

ISSUE 3; October 2023

Description

- Voltage controlled temperature compensated crystal oscillator (VCTCXO) in a 5x3.2mm SMD package.



Frequency Parameters

- Frequency: 12.8MHz
- Frequency Tolerance: $\pm 0.50\text{ppm}$
- Frequency Stability: $\pm 0.14\text{ppm}$
- Ageing: $\pm 0.02\text{ppm max/day, } \pm 1\text{ppm max/year}$
- Frequency Tolerance: Measurement referenced to frequency observed with $T_A=25^\circ\text{C}$, $V_s=3.3\text{V}$, $V_C=1.5\text{V}$ and within 30 days after ex-works.
- Frequency Stability: TA varied across the operating temperature range, measurement referenced to frequency observed with $F_{\text{ref}}=(F_{\text{max}}-F_{\text{min}})/2$, $V_s=3.3\text{V}$, $V_C=1.5\text{V}$, load=15pF and temperature variable speed less than 2°C per minute.
- Ageing: $T_A=25^\circ\text{C}$, $V_s=3.3\text{V}$, $V_C=1.5\text{V}$ and after 1hr of operation.
- Supply Voltage Variation (measurement referenced to frequency observed with $T_A=25^\circ\text{C}$, V_s varied from 3.13V to 3.47V, $V_C=1.5\text{V}$ and load=15pF): $\pm 0.1\text{ppm max}$
- Load Variation (measurement referenced to frequency observed with $T_A=25^\circ\text{C}$, $V_s=3.3\text{V}$, $V_C=1.5\text{V}$ and load change=15pF $\pm 5\%$): $\pm 0.2\text{ppm max}$

Electrical Parameters

- Supply Voltage: 3.3V $\pm 5\%$
- Current Consumption: @ $T_A=25^\circ\text{C}$, $V_s=3.3\text{V}$, $V_C=1.5\text{V}$ and load=15pF): 10mA max

Frequency Adjustment

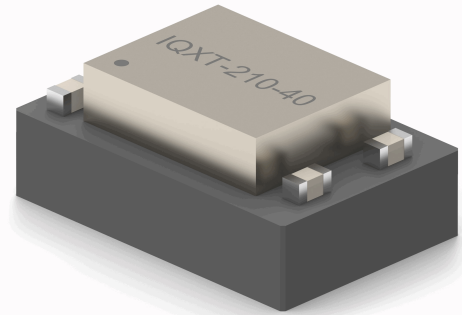
- Pulling: $\pm 10\text{ppm min to } \pm 15\text{ppm max}$
- Control Voltage: 1.5V $\pm 1.5\text{V}$
- Input Impedance: 100k Ω min
- Linearity: 10% max
- Slope: Positive

Operating Temperature Ranges

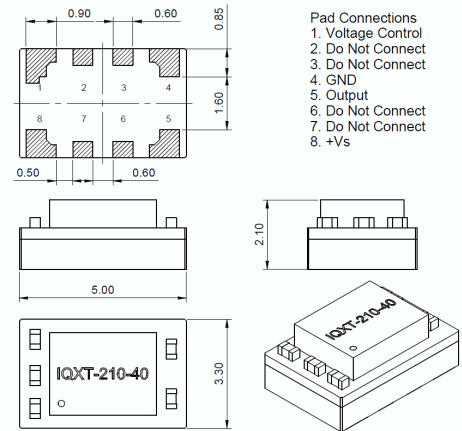
- -40 to 85°C

Output Details

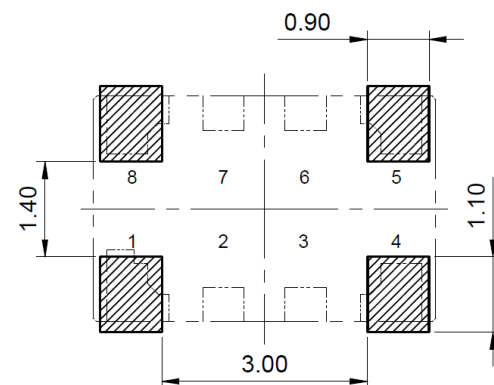
- Output Compatibility: HCMOS
- Drive Capability: 15pF
- Output Voltage Levels (@ $V_s=3.3\text{V}$ and load=15pF):
Output Low (VoL): 0.4V max
Output High (VoH): 2.4V min



Outline (mm)



Recommended Solder Pad Layout



Sales Office Contact Details:

UK: +44 (0)1460 270200

USA: +1 760 318 2824

Email: info@iqdfrequencyproducts.com

Web: www.iqdfrequencyproducts.com

Noise Parameters

- Phase Noise (typ @ 25°C):
 - 85dBc/Hz @ 10Hz
 - 115dBc/Hz @ 100Hz
 - 135dBc/Hz @ 1kHz
 - 145dBc/Hz @ 10kHz
 - 150dBc/Hz @ 100kHz
 - 150dBc/Hz @ 1MHz
- Phase Noise (max @ 25°C):
 - 80dBc/Hz @ 10Hz
 - 110dBc/Hz @ 100Hz
 - 130dBc/Hz @ 1kHz
 - 140dBc/Hz @ 10kHz
 - 145dBc/Hz @ 100kHz
 - 145dBc/Hz @ 1MHz

Environmental Parameters

- Storage Temperature Range: -55 to 105°C
- ESD Levels:
 - Human Body Model, Class 2: 2000V to 4000V, ANSI/ESDA/JEDEC JS-001-2010
 - Machine Model, Class B: 200V to 400V, JEDEC JESD22-A115C
- Shock: IEC 60068-2-27, Test Ea, Severity 50A: 100g acceleration for 6ms, half sine wave, 3 times in 3 mutually perpendicular planes.
- Vibration: IEC 60068-2-06, Test Fc: 10Hz-2000Hz, 0.75mm amplitude, 10g acceleration, 30mins per cycle, 3 times in 3 mutually perpendicular planes, test duration 2hrs.

Manufacturing Details

- RoHS Reflow 260°C max for 30s max

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: 1,000
- Pack Style: Cutt Cut tape
Pack Size: 1

Electrical Specification - maximum limiting values 3.30V ±5%

Frequency	Temperature Range	Stability	Current Draw	Rise and Fall Time (10-90%)	Duty Cycle
	°C	ppm	mA	ns	%
12.8MHz	-40 to 85	±0.14	10	8	45/55%

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