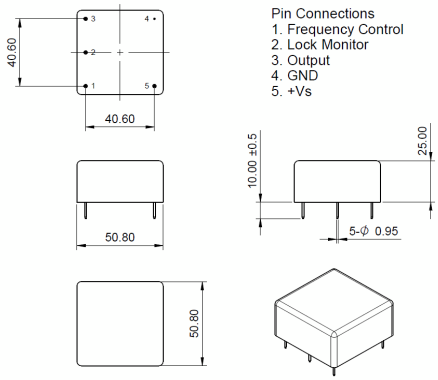
ISSUE 5; November 2023

Outline (mm)



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 10.0MHz
- Ageing:
  Day 0.005ppb
  Month 0.05ppb
- Frequency Stability (Temperature varied across the operating temperature range, measurement referenced to frequency observed with fref=(Δfmax, fmin)/2) : ±0.5ppb typical
- Retrace: ±0.02ppb max
- Magnetic Field Sensitivity, DC (±2 Gauss): ±0.04ppb/Gauss max

Electrical Parameters

- Supply Voltage 12.0V
- Note: The device will operate over the Supply Voltage Range 12V to 18V
- Start-up Current (Vs=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: (Vs = 12V, 25°C ambient): 0.5A max
- Lock Monitor: Pin 2 is high (5V) when out of lock and low (0V) when locked

Sales Office Contact Details:

UK: +44 (0)1460 270200

USA: +1 760 668 8935

Email: info@iqdfrequencyproducts.com

Web: www.iqdfrequencyproducts.com

Frequency Adjustment

- Pulling ±5ppb min
- Control Voltage 0V to 5V
- Input Impedance 10kΩ min
- Pulling is sufficent to allow ±5ppb 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

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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