



Features

- Very low phase noise
- Very stable 10 MHz output
- Low cost
- CMOS alarm signal indication of Rb oscillator loses lock
- Meets UMTS and CDMA frequency requirements without an external reference or routine calibration
- CE Compliant

Low Noise Option Rubidium Oscillator

The LPRO-LN is designed for Rubidium controlled time and frequency systems requiring low phase noise. The height and footprint are designed to accommodate a 2-slot VME application. It is easy to integrate into a system, requiring only one input supply voltage and allowing direct plug-in onto another circuit board. It offers the high reliability of a design that has been refined over many years from the experience gained in fielding tens of thousands of Rubidium oscillators. It is an oscillator package incorporating surface mount technology, *and decreased temperature sensitivity*.

Suitable applications are telecom networks such as digital cellular/PCS base stations, SONET/SDH digital network timing, etc. Linked with a GPS receiver, the LPRO-LN provides the necessary timing requirements for CDMA cellular and PCS systems. The low temperature coefficient and excellent frequency stability extend holdover performance when the GPS signals are not available.

The LPRO-LN is designed for long operating periods without maintenance (long life Rb lamp, extended crystal control range) with a goal to exceed 10 years. The design provides a stable frequency with a good short and long term stability, and excellent spur performance. The LPRO-LN provides a 5V CMOS-compatible alarm signal derived from the basis physics operation which indicates when output frequency is outside roughly $\pm 5E - 8$ of absolute frequency offset.

Features

Electrical Specifications

Unless otherwise indicated, 24 Vdc input @25°C

- **Output/Frequency/Waveform:** 10 MHz sine wave
- **Output Level:** +9 dBm $\pm$ 1.5 dBm
- **Output Impedance:** 50 Ω @10 MHz
- **Phase Noise (SSB):**

1 Hz	<-100 dBc/Hz
10 Hz	<-130 dBc/Hz
100 Hz	<-145 dBc/Hz
1000 Hz	<-150 dBc/Hz
10 kHz	<-155 dBc/Hz
- **Spurs:**

Harmonic:	<-60 dBc
Non-Harmonic:	<-80 dBc
- **Aging:**

Monthly (after 1 month):	<5E-11/month
10 years	<1E-9
- **Frequency Accuracy At Shipment:** $\pm$ 5E-11 (25°C)
- **Frequency Retrace:**

< $\pm$ 2.5E-11
(after 24 hrs power on @ 25°C & up to 48 hrs power off)
- **Short Term Stability:**

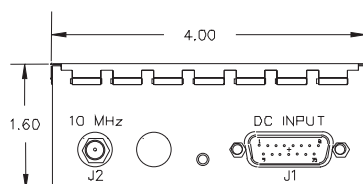
t=1 sec	<1.4E-11
t=10 sec	<0.8E-11
t=100 sec	<0.25E-11
- **Frequency Control:**

External trim range (electronic):	$\geq \pm$ 1.5E-9 (0V to +5V)
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- **Warm-Up:**

(at 25°C)	
Time to Lock:	< 6 min
- **Input Voltage Range:** +19 to 32.0 Vdc
- **Voltage Sensitivity:** .72E - 11/V (over input voltage range)
- **Input Power, Quiescent:**

+24Vdc <20W @ 25°C
44 W max. at turn-on
- **Status Monitor:**

Analog	VCXO volts, lamp volts (20 kOhm impedance, filtered)
Digital	LOCK monitor: 5V CMOS load
Lock:	0V to 50 mV (within $\sim \pm$ 5E - 8)
Unlock:	4.2 to 4.7V



Environmental Specifications

- **Operating Temperature:** -10°C to +55°C
- **Temperature Coefficient:** (0°C to 50°C) <3E-10
- **Storage Temperature:** -55°C to +85°C
- **Altitude:**

Operating:	-200 ft to 40,000 ft.
Non-operating:	-200 ft to 70,000 ft.
- **Magnetic Field Sensitivity, dc ($\pm$ 2 GAUSS):** $\leq \pm$ 4E - 11/GAUSS
- **Relative Humidity:** $\leq$ 85% non-condensing; meet or exceed Telcordia GR-63-CORE Issue 1, October 1995, section 4.1.2.
- **Vibration:**

Operating	Meets or exceeds Telcordia GR-63-CORE, Issue 1, October 1995, section 4.4.3 and section 5.4.2 (no unlock. 1.0 g peak sine @ 5-100Hz).
Non-operating (transportation)	Telcordia GR-63-CORE, Issue 1, October 1995, section 4.4.4 and section 5.4.3, curve 1 of Figure 4-3. (1.5 g peak max sine @ 5-500Hz)
- **EMI:** Compliant to FCC Part 15 Class B (conducted and radiated emissions) and complies with EN55022B emissions (radiated and conducted) and EN50082-1 (immunity).

Physical Specifications

- **Weight:** 2.25 lbs. (1.013 kg) max.
- **Size:** 4.0" X 8.5" X 1.6" H
(10.16 cm X 21.59 cm X 4.06 cm)
- **Warranty:** 2 years
- **Extended Warranty:** Consult factory

Note: Consult factory for application support, test reports or special requirements.
Values typical unless otherwise noted.

