



MMIC VCO w/ BUFFER AMPLIFIER, 5.5 - 6.1 GHz

Typical Applications

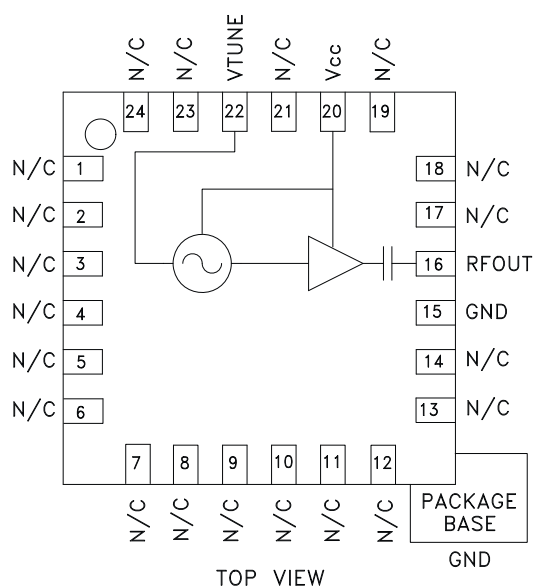
Low noise MMIC VCO w/Buffer Amplifier
for C-Band applications such as:

- 802.11a & HiperLAN WLAN
- VSAT Radios
- UNII & Point-to-Point Radios

Features

Pout: +2 dBm
Phase Noise: -102 dBc/Hz @100 kHz
No External Resonator Needed
Single Supply: 3V @ 27 mA
16mm² Leadless SMT Package

Functional Diagram



General Description

The HMC431LP4 & HMC431LP4E are GaAs InGaP Heterojunction Bipolar Transistor (HBT) MMIC VCOs with integrated resonators, negative resistance devices, varactor diodes, and buffer amplifiers. The VCO's phase noise performance is excellent over temperature, shock, vibration and process due to the oscillator's monolithic structure. Power output is 2 dBm typical from a 3V supply voltage. The voltage controlled oscillator is packaged in a low cost leadless QFN 4 x 4 mm surface mount package.

Electrical Specifications, $T_A = +25^\circ \text{C}$, $V_{CC} = +3V$

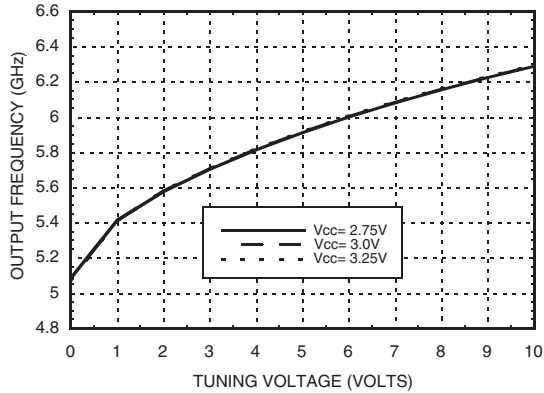
Parameter	Min.	Typ.	Max.	Units
Frequency Range				



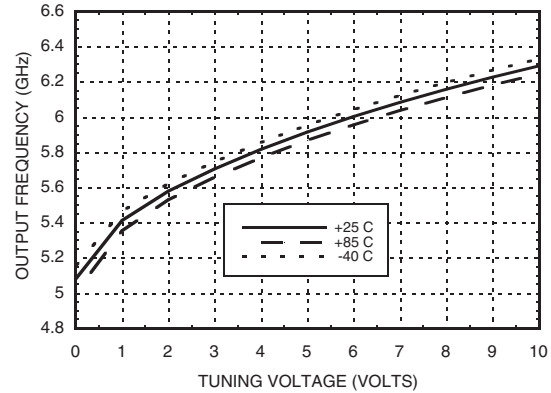
HMC431LP4 / 431LP4E

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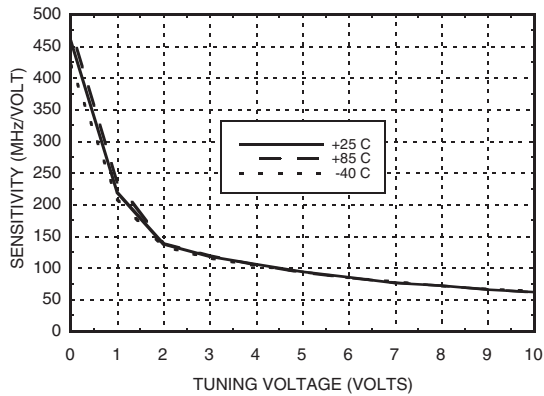
Frequency vs. Tuning Voltage, $T = 25^{\circ}\text{C}$



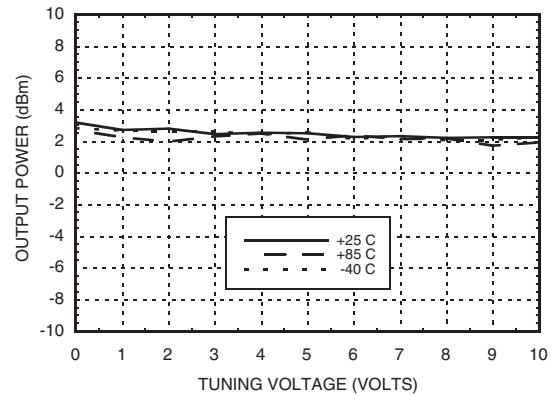
Frequency vs. Tuning Voltage, $V_{cc} = +3\text{V}$



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



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



Phase Noise



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Absolute Maximum Ratings

Vcc	+3.5 Vdc
Vtune	0 to +11V
Channel Temperature	135 °C
Continuous P _{diss} (T = 85°C) (derate 6.28 mW/°C above 85°C)	565 W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
ESD Sensitivity (HBM)	Class 1A

Typical Supply Current vs. Vcc

Vcc (V)	Icc (mA)
2.75	19
3.0	27
3.25	34

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

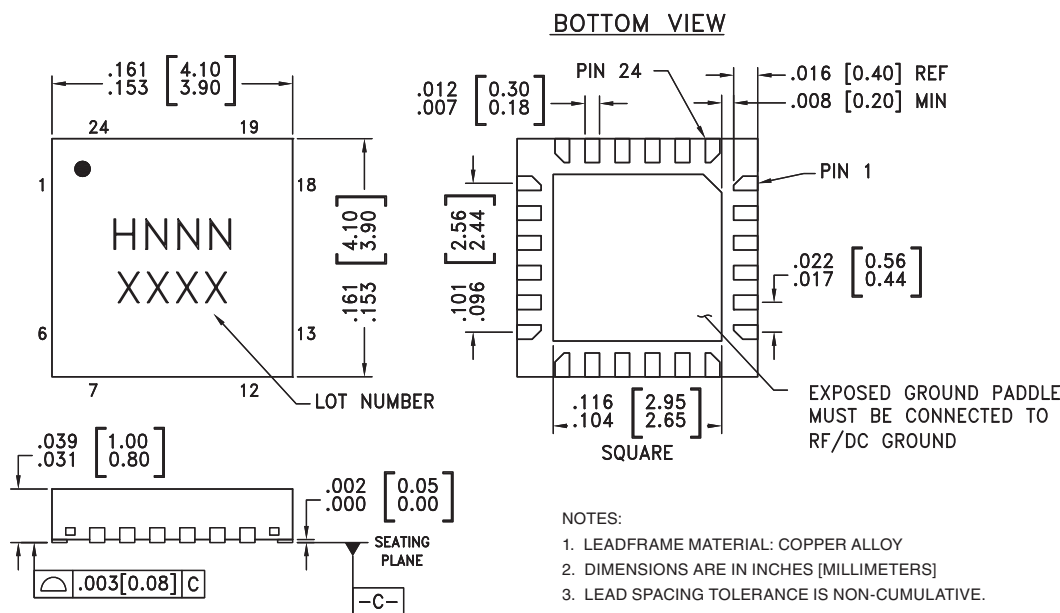


ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

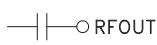
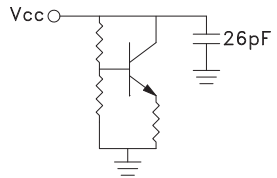
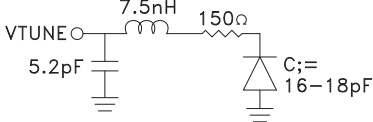
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VCOs & PLOs - SMT

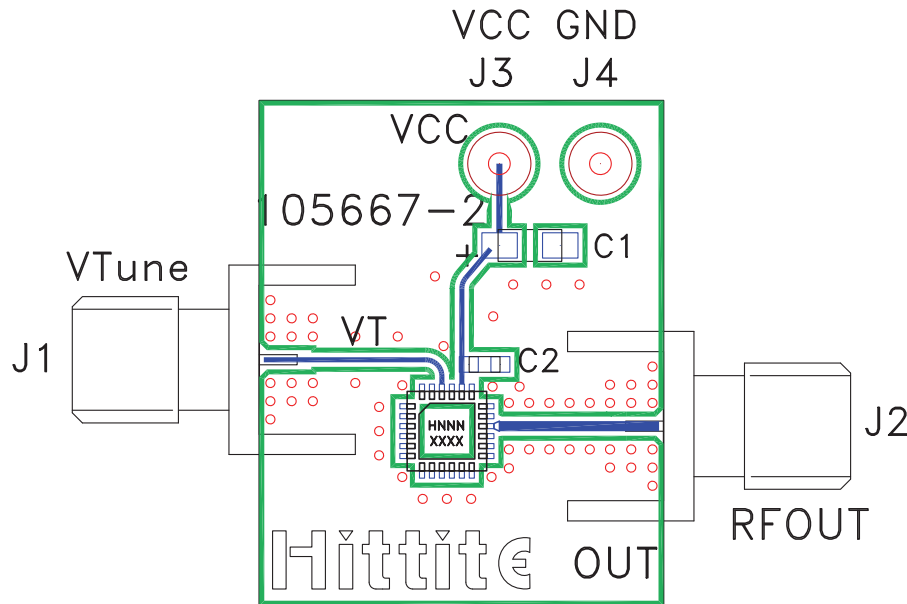
Outline Drawing



Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1 - 14, 17 - 19, 21, 23, 24	N/C	No Connection	
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	HMC431LP4 / HMC431LP4E 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



Notes:

v04.1106

HMC431LP4 / 431LP4E

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VCOs & PLOs - SMT

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