

GaAs MMIC x2 ACTIVE FREQUENCY MULTIPLIER, 18 - 29 GHz OUTPUT

Typical Applications

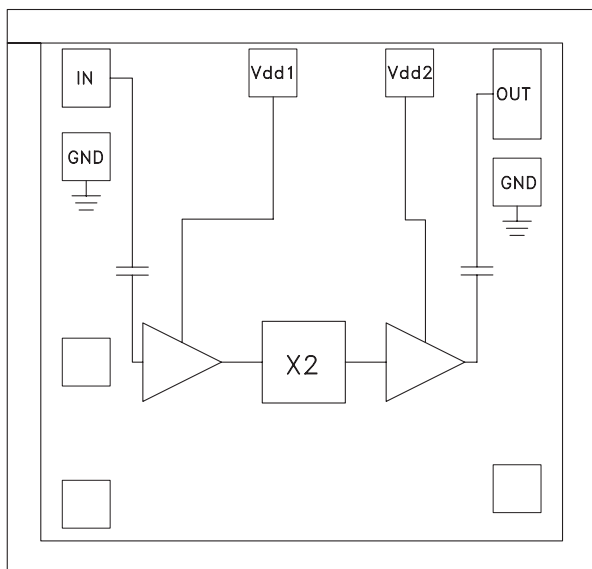
The HMC576 is suitable for:

- Clock Generation Applications:
SONET OC-192 & SDH STM-64
- Point-to-Point & VSAT Radios
- Test Instrumentation
- Military EW / Radar
- Space

Features

- High Output Power: +17 dBm
- Low Input Power Drive: -2 to +6 dBm
- Fo Isolation: >20 dBc @ Fout= 24 GHz
- 100 KHz SSB Phase Noise: -132 dBc/Hz
- Single Supply: +5V@ 82 mA
- Die Size: 1.18 x 1.23 x 0.1 mm

Functional Diagram



General Description

The HMC576 die is a x2 active broadband frequency multiplier utilizing GaAs PHEMT technology. When driven by a +3 dBm signal, the multiplier provides +17 dBm typical output power from 18 to 29 GHz. The Fo and 3Fo isolations are >20 dBc and >30 dBc respectively at 24 GHz. The HMC576 is ideal for use in LO multiplier chains for Pt to Pt & VSAT Radios yielding reduced parts count vs. traditional approaches. The low additive SSB Phase Noise of -132 dBc/Hz at 100 kHz offset helps maintain good system noise performance.

Electrical Specifications, $T_A = +25^\circ C$, Vdd1, Vdd2 = 5.0V, 3 dBm Drive Level

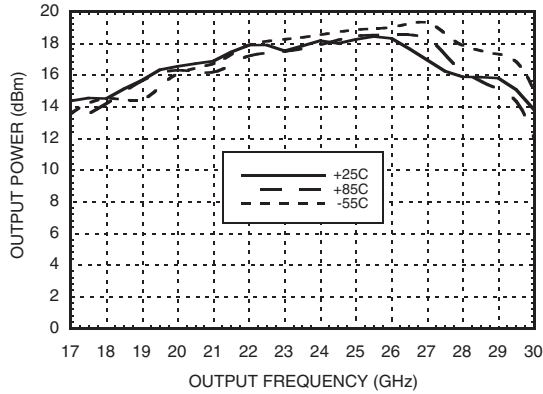
Parameter	Min.	Typ.	Max.	Units
Frequency Range, Input	9.0 - 14.5			GHz
Frequency Range, Output	18 - 29			GHz
Output Power	11	17		dBm
Fo Isolation (with respect to output level)		20		dBc
3Fo Isolation (with respect to output level)		17		dBc
Input Return Loss		10		dB
Output Return Loss		9		dB
SSB Phase Noise (100 kHz Offset)		-132		dBc/Hz
Supply Current (Idd1 & Idd2)		82		mA

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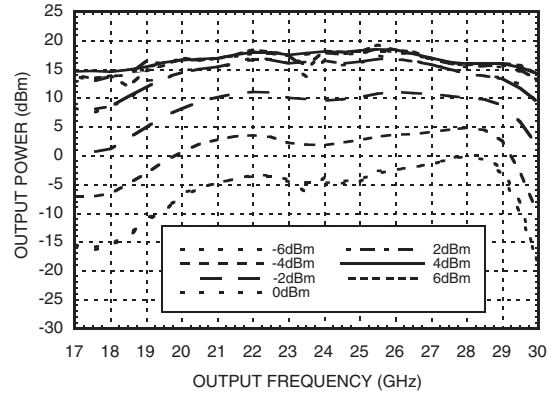
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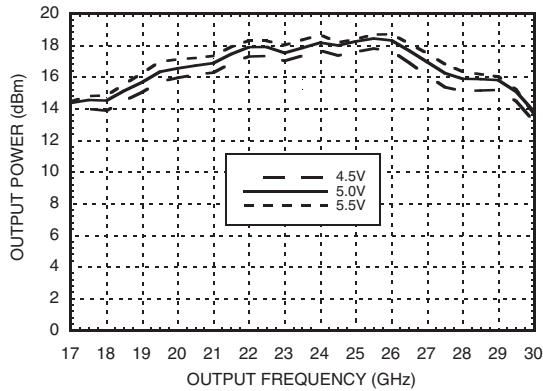
Output Power vs. Temperature @ 3 dBm Drive Level



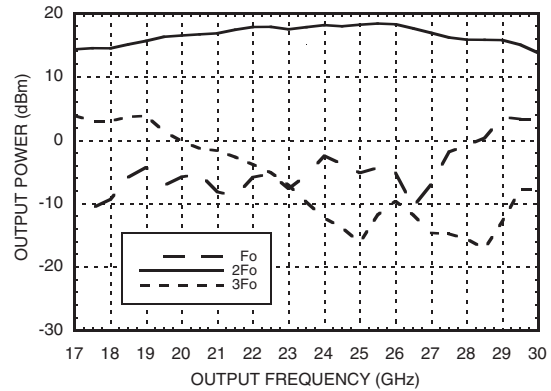
Output Power vs. Drive Level



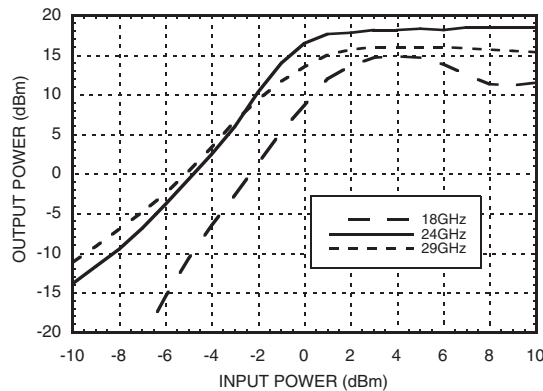
Output Power vs. Supply Voltage @ 3 dBm Drive Level



Isolation @ 3 dBm Drive Level



Output Power vs. Input Power

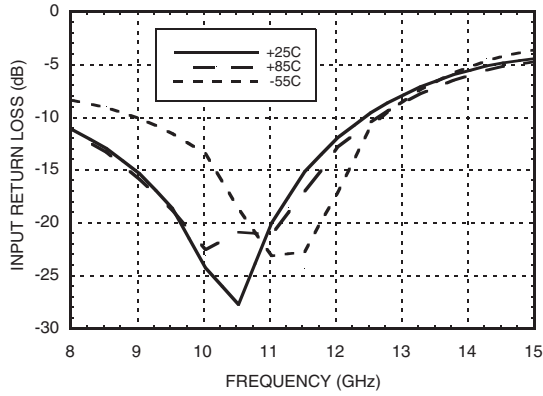


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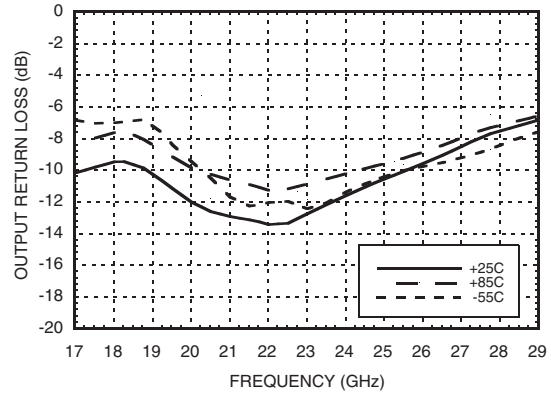
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Input Return Loss vs. Temperature



Output Return Loss vs. Temperature



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Absolute Maximum Ratings

RF Input (Vdd = +5V)	+20 dBm
Supply Voltage (Vdd1, Vdd2)	+6.0 Vdc
Channel Temperature	175 °C
Continuous P _{diss} (T= 85 °C) (derate 7.9 mW/°C above 85 °C)	709 mW
Thermal Resistance (channel to die bottom)	126 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C

Typical Supply Current vs. Vdd

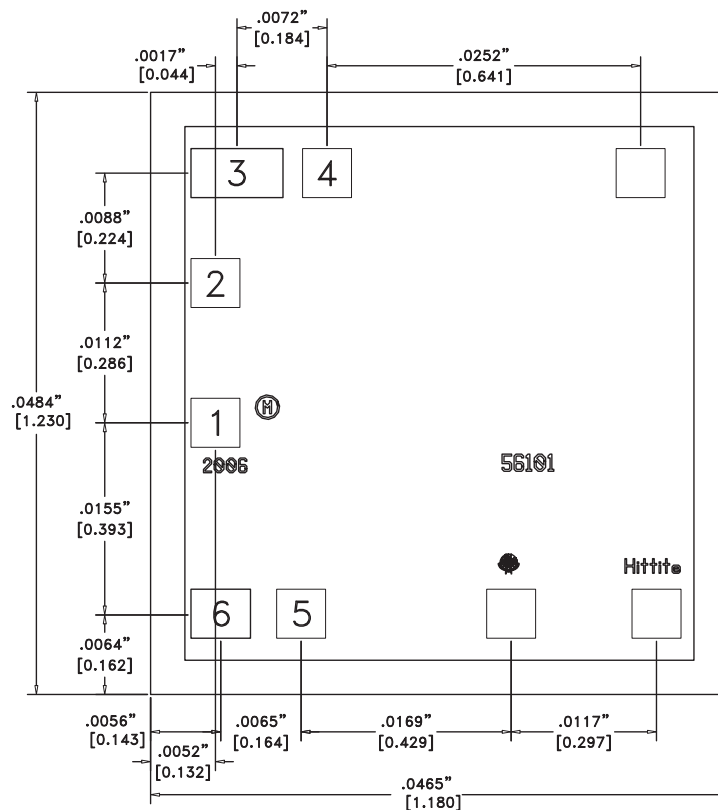
Vdd (V)	I _{dd} (mA)
4.5	82
5.0	82
5.5	83

Note:
Multiplier will operate over full voltage range shown above.



ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Outline Drawing



Die Packaging Information [1]

Standard	Alternate [2]
GP-2 (Gel Pack)	—

[1] Refer to the "Packaging Information" section for die packaging dimensions.
[2] Reference this suffix only when ordering alternate die packaging.

NOTES:

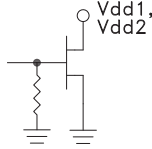
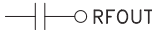

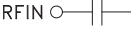
- ALL DIMENSIONS ARE IN INCHES [MILLIMETERS].
- DIE THICKNESS IS .004"
- TYPICAL BOND PAD IS .004" SQUARE.
- TYPICAL BOND SPACING IS .006" CENTER TO CENTER.
- BOND PAD METALIZATION: GOLD
- BACKSIDE METALIZATION: GOLD
- BACKSIDE METAL IS GROUND.
- NO CONNECTION REQUIRED FOR UNLABELED BOND PADS.

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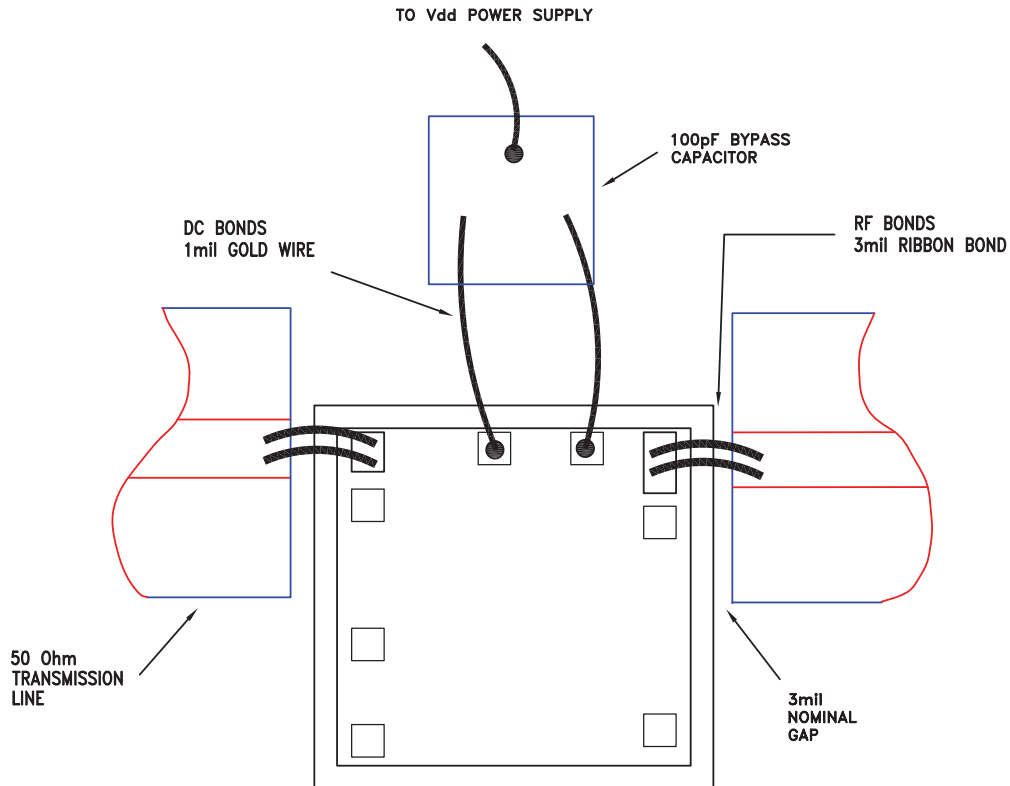
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Pad Description

Pad Number	Function	Description	Interface Schematic
1, 2	Vdd1, Vdd2	Supply voltage 5V ± 0.5V.	
3	RFOUT	Pin is AC coupled and matched to 50 Ohms from 18 - 29 GHz.	
4, 5	GND	Die bottom must be connected to RF ground.	
6	RFIN	Pin is AC coupled and matched to 50 Ohms from 9 - 14.5 GHz.	

Assembly Diagram



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