Symmetricom

DATA SHEET

8200LN

Rubidium Oscillator

Key Features

- 10 MHz Output
- 1 PPS Output
- 1 PPS Input
- Low Phase Noise
- Low Physical Profile (< 1.0" high)
- Low Weight < 2 lbs.
- Digital Monitor and Control
- Shock/Vibration Hardened

Optional Features:

- 5 MHz Output
- Low-g sensitivity

Key Benefits:

- Superior frequency stability
- Diverse environmental conditions support

The Symmetricom® 8200LN is a ruggedized rubidium oscillator designed for ground tactical, shipboard and airborne applications where superior frequency stability under diverse environmental conditions is required. Advanced communications, navigation and targeting systems require precision oscillators that can withstand a wide range of operating environments with minimal degradation in frequency accuracy and stability. The 8200LN support these applications with superior phase noise and excellent short and long term frequency stability.

The 8200LN is unique in that it combines excellent frequency stability and low dynamic phase noise in a small, low profile package measuring less than 1.0 inches high and weighing less than 2 lbs.

The standard performance 8200LN provides both 10MHz and 1PPS outputs along with a 1PPS input for disciplining to a GPS receiver or other primary standard. Optional configurations can support additional outputs or custom outputs. When equipped with an optional low g sensitivity crystal, the 8200LN can maintain low phase noise performance over a wide range of vibration profiles. The 8200LN is designed around proven rubidium and OCXO technology that has been deployed in numerous airborne, shipboard and ground tactical platforms for over thirty years.

8200LN

Specifications

ELECTRICAL SPECIFICATIONS

- **RF Output**

Frequency:	10 MHz (nominal)
Format:	Sinewave
Amplitude:	+10 dBm ±2 dBm (0.7 V rms nominal)
VSWR	1.5:1
Harmonic Distortion	< -30 dBc
Non-harmonic Distortion	< -80 dBc
Load Impedance:	50 ohms @ 10MHz
Connector:	SMA Female
Qty:	2

- **1PPS Output**

Rise Time:	<5 ns
Pulse Width:	<400 ns +/-10%
Level:	>3 Vdc TTL Compatible
Jitter:	<10 ps RMS
Output Impedance:	50 ohms
Connector:	SMA Female
Qty:	2

PERFORMANCE PARAMETERS

- **Phase noise (SSB), £(f), dBc/Hz (Static)**

SB Freq	10 MHz	5 MHz
1 Hz	<-98	<-103
10 Hz	<-130	<-135
100 Hz	<-148	<-153
1 KHz	<-154	<-155
10 KHz	<-157	<-157

- Spectral purity
  - Harmonics: <-40 dBc
  - Non-harmonics: <-80 dBc
- Aging
  - Monthly (after 1 month): <±5.0E-11
- Frequency accuracy at shipment: <±5.0E-11 (@ +25° C)
- Frequency retrace: <±5.0E-11 (on-off-on: 24 hours, 24 hours, 24 hours @ 25°C)
- Short term stability σy (τ) (Allan deviation)

τ (sec)	
1	<1.4E-11
10	<7.0E-12
100	<2.5E-12

- Frequency control

Analog freq. adj. range:	+/-1.5E-9, 0 - 5V into 5Kohm impedance (optional)	
Digital freq. adj. res:	+/-1.0E-6 with 1.0E-12 resolution	
Warm-up times	-40° C	+25°
Time to lock:	<8 min	<6 min
Time to <1E-9:	<10 min	<8 min
Power Consumption @ 28V:	<28W	<28W

- Input voltage range: +15 to 32 Vdc
  (Protected against reverse polarity & transients)
- Voltage sensitivity: <5.0E-12 Vdc
  (±10% voltage change from nom. 28 Vdc Input)
- Input power, quiescent:

+28 Vdc @ -40° C baseplate	<20W
+28 Vdc @ +25° C baseplate	<15W
+28 Vdc @ +75° C baseplate	<11W

- Lock Status (BITE)
  - TTL low = Lock
  - TTL high = Unlock
- RS-232 control/monitor interface

Provides ID, status/monitor information, and frequency/operating parameter adjustments. Protocol: 9600, 8, 1, None, No flow control.

ENVIRONMENTAL & PHYSICAL SPECIFICATIONS

- Temperature

Operating:	-40° C to +75° C baseplate
Storage:	-55° C to +95° C
Frequency Sensitivity:	<3.0E-10 over op. temp. range

- Thermal shock (non-operating):
  MIL-STD-202, Method 107, Test Condition A, 10 cycles -55° C to 85° C
- Orientation sensitivity: <5.0E-11 for any orientation
- Pressure sensitivity: <1.0E-13/mbar
- Altitude
  - Operating: Sea level to 40,000' (12,192 m)
  - Non-operating: Sea level to 80,000' (24,384 m)
- Magnetic field sensitivity: (DC field, ≤2 Gauss)
  ≤ ±4.0E-11/Gauss
- Relative humidity (operating):
  0 to 95% RH per MIL-STD-810, Method 507.4
- Salt fog: MIL-STD-810, Method 509.4
- Vibration: MIL-STD-810, Method 514.5, Procedure I
  - Operating: Category 24, Minimum Integrity, 7.7 grms @ 0.04 g/Hz, 20 Hz -1KHz, 15 min/axis (maintain frequency lock)
  - Non-Operating: Category 24, Minimum Integrity, 15.4 grms @ 0.16 g/Hz, 20 Hz -1KHz, 30 min/axis
- Shock: MIL-STD-202, Method 213
  - Operating: 30g, 11ms, half-sine impulse (maintain frequency lock)
  - Non-Operating: 50g, 11ms, half-sine impulse
- EMI MIL-STD-461
  - Emissions: CE102, RE102
  - Susceptibility: CS101, CS114, RS103
- MTBF: 70,000 hours (ground fixed)
  @ +40° C baseplate
- On-Off cycling endurance: 5000 cycles at 10° C baseplate
- Reliability Specification: MIL-HDBK-217F
- Input Connector: (1) DB-9 (All input power)
  (1) DB-9 (All monitoring)
- Reliability Specification: MIL-HDBK-217F
- Dimensions

Height:	0.95"
Width:	6.13"
Depth:	5.52"
Volume:	32.2 in3
Weight:	<2.0 lbs

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