

**ISSUE 2; January 2015 - RoHS 2011/65/EU**
**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**

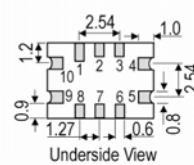
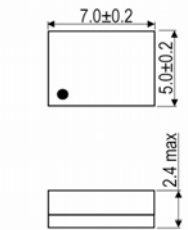
- Frequency: 10.0MHz to 50.0MHz
- Frequency Tolerance:  $\pm 0.50\text{ppm}$
- Tolerance Condition: @ 25°C, 3.3V & VC=1.65V/NC
- Frequency Stability:  $\pm 0.28\text{ppm}$  to  $\pm 2.00\text{ppm}$
- Ageing:  $\pm 0.02\text{ppm}$  max per day,  $\pm 1.0\text{ppm}$  max per year
- Frequency Tolerance (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

**Electrical Parameters**

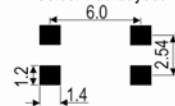
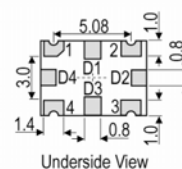
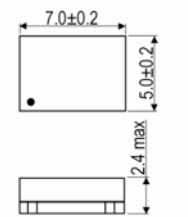
- Supply Voltage: 3.3V  $\pm 5\%$
- Current: TA=25°C, Vs=3.3V, VC=1.65V/NC and load=15pF/10kΩ//10pF

**Frequency Adjustment**

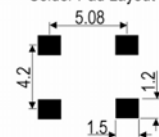
- Pulling:  $\pm 10\text{ppm}$  to  $\pm 15\text{ppm}$
- Control Voltage: 1.65V  $\pm 1.65\text{V}$
- Linearity:  $\pm 10\%$  max
- Slope: Positive
- Input Impedance: 100kΩ min

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

**Pad Connections**

- N/C
- N/C
- N/C
- GND
- Output
- N/C
- N/C
- N/C
- +Vs
- Voltage Control or N/C

**Solder Pad Layout**

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

**Pad Connections**

- Voltage Control or N/C
  - GND
  - Output
  - +Vs
- D1, D2, D3, D4: N/C

**Solder Pad Layout**

**Sales Office Contact Details:**

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**Operating Temperature Ranges**

- -20 to 70°C
- -30 to 75°C
- -40 to 85°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 (@ Vs=3.3V, load=15pF): 0.4V max  
  High (@ Vs=3.3V, load=15pF): 2.4V min
- Output Load (Clipped Sine): 10kΩ//10pF
- 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°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°C (30secs max)

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**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                           Compliant
- REACh Status                           Compliant
- MSL Rating (JDEC-STD-033):       2

**Packaging Details**

- Pack Style: Bulk            Loose in bulk pack  
Pack Size: 1
- 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	$\pm 0.28$	10	-	-
		-30 to 75	$\pm 0.28$	10	-	-
		-40 to 85	$\pm 0.28$	10	-	-

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

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