

### Features

- Miniature Ceramic surface mount with Metal Lid
- Package Size:7.0 x1.5 x1.4mm Max.
- Low Aging, Low Power Consumption,High reliability characteristics
- RoHS Compliant/Pb Free

### Applications

- Real Time Clock
- Portable Electronics
- Smart Meters
- Communication Electronics
- IoT Devices



### Electrical Specifications

Item	Symb.	Electrical spec.	Notes
Nominal Frequency	Freq.	32.768KHz	
Operating Temperature	T <sub>use</sub>	-40°C ~ +85°C	
Storage Temperature Range	T <sub>stg</sub>	-55 ~ 125°C	
Oscillation Mode	-	Fundamental	
Frequency Tolerance	f <sub>tol</sub>	±10ppm / ±20ppm	at 25°C ±3°C
Turnover Temperature	T <sub>i</sub>	25°C ±5°C	
Parabolic curvature constant	B	-0.042ppm/(Δ°C) <sup>2</sup> max.	Over Operating Temp. Range (Reference 25°C)
Drive Level	DL	0.5 μW Max.	
Load Capacitance	CL	7pF , 9pF, 12.5pF	
Effective Resistance	RR	65kΩ max.	
Aging	f <sub>age</sub>	±3 ppm Max.	1st. Year at 25°C

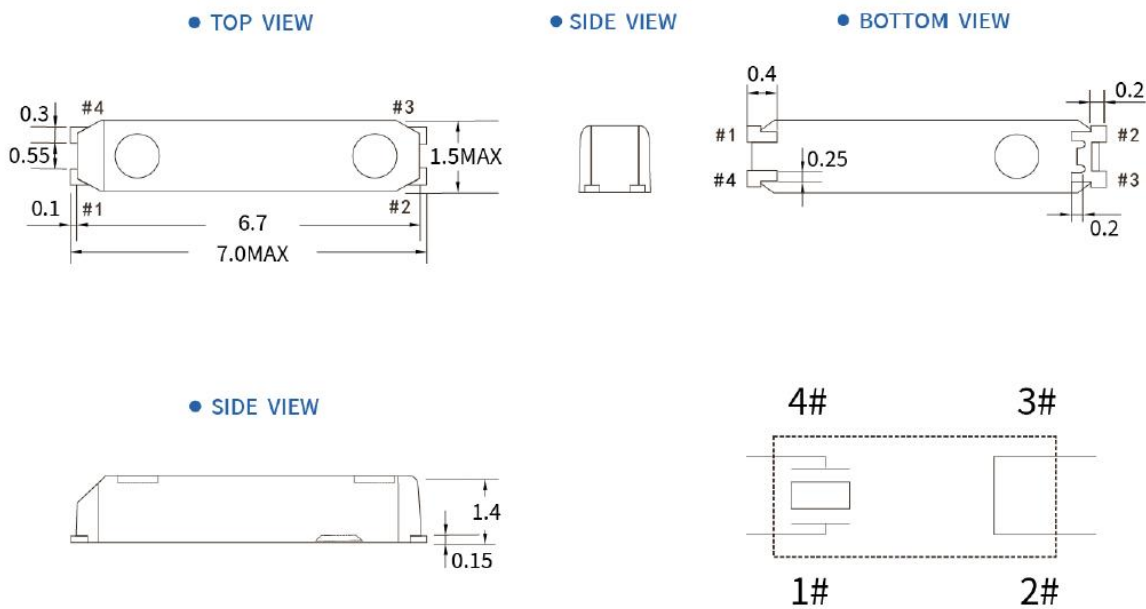


**Frequency Stability & Operating Temperature Range**

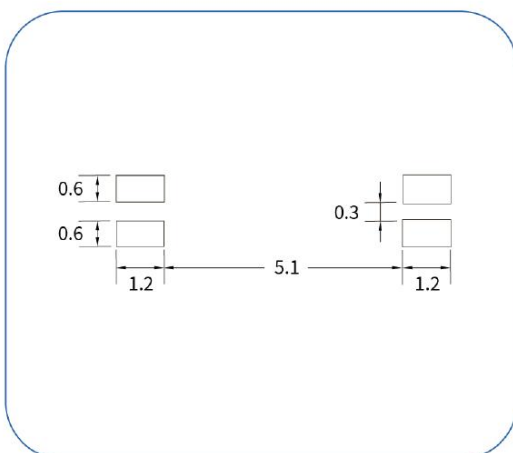
Temp. \ FT	±10ppm	±15ppm	±20ppm	±30ppm
-20°C to +70°C	△	★	★	★
-40°C to +85°C		△	★	★

★: Available    △: Conditional

**Dimensions (mm)**



**Solder pad layout** (UNIT:mm)

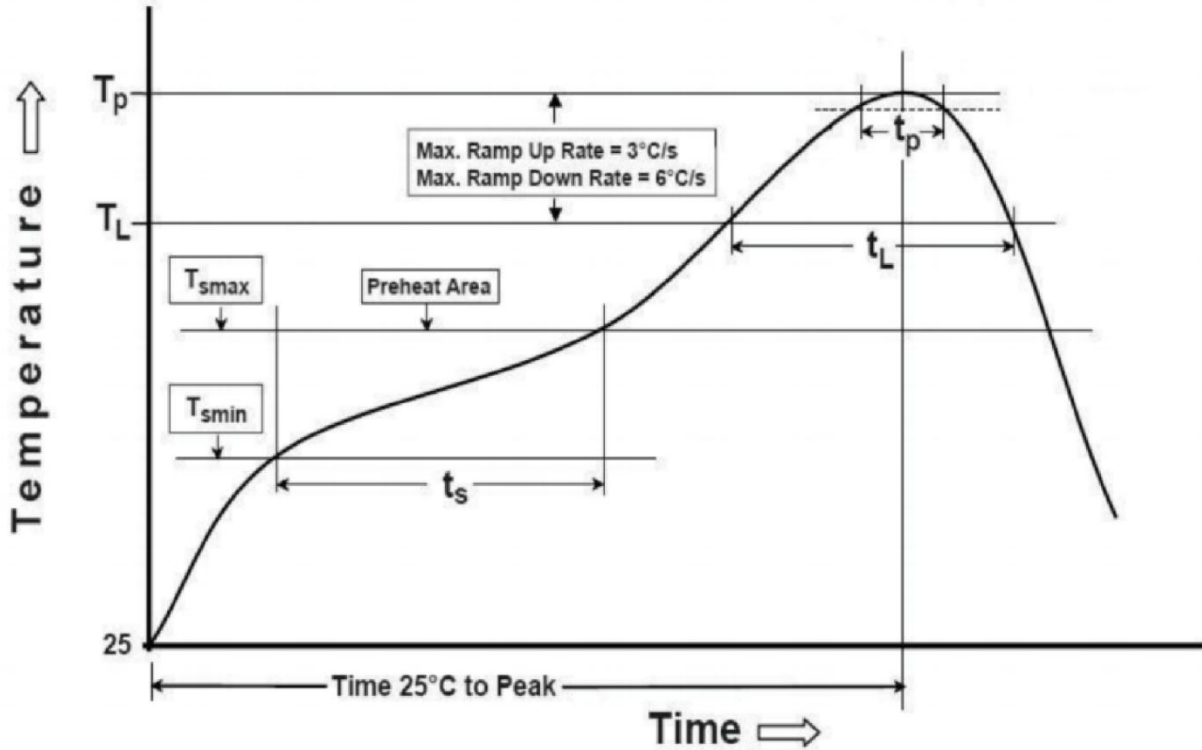


**Notes:**

- (1) Do not connect 2# and 3# to external device.
- (2) The metal case inside of the molding compound may be exposed on the top or bottom of this product. This purely cosmetic and does not have any effect on quality reliability or electrical specs.



**Suggested Reflow Profile**



Profile Feature	Sn - Pb Eutectic Assembly	Preheat / Soak
Preheat / Soak <ul style="list-style-type: none"> <li>● Temperature Min ( T<sub>s</sub> min )</li> <li>● Temperature Max ( T<sub>s</sub> max )</li> <li>● Time ( T<sub>s</sub> min to T<sub>s</sub> max )</li> </ul>	100°C 150°C 60-120 seconds	150°C 200°C 60-120 seconds
Ramp - up rate ( T <sub>L</sub> to T <sub>p</sub> )	3°C/ second max.	3°C/ second max.
Time maintained above <ul style="list-style-type: none"> <li>● Liquidous temperature ( T<sub>L</sub> )</li> <li>● Time ( t<sub>L</sub> ) maintained above T<sub>L</sub></li> </ul>	183°C 60-150 seconds	217°C 60-150 seconds
Peak package body temperature ( T <sub>p</sub> )	235°C	260°C
Time within 5° C of the specified classification temperature ( T <sub>p</sub> )	20 seconds	30 seconds
Ramp - down rate ( T <sub>p</sub> to T <sub>L</sub> )	6°C/ second max.	6°C/ second max.
Time 25° C to peak temperature	6 minutes max.	8 minutes max.
<b>Suggest reflow times</b>	<b>2 Times max.</b>	



**PN Structure:**

WQC-TF70153276812520FTR

WQC-TF7015 32.768KHz 12.5pF ±20ppm -40°C ~ +85°C ESR 65KΩ 1,6x1,0mm 2PIN SMD Tape Reel RoHS

WQC-	TF7015		32768	12.5	20	F	T	R
Series	Effective Resistance	Frequency Code	Load Capacitance	Frequency Tolerance	Operating Temperature	Tape Reel	RoHS	
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	

**1. Effective Resistance**

Blank	Standard
R	50KΩ Max.

**2, Frequency Code(KHz)**

32768	32.768
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**3, Capacitance**

125	12.5pF
09	9pF
07	7pF
06	6pF

**4, Frequency Tolerance**

10	±10ppm
20	±20ppm

**5, Operating Temperature**

E	-20°C +70°C
F	-40°C +85°C

**6, Packing**

T	Tape Reel
B	Bulk

**7, RoHS**

R	RoHS
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