# Product Specification
# TCXO

| | |
|---|---|
| Customer | 中电华瑞技术有限公司 |
| Model | 3TN2500002 |
| Size | 3225 |
| Frequency | 25.000000MHz |
| Type | TCXO |
| Vcc | +1.7~+3.3 V |
| Vcont | N/A |
| AFC Range | N/A |
| Temp. | ±2.0ppm max.@-30 ~ +85℃ |
| Slope | ±0.2ppm/℃ max.@-20 ~ +70℃ |
| Initial Frequency | ±2.0ppm max.(After 2times reflow) |

| | |
|---|---|
| Issued Date | 2017.12.28 |
| Revised Date | 2020.05.19 |
| Prepared part | R&D |
| Drawn | Han Shuang |
| Checked | Kuro Peng |
| Approved | Jay |

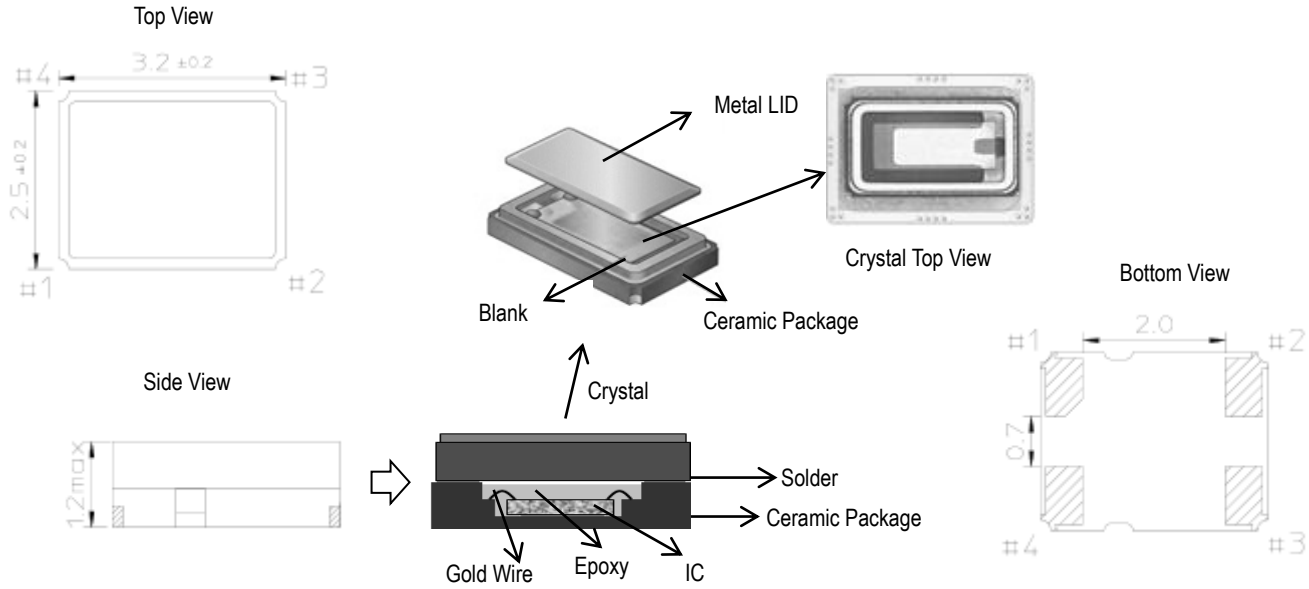
# 1. Electrical Characteristics

| Parameter | | Value | Conditions |
|---|---|---|---|
| Frequency | | 25.000000MHz | |
| Supply Voltage(Vcc) | | +1.8V±5% | |
| | | +2.4V±5% | |
| | | +2.8V±5% | |
| | | +3.0V±5% | |
| Output Load | | 10kohm//10pF±10% | |
| Auto Frequency Control(AFC) | | N/A | |
| Output Level | | 0.8Vp-p min. | Clipped sine wave (DC-coupled) |
| Current | | 1.5mA max. | 10koms//10pF±10% |
| Duty Cycle | | 50±10% | |
| Operating Temperature Range | | -30~+85°C | |
| Storage Temperature Range | | -40~+85°C | |
| Initial Frequency Tolerance | | ±1.0ppm max. | at +25℃±2℃ after 2times reflow |
| Frequency Stability | vs. Temperature(-30 ~ +85°C) | ±2.0ppm max. | Referenced to +25°C frequency |
| | vs. Supply Voltage | ±0.2ppm max. | +1.8V±5%,+2.4V±5%,+2.8V±5%,+3.0V±5% |
| | vs. Load | ±0.2ppm max. | 10koms//10pF±10% each |
| | vs. Aging | ±1.0ppm max. | 1st Year |
| Frequency Stability Slope | | | |
| Startup Time | | 2ms max. | more than 90% of final amplitude |
| Phase Noise | | -50dBc/Hz typ. | 1Hz offset |
| | | -80dBc/Hz typ. | 10Hz offset |
| | | -105dBc/Hz typ. | 100Hz offset |
| | | -130dBc/Hz typ. | 1KHz offset |
| | | -144dBc/Hz typ. | 10KHz offset |
| | | -150dBc/Hz typ. | 100KHz offset |

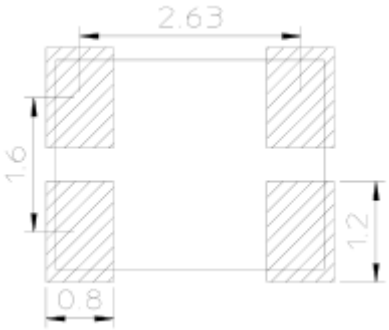
Notes:
- Please leave after reflow in 2h or more at room ambient

## 2. Outline Specification

Unit： mm

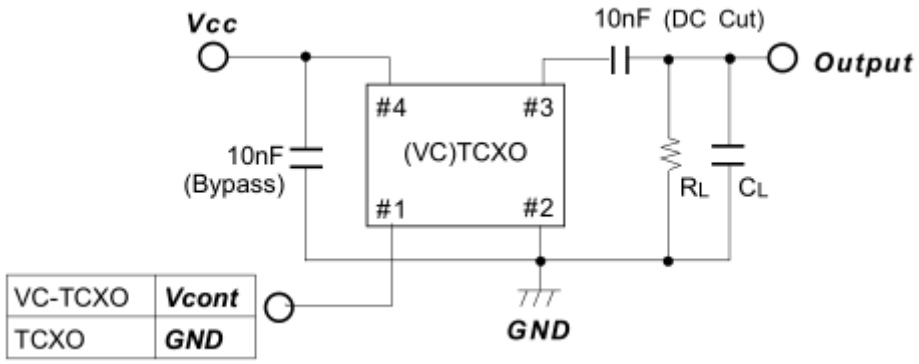



Recommended Land Pattern




| Pad No. | Connection | |
|---|---|---|
| | TCXO | VC-TCXO |
| #1 | GND | Vcont |
| #2 | GND | GND |
| #3 | Output | Output |
| #4 | Vcc | Vcc |

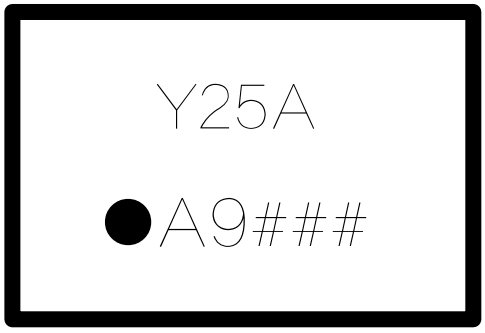
**Measurement Circuit**




Notes：

- Please connect a bypass capacitor closely to Vcc Pad.
- Load capacitance (CL) includes probe and test board capacitance.

## 3. Marking Specification




●Mark-1: Y (①) 25A (②~④)

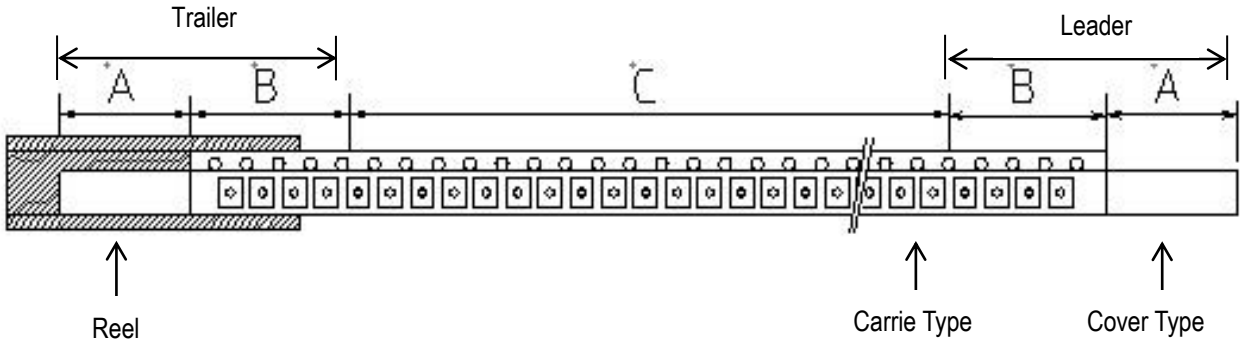
●Mark-2: ● (①) A9 (②~③) ### (④~⑥)

| Mark-1(X-TAL Marking) | | |
|---|---|---|
| **Digit order** | **Symbol** | **Explanation** |
| 1 | Y | YL(YouLian) |
| 2~4 | 25A | Frequency |
| **Mark-2(TCXO Marking)** | | |
| **Digit order** | **Symbol** | **Explanation** |
| 1 | ● | Index |
| 2~3 | A9 | Serial Number(A0~Z9) |
| 4~6 | ### | Production Year + Month + Day |

| TCXO Frequency:25A | | | | | |
|---|---|---|---|---|---|
| **Symbol** | **Frequency [MHz]** | **Symbol** | **Frequency [MHz]** | **Symbol** | **Frequency [MHz]** |
| 16B | 16.367667 | 13A | 13.000000 | 40A | 40.000000 |
| 16C | 16.367000 | 19B | 19.200000 | 38B | 38.400000 |
| 16D | 16.367600 | 26A | 26.000000 | 25A | 25.000000 |
| 16E | 16.368000 | 32A | 32.000000 | 16G | 16.384000 |
| 16F | 16.369000 | 32B | 32.768000 | | |

# 4. Packing Specifications

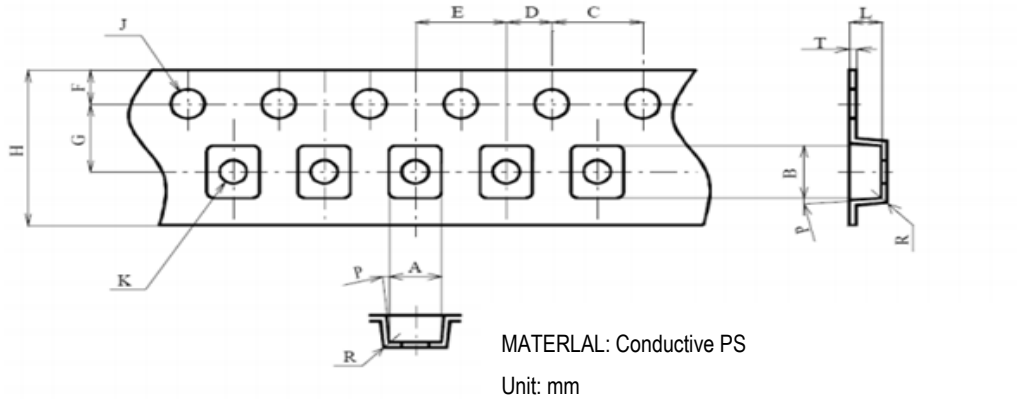
## Basic Taping Specification




| | | |
|---|---|---|
| A | Cover tape only | 200mm min. |
| B | Empty carrier tape | 300mm min. |
| C | Component Section | |

Notes:
- Insert TCXO product in carrier tape
- Attach cover tape using heat pressing method

## Carrier Tape ( 8mm)

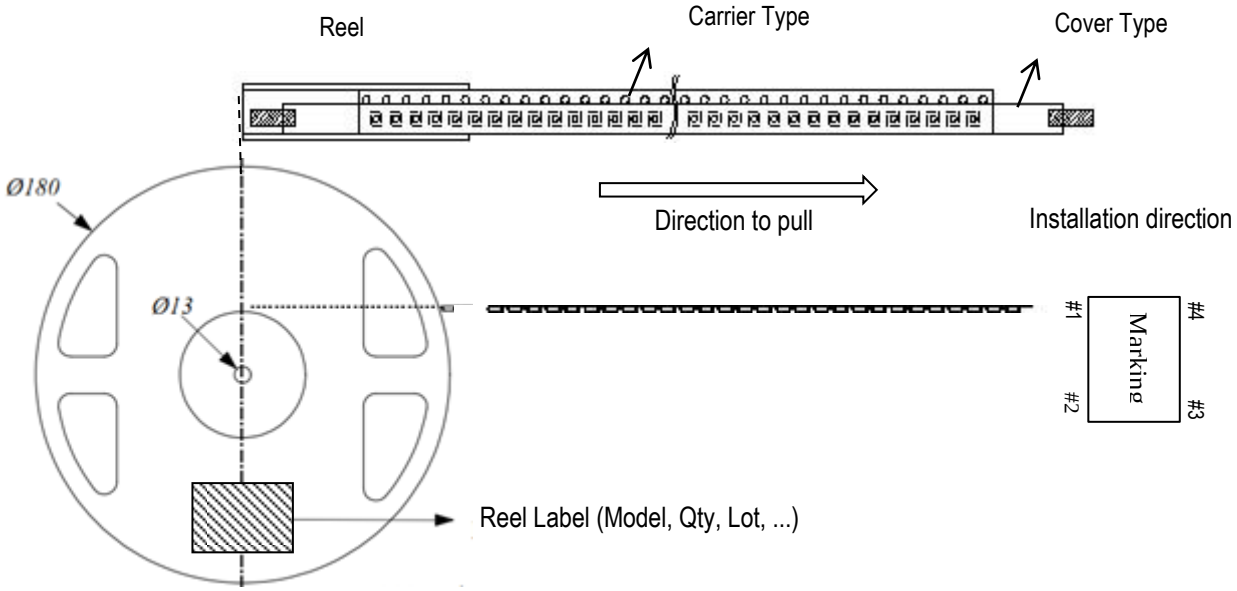



MATERLAL: Conductive PS

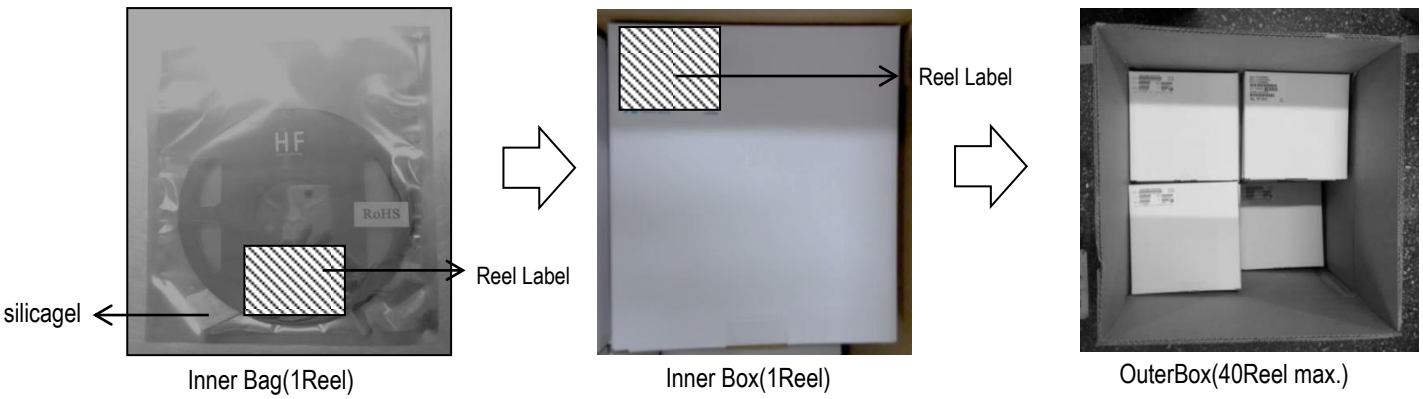
Unit: mm

| Symbol | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| Dimension | 2.3±0.1 | 2.7±0.1 | 4.0±0.1 | 2.0±0.05 | 4.0±0.1 | 1.75±0.1 | 3.5±0.05 |
| Symbol | H | J | K | L | P | T | R |
| Dimension | 8.0±0.2 | Φ1.5+0.1/-0 | Φ1.2±0.1 | 1.4±0.1 | 5° max. | 0.3±0.05 | R0.3 max. |

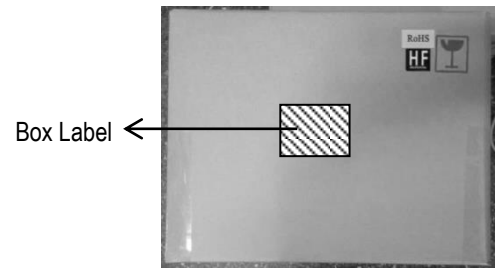
## Reel Taping




## Inner Bag / Inner Box / Outer Box



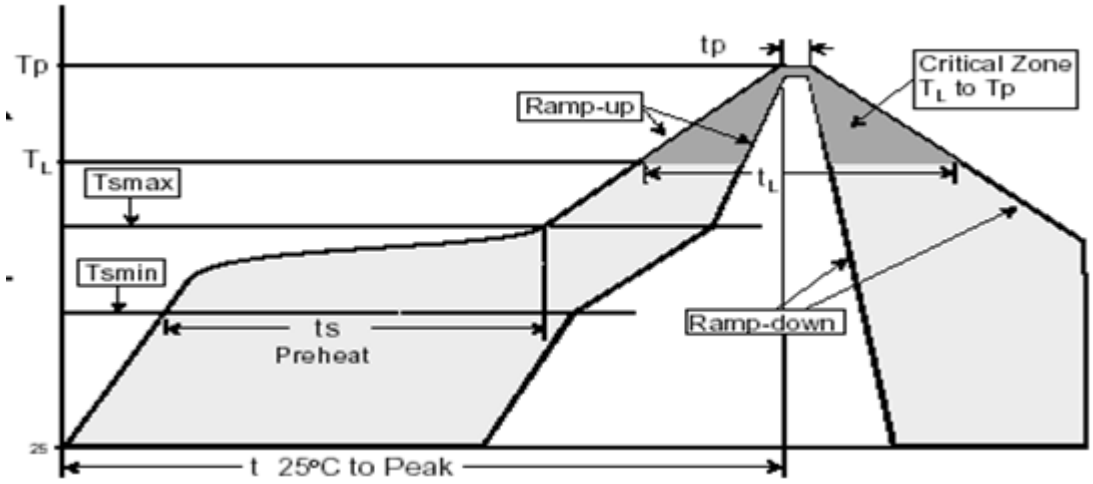

| Reel | Inner Bag | Inner Box | Outer Box |
|---|---|---|---|
| 3,000pcs | 3,000pcs | 3,000pcs | 120,000pcs max. |



# 5. Reliability Specifications

| | Test Item | Test Condition | Criteria |
|---|---|---|---|
| 1 | Preconditioning | 125'C 24Hr → 85'C,85%RH 168Hr → 3times reflow<br>It shall be measured after 4Hr to 12Hr at room temperature & humidity | ±1.0ppm |
| 2 | Drop | Preparation: Test pieces should be fixed on the dummy load with 120~150g weights<br>Condition: Height 150cm onto Iron-plate<br>Drop times: 3 times in 6 mutually perpendicular axes, 1 time random drop total 19 times<br>Condition: Height 120cm onto Iron-plate<br>Drop times: 2 times in 6mutually perpendicular axes<br>Total drop times: 31 times | ±1.0ppm |
| 3 | High Temp. & Humidity Storage | 85'C,85%RH 240Hr<br>It shall be measured after 4Hr to 12Hr at room temperature & humidity | ±1.0ppm |
| 4 | Thermal shock | -40'C/30min↔ 85'C/30min, 100cycles<br>It shall be measured after 4Hr to 12Hr at room temperature & humidity | ±1.0ppm |
| 5 | Vibration | 20~2000Hz, PSD 0.053g2/Hz, X.Y.Z direction,15min/direction | ±1.0ppm |
| 6 | High Temp. Storage | 125'C, 240Hr | ±1.0ppm |
| 7 | Low Temp. Storage | -55'C, 240Hr | ±1.0ppm |
| 8 | Solderability | Precondition: 105'C, 100%RH, 4Hr<br>Condition:235±5'C for 3±0.5sec, Solder Pot | 90% |
| 9 | Solder Heat Resistance | 260±5'C, 10±1sec, Solder Pot<br>It shall be measured after 2Hr to 4Hr at room temperature & humidity | ±1.0ppm |
| 10 | ESD(Electrostatic Discharge)<br>Human Body Model | C = 100pF, V = ±1KV, R = 1.5kohm, 3times | ±1.0ppm |

## 6. Recommended Reflow Profile




| | | |
|---|---|---|
| 1 | Preheat<br>-Temp. Min (Tsmin)<br>-Temp. Max (Tsmax)<br>-Time (ts) | <br>150'C<br>200'C<br>60~180sec |
| 2 | Primary Heat<br>-Temp. (TL)<br>-Time (tL) | <br>220'C<br>60~150sec |
| 3 | Peak<br>-Temp. (Tp)<br>-Time (tp) | <br>260'C<br>10sec max. |