

TCXO SPECIFICATION



Customer : \_\_\_\_\_

Customer P/N : \_\_\_\_\_

Agent : \_\_\_\_\_

Agent Code : \_\_\_\_\_

SIWARD P/N : TXO952005-STO-3218

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

DATE : 2014/11/28

Approved By : Steve Chen

品質保證部/ QUALITY ASSURANCE DEPT.

TEL: (04)25347909 EXT 1340/1341

Checked By : Steve Chen

研發部/R & D DEPT.

TEL: (04)25347909 EXT 1521

Designer : Amy Ou

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



## TCXO SPECIFICATION

1. Description : Temperature Compensated Crystal Oscillator
2. Center Frequency : 26.000000 MHz
3. Dimension & Drawing No. : STO-2520A ; TCO-019
4. Packing Style : TP-131
5. Measurement Circuit :
6. Absolute Maximum Ratings :

Item	Symbol	Rating	Unit	Condition
Supply Voltage	Vcc	-0.3 to 6	V	
Storage Temperature	Tstg	-40 to 85	°C	

7. Electrical Characteristics :

[1] Operating Conditions :

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Supply Voltage	Vcc	1.8		3.3	V	
Operating Temp. Range	Topt	-30		85	°C	
Load(Impedance)	R	9	10	11	KΩ	
Load(Capacitance)	C	9	10	11	pF	

\* No Tri-state(no standby function)

[2] Frequency Stability :

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Vs. Temperature	dF/F25	-0.5		0.5	ppm	
Vs. Supply Voltage	dF/F25	-0.2		0.2	ppm	
Vs. Load	dF/F25	-0.2		0.2	ppm	
Vs. Aging	dF/F25	-1		1	ppm	PER YEAR ( AT 25°C ± 5°C )
Frequency tolerance after reflow	dF/Fo	-2		2	ppm	Sixty minutes after 2 times reflow
Temperature slope		-0.1		0.1	ppm/°C	@-20°C ~ +75°C
Temperature slope		-0.3		0.3	ppm/°C	@-30°C ~ +85°C

[3] Frequency Adjustment :

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
------	--------	------	------	------	------	-----------

[4] Electrical Performance :

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Output Waveform						Clipped Sine
Current Consumption	I <sub>cc</sub>			1.5	mA	
Output Level Clipped Sine	V <sub>p-p</sub>	0.8			V	
Duty Cycle	D.C	40	50	60	%	
Start Time				2.5	mS	@ 90% of V <sub>p-p</sub> , within ±1.0ppm
Harmonic				-7	dBc	
Phase Noise	C/N		-70		dBc/Hz	@ 10Hz
Phase Noise	C/N		-105		dBc/Hz	@ 100Hz
Phase Noise	C/N		-130		dBc/Hz	@ 1KHz
Phase Noise	C/N		-145		dBc/Hz	@ 10KHz

dF/Fo: Frequency Deviation Refer to Center Frequency

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

8. Marking : Laser

\* Y=Last 1 digit of year , M=Month(Ex : CE=May 2003)  
 Year : A=1 B=2 C=3 D=4 E=5 F=6 G=7 H=8 J=9 K=0  
 Month : A=1 B=2 C=3 D=4 E=5 F=6 G=7 H=8 J=9 K=10 L=11 M=12  
 XXXXXXX : Internal code

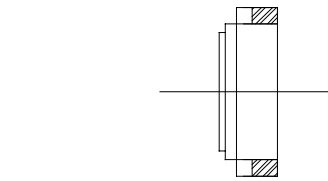
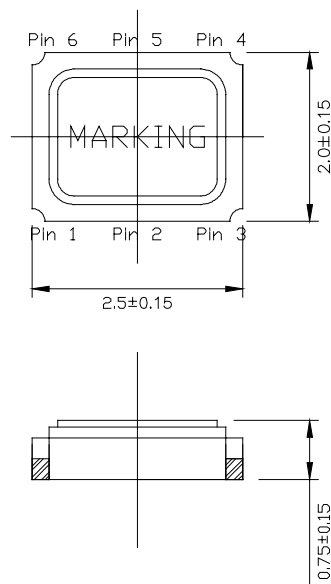
XXXXXXX  
 ○S26YM

9. Remark :

\* Lead Free,RoHS Compliant

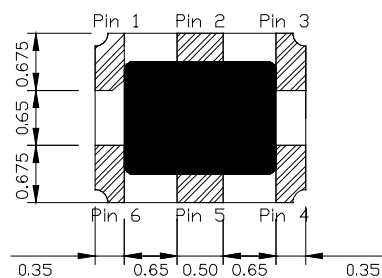
## DIMENSIONS

Unit: mm

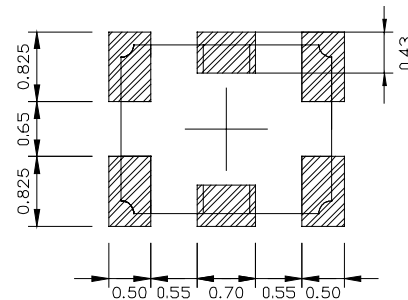


PIN NO	CONNECTION
Pin 1	GND
Pin 2	N.C
Pin 3	GND
Pin 4	OUTPUT
Pin 5	N.C
Pin 6	VCC

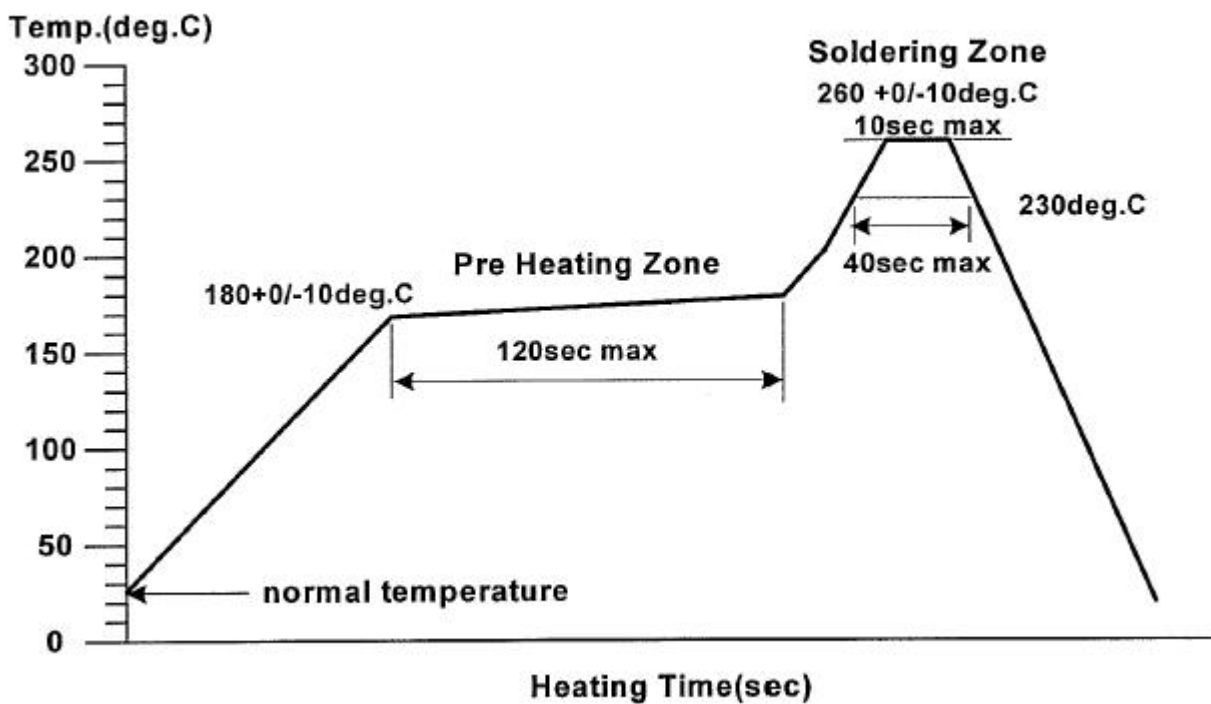
**BOTTOM VIEW**



**LAND PATTERN (REFERENCE)**



## SUGGESTED REFLOW PROFILE



## ■RELIABILITY SPECIFICATION

REFER TO JIS C 6710

### 1. ENVIRONMENTAL PERFORMANCE

ITEM	CONDITION										
1.AGING ON POWER	TEMPERATURE:85±2℃ TIME:96H±2H. VOLTAGE: SUPPLY VOLTAGE V <sub>cc</sub> MEASURE UNDER THE STABILIZED THE ENVIRONMENT.										
2. COLD	STORED AT -40±2℃ FOR 96±2H. THEN 25±2℃ OVER 2H BEFORE TESTING.										
4. DAMP HEAT	STORED AT 60±2℃ AND HUMIDITY 90~95% FOR 96±2 H. THEN 25±2℃ OVER 2H BEFORE TESTING.										
4. 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 : <table data-bbox="635 817 1117 1019"> <thead> <tr> <th>TEMPERATURE</th><th>DURATION</th></tr> </thead> <tbody> <tr> <td>1. -40+0/-6℃</td><td>30±3 MINUTES</td></tr> <tr> <td>2. 25℃±2℃</td><td>2~3 MINUTES</td></tr> <tr> <td>3. 85+4/-0℃</td><td>30±3 MINUTES</td></tr> <tr> <td>4. 25℃±2℃</td><td>2~3 MINUTES</td></tr> </tbody> </table>	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
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										

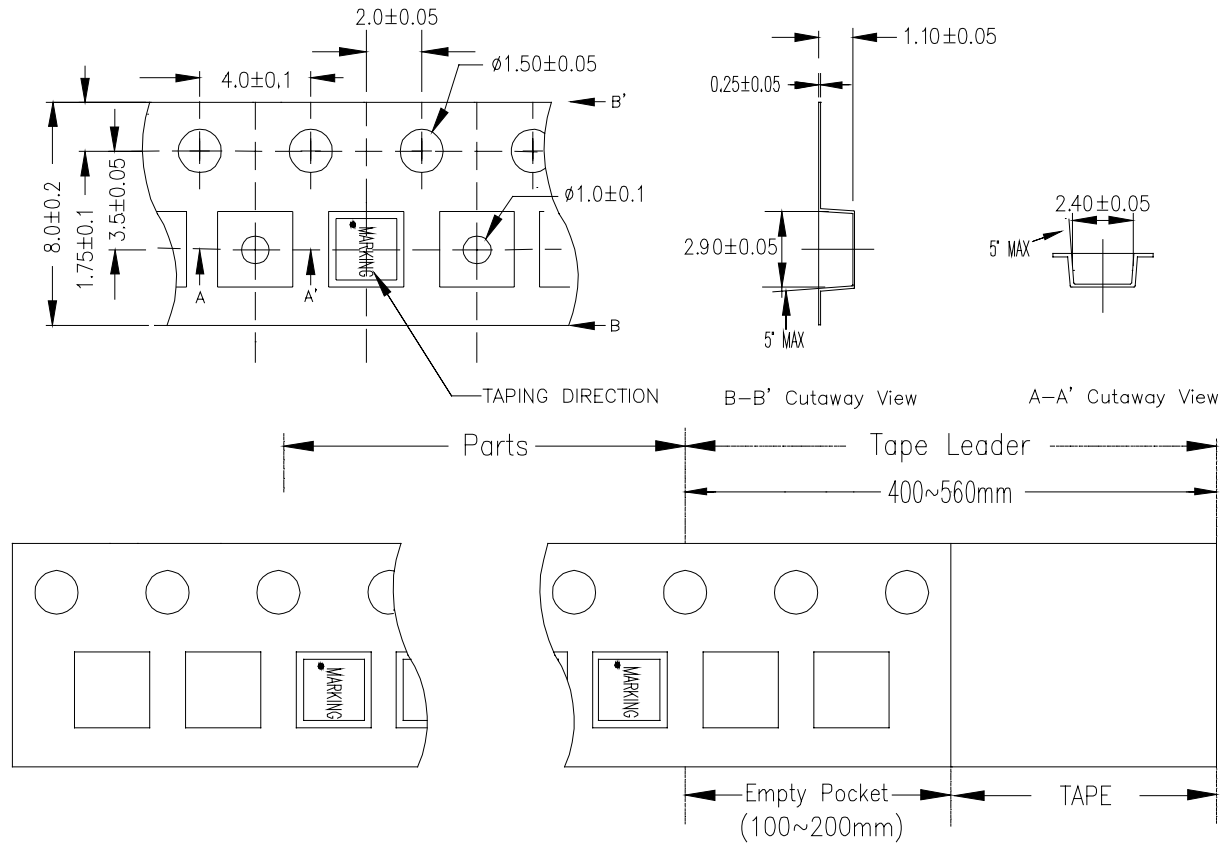
### 2. MECHANICAL PERFORMANCE

ITEM	CONDITION
5. SOLDER HEAT TEST	ALL LEADS SHALL BE SOLDERED AT TEMPERATURE OF 350±5℃ FOR 5±1 SEC. USING A SOLDERING IRON.
6. RESISTANCE TO SOLDERING HEAT	REFLOW CHART AS ATTACH SHEET. TWICE PASS.
7. SEALING	MASS-SPECTROMETER-TYPE LEAK DETECTOR SHALL BE USED TO MEASURE THE LEAKAGE RATE OF GAS THROUGH ANY FAULTY SEAL.
8. VIBRATION	10 TO 55 TO 10Hz 1.5mm CONSTANT AMPLITUDE 1min. PERIOD X, Y , Z DIRECTION 2H EACH 6H TOTAL.
9. FREE FALL	A TEST PIECE (200g) MADE BY TEFLON IS DROPPED 3 CYCLES (1 CYCLE : 6 DIRECTIONS) FROM THE HEIGHT OF 150cm HARD BOARD.

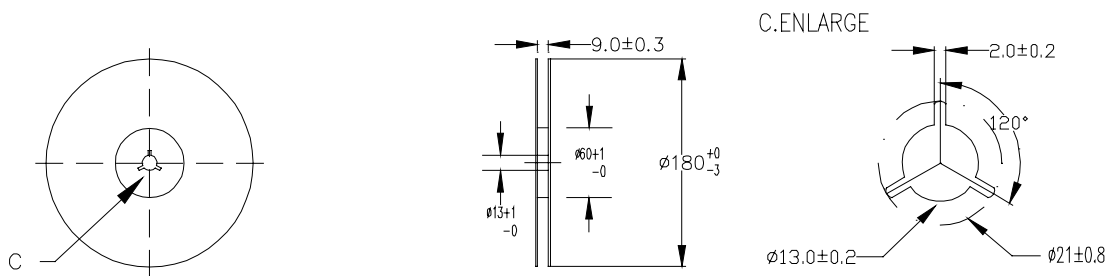
## PACKING

Unit: mm

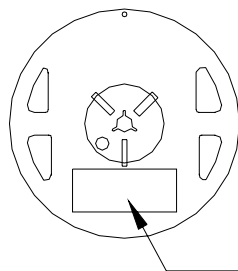
### 1. CARRIER TYPE



### 2. REEL : 3000PCS

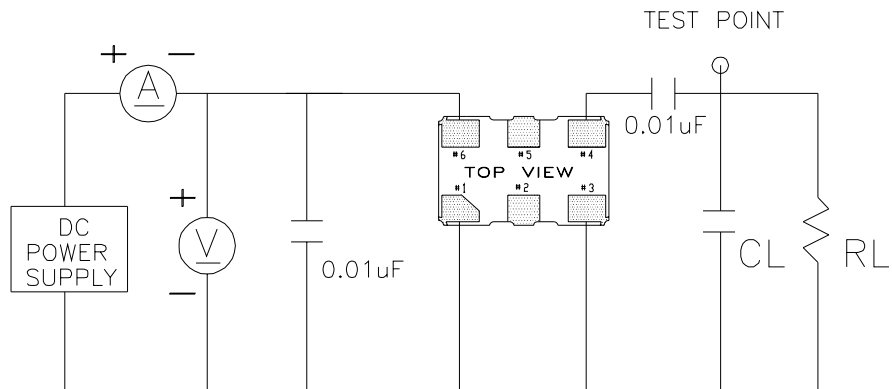


### 3. LABEL



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

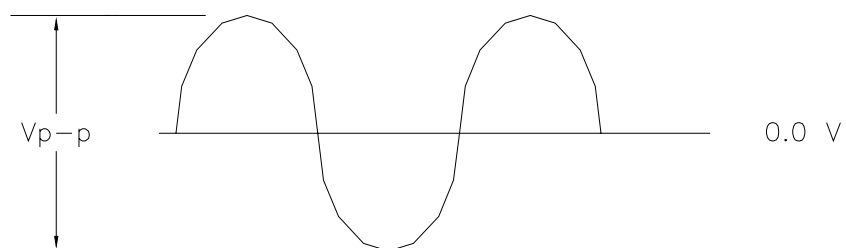
## ■ TEST CIRCUIT



\* CL= pF(INCLUDING PROBE AND JIG CAPACITANCE)

\* RL= KOHM

## ■ OUTPUT WAVEFORM





## Handling Instructions

Type    Crystal oscillator (SMD, Seam weld type)

### 1. Cautions for Handling

#### a) Prevention against electrostatic breakdown

Your full attention to static electricity is still requested.

#### b) Direction

Before mounting the crystal oscillator on board, Please confirm the direction to make sure the GND terminal and the terminal of power supply are not taken wrongly.

### 2. Prevention against Vibration and Shock

While the product is being transported or mounted onto board, if undue shock and vibration exceeding the specification is put on, there is risk that the built-in crystal blank is broken.

When undue shock and vibration exceeding the specification is put on the product, please be sure to make confirmation of the product's characteristics.

### 3. Soldering

In order to assure the reliability of the crystal oscillator, please use the product under the recommended conditions.

### 4. Surface mounting

#### a) This product is surface-mounting device.

So, Please pay attention to the following things.

#### b) Extreme deformation of board may make pattern off, the electrode of terminals off and solder broken.

Full attention is requested especially when splitting the board with the oscillator mounted where the camber of the board occurs.

#### c) In case that automatic mounter is used, please choose the type with small shock generation and make confirmation of the shock before use.

## 5. Cleaning

Because cleaning will cause change to all characteristics, cleaning is forbidden.

## 6. Store keeping (method and duration)

Long-time storage in the high/low temperature and high humidity leads to deterioration of solderability. So, please keep the product in the temperature of +5~+35 °C and humidity of 45~70%.

Moreover, please keep the product in the circumstance with measures against static electricity.

The storage life is 6 months before the pack is opened and please use it within 168 hours after the pack is opened.

(Please keep it with desiccator etc. when you exceed 168 hours after the bag is opened. Please use it after confirming the product solderability.)