

ISSUE 5; February 2021

### Description

- The IQRB-1 rubidium oscillator is a sub-miniature atomic clock in a 65cc OCXO style package.
- Features:
  - 50.8 x 50.8 x 25 mm (2" x 2" x 1") form factor
  - 0.05ppb accuracy
  - Short term stability 8E-12 @ 100s
  - Low ageing
  - Low current consumption
- Applications:
  - Stand-alone frequency source. Ideal for synchronisation of or as reference for satellite & secure communications, navigation systems in financial, utility, security and communications timing applications



### Frequency Parameters

- Frequency: 10.00MHz
- Ageing:
  - Day: 0.005ppb
  - Month: 0.05ppb
- Frequency Stability (Temperature varied across the operating temperature range, measurement referenced to frequency observed with  $f_{ref} = (\Delta f_{max} + f_{min}) / 2$ ):  $\pm 0.5$ ppb typical
- Retrace:  $\pm 0.02$ ppb max
- Magnetic Field Sensitivity, DC ( $\pm 2$  Gauss):  $\pm 0.04$ ppb/Gauss max

### Electrical Parameters

- Supply Voltage: 12.0V
- Note: The device will operate over the Supply Voltage Range 12V to 18V
- Start-up Current ( $V_s = 12V$ , @25°C): 1.7A max  
Initial Spike: 2.5A max for 10ms max
- Warm up time: 5mins to lock status, 10mins to optimum frequency and power performance
- Steady State Current: ( $V_s = 12V$ , 25°C ambient): 0.5A max
- Lock Monitor: Pin 2 is high (5V) when out of lock and low (0V) when locked

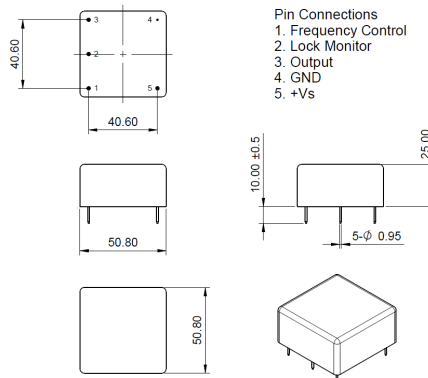
### Frequency Adjustment

- Pulling:  $\pm 5$ ppb min
- Control Voltage: 0V to 5V
- Input Impedance: 10k $\Omega$  min
- Pulling is sufficient to allow  $\pm 5$ ppb after the initial frequency offset is removed
- Control Voltage Input Current (Pin 1 swept from 0V to 5V): 40uA typ
- Control Voltage Input Capacitance (Pin 1): 5pF typ
- Note if no voltage is applied to the control voltage (pin1) it will be internally set to 2.5V. If a voltage is applied (even GND) to Pin 1, the oscillator will accept the external control voltage input.

### Operating Temperature Ranges

- -30 to 65°C

### Outline (mm)



### Sales Office Contact Details:

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### Output Details

- Output Compatibility Sine
- Drive Capability 50Ω
- Output Levels: 7dBm min, 11dBm typ, 13dBm max

### Noise Parameters

- Short Term Stability (ADEV) Typical:
  - 1s 8E-11
  - 10s 2E-11
  - 100s 6E-12
- Phase Noise (typ):
  - 67dBc/Hz @ 1Hz
  - 95dBc/Hz @ 10Hz
  - 127dBc/Hz @ 100Hz
  - 140dBc/Hz @ 1kHz
  - 148dBc/Hz @ 10kHz
  - 150dBc/Hz @ 100kHz
- Harmonics: -40dBm max

### Environmental Parameters

- Storage Temperature Range: -55 to 85°C
- Base Plate Temperature: -30 to 85°C
- Case Temperature (after 1hr, ambient temperature 25°C, no ventilation): 60°C typ
- 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: 1E-13 mbar max
- EMI: Compliant to FCC Part 15, Class B

### Manufacturing Details

- These products need to maintain thermal stability to obtain optimum performance. Large copper plates should be avoided under the device, or mount the device with 1mm clearance from the PCB. Avoid airflow and do not attempt to mount heat sink to the device.
- The oscillator base plate runs hot: be aware that this may cause damage to other components in close proximity.
- RoHS Terminations Pin material is Kovar with Au plating.

### Compliance

- RoHS Status (2015/863/EU) Compliant
- REACH Status Compliant
- MSL Rating (JDEC-STD-033): Not Applicable

### Packaging Details

- Pack Style: Bulk Bulk pack
- Pack Size: 1

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