

|                    |                              |                                      |                                    |
|--------------------|------------------------------|--------------------------------------|------------------------------------|
| TCXO<br>2TG3840001 | <b>Product Specification</b> | Produced date / Rev.<br>Revised date | 2020.03.24 / S1<br>2021.03.23 / S2 |
|--------------------|------------------------------|--------------------------------------|------------------------------------|

# Product Specification

## TCXO

|                   |                                   |
|-------------------|-----------------------------------|
| Customer          |                                   |
| Model             | 2TG3840001                        |
| Size              | 2520                              |
| Frequency         | 38.400000MHz                      |
| Type              | TCXO                              |
| Vcc               | +1.7V ~ +3.3V                     |
| Vcont             | N/A                               |
| AFC Range         | N/A                               |
| Temp.             | ±0.5ppm max.@-30 ~ +85°C          |
| Initial Frequency | ±2.0ppm max.(After 2times reflow) |

|               |            |
|---------------|------------|
| Issued Date   | 2020.03.24 |
| Revised Date  | 2021.03.23 |
| Prepared part | R&D        |
| Drawn         | Han Shuang |
| Checked       | Kuro Peng  |
| Approved      | Jay Lee    |

|                    |                              |                                      |                                    |
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## 1. Electrical Characteristics

| Parameter                   |                             | Value            | Conditions                       |
|-----------------------------|-----------------------------|------------------|----------------------------------|
| Frequency                   |                             | 38.400000MHz     |                                  |
| Supply Voltage(Vcc)         |                             | +1.8V±5%         |                                  |
|                             |                             | +2.8V±5%         |                                  |
|                             |                             | +3.0V±5%         |                                  |
| Output Load                 |                             | 10kohm//10pF±10% |                                  |
| Control Voltage(Vcont)      |                             | N/A              |                                  |
| Voltage Control Range       |                             | N/A              |                                  |
| Output Level                |                             | 0.8Vp-p min.     | Clipped sine wave(DC-coupled)    |
| Current                     |                             | 2.0mA max.       | 10koms//10pF±10%                 |
| Duty Cycle                  |                             | 50±10%           |                                  |
| Operating Temperature Range |                             | -30~+85℃         |                                  |
| Storage Temperature Range   |                             | -30~+85℃         |                                  |
| Initial Frequency Tolerance |                             | ±2.0ppm max.     | After 2times reflow              |
| Frequency Stability         | vs. Temperature(-30 ~ +85℃) | ±0.5ppm max.     | Referenced to +25℃ frequency     |
|                             | vs. Supply Voltage          | ±0.2ppm max.     | Vcc±5%                           |
|                             | vs. Load                    | ±0.2ppm max.     | 10koms//10pF±10% each            |
|                             | vs. Aging                   | ±1.0ppm max.     | 1st Year                         |
| Frequency Slope             | vs. Temperature(-20 ~ +65℃) | ±0.1ppm/℃ max.   | Every +2℃                        |
|                             | vs. Temperature(-30 ~ +85℃) | ±0.2ppm/℃ max.   |                                  |
| Startup Time                |                             | 2ms max.         | more than 90% of final amplitude |
| Phase Noise                 |                             | -130dBc/Hz typ.  | 1KHz offset                      |

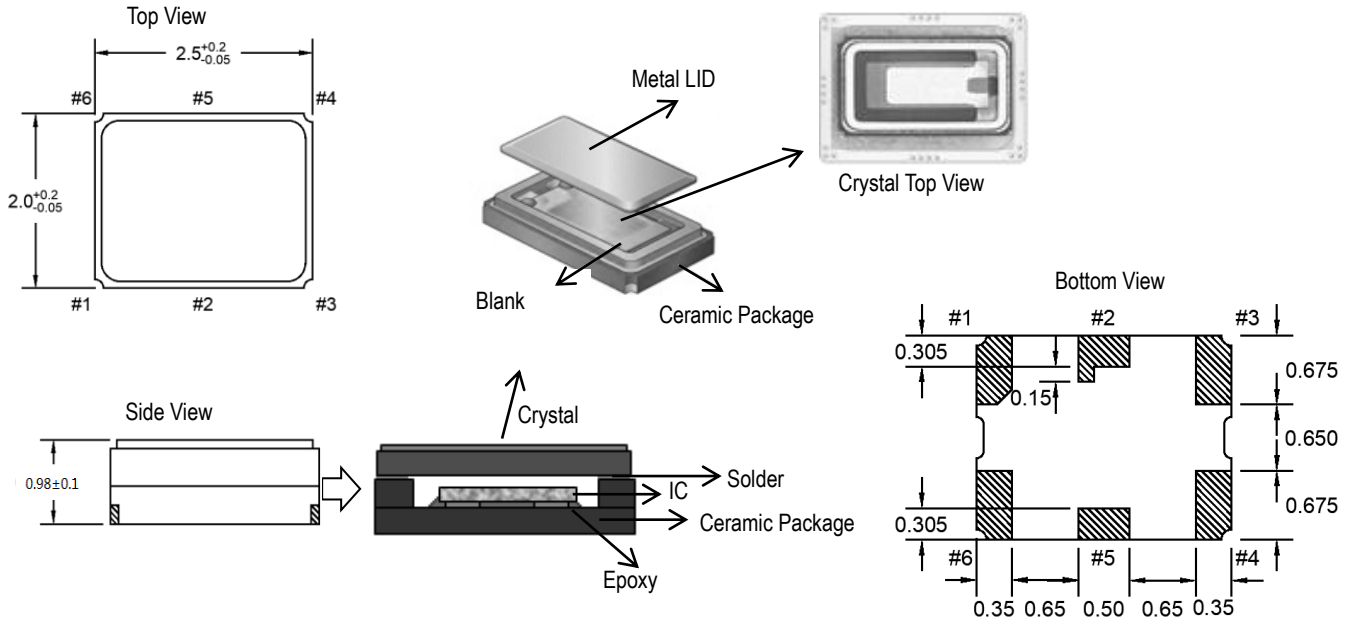
Notes:

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

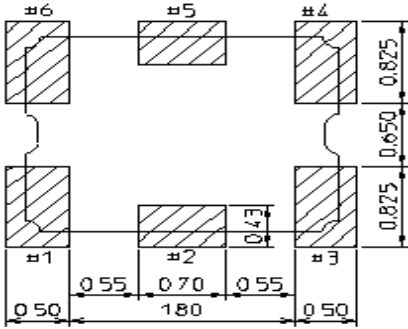
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|----------------------------|-------------------------------------|--|--|

## 2. Outline Specification

Unit: mm

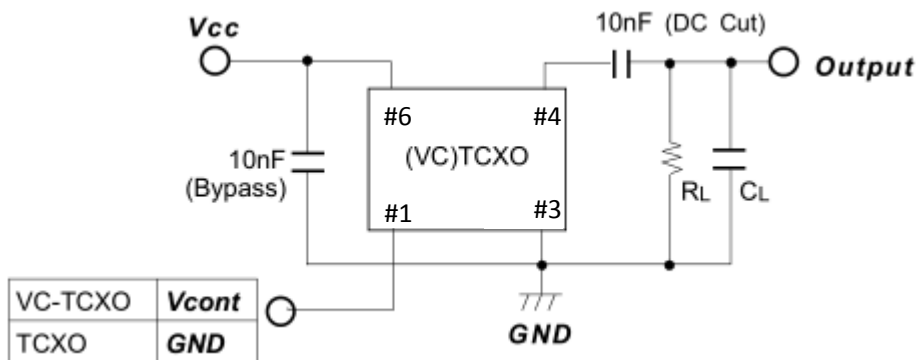


### Recommended Land Pattern



| Pad No. | Connection |         |
|---------|------------|---------|
|         | TCXO       | VC-TCXO |
| #1      | GND        | Vcont   |
| #3      | GND        | GND     |
| #4      | Output     | Output  |
| #6      | Vcc        | Vcc     |
| #2,#5   | N.C.       | N.C.    |

### Measurement Circuit

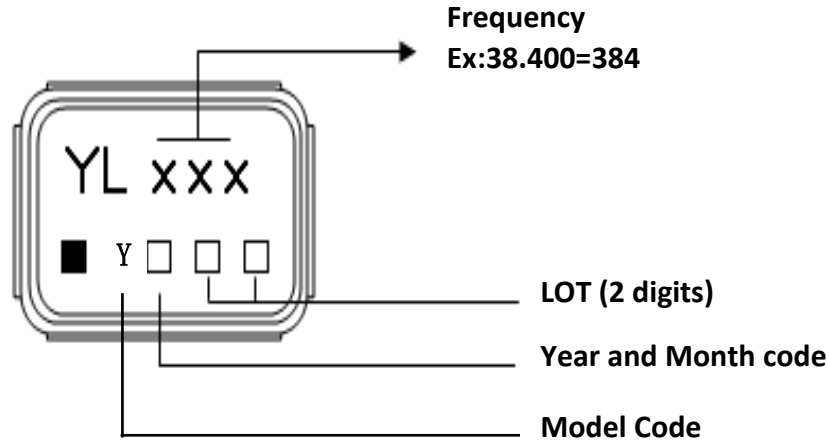


### Notes:

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

|                    |                                |                                      |                                    |
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|--------------------|--------------------------------|--------------------------------------|------------------------------------|

### 3. Marking Specification

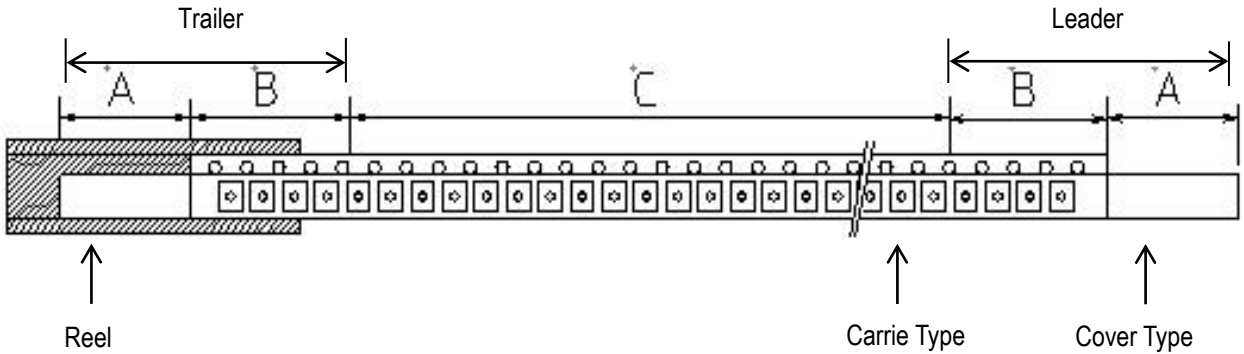


|      |      | month |     |     |     |     |     |     |     |     |     |     |     |   |
|------|------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|
|      |      | JAN   | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |   |
| year | 2017 | 2021  | A   | B   | C   | D   | E   | F   | G   | H   | J   | K   | L   | M |
|      | 2018 | 2022  | N   | P   | Q   | R   | S   | T   | U   | V   | W   | X   | Y   | Z |
| 2019 | 2023 | a     | b   | c   | d   | e   | f   | g   | h   | j   | k   | l   | m   |   |
| 2020 | 2024 | n     | p   | q   | r   | s   | t   | u   | v   | w   | x   | y   | z   |   |

|                                  |                              |                                      |                                    |
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## 4. Packing Specifications

### Basic Taping Specification

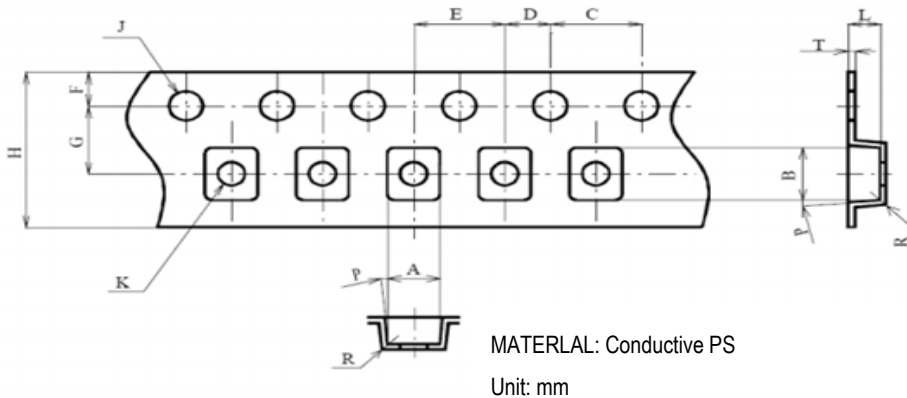


|   |                    |            |
|---|--------------------|------------|
| A | Cover tape only    | 200mm min. |
| B | Empty carrier tape | 300mm min. |
| C | Component Section  |            |

Notes:

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

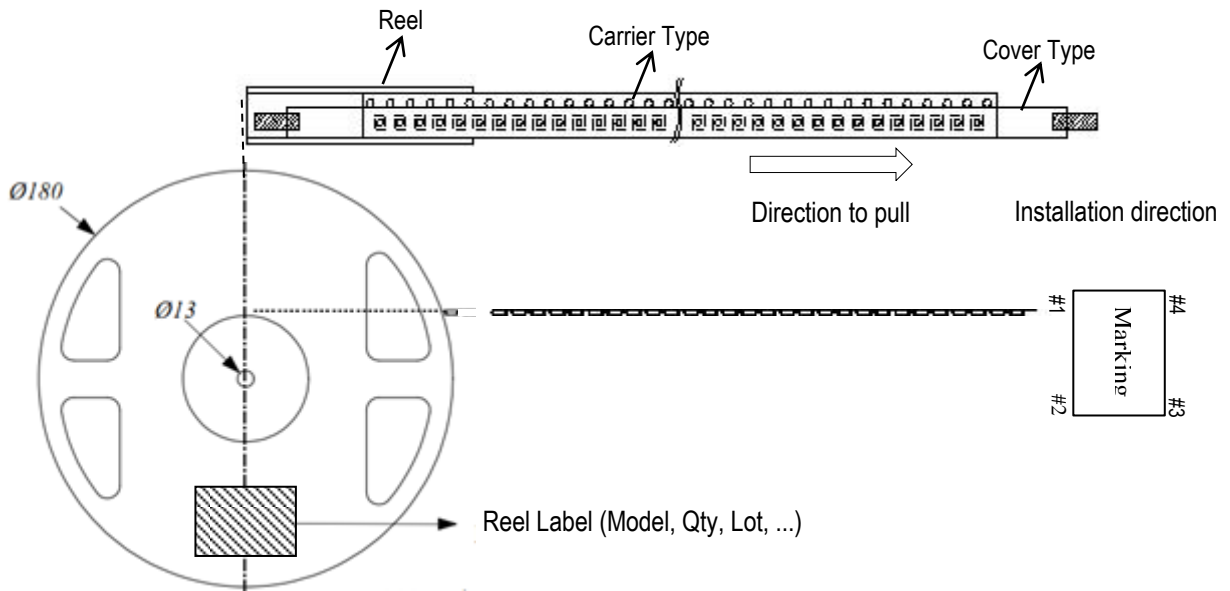
### Carrier Tape ( 8mm)



|           |         |              |           |          |         |          |           |
|-----------|---------|--------------|-----------|----------|---------|----------|-----------|
| 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 | Φ 1.5+0.1/-0 | Φ 1.2±0.1 | 1.4±0.1  | 5° max. | 0.3±0.05 | R0.3 max. |

|                                  |                                |                                      |                                    |
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**Reel Taping**



**Inner Bag / Inner Box / Outer Box**



Inner Bag(1Reel)



HDPE(15 reels enter)



Outer Box(60Reel max.)

|           |           |
|-----------|-----------|
| pocketful | Outer Box |
| 45Kpcs    | 180Kpcs   |

Box Label



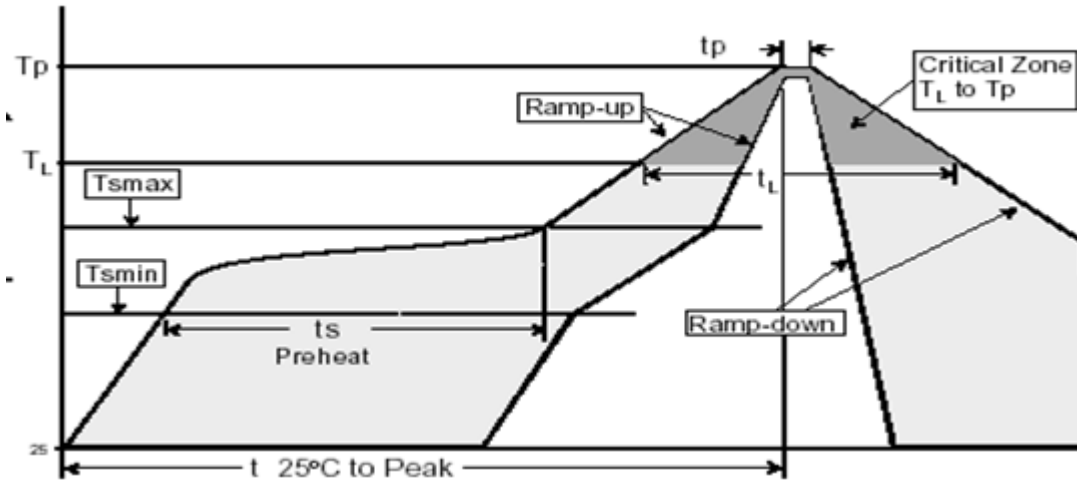
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|--------------------|------------------------------|--------------------------------------|------------------------------------|

## 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 6 mutually 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 0.053g <sup>2</sup> /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  |

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## 6. Recommended Reflow Profile



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