

ISSUE 1; January 2016

### Description

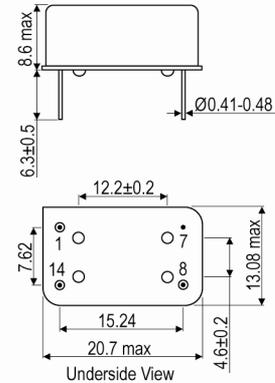
- The IQOV-74 Oven Controlled Crystal Oscillator (OCXO) is from the world's first ASIC-based OCXO family using patented ASIC technology. This Stratum 3 compliant oscillator delivers stability as low as  $\pm 10$ ppb over  $-20$  to  $70^\circ\text{C}$  and is capable of short-term ageing typically less than  $\pm 2$ ppb/day. The highly integrated oven ensures short warm-up times and low power consumption of typically 350mW at room temperature. The ASIC architecture delivers 1000x reliability improvement compared to traditional OCXOs and is available in a 14pin-DIL package.

For specific enquiries please contact one of IQD's Sales Offices where we can tailor a unique specification to meet your needs.
- Features:**

  - Frequency stability over temperature as low as  $\pm 10$ ppb over  $-20$  to  $70^\circ\text{C}$ .
  - Low power consumption.
  - High reliability.
- Applications:**

  - Stratum 3
  - Small Cells
  - Switches and Routers
  - Time and Frequency References
  - SyncE and IEEE1588
- Standard Frequencies:** 10.0MHz, 12.80MHz, 19.20MHz, 19.440MHz, 20.0MHz, 24.5760MHz, 25.0MHz & 26.0MHz.

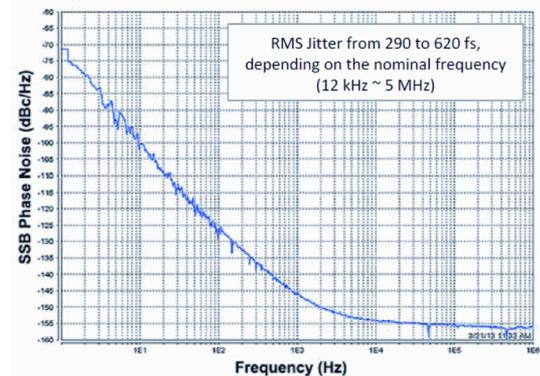
### Outline (mm)



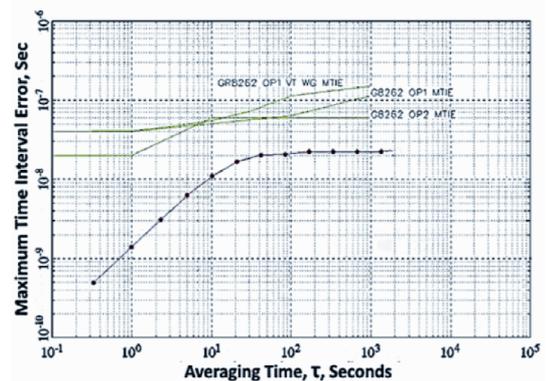
Pin Connections

- Do not connect
- GND
- Output
- +Vs

### Example Phase Noise @ 12.80MHz



### Maximum Time Interval Error (MTIE)



### Sales Office Contact Details:

UK: +44 (0)1460 270200  
Germany: 0800 1808 443

France: 0800 901 383  
USA: +1.760.318.2824

Email: [info@iqdfrequencyproducts.com](mailto:info@iqdfrequencyproducts.com)  
Web: [www.iqdfrequencyproducts.com](http://www.iqdfrequencyproducts.com)

### Frequency Parameters

- Frequency 10.0MHz to 26.0MHz
- Frequency Tolerance  $\pm 500.00\text{ppb}$
- Tolerance Condition @  $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$
- Frequency Stability:  $\pm 10\text{ppb}$  to  $\pm 100\text{ppb}$   
TA varied over operating temperature range in still air, measurement referenced to frequency observed with  $F_{\text{ref}} = (F_{\text{max}} + F_{\text{min}})/2$ , nominal voltage and load.
- Ageing:  
< $\pm 2\text{ppb}$  typ per day (after 30 days of continuous operation)  
 $\pm 1\text{ppm}$  typ in 1st year  
 $\pm 3\text{ppm}$  typ over 10 years
- Frequency Slope (measured in still air at a maximum rate of  $1^{\circ}\text{C}/\text{minute}$  within the operating temperature range):  $\pm 0.5$  to  $\pm 2\text{ppb}/^{\circ}\text{C}$
- Holdover Drift (24hrs, temperature variation  $\leq 1^{\circ}\text{C}$  - after 30 days continuous operation):  $< \pm 2.5$  to  $\pm 4\text{ppb}$  typ
- Root Allan Variance (20MHz, @  $25^{\circ}\text{C}$ ,  $\tau = 1\text{s}$ ):  $7 \times 10^{-11}$  typ
- Acceleration Sensitivity (gamma vector of all 3 axes from 30 to 1500Hz): Typically  $2\text{ppb}/\text{G}$  max
- Supply Voltage Variation ( $\pm 5\%$  change @  $25^{\circ}\text{C}$ , frequencies  $\leq 26\text{MHz}$ ):  $\pm 10\text{ppb}$  typ
- Load Variation ( $\pm 5\text{pF}$  or  $\pm 10\%$  change @  $25^{\circ}\text{C}$ , frequencies  $\leq 26\text{MHz}$ ):  $\pm 10\text{ppb}$  typ
- Reflow Variation (after reflow soldering and 1hr recovery @  $25^{\circ}\text{C}$ ):  $\pm 1\text{ppm}$  max
- Free-run Accuracy (all causes, 20yrs life, reference to nominal frequency):  $\pm 4.6\text{ppm}$  typ
- Wander Compliance (Loop Bandwidth 3MHz min): MTIE compliant with GR-1244 Fig 5-5 and G.812 Type 111 Fig 1 ( $\leq 100\text{ns}$ ), TDEV compliant with GR-1244 Fig 5-4 and G.812 Type 111 Fig 2 ( $\leq 10\text{ns}$ ), oscillator stabilised 24hrs at constant temperature ( $\pm 1^{\circ}\text{C}$ , still air), data collected over 100000secs at 1sec intervals (-3dB cut-off, 2nd order high pass loop filter).
- Note:  
Parts should be shielded from drafts causing unexpected thermal gradients. Temperature changes due to ambient air currents can lead to short term frequency drift.  
The characteristics of the component may be temporarily affected by the processes of assembly and soldering. The frequency specifications apply 48hrs after assembly. Nominal conditions apply unless otherwise stated.

### Electrical Parameters

- Supply Voltage Range Options: 2.7V to 5.5V ( $\pm 5\%$ )
- Power Consumption ( $-40$  to  $85^{\circ}\text{C}$  devices):  
Warm Up:  $1000\text{mW}$  typ  
Steady State (@  $25^{\circ}\text{C}$  in still air):  $400\text{mW}$  max
- Warm Up Time @  $25^{\circ}\text{C}$  (time needed for frequency to be within  $\pm 20\text{ppb}$  reference to frequency after 1hr @  $25^{\circ}\text{C}$  - this parameter is frequency, assembly and operating history dependent): Typically 3mins max

### Operating Temperature Ranges

- $-40$  to  $85^{\circ}\text{C}$

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#### Output Details

- Output Compatibility HCMOS/Clipped Sine
- HCMOS Output:
  - Voltage Output Low (VoL): 10%Vs max
  - Voltage Output High (VoH): 90%Vs min
  - Duty Cycle: 45/55% max
  - R/F Times (10 to 90%): 4ns max
  - Load: 15pF typ, 30pF max
- Clipped Sine Output (@ minimum Vs and load=10kΩ/10pF):  
0.8V pk-pk min, 1.1V pk-pk typ

#### Environmental Parameters

- Storage Temperature Range: -55 to 125°C
- Mechanical Shock: IEC 60068-2-27, Test Ea: 1000m/s<sup>2</sup> (100G) acceleration for 6ms, half sine pulse, 3 shocks in each direction along 3 mutually perpendicular planes (18 shocks total).
- Vibration: IEC 60068-2-06, Test Fc: 10 to 60Hz 0.75mm displacement, 60 to 500Hz 100m/s<sup>2</sup> (10G) acceleration, 30mins in each of 3 mutually perpendicular planes @ 1oct/min.
- Thermal Shock: IEC 60068-2-14, Test Nc: 15 cycles, -55°C to 125°C.
- Resistance to Solder Shock (for through-hole mounted devices): JESD22-B106-D:
  - Solder Bath Temperatures:
    - SnPb Solders: 260°C ±5°C
    - Pb-free Solders: 270°C ±5°C
  - Dwell Time: 10 to 12secs
- Solderability: IEC 60068-2-20, Test Ta: Precondition 16hrs @ 155°C, solder dip 3secs @ 245°C.
- Temperature Cycling: IEC 60068-2-14, Test Na: 400 cycles, -40°C to 125°C.
- Cold Power Cycle: 1000 cycles @ -45°C, 10mins power on, 20mins power off.
- Humidity: EIA/JEDEC22-A101: 85°C/85% R.H., 1000hrs.
- Hermeticity, Gross Leak: IEC 60068-2-17, Test Qc: 30secs immersion @ 125°C.
- Hermeticity, Fine Leak: IEC 60068-2-17, Test Qk: 1x10<sup>-8</sup>cc/s max of Helium.
- Lead Integrity: MIL-STD- 883, Method 2004 B2: 3 bends

#### Manufacturing Details

- Note: This through-hole component is suitable for assembly using both wave soldering and hand soldering, but the part has not been qualified for assembly with a reflow soldering process.

#### Compliance

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

#### Packaging Details

- Pack Style: Bulk Bulk pack
- Pack Size: 10

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Electrical Specification - maximum limiting values

Frequency Min	Frequency Max	Temperature Range	Stability Min	Current Draw	Rise and Fall Time	Duty Cycle
		°C	ppb	mA	ns	%
10.0MHz	26.0MHz	-40 to 85	-	-	-	-

This document was correct at the time of printing; please contact your local sales office for the latest version.

[Click to view latest version on our website.](#)

Chipset Approval Table

IQD Model	Ref No.	Frequency	Chipset Type	IC Supplier	
IQOV-74-1	M5860LF	12.8MHz	BCM560xx, BCM561xx, BCM562xx, BCM563xx, BCM564xx, BCM56440, BCM565xx, BCM566xx, BCM567xx, BCM56750, BCM568xx, BCM56851	Broadcom	
IQOV-74-2	M5861LF	25MHz	BCM560xx, BCM561xx, BCM562xx, BCM563xx, BCM564xx, BCM56440, BCM565xx, BCM566xx, BCM567xx, BCM56750, BCM568xx, BCM56852	Broadcom	
IQOV-74-3	M5950LF	50MHz	BCM560xx, BCM561xx, BCM562xx, BCM563xx, BCM564xx, BCM56440, BCM565xx, BCM566xx, BCM567xx, BCM56750, BCM568xx, BCM56854	Broadcom	
IQOV-74-4	M6329LF	30.72MHz	CNF71xx	Cavium	

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