HMC466LP4 / 466LP4E

v03.1109

MMIC VCO w/ BUFFER AMPLIFIER, 6.1 - 6.72 GHz

Typical Applications

Low noise MMIC VCO w/Buffer Amplifier for:

- VSAT & Microwave Radio
- CATV & Broadcast Relays
- Test Equipment & Industrial Controls
- Military

Features

Pout: +4.5 dBm

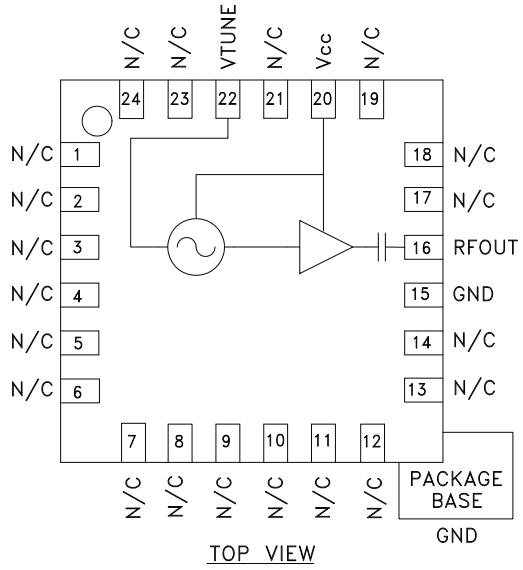
Phase Noise: -101 dBc/Hz @100 KHz

No External Resonator Needed

Single Supply: +3V @ 31 mA

24 Lead 4x4mm QFN Package: 16 mm²

Functional Diagram



General Description

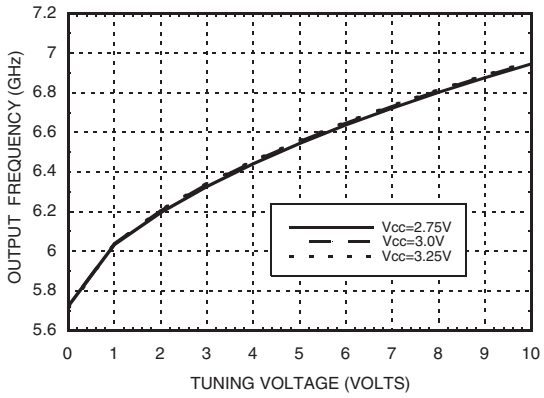
The HMC466LP4 & HMC466LP4E are GaAs InGaP Heterojunction Bipolar Transistor (HBT) MMIC VCOs with integrated resonators, negative resistance devices, varactor diodes, and buffer amplifiers. Covering 6.1 to 6.72 GHz, the VCO's phase noise performance is excellent over temperature, shock, vibration and process due to the oscillator's monolithic structure. Power output is 4.5 dBm typical from a single supply of 3V @31mA. The voltage controlled oscillator is packaged in a low cost leadless QFN 4 x 4 mm surface mount package.

Electrical Specifications, T_A = +25° C, Vcc = +3V

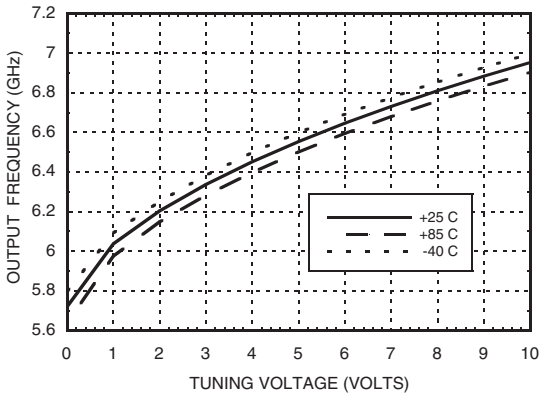
Parameter	Min.	Typ.	Max.	Units
Frequency Range		6.1 - 6.72		GHz
Power Output	1.5	4.5		dBm
SSB Phase Noise @ 100 kHz Offset, Vtune= +5V @ RF Output		-101		dBc/Hz
Tune Voltage (Vtune)	0		10	V
Supply Current (Icc) (Vcc = +3V)		31		mA
Tune Port Leakage Current			10	µA
Output Return Loss		7		dB
Harmonics 2nd 3rd		 -13 -24		 dBc dBc
Pulling (into a 2.0:1 VSWR)		11		MHz pp
Pushing @ Vtune= +5V		30		MHz/V
Frequency Drift Rate		0.8		MHz/°C

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

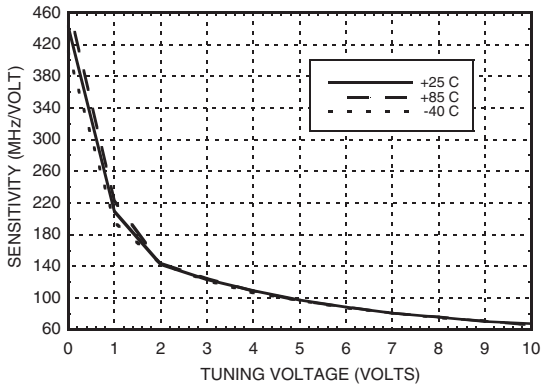
Frequency vs. Tuning Voltage, T= 25°C



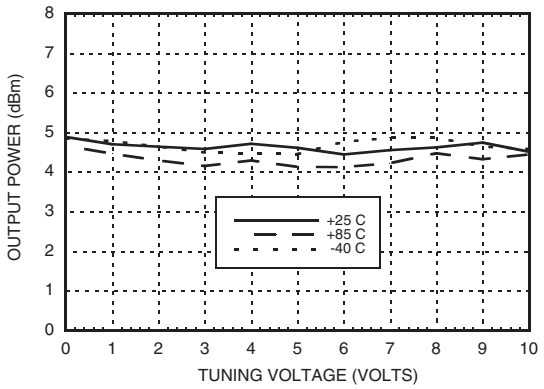
Frequency vs. Tuning Voltage, Vcc= +3V



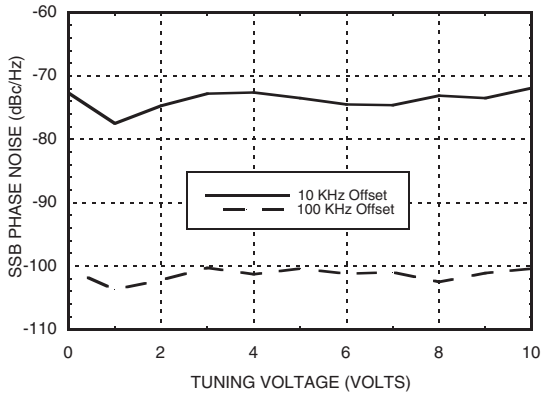
Sensitivity vs. Tuning Voltage, Vcc= +3V



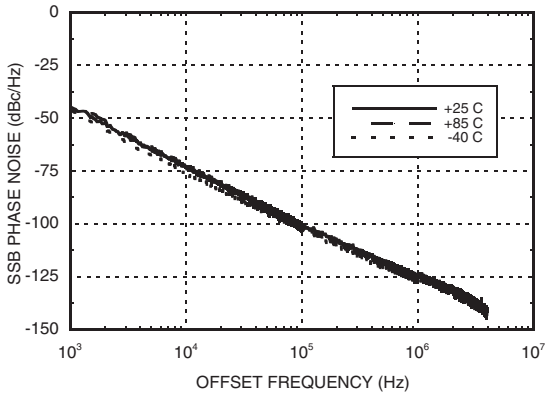
Output Power vs. Tuning Voltage, Vcc= +3V



Phase Noise vs. Tuning Voltage



Typical SSB Phase Noise @ Vtune= +5V



For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

Absolute Maximum Ratings

Vcc	+3.5 Vdc
Vtune	0 to +11V
Channel Temperature	135 °C
Continuous Pdiss (T = 85°C) (derate 6.28 mW/°C above 85°C)	5.65 W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C

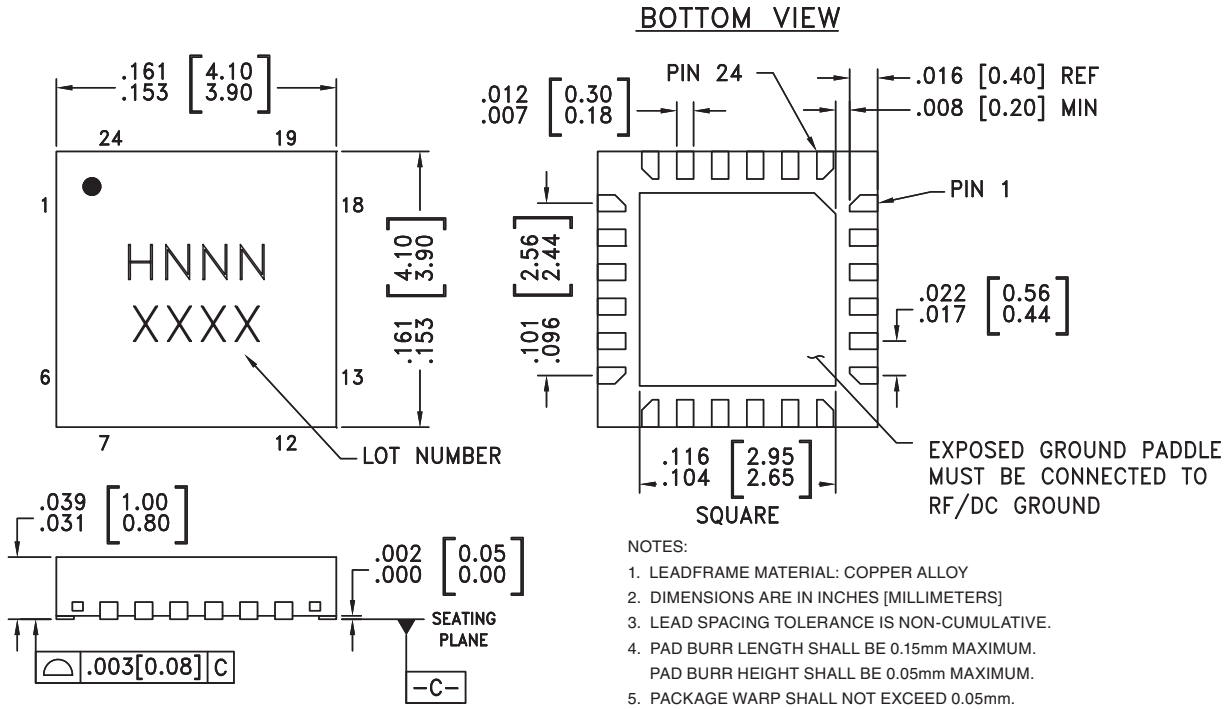
ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Typical Supply Current vs. Vcc

Vcc (V)	Icc (mA)
2.75	22
3.0	31
3.25	41

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

Outline Drawing



NOTES:

1. LEADFRAME MATERIAL: COPPER ALLOY
2. DIMENSIONS ARE IN INCHES [MILLIMETERS]
3. LEAD SPACING TOLERANCE IS NON-CUMULATIVE.
4. PAD BURR LENGTH SHALL BE 0.15mm MAXIMUM. PAD BURR HEIGHT SHALL BE 0.05mm MAXIMUM.
5. PACKAGE WARP SHALL NOT EXCEED 0.05mm.
6. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND.
7. REFER TO HITTITE APPLICATION NOT FOR SUGGESTED LAND PATTERN.

Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking [3]
HMC466LP4	Low Stress Injection Molded Plastic	Sn/Pb Solder	MSL1 [1]	H466 XXXX
HMC466LP4E	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 [2]	H466 XXXX

[1] Max peak reflow temperature of 235 °C
[2] Max peak reflow temperature of 260 °C
[3] 4-Digit lot number XXXX

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D