

# 深圳市维拓精电科技有限公司

## WTL International Limited

### APPROVAL SHEET

DESCRIPTION :	$\phi$ 2X6mm 2 Leads DIP Tuning Fork Crystal			
NOMINAL FREQ.:	32.768KHz			
WTL P/N:	WTL2X85604FO			
VERSION:	2			
DATE:	2023.04.18			
Customer	Customer P/N			
	/			
Customer Signature	WTL			
	Approved by: <i>Kevin Liu</i>			
	Checked by: <i>Shu Ping</i>			
	Issued by: <i>Shengbiao</i>			
<b>REVISION HISTORY</b>				
Revised Page	Revision Content	Date	Ref. No.	Reviser



## CONTENT CATALOG

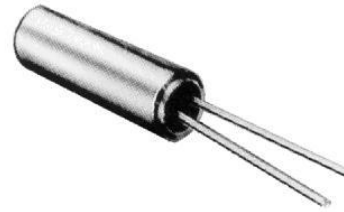
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Attachment(s):

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

**FEATURE**

- Wide Frequency range
- High shock tolerance
- Small size
- Reliable frequency stability



**APPLICATIONS**

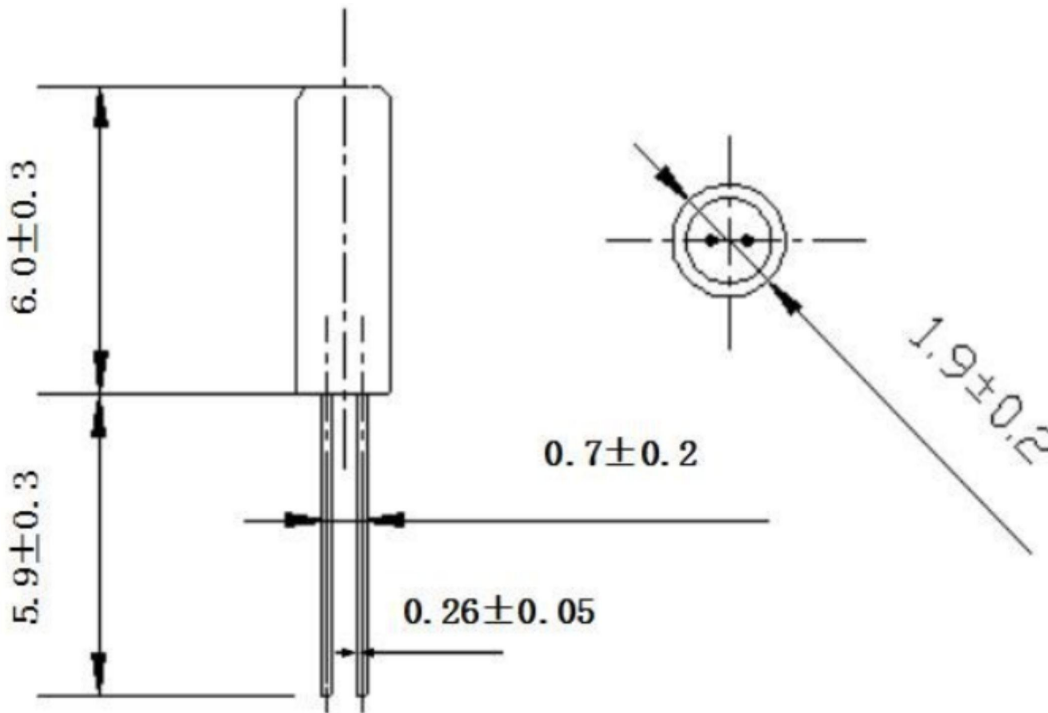
- Microprocessor Systems
- Consumer Electronics
- Instrument
- Automotive electronics

**1、 ELECTRICAL SPECIFICATIONS**

Hold Style	$\phi$ 2X6MM DIP TUNING FORK CRYSTAL
Nominal Frequency	32.768KHz
Frequency Tolerance (at 25°C)	$\pm$ 20ppm
ESR	40Kohm Max
Turnover Temperature	25 $\pm$ 5°C
Frequency Temperature Curve	-0.034( $\pm$ 0.006)ppm/°C <sup>2</sup>
Operating Temperature Range	-20 °C to +70 °C
Storage Temperature Range	-40 °C to +85 °C
Shunt Capacitance (C <sub>0</sub> )	1.5pF Typ.
Dynamic Capacitance (C <sub>1</sub> )	3.0fF Typ.
Driver Level (Typical)	0.1 $\mu$ W
Driver Level(Max)	1 $\mu$ W
Load Capacitance(C <sub>L</sub> )	6pF
Insulation Resistance	More than 500Mohms at DC100V
Aging @25°C 1 <sup>st</sup> year (Max)	$\pm$ 5ppm/year

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

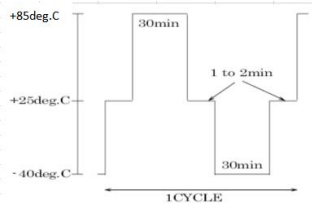
## 2、DIMENSIONS (Unit: mm)



### **Attention**

Not recommended reflow furnace welding,  
If it is to be used, the maximum temperature shall not exceed 230°C.

### 3、RELIABILITY SPECIFICATIONS

Item	Conditions	Result
Vibration	(1)Vibration Frequency 10 to 55Hz (2)Vibration Amplitude 1.5mm (3) Cycle Time 1-2min(10-55-10Hz) (4)Direction X.Y.Z (5)Duration 2h/each direction	Frequency Change:±5ppm Max. Resistance Change: 5kohm Max.
Drop Test	3 Times free drop from 75cm height to hard wooden board of thickness more than 30mm	Frequency Change:±5ppm Max. Resistance Change: 5kohm Max.
Air tightness test	The crystal is put into an alcohol pressure tank, the pressure is increased to 0.4Mpa, and the crystal is taken out after 15min. Full inspection will be conducted before shipment.	No necrosis AC=0、RE=1
Weldability	Dip the leads of crystal units into the solution (7-10%) of rosin 3±1s, then dip into solder to 2~3mm at the root of the lead and lift it after 5±1S. Temperature of solder melted tank is 245±10°C	The dipped surface of the leads should be at least 90% covered with continuous new solder coating
High temperature	96 hours at 100±5°C After being left at room temperature for 2 hours, the test is carried out.	Frequency Change:±10ppm Max. Resistance Change: 5kohm Max.
Low temperature	48 hours at -40±3°C After being left at room temperature for 2 hours, the test is carried out.	Frequency Change:±5ppm Max. Resistance Change: 5kohm Max.
High Temperature and Humidity	48 hours at 60±3°C, relative humidity 90-100% After being left at room temperature for 2 hours, the test is carried out.	Frequency Change:±5ppm Max. Resistance Change: 5kohm Max.
Temperature cycle	After supplying the following temperature cycle (100times) 	Frequency Change:±5ppm Max. Resistance Change: 5kohm Max.x.

Lead strength	In the lead 1.00 Kg tensile force was applied at the end to keep more than 5 seconds	Frequency Change: $\pm 5$ ppm Max. Resistance Change: 5kohm Max.
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#### 4、 HANDING NOTICE FOR STANDARD TUNING FORK CRYSTAL (Cylindrical Type)

##### 4.1. Shock resistance

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

##### 4.2. Heat and humidity resistance in storage

Storing the crystal products under higher or lower temperature or high humidity for a long period may deteriorate the characteristics of crystal units. Please store and use the crystal products at the normal temperature and humidity.

##### 4.3. Solder heat resistance

Standard type crystal products use Material have a 230°C melting point. Heating up the package more than 230°C may deteriorate the characteristics or cause of no oscillation the products. If the crystal products need to be soldered at temperature of more than +230°C, please study heat-resistance products or SMD products.

Please review the condition or consult us about flow solder process. Our soldering condition is under 280°C within 3sec or 320°C within 2sec for lead parts use the soldering iron .

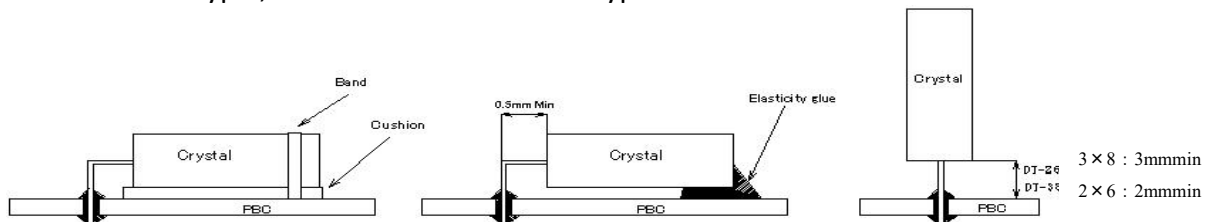
Please don't solder the crystal unit (case) directly. It may cause of deteriorate the characteristics.

##### 4.4. Mounting method to PCB

When the crystal products need to be lay down please fix to PCB securely.

If the crystal is used with mechanical vibration location, please put cushion in between PCB or fix with elasticity glue (Silicon etc) as shown in below figure. Please don't gluing hermetic seal glass.

When the crystal products need to be mounted vertically, gap between crystal units and PCB more than 3mm for 3x8 type , more than 2mm for 2x6 type is recommended.



##### 4.5. Lead process

When the lead needs to be cut please maintenance the cutter.

When the lead needs to be bent or repaired please be careful not to giving excess pressure at the root of the lead to avoid crack of the hermetic seal glass. Also please be careful not to giving excess pressure at sealing to avoid sealing tightness deteriorate. Leave more than 0.5 mm of lead from the case.

##### 4.6. Ultrasonic cleaning and ultrasonic soldering

Soldered by ultrasonic cannot be guaranteed, because crystal may be sympathetic vibrated and may damage. Please study at your side about ultrasonic cleaning.

#### 4.7. Drive level

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.

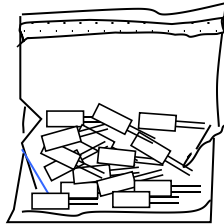
All the products we provide meet the requirements of RoHS and Reach regulations, and we send SGS for ICP test every year.

### 5、PACKING SPECIFICATIONS (Unit: mm)

Bag packaging

Size: 150\*120 mm

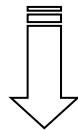
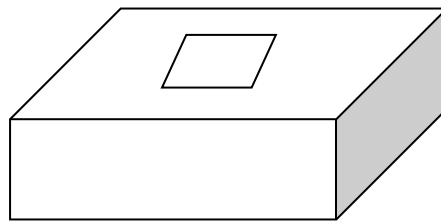
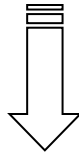
Quantity:1000pcs



Packing inner box

Size: 170\*120\*75 mm

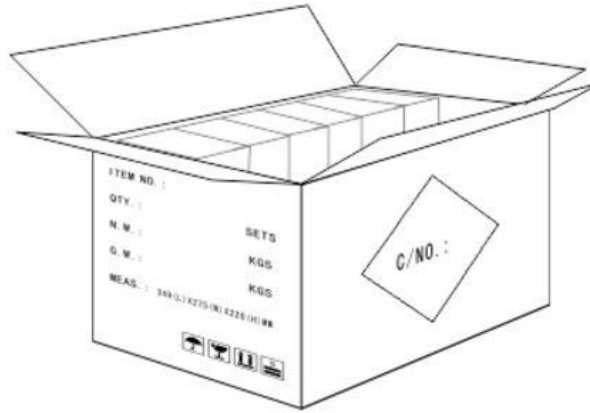
Quantity: 10,000pcs



Packing box

Size: 360\*320\*170 mm

10 boxes in each outer carton, Q ` TY: 100,000pcs



## **6、WTL PART NUMBER SYSTEM :**

For example: WTL2X85604FO

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

WTL - 2X - 85604 - FO

**WTL**: Brand

**2X** : Package Code

**85604**: Serial number , flow code , without any rules

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