

**Customer Part:**

**Description**

- The IQXT-316-10 uses ASIC technology and is designed to meet the short and medium term stability requirements of packet network synchronisation for Small Cells.
- Model IQXT-316-10
- Model Issue number 2

**Frequency Parameters**

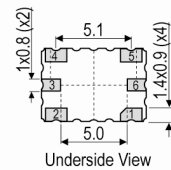
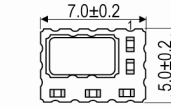
- Frequency 30.720MHz
- Frequency Tolerance  $\pm 1.00$ ppm
- Tolerance Condition @ 25°C  $\pm 1^\circ\text{C}$  & VC=1.5V
- Frequency Stability  $\pm 0.05$ ppm
- Operating Temperature Range 0.00 to 55.00°C
- Ageing (@ 25°C):
  - ±5ppb typ per day (±20ppb max per day)
  - ±1.5ppm max in 1st year
  - ±4ppm max over 10yrs
- Temperature Rate of Change (maximum rate of change of temperature condition for guaranteed stability specifications): 1°C/min max
- Frequency Slope  $\Delta F/\Delta T$  (in still air):  $\pm 20$ ppb/°C max
- Root Allan Variance (@ 25°C, tau=1sec): 1ppb 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 Vs):  $\pm 10$ ppb typ
- Load Variation ( $\pm 2\%$  change @ 25°C, measurement referenced to frequency observed @ nominal load):  $\pm 10$ ppb typ
- Reflow Variation (pre to post reflow  $\Delta F$ , measured after 1hr recovery @ 25°C):  $\pm 1$ ppm max
- Note: The characteristics of the oscillator 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. Nominal conditions apply unless otherwise stated.

**Electrical Parameters**

- Supply Voltage 3.3V  $\pm 5\%$
- Current Draw 7.000mA
- 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.

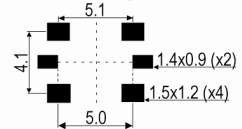
**Frequency Adjustment**

- Pulling  $\pm 5$ ppm min
- Control Voltage 1.5V  $\pm 1.0$ V
- Input Impedance 100k $\Omega$  min
- Linearity: 1% max
- Frequency Tuning Slope: +7.5ppm/V typ
- Modulation Bandwidth: 1Hz min
- Note: Pulling referenced to frequency @ VC=1.5V.

**Outline (mm)**

**Pad Connections**

1. Voltage Control
2. GND
3. Do not connect
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.

**Solder Pad Layout**

**Sales Office Contact Details:**

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**Customer Part:****Output Details**

- Output Compatibility HCMOS
- Drive Capability 15pF
- Rise and Fall Time 8.0ns max
- Duty Cycle 45/55%
- Output Voltage Levels:  
Output Low (VoL): 10%Vs max  
Output High (VoH): 90%Vs min
- Start Up Time (amplitude within 90% of specified output level):  
15ms max

**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 100kΩ 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: 100μs max

**Noise Parameters**

- Phase Noise @ 25°C (typ):  
-65dBc/Hz @ 1Hz  
-92dBc/Hz @ 10Hz  
-120dBc/Hz @ 100Hz  
-139dBc/Hz @ 1kHz  
-149dBc/Hz @ 10kHz  
-151dBc/Hz @ 100kHz  
-152dBc/Hz @ 1MHz
- RMS Phase Jitter @ 25°C (12kHz to 5MHz): 0.38ps 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: 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).
- RoHS Terminations
- RoHS Reflow Temp 260°C max for 30secs max

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**Customer Part:****Compliance**

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

**Packaging Details**

- Pack Style: Reel      Tape & reel in accordance with EIA-481-D  
Pack Size: 500
- *Alternative packing option available*

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