

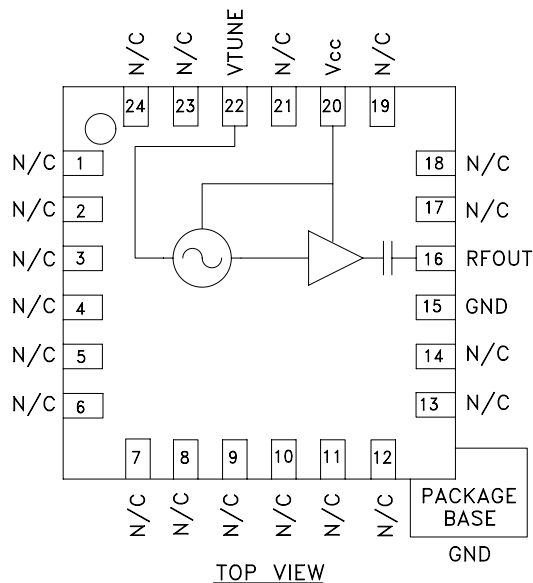
MMIC VCO w/ BUFFER AMPLIFIER, 5.5 - 6.1 GHz

Typical Applications

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

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

Functional Diagram



Features

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

General Description

The HMC431LP4 is a GaAs InGaP Heterojunction Bipolar Transistor (HBT) MMIC VCO with integrated resonator, negative resistance device, varactor diode, and buffer amplifier. 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 3.0V supply voltage. The voltage controlled oscillator is packaged in a low cost leadless QFN 4 x 4 mm surface mount package.

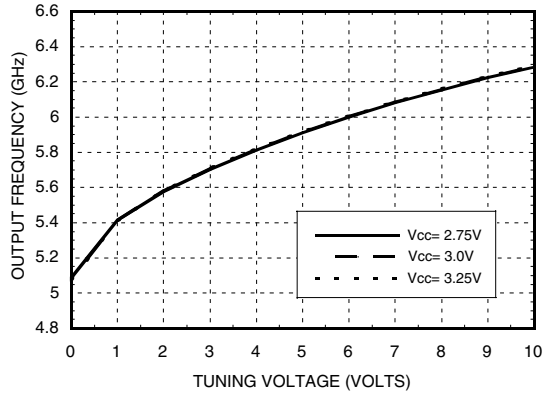
Electrical Specifications, $T_A = +25^\circ C$, $V_{cc} = +3V$

Parameter	Min.	Typ.	Max.	Units
Frequency Range	5.5 - 6.1			GHz
Power Output	-1	2		dBm
SSB Phase Noise @ 100 kHz Offset, Vtune= +5V @ RF Output		-102		dBc/Hz
Tune Voltage (Vtune)	0		10	V
Supply Current (Icc) (Vcc= 3.0V)		27		mA
Tune Port Leakage Current			10	μ A
Output Return Loss		6		dB
Harmonics 2nd 3rd		-15 -30		dBc dBc
Pulling (into a 2.0:1 VSWR)		9		MHz pp
Pushing @ Vtune= +5V		12		MHz/V
Frequency Drift Rate		0.8		MHz/°C

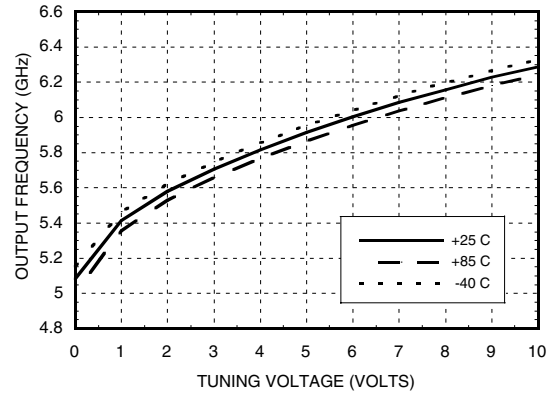
For price, delivery, and to place orders, please contact Hittite Microwave Corporation:
12 Elizabeth Drive, Chelmsford, MA 01824 Phone: 978-250-3343 Fax: 978-250-3373
Order Online at www.hittite.com

MMIC VCO w/ BUFFER AMPLIFIER, 5.5 - 6.1 GHz

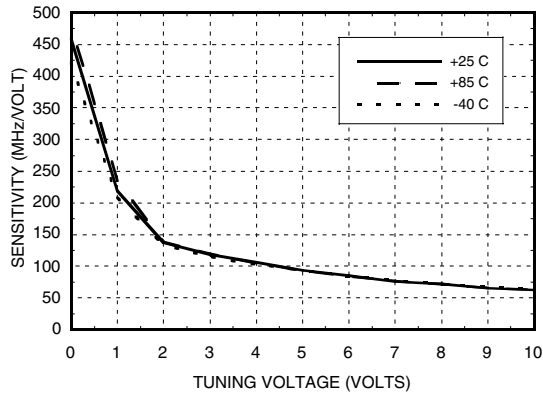
Frequency vs. Tuning Voltage, T= 25°C



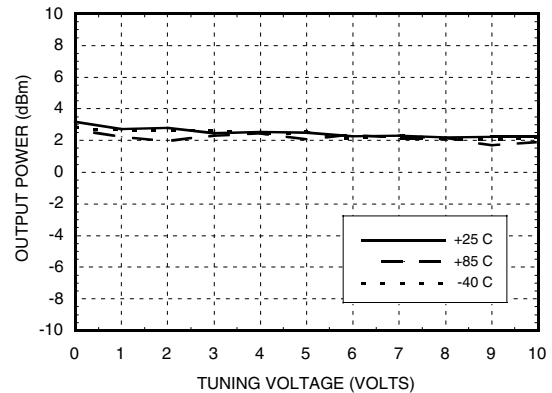
Frequency vs. Tuning Voltage, Vcc= +3V



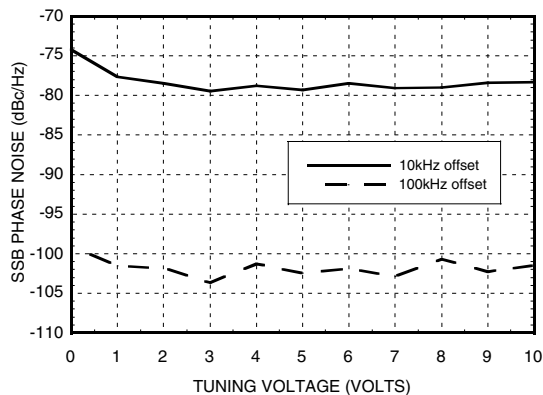
Sensitivity vs. Tuning Voltage, Vcc= +3V



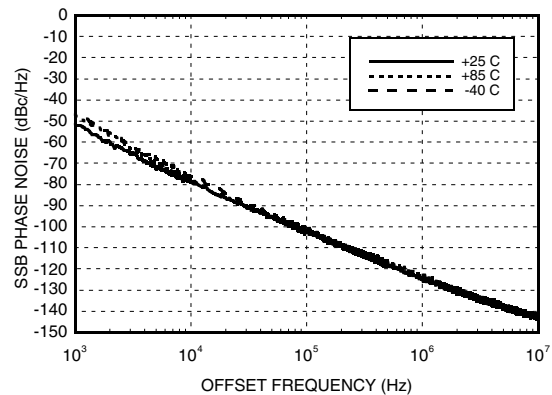
Output Power vs. Tuning Voltage, Vcc= +3V



Phase Noise vs. Tuning Voltage


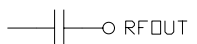
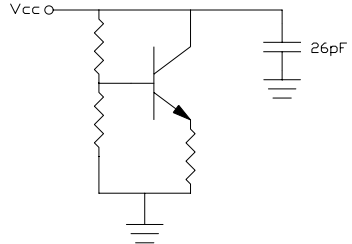
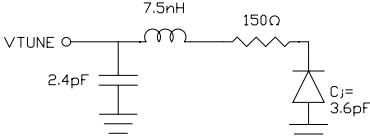



Typical SSB Phase Noise @ Vtune= +5V

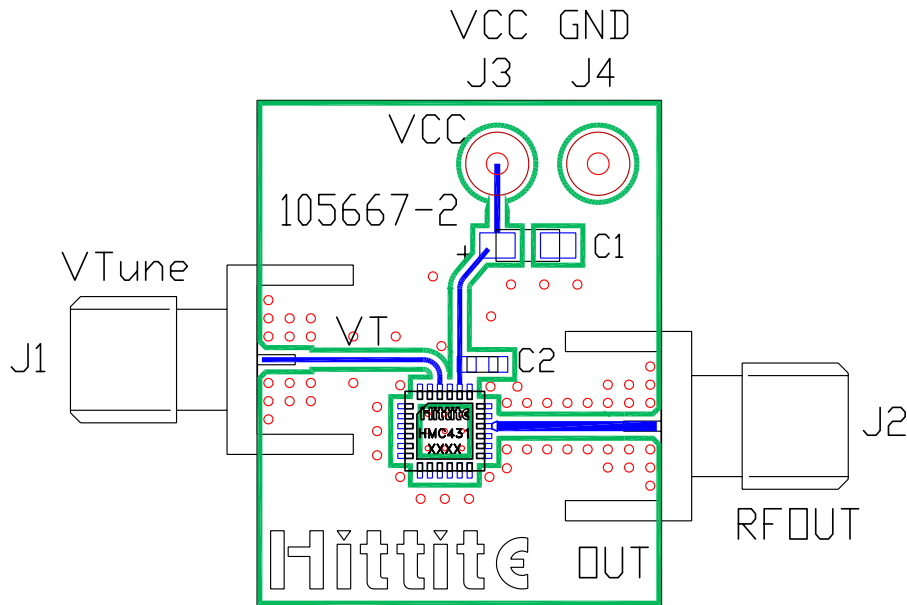


MMIC VCO w/ BUFFER AMPLIFIER, 5.5 - 6.1 GHz

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

Item	Description
J1 - J2	PC Mount SMA RF Connector
J3 - J4	DC Pin
C1	4.7 µF Tantalum Capacitor
C2	10,000 pF Capacitor, 0603 Pkg.
U1	HMC431LP4 VCO
PCB*	105667 Eval Board

* 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.

MMIC VCO w/ BUFFER AMPLIFIER, 5.5 - 6.1 GHz

Notes: