

# 深圳市维拓精电科技有限公司

## WTL International Limited

### APPROVAL SHEET

DESCRIPTION :	7.0*5.0mm 4 Pads SMD Crystal Oscillator			
NOMINAL FREQ.:	16.000MHz			
WTL P/N:	WTL7K85553FO			
VERSION:	1			
DATE:	2023.04.04			
Customer	Customer P/N			
Promelectronics	/			
Customer Signature	WTL			
	Approved by:	<i>Kavin Liu</i>		
	Checked by:	<i>Shu Ping</i>		
	Issued by:	<i>Shengbia</i>		
<b>REVISION HISTORY</b>				
Revised Page	Revision Content	Date	Ref. No.	Reviser



## CONTENT CATALOG

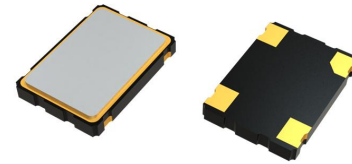
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Attachment(s):

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

**FEATURE**

- Typical 7.0×5.0×1.3mm ceramic SMD package
- Tight symmetry (45 to 55%) available
- Realize the standby function with Tri-state



**APPLICATIONS**

- xDSL, WLAN, Fiber / 10Gbit Ethernet
- Notebook, PDA
- PC main board, VGA card

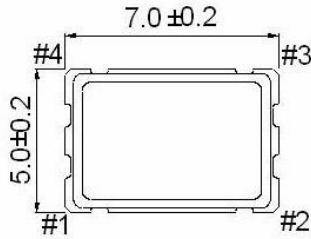
**1、 ELECTRICAL SPECIFICATIONS**

Parameter		Min.	Typ.	Max.	Units	Test Condition
1.1	Nominal Frequency	16.000			MHz	
1.2	Frequency stability	All condition	-50	+50	ppm	
	Aging		-3	+3	ppm	Frequency drift in first year
1.3	Operating Temperature Range	-40		+85	°C	The operating temperature range over which the frequency stability is measured
1.4	Storage Temperature Range	-40		+85	°C	
1.5	Supply voltage	4.5	5.0	5.5	V	
1.6	Current			10	mA	At maximum supply voltage
1.7	Output waveform	HCMOS				
1.8	Duty Cycle	45	50	55	%	
1.9	Start Time			5	mSec	
1.10	Transition Time :Rise/Fall Time			5	nSec	
1.11	Output Level CMOS	Out High(Logic"1")	4.5		V	
		Out Low(Logic"0")			0.5	V
1.12	Output Load			30	pF	
1.13	Tri-State	Output Active	3.5		V	Pin 1 Tri-state
		Output in High-Impedance state			1.5	
1.14	Standby current			10	μA	
1.15	Period Jitter (Pk-Pk)			40	pSec	

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

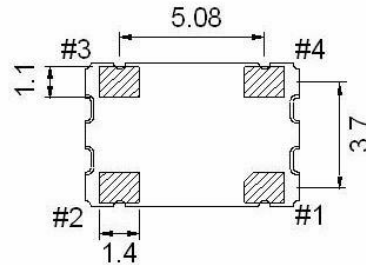
## 2、DIMENSIONS (Unit: mm)

[ TOP VIEW ]

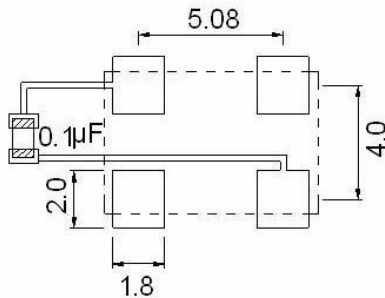
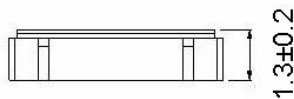


[ BOTTOM VIEW ]

Unit:mm



[ SIDE VIEW ]

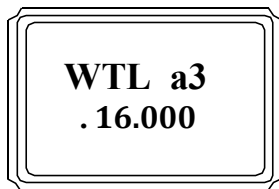


Recommended soldering pattern

Pin	Function
#1	Tri-State/NC
#2	GND
#3	Output
#4	V <sub>DD</sub>

PIN FUNCTIONS

## 3、MARKING

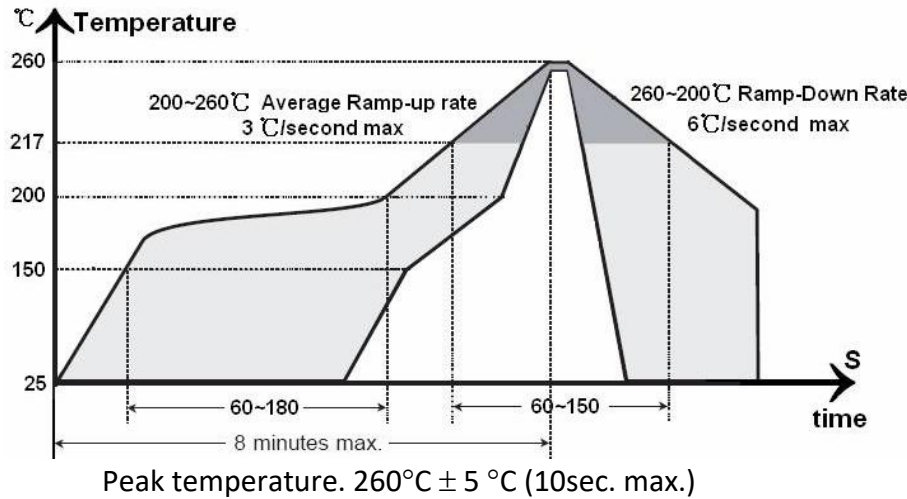


- WTL → Brand Logo
- 16.000 → Frequency ( MHz )
- a → Week ( a、b、c...z、A、B、C...Y、Z ,from 1 to 52week )
- 3 → YEAR ( 2=2022year, 3=2023year, 4=2024year....)

### Marking Instruction :

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

#### 4、 SUGGESTED REFLOW PROFILE



#### 5、 RELIABILITY SPECIFICATIONS

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

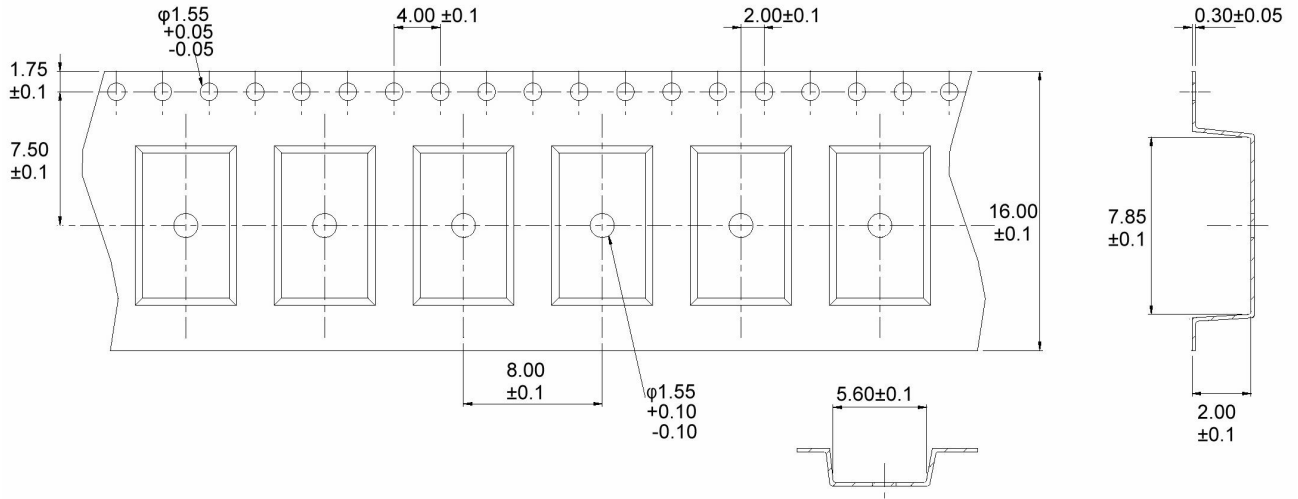
**6、SUBSTANCES IN PRODUCT (weigh:157.5mg)**

Drawing number	Homogeneous Material Name.	Disassembly Unit/component description	Substance Name	CAS No.	Substance Mass. (mg)	Content Rate(%)per
7050 OSC	Crystal blank	Quartz	SiO <sub>2</sub>	14808-60-7	5.5000	100.00%
	Electrode	Electrode	Ag	7440-22-4	15.0000	100.00%
	Package	Ceramic	Al <sub>2</sub> O <sub>3</sub>	1344-28-1	68.7440	66.10%
			Mn <sub>2</sub> O <sub>3</sub>	1317-34-6	2.2880	2.20%
			SiO <sub>2</sub>	7631-86-9	0.4160	0.40%
			MgO	1309-48-4	4.5660	4.39%
			MoO <sub>3</sub>	1313-27-5	0.4160	0.40%
			Electric conductor	Tungsten-W	7440-33-7	6.2400
		Mo		7439-98-7	0.2080	0.20%
		Brazing material	Silver-Ag	7440-22-4	1.8720	1.80%
			Copper-Cu	7440-50-8	0.7280	0.70%
		Kovar ring	Iron-Fe	7439-89-6	9.0480	8.70%
			Nichel-Ni	7440-02-0	4.8880	4.70%
			Cobalt-Co	7440-48-4	2.9120	2.80%
		Ni plating	Nickel-Ni	7440-02-0	1.0400	1.00%
			Cobalt-Co	7440-48-4	0.4160	0.40%
	Au plating	Gold-Au	7440-57-5	0.2080	0.20%	
	Alloy	Lid	Iron	7439-89-6	11.7106	53.23%
			Nickel	7440-02-0	6.4878	29.49%
			Cobalt	7440-48-4	3.6872	16.76%
			Mn	7439-96-5	0.0858	0.39%
			Silicone Si	7440-21-3	0.0176	0.08%
			Copper Cu	7440-50-8	0.0110	0.05%
	Conduct Adhesive	Conduct Adhesive	Ag	7440-22-4	3.5000	70.00%
			Pd	7440/5/3	0.2500	5.00%
			C <sub>11</sub> H <sub>24</sub>	1120-21-4	0.5000	10.00%
			C <sub>12</sub> H <sub>26</sub>	112-40-3	0.2500	5.00%
			SiO <sub>2</sub>	7631-86-9	0.5000	10.00%
	Connect	Gold Wire	Gold-Au	7440-57-5	5.7600	100.00%
	IC	IC	Silicon Si	7440-21-3	0.2392	99.65%
Al			7429-90-5	0.0008	0.34%	

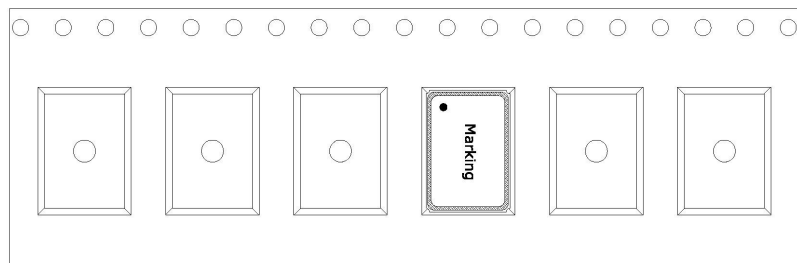
All the products we provide meet the requirements of RoHS and Reach regulations, and we send SGS for ICP test every year.

## 7、PACKING SPECIFICATIONS (Unit: mm)

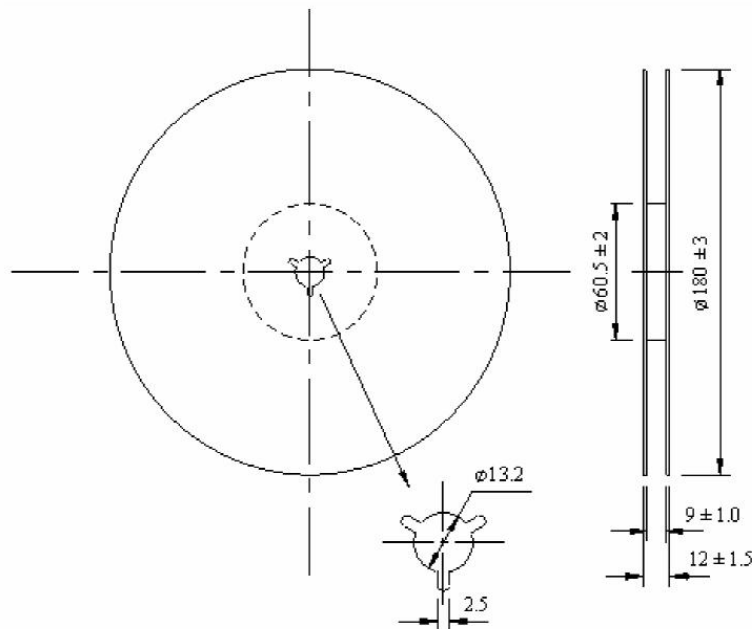
### TAPE SPECIFICATION:



### THE DIRECTION OF PACKING:



### OUTLINE DIMENSION:



Q'ty: 1000pcs/Reel

## **8、WTL PART NUMBER SYSTEM :**

For example: WTL7K85553FO

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

WTL - 7K - 85553 - FO

WTL: Brand

7K : Package Code

85553: Serial number , flow code , without any rules

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