



# 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: Tuning Fork Crystal Unit 3.2x1.5 32.768KHz

TST Part No.: TZ1166A

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

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

Checked by: \_\_\_\_\_ Yifan Chen *Yifan*

Approved by: \_\_\_\_\_ Kelly Huang *Kelly Huang*

Date: \_\_\_\_\_ 07/14/2016

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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## Tuning Fork 3.2x1.5 32.768KHz Crystal Unit

MODEL NO.: TZ1166A

REV. NO.: 1.0

### Revise:

Rev.	Rev. Page	Rev. Account	Date	Ref. No.	Reviser
1	N/A	Initial release	07/14/16'	N/A	Yifan Chen



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## Tuning Fork 3.2x1.5 32.768KHz Crystal Unit

MODEL NO.: TZ1166A

REV. NO.: 1.0

### Features:

- Ceramic Seam Weld Package
- Excellent Reliability Performance
- Ultra Miniature Package
- Available to Surface Mount Technology and IR Reflow Process

RoHS Compliant  
Lead free  
Lead-free soldering

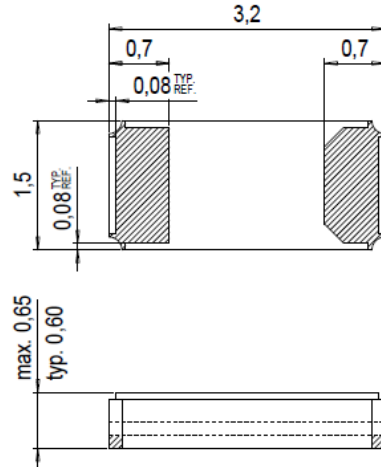
### Description and Applications:

Surface mount 3.2mmx1.5mm crystal unit for use in communications devices,.

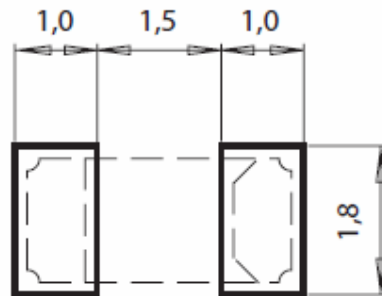
### Electrical Specifications:

TZ1166A	Specification
Nominal Frequency	32.768000 KHz
Mode of Oscillation	Fundamental
Storage Temperature Range	-55°C to +125°C
Operating Temperature Range	-40°C to +85°C
Frequency vs. Temperature	-0.035 ppm / °C <sup>2</sup> +/-10%
Turnover temperature	25 +/-5°C
Frequency Make Tolerance (FL)	+/-20 ppm @ 25°C +/- 3°C
Equivalent Series Resistance (ESR)	50k Ω typ ; 70k Ω max
Nominal Drive Level	1.0 uW max
Shunt Capacitance (Co)	1.2 pF typ
Motional Capacitance (C1)	3.7 fF typ
Load Capacitance (CL)	7 pF
Aging	+/-3.0 ppm max/first year @25°C
Insulation Resistance	500 MΩ min./DC 100V
Marking	Inerasable marking

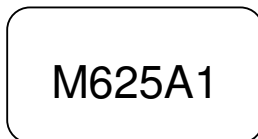
## Mechanical Dimensions (mm):



## Recommended Land Pattern: (unit: mm)



## Marking:



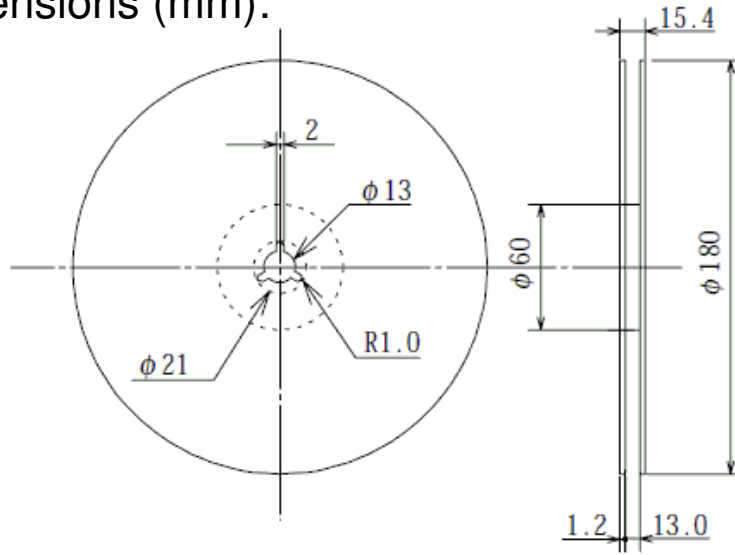
M: Metal Lid

6: Year code : 6 for 2016

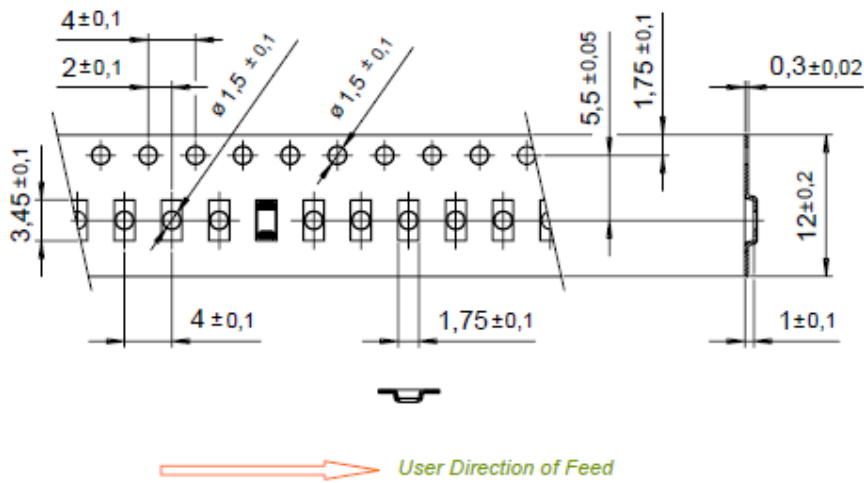
25: Week code

A1: Lot number

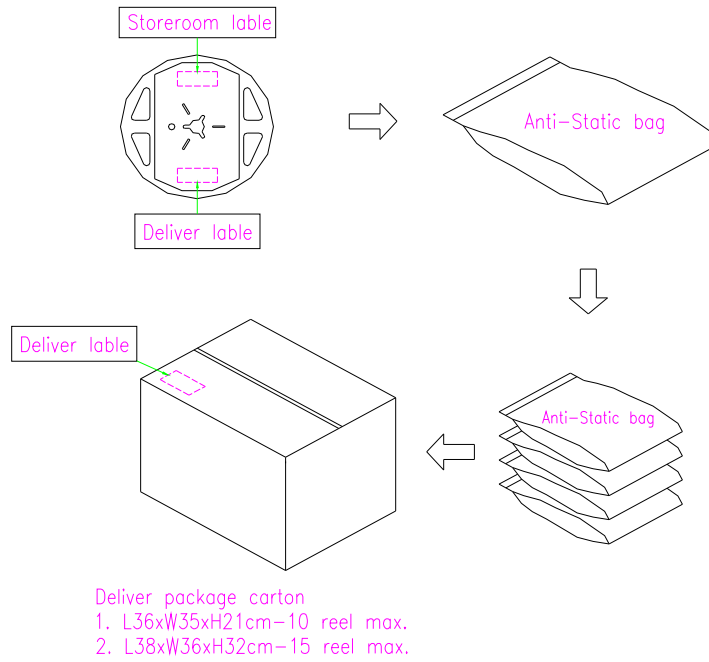
Reel Dimensions (mm):



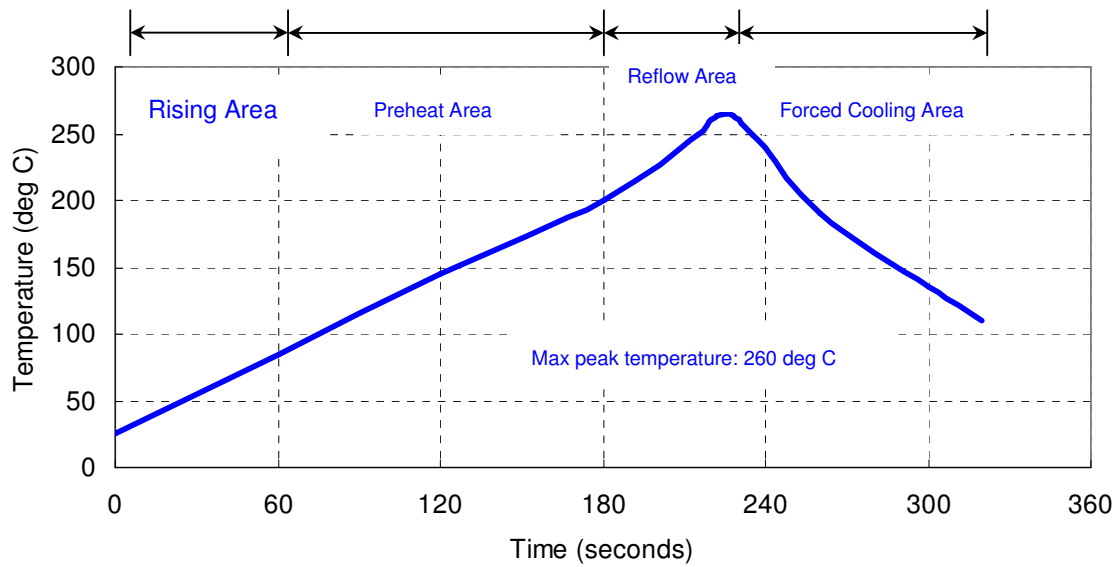
Tape Dimensions (mm):



# Packing Quantity/Packing: 3K pcs maximum per reel



## Reflow Profile:



# Reliability Specifications

Test name	Test process / method	Reference standard
<b>Mechanical characteristics</b>		
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
<b>Environmental characteristics</b>		
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