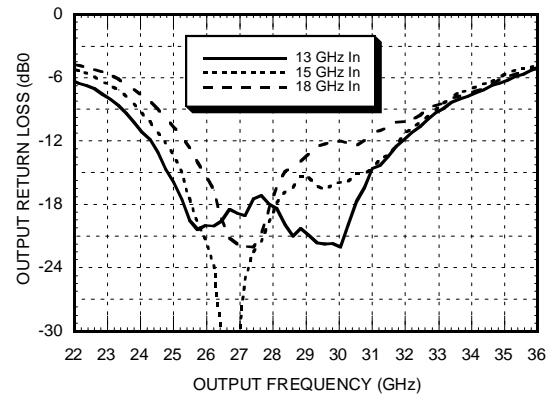


\* With respect to input level

**Input Return Loss vs. Drive level**



**Output Return Loss  
For Three Input Frequencies**

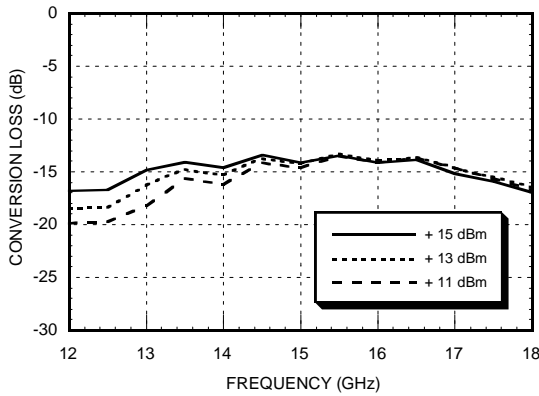


**GaAs MMIC FREQUENCY DOUBLER 12 - 18 GHz INPUT**

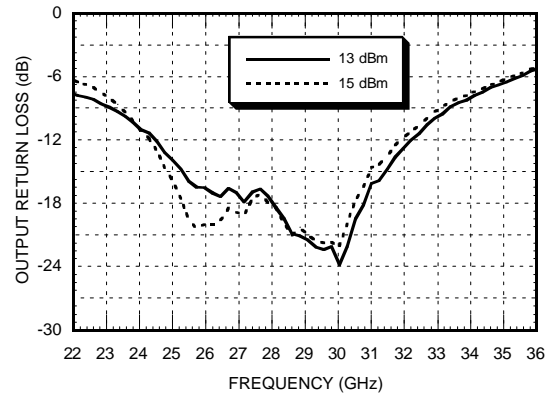
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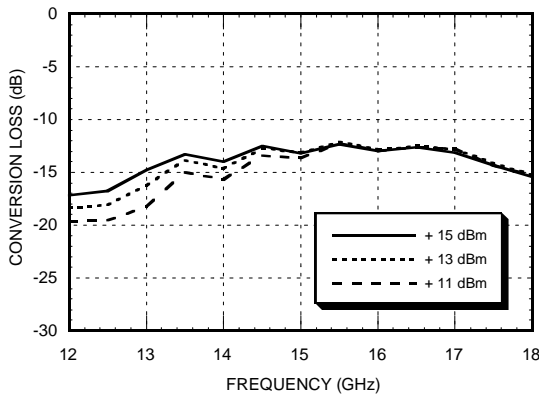
**Conversion Loss @  
25 Deg C vs. Drive Level**



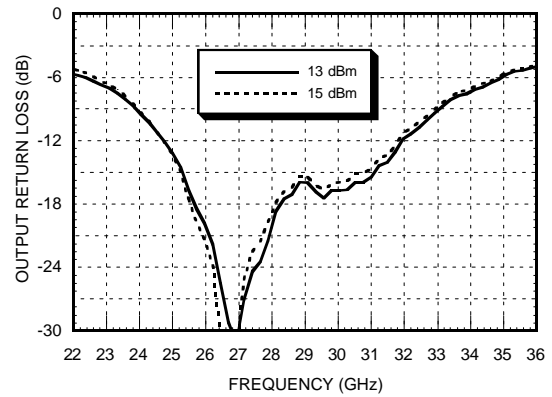
**Output Return Loss  
with 13GHz Input**



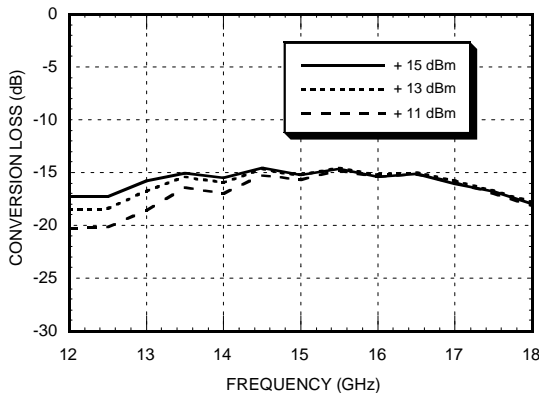
**Conversion Loss @  
-55 Deg C vs. Drive Level**



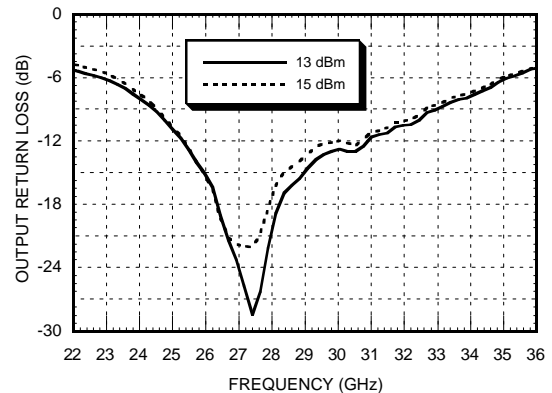
**Output Return Loss  
with 15 GHz Input**



**Conversion Loss @  
+85 Deg C vs. Drive Level**



**Output Return Loss  
with 18 GHz Input**



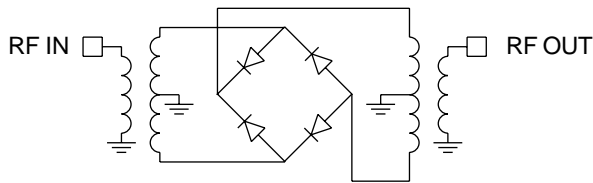
3 MULTIPLIERS  
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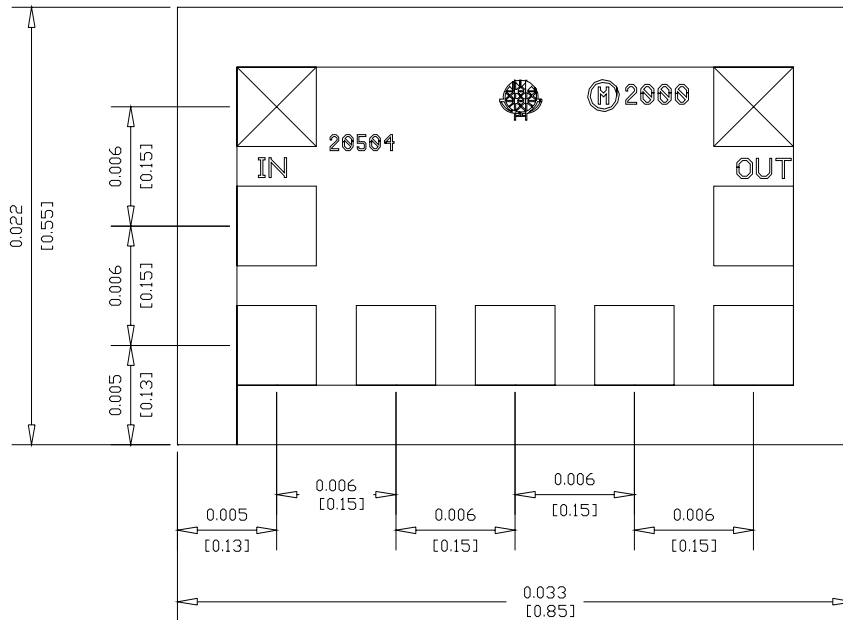
## Schematic



## Absolute Maximum Ratings

Input Drive	+27 dBm
Storage Temperature	-65 to +150 deg C
Operating Temperature	-55 to +125 deg C

## Outline Drawing ( See Pages 8 - 2 and 8 -3 for Handling Procedures )



DIE THICKNESS IS 0.100 (0.004), BACKSIDE IS GROUND  
 BOND PADS ARE 0.100 (0.004) SQUARE  
 BOND PADSPACING, CTR-CTR: 0.150 (0.006)  
 ALL DIMENSION IN INCHES (MILLIMETERS)  
 ALL TOLERANCES ARE ± 0.025 (± 0.001)  
 BOND PAD METALLIZATION: GOLD  
 BACKSIDE METALLIZATION: GOLD

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MULTIPLIERS  
DIE

