

HMC416* PRODUCT PAGE QUICK LINKS

Last Content Update: 02/23/2017

COMPARABLE PARTS

View a parametric search of comparable parts.

EVALUATION KITS

- HMC416LP4 Evaluation Board

DOCUMENTATION

Application Notes

- Determining the FM Bandwidth of a Wideband Varactor Tuned VCO

Data Sheet

- HMC416 Data Sheet

REFERENCE MATERIALS

Quality Documentation

- Package/Assembly Qualification Test Report: LP4, LP4B, LP4C, LP4K (QTR: 2013-00487 REV: 04)
- Package/Assembly Qualification Test Report: Plastic Encapsulated QFN (QTR: 05006 REV: 02)
- Semiconductor Qualification Test Report: GaAs HBT-A (QTR: 2013-00228)

DESIGN RESOURCES

- HMC416 Material Declaration
- PCN-PDN Information
- Quality And Reliability
- Symbols and Footprints

DISCUSSIONS

View all HMC416 EngineerZone Discussions.

SAMPLE AND BUY

Visit the product page to see pricing options.

TECHNICAL SUPPORT

Submit a technical question or find your regional support number.

DOCUMENT FEEDBACK

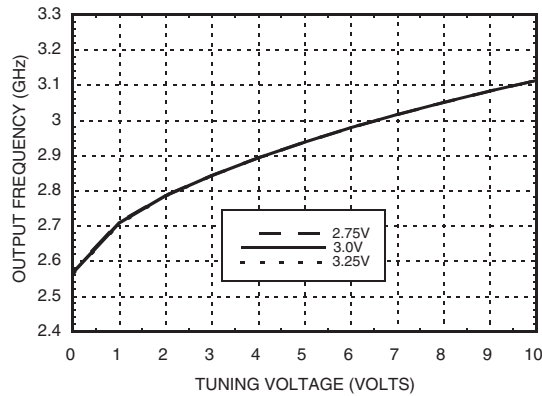
Submit feedback for this data sheet.



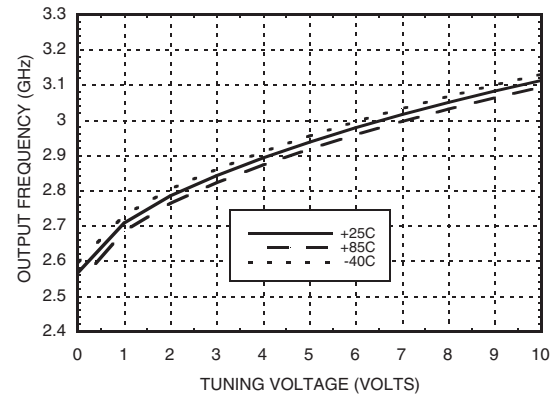
HMC416LP4 / 416LP4E

MMIC VCO w/ BUFFER AMPLIFIER, 2.75 - 3.0 GHz

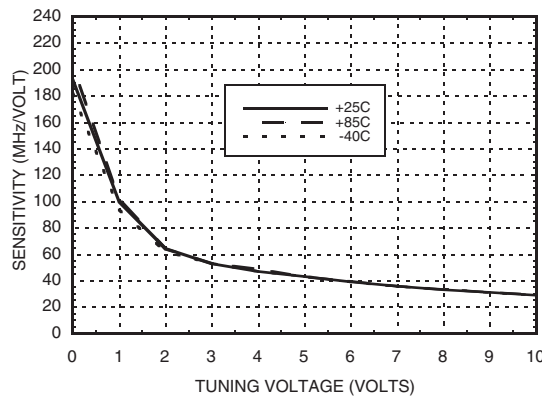
Frequency vs. Tuning Voltage, $T = 25^{\circ}\text{C}$



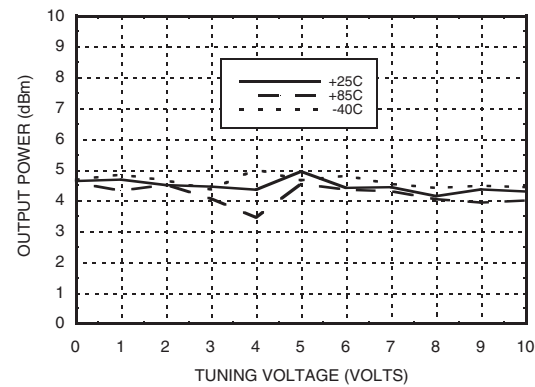
Frequency vs. Tuning Voltage, $V_{CC} = +3\text{V}$



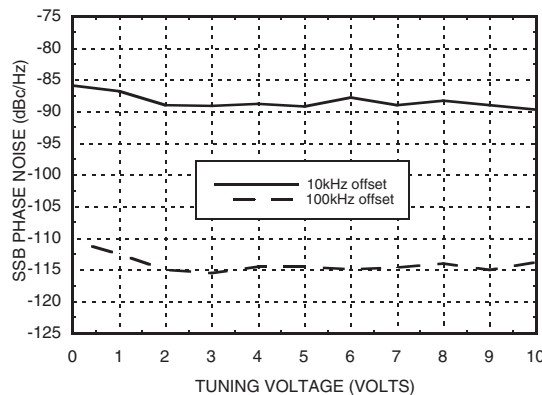
Sensitivity vs. Tuning Voltage, $V_{CC} = +3\text{V}$



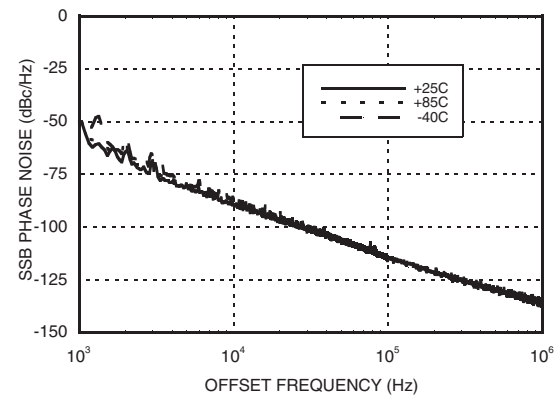
**Output Power vs.
Tuning Voltage, $V_{CC} = +3\text{V}$**



Phase Noise vs. Tuning Voltage



Typical SSB Phase Noise @ $V_{tune} = +5\text{V}$



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MMIC VCO w/ BUFFER AMPLIFIER, 2.75 - 3.0 GHz

Absolute Maximum Ratings

Vcc	+3.5 Vdc
Vtune	0 to +11V
Channel Temperature	135 °C
Continuous P _{diss} (T = 85°C) (derate 3.6 mW/°C above 85°C)	180 mW
Thermal Resistance (R _{TH}) (junction to package base)	277 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C

Typical Supply Current vs. Vcc

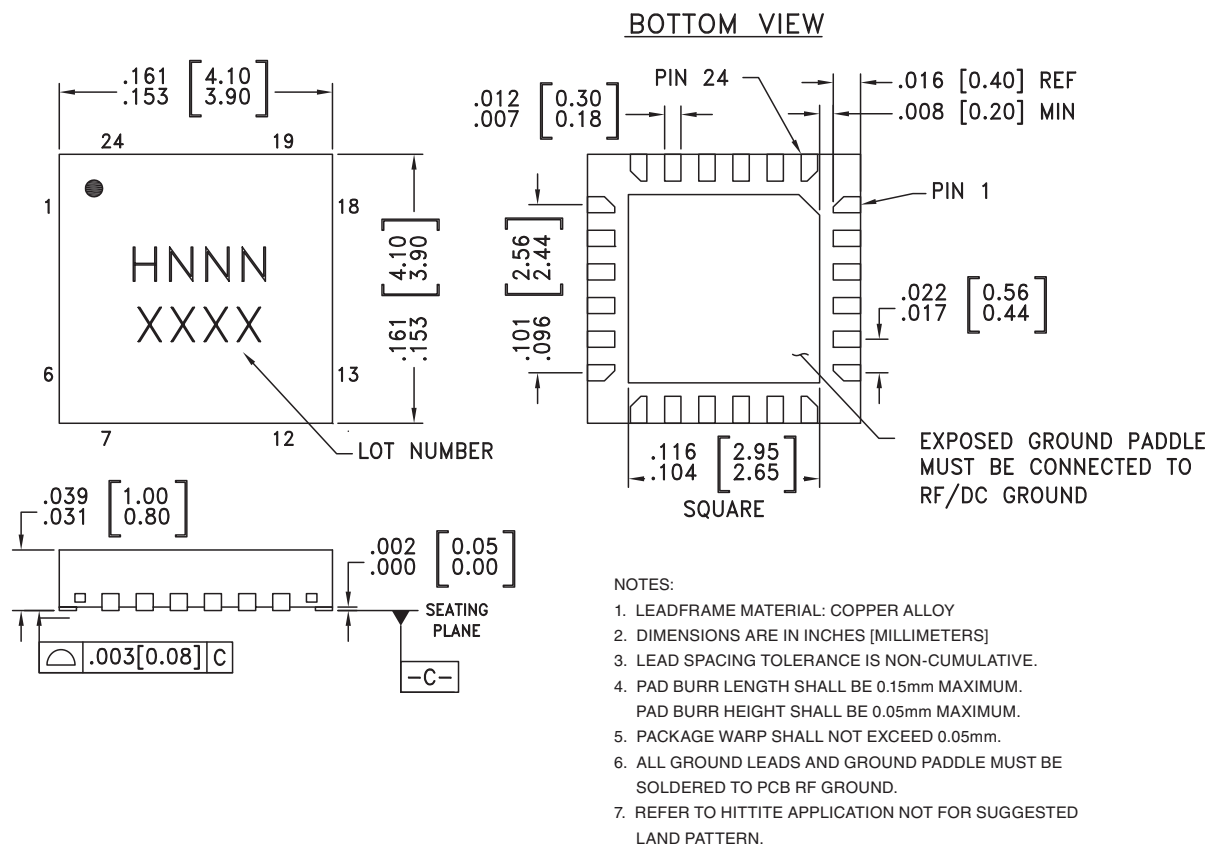
Vcc (V)	Icc (mA)
2.75	32
3.0	37
3.25	42

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



ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Outline Drawing



Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking ^[3]
HMC416LP4	Low Stress Injection Molded Plastic	Sn/Pb Solder	MSL1 ^[1]	H416 XXXX
HMC416LP4E	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 ^[2]	H416 XXXX

[1] Max peak reflow temperature of 235 °C


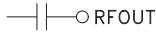
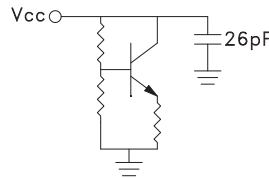
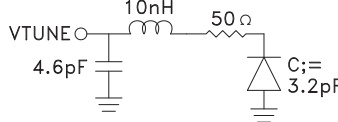

[2] Max peak reflow temperature of 260 °C

[3] 4-Digit lot number XXXX

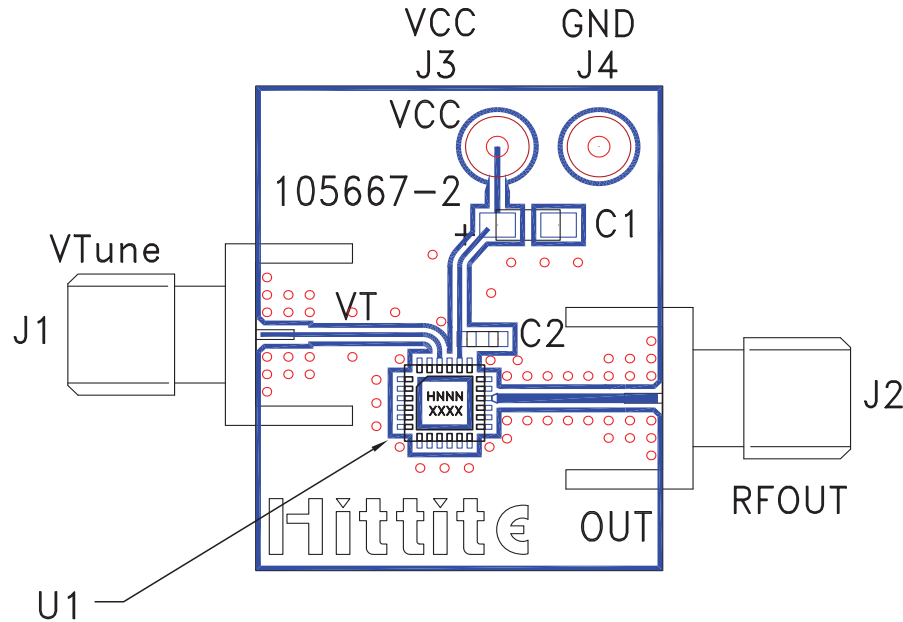
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Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1- 14, 17 - 19, 21, 23, 24	N/C	No Connection. These pins may be connected to RF ground. Performance will not be affected.	
15	GND	This pin must be connected to RF & DC ground.	
16	RFOUT	RF output (AC coupled)	
20	Vcc	Supply Voltage Vcc= 3V	
22	VTUNE	Control Voltage Input. Modulation port bandwidth dependent on drive source impedance.	
	GND	Package bottom has an exposed metal paddle that must be RF & DC grounded.	

Evaluation PCB



List of Materials for Evaluation PCB 105706 ^[1]

Item	Description
J1 - J2	PCB Mount SMA RF Connector
J3 - J4	DC Pin
C1	4.7 μ F Tantalum Capacitor
C2	10,000 pF Capacitor, 0603 Pkg.
U1	HMC416LP4 / HMC416LP4E VCO
PCB [2]	105667 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 use 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. A sufficient number of via holes should be used to connect the top and bottom ground planes. The evaluation circuit board shown is available from Hittite upon request.



Notes:

v02.0805

HMC416LP4 / 416LP4E

**MMIC VCO w/ BUFFER
AMPLIFIER, 2.75 - 3.0 GHz**

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VCOs & PLOs - SMT

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