

# SPECIFICATION FOR APPROVAL

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

PRODUCT TYPE : SMD TCXO 7.0 \* 5.0

NOMINAL FREQ. : 10.000000MHz

TXC P/N : 7N10070005

REVISION : A1

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.

**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> <b>Eric Tsao</b>	<i>Mingjung Lin</i> <b>MingJung Lin</b>	<i>Alex Huang</i> <b>Alex Huang</b>
<i>8-Apr-20</i>	<i>8-Apr-20</i>	<i>8-Apr-20</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.

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## ■ ELECTRICAL SPECIFICATIONS

Item	Parameters	Condition	Electrical Specifications				Note
			MIN	TYP	MAX	UNITS	
1	Nominal Frequency		10.000000			MHz	
2	Operating Temperature Range		-40		+85	°C	
3	Storage Temperature		-55		+85	°C	
4	Supply Voltage		3.135	3.30	3.465	V	
5	Current Drain	With standard output load			10.0	mA	
6	Output Type		CMOS				
7	Output Low				0.1*Vdd	V	
8	Output High		0.9*Vdd			V	
9	Rise Time	10% to 90% output swing			6	ns	
10	Fall Time	90% to 10% output swing			6	ns	
11	Output Load	Capacitance			15	pF	
12	Duty Cycle		45		55	%	
13	Initial Frequency Tolerance				±1.0	ppm	1
14	Frequency Tolerance After Reflow	After 2 times reflow			±1.0	ppm	2
15	Frequency Stability	vs. Temperature	-40°C to +85°C		±0.14	ppm	3
16		vs. Load	Standard output load ± 5%		±0.05	ppm	
17		vs. Supply Voltage	Standard Vcc ± 5%		±0.05	ppm	
18	Static Temperature Hysteresis				0.4	ppm	4
19	Slope over Temperature ( $\Delta F/\Delta T$ )				±0.1	ppm/°C	
20	Aging	24 hours			±10	ppb	5
21	Free-run Accuracy	20 years			±4.6	ppm	6
22	Phase Noise	@ 10 Hz offset		-85		dBc/Hz	
23		@ 100 Hz offset		-115		dBc/Hz	
24		@ 1 kHz offset		-133		dBc/Hz	
25		@ 10 kHz offset		-150		dBc/Hz	
26		@ 100 kHz offset		-153		dBc/Hz	
27	RMS Phase Jitter	From 12 kHz to 5 MHz offset		300		fs	

Note 1 Refer to nominal frequency

Note 2 Operation after reflow 2hrs, refer to initial frequency

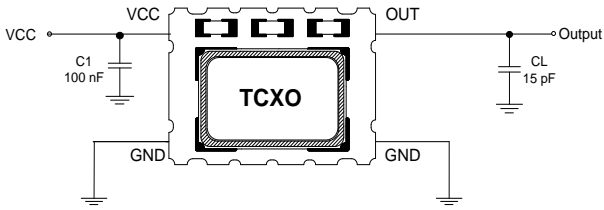
Note 3 Reference  $(F_{max} + F_{min})/2$

Note 4 Frequency change after reciprocal temperature ramped over the operatiin range. Reading taken at 25±2°C.

Note 5 Constant temp range ± 2.8°C

Note 6 Inclusive Initial Tolerance at 25°C, Temperature, Supply Voltage, Load, Reflow and 20 Years Aging.

**TESTING CIRCUIT**

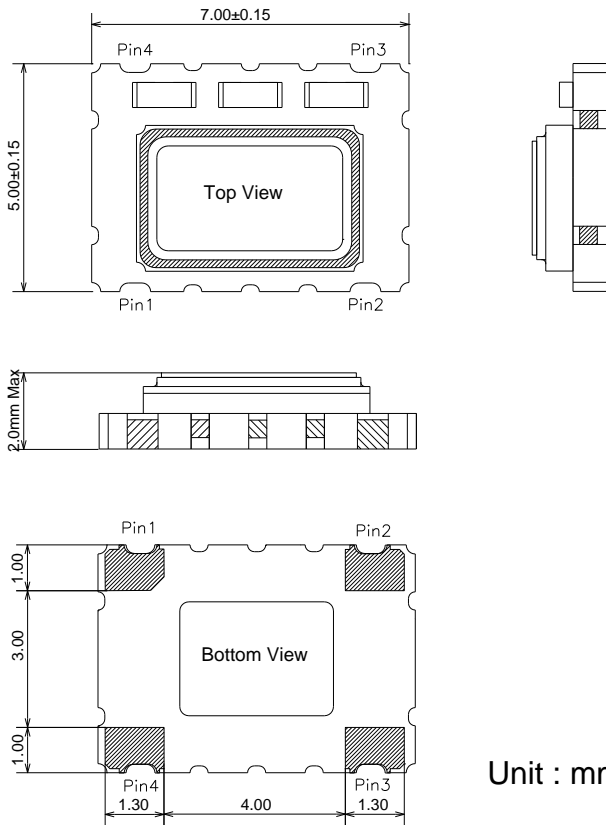


**External Components**

Name	Function
C1	AC Noise Bypass for VCC
CL	Load Capacitance

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

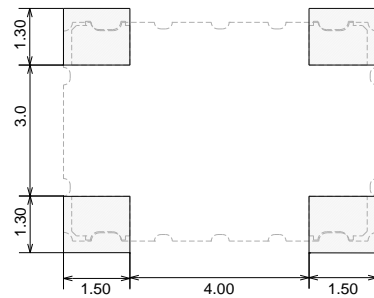
**DIMENSIONS**



**Pin Connection**

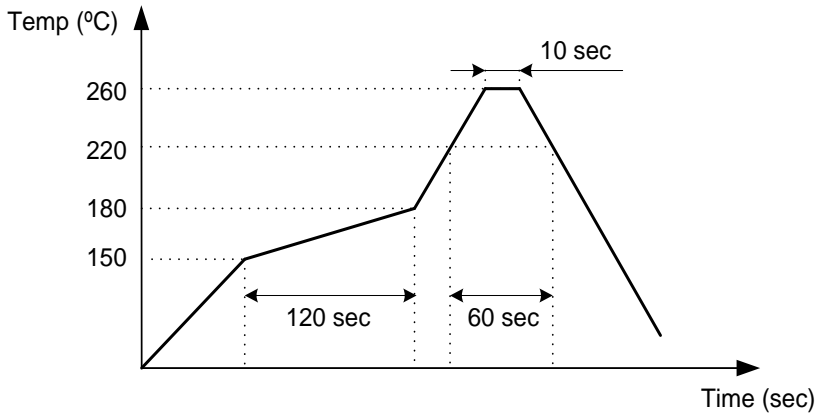
Name	Function
Pin 1	NC or GND
Pin 2	GND
Pin 3	OUTPUT
Pin 4	VCC

**Recommended Land Pattern**



Unit : mm

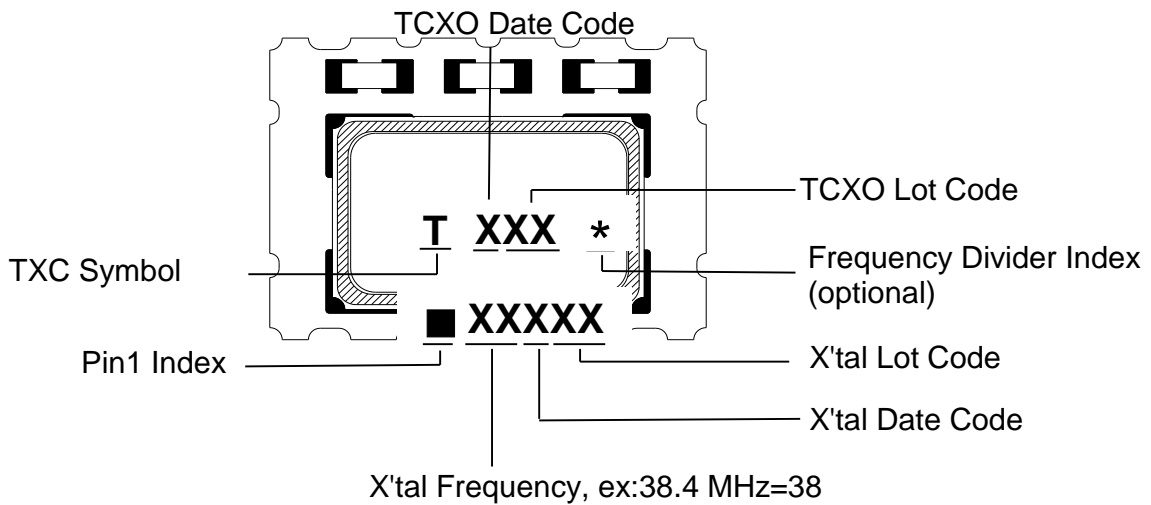
**■ SUGGESTED REFLOW PROFILE**



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**

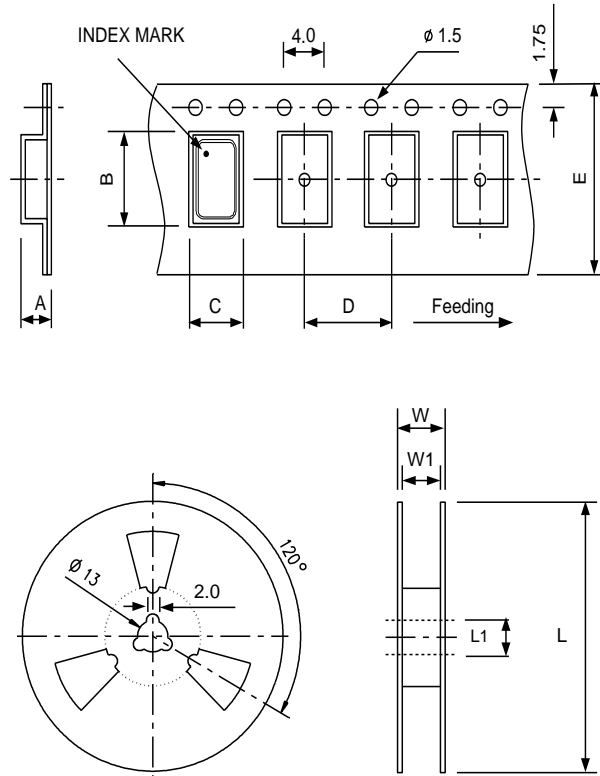


**DATE CODE**

					MONTH											
YEAR					JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2005	2009	2013	2017	2021	A	B	C	D	E	F	G	H	J	K	L	M
2006	2010	2014	2018	2022	N	P	Q	R	S	T	U	V	W	X	Y	Z
2007	2011	2015	2019	2023	a	b	c	d	e	f	g	h	j	k	l	m
2008	2012	2016	2020	2024	n	p	q	r	s	t	u	v	w	x	y	z

\* This date code will be cycled every four years.

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



Unit: mm

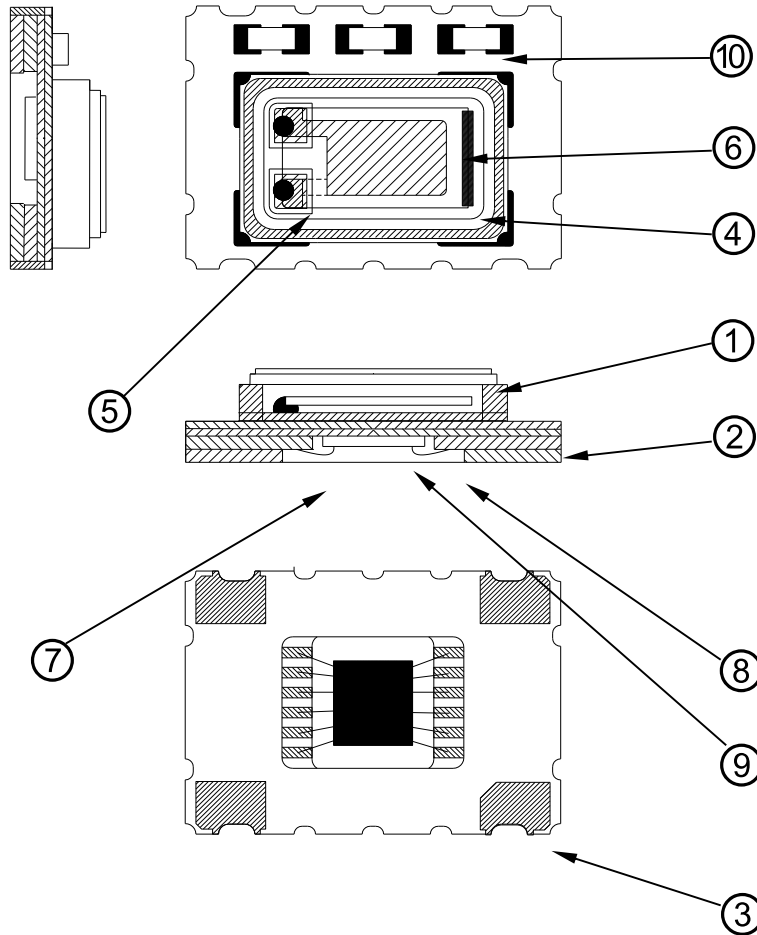
DIMENSIONS	A	B	C	D	E	L	L1	W	W1	Standard Reel Quantity is 1,000 pcs per reel
	2.00	7.90	5.45	8.00	16.0	180.0	13.0	20.5	16.0	

**WEIGHT**

0.149 g / piece(TYP), 149±5 g / 1 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	Tungsten 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	Bonding Wire	Au	
9	IC	Si	
10	Capacitor	Ceramic	

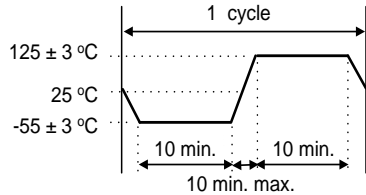


**RELIABILITY SPECIFICATIONS**

1. Mechanical Endurance

No.	Test Item	Test Methods	Standard
1.1	Drop Test	Height : 75 cm height Test cycles : 3 cycles Fall freely on to wood floor	IEC-68-02-27
1.2	Mechanical Shock	Acceleration : 1000 g Duration : 0.5 ms Test cycles : 3 times for all 3 directions	MIL-STD-202 Method 213B
1.3	Vibration	Acceleration : 20 g Duration : 4 hours/each direction Frequency range : 10 ~ 2000 Hz Amplitude : 1.52 mm Direction : X,Y,Z 3 directions Sweep speed : 20 minutes/cycle	MIL-STD-883 Method 2007.3
1.4	Solderability	Preheate temperature : 125°C ± 5°C Preheate time : 120 sec Soldering temperature : 245°C ± 5 °C Duration : 5 ± 1 sec Method : Solder bath method Criterion : >90% Coated	J-STD-002

2. Environmental Endurance

No.	Test Item	Test Methods	Standard
2.1	High Temp. Storage	Temperature : +125°C ± 3°C Duration : 1000 hours	MIL-STD-883 Method 1005.8
2.2	Low Temp. Storage	Temperature : -40°C ± 3°C Duration : 1000 hours	MIL-STD-883 Method 1013
2.3	Thermal Shock (Air to Air)	Total 500 cycles of the following temperature cycle : 	MIL-STD-883 Method 1011.9
2.4	High Temp & Humidity	Temperature : 85°C ± 3°C Humidity: RH 85% Duration : 1000 hours	EIA-JESD22-A101-B
2.5	Aging	Temperature : 85°C ± 3°C Duration : 1000 hours Voltage input by specification	JIS C6701
2.6	ESD	HBM : 2000 V	JESD22-A114-B
		CDM : 500 V	JESD22-C101-B
		MM : 200 V	JESD22-A115-B

[Note] This product is Level 1 for JEDEC J-STD-020D moisture sensitivity level.