



# TAI-SAW TECHNOLOGY CO., LTD.

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## Product Specifications Approval Sheet

Product Description: Crystal Unit SMD 2.0x1.6 50.0MHz

TST Part No.: TZ4094DWAB44

Customer Part No.: \_\_\_\_\_

Customer signature required

Company: \_\_\_\_\_

Division: \_\_\_\_\_

Approved by : \_\_\_\_\_

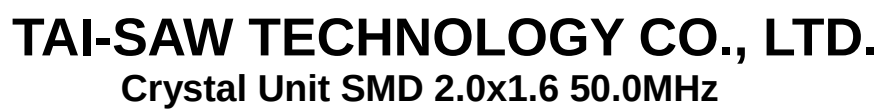
Date: \_\_\_\_\_

Checked by: \_\_\_\_\_ Hao Yu Liao *Hao Yu*

Approved by: \_\_\_\_\_ Yifan Chen *Yifan*

Date: \_\_\_\_\_ 02/16/2024

1. Customer signed back is required before TST can proceed with sample build and receive orders.
2. Orders received without customer signed back will be regarded as agreement on the specifications.
3. Any specifications changes must be approved upon by both parties and a new revision of specifications shall be released to reflect the changes.



## Revise:

| Rev. | Rev. Page | Rev. Account    | Date      | Ref. No. | Revised by  |
|------|-----------|-----------------|-----------|----------|-------------|
| 1    | N/A       | Initial release | 02/16/24' | N/A      | Hao Yu Liao |



MODEL NO.: TZ4094DWAB44

REV. NO.: 1

## Features:

- Surface Mount Hermetic Package
- Excellent Reliability Performance
- Good Frequency Perturbation and Stability over temperature
- Ultra Miniature Package
- AEC-Q200 compliance
- Moisture Sensitivity Level (MSL) : Level-1

RoHS Compliant  
Lead free  
Lead-free soldering

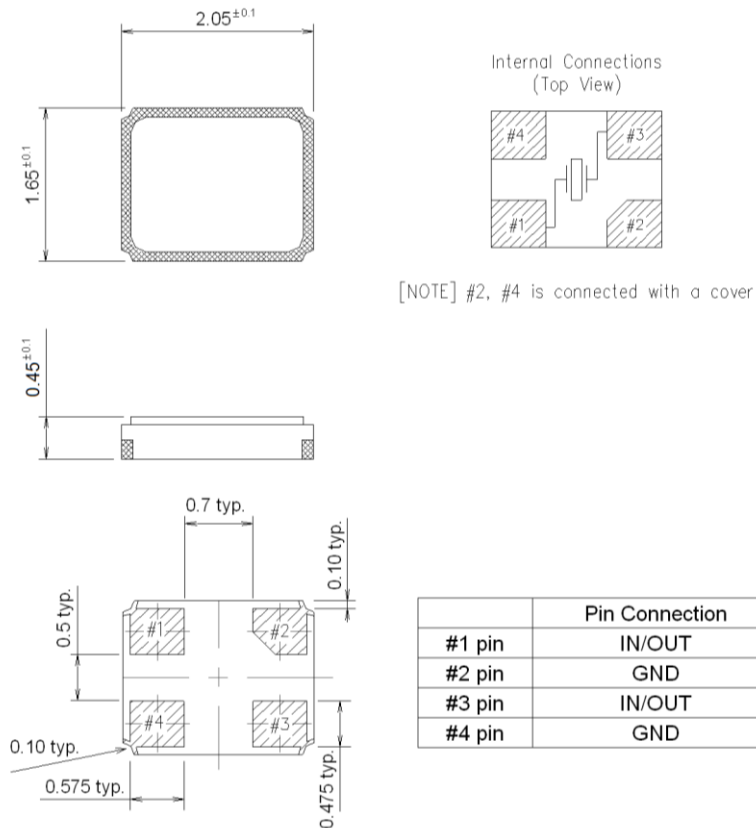
## Description and Applications:

Surface mount 2.0mmx1.6mm crystal unit for use in wireless communications devices, especially for a need of ultra miniature package for mobility.

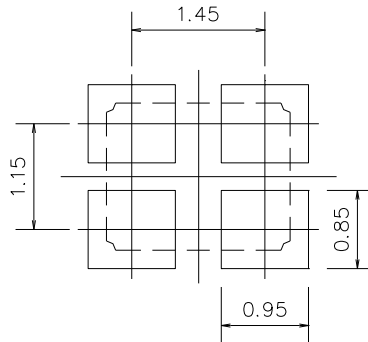
## Electrical Specifications:

| <b>TZ4094DWAB44</b>                        | <b>Specification</b>                                         |
|--------------------------------------------|--------------------------------------------------------------|
| Nominal Frequency                          | 50.000000 MHz                                                |
| Mode of Oscillation                        | Fundamental                                                  |
| Storage Temperature Range                  | -40°C to +125°C                                              |
| Operating Temperature Range                | -40°C to +105°C                                              |
| Frequency Stability Over Temperature Range | +/-32 ppm (referred to the value at 25°C)                    |
| Frequency Make Tolerance (FL)              | +/-13 ppm @ 30°C +/- 3°C (+/-10 ppm @ 25°C +/- 3°C Guaranty) |
| Equivalent Series Resistance (ESR)         | 10 $\Omega$ typical and 22 $\Omega$ max                      |
| Nominal Drive Level                        | 50uW typical and 100uW max                                   |
| Shunt Capacitance (Co)                     | 3.0 pF max                                                   |
| Load Capacitance (CL)                      | 12 pF                                                        |
| Aging                                      | +/-5ppm/10 years                                             |
| Insulation Resistance                      | 500 M $\Omega$ min./DC 100V                                  |
| Marking                                    | Laser Marking                                                |
| Unit Weight                                | 5.7mg+/-0.5mg                                                |

## Mechanical Dimensions (mm): Base



## Recommended Land Pattern: (unit: mm)

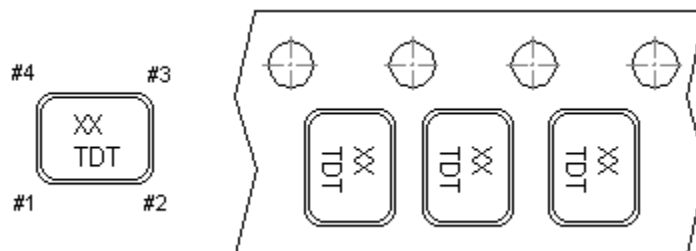


Recommended Land Pattern

## Marking:

Line 1: XX; Frequency (50)

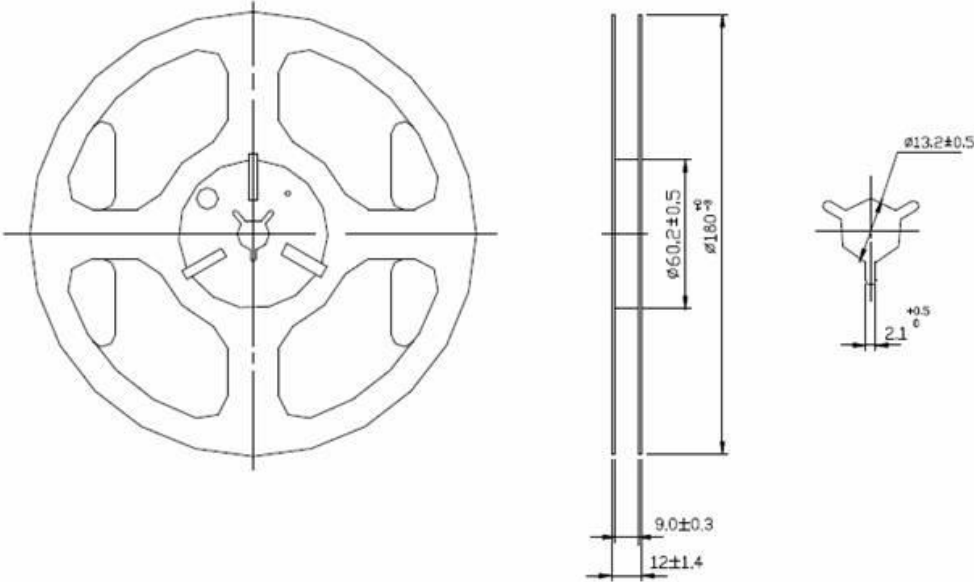
Line 2: T; Traceable Code + D; date Code of Year/Month+T ; Traceability code (1 or no letter)



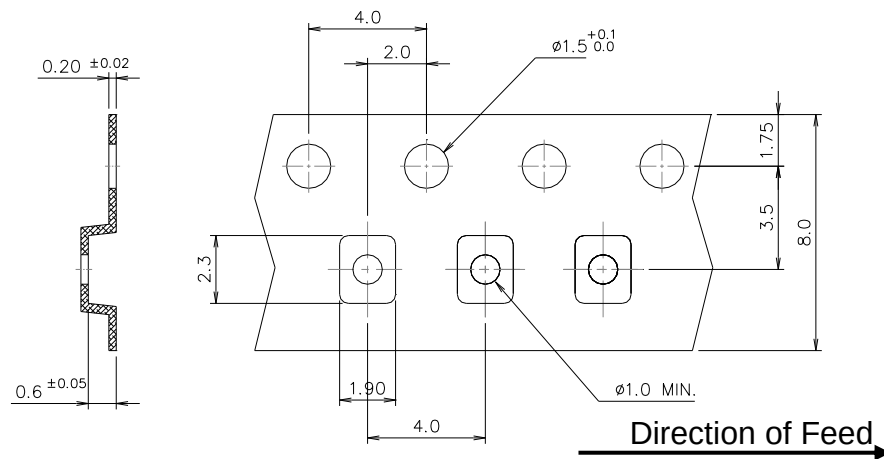
Date Code Table: Year/Month

| Year/Month | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|------------|---|---|---|---|---|---|---|---|---|----|----|----|
| 2018       | A | B | C | D | E | F | G | H | J | K  | L  | M  |
| 2019       | N | P | Q | R | S | T | U | V | W | X  | Y  | Z  |
| 2020       | a | b | c | d | e | f | g | h | i | j  | k  | m  |
| 2021       | n | p | q | r | s | t | u | v | w | x  | y  | z  |
| 2022       | A | B | C | D | E | F | G | H | J | K  | L  | M  |
| 2023       | N | P | Q | R | S | T | U | V | W | X  | Y  | Z  |
| 2024       | a | b | c | d | e | f | g | h | i | j  | k  | m  |
| 2025       | n | p | q | r | s | t | u | v | w | x  | y  | z  |

Reel Dimensions (mm):



## Tape Dimensions (mm):

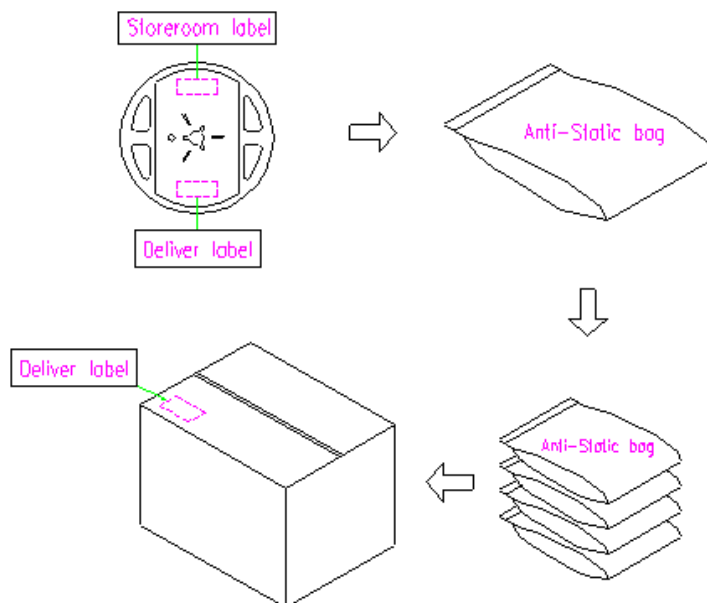


### [NOTE]:

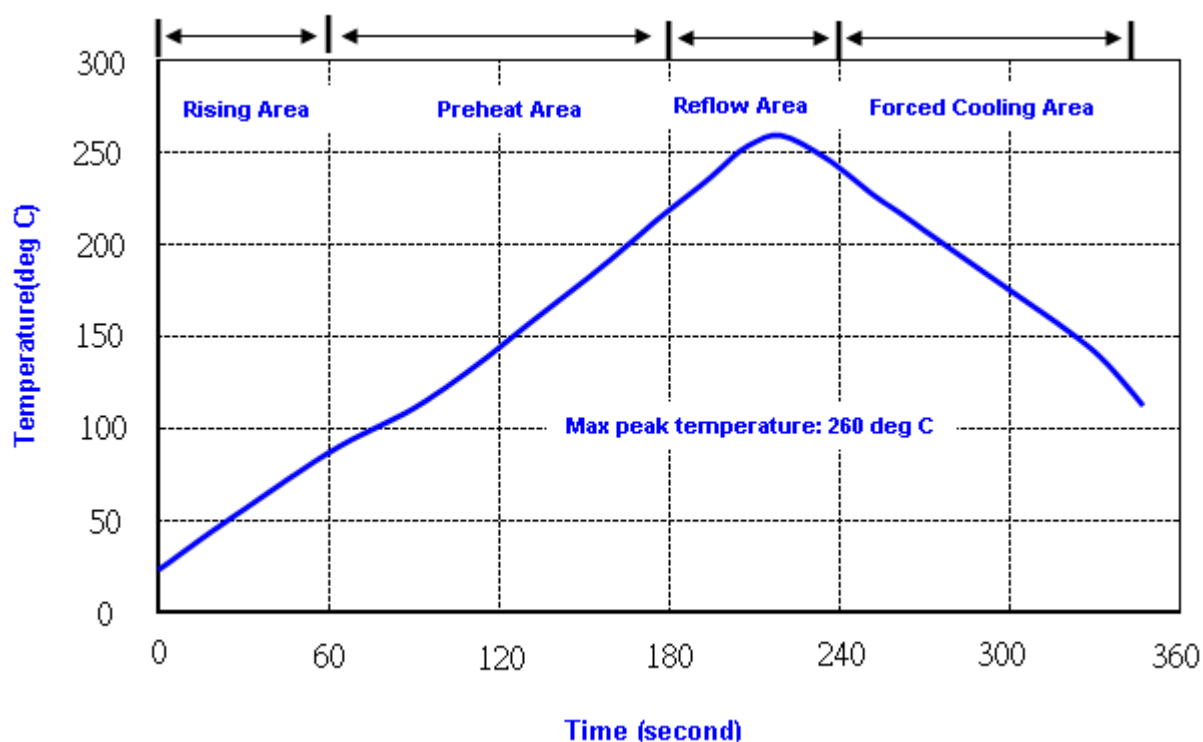
1. Unless otherwise specified tolerance on dimension  $\pm 0.1$  mm.
2. Material: conductive polystyrene with color black.
3. 10 pitch cumulative tolerance  $\pm 0.2$  mm.

## Packing Quantity/Packing:

3K pcs maximum per reel



## Reflow Profile:



Note: 1. Max peak temperature: 260 $\pm$ 5 deg C; Time: 10 $\pm$ 2 sec  
2. Temperature: 217 $\pm$ 5 deg C; Time: 90~100 sec

## Reliability Specifications (AEC-Q200)

| Test name                                | Test process / method                                                                                                                              | Reference standard            |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <b>Mechanical characteristics</b>        |                                                                                                                                                    |                               |
| resistance to Soldering heat (IR reflow) | Temp./ Duration : 265°C /10sec ×2 times<br>Total time : 4min.(IR-reflow)                                                                           | EIAJED-4701<br>-300(301)M(II) |
| Vibration                                | Total peak amplitude : 1.5mm<br>Vibration frequency : 10 to 2000 Hz<br>Sweep period : 20 minute<br>Vibration directions : 3 mutually perpendicular | MIL-STD 202G<br>method 204    |
| Mechanical Shock                         | directions : 3 impacts per axis<br>Acceleration : 6000g's, +20/-0 %<br>Duration : 0.3 ms (total 18 shocks)<br>Waveform : Half-sine                 | MIL-STD 202G<br>method 213    |
| Solderability                            | Solder Temperature:265±5°C<br>Duration time: 5±0.5 seconds.                                                                                        | J-STD-002                     |
| <b>Environmental characteristics</b>     |                                                                                                                                                    |                               |
| Thermal Shock                            | Heat cycle conditions<br>-55 °C (30min) ↔ 125 °C (30min)<br>* cycle time : 1000 times                                                              | MIL-STD 883G<br>method 1010.8 |
| Humidity test                            | Temperature : 85 ± 2 °C<br>Relative humidity : 85%<br>Duration : 1000 hours                                                                        | MIL-STD 202G<br>method 103    |
| Dry heat<br>( Aging test )               | Temperature : 125 ± 2 °C<br>Duration : 1000 hours                                                                                                  | MIL-STD 202G<br>method 108A   |
| Cold resistance<br>(Low Temp Storage)    | Temperature : -40 ± 3 °C<br>Duration : 1000 hours                                                                                                  | IEC 60068-2-1                 |