



### Description

- The IQXT-316-9 uses ASIC technology and is designed to meet the short and medium term stability requirements of packet network synchronisation for Small Cells.
- Model IQXT-316-9
- Model Issue number 2

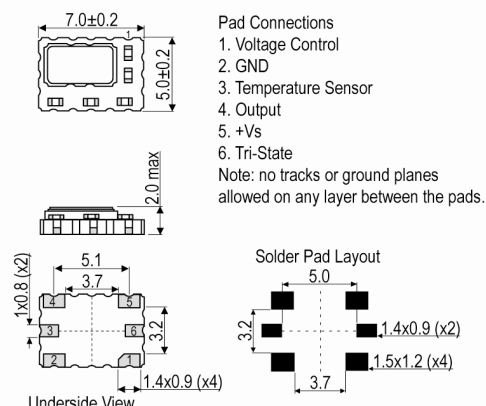
### Frequency Parameters

- Frequency 30.720MHz
- 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  $\pm 0.25\text{ppm}$
- Operating Temperature Range  $-5.00$  to  $85.00^{\circ}\text{C}$
- In-service Short-term Frequency Stability (over any 24-hr timeslot @ fixed supply voltage and load):  
 $50$  to  $70^{\circ}\text{C}$ :  $\pm 80\text{ppb}$  max  
 $15$  to  $85^{\circ}\text{C}$ :  $\pm 100\text{ppb}$  max  
 $-5$  to  $85^{\circ}\text{C}$ :  $\pm 250\text{ppb}$  max
- Ageing:  
 $\pm 20\text{ppb}$  max/day  
 $\pm 200\text{ppb}$  max/month  
 $\pm 1\text{ppm}$  max/year  
 $\pm 2\text{ppm}$  max over 3yrs
- 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  $1500\text{Hz}$ ): Typically  $2\text{ppb}/\text{G}$  max
- Supply Voltage Variation ( $\pm 2\%$  change @  $25^{\circ}\text{C}$ , measurement referenced to frequency observed @ nominal  $V_s$ ):  $\pm 10\text{ppb}$  typ
- Load Variation ( $\pm 2\%$  change @  $25^{\circ}\text{C}$ , measurement referenced to frequency observed @ nominal load):  $\pm 10\text{ppb}$  typ
- Reflow Variation (pre to post reflow  $\Delta F$ , measured after 1hr recovery @  $25^{\circ}\text{C}$ ):  $\pm 1\text{ppm}$  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  $3.3\text{V} \pm 5\%$
- Current Draw  $4.500\text{mA}$
- Absolute Maximum Ratings:  
Supply Voltage ( $V_s$ ):  $-0.5\text{V}$  to  $7\text{V}$   
Control Voltage ( $\text{VC}$ ):  $-0.5\text{V}$  to  $9\text{V}$   
All other inputs:  $-0.5\text{V}$  to  $V_s + 0.5\text{V}$   
Power Dissipation:  $100\text{mW}$  max  
Junction Temperature:  $150^{\circ}\text{C}$  max  
Note: Operating beyond these limits may result in change or permanent damage to the oscillator.

### Outline (mm)



### Sales Office Contact Details:

UK: +44 (0)1460 270200

Email: [info@iqdfrequencyproducts.com](mailto:info@iqdfrequencyproducts.com)

Web: [www.iqdfrequencyproducts.com](http://www.iqdfrequencyproducts.com)

**Frequency Adjustment**

- Pulling  $\pm 7\text{ppm min to } \pm 12\text{ppm max}$
- Control Voltage  $1.5\text{V} \pm 1.0\text{V}$
- Input Impedance  $100\text{k}\Omega \text{ min}$
- Linearity (deviation from straight line curve fit): 1% max
- Frequency Tuning Slope: Positive
- Modulation Bandwidth: 1Hz min
- Note: Pulling referenced to frequency @ VC=1.5V

**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
- Output: DC coupled
- Temperature Sensor Output (pad 3):  
Vtemp (@ 25°C): 1.76V typ  
Slope Option: -2.1mV/°C typ  
Resistive Load: 100kΩ min  
Capacitive Load: 30pF max  
Output Impedance (@ 25°C): 1kΩ 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 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  
-125dBc/Hz @ 100Hz  
-143dBc/Hz @ 1kHz  
-149dBc/Hz @ 10kHz  
-152dBc/Hz @ 100kHz  
-155dBc/Hz @ 1MHz
- Phase Jitter (12kHz to 5MHz): 300fs 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: 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

**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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