



Description

- The IQXT-316-2 uses ASIC technology and is designed to meet the short and medium term stability requirements of packet network synchronisation for Small Cells.
- Model IQXT-316-2
- Model Issue number 2

Frequency Parameters

- Frequency 19.20MHz
- Frequency Tolerance $\pm 1.00\text{ppm}$
- Tolerance Condition @ $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ & $\text{VC}=1.5\text{V}$
- Frequency Stability $\pm 0.10\text{ppm}$
- Operating Temperature Range -40.00 to 85.00°C
- Ageing:
 - $\pm 20\text{ppb}$ max/day
 - $\pm 200\text{ppb}$ max/month
 - $\pm 1\text{ppm}$ max/year
 - $\pm 1.5\text{ppm}$ max over 5yrs
- Temperature Rate of Change (maximum rate of change of temperature condition for guaranteed stability specifications): $1^{\circ}\text{C}/\text{min}$ max
- Acceleration Sensitivity (gamma vector of all 3 axes from 30 to 1500Hz): Typically 2ppb/G max
- Supply Voltage Variation ($\pm 2\%$ change @ 25°C , measurement referenced to frequency observed @ nominal V_s): $\pm 10\text{ppb}$ typ
- Load Variation ($\pm 2\%$ change @ 25°C , measurement referenced to frequency observed @ nominal load): $\pm 10\text{ppb}$ typ
- Reflow Variation (pre to post reflow ΔF , measured after 1hr recovery @ 25°C): $\pm 1\text{ppm}$ max
- Note: The characteristics of the oscillator may be temporarily affected by the processes of assembly and soldering. The frequency stability specification applies after 48hrs continuous operation and after the first excursion over the temperature range. Nominal conditions apply unless otherwise stated.

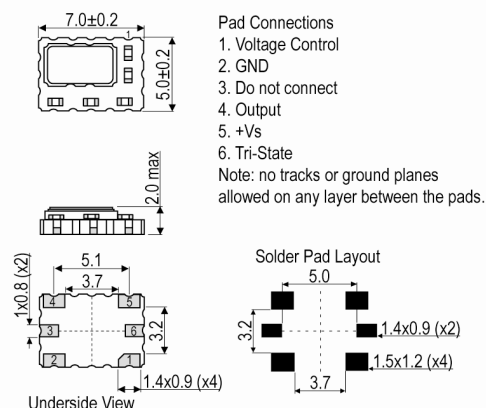
Electrical Parameters

- Supply Voltage $3.3\text{V} \pm 5\%$
- Current Draw 3.000mA
- Absolute Maximum Ratings:
 - Supply Voltage (V_s): -0.5V to 7V
 - Control Voltage (VC): -0.5V to 9V
 - All other inputs: -0.5V to $V_s+0.5\text{V}$
 - Power Dissipation: 100mW max
 - Junction Temperature: 150°C max
- Note: Operating beyond these limits may result in change or permanent damage to the oscillator.

Frequency Adjustment

- Pulling $\pm 4.5\text{ppm}$ min to $\pm 10\text{ppm}$ max
- Control Voltage $1.5\text{V} \pm 1.0\text{V}$
- Input Impedance $100\text{k}\Omega$ min
- Linearity (deviation from straight line curve fit): 1% max
- Frequency Tuning Slope: $+7\text{ppm}/\text{V}$ typ
- Modulation Bandwidth: 1Hz min
- Note: Pulling referenced to frequency @ $\text{VC}=1.5\text{V}$.

Outline (mm)



Pad Connections

1. Voltage Control
 2. GND
 3. Do not connect
 4. Output
 5. $+V_s$
 6. Tri-State
- Note: no tracks or ground planes allowed on any layer between the pads.

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Output Details

- Output Compatibility Clipped Sine
- Drive Capability 10k Ω //10pF
- Output Voltage Level: 0.8V pk-pk min, 1.1V pk-pk typ
- Start Up Time (amplitude within 90% of specified output level): 15ms max
- Output: AC coupled

Output Control

- Tri-State Mode:
Logic '0' (20%Vs max) to pad 6 disables the oscillator output, the output goes to a high impedance state.
Logic '1' (60%Vs min) or no connection to pad 6 enables the oscillator output.
Note: The tri-state control (enable) input pad has an internal 100k Ω pull up resistor which allows it to be left unconnected if not used. When in tri-state mode, the output stage is disabled, but the oscillator and compensation circuit are still active (Current Consumption: 2mA typ).
- Output Enable Time: 100 μ s max

Noise Parameters

- Phase Noise @ 25°C (typ):
 - 70dBc/Hz @ 1Hz
 - 100dBc/Hz @ 10Hz
 - 130dBc/Hz @ 100Hz
 - 145dBc/Hz @ 1kHz
 - 153dBc/Hz @ 10kHz
 - 157dBc/Hz @ 100kHz
 - 159dBc/Hz @ 1MHz
- Phase Jitter (12kHz to 5MHz): 300fs RMS typ

Environmental Parameters

- Low Temperature Storage: IEC 60068-2-01, Test Ab: 1000hrs @ -55°C.
- High Temperature Storage: IEC 60068-2-02, Test Bb: 1000hrs @ 150°C.
- Mechanical Shock: JESD22-B104: 1500G, 0.5ms duration, 5 pulses in each of 6 directions.
- Vibration: JESD22-B103: 20G peak acceleration for 4hrs in each of the 3 orientations, tested from 60-2000Hz, 12hrs total.
- High Temperature Operating Life (HTOL): JESD22-A108: 1008hrs @ 125°C.
- Thermal Cycling: JESD22-A104: 500 temperature cycles, -55 to 125°C.
- Solderability: JESD22-B102, Method 1, Condition E: 260°C for 5secs (preconditioning: 150°C, 16hrs).
- Resistance to Soldering Heat: IPC/JEDEC J-STD-020: 3 reflow cycles (peak temperature 260°C).
- Humidity: JESD22-A101: After 1008hrs @ 85°C $\pm$ 2°C, 85% RH non-condensing (preconditioning: 3 reflow cycles @ peak temperature 260°C).
- Ageing: MIL-PRF-55310: 1008hrs @ 85°C (preconditioning: 3 reflow cycles @ peak temperature 260°C).

Manufacturing Details

- Maximum Process Temperature: 260°C (30secs max)
- RoHS Terminations
- RoHS Reflow Temp 260°C max for 30secs max

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