RFS1: Low Phase Noise Rubidium Oscillator

RFS1 Module **RFS1 with integrated GPS receiver**

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.

Many options are available for the RFS1 including 1 pps disciplining and integrated GPS receiver.

Specifications

Output

- Output frequency 10 MHz sine wave
- Amplitude 0.5 Vrms, ±10 %
- Output Pulse: 1 pps
- Phase noise (SSB) < -95 dBc/Hz (1 Hz offser), -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 x 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 ±5 × 10^{-11} (72 hrs. off then 72 hrs. on)
- Settability <5 × 10^{-12}
- Trim range ±2 × 10^{-9} (0 to 5 VDC), ±1 ppm (via RS-232)
- Warm-up time <6 minutes (time to lock), <7 minutes (time to 1 × 10^{-9})
- Voltage sensitivity <2 × 10^{-11} (1 VDC supply change)

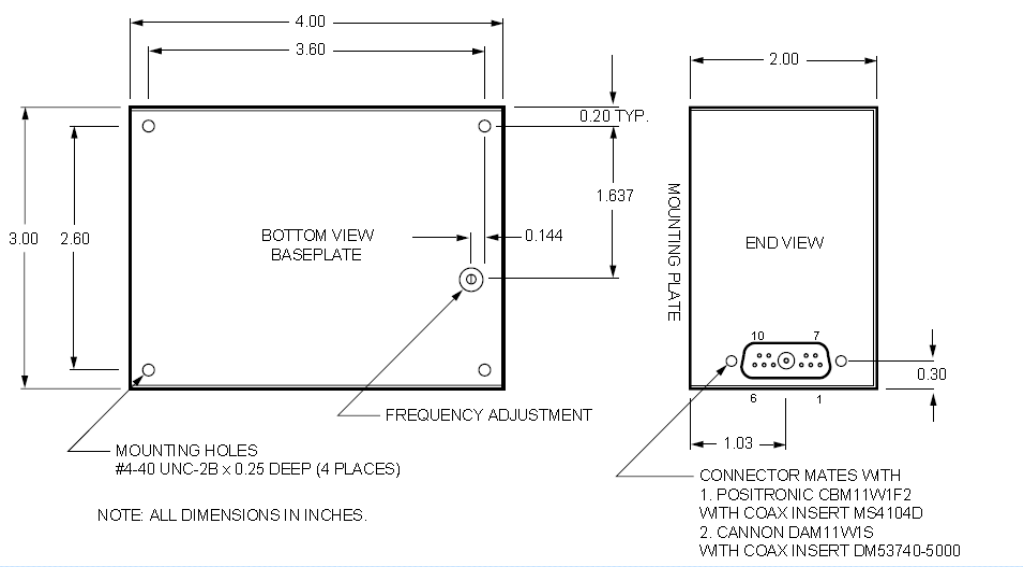
Electrical

- 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 ±30 VDC to any pin except rf out
- RF protection 100 mA (stable w/ any termination)
- Cal reference out 5.00 ±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 ±10 ns (accuracy), ±1 ns (resolution)
- 1 pps output set ±10 ns (accuracy), ±1 ns (resolution)

Environmental

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

Mechanical



Miscellaneous

- Design life2 20 yrs.
- 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

Options

- Option 01: D sub connector.
- Option 01B: SMA connector for 10 MHz output.
- Option 02: Built in GPS receiver (case size increases to 150 x 76.2 x 50.8)
- Option 03A: External 1 pps locking input. TTL levels.
- Option 03B: External 10 MHz locking input.
- Option 04: 12 - 18 V DC power input @ 5Amps (warm-up) and 1.5 A (srteady)
- Option 05: Ultra low phase noise (-110 dBc @ 1 Hz offset with a -168 dBc noise floor)
- Option 06: 1 pps output (rising edge is aligned to rising edge of input 1 pps, if option 03A is also fitted).
- Option 07: Higher output for 10 MHz sinewave with improved harmonics (state level)
- Option 08: Case with heatsink for bench use

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Full specifications available from www.ptsyst.com. Specifications and features subject to change without notice (240616)