

# Shenzhen Leadtek Electronics Co.,Ltd

## PRODUCT SPECIFICATION

### TFT-LCD MODULE

**Module No: LTK015QVHCT04-V3**

☒ Preliminary Specification

☐ Approval Specification

| Designed by | Checked by | Approved by |
|-------------|------------|-------------|
| <i>jona</i> | <i>tom</i> | <i>lan</i>  |

### Final Approval by Customer

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

※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.

## Revision History

[illegible]



## 2. GENERAL INFORMATION

| ITEM                      | STANDARD VALUES                     | UNITS |
|---------------------------|-------------------------------------|-------|
| LCD type                  | 1.54'TFT                            | --    |
| Dot arrangement           | 240(RGB)×240                        | dots  |
| Color filter array        | RGB vertical stripe                 | --    |
| Display mode              | IPS / Transmissive / Normally Black | --    |
| Viewing Direction         | 80/80/80/80                         | --    |
| TFT Driver IC             | ST7789T3                            | --    |
| CTP type                  | G+F                                 | --    |
| Cover surface treatment   | NA                                  | --    |
| CTP Driver IC             | CST816D                             | --    |
| LCM+CTP Outline Dimension | 42.30(W)×42.30(H)×3.90(T)           | mm    |
| Active area               | 27.72(W)×27.72(H)                   | mm    |
| Dot pitch                 | 0.08625(H) x 0.08625(V)             | mm    |
| Interface                 | 4line SPI                           | --    |
| Back Light                | 4pcs White LED                      | --    |
| Weight                    | TBD                                 | g     |

## 3. ABSOLUTE MAXIMUM RATINGS

| Parameter              | Symbol  | Min  | Max         | Unit |
|------------------------|---------|------|-------------|------|
| Power Supply voltage 1 | VCC 2.8 | -0.3 | +3.6        | V    |
| Power Supply voltage 2 | VDD1V8  | -0.3 | +3.6        | V    |
| Operating temperature  | TOP     | -10  | +60         | ℃    |
| Storage temperature    | TST     | -20  | +70         | ℃    |
| Humidity               | RH      | -    | 90%(Max60℃) | RH   |



## 4. ELECTRICAL CHARACTERISTICS

### DC CHARACTERISTICS

| Parameter                        | Symbol  | Min       | Typ | Max       | Unit |
|----------------------------------|---------|-----------|-----|-----------|------|
| Supply voltage for analog        | VCC 2.8 | 2.6       | 2.8 | 3.3       | V    |
| Supply voltage for interface I/O | VDD1V8  | 1.65      | --  | 3.3       | V    |
| I/O leakage current              | IDD     | -         | -   | TBD       | mA   |
| Input voltage 'H'level           | VIH     | 0.7*IOVCC | —   | IOVCC     | V    |
| Input voltage 'L'level           | VIL     | 0         | —   | 0.3*IOVCC | V    |
| Output voltage 'H'level          | VOH     | 0.8*IOVCC | —   | IOVCC     | V    |
| Output voltage 'L'level          | VOL     | 0         | —   | 0.2*IOVCC | V    |

## 5. TIMING OF POWER SUPPLY

PLEASE REFER TO THE DRIVER IC SPECIFICATION.

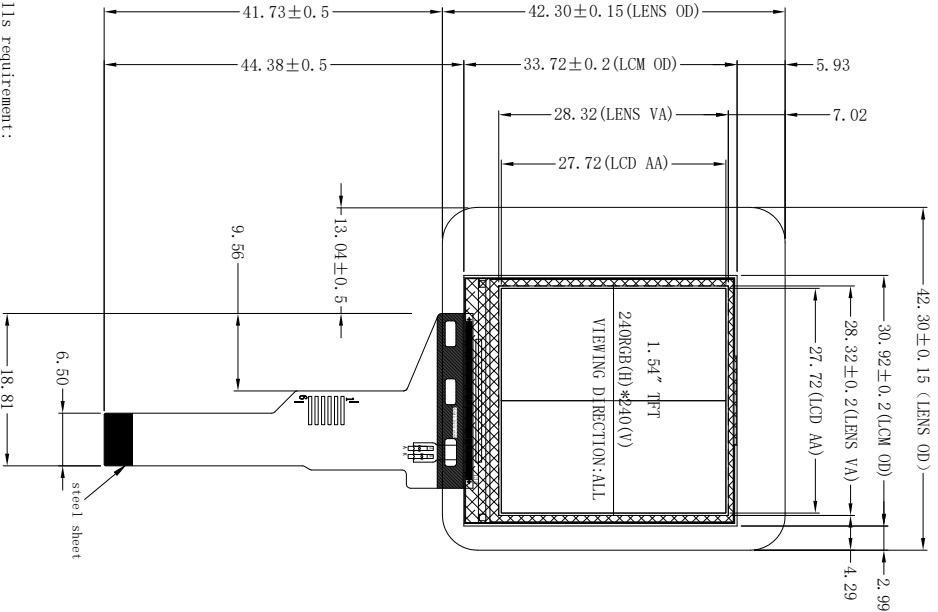
## 6. BACKLIGHT CHARACTERISTICS

| Item            | Symbol | Min               | Typ | Max | Unit              | Condition   |
|-----------------|--------|-------------------|-----|-----|-------------------|-------------|
| Forward voltage | Vf     | 3.0               | 3.2 | 3.4 | V                 | If=80<br>mA |
| Luminance       | LV     | -                 | 300 | —   | cd/m <sup>2</sup> |             |
| Number of LED   | -      | 4                 |     |     | Piece             | -           |
| Connection mode | p      | 1Serial/4Parallel |     |     | -                 | -           |

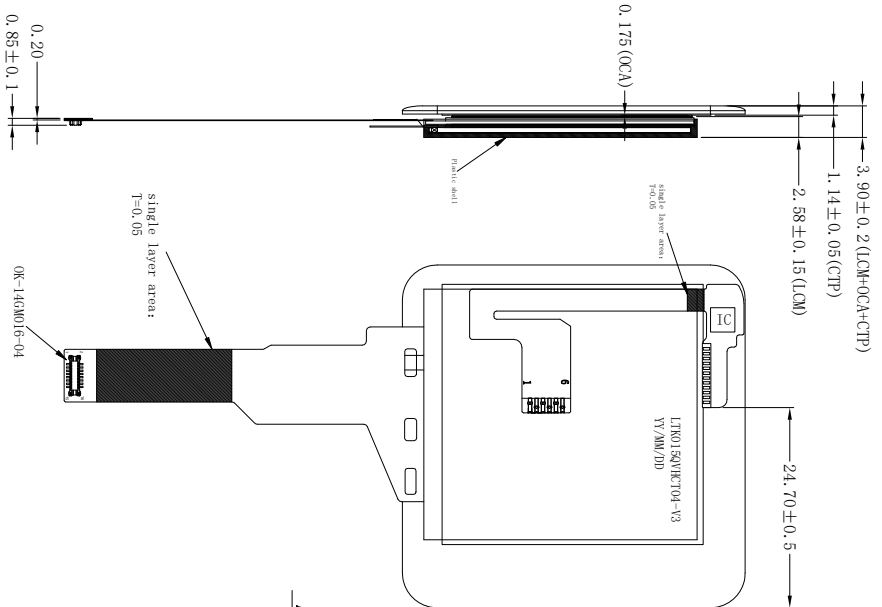
Using condition: constant current driving method If= 20mA×4 (+/-10%)

## 7. Mechanical Drawing

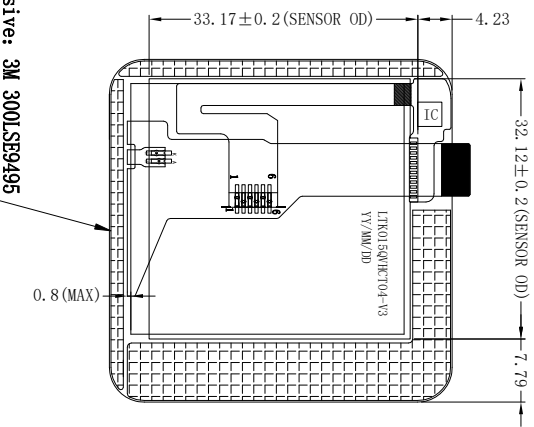
Front View



Side View

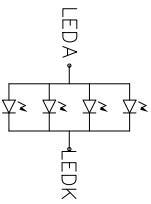


Back View



Adhesive: 3M 300LSE9495  
T=0.175mm

| PIN# | ASSIGNMENT |
|------|------------|
| 1    | VDD2.8V    |
| 2    | SDA1.8V    |
| 3    | SCL1.8V    |
| 4    | RESET      |
| 5    | INT        |
| 6    | GND        |



- skills requirement:
1. TP structure G+F, single touch, IC: CST816D
  2. Material: 1.0MM
  3. Cover surface treatment: AF
  4. Transmittance ≥ 85%
  5. Unmarked tolerance: ±0.2
  6. Operating temperature: -10~60° C, storage temperature: -20~70° C
  7. Environmental protection complies with ROHS and REACH requirements;

- Notes:
1. Display : 1.54"
  2. Resolution: 240xRGBx240
  3. View Direction: ALL
  4. LCD Driver IC: ST7789T3
  5. LCM+CTP Brightness:300cd/m<sup>2</sup> (TYP)
  6. \*:Critical dimension ( ) : Reference dimension;
  7. **GENERAL TOLERANCE : ±0.2mm**
  8. **OPERATING TEMP: -10° C ~ +60° C**
  9. **STORAGE TEMP: -20° C ~ +70° C**
  10. Requirements on Environmental Protection: ROHS

| PIN | SYMBOL    |
|-----|-----------|
| 1   | LED-      |
| 2   | LED+      |
| 3   | GND       |
| 4   | VCC2.8    |
| 5   | TE        |
| 6   | NRESET    |
| 7   | CS        |
| 8   | WRX       |
| 9   | DCX       |
| 10  | SDA       |
| 11  | TP_GND    |
| 12  | TP_INT    |
| 13  | TP_RESET  |
| 14  | TP_SCL1.8 |
| 15  | TP_SDA1.8 |
| 16  | TP_VDD2.8 |

LEADTEK COMPANY LIMITED

| REV | DESCRIPTION                | DATE       | NAME |
|-----|----------------------------|------------|------|
| 3   |                            |            |      |
| 2   | Cover surface treatment AF | 2022.08.29 | Ian  |
| 1   | NEW                        | 2022.08.23 | Ian  |
| 0   |                            |            |      |

| LEADTEK DISPLAY |               |           |         |
|-----------------|---------------|-----------|---------|
| SCALE: 1/1      | UNIT: mm      | PAGE: 1/1 | VER: V3 |
| Part No:        | LTK015QVHCT04 | Approve   | Check   |
| Customer No:    |               | Drawn     | Ian     |

## 8. Interface Signal

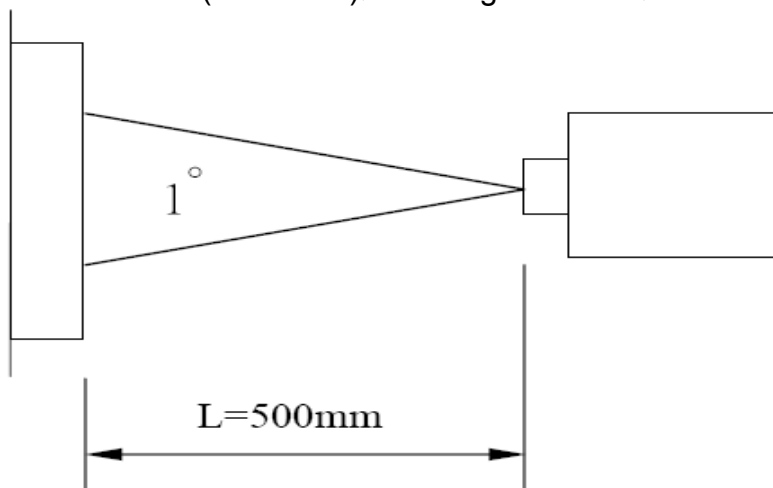
| Pin No. | Symbol | Description                                                     |
|---------|--------|-----------------------------------------------------------------|
| 1       | LEDK   | LED backlight cathode.                                          |
| 2       | LEDA   | LED backlight anode.                                            |
| 3       | GND    | Power ground                                                    |
| 4       | VCC    | Power supply for the analog power.                              |
| 5       | TE     | Serves TE (Tearing Effect ) pin on MPU interface.               |
| 6       | RESET  | Reset signal(low active)                                        |
| 7       | CS     | Chip select pin                                                 |
| 8       | RS     | Data or command select pin                                      |
| 9       | SCL    | Servers as SCL (Serial Clock)                                   |
| 10      | SDA    | Serial data input pin                                           |
| 11      | TP_GND | TP Ground                                                       |
| 12      | TP_INT | Interrupt request to the host, or Wakeup request from the host. |
| 13      | TP_RES | External Reset, Low is active.                                  |
| 14      | TP_SCL | I2C clock input.                                                |
| 15      | TP_SDA | I2C data input and output.                                      |
| 16      | TP_VCC | Power Supply For CTP.                                           |

## 9. ELECTRO-OPTICAL CHARACTERISTICS

| Item                     |       | Symbol           |               | Condition                                  | Min   | Typ   | Max   | Unit              | Remark |
|--------------------------|-------|------------------|---------------|--------------------------------------------|-------|-------|-------|-------------------|--------|
| Transmittance (w/o APCF) |       | T%               |               | $\theta=0^\circ$<br>$T_a=25^\circ\text{C}$ | 4.25  | 5     | -     | %                 |        |
| Contrast ratio           |       | Cr               |               |                                            | -     | 800   | -     | -                 | 3      |
| Response time            |       | $T_{on}+T_{off}$ |               |                                            | -     | 30    | 40    | ms                | 4      |
| Surface Luminance        |       | LV               |               |                                            |       | 300   | -     | cd/m <sup>2</sup> | 2      |
| Viewing angle range      |       | Hor<br>Ver       | $\Theta_{x+}$ | CR>10                                      | -     | 80    | -     | deg               | 5      |
|                          |       |                  | $\Theta_{x-}$ |                                            | -     | 80    | -     | deg               |        |
|                          |       |                  | $\Theta_{Y+}$ |                                            | -     | 80    | -     | deg               |        |
|                          |       |                  | $\Theta_{Y-}$ |                                            | -     | 80    | -     | deg               |        |
| CIE(x,y) chromaticity    | Red   | x                |               | $\theta=0^\circ$<br>$T_a=25^\circ\text{C}$ | 0.562 | 0.592 | 0.622 |                   | 6      |
|                          |       | y                |               |                                            | 0.320 | 0.350 | 0.380 |                   |        |
|                          | Green | x                |               |                                            | 0.278 | 0.308 | 0.338 |                   |        |
|                          |       | y                |               |                                            | 0.548 | 0.578 | 0.608 |                   |        |
|                          | Blue  | x                |               |                                            | 0.116 | 0.146 | 0.176 |                   |        |
|                          |       | y                |               |                                            | 0.073 | 0.103 | 0.133 |                   |        |
|                          | White | x                |               |                                            | 0.245 | 0.275 | 0.305 |                   |        |
|                          |       | y                |               |                                            | 0.275 | 0.305 | 0.335 |                   |        |

Note 1.Ambient condition:  $25^\circ\text{C}\pm 2^\circ\text{C}$ ,  $60\pm 10\%\text{RH}$ , under 10 Lunx in the darkroom。

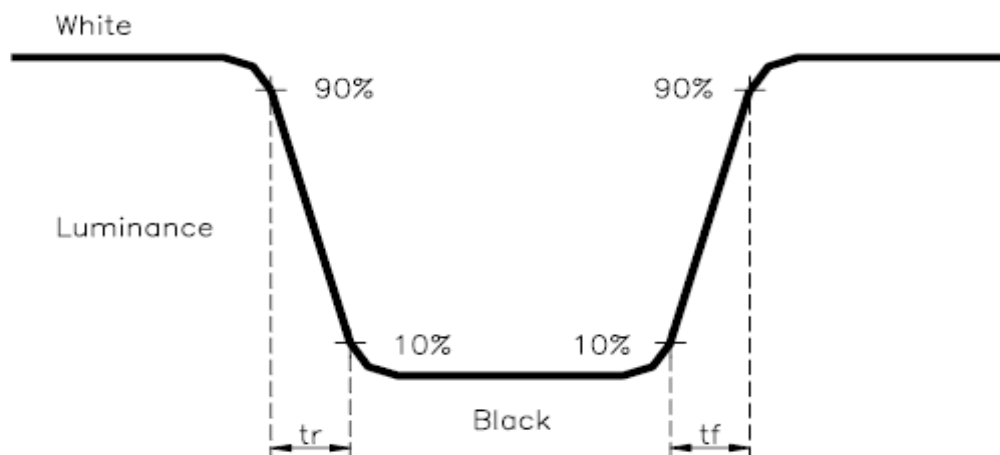
Note 2.Measure device: BM-7A (TOPCON), viewing cone=  $1^\circ$ , IL=40mA。



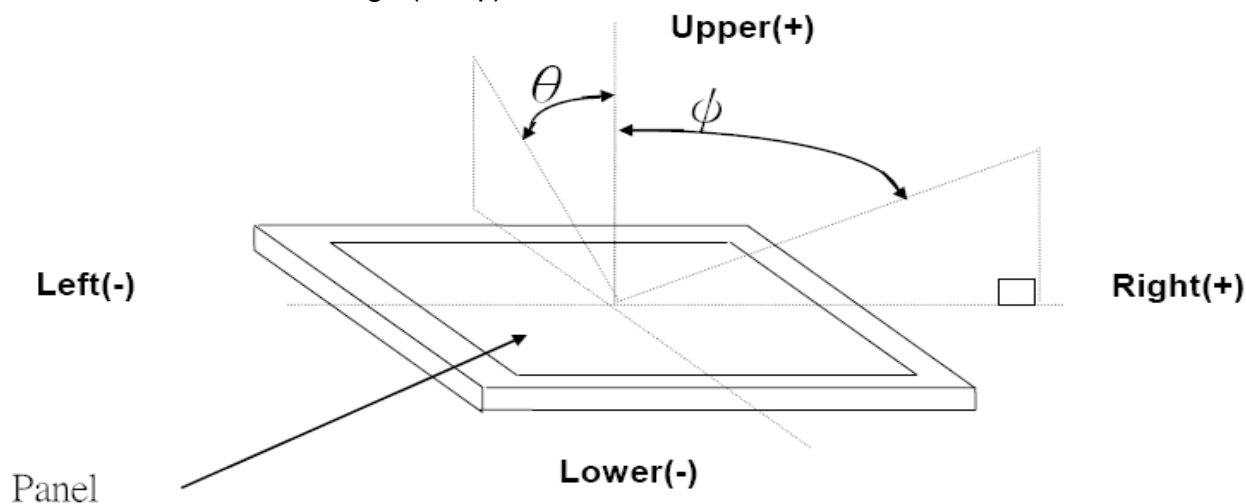
Note 3. Definition of Contrast Ratio:

$CR = \text{White Luminance (ON)} / \text{Black Luminance (OFF)}$

Note 4. Definition of response time: The response time is defined as the time interval between the 10% and 90% amplitudes.



Note 5. Definition of view angle( $\theta$ ,  $\psi$ ):



Note 6. Light source: C light.

## 10. RELIABILITY TEST

Reliability test conditions ( Polarizer characteristics null )

| No. | Test Items                             | Test Condition                                        | Remarks                              |
|-----|----------------------------------------|-------------------------------------------------------|--------------------------------------|
| 1   | High Temperature Storage               | T =70℃ for 48hr                                       | Module<br>(Without<br>Contamination) |
| 2   | Low Temperature Storage                | T = -20℃ for 48hr                                     |                                      |
| 3   | High Temperature Operating             | T = 60℃ for 8hr                                       |                                      |
| 4   | Low Temperature Operating              | T = -10℃ for 8hr<br>(But no condensation of dew)      |                                      |
| 5   | High Temp. and High Humidity Operating | T = 50℃ /90% for 48hr<br>(But no condensation dew)    |                                      |
| 6   | Thermal Shock                          | -10±2℃~25~60±2℃×10cycles<br>(30min.) (5min.) (30min.) |                                      |
| 7   | Packing Shock                          | 1corner, 3edge, 6face /<br>76cmDrop                   | Packing                              |
| 8   | Packing Vibration                      | Random 1.06Grms XYZ 30min<br>for each direction       |                                      |

## 11. Standards of inspection items

### 11.1.Scope 1适用范围

This document shall be applied to 0.95~5.0 TFT-LCD Panel.

本文件适用于1.54 TFT-LCD Panel.

### 11.2.Inspection and Environment onditions/检查条件与环境

#### 11.3Inspection Conditions 检查条件:

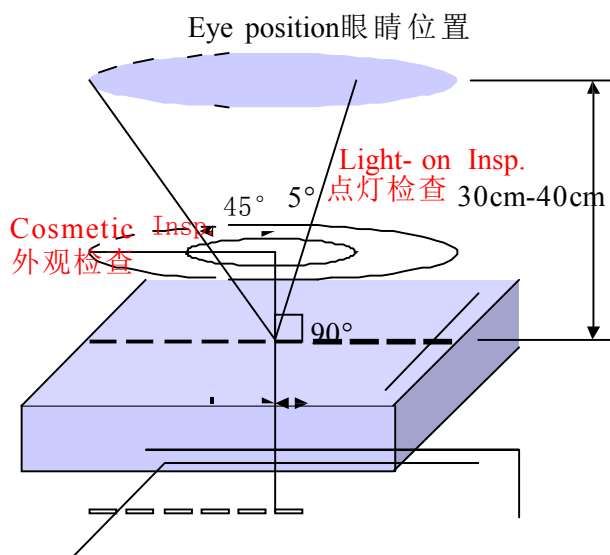
(1) Inspection Distance检测距离: 35 cm $\pm$ 5cm

(2) Each picture /每个画面: 2~3 secs/秒, Cosmetic Insp./外观10~12 secs/秒

(3) View Angle观看角度:

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垂直于液晶显示表面)

#### 14. Environment Conditions环境条件:

|                            |                               |                |
|----------------------------|-------------------------------|----------------|
| 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     |

#### 15. Sampling Conditions 抽样条件:

(1) Lot Size : Quantity of shipment lot per model/.

批量: 单次运送单一机型数量

- (2) Sampling Method :  
抽样方法:

| Sampling Plan<br>抽样计划 |                      | GB2828/2003                                     |
|-----------------------|----------------------|-------------------------------------------------|
|                       |                      | Normal Inspection, Single Sampling<br>正常检验、单次抽样 |
|                       |                      | General II Inspection<br>普通二级                   |
| AQL                   | Major Defect<br>主要缺点 | 0.25                                            |
|                       | Minor Defect<br>次要缺点 | 0.65                                            |

- (3) The classification of Major(MA) and Minor(MI) defects is shown as 3. Inspection Criteria.

主缺(MA)及次缺(MI)定义于”3.检查标准”

## 16. Terms and Definitions/术语和定义

### 16.1 Classification of defects缺陷的分类:

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.

主要缺陷：会导致产品功能失效或减少产品可用性的缺陷。

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

次要缺陷：不会导致产品功能失效，不会减少产品的有效使用和操作。

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

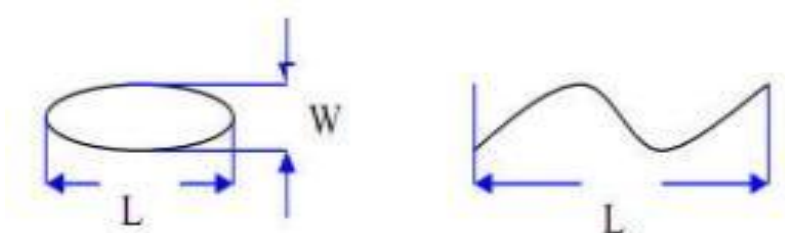
可以被擦拭干净的表面物质不视为缺陷 (如手指印，尘粒) 。

### 16.3 Defects on the Black Matraix(outside ofActive Area) are not considered as a defect . BM

区域 (AA 区以外) 的缺陷不视为缺陷。

### 16.4 Size of circular defect,is defined by diameter”D” 。 The defect average diameter $D=1/2(W+L)$ 圆形缺陷

的大小是由直径 D 定义的。缺陷的平均直径  $D=1/2(W+L)$



16.5 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。3.6 3.6 Mura criteria :judged by ND filter6%,and can't be seen under at ND filter 6% .

16.6 MURA 判断标准：使用 ND6%判定，且透过 ND6% ，遮住不可见。

16.7 Dot defect is defin as the defective area of the dot is larger than 50% of the dot area and is visiblethrough 6% ND filter

DOT 定义为点缺陷面积大于 50% DOT 面积, 且透过 ND6%遮住是可见的。

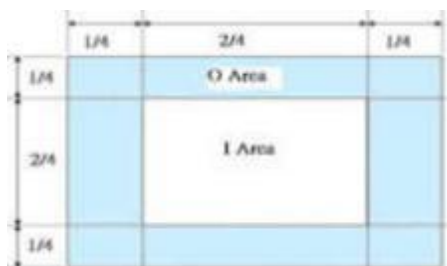
The drawing of 1/2 area sub-pixel definition: The 1/2 area sub-pixel can be defined as below one or more of specific shapes

1/2 面积的子像素定义绘图：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：



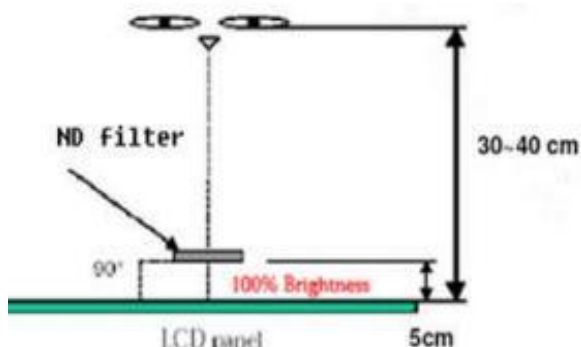
16.8 A dot defect that is smaller than the defined dot defect will be treated as small bright dot. 细碎亮点：小于“DOT 定义”的点缺陷视为细碎亮点。

I 区与 O 区比例：1： 2： 1



16.9 Inspection method of ND Filter - holding ND filter in front of the panel around 5cm and examine the panel from 35±5 cm in the front view for 2~3 second.

ND 卡的检查方法：在面板上方大约 5CM 处握住 ND 卡，眼睛距离面板 30-40CM ，通过 2~3 秒观察。



## 17. Inspection Criteria 检验标准

### 17.1 Appearance Inspection specification 外观检查规格:

| Judge area<br>区域             | Judge item<br>项目                  | Specification inspection<br>检查规格                                                                     | Judge criterion |       |
|------------------------------|-----------------------------------|------------------------------------------------------------------------------------------------------|-----------------|-------|
|                              |                                   |                                                                                                      | Major           | Minor |
| Silicone<br>硅胶               | Silicone spread<br>硅胶涂布           | The height can't over C/F , color filter , or gommu<br>高度不能过超 C/F                                    |                 | MI    |
|                              | Silicone residue<br>硅胶残余          | Can't cover polarizer, FPC ...etc.<br>不能覆盖 POL, FPC 等                                                |                 | MI    |
| LCD<br>玻璃                    | Wire(on Array)<br>线路              | No damage<br>不能损伤                                                                                    | MA              |       |
|                              | Edge<br>边缘                        | No extended crack<br>不可有延伸性裂纹                                                                        | MA              |       |
| PCBA<br>Connector<br>FPC/FFC | Appearance<br>外观                  | Scratch or damage result in copper expose is not allowed<br>划伤或损伤不允许导致出现露铜                           |                 | MI    |
|                              | Component<br>零件                   | No damage<br>不能损伤                                                                                    | MA              |       |
|                              | Connection status<br>连接状况         | Need correct connection<br>需要正确连接                                                                    | MA              |       |
|                              | Broken<br>破裂                      | Not allowable<br>不允许                                                                                 | MA              |       |
|                              | Folding sign<br>对位记号折叠            | Not allowable<br>不允许                                                                                 | MA              |       |
| POL<br>偏光片                   | Scratch on the polarizer<br>偏光片划伤 | 1. $W \leq 0.05\text{mm}$ ; $L \leq 5\text{mm}$ , Ignore (忽略)                                        |                 | MI    |
|                              |                                   | 2. $0.05\text{mm} < W \leq 0.10\text{mm}$ ; $L \leq 5\text{mm}$ ; $N \leq 3$ ; $DS \geq 10\text{mm}$ |                 |       |
|                              |                                   | 3. $10\text{mm} < W$ ; $5\text{mm} < L$ , Not allowable不允许                                           |                 |       |

| Judge area<br>区域 | Judge item<br>项目                  | Specification inspection<br>检查规格                                                          | Judge criterion |       |
|------------------|-----------------------------------|-------------------------------------------------------------------------------------------|-----------------|-------|
|                  |                                   |                                                                                           | Major           | Minor |
| POL<br>偏光片       | Dent on the<br>polarizer<br>偏光片凹痕 | 1.D<0.15mm, Ignore (忽略)                                                                   |                 | MI    |
|                  |                                   | 2.0.15mm<D≤0.30mm; N≤3; DS≥10mm                                                           |                 |       |
|                  |                                   | 3.0.30mm<D, Not allowable不允许                                                              |                 |       |
|                  | POL Linear bubble<br>线状气泡         | 1.W≤0.05mm; L≤5mm, Ignore (忽略)                                                            |                 | MI    |
|                  |                                   | 2.0.05mm<W≤0.10mm; L≤5mm; N≤3; DS≥10mm                                                    |                 |       |
|                  |                                   | 3.0.10mm<W; 5mm<L, Not allowable不允许                                                       |                 |       |
|                  | POL dot bubble<br>点状气泡            | 1.D<0.15mm, Ignore (忽略)                                                                   |                 | MI    |
|                  |                                   | 2.0.15mm<D≤0.30mm; N≤3; DS≥10mm                                                           |                 |       |
|                  |                                   | 3.0.30mm<D, Not allowable不允许                                                              |                 |       |
|                  | POL edge bubble<br>片边缘气泡          | 1. The display area is 1/2BM outside, Not allowable<br>显示区往外 1/2BM 区域内, 不允许               |                 | MI    |
|                  |                                   | 2. The display area is outside the outer 1/2BM area, Not allowable<br>显示区往外1/2BM区域以外, 不管控 |                 |       |

| Judge area<br>区域 | Judge item<br>项目                       | Specification inspection<br>检查规格                                                                                                                                | Judge criterion |       |
|------------------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------|
|                  |                                        |                                                                                                                                                                 | Major           | Minor |
| TP&CG            | Foreign Material in spot shape<br>点状异物 | 1.D≤0.15mm; Ignored (忽略)<br>2.0.15mm<D≤0.30mm; N≤3; DS≥10mm<br>3.D>0.30mm; Not allowable不允许                                                                     |                 | MI    |
|                  | Fisheye/bubbles<br>鱼眼/气泡               | 1.D≤0.15mm; Ignored (忽略)<br>2.0.15mm<D≤0.30mm; N≤3; DS≥10mm<br>3.D>0.30mm; Not allowable不允许                                                                     |                 | MI    |
|                  | Scratches on the surface<br>表面划伤       | 1.W≤0.05mm; Ignored (忽略)<br>2.0.05mm<W≤0.10mm, L≤5mm; N≤3; DS≥10mm<br>3.W>0.10mm, L>5mm; Not allowable不允许                                                       |                 | MI    |
|                  | Collapse corner、Crash edge<br>崩角、崩边    | Product front:/产品正面:<br>collapse corners, collapsed edges are not allowed<br>崩角、崩边不允许;<br><br>Product back/产品背面:<br>X≤0.5, Y≤0.5, Z≤1/2T; N≤2; DS≥10mm          | MA              |       |
|                  | Printed fonts/LOGO<br>丝印/LOGO          | Printed fonts/LOGO clarity、complete、content right<br>字体/LOGO丝印清晰、完整、内容正确                                                                                        |                 | MI    |
|                  | Broken<br>破损                           | Not allowable不允许                                                                                                                                                | MA              |       |
|                  | Dirty surfaces<br>表面脏污                 | Dirt cannot be wiped, Not allowable<br>不可擦拭的脏污, 不允许                                                                                                             |                 | MI    |
|                  | IR hole<br>IR孔                         | Black spots/黑点:<br>W≤0.15mm, N≤2, Not visible against a black background/黑色背景下不可见                                                                               |                 | MI    |
|                  |                                        | IR hole Scratches:<br>1.W<0.03mm, Ignored (忽略)<br>(Dense points Not allowable 不允许密集);<br>2.0.03mm<W≤0.08mm; L≤2mm; N≤2;<br>3.W>0.08mm, L>2mm, Not allowable 不允许 |                 | MI    |

## 7.2 Electrical Inspection specification电性检查规格:

| Item<br>项目                                                        | Judgment Criteria<br>判定标准                                                                                                                   | Judge criterion |       |
|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------|
|                                                                   |                                                                                                                                             | Major           | Minor |
| LCD Bright /Dark dot<br>玻璃亮点/暗点                                   | 1.D $\leq$ 0.15mm, Ignored (忽略), Not dense (不可密集)<br>2.0.15mm<D $\leq$ 0.30mm ; N $\leq$ 3 ; DS $\geq$ 10mm<br>3.D>0.30mm , Not allowed/不允许 |                 | MI    |
| Mura                                                              | Invisible through 6% ND filter, 200~300Lux<br>透过ND6% 遮住 , 目测不可见即为OK, 200~300Lux                                                             |                 | MI    |
| Small bright dot<br>细碎亮点                                          | Not allowed if it can be observed<br>through ND Filter6%<br>透过ND6%目测看得见, 不允许                                                                |                 | MI    |
| ZBD Rate<br>玻璃亮点比率                                                | 90:10                                                                                                                                       |                 | MI    |
| Light Leakage<br>漏光                                               | Invisible through 6% ND filter, OK<br>透过ND6%遮住目测不可见即为OK<br>If necessary,set up set up Limit Sample.<br>如果有必要,可制订限度样品                        |                 | MI    |
| Bubble in Cell (LC<br>Bubble/Actice Area)<br>CELL气泡<br>(AA区LCD气泡) | Eyes should not find it .<br>目视观察不可见, 视为 OK                                                                                                 | MA              |       |

| Item<br>项目                                          | Judgment Criteria<br>判定标准                                                                                                                                                                 | Judge criterion |       |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------|
|                                                     |                                                                                                                                                                                           | Major           | Minor |
| Foreign Material in spot<br>shape<br>点状异物           | 1. $D \leq 0.15\text{mm}$ , Ignored (忽略)<br>2. $0.15\text{mm} < D \leq 0.30\text{mm}$ ; $N \leq 3$ ; $DS \geq 10\text{mm}$<br>3. $D > 0.30\text{mm}$ , Not allowable/不允许                  |                 | MI    |
| Foreign Material in line<br>or spiral shape<br>线状异物 | 1. $W \leq 0.05\text{mm}$ , Ignored (忽略)<br>2. $L \leq 5\text{mm}$ ; $0.05\text{mm} < W \leq 0.10\text{mm}$ ; $N \leq 3$<br>3. $W > 0.10\text{mm}$ ; $L > 5\text{mm}$ , Not allowable/不允许 |                 | MI    |
| White dot in back-light<br>白点                       | 1. $D \leq 0.15\text{mm}$ , Ignored (忽略)<br>2. $0.15\text{mm} < D \leq 0.30\text{mm}$ ; $N \leq 3$ ; $DS \geq 10\text{mm}$<br>3. $D > 0.30\text{mm}$ , Not allowed/不允许                    |                 | MI    |
| TP no touch<br>无触摸                                  | Not allowable<br>不允许                                                                                                                                                                      | MA              |       |
| Abnormal Disply<br>显示异常                             | Not Allowed<br>不允许                                                                                                                                                                        | MA              |       |
| NO display<br>无显示                                   | Not Allowed<br>不允许                                                                                                                                                                        | MA              |       |
| Line Defect<br>缺线                                   | Not Allowed<br>不允许                                                                                                                                                                        | MA              |       |
| Angle of view error<br>视角错误                         | Not Allowed<br>不允许                                                                                                                                                                        | MA              |       |
| Tect crostalk<br>不消失的残影                             | Not Allowed<br>不允许                                                                                                                                                                        | MA              |       |