## Description

Q-Tech's surface-mount QTCT220 oscillators consist of an IC 3.3Vdc TCXO built in a low profile ceramic package with gold plated contact pads.

Features

- ECCN: EAR99
- Frequency range from 10.000000MHz to 52.000000MHz
- Small footprint
- Clipped Sine logic
- 2.8, 3.0, 3.3Vdc supply
- Operating temperature -40ºC to +85ºC available
- Optional Free Tuning
- Hermetically sealed ceramic package
- Military screening tests per MIL-PRF-55310 for Class 3 devices is available
- Tape and reel packaging
- Lead Free, RoHS Compliant
- VCTCXO Option
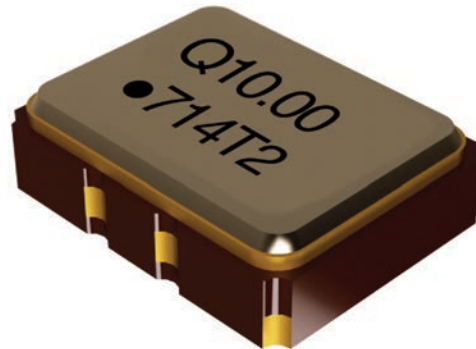
Applications

- Designed to meet today's requirements for low voltage applications
- Instrumentation
- Navigation
- Avionics
- Ethernet/SynchE
- Base Station
- Global Positioning Systems (GPS)
- Manpack Radio
- FEMTO Cells

Stock List

See all QTCT products IN STOCK

Ordering is NOT limited to the IN STOCK list. Please consult with our sales managers to order custom frequencies.

Ordering Information

Sample part number

QTCT2203S1T-10.000000

| QTCT220 | 3 | S | 1 | T | - | 10.000000 |

Output Frequency

Supply Voltage:
3 = +3.3V
A = +3.0V
2 = +2.8V

Screening
Blank = Unscreened
M = Per MIL-PRF-55310, Class 3, Level B

Output Logic
S = Clipped Sine

Frequency vs. Temperature Code (*):
B	= ±	2.5ppm	at -40ºC to +85ºC
R	= ±	1ppm	at -20ºC to +70ºC
T	= ±	1ppm	at -40ºC to +85ºC
P	= ±	0.5ppm	at -20ºC to +70ºC
Q	= ±	0.5ppm	at -40ºC to +85ºC

VC Option
0 = No VCO
1 = ± 5ppm

(*) Frequency Stability is referenced to the midpoint between minimum and maximum frequency value over the temperature range.

Other Options Available For An Additional Charge

- Hot Solder Dip Sn60/Pb40 per MIL-PRF 55310

Specifications subject to change without prior notice.

Frequency stability vs. temperature codes may not be available in all frequencies.
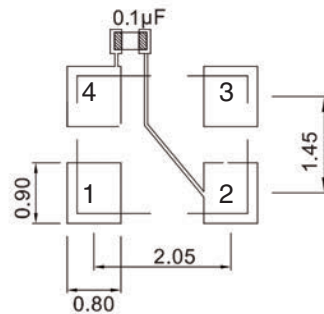**For Non-Standard requirements, contact Q-Tech Corporation at Sales@Q-Tech.com**
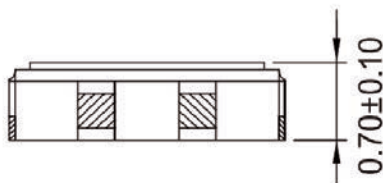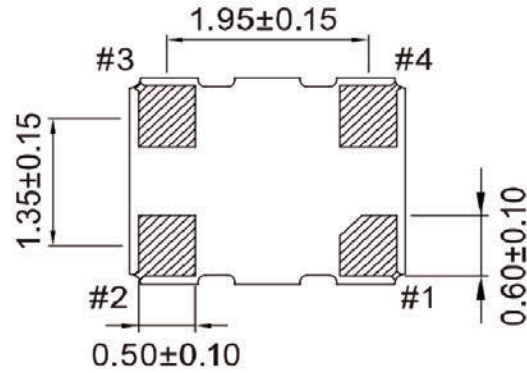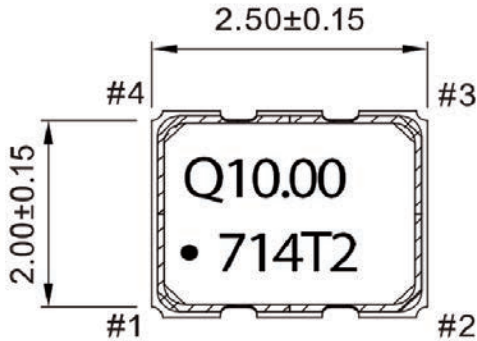
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Package Outline and Pin Connections

Dimensions are in mm

An external bypass capacitor 0.1µF is required between Vdd and GND

Pin No.	Function
1	VC or NC
2	GND/CASE
3	OUTPUT
4	VDD

Marking

Line 1: QXX.XX   (Q for Q-Tech, no space 5 Characters of Frequency including decimal)

Line 2: Dot (Pin 1 Indicator) + Date code (Y/WW) + Internal Traceability Code (No Spaces)

Package Information

• Termination pads (4x), Electro nickel plating 1.27µm ~ 8.89µm typ.,
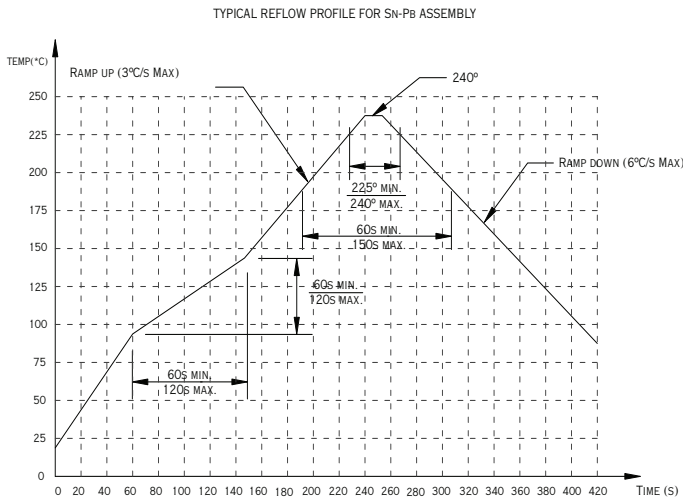 with gold 0.3µm ~ 1.0µm flash plate

• Weight: 0.025g typ.

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Electrical Characteristics

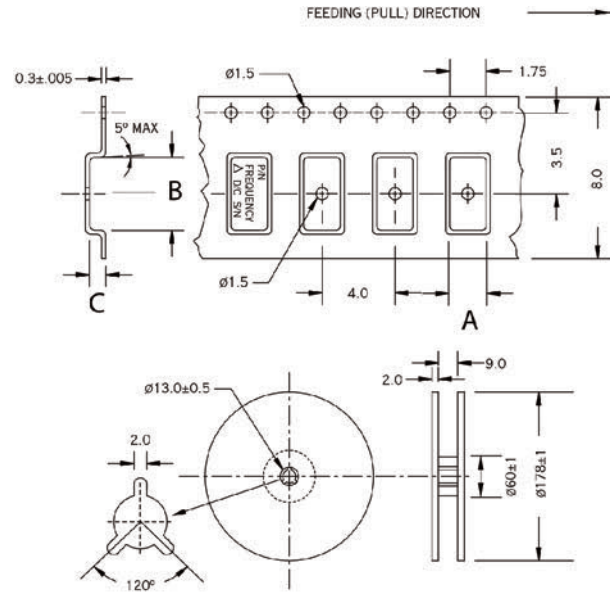| Parameters	QTCT220
Output frequency range (Fo)	**10.000000MHz — 52.000000MHz**
Logic	**Clipped Sine**
Supply voltage (Vdd)	2.8, 3.0, 3.3Vdc ± 5%
Supply current (Idd)	1.5 mA max. - 10MHz ~ ≤ 26MHz 2.5 mA max. - 26MHz ~ ≤ 52MHz
VCO Option (Tuning Range)	See Part Number on Page 1
Operating temperature (Topr)	See Part Number on Page 1
Storage temperature (Tsto)	-40ºC to +85ºC
Start-up time (Tstup)	2ms max.
Output Level	Vop-p = 0.8V
Output Load	10k ‖ 10pF
Control Voltage to reach Pull Range **(Note 1)**	0.5V min. 2.5V max.
Pulling Range **(Note 1)**	±5 ppm min.
Control Voltage Impedance **(Note 1)**	500kΩ min.

Phase Noise typ. at 19.2MHz
  100Hz
  1kHz
  10kHz
	-115 dBc/Hz
	-135 dBc/Hz
	-148 dBc/Hz

Frequency Tolerance (Ftol) at 25ºC **(Note 2)**	±2.0ppm max.
Power Supply Stability ±5% (Fpwr)	±0.2ppm max.
Load Stability ±10% (Fload)	±0.2ppm max.
Aging	±1.0ppm max. 1st year

Notes
1. For VCTCXO option.
2. Frequency at 25ºC, 1 hour after reflow.

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Reflow Profile

TYPICAL REFLOW PROFILE FOR Sn-Pb ASSEMBLY

Embossed Tape and Reel Information

FEEDING (PULL) DIRECTION

Package	A	B	C
QTCT 220	2.30 ±0.1	2.80 ±0.1	1.00 ±0.1

Reel size (Diameter in mm)	Qty per reel (pcs)
178	1,000

Environmental and Mechanical Specifications

Environmental Test	Test Conditions
Temperature cycling	MIL-STD-883, Method 1010, Cond. B
Constant acceleration	MIL-STD-883, Method 2001, Cond. A, Y1
Seal: Fine and Gross Leak	MIL-STD-883, Method 1014, Cond. A and C
Vibration sinusoidal	MIL-STD-202, Method 204, Cond. D
Shock, non operating	MIL-STD-202, Method 213, Cond. I
Resistance to solder heat	MIL-STD-202, Method 210, Cond. B
Resistance to solvents	MIL-STD-202, Method 215
Solderability	MIL-STD-202, Method 208
ESD Classification	MIL-STD-883, Method 3015, Class 1
Moisture Sensitivity Level	J-STD-020, MSL=1

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DCO	REV	REVISION SUMMARY	PAGE	DATE
7527	-	Initial Release		12/29/2017
10039	A	Revise Frequency format to six digits after decimal (for ordering info)	All	06/17/2019
		Fix max frequency in Electrical Characteristics Table to 52MHz (now matches all other data sheet information)	All	
10834	B	Add note to Frequency vs. Temperature options for clarification of the specification	1	11/05/2019
13936	C	Add 'Class 3' to MIL-PRF-55310 screening for clarification of requirements	1	10/26/2021
		Change Storage Temperature	3	

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