



# SPECIFICATION FOR APPROVAL

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

PRODUCT TYPE : SMD TCXO 2.5 \* 2.0

NOMINAL FREQ. : 26 MHz

TXC P/N : 7L26002009

REVISION : A3

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

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

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

CUSTOMER CONFIRMATION : (Singnature) \_\_\_\_\_  
(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

**MSL:Level 1**  
**RoHS Compliant**

(for glass crystal only : Pb used in sealing glass material is exempt from EU directive)



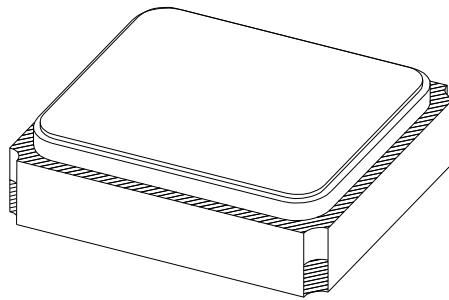
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PE/RD	QA	MFG
<i>Eric Tsao</i>	<i>Alex Huang</i>	<i>Hungte Liu</i>
<b>Eric Tsao</b>	<b>Alex Huang</b>	<b>Hungte Liu</b>
<i>26-Apr-16</i>	<i>26-Apr-16</i>	<i>26-Apr-16</i>

**NOTE:**

- (1) The green product standard set by TXC is based upon the international standards. Related information is publicly described on the TXC's Website, and updated regularly. The document is compliant with the latest green product quality system directives at the time.
- (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.

**MSL:Level 1**  
**RoHS Compliant**

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## ■ ELECTRICAL SPECIFICATIONS

Item	Parameters		Condition	Electrical Specifications				Note
				MIN	TYP	MAX	UNITS	
1	Nominal Frequency			26.000000			MHz	
2	Operating Temperature Range			-40		+85	°C	
3	Supply Voltage			1.63	1.80	3.30	V	
4	Current Drain					1.5	mA	
5	Output Level			1.1	1.2		V	1
6	Output Type			Clipped Sinewave				
7	Output Load		Resistance	9	10	11	kΩ	
8			Capacitance	9	10	11	pF	
9	Frequency Tolerance		After 2 times reflow			±2.0	ppm	2
10	Frequency Stability	vs. Temperature	Temp: -30 ~ +85 °C			±0.5	ppm	3,4
11			Temp: -40 ~ -30 °C			±3	ppm	3,4
12		vs. Load	Load: 10 kΩ // 10 pF ±10%			±0.1	ppm	
13		vs. Supply Voltage	Vcc: 2.8 V ±5%			±0.1	ppm	
14	Slope of Frequency Drift over Temperature		Temp: -20 ~ +65°C			±0.05	ppm/°C	4
15			Temp: -30 ~ +85°C			±0.1	ppm/°C	
16			Temp: -40 ~ -30°C			±0.35	ppm/°C	
17	Static Temperature Hysteresis					±0.6	ppm	5
18	Thermal Frequency Drift		@Temp. slope 0.3°C/s			±10	ppb/s	
19	Storage Temperature			-40		+85	°C	
20	Start-up Time	vs. Frequency	Within ± 0.5 ppm			2.0	ms	
21		vs. Output Level	To 90% of Vp-p			2.0	ms	
22	Duty Cycle			45	50	55	%	
23	Aging		1 <sup>st</sup> year			±1.0	ppm/year	
24			2 <sup>nd</sup> year			±1.5	ppm/year	
25			5 <sup>th</sup> year			±2.5	ppm/year	
26			10 <sup>th</sup> year			±5	ppm/year	
27	Harmonics					-8	dBc	
28	Phase Noise	@ 1 Hz offset				-50	dBc/Hz	
29		@ 5 Hz offset				-73	dBc/Hz	
30		@ 10 Hz offset				-80	dBc/Hz	
31		@ 100 Hz offset				-106	dBc/Hz	
32		@ 1 kHz offset				-134	dBc/Hz	
33		@ 10 kHz offset				-144	dBc/Hz	
34		@ 100 kHz offset				-152	dBc/Hz	

Note 1 Decoupling capacitor is required in external circuit.

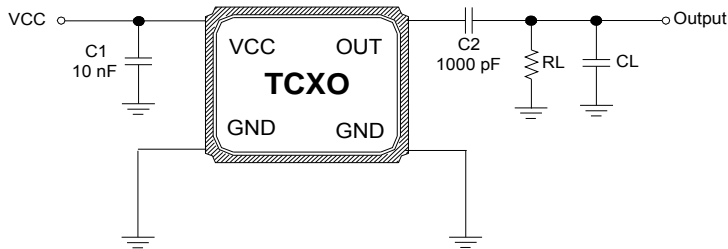
Note 2 Refer to nominal frequency

Note 3 Refer to frequency before reflow

Note 4 Minimum of 1 frequency reading every 2°C over temperature, based on temperature varied at maximum of 2°C per minute.

Note 5 Frequency deviation at 25°C after reciprocal temperature cycle over the operating temperature range

**TESTING CIRCUIT**

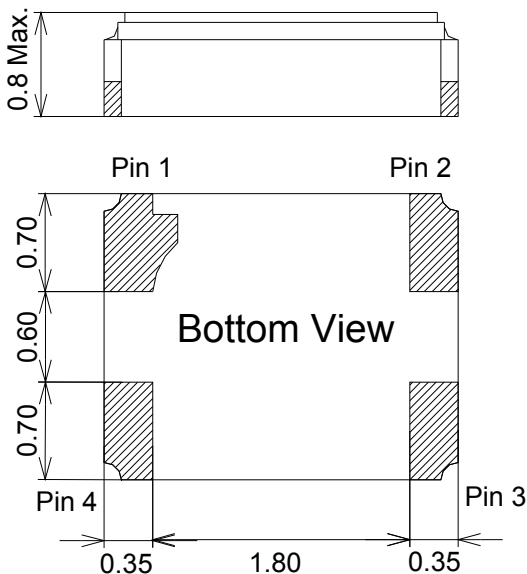
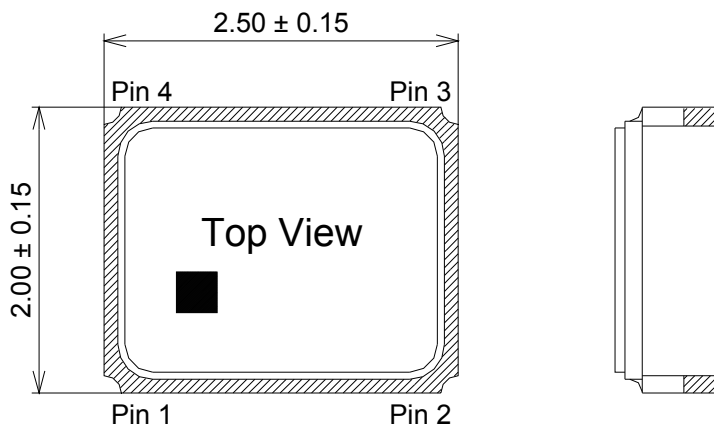


**External Components**

Name	Function
C1	AC Noise Bypass for VCC
C2	DC Block for Output
RL	Load Resistance
CL	Load Capacitance

Note: Bypass capacitor (C1) and DC blocking capacitor (C2) should be placed.

**DIMENSIONS**

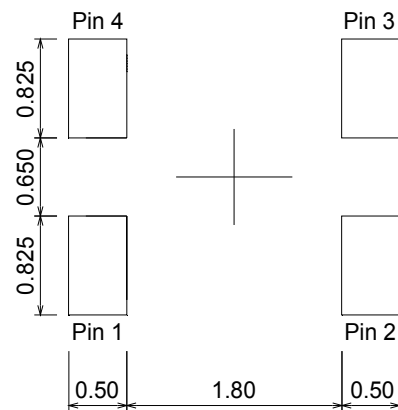


Unit: mm

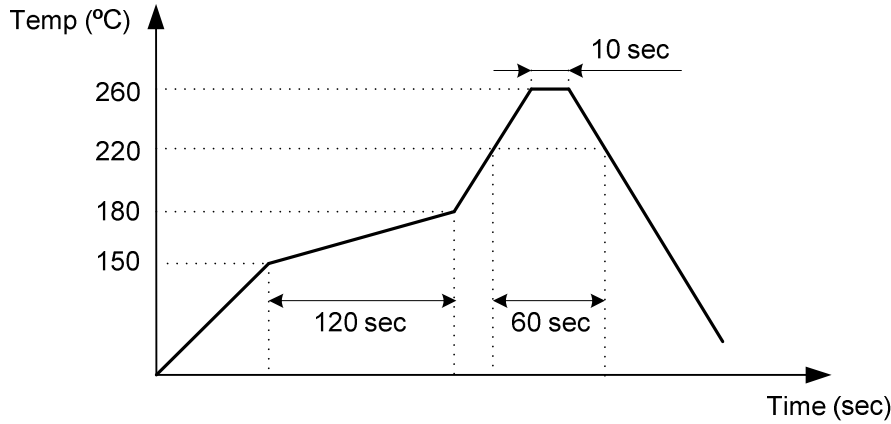
**Pin Connection**

Name	Function
Pin 1	GND or NC
Pin 2	GND
Pin 3	OUTPUT
Pin 4	VCC

**Recommended Land Pattern**



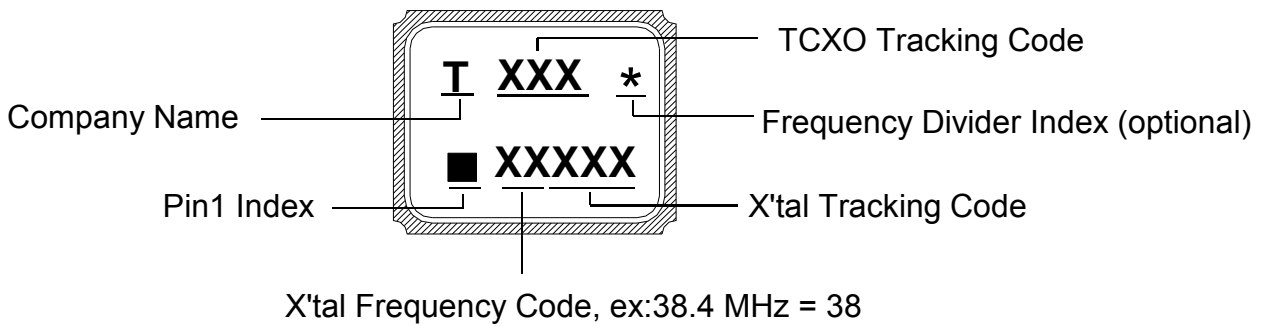
**■ SUGGESTED REFLOW PROFILE**



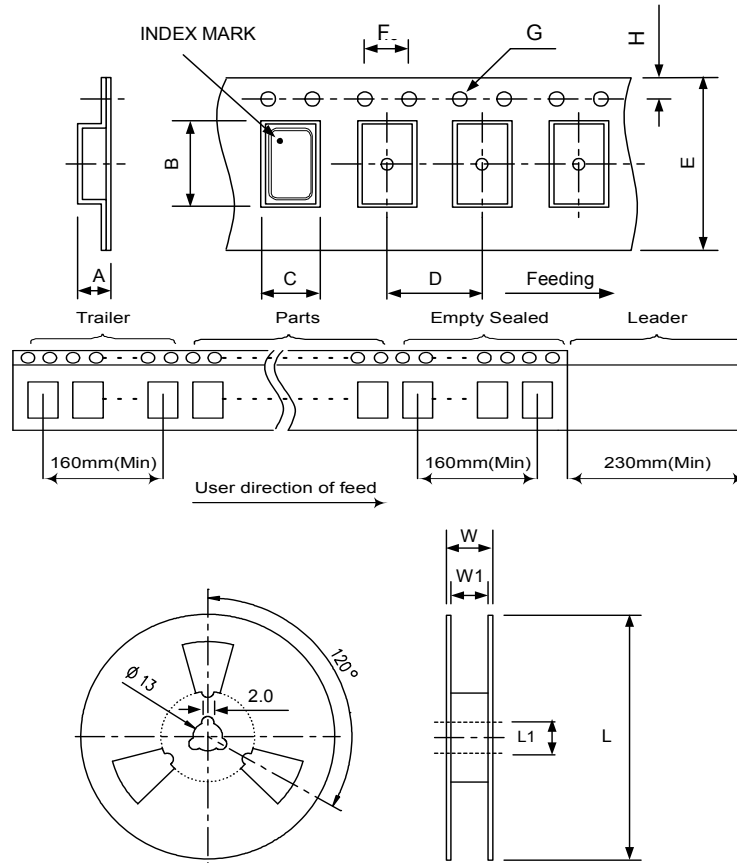
Note 1: Period while temperature exceeds the solder melting point : 220°C should be less than 200 sec.

Note 2: Period while temperature stays at the top melting point : 260°C should be less than 30 sec.

**■ MARKING**



■ **PACKING : (EIA-481-2)**



Unit: mm

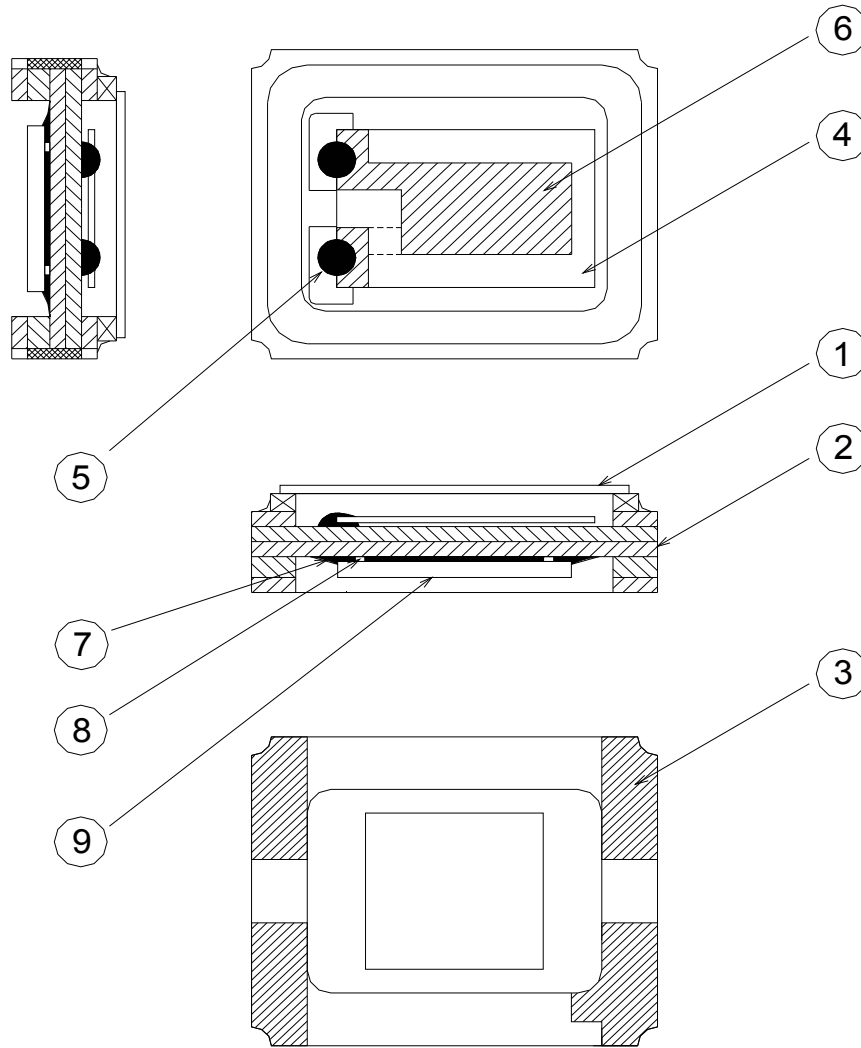
DIMENSIONS (mm)	A	B	C	D	E	F	G	H	L	L1	W	W1	Standard Reel Quantity is 3,000 pcs per reel
	1.15	2.70	2.25	4.00	8.00	4.00	1.55	1.75	178	13.0	11.6	8.4	

■ **WEIGHT**

0.0135 g / piece(TYP), 40 ± 2 g / 3 kpcs( regardless of tape weight )

**STRUCTURE ILLUSTRATION**

Crystal Enclosure Seal: Seam Welding



No.	COMPONENTS	MATERIALS	FINISH/SPECIFICATIONS
1	Cap	Metal(Fe + Co + Ni)	-
2	Base	Ceramic	Color Black
3	Pad	Au	Molybdenum Metalize + Ni Plating + Au Plating
4	Crystal Blank	SiO <sub>2</sub>	-
5	Conductive Adhesive	Ag	Silicone Resin
6	Electrode	Noble Metal	-
7	Underfill	Organic	Color Black
8	Bump	Au	
9	IC	Si	



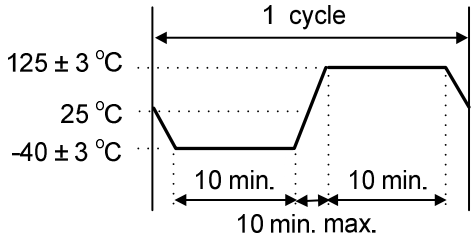
## ■ RELIABILITY SPECIFICATIONS

### 1. Mechanical Endurance

No.	Test Item	Test Methods	Criteria
1.1	Drop Test	Hegiht : 100 cm height Direction : X,Y,Z 6 directions Test cycles : 3 cycles Fall freely on to concrete floor Mounting on test fixture (total weight=100 g)	+/- 2.0 ppm
1.2	Mechanical Shock	Acceleration : 1000 g Duration : 0.5 ms Test cycles : 3 times for all 3 directions	+/- 2.0 ppm
1.3	Vibration	Frequency range : 10 ~ 2000 Hz Amplitude : 1.52 mm (10 ~ 80 Hz) Acceleration : 20 g (80 ~ 2000 Hz) Sweep speed : 20 minutes/cycle Direction : X,Y,Z 3 directions Duration : 4 hours/each direction	+/- 2.0 ppm
1.4	Gross Leak	Standard sample for automatic gross leak detector. Test Pressure : 2 kg/cm <sup>2</sup>	< 1.5 × 10 <sup>-5</sup> Pa m <sup>3</sup> / sec
1.5	Fine Leak	Helium bomging 4.5 kgf/cm <sup>2</sup> for 2 hours	< 1.0 × 10 <sup>-9</sup> Pa m <sup>3</sup> / sec
1.6	Solderability	Preheate temperature : 125°C ± 5°C Preheate time : 120 sec Solding temperature : 245°C ± 5 °C Duration : 5 ± 1 sec Method : Solder bath method	90% Coated

[Note] Criteria mean the maximum frequency change after reliability test, frequency shell be measured at 25°C.

**2. Environmental Endurance**

No.	Test Item	Test Methods	Criteria
2.1	High Temp. Storage	Temperature : +125°C ± 3°C Duration : 168 hours	+/- 2.0 ppm
2.2	Low Temp. Storage	Temperature : -40°C ± 3°C Duration : 500 hours	+/- 2.0 ppm
2.3	Thermal Shock (Air to Air)	Total 100 cycles of the following temperature cycle :  	+/- 2.0 ppm
2.4	High Temp & Humidity	Temperature : 85°C ± 3°C Humidity: RH 85% Duration : 168 hours	+/- 2.0 ppm
2.5	Aging	Temperature : 85°C ± 3°C Duration : 500 hours Voltage input by specification	+/- 2.0 ppm

[Note] Criteria mean the maximum frequency change after reliability test, frequency shall be measured after 2 hours at 25°C leaving.