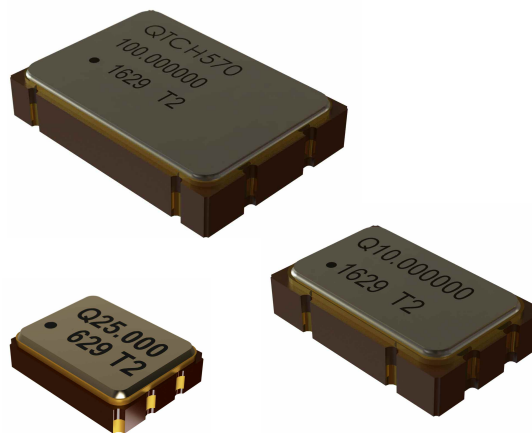


5PeNdTbfTaY

The QTCH series are miniature surface-mount (SMD) crystal oscillators supporting a frequency between 1MHz and 48MHz* fundamental mode operating in a wide supply voltage range from 1.8Vdc to 3.3Vdc, very low power consumption (<3mA) with a temperature range from -55°C to +200°C. Package offerings in three low profile ceramic packages, 2.5x3.2mm, 3.2x5.0mm and 5.0x7.0mm, which are hermetically sealed with gold plated contacts or hot solder dipped.

* Consult factory for frequencies >48MHz



Features

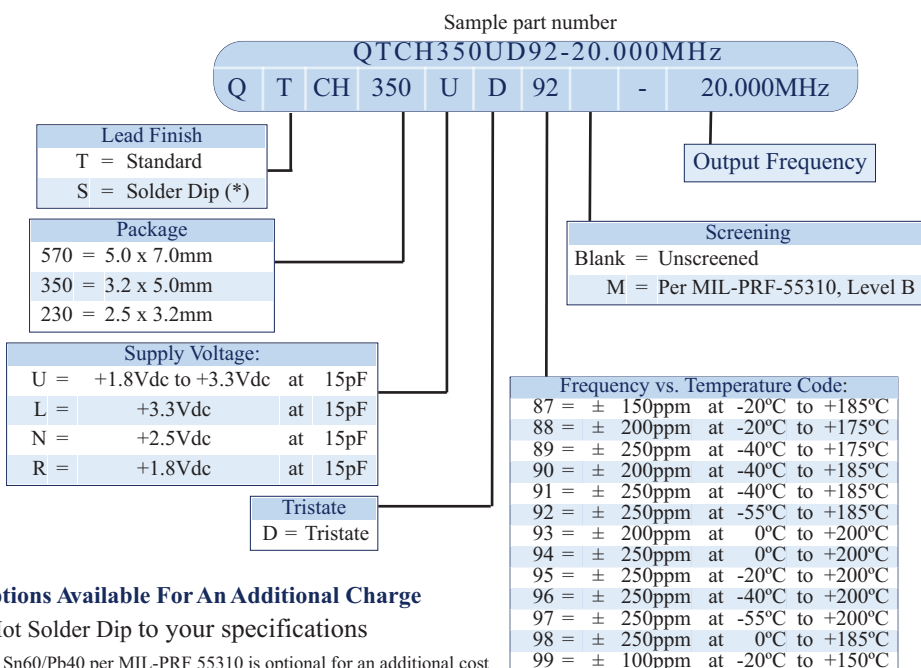
- ECCN: EAR99
- Capable to work at multiple supply voltages
- Wide operating temperature -55°C to +200°C available
- Very low power consumption
- CMOS logic 1.8Vdc, 2.5Vdc, 3.3Vdc
- Tri-State Output Standard
- Fundamental amode AT cut crystal
- High shock and vibration resistant
- Military screening tests per MIL-PRF-55310 available
- Tape and reel packaging
- Lead Free, RoHS Compliant

Applications

- Drilling, data logging tools
- Oil service industry
- High temperature applications

[See our Stock List \(Updated Monthly\)](#)

Ordering Information



Other Options Available For An Additional Charge

Hot Solder Dip to your specifications

(*) Hot Solder Dip Sn60/Pb40 per MIL-PRF 55310 is optional for an additional cost

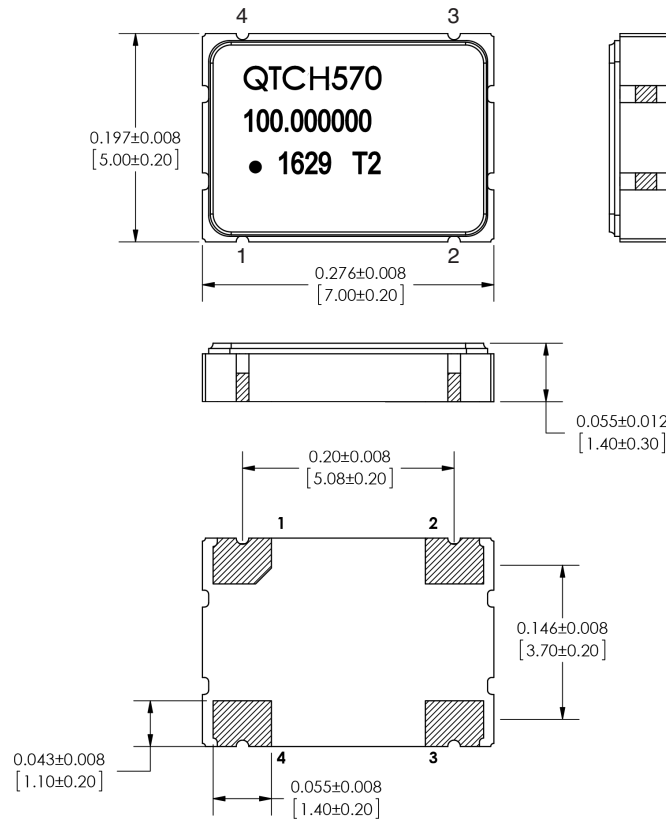
Specifications subject to change without prior notice.

Frequency stability vs. temperature codes may not be available in all frequencies.

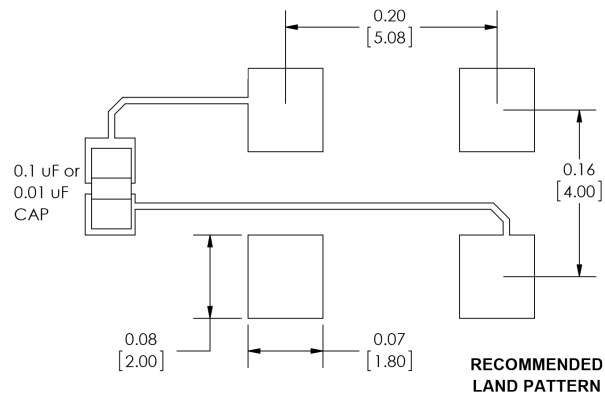
For Non-Standard requirements, contact Q-Tech Corporation at Sales@Q-Tech.com

QTCH570 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

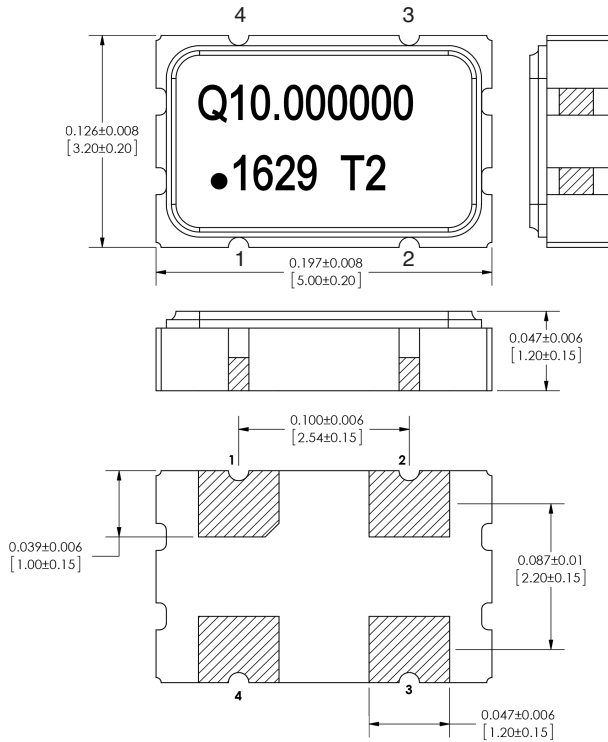
- Line 1: QTCH570 (First 7 Characters of Description)
- Line 2: XXX.XXXXXX (9 or 10 Characters of Frequency in MHz including decimal)
- Line 3: Dot (Pin 1 Indicator) + Date code (YY/WW), Internal Traceability Code

Package Information

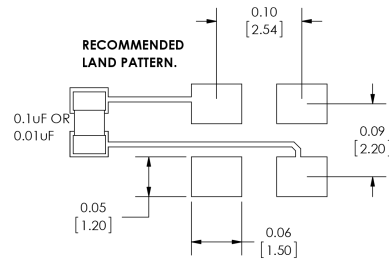
- Termination pads (4x), Electro nickel plating 1.27µm ~ 8.89µm typ., with gold 0.3µm ~ 1.0µm flash plate
- Weight: 0.15g typ., 2.0g max.

QTCH350 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 0.01 μF is required between Vdd and GND

Marking

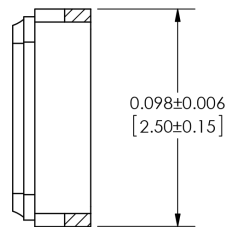
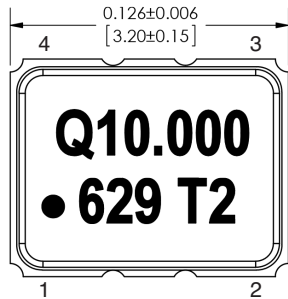
Line 1: QXXX.XXXXXX (Q for Q-Tech, no space 9 or 10 Characters of Frequency including decimal)
 Line 2: Dot (Pin 1 Indicator) + Date code (YY/WW), Internal Traceability Code

Package Information

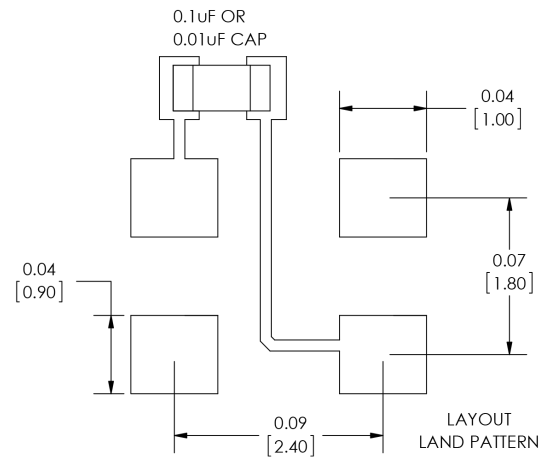
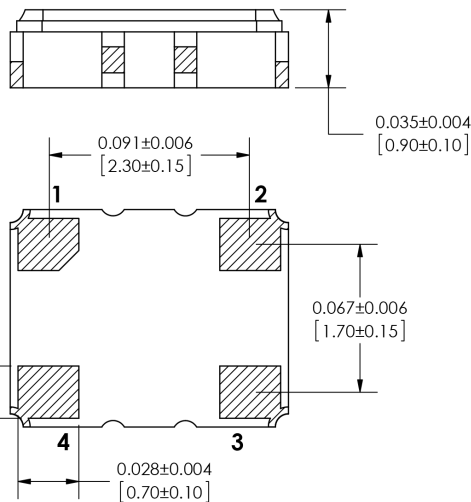
- Termination pads (4x), Electro nickel plating 1.27 μm ~ 8.89 μm typ., with gold 0.3 μm ~ 1.0 μm flash plate
- Weight: 0.057g typ.

QTCH230 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.



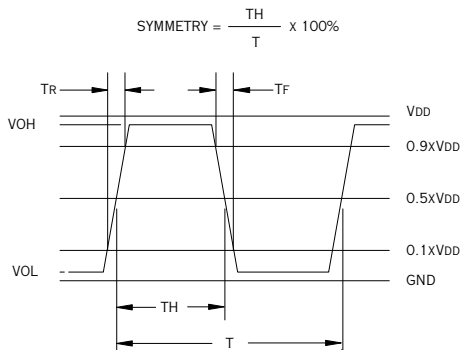
QTCH HIGH TEMPERATURE MINIATURE SMD OSCILLATORS

5 x 7mm, 3.2 x 5mm, 2.5 x 3.2mm, SMD UP TO 200°C
1.8Vdc, 2.5Vdc and 3.3Vdc - 1MHz to 48MHz

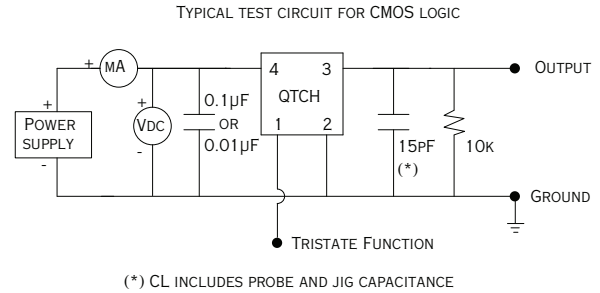
Electrical Characteristics

Parameters	QTCH-RD	QTCH-ND	QTCH-LD
Output frequency range (Fo) <u>1/</u>	1.000MHz — 48.000MHz		
Supply voltage (Vdd) <u>2/</u>	1.8Vdc ± 10%	2.5Vdc ± 10%	3.3Vdc ± 10%
Maximum Applied Voltage (Vdd max.)	-0.3 to +4.0Vdc		
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)	2mA max.		3mA max.
Symmetry (50% of output waveform)	45/55%		
Rise and Fall times	6ns max.		
Output Load	15pF max.		
Start-up time (Tstup)	10ms max.		
High Output Voltage (Voh)	0.9*Vdd min.		
Low Output Voltage (Vol)	0.1*Vdd max.		
Enable VIH Pin 1	VIH ≥ 0.7*Vdd Active		
Disable VIL Pin 1	VIL ≤ 0.3*Vdd High Impedance		
Aging	±5ppm/first year		
Notes			
<u>1/</u> Consult factory for frequencies greater than 48MHz			
<u>2/</u> Part is designed to work from 1.8Vdc to 3.3Vdc. Supply voltage code is used to test the part to specific nominal voltage specified in a Purchase Order.			

Output Waveform (Typical)

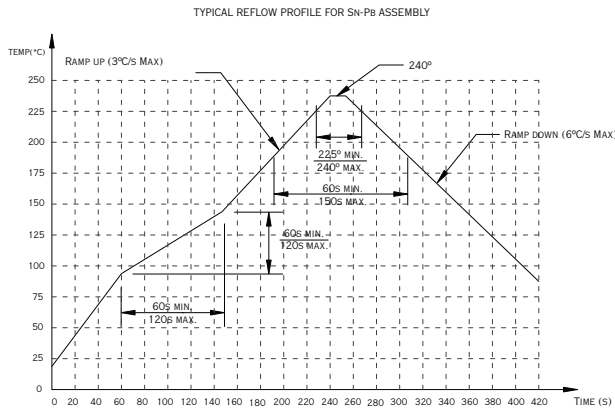


Test Circuit

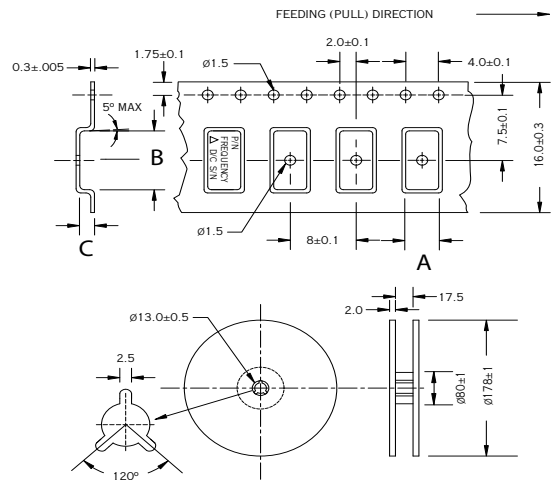


The Tristate function on pin 1 has a built-in pull-up resistor so it can be left floating or tied to Vdd without deteriorating the electrical performance.

Reflow Profile



Embossed Tape and Reel Information



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

Package	A	B	C
QTCH 570	5.35 ±0.1	7.75 ±0.1	1.85 ±0.1
QTCH 350	3.70 ±0.1	5.50 ±0.1	1.40 ±0.1
QTCH 230	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
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



QTCH HIGH TEMPERATURE MINIATURE SMD OSCILLATORS

5 x 7mm, 3.2 x 5mm, 2.5 x 3.2mm, SMD UP TO 200°C
1.8Vdc, 2.5Vdc and 3.3Vdc - 1MHz to 48MHz

DCO	REV	REVISION SUMMARY	PAGE	DATE
6434	A	Fix L and R voltages	1 and 5	2/14/17
8121	B	Add Temperature Code 99	1	5/8/18