



Description

- The IQXT-316-8 uses ASIC technology and is designed to meet the short and medium term stability requirements of packet network synchronisation for Small Cells. The oscillator has low jitter to meet network interface requirements (e.g. 10GE) and low phase noise to meet radio interface requirements of LTE-A (TS 36.104) and WCDMA (TS 25.104) transceivers. The IQXT-316-8 is the ideal choice for Small Cell synchronisation requirements.
- Model IQXT-316-8
- Model Issue number 2

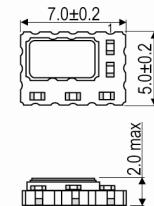
Frequency Parameters

- Frequency 38.40MHz
- Frequency Tolerance $\pm 1.00\text{ppm}$
- Tolerance Condition @ $25^\circ\text{C} \pm 1^\circ\text{C}$ & $VC=1.4\text{V}$
- Frequency Stability $\pm 0.25\text{ppm}$
- Operating Temperature Range -5.00 to 85.00°C
- In-service Short-term Frequency Stability:
 - 50 to 70°C : $\pm 80\text{ppb}$ max
 - 15 to 85°C : $\pm 100\text{ppb}$ max
 - 5 to 85°C : $\pm 250\text{ppb}$ max
- Ageing:
 - $\pm 20\text{ppb}$ max/24hrs
 - $\pm 200\text{ppb}$ max/month
 - $\pm 1\text{ppm}$ max/year
 - $\pm 2\text{ppm}$ max over 3yrs
- Frequency Slope $\Delta F/\Delta T$ (in still air, over operating temperature range): $<50\text{ppb}/^\circ\text{C}$ typ, $100\text{ppb}/^\circ\text{C}$ max
- 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 $2\text{ppb}/\text{G}$ max
- Supply Voltage Variation ($\pm 2\%$ change @ 25°C ref to frequency @ nominal Vs): $\pm 10\text{ppb}$ typ
- Load Variation ($\pm 2\%$ change @ 25°C ref to frequency @ nominal load): $\pm 10\text{ppb}$ typ
- Reflow Variation (after 1hr recovery @ 25°C): $\pm 1\text{ppm}$ max
- Note: The characteristics of the component may be temporarily affected by the processes of assembly and soldering. The in-service short term frequency stability specification applies after 48hrs continuous operation and after the first excursion over the temperature range.

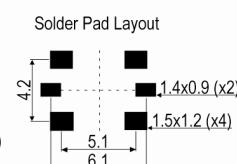
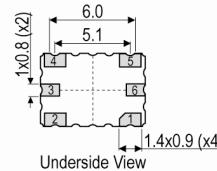
Electrical Parameters

- Supply Voltage $2.85\text{V} \pm 5\%$
- Current Draw 4.500mA
- Absolute Maximum Ratings:
 - Supply Voltage (Vs): -0.5V to 7V
 - Control Voltage (VC): -0.5V to 9V
 - All other inputs: -0.5V to Vs+0.5V
 - Power Dissipation: 100mW max
 - Junction Temperature: 150°C max
- Note: Operating beyond these limits may result in change or permanent damage to the oscillator.

Outline (mm)



Pad Connections
 1. Voltage Control
 2. GND
 3. Temp Sensor Output (Vtemp)
 4. Output
 5. +Vs
 6. Enable/Disable
 Note: the area between the pads is a keep-out area, no tracks or ground plane allowed in any layer.



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Frequency Adjustment

- Pulling $\pm 4.5\text{ppm}$ min to $\pm 10\text{ppm}$ max
- Control Voltage $1.4\text{V} \pm 1.0\text{V}$
- Input Impedance $100\text{k}\Omega$ min
- Linearity: 1% max
- Frequency Tuning Slope: $+6\text{ppm/V}$ typ
- Modulation Bandwidth: 1Hz min
- Note: Pulling referenced to frequency @ $VC=1.4\text{V}$.

Output Details

- Output Compatibility Clipped Sine
- Drive Capability $10\text{k}\Omega//10\text{pF}$
- 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
- Temperature Sensor Output (Vtemp on pad 3)
Vtemp (@ 25°C): 1.76V typ
Slope Option: $-2.1\text{mV/}^{\circ}\text{C}$ typ
Resistive Load: $100\text{k}\Omega$ min
Capacitive Load: 30pF max
Output Impedance (@ 25°C): $1\text{k}\Omega$ typ
Sensor Linearity: 1.5% typ

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 $100\text{k}\Omega$ 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 μs max

Noise Parameters

- Phase Noise (typ @ 25°C):
-60dBc/Hz @ 1Hz
-90dBc/Hz @ 10Hz
-125dBc/Hz @ 100Hz
-145dBc/Hz @ 1kHz
-153dBc/Hz @ 10kHz
-154dBc/Hz @ 100kHz
-156dBc/Hz @ 1MHz
- Phase Jitter (12kHz-5MHz): 210fs RMS typ

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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: 245°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 ±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

Compliance

- RoHS Status (2015/863/EU) Compliant
- REACH Status Compliant
- MSL Rating (JDEC-STD-033): 1

Packaging Details

- Tape & reel in accordance with EIA-481
Quantities below the standard reel size to be supplied on cut tape
- Standard Pack Quantity: 500

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