

# ELPROMA Rubidium RB01 Oscillator (NTS-5000)

## Output

Output frequency	10 MHz sine wave
Amplitude	0.5 Vrms, $\pm 10\%$
Phase noise (SSB)	$< -130$ dBc/Hz (10 Hz) $< -140$ dBc/Hz (100 Hz)
Spurious	$< -130$ dBc (100 kHz BW)
Harmonic distortion	$< -25$ dBc
Return loss	$> 25$ dB (at 10 MHz)
Accuracy at shipment	$\pm 5 \times 10^{-11}$
Aging (after 30 days)	
Monthly	$< 5 \times 10^{-11}$ ( $< 2.5 \times 10^{-11}$ with opt. C)
Yearly	$< 5 \times 10^{-10}$
Short-term stability	$< 2 \times 10^{-11}$ (1 s)
(Allan variance)	$< 1 \times 10^{-11}$ (10 s) $< 2 \times 10^{-12}$ (100 s)
Holdover	72 hour Stratum 1 level
Frequency retrace	$\pm 5 \times 10^{-11}$ (72 hrs. off, then 72 hrs. on)
Settability	$< 5 \times 10^{-12}$
Trim range	$\pm 2 \times 10^{-9}$ (0 to 5 VDC) $\pm 1$ ppm (via RS-232)
Warm-up time	$< 6$ minutes (time to lock) $< 7$ minutes (time to $1 \times 10^{-9}$ )
Voltage sensitivity	$< 2 \times 10^{-11}$ (1 VDC supply change)

## Electrical

Input voltage	+24 VDC (nom.), +22 VDC (min.), +30 VDC (max.)
Current	2.2 A (warm-up), 0.6 A (steady-state)

Protection	at 25 °C (Note 1) $\pm 30$ VDC to any pin except rf out
RF protection	100 mA (stable w/ any termination)
Cal reference out	5.00 $\pm$ 0.05 VDC
RS-232	9600 baud, 8 bits, no parity, 1 stop bit, 0 to 5 V levels with X-on/X-off protocol
1 pps measurement	$\pm 10$ ns (accuracy), $\pm 1$ ns (resolution)
1 pps output set	$\pm 10$ ns (accuracy), $\pm 1$ ns (resolution)

## Environmental

Operating temperature	-20 °C to +65 °C (baseplate)
Temperature stability	$\pm 1 \times 10^{-10}$ (-20 °C to +65 °C baseplate)
Storage temperature	-55 °C to +85 °C
Magnetic field	$< 2 \times 10^{-10}$ for 1 Gauss field reversal
Relative humidity	95 % (non-condensing)

## Miscellaneous

Design life <sup>2</sup>	20 yrs.
Size	2.00" $\times$ 3.00" $\times$ 4.00" (HWD)
Weight	1.32 lbs.
Baseplate threads	4-40 (4 places)
Connector	Mates with ITT/Cannon DAM11W1S series
Warranty	One year parts and labor on defects in materials and workmanship

1. Low power warm-up option is available. Contact factory for details.
2. Lamp lifetime is the dominant consideration in the design life estimate. The estimate is based on the measured reduction of lamp intensity and the elevation of lamp start voltage with time.

