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Customer (客户名称): \_\_\_\_\_

Customer No.(客户料号) : \_\_\_\_\_

Product No. (产品料号): ET156FH02-0T

Date (日期): 2026-06-23

Shenzhen Aoshite Technology Co., Ltd

Customer  
Approval  
客户批准

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## History of Version 变更记录

| Date 日期    | Ver.版 | Description 描述 | Page 页 | Design by 变更人 |
|------------|-------|----------------|--------|---------------|
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## 1. General Specification 产品规格

| Item 项目                    | CONTENTS 内容                                 | Unit 单位 |
|----------------------------|---------------------------------------------|---------|
| Outline Dimension 外形尺寸     | 384*251.4                                   | mm      |
| Active Area(W*L) 动作区       | 346.76*196.19                               | mm      |
| View Area 可视区              | 343.76*193.19(15.6inch)                     | mm      |
| TFT thickness 液晶厚度         | 8.8                                         | mm      |
| TP thickness TP 厚度         | 2.9                                         | mm      |
| Total 总厚度                  | 12.1                                        | mm      |
| Touch IC 触摸 IC             | ILI2511                                     | —       |
| Number of touchpoint 触点数量  | 10                                          | Points  |
| Number of button 按键数量      | —                                           | —       |
| Interface Type 接口方式        | USB+IIC(预留)                                 | —       |
| Operation Temperature 工作温度 | -20℃~70℃                                    | ℃       |
| Storage Temperature 储存条件   | 温度 23±3℃；湿度 40%-70%RH<br>(装机前) 仓储不能超过 6 个月。 | ℃       |
|                            | 温度-30℃~80℃ (装机后)                            | ℃       |



## 2 Optical Characteristics 光学参数

### 2.1 Optical parameters that match the CTP

| Item 项目          | CONTENTS 内容 | Remark 备注 |
|------------------|-------------|-----------|
| Transparency 透过率 | $\geq 85\%$ | ---       |

### 2.2 The optical parameters of the LCM

| Item                                                 |             | Unit              | Conditions                               | Min.     | Typ.     | Max.   | Note     |
|------------------------------------------------------|-------------|-------------------|------------------------------------------|----------|----------|--------|----------|
| White Luminance                                      |             | cd/m <sup>2</sup> | I <sub>LED</sub> =50mA<br>Center average | 400      | 500      | -      | 1, 2     |
| Luminance Uniformity                                 |             | %                 | 9 Points                                 | 75       | 80       |        | 1, 2 , 3 |
| Contrast Ratio                                       |             | --                |                                          | 700      | 1000     | -      | 1, 4     |
| Response Time                                        |             | msec              | Rising + Falling                         | -        | 25       | 35     | 1, 5     |
| Viewing Angle                                        |             | degree            | Horizontal (Right)<br>CR = 10 (Left)     | 80<br>80 | 89<br>89 | -<br>- | 1, 6     |
|                                                      |             |                   | Vertical (Upper)<br>CR = 10 (Lower)      | 80<br>80 | 89<br>89 | -<br>- |          |
|                                                      |             |                   |                                          |          |          |        |          |
|                                                      |             |                   |                                          |          |          |        |          |
| Color /<br>Chromaticity<br>Coordinates<br>(CIE 1931) | Red         | Rx                | CIE 1931                                 | 0.589    | 0.639    | 0.689  | 4        |
|                                                      |             | Ry                |                                          | 0.283    | 0.333    | 0.383  |          |
|                                                      | Green       | Gx                |                                          | 0.252    | 0.302    | 0.352  |          |
|                                                      |             | Gy                |                                          | 0.574    | 0.624    | 0.674  |          |
|                                                      | Blue        | Bx                |                                          | 0.107    | 0.157    | 0.207  |          |
|                                                      |             | By                |                                          | 0.008    | 0.058    | 0.108  |          |
|                                                      | White       | Wx                |                                          | 0.263    | 0.313    | 0.363  |          |
|                                                      |             | Wy                |                                          | 0.279    | 0.329    | 0.379  |          |
|                                                      | Color Gamut |                   |                                          | %        |          | -      |          |

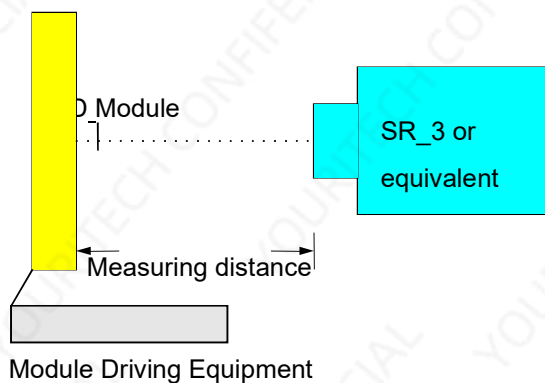
**Note 1:** Measurement method

Equipment Pattern Generator, Power Supply, Digital Voltmeter, Luminance meter (SR\_3 or equivalent)

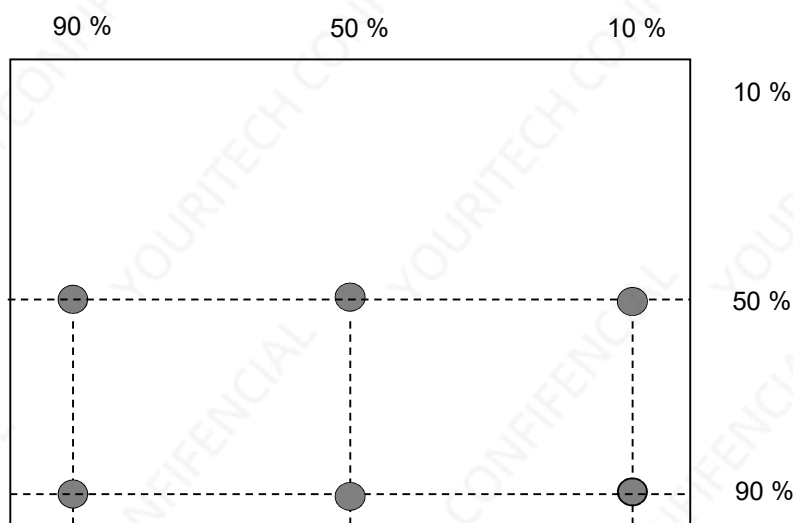
Aperture 1° with 50cm viewing distance

Test Point Center

Environment < 1 lux



**Note 2:** 9 points position



**Note 3:** The luminance uniformity of 9 points is defined by dividing the maximum luminance values by the minimum test point luminance. And measured by TOPCON SR-3

$$\delta_{w9} = \frac{\text{Minimum Luminance of 9 points}}{\text{Maximum Luminance of 9 points}}$$

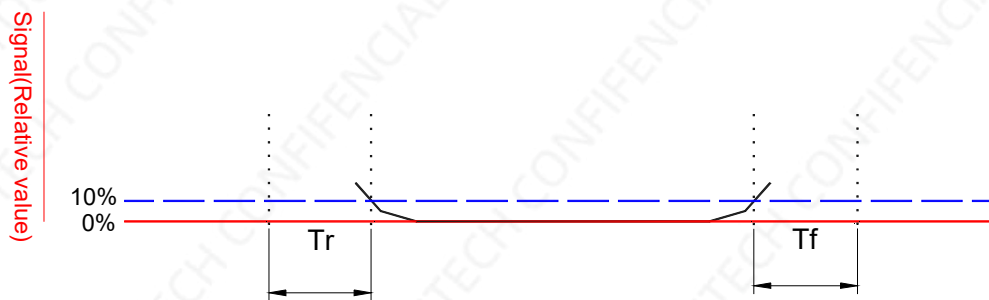
**Note 4 :** Definition of contrast ratio:

Contrast ratio is calculated with the following formula.

$$\text{Contrast ratio (CR)} = \frac{\text{Brightness on the "White" state}}{\text{Brightness on the "Black" state}}$$

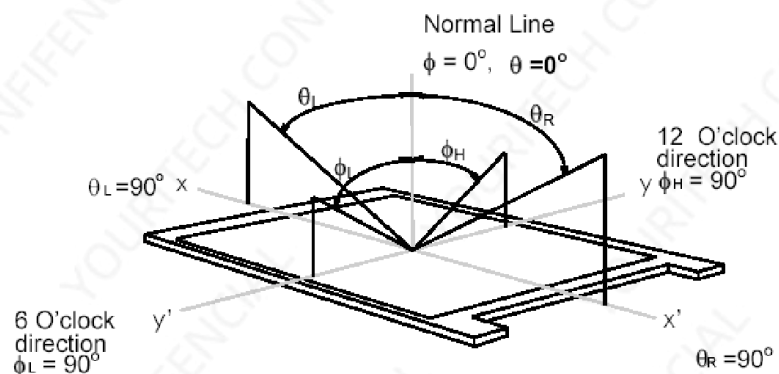
**Note 5:** Definition of response time:

The output signals of BM-7 or equivalent are measured when the input signals are changed from "Black" to "White" (falling time) and from "White" to "Black" (rising time), respectively. The response time interval between the 10% and 90% of amplitudes. Refer to figure as below.



**Note 6:.** Definition of viewing angle

Viewing angle is the measurement of contrast ratio  $\geq 10$ , at the screen center, over a  $180^\circ$  horizontal and  $180^\circ$  vertical range (off-normal viewing angles). The  $180^\circ$  viewing angle range is broken down as follows;  $90^\circ$  ( $\theta$ ) horizontal left and right and  $90^\circ$  ( $\Phi$ ) vertical, high (up) and low (down). The measurement direction is typically perpendicular to the display surface with the screen rotated about its center to develop the desired measurement viewing angle.





### 3. Reliability 信赖性

| Item 项目                                   | Specifications 规格                               | Remark 备注             |
|-------------------------------------------|-------------------------------------------------|-----------------------|
| High Temperature Storage<br>高温存储          | 80°C,500hrs                                     |                       |
| Low Temperature Storage<br>低温存储           | -20°C, 500hrs                                   | Non-condensing<br>无结露 |
| High Temperature Operation<br>高温工作        | 70°C,48hrs                                      | ---                   |
| Low Temperature Operation<br>低温工作         | -20 °C,48hrs                                    | Non-condensing<br>无结露 |
| Temperature/ Humidity<br>Operation工作温度/湿度 | 60%~90%RH500hrs                                 | Non-condensing<br>无结露 |
| Thermal Shock 冷热冲击                        | -20°Cto 60°C,<br>Duration at 30 min, 100 cycles | ---                   |

### 4.Electronic Characteristics 电器特性

#### 4.1 Electrical Characteristics of TP Screen

| 项目                | 说明   |
|-------------------|------|
| ESD 触摸面（接触 Touch） | ±4kv |
| ESD 触摸面（空气 Air）   | ±8kv |

#### 4.2 TFT LCD Module

##### 4.2.1 Power Specification

Input power specifications are as follows;

The power specification are measured under 25°C and frame frequency under 60Hz

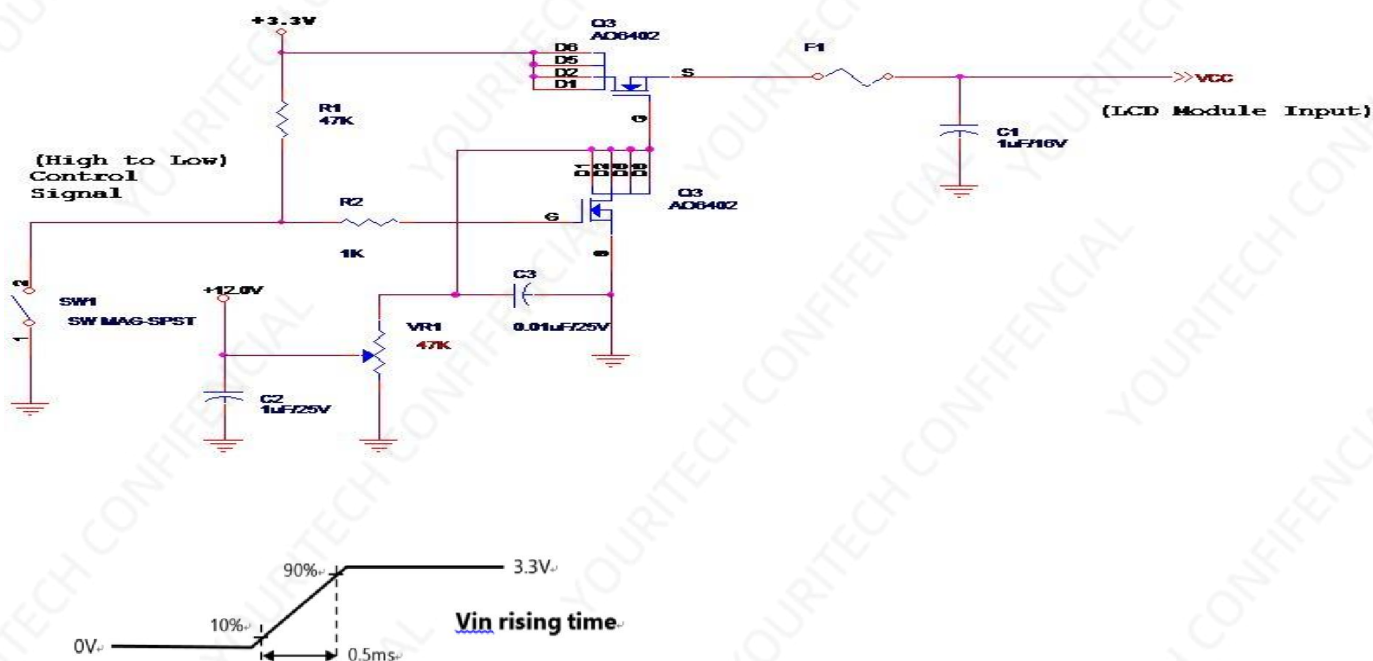
| Symble | Parameter                                | Min | Typ  | Max  | Units    | Remark                                       |
|--------|------------------------------------------|-----|------|------|----------|----------------------------------------------|
| VDD    | Logic/LCD Drive Voltage                  | 3.0 | 3.3  | 3.6  | [Volt]   |                                              |
| PDD    | VDD Power                                | -   | 1.75 | 2.11 | [Watt]   | All White Pattern (VDD=3.3V, at 60Hz),Note 1 |
| IDD    | IDD Current                              | -   | 0.53 | 0.64 | [A]      | All White Pattern (VDD=3.3V, at 60Hz) Note 2 |
| IRush  | Inrush Current                           | -   | -    | 2000 | [mA]     | Note 1                                       |
| VDDrp  | Allowable Logic/LCD Drive Ripple Voltage | -   | -    | 100  | [mV] p-p | All White Pattern (VDD=3.3V, at 60Hz)        |

**Note 1 :** Maximum Measurement Condition : White Pattern at 3.3V driving voltage. ( $P_{max}=V_{3.3} \times I_{white}$ )

Typical Measurement Condition: Mosaic Pattern

**Note 2 :** Current fuse is built in a module. Current capacity of power supply for VDD should be larger than 1.5A, so that the fuse can be opened at the trouble of electrical circuit of module.

**Note 3 :** Measure Condition



### 4.2.2 LVDS DC Signal Electrical Characteristics

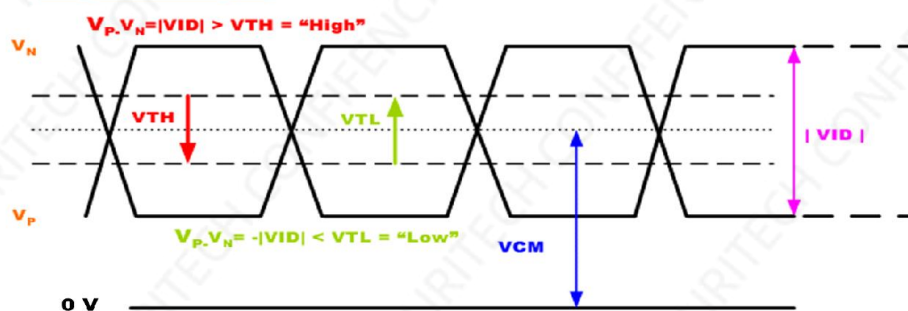
Input signals shall be low or High-impedance state when VDD is off.

| Symbol | Item                                   | Min. | Typ. | Max. | Unit | Remark          |
|--------|----------------------------------------|------|------|------|------|-----------------|
| VTH    | Differential Input High Threshold      |      |      | +100 | [mV] | VCM=1.2V        |
| VTL    | Differential Input Low Threshold       | -100 |      |      | [mV] | VCM=1.2V        |
| VID    | Input Differential Voltage             | 100  |      | 600  | [mV] |                 |
| VICM   | Differential Input Common Mode Voltage | 1.0  | 1.2  | 1.5  | [V]  | VTH/VTL=+-100mV |

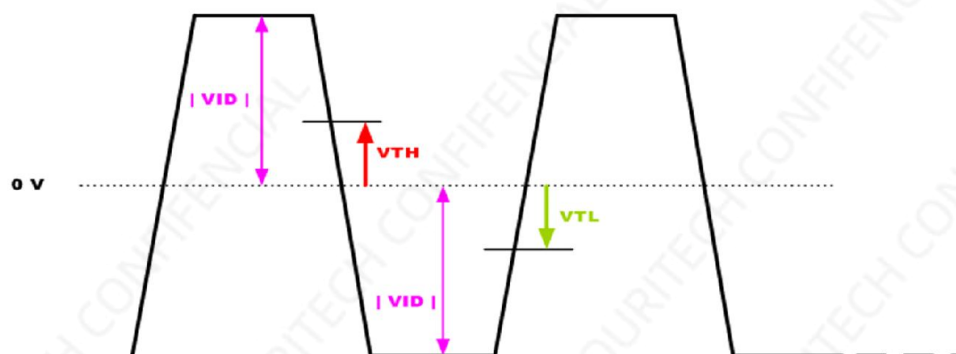
**Note:** LVDS Signal Waveform.

$V_P - V_N = |VID| > V_{TH} = \text{"High"}$   
 $V_P - V_N = -|VID| < V_{TL} = \text{"Low"}$

#### Single-end Signal



#### Differential Signal



## 4.3 Backlight Unit

### 4.3.1 LED Backlight Unit : Driver Connector

| Connector Name / Designation | Lamp Connector               |
|------------------------------|------------------------------|
| Manufacturer                 | Entery                       |
| Connector Model Number       | 3808K-F05N-02 or compatible  |
| Mating Model Number          | H208K-D05N-22B or compatible |

| Pin No. | Symbol  | Description  |
|---------|---------|--------------|
| Pin1    | VLED    | 12V input    |
| Pin2    | GND     | GND          |
| Pin3    | VLED_EN | 5V-ON,0V-OFF |
| Pin4    | VPWM_EN | PWM          |
| Pin5    | NA      | NC           |

### 4.3.2 Parameter guideline for LED

Following characteristics are measured under a stable condition using an inverter at 25°C (Room temperature)

#### LED characteristics

| Parameter                   | Symbol | Min    | Typ | Max  | Units  | Condition                     |
|-----------------------------|--------|--------|-----|------|--------|-------------------------------|
| Backlight Power Consumption | PLED   | -      | 8.3 | 10.4 | [Watt] | (Ta=25°C), Note 1<br>Vin =12V |
| LED Life-Time               | N/A    | 50,000 | -   | -    | Hour   | (Ta=25°C), Note 2,3           |

**Note 1:** Ta means ambient temperature of TFT-LCD module.

**Note 2:** If G156HAN02.3 module is driven at high ambient temperature & humidity condition. The operating life will be reduced.

**Note 3:** Operating life means brightness goes down to 50% initial brightness. Min. operating life time is estimated data.

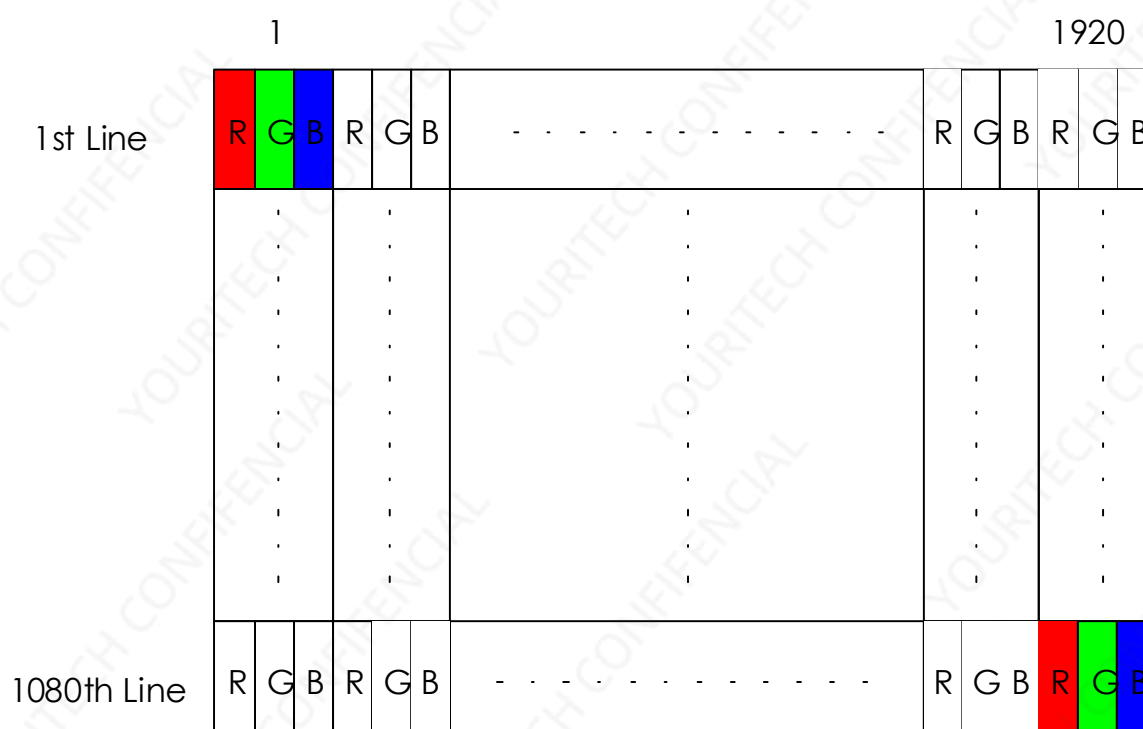
## Backlight input signal characteristics

| Parameter                   | Symbol  | Min  | Typ | Max  | Units  | Remark                                  |
|-----------------------------|---------|------|-----|------|--------|-----------------------------------------|
| LED Power Supply            | VLED    | 10.8 | 12  | 13.2 | [Volt] | Define as Connector Interface (Ta=25°C) |
| LED Enable Input High Level | VLED_EN | 2.5  | --  | 5.5  | [Volt] |                                         |
| LED Enable Input Low Level  |         | 0    | --  | 0.7  | [Volt] |                                         |
| PWM Logic Input High Level  | VPWM_EN | 2.5  | --  | 5.5  | [Volt] |                                         |
| PWM Logic Input Low Level   |         | 0    | --  | 0.7  | [Volt] |                                         |
| PWM Input Frequency         | FPWM    | 200  | 1K  | 15K  | Hz     |                                         |
| PWM Duty Ratio              | Duty    | 10   | --  | 100  | %      |                                         |

**Note 1 :** Recommended system pull up/down resistor no bigger than 10kohm.

## 4.4 Signal Interface Characteristic

Following figure shows the relationship of the input signals and LCD pixel format.





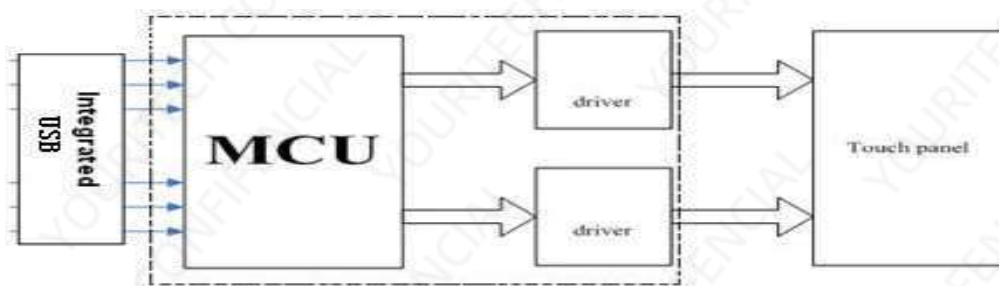
## 5. Touch panel description 触摸屏功能描述

### 5.1 touch panel drawing 外形图

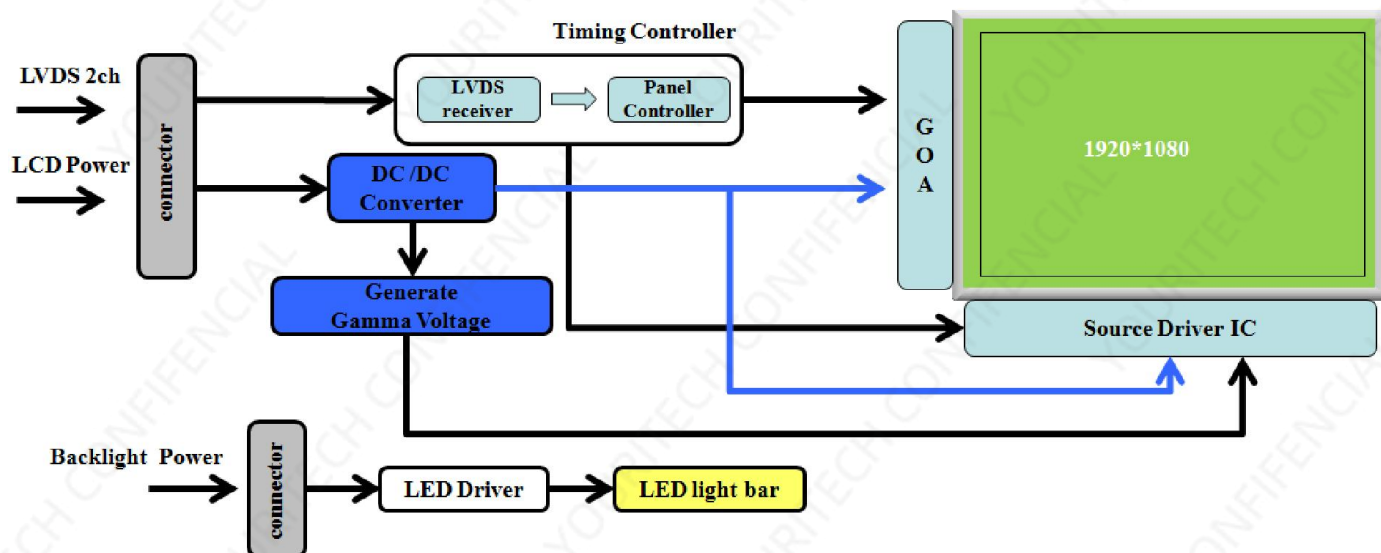
See appendix(见附工程图)

### 5.2 Block diagram 功能方框图

#### 5.2.1 Touch panel



#### 5.2.1 TFT/LCD module.



## 5.3 pin assignment 引脚定义

### 5.3.1 Touch panel

| Pin | Symbol |
|-----|--------|
| 1   | +5V    |
| 2   | D-     |
| 3   | D+     |
| 4   | GND    |

### 5.3.2 TFT/LCD module.

The module uses a LVDS receiver embedded in Aoshite's ASIC. LVDS is a differential signal technology for LCD interface and a high-speed data transfer device.

|                          |              |                        |                |
|--------------------------|--------------|------------------------|----------------|
| <b>TFT-LCD Connector</b> | Manufacturer | P-TWO                  | STM            |
|                          | Part Number  | 187034-3009            | MSBKT2407P30HB |
| <b>Mating Connector</b>  | Manufacturer | JAE or Equivalent      |                |
|                          | Part Number  | FI-X30HL (Locked Type) |                |

| PIN # | Symbol  | Description                                           | Remark |
|-------|---------|-------------------------------------------------------|--------|
| 1     | RxO0-   | Negative LVDS differential data input (Odd data)      |        |
| 2     | RxO0+   | Positive LVDS differential data input (Odd data)      |        |
| 3     | RxO1-   | Negative LVDS differential data input (Odd data)      |        |
| 4     | RxO1+   | Positive LVDS differential data input (Odd data)      |        |
| 5     | RxO2-   | Negative LVDS differential data input (Odd data)      |        |
| 6     | RxO2+   | Positive LVDS differential data input (Odd data)      |        |
| 7     | GND     | Ground                                                |        |
| 8     | RxOCLK- | Negative LVDS differential clock input (Odd clock)    |        |
| 9     | RxOCLK+ | Positive LVDS differential clock input (Odd clock)    |        |
| 10    | RxO3-   | Negative LVDS differential data input (Odd data)      |        |
| 11    | RxO3+   | Positive LVDS differential data input (Odd data)      |        |
| 12    | RxE0-   | Negative LVDS differential data input (Even data)     |        |
| 13    | RxE0+   | Positive LVDS differential data input (Even data)     |        |
| 14    | GND     | Ground                                                |        |
| 15    | RxE1-   | Negative LVDS differential data input (Even data)     |        |
| 16    | RxE1+   | Positive LVDS differential data input (Even data)     |        |
| 17    | GND     | Ground                                                |        |
| 18    | RxE2-   | Negative LVDS differential data input (Even data)     |        |
| 19    | RxE2+   | Positive LVDS differential data input (Even data)     |        |
| 20    | RxECLK- | Negative LVDS differential clock input (Even clock)   |        |
| 21    | RxECLK+ | Positive LVDS differential clock input (Even clock)   |        |
| 22    | RxE3-   | Negative LVDS differential data input (Even data)     |        |
| 23    | RxE3+   | Positive LVDS differential data input (Even data)     |        |
| 24    | GND     | Must Connect to GND                                   |        |
| 25    | NC      | No connection (for Aoshite test only. Do not connect) |        |
| 26    | NC      | No connection (for Aoshite test only. Do not connect) |        |
| 27    | NC      | No connection (for Aoshite test only. Do not connect) |        |
| 28    | VDD     | Power Supply Input Voltage                            |        |
| 29    | VDD     | Power Supply Input Voltage                            |        |
| 30    | VDD     | Power Supply Input Voltage                            |        |

## 5.4 LCD Interface Timing

### 5.4.1 Timing Characteristics

Basically, interface timings should match the 1920x1080 /60Hz manufacturing guide line timing.

| Parameter          | Symbol                 | Min.     | Typ. | Max. | Unit   |
|--------------------|------------------------|----------|------|------|--------|
| Frame Rate         | -                      | -        | 60   | -    | Hz     |
| Clock frequency    | $1 / T_{\text{Clock}}$ | 68.5     | 70.5 | 73   | MHz    |
| Vertical Section   | Period                 | $T_V$    | 1104 | 1116 | 1080+A |
|                    | Active                 | $T_{VD}$ | 1080 |      |        |
|                    | Blanking               | $T_{VB}$ | 24   | 36   | A      |
| Horizontal Section | Period                 | $T_H$    | 1050 | 1052 | 960+B  |
|                    | Active                 | $T_{HD}$ | 960  |      |        |
|                    | Blanking               | $T_{HB}$ | 90   | 92   | B      |

**Note1** : The above is as optimized setting

**Note2** : The maximum clock frequency =  $[(960 + B) * (1080 + A) * 60] < 74.5\text{MHz}$

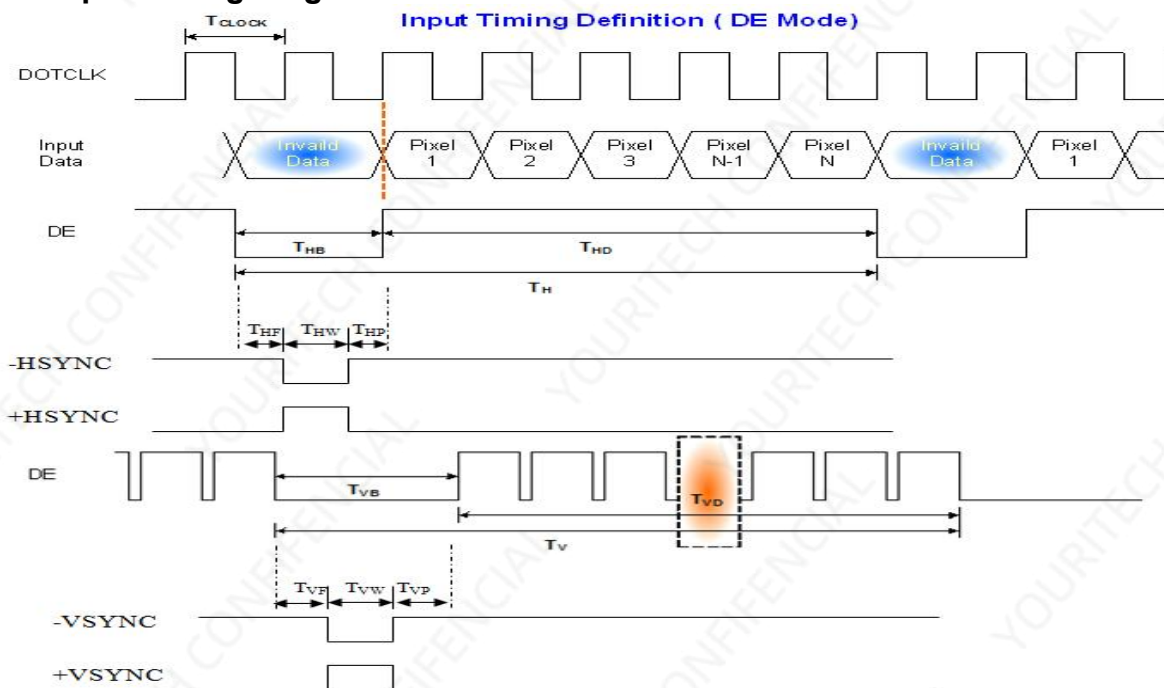
**Note3** : Horizontal related parameters must be constant without variation( H\_Sync\_Width(THW), H\_Front\_Porch(THF) and H\_Back\_Porch(THP) must be constant on each scan line).

**Note4** : On vertical blank area, H\_Sync\_Width (THW)and H\_Total(TH) must be same as on the V\_Active area.

**Note5** : Vertical related parameters must be constant without variation.( V\_Sync\_Width(TVW), V\_Front\_Porch(TVF) and V\_Back\_Porch(TVP) must be constant on each video field ).

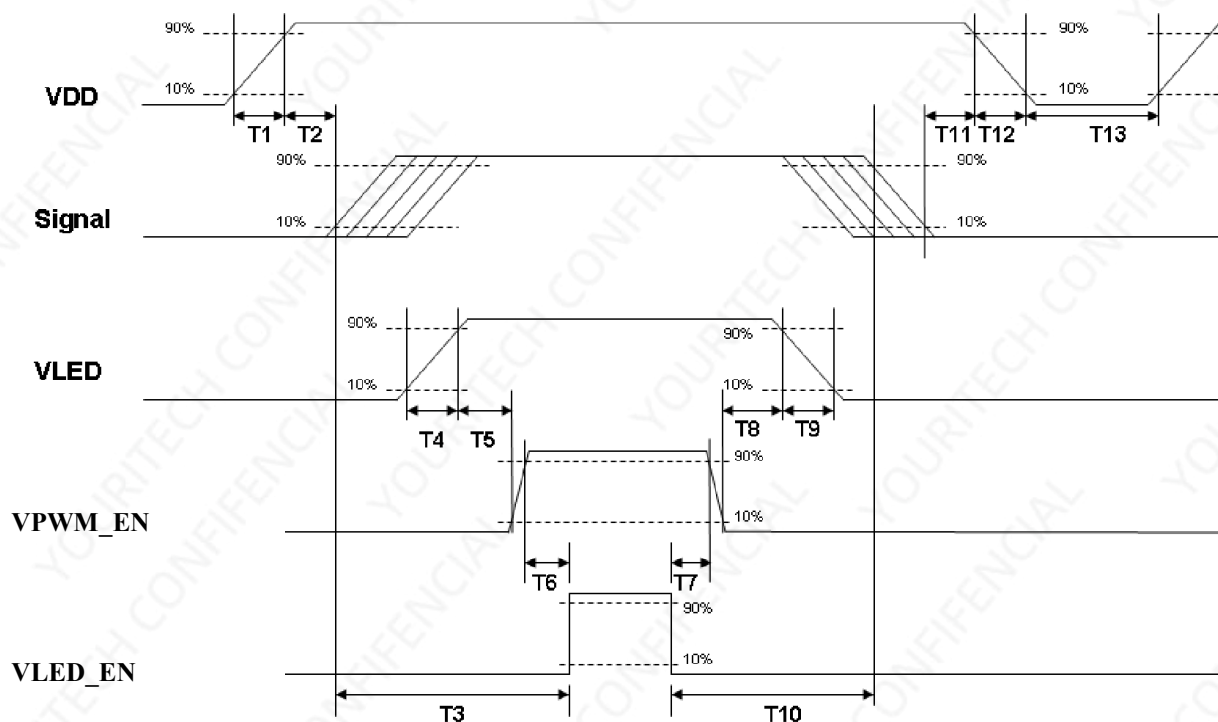
**Note6** : The DE timings also must be constant without variation( H/V timing requirements are as same as previous. Blank timing must also be constant ).

### 5.4.2 Input Timing Diagram



### 5.4.3 Power ON/OFF Sequence

VDD power and lamp on/off sequence is as below. Interface signals are also shown in the chart. Signals from any system shall be High-impedance state or low level when VDD is off.



### 5.4.4 Power ON/OFF sequence timing

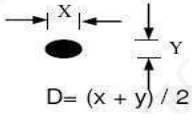
| Parameter | Value |      |      | Units |
|-----------|-------|------|------|-------|
|           | Min.  | Typ. | Max. |       |
| T1        | 0.5   | --   | 10   | [ms]  |
| T2        | 30    | 40   | 50   | [ms]  |
| T3        | 200   | --   | --   | [ms]  |
| T4        | 0.5   | --   | 10   | [ms]  |
| T5        | 10    | --   | --   | [ms]  |
| T6        | 10    | --   | --   | [ms]  |
| T7        | 0     | --   | --   | [ms]  |
| T8        | 10    | --   | --   | [ms]  |
| T9        | --    | --   | 10   | [ms]  |
| T10       | 110   | --   | --   | [ms]  |
| T11       | 0     | 16   | 50   | [ms]  |
| T12       | --    | --   | 10   | [ms]  |
| T13       | 1000  | --   | --   | [ms]  |

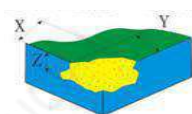
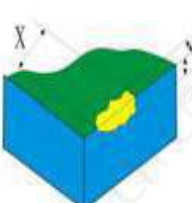
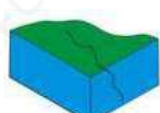
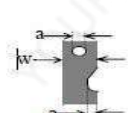
The above on/off sequence should be applied to avoid abnormal function in the display. Please make sure to turn off the power when you plug the cable into the input connector or pull the cable out of the connector.



## 6.inspection specification 检验规范

### 6.1 External appearance examination standard 外观检验标准:

| 不良项目                                                                                                                                         | 检验标准                                                                                 | 缺陷分类 |    |    |    | 判定   |
|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------|----|----|----|------|
|                                                                                                                                              |                                                                                      | ACC  | MI | MA | CR |      |
| 线状物 (包括刮伤、纤维)<br><br>W: 宽度 L: 长度                            | $W \leq 0.08\text{mm}$ , 忽略不计                                                        | ★    |    |    |    | PASS |
|                                                                                                                                              | $0.08\text{ mm} < W \leq 0.15\text{ mm}$ , $L \leq 6\text{mm}$ , 允许 3 条, 距离在 30mm 以上 | ★    |    |    |    | PASS |
|                                                                                                                                              | $W > 0.15\text{mm}$ , $L > 6\text{mm}$                                               |      | ★  |    |    | NG   |
| 点状物 (异色点、白点、黑点)<br>D 代表直径 (可视区内)<br><br>$D = (x + y) / 2$ | $D \leq 0.2\text{ mm}$ , 忽略不计, 整面及密集点不允许。                                            | ★    |    |    |    | PASS |
|                                                                                                                                              | $0.2\text{ mm} < D \leq 0.35\text{ mm}$ , 允许 3 个, 距离在 30mm 以上。                       | ★    |    |    |    | PASS |
|                                                                                                                                              | $D > 0.35\text{mm}$                                                                  |      | ★  |    |    | NG   |
| 不良项目                                                                                                                                         | 触摸屏标准                                                                                | 缺陷分类 |    |    |    | 判定   |

|                                                                                               |                                                                  | ACC | MI | MA | CR |      |
|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------|-----|----|----|----|------|
| 崩角<br>       | $X \leq 0.2\text{mm}; Y \leq 0.3\text{mm}; Z \leq 1/2T$ ; 单边允许1个 | ★   |    |    |    | PASS |
|                                                                                               | $X > 0.2\text{mm}, Y > 0.3\text{mm}$                             |     | ★  |    |    | NG   |
| 崩边<br>       | $X \leq 0.2\text{mm}; Y \leq 0.3\text{mm}, Z \leq 1/2T$ ; 单边允许1个 | ★   |    |    |    | PASS |
|                                                                                               | $X > 0.2\text{mm}, Y > 0.3\text{mm}$                             |     | ★  |    |    | NG   |
|                                                                                               | Sensor 面崩边/崩角未伤及线路且正视不可见。                                        | ★   |    |    |    | PASS |
|                                                                                               | Sensor 面崩边或崩角伤及线路或正视可见。                                          |     |    | ★  |    | NG   |
| 玻璃裂纹<br>   | 任何裂纹                                                             |     |    | ★  |    | NG   |
| FPC 缺陷<br> | 凹痕, 针孔 $a \leq w/3$                                              | ★   |    |    |    | PASS |
|                                                                                               | 开路/划伤线路/裂开                                                       |     |    | ★  |    | NG   |
|                                                                                               | 氧化, 污染                                                           |     |    | ★  |    | NG   |
| FPC 折伤                                                                                        | FPC 折伤/压伤, 死折(锐角折痕)不允许, 锐角凸起                                     |     |    | ★  |    | NG   |

## 6.2 Classification of defects:

Defects are classified as major defects and minor defects according to the degree of defectiveness defined herein.

### Major defects:

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.

### Minor defects:

A minor defect is either a defect that is not likely to reduce materially the usability of the product for its intended purpose, or a departure from an intended purpose with little bearing on the effective use or operation of the product.

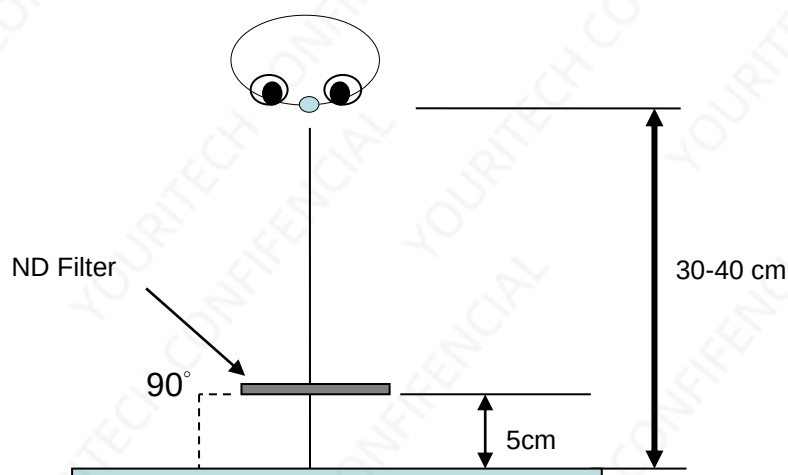
### 6.2.1 Electrical inspection specification:

| Inspection Item   |                                                                            | Specification |
|-------------------|----------------------------------------------------------------------------|---------------|
| Line defect       |                                                                            | Can't be seen |
| Bright dots       |                                                                            | $\leq 2$ dot  |
| Dark dots         |                                                                            | $\leq 4$ dots |
| Total dots defect |                                                                            | $\leq 6$ dots |
| Continuous defect | Two continuous bright dots :                                               | $\leq 1$ pair |
|                   | Over three continuous bright dots (vertical, horizontal, oblique) :        | Not allowed   |
|                   | Two continuous dark dots (vertical, horizontal, oblique) :                 | $\leq 1$ pair |
|                   | Over three continuous dark dots (vertical, horizontal, oblique) :          | Not allowed   |
|                   | Two continuous dark dots and bright dots (vertical, horizontal, oblique) : | $\leq 1$ pair |
|                   | Over three continuous dots (vertical, horizontal, oblique) :               | $\leq 0$ pair |
|                   | Distance between 2 Bright dots :                                           | $\geq 5$ mm   |
|                   | Distance between 2 Dark dots :                                             | $\geq 5$ mm   |
|                   | Distance between Dark dot and Bright Dot :                                 | $\geq 5$ mm   |
| Mura              | 5% ND filter or judged by equivalent limit sample                          |               |

Note 1) For dot defect, one sub pixel is defined as one dot. Defect area (of dot defect) should be larger than 1/2 area of one sub-pixel to be count as 1 dot defect. However, if bright area is small than 1/2 area of a sub-pixel, it won't be considered as a defect..

Note 2) Judgment criteria (For Bright dot and Small Bright dot) : Using ND Filter 5% (distance : 30 cm). If it could be observed, dot defines as one bright dot. If not, dot defines as one small bright dot.

ND filter use method: The inspection method of ND Filter - holding ND filter in front of the panel around 5 cm and examine the panel from **35±5** cm in the front view for **3** seconds



The drawing of 1/2 area sub-pixel definition: The 1/2 area sub-pixel can be defined as below one or more of specific shapes (Fig.1). The small bright dots is less than or equal to 10 dots.



Fig.1

Note 3) All bright dot defects should not be noticeable by observer under specified inspection environment (Please refer to item 5).

Note 4) Adjacent-dot defect should be observed under the same display pattern in any one of Black/Green/Blue/Red pattern.

Definition of two continuous bright dots: Only for two continuous dots (included vertical, horizontal, oblique type)

\*Inspection pattern: Standard inspection patterns of dot defect are listed below. AU uses these patterns as standard criteria for judging dot defect. Please inform AU if any other pattern is to be used to examine dot defect.

| Test Pattern | Defect                     |
|--------------|----------------------------|
| Black        | For bright dot(s)          |
| White        | For dark dot(s)            |
| Red          | For bright and dark dot(s) |

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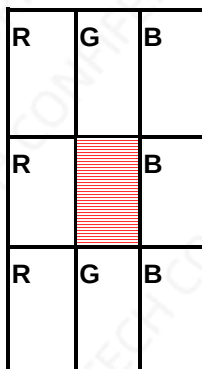
|       |                            |
|-------|----------------------------|
| Green | For bright and dark dot(s) |
| Blue  | For bright and dark dot(s) |

Note 6) In three (or more) adjacent dot defect, for any 3<sup>rd</sup> dot that adjacent to 2 continuous defective dots (can be of any combination of bright dots and dark dots), the 3<sup>rd</sup> dot, no matter how large it may be, should be viewed as a dot.

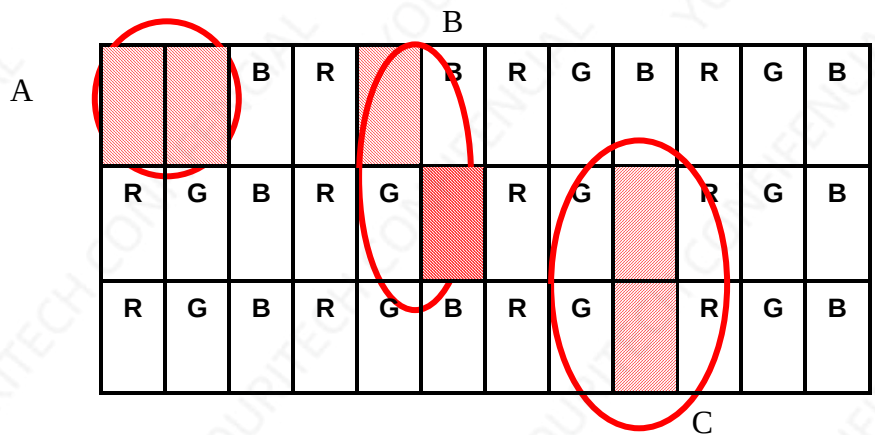
Note 7) Defect criteria diagram

- Dot defect diagram

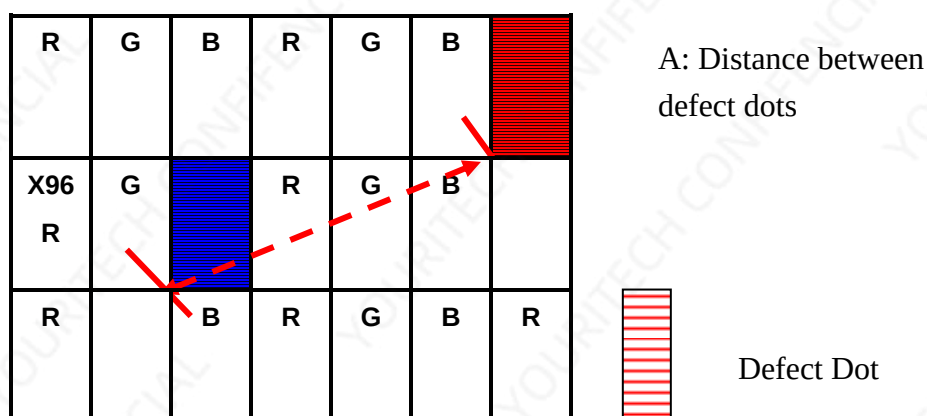
**One dot (Bright /Dark)**



**Two continuous dots(Bright/Dark)**



- Definition of distance between defect dots as following



Note 8) Unless otherwise specified by written document or limit samples, Mura (display un-uniformity) should be inspected under the ND filter and shall be accepted when it is invisible 5% ND filter is applied.

Note 9) While operating over 50°C ambient temperature, there should be no function failure occur and Mura (display un-uniformity) should be invisible under 1% ND filter applied.

Note 10) Image Retention: 5secs Test pattern and Image sticking must be disappeared in 5secs after pattern



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changed

## 6.2.2 Inspection specification

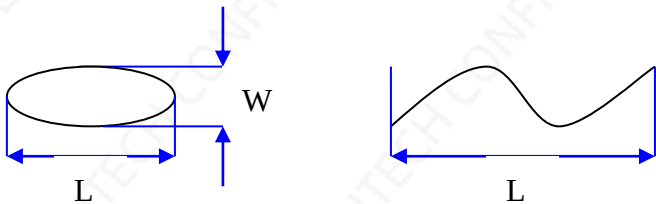
| Judge area                       | Judge item                                    |                              | Inspection specification                              |                           |         | Judge criterion |       |             |     |
|----------------------------------|-----------------------------------------------|------------------------------|-------------------------------------------------------|---------------------------|---------|-----------------|-------|-------------|-----|
|                                  |                                               |                              |                                                       |                           |         | Major           | Minor |             |     |
| Active area                      | Particles,                                    | Circular                     | Average diameter: D (mm)<br>Distance: ND(mm)          |                           | Numbers |                 | ○     |             |     |
|                                  |                                               |                              | D≤0.15                                                |                           |         |                 |       | Disregarded |     |
|                                  |                                               |                              | 0.15<D≤0.5                                            |                           |         |                 |       |             |     |
|                                  |                                               |                              | 0.5<D                                                 |                           |         |                 |       |             |     |
|                                  |                                               | Linear                       | Width: W (mm)<br>Length: L (mm)                       |                           | Numbers |                 | ○     |             |     |
|                                  |                                               |                              | W≤0.07                                                | —                         |         |                 |       | Disregarded |     |
|                                  |                                               |                              | 0.07<W≤0.1                                            | 1. L≤30<br>2. L≤5 (w/ AG) |         |                 |       |             | N≤5 |
|                                  |                                               |                              | 0.1<W                                                 | 1. 30<L<br>2. 5<L (w/ AG) |         |                 |       |             |     |
|                                  | Scratch/Dent                                  | Circular                     | Average diameter: D (mm)                              |                           | Numbers |                 | ○     |             |     |
|                                  |                                               |                              | D≤0.15                                                |                           |         |                 |       | Disregarded |     |
|                                  |                                               |                              | 0.15<D≤0.5                                            |                           |         |                 |       |             |     |
|                                  |                                               |                              | 0.5<D                                                 |                           |         |                 |       |             |     |
|                                  |                                               | Linear                       | Width: W (mm)<br>Length: L (mm)                       |                           | Numbers |                 | ○     |             |     |
|                                  |                                               |                              | W≤0.07                                                | —                         |         |                 |       | Disregarded |     |
|                                  |                                               |                              | 0.07<W≤0.1                                            | 1. L≤30<br>2. L≤5 (w/ AG) |         |                 |       |             | N≤5 |
|                                  |                                               |                              | 0.1<W                                                 | 1. 30<L<br>2. 5<L (w/ AG) |         |                 |       |             |     |
|                                  | Bubble                                        | Circular                     | Average diameter: D (mm)                              |                           | Numbers |                 | ○     |             |     |
|                                  |                                               |                              | D≤0.15                                                |                           |         |                 |       | Disregarded |     |
|                                  |                                               |                              | 0.15<D≤0.5                                            |                           |         |                 |       |             |     |
|                                  |                                               |                              | 0.5<D                                                 |                           |         |                 |       |             |     |
| Bezel                            | Gap between front and back bezel on all sides | W≤1.0mm                      |                                                       |                           |         | ○               |       |             |     |
|                                  | Scratches, Wrap and Sunken                    | Allowed (No harm, dangerous) |                                                       |                           |         | ○               |       |             |     |
|                                  | Assembly Fail                                 | Not allowed                  |                                                       |                           | ○       |                 |       |             |     |
|                                  | Color Difference                              | Allowed (No harm, dangerous) |                                                       |                           |         | ○               |       |             |     |
| Carton/Panel Label (SN,B/L,Week) | No label                                      |                              | Not allowed                                           |                           |         | ○               |       |             |     |
|                                  | Invert label                                  |                              | Not allowed                                           |                           |         | ○               |       |             |     |
|                                  | Broken                                        |                              | Not allowed                                           |                           |         | ○               |       |             |     |
|                                  | Dirt                                          |                              | Allowed<br>(Word can be read. Barcode can be scanned) |                           |         | ○               |       |             |     |

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|           |                   |                                                       |   |   |
|-----------|-------------------|-------------------------------------------------------|---|---|
|           | Not clear         | Word can be read. Barcode can be scanned              |   | ○ |
|           | Word out of shape | Word can be read. Barcode can be scanned              |   | ○ |
|           | Content Error     | Not allowed                                           | ○ |   |
|           | Position          | Be attached on right position                         |   | ○ |
|           | Crease            | Allowed<br>(Word can be read. Barcode can be scanned) | ○ |   |
|           | Label overlapping | Allowed                                               | ○ |   |
| Screw     | Not enough (Q'ty) | No                                                    | ○ |   |
|           | Loose             | No                                                    | ○ |   |
| Connector | Appearance        | No broken, rising, deformation                        | ○ |   |

Note 1 : When  $L \geq 2W$ , defect count as liner defect.

Note 2:  $D=(W+L)/2$



Note 3 : Extraneous substances which can be wiped out, such as fingerprint and particles are not considered as a defect.

Note 4 : Defects on the Black Matrix are not considered as a defect.

## 7.Inspection conditions 检验条件

7.1 Equipment / materials: light box, ion fan, humidifier, film card, alcohol / ethyl acetate, finger cover, dust-free cloth

Vernier / digital caliper.设备/材料: 灯箱、离子风扇、加湿器、菲林卡片、酒精/乙酸乙酯、手指套、无尘布、 游标/ 数显卡尺。

### 7.2. Testing environment检验环境

7.2.1 Inspection environment: 30cm ± 5cm from the product, temperature: 22 ± 2 °C; humidity: 40% ~ 70% RH; cleanliness: Level 10000.检验环境：目视距离产品30cm±5cm，温度：22±2℃；湿度：40%~70%RH；洁净度：10000 级。

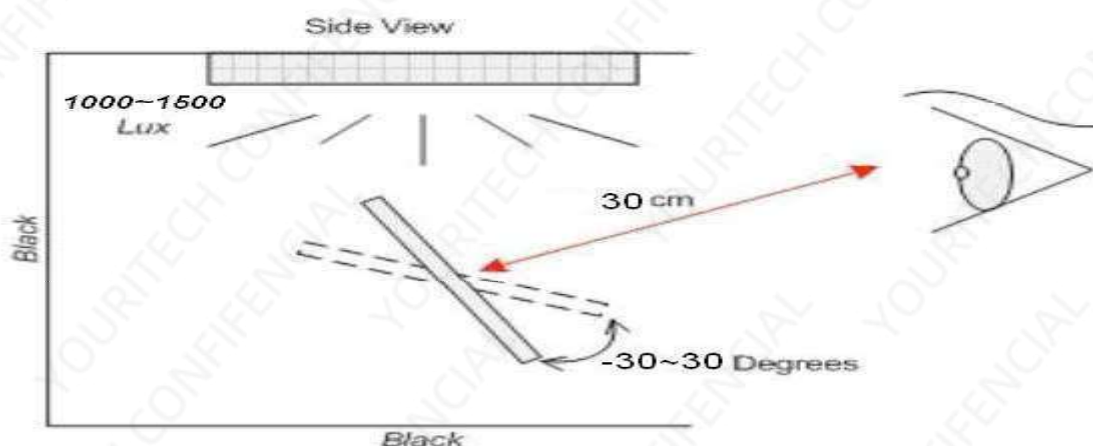
7.2.2 Inspection angle: vertical rotation angle: ± 30 °, from top to bottom; horizontal rotation angle: ± 30 °, from left to right.检视角度：垂直旋转角度：±30°，从上往下；水平旋转角度：±30°，从左往右。

7.2.3 Inspection illuminance: fluorescent lamp inspection area illuminance: 1500-1800lux; table lamp inspection area illuminance: 1500-1800lux; It is convenient for internal uniform illumination requirements.检视照度：日光灯检查区域照度：台灯检查区域照度：便于内部统一光照度要求。

7.2.4 Background color: Black / white.背景颜色：黑色/白色。

7.2.5 Inspection time: the inspection time of one piece of product shall not exceed 15 seconds. 检查时间：检验1片产品时间不超过15秒。

### Black Booth or Black Background



## 8. Notice 注意事项

### 8.1 Notice 常规注意事项:

- 8.1.1 Due to the system of capacitive touch screen is made of glass, Please do not strong impact, The impact, Or Fall from height; 由于电容式触摸屏是由玻璃所制, 请勿强力撞击, 或高处落下;
- 8.1.2 Please do not stack up TPs. Don't load on TP; 保存时请勿重叠放置, 或重物叠压;
- 8.1.3 Please do not put the capacitive touch screen itself or FPC direct contact with metal material; 电容式触摸屏本身或FPC具有导电性, 避免与金属物质直接接触;
- 8.1.4 When assembling, please do not bend or strength to pull FPC, Avoid to cause the injured; 安装时请勿折弯或强力拉扯FPC, 避免造成折伤;
- 8.1.5 When assembling, please do not touch ink face of back of TP, Avoid to scratches; 安装时请勿用硬物接触电容式触摸屏背后的油墨, 避免造成刮伤;
- 8.1.6 When assembling, please do not contact the visual area, if have dirty in VA, Recommend the use of anhydrous ethanol to clean; 安装时请勿接触可视区, 如果触摸造成脏污, 请采用威广骏指定的清洁方法除污, 建议使用无水乙醇清洁;
- 8.1.7 Operation of the capacitive touch screen, Use finger or conductive touch pen, please; must avoid high voltage and static electricity. 操作电容式触摸屏时, 请采用手指或导电性笔触摸; 注意预防高压和静电。

### 8.2. Other instructions 其他说明:

- 8.2.1 Out of this inspection standard in project, to ref confirmed drawings or specs.

本检验标准中未提及或未规定的项目以双方确认的工程图纸或规格书为准, 双方如有特别要求, 可协商确定, 以协商确定的图纸或规格书要求为准, 当工程图纸或客户有指定要求时, 以工程图纸或客户要求为准。

8.2.2 When have quality issue · to follow up this standard, approved specification · and approved samples.

Others, will be discuss one by one. 在发生产品品质争议时，首先以本标准、双方确认规格书，双方协定技术要求和限度样本为准，无协定或本标准未提及的，双方另行协商处理。

### 8.3. Suggest 建议:

8.3.1 The finished product protection film is used to protect finished product in the process of the goods

shipped to the customer, prevent the finished goods delivery Process in the environmental impact, so

the external surface of the protective film is there is no guarantee that no scratches or dirt, the

finished product protection film Strongly do not recommend use in client follow-up process. 成品保护

膜是用来保护成品于货物运送至客户指定地点之过程中,避免成品受到货物运送过程之外在环境影响,因此保护膜外表面是无法保证完全没有刮伤或脏污,该成品保护膜强烈不建议在客户端的后续制程中使用。

8.3.2 Storage condition 储存条件:

8.3.2.1 suggest to keep the products at temperature  $23\pm3^{\circ}\text{C}$  and humidity 40%-70%RH and Storage can not be more than 6 months.

建议将材料存储在温度 $23\pm3^{\circ}\text{C}$ ; 湿度40%-70%RH并不超过6个月以避免环境引起的保护膜脱胶，从而导致产品表面污染。

8.3.2.2 Suggest to keep the materials no more than 3 months in normal condition.

建议在正常环境下（非恒温恒湿），材料的储存周期不能超过3个月，以避免环境引起的保护膜脱胶，从而导致产品表面污染。

8.3.3 Advising clients to peel off protective film from TP, Then necessary to do cleaning and inspection

before assembling · Don't put the used protective film back to TP. 建议客户在使用前撕去成品保护膜,进行必要

清洁及外观检查,再使用该成品进行后续加工组装,不要将已撕去之成品保护膜贴回产品上,因为已撕去的保护膜已经被作业员接触到保护膜内面而造成污染,再将已撕去的成品保护膜贴回产品上会造成脏污转移污染。

8.3.4 It is strongly recommended that clients to remove the protective film in clear room, to clear the surface

with Ethanol anhydrous before assembling . 强烈建议客户或使用者在使用本产品进行外观检查或贴合前，一定要

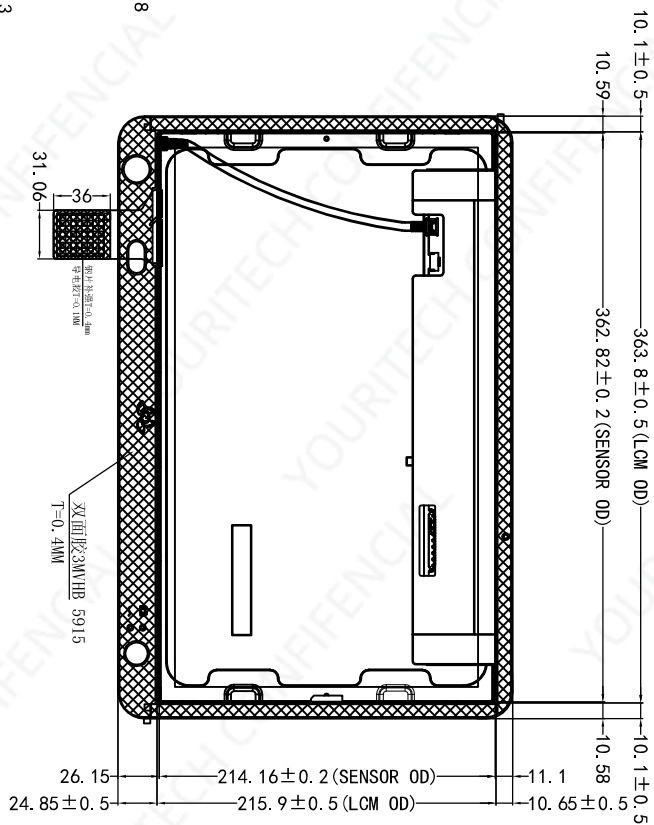
先完全撕去保护膜,然后使用无尘室专用的无尘干布加上适量的溶剂(如Ethanol 无水乙醇),戴上干净的手指套,然后使用正确的清洁手法进行清洁。

8.3.5 TP not allowed to plug and unplug with electricity

TP不允许带电插拔

Appendix 附件 工程图





- | I2C连接器 |     |
|--------|-----|
| PIN    | 定义  |
| 1      | RST |
| 2      | VCC |
| 3      | GND |
| 4      | INT |
| 5      | SDA |
| 6      | SCK |

|                                                                                   |        |              |              |      |            |
|-----------------------------------------------------------------------------------|--------|--------------|--------------|------|------------|
| TP+液晶<br>全贴合结构图                                                                   |        | 深圳市奥视特科技有限公司 |              |      |            |
| Sheet                                                                             | 1 of 1 | Model NO.    | ET156FH02-OT |      |            |
| UNIT                                                                              | mm     | CUSTOMER P/N | 15.6寸        |      |            |
| REV.                                                                              | A1     | Designed     | LL           | Date | 2026-04-30 |
| Scale                                                                             | FIT    | Checked      | PLX          | Date | 2026-04-30 |
|  |        | Approved     |              | Date |            |