



**EN:** This Datasheet/Document is presented by the manufacturer.

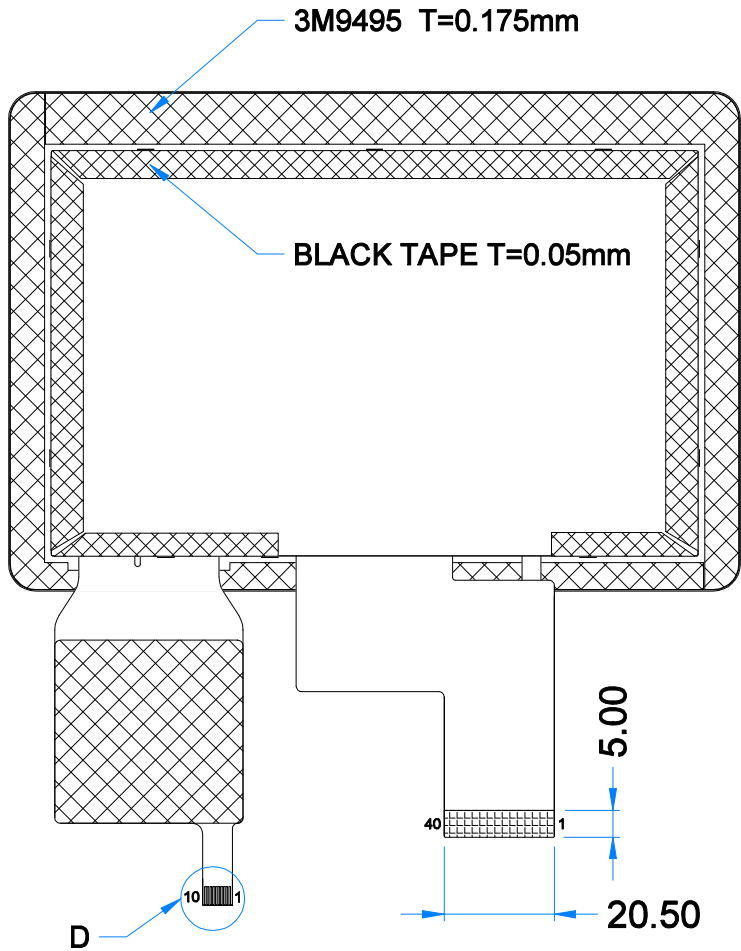
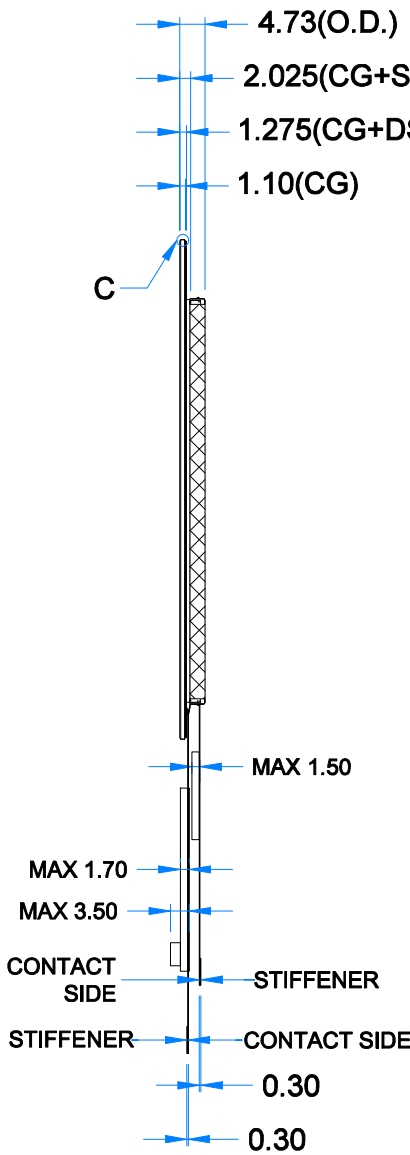
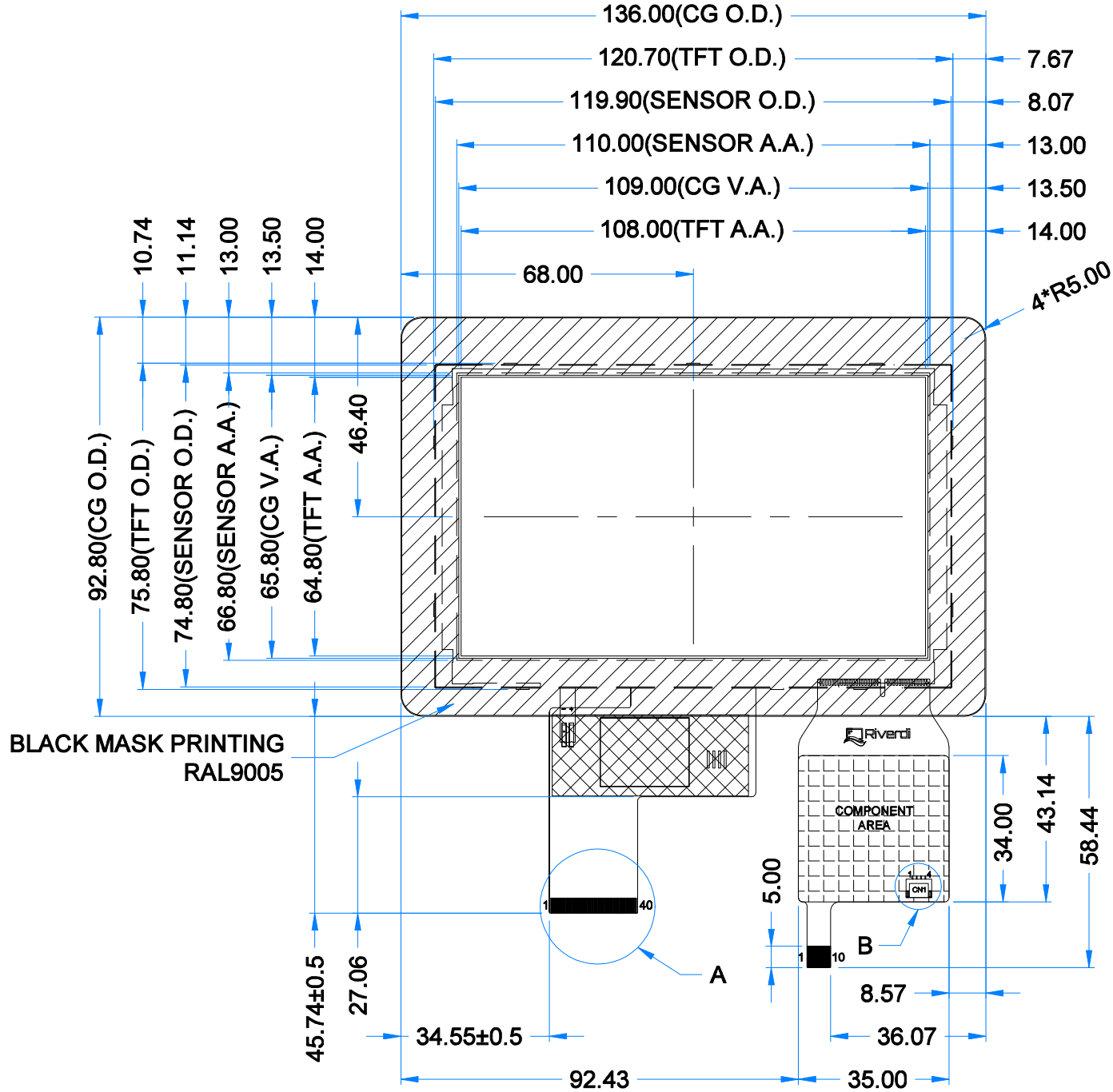
Please visit our website for pricing and availability at [www.hestore.hu](http://www.hestore.hu).



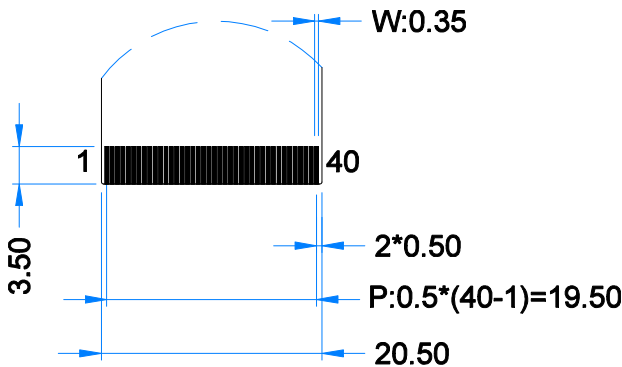




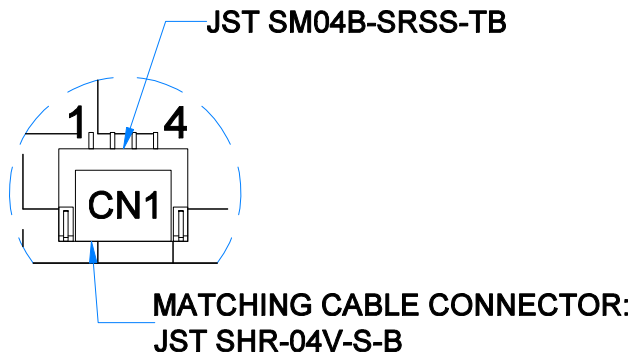
|           |              |            |
|-----------|--------------|------------|
| Revision: | Changes:     | Date:      |
| 1.0       | Initial Case | 2020.08.10 |



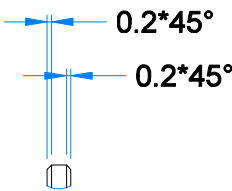
DETAIL A  
SCALE 2:1



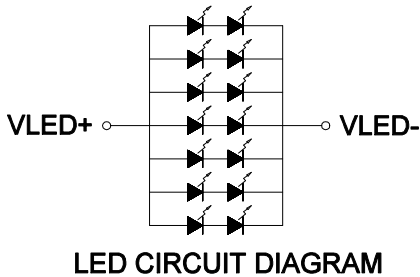
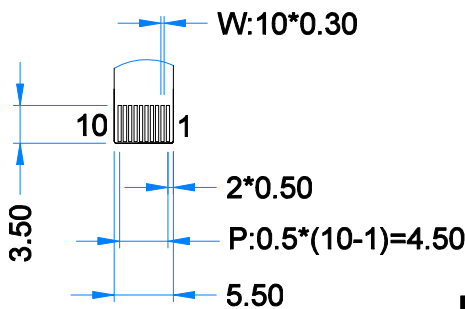
DETAIL B  
SCALE 4:1



DETAIL C  
SCALE 4:1



DETAIL D  
SCALE 2:1



PINOUT ON THE 2ND PAGE

**TFT NOTES:**  
1. LCD TYPE: TRANSMISSIVE, NORMALLY BLACK, IPS  
2. RESOLUTION: 800x480  
3. VIEWING ANGLE: FREE  
4. IC CONTROLLER: ST7262-G4  
5. OPERATING VOLTAGE: 3.3V  
6. BACKLIGHT: 14-LED WHITE, Vf=12.0V, If=140mA

**TP NOTES:**  
1. TP STRUCTURE: G+G  
2. CG THICKNESS: 1.10 mm  
3. DRIVER IC: ILI2132A  
4. INTERFACE: USB; I2C; OPTIONAL UART  
5. OPERATING VOLTAGE: 3.3V(I2C); 5.0V(USB)

**GENERAL NOTES:**  
1. MODULE SURFACE LUMINANCE: 850 cd/m<sup>2</sup>  
2. OPERATING TEMPERATURE: -20°C ~ 70°C  
3. STORAGE TEMPERATURE: -30°C ~ 80°C  
4. WITHOUT INDIVIDUAL TOLERANCE:  $\pm$ 0.3mm  
5. RoHS COMPLIANT

|                     |                                                                                       |           |
|---------------------|---------------------------------------------------------------------------------------|-----------|
| PN: RVT50HQTNWC00-B |  |           |
| SN:                 |                                                                                       |           |
| DRAWN: M.Natywa     | 2020.08.10                                                                            | 1:1.41    |
| CHECKED: Carol Gao  |                                                                                       | [mm]      |
| APPR:               |                                                                                       | ISO A3    |
|                     |                                                                                       | P. 1 of 1 |

### 3 ABSOLUTE MAXIMUM RATINGS

| PARAMETER                     | SYMBOL           | MIN  | MAX | UNIT | NOTE         |
|-------------------------------|------------------|------|-----|------|--------------|
| Operating Ambient temperature | T <sub>OP</sub>  | -20  | 70  | °C   |              |
| Storage Temperature           | T <sub>ST</sub>  | -30  | 80  | °C   |              |
| Operating Ambient Humidity    | H <sub>OP</sub>  | 10   | -   | % RH |              |
| Power for Circuit Driving     | VDD              | -0.3 | 5   | V    |              |
| Backlight Forward Current     | I <sub>LED</sub> | -    | 25  | mA   | For Each LED |

**Note.** The following are maximum values. If exceeded it may cause operation or damage to the unit.

### 4 ELECTRICAL CHARACTERISTICS

| PARAMETER                       | SYMBOL       | MIN             | TYP       | MAX | UNIT    |
|---------------------------------|--------------|-----------------|-----------|-----|---------|
| Power Supply for Analog Circuit | VDD          | 3.0             | 3.3       | 3.6 | V       |
| Logic Input Voltage             | Low Voltage  | V <sub>IL</sub> | 0         | -   | 0.3VDD  |
|                                 | High Voltage | V <sub>IH</sub> | 0.7VDD    | -   | VDD     |
| Logic Output Voltage            | Low Voltage  | V <sub>OL</sub> | -         | -   | GND+0.4 |
|                                 | High Voltage | V <sub>OH</sub> | VDD - 0.4 | -   | V       |
| Power Consumption               | Black Mode   | P <sub>b</sub>  | 80        | 85  | mA      |
|                                 | Standby Mode | P <sub>w</sub>  | 40        | 50  | uA      |

### 5 BACKLIGHT DRIVING CONDITIONS

| PARAMETER                   | SYMBOL          | MIN  | TYP    | MAX  | UNIT | NOTE     |
|-----------------------------|-----------------|------|--------|------|------|----------|
| Backlight Driving Voltage   | V <sub>F</sub>  | 11.2 | 12.0   | 12.8 | V    | Note 1,2 |
| Backlight Driving Current   | I <sub>F</sub>  | -    | 140    | -    | mA   |          |
| Backlight Power Consumption | W <sub>BL</sub> | -    | 1680   | -    | mW   |          |
| Backlight Life Time         | -               | -    | 50,000 | -    | Hrs  | Note 3   |

**Note 1.** Unless specified, the ambient temperature Ta=25°C

**Note 2.** The recommended operating conditions refer to a range in which operation of this product is guaranteed. Should this range is exceeded, the operation cannot be guaranteed even if the values may be without the absolute maximum ratings.

**Note 3.** If LED is driven by high current, high ambient temperature & humidity condition. The life time of LED will be reduced. Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.

## 6 ELECTRO-OPTICAL CHARACTERISTICS

| ITEM                       | SYMBOL            | CONDITION                                                    | MIN   | TYP   | MAX   | UNIT              | REMARK | NOTE |
|----------------------------|-------------------|--------------------------------------------------------------|-------|-------|-------|-------------------|--------|------|
| Response Time              | Tr+Tf             | $\theta=0^\circ$<br>$\phi=0^\circ$<br>$T_a=25^\circ\text{C}$ | -     | 30    | -     | ms                | FIG 1. | 4    |
| Contrast Ratio             | Cr                |                                                              | -     | 1000  | -     | ---               | FIG 2. | 1    |
| Luminance Uniformity       | $\delta$<br>WHITE |                                                              | -     | 75    | -     | %                 | FIG 2. | 3    |
| Surface Luminance          | Lv                |                                                              | 720   | 850   | -     | cd/m <sup>2</sup> | FIG 2. | 2    |
| Viewing Angle Range        | $\theta$          | $\phi = 90^\circ$                                            | -     | 80    | -     | deg               | FIG 3. | 6    |
|                            |                   | $\phi = 270^\circ$                                           | -     | 80    | -     | deg               | FIG 3. |      |
|                            |                   | $\phi = 0^\circ$                                             | -     | 80    | -     | deg               | FIG 3. |      |
|                            |                   | $\phi = 180^\circ$                                           | -     | 80    | -     | deg               | FIG 3. |      |
| CIE (x, y)<br>Chromaticity | Red               | x                                                            | 0.575 | 0.615 | 0.655 | FIG 2.            |        | 5    |
|                            |                   | y                                                            | 0.296 | 0.336 | 0.376 |                   |        |      |
|                            | Green             | x                                                            | 0.352 | 0.392 | 0.432 |                   |        |      |
|                            |                   | y                                                            | 0.512 | 0.552 | 0.592 |                   |        |      |
|                            | Blue              | x                                                            | 0.100 | 0.140 | 0.180 |                   |        |      |
|                            |                   | y                                                            | 0.085 | 0.125 | 0.165 |                   |        |      |
|                            | White             | x                                                            | 0.274 | 0.316 | 0.358 |                   |        |      |
|                            |                   | y                                                            | 0.295 | 0.336 | 0.378 |                   |        |      |

**Note 1.** Contrast Ratio(CR) is defined mathematically as below, for more information see Figure 1.

$$\text{Contrast Ratio} = \frac{\text{Average Surface Luminance with all white pixels (P1, P2, P3, P4, P5)}}{\text{Average Surface Luminance with all black pixels (P1, P2, P3, P4, P5)}}$$

**Note 2.** Surface luminance is the LCD surface from the surface with all pixels displaying white. For more information see Figure 2.

$$L_v = \text{Average Surface Luminance with all white pixels (P1, P2, P3, P4, P5)}$$

**Note 3.** The uniformity in surface luminance  $\delta$  WHITE is determined by measuring luminance at each test position 1 through 5, and then dividing the maximum luminance of 5 points luminance by minimum luminance of 5 points luminance. For more information see Figure 2.

$$\delta \text{ WHITE} = \frac{\text{Minimum Surface Luminance with all white pixels (P1, P2, P3, P4, P5)}}{\text{Maximum Surface Luminance with all white pixels (P1, P2, P3, P4, P5)}}$$

**Note 4.** Response time is the time required for the display to transition from white to black (Rise Time, Tr) and from black to white (Decay Time, Tf). For additional information see Figure 1. The test equipment is Autronic-Melchers's ConoScope series.

**Note 5.** CIE (x, y) chromaticity, the x, y value is determined by measuring luminance at each test position 1 through 5, and then make average value.

**Note 6.** Viewing angle is the angle at which the contrast ratio is greater than 2. For TFT module the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to LCD surface. For more information see Figure 3.

**Note 7.** For viewing angle and response time testing, the testing data is based on Autronic-Melchers's ConoScope series. Instruments for Contrast Ratio, Surface Luminance, Luminance Uniformity, CIE the test data is based on TOPCON's BM-5 photo detector.

Figure 1. The definition of response time

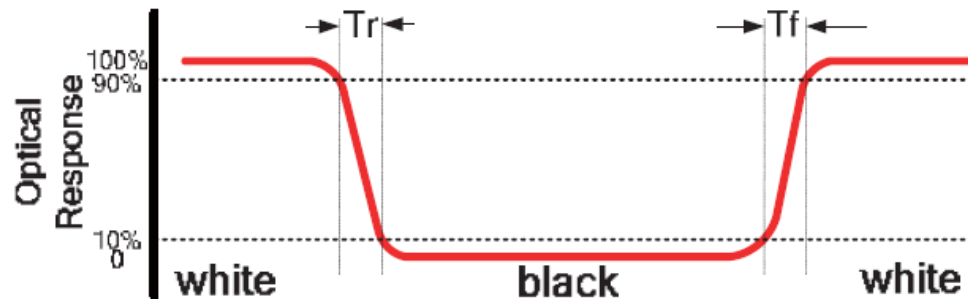


Figure 2. Measuring method for Contrast ratio, surface luminance, Luminance uniformity, CIE (x, y) chromaticity

A : 5 mm  
B : 5 mm  
H, V : Active Area  
Light spot size  $\varnothing=5\text{mm}$ , 500mm distance from the LCD surface to detector lens  
measurement instrument is TOPCON's luminance meter BM-5

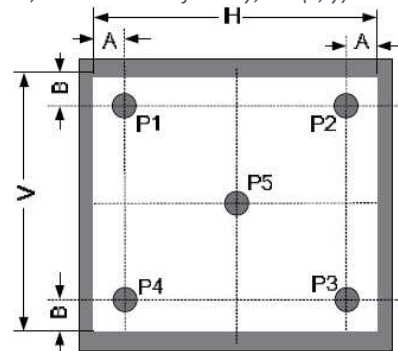
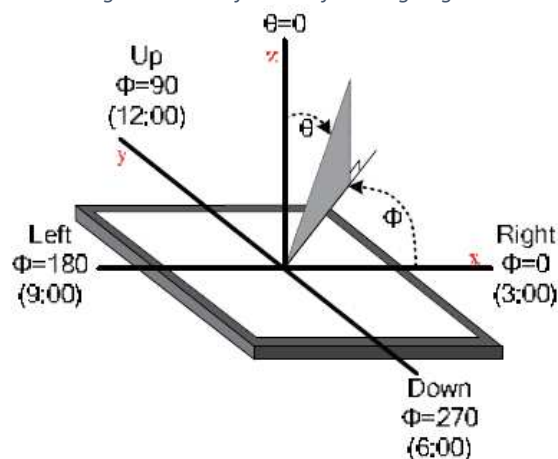
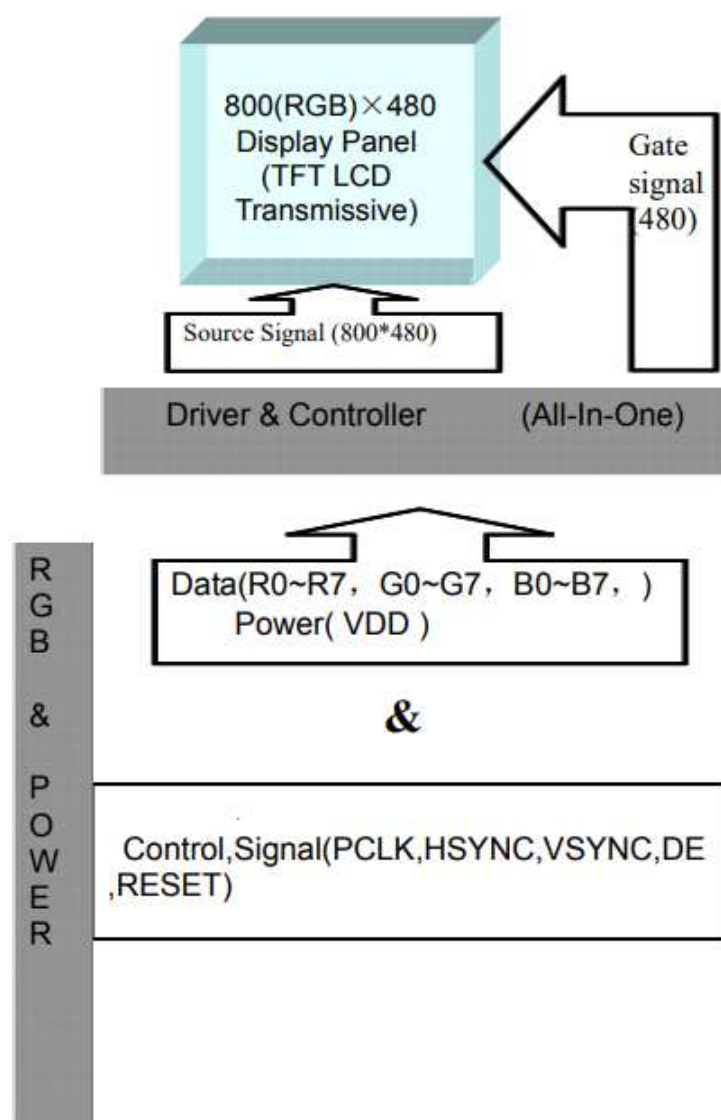


Figure 3. The definition of viewing angle





## 7 BLOCK DIAGRAM



## 8 INTERFACE DESCRIPTION

### 8.1 TFT assignment

| PIN NO. | SYMBOL | DESCRIPTION                       |
|---------|--------|-----------------------------------|
| 1       | VLED-  | Backlight Power Input PIN Cathode |
| 2       | VLED+  | Backlight Power Input PIN Anode   |
| 3       | GND    | Ground                            |
| 4       | VDD    | Power Supply Voltage              |
| 5-12    | R0-R7  | Red Data                          |
| 13-20   | G0-G7  | Green Data                        |
| 21-28   | B0-B7  | Blue Data                         |
| 29      | GND    | Ground                            |
| 30      | DCLK   | Clock for Input Data              |
| 31      | DISP   | Display on/off Control            |
| 32      | HSYNC  | Horizontal Synchronized Signal    |
| 33      | VSNC   | Vertical Synchronized Signal      |
| 34      | DE     | Data Input Enable                 |
| 35      | NC     | Not Connect                       |
| 36      | GND    | Ground                            |
| 37      | NC/XR  | No Connect                        |
| 38      | NC/YD  | No Connect                        |
| 39      | NC/XL  | No Connect                        |
| 40      | NC/YU  | No Connect                        |

### 8.2 Touch panel assignment

| PIN NO. | SYMBOL      | DESCRIPTION                   |
|---------|-------------|-------------------------------|
| 1       | USB_GND     | USB_Ground                    |
| 2       | USB_VDD     | USB_Power for CTP, DC 5.0 V   |
| 3       | USB_D-      | USB_Data Signal -             |
| 4       | USB_D+      | USB_Data Signal +             |
| 5       | I2C_GND     | I2C_Ground                    |
| 6       | I2C_VDD     | I2C_Power For CTP, DC 3.3 V   |
| 7       | I2C_RST     | I2C_Reset Pin                 |
| 8       | I2C_SCL     | I2C_Clock Input               |
| 9       | I2C_INT     | I2C_Interrupt Signal from CTP |
| 10      | I2C_SDA/TXD | I2C_Data Signal               |

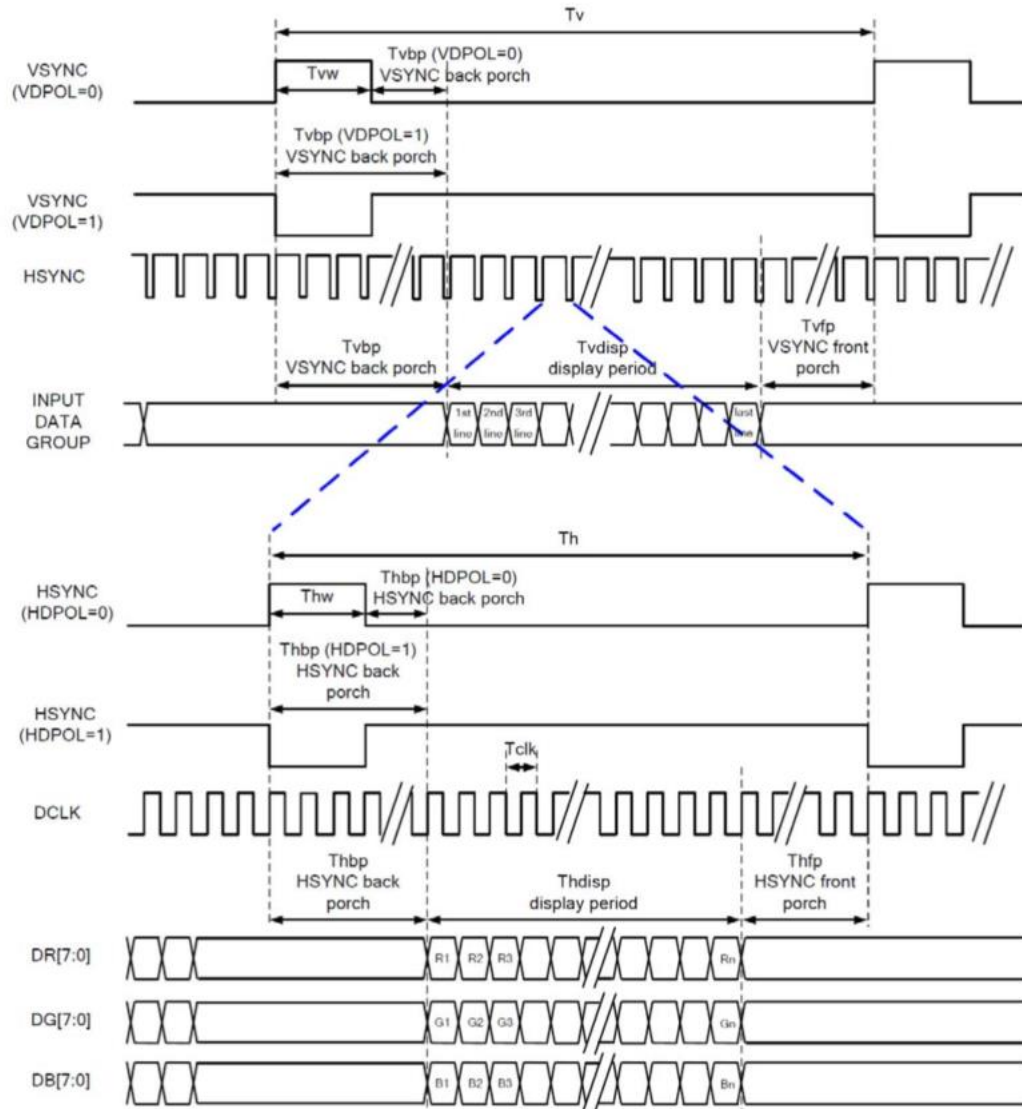
### 8.3 CON1 assignment

| PIN NO. | SYMBOL  | DESCRIPTION                |
|---------|---------|----------------------------|
| 1       | USB_VDD | USB_Power for CTP, DC 5.0V |
| 2       | USB_D-  | USB_Data Signal -          |
| 3       | USB_D+  | USB_Data Signal +          |
| 4       | USB_GND | USB_Ground                 |

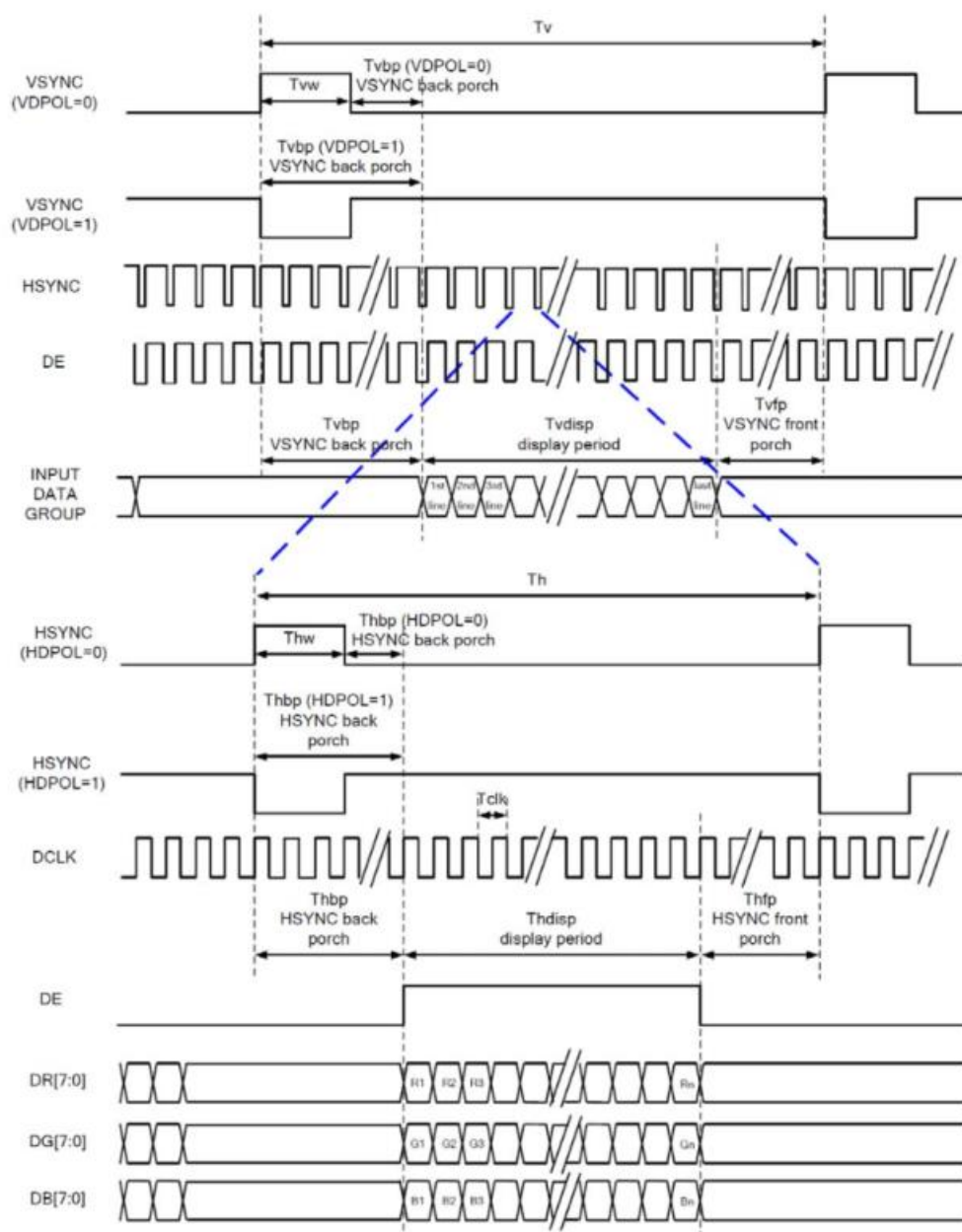
## 9 TIMING CHARACTERISTICS

### 9.1 System bus timing for RGB interface

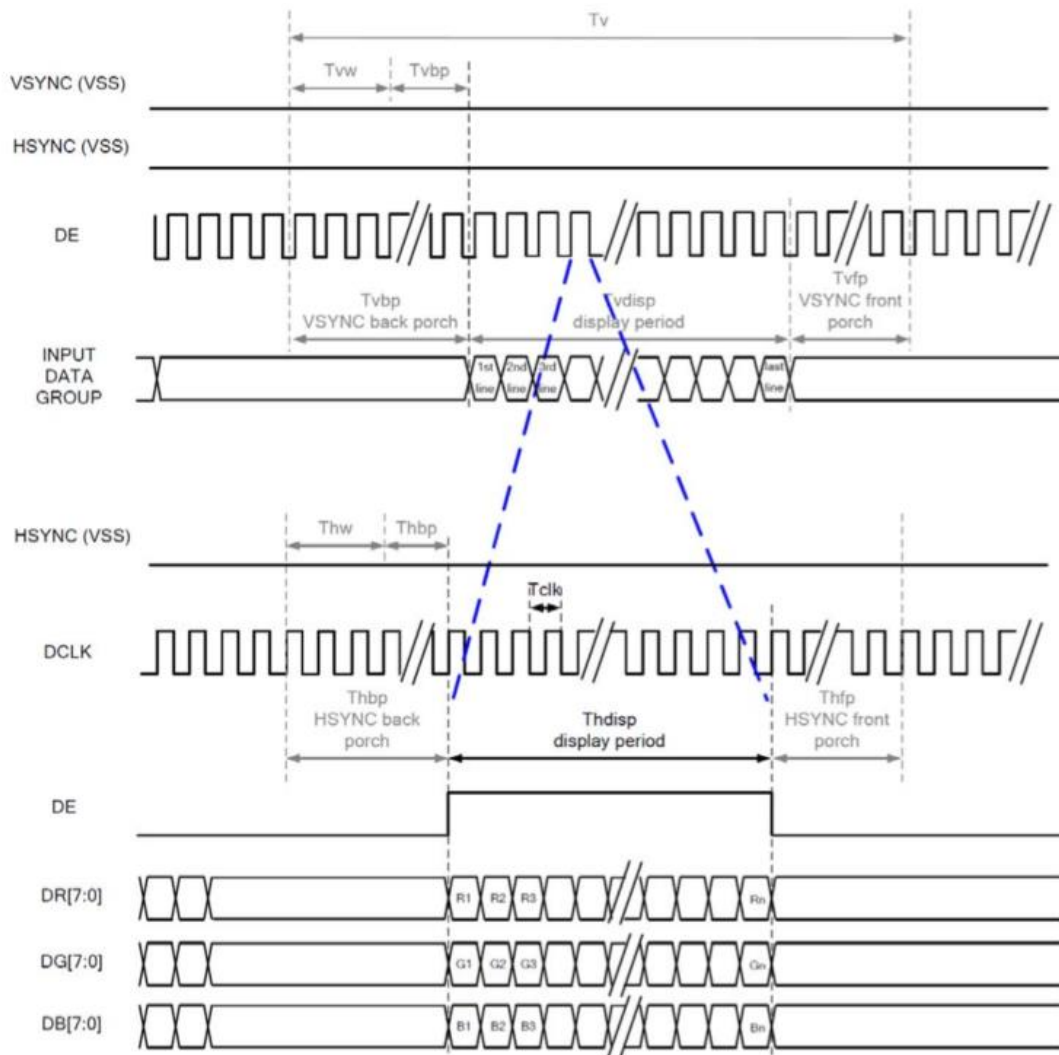
#### 9.1.1 SYNC Mode



## 9.1.2 SYNC-DE Mode



### 9.1.3 DE Mode



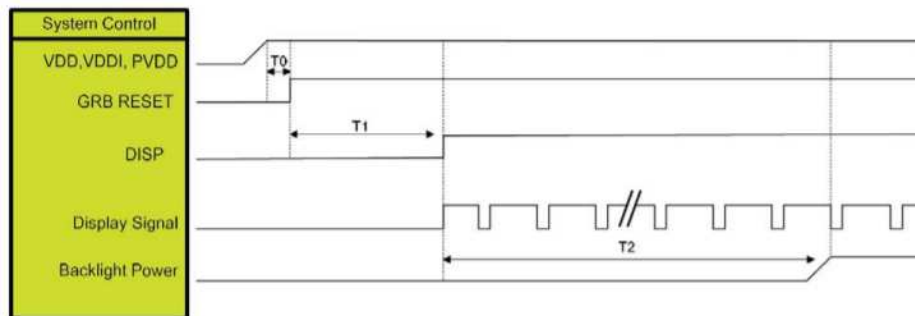
## 9.2 Parallel 24-bit RGB input timing table

Parallel 24-bit RGB input Timing (PVDD=VDD=VDDI=3.3V, AGND=0V,  $T_a=25^\circ\text{C}$ )

| PARAMETER      |                   | SYMBOL | MIN | TYP | MAX | UNIT  |
|----------------|-------------------|--------|-----|-----|-----|-------|
| DCLK Frequency |                   | Fclk   | 23  | 25  | 27  | MHz   |
| HSYNC          | Period Time       | Th     | 808 | 816 | 896 | DCLK  |
|                | Display Period    | Thdisp | 800 |     |     | DCLK  |
|                | Hsync Back Porch  | Thbp   | 4   | 8   | 48  | DCLK  |
|                | Hsync Front Porch | Thfp   | 4   | 8   | 48  | DCLK  |
|                | Hsync Pluse Width | Thw    | 2   | 4   | 8   | DCLK  |
| VSYNC          | Period Time       | Tv     | 488 | 496 | 504 | HSYNC |
|                | Display Period    | Tvdisp | 480 |     |     | HSYNC |
|                | Vsync Back Porch  | Tvbp   | 4   | 8   | 12  | HSYNC |
|                | Vsync Front Porch | Tvfp   | 4   | 8   | 12  | HSYNC |
|                | Vsync Pluse Width | Tvw    | 2   | 4   | 8   | HSYNC |

### 9.3 Power ON/OFF sequence

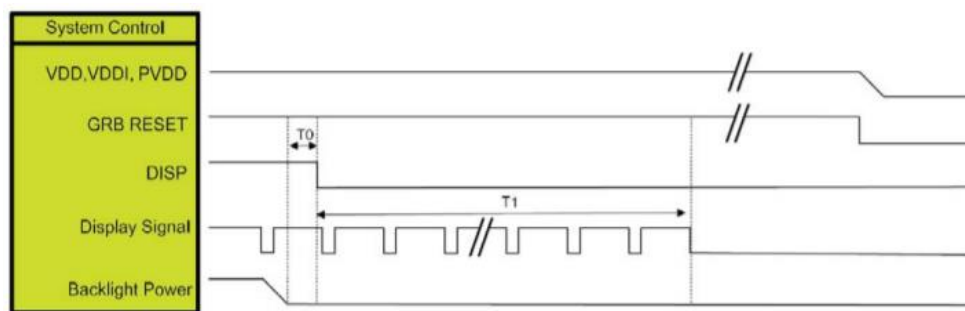
#### 9.3.1 Power On sequence



| SYMBOL | DESCRIPTION                                 | MIN. TIME | UNIT |
|--------|---------------------------------------------|-----------|------|
| T0     | System power stability to GRB RESET signal  | 0         | ms   |
| T1     | GRB RESET="High " to DISP="High "           | 10        | ms   |
| T2     | Display Signal output to Backlight Power on | 250       | ms   |

**Note.** RGB interface display signal: DCLK, VSYNC, HSYNC, DE, DR[7:0], DB[7:0].

#### 9.3.2 Power Off sequence



| SYMBOL | DESCRIPTION                                             | MIN. TIME | UNIT |
|--------|---------------------------------------------------------|-----------|------|
| T0     | Backlight Power off to DISP="Low "                      | 5         | ms   |
| T1     | DISP = "Low " to IC internal voltage discharge complete | 100       | ms   |

**Note.** RGB interface display signal: DCLK, VSYNC, HSYNC, DE, DR[7:0], DB[7:0]

## 10 CAPACITIVE TOUCH SCREEN PANEL SPECIFICATIONS

### 10.1 Mechanical characteristics

| DESCRIPTION              | SPECIFICATION        | REMARK  |
|--------------------------|----------------------|---------|
| Touch Panel Size         | 5.0 inch             | UxTouch |
| Outline Dimension of CTP | 136.00 mm x 92.80 mm | UxTouch |
| Product Thickness        | 2.45 mm              | UxTouch |
| Glass Thickness          | 1.1 mm               | UxTouch |
| CTP View Area            | 109.00 mm x 65.80 mm | UxTouch |
| Sensor Active Area       | 110.00 mm x 66.80 mm | UxTouch |
| Structure type           | Glass + Glass        | UxTouch |
| Surface Hardness         | 6H                   | UxTouch |

## 10.2 Electrical characteristics

| DESCRIPTION             |             | SPECIFICATION                        |
|-------------------------|-------------|--------------------------------------|
| Operating Voltage       |             | DC 5.0 V (USB)                       |
|                         |             | DC 3.3 V (I <sup>2</sup> C )         |
| Power Consumption (IDD) | Active Mode | 90 mA                                |
|                         | Sleep Mode  | 10 mA                                |
| Interface               |             | USB / I <sup>2</sup> C/Optional UART |
| Linearity               |             | +/-1.5mm                             |
| Controller              |             | ILI2132A                             |
| I2C address             |             | 0X82                                 |
| Resolution              |             | 800 x 480                            |

## 11 INSPECTION

Standard acceptance/rejection criteria for TFT module.

### 11.1 Inspection condition

Ambient conditions:

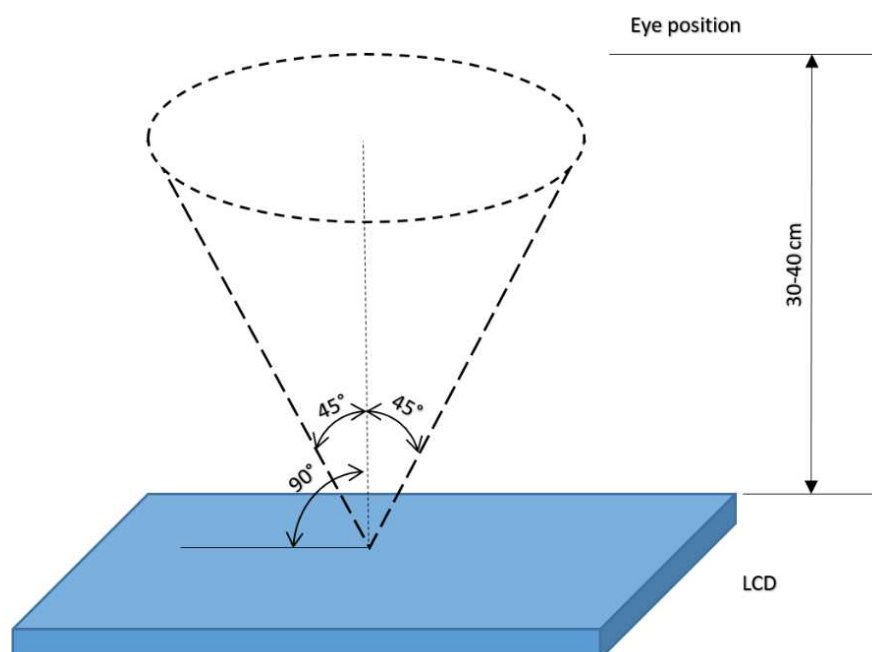
- Temperature: 25±2°C
- Humidity: (60±10)%RH
- Illumination: Single fluorescent lamp non-directive (300 to 700 lux)

Viewing distance:

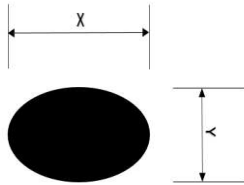
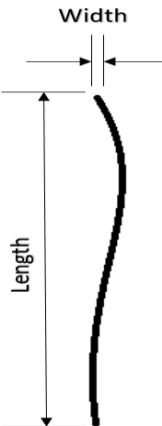
35±5cm between inspector bare eye and LCD.

Viewing Angle:

U/D: 45°/45°, L/R 45°/45°



## 11.2 Inspection standard

| Item                                                                               | Criterion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--|------------------|---------------|-------------|---------------|-----------------------|---------|----------------------------|-------------|----------------|---|------------------|----------------|-------------|---------|---------------------|-------------|----------------------------|-------------|--|--------|-------|---------------|---|----------|---------|---------|---------------|---|---------|---------|-------------|
| Black spots,<br>white spots,<br>light leakage,<br>Foreign Particle<br>(round Type) | <div><div><math display="block">D = \frac{(x + y)}{2}</math><p>*Spots density: 10 mm</p></div><div><table><tr><th colspan="2">3.5" ≤ Size ≤ 5"</th></tr><tr><th>Average Diameter</th><th>Qualified Qty</th></tr><tr><td>D ≤ 0.15 mm</td><td>Ignored</td></tr><tr><td>0.15 mm &lt; D ≤ 0.30 mm</td><td>N≤3</td></tr><tr><td>0.3mm &lt; D</td><td>Not allowed</td></tr></table><br/><table><tr><th colspan="2">Size =7"</th></tr><tr><th>Average Diameter</th><th>Qualified Qty</th></tr><tr><td>D ≤ 0.2 mm</td><td>Ignored</td></tr><tr><td>0.2 mm &lt; D ≤ 0.3 mm</td><td>N≤3</td></tr><tr><td>0.5mm &lt; D</td><td>Not allowed</td></tr></table></div></div>                                                                                         | 3.5" ≤ Size ≤ 5" |  | Average Diameter | Qualified Qty | D ≤ 0.15 mm | Ignored       | 0.15 mm < D ≤ 0.30 mm | N≤3     | 0.3mm < D                  | Not allowed | Size =7"       |   | Average Diameter | Qualified Qty  | D ≤ 0.2 mm  | Ignored | 0.2 mm < D ≤ 0.3 mm | N≤3         | 0.5mm < D                  | Not allowed |  |        |       |               |   |          |         |         |               |   |         |         |             |
| 3.5" ≤ Size ≤ 5"                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| Average Diameter                                                                   | Qualified Qty                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| D ≤ 0.15 mm                                                                        | Ignored                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| 0.15 mm < D ≤ 0.30 mm                                                              | N≤3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| 0.3mm < D                                                                          | Not allowed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| Size =7"                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| Average Diameter                                                                   | Qualified Qty                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| D ≤ 0.2 mm                                                                         | Ignored                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| 0.2 mm < D ≤ 0.3 mm                                                                | N≤3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| 0.5mm < D                                                                          | Not allowed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| LCD black spots,<br>white spots,<br>light leakage<br>(line Type)                   | <div><div><p>*Spots density: 10 mm</p></div><div><table><tr><th colspan="3">3.5" ≤ Size ≤ 5"</th></tr><tr><th>Length/mm</th><th>Width/mm</th><th>Qualified Qty</th></tr><tr><td>-</td><td>W≤ 0.03</td><td>Ignored</td></tr><tr><td>L ≤ 3.0</td><td>0.03&lt; W ≤ 0.05</td><td>2</td></tr><tr><td>L ≤ 3.0</td><td>0.05 &lt; W ≤ 0.1</td><td>1</td></tr><tr><td>3.0 &lt; L</td><td>0.1&lt; W</td><td>Not allowed</td></tr></table><br/><table><tr><th colspan="3">Size =7"</th></tr><tr><th>Length</th><th>Width</th><th>Qualified Qty</th></tr><tr><td>-</td><td>W ≤ 0.05</td><td>Ignored</td></tr><tr><td>L ≤ 5.0</td><td>0.05&lt; W ≤ 0.1</td><td>3</td></tr><tr><td>5.0 &lt; L</td><td>0.10&lt; W</td><td>Not allowed</td></tr></table></div></div> | 3.5" ≤ Size ≤ 5" |  |                  | Length/mm     | Width/mm    | Qualified Qty | -                     | W≤ 0.03 | Ignored                    | L ≤ 3.0     | 0.03< W ≤ 0.05 | 2 | L ≤ 3.0          | 0.05 < W ≤ 0.1 | 1           | 3.0 < L | 0.1< W              | Not allowed | Size =7"                   |             |  | Length | Width | Qualified Qty | - | W ≤ 0.05 | Ignored | L ≤ 5.0 | 0.05< W ≤ 0.1 | 3 | 5.0 < L | 0.10< W | Not allowed |
| 3.5" ≤ Size ≤ 5"                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| Length/mm                                                                          | Width/mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Qualified Qty    |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| -                                                                                  | W≤ 0.03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Ignored          |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| L ≤ 3.0                                                                            | 0.03< W ≤ 0.05                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 2                |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| L ≤ 3.0                                                                            | 0.05 < W ≤ 0.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1                |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| 3.0 < L                                                                            | 0.1< W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Not allowed      |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| Size =7"                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| Length                                                                             | Width                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Qualified Qty    |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| -                                                                                  | W ≤ 0.05                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Ignored          |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| L ≤ 5.0                                                                            | 0.05< W ≤ 0.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3                |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| 5.0 < L                                                                            | 0.10< W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Not allowed      |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| Bright/Dark<br>Dots                                                                | <div><table><tr><th colspan="2">3.5" ≤ Size ≤ 5"</th></tr><tr><th>item</th><th>Qualified Qty</th></tr><tr><td>Bright Dots</td><td>N≤1</td></tr><tr><td>Dark Dots</td><td>N≤2</td></tr><tr><td>Total Bright and Dark Dots</td><td>N≤3</td></tr></table><br/><table><tr><th colspan="2">Size =7"</th></tr><tr><th>item</th><th>Qualified Qty</th></tr><tr><td>Bright Dots</td><td>N≤2</td></tr><tr><td>Dark Dots</td><td>N≤3</td></tr><tr><td>Total Bright and Dark Dots</td><td>N≤4</td></tr></table></div>                                                                                                                                                                                                                                                                                                                             | 3.5" ≤ Size ≤ 5" |  | item             | Qualified Qty | Bright Dots | N≤1           | Dark Dots             | N≤2     | Total Bright and Dark Dots | N≤3         | Size =7"       |   | item             | Qualified Qty  | Bright Dots | N≤2     | Dark Dots           | N≤3         | Total Bright and Dark Dots | N≤4         |  |        |       |               |   |          |         |         |               |   |         |         |             |
| 3.5" ≤ Size ≤ 5"                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| item                                                                               | Qualified Qty                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| Bright Dots                                                                        | N≤1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| Dark Dots                                                                          | N≤2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| Total Bright and Dark Dots                                                         | N≤3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| Size =7"                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| item                                                                               | Qualified Qty                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| Bright Dots                                                                        | N≤2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| Dark Dots                                                                          | N≤3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |
| Total Bright and Dark Dots                                                         | N≤4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                  |  |                  |               |             |               |                       |         |                            |             |                |   |                  |                |             |         |                     |             |                            |             |  |        |       |               |   |          |         |         |               |   |         |         |             |



| Item                           | Criterion                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                 |               |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--|------------------|------------------|---------------|---------------|------------|---------|----------------------|---------------------|---|---------------------|---------------------|---|------------|------------|---|------------|--|---|
| Clear spots                    | <table><tr><th colspan="3">Size &lt; 5"</th></tr><tr><td colspan="2">Average Diameter</td><td>Qualified Qty</td></tr><tr><td colspan="2">D &lt; 0.2 mm</td><td>Ignored</td></tr><tr><td colspan="2">0.2 mm &lt; D &lt; 0.3 mm</td><td>3</td></tr><tr><td colspan="2">0.3 mm &lt; D &lt; 0.5 mm</td><td>2</td></tr><tr><td colspan="2">0.5 mm &lt; D</td><td>0</td></tr></table>                                             | Size < 5"                                                                                                                                                                                                                                                                                                                                                                       |               |  | Average Diameter |                  | Qualified Qty | D < 0.2 mm    |            | Ignored | 0.2 mm < D < 0.3 mm  |                     | 3 | 0.3 mm < D < 0.5 mm |                     | 2 | 0.5 mm < D |            | 0 |            |  |   |
|                                | Size < 5"                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                 |               |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | Average Diameter                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                 | Qualified Qty |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | D < 0.2 mm                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                 | Ignored       |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | 0.2 mm < D < 0.3 mm                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                 | 3             |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | 0.3 mm < D < 0.5 mm                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                 | 2             |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | 0.5 mm < D                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                 | 0             |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | <table><tr><th colspan="3">Size &gt;= 5"</th></tr><tr><td colspan="2">Average Diameter</td><td>Qualified Qty</td></tr><tr><td colspan="2">D&lt;0.2 mm</td><td>Ignored</td></tr><tr><td colspan="2">0.2 mm &lt; D &lt; 0.3 mm</td><td>4</td></tr><tr><td colspan="2">0.3 mm &lt; D &lt; 0.5 mm</td><td>2</td></tr><tr><td colspan="2">0.5 mm &lt; D</td><td>0</td></tr></table>                                              | Size >= 5"                                                                                                                                                                                                                                                                                                                                                                      |               |  | Average Diameter |                  | Qualified Qty | D<0.2 mm      |            | Ignored | 0.2 mm < D < 0.3 mm  |                     | 4 | 0.3 mm < D < 0.5 mm |                     | 2 | 0.5 mm < D |            | 0 |            |  |   |
|                                | Size >= 5"                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                 |               |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | Average Diameter                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                 | Qualified Qty |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | D<0.2 mm                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                 | Ignored       |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | 0.2 mm < D < 0.3 mm                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                 | 4             |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | 0.3 mm < D < 0.5 mm                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                 | 2             |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | 0.5 mm < D                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                 | 0             |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | *Spots density: 10 mm                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                 |               |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
| Polarizer bubbles              | <table><tr><th colspan="3">3.5" ≤ Size ≤ 5"</th></tr><tr><td colspan="2">Average Diameter</td><td>Qualified Qty</td></tr><tr><td colspan="2">D ≤ 0.2 mm</td><td>Ignored</td></tr><tr><td colspan="2">0.2 mm &lt; D ≤ 0.3 mm</td><td>2</td></tr><tr><td colspan="2">0.3 mm &lt; D ≤ 0.5mm</td><td>1</td></tr><tr><td colspan="2">0.5 mm &lt; D</td><td>0</td></tr><tr><td colspan="2">Total Q'ty</td><td>3</td></tr></table> | 3.5" ≤ Size ≤ 5"                                                                                                                                                                                                                                                                                                                                                                |               |  | Average Diameter |                  | Qualified Qty | D ≤ 0.2 mm    |            | Ignored | 0.2 mm < D ≤ 0.3 mm  |                     | 2 | 0.3 mm < D ≤ 0.5mm  |                     | 1 | 0.5 mm < D |            | 0 | Total Q'ty |  | 3 |
|                                | 3.5" ≤ Size ≤ 5"                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                 |               |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | Average Diameter                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                 | Qualified Qty |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | D ≤ 0.2 mm                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                 | Ignored       |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | 0.2 mm < D ≤ 0.3 mm                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                 | 2             |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | 0.3 mm < D ≤ 0.5mm                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                 | 1             |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | 0.5 mm < D                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                 | 0             |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | Total Q'ty                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                 | 3             |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | <table><tr><th colspan="3">Size &gt;= 5"</th></tr><tr><td colspan="2">Average Diameter</td><td>Qualified Qty</td></tr><tr><td colspan="2">D&lt;0.25 mm</td><td>Ignored</td></tr><tr><td colspan="2">0.25 mm &lt; D &lt; 0.5 mm</td><td>3</td></tr><tr><td colspan="2">0.5 mm &lt; D</td><td>0</td></tr></table>                                                                                                             | Size >= 5"                                                                                                                                                                                                                                                                                                                                                                      |               |  | Average Diameter |                  | Qualified Qty | D<0.25 mm     |            | Ignored | 0.25 mm < D < 0.5 mm |                     | 3 | 0.5 mm < D          |                     | 0 |            |            |   |            |  |   |
|                                | Size >= 5"                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                 |               |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | Average Diameter                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                 | Qualified Qty |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | D<0.25 mm                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                 | Ignored       |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | 0.25 mm < D < 0.5 mm                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                 | 3             |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | 0.5 mm < D                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                 | 0             |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | Touch panel spot                                                                                                                                                                                                                                                                                                                                                                                                            | <table><tr><th colspan="3">Size &lt; 5"</th></tr><tr><td colspan="2">Average Diameter</td><td>Qualified Qty</td></tr><tr><td colspan="2">D &lt; 0.2 mm</td><td>Ignored</td></tr><tr><td colspan="2">0.2 mm &lt; D &lt; 0.4 mm</td><td>5</td></tr><tr><td colspan="2">0.4 mm &lt; D &lt; 0.5 mm</td><td>2</td></tr><tr><td colspan="2">0.5 mm &lt; D</td><td>0</td></tr></table> | Size < 5"     |  |                  | Average Diameter |               | Qualified Qty | D < 0.2 mm |         | Ignored              | 0.2 mm < D < 0.4 mm |   | 5                   | 0.4 mm < D < 0.5 mm |   | 2          | 0.5 mm < D |   | 0          |  |   |
| Size < 5"                      |                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                 |               |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
| Average Diameter               |                                                                                                                                                                                                                                                                                                                                                                                                                             | Qualified Qty                                                                                                                                                                                                                                                                                                                                                                   |               |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
| D < 0.2 mm                     |                                                                                                                                                                                                                                                                                                                                                                                                                             | Ignored                                                                                                                                                                                                                                                                                                                                                                         |               |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
| 0.2 mm < D < 0.4 mm            |                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                                                                                                                                                                                                                                                                                                                                                                               |               |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
| 0.4 mm < D < 0.5 mm            |                                                                                                                                                                                                                                                                                                                                                                                                                             | 2                                                                                                                                                                                                                                                                                                                                                                               |               |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
| 0.5 mm < D                     |                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                                                                                                                                                                                                                                                                                                                                                                               |               |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
| Touch panel White line Scratch | <table><tr><th colspan="3">Size &lt; 5"</th></tr><tr><td>Length</td><td>Width</td><td>Qualified Qty</td></tr><tr><td>-</td><td>W&lt; 0.02</td><td>Ignored</td></tr><tr><td>L &lt; 3.0</td><td>0.02 &lt; W &lt;0.05</td><td rowspan="2">2</td></tr><tr><td>L &lt; 2.5</td><td>0.05 &lt; W &lt;0.08</td></tr><tr><td>-</td><td>0.08 &lt; W</td><td>0</td></tr></table>                                                        | Size < 5"                                                                                                                                                                                                                                                                                                                                                                       |               |  | Length           | Width            | Qualified Qty | -             | W< 0.02    | Ignored | L < 3.0              | 0.02 < W <0.05      | 2 | L < 2.5             | 0.05 < W <0.08      | - | 0.08 < W   | 0          |   |            |  |   |
|                                | Size < 5"                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                 |               |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | Length                                                                                                                                                                                                                                                                                                                                                                                                                      | Width                                                                                                                                                                                                                                                                                                                                                                           | Qualified Qty |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | -                                                                                                                                                                                                                                                                                                                                                                                                                           | W< 0.02                                                                                                                                                                                                                                                                                                                                                                         | Ignored       |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | L < 3.0                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.02 < W <0.05                                                                                                                                                                                                                                                                                                                                                                  | 2             |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | L < 2.5                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.05 < W <0.08                                                                                                                                                                                                                                                                                                                                                                  |               |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |
|                                | -                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.08 < W                                                                                                                                                                                                                                                                                                                                                                        | 0             |  |                  |                  |               |               |            |         |                      |                     |   |                     |                     |   |            |            |   |            |  |   |

## 12 RELIABILITY TEST

| NO. | TEST ITEM                           | TEST CONDITION                                                                                                              |
|-----|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| 1   | High Temperature Storage            | 80°C/120 hours                                                                                                              |
| 2   | Low Temperature Storage             | -30°C/120 hours                                                                                                             |
| 3   | High Temperature Operating          | 70 °C /120 hours                                                                                                            |
| 4   | Low Temperature Operating           | -20°C/120 hours                                                                                                             |
| 5   | High Temperature and High Humidity  | Humidity 40°C, 90%RH, 120Hrs                                                                                                |
| 6   | Thermal Cycling Test (No operation) | -20°C for 30min, 70°C for 30 min. 100 cycles. Then test at room temperature after 1 hour                                    |
| 7   | Damp Proof Test                     | 40°C, 90%RH/120 hours                                                                                                       |
| 8   | Vibration Test                      | Frequency :10~55 HZ;<br>Stroke :1.5mm;<br>Sweep:10HZ~55HZ~10HZ;<br>2 hours for each direction of X, Y, Z(6 hours for total) |
| 9   | Package Drop Test                   | Height: 60 cm<br>1 corner,3 edges,6 surfaces                                                                                |
| 10  | ESD Test                            | Air: ±2 KV , Human Body Mode, 100 pF /1500 Ω                                                                                |

**Note 1.** Sample quantity for each test item is 5 ~ 10 pcs.

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

## 13 LEGAL INFORMATION

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