

ISSUE 1; January 2016

Description

- A high performance, surface-mount Temperature Compensated Crystal Oscillator (TCXO) offering excellent phase noise, frequency stability and VC tilt compensation. The IQXT-317 employs an analogue IC for the oscillator and temperature compensation.
- FEATURES:**
Excellent Phase Noise and Frequency Stability performance. Frequency Slope and Perturbation specifications can be customized.
- APPLICATIONS:**
Communications, Base Station, 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

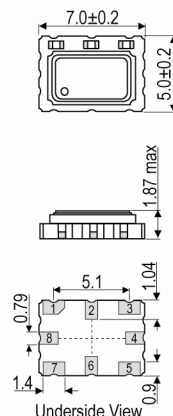
Frequency Adjustment

- Pulling: $\pm 6\text{ppm}$ to $\pm 30\text{ppm}$
- Control Voltage: 2.5V $\pm 2.0\text{V}$
- Input Impedance: 100kΩ 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

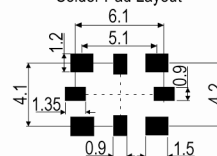
- 40 to 85°C

Outline (mm)

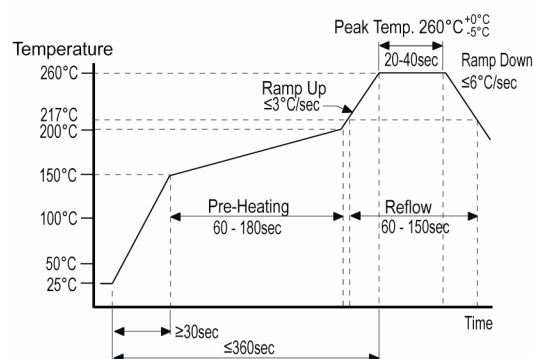


Pad Connections	
Without VC	With VC
1. N/C	1. Voltage Control
2. N/C	2. N/C
3. GND	3. GND
4. N/C	4. N/C
5. Output	5. Output
6. N/C	6. N/C
7. +Vs	7. +Vs
8. N/C	8. N/C

Solder Pad Layout



Pb-Free Reflow



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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: AC-coupled
 - 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

Packaging Details

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

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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	-	-	-	-

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

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Chipset Approval Table

IQD Model	Ref No.	Frequency	Chipset Type	IC Supplier	
IQXT-317-1	509408	20.0MHz	ZL30152, ZL30155, ZL30157, ZL30159, ZL30160, ZL30165	Microsemi	
IQXT-317-2	509768	40.0MHz	Si5328, AppNote 776	SiLabs	
IQXT-317-3	513872	40.0MHz	Si5342, Si5344, Si5345	SiLabs	

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