

深圳市维拓精电科技有限公司  
WTL International Limited

APPROVAL SHEET

DESCRIPTION :	6.9*1.4mm SMD Tuning Fork Crystal			
NOMINAL FREQ.:	32.768KHz			
WTL P/N:	WTL4X85573FO			
VERSION:	2			
DATE:	2023.04.18			
Customer	Customer P/N			
	/			
Customer Signature	WTL			
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<b>REVISION HISTORY</b>				
Revised Page	Revision Content	Date	Ref. No.	Reviser

## CONTENT CATALOG

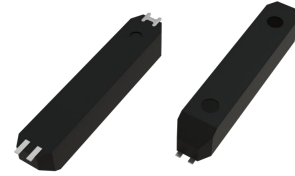
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Attachment(s):

- 1.Product Specification Sheet
- 2.Electrical Testing Report
- 3.Reliability Report
- 4.ICP Test Report

**FEATURE**

- Ultra small size 6.9×1.4×1.3 mm
- High reliability environmental performance
- High frequency stability and high precision
- Designed for automatic mounting and reflow soldering
- RoHS Compliant / Pb Free

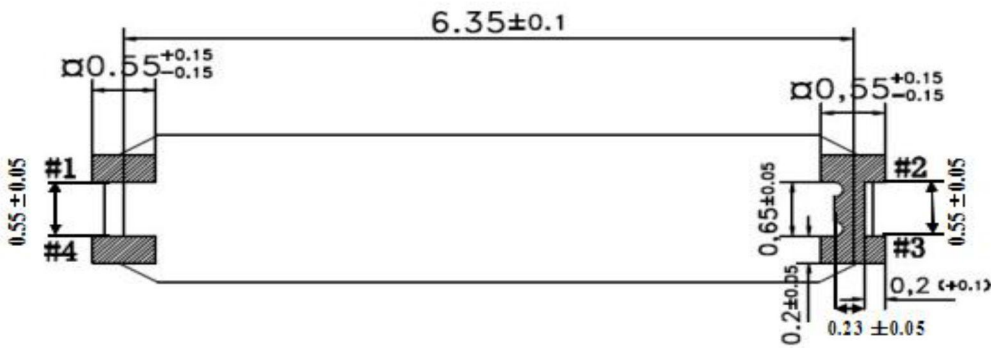
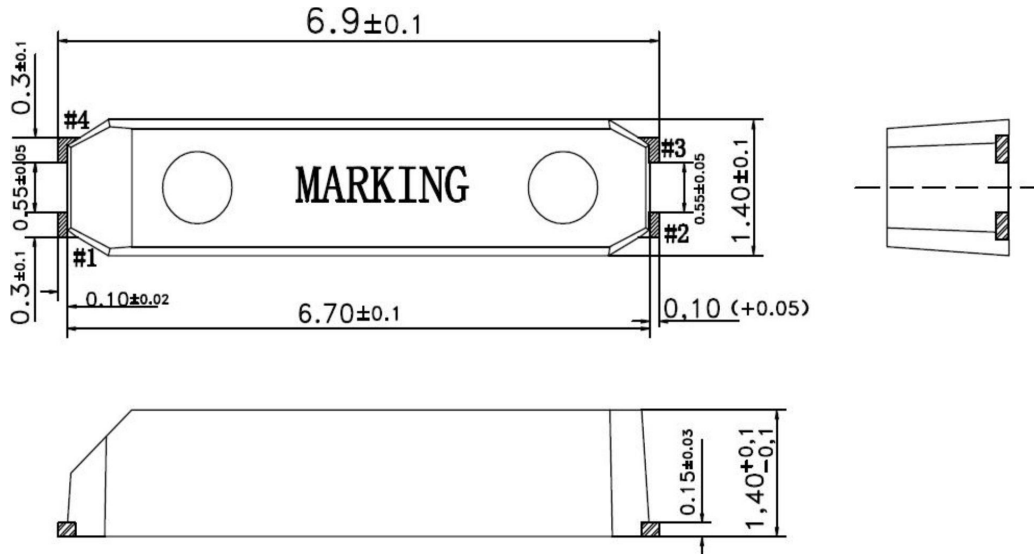


**1、 ELECTRICAL SPECIFICATIONS**

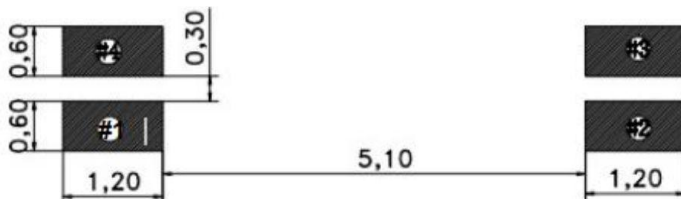
Hold Style	6.9X1.4MM TUNING FORK SMD CRYSTAL
Nominal Frequency	32.768KHz
Frequency Tolerance (at 25°C)	±20ppm
ESR	65Kohm Max
Turnover Temperature	25 ± 5°C
Frequency Temperature Curve	(-0.036±10%) x 10 <sup>-6</sup> /°C <sup>2</sup>
Operating Temperature Range	-40 °C to + 85 °C
Storage Temperature Range	-55 °C to +125 °C
Shunt Capacitance (C <sub>0</sub> )	3pF Typ.
Dynamic Capacitance (C <sub>1</sub> )	1.9fF Typ.
Driver Level (Typical)	0.1μW
Driver Level(Max)	1μW
Load Capacitance(C <sub>L</sub> )	7pF
Insulation Resistance	More than 500Mohms at DC100V
Aging @25°C 1 <sup>st</sup> year (Max)	±5ppm/year

**REMARK:** SPECIFICATIONS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE. PLEASE CONFIRM WITH OUR SALES ENGINEER.

## 2、DIMENSIONS (Unit: mm)



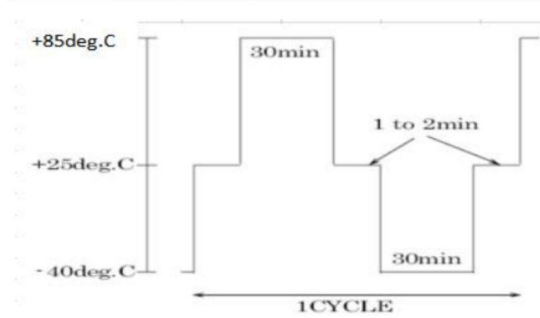
### Recommended soldering pattern



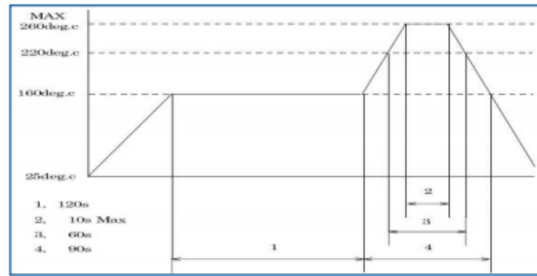
### Internal Connection



### 3、RELIABILITY SPECIFICATIONS

Test Items (测试项目)	Test Method and Condition (测试方法)	Requirements (标准)
Vibration (震动)	(1)Vibration Frequency (震动频率) 10 to 55Hz (2)Vibration Amplitude (震动幅度) 1.5mm (3) Cycle Time (循环时间) 1-2min(10-55-10Hz) (4)Direction (震动方向) X.Y.Z (5)Duration (持续时长) 2h/each direction	Frequency Change(频率变化):±10ppm Max. Resistance Change (电阻变化):10kohm Max.
Shock (跌落冲击试验)	3 Times free drop from 75cm height to hard wooden board of thickness more than 30mm (从75cm高度自由下落3次至厚度大于30cm的硬木板上)	Frequency Change(频率变化):±10ppm Max. Resistance Change (电阻变化): 15kohm Max.
Hermetic seal (气密性测试)	Helium leak detector Checked:before the molded crystal units	less than $1 \times 10^{-7}$ mbar.l/sec.
Weldability (可焊性)	Dip the leads of crystal units into the solution (7-10%) of rosin 3±1s, then dip into tank 5~10S s. Temperature of solder melted tank is 245°C±5°C 将晶体单元的引线浸入松香的溶液(7-10%)中3±1s, 然后浸入焊锡至引线根部2~3mm处, 5±1S后提起。 焊料熔化罐的温度: 245°C±5°C	The dipped surface of the leads should be at least 95% covered with continuous new solder coating 引脚的浸涂表面应至少覆盖95%的连续新焊料涂层。
High temperature (高温测试)	96 hours at 125°C±2°C (置于125°C±2°C下96小时) After being left at room temperature for 2 hours, the test is carried out. (在室温下放置2小时后测试)	Frequency Change(频率变化):±20ppm Max. Resistance Change (电阻变化): 10kohm Max.
Low temperature (低温测试)	96 hours at -40°C±2°C (置于-40°C±2°C下96小时) After being left at room temperature for 2 hours, the test is carried out. (在室温下放置2小时后测试)	Frequency Change(频率变化):±10ppm Max. Resistance Change (电阻变化): 10kohm Max.
High temperature (高温测试)	96 hours at 125°C±2°C (置于125°C±2°C下96小时) After being left at room temperature for 2 hours, the test is carried out. (在室温下放置2小时后测试)	Frequency Change(频率变化):±20ppm Max. Resistance Change (电阻变化): 10kohm Max.
Low temperature (低温测试)	96 hours at -40°C±2°C (置于-40°C±2°C下96小时) After being left at room temperature for 2 hours, the test is carried out. (在室温下放置2小时后测试)	Frequency Change(频率变化):±10ppm Max. Resistance Change (电阻变化): 10kohm Max.
High temperature and humidity (高温高湿)	96 hours at 60°C±2°C, relative humidity 90-100% (置于60°C±3°C下96小时, 相对湿度90-100%) After being left at room temperature for 2 hours, the test is carried out. (在室温下放置2小时后测试)	Frequency Change(频率变化):±20ppm Max. Resistance Change (电阻变化): 10kohm Max.
Temperature cycle (高低温循环测试)	After supplying the following temperature cycle (100 time) (提供以下温度循环(100次)) 	Frequency Change(频率变化):±10ppm Max. Resistance Change (电阻变化): 10kohm Max.

Reflow soldering  
(回流焊)



After 24h past from frequency test,  
Frequency Change:  $\pm 20$ ppm Max.  
Resistance Change: 20kohm Max.

Notice:

1、Using the infrared lamp at soldering process may cause uneven temperature rise on plastic surface of the parts, so that please keep the package temperature within left conditions.

2、DO NOT dip the plastic part into solder

## 10. Handling Notice for Standard Tuning Fork Crystal (Cylindrical Type) 标准音叉类晶振注意事项(圆柱型)

### 10.1. Shock resistance 跌落

It may deteriorate the characteristics or cause of no oscillation if excess physical shock given. Please be careful not to drop. Please use under condition to minimize the shocks as much as possible.

请不要跌落本产品，晶体受到冲击可能会使之性能恶化或不起振。在使用时，请尽量避免震动。

Please review the conditions if it is used by auto mounting or after the conditions are changed.

请在使用自动焊接设备，或在工作环境改变的情况下，检测本品的性能。

### 10.2. Heat and humidity resistance in storage 储存中得耐湿热性

Storing the crystal products under higher or lower temperature or high humidity for a long period may deteriorate the characteristics of crystal units.

长时间储存在高温，低温或高湿的环境下会使本品性能恶化。

Please store and use the crystal products at the normal temperature and humidity.

请储存在常温常湿的环境中。

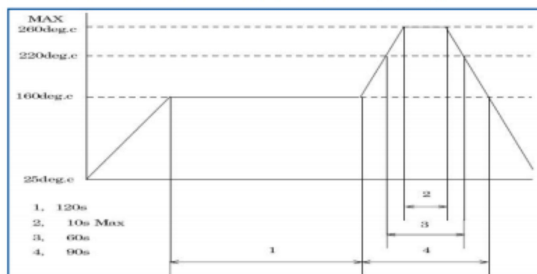
### 10.3. Solder heat resistance 焊锡耐热性

Please review the condition or consult us about flow solder process.

请查阅有关流动焊接工艺的条件或咨询我们。

**Our soldering condition is under 260°C within 10sec**

我们的焊接条件为低于 260°C 时间不超过 10 秒。

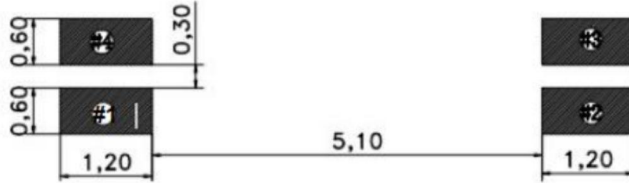




#### 10.4. Mounting method to PCB (PCB 上的焊接方法)

When the crystal products need to be lay down please fix to PCB securely. Recommended size of solder plate as shown below.

当需要放置晶振时，请将其固定在 PCB 上，推荐焊盘尺寸如下图；



#### 10.5 Ultrasonic cleaning and ultrasonic soldering 超声波清洗和超声波焊接

Soldered by ultrasonic cannot be guaranteed, because crystal may be sympathetic vibrated and may damage.

Please study at your side about ultrasonic cleaning.

超声波焊接无法提供品质保证，因为晶体可能会发生共振，并可能损坏。

#### 10.6. Drive level 激励功率

Applying excessive drive level to the crystal units may cause deterioration of characteristics or damage. Less than  $1.0\mu\text{W}$  is recommended to this products. More than  $2.0\mu\text{W}$  cannot be guaranteed.

对晶体施加较大的激励功率会导致晶体的性能恶化或者损坏。我司推荐晶体激励功率小于  $1.0\mu\text{W}$ ，超过  $2.0\mu\text{W}$  激励功率我司无法保证晶体品质稳定。

#### 10.7.Solder paste should be more than $150\mu\text{m}$ thickness.

焊膏厚度应不低于  $150\mu\text{m}$ 。

#### 10.8. Storage environment

储存环境

##### 10.8.1 To storage the reel at $+15^\circ\text{C}$ to $+35^\circ\text{C}$ , 25%RH to 65%RH of Humidity.

温度  $+15^\circ\text{C}\sim+35^\circ\text{C}$ ，湿度 25%Rh~65%Rh 的环境下储存物料。

##### 10.9.2 To open the packing just before using.

使用前请打开包装；

##### 10.9.3 Not to expose the sun.

请勿暴晒

##### 10.9.4 Not to storage with some erosive chemicals.

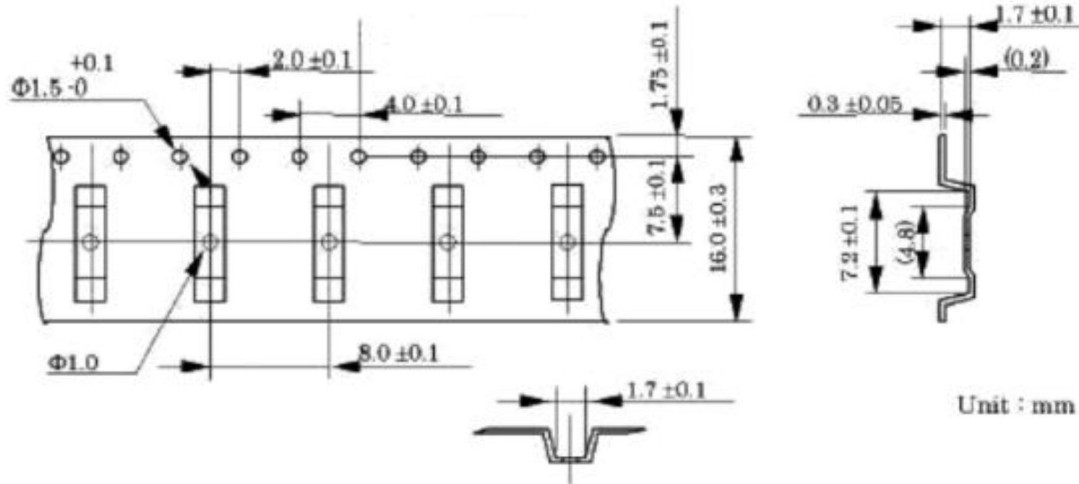
请勿与腐蚀化学物质储存在一起。

##### 10.9.5 Nothing is allowed to put on the reel or carton to prevent mechanical damage.

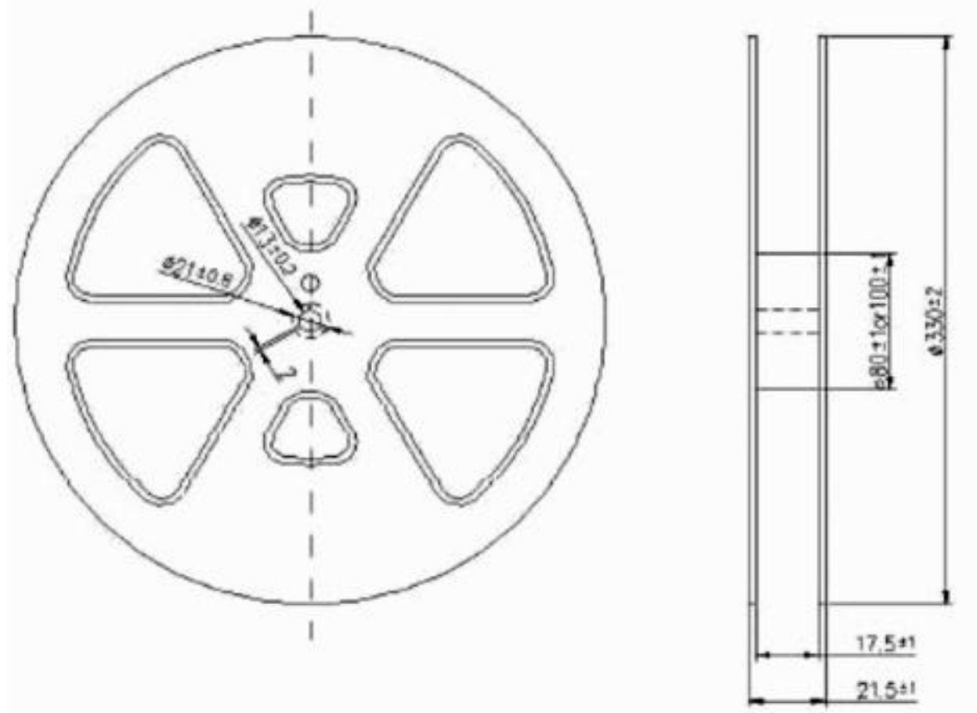
为了防止机械损坏，禁止将任何东西放在料盘或纸箱上。

## 6、PACKING SPECIFICATIONS (Unit: mm)

TAPE SPECIFICATION:



OUTLINE DIMENSION:



Q' ty: 3000pcs/Reel



## 7、WTL PART NUMBER SYSTEM :

For example: WTL4X85573FO

[Instructions: for project management, WTL will trace back the part number to developer wherever it goes]

WTL - 4X - 85573 - FO

WTL: Brand

4X : Package Code

855873: Serial number , flow code , without any rules

FO: WTL Developer Code, for example: VH,CH,PZ,RZ,ML