

# 深圳市维拓精电科技有限公司

## WTL International Limited

### APPROVAL SHEET

DESCRIPTION :	2.0*1.2mm 2 Pads SMD Tuning Fork Crystal			
NOMINAL FREQ.:	32.768KHz			
WTL P/N:	WTL1W85569FO			
VERSION:	1			
DATE:	2023.04.18			
Customer	Customer P/N			
	/			
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



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Attachment(s):

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

**FEATURES**

- Wide Frequency range
- Small size
- Tape & Reel
- Reflow available



**APPLICATIONS**

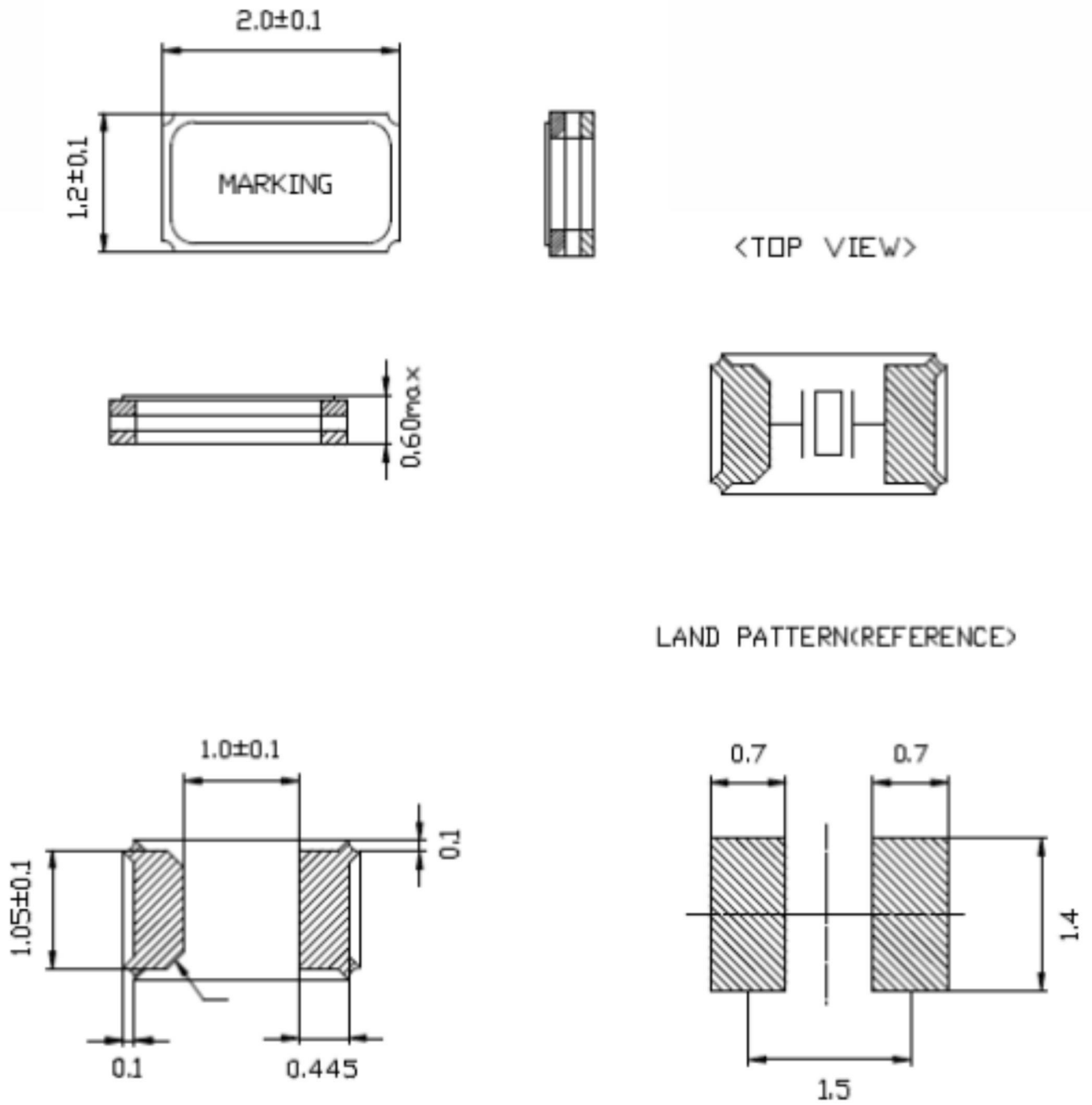
- Microprocessor Systems
- Consumer Electronics

**1、 ELECTRICAL SPECIFICATIONS**

Hold Style	2.0X1.2MM SMD TUNING FORK CRYSTAL
Nominal Frequency	32.768 KHz
Frequency Tolerance (at 25°C)	±20 PPM
Load Capacitance(C <sub>L</sub> )	12.5pF
ESR	80 kΩ Max
Turnover Temperature	25 ± 5°C
Frequency Temperature Curve	(-0.03±0.01) PPM/°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> )	1.15pF Typ.
Dynamic Capacitance (C <sub>1</sub> )	6 fF Typ.
Driver Level (Typical)	0.1μW
Driver Level(Max)	0.5μW
Insulation Resistance	More than 500M Ω at DC100V
Aging @25°C 1 <sup>st</sup> year (Max)	±3 PPM/year

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

## 2、DIMENSIONS (Unit: mm)



### 3、RELIABILITY SPECIFICATIONS

Item	Conditions	Result
Low Temp. Storage	After storage under -40 °C for 1000 hours, measure at room temperature. (*1 *3)	$\Delta f/f_0 = \pm 10\text{ppm}$
High Temp. Storage	After storage under 125 °C for 1000 hours, measure at room temperature. (*1 *3)	$\Delta f/f_0 = \pm 15\text{ppm}$
High Temp & Humidity	After storage under +85±2 °C , 85 % RH for 1000h, measure at room temperature. (*1 *3)	$\Delta f/f_0 = \pm 10\text{ppm}$
Thermal Shock	Measure at room temperature after 100 cycles. -55 °C ⇔ +125 °C for 30 minutes. (*1 *3)	$\Delta f/f_0 = \pm 10\text{ppm}$
IR Reflow	Measure after 2 time reflow under reflow profile specified (*1)	$\Delta f/f_0 = \pm 10\text{ppm}$
Mechanical shock	Measure after 100g-dummy (SII Standard) drop from 1500mm height on the concrete 3 directions 10times. (*2)	$\Delta f/f_0 = \pm 10\text{ppm}$
Vibration Test	Amplitude 1.5mm and 10 ~ 60Hz with cycle time 2 ~ 3 minutes in 3 direction (X,Y,and Z axis) each for 2 h. (*2)	$\Delta f/f_0 = \pm 10\text{ppm}$
Shear strength	Pressuring force 10N×10±1sec. according to IEC60068-2-21 (*2)	No peeling-off
Peel strength	Pressuring force 10N×10±1sec. according to IEC60068-2-21 (*2)	No peeling-off
Bending test	Bending: 3mm×5±1sec. Thickness of the testing board: 1mm (*2)	No peeling-off

1. Each test shall be done independently. (not in series tests)
2. \*1: Measure after 24 hours left at room temperature.
3. \*2: Measure after 2 hours left at room temperature.
4. \*3: Pre conditions
  - (1) IR Reflow : 2 times
  - (2) Initial values shall be measured after 24 hours at room temperature.
5. Shift in series resistance after the above tests shall be less than ±20% or less than ±15kΩ.  
 In case of resistance to IR reflow, shift in series resistance after the above tests shall be less than ±30% or ±20kΩ.

In case of resistance to high temperature storage ( $\pm 125^{\circ}\text{C}$  for 1000 hours), shift in series resistance after the above tests shall be less than  $\pm 40\%$  or  $\pm 30\text{k}\Omega$ .

#### 4、 SUGGESTED REFLOW PROFILE

Peak temperature.  $350^{\circ}\text{C} \pm 10^{\circ}\text{C}$  (3sec. max.) Reflow is permitted 2 times max.

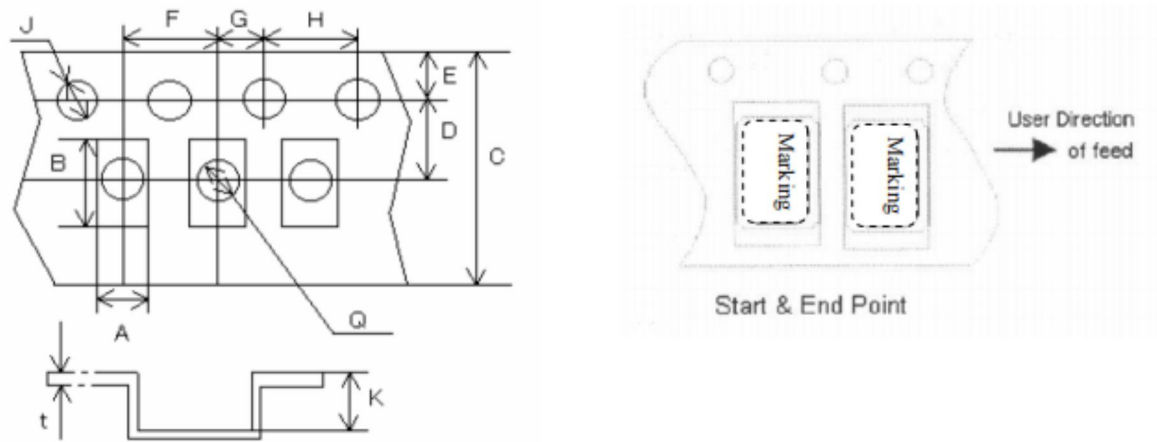
#### 5、 SUBSTANCES IN PRODUCT

Breakdown of component	Material Name	Substance Name	CAS No.	Substance Mass					Note		
				(mg)	(g)	(w%) / Part	(ppm) / Total Weight	(w%) / Total Weight			
Crystal Element	Crystal	Silicon Dioxide	SiO <sub>2</sub>	14808-60-7	0.189660	0.00018966	100.00	41230.43	4.12		
	Electrode	Chromium	Cr	7440-47-3	0.001560	0.00000156	100.00	339.13	0.03		
	Electrode	Gold	Au	7440-57-5	0.006540	0.00000654	100.00	1421.74	0.14		
Lid	Kovar	Iron	Fe	7439-89-6	0.476800	0.00047680	53.33	103652.17	10.37		
		Cobalt	Co	7440-48-4	0.151800	0.00015180	16.98	33000.00	3.30		
		Nickel	Ni	7440-02-0	0.260400	0.00026040	29.13	56608.70	5.66		
		Manganese	Mn	7439-96-5	0.003800	0.00000380	0.43	826.09	0.08		
		Silicon	Si	7440-21-3	0.000600	0.00000600	0.07	130.43	0.01		
		Chromium	Cr	7440-47-3	0.000400	0.00000400	0.05	86.96	0.01		
		Carbon	C	7440-44-0	0.000100	0.00000100	0.01	21.74	0.00		
		Plating	Nickel	Ni	7440-02-0	0.096000	0.00009600	100.00	20869.57	2.09	
	Conductive adhesive		Silver	Ag	7440-22-4	0.088130	0.00008813	78.50	19158.70	1.92	
Silicone resin			Si	Trade Secret	0.008100	0.00000810	7.20	1760.87	0.18		
Silsesquioxanes, Me			C12H32O8Si8	68554-70-1	0.008100	0.00000810	7.20	1760.87	0.18		
n-Dodecane			C12H26	112-40-3	0.007900	0.00000790	7.00	1717.39	0.17		
Alkoxysilane			C11H22O4Si	3388-04-3	0.000100	0.00000100	0.10	21.74	0.00		
Ceramic package	Ceramic	Aluminum oxide	Al <sub>2</sub> O <sub>3</sub>	1344-28-1	1.660000	0.00166000	50.99	360869.57	36.09		
		Manganese oxide	Mn2O3	1317-34-6	0.064000	0.00006400	1.88	13913.04	1.39		
		Silicon dioxide	SiO2	7631-86-9	0.064000	0.00006400	1.78	13913.04	1.39		
		Molybdenum oxide	MoO3	1313-27-5	0.014000	0.00001400	0.27	3043.48	0.30		
		Magnesium oxide	MgO	1309-48-4	0.014000	0.00001400	0.16	3043.48	0.30		
	Metalize	Molybdenum	Mo	7439-98-7	0.484000	0.00048400	14.64	105217.39	10.52		
		Seal ring	Iron	Fe	7439-89-6	0.324000	0.00032400	9.74	70434.78	7.04	
	Nickel		Ni	7440-02-0	0.170000	0.00017000	5.23	36956.52	3.70		
	Cobalt		Co	7440-48-4	0.100000	0.00010000	3.07	21739.13	2.17		
	Silver solder	Silver	Ag	7440-22-4	0.194000	0.00019400	5.71	42173.91	4.22		
		Copper	Cu	7440-50-8	0.032000	0.00003200	1.01	6956.52	0.70		
	Electrode	Nickel	Ni	7440-02-0	0.110000	0.00011000	3.46	23913.04	2.39		
		Cobalt	Co	7440-48-4	0.030000	0.00003000	0.87	6521.74	0.65		
		Gold	Au	7440-57-5	0.040000	0.00004000	1.20	8695.65	0.87		
		Thallium	Tl	7440-28-0	0.000010	0.00000001	<1	2.17	0.00		
	Total					4.600000	0.00460000		1000000	100.00	

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

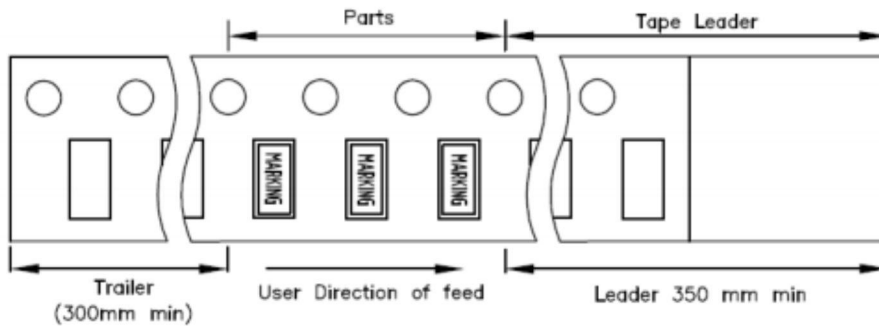
6、PACKING SPECIFICATIONS (Unit: mm)

TAPE SPECIFICATION:

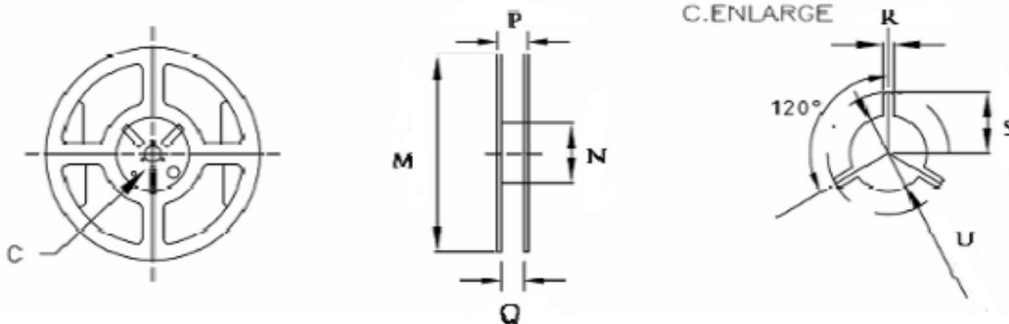


A	B	C	D	E	F	G	H	J	K	t
1.4	2.3	8.0	3.5	1.75	4.0	2.0	4.0	1.5	0.75	0.25

备注 REMARK:



※圆卷 REEL: 3000 PCS/Reel



M	N	P	Q	R	S	U
178	60.2	11.5	8.0	2.5	11.0	13.0