


**Description**

- The IQXT-270-3 temperature compensated crystal oscillator (TCXO) employs an analogue ASIC for the oscillator and a high order temperature compensation circuit in a 2.0 x 1.6mm size package.
- Model IQXT-270-3
- Model Issue number 1

**Frequency Parameters**

- Frequency 16.3690MHz
- Frequency Tolerance  $\pm 1.00\text{ppm}$
- Frequency Stability  $\pm 0.50\text{ppm}$
- Operating Temperature Range  $-40.00$  to  $85.00^\circ\text{C}$
- Ageing  $\pm 1\text{ppm}$  max per year at  $25^\circ\text{C}$
- Frequency Tolerance: Offset from nominal frequency measured at  $25^\circ\text{C} \pm 2^\circ\text{C}$ .
- Reflow Shift (two consecutive reflows as per profile after 1 hour relaxation at  $25^\circ\text{C}$ ):  $\pm 1\text{ppm}$  max
- Frequency Stability: Referenced to the midpoint between minimum and maximum frequency value over the specified temperature range (note 1).
- Frequency Slope (minimum of one frequency reading every  $2^\circ\text{C}$ , over the operating temperature range - note 1):  $0.1\text{ppm}/^\circ\text{C}$  max
- Static Temperature Hysteresis (frequency change after reciprocal temperature ramped over the operating range, frequency measured before and after at  $25^\circ\text{C}$ ):  $\pm 0.6\text{ppm}$  max
- Supply Voltage Variation ( $\pm 5\%$  change at  $25^\circ\text{C}$ ):  $\pm 0.1\text{ppm}$  max
- Load Variation ( $\pm 10\%$  change at  $25^\circ\text{C}$  - note 2):  $\pm 0.2\text{ppm}$  max
- Frequency Drift Rate:  
Drift Period: 0.03 to 0.3 seconds: 500ppb/s max  
Drift Period: 0.3 to 1.0 seconds: 40ppb/s max  
Drift Period: 1.0 to 3.0 seconds: 2.5ppb/s max

**Electrical Parameters**

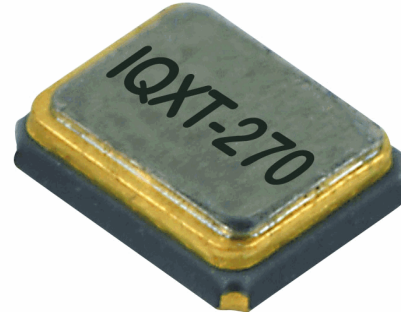
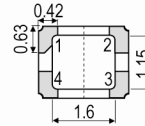
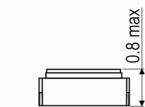
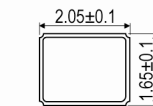
- Supply Voltage  $1.8\text{V} \pm 5\%$
- Current Draw  $1.50\text{mA}$
- Supply Current (at  $V_s$  max - note 2):  $1.5\text{mA}$  max

**Output Details**

- Output Compatibility Clipped Sine
- Drive Capability  $10\text{k}\Omega/10\text{pF} \pm 10\%$
- Output Voltage Level (at  $V_s$  min - note 2):  $0.8\text{V}$  pk-pk min
- Output: DC coupled (note 3)

**Noise Parameters**

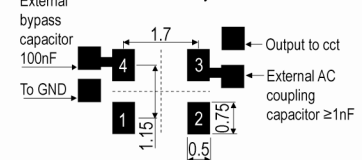
- Phase Noise at  $25^\circ\text{C}$  (typical):  
-62dBc/Hz @ 1Hz  
-90dBc/Hz @ 10Hz  
-112dBc/Hz @ 100Hz  
-132dBc/Hz @ 1kHz  
-145dBc/Hz @ 10kHz  
-147dBc/Hz @ 100kHz


**Outline (mm)**


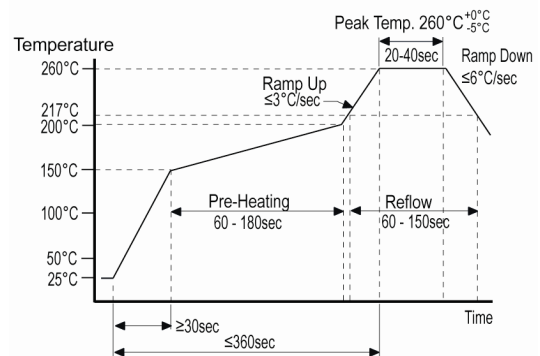
Underside View

**Pad Connections**

1. GND / N/C
2. GND
3. Output
4.  $+V_s$

**Solder Pad Layout**


Recommend no tracks, including plains under the device.

**Pb-Free Reflow**

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**Environmental Parameters**

- Shock: MIL-STD-202 M213 (note 4): Half sine-wave acceleration of 3000G peak amplitude, duration 0.3ms, velocity 12.3ft/s.
- Moisture Resistance: MIL-STD-202 M106g (note 4): 1000 hours at 85°C, 85% relative humidity. Biased.
- Thermal Cycling: JESD22 Method JA-104C (note 4): 1000 temperature cycles, where each cycle consists of a 25 minutes soak time at -40°C followed by a 25 minute soak time at 85°C, with a 60 second maximum transition time between temperatures. Air to air transition.
- Vibration: JESD22-B103-B (note 4): 10G peak acceleration for 20 minutes 12 cycles in each of the 3 orientations, swept from 10-2000Hz.
- Storage Temperature Range: -40 to 85°C

**Manufacturing Details**

- Maximum Process Temperature: 260°C (40secs max)
- Note 1: Parts should be shielded from drafts causing unexpected thermal gradients. Temperature changes due to ambient air currents can lead to short term frequency drift.
- Note 2: Specified for the load stated in Output Details above, at 25°C.
- Note 3: External AC coupling capacitor required; 1nF or greater recommended.
- Note 4: Frequency shift of  $\pm 1$ ppm max after environmental conditions.

**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: 4,000
- *Alternative packing option available*

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