HMC-C028

v02.0916

WIDEBAND VCO w/ BUFFER AMPLIFIER MODULE, 4 - 8 GHz

Features

Wide Tuning Bandwidth

High Output Power: +20 dBm

Low SSB Phase Noise: -95 dBc/Hz @100 kHz

No External Resonator Needed

Single Positive Supply: +8 to +15V @ 185 mA

RoHS Compliant Hermetically Sealed Module

Field Replaceable SMA Connectors

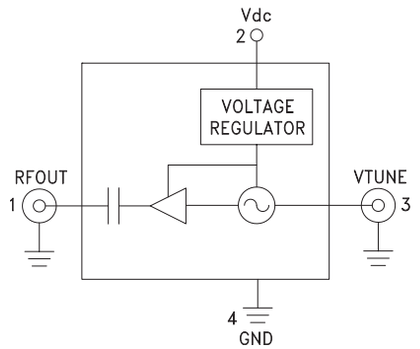
-40°C to +85°C Operating Temperature

Typical Applications

The HMC-C028 VCO Module is ideal for:

- Industrial/Medical Equipment
- Test & Measurement Equipment
- Military Radar, EW & ECM
- Lab Instrumentation

Functional Diagram



General Description

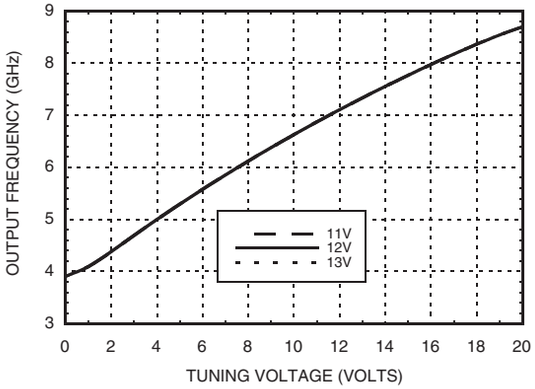
The HMC-C028 is a wideband GaAs InGaP Voltage Controlled Oscillator which incorporates the resonator, negative resistance device, and varactor diode. An internal voltage regulator provides excellent 0.2 MHz/V frequency pushing while the output buffer amplifier boosts output power to +20 dBm; which is enough to drive one or two mixers. Phase noise performance is excellent over temperature due to the oscillator's monolithic construction. The Vtune port accepts an analog tuning voltage from 0 to +18V. The HMC-C028 VCO operates from a single +8V to +15V supply, and is housed in a hermetically sealed module. This wideband VCO uniquely combines the attributes of small size, low phase noise, wide tuning range and high output power.

Electrical Specifications, T_A = +25° C, Vdc = +12V

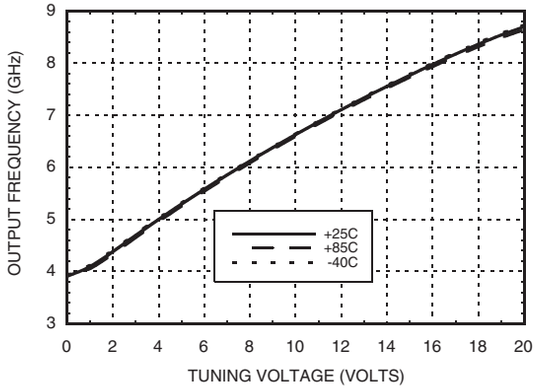
Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range		4.0 - 8.0			5.0 - 8.0		GHz
Power Output	13	15		17	20		dBm
SSB Phase Noise @ 100 kHz Offset		-95			-95		dBc/Hz
SSB Phase Noise @ 10 kHz Offset		-75			-75		dBc/Hz
Tune Voltage (Vtune)	0		18	3		18	V
Supply Current (Idc) (Vdc = +12V)		185			185		mA
Tune Port Leakage Current (Vtune = +15V)			10			10	µA
Output Return Loss		15			15		dB
2nd Harmonic		-10			-10		dBc
Pulling (into a 2.0:1 VSWR)		1			1		MHz pp
Pushing @ Vtune= +5V		0.2			0.2		MHz/V
Frequency Drift Rate		0.8			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

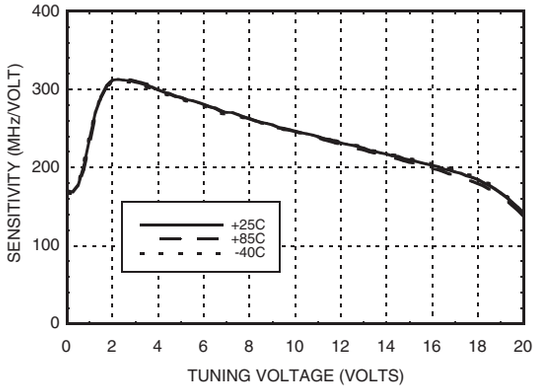
Frequency vs. Tuning Voltage, Vdc = +12V



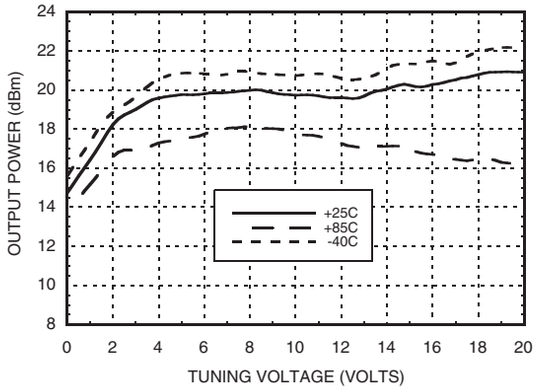
Frequency vs. Tuning Voltage, T = +25°C



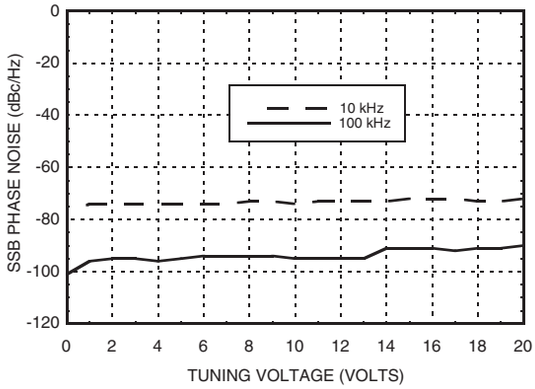
Sensitivity vs. Tuning Voltage, Vcc = +12V



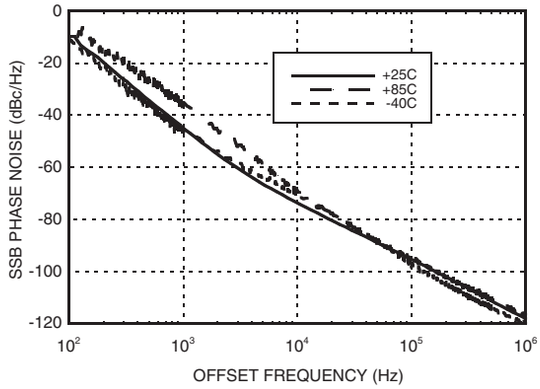
Output Power vs. Tuning Voltage, Vcc = +12V



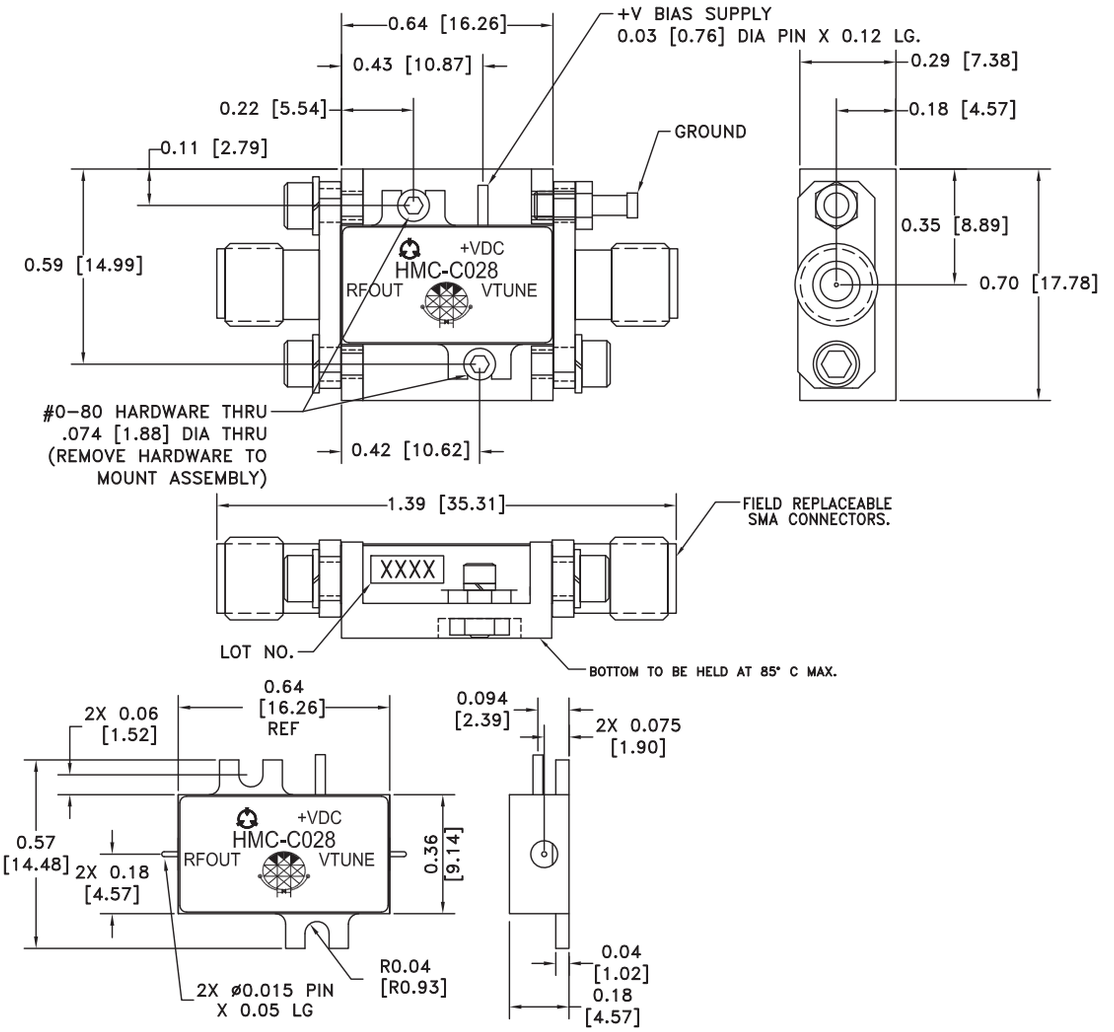
SSB Phase Noise vs. Tuning Voltage



Typical SSB Phase Noise @ Vtune = +12V



Outline Drawing



Package Information

Package Type	C-1
Package Weight [1]	10.2 gms [2]
Spacer Weight	N/A

[1] Includes the connectors

[2] ±1 gms Tolerance

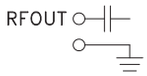
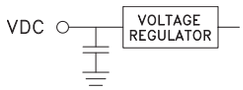
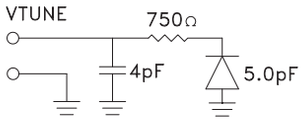
NOTES:

1. PACKAGE, LEADS, COVER MATERIAL: KOVAR™
2. BRACKET MATERIAL: ALUMINUM.
3. PLATING: ELECTROLYTIC GOLD 50 MICROINCHES MIN., OVER ELECTROLYTIC NICKEL 75 MICROINCHES MIN.
4. ALL DIMENSIONS ARE IN INCHES [MILLIMETERS].
5. TOLERANCES: ±.010 [0.25] UNLESS OTHERWISE SPECIFIED.
6. MARK LOT NUMBER ON LABEL WHERE SHOWN, WITH .030" MIN TEXT HEIGHT.

Absolute Maximum Ratings

Vdc	-0.3 Vdc to +25 Vdc
Vtune	0 to +22V
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C

Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1	RFOUT	RF output (AC coupled) uses a female SMA connector.	
2	Vdc	Supply Voltage Vdc = +8V to +15V.	
3	VTUNE	Control Voltage and Modulation Input uses a female SMA connector. Modulation bandwidth dependent on drive source impedance. See “Determining the FM Bandwidth of a Wideband Varactor Tuned VCO” application note.	
4	GND	Must be connected to power supply ground.