



# 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 5.0x3.2 500MHz

TST Part No.: TW0718VA6220

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

Customer signature required

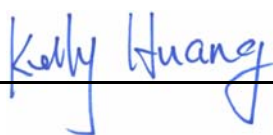
Company: \_\_\_\_\_

Division: \_\_\_\_\_

Approved by : \_\_\_\_\_

Date: \_\_\_\_\_

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

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

Date: \_\_\_\_\_ 01/09/2023

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 5.0x3.2 500MHz Crystal Oscillator

MODEL NO.: TW0718VA6220

REV. NO.: 1.0

### Revise:

| Rev. | Rev. Page | Rev. Account    | Date      | Ref. No. | Reviser    |
|------|-----------|-----------------|-----------|----------|------------|
| 1    | N/A       | Initial release | 01/09/23' | N/A      | Yifan Chen |



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## SMD 5.0x3.2 500MHz Crystal Oscillator

MODEL NO.: TW0718VA6220

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 PECL Output
- Option-able stand-by function for output .

### Electrical Characteristics:

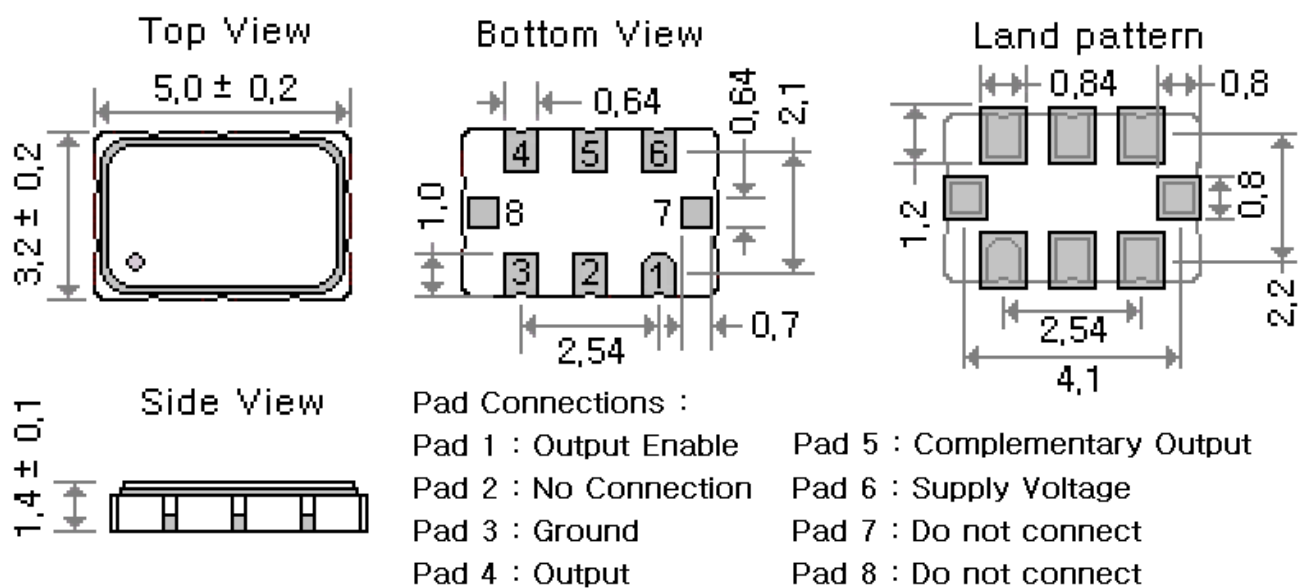
|    | Parameters                | SYM.             | Electrical Spec. |         |      |        | Notes                                     |
|----|---------------------------|------------------|------------------|---------|------|--------|-------------------------------------------|
|    |                           |                  | Min.             | Typical | Max. | Unit   |                                           |
| 1  | Nominal Frequency         | FL               | 500.000000       |         |      |        | MHz                                       |
| 2  | Holder Type               |                  | -                |         |      |        | 5.0 * 3.2 * 1.4 mm , 8pads , SMD Type     |
| 3  | Input Voltage             | VDD              |                  | 3.3     |      | V      | D.C. ± 10 %                               |
| 4  | Output Wave Form          |                  |                  |         |      |        | PECL Differential output                  |
| 5  | Output Voltage High " 1 " | Voh              | 2.135            |         | 2.5  | V      | VDD – 1.165 ( min. ) , VDD - 0.8 ( max. ) |
| 6  | Output Voltage Low " 0 "  | VoL              | 1.3              |         | 1.75 | V      | VDD – 2.0 ( min. ) , VDD - 1.55 ( max. )  |
| 7  | Output Swing              | Vos              | 595              |         | 930  | mV     |                                           |
| 8  | Frequency Stability       | $\Delta f / f_0$ | -25              |         | 25   | ppm    | Over Operating Temperature                |
| 9  | Current Consumption       | IDD              |                  | 100     | 120  | mA     | measured with terminating resistors       |
| 10 | Rise Time & Fall Time     | Tr , Tf          |                  |         | 0.4  | n Sec. | 20% ↔ 80 % of waveform                    |
| 11 | Duty Cycle                | tw/t             | 45               |         | 55   | %      | at 50 % waveform ± 5 %                    |
| 12 | Star -up Time             | ST               |                  | 5       | 10   | m Sec. |                                           |
| 13 | Load                      | CL               |                  | 50      |      | Ω      | Into VDD - 2V or Thevenin equivalent      |
| 14 | RMS Jitter                | Jrms             |                  | 0.15    |      | pS     | 12 KHz to 20 MHz integrated               |
| 15 | Operating Temperature     | T_opr            | -40              |         | 85   | °C     |                                           |
| 16 | Storage Temperature       | T_stg            | -55              |         | 150  | °C     |                                           |

TST DCC

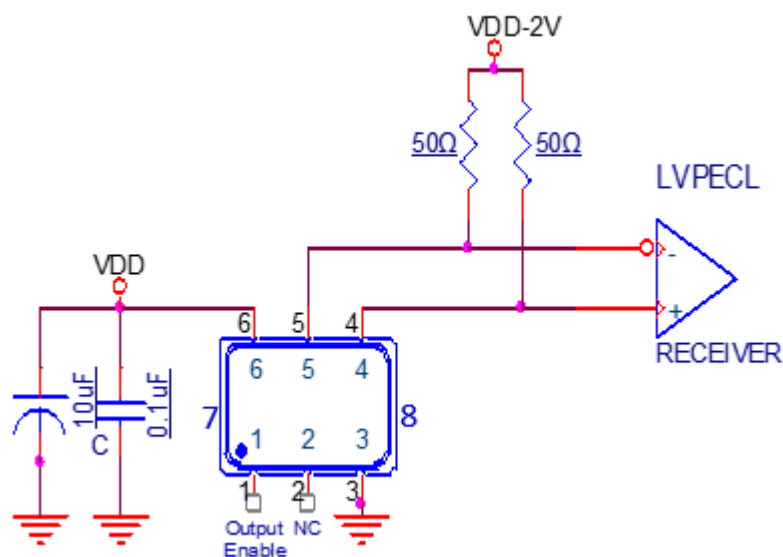
Release document

|    |                                           |                                                                                                                                        |        |       |        |         |            |  |
|----|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|--------|-------|--------|---------|------------|--|
| 17 | Aging                                     | fa                                                                                                                                     | -3     |       | 3      | ppm     | first year |  |
| 18 | SSB Phase Noise<br>(dBc / Hz) [ typical ] | 10 Hz                                                                                                                                  | 100 Hz | 1k Hz | 10k Hz | 100k Hz | 1M Hz      |  |
|    |                                           | -55                                                                                                                                    | -87    | -108  | -116   | -125    | -137       |  |
| 19 | OE Control on Pad 1                       | If VDD * 80% (min.) is applied : Output. Enable<br>Oscillation enable time : 2.5 ms (max.)                                             |        |       |        |         |            |  |
|    |                                           | If VDD * 20% (max.) is applied : Output Disable<br>Oscillation disable time : 10 u sec. (max.)<br>Current consumption is 74 mA typical |        |       |        |         |            |  |

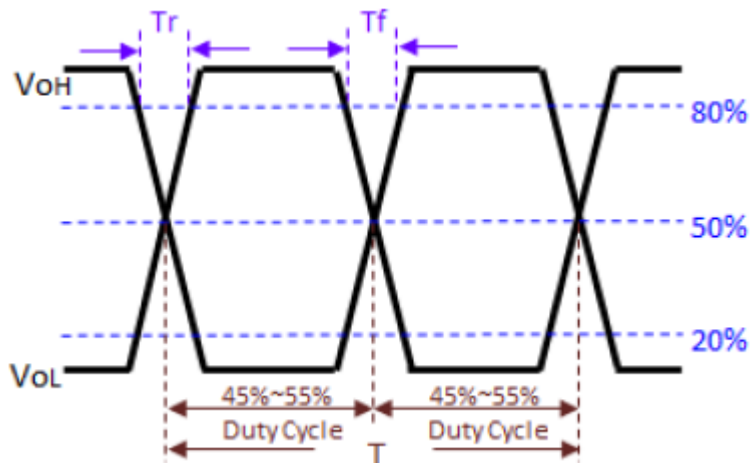
## Mechanical Dimensions: (Unit: mm)



## Test Circuit:



## Output Waveform :



## Marking :

Line 1 : Frequency (500.000)

Line 2 :  $\textcircled{T}$ WDXX (TST Logo + Product Code + Date Code + Internal Traceability Code (XX) :

Can be 1 or 2 letters)

500.000

$\textcircled{T}$ WDXX

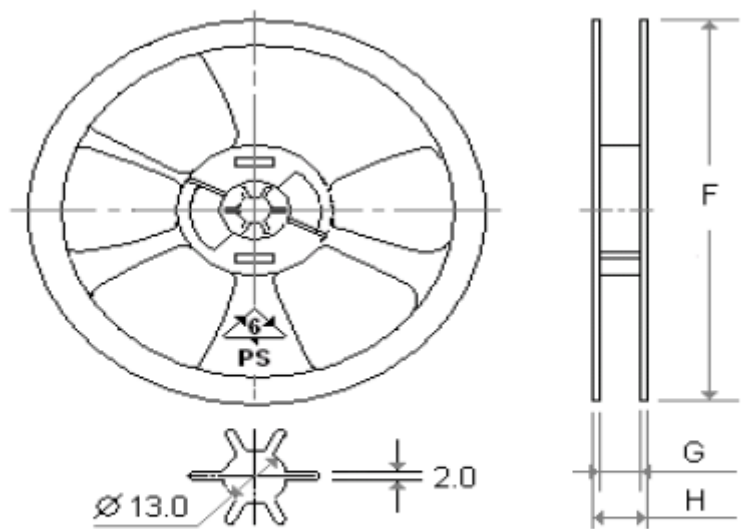
### Product Code Table

|              |      |      |          |          |
|--------------|------|------|----------|----------|
| Year         | 2021 | 2022 | 2023     | 2024     |
|              | 2025 | 2026 | 2027     | 2028     |
|              | 2029 | 2030 | 2031     | 2032     |
| Product code | W    | w    | <u>W</u> | <u>w</u> |

### Date Code Table

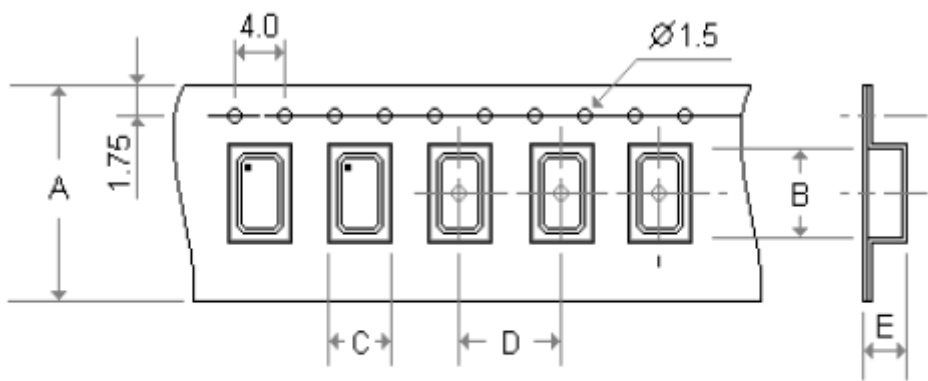
| WK01 | WK02 | WK03 | WK04 | WK05 | WK06 | WK07 | WK08 | WK09 | WK10 | WK11 | WK12 | WK13 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| A    | B    | C    | D    | E    | F    | G    | H    | I    | J    | K    | L    | M    |
| WK14 | WK15 | WK16 | 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):



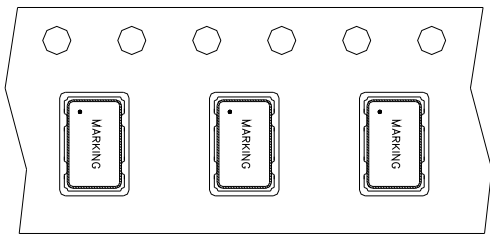
| F     | G    | H    |
|-------|------|------|
| 180.0 | 13.0 | 16.0 |

Tape Dimensions (mm):



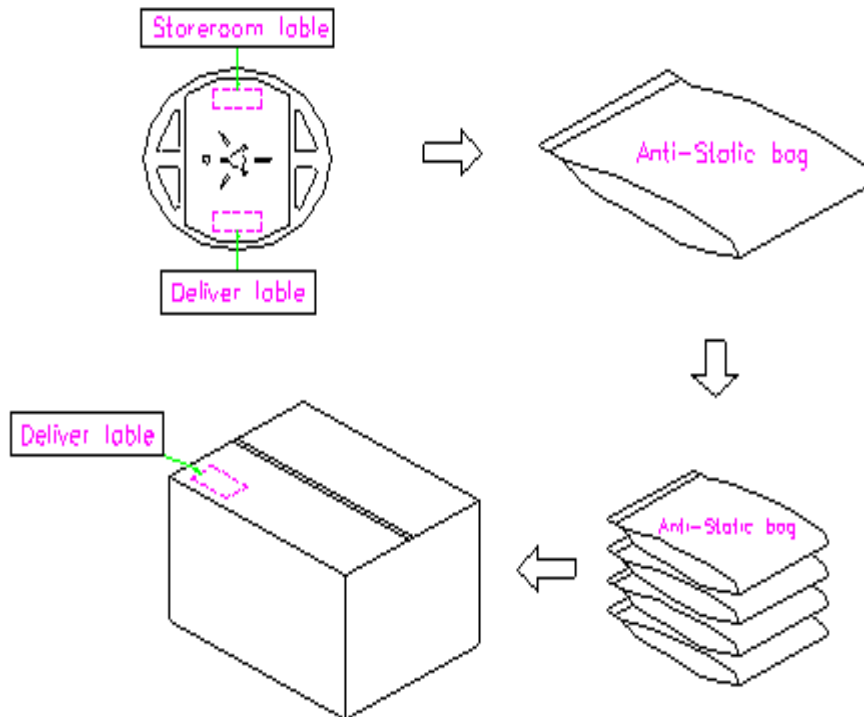
| A    | B   | C   | D   | E   |
|------|-----|-----|-----|-----|
| 12.0 | 5.3 | 3.6 | 8.0 | 1.4 |

PACKING DIRECTION:

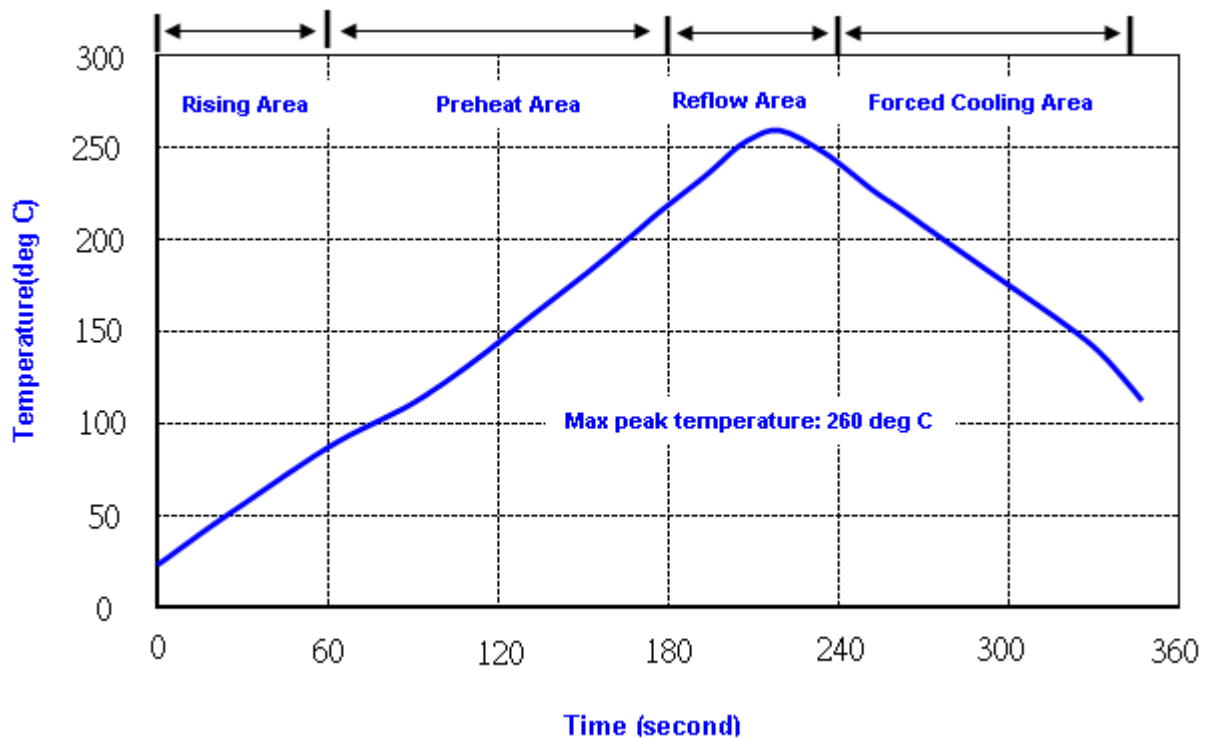


## Packing Quantity/Packing:

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                |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| <b>Mechanical characteristics</b>        |                                                                                                                                                                                |                                   |
| resistance to Soldering heat (IR reflow) | Temp/ Duration : 265°C /10sec ×2 times<br>Total time : 4min.(IR-reflow)                                                                                                        | EIAJED-4701<br><br>-300(301)M(II) |
| Vibration                                | Total peak amplitude : 1.5mm<br>Vibration frequency : 10 to 2000 Hz<br>Sweep period : 20 minute<br>Vibration directions : 3 mutually perpendicular<br>Duration : 2 hr / direc. | MIL-STD 202G<br>method 204        |
| Mechanical Shock                         | directions : 3 impacts per axis<br>Acceleration : 3000g's, +20/-0 %<br>Duration : 0.3 ms (total 18 shocks)<br>Waveform : Half-sine                                             | MIL-STD 202G<br>method 213        |
| Solderability                            | Solder Temperature:265±5°C<br>Duration time: 5±0.5 seconds.                                                                                                                    | J-STD-002                         |
| <b>Environmental characteristics</b>     |                                                                                                                                                                                |                                   |
| Thermal Shock                            | Heat cycle conditions<br>-40 °C (30min) ↔ 85 °C (30min)<br>* cycle time : 10 times                                                                                             | MIL-STD 883G<br>method 1010.8     |
| Humidity test                            | Temperature : 85 ± 2 °C<br>Relative humidity : 85%<br>Duration : 96 hours                                                                                                      | MIL-STD 202G<br>method 103        |
| Dry heat<br>( Aging test )               | Temperature : 125 ± 2 °C<br>Duration : 168 hours                                                                                                                               | MIL-STD 202G<br>method 108A       |
| Cold resistance<br>(Low Temp Storage)    | Temperature : -40 ± 2 °C<br>Duration : 96 hours                                                                                                                                | IEC 60068-2-1                     |