



# 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](mailto:tstsales@mail.taisaw.com) Web: [www.taisaw.com](http://www.taisaw.com)

## Product Specifications Approval Sheet

Product Description: LVDS SAW Oscillator 93.75MHz SMD 7.0X5.0 mm

TST Part No.: TS0017A

Customer Part No.: \_\_\_\_\_

Customer signature required
Company: _____
Division: _____
Approved by : _____
Date: _____

Checked by: Paul Ni *Paul Ni*

Approved by: Francis Chen *FCN*

Date: 2010/11/04

- Customer signed back is required before TST can proceed with sample build and receive orders.
- Orders received without customer signed back will be regarded as agreement on the specifications
- 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 7.0x5.0 LVDS SAW Oscillator

MODEL NO.: TS0017A

REV. NO.:1.0

RoHS Compliant  
Lead free  
Lead-free soldering

### Conditions:

Parameter	Symbol	Limits			Units
		min.	typ.	max.	
Supply Voltage	V <sub>CC</sub>	2.375	2.5	2.625	V
Load Impedance	-	-	100	-	Ω
Operating Temperature Range	T <sub>a</sub>	-10	-	70	°C

### Electrical Specifications:

For different applications, the specification change is possible. Please contact TST sales representative or application engineer for your requirement.

Parameter	Symbol	Limits			Units	Conditions
		min.	typ.	max.		
Output Frequency	-	-	<b>93.75</b>	-	MHz	
Frequency tolerance	-	-100	-	100	ppm	Include T <sub>a</sub> range
Current Consumption	-	-	-	66	mA	OE=V <sub>CC</sub> L_LVDS=100Ω
Differential output voltage*1	V <sub>OD</sub>	247	-	454	mV	Measurement cct.1, OE=open, RL=100Ω, OUT-OUTN differential voltage, f=100MHz
Differential output error*1	ΔV <sub>OD</sub>	-	-	50	mV	
Offset voltage*1	V <sub>OS</sub>	1.125	-	1.375	V	Measurement cct.1, OE=open, RL=100Ω, OUT-OUTN mid-level potential, f=100MHz
Offset error*1	ΔV <sub>OS</sub>	-	-	50	mV	
HIGH-level input voltage*1	V <sub>IH</sub>	0.7V <sub>CC</sub>	-	-	V	OE terminal
LOW-level input voltage*1	V <sub>IL</sub>	-	-	0.3V <sub>CC</sub>	V	OE terminal
LVDS Rise time *1	t <sub>r</sub>	-	-	0.4	ns	20%→80% - of differential output voltage
LVDS Fall time *1	t <sub>f</sub>	-	-	0.4	ns	80%→20% - of differential output voltage
Output clock duty cycle*1	SYM	45	-	55	%	At outputs crossing point
Oscillation Start Up time	t <sub>str</sub>	-	-	10	msec.	t=0 at V <sub>CC</sub> min
Phase Jitter	t <sub>PJ</sub>	-	-	1	ps	Integration of Phase noise Offset 12KHz~20 MHz
Frequency Aging		-	-	+/-10	ppm/yr	25 deg.C 1 <sup>st</sup> year.

\*1 Please see page 6 : Timing chart

\*Reference value

Parameter	Symbol	Limits			Units	Conditions
		min.	typ.	max.		
Deterministic Jitter	t <sub>DJ</sub>	-	0.2	-	ps	-
Random Jitter	t <sub>RJ</sub>	-	3	-	ps	-
$\sigma$ (RMS of total distri.)	t <sub>RMS</sub>	-	3	-	ps	-
Peak to Peak	t <sub>p-p</sub>	-	25	-	ps	-
Accumulated Jitter( $\sigma$ ) n=2~50 000cycles	t <sub>acc</sub>	-	4	-	ps	-

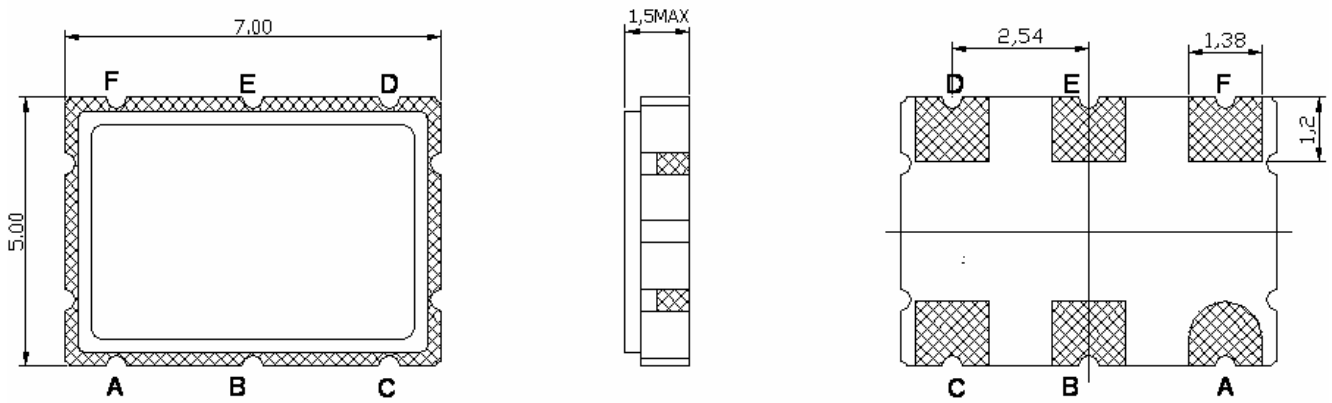
Phase Noise :

Parameter	Symbol	Limits			Units	Conditions
		min.	typ.	max.		
Phase Noise @ 100Hz	PN1	-	-93	-	dBc/Hz	-
Phase Noise @ 1KHz	PN1	-	-121	-	dBc/Hz	-
Phase Noise @ 10 KHz	PN2	-	-143	-	dBc/Hz	-
Phase Noise @ 100KHz	PN3	-	-144	-	dBc/Hz	-
Phase Noise @ 1MHz	PN4	-	-144	-	dBc/Hz	-

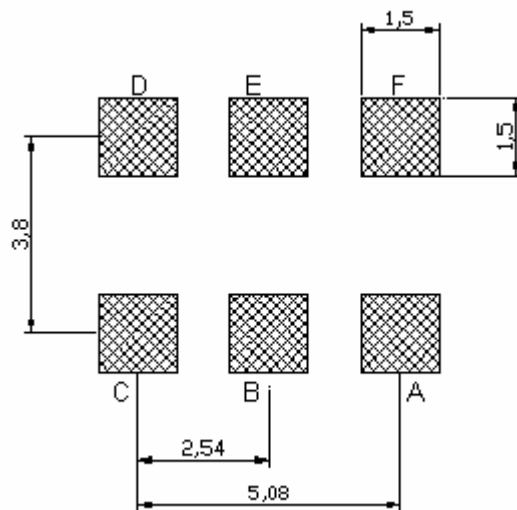


**Mechanical Dimensions (mm):**

- LVDS SO TS0017A PACKAGE DIM.:
- 



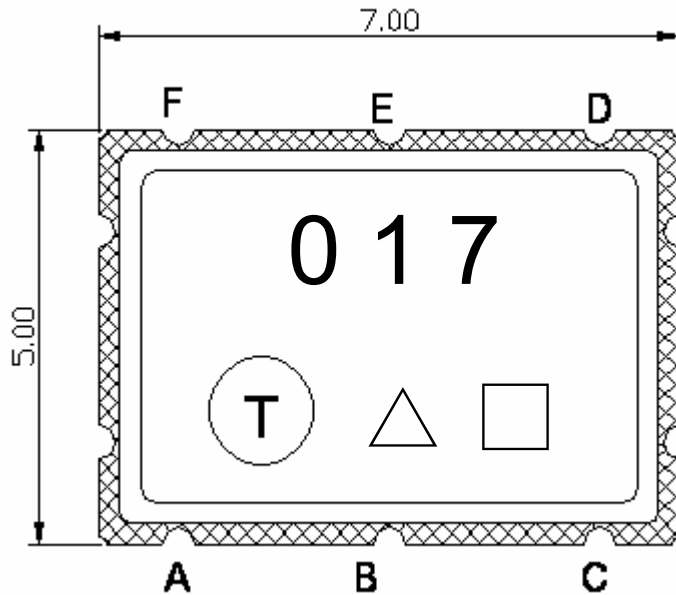
- Recommended customer PCB Layout footprint (mm):



**Marking:**

Line 1: TST P/N (TS0017A)

Line 2: TST Logo + SO Product Code + Date Code



Pin	Connection
A	OE
B	N.C.
C	GND
D	OUT
E	$\overline{\text{OUT}}$
F	Vcc

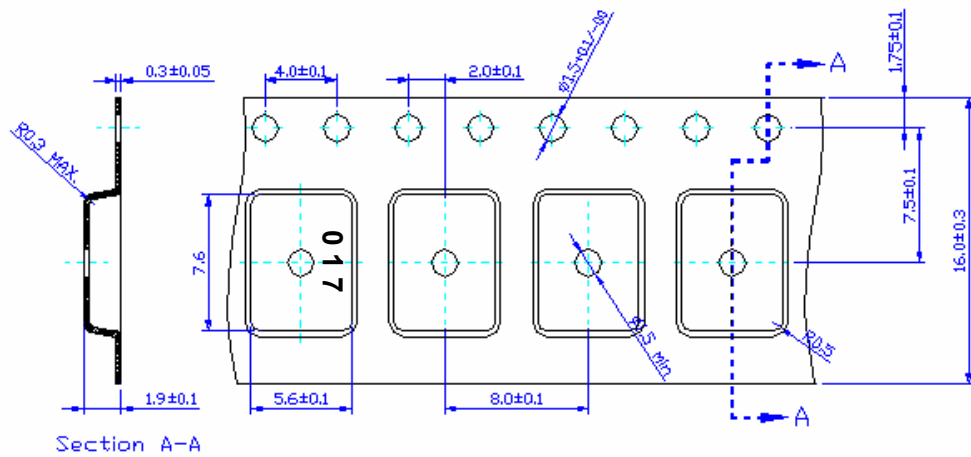
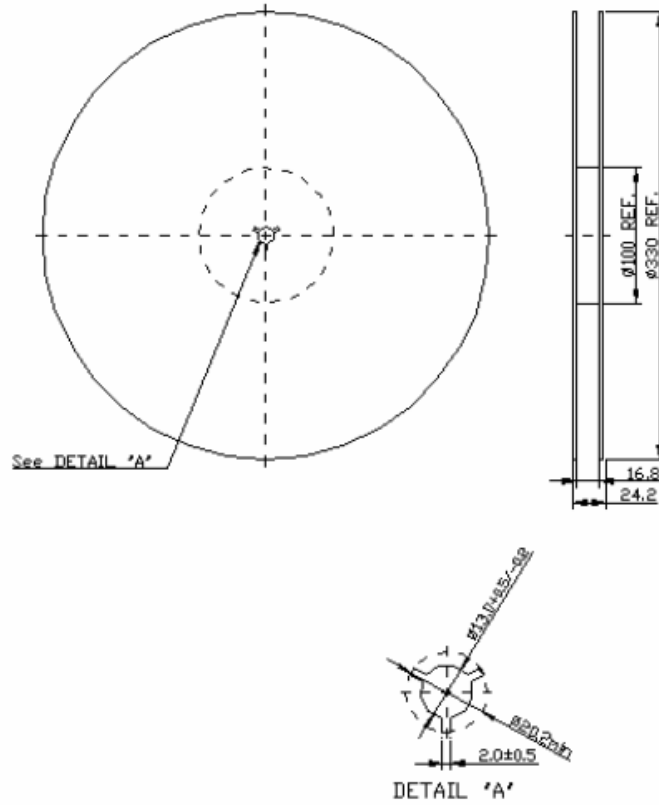
**Product Code Table:**

Year	2009 2013	2010 2014	2011 2015	2012 2016
Product Code	S	s	<u>S</u>	<u>s</u>

**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

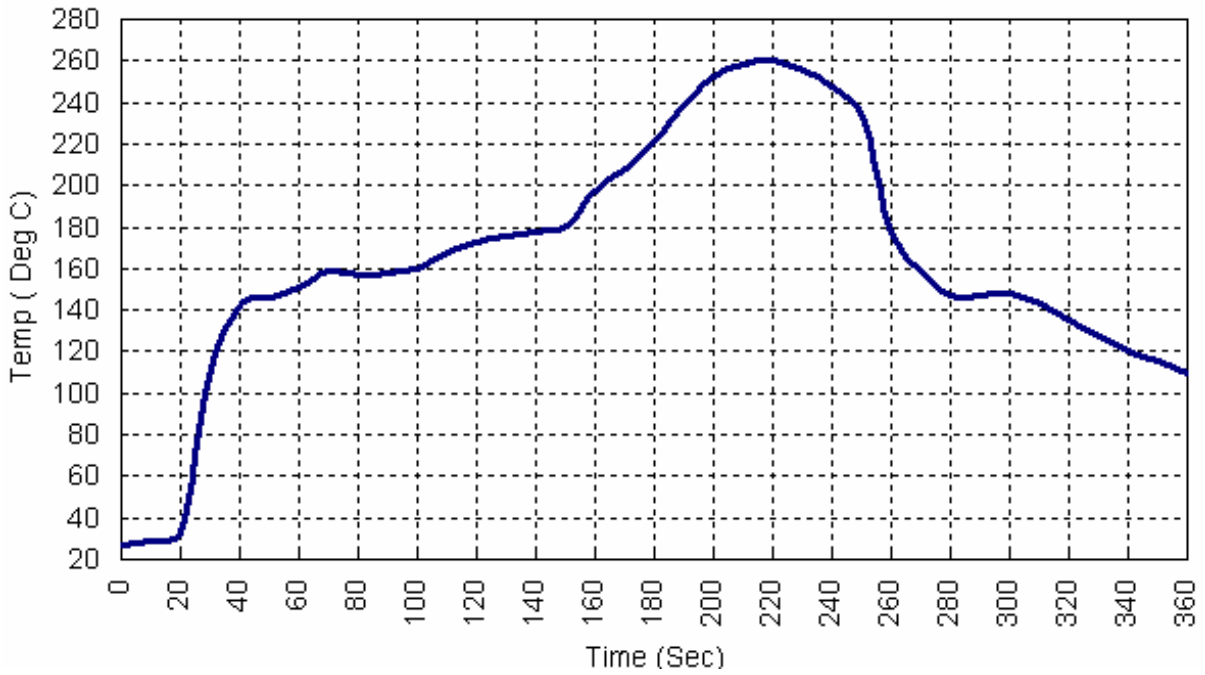
**Tape & Reel:**



**[NOTE]**

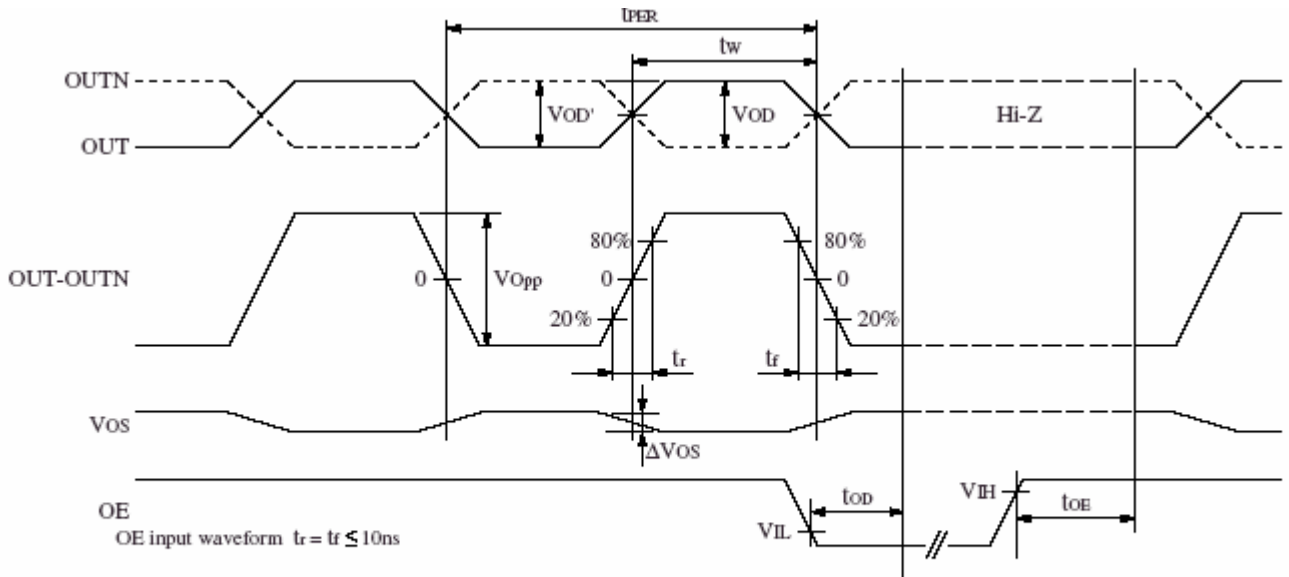
1. UNIT : MM.
2. UNLESS OTHERWISE SPECIFIED TOLERANCE ON DIM. +/-0.1MM.
3. MATERIAL : CONDUCTIVE POLYSTYRENE.
4. COLOR : BLACK.
5. 10 PITCH CUMULATIVE TOLERANCE +/-0.2MM.

**RECOMMENDED REFLOW PROFILE:**



**Timing chart :**

Output waveform(OUT and OUTN)



$$DUTY = 100 \frac{t_w}{t_{PER}} (\%) \text{ @ crossing point}$$

$$\Delta V_{OD} = |V_{OD}' - V_{OD}|$$

$$SYM = t_w / t_{PER}$$

**OE Function**

OE	OUT,OUTN	Oscillator
HIGH(or open)	Either fo or fo/2	Normal operation
LOW	high impedance	Stopped

When OE goes LOW, the oscillator stops and the output pins(OUT,OUTN)become high impedance.