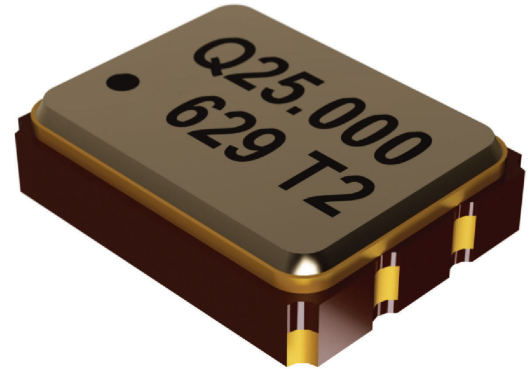


**Description**

Q-Tech’s surface-mount QTCC230 oscillators consist of an IC 3.3Vdc, 2.5Vdc, and 1.8Vdc clock square wave generator and a miniature strip AT quartz crystal built in a low profile ceramic package with gold plated contact pads.

**Features**

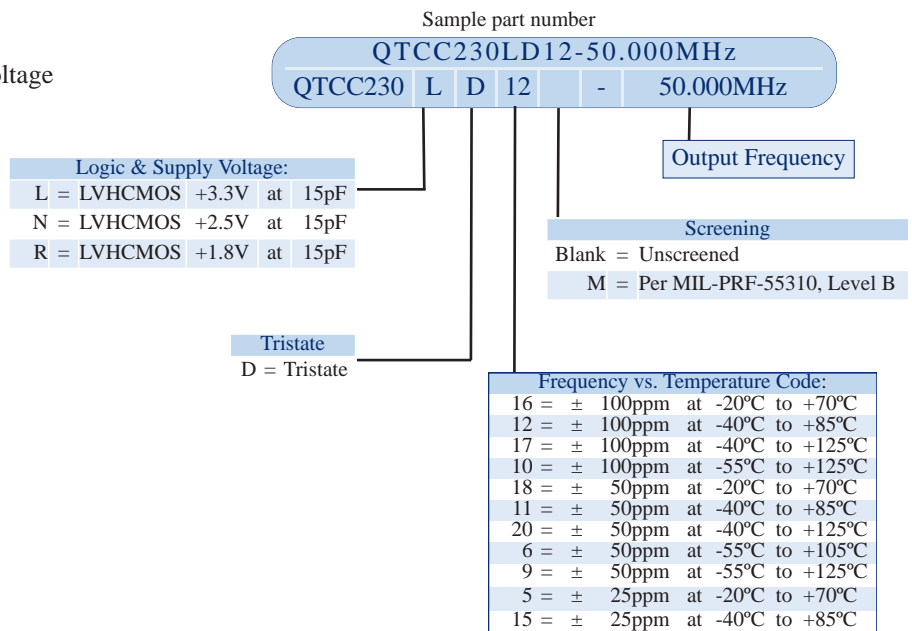
- ECCN: EAR99
- Broad frequency range from 32.768kHz, and 1.5MHz to 133.000MHz
- Small footprint
- HCMOS logic
- 3.3Vdc, 2.5Vdc, and 1.8Vdc supply
- Operating temperature -55°C to +125°C available
- Able to meet 20,000G shock, half-sine, 0.1ms
- Tri-State Output Standard
- Hermetically sealed ceramic package
- Fundamental and 3rd Overtone designs
- Military screening tests per MIL-PRF-55310 available
- Tape and reel packaging
- Lead Free, RoHS Compliant



**Applications**

- Designed to meet today’s requirements for low voltage applications
- Gun launched munitions and systems
- Smart munitions
- Instrumentation
- Navigation
- Avionics
- Ethernet/SynchE
- SONET
- Microprocessor clock

**Ordering Information**



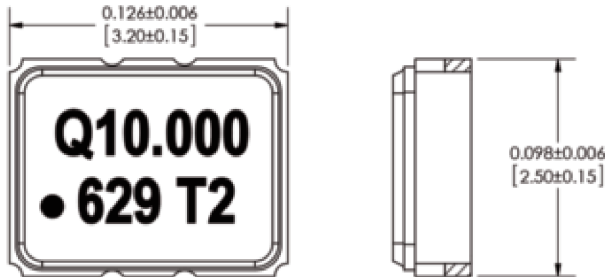
**Other Options Available For An Additional Charge**

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

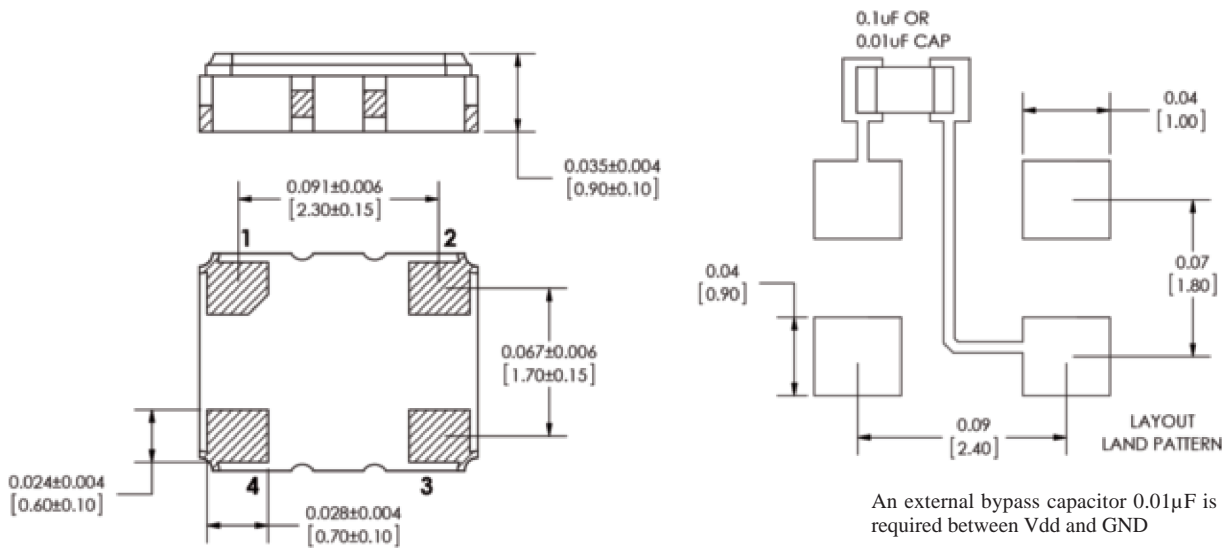
Specifications subject to change without prior notice.

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

**Package Outline and Pin Connections**  
Dimensions are in inches (mm)



Pin No.	Function
1	TRISTATE
2	GND/CASE
3	OUTPUT
4	VDD



An external bypass capacitor 0.01µF is required between Vdd and GND

**Marking**

Line 1: QXX.XXX (Q for Q-Tech, no space 7 Characters of Frequency including decimal)  
Line 2: Dot (Pin 1 Indicator) + Date code (Y/WW), Internal Traceability Code

**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.

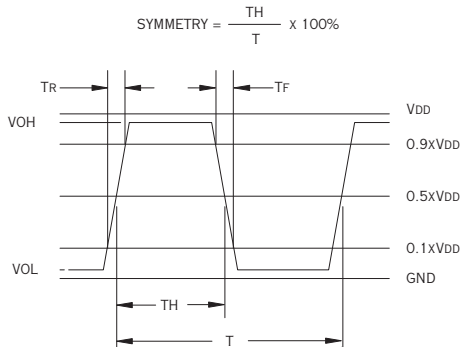
**Electrical Characteristics**

Parameters	QTCC230L	QTCC230N	QTCC230R
Output frequency range (Fo)	<b>1.500MHz — 133.000MHz</b> <b>32.768kHz</b>	<b>1.500MHz — 125.000MHz</b> <b>32.768kHz</b>	
Supply voltage (Vdd)	3.3Vdc ± 10%	2.5Vdc ± 10%	1.8Vdc ± 10%
Maximum Applied Voltage (Vdd max.)	-0.5 to +5.0Vdc		-0.5 to +3.6Vdc
Frequency stability (ΔF/ΔT)	See Part Number on Page 1		
Operating temperature (Topr)	See Part Number on Page 1		
Storage temperature (Tsto)	-62°C to +125°C		
Operating supply current (No Load)	6 mA max. - < 20MHz 7 mA max. - 20MHz ~ < 40MHz 8 mA max. - 40MHz ~ < 50MHz 9 mA max. - 50MHz ~ < 80MHz 10 mA max. - 80MHz ~ < 100MHz 40 mA max. - 100MHz ~ 125MHz	4.5 mA max. - < 20MHz 5.5 mA max. - 20MHz ~ < 40MHz 7 mA max. - 40MHz ~ < 80MHz 7.5 mA max. - 80MHz ~ < 100MHz 30 mA max. - 100MHz ~ < 125MHz	2.5 mA max. - < 40MHz 3.5 mA max. - 40MHz ~ < 50MHz 6.5 mA max. - 50MHz ~ < 80MHz 7 mA max. - 80MHz ~ < 100MHz 20 mA max. - 100MHz ~ < 125MHz
Symmetry (50% of output waveform)	45/55%		
Rise and Fall times	4ns		5ns
Output Load	15pF max.		
Start-up time (Tstup)	5ms max.		
Output voltage (Voh/Vol)	0.9Vdd min. / 0.1Vdd max.		
Output Current (Ioh/Iol)	± 4mA max. - <100MHz ± 8mA max. - ≥100MHz		± 2.8mA max. - <40MHz ± 4mA max. - ≥40MHz
Enable/Disable function Pin 1	VIH ≥ 0.7×Vdd Active		
	VIL ≤ 0.3×Vdd High Z		
Aging	±5ppm max. First Year ±2ppm max. Each Year Thereafter		
Jitter (RMS) (Note 1) Integrated 12kHz to 20MHz	1ps max.		

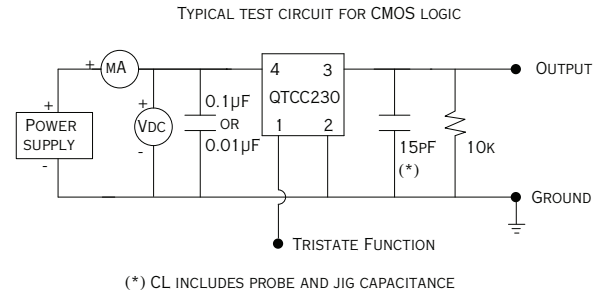
**Notes:**

1. Jitter performance is guaranteed by design and not tested. Contact factory for additional information.

### Output Waveform (Typical)

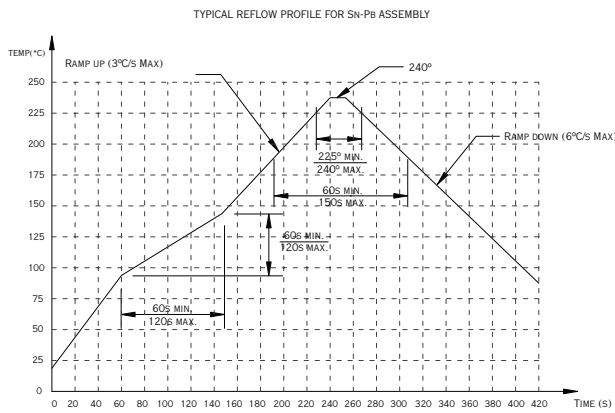


### Test Circuit

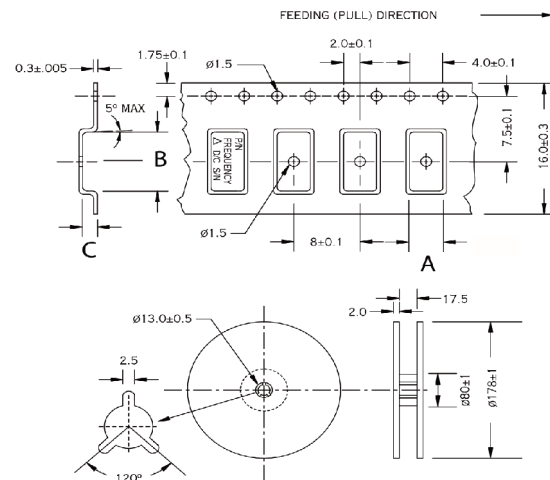


The Tristate function on pin 1 has a built-in pull-up resistor so it can be left floating or tied to Vdd without deteriorating the electrical performance.

### Reflow Profile



### Embossed Tape and Reel Information



Dimensions are in mm. Tape is compliant to EIA-481-A.

Package	A	B	C
QTCC230	2.80 ±0.1	3.50 ±0.1	1.50 ±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 (Note 1)
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

Note 1: QTCC230 has been tested and survived the following additional shock levels:

- 20,000g peak, half-sine, 0.1 ms duration, 3 shocks in each mutually perpendicular axis (18 shocks total)



**QTCC230 SERIES**

**LOW PROFILE 2.5 x 3.2mm MINIATURE SMD CRYSTAL OSCILLATORS**  
 1.8, 2.5, and 3.3Vdc - 32.768kHz, 1.500 MHz to 133.000MHz

DCO	REV	REVISION SUMMARY	PAGE	DATE
6162	A	Add N and R logic options	1	02/03/2017
		Storage temp changed -55C to -62C	3	
		Jitter information added		
		Add N and R Electrical Characteristics		
6502	B	Remove 'LA - 3.3V at 50pF' logic option	1, 3	04/24/2017
		Revise Voh/Vol	3	
		Correct Tape/Reel Information	4	
		Revise date code markings. Was: YYWW, is now: YWW	2	
		Add temperature codes 5 and 15	1	
		Revise Aging	3	
12345	C	Change Frequency Range to (32.768kHz, 1.5MHz to 133MHz)	All	11/01/2022
		Add jitter (RMS) parameter to Electrical Characteristics table	3	
		Add informations for shock levels survived by QTCC230	1, 4	