

ISSUE 1; April 2016

### Description

- A high performance, surface-mount Temperature Compensated Crystal Oscillator (TCXO) utilising an analogue IC and offering excellent phase noise, frequency stability and VC tilt compensation.
- FEATURES:  
Excellent Phase Noise and Frequency Stability performance. Frequency Slope and Perturbation specifications can be customised.
- APPLICATIONS:  
Communications, Base Station, Handset, Femtocell, DSL/ADSL, LTE, SONET/SDH, WiMAX/WiBro, WLAN, IP Timing, Precision GPS.

### Frequency Parameters

- Frequency: 5.0MHz to 52.0MHz
- Frequency Tolerance:  $\pm 1.00\text{ppm}$
- Tolerance Condition: @ 25°C  $\pm 2^\circ\text{C}$
- Frequency Stability (referenced to  $(F_{\text{max}}+F_{\text{min}})/2$ , temperature ramp  $\leq 1^\circ\text{C}/\text{min}$  and VC=2.5V):  $\pm 0.1\text{ppm}$  to 3.0ppm
- Ageing (@ 25°C):  $\pm 1\text{ppm}$  max over 1yr
- Frequency Slope (minimum of one frequency reading every 2°C over the operating temperature range, temperature ramp  $\leq 1^\circ\text{C}/\text{min}$  and VC=2.5V): 0.1ppm/°C max
- Static Temperature Hysteresis (frequency change after reciprocal temperature ramped over the operating range - frequency measured before and after @ 25°C): 0.4ppm max
- Supply Voltage Variation ( $\pm 5\%$  change @ 25°C):  $\pm 0.1\text{ppm}$  max
- Load Variation ( $\pm 10\%$  change @ 25°C and load as stated in Output Details section):  $\pm 0.2\text{ppm}$  max
- Reflow Variation (after two consecutive reflows as per profile shown and 1hr recovery @ 25°C):  $\pm 1\text{ppm}$  max
- 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.

### Electrical Parameters

- Supply Voltage Range: 2.8V to 5.5V
- Supply Current (@ TA=25°C, Vs max and load as stated in Output Details section): 2.9mA max

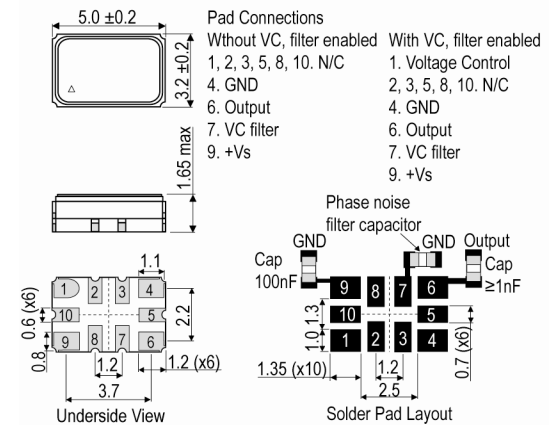
### Frequency Adjustment

- Pulling:  $\pm 6\text{ppm}$  to  $\pm 30\text{ppm}$
- Control Voltage: 2.5V  $\pm 2.0\text{V}$
- Input Impedance: 100k $\Omega$  min
- Linearity (deviation from straight line curve fit): 10% max
- Note: VC of 4.5V is only applicable when a Vs of 5.0V is applied.

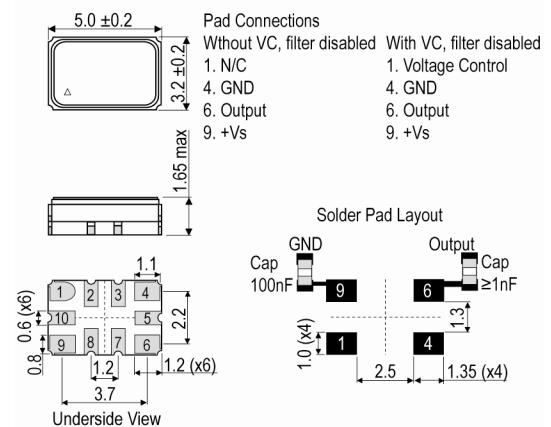
### Operating Temperature Ranges

- -40 to 85°C

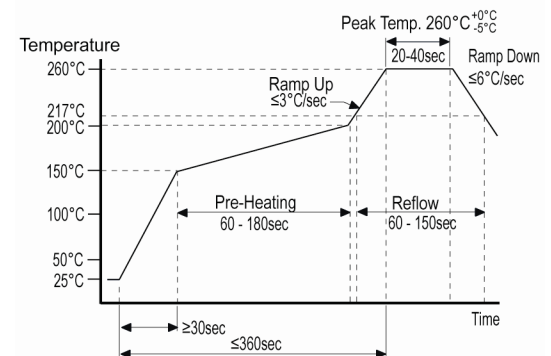
### Outline (mm)



### Outline (mm)



### Pb-Free Reflow



### Sales Office Contact Details:

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**Output Details**

- Output Compatibility HCMOS/Clipped Sine
- HCMOS Output Waveform:
  - Output Voltage Level Low (VoL): 10%Vs max
  - Output Voltage Level High (VoH): 90%Vs min
  - Rise and Fall Times (measured @ 10pF): 5ns max
  - Duty Cycle (measured @ 50% level): 40/60% max
  - Output Load Capability: 10pF
  - Settling Time (time taken for frequency to reach specified Frequency Tolerance): 10ms max
- Note: Assumes no phase noise filtering - if low phase noise is required the Settling Time will be extended.
- Clipped Sine Output Waveform:
  - Output Voltage Level (@ TA=25°C, Vs min and load=10kΩ/10pF): 0.8V pk-pk min
  - Output Load Capability: 10kΩ/10pF
  - Output: DC-coupled
  - Note: AC-coupled output requires an external capacitor, ≥1nF recommended.
  - Start Up Time (amplitude within 90% of specified output level): 1ms max
  - Settling Time (time taken for frequency to reach specified Frequency Tolerance): 10ms max
- Note: Assumes no phase noise filtering - if low phase noise is required the Settling Time will be extended.

**Noise Parameters**

- Phase Noise (typical for a 10MHz HCMOS oscillator @ 25°C):
  - 75dBc/Hz @ 1Hz
  - 98dBc/Hz @ 10Hz
  - 127dBc/Hz @ 100Hz
  - 147dBc/Hz @ 1kHz
  - 152dBc/Hz @ 10kHz
  - 155dBc/Hz @ 100kHz
  - 157dBc/Hz @ 1MHz

**Environmental Parameters**

- Storage Temperature Range: -40 to 85°C
- Mechanical Shock: IEC 60068-2-27: Half sine-wave acceleration of 100G peak amplitude for 6ms duration, 3 times in 3 mutually perpendicular planes.
- Vibration: 10G rms from 30Hz to 1500Hz random for 4hrs in 3 mutually perpendicular planes, 12hrs total.
- Thermal Shock: Exposed @ -40°C for 30mins then 85°C for 30mins constantly for a period of 5 days.
- Humidity: After 48hrs @ 85°C ±2°C, 85% RH non-condensing.
- Note: The environmental conditions will cause a frequency shift @ 25°C of ≤1ppm.

**Manufacturing Details**

- Maximum Process Temperature: 260°C (40secs max)

**Compliance**

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

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### Packaging Details

- Pack Style: Reel      Tape & reel in accordance with EIA-481-D  
Pack Size: 2,000
- Pack Style: Bulk      Bulk pack  
Pack Size: 1

### Electrical Specification - maximum limiting values

Frequency Min	Frequency Max	Temperature Range	Stability	Current Draw	Rise and Fall Time	Duty Cycle
		°C	ppm	mA	ns	%
5.0MHz	52.0MHz	-40 to 85	-	-	-	-

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### Chipset Approval Table

IQD Model	Ref No.	Frequency	Chipset Type	IC Supplier	
IQXT-313-1	509164	30.720MHz	OCTEON Fusion CNF71xx	Cavium	
IQXT-313-2	509237	12.80MHz	82V3910, 82V3911, 8V89316 and all 82V33xx SyncE chipsets.	IDT	
IQXT-313-3	509407	24.5760MHz	ZL30152, ZL30155, ZL30157, ZL30159, ZL30160, ZL30165	Microsemi	
IQXT-313-4	509673	19.20MHz	FSM9xxx, FSM99xx	Qualcomm	
IQXT-313-5	509756	25.0MHz	Transcede 2000, Transcede 3000, Transcede 4000	Intel	
IQXT-313-6	512476	19.20MHz	Transcede 2000, Transcede 3000, Transcede 4000	Intel	

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