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

Product Specifications Approval Sheet

Product Description: Crystal Unit SMD 3.2x2.5 12.00MHz

TST Part No.: TZ3478D

Customer Part No.:_____

Customer signature required

Company:_____

Division:_____

Approved by :_____

Date:_____

Checked by: Chia Haur Rau CH

Approved by: Kelly Huang Kelly Huang

Date: 02/26/2019

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.

TAI-SAW TECHNOLOGY CO., LTD.

Crystal Unit SMD 3.2x2.5 12.00MHz

MODEL NO.: TZ3478D REV. NO.: 1

Revise:

Rev.	Rev. Page	Rev. Account	Date	Ref. No.	Revised by
1	N/A	Initial release	02/26/19’	N/A	Chia Haur Rau

TAI-SAW TECHNOLOGY CO., LTD.

Crystal Unit SMD 3.2x2.5 12.00MHz

MODEL NO.: TZ3478D REV. NO.: 1

Features:

RoHS Compliant
Lead free
Lead-free soldering

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

Description and Applications:

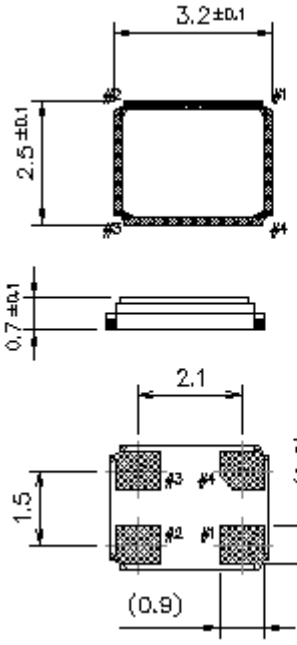
Surface mount 3.2mmx2.5mm crystal unit for customer for use in wireless communications devices, especially for a need of ultra miniature package for mobility.

Electrical Specifications:

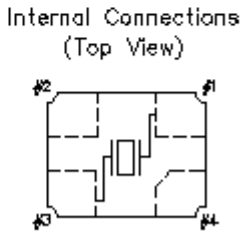
TZ3478D	**Specification**
Nominal Frequency	12.000000 MHz
Mode of Oscillation	Fundamental
Storage Temperature Range	-40°C to +105°C
Operating Temperature Range	-40°C to +85°C
Frequency Stability over Operating Temperature	+/- 20 ppm (referred to the value at 25°C)
Frequency Make Tolerance (FL)	+/- 10 ppm @ 25°C +/- 3°C
Equivalent Series Resistance (ESR)	100 Ω max.
Nominal Drive Level	50uW typical and 100uW max
Shunt Capacitance (Co)	3.0 pF max
Load Capacitance (CL)	12 pF
Aging	+/-2ppm/year
Insulation Resistance	500 MΩ min./DC 100V
Marking	Laser Marking
Unit Weight	0.017+/-0.005 g

Mechanical Dimensions (mm):

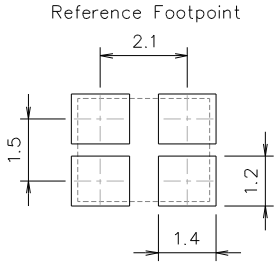
Base



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



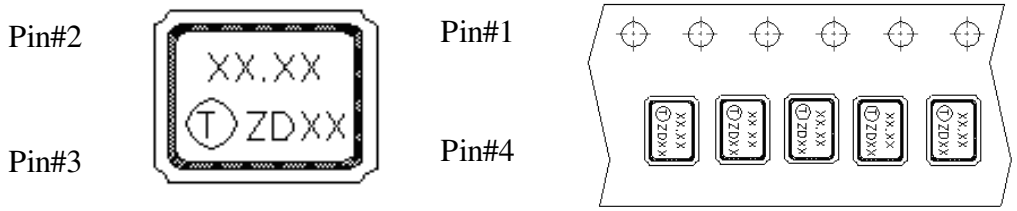
Recommended Land Pattern: (unit: mm)



Marking:

Line 1: Frequency (12.00)

Line 2: TST Logo + Crystal Product Code + Date Code + Traceability code (1 or 2 letters, underline or no underline)



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

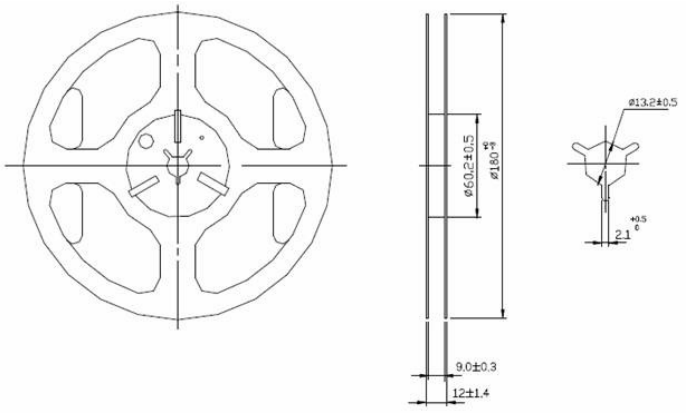
Product Code Table

Year	2013	2014	2015	2016
	2017	2018	2019	2020
	2021	2022	2023	2024
product code	Z	z	Z	z

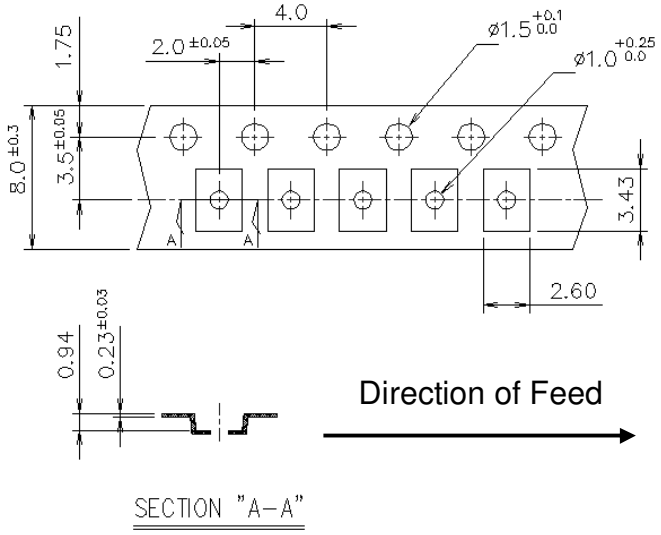
Date Code Table

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

Reel Dimensions (mm):



Tape Dimensions (mm):



[NOTE]

1 UNIT : mm.

2 UNLESS OTHERWISE SPECIFIED TOLERANCEON DIM. +/-0.1mm.

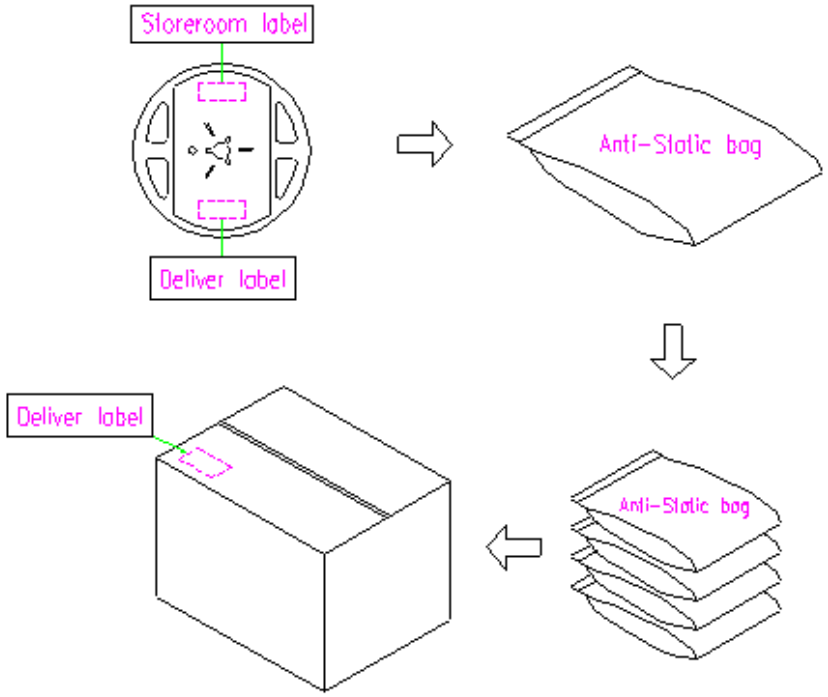
3 MATERIAL : CONDUCTIVE POLYSTYRENE.

4 COLOR : BLACK.

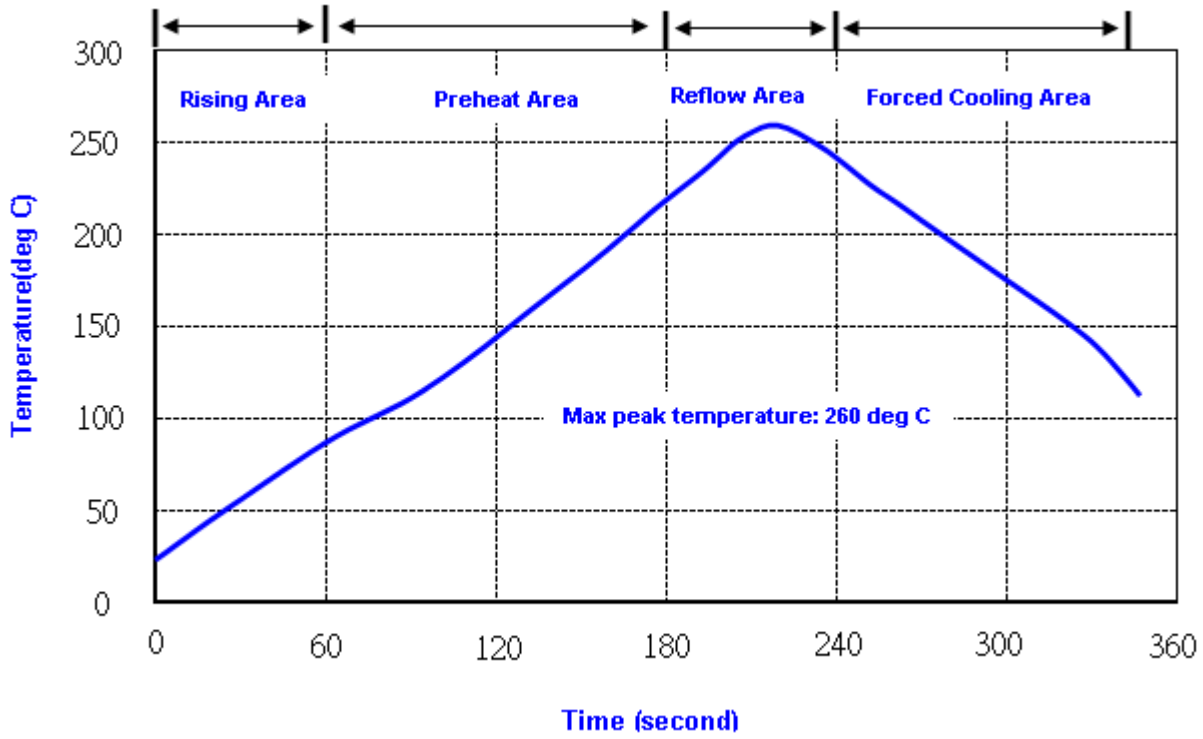
5 10 PITCHES CUMULATIVETOLERANCE +/-0.2mm.

Packing Quantity/Packing:

3K pcs maximum per reel



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 : 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℃ Duration time: 5±0.5 seconds.	J-STD-002
Environmental characteristics		
Thermal Shock	Heat cycle conditions -40 ℃ (30min) ←→ 85 ℃ (30min) * cycle time : 10 times	MIL-STD 883G method 1010.8
Humidity test	Temperature : 85 ± 2 ℃ Relative humidity : 85% Duration : 96 hours	MIL-STD 202G method 103
Dry heat (Aging test)	Temperature : 125 ± 2 ℃ Duration : 168 hours	MIL-STD 202G method 108A
Cold resistance (Low Temp Storage)	Temperature : -40 ± 2 ℃ Duration : 96 hours	IEC 60068-2-1