

SMT GaAs MMIC x2 ACTIVE FREQUENCY MULTIPLIER, 25 - 31 GHz OUTPUT



Typical Applications

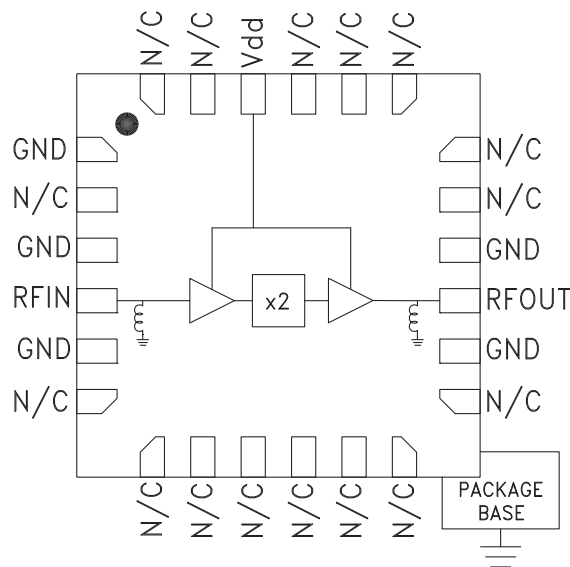
The HMC942LP4E is ideal for:

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

Features

- High Output Power: +21 dBm
- Low Input Power Drive: 0 to +6 dBm
- Fo Isolation: >45 dBc
- Single Supply: +4.5V @ 214 mA
- 24 Lead 4x4 mm SMT Package: 16 mm²

Functional Diagram



General Description

The HMC942LP4E is a x2 active broadband frequency multiplier utilizing GaAs pHEMT technology in a leadless RoHS compliant SMT package. When driven by a +4 dBm signal, the multiplier provides +17 dBm typical output power from 13 to 24.6 GHz. The Fo and 3Fo isolations are >20 dBc at 19 GHz. The HMC942LP4E is ideal for use in LO multiplier chains for Pt-to-Pt & VSAT Radios yielding reduced parts count vs. traditional approaches.

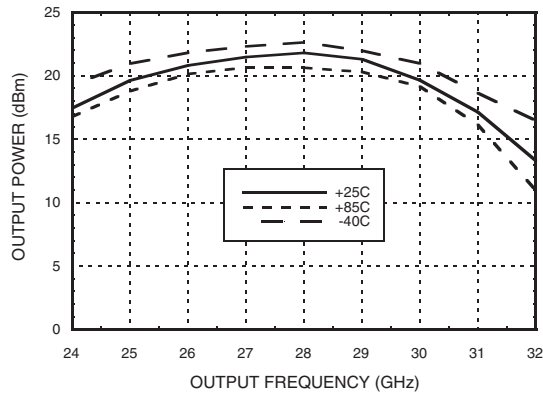
Electrical Specifications, $T_A = +25^\circ\text{C}$, $V_{DD} = +4.5\text{V}$, +4 dBm Drive Level

Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range, Input		12.5 - 15.0		15.0 - 15.5			GHz
Frequency Range, Output		25 - 30		30 - 31			GHz
Output Power	17	21		14	18		dBm
Fo Isolation (with respect to output level)		55		55			dBc
Input Return Loss	4	12		4	9		dB
Output Return Loss	6	12		5	10		dB
Supply Current (I _{dd1} & I _{dd2})		214	240		214	240	mA

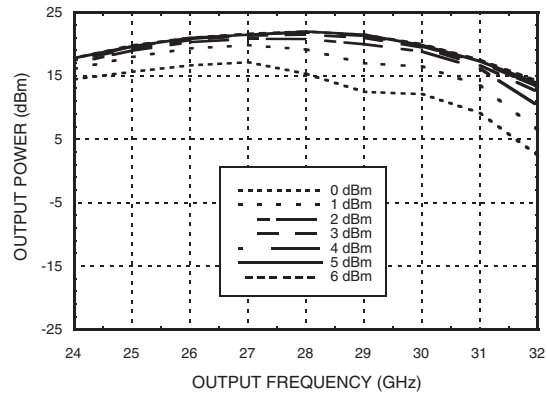


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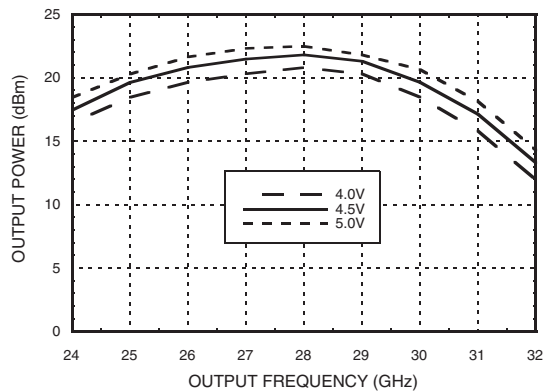
Output Power vs. Temperature @ +4 dBm Drive Level



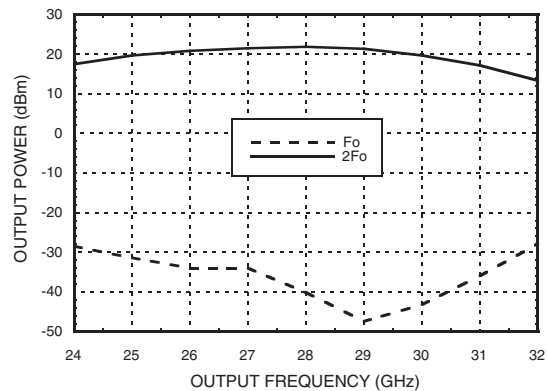
Output Power vs. Drive Level



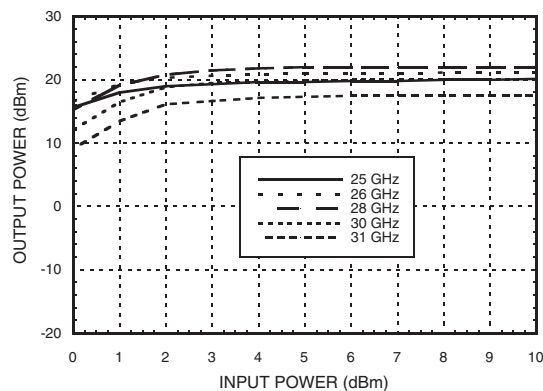
Output Power vs. Supply Voltage @ +4 dBm Drive Level



Isolation @ +4 dBm Drive Level



Output Power vs. Input Power



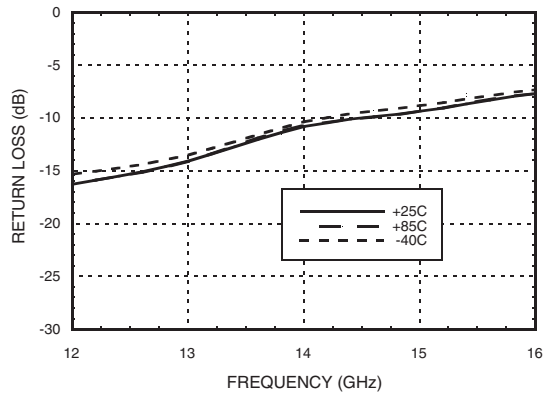
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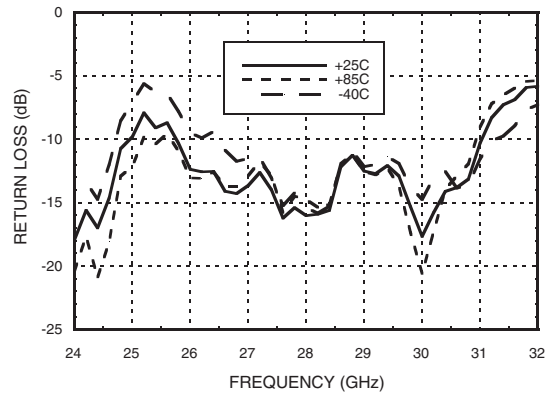


**SMT GaAs MMIC x2 ACTIVE FREQUENCY
MULTIPLIER, 25 - 31 GHz OUTPUT**

Input Return Loss vs. Temperature



Output Return Loss vs. Temperature





SMT GaAs MMIC x2 ACTIVE FREQUENCY MULTIPLIER, 25 - 31 GHz OUTPUT

Absolute Maximum Ratings

RF Input (Vdd = +5V)	+10 dBm
Supply Voltage (Vdd1, Vdd2)	+5.5 Vdc
Channel Temperature	175 °C
Continuous Pdiss (T= 85 °C) (derate 16.4 mW/°C above 85 °C)	1.48 W
Thermal Resistance (channel to ground paddle)	60 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
ESD Sensitivity (HBM)	Class 1B

Typical Supply Current vs. Vdd

Vdd (Vdc)	Idd (mA)
4.0	211
4.5	214
5.0	217

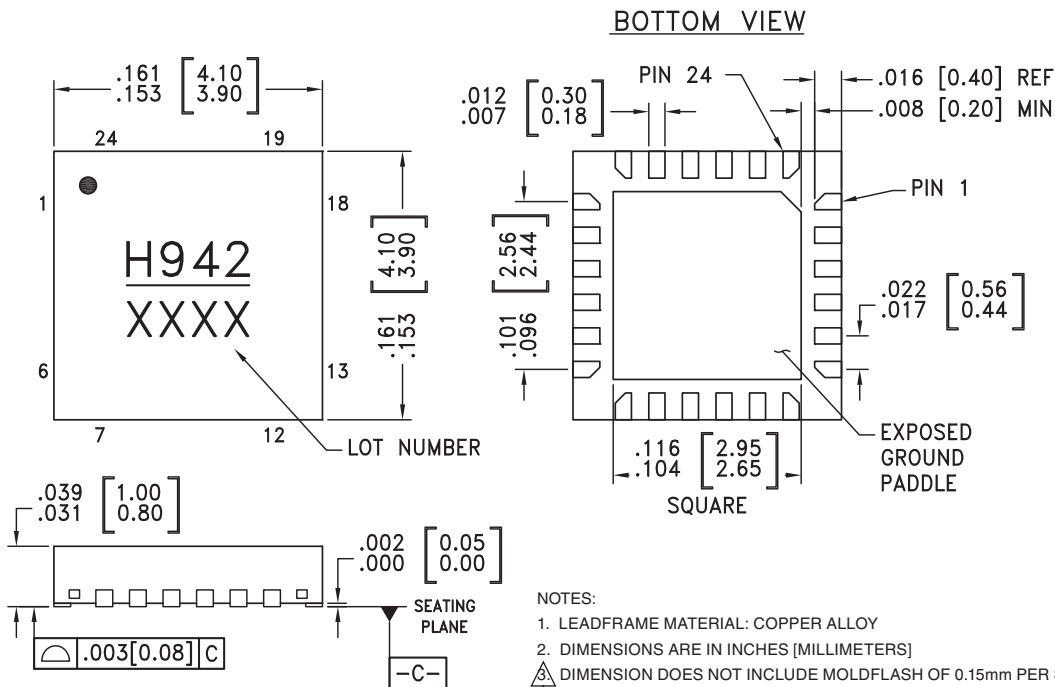
Note:
Multiplier will operate over full voltage range shown above.



ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

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Outline Drawing



Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking ^[1]
HMC942LP4E	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 ^[2]	H942 XXXX

[1] 4-Digit lot number XXXX

[2] Max peak reflow temperature of 260 °C



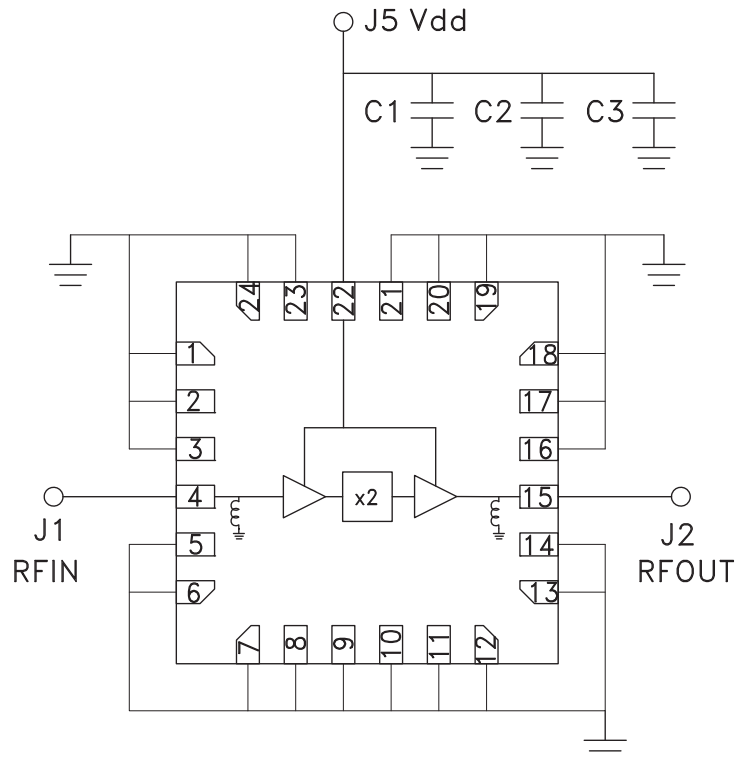
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Pin Description

Pin Number	Function	Description	Interface Schematic
1, 3, 5, 6, 7, 12, 13, 14, 16, 18, 19, 24	GND	Package bottom must also be connected to RF/DC ground.	
4	RFIN	This pin is DC coupled and matched to 50 Ohms.	
2, 8, 9, 10, 11, 17, 20, 21, 23	N/C	These pins are not connected internally; however, all data shown herein was measured with these pins connected to RF/ DC ground.	
15	RFOUT	This pin is AC coupled and matched to 50 Ohms.	
22	Vdd	Supply voltage 4.5V ± 0.5V. External bypass capacitors of 100 pF, 1,000 pF and 2.2 μF are recommended.	

Application Circuit

Component	Value
C1	100 pF
C2	1,000 pF
C3	4.7 μF



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