

**Customer Part:**

**Description**

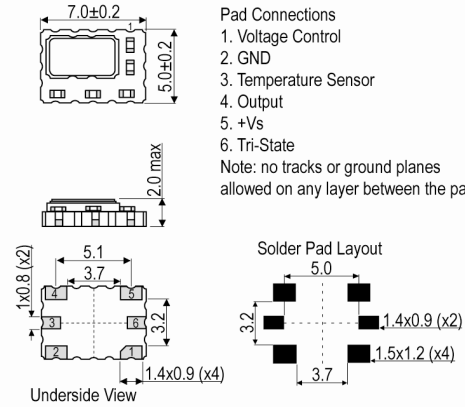
- The IQXT-316-9 uses ASIC technology and is designed to meet the short and medium term stability requirements of packet network synchronisation for Small Cells.
- Model IQXT-316-9
- Model Issue number 1

**Frequency Parameters**

- Frequency 30.720MHz
- Frequency Tolerance ±1.00ppm
- Tolerance Condition @ 25°C ±1°C & VC=1.5V
- Frequency Stability ±0.25ppm
- Operating Temperature Range -5.00 to 85.00°C
- In □service Short-term Frequency Stability (over any 24-hr timeslot @ fixed supply voltage and load):
  - 50 to 70°C: ±80ppb max
  - 15 to 85°C: ±100ppb max
  - 5 to 85°C: ±250ppb max
- Ageing:
  - ±20ppb max/day
  - ±200ppb max/month
  - ±1ppm max/year
  - ±2ppm max over 3yrs
- Temperature Rate of Change (maximum rate of change of temperature condition for guaranteed stability specifications): 1°C/min max
- Acceleration Sensitivity (gamma vector of all 3 axes from 30 to 1500Hz): Typically 2ppb/G max
- Supply Voltage Variation (±2% change @ 25°C, measurement referenced to frequency observed @ nominal Vs): ±10ppb typ
- Load Variation (±2% change @ 25°C, measurement referenced to frequency observed @ nominal load): ±10ppb typ
- Reflow Variation (pre to post reflow ΔF, measured after 1hr recovery @ 25°C): ±1ppm 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 ±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. Temperature Sensor
  4. Output
  5. +Vs
  6. Tri-State
- Note: no tracks or ground planes allowed on any layer between the pads.

**Sales Office Contact Details:**

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## Customer Part:

## 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:  $-2.1\text{mV}/^\circ\text{C}$  typ  
Resistive Load:  $100\text{k}\Omega \text{ min}$   
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 $\mu\text{s}$  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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## Customer Part:

## 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 ±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

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

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