

**SMD QUARTZ CRYSTAL RESONATOR**

**4 Pad Version 8.0×3.8 mm**

- Tuning fork crystal in standard package
- 32.768 KHz standard
- ±10 ppm available
- Excellent Reliability Performance
- Reflow soldering temperature: 260°C max



RoHS compliant

**★ PARAMETERS**

PARAMETERS	SPECIFICATION
Frequency Range	32.768KHz standard, 20.000~165.000KHz
Loading Capacitance	12.5pF Std. 6 to 20pF Series available
Drive Level	1.0 μ W Max
Frequency Tolerance	±10ppm ~ ±30ppm ( at 25°C )
Equivalent Resistance	50KΩ Max
Temperature coefficient	-0.04×10 <sup>-6</sup> /°C <sup>2</sup> max
Operating Temp. Range:	-20 ~ +70°C / -40 ~ +85°C (-40~+125°C available)
Storage Temp. Range:	-40~+85°C
Aging (25°C, First Year)	±3ppm Max

○ All specification subject change without notice.

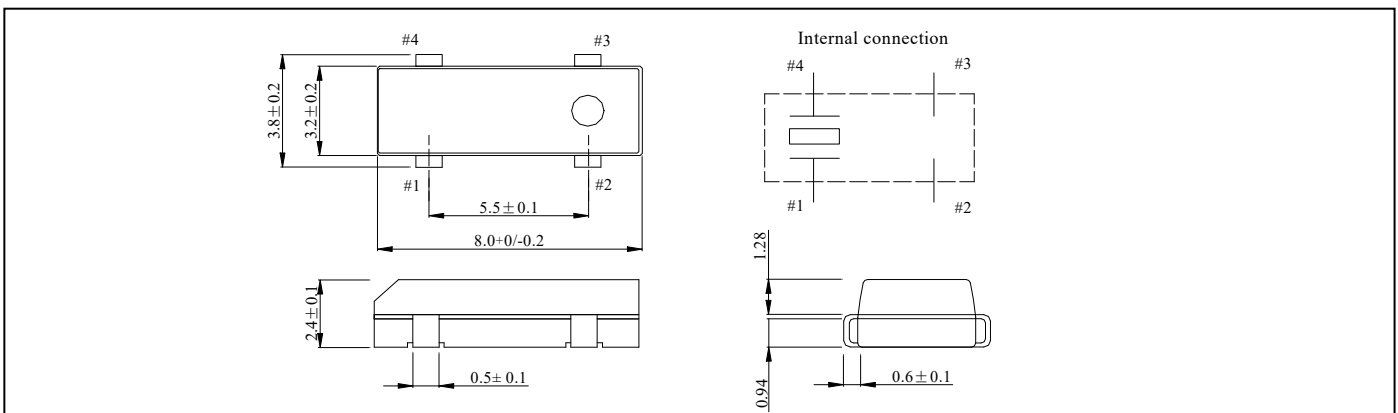
**★ FREQUENCY STABILITY VS. TEMPERATURE**

Operation Temperature Range	Frequency Stability	
	-80ppm	-160ppm
-20°C~+70°C	●	
-40°C~+85°C		●

● standard ○ available

**★ ESR (SERIES RESISTANCE RS)**

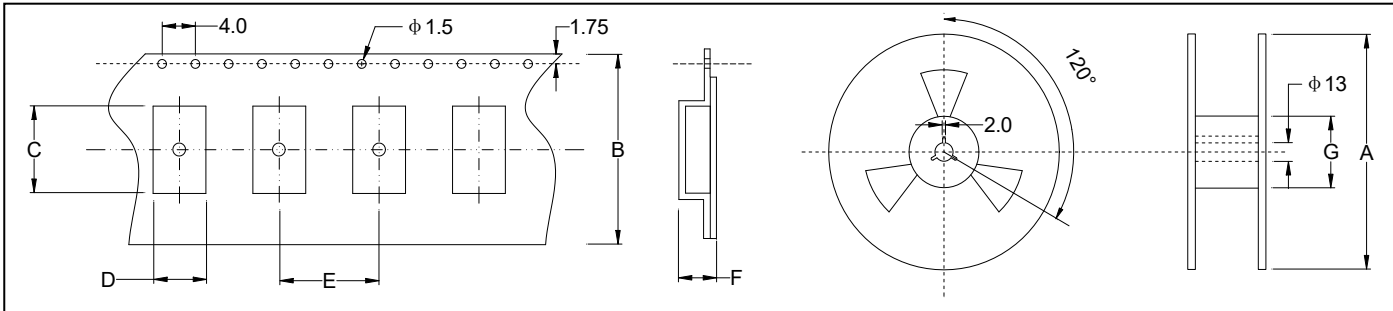
Frequency	20-30KHz	30-40KHz	40-70KHz	70-165KHz
ESR	50KΩ Max	45KΩ Max	20KΩ Max	12KΩ Max

**★ DIMENSIONS & LAND PATTERN LAYOUT (Unit: mm)**

**★ PART NUMBER GUIDE** e.g. FTX32.768K12.5SM8-20D (\*SM8=8.0×3.8 SMD)

	Quartz Crystal Resonator	Frequency Hz	Load Capacitance pF	Package	Frequency Tolerance ppm	Operating Temp. Range
FT	X	32.768KHz	12.5	SM8	20	D

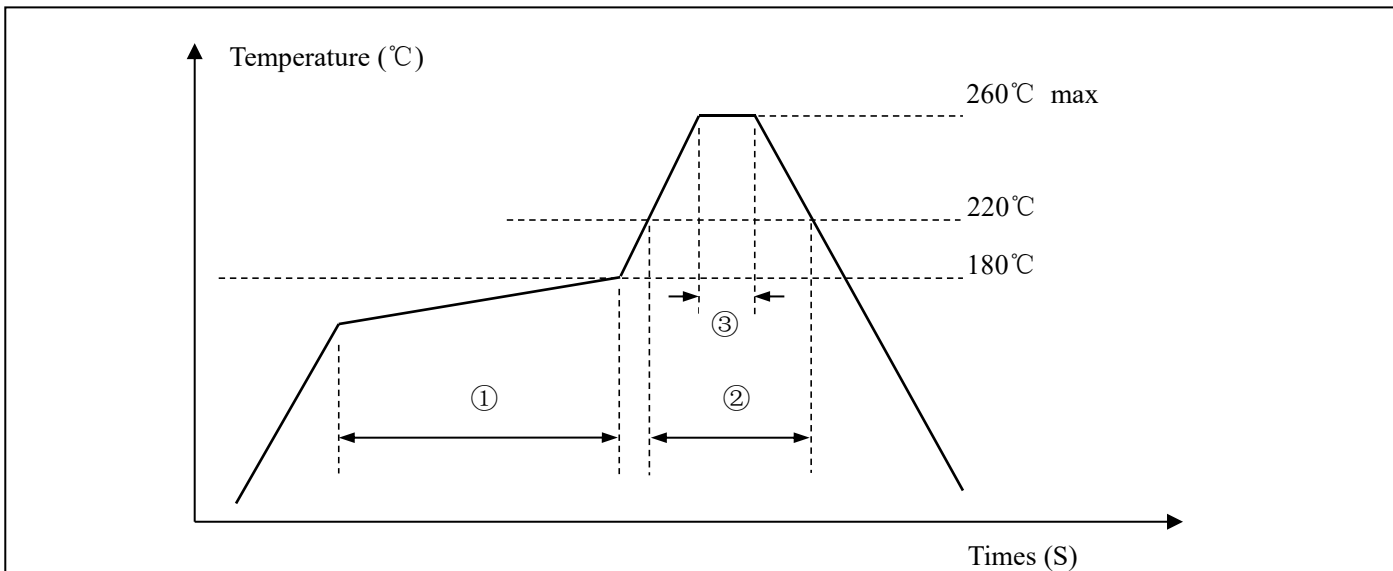
Definition	Description	
Operating Temperature Range	A: -10~+60°C	B: -20~+70°C
	C: -30~+80°C	D: -40~+85°C
	E: -30~+105°C	F: -40~+105°C
	G: -40~+125°C	S: Customer specified

★ TAPING SPECIFICATION (Unit: mm)



	A	B	C	D	E	F	G
SMD8×3.8	330	16	8.4	4.0	8.0	2.8	100
2000 pcs per reel							

★ REFLOW SOLDERING PROFILE



Pb free reflow A	①	Preheat	160~180°C	100sec. max
	②	Primary heat	220°C	35sec. max
	③	Peak	260°C	10sec. max