

ISSUE 3; October 2021

### Description

- Temperature compensated crystal oscillator available with or without voltage control function.

Please note: This document is intended to illustrate the general capability and versatility of IQD's design. For specific enquiries please contact one of IQD's sales offices where we can tailor a unique specification to meet your needs.



### Frequency Parameters

- Frequency: 10.0MHz to 40.0MHz
- Frequency Tolerance:  $\pm 1.00$ ppm
- Frequency Stability:  $\pm 0.28$ ppm
- Ageing:  $\pm 0.02$ ppm max/day,  $\pm 1$ ppm max/year
- Frequency Tolerance: Measurement referenced to frequency observed with  $T_A=25^\circ\text{C}$ ,  $V_s=3.3\text{V}$ ,  $V_C=1.5\text{V}$  and load= $10\text{k}\Omega//10\text{pF}$ , within 30 days after ex-works.
- Frequency Stability:  $T_A$  varied across the operating temperature range, measurement referenced to frequency observed with  $f_{\text{ref}}=(f_{\text{max}}+f_{\text{min}})/2$ ,  $V_s=3.3\text{V}$ ,  $V_C=1.5\text{V}$ , load= $10\text{k}\Omega//10\text{pF}$  and temperature variable speed less than  $2^\circ\text{C}/\text{min}$ .
- Ageing:  $V_s$ ,  $V_C$ ,  $T_A$  and load constant, measurement referenced to frequency observed with  $T_A=25^\circ\text{C}$ ,  $V_s=3.3\text{V}$ ,  $V_C=1.5\text{V}$ , load= $10\text{k}\Omega//10\text{pF}$  and after 1hr of operation.
- Supply Voltage Variation (measurement referenced to frequency observed  $T_A=25^\circ\text{C}$ ,  $V_s$  varied from 3.13V to 3.47V,  $V_C=1.5\text{V}$  and load= $10\text{k}\Omega//10\text{pF}$ ):  $\pm 0.1$ ppm max
- Load Variation (measurement referenced to frequency observed with  $T_A=25^\circ\text{C}$ ,  $V_s=3.3\text{V}$ ,  $V_C=1.5\text{V}$  and load change= $10\text{k}\Omega//10\text{pF} \pm 5\%$ ):  $\pm 0.1$ ppm max
- Developed Frequencies:  
10.0MHz, 12.80MHz, 16.320MHz, 16.3840MHz, 19.20MHz, 20.0MHz, 30.720MHz, 32.7680MHz, 38.880MHz, 40.0MHz.

### Electrical Parameters

- Supply Voltage: 3.3V  $\pm 5\%$
- Current Consumption (@  $T_A=25^\circ\text{C}$ ,  $V_s=3.3\text{V}$ ,  $V_C=1.5\text{V}$  and load= $10\text{k}\Omega//10\text{pF}$ ): 5mA max

### Frequency Adjustment

- For devices with Voltage Control:  
Pulling:  $\pm 10$ ppm min to  $\pm 15$ ppm max  
Control Voltage: 1.5V  $\pm 1.0\text{V}$   
Input Impedance:  $100\text{k}\Omega$  min  
Linearity: 10% max  
Slope: Positive

### Operating Temperature Ranges

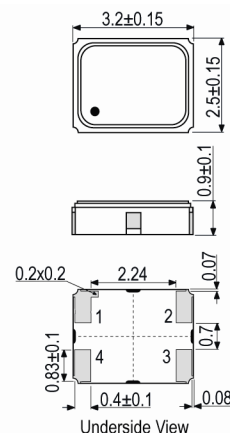
- 40 to  $85^\circ\text{C}$

### Output Details

- Output Compatibility: Clipped Sine
- Drive Capability:  $10\text{k}\Omega//10\text{pF}$
- Output Voltage Level: 0.8V pk-pk min



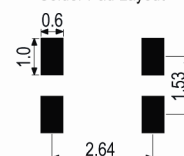
### Outline (mm) None =



### Pad Connections

1. N/C or Voltage Control
2. GND
3. Output
4. +Vs

### Solder Pad Layout



### Sales Office Contact Details:

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**Noise Parameters**

- Phase Noise @ 25°C (F=10.0MHz, typ):
  - 90dBc/Hz @ 10Hz
  - 120dBc/Hz @ 100Hz
  - 140dBc/Hz @ 1kHz
  - 145dBc/Hz @ 10kHz
  - 148dBc/Hz @ 100kHz

**Environmental Parameters**

- Operable Temperature Range: -40 to 85°C
- Storage Temperature Range: -55 to 105°C
- ESD Levels:
  - ESD Human Body Model (JEDEC JS-001-2010): Class 2: 2000V to 4000V
  - ESD Machine Model (JEDEC JESD22-A115C): Class B: 200V to 400V
- Shock: IEC 60068-2-27, Test Ea, Severity 50A: 100G acceleration for 6ms, half sine wave, 3 times in 3 mutually perpendicular planes.
- Vibration: IEC 60068-2-06, Test Fc: 10Hz-2000Hz, 0.75mm amplitude, 10G acceleration, 30mins per cycle, 3 times in 3 mutually perpendicular planes, test duration 2hrs.

**Manufacturing Details**

- Storage Conditions:
  - Temperature: -10 to 35°C
  - Humidity: 20 to 70% RH
- RoHS Terminations                      Ni (1µm~9µm), Au (0.5µ~1µm)
- RoHS Reflow                                      260°C max for 30sec max

**Compliance**

- RoHS Status (2015/863/EU)              Compliant
- REACH Status                                      Compliant
- MSL Rating (JDEC-STD-033):              2

**Packaging Details**

- Pack Style: Cutt              Cut tape  
Pack Size: 100
- Pack Style: Reel              Tape & reel in accordance with EIA-481-D  
Pack Size: 2,000

**Electrical Specification - maximum limiting values 3.3V ±5%**

| Frequency Min | Frequency Max | Temperature Range | Stability (Min) | Current Draw | Rise and Fall Time | Duty Cycle |
|---------------|---------------|-------------------|-----------------|--------------|--------------------|------------|
|               |               | °C                | ppm             | mA           | ns                 | %          |
| 10.0MHz       | 40.0MHz       | -40 to 85         | ±0.28           | 5            | -                  | -          |

*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.](#)

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