

SPECIFICATION FOR APPROVAL

CUSTOMER : _____

PRODUCT TYPE : SMD TCXO 2.5 * 2.0

NOMINAL FREQ. : 26 MHz

TXC P/N : 7L26002009

REVISION : A2

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

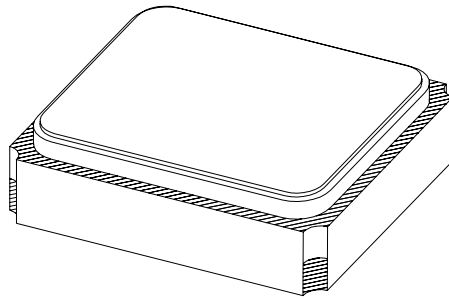
PRODUCT SPECIFICATION SHEET

PRODUCT TYPE : SMD TCXO 2.5 * 2.0

NOMINAL FREQ. : 26 MHz

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REVISION : A2



| PE/RD | QA | MFG |
|--------------------|------------------|------------------|
| <i>Kenneth Kao</i> | <i>Chen Chen</i> | <i>July Tang</i> |
| <i>6/1 '11</i> | <i>6/3 '11</i> | <i>5/23</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

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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 | | | 1.70 | 2.80 | 3.30 | V | |
| 4 | Current Drain | | | | | 1.5 | mA | |
| 5 | Output Level | | | 0.8 | | | 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: 2.8V ±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 | Storage Temperature | | | -40 | | +85 | °C | |
| 19 | Start-up Time | vs. Frequency | Within ± 0.5 ppm | | | 2.0 | ms | |
| 20 | | vs. Output Level | To 90% of Vp-p | | | 2.0 | ms | |
| 21 | Duty Cycle | | | 40 | 50 | 60 | % | |
| 22 | Aging | | 1 st year | | | ±1.0 | ppm/year | |
| 23 | | | 2 nd year | | | ±1.5 | ppm/year | |
| 24 | | | 5 th year | | | ±2.5 | ppm/year | |
| 25 | | | 10 th year | | | ±5 | ppm/year | |
| 26 | Harmonics | | | | | -8 | dBc | |
| 27 | Phase Noise | @ 1 Hz offset | | | -50 | | dBc/Hz | |
| 28 | | @ 10 Hz offset | | | -80 | | dBc/Hz | |
| 29 | | @ 100 Hz offset | | | -105 | | dBc/Hz | |
| 30 | | @ 1 kHz offset | | | -130 | | dBc/Hz | |
| 31 | | @ 10 kHz offset | | | -148 | | dBc/Hz | |
| 32 | | @ 1 MHz offset | | | -150 | | dBc/Hz | |

Note 1 Decoupling capacitor is required in external circuit.

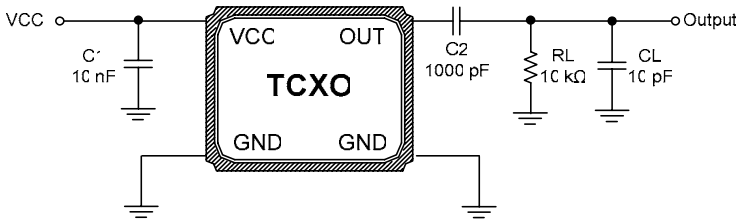
Note 2 Refer to nominal frequency

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

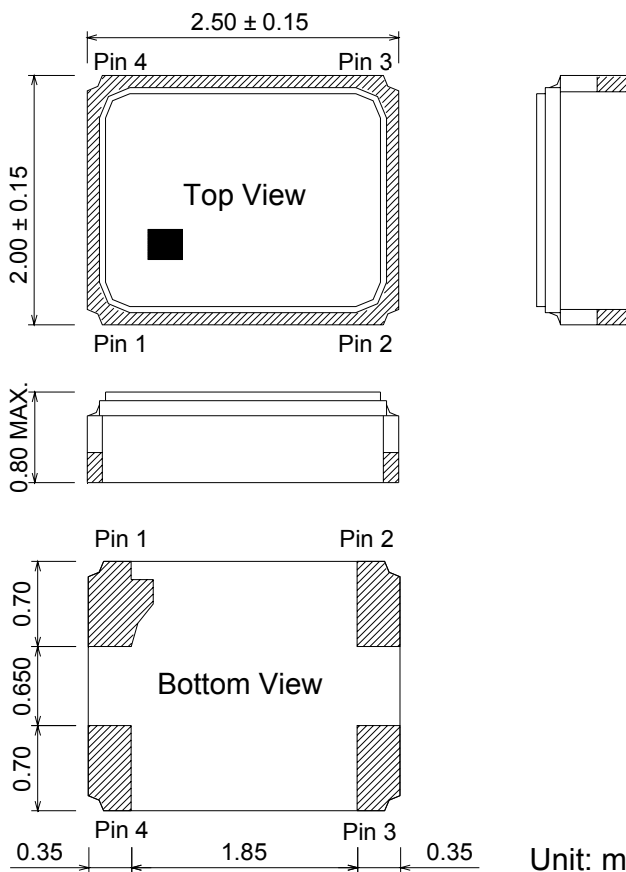


External Components

| 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

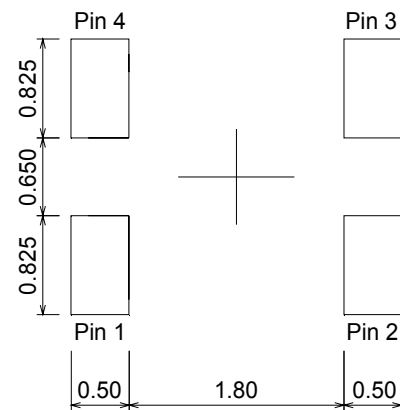


Unit: mm

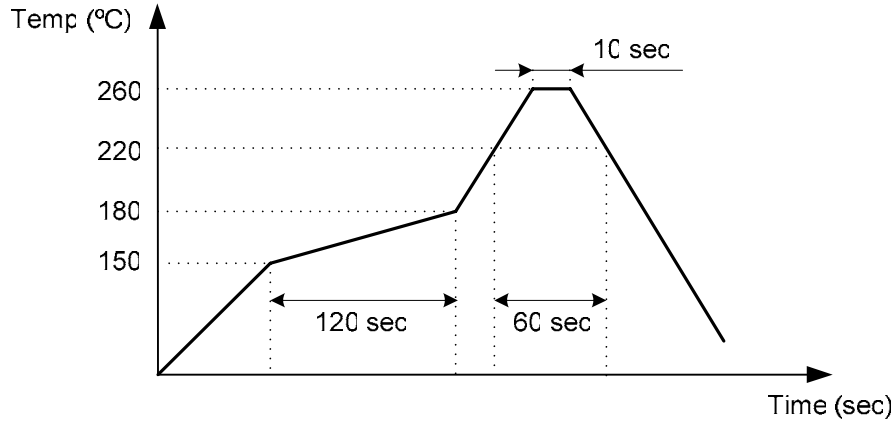
Pin Connection

| Name | Function |
|-------|----------|
| Pin 1 | GND |
| Pin 2 | GND |
| Pin 3 | OUTPUT |
| Pin 4 | VCC |

Recommended Land Pattern

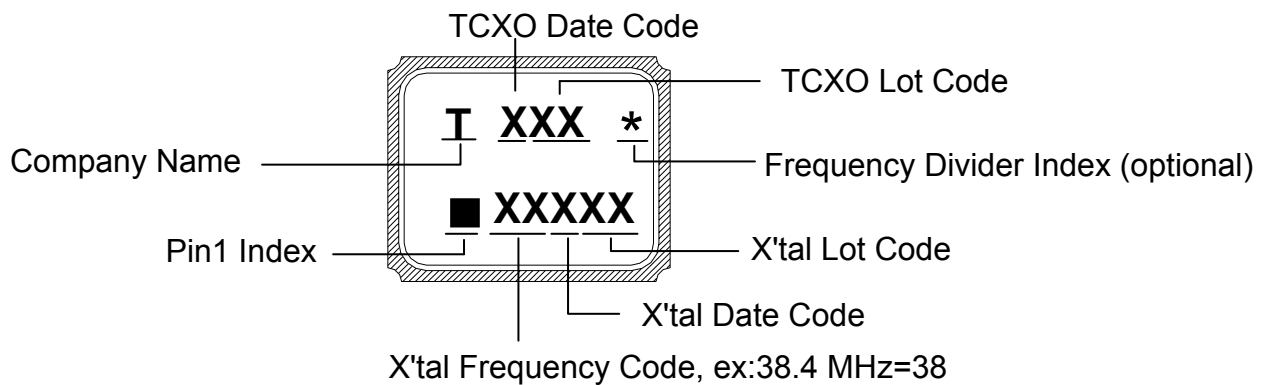


■ **SUGGESTED REFLOW PROFILE**



Note : Total Time: 200 sec. Max., Solder Melting Point: 220°C

■ **MARKING**



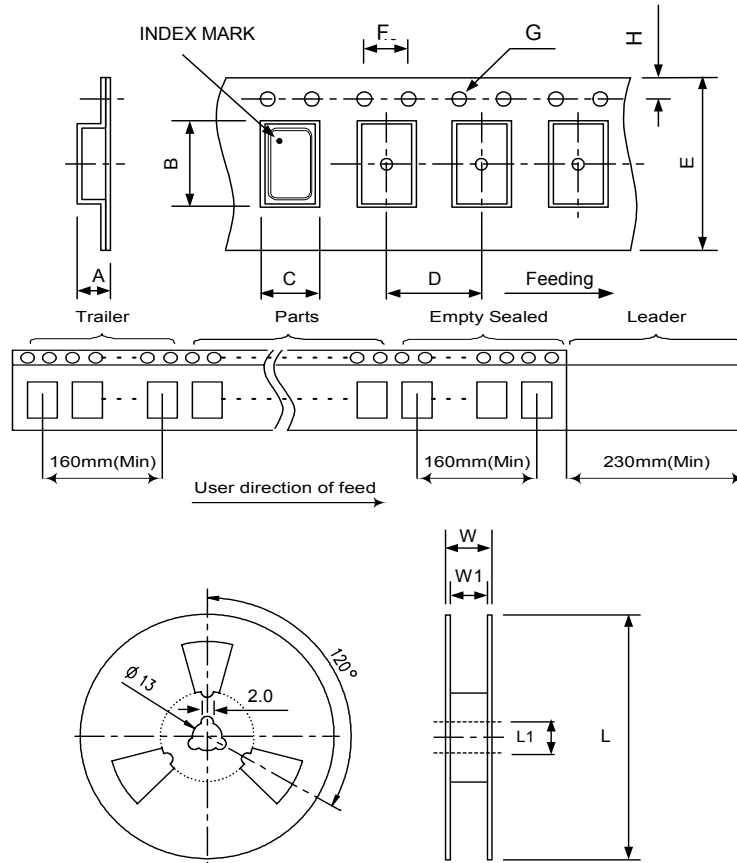
DATE CODE

| | | | | MONTH | | | | | | | | | | | |
|------|------|------|------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| YEAR | | | | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
| 2005 | 2009 | 2013 | 2017 | A | B | C | D | E | F | G | H | J | K | L | M |
| 2006 | 2010 | 2014 | 2018 | N | P | Q | R | S | T | U | V | W | X | Y | Z |
| 2007 | 2011 | 2015 | 2019 | a | b | c | d | e | f | g | h | j | k | l | m |
| 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.

Note: If TCXO frequency is X'tal frequency divided by 2, then frequency divider index appears.
 If TCXO frequency is the same as X'tal frequency, then no frequency divider index appears.

■ **PACKING : (EIA-481-2)**



Unit: mm

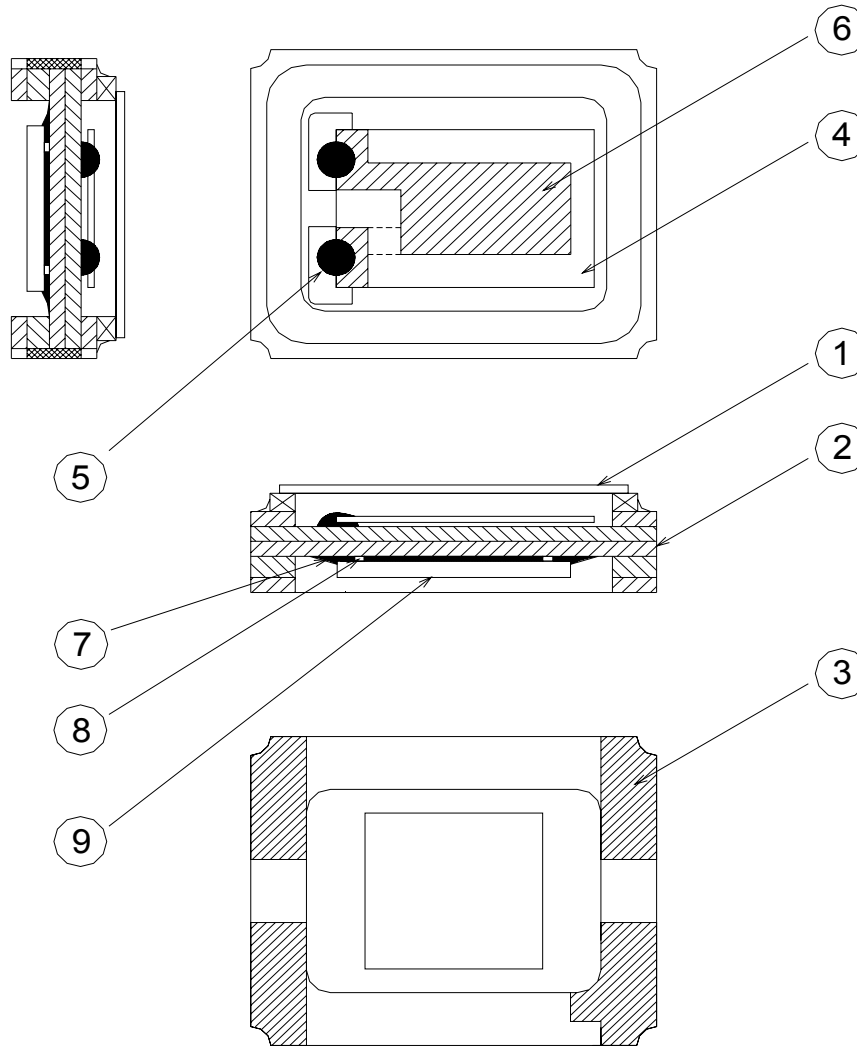
| DIMENSIONS (mm) | A | B | C | D | E | F | G | H | L | L1 | W | W1 | Standard Reel Quantity is 3,000 pcs per reel |
|-----------------|------|------|------|------|------|------|------|------|-----|------|------|-----|--|
| | 1.15 | 2.70 | 2.25 | 4.00 | 8.00 | 4.00 | 1.55 | 1.75 | 178 | 13.0 | 11.6 | 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 | Tungsten Metalize + Ni Plating + Au Plating |
| 4 | Crystal Blank | SiO ₂ | - |
| 5 | Conductive Adhesive | Ag | Silicone Resin |
| 6 | Electrode | Noble Metal | - |
| 7 | Underfill | Organic | Color Black |
| 8 | Bump | Au | |
| 9 | IC | Si | |

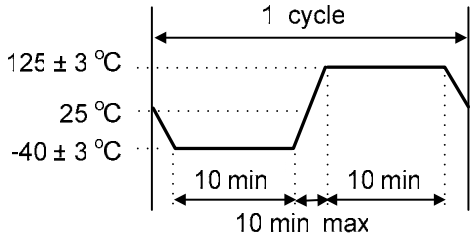
■ RELIABILITY SPECIFICATIONS

1. Mechanical Endurance

| No. | Test Item | Test Methods | Criteria |
|-----|------------------|---|---|
| 1.1 | Drop Test | Height : 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 ² | < 1.5 × 10 ⁻⁵ Pa m ³ / sec |
| 1.5 | Fine Leak | Helium bombing 4.5 kgf/cm ² for 2 hours | < 1.0 × 10 ⁻⁹ Pa m ³ / sec |
| 1.6 | 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 | 90% Coated |

[Note] Criteria mean the maximum frequency change after reliability test, frequency shall 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.