

40 MHz to 1300 MHz Wideband Integrated VCO with Differential Output

Description

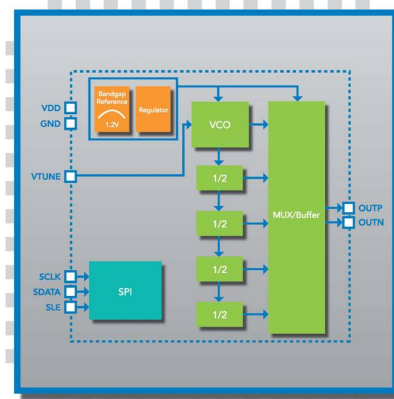
The EPX002-0 (Working Sample) is a wideband integrated voltage controlled oscillator (VCO) for wireless communication applications.

The inductor and varactor of the VCO circuit are integrated on-chip to reduce external components. The VCO consists of a varactor whose capacitance varies with the control voltage from 0.4 V to 2.4 V for fine tuning, and a 7-bit capacitor array for coarse tuning. The VCO typically oscillates from 650 MHz to 1300 MHz. The four dividers are integrated on-chip to support wideband applications. Each divider output, including the VCO output, is buffered.

Features

- +3.3V Single-Supply Operation
- Integrated Inductor and Varactors
- Wide Frequency Range
- Low Phase Noise
- Linearized VCO Gain

Functional Diagram



Contact Information

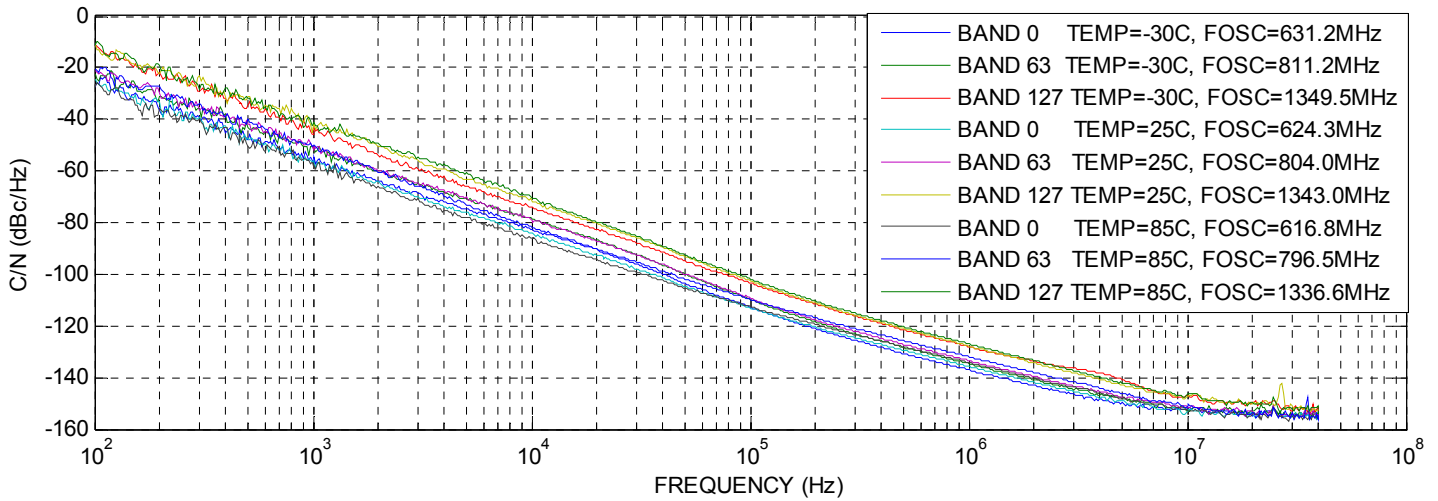
To request an evaluation board, please contact:
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DC/AC Measured Electric Characteristics

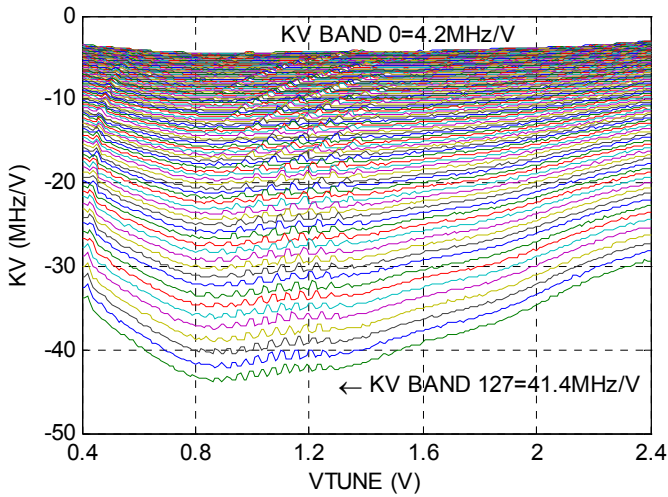
VDD (Supply Voltage) = 3.15 V to 3.45 V; TEMP (Temperature) = -30 °C to 85 °C; VTUNE (VCO Tuning Voltage) = 0.4 V to 2.4 V; VCO BAND = 0 to 127, unless otherwise noted. Typical conditions are VDD = 3.3 V; TEMP = 25 °C; VTUNE = 1.4 V; VCO BAND = 63.

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|----------|---|-----------------------------|--------|--------|--------|--------|
| ITOT | Total supply current | All dividers turned on | 27.5 | 34.0 | 40.7 | mA |
| IVCO | VCO supply current | Regulator and VCO are ON | 9.1 | 15.1 | 20.5 | mA |
| ISTB | Standby current | | - | 0 | - | uA |
| POUT | Differential output power | With 50-ohm Microstrip line | -12.8 | -7.94 | -6.43 | dBm |
| FOSC | VCO frequency tuning range | TEMP = 25 C | 620.5 | - | 1384.5 | MHz |
| FOSCT | VCO frequency temperature variation | | 98 | 128 | 137 | kHz/C |
| KV | VCO gain | At VCO output | 2.95 | 8.82 | 45.25 | MHz/V |
| FPSH | VCO frequency supply pushing | | - | 830 | 8400 | kHz/V |
| CNL_100K | Phase noise at lower band (offset=100 kHz) | FOSC = 625 MHz | -113.5 | -113 | -111.5 | dBc/Hz |
| CNL_1M | Phase noise at lower band (offset=1 MHz) | FOSC = 625 MHz | -137.4 | -135.5 | -133.8 | dBc/Hz |
| CNM_100K | Phase noise at middle band (offset=100 kHz) | FOSC = 800 MHz | -110.4 | -109 | -107.1 | dBc/Hz |
| CNM_1M | Phase noise at middle band (offset=1 MHz) | FOSC = 800 MHz | -135.3 | -133.5 | -129.4 | dBc/Hz |
| CNH_100K | Phase noise at higher band (offset=100 kHz) | FOSC = 1330 MHz | -104.6 | 102.5 | -101.5 | dBc/Hz |
| CNH_1M | Phase noise at higher band (offset=1 MHz) | FOSC = 1330 MHz | -130.6 | 128 | -126.5 | dBc/Hz |

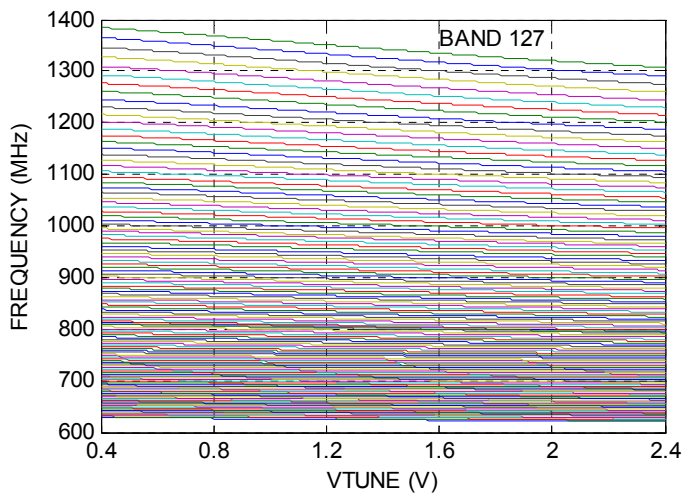
C/N vs Offset Frequency at TEMP = -30 C to 85 C, VTUNE=1.4V



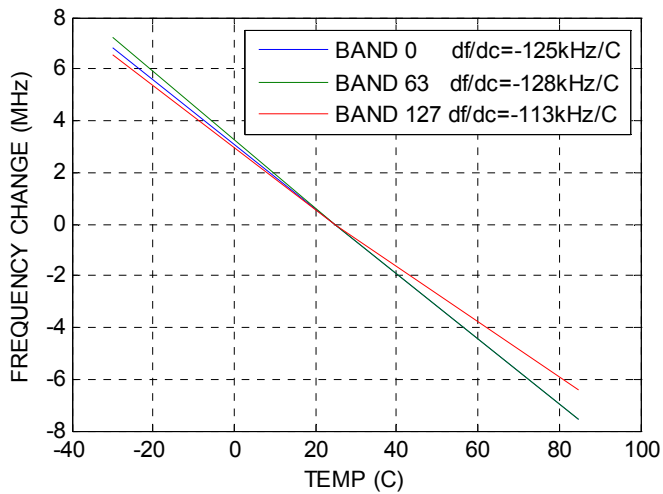
KV vs VTUNE at TEMP = 25 C



VCO Frequency Tuning vs VTUNE at TEMP =25 C



Frequency change vs TEMP at VTUNE=1.4V



Power Supply Pushing vs VTUNE at TEMP = 25 C VDD=3.15V to 3.45V

