



XO SPECIFICATION



Customer: _____
Customer P/N: _____
TKD P/N: XO25F025000GBHE007
Part Name: SMD XO 2520
Product Description: 25.000000MHz
Issue Date: 2023/8/3

CUSTOMER'S APPROVAL

(PLEASE RETURN A COPY WITH APPROVAL)

TKD Science and Technology Co.,Ltd
泰晶科技股份有限公司

| Approved | Checked | Designer |
|----------------|-----------|----------|
| Zhong Yuan Hua | Wang Peng | Li Yan |

地址：湖北省随州市高新区神农大道9号泰晶科技园

Address: TKD Technology Park, No.9, ShenNong Avenue, High-tech Zone, SuiZhou, Hubei

Sales Tel: 0722-7509016, Fax: 0722-7509036, URL: www.sztkd.com



| Rev. | Description of Revision History | Date | Designer | Checked By |
|------|---------------------------------|-----------|----------|------------|
| A | New Revision | 2023/6/13 | Li Yan | Wang Peng |
| B | Add The Product Reliability | 2023/8/3 | Li Yan | Wang Peng |



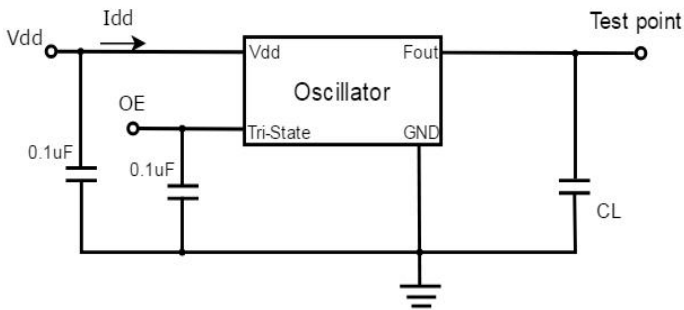
XO SPECIFICATION

- 1.Description** : SMD Simple Packaged Xtal Oscillator 2520
- 2.Nominal Frequency** : 25.000000MHz
- 3.Electrical Specifications** :

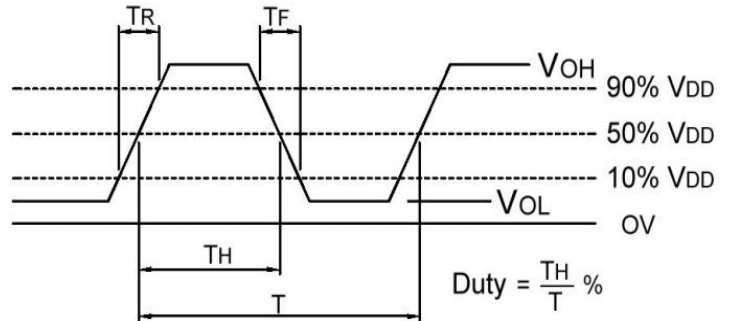
| Item | Parameters | Condition | Electrical Specifications | | | |
|------|-----------------------------|------------|---------------------------|------|---------|-------|
| | | | Min | Typ | Max | Units |
| 1 | Nominal Frequency | | 25.000000 | | | MHz |
| 2 | Frequency Stability Overall | Note1 | -50 | | 50 | ppm |
| 3 | Operating Temperature Range | | -40 | | 85 | °C |
| 4 | Supply Voltage | | 1.62 | 3.30 | 3.63 | V |
| 5 | Current Consumption | Operating | | | 15 | mA |
| 6 | Output Waveform | | CMOS | | | |
| 7 | Output Load | | 15 | | | pF |
| 8 | Duty Cycle | | 45 | 50 | 55 | % |
| 9 | Output Rise/Fall Time | | | | 4 | ns |
| 10 | High Output Voltage | | 0.9Vdd | | | V |
| 11 | Low Output Voltage | | | | 0.1Vdd | V |
| 12 | Enable | | Vdd*70% | | | V |
| 13 | Disable | | | | Vdd*30% | V |
| 14 | Aging | Frist year | -3 | | 3 | ppm |
| 15 | Start Time | | | | 5 | ms |
| 16 | Storage Temperature | | -55 | | 125 | °C |

Note1 Frequency stability includes frequency tolerance@25°C and frequency stability vs. operating temperature range and voltage variance and first year aging

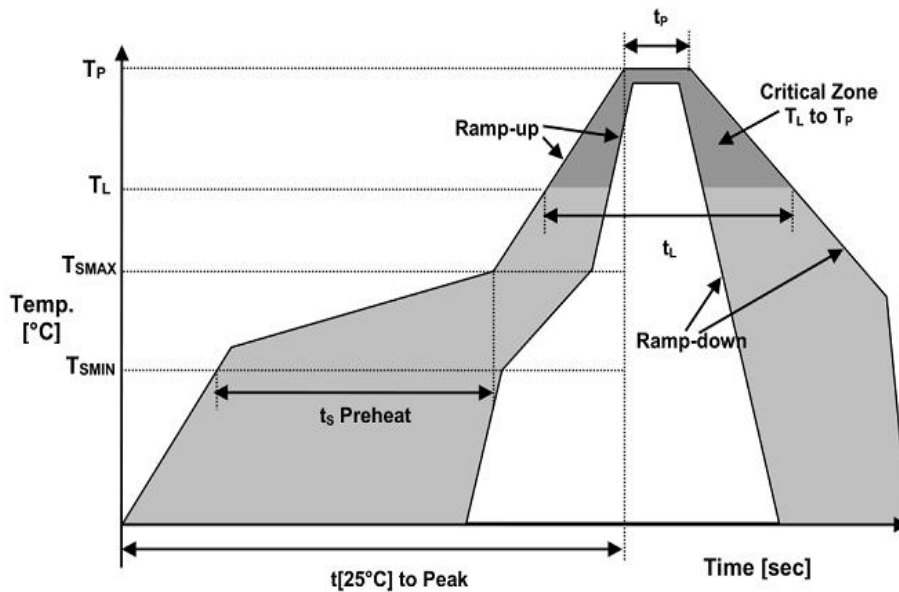
4. Test Circuit (CMOS Load)



5. Output Waveform (CMOS Load)



6. Recommended Reflow Profile

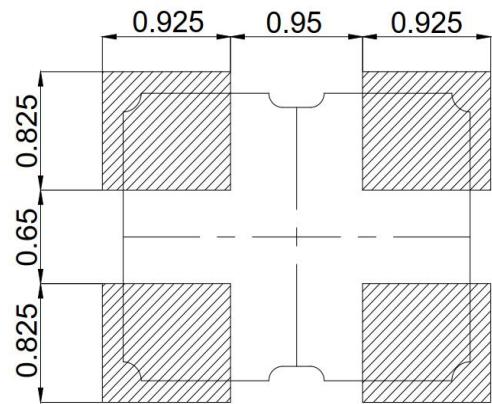
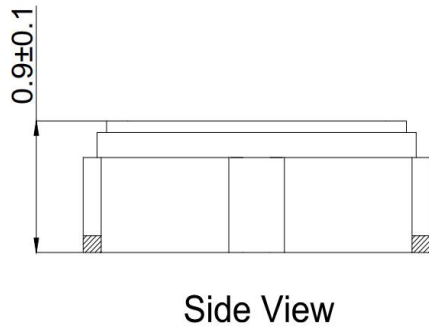
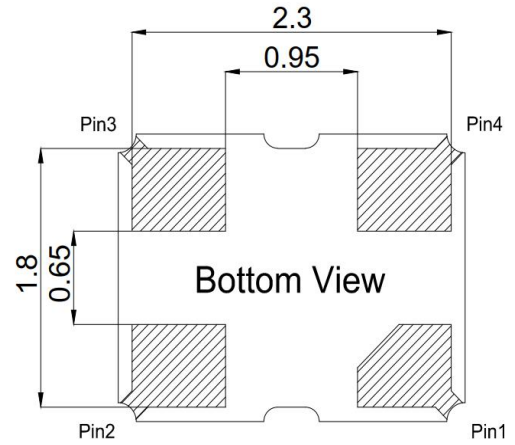
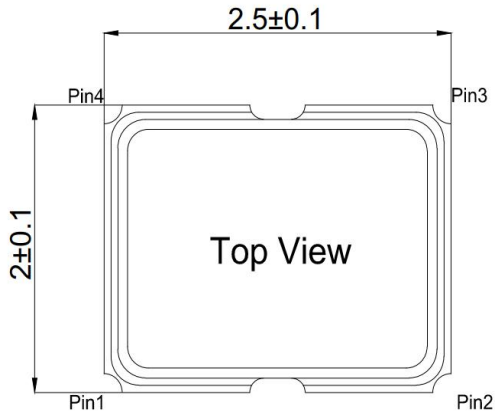


| Reflow Profile | | |
|--|-------------------------------------|-------------|
| Temperature MIN Preheat | T_{SMIN} | 150°C |
| Temperature MAX Preheat | T_{SMAX} | 200°C |
| Time ($T_{SMIN} - T_{SMAX}$) | t_s | 60-180sec |
| Temperature | T_L | 217°C |
| Peak Temperature | T_P | 260°C |
| Ramp-up Rate | R_{UP} | 3°C/sec max |
| Ramp-Down Rate | R_{DOWN} | 6°C/sec max |
| Time within 5°C of Peak Temperature | t_p | 10sec |
| Time $t(25^\circ\text{C})$ to Peak Temperature | $t(25^\circ\text{C})\text{to Peak}$ | 480sec |
| Time | t_L | 60-150sec |



7.Product Dimensions

Unit: mm



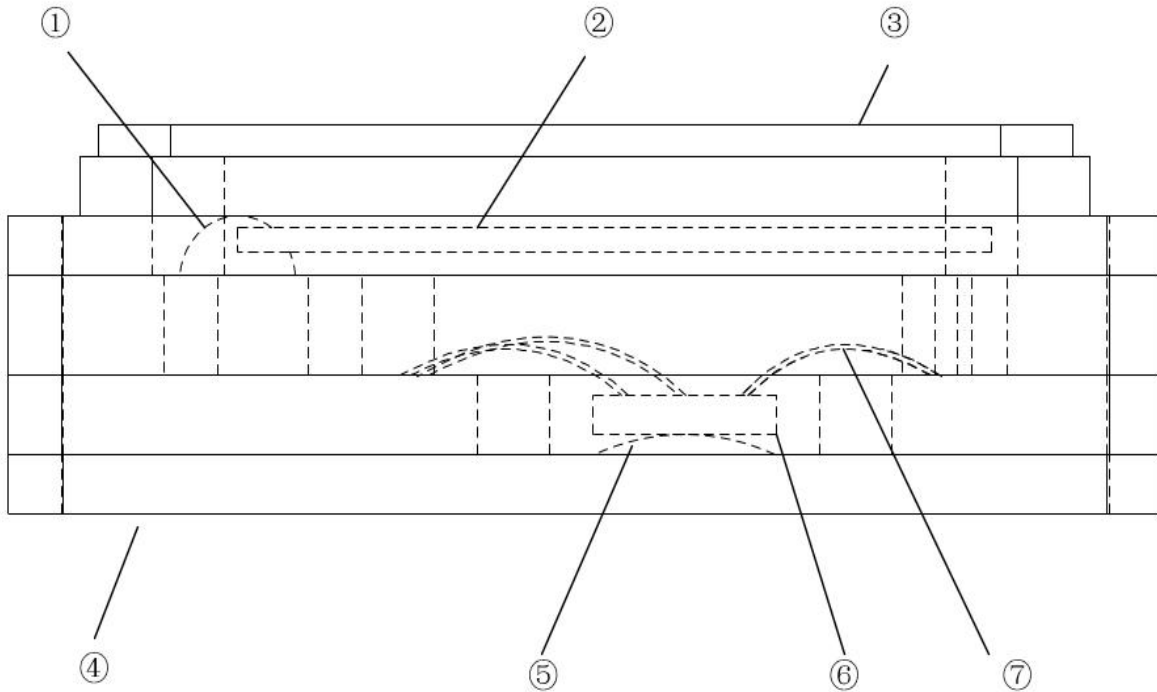
Pin Connection

| Name | Connection |
|-------|------------|
| pin 1 | Tri-State |
| pin 2 | GND |
| pin 3 | Fout |
| pin 4 | Vdd |

Function

| | |
|------------|-----------------|
| Pin1 Input | Pin3 Output |
| High level | Oscillation Out |
| Open | |
| Low level | High Z |

8. Structure illustration



| No. | Components | Materials |
|-----|---------------------------------|---------------------|
| ① | Conductive Adhesive | Ag+Silicone resin |
| ② | Crystal Blank | SiO ₂ |
| ③ | Lid | Fe-Ni-Co Alloy |
| ④ | Base | Ceramic+Noble Metal |
| ⑤ | Conductive Adhesive of Solid IC | Ag+Epoxy resin |
| ⑥ | IC | Si |
| ⑦ | Gold wire | Au |



9.Product Identification (Marking)

| | |
|----------------------|--|
| T: TKD Logo | |
| O: Oscillator Code | |
| 025A: Frequency Code | |
| ●: Pin1 Index | |
| D: Date Code | |
| ####: XO Lot Code | |

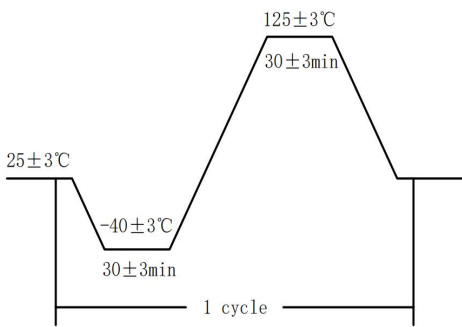
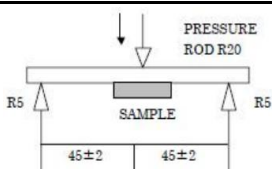
Date Code

| Year | | 2019 | 2020 | 2021 | 2022 | | |
|-------|-----|------|------|------|------|------|------|
| | | | | 2023 | 2024 | 2025 | 2026 |
| | | | | 2027 | 2028 | 2029 | 2030 |
| | | | | 2031 | 2032 | 2033 | 2034 |
| Month | JAN | a | n | A | N | | |
| | FEB | b | p | B | P | | |
| | MAR | c | q | C | Q | | |
| | APR | d | r | D | R | | |
| | MAY | e | s | E | S | | |
| | JUN | f | t | F | T | | |
| | JUL | g | u | G | U | | |
| | AUG | h | v | H | V | | |
| | SEP | j | w | J | W | | |
| | OCT | k | x | K | X | | |
| | NOV | l | y | L | Y | | |
| | DEC | m | z | M | Z | | |

This date code will be cycled every four years.



10. Reliability

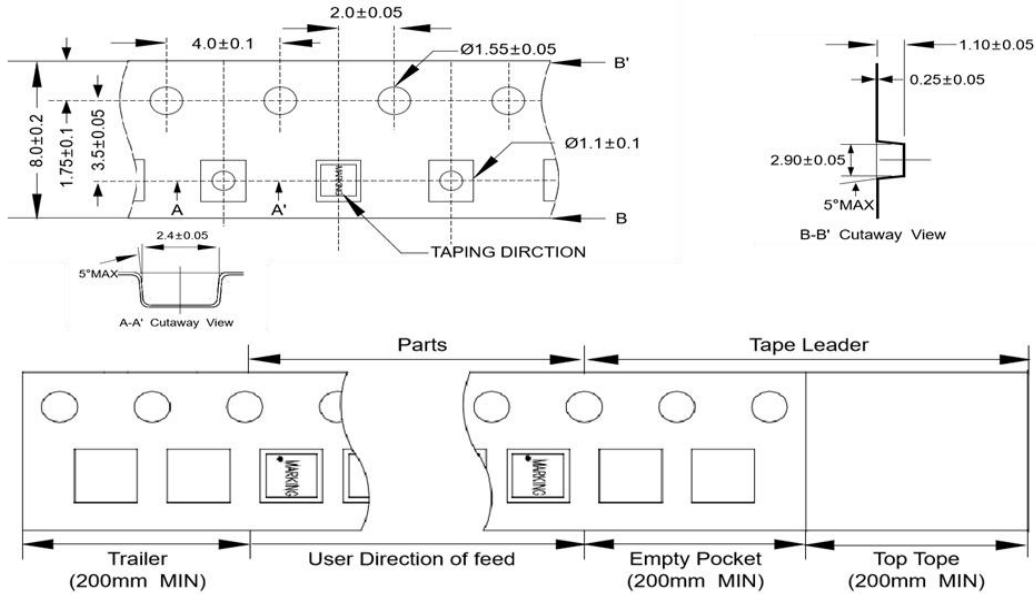
| No. | Item | Test Methods | Criteria |
|-----|---------------------------------|--|----------------|
| 1 | Low Temperature Storage | Temperature: $-40^{\circ}\text{C} \pm 3^{\circ}\text{C}$ (or the specification shall prevail) Duration: 500 hours | ± 5.0 ppm |
| 2 | High temperature and humidity | Temperature: $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$ Humidity: RH 85% Duration: 500 hours | ± 5.0 ppm |
| 3 | Thermal Shock |  <p>Temperature: $-40^{\circ}\text{C} \sim 125^{\circ}\text{C}$ (or the specification shall prevail) Duration: 100 cycles</p> | ± 5.0 ppm |
| 4 | High Temperature Operating Life | Temperature : 85°C (or the specification shall prevail) Duration : 1000 hours Vdd Applied | ± 10.0 ppm |
| 5 | Vibration | Duration : 2 hours/each direction Frequency range: 10 ~ 55 Hz Direction: 3 axis | ± 5.0 ppm |
| 6 | Mechanical Shock | Acceleration: 100 g Duration: 6.0 ms Test cycles: 3 times for all 6 axis , half sina | ± 5.0 ppm |
| 7 | Drop Test | Height: 100 cm Test cycles: 3 times | ± 5.0 ppm |
| 8 | Solderability | Soldering bath temperature: $245^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Duration: 2 ± 0.6 second | 95% Coated |
| 9 | Resistance to Soldering Heat | Soldering temperature : $260^{\circ}\text{C} \pm 10^{\circ}\text{C}$ Duration : 15 ± 5 second | ± 5.0 ppm |
| 10 | Board Flex | Height: 3.0 mm Duration: 5 second Speed: 0.5mm/sec  | ± 5.0 ppm |



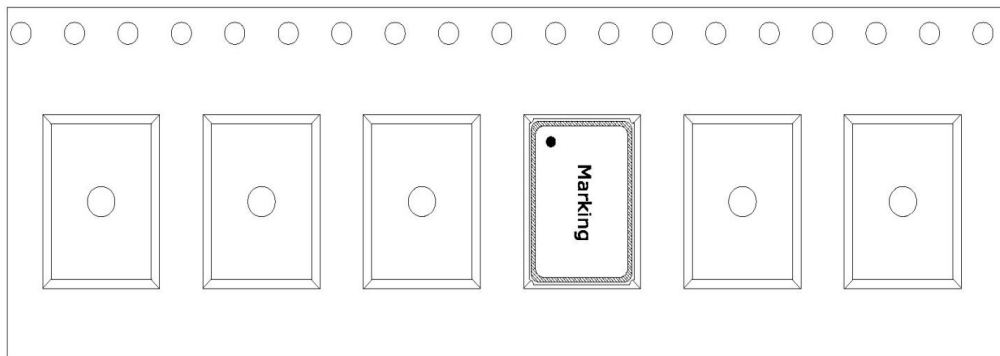
11.Package Information

Tape (Carrier) Dimensions

Unit: mm



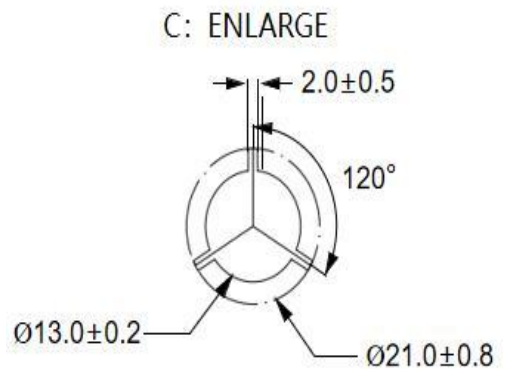
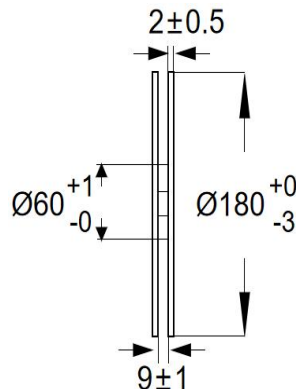
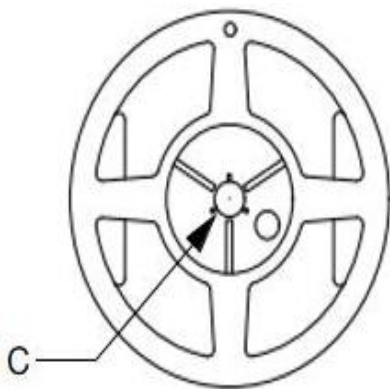
The Direction of Packing



Reel Dimensions

3000 Pcs/Reel

Unit: mm





Handling Instructions

1. Cautions for Handling

a) Prevention against electrostatic breakdown

Your full attention to static electricity is still requested.

b) Direction

Before mounting the crystal oscillator on board, Please confirm the direction to make sure the GND terminal and the terminal of power supply are not taken wrongly.

2. Prevention against Vibration and Shock

While the product is being transported or mounted onto board, if undue hock and vibration exceeding the specification is put on, there is risk hat the built-in crystal blank is broken.

When undue shock and vibration exceeding the specification is put on the product, please be sure to make confirmation of the product's characteristics.

3. Soldering

In order to assure the reliability of the crystal oscillator, please use the product under the recommended conditions.

4. Surface mounting

a) This product is surface-mounting device.

So, Please pay attention to the following things.

b) Extreme deformation of board may make pattern off, the electrode of terminals off and solder broken. Full attention is requested especially when splitting the board with the oscillator mounted where the camber of the board occurs.

c) In case that automatic mounter is used, please choose the type with small shock generation and make confirmation of the shock before use.

5. Cleaning

Because cleaning will cause change to all characteristics, cleaning is forbidden.

6. Store keeping (method and duration)

Long-time storage in the high/low temperature and high humidity leads to deterioration of solderability. So, please keep the product in the temperature of +5~+35 and humidity of 45~70%.

Moreover, please keep the product in the circumstance with measures against static electricity.

(Please use it after confirming the product solderability.)

7. Caution

This product should not be used in toxic, harmful, or corrosive environments such as mercury, chlorine, sulfur, acid-base environments etc.