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## Product Specification

Model: TOQ652XVT-01C

6.52"AMOLEDDisplayModule(2520×840)

This module uses RoHS material

Tailor Pixels Technology Co., Ltd.

[www.tailorpixels.com](http://www.tailorpixels.com)

[tailor@tailorpixels.com](mailto:tailor@tailorpixels.com)

Ph: 86-755-8821 2653

**Record of Revision**

| Version | Revise Date | Page | Content             |
|---------|-------------|------|---------------------|
| V1.0    | 2024/07/13  | /    | -1st Version set up |

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## 1 General Description

### 1.1 Features

- 1.1.1 6.52" Flexible AMOLED Panel
- 1.1.2 Supported FHD +(2520×840 pixels) Resolution
- 1.1.3 Green Design
- 1.1.4 Driving Frequency: support 60Hz & 90Hz;

### 1.2 Specifications Summary

| No. | Item              | Unit | Specification                     | Note       |
|-----|-------------------|------|-----------------------------------|------------|
| 1   | Screen size       | inch | 6.52                              |            |
| 2   | Resolution        | dot  | 2520×840 (SPR)                    |            |
| 3   | Display mode      | --   | AMOLED                            |            |
| 4   | Aspect Ratio      | --   | 27 : 9                            |            |
| 5   | Active area       | mm   | 52.3992*157.1976                  |            |
| 6   | Outline Dimension | mm   | 54.3792* 159.472                  | MOD W/O CG |
| 7   | Driver IC         | --   | RM692C4 (Recommend)               |            |
| 8   | Touch IC          | --   | FT3658U (Recommend)               |            |
| 9   | IC Location       | --   | Driver IC : COP<br>Touch IC : FPC |            |
| 10  | Touch Sensor      | --   | DOT                               |            |
| 11  | Interface         | --   | Drive : MIPI<br>Touch : I2C       |            |

## 2 Electrical Specifications

### 2.1 Module Panel Absolute Maximum Ratings

| Item                             | Symbol | Value |      | Unit | Remark                  |
|----------------------------------|--------|-------|------|------|-------------------------|
|                                  |        | Min.  | Max. |      |                         |
| Digital Power Supply             | VDDIO  | 1.65  | 1.95 | V    | Note1                   |
| Analog Power Supply              | VCI    | 2.65  | 4.8  | V    |                         |
| Power Supply For Analog Circuit. | AVDD   | 6     | 8.0  | V    |                         |
| Digital Power Supply             | DVDD   | 1.1   | 1.23 | V    |                         |
| ELVDD Power Supply               | ELVDD  | 4.6   | 5.0  | V    | Note2                   |
| ELVSS Power Supply               | ELVSS  | -5.4  | -1.4 | V    |                         |
| Operating Temperature(Ambient)   | Top    | -     | -    | °C   | Refer to RA test result |
| Storage Temperature(Ambient)     | Tstg   | -     | -    | °C   |                         |
| Humidity                         | Hstg   | -     | -    | %RH  |                         |

Note1: If the module exceeds the absolute maximum ratings, it may be damaged permanently.

Note2: PMIC (NT50372S) Supply;

### 3 Electrical Characteristics

| Item                                             | Symbol           | Condition                               | Values      |       |         | Unit | Notes          |
|--------------------------------------------------|------------------|-----------------------------------------|-------------|-------|---------|------|----------------|
|                                                  |                  |                                         | Min.(≥)     | Typ.  | Max.(≤) |      |                |
| Color shift                                      | $\Delta u' \ v'$ | Up/Down/Right/Left<br>$\theta=30^\circ$ | /           | /     | 3.5     | JNCD | Note1<br>Note2 |
|                                                  |                  | Up/Down/Right/Left<br>$\theta=45^\circ$ | /           | /     | 5.5     |      |                |
|                                                  |                  | Up/Down/Right/Left<br>$\theta=60^\circ$ | /           | /     | 6       |      |                |
| Contrast ratio                                   | CR               | @0 degree                               | 400,000 : 1 | /     | /       | /    | Note2          |
| Viewing angle                                    | CR               | @80 degree                              | 1000 : 1    | /     | /       | /    | Note2          |
| HBM mode color chromaticity equal to normal mode | RGBW $\Delta x$  | CIE1931 x                               | -0.005      | 0     | 0.005   | /    | Note2          |
|                                                  | RGBW $\Delta y$  | CIE 1931 y                              | -0.005      | 0     | 0.005   | /    |                |
| AOD mode color chromaticity equal to normal mode | RGBW $\Delta x$  | CIE1931 x                               | -0.008      | 0     | 0.008   | /    | Note2          |
|                                                  | RGBW $\Delta y$  | CIE 1931 y                              | -0.008      | 0     | 0.008   | /    |                |
| Color chromaticity (CIE1931)                     | Wx               | CIE1931 x                               | 0.290       | 0.300 | 0.310   | /    | Note2          |
|                                                  | Wy               | CIE 1931 y                              | 0.305       | 0.315 | 0.325   |      |                |
|                                                  | Rx               | CIE1931 x                               | 0.663       | 0.683 | 0.703   |      |                |
|                                                  | Ry               | CIE 1931 y                              | 0.297       | 0.317 | 0.337   |      |                |
|                                                  | Gx               | CIE1931 x                               | 0.225       | 0.255 | 0.285   |      |                |
|                                                  | Gy               | CIE 1931 y                              | 0.683       | 0.713 | 0.743   |      |                |

|                                        | Bx           | CIE1931 x        | 0.104   | 0.134 | 0.164   |      |                      |
|----------------------------------------|--------------|------------------|---------|-------|---------|------|----------------------|
|                                        | By           | CIE 1931 y       | 0.026   | 0.056 | 0.065   |      |                      |
| Color Gamut                            | /            | DCI P3( CIE1931) | 98%     | 100   | /       | %    | Note2                |
| Luminance<br>(complete machine)        | L            | /                | 387     | 430   | 473     | nits | Note2                |
| HBM<br>Luminance<br>(complete machine) | L            | /                | 630     | 700   | 770     | nits | Note2                |
| AOD<br>Luminance<br>(complete machine) | L            | /                | 54      | 60    | 66      | nits | Note2                |
| Reflectivity                           | reflectivity | /                | /       | /     | 5       | %    | /                    |
|                                        | a            | L*a*b            | -1.8    | 0     | 1.8     | /    |                      |
|                                        | b            | L*a*b            | -1.8    | 0     | 1.8     | /    |                      |
| Response time<br>(first frame on+off)  | /            | /                | /       | /     | 2       | ms   | /                    |
| The brightness of first frame          | /            | /                | 80      | /     | /       | %    | Note 7               |
| Color uniformity                       | /            | L255/L128/L64    | /       | /     | 2       | JNCD |                      |
| Luminance uniformity                   | U%           |                  | 80      | /     | /       | %    |                      |
| Crosstalk                              | /            | IEC              | /       | /     | 2       | %    | Note 6               |
| Lifetime@T95                           | /            | /                | 400     | /     | /       | Hr   | Note2                |
|                                        |              | $\Delta u' v'$   |         |       | 0.004   |      |                      |
| Item                                   | Symbol       | Condition        | Values  |       |         | Unit | Notes                |
|                                        |              |                  | Min.(≥) | Typ.  | Max.(≤) |      |                      |
| Gamma                                  | /            | L5~L232          | 2.0     | 2.2   | 2.4     | /    | HBM : 700nit         |
|                                        |              | L233~L240        | 1.9     | 2.2   | 2.5     | /    |                      |
|                                        |              | L5~L232          | 2.0     | 2.2   | 2.4     | /    | 100nit < L255≤430nit |
|                                        |              | L233~L240        | 1.9     | 2.2   | 2.5     | /    |                      |
|                                        |              | L13~L227         | 2.0     | 2.2   | 2.4     | /    | 10nit < L255≤100nit  |
|                                        |              | L228~L235        | 1.9     | 2.2   | 2.5     | /    |                      |
|                                        |              | L25~L222         | 2.0     | 2.2   | 2.4     | /    | 2nit≤L255≤10nit      |
|                                        |              | L223~L230        | 1.9     | 2.2   | 2.5     | /    |                      |
|                                        |              | L13~L227         | 2.0     | 2.2   | 2.4     | /    | AOD : 60nit          |
|                                        |              | L228~L235        | 1.9     | 2.2   | 2.5     | /    |                      |

|                                                              |                    |                                     |   |    |       |     |             |
|--------------------------------------------------------------|--------------------|-------------------------------------|---|----|-------|-----|-------------|
| Color shift of white pattern in different DBV register value | $\Delta u^* \ v^*$ | Condition1                          | / | /  | 0.004 | /   | L255 满足左侧需求 |
|                                                              | CCT                | Condition2                          | / | /  | 400   | K   |             |
| Image Sticking                                               | /                  | The Time to < 1 JND(0.004)          | / | 20 | 25    | s   | Note 9      |
|                                                              | /                  | 8*8 checker pattern 10min , to G128 | / | 45 | 50    | min |             |

Note1 : Internal control, to ensure that large Angle of view to the direction of green.

Note2 : 视角超规部分以主观眼样为准 ;

#### Test Conditions:

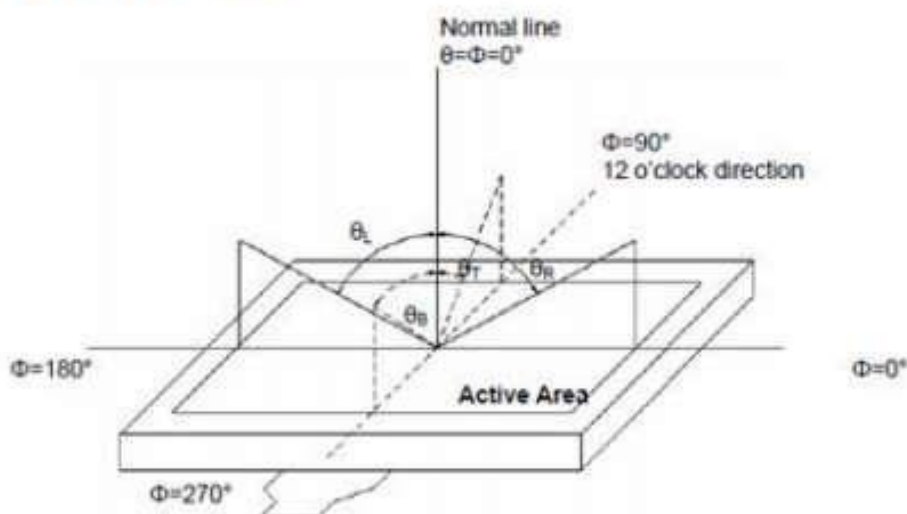
Condition1 :  $\max(\text{duv of (DBV level min- max)}) - \min(\text{duv of (DBV level min- max)})$  , DBV level 1=2nits ;

Condition2 :  $\max(\text{CCT of (DBV level min- max)}) - \min(\text{CCT of (DBV level min- max)})$  , DBV level 1=2nits ;

Condition3 : The ambient temperature is 25°C,in dark room

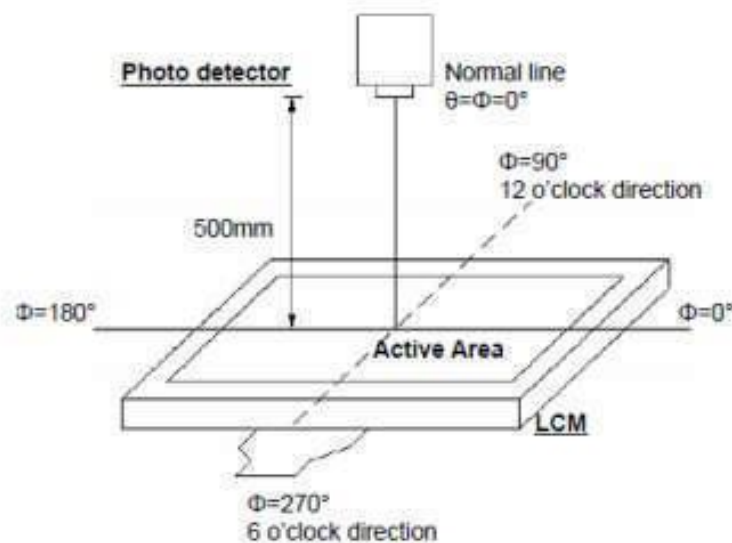
Condition4 : The test systems refer to Note 2.

Note 1 : Definition of viewing angle range



Note 2 : Definition of optical measurement system.

The optical characteristics should be measured in dark room. The optical properties are measured at the center point of the OLED screen. (Viewing angle is measured by CS2000A/Height :500mm , Response time is measured by Eldim optiscope200, other items are measured by CS2000A/ spot diameter 8mm /Height: 500mm.)



Note 3 : Definition of contrast ratio

Contrast ratio (CR) = Luminance measured when OLED on the "White" state/ Luminance measured when OLED on the "Black" state

Note 4 : Definition of color chromaticity

White/Red/Green/Blue Color coordinates measured at center point of OLED.

Note 5 : Definition of Luminance

White 255 Gray measured at center point of OLED.

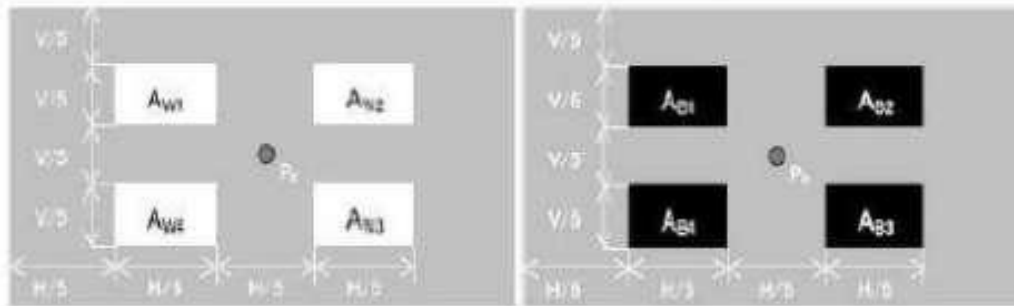
Note 6 : Definition of cross-talk

Measure luminance at the position,  $P_0$

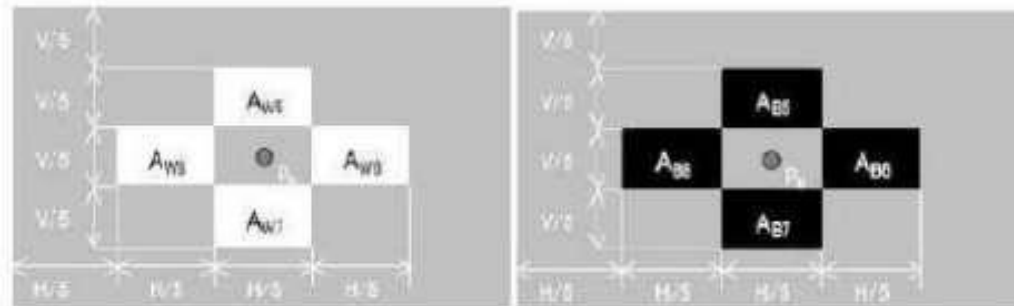
Calculate cross-talk as below equation

$$crosstalk = \frac{|L_{Wi\_ON} - L_{W\_OFF}|}{L_{W\_OFF}} \times 100\% \quad (i = 5 \text{ to } 8)$$

$$crosstalk = \frac{|L_{Bi\_ON} - L_{B\_OFF}|}{L_{B\_OFF}} \times 100\% \quad (i = 5 \text{ to } 8)$$



(a)  $L_{W\_OFF}$ ,  $L_{B\_OFF}$  measuring pattern

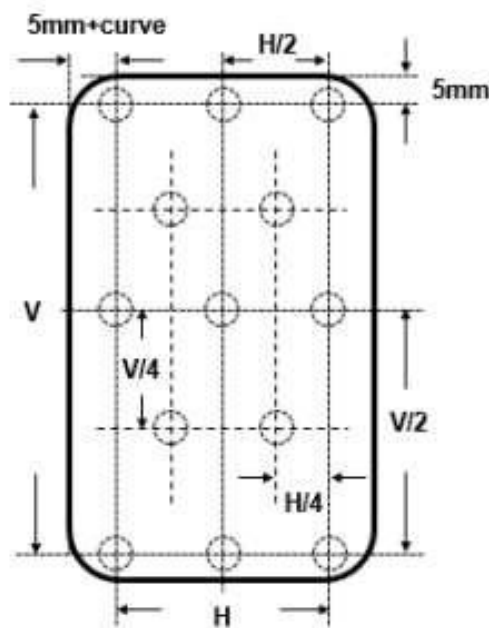


(b)  $L_{W\_ON}$ ,  $L_{B\_ON}$  measuring pattern

Note 7 : Definition of Luminance Uniformity

Measure the luminance of gray level 255 & 128 & 64 at 13 points

$$\text{Uniformity} = \frac{L_{min}}{L_{max}} * 100\%$$

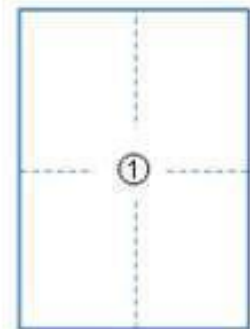


Note 8 : Definition of Lifetime

Lifetime Measure Steps :

- ◆ Light on W Aging pattern for 0.5h before lifetime measure
- ◆ 0h ——W Aging pattern,measure pt.① initial luminance &  $\Delta U^*V^*$
- ◆ 0~1h ——W Aging pattern
- ◆ 1h ——W Aging pattern,measure pt ① luminance &  $\Delta U^*V^*$
- ◆ Loop step below progress ....to 300h

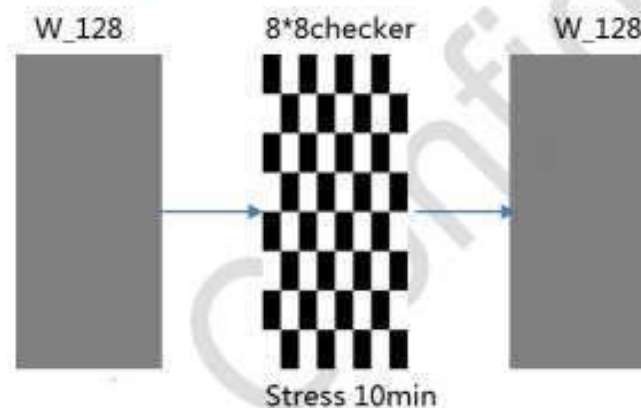
Aging pattern



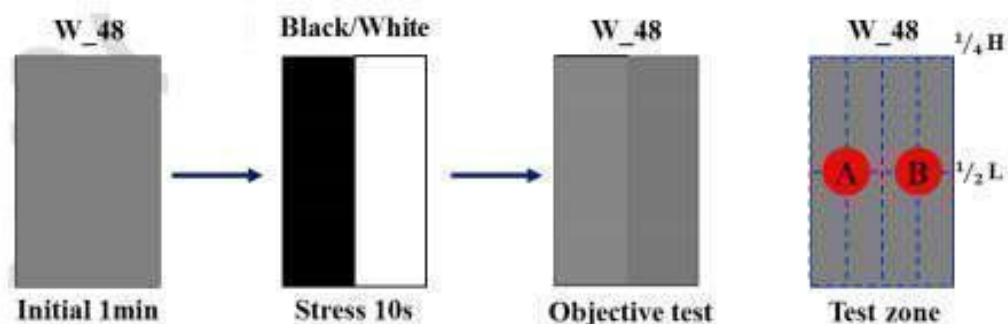
Note 9 : Definition of Image sticking

9.1 Subjective test

1. Test environment temperature is 25°C.
2. Light on W48 pattern for 1min , then change to 8\*8 checker pattern for 10s , at last change to W48 pattern and record the time of duration.



9.2 Objective test



Step:

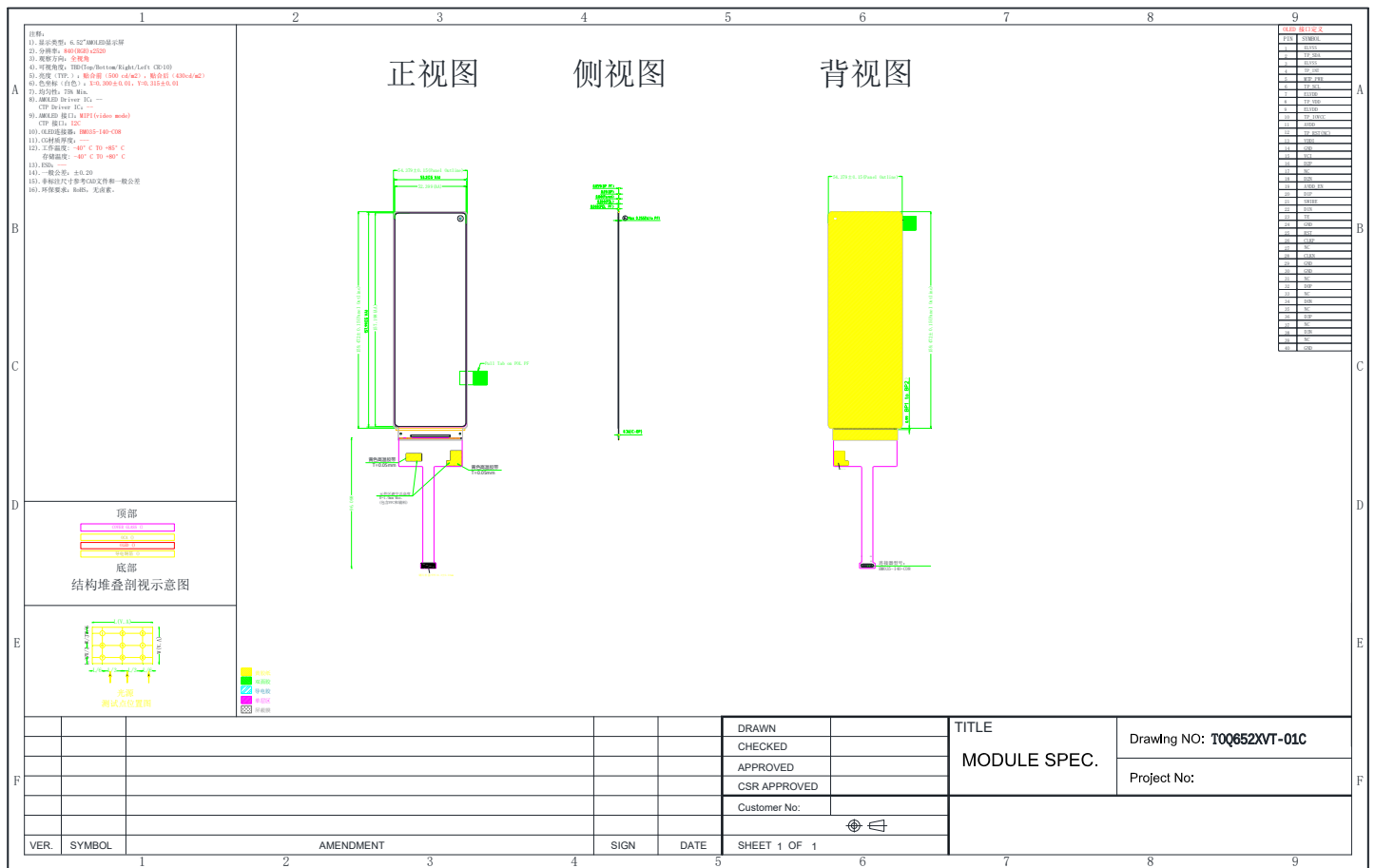
1. Test environment temperature is 25°C.
2. light on 48 gray pattern for 1min , than Change to a black/white pattern for 10s , at last change the pattern back to 48 gray for 1min.

- Using CA-P410 measures the luminance once a second of test zone in the whole process.
- Calculate the Michelson contrast value  $X$  with formula below :

$$X = \left( \frac{L_{A(t)} - L_{B(t)}}{L_{A(t)} + L_{B(t)}} - \frac{L_{A(Initial\ average)} - L_{B(Initial\ average)}}{L_{A(Initial\ average)} + L_{B(Initial\ average)}} \right) / 1JND$$

$$1JND = 0.4\%$$

#### 4 OUTLINE DTAWING (Unit: mm)



## 5 Package Drawing

### 5.1 Packing Specifications

| Item                | Specification | Remark |
|---------------------|---------------|--------|
| Carton(Box) Packing | -----         |        |
| Gross weight        | -----         |        |
| Net weight          | -----         |        |
| Packing Quantity    | 2880 pcs      |        |

### 5.2 Packing Method

