

**PRODUCT SPECIFICATION****TFT-LCD MODULE****Module No: 312238-01**

| Designed by | Checked by | Approved by |
|-------------|------------|-------------|
|             |            |             |

**Final Approval by Customer**

| Approved by | Comment |
|-------------|---------|
|             |         |

For more information, contact us:

※The specification of "TBD" should refer to the measured value of sample. If there is difference between the design specification and measured value, we naturally shall negotiate and agree to solution with customer.

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## 1. Numbering System

TBD

## 2. General Information

| ITEM                | STANDARD VALUES               | UNITS |
|---------------------|-------------------------------|-------|
| LCD type            | 7.0" TFT+CTP                  | --    |
| Dot arrangement     | 800(RGB) × 1280               | dots  |
| Color filter array  | RGB vertical stripe           | --    |
| Display mode        | Transmissive / Normally Black | --    |
| LCM+CTP Module size | 192.8(W) × 125.7(H) × 4.2(T)  | mm    |
| LCM Module size     | 161.6(W) × 99.75(H) × 2.6(T)  | mm    |
| Active area         | 150.72 (W) × 94.2 (H)         | mm    |
| Dot pitch           | 0.11775(W) × 0.11775(H)       | mm    |
| Interface           | MIPI                          |       |



## 4. Interface Description

### 4.1 TFT Interface Description

| Pin NO. | SYMBOL    | DESCRIPTION                                                  |
|---------|-----------|--------------------------------------------------------------|
| 1       | VCOM (NC) | No connection                                                |
| 2       | VDDIN     | Power Voltage for digital circuit(3.3V)                      |
| 3       | VDDIN     | Power Voltage for digital circuit(3.3V)                      |
| 4       | GND       | Power ground.                                                |
| 5       | RESET     | Device reset signal.                                         |
| 6       | NC        | No connection                                                |
| 7       | GND       | Power ground.                                                |
| 8       | MIPI_D0N  | MIPI-DSI Data differential signal input pins. (Data lane 0-) |
| 9       | MIPI_D0P  | MIPI-DSI Data differential signal input pins. (Data lane 0+) |
| 10      | GND       | Power ground.                                                |
| 11      | MIPI_D1N  | MIPI-DSI Data differential signal input pins. (Data lane 1-) |
| 12      | MIPI_D1P  | MIPI-DSI Data differential signal input pins. (Data lane 1+) |
| 13      | GND       | Power ground.                                                |
| 14      | MIPI_CKN  | MIPI-DSI CLOCK differential signal input pins.               |
| 15      | MIPI_CKP  | MIPI-DSI CLOCK differential signal input pins.               |
| 16      | GND       | Power ground.                                                |
| 17      | MIPI_D2N  | MIPI-DSI Data differential signal input pins. (Data lane 2-) |
| 18      | MIPI_D2P  | MIPI-DSI Data differential signal input pins. (Data lane 2+) |
| 19      | GND       | Power ground.                                                |
| 20      | MIPI_D3N  | MIPI-DSI Data differential signal input pins. (Data lane 3-) |
| 21      | MIPI_D3P  | MIPI-DSI Data differential signal input pins. (Data lane 3+) |
| 22      | GND       | Power ground.                                                |
| 23      | NC        | No connection                                                |
| 24      | NC        | No connection                                                |
| 25      | GND       | Power ground.                                                |
| 26      | NC        | No connection                                                |
| 27      | LED_PWM   | PWM control signal for LED driver(CABC)                      |
| 28      | NC        | No connection                                                |
| 29      | VCL (NC)  | No connection                                                |
| 30      | GND       | Power ground.                                                |
| 31      | VLED-     | Power for LED backlight (Cathode).                           |
| 32      | VLED-     | Power for LED backlight (Cathode).                           |
| 33      | NC        | No connection                                                |
| 34      | NC        | No connection                                                |
| 35      | AVEE      | Negative Power supply (-5.5V)                                |
| 36      | NC        | No connection                                                |
| 37      | NC        | No connection                                                |
| 38      | AVDD      | Positive Power supply (+5.5V)                                |
| 39      | VLED+     | Power for LED backlight (Anode).                             |
| 40      | VLED+     | Power for LED backlight (Anode).                             |

## 4.2 CTP Interface Description

| Pin NO. | SYMBOL | I/O   | DESCRIPTION                           |
|---------|--------|-------|---------------------------------------|
| 1       | GND    | Power | Power ground.                         |
| 2       | VDD    | Power | Digital Power: 3.3V                   |
| 3       | SCL    | I     | I2C_clock (1.8V)                      |
| 4       | SDA    | I/O   | I2C_data (1.8V)                       |
| 5       | NC     | -     | NC                                    |
| 6       | RESET  | I     | External Reset, Low is active (1.8V)  |
| 7       | INT    | O     | External interrupt to the host (1.8V) |
| 8       | ID0    | -     | GND                                   |
| 9       | ID1    | -     | GND                                   |
| 10      | ID2    | -     | GND                                   |

## 5. Absolute Maximum Ratings

| Item               | Symbol | Min. | Max. | Unit | Remarks:                             |
|--------------------|--------|------|------|------|--------------------------------------|
| TFT Supply Voltage | VDDIN  | -0.3 | 5.5  | V    | Test condition refer to paragraph 10 |
| CTP Supply Voltage | VDD    | 2.6  | 3.47 | V    |                                      |
|                    |        |      |      |      |                                      |
|                    |        |      |      |      |                                      |
|                    |        |      |      |      |                                      |

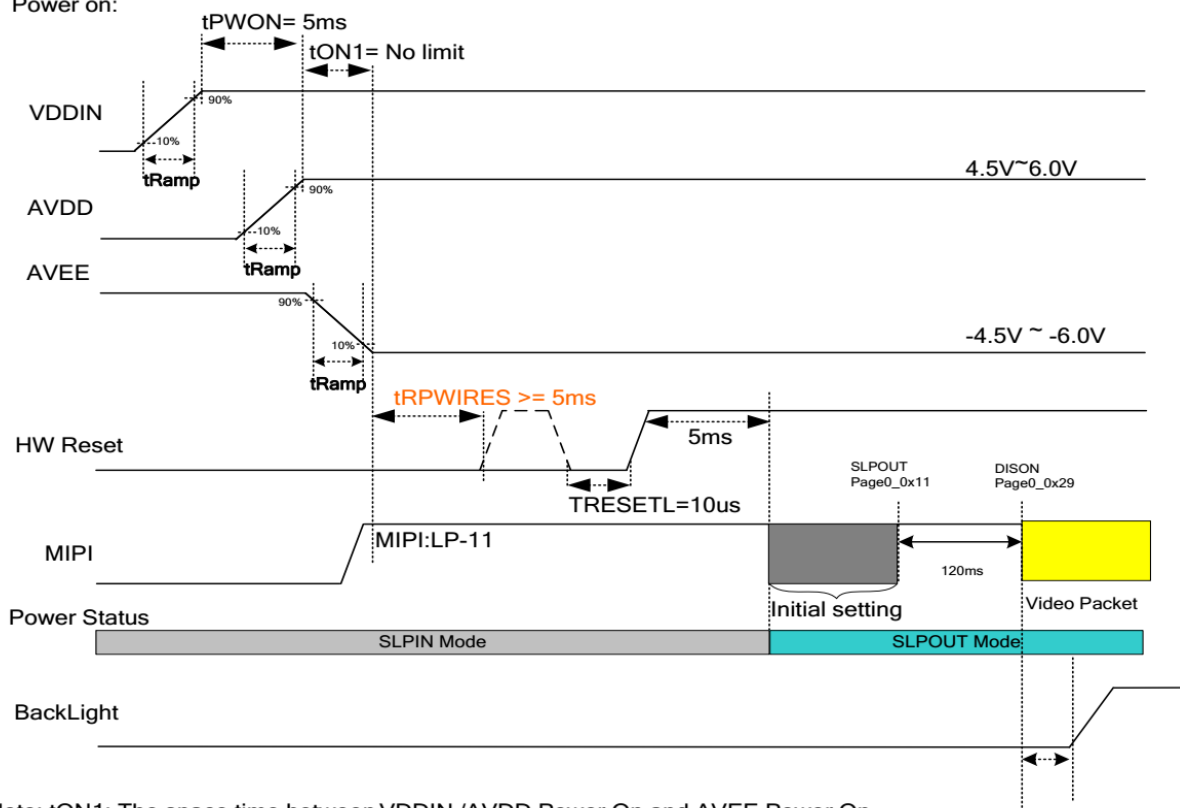
## 6. DC Characteristics

| Item                    | Symbol | Min. | Typ. | Max. | Unit | Remark     |
|-------------------------|--------|------|------|------|------|------------|
| TFT Supply Voltage      | VDDIN  | 3.0  | 3.3  | 3.6  | V    | -          |
|                         | AVDD   | 5.2  | 5.8  | 6.0  | V    | -          |
|                         | AVEE   | -6.0 | -5.8 | -5.2 | V    | -          |
| CTP Supply Voltage      | VDD    | 2.6  | -    | 3.3  | V    | -          |
| TFT Current Consumption | IVDDIN | -    | 30   | 40   | mA   | VDDIN=3.3V |
|                         | IAVDD  | -    | 0.25 | 0.4  | mA   | AVDD=5.8V  |
|                         | IAVEE  | -    | 0.25 | 0.4  | mA   | AVEE=-5.8V |

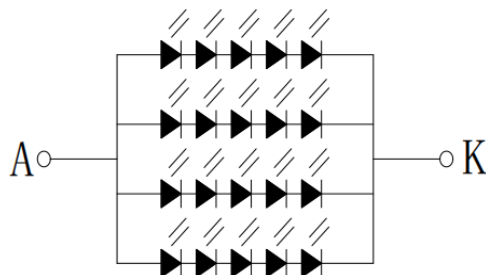
## 7. Power on sequence

VDDIN = 3.0V ~ 3.6V, AVDD=4.5V ~ 6.0V, AVEE=-4.5V ~ -6.0V

Power on:



## 8. Backlight Characteristics



CURRENT  $I_F = 80mA$   
 $5C * 4B = 20LED$

| Item                           | Symbol | MIN    | TYP | MAX | UNIT              | Test Condition |
|--------------------------------|--------|--------|-----|-----|-------------------|----------------|
| Supply Voltage                 | Vf     | 15     | 16  | 17  | V                 | If=80mA        |
| Luminous Intensity for LCM+CTP | -      | -      | 295 | -   | cd/m <sup>2</sup> | If=80mA        |
| Uniformity for LCM             | -      | -      | 80  | -   | %                 | If=80mA        |
| LED Life Time                  | -      | 20,000 | -   | -   | Hr                | If=80mA        |
| Backlight Color                | White  |        |     |     |                   |                |

## 9. Optical Characteristics

| Parameter                        |               | Symbol        | Condition                       | Min. | Typ.  | Max. | Unit              | Remark   |
|----------------------------------|---------------|---------------|---------------------------------|------|-------|------|-------------------|----------|
| Viewing Angle range              | Horizontal    | $\Theta_3$    | CR > 10                         | 80   | 89    | -    | Deg.              | Note 1   |
|                                  |               | $\Theta_9$    |                                 | 80   | 89    | -    | Deg.              |          |
|                                  | Vertical      | $\Theta_{12}$ |                                 | 80   | 89    | -    | Deg.              |          |
|                                  |               | $\Theta_6$    |                                 | 80   | 89    | -    | Deg.              |          |
| Color Gamut                      |               |               |                                 | 45   | 50    | 55   | %                 | -        |
| Tr.                              |               |               |                                 | -    | 6.8   | -    | %                 | With APF |
| Luminance Contrast ratio         |               | CR            | $\Theta = 0^\circ$              | 700  | 850   | -    | -                 | Note 2   |
| Luminance of White               | Center Points | $Y_w$         | $\Theta = 0^\circ$              | -    | -     | -    | cd/m <sup>2</sup> | Note 3   |
| White Luminance uniformity       | 9 Points      | $\Delta Y5$   |                                 | -    | -     | -    | %                 | Note 4   |
| White balance                    |               | Color Temp    | $\Theta = 0^\circ$              | -    | -     | -    | K                 | Note 5   |
|                                  |               | $\Delta uv$   |                                 | -    | -     | -    | -                 |          |
| Reproduction of color            | Red           | $R_x$         | $\Theta = 0^\circ$              |      | 0.610 |      | -                 | Note6    |
|                                  |               | $R_y$         |                                 |      | 0.350 |      |                   |          |
|                                  | Green         | $G_x$         |                                 |      | 0.340 |      |                   |          |
|                                  |               | $G_y$         |                                 |      | 0.570 |      |                   |          |
|                                  | Blue          | $B_x$         |                                 |      | 0.160 |      |                   |          |
|                                  |               | $B_y$         |                                 |      | 0.120 |      |                   |          |
| Response Time (Rising + Falling) |               | $T_{RT}$      | Ta= 25° C<br>$\Theta = 0^\circ$ | -    | 30    | 35   | ms                | Note 7   |
| Gamma Scale                      |               | CT            | $\Theta = 0^\circ$              | -    | -     | -    | -                 | -        |

### 1. Note :

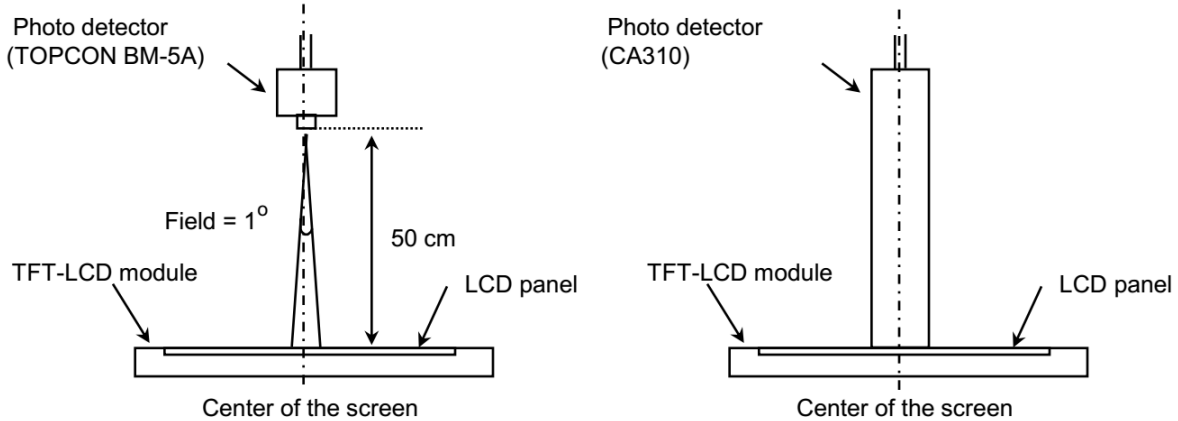
- Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or 3, 9 o'clock direction and the vertical or 6, 12 o'clock direction with respect to the optical axis which is normal to the LCD surface (see FIGURE 1).
- Contrast measurements shall be made at viewing angle of  $\Theta = 0$  and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state . (see FIGURE 1) Luminance Contrast Ratio (CR) is defined mathematically.

$$CR = \text{Luminance with all pixels white} / \text{Luminance with all pixels black}$$

- Center Luminance of white is defined as luminance values of 1point average across the LCD surface. Luminance shall be measured with all pixels in the view field set first to white. This measurement shall be taken at the locations shown in FIGURE 2 for a total of the measurements per display. The luminance is measured by CA310 when the LED current is set at 16.8mA.
- The White luminance uniformity on LCD surface is then expressed as :  $\Delta Y = \text{Minimum Luminance of 9points} / \text{Maximum Luminance of 9points}$  (see FIGURE 2).

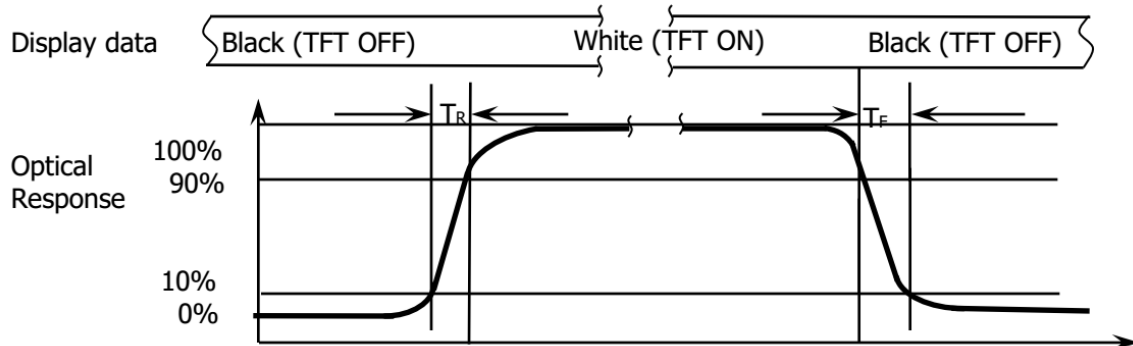
5. The color chromaticity coordinates specified shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.
6. The color chromaticity coordinates specified shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.
7. The electro-optical response time measurements shall be made as FIGURE 4 by switching the "data" input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is  $T_r$ , and 90% to 10% is  $T_d$ .

Figure 1. Measurement Set Up



View angel range measurement setup    Luminance , uniformity and color measurement setup

Figure 4. Response Time Testing



## 10. Reliability Test Conditions And Methods

| NO. | TEST ITEMS                 | TEST CONDITION                                                                                                | INSPECTION AFTER TEST                                                                                                                                                                                                                                                                                                                                                  |
|-----|----------------------------|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | High Temperature Storage   | 70℃±2℃×48Hours                                                                                                | Inspection after 2~4hours storage at room temperature,the samples should be free from defects:<br>1,Air bubble in the LCD.<br>2,Sealleak.<br>3,Non-display.<br>4,Missing segments.<br>5,Glass crack.<br>6,Current IDD is twice higher than initial value.<br>7,The surface shall be free from damage.<br>8,The electric charateristic requirements shall be satisfied. |
| ②   | Low Temperature Storage    | -30℃±2℃×48Hours                                                                                               |                                                                                                                                                                                                                                                                                                                                                                        |
| ③   | High Temperature Operating | 60℃±2℃×48Hours                                                                                                |                                                                                                                                                                                                                                                                                                                                                                        |
| ④   | Low Temperature Operating  | -20℃±2℃×48Hours                                                                                               |                                                                                                                                                                                                                                                                                                                                                                        |
| ⑤   | Temperature Cycle(Storage) | -20℃ $\longleftrightarrow$ 25℃ $\longleftrightarrow$ 60℃<br>(30min) (5min) (30min)<br>1cycle<br>Total 10cycle |                                                                                                                                                                                                                                                                                                                                                                        |
| ⑥   | Damp Proof Test (Storage)  | 50℃±5℃×90%RH×96Hours                                                                                          |                                                                                                                                                                                                                                                                                                                                                                        |
| ⑦   | Vibration Test             | Frequency:10Hz~55Hz~10Hz<br>Amplitude:1.5M<br>X,Y,Z direction for total 3hours<br>(Packing Condition)         |                                                                                                                                                                                                                                                                                                                                                                        |
| ⑧   | Drooping Test              | Drop to the ground from 1M height one time every side of carton. (Packing Condition)                          |                                                                                                                                                                                                                                                                                                                                                                        |
| ⑨   | ESD Test                   | ± 2KV, Human Body Mode, 100pF/1500Ω                                                                           |                                                                                                                                                                                                                                                                                                                                                                        |

Note 1: Ta is the ambient temperature of samples.

Note 2: Ts is the temperature of panel's surface.

Note 3: In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but don't guarantee all of the cosmetic specification.

Note 4: Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

## 11. Handling Precautions

### 11.1 Mounting method

The LCD panel of LCD module consists of two thin glass plates with polarizers which easily be damaged. And since the module is so constructed as to be fixed by utilizing fitting holes in the printed circuit board.

Extreme care should be needed when handling the LCD modules.

### 11.2 Caution of LCD handling and cleaning

When cleaning the display surface, Use soft cloth with solvent  
[recommended below] and wipe lightly

- Isopropyl alcohol
- Ethyl alcohol

Do not wipe the display surface with dry or hard materials that will damage the polarizer surface.

Do not use the following solvent:

- Water
- Aromatics

Do not wipe ITO pad area with the dry or hard materials that will damage the ITO patterns

Do not use the following solvent on the pad or prevent it from being contaminated:

- Soldering flux
- Chlorine (Cl) , Sulfur (S)

If goods were sent without being silicon coated on the pad, ITO patterns could be damaged due to the corrosion as time goes on.

If ITO corrosion happens by miss-handling or using some materials such as Chlorine (Cl), Sulfur (S) from customer, Responsibility is on customer.

### 11.3 Caution against static charge

The LCD module uses C-MOS LSI drivers, so we recommend that you:

Connect any unused input terminal to Vdd or Vss, do not input any signals before power is turned on, and ground your body, work/assembly areas, assembly equipment to protect against static electricity.

### 11.4 packing

- Module employs LCD elements and must be treated as such.
- Avoid intense shock and falls from a height.
- To prevent modules from degradation, do not operate or store them exposed direct to sunshine or high temperature/humidity

### 11.5 Caution for operation

- It is an indispensable condition to drive LCD's within the specified voltage limit since the higher voltage than the limit causes the shorter LCD life.
- An electrochemical reaction due to direct current causes LCD's undesirable deterioration, so that the use of direct current drive should be avoided.
- Response time will be extremely delayed at lower temperature than the operating temperature range and on the other hand at higher temperature LCD's show dark color in them. However those phenomena do not mean malfunction or out of order with LCD's, which will come back in the specified operation temperature.
- If the display area is pushed hard during operation, some font will be abnormally displayed but it resumes normal condition after turning off once.
- A slight dew depositing on terminals is a cause for electro-chemical reaction resulting in terminal open circuit.

Usage under the maximum operating temperature, 50%Rh or less is required.

### 11.6 storage

In the case of storing for a long period of time for instance, for years for the purpose or replacement use, the following ways are recommended.

- Storage in a polyethylene bag with the opening sealed so as not to enter fresh air outside in it . And with no desiccant.
- Placing in a dark place where neither exposure to direct sunlight nor light's keeping the storage temperature range.
- Storing with no touch on polarizer surface by the anything else.

[It is recommended to store them as they have been contained in the inner container at the time of delivery from us

### 11.7 Safety

- It is recommendable to crash damaged or unnecessary LCD's into pieces and wash off liquid crystal by either of solvents such as acetone and ethanol, which should be burned up later.
- When any liquid leaked out of a damaged glass cell comes in contact with your hands, please wash it off well with soap and water

## 12. Precaution For Use

### 12.1

A limit sample should be provided by the both parties on an occasion when the both parties agreed its necessity. Judgment by a limit sample shall take effect after the limit sample has been established and confirmed by the both parties.

### 12.2

On the following occasions, the handing of problem should be decided through discussion and agreement between responsible of the both parties.

- When a question is arisen in this specification
- When a new problem is arisen which is not specified in this specifications
- When an inspection specifications change or operating condition change in customer is reported to LCD , and some problem is arisen in this specification due to the change
- When a new problem is arisen at the customer's operating set for sample evaluation in the customer site.

## 13. Packing Method

TBD

深圳市丽台电子有限公司

## Quality Inspection Standards

## 品质允收标准

Model No. / 产品型号: Applies 5.5~10.0 Inch Touch Display ScreenUpdated Date / 生效日期: 2022-05-20Version / 版本: A0

Customer confirmation : \_\_\_\_\_

Record of Revision / 修订履历

| Version / 版本 | Revision Record / 修订内容 | Reviser / 修订人 | Revision Date / 修订日期 |
|--------------|------------------------|---------------|----------------------|
| V0           | 首发 / Starting          |               | 2022.05.20           |
|              |                        |               |                      |
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|              |                        |               |                      |
|              |                        |               |                      |

## 1.Scope of application /适用范围.

This document shall be applied to 5.5~10.0 inch touch display screen.

本文件适用于5.5~10.0 寸触摸显示屏.

## 2.Inspection conditions and environment /检验条件与环境.

### 2.1 Inspection Conditions /检验条件:

(1) Inspection Distance /检测距离: 35cm  $\pm$  5cm.

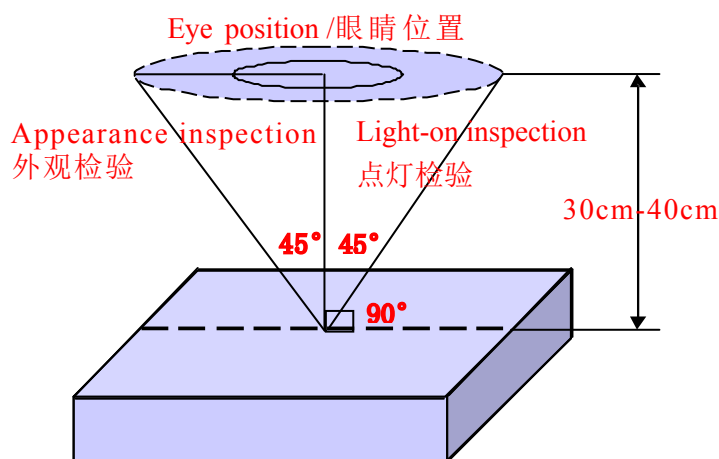
(2) Check time /检验时间:

Displays performance test /功能测试: 2~3S /Image, Cosmetic Inspection /外观检验: 10~12S.

(3) Check the viewing angle /检验视角:

Light-on Inspection Angle /点灯检验角度:  $\pm 45^\circ$ .

Cosmetic Inspection Angle /外观检验角度:  $\pm 45^\circ$ .



(Perpendicular to LCD panel surface /垂直于LCD表面)

### 2.2 Inspection environment /检验环境:

|                            |                               |                |
|----------------------------|-------------------------------|----------------|
| Ambient Temperature<br>温度  |                               | 25°C $\pm$ 5°C |
| Ambient Humidity<br>湿度     |                               | 55 $\pm$ 5%RH  |
| Ambient Illumination<br>亮度 | Cosmetic Inspection<br>外观检验   | 800-1000 Lux   |
|                            | Functional Inspection<br>点灯检验 | 200~300Lux     |

### 2.3 Sampling Conditions /抽样条件:

(1) Quantity to be inspected /批量: Quantity of shipment lot per model /单次运送单一型号数量.

## (2) Sampling method /抽样方法:

| Sampling Plan /抽样计划 |                    | GB/T 2828.1- 2003                                |
|---------------------|--------------------|--------------------------------------------------|
|                     |                    | Normal Inspection , Single Sampling<br>正常检验、单次抽样 |
|                     |                    | General inspection level: II<br>一般检验水平: 二级       |
| AQL                 | Major Defect /主要缺陷 | 0.65                                             |
|                     | Minor Defect /次要缺陷 | 1.0                                              |

(3) The classification of Major(MA) and Minor(MI) defects is shown as “3.1 Classification of defects” .  
主缺(MA)及次缺(MI)定义于”3.1缺陷分类”.

## 3.Terms And Definitions /术语和定义

## 3.1 Classification of defects / 缺陷分类 :

## (1) Major defects /主要缺陷:

A major defect is a defect that is likely to result in failure, or to reduce materially the usability of the product for its intended purpose .

可导致产品功能失效或减少产品可用性的缺陷.

## (2) Minor defects /次要缺陷:

It will not cause the product to fail and reduce the defects in the effective use and operation of the product.

不会导致产品功能失效和减少产品的有效使用与操作的缺陷.

## 3.2 Point defects /点状缺陷:

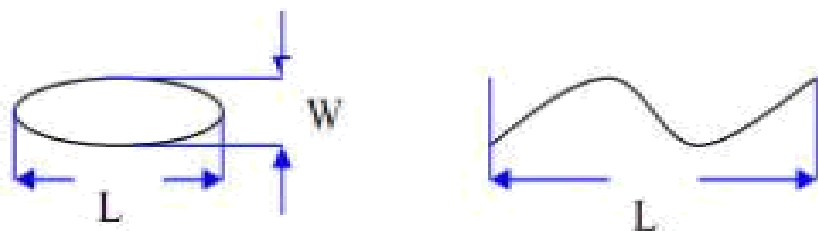
The size of the point defect is defined by the diameter D, and the average diameter of the defect is  $D=1/2 (W+L)$  .

点状缺陷的大小是由直径 D 定义的, 缺陷的平均直径  $D=1/2(W+L)$ .

## 3.3 Linear defects /线状缺陷:

When defect size  $L \geq 2W$ , the defect count as liner type defect. Size of linear defect is defined by length ( L) and the maximum width (W).

当缺陷尺寸  $L \geq 2W$  时, 被视为线状缺陷, 线状缺陷是由长度 (L) 和最大宽度 (W) 定义的.



### 3.4 LCD sub-pixel dot /LCD子像素点

(1) Definition /定义 : The point defect area is greater than 50% of the LCD sub-pixel area, and is visible through ND5% filter masking .

子像素点缺陷面积大于 50% LCD子像素面积, 且透过 ND5%遮盖是可见的.

(2) The drawing of 1/2 area sub-pixel definition / 1/2 面积的子像素定义绘图:

The 1/2 area sub-pixel can be defined as below one or more of specific shapes

1/2 面积的子像素可以定义为如下一个或多个特定形状图:



### 3.5 Small bright dot /细碎亮点 :

Point defects smaller than "LCD sub-pixels" /小于“LCD子像素点”的点缺陷.

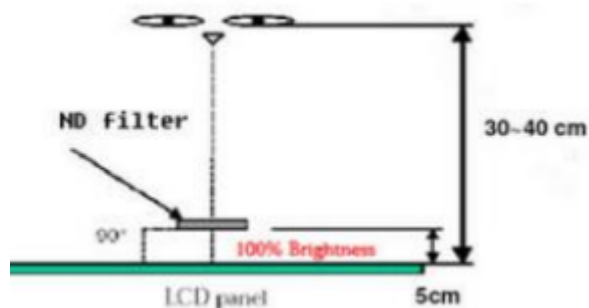
(Ratio of Zone I to Zone O /I 区与 O 区比例: 1: 2: 1)



### 3.6 ND filter inspection method /ND卡的检验方法:

Hold the ND filter about 5cm above the display area, with your eyes 30-40cm away from the panel, and observe for 2~3 seconds.

在显示区域上方大约 5cm 处握住 ND 卡, 眼睛距离面板 30-40cm, 观察2~3 秒.



3.7 Any FPC surface problems that do not leak copper on the surface and do not cause functional failure are acceptable.

任何 FPC 表面问题, 表面未露铜和不造成功能失效是可以接受.

3.8 Extraneous substances that can be wiped out , like Finger point,Particles are not considered as a defect .

可以被擦拭干净的表面物质不视为缺陷 (如手指印, 尘粒) .

3.9 Defects that can be covered by the material and are not visible in appearance are not considered defects.

能被物料覆盖，外观不可见的缺陷不视为缺陷。

3.10 Panel damage /面板损伤：

Glass damage outside the AA display area that does not affect the effective wiring is acceptable.

AA 显示区域以外的玻璃损伤，不影响有效线路是可以接受的。

3.11 Issues not specified or defined in this acceptance standard shall be handled through friendly negotiation between the two parties.

本允收标准中未规定或定义的问题，双方友好协商处理。

## 4. Inspection standards /检验标准

### 4.1 Structural Dimensions /结构尺寸规格

| Serial Number<br>序号 | Measurement items /测量项目              |          | Specification /规格 | Remark /备注                                                                                             |
|---------------------|--------------------------------------|----------|-------------------|--------------------------------------------------------------------------------------------------------|
|                     | 名称 /Name                             | Unit /单位 | Tolerance /公差     |                                                                                                        |
| 1                   | Outside dimension: Length<br>尺寸：长    | mm /毫米   | 0.15mm~0.30mm     | Please refer to the product specification for detailed dimensions and tolerances<br>详细的尺寸规格和公差请参考产品规格书 |
| 2                   | Outside dimension: Width<br>尺寸：宽     | mm /毫米   | 0.15mm~0.30mm     |                                                                                                        |
| 3                   | Outside dimension: Thickness<br>尺寸：高 | mm /毫米   | 0.20mm~0.50mm     |                                                                                                        |

### 4.2 Appearance Inspection Specification /外观检验规格

( D : diameter, W : width, L : length, N : quantity, DS : spacing )

| Inspection area<br>检验区域 | Inspection items<br>检验项目          | Inspection specifications<br>检验规格                              | Defect category<br>缺陷类别 |    |
|-------------------------|-----------------------------------|----------------------------------------------------------------|-------------------------|----|
| Glass<br>玻璃             | Wire(on Array)<br>线路              | Can't be damaged<br>不能损伤                                       | MA                      |    |
|                         | Chipping/corner breaking<br>崩边/破角 | Can't affect the effective lines and functions<br>不能影响有效线路和功能  | MA                      |    |
|                         | Edge<br>边缘                        | There must be no extensional cracks<br>不可有延伸性裂纹                | MA                      |    |
| Silicone<br>硅胶          | Silicone coating<br>硅胶涂布          | The height must not exceed the LCD CF surface<br>高度不能超过LCD CF面 |                         | MI |
|                         | Glue overflow<br>溢胶               | Can't cover FPC, POL, etc<br>不能覆盖到FPC、POL等                     |                         | MI |

| Inspection area<br>检验区域                 | Inspection items<br>检验项目                                 | Inspection specifications<br>检验规格                                                                                                                                                                                                        | Defect category<br>缺陷类别 |    |
|-----------------------------------------|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----|
| PCBA<br><br>FPC<br><br>Connector<br>连接器 | Appearance<br>外观                                         | Scratches or injuries are not allowed to cause copper exposure<br>划伤或损伤不允许表面出现露铜                                                                                                                                                         |                         | MI |
|                                         | Component<br>元器件                                         | Can't be damaged and lack<br>不能损伤和缺少                                                                                                                                                                                                     | MA                      |    |
|                                         | Goldfinger oxidation<br>金手指氧化                            | Not allowed<br>不允许                                                                                                                                                                                                                       |                         | MI |
|                                         | Connection status<br>连接状况                                | The connection must be accurate and stable<br>必须准确稳定连接                                                                                                                                                                                   | MA                      |    |
|                                         | Break<br>破裂                                              | Not allowed<br>不允许                                                                                                                                                                                                                       | MA                      |    |
|                                         | Soldering, false soldering/tinning/tin beads<br>假焊/连锡/锡珠 | Not allowed<br>不允许                                                                                                                                                                                                                       | MA                      |    |
| POL<br>偏光片                              | Scratches<br>划伤                                          | 1. $W \leq 0.07\text{mm}$ ; $L \leq 5\text{mm}$ , Ignore (忽略)<br>2. $0.07\text{mm} < W \leq 0.12\text{mm}$ ; $L \leq 5\text{mm}$ ; $N \leq 4$ ; $DS \geq 10\text{mm}$<br>3. $0.12\text{mm} < W$ ; $5\text{mm} < L$ , Not allowable (不允许) |                         | MI |
|                                         | Dent<br>凹凸印                                              | 1. $D \leq 0.20\text{mm}$ , Ignore (忽略)<br>2. $0.20\text{mm} < D \leq 0.40\text{mm}$ ; $N \leq 4$ ; $DS \geq 10\text{mm}$<br>3. $0.40\text{mm} < D$ , Not allowable (不允许)                                                                |                         | MI |
|                                         | Bubbles<br>气泡                                            | 1. $D \leq 0.20\text{mm}$ , Ignore (忽略)<br>2. $0.20\text{mm} < D \leq 0.40\text{mm}$ ; $N \leq 4$ ; $DS \geq 10\text{mm}$<br>3. $0.40\text{mm} < D$ , Not allowable (不允许)                                                                |                         | MI |
|                                         | Point defects<br>点状不良                                    | 1. $D \leq 0.20\text{mm}$ , Ignore (忽略)<br>2. $0.20\text{mm} < D \leq 0.40\text{mm}$ ; $N \leq 4$ ; $DS \geq 10\text{mm}$<br>3. $0.40\text{mm} < D$ , Not allowable (不允许)                                                                |                         | MI |
|                                         | Edge bubbles<br>边缘气泡                                     | 1. Within 1/2BM of the display area, it is not allowed<br>显示区往外 1/2BM 区域内, 不允许<br>2. The display area is 1/2 outside the BM area, and it is not controlled<br>显示区往外 1/2BM 区域以外, 不管控                                                      |                         | MI |
|                                         | Dirty/watermarked<br>脏污/水印                               | No dirt/water lines/finger marks are allowed, and must be wiped clean<br>不允许有脏污/水纹/手指印, 须擦拭干净方可                                                                                                                                          |                         | MI |
|                                         | Warping<br>起翘                                            | Not allowed<br>不允许                                                                                                                                                                                                                       |                         | MI |
|                                         | Attaching offset<br>贴偏                                   | It is necessary to completely cover the display area outward, within the 1/2BM area, or without leaking POL edges after TP is attached<br>需完整覆盖显示区往外、1/2BM 区以内或贴合 TP 后不会出现漏偏光片边缘                                                         |                         | MI |
|                                         | Mixture<br>混料                                            | Mixing different types of POL or not using POL as required by the BOM, not allowed<br>不允许混贴不同型号的 POL 或未按 BOM 要求使用 POL                                                                                                                    | MA                      |    |

| Inspection area<br>检验区域 | Inspection items<br>检验项目                                                                       | Inspection specifications<br>检验规格                                                                                                                                                                                                                                                                     | Defect category<br>缺陷类别 |    |
|-------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----|
| TP&CG                   | Point defects<br>点状不良                                                                          | 1. $D \leq 0.20\text{mm}$ , Ignore (忽略)<br>2. $0.20\text{mm} < D \leq 0.40\text{mm}$ ; $N \leq 4$ ; $DS \geq 10\text{mm}$<br>3. $0.40\text{mm} < D$ , Not allowable (不允许)                                                                                                                             |                         | MI |
|                         | Scratches<br>划伤                                                                                | 1. $W \leq 0.07\text{mm}$ ; $L \leq 5\text{mm}$ , Ignore (忽略)<br>2. $0.07\text{mm} < W \leq 0.12\text{mm}$ ; $L \leq 5\text{mm}$ ; $N \leq 4$ ; $DS \geq 10\text{mm}$<br>3. $0.12\text{mm} < W$ ; $5\text{mm} < L$ , Not allowable (不允许)<br>4. There is a feeling scratch, Not allowable<br>有感划伤, 不允许 |                         | MI |
|                         | Edges and corners cracked<br>崩角/崩边                                                             | 1. Product front / 产品正面: Edge and corner chipping is not allowed 崩角、崩边不允许<br>2. Product back / 产品背面:<br>$X \leq 0.5$ , $Y \leq 0.5$ , $Z \leq 1/2T$ ; $N \leq 4$ ; $DS \geq 10\text{mm}$                                                                                                              |                         | MI |
|                         | Silk screen<br>丝印                                                                              | The silk screen is clear, complete and correct<br>丝印清晰、完整、内容正确                                                                                                                                                                                                                                        |                         | MI |
|                         | Dirty<br>脏污                                                                                    | Non-wipeable dirt, not allowed<br>不可擦拭的脏污, 不允许                                                                                                                                                                                                                                                        |                         | MI |
|                         | Broken<br>破损                                                                                   | Not allowable<br>不允许                                                                                                                                                                                                                                                                                  | MA                      |    |
|                         | Ink color aberration<br>油墨色差                                                                   | $\Delta E > 1$ , Not allowable (不允许)                                                                                                                                                                                                                                                                  |                         | MI |
|                         | Cover pinholes<br>针孔                                                                           | 1. $D \leq 0.15\text{mm}$ , $N \leq 4$ , $DS \geq 10\text{mm}$ , allowable<br>2. $D > 0.15\text{mm}$ , intensive pinholes (密集型针孔), Not allowable (不允许)                                                                                                                                                |                         | MI |
|                         | IR holes<br>IR孔                                                                                | Dirt, deviation, color difference, etc. are not allowed<br>不允许脏污、偏位、色差等                                                                                                                                                                                                                               |                         | MI |
| BL<br>背光                | Backlight separation<br>背光分离                                                                   | Not allowable<br>不允许                                                                                                                                                                                                                                                                                  |                         | MI |
|                         | Deformation of rubber iron and rubber frame<br>胶铁、胶框变形                                         | Use the plug gauge 0.3mm on the flat surface and can snap in and judge NG<br>在平面上使用塞规0.3mm卡翘曲位置, 能卡进判定NG                                                                                                                                                                                              |                         | MI |
|                         | The iron frame is oxidized and not tightened<br>铁框氧化、卡不紧                                       | Not allowable<br>不允许                                                                                                                                                                                                                                                                                  |                         | MI |
|                         | Backlight sticky solder beads, glue, etc<br>背面粘锡珠、残胶等                                          | Not allowable<br>不允许                                                                                                                                                                                                                                                                                  |                         | MI |
|                         | Inkjet coding, Barcode, QR code<br>喷码/条码/二维码                                                   | The Inkjet coding is clear and complete, the barcode and QR code can be scanned normally, and the content and format match<br>喷码清晰完整、条码和二维码可正常扫描, 内容和格式相符                                                                                                                                             |                         | MI |
|                         | Accessories(protective film, double-sided tape, insulating adhesive, etc.)<br>辅料(保护膜、双面胶、绝缘胶等) | Defects such as missing pastes, sticking deviations, defects, and fractures are not allowed<br>不允许有漏贴、贴偏、残缺、断裂等缺陷                                                                                                                                                                                     |                         | MI |

## 4.3 Electrical test specifications /电性检查规格

(D : diameter, W : width, L : length, N : quantity, DS : spacing)

| Inspection items<br>检验项目                          | Inspection specifications<br>检验规格                                                                                                                                                                                                        | Defect category<br>缺陷类别 |    |
|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----|
| Glass bright spots/dark spots<br>玻璃亮点/暗点          | 1. $D \leq 0.20\text{mm}$ , Ignore (忽略)<br>2. $0.20\text{mm} < D \leq 0.40\text{mm}$ ; $N \leq 4$ ; $DS \geq 10\text{mm}$<br>3. $0.40\text{mm} < D$ , Not allowable (不允许)                                                                |                         | MI |
| Mura                                              | Use ND5% filter masking, visual invisibility is OK, 200~300Lux<br>使用ND5%遮盖, 目视不可见即为OK, 200~300Lux                                                                                                                                        |                         | MI |
| Small bright dot<br>细碎亮点                          | Use ND5% filter masking, visual invisibility is OK<br>使用ND5%遮盖, 目视不可见即为OK                                                                                                                                                                |                         | MI |
| Light leakage<br>漏光                               | 1. Use ND5% filter masking, visual invisibility is OK<br>使用ND5%遮盖, 目视不可见即为OK<br>2. If necessary, sign off on the sample<br>必要时, 签限定样                                                                                                     |                         | MI |
| Backlight black/white dots<br>背光黑点/白点             | 1. $D \leq 0.20\text{mm}$ , Ignore (忽略)<br>2. $0.20\text{mm} < D \leq 0.40\text{mm}$ ; $N \leq 4$ ; $DS \geq 10\text{mm}$<br>3. $0.40\text{mm} < D$ , Not allowable (不允许)                                                                |                         | MI |
| Linear foreign bodies<br>线状异物 (异物毛丝等)             | 1. $W \leq 0.07\text{mm}$ ; $L \leq 5\text{mm}$ , Ignore (忽略)<br>2. $0.07\text{mm} < W \leq 0.12\text{mm}$ ; $L \leq 5\text{mm}$ ; $N \leq 4$ ; $DS \geq 10\text{mm}$<br>3. $0.12\text{mm} < W$ ; $5\text{mm} < L$ , Not allowable (不允许) |                         | MI |
| Black/White Print<br>黑印/白印                        | Use ND5% filter masking, visual invisibility is OK<br>使用ND5%遮盖, 目视不可见即为OK                                                                                                                                                                |                         | MI |
| The display is uneven<br>显示不均匀                    | Use ND5% filter masking, visual invisibility is OK<br>使用ND5%遮盖, 目视不可见即为OK                                                                                                                                                                |                         | MI |
| The brightness is uneven<br>亮度不均匀                 | Brightness uniformity $< 85.0\%$ , Not allowable<br>亮度均匀性 $< 85.0\%$ , 不允许                                                                                                                                                               |                         | MI |
| Displacement of the membrane<br>膜材移位              | Not allowable<br>不允许                                                                                                                                                                                                                     |                         | MI |
| Interference pattern/Newtonian pattern<br>干涉纹/牛顿纹 | Not allowable<br>不允许                                                                                                                                                                                                                     |                         | MI |
| Display abnormal<br>显示异常                          | Not allowable<br>不允许                                                                                                                                                                                                                     | MA                      |    |
| No display<br>无显示                                 | Not allowable<br>不允许                                                                                                                                                                                                                     | MA                      |    |
| Line/Missing Drawing<br>线条/缺画                     | Not allowable<br>不允许                                                                                                                                                                                                                     | MA                      |    |
| Splash screen<br>闪屏                               | Not allowable<br>不允许                                                                                                                                                                                                                     | MA                      |    |
| LCD grid<br>LCD网格                                 | Not allowable<br>不允许                                                                                                                                                                                                                     | MA                      |    |
| Afterimage<br>残影                                  | Not allowable<br>不允许                                                                                                                                                                                                                     | MA                      |    |
| Wrong viewing angle<br>视角错误                       | Not allowable<br>不允许                                                                                                                                                                                                                     | MA                      |    |
| No touch<br>无触摸                                   | Not allowable<br>不允许                                                                                                                                                                                                                     | MA                      |    |
| Touch the jump point<br>触摸跳点                      | Not allowable<br>不允许                                                                                                                                                                                                                     | MA                      |    |
| Not sensitive<br>触摸不灵敏                            | Not allowable<br>不允许                                                                                                                                                                                                                     | MA                      |    |