

## Features

- Miniature Ceramic surface mount with Metal Lid
- Package Size:3.2 x1.5 x 0.8mm 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
		TF3215	TF3215R	
Nominal Frequency	Freq.	32.768KHz		
Operating Temperature	T_use	-40°C~+85°C		
Storage Temperature Range	T_stg	-55~125°C		
Oscillation Mode	-	Fundamental		
Frequency Tolerance	f_tol	±10ppm / ±20ppm		at 25°C±3°C
Turnover Temperature	Ti	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	6pF;7pF;9pF;12.5pF		
Effective Resistance	RR	70kΩ max.	50kΩ max.	
Aging	f_age	±3 ppm Max.		1st. Year at 25°C

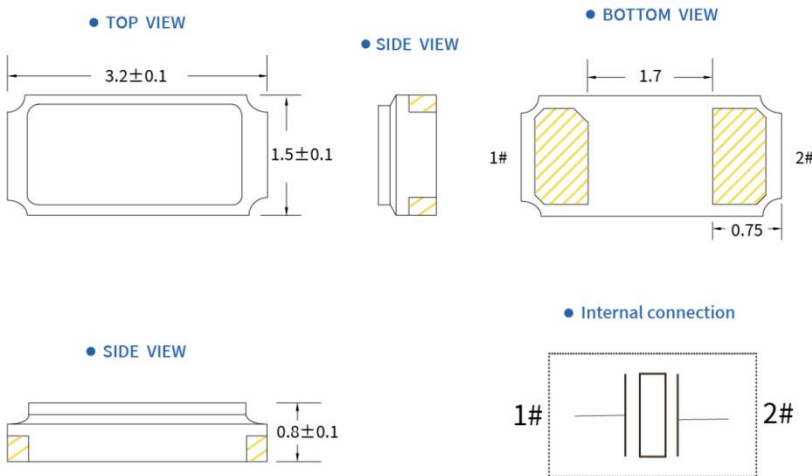


**Frequency Stability & Operating Temperature Range**

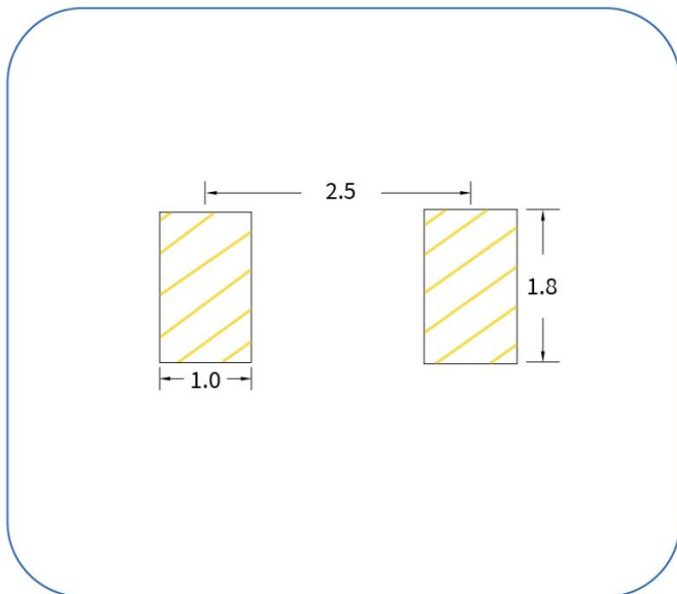
Temp. \ FT	±10ppm	±15ppm	±20ppm	±30ppm
-20°C to +70°C	△	★	★	★
-40°C to +85°C		△	★	★

★: Available    △: Conditional

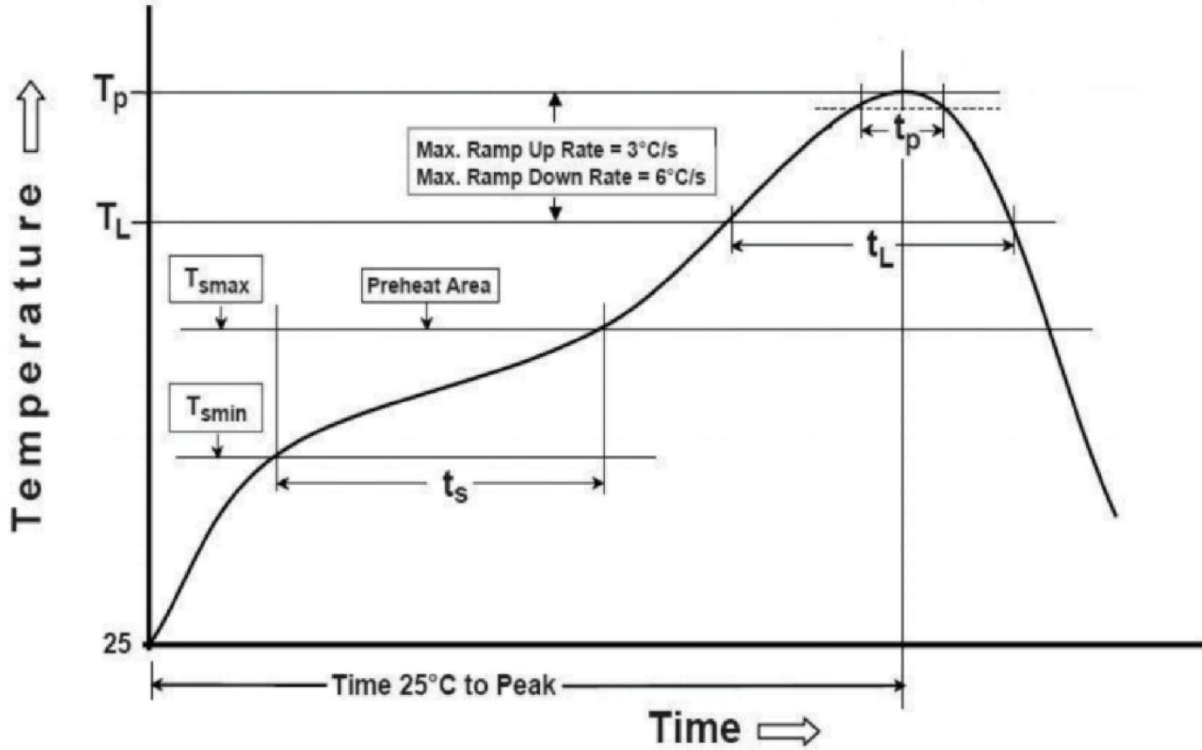
**Dimensions (mm)**



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



**Suggested Reflow Profile**



Profile Feature	Sn - Pb Eutectic Assembly	Preheat / Soak
Preheat / Soak ● Temperature Min ( T <sub>s</sub> min ) ● Temperature Max ( T <sub>s</sub> max ) ● Time ( T <sub>s</sub> min to T <sub>s</sub> max )	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 ● Liquidous temperature ( T <sub>L</sub> ) ● Time ( t <sub>L</sub> ) maintained above T <sub>L</sub>	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-TF3215R327680620FTR

WQC-TF3215 32.768KHz 6pF±20ppm -40°C~+85°C ESR 50KΩ 3,2x1,5mm 2PIN SMD Tape Reel RoHS

WQC-	TF3215	R	32768	6	20	F	T	R
Series		Effective Resistance	Frequency Code	Load Capacitance	Frequency Tolerance	Operating Temperature	Tape Reel	RoHS
		1	2	3	4	5	6	7

**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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