Rubidium Specification

Part No. + Packaging: ***LFRBXO059244Bulk***

Description

- The IQRB-1 rubidium oscillator is a sub-miniature atomic clock exhibiting normal rubidium oscillator performance in a 65cc OCXO style package.
  This rubidium oscillator has 100 times less drift than OCXOs and with short term stability of 0.008ppb/s at 100s, this rubidium oscillator provides significant improvements in performance over OCXOs.
- Model IQRB-1
- Model Issue number 3

Frequency Parameters

- Frequency 10.0MHz
- Frequency Tolerance ±0.05ppb
- Tolerance Condition @ 25°C
- Frequency Stability ±1.50ppb
- Operating Temperature Range -30.00 to 65.00°C
- Short Term Stability (AVAR):
  1s 0.08ppb
  10s 0.03ppb
  100s 0.008ppb
- Ageing:
  Day 0.005ppb
  Month 0.05ppb
- Magnetic Field Sensitivity, DC (±2 Gauss): ±0.04ppb/Gauss max
- Temperature Coefficient (ambient): $5x10^{-10}$ (0 to 50°C)
- Retrace: ±0.02ppb max

Electrical Parameters

- Supply Voltage 12.0V
- Note: The device will operate over the Supply Voltage Range 12V to 18V.
- Input Power (@ 25°C): 6W @ 12V, 1.2A max.
- Start-Up Current (at room temperature): 1.5A for 10s max
- Warm Up Time: 5mins to lock @ 25°C.
- Lock Monitor: Pin 2 is high (5V) when out of lock and low (0V) when locked.

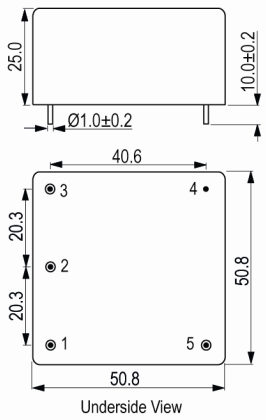
Frequency Adjustment

- Pulling ±5ppb min
- Control Voltage 2.5V ±2.5V
- Input Impedance 10kΩ min
- Control Voltage Input Current (Pin 1 swept from 0V to 5V): 40uA typ
- Control Voltage Input Capacitance (Pin 1): 5pF typ
- Note: The oscillator will detect if no control voltage is applied to Pin 1 and will automatically set the control voltage internally to 2.5V. Further when the oscillator is locked Pin 1 (frequency control) is set to internal default voltage 2.5V. However if a voltage is applied (even GND) to Pin 1 then the oscillator will switch to accept an external control voltage input.

Output Details

- Output Compatibility Sine
- Drive Capability 50Ω
- Output Levels: 7dBm min, 9.5dBm typ, 13dBm max

Outline (mm)



Pin Connections
1. Frequency Control
2. Lock Monitor
3. Output
4. GND
5. $+V_S$

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Noise Parameters

- Phase Noise (typ):
  -67dBc/Hz @ 1Hz
  -95dBc/Hz @ 10Hz
  -127dBc/Hz @ 100Hz
  -140dBc/Hz @ 1kHz
- Harmonics: -40dBc max

Environmental Parameters

- Storage Temperature Range: -55 to 85°C
- Base Plate Temperature: -30 to 85°C
- Case Temperature (after 1hr, ambient temp 25°C, no ventilation): 45°C max
- Mechanical Shock: IEC 60068-2-27, Test Ea: Acceleration of 50G peak amplitude for 11ms duration.
- Vibration: IEC 60068-2-06, Test Fc: 10Hz-55Hz 1.5mm displacement, 55Hz-500Hz 10G acceleration.
- Atmospheric Pressure: -60m to 4000m: $1x10^{-13}$mbar max
- EMI: Compliant to FCC Part 15, Class B.

Manufacturing Details

- MTBF (Stationary): Approx 100000hrs
- Note: In regard to PCB layout; the oscillator base plate runs hot and it is not a good idea to place components on the opposite side of the PCB to the rubidium module as the base plate can be 85°C depending upon environmental conditions. We recommend leaving about a 5mm minimum gap around the rubidium module wherever possible.

Compliance

- RoHS Status (2011/65/EU) Compliant
- REACh Status Non-Compliant
- MSL Rating (JDEC-STD-033): Not Applicable

Packaging Details

- Pack Style: Bulk Bulk pack
  Pack Size: 1
- *Alternative packing option available*

Technical Notes

- *RoHS Compliance: 5/6*

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