



# SPECIFICATION FOR APPROVAL

CUSTOMER : \_\_\_\_\_

PRODUCT TYPE : SMD GLASS SEALING X'TAL 3.2\*2.5

NOMINAL FREQ. : 48.000000MHz

TXC P/N : 7V48000012

REVISION : S1

CUSTOMER P/N : \_\_\_\_\_

PM / SALES : \_\_\_\_\_

DATE : \_\_\_\_\_

CUSTOMER SIGNATURE & Date

\_\_\_\_\_

\_\_\_\_\_

- (1) TXC requires one copy returned with signature and title of authorized individual that signifies acceptance of the attached specifications.
- (2) Orders received and accepted by TXC after return of signed copy of specification will be produced per these specifications.
- (3) Any changes to these specifications must be agreed upon by both parties and new revision of the Product Specification Sheet will be issued.
- (4) Any issuance of purchase order prior to consigning back the Approval page of "Specification Sheets" from customers will be regarded as the agreement on the contents of these specifications.

Attachment: Product Specification Sheet

- 1
- 2
- 3
- 4
- 5

**RoHS Compliant**



# PRODUCT SPECIFICATION SHEET

PRODUCT TYPE : SMD GLASS SEALING X'TAL 3.2\*2.5

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NOMINAL FREQ. : 48.000000MHz

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REVISION : S1

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PE/RD	QA	MFG
<i>Jake Lin</i>		
<i>23-Jun-08</i>		

**NOTE:**

- (1)Lead Free Products are "Directive 2002/95/EC of The European Parliament of 27 January 2003 on the restriction of the use of certain hazardous substances (RoHS) in electrical and electronic equipment" Compliant (Attachment: SGS Test Report).
- (2)Revision "Sx" is for engineering samples only. PE/RD's approval required.
- (3)Revision "Ax" is production ready. PE, QA and MFG's approval required.

**RoHS Compliant**



<u>Rev</u>	<u>Revise page</u>	<u>Revise contents</u>	<u>Date</u>	<u>Ref.No.</u>	<u>Reviser</u>
S1	N/A	Initial released	23-Jun-08	N/A	Xiaoyan Jiang

## ■ ELECTRICAL SPECIFICATIONS

### Standard atmospheric conditions

Unless otherwise specified, the standard range of atmospheric conditions for making measurement and tests are as follow:

Ambient temperature :  $25 \pm 5^{\circ}\text{C}$   
 Relative humidity : 40%~70%

If there is any doubt about the results, measurement shall be made within the following limits:

Ambient temperature :  $25 \pm 3^{\circ}\text{C}$   
 Relative humidity : 40%~70%

### Measure equipment

Electrical characteristics measured by HP E5100A or equivalent.

### Crystal cutting type

The crystal is using AT CUT (thickness shear mode).

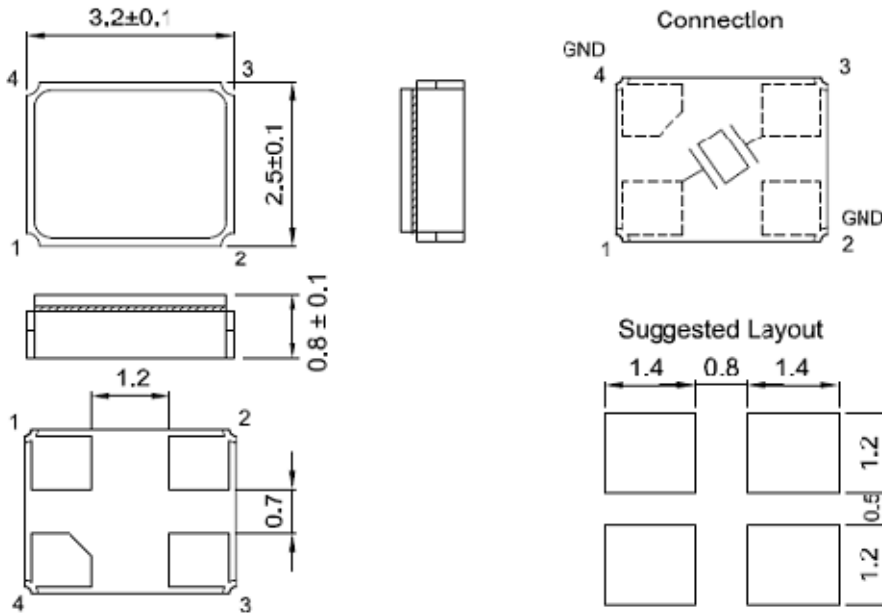
### Unit Weight:

0.018±0.001 g/pcs

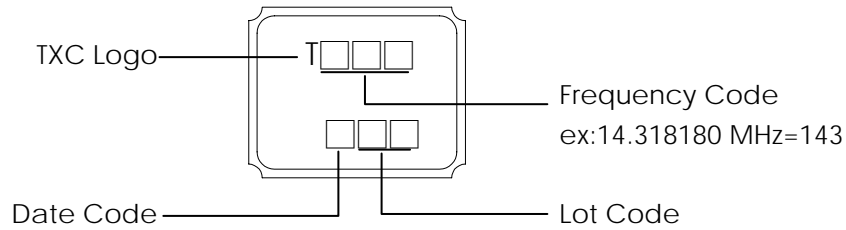
	Parameters	SYM.	Electrical Spec.				Notes
			MIN	TYPE	MAX	UNITS	
1	Nominal Frequency	FL	48.000000			MHz	-
2	Oscillation Mode	-	Fundamental			-	-
3	Load Capacitance	CL	8			pF	-
4	Frequency Tolerance	-	±15			ppm	at $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$
5	Series Resonant Resistance	Rr	-	-	40	$\Omega$	-
6	Operating Temperature Range	-	-10	~	70	$^{\circ}\text{C}$	-
7	Frequency Tolerance	-	±15			ppm	Over Operating Temp. Range (Reference $25^{\circ}\text{C}$ )
8	Drive Level	DL	-	10	-	$\mu\text{W}$	-
9	Shunt Capacitance	C0	-	-	2	pF	-
10	Aging	-	±3			ppm	1st Year
11	Insulation Resistance	-	500	-	-	M $\Omega$	at DC 100V
12	Storage Temperature Range	-	-40	~	85	$^{\circ}\text{C}$	-

**■ DIMENSIONS**

UNIT:mm



**■ MARKING**



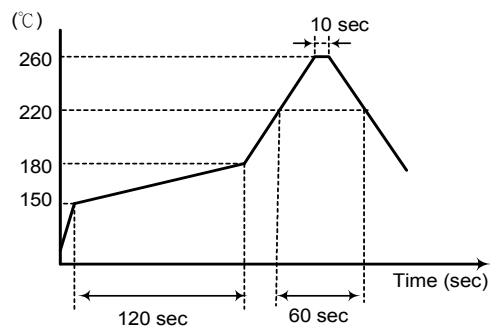
Date Code

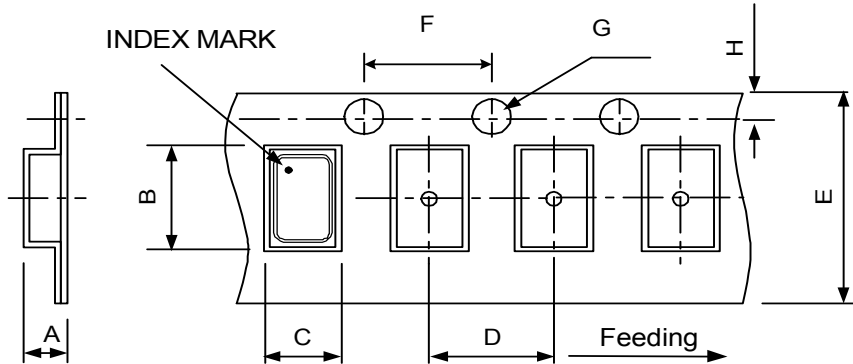
YEAR					MONTH											
					JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2001	2005	2009	2013	2017	A	B	C	D	E	F	G	H	J	K	L	M
2002	2006	2010	2014	2018	N	P	Q	R	S	T	U	V	W	X	Y	Z
2003	2007	2011	2015	2019	a	b	c	d	e	f	g	h	j	k	l	m
2004	2008	2012	2016	2020	n	p	q	r	s	t	u	v	w	x	y	z

This date code will be cycled every four years

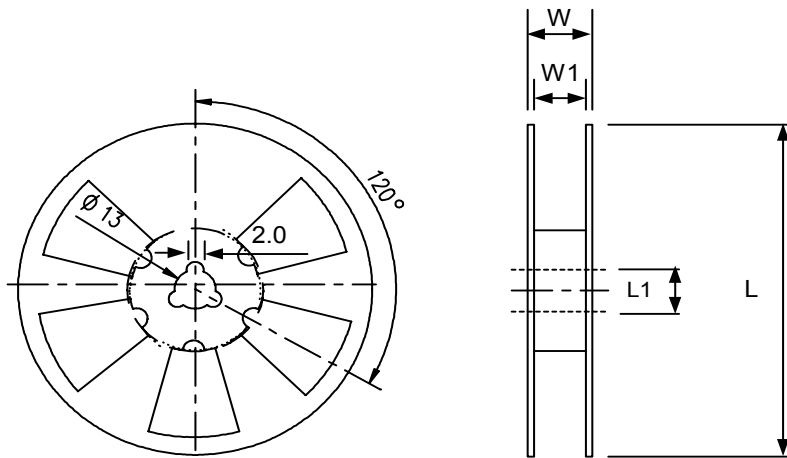
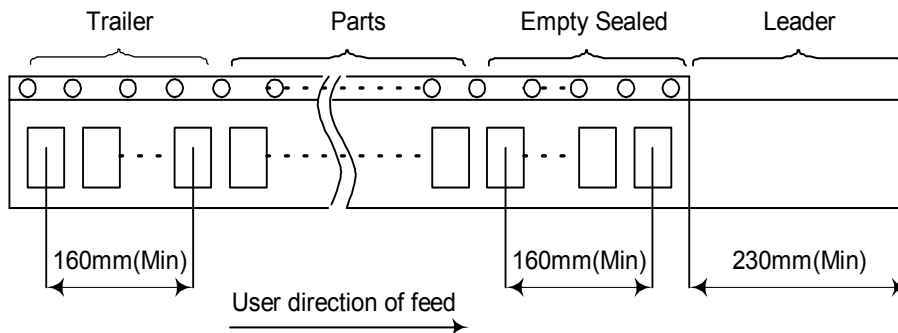
**■ SUGGESTED REFLOW PROFILE**

Total time : 200 sec. Max.  
Solder melting point :220 °C

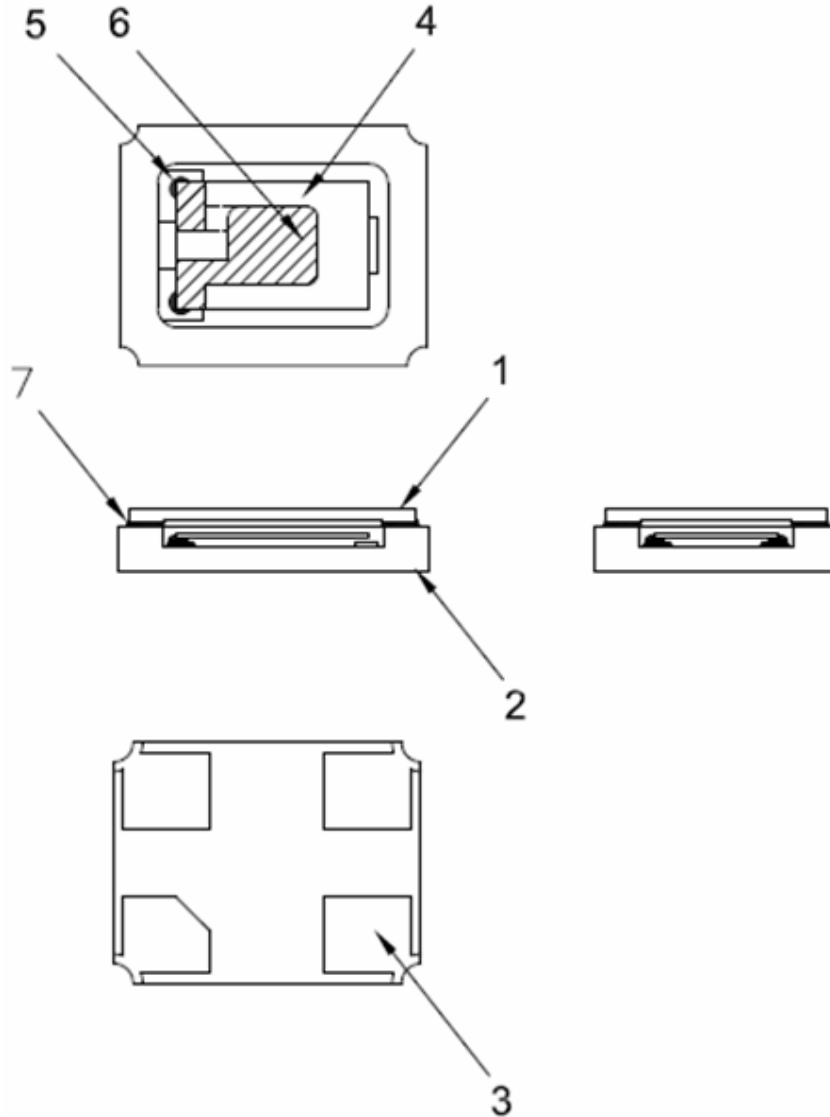


**PACKING : (EIA-481-2)**


DIMENSIONS	A	B	C	D	E	F	G	H	(UNIT : mm)
	1.40	3.40	2.70	4.00	8.00	4.00	1.50	1.75	

**REMARK :**


DIMENSIONS	L	L1	W	W1	pcs / Reel (UNIT : mm)
	178	13	11.5	8	Standard Reel Quantity is 3,000 pcs per reel

**■ STRUCTURE ILLUSTRATION**


NO	COMPONENTS	MATERIALS	QTY	FINISH/SPECIFICATIONS
1	Cap	Ceramic	1	Color black
2	Package	Ceramic	1	Color black
3	PAD	Au	4	Tungsten metalize + Ni plating + Au plating
4	Crystal blank	SiO <sub>2</sub>	1	-
5	Conductive adhesive	Ag	4	Silicon resin
6	Electrode	Ag + Cr	2	-
7	Glass	-	-	-

**RELIABILITY SPECIFICATIONS**

## 1. Mechanical Endurance

No.	Test Item	Test Methods	CRITIREA	REF.DOC
1.1	Drop Test	100 cm height, 3 times on concrete floor.	$\Delta F/F < +/- 5\text{ppm}$ $\Delta Cl < +/- 5 \text{ Ohm}$	JIS C6701
1.2	Mechanical Shock	Device are shocked to half sine wave ( 1000 G ) three mutually perpendicular axes each 3 times. 0.5m sec. duration time	$\Delta F/F < +/- 5\text{ppm}$ $\Delta Cl < +/- 5 \text{ Ohm}$	MIL-STD-202F
1.3	Vibration	Frequency range 10 ~ 2000 Hz Amplitude 1.52 mm/20G Sweep time 20 minute Perpendicular axes each test time 4 hours (Total test time 12 hours)	$\Delta F/F < +/- 5\text{ppm}$ $\Delta Cl < +/- 5 \text{ Ohm}$	MIL-STD-883E
1.4	Solder ability	Temperature 240 °C ± 5°C Immersing depth 0.5 mm minimum Immersion time 5 ± 1 seconds Flux Rosin resin methyl alcohol solvent ( 1 : 4 )	Check by Microscope At Least 95% Coated	MIL-STD-883E

## 2. Environmental Endurance

No.	Test Item	Test Methods	CRITIREA	REF. DOC
2.1	Resistance To Soldering Heat	Pre-heat temperature 125 °C Pre-heat time 60 ~ 120 sec. Test temperature 260 ± 5 °C Test time 10 ± 1 sec. Times 3	$\Delta F/F < +/- 5\text{ppm}$ $\Delta Cl < +/- 5 \text{ Ohm}$	MIL-STD-202F
2.2	High Temp. Storage	+ 125 °C ± 3 °C for 500 ± 12 hours	$\Delta F/F < +/- 5\text{ppm}$ $\Delta Cl < +/- 5 \text{ Ohm}$	MIL-STD-883E
2.3	Low Temp. Storage	- 40 °C ± 3 °C for 500 ± 12 hours	$\Delta F/F < +/- 5\text{ppm}$ $\Delta Cl < +/- 5 \text{ Ohm}$	
2.4	Thermal Shock	Total 100 cycles of the following temperature cycle 	$\Delta F/F < +/- 5\text{ppm}$ $\Delta Cl < +/- 5 \text{ Ohm}$	MIL-STD-883E
2.5	High Temp & Humidity	85°C ± 3°C, RH 85% , 500Hrs	$\Delta F/F < +/- 5\text{ppm}$ $\Delta Cl < +/- 5 \text{ Ohm}$	JIS C5023