SPEC. NO.: SCO-G293

OSC SPECIFICATION

Customer :

Customer P/N :

Agent :

Agent Code :

SIWARD P/N : OSC813200-SCO-G293

Customer Approval :

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

業務部/ SALE DEPARTMENT
TEL: (04)25347909
FAX: (04)25327885 / 25337396
URL HTTP://www.siward.com.tw

品質保證部/ QUALITY ASSURANCE DEPT.
TEL: (04)25347909 EXT 1340/1341

研發部/R & D DEPT.
TEL: (04)25347909 EXT 1521

Address:1-1,LANE 111,JUNG-SHAN RD.,SEC.3, TANTZU HSING,TAICHUNG 427,TAIWAN,R.O.C.

DATE : 2016/08/03

Approved By : Steve Chen

Checked By : Angel Hsu

Designer : Amy Ou

Rev.	Description of Revision History	Date	Designer	Checked By
1	New Publication	2016/08/02	Amy Ou	Angel Hsu

SPEC. NO.: SCO-G293

OSC SPECIFICATION

1. Description : Crystal Oscillator

2. Center Frequency : 24.000000 MHz

3. Dimension & Drawing No. : OSC81 ; CXO-012

4. Packing Style : TP-102

5. Measurement Circuit :

6. Absolute Maximum Ratings :

Item	Symbol	Rating	Unit	Condition
Supply Voltage	Vcc	-0.6 to 6	V	
Storage Temperature	Tstg	-55 to 125	℃	

7. Electrical Characteristics :

[1] Operating Conditions :

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Supply Voltage	Vcc	3.135	3.3	3.465	V	
Operating Temp. Range	Topt	-20		75	℃	
Load(Capacitance)	C			15	pF	
Tri-state(standby function)	Vih	2.97		Vcc	V	Oscillation Enable
Tri-state(standby function)	Vil	GND		0.33	V	Oscillation Disable

[2] Frequency Stability :

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Frequency Stability	dF/Fo	-20		20	ppm	Include Freq. Tolerance, Temp., Supply voltage, Load.
Frequency Tolerance	dF/Fo				ppm	Refer to Center Frequency @25±3℃
Vs. Temperature	dF/Fo				ppm	
Vs. Supply Voltage	dF/F25				ppm	
Vs. Load	dF/F25				ppm	
Vs. Aging	dF/F25	-5		5	ppm	PER YEAR (AT 25℃ ± 5℃)

[3] Electrical Performance :

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Output Waveform						Square / HCMOS
Current Consumption	Icc			13	mA	
Output Level Logic 1	Voh	2.97			V	
Output Level Logic 0	Vol			0.33	V	
Duty Cycle	D.C	45	50	55	%	@ 1.65 V
Rise/Fall Time	Tr/Tf			10	nS	
Start Time				10	mS	@+3.135V

dF/Fo: Frequency Deviation Refer to Center Frequency

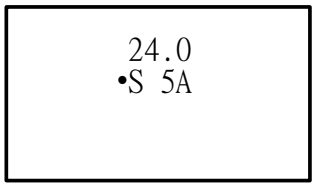
dF/F25: Frequency Deviation Refer to 25 ℃ Frequency

8. Marking : Laser

＊5A: YEAR -> 5 (Last 1 digit of the year) MONTH -> A

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



9. Remark :

＊Compliant with RoHS and Siward QAD-S-116 Standard.

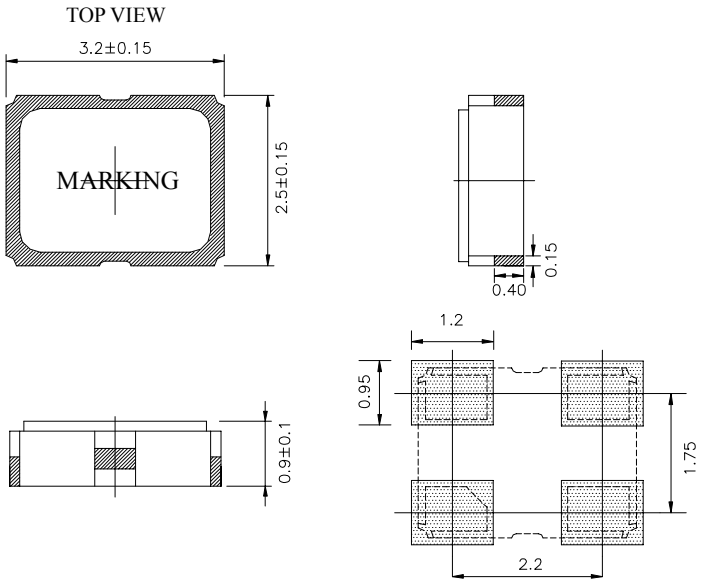
■Note

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.

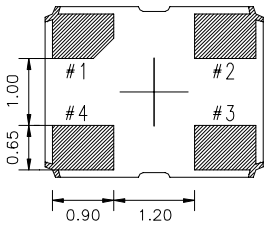
2.Avoid mounting and processing by Ultrasonic welding this method has a possibility of an excessive vibration spreading inside the crystal products and becoming the cause of characteristic deterioration and not oscillating.

■ DIMENSIONS

Unit: mm



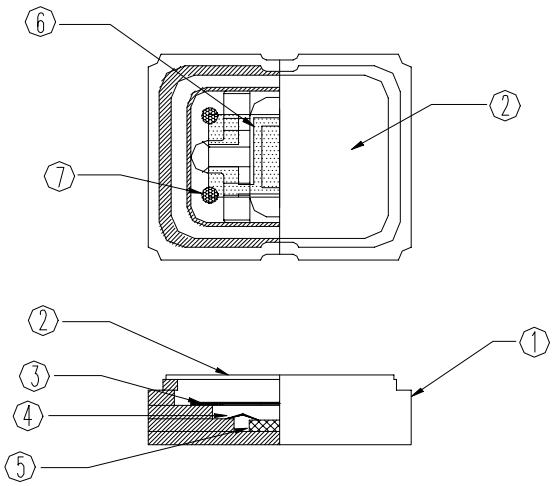
BOTTOM VIEW



Terminal	Connection
#1	Tri-state or N.C
#2	GND
#3	OUTPUT
#4	Vcc

Tri-state Function	
Tri-state pin	Output
High or Floating	Active
Low	Hi-Impedance

■ STRUCTURE ILLUSTRATION



PART NAME		MATERIAL	PART NAME		MATERIAL
1.	BASE	CERAMIC	5.	IC	CHIP
2.	LID	KOVAR	6.	ELECTRODE	Metal
3.	BLANK	QUARTZ	7.	ADHESIVES	SILVER GLUE
4.	WIRE	Au			

■RELIABILITY SPECIFICATION

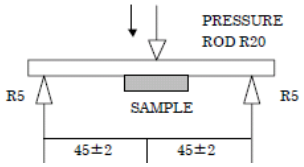
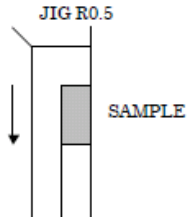
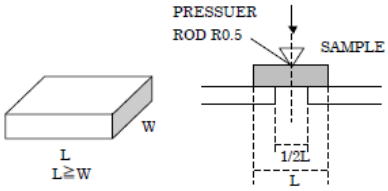
REFER TO JIS C 6710

1. ENVIRONMENTAL PERFORMANCE

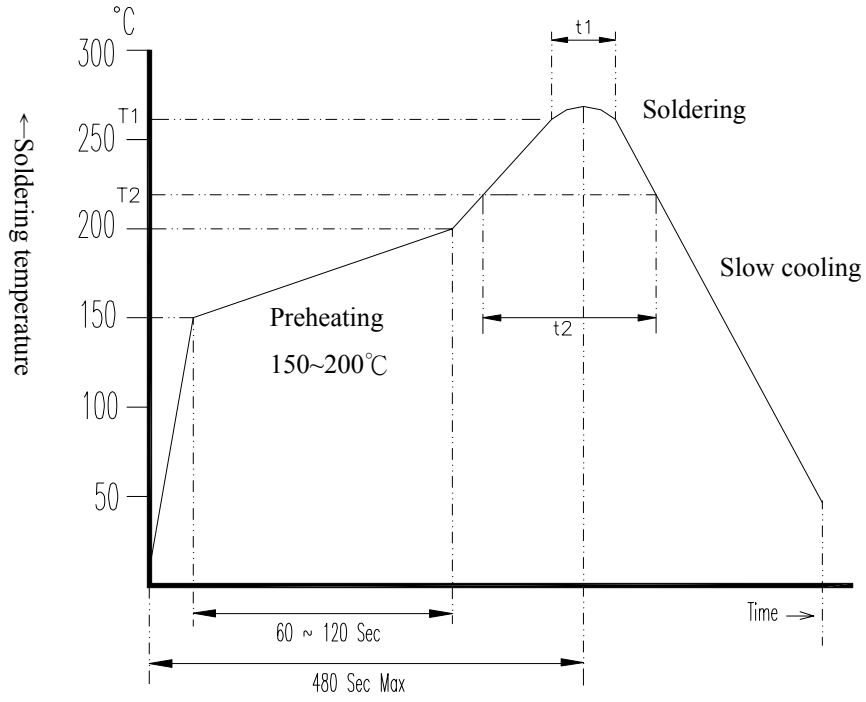
ITEM	CONDITION
1.AGING ON POWER	TEMPERATURE:85±3℃ TIME:720H±12H. VOLTAGE: SUPPLY VOLTAGE Vcc MEASURE UNDER THE STABILIZED THE ENVIRONMENT.
2. DRY HEAT	STORED AT 85±3℃ FOR 500±12H. THEN 25±2℃ OVER 2H BEFORE TESTING.
3. COLD	STORED AT -40±3℃ FOR 500±12H. THEN 25±2℃ OVER 2H BEFORE TESTING.
4. DAMP HEAT	STORED AT 60±2℃ AND HUMIDITY 90～95% FOR 500±12 H. THEN 25±2℃ OVER 2H BEFORE TESTING.
5. TEMPERATURE CYCLE	THE OSC UNIT SHALL BE SUBJECTED TO 100 SUCCESSIVE CHANGE OF TEMPERATURE CYCLES, THEN 25±2℃ OVER 2H BEFORE TESTING, EACH CYCLE AS BELLOW： TEMPERATURE DURATION 1. -40+0/-6℃ 30±3 MINUTES 2. 25℃±2℃ 2～3 MINUTES 3. 85+4/-0℃ 30±3 MINUTES 4. 25℃±2℃ 2～3 MINUTES

2. MECHANICAL PERFORMANCE

ITEM	CONDITION
6. SOLDERABILITY	THE LEAD IS IMMERSED IN A 260±5℃ SOLDER BATH WITHIN 2±0.5 SECONDS.
7. RESISTANCE TO SOLDERING HEAT	REFLOW CHART AS ATTACH SHEET. TWICE PASS.
8. SEALING	MASS-SPECTROMETER-TYPE LEAK DETECTOR SHALL BE USED TO MEASURE THE LEAKAGE RATE OF GAS THROUGH ANY FAULTY SEAL.
9. VIBRATION	FREQUENCY：10～55Hz, AMPLITUDE (TOTAL EXCURSION)：1.5mm±15%, SWEEP TIME：1MIN, 3 DIRECTION(X, Y, Z) EACH 2H.
10. FREE FALL	FREE DROPPING FROM 100 cm HEIGHT 3 TIMES ON A HARD WOODEN BOARD.

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

■ SUGGESTED REFLOW PROFILE

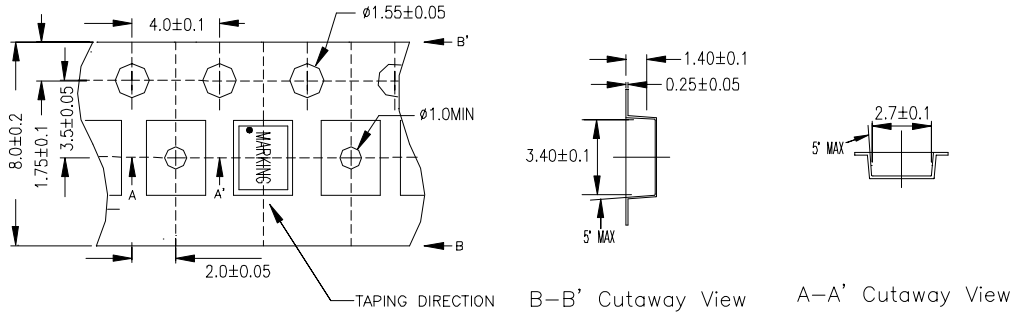


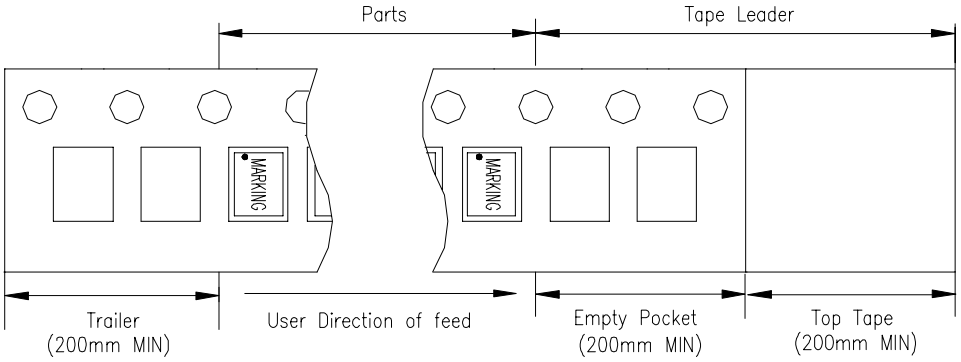
Application\Temperature Time	T1 / t1	T2 / t2
Lead Free	260±5℃ / 10±5 Sec Max	217℃ Min / 60~150 Sec
Non Lead Free	240±5℃ / 10±5 Sec Max	183℃ Min / 60~150 Sec

■ PACKING

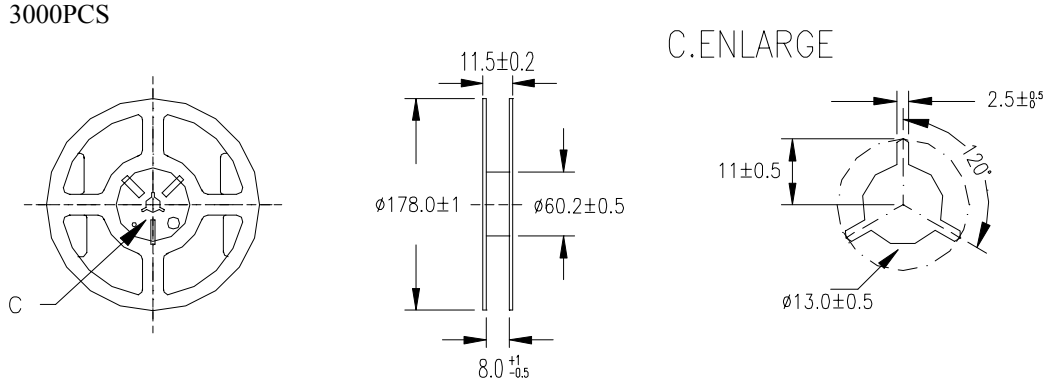
Unit: mm

1. CARRIER TYPE

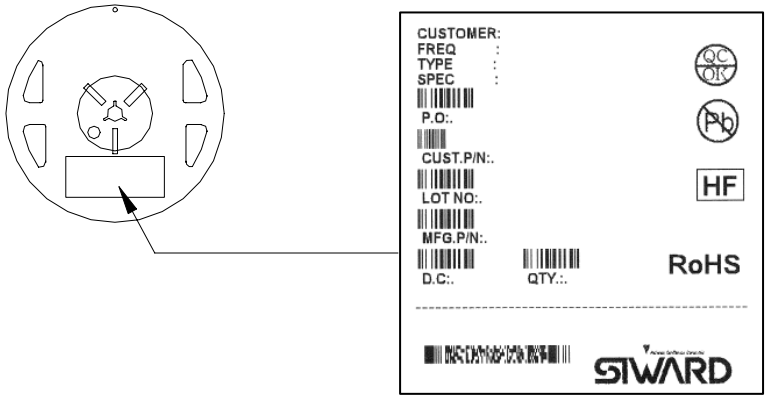




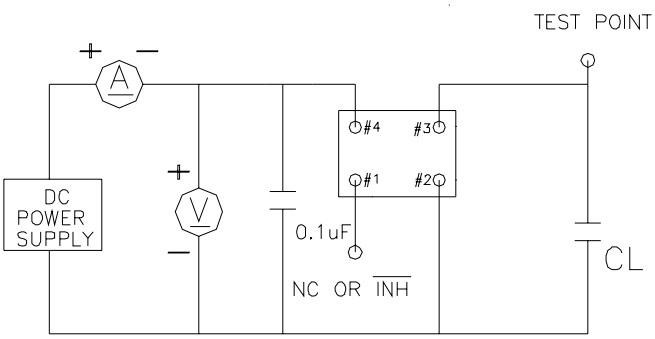
2. REEL： 3000PCS



3. LABEL



■ TEST CIRCUIT



* CL= pF(INCLUDING PROBE AND JIG CAPACITANCE)

■ OUTPUT WAVEFORM