



## RFS1: Low Phase Noise Rubidium Oscillator



**RFS1 Module**

### Description

The RFS1 is a high-quality rubidium oscillator module. Intended for OEM applications, the RFS1 provides a very accurate 10 MHz output signal. The RFS1's base plate will need to be placed on a suitable heatsink

A special feature of the RFS1 is the very low phase noise, typically -130 dBc/Hz at a 10 Hz offset. This is typically 30 to 40 dB lower than competitive units. The entire oscillator is very reliable and has been designed for a 20 year life.

### Specifications

#### Output

- Output frequency 10 MHz sine wave
- Amplitude 0.5 Vrms,  $\pm 10\%$ : Output Pulse: 1 pps
- Phase noise (SSB)  $< -95$  dBc/Hz (1 Hz offset),  $-130$  dBc/Hz (10 Hz),  $< -150$  dBc/Hz (100 Hz),  $< -155$  dBc/Hz (1 kHz),  $< -158$  dBc/Hz (10 kHz)
- Spurious  $< -130$  dBc (100 kHz BW): Harmonic distortion  $< -25$  dBc
- Return loss  $> 25$  dB @ 10 MHz
- Accuracy at shipment  $\pm 5 \times 10^{-11}$
- Aging (after 30 days)  $< 1 \times 10^{-11}$  (72 hours),  $< 5 \times 10^{-11}$  (monthly),  $< 5 \times 10^{-10}$  (yearly)
- Short-term stability  $< 2 \times 10^{-11}$  (1 s),  $< 1 \times 10^{-11}$  (10 s),  $< 2 \times 10^{-12}$  (100 s)
- Holdover 72-hour Stratum 1 level
- Time Drift:  $< 1$  us/72 hours typical (after 30 days continuous operation)
- 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)

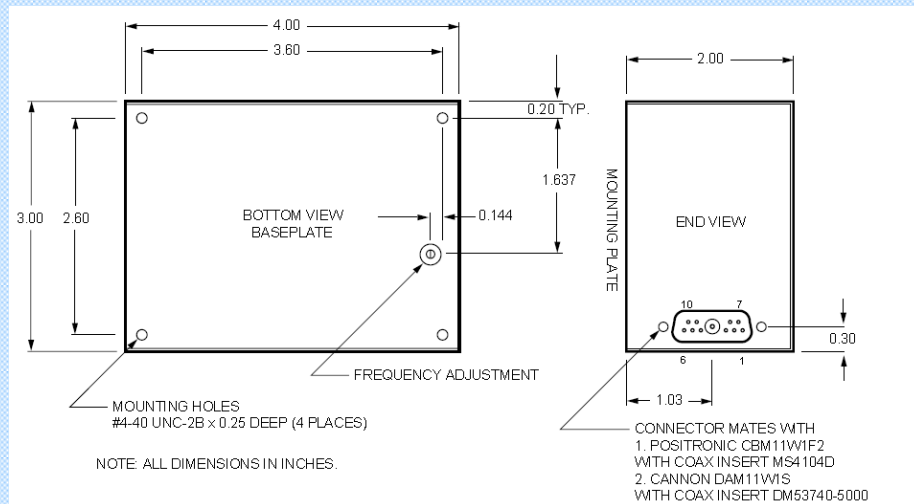
## Electrical

- Input voltage +24 VDC (nom.), +22 VDC (min.), +30 VDC (max.)
- Current 2.2 A (warm-up), 0.6 A (steady-state), at 25 °C (Note 1)
- Protection  $\pm 30$  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 5V 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)

## Mechanical



## Miscellaneous

- Size : 101.6 mm (depth) x 76.2 mm (wide) x 50.8 mm (high). Weight 1.32 lbs.
- Baseplate threads 4-40 (4 places). Connector Mates with ITT/Cannon DAM11W1S series
- Warranty Two year parts and labor on defects in materials and workmanship

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Full specifications available from [www.ptsyst.com](http://www.ptsyst.com). Specifications and features subject to change without notice (101221)