

Customer Part:

Description

- The IQXT-270-10 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-270-10
- Model Issue number 2

Frequency Parameters

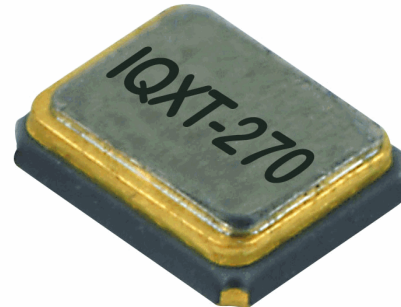
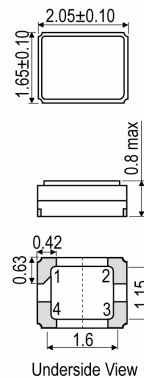
- Frequency 19.20MHz
- Frequency Tolerance $\pm 1.00\text{ppm}$
- Frequency Stability $\pm 0.50\text{ppm}$
- Operating Temperature Range -30.00 to 85.00°C
- Ageing $\pm 0.7\text{ppm}$ max per year at 25°C
- Frequency Tolerance: Offset from nominal frequency measured at $25^\circ\text{C} \pm 2^\circ\text{C}$.
- Reflow Shift (two consecutive reflows as per profile after 1 hour relaxation at 25°C): $\pm 1\text{ppm}$ max
- Frequency Stability: Referenced to the midpoint between minimum and maximum frequency value over the specified temperature range. Control voltage set to midpoint of control voltage (note 1).
- Frequency Slope (minimum of one frequency reading every 2°C , over -10 to 60°C . Control voltage set to midpoint of control voltage, note 1): $0.05\text{ppm}/^\circ\text{C}$ max
- Frequency drift (calculated from frequency slope with temperature varied at a maximum of $1.92^\circ\text{C}/\text{min}$ ($0.032^\circ\text{C}/\text{s}$) over -10°C to 60°C , note 5): $1.6\text{ppb}/\text{sec}$ max
- Frequency Slope (minimum of one frequency reading every 2°C , over -30°C to -85°C . Control voltage set to midpoint of control voltage, note 1): $0.1\text{ppm}/^\circ\text{C}$ max
- Frequency drift (calculated from frequency slope with temperature varied at a maximum of $0.96^\circ\text{C}/\text{min}$ ($0.016^\circ\text{C}/\text{s}$) over -30°C to 85°C , note 5): $1.6\text{ppb}/\text{sec}$ max
- Small thermal cycle frequency slope (measured at 0.5°C intervals over any 5°C heating and 5°C cooling cycle, at a minimum rate of $1^\circ\text{C}/\text{minute}$ within the operating temperature range, note 6): $50\text{ppb}/^\circ\text{C}$ max
- Small thermal cycle hysteresis (difference in frequency measurements over any 5°C heating and 5°C cooling cycle, at a minimum rate of $1^\circ\text{C}/\text{minute}$ within the operating temperature range): 50ppb pk-pk max
- Supply Voltage Variation ($\pm 5\%$ change at 25°C): $\pm 0.1\text{ppm}$ max
- Load Variation ($\pm 10\%$ change at 25°C): $\pm 0.2\text{ppm}$ max

Electrical Parameters

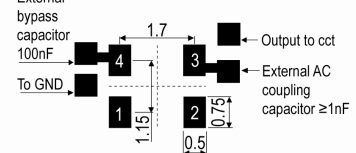
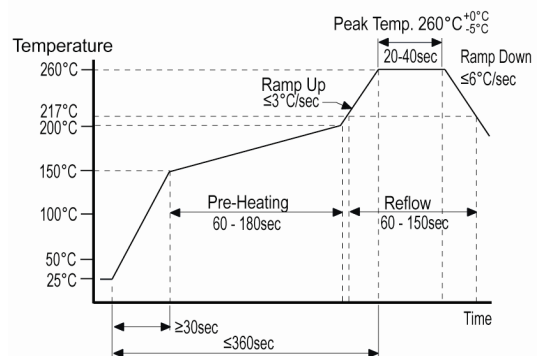
- Supply Voltage $2.85\text{V} \pm 0.15\text{V}$
- Current Draw 1.500mA
- Supply Current (at V_s max - note 2)

Frequency Adjustment

- Pulling $\pm 7.8\text{ppm}$ to $\pm 12\text{ppm}$
- Control Voltage $1.4\text{V} \pm 1.0\text{V}$
- Input Impedance $500\text{k}\Omega$ min
- Control voltage range: the nominal control voltage value is midway between the minimum and maximum. Voltage control should not exceed the supply voltage $+0.2\text{V}$ or GND.
- Linearity (deviation from straight line curve fit): 10% max


Outline (mm)

Pad Connections

1. Voltage Control
2. GND
3. Output
4. +Vs

Solder Pad Layout

Pb-Free Reflow

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Customer Part:**Output Details**

- Output Compatibility Clipped Sine
- Drive Capability 10k Ω /10pF \pm 10%
- Output: DC coupled (note 3)
- Output Voltage Level (at Vs min - note 2): 0.8V pk-pk min

Noise Parameters

- Phase Noise (typ @ 25°C):
 - 64dBc/Hz @ 1Hz
 - 93dBc/Hz @ 10Hz
 - 118dBc/Hz @ 100Hz
 - 137dBc/Hz @ 1kHz
 - 149dBc/Hz @ 10kHz
 - 151dBc/Hz @ 100kHz
- Phase Noise (max @ 25°C):
 - 57dBc/Hz @ 1Hz
 - 86dBc/Hz @ 10Hz
 - 111dBc/Hz @ 100Hz
 - 133dBc/Hz @ 1kHz
 - 144dBc/Hz @ 10kHz
 - 148dBc/Hz @ 100kHz

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 (also see 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 1ppm max after environmental conditions.
- Note 5: Frequency drift rate is calculated from the equation ppb/s= $^{\circ}$ C/s x ppb/ $^{\circ}$ C
- Note 6: Discard the first 0.5°C interval of each heating and cooling cycle.

Compliance

- RoHS Status (2015/863/EU) Compliant
- REACH Status Compliant
- MSL Rating (JDEC-STD-033): Not Applicable

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Customer Part:

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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