



TAI-SAW TECHNOLOGY CO., LTD.

No. 3, Industrial 2nd Rd., Ping-Chen Industrial District,
Taoyuan, 324, Taiwan, R.O.C.

TEL: 886-3-4690038 FAX: 886-3-4697532

E-mail: tstsales@mail.taisaw.com Web: www.taisaw.com

Approval Sheet For Product Specification

Issued Date: 8/25/2008 (REV. NO: 2)

Product Name: SMD 2.5x2.0 32.0MHz Crystal Unit

TST Parts No.: TZ1213B

Customer Parts No. : _____

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

Checked by: Kelly Huang *Kelly Huang*

Approval by: Robert Chang *Robert Chang*

Date: 8/25/2008



TAI-SAW TECHNOLOGY CO., LTD.
SMD 2.5x2.0 32.0MHz Crystal Unit

MODEL NO.: TZ1213B

REV. NO.: 2

Revise:

| Rev. | Rev. Page | Rev. Account | Date | Ref. No. | Reviser |
|------|-----------|----------------------|----------|------------|-------------|
| 2 | 4 | Changed marking Rule | 8/25/08' | ECN2008118 | Kelly Huang |



TAI-SAW TECHNOLOGY CO., LTD.

SMD 2.5x2.0 32.0MHz Crystal Unit

MODEL NO.: TZ1213B

REV. NO.: 2

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

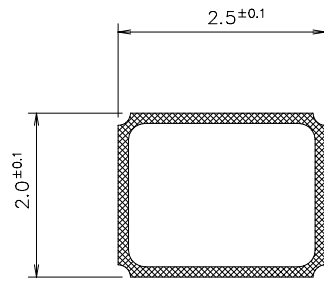
Description and Applications:

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

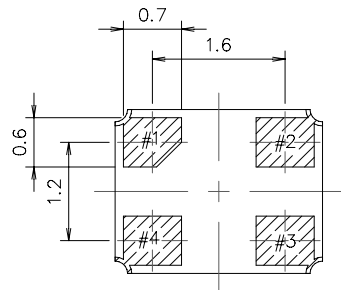
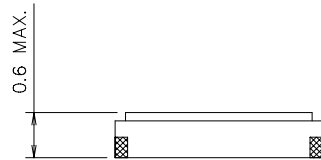
Electrical Specifications:

| TZ1213B | Specification |
|--|---|
| Nominal Frequency | 32.000000 MHz |
| Mode of Oscillation | Fundamental |
| Storage Temperature Range | -40°C to +85°C |
| Operating Temperature Range | -40°C to +85°C |
| Frequency Stability over Operating Temperature Range | +/-20 ppm (referred to the value at 25°C) |
| Frequency Make Tolerance (FL) | +/-10 ppm @ 25°C +/- 3°C |
| Equivalent Series Resistance (ESR) | 60 Ω max |
| Nominal Drive Level | 10 uW max. |
| Shunt Capacitance (Co) | 5.0 pF max |
| Load Capacitance (CL) | 12 pF |
| Insulation Resistance | 500 MΩ min./DC 100V |
| Marking | Laser Marking |
| Unit Weight | 9.5 +/-0.5mg |

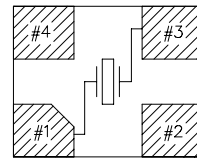
Mechanical Dimensions (mm):



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

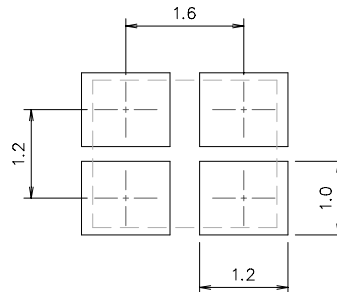


Internal Connections (Top View)



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

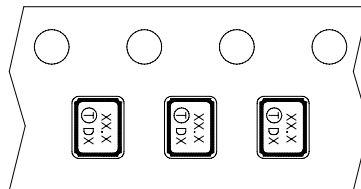
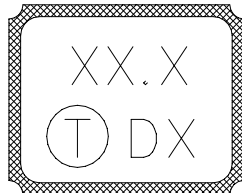
Recommended Land Pattern: (unit: mm)



Marking:

Line 1: Frequency (32.0)

Line 2: TST Logo + Date Code + Product Code



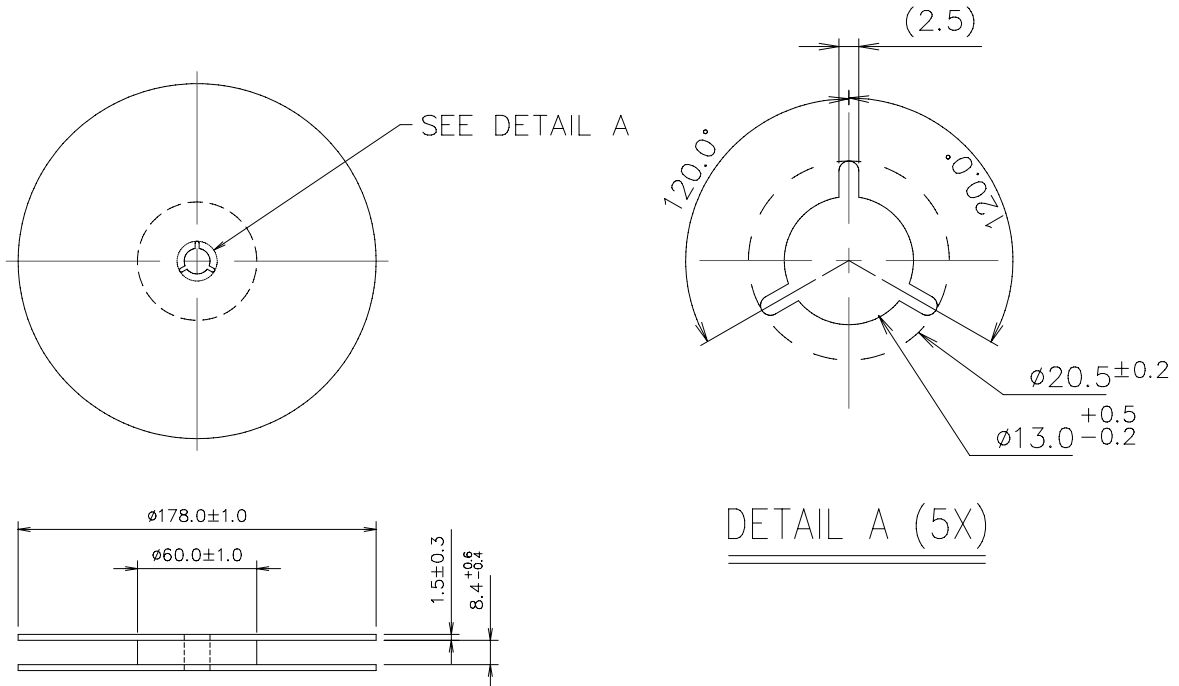
Date Code Table

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

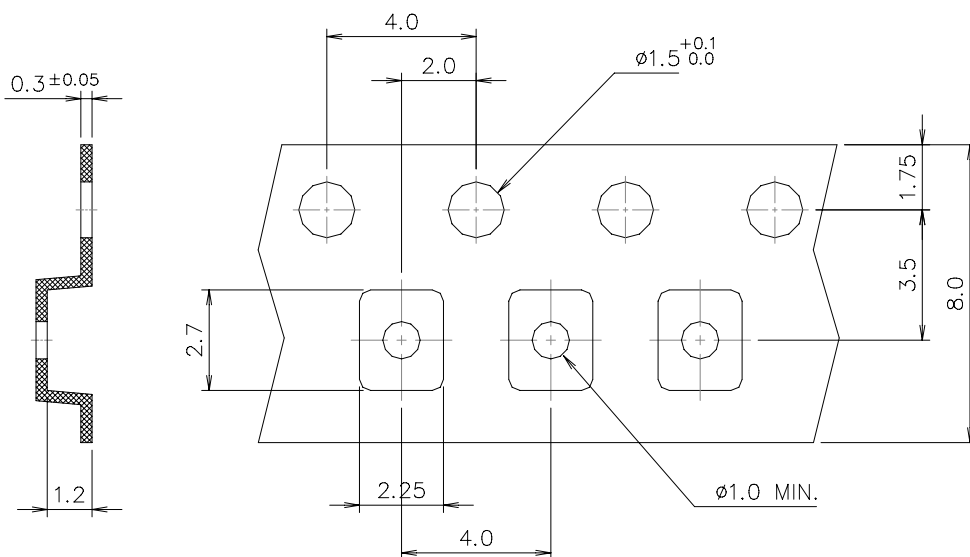
Product Code Table:

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

Reel Dimensions (mm):



Tape Dimensions (mm):

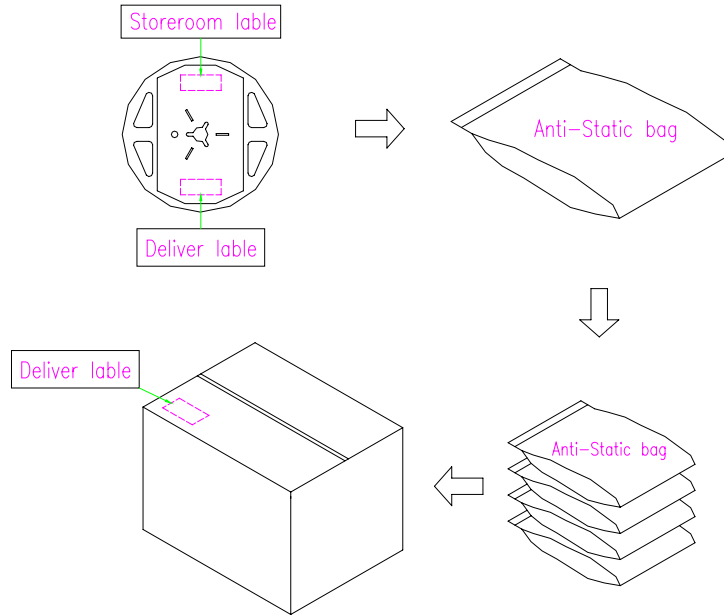


[NOTE]:

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

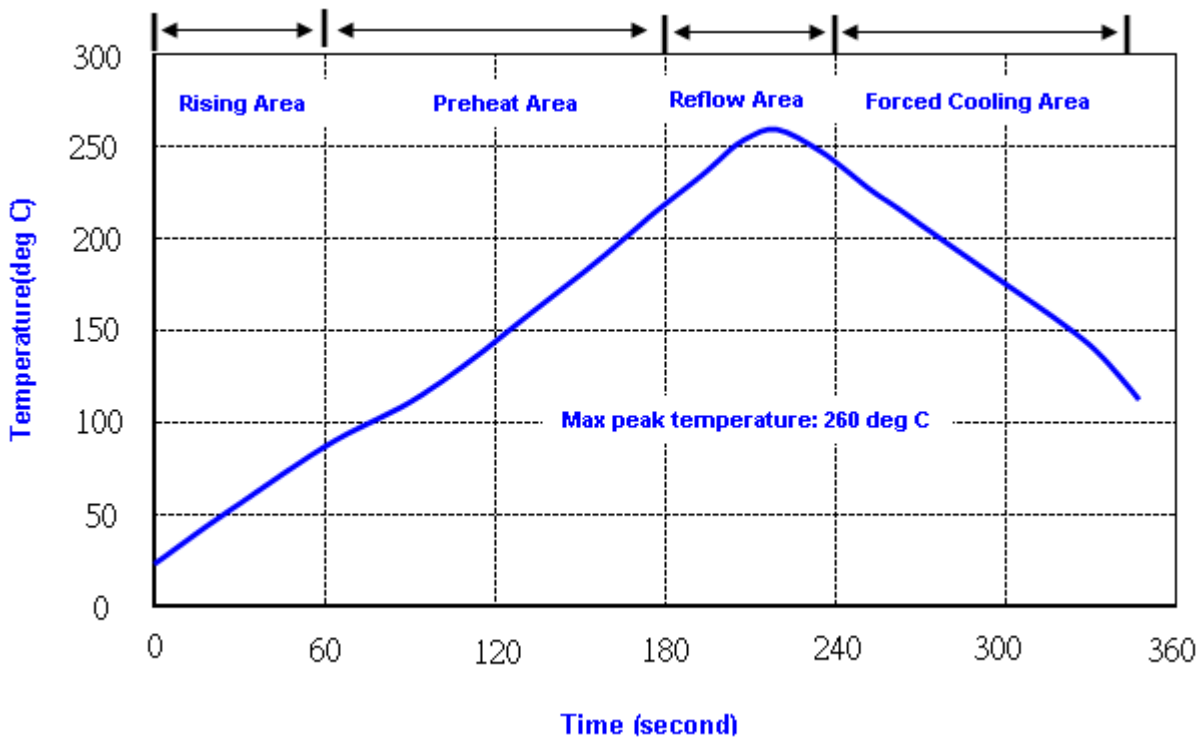
Packing Quantity/Packing:

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

Reliability Specifications

| Test name | Test process / method | Reference standard |
|--|---|--|
| Mechanical characteristics | | |
| resistance to Soldering heat (IR reflow) | Temp./ Duration : 260°C /10sec ×2 times Total time : 4min.(IR-reflow) | EIAJED-4701 -300(301)M(II) |
| Vibration | Total peak amplitude : 1.5mm Vibration frequency : 10 to 55 Hz Sweep period : 1.0 minute Vibration directions : 3 mutually perpendicular Duration : 2 hr / direc. | MIL-STD 202F method 201A |
| Mechanical Shock | directions : 3 impacts per axis Acceleration : 3000g's, +20/-0 % Duration : 0.3 ms (total 18 shocks) Waveform : Half-sine | MIL-STD 202F method 213C |
| Solderability | Solder Temperature:265±5°C Duration time: 5±0.5 seconds. | MIL-STD 883G method 2003 |
| Environmental characteristics | | |
| Thermal Shock | Heat cycle conditions -55 °C (30min) ↔ 125 °C (30min) * cycle time : 10 times | MIL-STD 883G method 1010.7 |
| Humidity test | Temperature : 70 ± 2 °C Relative humidity : 90~95% Duration : 96 hours | MIL-STD 202F method 103B |
| Dry heat (Aging test) | Temperature : 125 ± 2 °C Duration : 168 hours | MIL-STD 883G method 1008.2 condition C |
| PCT test | Pressure: 2.06kg/cm ² (2.03*10 ⁵ pa) Temperature : 121 ± 2 °C Relative humidity : 100% Duration : 24 hours | EIAJED-4701-3 B-123A |

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