



TAI-SAW TECHNOLOGY CO., LTD.

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Approval Sheet For Product Specification

Issued Date: 7/20/2004 (REV. NO: 4)

Product Name: SMD 5.0x3.2 23.104MHz Crystal Unit

TST Parts No.: TZ0499A

Customer Parts No. : _____

Company: _____

Division: _____

Approved by: _____

Date: _____

Checked by: _____ Kelly Huang

Approval by: _____ TF Yang

Date: _____ 7/20/2005



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SMD 5.0x3.2 23.104MHz Crystal Unit

MODEL NO.: TZ0499A

REV. NO.: 4

Features:

- Surface Mount Seam Weld Package
- Excellent Reliability Performance
- Good Frequency Perturbation and Stability over temperature

RoHS Compliant
Lead free
Lead-free soldering

Description and Applications:

Surface mount 5.0mmx3.2mm crystal unit for GPS application.

Electrical Specifications:

TZ0499A	Specification
Nominal Frequency	23.104000 MHz
Mode of Oscillation	Parallel Resonance, Fundamental Mode
Operating Temperature Range	-40°C to +85°C
Frequency Stability over Operating Temperature Range	+/-15 ppm (referred to the value at 25°C)
Frequency Perturbations ¹	+/-0.5 ppm
Static Temperature Hysteresis ²	+/-0.4 ppm
Frequency Make Tolerance (FL)	+/-7 ppm @ 25°C +/- 3°C
Load Capacitance (CL)	19 pF
Equivalent Series Resistance (ESR)	30 Ω max
Drive Level	10 uW nom., 200 uW max.
Shunt Capacitance (Co)	6 pF max
Drive Level Dependence (Delta R)	0.6 ohms max (10 drive level points: 0.001, 0.05, 0.01, 0.05, 0.1, 0.5, 1, 10, 50, 100 uW)
Pullability	12 ppm/pF max
Short Term Stability (Root Allan Variance for 1 second Tau)	1.0 ppb max
Long Term Stability, frequency drift over 1 year	+/-1.0 ppm
Long Term Stability, frequency drift over 2 years	+/-1.5 ppm

Long Term Stability, frequency drift over 10 years	+/-5.0 ppm
G Sensitivity, all 3 axes, random vibration, 30Hz to 1.5KHz	1.5 ppb max per G
Shock, frequency shift after 1000G 250uS sine	+/-0.5 ppm
Insulation Resistance	500 MΩ min./DC 100V
Marking	Laser marking

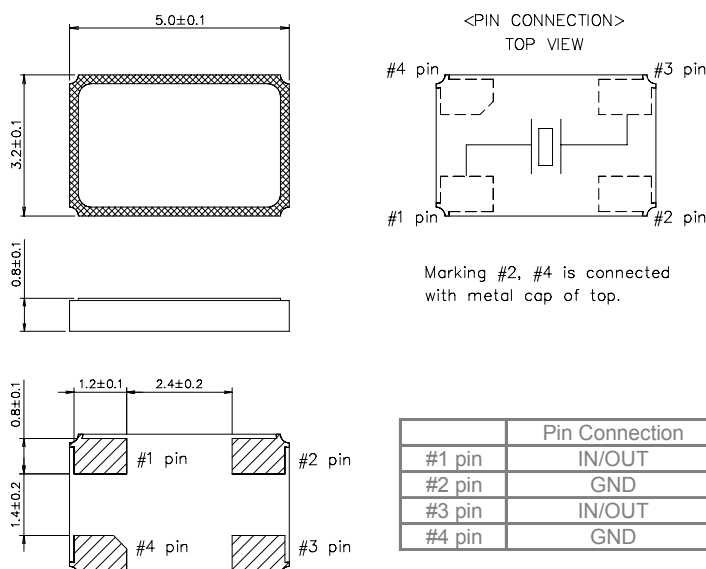
Note:

1. Peak to peak deviation from the frequency versus AT temperature curve fit. Minimum of 1 frequency reading every 3°C over operating temperature range. 100% testing and screening for frequency perturbations and micro jump occurrence.
2. Frequency change after reciprocal temperature ramped over the operating temperature range. Frequency measured before and after at 25°C.

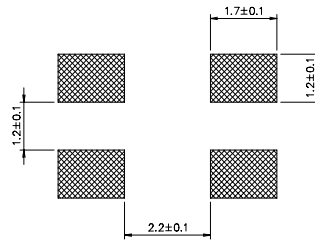
Environmental Specifications

Shock	Half sine wave acceleration of 100 G peak amplitude for 11 ms duration, 3 cycles each plane
Vibration	10G RMS 30Hz to 1500Hz, duration of 6 hours
Humidity	48 hours at 85°C 85% relative humidity non-condensing
Thermal Shock	Exposed at -40°C for 30 minutes then to +85°C for 30 minutes constantly for 120 cycles (5 days)
Storage Temperature	-40°C to +85°C

Mechanical Dimensions (mm):



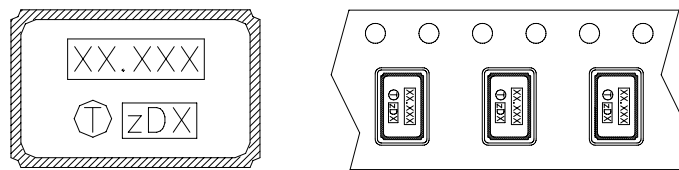
Recommended Land Pattern: (unit: mm)



Marking:

Line 1: Frequency (23.104)

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



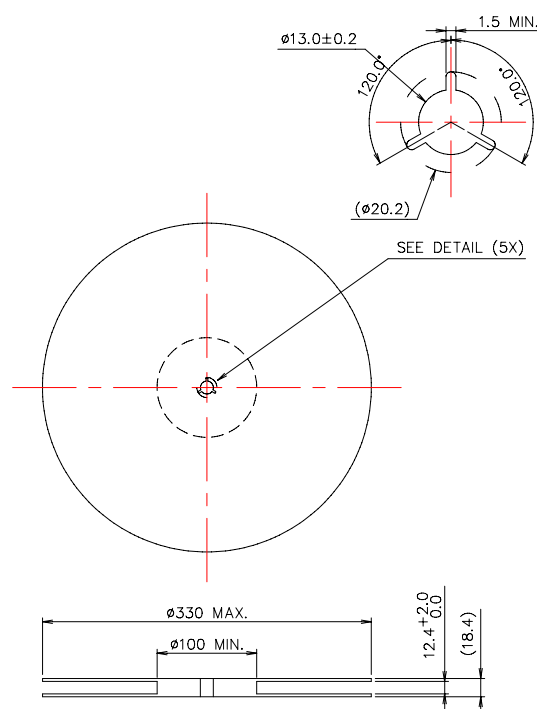
Product Code Table

Year	2001 2005	2002 2006	2003 2007	2004 2008
Product Code	Z	z	<u>Z</u>	<u>z</u>

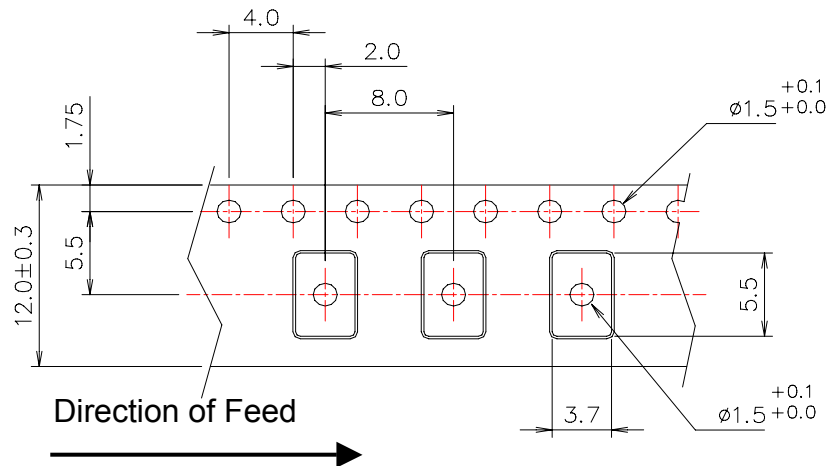
Date Code Table

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

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.

Reflow Profile:

