

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.:	16.000MHz
WTL P/N:	WTL2M85525FO
VERSION:	1
DATE:	2023.02.10
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



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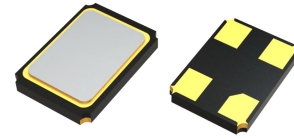
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Attachment(s):

- 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

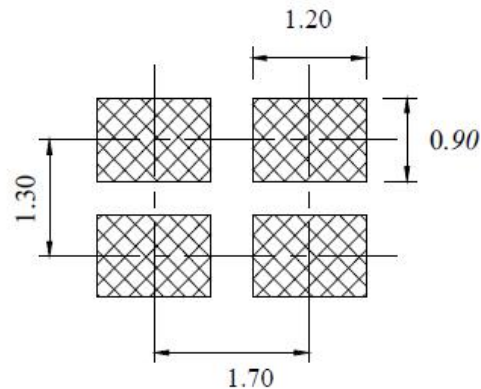
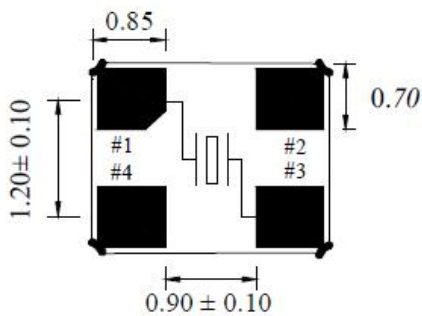
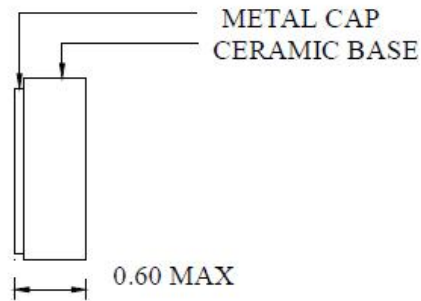
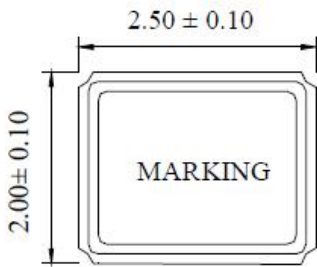
- The best choice of Bluetooth wireless communication sets. DSN, PDA and mobile phone.

1、 ELECTRICAL SPECIFICATIONS

Hold Style	2520 Seam
Nominal Frequency	16.000MHz
Mode	Fundamental / AT
Frequency Tolerance (at 25°C)	±10ppm
Frequency Stability Over Operating Temperature Characteristics	±15ppm
Operating Temperature Range	-30°C ~ +85°C
Storage Temperature Range	-55°C ~ +125°C
Shunt Capacitance (C ₀)	2.0pF Max
Driver Level (Typical)	100μW Max
Load Capacitance(C _L)	8 pF
ESR	80Ω Max
Insulation Resistance	More than 500Mohms at DC100V
Aging @25°C 1 st year (Max)	±3ppm/year

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

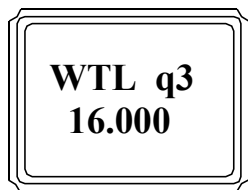
2、DIMENSIONS (Unit: mm)



#2 GND #4 GND
Bottom

(Recommended Land Pattern)

3、MARKING

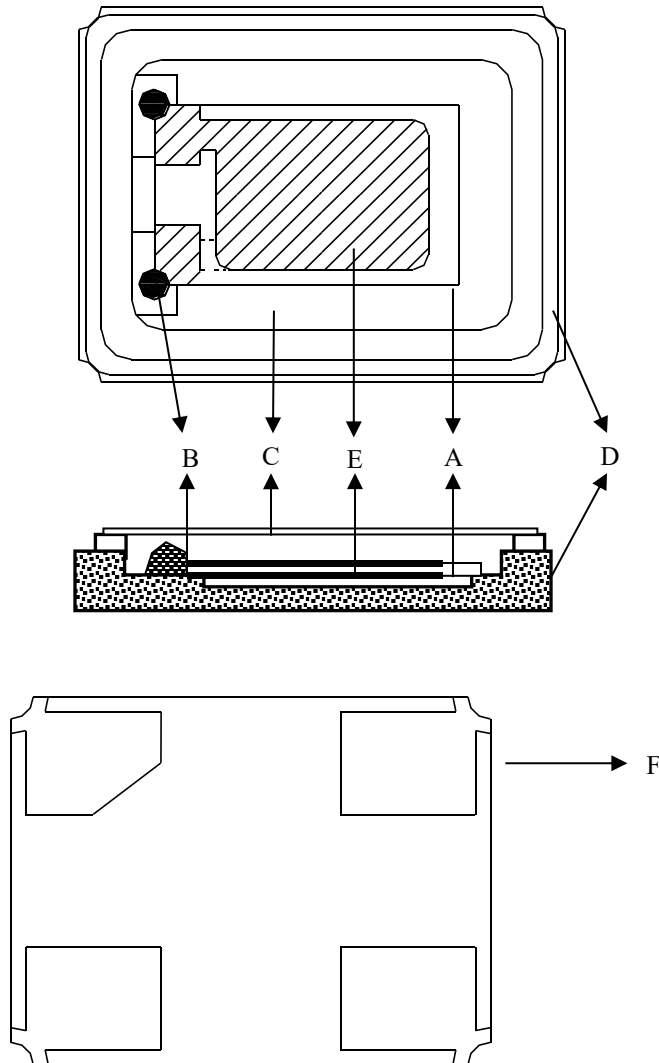


- WTL → Brand Logo
- 16.000 → Frequency (MHz)
- q → Week (a、 b、 c...z、 A、 B、 C...Y、 Z ,from 1 to 52week)
- 3 → YEAR (9=2019year, W=2020year, 2=2023year....)

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

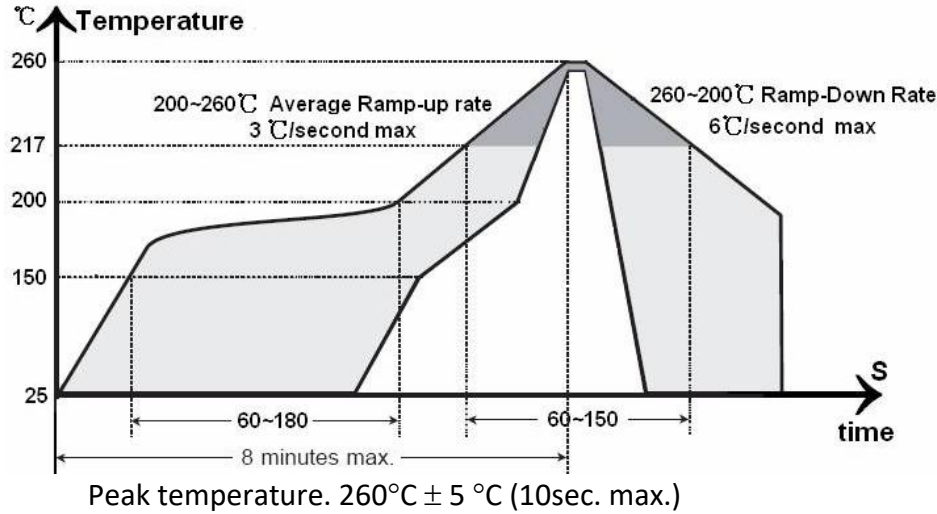


Parts		Material	QTY	COLOR	SUPPLIER
A	Blank	Mostly SiO ₂	1	White	Russia Ural
B	Conductive paste	Ag:80%, silicone resin 10%	2	Greyish	Japan Three Bond
C	Lid	Fe:52~56%,Ni:16~18%,Co:28~30%	1	Silvery	Japan Yoshikawa
D	Package	Ceramic	1	Brown	Japan NTK/SMI
E	Plating(blank)	Ag:99.99%	2	Silvery	Shanghai Yisheng
F	Pad	Cu:6.6%,Au:0.2%,Fe:56%,Ni:18%	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 ± 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 ± 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 ± 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 ± 1 M, then change the temperature to $+85^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 30 ± 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 ± 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 1000m/s^2 , normal width 6ms half sine wave form, 3.7m/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 4.5kgf/cm^2 for 2 hr	Less than $1 * 10^{-8} \text{atm.c.c./sec}$, Helium
Solderability	In $245 \pm 5^{\circ}\text{C}$ solder bath for 2 ± 0.5 seconds. 8-12X magnifier.	Terminals shall be covered more then 95% with solder.

6、SUGGESTED REFLOW PROFILE



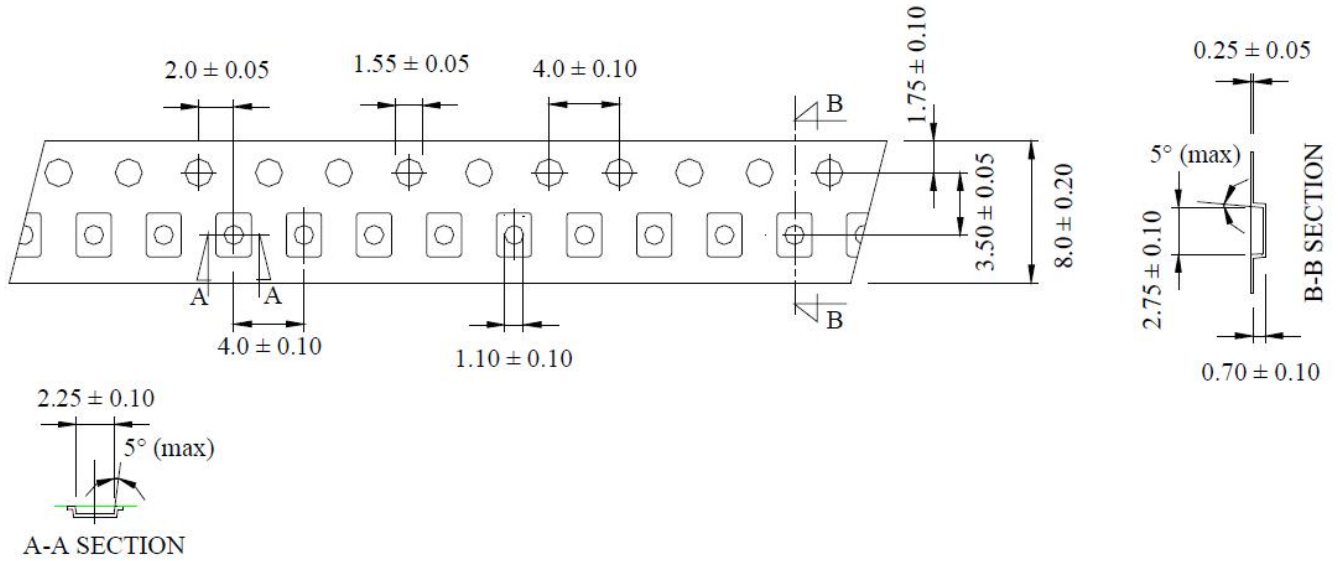
7、SUBSTANCES IN PRODUCT

Drawing number	Disassembly Unit/component description	Homogeneous Material Name.	Substance Name	CAS No.	Substance Mass. (mg)	Content Rate(%)per
SMD2520	Crystal blank	Quartz	SiO ₂	14808-60-7	0.1852	100.00%
	Electrode	Electrode-Ag	Ag	7440-22-4	0.0426	100.00%
	Package	Ceramics	Al ₂ O ₃	1344-28-1	5.9718	90.00%
			Mn ₂ O ₃	1317-34-6	0.2654	4.00%
			SiO ₂	7631-86-9	0.2654	4.00%
			MoO ₃	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 ₁₁ H ₂₄			1120-21-4	0.0160	10.00%	
C ₁₂ H ₂₆			112-40-3	0.0080	5.00%	
SiO ₂			7631-86-9	0.0160	10.00%	

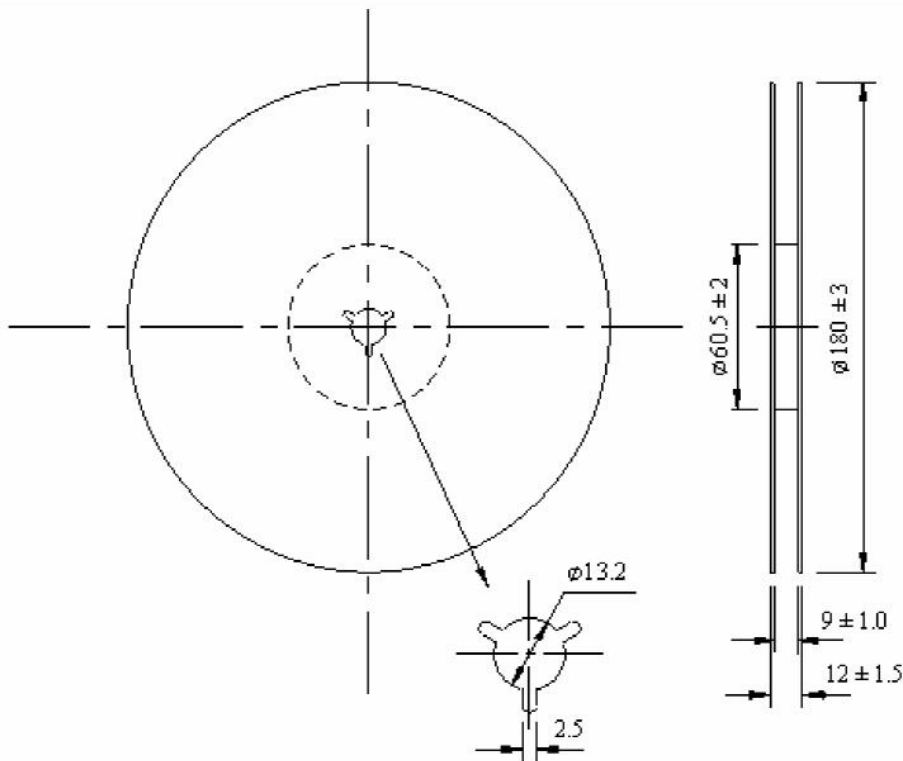
All the products we provide meet the requirements of RoHS and Reach regulations, and we send SGS for ICP test every year.

8、PACKING SPECIFICATIONS (Unit: mm)

TAPE SPECIFICATION:



OUTLINE DIMENSION:



Q'ty: 3000pcs/Reel

9、WTL PART NUMBER SYSTEM :

For example: WTL2M85525FO

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

WTL - 2M - 85525 - FO

WTL: Brand

2M : Package Code , please see Table 1

85525: 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