



TAI-SAW TECHNOLOGY CO., LTD.

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

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Product Specifications Approval Sheet

Product Description: Crystal Oscillator SMD 2.5x2.0 156.25MHz

TST Part No.: TW0658BAAE40

Customer Part No.: _____

Customer signature required

Company: _____

Division: _____

Approved by : _____

Date: _____

Checked by: _____ Yifan Chen

Approved by: _____ Kelly Huang

Date: _____ 01/04/2024

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.



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SMD 2.5x2.0 156.25MHz Crystal Oscillator

MODEL NO.: TW0658BAAE40

REV. NO.: 1.0

Revise:

Rev.	Rev. Page	Rev. Account	Date	Ref. No.	Reviser
1	N/A	Initial release	01/04/24'	N/A	Yifan Chen



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SMD 2.5x2.0 156.25MHz Crystal Oscillator

MODEL NO.: TW0658BAAE40

REV. NO: 1.0

Features:

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

RoHS Compliant
Lead free
Lead-free soldering

Application:

- Supply Voltage LVDS Output
- Option-able stand-by function for output .

Electrical Characteristics:

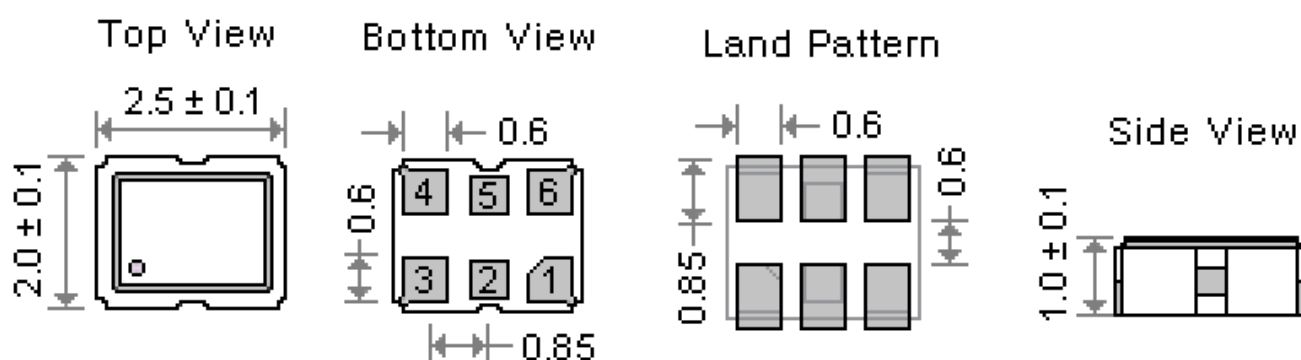
	Parameters	SYM.	Electrical Spec.				Notes
			Min.	Typical	Max.	Unit	
1	Nominal Frequency	FL	156.250000				MHz
2	Holder Type		-				2.5 * 2.0 * 1.0 mm , 6pads , SMD Type
3	Input Voltage	VDD		1.8		V	D.C ± 10 %
4	Output Wave Form						LVDS Differential output
5	Output Voltage High " 1 "	Voh		1.4	1.6	V	RL = 100 ohms
6	Output Voltage Low " 0 "	VoL	0.9	1.1		V	
7	Output Swing	Vos	250	350	450	mV	
8	Frequency Stability	$\Delta f / f_0$	-20		20	ppm	Over Operating Temperature
9	Current Consumption	I _{DD}		22	30	mA	measured with terminating resistors
10	Rise Time & Fall Time	Tr , Tf		0.15	0.3	n Sec.	20% ←→ 80 % of waveform
11	Duty Cycle	tw / t	45		55	%	at 50 % waveform ± 5 %
12	Star -up Time	ST		1	5	m Sec.	
13	Load	RL		100		Ω	between output and complimentary output
14	Operating Temperature	T _{opr}	-40		105	°C	
15	Storage Temperature	T _{stg}	-55		125	°C	
16	Aging	fa	-3		3	ppm	first year

TST DCC

Release document

17	Integrated Phase Jitter	Jrms		50	70	fs	12 KHz to 20 MHz integrated		
19	PhaseNoise (dBc/Hz) [typical] For reference only	Offset	10 Hz	100 Hz	1k Hz	10k Hz	100k Hz	1M Hz	10M Hz
		156.250 MHz	-77	-107	-124	-139	-152	-156	-159
20	OE Control on Pad 1	If VDD * 70% (min.) is applied : Output. Enable Oscillation enable time : 10 ms (max.)							
		If VDD * 30% (max.) is applied : Output Disable Oscillation disable time : 0.2 us (max.) Current consumption is 10 uA max. ($OE \leq 0.3V$)							

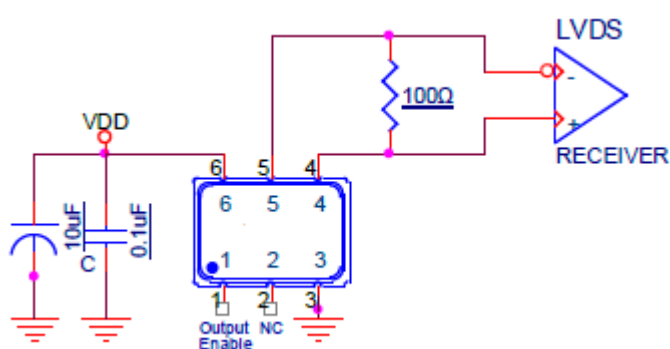
Mechanical Dimensions: (Unit: mm)



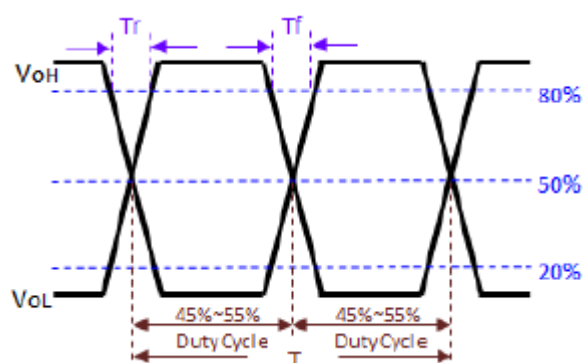
Pad Connections :

Pad 1 : OE Pad 4 : Output Pad 5 : Complementary
 Pad 2 : No Connection Pad 3 : Ground Pad 6 : Supply Voltage

Test Circuit:



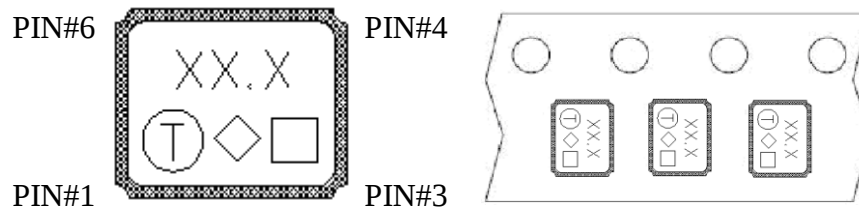
Output Waveform :



Marking:

Line 1: Frequency (156.2)

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.

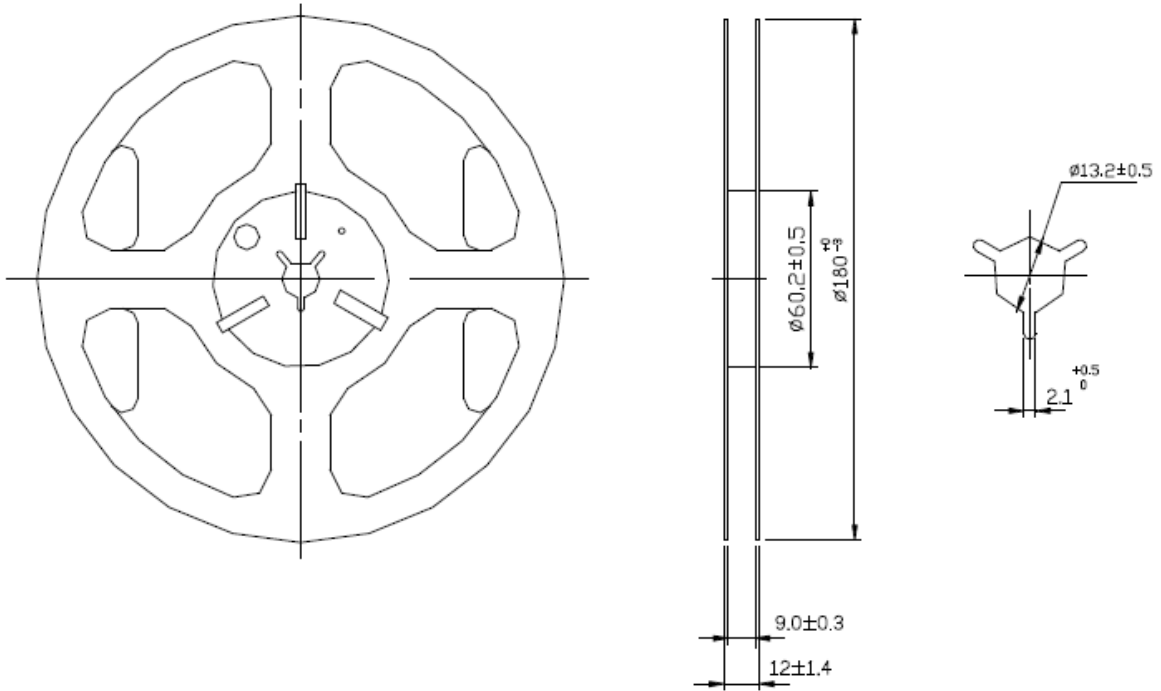
◇:Date Code Table

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

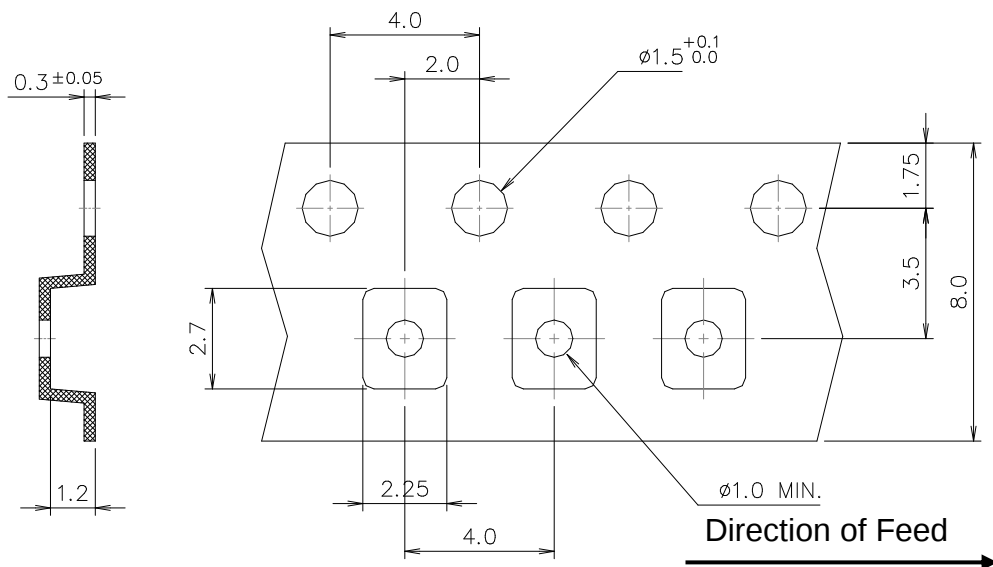
Product Code Table: (Under line With Even Year and Odd Year for Nothing)

Year						Product Code
2021	2023	2025	2027	2029	2031	□
2022	2024	2026	2028	2030	2032	<u>□</u>

Reel Dimensions (mm):



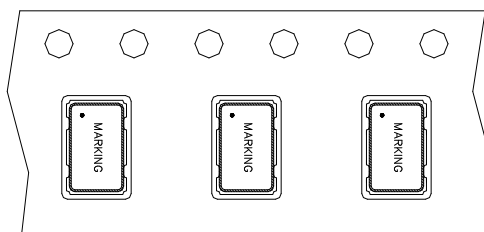
Tape Dimensions (mm):



[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 DIRECTION:

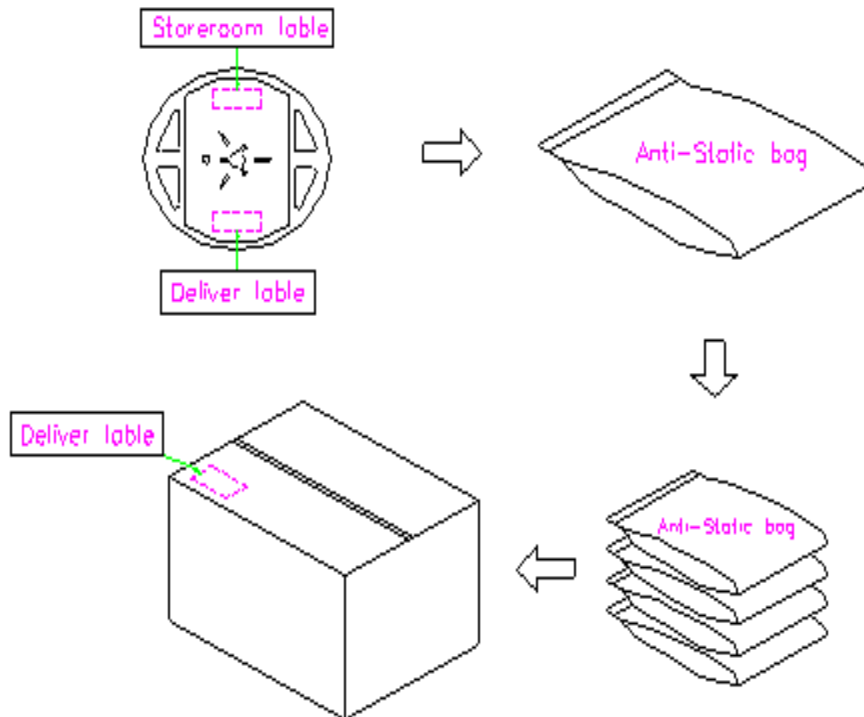


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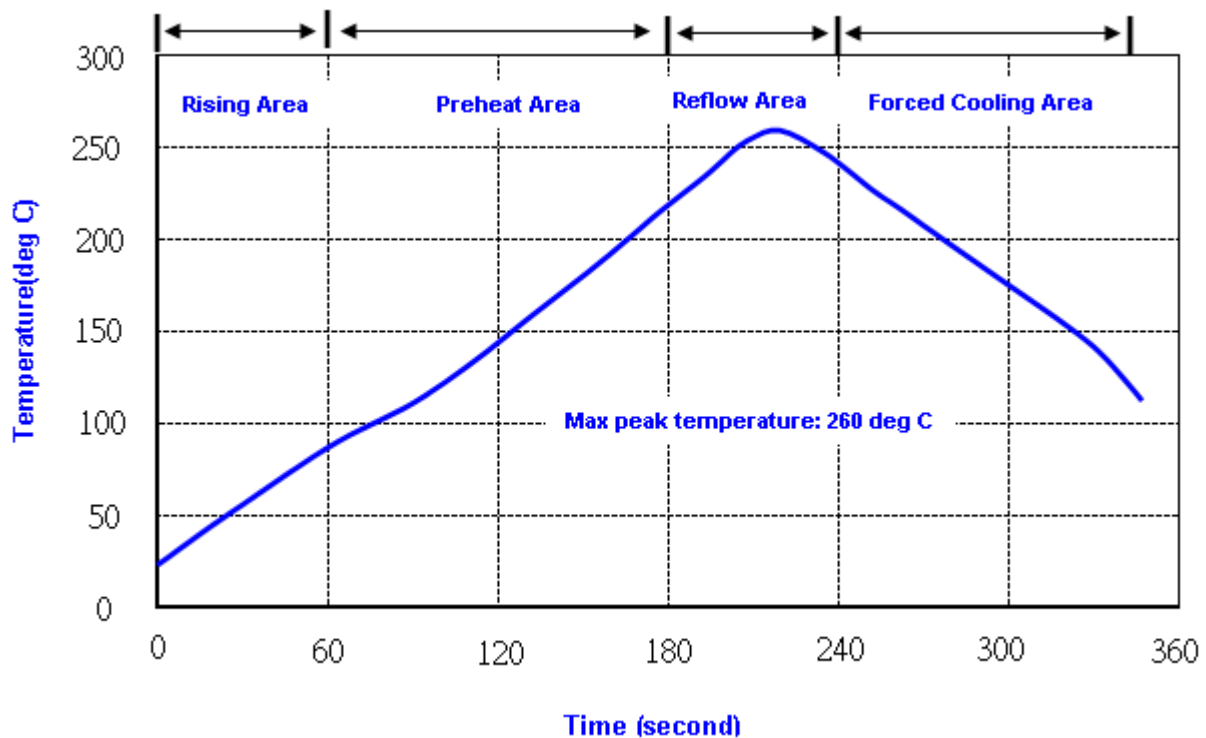
TST DCC
Release document

Packing Quantity/Packing:

1K 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