



TAI-SAW TECHNOLOGY CO., LTD.

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Product Specifications Approval Sheet

Product Description: Crystal Unit SMD 1.2x1.0 48MHz

TST Part No.: TZ3465A

Customer Part No.: _____

Customer signature required

Company: _____

Division: _____

Approved by : _____

Date: _____

Checked by: _____ Yifan Chen *Yifan*

Approved by: _____ Kelly Huang *Kelly Huang*

Date: _____ 11/13/2019

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.



MODEL NO.: TZ3465A

REV. NO.: 2

Revise:

Rev.	Rev. Page	Rev. Account	Date	Ref. No.	Revised by
1	N/A	Initial release	07/30/19'	N/A	Yifan Chen
2	4	Updated Base drawing	11/13/19'	ECN-201900502	Yifan Chen



TAI-SAW TECHNOLOGY CO., LTD.

Crystal Unit SMD 1.2x1.0 48MHz

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MODEL NO.: TZ3465A

REV. NO.: 2

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

HiQ Xtal

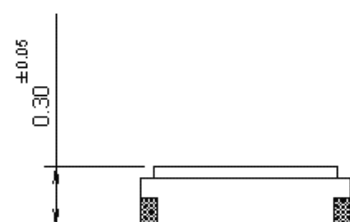
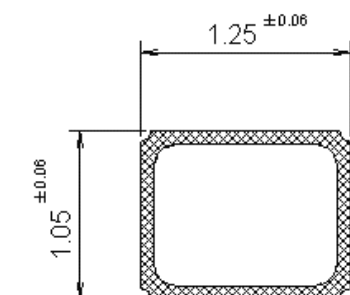
Description and Applications:

Surface mount 1.2mmx1.0mm crystal unit for use in wireless communications devices, especially for a need of ultra miniature package for mobility.

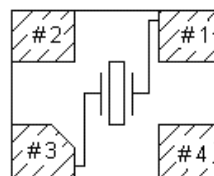
Electrical Specifications:

TZ3465A	Specification			
Characteristic	Min	Nom	Max	Unit
Nominal Frequency		48.000000		MHz
Mode of Oscillation		Fundamental		°C
Storage Temperature Range	-40		125	°C
Operating Temperature Range	-40		105	°C
Frequency Stability over Operating Temperature Range -40°C~100°C (referred to the value at 25°C)	-15		13	ppm
Frequency Make Tolerance(@ 25°C +/- 3° C)	-1		5	ppm
IR Reflow(2 times)	-1		1	ppm
Aging(5 years)	-2		0	ppm
Frequency perturbation(ppm)	-1		1	ppm
Total Budget(ppm)	-20		20	ppm
Equivalent Series Resistance (ESR)	10	17	25	Ω
Nominal Drive Level	0.01	200	300	uW
Motional Inductance	4.3	5.3	7.0	mH
Load Capacitance (CL) (Measure by Saunders(S&A) Network Analyzer 250B)		9.9		pF
Motional Capacitance	1.5	2.5	4.0	fF
Shunt Capacitance	0.3	0.7	1.0	pF
Insulation Resistance(DC 100V)	500			MR

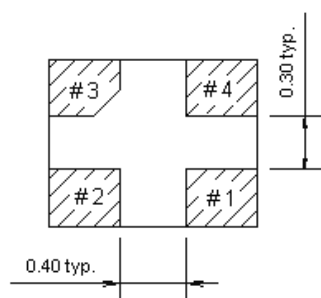
Mechanical Dimensions (mm):



Internal Connections
(Top View)

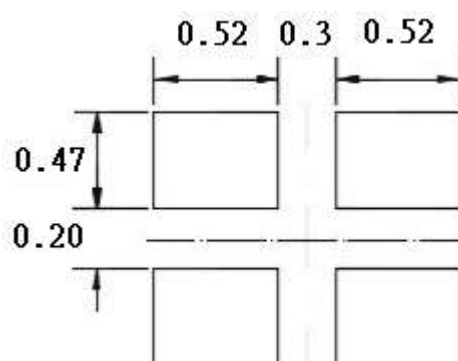


[NOTE] #2 =NC, #4 is connected with a metal cover



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

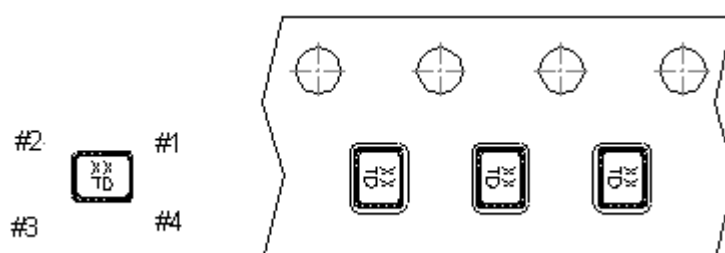
Recommended Land Pattern: (unit: mm)



Marking:

Line 1: XX; Frequency (48)

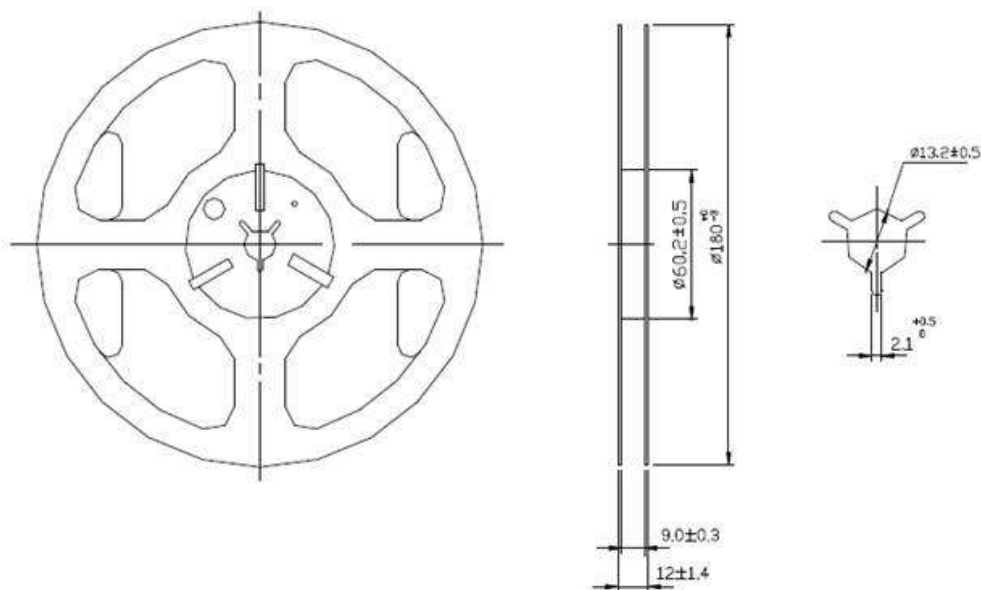
Line 2: T; Traceable Code + D; date Code of Year/Month



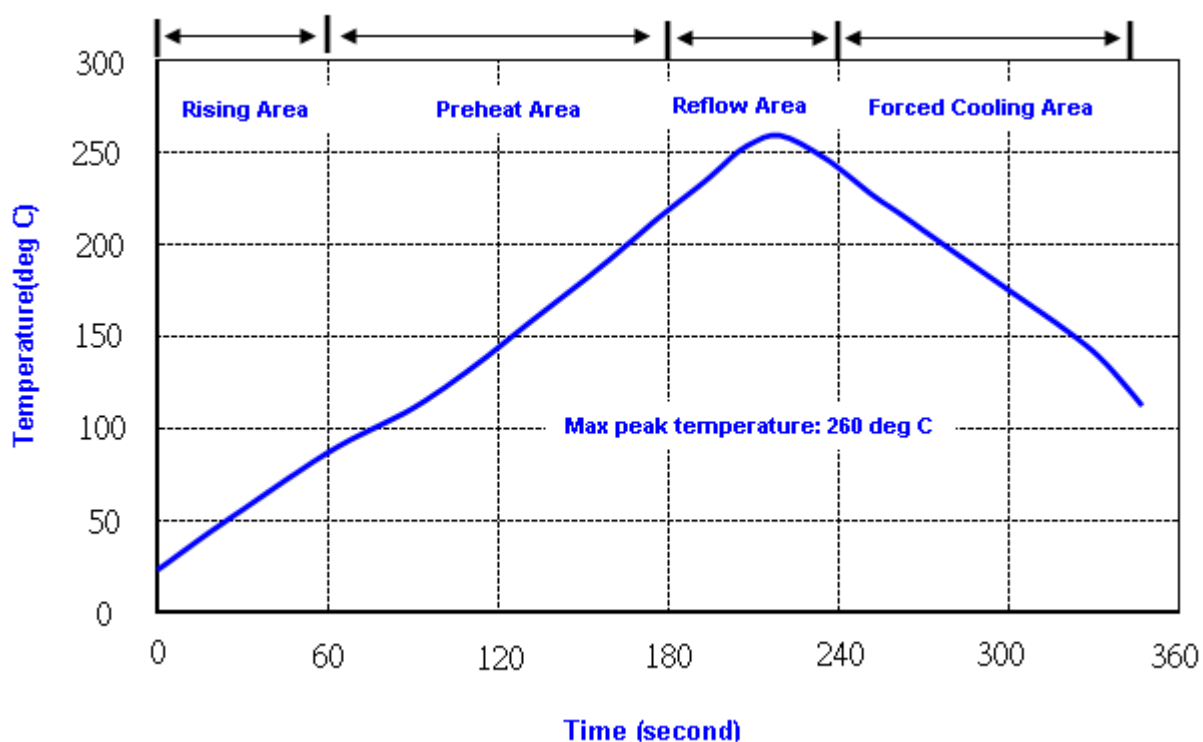
Date Code Table: Year/Month

Year/Month	1	2	3	4	5	6	7	8	9	10	11	12
2012	a	b	c	d	e	f	g	h	i	j	k	m
2013	n	p	q	r	s	t	u	v	w	x	y	z
2014	A	B	C	D	E	F	G	H	J	K	L	M
2015	N	P	Q	R	S	T	U	V	W	X	Y	Z
2016	a	b	c	d	e	f	g	h	i	j	k	m
2017	n	p	q	r	s	t	u	v	w	x	y	z
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):



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