

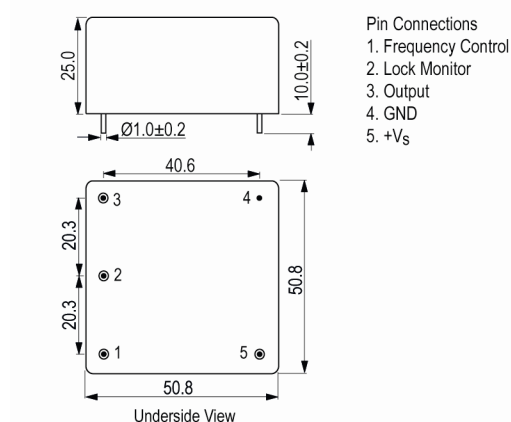
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## Description

- 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.
- FEATURES:**  
 10MHz output  
 2" x 2" x 1" form factor  
 -95dBc/Hz at 10Hz  
 0.05ppb accuracy  
 0.008ppb/s @ 100s  
 Atomic accuracy  
 Low power consumption  
 100 times less drift than OCXOs
- APPLICATIONS:**  
 Stand-alone (free-run) stable frequency source for UMTS and LTE.  
 Extended holdover for CDMA, WiMAX and LTE base stations.  
 Stability for various other communication and transmission applications.



## Outline (mm)



## Frequency Parameters

- Frequency: 10.0MHz
- Frequency Tolerance:  $\pm 0.05$ ppb
- Tolerance Condition: @ 25°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 ( $\pm 2$  Gauss):  $\pm 0.04$ ppb/Gauss max
- Temperature Coefficient (ambient):  $5 \times 10^{-10}$  (0 to 50°C)
- Retrace:  $\pm 0.02$ ppb 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.

## Sales Office Contact Details:

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**Frequency Adjustment**

- Pulling 5ppb min
- Control Voltage 0V to 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.

**Operating Temperature Ranges**

- -30 to 60°C

**Output Details**

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

**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:  $1 \times 10^{-13}$ 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.
- RoHS Terminations Pin material is Kovar with Au plating.

**Compliance**

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

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#### Packaging Details

- Pack Style: Bulk      Bulk pack  
Pack Size: 1

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