



**THE DATASHEET OF
7N19471005**



SPECIFICATION FOR APPROVAL

CUSTOMER : _____

PRODUCT TYPE : SMD TCXO 7.0 * 5.0

NOMINAL FREQ. : 19.440000MHz

TXC P/N : 7N19471005

REVISION : S1

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)

PRODUCT SPECIFICATION SHEET

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| PE/RD | QA | MFG |
|--------------------------------------|----|-----|
| <i>Eric Tsao</i> Eric Tsao | | |
| <i>30-Jun-21</i> | | |

NOTE:

- (1) If customer's application involves ultrasonic , molding , PCBA dicing and manual soldering processes or customer's products are used in automotive system, the applicability should be confirmed with TXC R&D responsible person.
- (2) 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.
- (3) Revision "Sx" is for engineering samples only. PE/RD's approval required.
- (4) Revision "Ax" is production ready. PE, QA and MFG's approval required.

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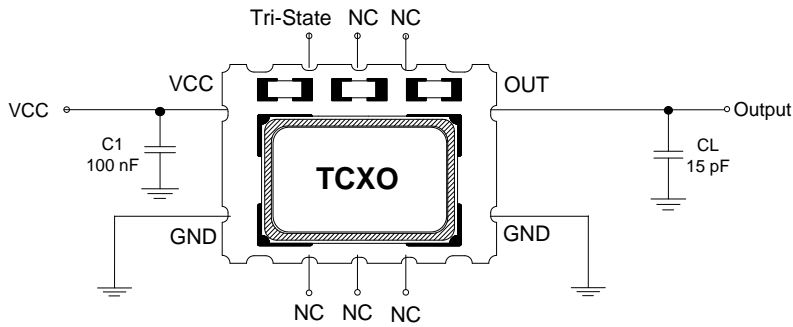
(for glass crystal only : Pb used in sealing glass material is exempt from EU directive)

ELECTRICAL SPECIFICATIONS

| Item | Parameters | | Condition | Electrical Specifications | | | | Note |
|------|--------------------------------|--------------------|--|---------------------------|------|---------|--------|------|
| | | | | MIN | TYP | MAX | UNITS | |
| 1 | Nominal Frequency | | | 19.440000 | | | MHz | |
| 2 | Operating Temperature Range | | | -40 | | +85 | °C | |
| 3 | Storage Temperature | | | -55 | | +125 | °C | |
| 4 | Supply Voltage | | | 2.97 | 3.30 | 3.63 | V | |
| 5 | Current Drain | | With standard output load | | | 6.0 | mA | |
| 6 | Output Type | | | CMOS | | | | |
| 7 | Output Load | | Capacitance | 13.5 | 15 | 16.5 | pF | |
| 8 | Output Low | | | | | 0.1*Vcc | V | |
| 9 | Output High | | | 0.9*Vcc | | | V | |
| 10 | Enable Voltage High | | Output Enabled | 2.97 | | | V | |
| 11 | Enable Voltage Low | | Output Disable | | | 0.33 | V | |
| 12 | Rise Time | | 10% to 90% output swing | | | 5 | ns | |
| 13 | Fall Time | | 90% to 10% output swing | | | 5 | ns | |
| 14 | Duty Cycle | | | 45 | 50 | 55 | % | |
| 15 | Start-up Time | Output Level | To 90% of Vp-p | | | 10 | ms | |
| 16 | Frequency Tolerance | | After 2 times reflow | | | ±1.5 | ppm | 1 |
| 17 | Frequency Stability | vs. Temperature | -40 °C to +85 °C | | | ±0.14 | ppm | 2 |
| 18 | | vs. Load | Standard output load ±10% | | | ±0.1 | ppm | 3 |
| 19 | | vs. Supplu Voltage | Standard Vcc ± 10% | | | ±0.1 | ppm | 4 |
| 20 | Slope over Temperature (ΔF/ΔT) | | | | | ±0.1 | ppm/°C | |
| 21 | Aging | | 20years | | | ±2.5 | ppm | 5 |
| 22 | Free-run Accurary | | 20years | | | ±4.6 | ppm | 6 |
| 23 | Spurious Suppression | | | | | -75 | dBc | |
| 24 | Phase Noise | @ 1 Hz offset | | | | -68 | dBc/Hz | |
| 25 | | @ 10 Hz offset | | | | -105 | dBc/Hz | |
| 26 | | @ 100 Hz offset | | | | -130 | dBc/Hz | |
| 27 | | @ 1 kHz offset | | | | -150 | dBc/Hz | |
| 28 | | @ 10 kHz offset | | | | -155 | dBc/Hz | |
| 29 | | @ 100 kHz offset | | | | -157 | dBc/Hz | |
| 30 | | @ 1 MHz offset | | | | -158 | dBc/Hz | |
| 31 | RMS Jitter | | 10Hz - 100kHz | | | 0.8 | ps | |
| 32 | Short Term Frequency Stability | | Tau=1 sec | | | 0.1 | ppb/s | 5 |
| 33 | G-sensitivity | | Gamma vector of all three axes from 30 Hz to 1500 Hz | | | 2.0 | ppb/g | |

- Note 1 Operation after reflow 2hrs, refer to nominal frequency
- Note 2 Reference (Fmax + Fmin)/2
- Note 3 Reference to frequency at 15 pF
- Note 4 Reference to frequency at 3.3 V
- Note 5 After 48hrs continuous operation and fix temperautre
- Note 6 Inclusive of calibration tolerance at 25°C , frequency vs. change in temperature, change in supply voltage (±10%), load change (±10%), reflow soldering and 20 years aging.

TESTING CIRCUIT

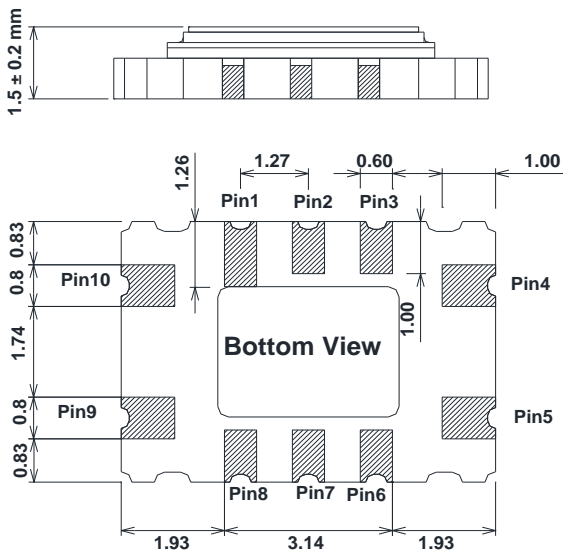
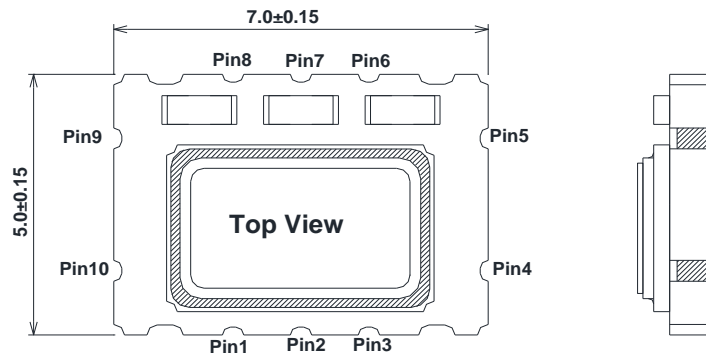


Note: Bypass capacitor (C1) should be placed.

External Components

| Name | Function |
|------|-------------------------|
| C1 | AC Noise Bypass for VCC |
| CL | Load Capacitance |

DIMENSIONS

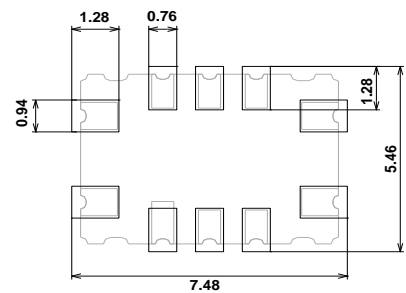


Unit : mm

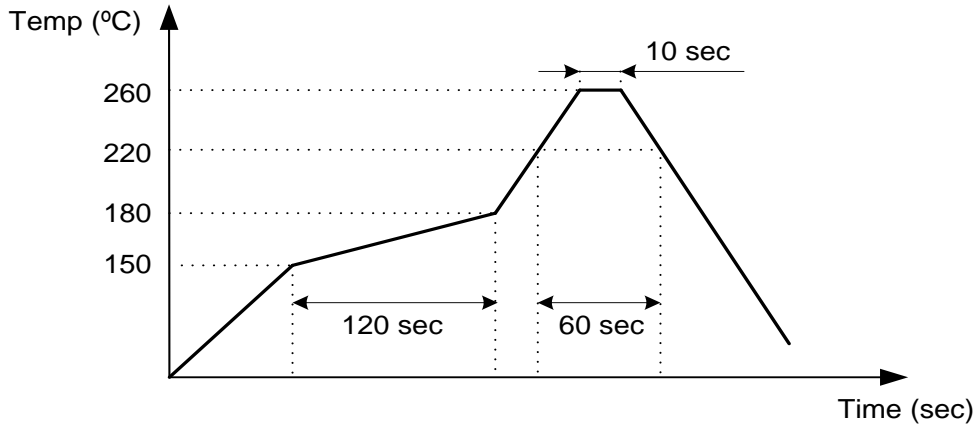
Pin Connection

| Name | Function |
|--------|-----------|
| Pin 1 | NC |
| Pin 2 | NC |
| Pin 3 | NC |
| Pin 4 | GND |
| Pin 5 | Output |
| Pin 6 | NC |
| Pin 7 | NC |
| Pin 8 | Tri-State |
| Pin 9 | VCC |
| Pin 10 | GND or NC |

Recommended Land Pattern



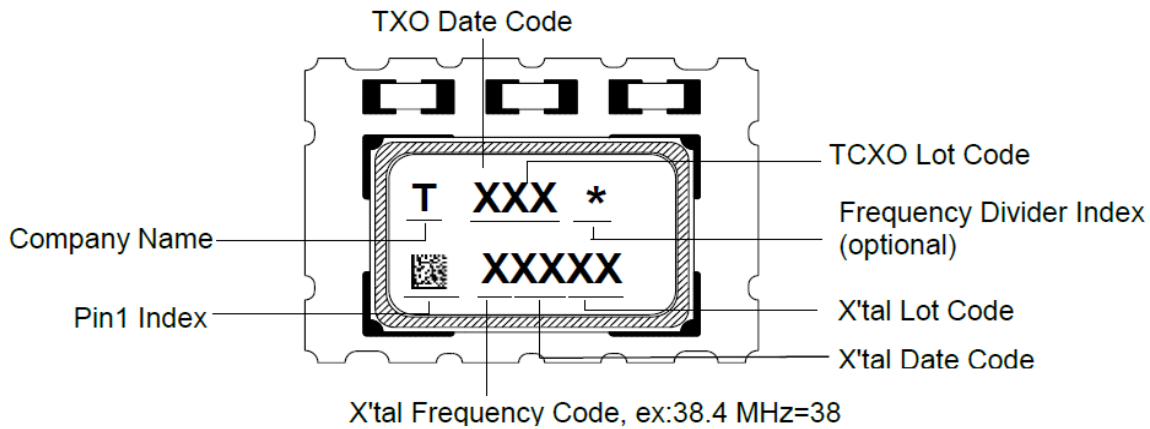
■ SUGGESTED REFLOW PROFILE



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

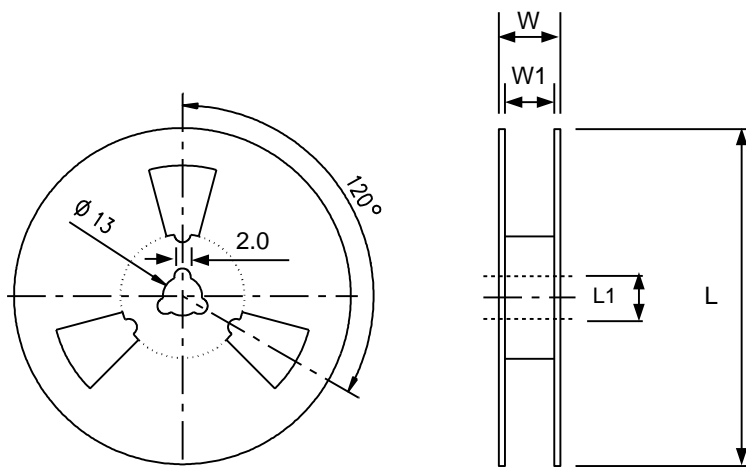
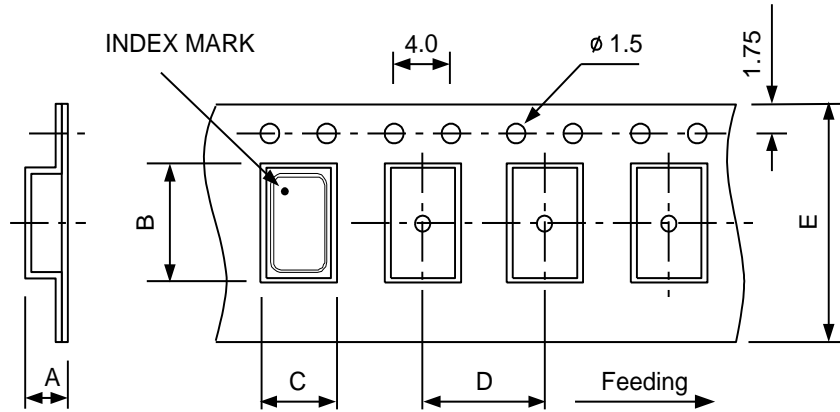


| | | | | | MONTH | | | | | | | | | | | |
|------|------|------|------|------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| YEAR | | | | | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
| 2021 | 2025 | 2029 | 2033 | 2037 | A | B | C | D | E | F | G | H | J | K | L | M |
| 2022 | 2026 | 2030 | 2034 | 2038 | N | P | Q | R | S | T | U | V | W | X | Y | Z |
| 2023 | 2027 | 2031 | 2035 | 2039 | a | b | c | d | e | f | g | h | j | k | l | m |
| 2024 | 2028 | 2032 | 2036 | 2040 | 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 | L | L1 | W | W1 | Standard Reel Quantity is 1,000 pcs per reel |
|-----------------|------|------|------|------|-------|-----|------|------|------|--|
| | 2.00 | 7.90 | 5.45 | 8.00 | 16.00 | 180 | 13.0 | 20.5 | 16.0 | |

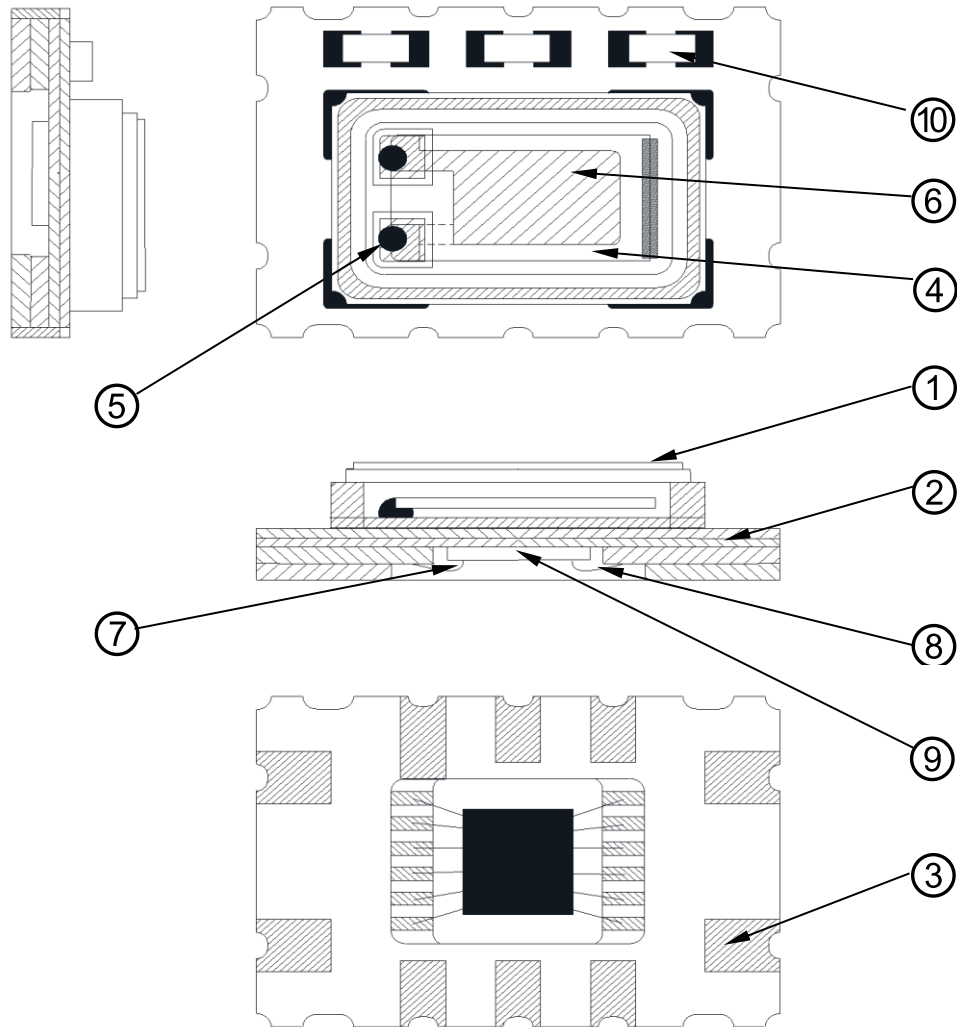
■ **WEIGHT**

0.137 g / piece(TYP) , 137±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 ₂ | - |
| 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 | Hegiht : 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 | Temperture : +125°C ± 3°C Duration : 1000 hours | MIL-STD-883 Method 1005.8 |
| 2.2 | Low Temp. Storage | Temperture : -40°C ± 3°C Duration : 1000 hours | MIL-STD-883 Method 1013 |
| 2.3 | Thermal Shock (Air to Air) | -55°C ~ 125°C, Dwell: 15min, Maximum transfer time 20sec, 500 cycles | MIL-STD-202 |
| 2.4 | High Temp&Humidity | Temperture : 85°C ± 3°C Humidity: RH 85% Duration : 1000 hours | EIA-JESD22-A101-B |
| 2.5 | Aging | Temperture : 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.

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