ISSUE 1; March 2016

Description

- A surface-mount Voltage Controlled Temperature Compensated Crystal Oscillator (VCTCXO) for applications where phase noise performance under vibration is critical. The IQXT-312 is a single chip oscillator with an analogue compensation circuit, and a patented crystal resonator design, resulting in high stability over a wide temperature range paired with good acceleration sensitivity.

Frequency Parameters

- Frequency 10.0MHz to 30.0MHz
- Frequency Tolerance ±1.00ppm
- Tolerance Condition @ 25°C ±2°C
- Frequency Stability: TA varied over operating temperature range, measurement referenced to frequency observed with Fref=(Fmax+Fmin)/2, Vs and load both equal to nominal values: ±0.2ppm to ±5.0ppm
- Ageing (F≤26MHz):
  1st year: ±1ppm max
  10yrs: ±3ppm max
- Ageing (F>26MHz):
  1st year: ±2ppm max
  10yrs: ±5ppm max
- Frequency Slope ΔF/ΔT (in still air, temperature ramp ≤1°C/min): 20 to 200 ppb/°C
- Acceleration Sensitivity (gamma vector over operating temperature range): 0.2ppb/G typ, 0.5ppb/G max
- Supply Voltage Variation (±5% change @ 25°C):
  HCMOS: ±0.2ppm max
  Clipped Sine: ±0.1ppm max
- Load Variation (@ 25°C)
  HCMOS (±5pF change ref freq @ 15pF): ±0.2ppm max
  Clipped Sine (±10% change ref freq @ 10kΩ//10pF): ±0.1ppm max
- Reflow Variation (after 1hr recovery @ 25°C): ±1ppm max

Electrical Parameters

- Supply Voltage Range: 2.5V to 5.7V
  (Standard Voltages are 3.3V & 5.0V)
- Supply Current (typically):
  HCMOS: 1+frequency(MHz)*supply(V)*{load(pF)+15}*10□³mA
  (e.g 20MHz, 5V, 15pF = 4mA)
  Clipped Sine: 1+frequency(MHz)*1.2*{load(pF)+30}*10□³mA

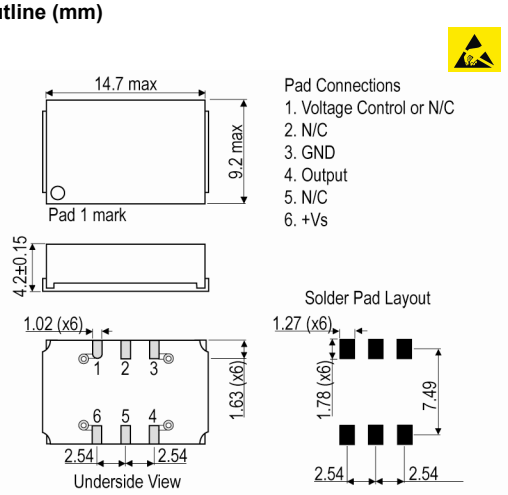
Frequency Adjustment

- Control Voltage 1.5V ±1.0V
- Pulling (F≤26MHz): ±5ppm min
- Pulling (F>26MHz): ±7ppm min

Operating Temperature Ranges

- -55 to 105°C

Outline (mm)



Sales Office Contact Details:

UK: +44 (0)1460 270200 France: 0800 901 383 Email: info@iqdfrequencyproducts.com
Germany: 0800 1808 443 USA: +1.760.318.2824 Web: www.iqdfrequencyproducts.com

Output Details

- Output Compatability 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 with Vs=3.3V): 8ns max
  Rise and Fall Times (measured with Vs=5.0V): 7ns max
  Duty Cycle (measured @ 50% level): 45/55% max
  Load: 15pF
- Clipped Sine Output Waveform:
  Output Voltage Level: 0.8V pk-pk min
  Output Load Resistance: 10kΩ
  Output Load Capacitance: 10pF
  Output: DC-coupled
- Note: Pure Sine & ACMOS are also available - please contact an IQD Sales Office.

Noise Parameters

- Phase Noise (typical for a 20MHz Clipped Sine oscillator @ 25°C):
  -63dBc/Hz @ 1Hz
  -93dBc/Hz @ 10Hz
  -104dBc/Hz @ 100Hz
  -128dBc/Hz @ 1kHz
  -136dBc/Hz @ 10kHz
  -140dBc/Hz @ 100kHz
  -143dBc/Hz @ 1MHz
- Note: For Phase Noise data on a HCMOS oscillator please contact an IQD Sales Office.

Environmental Parameters

- Storage Temperature Range: -55 to 125°C
- Shock: IEC 60068-2-27, Test Ea: Half sine-wave acceleration of 100G peak amplitude for 6ms duration, 3 times in 3 mutually perpendicular planes, 18 shocks total.
- Vibration: IEC 60068-2-06, Test Fc: 10Hz-60Hz 0.75mm displacement, 60Hz-500Hz 20G acceleration, 1.5hrs in 3 mutually perpendicular planes @ 1oct/min.
- Acceleration Steady State: IEC 60068-2-07, Test Ga: 5000G, 10secs @ peak acceleration, Y-axis only.
- Solderability: MIL-STD-202, Method 208, Category 3.

Manufacturing Details

- Maximum Process Temperature: 245°C (30secs max)

Compliance

- RoHS Status (2011/65/EU) Compliant
- REACh Status Compliant
- MSL Rating (JDEC-STD-033): 2

Packaging Details

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

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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	%
10.0MHz	30.0MHz	-55 to 105	-	-	-	-

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	
E3131LF		12.80MHz	ACS1790T, ACS9510, ACS9520T, ACS9522T, ACS9550, ACS9593T, ACS8522BT, ACS8509, ACS8510, ACS8514, ACS8515, ACS8520, ACS8520A, ACS8522	Semtech	
E3353LF		12.80MHz	ACS1790T, ACS9510, ACS9520T, ACS9522T, ACS9550, ACS9593T, ACS8522BT, ACS8509, ACS8510, ACS8514, ACS8515, ACS8520, ACS8520A, ACS8522	Semtech	
E3408LF		12.80MHz	ACS1790T, ACS9510, ACS9520T, ACS9522T, ACS9550, ACS9593T, ACS8522BT, ACS8509, ACS8510, ACS8514, ACS8515, ACS8520, ACS8520A, ACS8522	Semtech	
E4496LF		38.880MHz	ZL30152, ZL30155, ZL30157, ZL30159, ZL30160, ZL30165	Microsemi	
IQXT-312-1	E4497LF	38.880MHz	ZL30152, ZL30155, ZL30157, ZL30159, ZL30160, ZL30165	Microsemi	

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