

ISSUE 3; October 2023

### Description

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



### Frequency Parameters

- Frequency 20.0MHz
- Frequency Tolerance  $\pm 0.50$ ppm
- Frequency Stability  $\pm 0.14$ ppm
- Ageing  $\pm 0.02$ ppm max/day,  $\pm 1$ ppm max/yr
- 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  $2^\circ\text{C}$  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):  $\pm 0.1$ 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  $\pm 5\%$ ):  $\pm 0.2$ ppm max

### Electrical Parameters

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

### Frequency Adjustment

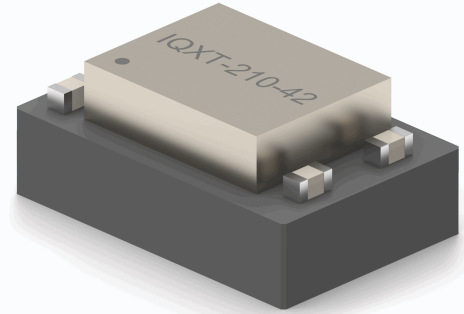
- Pulling  $\pm 10$ ppm min to  $\pm 15$ ppm max
- Control Voltage 1.5V  $\pm 1.5\text{V}$
- Input Impedance 100k $\Omega$  min
- Linearity: 10% max
- Slope: Positive

### Operating Temperature Ranges

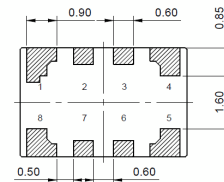
- -40 to  $85^\circ\text{C}$

### Output Details

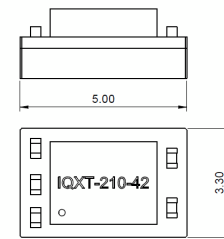
- Output Compatibility HCMOS
- Drive Capability 15pF
- Output Voltage Levels (@  $V_s=3.3\text{V}$  and load=15pF):  
Output Low (VoL): 0.4V max  
Output High (VoH): 2.4V min



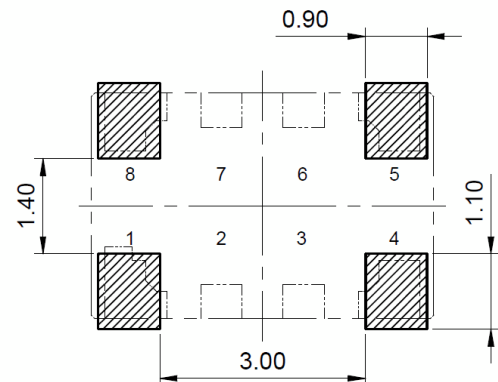
### Outline (mm)



- Pad Connections
1. Voltage Control
  2. Do Not Connect
  3. Do Not Connect
  4. GND
  5. Output
  6. Do Not Connect
  7. Do Not Connect
  8. +Vs



### Recommended Solder Pad Layout



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**Noise Parameters**

- Phase Noise (typ @ 25°C):
  - 85dBc/Hz @ 10Hz
  - 115dBc/Hz @ 100Hz
  - 130dBc/Hz @ 1kHz
  - 145dBc/Hz @ 10kHz
  - 150dBc/Hz @ 100kHz
  - 150dBc/Hz @ 1MHz
- Phase Noise (max @ 25°C):
  - 80dBc/Hz @ 10Hz
  - 108dBc/Hz @ 100Hz
  - 125dBc/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 30secs max

**Compliance**

- RoHS Status (2015/863/EU) Compliant
- REACH Status Compliant
- MSL Rating (JDEC-STD-033): 2

**Packaging Details**

- Pack Style: Cutt Cut tape  
Pack Size: 1
- Pack Style: Reel Tape & reel in accordance with EIA-481-D  
Pack Size: 1,000

**Electrical Specification - maximum limiting values 3.30V ±5%**

Frequency	Temperature Range	Stability	Current Draw	Rise and Fall Time	Duty Cycle
	°C	ppm	mA	ns	%
20.0MHz	-40 to 85	±0.14	10	8	45/55%

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