

CRYSTAL SPECIFICATION



Customer : _____

Customer P/N : _____

Agent : _____

Agent Code : _____

SIWARD P/N : XTL581200-P120-084

Customer Approval :

希華晶體科技股份有限公司
SIWARD CRYSTAL TECHNOLOGY CO., LTD.

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DATE : 2017/03/06

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Rev.	Description of Revision History	Date	Designer	Checked By
1	New Publication	2015/07/24	Sally Lin	Tom Tang

CRYSTAL SPECIFICATION

1. Description : Quartz Crystal
 2. Nominal Frequency : 40.000000 MHz
 3. Center Frequency : 40.000000 MHz
 4. Dimension & Drawing No. : SX-2520 ; SXD-00224
 5. Oscillation Mode : Fundamental
 6. Cutting Mode : AT cut
 7. Packing Style : TP-104
 8. Measurement Instrument : S&A 250B(Measured FL)
 9. Electrical Characteristics :
- [1] Operating Conditions :

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Operating Temperature Range	Topt	-30		105	°C	
Storage Temperature Range	Tstg	-55		125	°C	
Load Capacitance	CL		12		pF	
Drive Level	DL		50	200	μW	

[2] Frequency Stability :

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Tolerance	dF/Fo	-10		10	ppm	Refer to Center Frequency @25±3°C
Stability Over Temperature	dF/F25	-20		20	ppm	Refer to Operating Temperature
Aging	dF/F25	-2		2	ppm	Per Year

dF/Fo: Frequency Deviation Refer to Center Frequency

dF/F25: Frequency Deviation Refer to 25 °C Frequency

[3] Electrical Performance :

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Equivalent Series Resistance	ESR			50	Ω	@Series
Shunt Capacitance	C0			3.5	pF	
Insulation Resistance	IR	500			M Ω	@DC 100 Volt

10. Marking : Laser

<p>*MARKING : D ->YEAR C -> MONTH YEAR : 1 2 3 4 5 6 7 8 9 0 CODE : A B C D E F G H J K MONTH: 1 2 3 4 5 6 7 8 9 10 11 12 CODE : A B C D E F G H J K L M</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>40.0</p> <p>S DC</p> </div>
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11. Remark :

<p>* The component complies with Moisture Sensitivity Level 1 defined on JEDEC J-STD-020 standard. * Compliant with RoHS and Siward QAD-S-116 Standard.</p>
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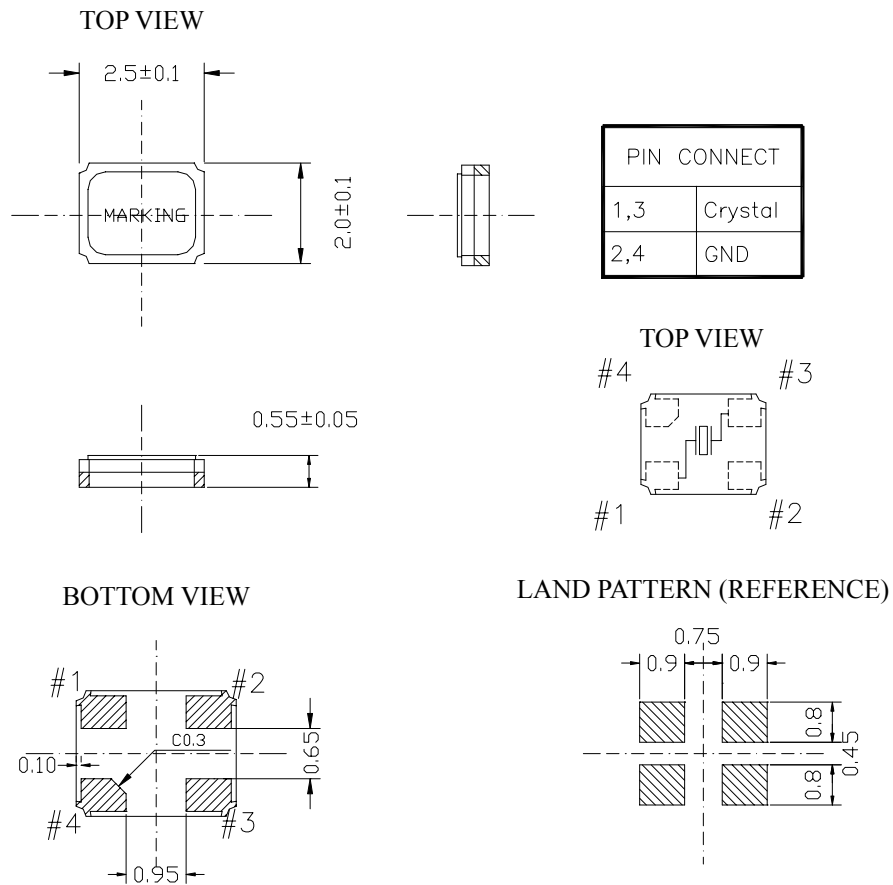
■Note

1.General cleaning solutions or ultrasonic cleaning method may be used to clean our products. However, under certain circumstances, ultrasonic cleaning machine could generate resonance at the oscillaton frequency of our products and thus deteriorate the electrical characteristics in devices, and even damage the overall structure of devices. Therefore, verification test is recommended before cleaning.

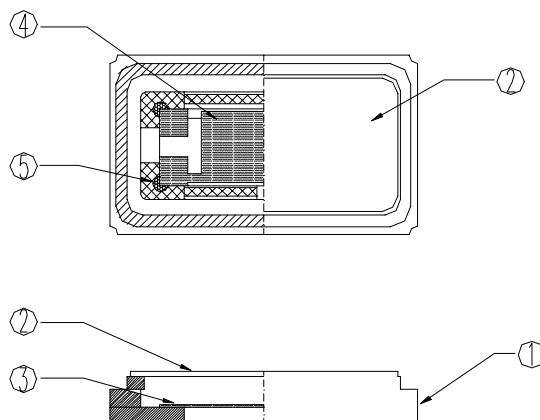
2.Avoid mounting and processing by Ultrasonic welding this method has a possibility of an excessive vibration spreading inside the crystal products and becoming the cause of characteristic deterioration and not oscillating.

DIMENSIONS

Unit: mm



STRUCTURE ILLUSTRATION



PART NAME		MATERIAL	PART NAME		MATERIAL
1.	BASE	CERAMIC	4.	ELECTRODE	Metal
2.	LID	KOVAR	5.	ADHESIVES	SILVER GLUE
3.	BLANK	QUARTZ			

■ RELIABILITY SPECIFICATION

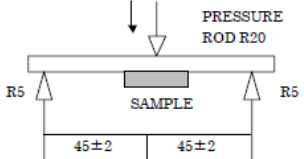
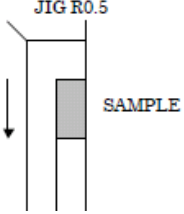
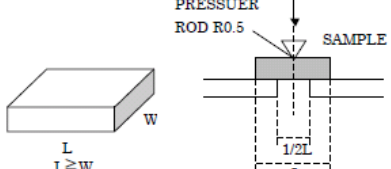
REFER TO JIS C 6701

1. ENVIRONMENTAL PERFORMANCE

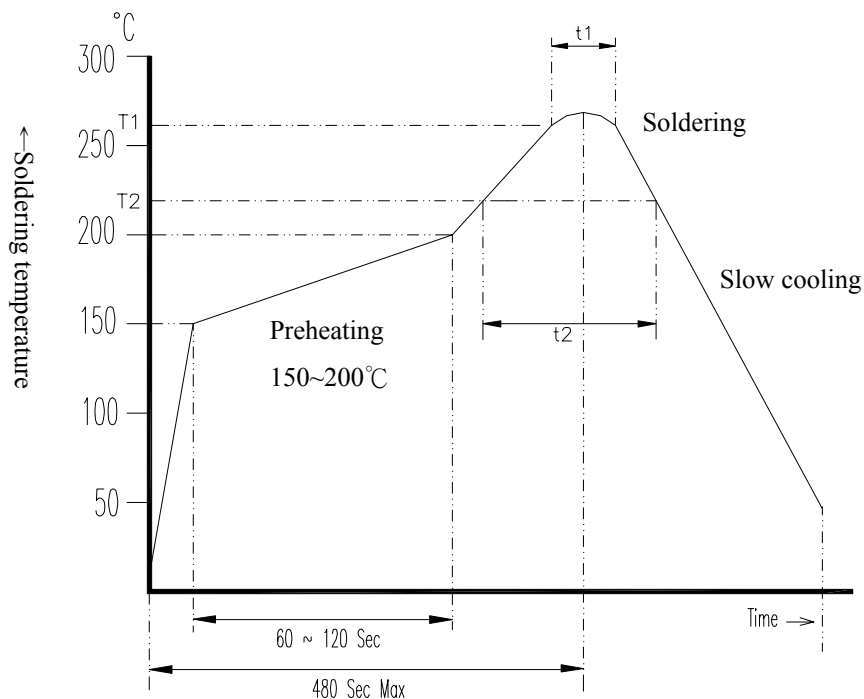
ITEM	CONDITION										
1. HIGH TEMPERATURE STORAGE	STORED AT $85\pm 2^{\circ}\text{C}$ FOR $720\pm 12\text{H}$. (If Customer's temperature request is higher than the standard, Temperature test must be done for customer requirements.) THEN $25\pm 2^{\circ}\text{C}$ OVER 2H BEFORE TESTING.										
2. LOW TEMPERATURE STORAGE	STORED AT $-40\pm 2^{\circ}\text{C}$ FOR $500\pm 12\text{H}$. (If Customer's temperature request is lower than the standard, Temperature test must be done for customer requirements.) THEN $25\pm 2^{\circ}\text{C}$ OVER 2H BEFORE TESTING.										
3. HIGH TEMP. & HUMIDITY	STORED AT $60\pm 2^{\circ}\text{C}$ AND HUMIDITY 90~95% FOR $500\pm 12\text{H}$. THEN $25\pm 2^{\circ}\text{C}$ OVER 2H BEFORE TESTING.										
4. TEMPERATURE CYCLE	THE CRYSTAL UNIT SHALL BE SUBJECTED TO 100 SUCCESSIVE CHANGE OF TEMPERATURE CYCLES, THEN $25 \pm 2^{\circ}\text{C}$ OVER 2 H BEFORE TESTING, EACH CYCLE AS BELLOW : <table border="1" data-bbox="635 1032 1141 1256"> <thead> <tr> <th>TEMPERATURE</th><th>DURATION</th></tr> </thead> <tbody> <tr> <td>1. $-40+0/-6^{\circ}\text{C}$</td><td>30\pm3 MINUTES</td></tr> <tr> <td>2. $25^{\circ}\text{C}\pm 2^{\circ}\text{C}$</td><td>2~3 MINUTES</td></tr> <tr> <td>3. $85+4/-0^{\circ}\text{C}$</td><td>30 \pm3 MINUTES</td></tr> <tr> <td>4. $25^{\circ}\text{C}\pm 2^{\circ}\text{C}$</td><td>2~3 MINUTES</td></tr> </tbody> </table>	TEMPERATURE	DURATION	1. $-40+0/-6^{\circ}\text{C}$	30 \pm 3 MINUTES	2. $25^{\circ}\text{C}\pm 2^{\circ}\text{C}$	2~3 MINUTES	3. $85+4/-0^{\circ}\text{C}$	30 \pm 3 MINUTES	4. $25^{\circ}\text{C}\pm 2^{\circ}\text{C}$	2~3 MINUTES
TEMPERATURE	DURATION										
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3. $85+4/-0^{\circ}\text{C}$	30 \pm 3 MINUTES										
4. $25^{\circ}\text{C}\pm 2^{\circ}\text{C}$	2~3 MINUTES										

2. MECHANICAL PERFORMANCE

ITEM	CONDITION
5. SOLDERABILITY	THE LEAD IS IMMERSSED IN A $260\pm 5^{\circ}\text{C}$ SOLDER BATH WITHIN 2 ± 0.6 SECONDS.
6. RESISTANCE TO SOLDERING HEAT	REFLOW CHART AS ATTACH SHEET. TWICE PASS.
7. FREE FALL	FREE DROPPING FROM 75 cm HEIGHT 3 TIMES ON A HARD WOODEN BOARD.
8. VIBRATION	FREQUENCY : 10~55Hz, AMPLITUDE (TOTAL EXCURSION) : $1.5\text{mm}\pm 15\%$, SWEEP TIME : 1MIN, 3 DIRECTION(X, Y, Z) EACH FOR 2 Hrs.
9. GROSS LEAK	STANDARD SAMPLE FOR AUTOMATIC GROSS LEAK DETECTOR, TEST PRESSURE: 0.2 Mpa
10. FINE LEAK	HELIUM BOMBING $5.0\sim 5.5\text{ Kg} / \text{cm}^2$ FOR 2 HOURS.

11. TERMINAL STRENGTH	<p>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.</p> 
12. STICKING TENDENCY	<p>A R0.5 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.</p> 
13. ELEMENT ASSEMBLY STRENGTH	<p>A R0.5 PRESSURIZED BAR SHALL BE USED TO APPLY A 10N LOAD IN THE CENTER OF ELEMENT AND RETAIN IT FOR 10 SECONDS.</p> 

■ SUGGESTED REFLOW PROFILE

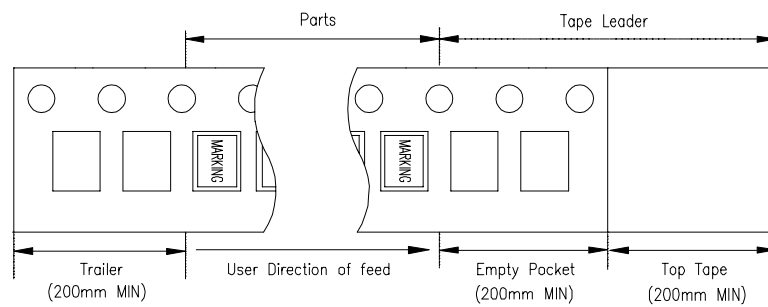
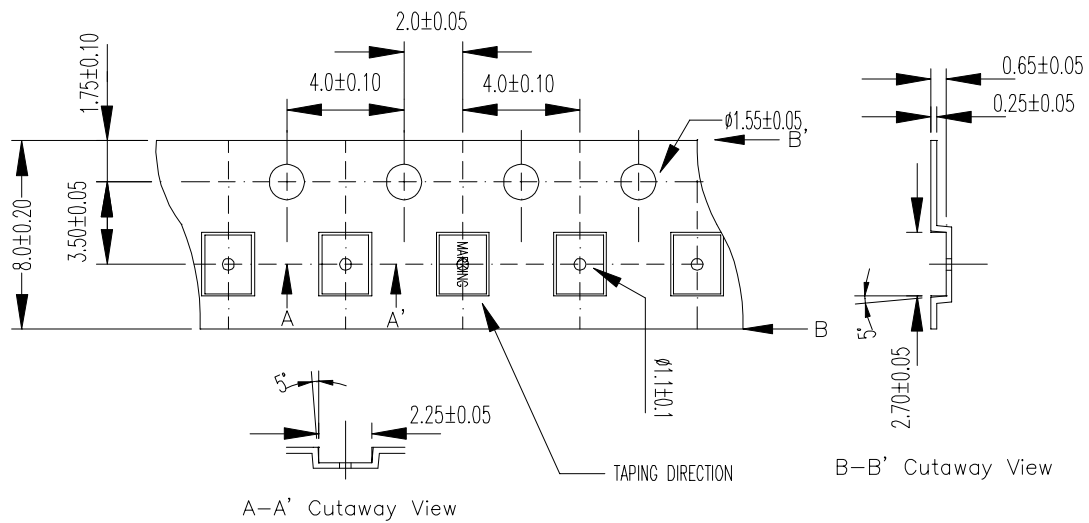


Application\Temperature Time	T1 / t1	T2 / t2
Lead Free	260±5°C / 10±5 Sec Max	217°C Min / 60~150 Sec
Non Lead Free	240±5°C / 10±5 Sec Max	183°C Min / 60~150 Sec

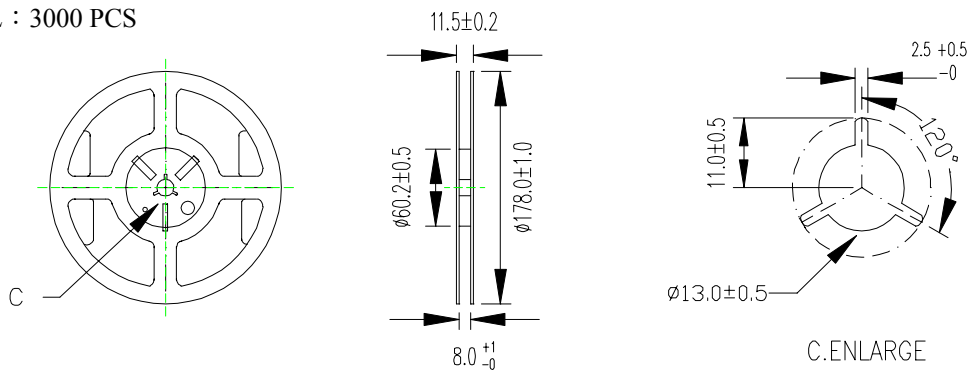
■ PACKING

Unit: mm

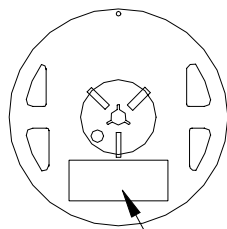
1. CARRIER TYPE



2. REEL : 3000 PCS



3. LABEL



CUSTOMER:
FREQ
TYPE
SPEC
P.O.:
CUST.P/N:..
LOT NO.:
MFG.P/N:..
D.C.: QTY:..

QC OK
Pb
HF

RoHS

STWARD