

Description

- The IQXT-270-4 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-270-4
- Model Issue number 1

Frequency Parameters

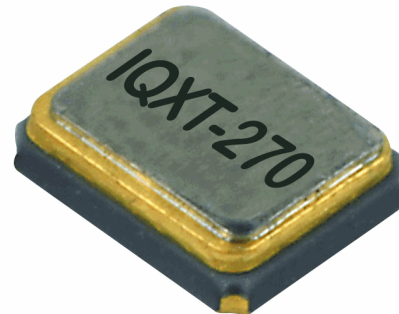
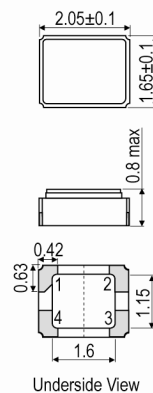
- Frequency 19.20MHz
- Frequency Tolerance $\pm 1.00\text{ppm}$
- Frequency Stability $\pm 0.50\text{ppm}$
- Operating Temperature Range -30.00 to 85.00°C
- Ageing $\pm 0.7\text{ppm}$ max per year at 25°C
- Frequency Tolerance: Offset from nominal frequency measured at $25^\circ\text{C} \pm 2^\circ\text{C}$.
- 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 (note 1).
- Frequency Slope (temperature range -10 to 60°C . Tested to a minimum of one frequency reading every 2°C - 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 (temperature range -30°C to 85°C . Tested to a minimum of 1 frequency reading every 2°C 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 - note 2): $\pm 0.2\text{ppm}$ max

Electrical Parameters

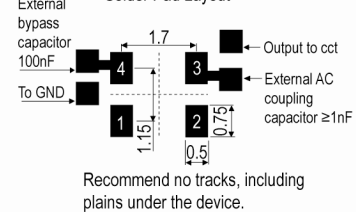
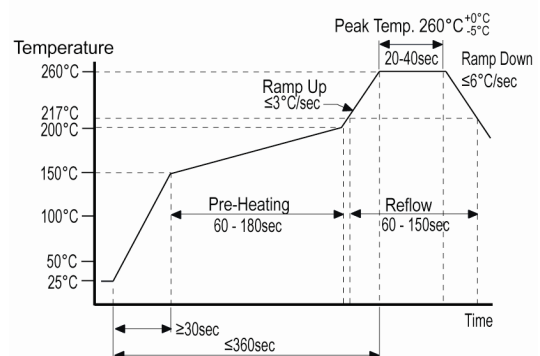
- Supply Voltage $1.8\text{V} \pm 5\%$
- Current Draw 1.50mA
- Supply Current (at V_s max - note 2): 1.5mA max

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): 0.8V pk-pk min
- Output: DC coupled (note 3)


Outline (mm)

Pad Connections

1. GND / N/C
2. GND
3. Output
4. +Vs

Solder Pad Layout

Pb-Free Reflow

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Noise Parameters

- Phase Noise at 25°C (typical):
 - 64dBc/Hz @ 1Hz
 - 93dBc/Hz @ 10Hz
 - 118dBc/Hz @ 100Hz
 - 137dBc/Hz @ 1kHz
 - 149dBc/Hz @ 10kHz
 - 151dBc/Hz @ 100kHz
- Phase Noise at 25°C (max):
 - 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 ± 1 ppm max after environmental conditions.
- Note 5: Frequency drift rate is calculated from the equation $\text{ppb/s} = ^\circ\text{C/s} \times \text{ppb}/^\circ\text{C}$
- Note 6: Discard the first 0.5°C interval of each heating and cooling cycle

Compliance

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|-------------------------------|----------------|
| ■ RoHS Status (2011/65/EU) | Compliant |
| ■ REACH Status | Compliant |
| ■ MSL Rating (JEDEC-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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