

SPECIFICATION FOR APPROVAL

CUSTOMER : _____

PRODUCT TYPE : SMD SEAM SEALING CXO 3.2 × 2.5

NOMINAL FREQ. : 27.000000MHz

TXC P/N : 7X27000009

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

PRODUCT TYPE : SMD SEAM SEALING CXO 3.2 × 2.5

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REVISION : S1

| PE/RD | QA | MFG |
|---|----|-----|
|  Oscar Chen | | |
| 7-Jun-16 | | |

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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| <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 | 7-Jun-16 | N/A | Yachuan Miao |
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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±5°C
- Relative humidity : 40%~70%

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

- Ambient temperature : 25±3°C
- Relative humidity : 40%~70%

Measure equipment

Electrical characteristics measured by MD 37WX-05M or equivalent.

Crystal cutting type

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

Unit Weight:

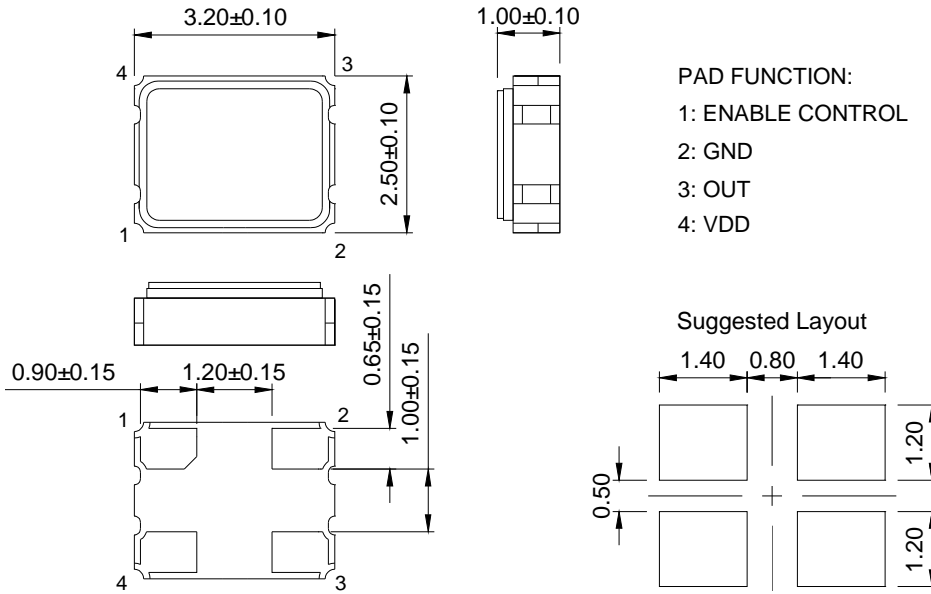
0.025±0.002 g/pcs

| | Parameters | Symbol | Electrical Spec. | | | | Notes |
|----|---------------------------|--------|------------------|------|--------|---------|------------------------------|
| | | | Min. | Typ. | Max. | Units | |
| 1 | Nominal Frequency | - | 27.000000 | | | MHz | - |
| 2 | Frequency Stability | - | ±25 | | | ppm | Note 1 |
| 3 | Operating Temperature | Topr | -40 | 25 | 90 | °C | - |
| 4 | Storage Temperature | Tstg | -55 | ~ | 125 | °C | - |
| 5 | Supply Voltage | VDD | 3.3 ±10% | | | V | - |
| 6 | Input Current | Icc | - | - | 10 | mA | - |
| 7 | Enable Control | - | Yes | | | - | Pad 1 |
| 8 | Output Load : CMOS | CL | 15 | | | pF | - |
| 9 | Output Voltage High | VoH | 90%Vdd | - | - | V | - |
| 10 | Output Voltage Low | VoL | - | - | 10%Vdd | V | - |
| 11 | Rise Time | Tr | - | - | 5 | ns | 10%→90%VDD Level |
| 12 | Fall Time | Tf | - | - | 5 | ns | 90%→10%VDD Level |
| 13 | Symmetry (Duty ratio) | TH/T | 45 | ~ | 55 | % | - |
| 14 | Start-up Time | Tosc | - | - | 10 | ms | - |
| 15 | Enable Voltage High | Vhi | 70%Vdd | - | - | V | - |
| 16 | Disable Voltage Low | Vlo | - | - | 30%Vdd | V | - |
| 17 | Aging | - | ±2 | | | ppm/yr. | 1st. Year at 25°C |
| 18 | Output Disable Delay Time | T off | - | - | 150 | us | - |
| 19 | Output Enable Delay Time | T on | - | - | 150 | us | - |
| 20 | RMS Phase Jitter | - | - | - | 1 | ps | Integrated from 12KHz - 5MHz |

Note 1: Include 25°C tolerance, operating temperature range, input voltage change, aging, load change, shock and vibration.

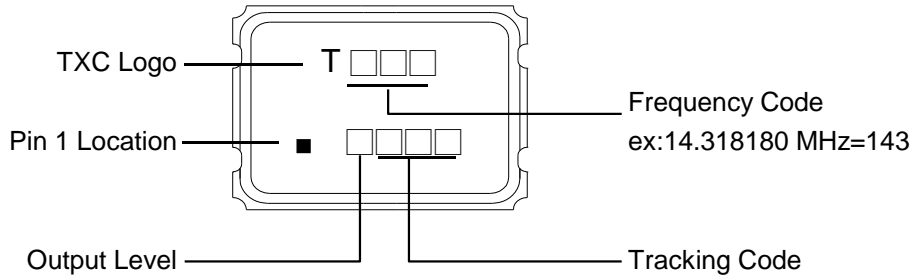
■ DIMENSIONS

(Unit:mm)



PAD FUNCTION:
 1: ENABLE CONTROL
 2: GND
 3: OUT
 4: VDD

■ MARKING



Output Level:

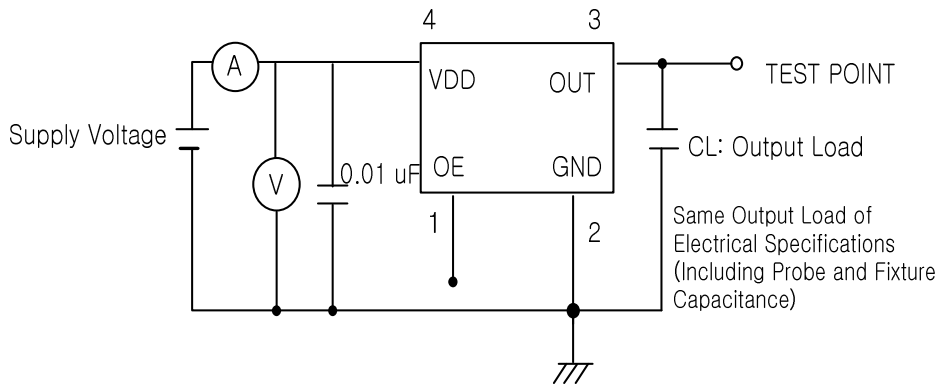
| | | | | | | | | | | | | | | | | | |
|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| $V_{DD}(V)$ | 5.00 | 3.30 | 2.80 | 2.50 | 1.80 | 2.90 | 3.00 | 2.85 | 2.60 | 2.55 | 2.00 | 1.50 | 2.70 | 3.40 | 1.90 | 1.20 | 1.00 |
| CODE | A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q | R | S |

Production location: Taiwan

TEST DIAGRAM

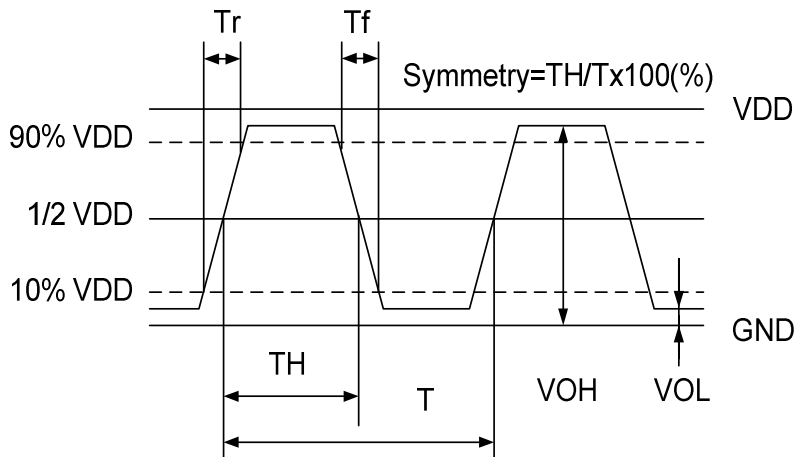
Pad 1 : Tri-State control

| Pad 1(OE) | Pad 3 (Output) | Oscillator |
|----------------|----------------|------------------|
| High (or open) | OSC out | Normal operation |
| Low | High impedance | Stop oscillation |



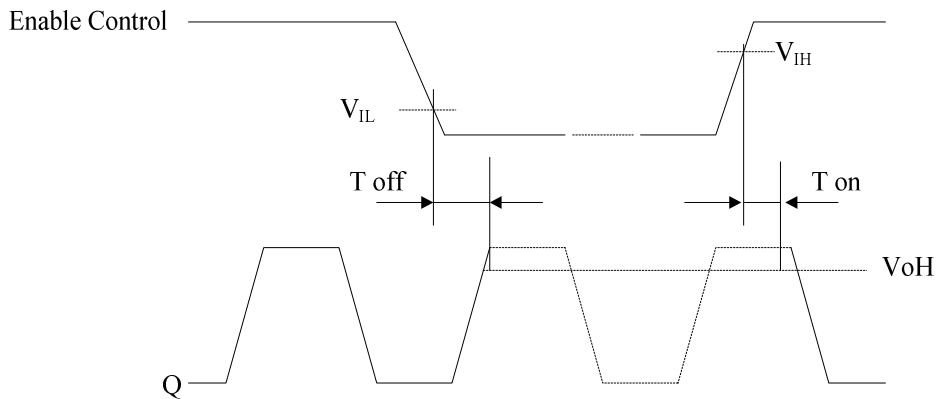
WAVEFORM CONDITIONS

Waveform measurement system should have a min. bandwidth of 5 times the frequency being tested.



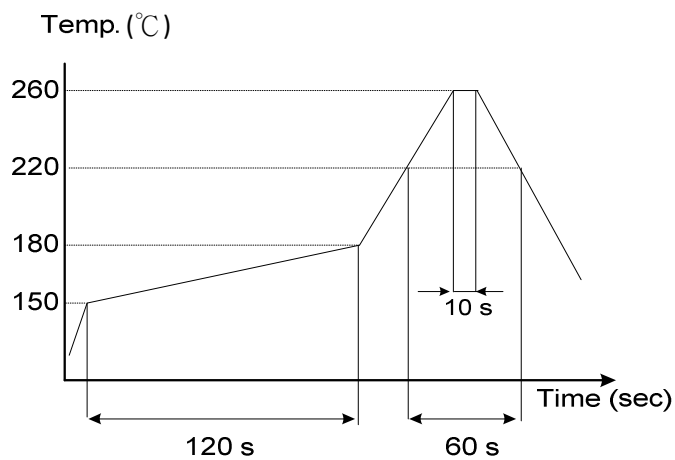
OUTPUT ENABLE / DISABLE DELAY

The following figure shows the oscillator timing during normal operation . Note that when the device is in standby, the oscillator stops. When standby is released, the oscillator starts and stable oscillator output occurs after a short delay.

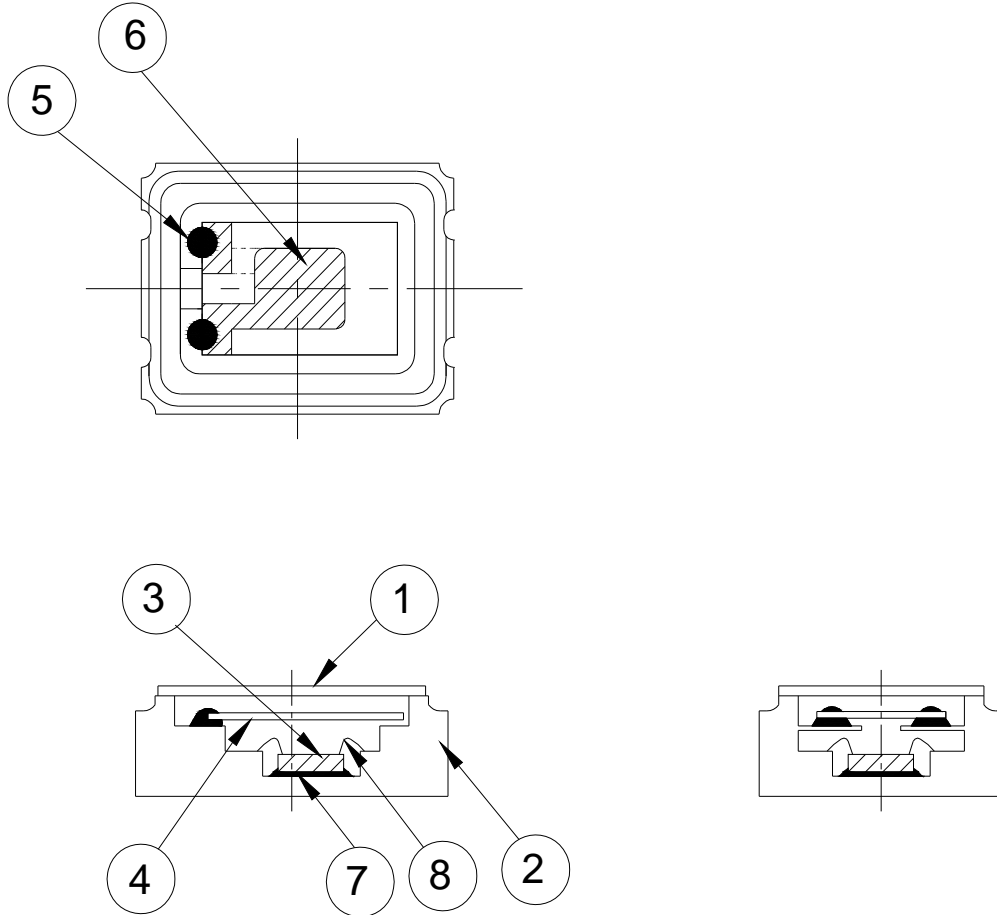


SUGGESTED REFLOW PROFILE

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

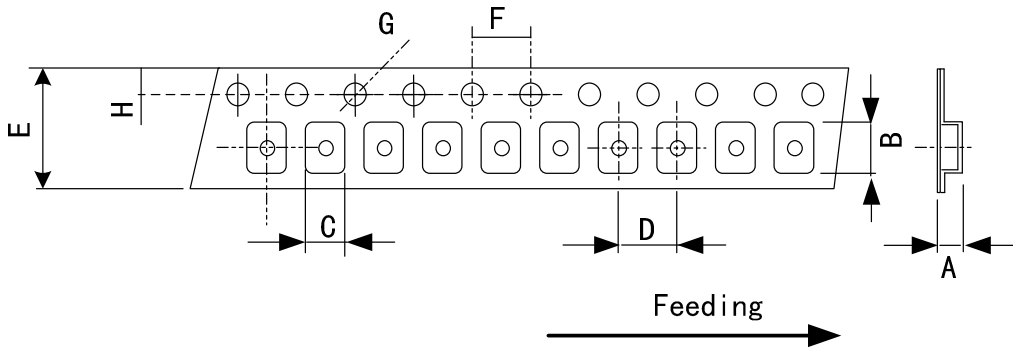


■ STRUCTURE ILLUSTRATION



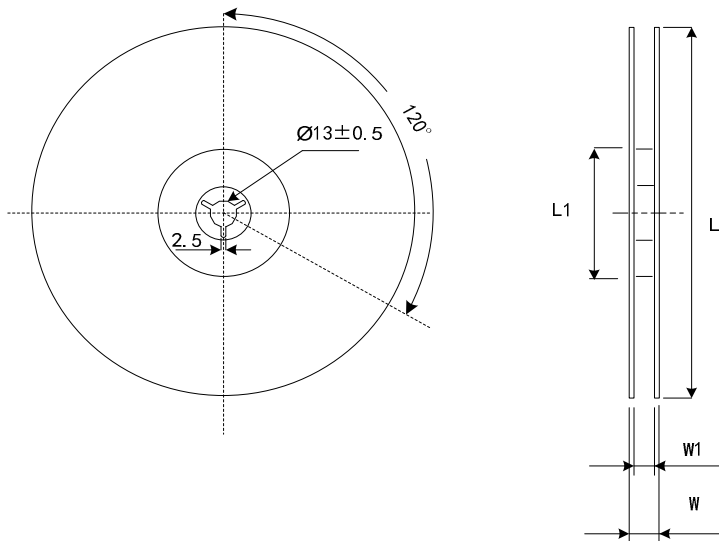
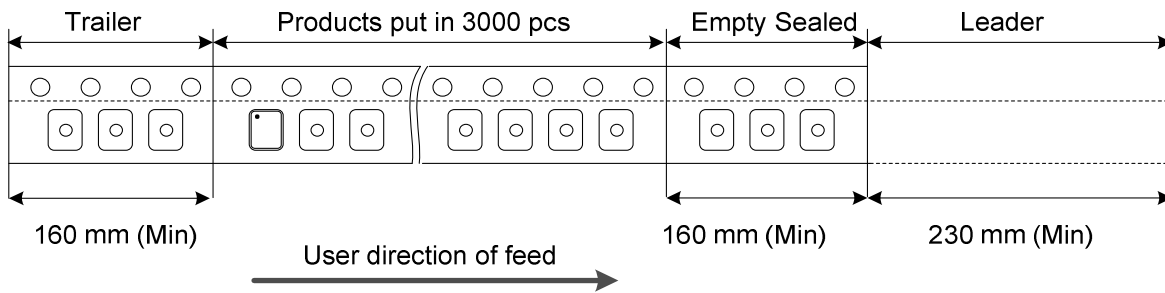
| NO | COMPONENTS | MATERIALS | FINISH/SPECIFICATIONS |
|----|---------------------|---|---|
| 1 | Lid | Kovar (Fe/Co/Ni) | - |
| 2 | Base (Package) | Ceramic (Al ₂ O ₃) + Kovar (Fe/Co/Ni)+Pad (Au) | - |
| 3 | IC chip | - | - |
| 4 | Crystal blank | SiO ₂ | - |
| 5 | Conductive adhesive | Ag | Silicon resin |
| 6 | Electrode | Noble Metal | - |
| 7 | Die attached | Conductive | Epoxy resin |
| 8 | Bonding wire | Au | Pad 1 options : NC is 5 wires , EN is 6 wires. |

EMBOSS CARRIER TAPE & REEL



| DIMENSIONS | A | B | C | D | E | F | G | H | |
|------------|-------|-------|-------|-------|-------|-------|-------|-------|-----------|
| | 1.65 | 3.40 | 2.70 | 4.00 | 8.00 | 4.00 | 1.55 | 1.75 | (UNIT:mm) |
| | ±0.10 | ±0.10 | ±0.10 | ±0.10 | ±0.20 | ±0.10 | ±0.05 | ±0.10 | |

REMARK :



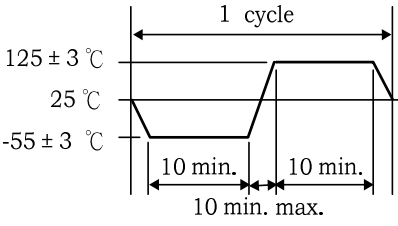
| DIMENSIONS | L | L1 | W | W1 | |
|------------|-------|-------|------|-------|--|
| | 178 | 60.2 | 11.5 | 8 | Standard Reel Quantity is 3,000 pcs per reel |
| | ±1.00 | ±0.50 | ±0.2 | +1/-0 | (UNIT:mm) |

RELIABILITY SPECIFICATIONS

1. Mechanical Endurance

| No. | Test Item | Test Methods | REF. DOC |
|-----|------------------|---|-------------|
| 1 | Drop Test | 75 cm height, 3 times on concrete floor . | JIS C6701 |
| 1 | Mechanical Shock | Device are shocked to half sine wave (1000 G) three mutually perpendicular axes each 3 times. 0.5m sec. duration time | MIL-STD-202 |
| 1 | Vibration | Frequency range 10 ~ 2000 Hz Amplitude 1.52 mm/20G Sweep time 20 minutes perpendicular axes each test time 4 Hrs (Total test time 12 Hrs) | MIL-STD-883 |
| 1 | Gross Leak | Standard Sample For Automatic Gross Leak Detector, Test Pressure: 2kg / cm ² | MIL-STD-883 |
| 2 | Fine Leak | Helium Bombing 4.5 kgf / cm ² for 2 Hrs | MIL-STD-883 |
| 2 | Solderability | Temperature 245 °C ± 5°C Immersing depth 0.5 mm minimum Immersion time 5 ± 1 seconds Flux Rosin resin methyl alcohol solvent (1 : 4) | MIL-STD-883 |

2. Environmental Endurance

| No. | Test Item | Test Methods | REF. DOC |
|-----|------------------------------|---|-------------|
| 2 | 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. | MIL-STD-202 |
| 2 | High Temp. Storage | + 125 °C ± 3 °C for 1000 ± 12 Hrs | MIL-STD-883 |
| 2 | Low Temp. Storage | - 40 °C ± 3 °C for 1000 ± 12 Hrs | |
| 2 | Thermal Shock | Total 100 cycles of the following temperature cycle  | MIL-STD-883 |
| 3 | High Temp & Humidity | 85°C ± 3°C, RH 85% , 1000 Hrs | EIA-JESD22 |
| 3 | Pressure Cooker Storage | 121 ± 3°C , RH100% , 2 bar , 240 Hrs | EIA-JESD22 |