

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

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Product Specifications Approval Sheet

Product Description: Crystal Unit SMD 2.5x2.0 24.0MHz

TST Part No.: TZ3538DAAE31

Customer Part No.: _____

Customer signature required

Company: _____

Division: _____

Approved by : _____

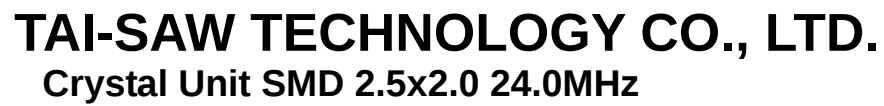
Date: _____

Checked by: _____ Glen Peng 

Approved by: _____ Yifan Chen 

Date: _____ 03/25/2024

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.



Rev.	Rev. Page	Rev. Account	Date	Ref. No.	Revised by
1	N/A	Initial release	03/25/24'	N/A	Glen Peng



MODEL NO.: TZ3538DAAE31

REV. NO.: 1

Features:

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

RoHS Compliant
Lead free
Lead-free soldering

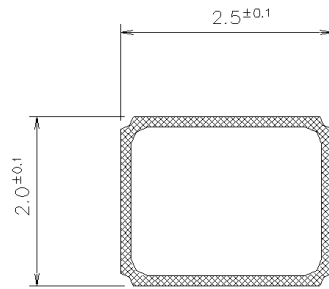
Description and Applications:

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

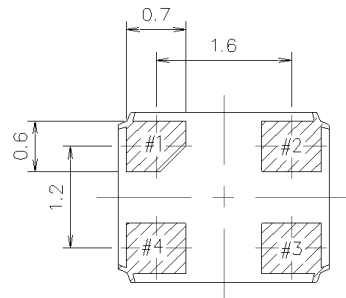
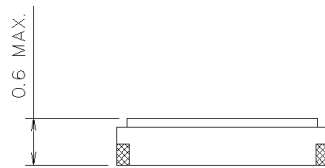
Electrical Specifications:

TZ3538DAAE31	Specification
Nominal Frequency	24.000000 MHz
Mode of Oscillation	Fundamental
Storage Temperature Range	-40°C to +125°C
Operating Temperature Range	-40°C to +105°C
Frequency Stability over Operating Temperature Range	+/-25 ppm (referred to the value at 25°C)
Frequency Make Tolerance (FL)	+/-20 ppm @ 25°C +/- 3°C
Equivalent Series Resistance (ESR)	60 Ω max
Nominal Drive Level	10uW typical and 200uW max
Shunt Capacitance (Co)	3.0 pF max
Load Capacitance (CL)	18 pF
Aging	+/-2ppm/ 1 st year
Insulation Resistance	500 MΩ min./DC 100V
Marking	Laser Marking
Unit Weight	9.5 +/-0.5mg

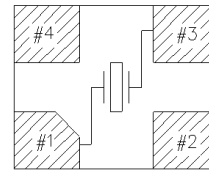
Mechanical Dimensions (mm): Base



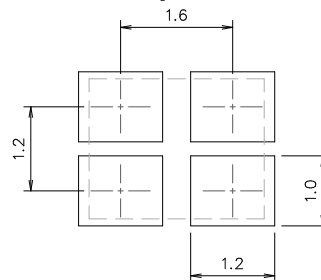
	Pin Connection
#1 pin	IN/OUT
#2 pin	GND
#3 pin	IN/OUT
#4 pin	GND



Internal Connections
(Top View)



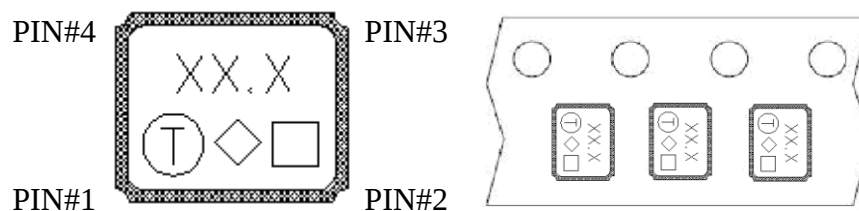
Recommended Land Pattern: (unit: mm)



Marking:

Line 1: Frequency (24.0)

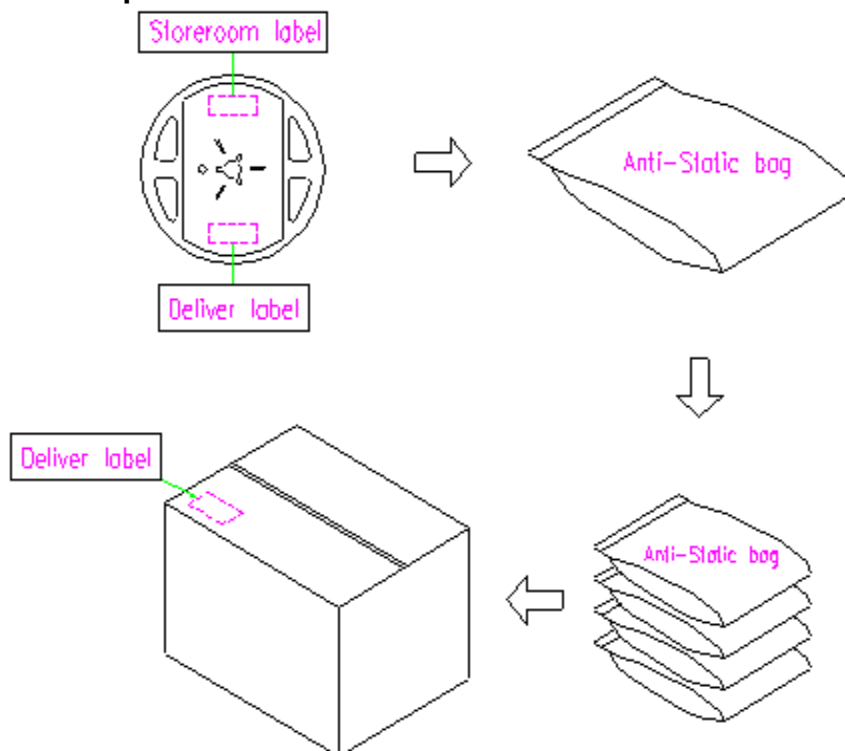
Line 2: TST Logo + Date Code (◇) + Product Code (□ is TST internal tracking code, could be a~z and A~Z, 1 or 2 letters, underline or no underline)



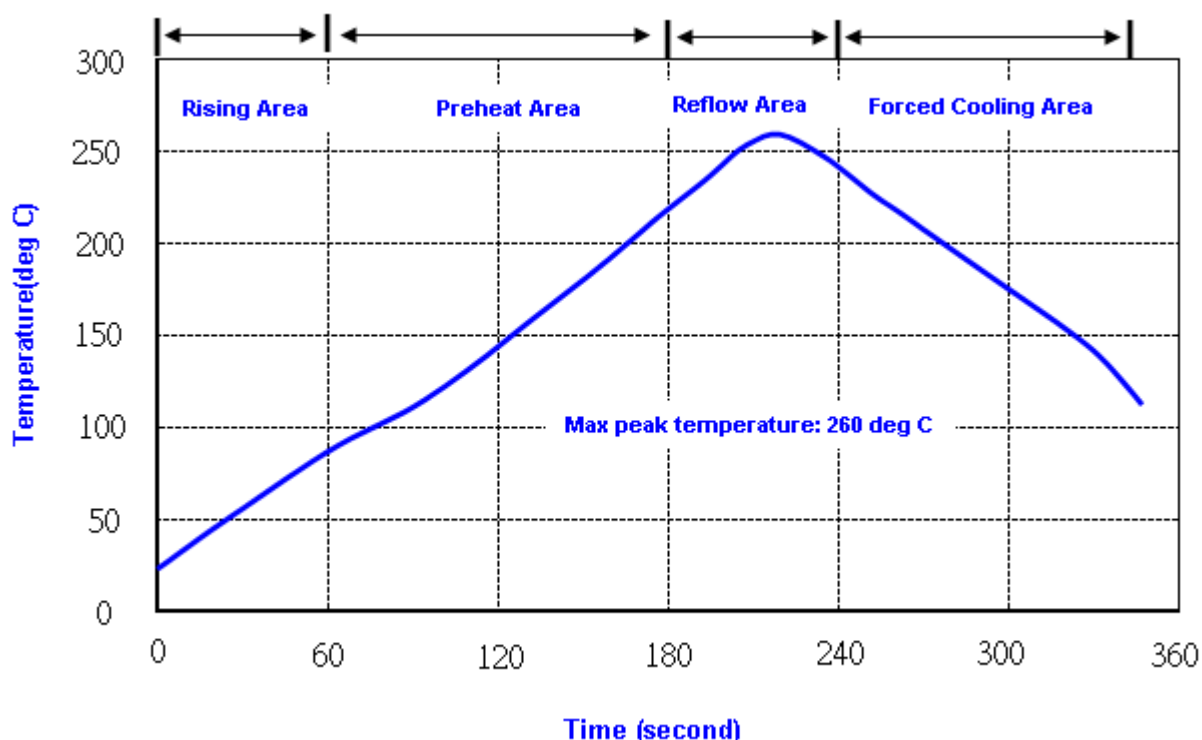
The inner vision of PIN#1, PIN#4 side is XTAL blank mounting pad.

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

Test name	Test process / method	Reference standard
Mechanical characteristics		
resistance to Soldering heat (IR reflow)	Temp./ Duration : 265°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 2000 Hz Sweep period : 20 minute Vibration directions : 3 mutually perpendicular Duration : 2 hr / direc.	MIL-STD 202G method 204
Mechanical Shock	directions : 3 impacts per axis Acceleration : 3000g's, +20/-0 % Duration : 0.3 ms (total 18 shocks) Waveform : Half-sine	MIL-STD 202G method 213
Solderability	Solder Temperature:265±5°C Duration time: 5±0.5 seconds.	J-STD-002
Environmental characteristics		
Thermal Shock	Heat cycle conditions -40 °C (30min) ↔ 85 °C (30min) * cycle time : 10 times	MIL-STD 883G method 1010.8
Humidity test	Temperature : 85 ± 2 °C Relative humidity : 85% Duration : 96 hours	MIL-STD 202G method 103
Dry heat (Aging test)	Temperature : 125 ± 2 °C Duration : 168 hours	MIL-STD 202G method 108A
Cold resistance (Low Temp Storage)	Temperature : -40 ± 2 °C Duration : 96 hours	IEC 60068-2-1