

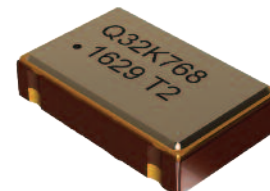
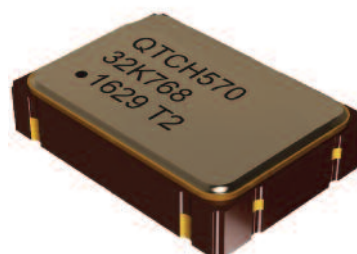
## Description

The QTCH series are miniature surface-mount (SMD) crystal oscillators supporting 32.768kHz\* fundamental mode operating in a wide supply voltage range from 2.5Vdc 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.

\* See separate data sheet for other frequencies.

## Features

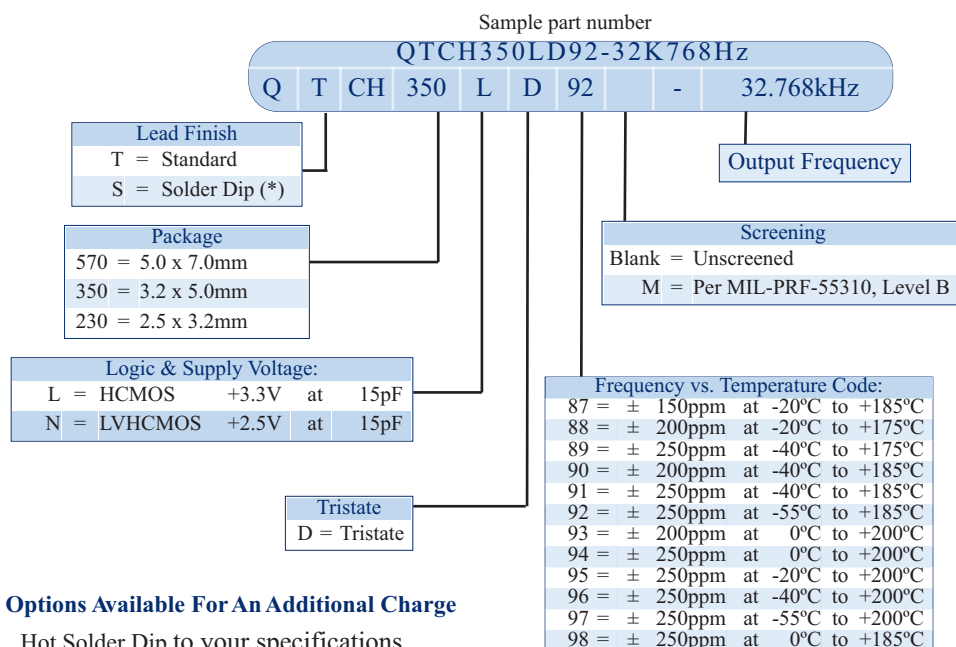
- ECCN: EAR99
- Wide operating temperature -55°C to +200°C available
- Very low power consumption
- CMOS logic 2.5Vdc and 3.3Vdc
- Tri-State Output Standard
- Fundamental amode AT cut crystal
- High shock and vibration resistant
- Military screening tests per MIL-PRF-55310 available
- Tape and reel packaging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



## Applications

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

## 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.

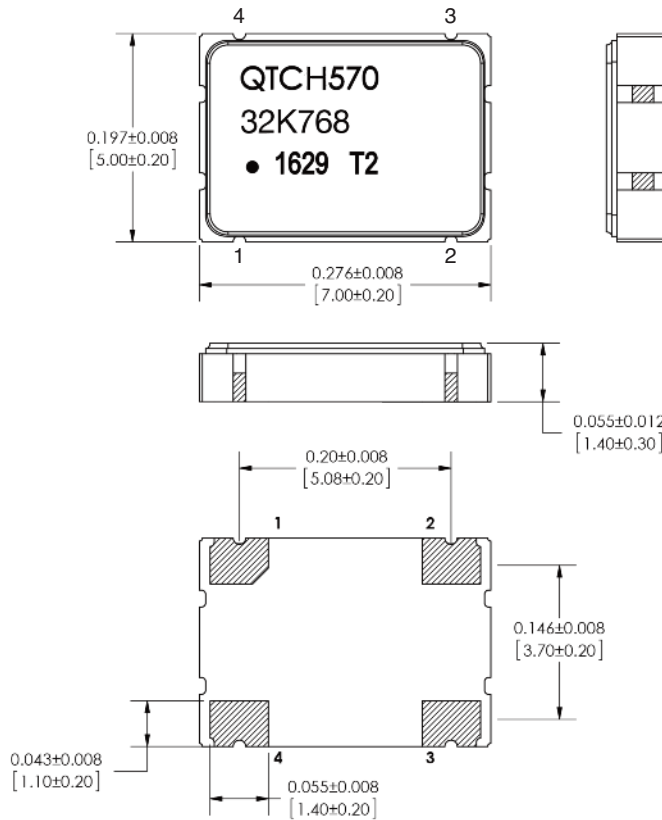
Frequency stability vs. temperature codes may not be available in all frequencies.

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

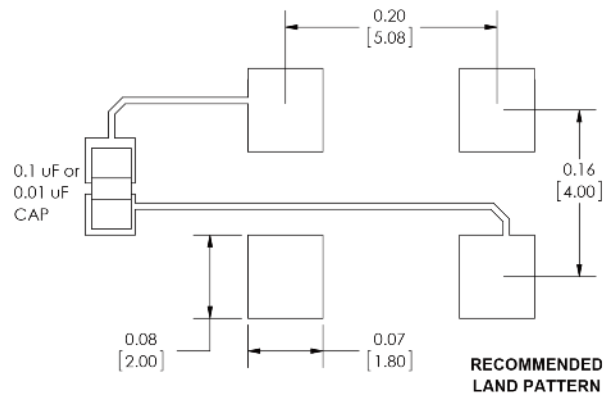


## QTCH570 Package Outline and Pin Connections

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: XX.XXX (6 Characters of Frequency)  
Line 3: Dot (Pin 1 Indicator) + Date code (YY/WW), Internal Traceability Code

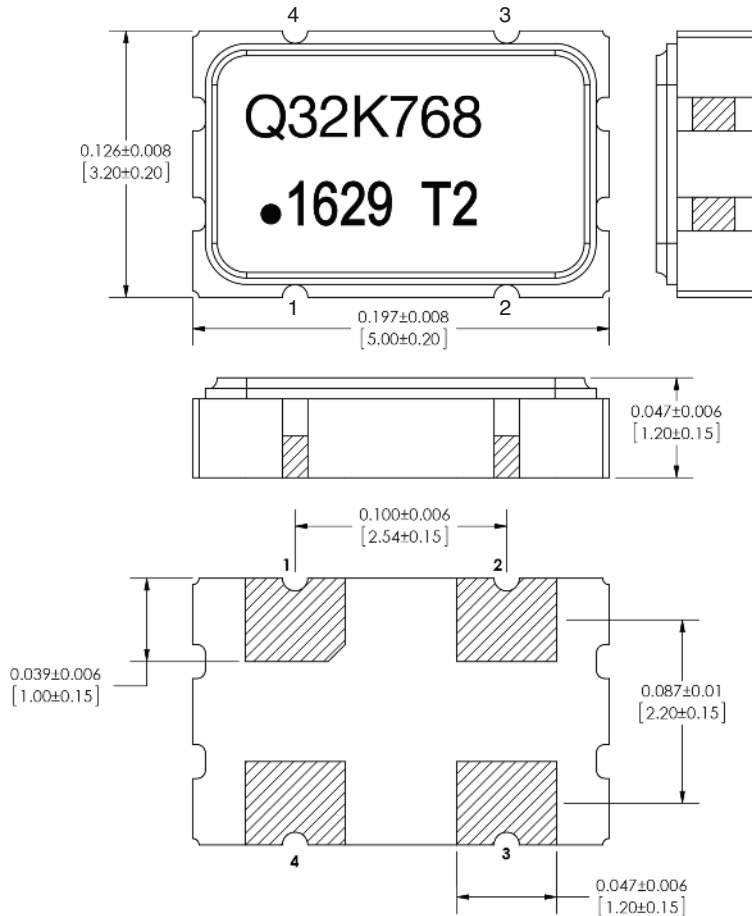
## Package Information

- 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.

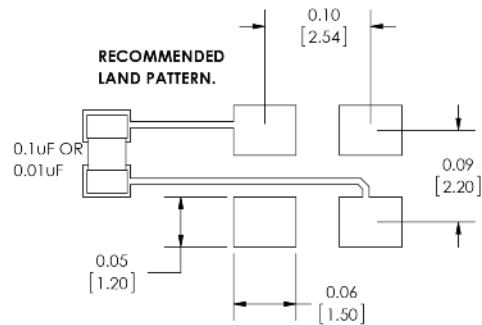


## QTCH350 Package Outline and Pin Connections

Dimensions are in inches (mm)



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



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

## Marking

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

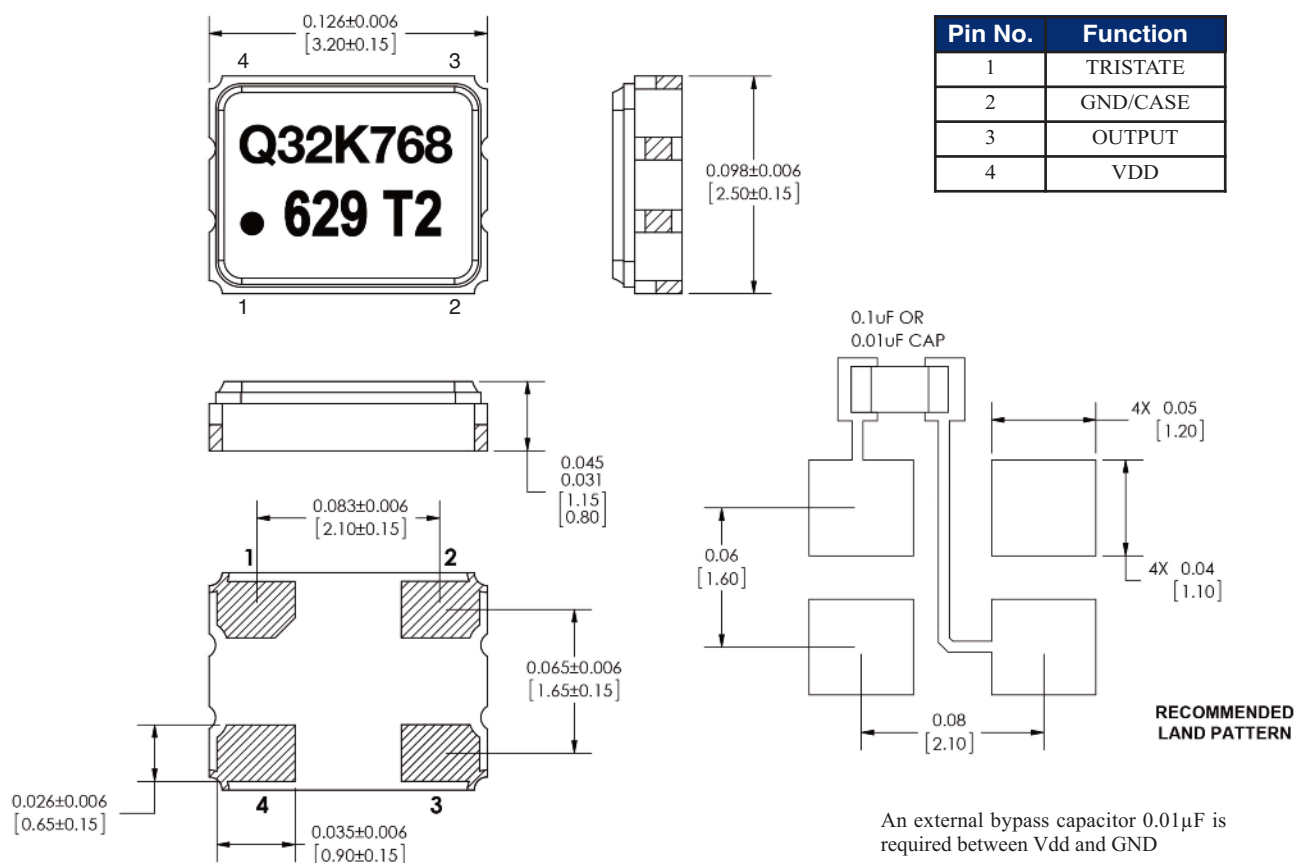
## Package Information

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



## QTCH230 Package Outline and Pin Connections

Dimensions are in inches (mm)



## Marking

Line 1: QXX.XXX (Q for Q-Tech, no space 7 Characters of Frequency)

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	QTCH-ND	QTCH-LD
Output frequency range (Fo) 1/	32.768kHz	
Supply voltage (Vdd)	2.5Vdc ± 10%	3.3Vdc ± 10%
Maximum Applied Voltage (Vdd max.)	-0.3 to +7.0Vdc	
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 + 150°C	
Operating supply current (No Load)	70μA typ.   120μA max.	
Symmetry (50% of ouput waveform )	45% min   50% typ.   55% max.	
Rise and Fall times	50ns typ.   200ns max.	
Output Load	15pF max.	
Start-up time (Tstup)	10ms max.	
High Output Voltage (Voh)	Vdd - 0.4 min.	
Low Output Voltage (Vol)	0V min.   0.4V max.	
Enable VIH Pin 1	VIH ≥ 0.7*Vdd Active	
Disable VIL Pin 1	VIL ≤ 0.3*Vdd High Impedance	
Aging	±5ppm/first year	
<u>Notes</u> 1/ See separate data sheet for other frequencies.		

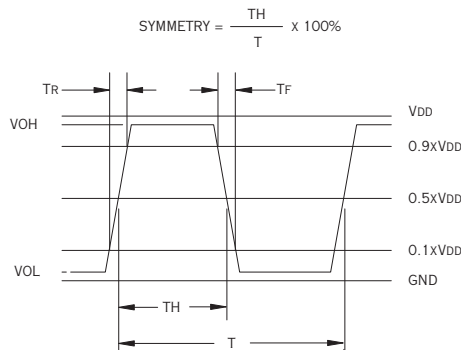


**Q-TECH**  
CORPORATION

## QTCH HIGH TEMPERATURE MINIATURE SMD OSCILLATORS

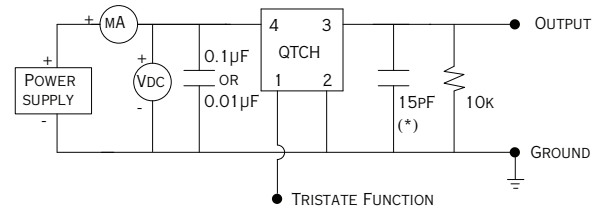
5 x 7mm, 3.2 x 5mm, 2.5 x 3.2mm, SMD UP TO 200°C  
2.5Vdc and 3.3Vdc - 32.768 kHz\*

### Output Waveform (Typical)



### Test Circuit

TYPICAL TEST CIRCUIT FOR CMOS LOGIC

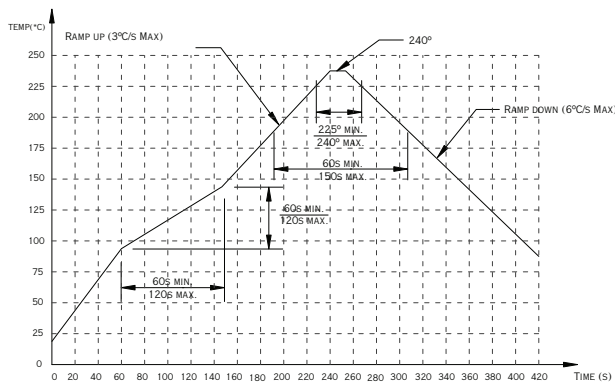


(\*) CL INCLUDES PROBE AND JIG CAPACITANCE

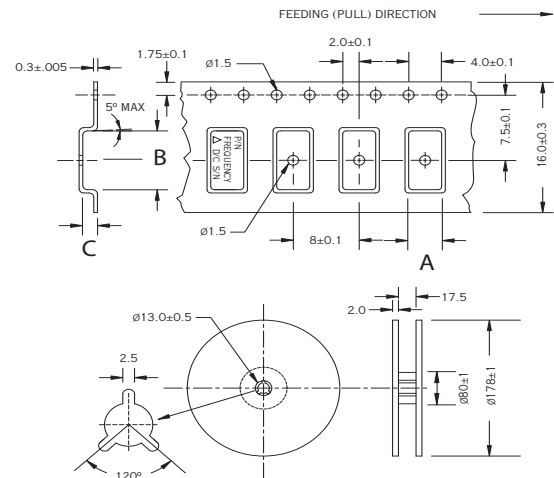
The Tristate function on pin 1 has a built-in pull-up resistor so it can be left floating or tied to Vdd without deteriorating the electrical performance.

### Reflow Profile

TYPICAL REFLOW PROFILE FOR Sn-Pb ASSEMBLY



### 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