



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 2.0x1.6 37.4MHz

TST Part No.: TZ2901C

Customer Part No.: _____

Customer signature required

Company: _____

Division: _____

Approved by : _____

Date: _____

Checked by: _____ Chia Haur Rau *CH*

Approved by: _____ Kelly Huang *Kelly Huang*

Date: _____ 04/26/2021

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.



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Crystal Unit SMD 2.0x1.6 37.4MHz

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MODEL NO.: TZ2901C

REV. NO.: 4

Revise:

Rev.	Rev. Page	Rev. Account	Date	Ref. No.	Revised by
1	N/A	Initial release	04/17/18'	N/A	Chia Haur Rau
2	3	Storage Temperature Range change to -40°C to +125°C	05/04/18'	ECN-201800205	Chia Haur Rau
3	8	Renew reliability specications	05/06/19'	ECN-201900214	Chia Haur Rau
4	3,4	ESR change to 60ohm max and Nominal Drive Level change to 200uW max, Renew marking rule.	04/26/21'	ECN-202100206	Chia Haur Rau



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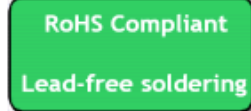
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MODEL NO.: TZ2901C

REV. NO.: 4

Features:

- Surface Mount Hermetic Package
- Excellent Reliability Performance
- Good Frequency Perturbation and Stability over temperature
- Ultra Miniature Package
- AEC-Q200 compliance
- Moisture Sensitivity Level (MSL) : Level-1



Description and Applications:

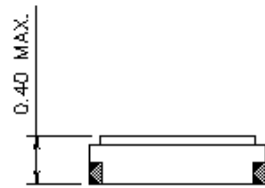
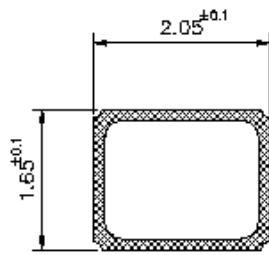
Surface mount 2.0mmx1.6mm crystal unit for use in wireless communications devices, especially for a need of ultra miniature package for mobility.

Electrical Specifications:

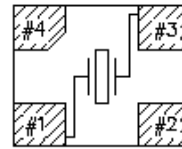
TZ2901C	Specification
Nominal Frequency	37.400000 MHz
Mode of Oscillation	Fundamental
Storage Temperature Range	-40°C to +125°C
Operating Temperature Range	-40°C to +85°C
Frequency Stability over Operating Temperature Range	+/-13 ppm (referred to the value at 25°C)
Frequency Make Tolerance (FL)	+/-7 ppm @ 25°C +/- 3°C
Equivalent Series Resistance (ESR)	60 Ω max
Nominal Drive Level	75uW typical and 200uW max
Shunt Capacitance (Co)	3.0 pF max
Load Capacitance (CL)	8 pF
Aging	+/-2ppm/year
Insulation Resistance	500 M Ω min./DC 100V
Marking	Laser Marking
Unit Weight	5.7mg+/-0.5mg

Mechanical Dimensions (mm):

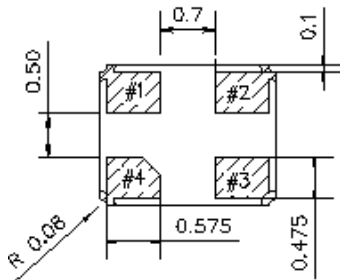
Base



Internal Connections
(Top View)

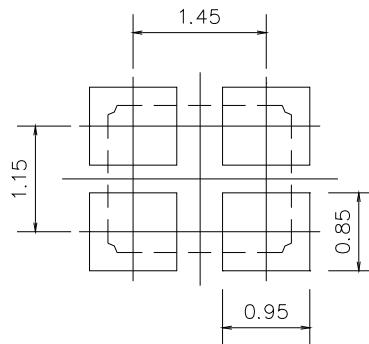


[NOTE] #2, #4 is connected with a metal cover



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

Recommended Land Pattern: (unit: mm)

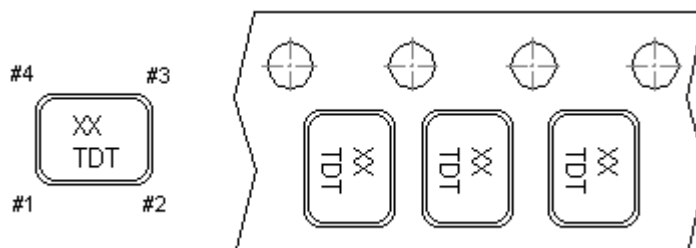


Recommended Land Pattern

Marking:

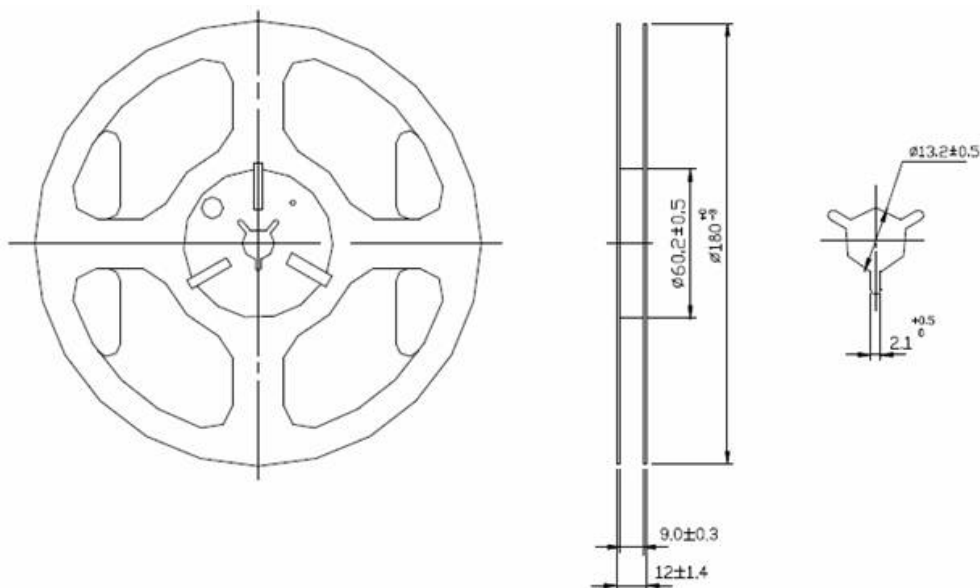
Line 1: XX; Frequency (37)

Line 2: T; Traceable Code + D; date Code of Year/Month+ T ; Traceability code (1 or no letter)

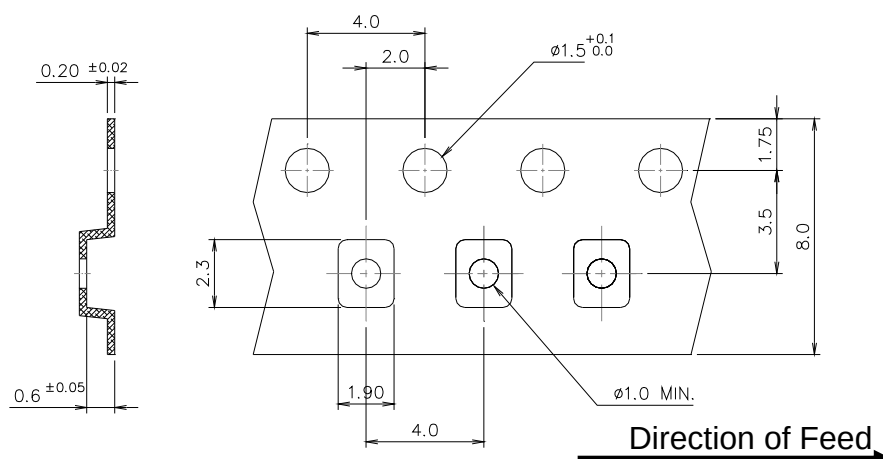


Date Code Table: Year/Month

Year/Month	1	2	3	4	5	6	7	8	9	10	11	12
2009	n	p	q	r	s	t	u	v	w	x	y	z
2010	A	B	C	D	E	F	G	H	J	K	L	M
2011	N	P	Q	R	S	T	U	V	W	X	Y	Z
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

Reel Dimensions (mm):

Tape Dimensions (mm):

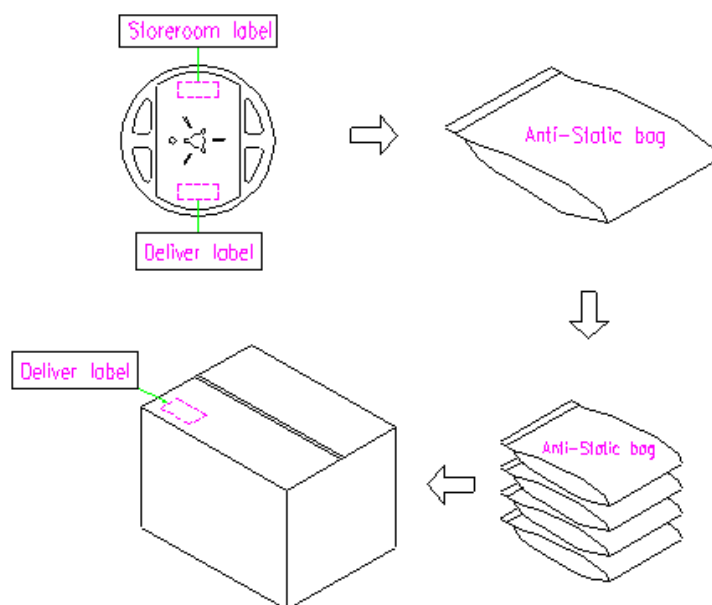


[NOTE]:

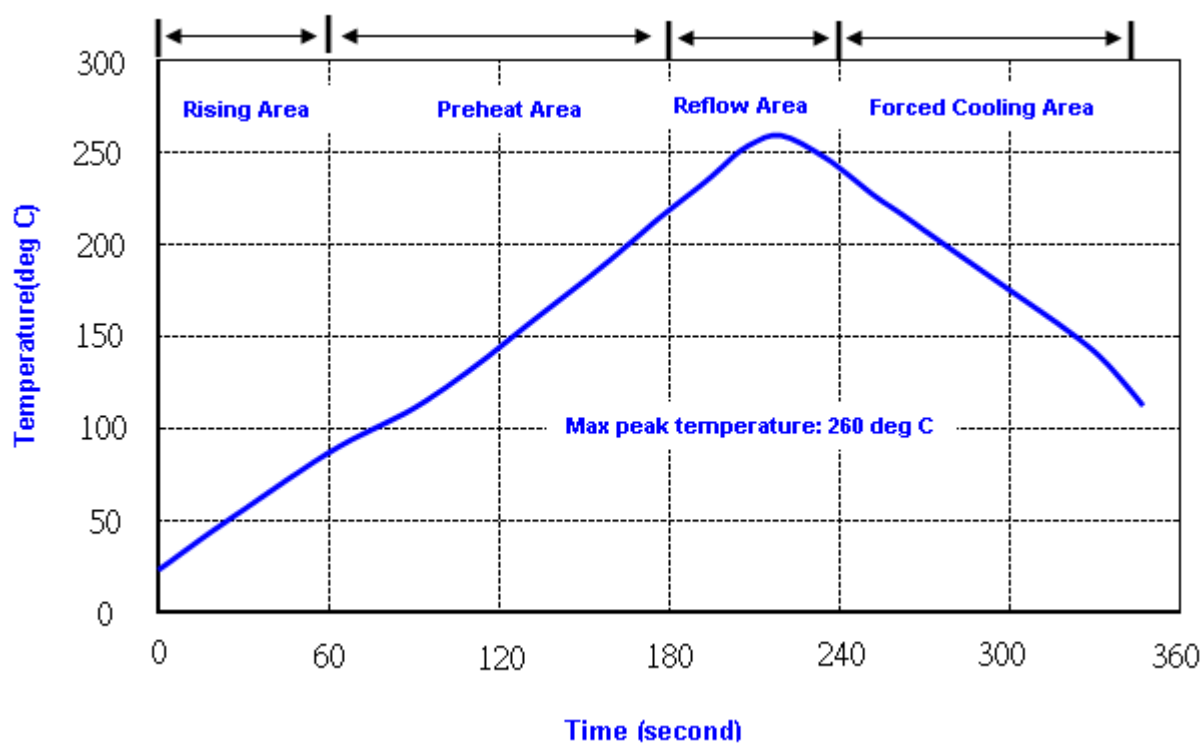
1. Unless otherwise specified tolerance on dimension ± 0.1 mm.
2. Material: conductive polystyrene with color black.
3. 10 pitch cumulative tolerance ± 0.2 mm.

Packing Quantity/Packing:

3K pcs maximum per reel



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 (AEC-Q200)

Test name	Test process / method	Acceptance criteria	Reference standard
Mechanical characteristics			
resistance to Soldering heat (IR reflow)	Temp./ Duration : 265°C /10sec Total time : 4min.(IR-reflow) 3 times	After test with following condition ,specimens would be kept at room temperature for 2 hour , and the specimens shall meet the electrical specifications , external visual inspection (Fs±2ppm, Rs±5 Ohm)	EIA/JED-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.	The specimens shall meet the electrical specifications (Fs±3ppm, Rs±5 Ohm)	MIL-STD 202G method 204
Mechanical Shock	directions : 3 impacts per axis Acceleration : 1500g's, +20/-0 % Duration : 0.3 ms (total 18 shocks) Waveform : Half-sine	The specimens shall meet the electrical specifications, external visual inspection (Fs±3ppm, Rs±5 Ohm)	MIL-STD 202G method 213
Solderability	Solder Temperature: 245±5°C Duration time: 5±0.5 seconds.	95% or more of the immersed surface shall be covered with solder (use 10~20X magnification) (Fs±3ppm, Rs±5 Ohm)	J-STD-002
Board Flex	60sec minimum holding time. deflection 3mm	After testing , specimens would be kept at room temperature for 2 hour , and the specimens shall meet the electrical specifications (Fs±3ppm, Rs±5 Ohm)	MIL-STD 202G method 108A
Terminal Strength (SMD)	1.8kg, 60+1 second, Check by microscope	After testing , specimens would be kept at room temperature for 2 hour , and the specimens shall meet the electrical specifications (Fs±3ppm, Rs±5 Ohm)	MIL-STD 202G method 108A
Thermal Shock	Heat cycle conditions -55 °C (30min) ↔ 125 °C (30min) * cycle time : 1000 times	After testing , specimens would be kept at room temperature for 2 hour , and the specimens shall meet the electrical specifications, external visual inspection (Fs±3ppm, Rs±5 Ohm)	MIL-STD 883G method 1010.8
Humidity test Bias 5V	Temperature : 85 °C Relative humidity : 85% Duration : 1000 hours	After testing , specimens shall be conditioned at room ambient conditions for not less than 1 hour , and the specimens shall meet the electrical specifications (Fs±3ppm, Rs±5 Ohm)	MIL-STD 202G method 103
Dry heat (Aging test)	Temperature : 125 ± 2 °C Duration : 1000 hours	After testing , specimens would be kept at room temperature for 2 hour , and the specimens shall meet the electrical specifications (Fs±3ppm, Rs±5 Ohm)	MIL-STD 202G method 108A
Dry heat (Aging test) Bias 5V	Temperature : 125 ± 2 °C Duration : 1000 hours	After testing , specimens would be kept at room temperature for 2 hour , and the specimens shall meet the electrical specifications (Fs±3ppm, Rs±5 Ohm)	MIL-STD 202G method 108A
PCT test	Pressure: 2.06kg/cm ² (2.03*10 ⁵ pa) Temperature : 121 ± 2 °C Relative humidity : 100±10% Duration : 24 hours	After testing , specimens shall be conditioned at room ambient conditions for not less than 0.5 hour , and the specimens shall meet the fine leak and gross leak test (Fs±3ppm, Rs±5 Ohm)	EIA/JED-4701-3 B-123A
Operating Temperature	Temp./ Duration : -40~105°C Duration : +/-13 ppm	Parametrically test per lot and sample size requirements, summary to show Min, Max Mean and standard deviation at room as well as min and max operating temperature (delta F/F= +/-13ppm reference to 25C)	User Spec