

ISSUE 3; March 2023

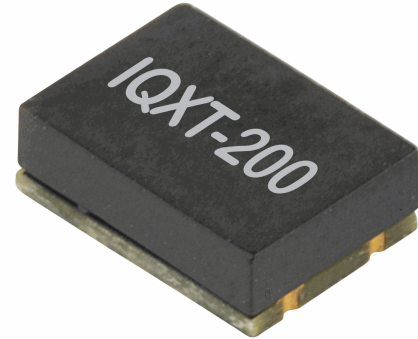
### Description

- Temperature compensated crystal oscillator available with or without voltage control in 8-pad or 10-pad package options.  
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.

Standard model options:-

- IQXT-200-1 HCMOS, no pulling
- IQXT-200-2 Clipped sine, no pulling
- IQXT-200-3 HCMOS, with pulling
- IQXT-200-4 Clipped sine, with pulling

- A 10 pad version
- B 8 pad version



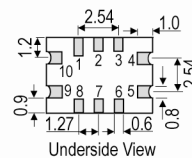
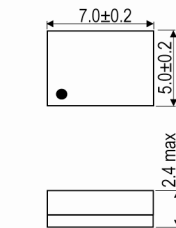
### Frequency Parameters

- Frequency 10.0MHz to 50.0MHz
- Frequency Tolerance  $\pm 0.50\text{ppm}$
- Tolerance Condition @ 25°C, 3.3V & VC=1.65V/NC
- Frequency Stability  $\pm 0.05\text{ppm}$  to  $\pm 2.00\text{ppm}$
- Ageing  $\pm 0.02\text{ppm}$  max per day,  $\pm 1.0\text{ppm}$  max per year
- Frequency Tolerance (measurement referenced to frequency observed with TA=25°C, Vs=3.3V, VC=1.65V/NC and within 30 days after ex-works):  $\pm 0.5\text{ppm}$
- Frequency Stability: TA varied across the operating temperature range, measurement referenced to frequency observed with TA=25°C, Vs=3.3V, VC=1.65V/NC, load=15pF/10kΩ/10pF and temperature variable speed less than 2°C per minute.
- Ageing: TA=25°C, Vs=3.3V, VC=1.65V/NC and after 1hr of operation.
- Supply Voltage Variation (measurement referenced to frequency observed with TA=25°C, Vs varied from 3.13V to 3.47V, VC=1.65V/NC and load=15pF/10kΩ/10pF):  $\pm 0.1\text{ppm}$  max
- Load Variation (5% load change measurement referenced to frequency observed with TA=25°C, Vs=3.3V, VC=1.65V/NC and load=15pF/10kΩ/10pF):  $\pm 0.1\text{ppm}$  max
- Short Term Stability (@ 25°C after 10mins power on): 5E-10/s typ @ 10.0MHz
- Developed Frequencies: 10.0MHz, 12.80MHz, 13.0MHz, 16.320MHz, 16.3840MHz, 19.20MHz, 19.440MHz, 20.0MHz, 25.0MHz, 26.0MHz, 30.720MHz, 38.88MHz, 40.0MHz, 50.0MHz

### Electrical Parameters

- Supply Voltage 3.3V  $\pm 5\%$
- Current: TA=25°C, Vs=3.3V, VC=1.65V/NC and load=15pF/10kΩ/10pF

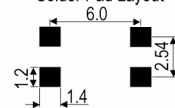
### Outline (mm) -A = 10 pad version



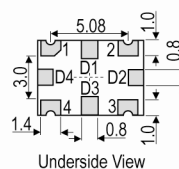
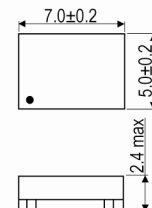
#### Pad Connections

1. N/C
2. N/C
3. N/C
4. GND
5. Output
6. N/C
7. N/C
8. N/C
9. +Vs
10. Voltage Control or N/C

#### Solder Pad Layout



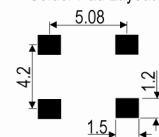
### Outline (mm) -B = 8 pad version



#### Pad Connections

1. Voltage Control or N/C
2. GND
3. Output
4. +Vs
- D1, D2, D3, D4. N/C

#### Solder Pad Layout



### Sales Office Contact Details:

UK: +44 (0)1460 270200

USA: +1 760 318 2824

Email: [info@iqdfrequencyproducts.com](mailto:info@iqdfrequencyproducts.com)

Web: [www.iqdfrequencyproducts.com](http://www.iqdfrequencyproducts.com)

**Frequency Adjustment**

- Pulling  $\pm 10\text{ppm}$  to  $\pm 15\text{ppm}$
- Control Voltage  $1.65\text{V} \pm 1.65\text{V}$
- Linearity:  $\pm 10\%$  max
- Slope: Positive
- Input Impedance:  $100\text{k}\Omega$  min

**Operating Temperature Ranges**

- $-20$  to  $70^\circ\text{C}$
- $-30$  to  $75^\circ\text{C}$
- $-40$  to  $85^\circ\text{C}$
- $-40$  to  $105^\circ\text{C}$

**Output Details**

- Output Compatibility HCMOS/Clipped Sine
- Duty Cycle (HCMOS): 45/55%
- Rise/Fall Time (HCMOS): 8ns max
- Output Load (HCMOS): 15pF
- Output Levels (HCMOS):  
Low (@  $V_s=3.3\text{V}$ , load=15pF): 0.4V max  
High (@  $V_s=3.3\text{V}$ , load=15pF): 2.4V min
- Output Load (Clipped Sine):  $10\text{k}\Omega//10\text{pF}$
- Output Levels (Clipped Sine): 0.8V pk-pk min

**Noise Parameters**

- Phase Noise (@ 10MHz typ):  
-90dBc/Hz @ 10Hz  
-115dBc/Hz @ 100Hz  
-135dBc/Hz @ 1kHz  
-145dBc/Hz @ 10kHz  
-148dBc/Hz @ 100kHz  
-150dBc/Hz @ 1MHz

**Environmental Parameters**

- Storage Temperature Range:  $-55$  to  $105^\circ\text{C}$
- ESD Level:  
HBM, Class 2: 2000V to 4000V, JEDEC JS-001-2010  
Machine Model, Class B: 200V to 400V, JEDEC JS-001-2010
- Shock: IEC 60068-2-27, Test Ea: 100g acceleration for 6ms, sinewave, in 3 mutually perpendicular planes
- Vibration: IEC 60068-2-6, Test Fc: 10Hz-2000Hz, 0.75mm amplitude, 10g acceleration, 30mins per cycle, in 3 mutually perpendicular planes, test duration 2hrs

**Manufacturing Details**

- Moisture Sensitivity Level: 2
- Maximum Reflow Temperature:  $260^\circ\text{C}$  (30secs max)

**Sales Office Contact Details:**

UK: +44 (0)1460 270200

USA: +1 760 318 2824

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

### Ordering Information

- Frequency\*
- Model Option\*
- Pad Variant\*
- Output Type\*
- Frequency Stability (over operating temperature range)\*
- Operating Temperature Range\*
- Supply Voltage
- Pulling\*
- (\*minimum required)
- Pad Variants:
  - A = 10 pad
  - B = 8 pad
- Example
  - 10.0MHz IQXT-200-3-B
  - HCMOS  $\pm 0.28\text{ppm}$  -20 to 70C 3.3V  $\pm 10\text{ppm}$  to  $\pm 15\text{ppm}$
- Note: not all stability/temperature combinations are available for all frequencies (please contact the IQD sales office to discuss your specific requirements)
- Note: 50MHz device has a reduced pulling range of  $\pm 5\text{ppm}$  to  $\pm 10\text{ppm}$  (please contact the IQD sale office to discuss your requirements)

### Compliance

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

### Packaging Details

- Pack Style: Reel      Tape & reel in accordance with EIA-481-D
- Pack Size: 600

### Electrical Specification - maximum limiting values 3.3V $\pm 5\%$

Frequency Min	Frequency Max	Temperature Range	Stability (Min)	Current Draw	Rise and Fall Time	Duty Cycle
		°C	ppm	mA	ns	%
10.0MHz	50.0MHz	-20 to 70	$\pm 0.05$	10	-	-
		-30 to 75	$\pm 0.05$	10	-	-
		-40 to 85	$\pm 0.05$	10	-	-
		-40 to 105	$\pm 0.05$	10	-	-

*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.](#)

### Sales Office Contact Details:

UK: +44 (0)1460 270200

USA: +1 760 318 2824

Email: [info@iqdfrequencyproducts.com](mailto:info@iqdfrequencyproducts.com)

Web: [www.iqdfrequencyproducts.com](http://www.iqdfrequencyproducts.com)