

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

APPROVAL SHEET

DESCRIPTION :	2.5*2.0mm 4 Pads SMD Quartz Crystal
NOMINAL FREQ.:	27.120 Mhz
WTL P/N:	WTL2M85589FO
VERSION:	1
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>

REVISION HISTORY

Revised Page	Revision Content	Date	Ref. No.	Reviser



## CONTENT CATALOG

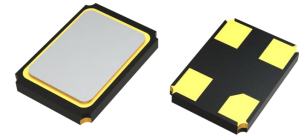
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Attachment(s):

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

## FEATURES

- Ultra thin, thickness 0.55mm
- Leadless type
- High precision characteristic covering up to high frequency range
- Designed for automatic mounting and reflow soldering
- Embossed tape packaging



## APPLICATIONS

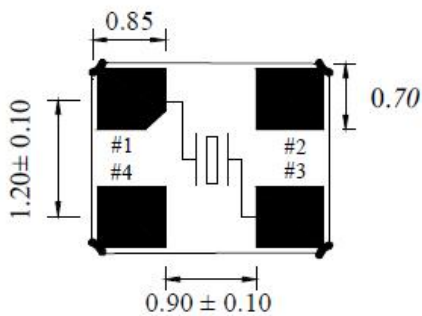
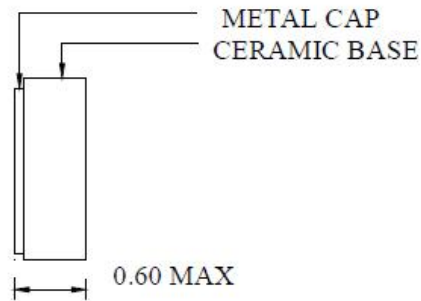
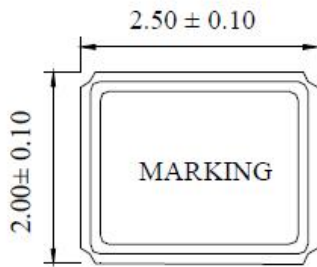
- The best choice of Bluetooth wireless communication sets. DSN, PDA and mobile phone.

## 1、 ELECTRICAL SPECIFICATIONS

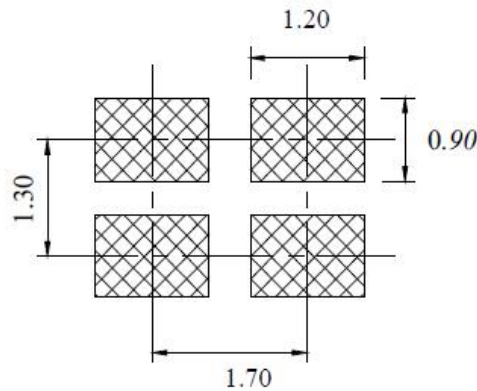
Hold Style	2520 Seam
Nominal Frequency	27.120 Mhz
Mode	Fundamental / AT
Frequency Tolerance (at 25°C)	±30ppm
Frequency Stability Over Operating Temperature Characteristics	±40ppm
Operating Temperature Range	-30°C ~ +85°C
Storage Temperature Range	-55°C ~ +125°C
Shunt Capacitance (C <sub>0</sub> )	2.0pF Max
Driver Level (Typical)	100μW Max
Load Capacitance(C <sub>L</sub> )	6 pF
ESR	60Ω Max
Insulation Resistance	More than 500Mohms at DC100V
Aging @25°C 1 <sup>st</sup> year (Max)	±3ppm/year

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

## 2、DIMENSIONS (Unit: mm)

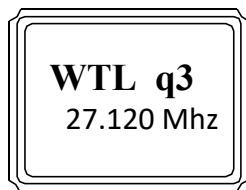


#2 GND #4 GND  
 Bottom



(Recommended Land Pattern)

## 3、MARKING

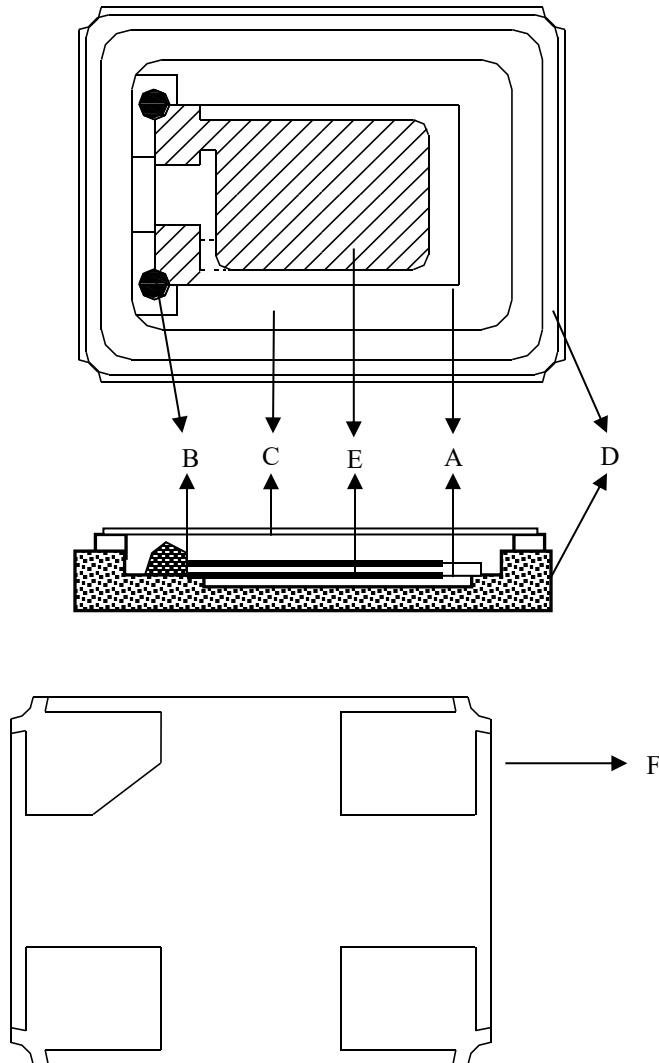


- WTL → Brand Logo
- 27.120 → Frequency ( MHz )
- q → Week (a、b、c...z、A、B、C...Y、Z ,from 1 to 52week )
- 3 → YEAR (9=2019year, W=2020year, 2=2023year....)

### Marking Instruction:

The date code was marked on the crystal body, which will be easily traced back in case of quality issue.

#### 4、STRUCTURE ILLUSTRATION

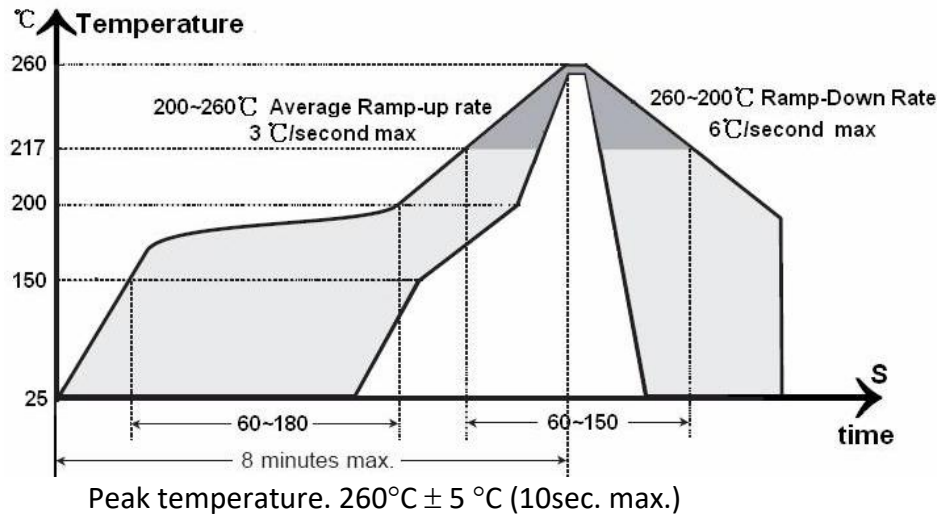


Parts	Material	QTY	COLOR	SUPPLIER
A	Blank	1	White	Russia Ural
B	Conductive paste	2	Greyish	Japan Three Bond
C	Lid	1	Silvery	Japan Yoshikawa
D	Package	1	Brown	Japan NTK/SMI
E	Plating(blank)	2	Silvery	Shanghai Yisheng
F	Pad	4	Golden	Japan NTK/SMI

## 5、RELIABILITY SPECIFICATIONS

Item	Conditions	Result
Low Temp. Storage (MIL-STD-883)	Put the crystal into the $-40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ constant temperature box for $500 \pm 2$ H , Measurement taken after 2 hour.	$\Delta F \cong \pm 5$ PPM $\Delta RR \cong \pm 15\%$
High Temp. Storage (MIL-STD-883)	Put the crystal into the $+100^{\circ}\text{C} \pm 2^{\circ}\text{C}$ constant temperature box for $500 \pm 2$ H, Measurement taken after 2 hour.	$\Delta F \cong \pm 5$ PPM $\Delta RR \cong \pm 15\%$
High Temp & Humidity (JIS C5023)	Put the crystal into the constant temperature & humid with the temperatures $85^{\circ}\text{C} \pm 3^{\circ}\text{C}$ and the humidity 98% for $500 \pm 2$ H. Measurement taken after 2 hour.	$\Delta F \cong \pm 5$ PPM $\Delta RR \cong \pm 15\%$
Thermal Shock (MIL-STD-883)	Put the crystal into the constant temperature $-55^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for $30 \pm 1$ M, then change the temperature to $+85^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for $30 \pm 1$ M, the total is 100times. Measurement taken after 2 hour.	$\Delta F \cong \pm 5$ PPM $\Delta RR \cong \pm 15\%$
Resistance To Soldering Heat (MIL-STD-202)	Passed through the re-flow oven under the following condition. Preheat to $150^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 60 to 120sec, and peak $265^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for $10\text{s} \pm 3\text{sec}$ . Measurement taken after DUT being left at room temperature for at $24 \pm 2$ hours	$\Delta F \cong \pm 5$ PPM $\Delta RR \cong \pm 15\%$
Drop Test (JIS C6701)	The crystal fall off the cement floor with the height $100\text{cm} \pm 5\text{cm}$ for 3 times . Measurement taken after 2 hour.	$\Delta F \cong \pm 5$ PPM $\Delta RR \cong \pm 15\%$
Vibration Test (MIL-STD-883)	Apply 0.75mm vibration at sweep frequency $10 \sim 500$ Hz, for 2h. 10 cycles in each direction of 3 axis. Measurement taken after 2 hour.	$\Delta F \cong \pm 5$ PPM $\Delta RR \cong \pm 15\%$
Shock MIL-STD-202F	Peak $1000\text{m/s}^2$ , normal width 6ms half sine wave form, $3.7\text{m/s}$ , 3 perpendicular axis of samples, 3 cycles / direction, total 18 cycles. Measurement taken after 2 hour.	$\Delta F \cong \pm 5$ PPM $\Delta RR \cong \pm 15\%$
Fine Leak (MIL-STD-883)	Helium Bombing $4.5\text{kgf/cm}^2$ for 2 hr	Less than $1 \times 10^{-8}$ atm.c.c./sec, Helium
Solderability	In $245 \pm 5^{\circ}\text{C}$ solder bath for $2 \pm 0.5$ seconds. 8-12X magnifier.	Terminals shall be covered more then 95% with solder.

## 6、SUGGESTED REFLOW PROFILE



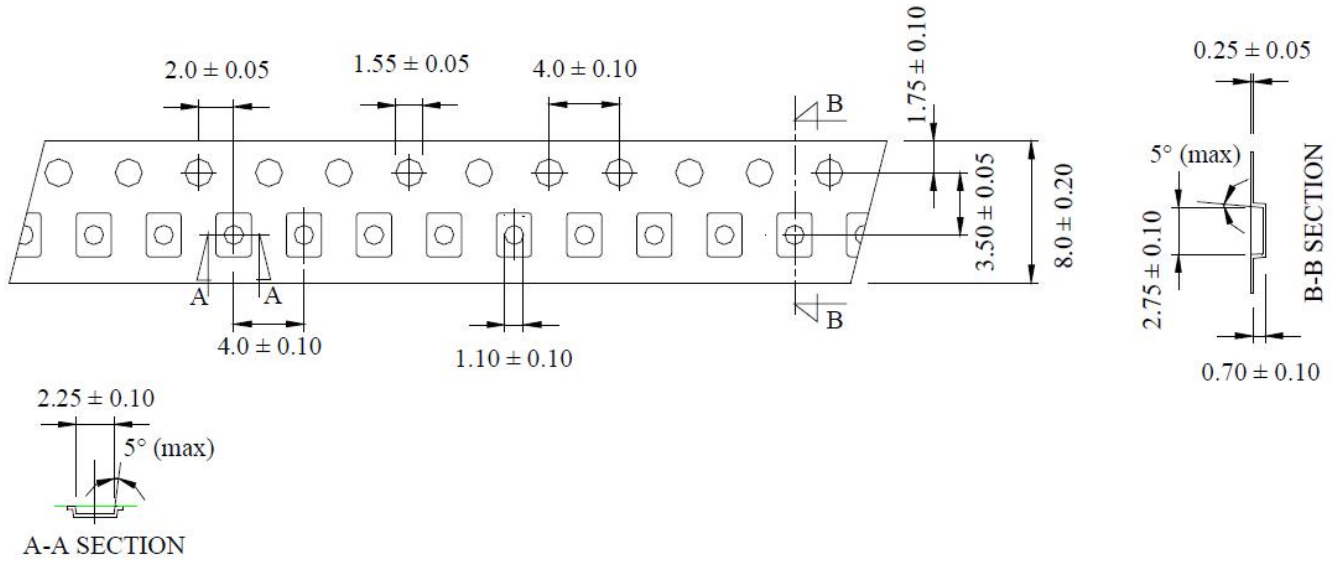
## 7、SUBSTANCES IN PRODUCT

Drawing number	Disassembly Unit/component description	Homogeneous Material Name.	Substance Name	CAS No.	Substance Mass. (mg)	Content Rate(%)per
SMD2520	Crystal blank	Quartz	SiO <sub>2</sub>	14808-60-7	0.1852	100.00%
	Electrode	Electrode-Ag	Ag	7440-22-4	0.0426	100.00%
	Package	Ceramics	Al <sub>2</sub> O <sub>3</sub>	1344-28-1	5.9718	90.00%
			Mn <sub>2</sub> O <sub>3</sub>	1317-34-6	0.2654	4.00%
			SiO <sub>2</sub>	7631-86-9	0.2654	4.00%
			MoO <sub>3</sub>	1313-27-5	0.0664	1.00%
			MgO	1309-48-4	0.0664	1.00%
			Kovar ring	Fe	7439-89-6	0.0773
		Ni		7440-02-0	0.0423	29.00%
		Co		7440-48-4	0.0262	18.00%
		Plate		Au	7440-57-5	0.0416
			Ni	7440-02-0	0.1772	81.00%
	Metallizing	Mo	7439-98-7	0.0729	100.00%	
		Solder	Ag	7440-22-4	0.1553	71.00%
			Cu	7440-50-8	0.0634	29.00%
	Lid	Kovar	Fe	7439-89-6	2.4834	48.50%
			Ni	7440-02-0	1.7921	35.00%
			Co	7440-48-4	0.8193	16.00%
			Mn	7439-96-5	0.0256	0.50%
	Conduct Adhesive	silver adhesive	Ag	7440-22-4	0.1122	70.00%
Pd			7440-05-3	0.0080	5.00%	
C <sub>11</sub> H <sub>24</sub>			1120-21-4	0.0160	10.00%	
C <sub>12</sub> H <sub>26</sub>			112-40-3	0.0080	5.00%	
SiO <sub>2</sub>			7631-86-9	0.0160	10.00%	

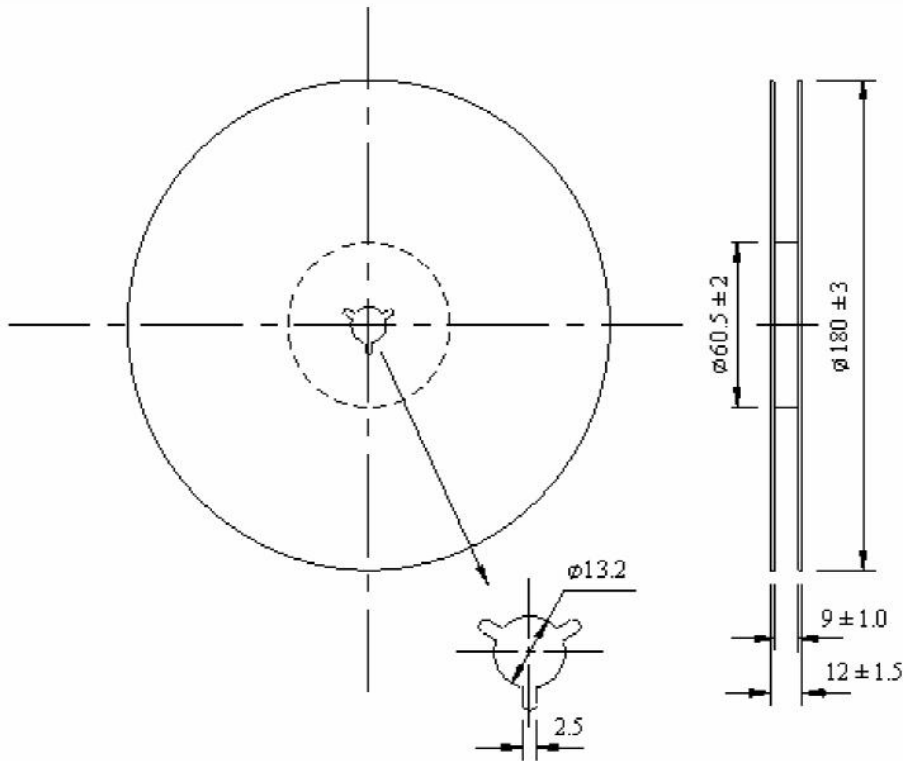
All the products we provide meet the requirements of RoHS and Reach regulations, and we send SGS for ICP test every year.

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

TAPE SPECIFICATION:



OUTLINE DIMENSION:



Q'ty: 3000pcs/Reel



**9、WTL PART NUMBER SYSTEM :**

For example: WTL2M85589FO

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

WTL - 2M - 85589 - FO

**WTL**: Brand

**2M** : Package Code , please see Table 1

**85589**: Serial number , flow code , without any rules

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

Table1

Type	SMD Seam Crystal							
Series	TX1	TX2	TX3	TX4	TX5	TX6	TX7	TX8
Package Code	1M	2M	3M	4M	5M	6M	7M	8M
Size(mm)	2.0*1.6	2.5*2.0	3.2*2.5	4.0*2.5	5.0*3.2	6.0*3.5	7.0*5.0	1.6*1.2
Type	SMD Glass Crystal					DIP Crystal		
Series	TG3	TG5	TG6	TG8	TG9	WX6	WX7	WZ7
Package Code	3G	5G	6G	8G	5A	9S	9M	9L
Size(mm)	3.2*2.5	5.0*3.2	6.0*3.5	8.0*4.5	5.0*3.2	10.5*4.7	11.4*4.7	7.6*4.0