

# **APPROVAL SHEET**

DESCRIPTION:	3.2*1.5mm 2 Pads SMD Tuning Fork Crystal
NOMINAL FREQ.:	32.768KHz
WTL P/N:	1X85615FO
VERSION:	1
DATE:	2023.04.23

# Revised Revision Content Date Ref. No. Reviser











## **CONTENT CATALOG**

APPROVAL SHEET	P. 1
CONTENT CATALOG	P. 2
ELECTRICAL SPECIFICATIONS	P. 3
DIMENSIONS	P. 4
MARKING	P. 4
STRUCTURE ILLUSTRATION	P. 5
SUBSTANCES IN PRODUCT	P. 5
RELIABILITY SPECIFICATIONS	P. 6
SUGGESTED REFLOW PROFILE	P. 7
CAUTION	P. 7
PACKING SPECIFICATIONS	P. 8
PART NUMBER SYSTEM	P. 9

# Attachment(s):

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

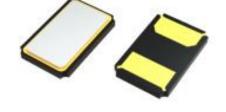
#### SMD TUNING FORK CRYSTAL 3.2X1.5MM

#### **FEATURES:**

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

#### **APPLICATIONS:**

- Microprocessor Systems
- Consumer Electronics

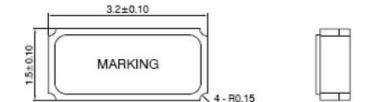


## 1, ELECTRICAL SPECIFICATIONS

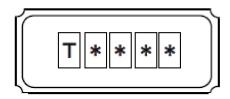
3.2X1.5MM SMD TUNING FORK CRYSTAL
32.768KHz
±20ppm
90Kohm Max
25 ± 5°C
-0.02ppm/℃2
-40 °C to +85 °C
-55 °C to +125 °C
1.1pF Typ.
4.1fF Typ.
0.1μW
12.5 pF
More than 500Mohms at DC100V
±3ppm/year

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

# 2, DIMENSIONS (Unit: mm)



#### 3, MARKING



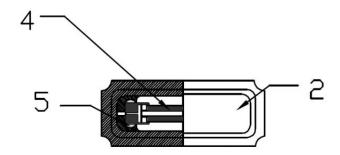
- \*1 Product name
- \*2 Year of Production( Last digit of year )
- \*3,4 Week of Production(01~52)
- \*5 CL

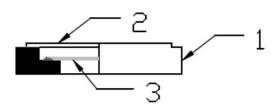
#CL: A:12.5pF B:9pF C:7pF D:6pF

## Marking Instruction:

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

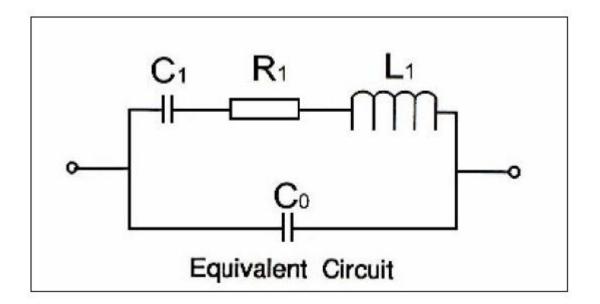
#### 4. STRUCTURE ILLUSTRATION



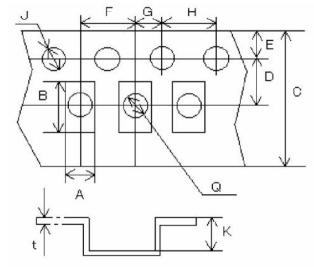


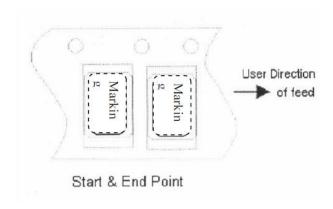
NO	COMPONENT MATERIALS		
1	Package	Ceramic(Al2O3)	
2	Lid	KOVAR(Fe/Co/Ni)	
3	Crystal blank	SiO2	
4	Electrode Cr+Au		
5	Adhesive	Resin+Ag	

# 5. EQUIVALENT CIRCUIT



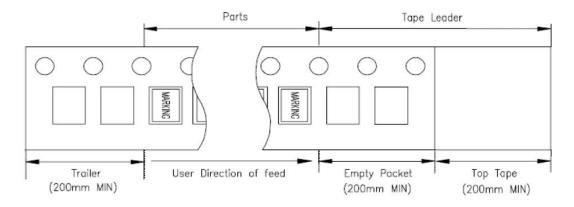
## 6. PACKAGING



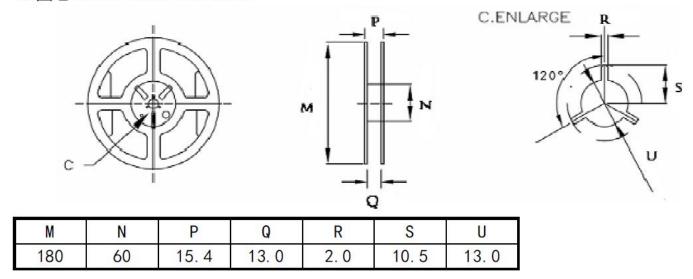


Α	В	C	D	E	F	G	Н	J	K	t
1.75	3. 45	12.0	5.5	1.75	4. 0	2. 0	4. 0	1.5	1.0	0. 25

## 备注 REMARK:

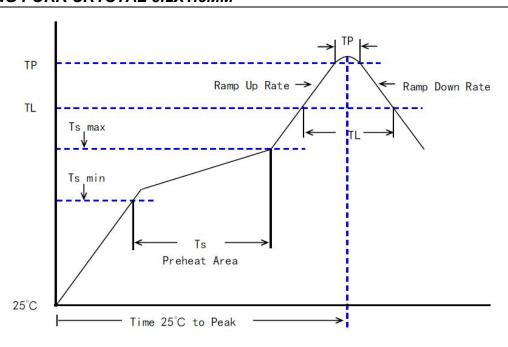


※圆卷 REEL: 3000 PCS/ReeⅠ



#### 7. REFLOW PROFILES

Profiles Feature	Pb-Free Assembly	
Preheat/Soak	150℃	
Temperature Min (Ts min)	200℃	
Temperature Max (Ts max)	60-120 seconds	
Time (Ts) from (Ts min to Ts max)		
Ramp-up rate (TL to TP)	3℃/second max.	
Liquidous temperature (TL)	<b>217</b> °C	
Time (TL) maintained above TL	60-150 seconds	
Peak/Classification Temperature (TP)	260±5℃	
Time within 5 °C of actual Peak	20~40 seconds	
Temperature (TP)		
Ramp-down rate (TP to TL)	6℃/second max.	
Time 25 °C to peak temperature	8 minutes max.	
Suggest reflow times	3 Times max	



NO	ITEM	CONDITIONS	
1	HIGH	STORED AT 125 $\pm$ 2 $^{\circ}\mathrm{C}$ for 500 $\pm$ 12H. THE CHARACTERISTIC	A.C
	TEMPERATURE	PARAMETERS OF 250B MUST BE TESTED IN 24H AFTER BEING STATIC	
		FOR MORE THAN 2H AT ROOM TEMPERATURE(25 $\pm$ 2 $^{\circ}$ C).	
		If Customer's temperature request is higher than the	
		standard, Temperature test must be done for customer	
		Requirements.	
2	LOW	STORED AT -40±2 $^{\circ}\mathrm{C}$ for 500±12H. THE CHARACTERISTIC	A.C
	TEMPERATURE	PARAMETERS OF 250B MUST BE TESTED IN 24H AFTER BEING STATIC	
		FOR MORE THAN 2H AT ROOM TEMPERATURE(25 $\pm$ 2 $^{\circ}$ C).	
		If Customer's temperature request is higher than the	
		standard, Temperature test must be done for customer	
		Requirements	
3	HIGH TEMP. &	STORED AT 85±2 $^{\circ}\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$	A.C.D
	HUMIDITY	CHARACTERISTIC PARAMETERS OF 250B MUST BE TESTED IN 24H	
		AFTER BEING STATIC FOR MORE THAN 2H AT ROOM	
		TEMPERATURE(25	
		±2℃).	
4	TEMPERATURE	140+0/-6 $^{\circ}\mathrm{C}$ 30 ±3MINUTES	A.C
	SHOCK 2. 25 $^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 2 $^{\sim}$ 3MINUTES		
		3. 125+4/-0 °C 30 ±3MINUTES	
		4. 25 ℃±2℃ 2 ~3MINUTES	
		THE CRYSTAL UNIT SHALL BE SUBJECTED TO 100 SUCCESSIVE	
		CHANGE OF TEMPERATURE CYCLES. THE CHARACTERISTIC	

		PARAMETERS OF 250B MUST BE TESTED IN 24H AFTER BEING STATIC FOR MORE THAN 2H AT ROOM TEMPERATURE(25±2℃)	
5	SOLDERABILI TY	THE LEAD IS IMMERSED IN A 260±5 °C SOLDER BATH WITHIN 2±0.6 SECONDS.	F
6	FINE LEAK	HELIUM BOMBING 5.0~5.5 Kgf / cm2,FOR 2 HOURS.	E
7	WELDING HEAT RESISTANCE	2 REFLOWS,THE MAXIMUM TEMPERATURE & TIME IS 265°C±5°C, 15 ±5SEC. THE CHARACTERISTIC PARAMETERS OF 250B MUST BE TESTED IN 24H AFTER BEING STATIC FOR MORE THAN 2H AT ROOM TEMPERATURE(25±2°C).	
8	FREE FALL	FREE DROPPING FROM 100cm HEIGHT 3 TIMES ON A HARD	B.C
9	VIBRATION	FREQUENCY: 10~55Hz  AMPLITUDE (TOTAL EXCURSION): THE SCANNING FREQUENCY IS  0.75OCT/MIN, AND THE PEAK ACCELERATION IS 5G.  SWEEP TIME: 3 DIRECTION(X, Y, Z) EACH FOR 2 Hrs.	
10	TERMINAL STRENGTH	SHALL BE PRESSURIZED AT A SPEED OF APPROX.0.5mm/sec IN THE DIRECTION INDICATED BY THE ARROW UNTIL THE BENDING WIDTH REACHES 3mm AND HELD FOR 5 SECONDS.  PRESSURE ROD R20  R5  SAMPLE  R5  SAMPLE  R5	
11	STICKING TENDENCY	A RO.5 JIG SHALL BE USED TO APPLY A 10N DEAD LOAD IN THE DIRECTION INDICATED BY THE ARROW TO THE ELEMENT AND RETAIN IT FOR 10 SECONDS.  JIG RO.5  SAMPLE	
12	ELEMENT ASSEMBLY STRENGTH	A RO.5 PRESSURIZED BAR SHALL BE USED TO APPLY A 10N LOAD IN THE CENTER OF ELEMENT AND RETAIN IT FOR 10 SECONDS.	
13	Mechanical Shock	100G,6MS, HALF SINE SHOCK PULSE, 6AXIS*3TIMES	A.C

SPECIFIC	SPECIFICATIONS				
Α	FREQUENCY CHANGE PERMITTED.	△F≪10PPM			
В	FREQUENCY CHANGE PERMITTED.	△F≪20PPM			
С	EQUIVALENT SERIES RESISTANCE CHANGE PERMITTED.	$\triangle$ CI $\leqslant$ 5K $\Omega$ or 20%			
U	EGOTVALENT SERTES RESTSTANCE CHANGE PERMITTED.	Make use larger value			
D	INSULATION RESISTANCE	$>$ 500M $\Omega$			
E	LEAK RATE LESS THAN	$<1*1E-9$ Pa · $m^3/sec$			
F	A NEW UNIFORM COATING OF SOLDER SHALL COVER A MINIM	JM 95% OF THE SURFACE			

#### Remark:

※Each test done independently

※ Measurement condition: Electrical characteristics measured by S&A250B or equivalent.

#### 10. PART NUMBER SYSTEM:

For example: 1X85615FO

<u>1X</u> - <u>85615</u> - <u>FO</u>

1X: Package Code

**85615:** Serial number, flow code, without any rules

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