

**TAI-SAW TECHNOLOGY CO., LTD.**

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## Approval Sheet For Product Specification

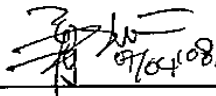
Issued Date: 07/04/2008 (REV. NO: 1)

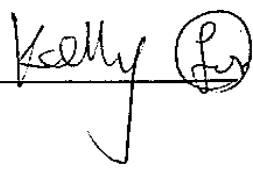
Product Name: SMD 2.5x2.0 27.0MHz Crystal Unit

TST Parts No.: TZ1449A

Customer Parts No. : \_\_\_\_\_

|                    |
|--------------------|
| Company: _____     |
| Division: _____    |
| Approved by: _____ |
| Date: _____        |

Checked by: Eddie Huang 

Approval by: Robert Chang 

Date: 07/04/2008

| Rev. | Rev. Page | Rev. Account    | Date      | Ref. No. | Reviser     |
|------|-----------|-----------------|-----------|----------|-------------|
| 1    | N/A       | Initial release | 07/04/08' | N/A      | Eddie Huang |



MODEL NO.: TZ1449A

REV. NO.: 1

## Features:

- Surface Mount Hermetic Package
- Excellent Reliability Performance
- Good Frequency Perturbation and Stability over temperature
- Ultra Miniature Package

RoHS Compliant  
Lead free  
Lead-free soldering

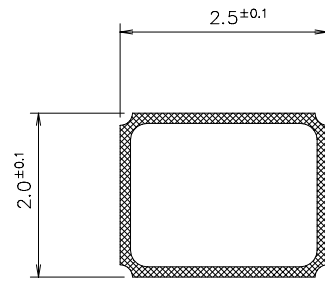
## Description and Applications:

Surface mount 2.5mmx2.0mm crystal unit for use in wireless communications devices, especially for a need of ultra miniature package for mobility.

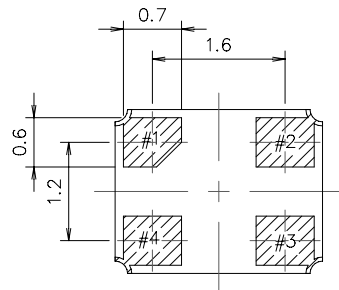
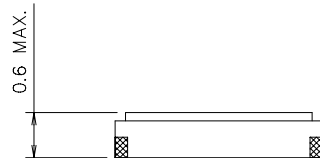
## Electrical Specifications:

| <b>TZ1449A</b>                                       | <b>Specification</b>                      |
|------------------------------------------------------|-------------------------------------------|
| Nominal Frequency                                    | 27.000000 MHz                             |
| Mode of Oscillation                                  | Fundamental                               |
| Storage Temperature Range                            | -40°C to +85°C                            |
| Operating Temperature Range                          | -10°C to +60°C                            |
| Frequency Stability over Operating Temperature Range | +/-10 ppm (referred to the value at 25°C) |
| Frequency Make Tolerance (FL)                        | +/-10 ppm @ 25°C +/- 3°C                  |
| Equivalent Series Resistance (ESR)                   | 100 $\Omega$ max                          |
| Nominal Drive Level                                  | 100 uW max.                               |
| Shunt Capacitance (Co)                               | 3.0 pF max                                |
| Load Capacitance (CL)                                | 16 pF                                     |
| Insulation Resistance                                | 500 M $\Omega$ min./DC 100V               |
| Aging                                                | +/-1ppm/year                              |
| Marking                                              | Laser Marking                             |
| Unit Weight                                          | 9.5 +/-0.5mg                              |

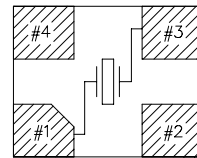
## Mechanical Dimensions (mm):



|        | Pin Connection |
|--------|----------------|
| #1 pin | IN/OUT         |
| #2 pin | GND            |
| #3 pin | IN/OUT         |
| #4 pin | GND            |

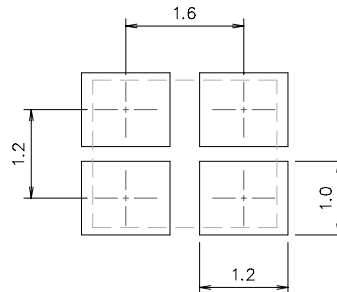


Internal Connections  
(Top View)



[NOTE] #2, #4 is connected with a cover  
(Please connect with a GND or a power supply)

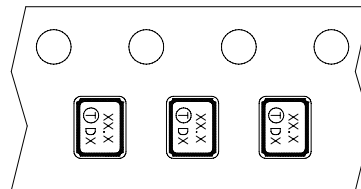
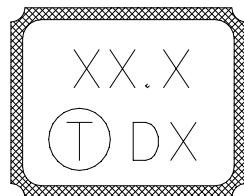
## Recommended Land Pattern: (unit: mm)



## Marking:

Line 1: Frequency (27.0)

Line 2: TST Logo + Date Code + Product Code

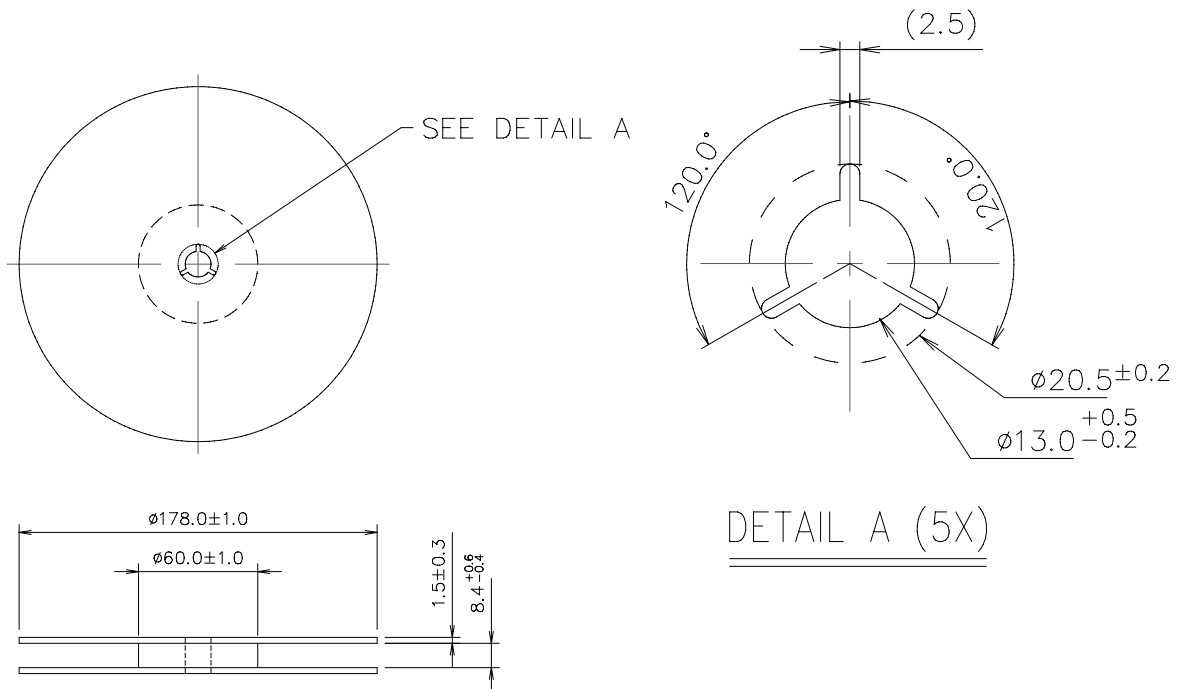
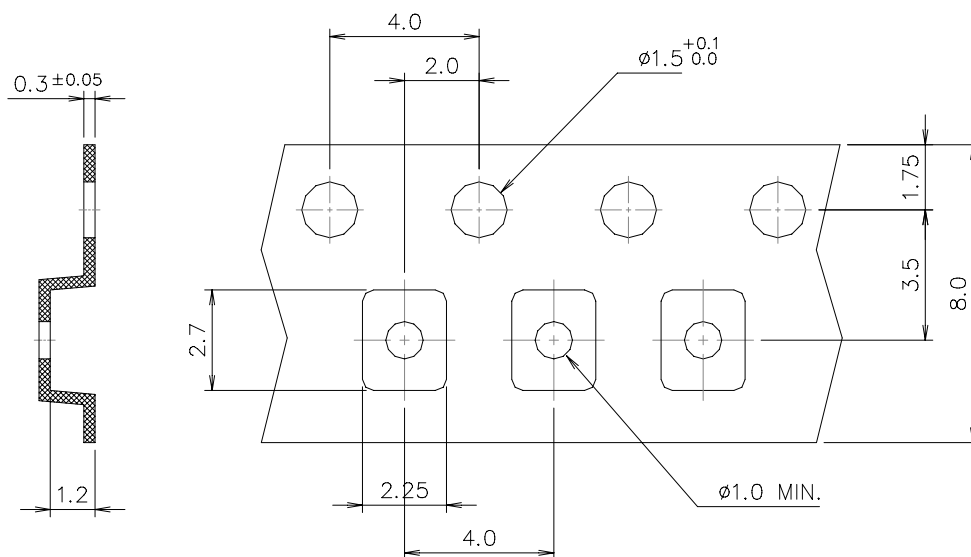


## Date Code Table

|      |      |      |      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| WK01 | WK02 | WK03 | WK04 | WK05 | WK06 | WK07 | WK08 | WK09 | WK10 | WK11 | WK12 | WK13 |
| A    | B    | C    | D    | E    | F    | G    | H    | I    | J    | K    | L    | M    |
| WK14 | WK15 | WK16 | WK17 | WK18 | WK19 | WK20 | WK21 | WK22 | WK23 | WK24 | WK25 | WK26 |
| N    | O    | P    | Q    | R    | S    | T    | U    | V    | W    | X    | Y    | Z    |
| WK27 | WK28 | WK29 | WK30 | WK31 | WK32 | WK33 | WK34 | WK35 | WK36 | WK37 | WK38 | WK39 |
| a    | b    | c    | d    | e    | f    | g    | h    | i    | j    | k    | l    | m    |
| WK40 | WK41 | WK42 | WK43 | WK44 | WK45 | WK46 | WK47 | WK48 | WK49 | WK50 | WK51 | WK52 |
| n    | o    | p    | q    | r    | s    | t    | u    | v    | w    | x    | y    | z    |

**Product Code Table:**

| Year         | 2007 | 2008 |
|--------------|------|------|
|              | 2009 | 2010 |
|              | 2011 | 2012 |
|              | 2013 | 2014 |
| Product code | X    | X    |

**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.

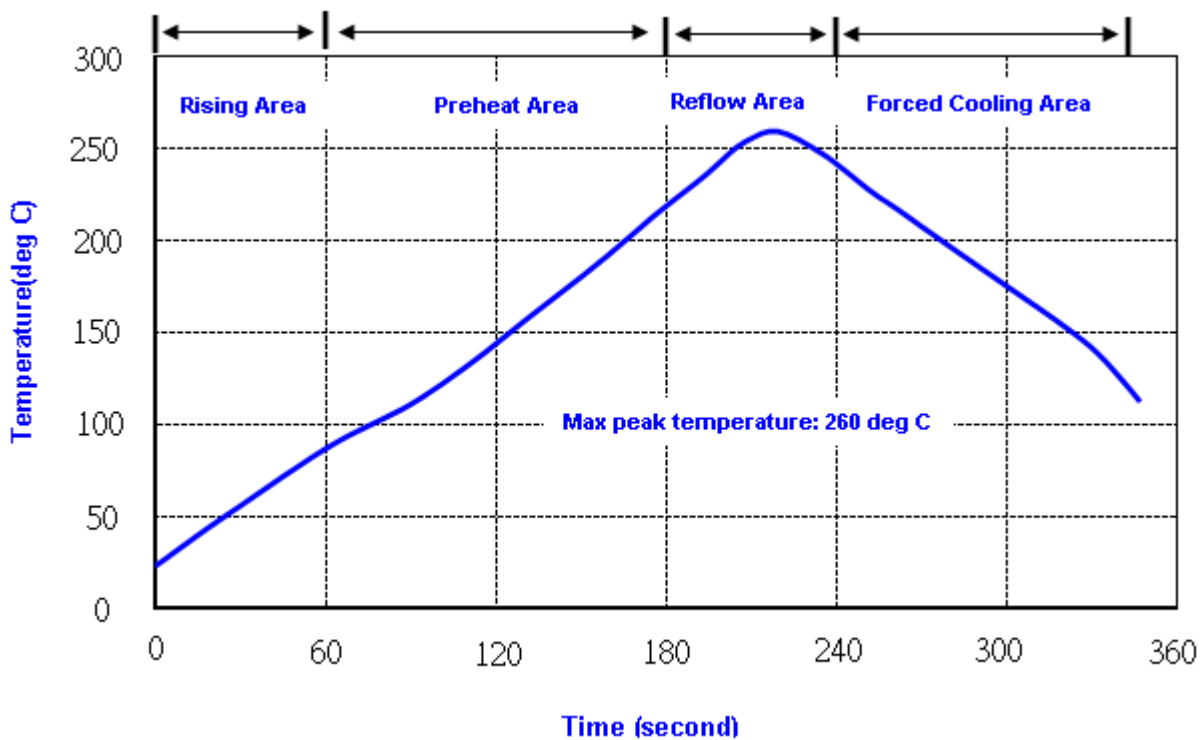
## Packing Quantity/Packing:

3K pcs maximum per reel



Deliver package carton  
 1. L36xW35xH21cm-10 reel max.  
 2. L38xW36xH32cm-15 reel max.

## Reflow Profile:



Note: 1. Max peak temperature: 260+/-5 deg C; Time: 10+/-2 sec

2. Temperature: 217+/-5 deg C; Time: 90~100 sec

TAI-SAW TECHNOLOGY CO., LTD.

**TST DCC**  
Release document

## Reliability Specifications

| Test name                                | Test process / method                                                                                                                                                         | Reference standard                           |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| <b>Mechanical characteristics</b>        |                                                                                                                                                                               |                                              |
| resistance to Soldering heat (IR reflow) | Temp./ Duration : 260°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 55 Hz<br>Sweep period : 1.0 minute<br>Vibration directions : 3 mutually perpendicular<br>Duration : 2 hr / direc. | MIL-STD 202F<br>method 201A                  |
| Mechanical Shock                         | directions : 3 impacts per axis<br>Acceleration : 3000g's, +20/-0 %<br>Duration : 0.3 ms (total 18 shocks)<br>Waveform : Half-sine                                            | MIL-STD 202F<br>method 213C                  |
| Solderability                            | Solder Temperature:265±5°C<br>Duration time: 5±0.5 seconds.                                                                                                                   | MIL-STD 883G<br>method 2003                  |
| <b>Environmental characteristics</b>     |                                                                                                                                                                               |                                              |
| Thermal Shock                            | Heat cycle conditions<br>-55 °C (30min) ↔ 125 °C (30min)<br>* cycle time : 10 times                                                                                           | MIL-STD 883G<br>method 1010.7                |
| Humidity test                            | Temperature : 70 ± 2 °C<br>Relative humidity : 90~95%<br>Duration : 96 hours                                                                                                  | MIL-STD 202F<br>method 103B                  |
| Dry heat ( Aging test )                  | Temperature : 125 ± 2 °C<br>Duration : 168 hours                                                                                                                              | MIL-STD 883G<br>method 1008.2<br>condition C |
| PCT test                                 | Pressure: 2.06kg/cm <sup>2</sup> (2.03*10 <sup>5</sup> pa)<br>Temperature : 121 ± 2 °C<br>Relative humidity : 100%<br>Duration : 24 hours                                     | EIAJED-4701-3<br>B-123A                      |