

|                  |      |                                                                                                 |      |                       |
|------------------|------|-------------------------------------------------------------------------------------------------|------|-----------------------|
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# SPECIFICATION

## VXT800BYH-01

☐ Preliminary Specification

☐ Final Specification



**Customer:**

**Made By:**

**Checked By:**

**Approved By:**

**Quality:**

**Date:**

**Note:**

**Approved By:**

**Date:**

**Note:**

## Records of Revision

[illegible]

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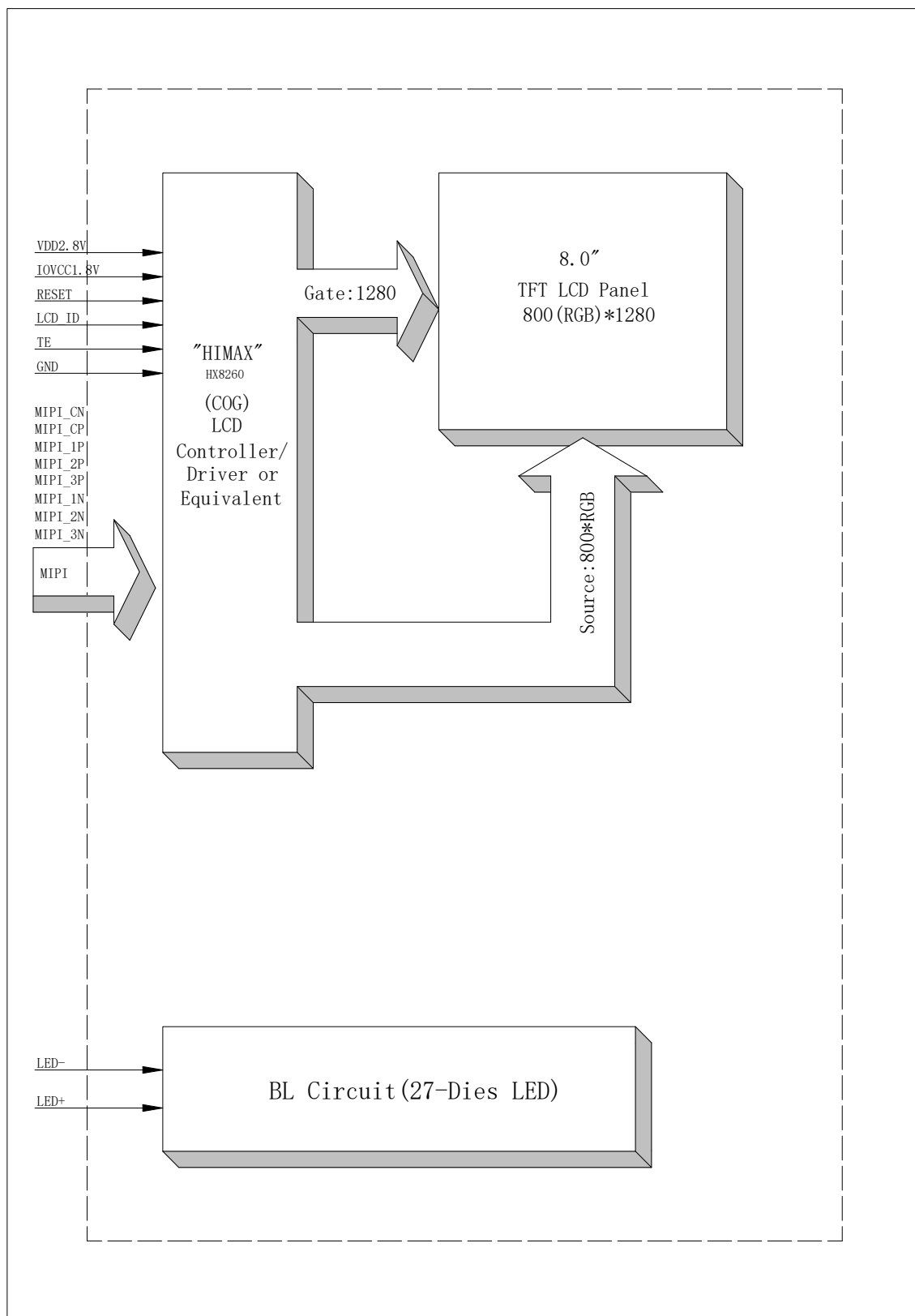
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# 1. General Specification

| Item                           | Contents              | Unit    |
|--------------------------------|-----------------------|---------|
| LCD TYPE                       | TFT/NORMALLY<br>BLACK |         |
| MODULE SIZE (W*H*T)            | 114.6*184.10*2.6      | MM      |
| ACTIVE SIZE (W*H)              | 107.64*172.22         | MM      |
| PIXEL PITCH (W*H)              | 0.13455*0.13455       | MM      |
| NUMBER OF DOTS                 | 800*1280              |         |
| LCD DRIVER IC                  | HX8260                |         |
| INTERFACE TYPE                 | MIPI                  |         |
| TOP POLARIZER TYPE             | ANTI-GLARE            |         |
| RECOMMEND VIEWING DIRECTION    | ALL                   | O'CLOCK |
| GRAY SCALE INVERSION DIRECTION | -                     | O'CLOCK |
| COLORS                         | 16.7M                 |         |
| BACKLIGHT TYPE                 | 21-LED WHITE          |         |
| TOUCH PANEL TYPE               | WITHOUT               |         |

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## 3. Block Diagram



## 4. Interface Pin Function

| Pin No. | Symbol        | Description                   |
|---------|---------------|-------------------------------|
| 1       | LEDK          | Cathode of LED backlight      |
| 2       | LEDA          | Anode of LED backlight        |
| 3       | GND           | Power ground                  |
| 4       | TE            | Teraing effective             |
| 5       | LCD_ID        | Lcd id                        |
| 6       | RESET         | RESET PIN                     |
| 7       | IOVCC<br>1.8V | Power supply for logic        |
| 8       | VDD 2.8V      | Logic power 2.8V              |
| 9       | GND           | Power ground                  |
| 10      | MIPI_D2P      | MIPI data positive signal(2P) |
| 11      | MIPI_D2N      | MIPI data negative signal(2N) |
| 12      | GND           | Power ground                  |
| 13      | MIPI_D1P      | MIPI data positive signal(1P) |
| 14      | MIPI_D1N      | MIPI data positive signal(1N) |
| 15      | GND           | Power ground                  |
| 16      | MIPI_CP       | MIPI data positive signal(CP) |
| 17      | MIPI_CN       | MIPI data positive signal(CN) |
| 18      | GND           | Power ground                  |
| 19      | MIPI_D0P      | MIPI data positive signal(0P) |
| 20      | MIPI_D0N      | MIPI data positive signal(0N) |
| 21      | GND           | Power ground                  |
| 22      | MIPI_D3P      | MIPI data positive signal(3P) |
| 23      | MIPI_D3N      | MIPI data positive signal(3N) |
| 24      | GND           | Power ground                  |

## 5. Absolute Maximum Ratings

| Parameter                 | Symbol           | Min  | Max | Unit |
|---------------------------|------------------|------|-----|------|
| Supply voltage for analog | VDD              | -0.3 | 3.6 | V    |
| Supply voltage for logic  | VDD              | -0.3 | 3.3 | V    |
| Supply current (One LED)  | I <sub>LED</sub> |      | 30  | mA   |
| Operating temperature     | T <sub>OP</sub>  | -20  | +70 | °C   |
| Storage temperature       | T <sub>ST</sub>  | -30  | +70 | °C   |

Note: The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

## 6. Electrical Characteristics

### 6.1 Input Power

| Item                      | Symbol           | Min     | Typ. | Max     | Unit | Applicable terminal |
|---------------------------|------------------|---------|------|---------|------|---------------------|
| Supply Voltage for Analog | VDD              | 2.8     | 2.8  | 3.6     | V    |                     |
| Supply Voltage for Logic  | VDD              | -       | 2.8  | -       | V    |                     |
| Input Voltage             | V <sub>IL</sub>  | GND     | -    | 0.3 VDD | V    |                     |
|                           | V <sub>IH</sub>  | 0.7 VDD | -    | VDD     |      |                     |
| Input leakage Current     | I <sub>LKG</sub> | -       |      | -       | μA   |                     |

### 6.2 Backlight Driving Conditions

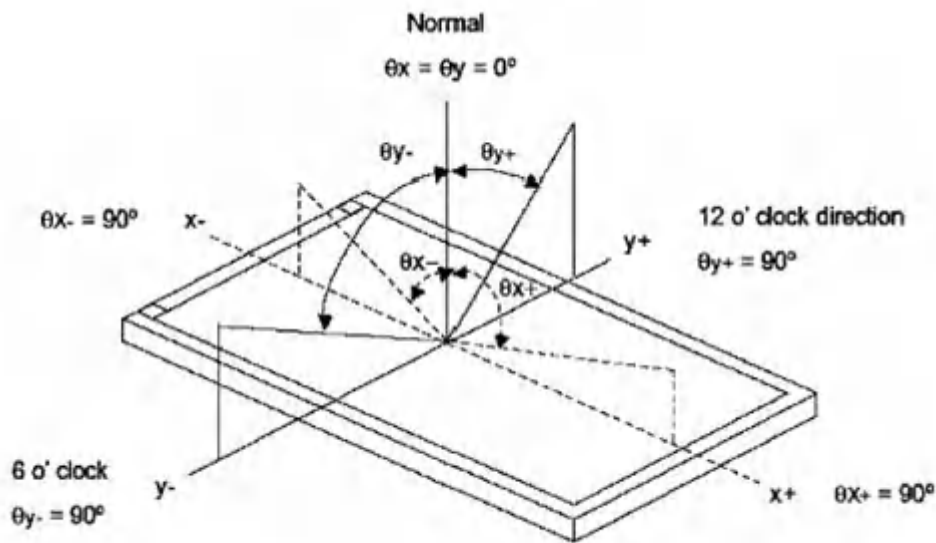
| Item                      | Symbol         | Value  |        |      | Unit | Remark               |
|---------------------------|----------------|--------|--------|------|------|----------------------|
|                           |                | Min.   | Typ.   | Max. |      |                      |
| Voltage for LED Backlight | V <sub>F</sub> | 18.2   | 21.7   | 22.4 | V    | I <sub>L</sub> =81mA |
| Current for LED Backlight | I <sub>L</sub> |        | 81     |      | mA   |                      |
| Power Consumption         | P              |        | 1.758  |      | W    |                      |
| LED Life Time             |                | 30,000 | 50,000 |      | Hr   | Note                 |

Note: Brightness to be decreased to 50% of the initial value at ambient temperature TA=25°C

## 7. Optical Characteristics

| ITEM                       |       | SYMBOL | CONDITIONS              | SPECIFICATIONS |      |     | UNIT            | NOTE |
|----------------------------|-------|--------|-------------------------|----------------|------|-----|-----------------|------|
|                            |       |        |                         | MIN            | TYP. | MAX |                 |      |
| Luminance                  |       | L      | $I_L = 81\text{mA}$     | 400            | 500  | 700 | $\text{Cd/m}^2$ |      |
| Contrast Ratio             |       | CR     | $\theta = 0^\circ$      | 700            | 900  |     |                 |      |
| Response Time              |       | TR     | $25^\circ\text{C}$      | --             | 30   | --  | ms              |      |
|                            |       | TF     |                         |                |      |     |                 |      |
| CIE<br>Color<br>Coordinate | Red   | $X_R$  | Viewing normal<br>angle |                |      |     |                 |      |
|                            |       | $Y_R$  |                         |                |      |     |                 |      |
|                            | Green | $X_G$  |                         |                |      |     |                 |      |
|                            |       | $Y_G$  |                         |                |      |     |                 |      |
|                            | Blue  | $X_B$  |                         |                |      |     |                 |      |
|                            |       | $Y_B$  |                         |                |      |     |                 |      |
|                            | White | $X_W$  |                         |                |      |     |                 |      |
|                            |       | $Y_W$  |                         |                |      |     |                 |      |
| Viewing<br>Angle           | Hor.  | $x$    | $CR \geq 10$            | 80             | 85   |     | Degree          |      |
|                            |       | $x$    |                         | 80             | 85   |     |                 |      |
|                            | Ver.  | $y$    |                         | 80             | 85   |     |                 |      |
|                            |       | $y$    |                         | 80             | 85   |     |                 |      |
| Uniformity                 | Un    |        |                         |                | 80   |     | %               |      |

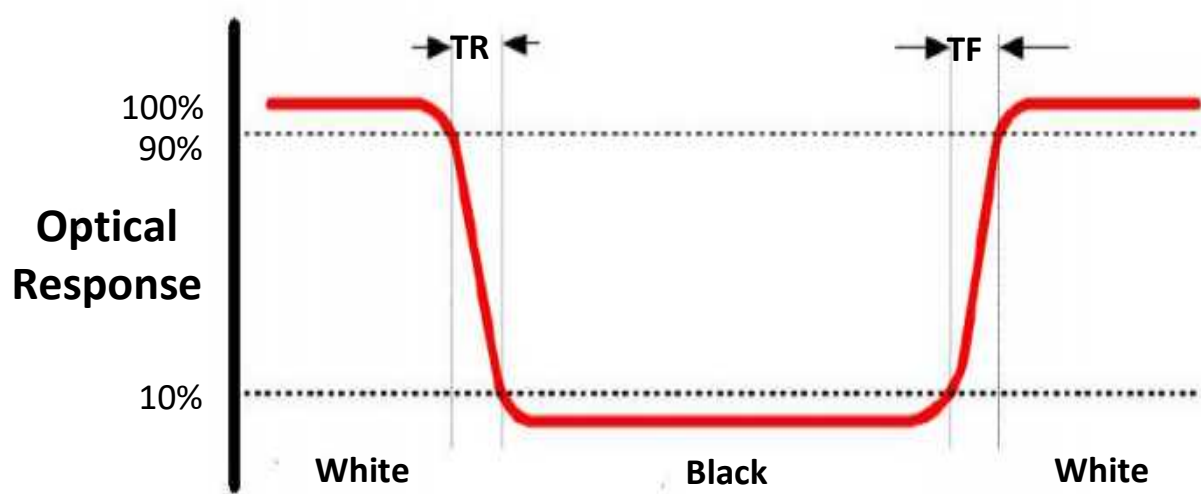
## Note 1: Definition of Viewing Angle $\theta_x$ and $\theta_y$ :



## Note 2: Definition of contrast ratio CR:

$$CR = \frac{\text{Luminance of white state}}{\text{Luminance of black state}}$$

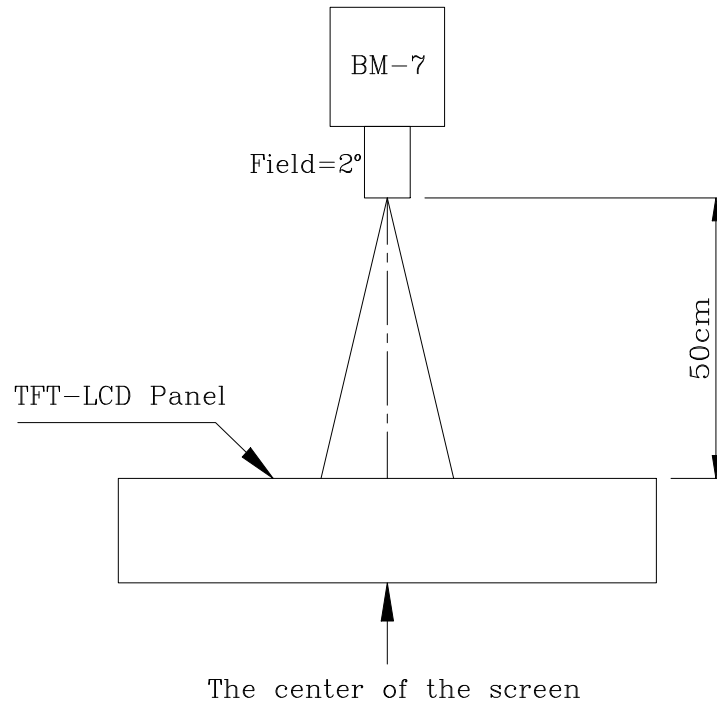
## Note 3: Definition of Response Time( $T_r$ , $T_f$ )



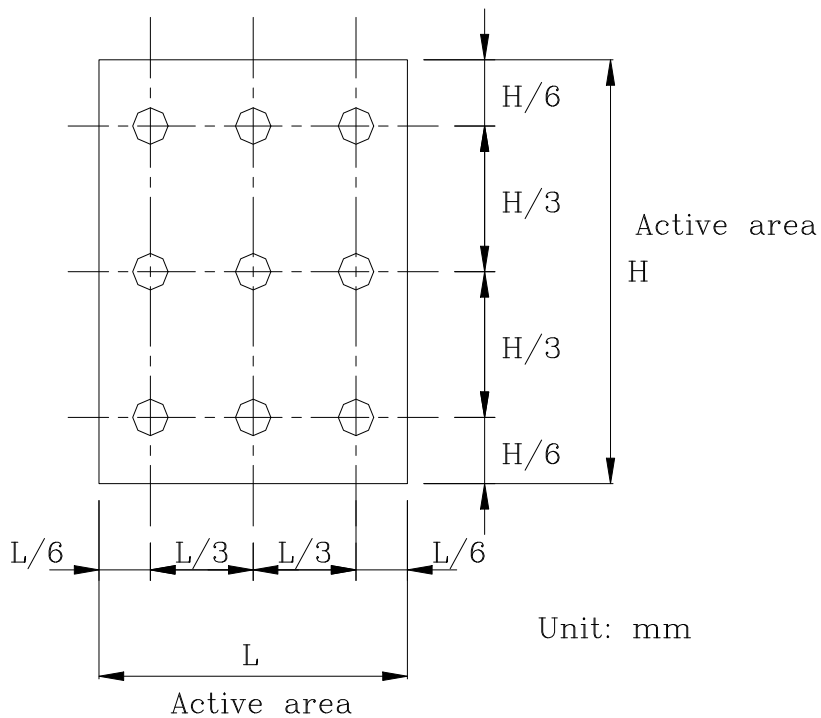
## Note 4: Definition of Luminance

### ①The Brightness Test Equipment Setup

Field=2°(As measuring “black” image, field=2°is the best testing condition)

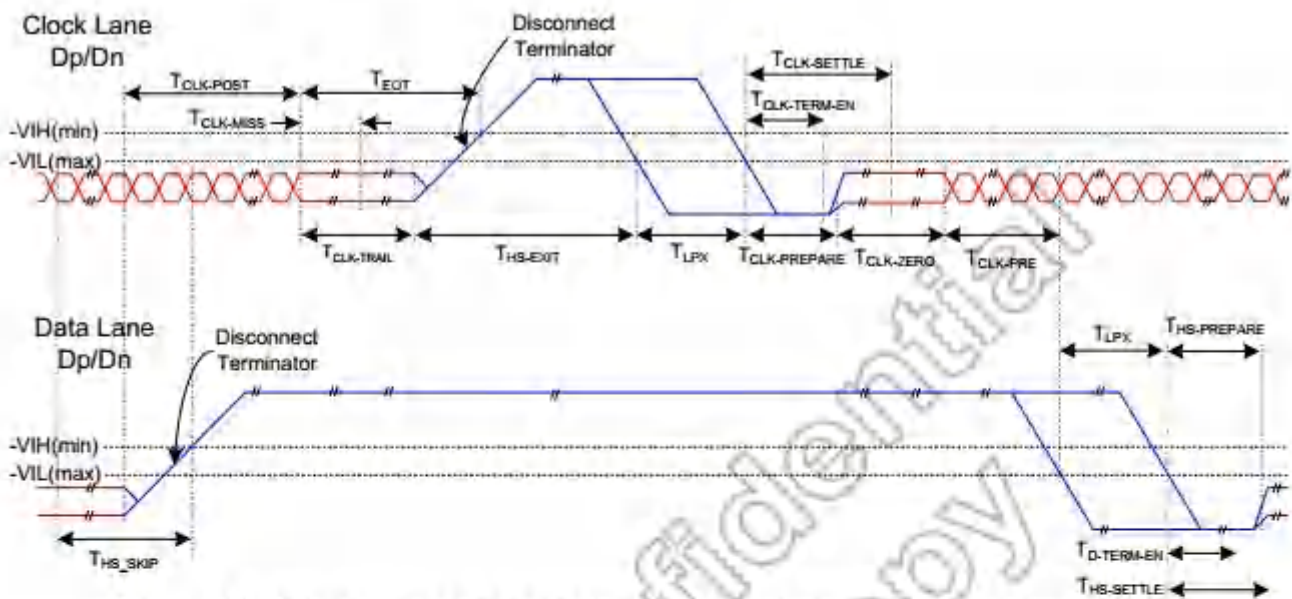


### ②The Brightness Test Point Setup

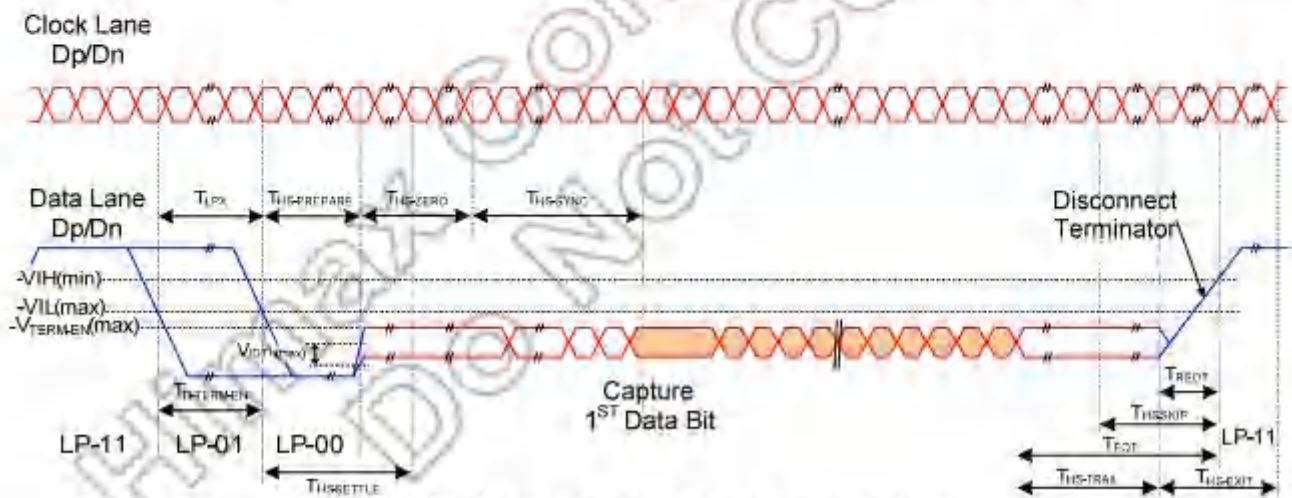


## 8. Timing Characteristics

### 8.1 MIPI AC Characteristics



**Figure 13.1: Switching the clock lane between clock transmission and low-power mode**



**Figure 13.2: Timing of high-speed data transmission in bursts**

## MIPI AC Characteristics:

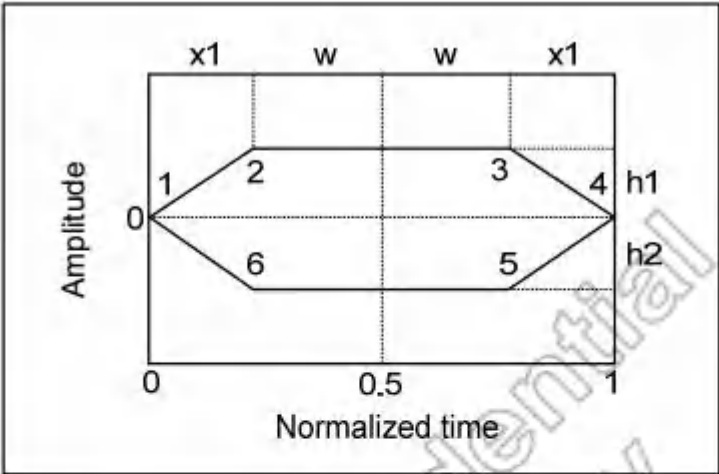
| Parameter                                  | Description                                                                                                                                                                                                                       | Spec.                                         |     |                                   | Unit |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-----|-----------------------------------|------|
|                                            |                                                                                                                                                                                                                                   | Min                                           | Typ | Max                               |      |
| $T_{\text{TREDT}}$                         | 30%-65% rise time and fall time.                                                                                                                                                                                                  | -                                             | -   | 35                                | ns   |
| $T_{\text{CLKMISS}}$                       | Timeout for receiver to detect absence of Clock transitions and disable the Clock Lane HS-RX.                                                                                                                                     | -                                             | -   | 60                                | ns   |
| $T_{\text{CLKPOST}}^{(1)}$                 | Time that the transmitter continues to send HS clock after the last associated Data Lane has transitioned to LP Mode.<br>Interval is defined as the period from the end of THS-TRAIL to the beginning of $T_{\text{CLK-TRAIL}}$ . | $60 \text{ ns} + 52^* \text{UI}$<br>(For DCS) | -   | -                                 | ns   |
| $T_{\text{CLKPRE}}$                        | Time that the HS clock shall be driven by the transmitter prior to any associated Data Lane beginning the transition from LP to HS mode.                                                                                          | 8                                             | -   | -                                 | ns   |
| $T_{\text{CLKSETTLE}}$                     | Time interval during which the HS receiver shall ignore any Clock Lane HS transitions, starting from the beginning of $T_{\text{CLKPRE}}$ .                                                                                       | 25                                            | -   | 300                               | ns   |
| $T_{\text{CLKTERMIN}}$                     | Time for the Clock Lane receiver to enable the HS line termination, starting from the time point when $D_n$ crosses $V_{\text{LMAX}}$ .                                                                                           | Time for $D_n$ to reach $V_{\text{TERMIN}}$   | -   | 38                                | ns   |
| $T_{\text{HSSETTLE}}$                      | Time interval during which the HS receiver shall ignore any Data Lane HS transitions, starting from the beginning of $T_{\text{HSPREPARE}}$ .                                                                                     | $85 \text{ ns} + 6^* \text{UI}$               | -   | $145 \text{ ns} + 10^* \text{UI}$ | ns   |
| $T_{\text{EOT}}$                           | Time from start of THS-TRAIL or TCLK-TRAIL period to start of LP-11 state                                                                                                                                                         | -                                             | -   | $105 \text{ ns} + 48^* \text{UI}$ | -    |
| $T_{\text{RSETUP}}^{(1)}$                  | time to drive LP-11 after HS burst                                                                                                                                                                                                | 100                                           | -   | -                                 | ns   |
| $T_{\text{HSPREPARE}}$                     | Time to drive LP-00 to prepare for HS transmission                                                                                                                                                                                | $40 \text{ ns} + 4^* \text{UI}$               | -   | $65 \text{ ns} + 6^* \text{UI}$   | ns   |
| $T_{\text{HSPREPARE}} + T_{\text{HSZERO}}$ | $T_{\text{HSPREPARE}}$ + Time to drive HS-0 before the Sync sequence                                                                                                                                                              | $745 \text{ ns} + 10^* \text{UI}$             | -   | -                                 | ns   |
| $T_{\text{HS-SOP}}$                        | Time-out at RX to ignore transition period of EoT                                                                                                                                                                                 | 40                                            | -   | $55 \text{ ns} + 4^* \text{UI}$   | ns   |
| $T_{\text{HS-TRAIL}}$                      | Time to drive flipped differential state after last payload data bit of a HS transmission burst                                                                                                                                   | $80 + 4^* \text{UI}$                          | -   | -                                 | ns   |
| $T_{\text{LP}}$                            | Length of any Low-Power state period                                                                                                                                                                                              | 50                                            | -   | -                                 | ns   |
| Ratio $T_{\text{LPX}}$                     | Ratio of $T_{\text{LPXMASTER}}/T_{\text{LPXSLAVE}}$ between Master and Slave side                                                                                                                                                 | 2/3                                           | -   | 3/2                               | -    |
| $T_{\text{TARGET}}$                        | Time to drive LP-00 by new TX                                                                                                                                                                                                     | $5^* T_{\text{LPX}}$                          |     |                                   | ns   |
| $T_{\text{TARGO}}$                         | Time to drive LP-00 after Turnaround Request                                                                                                                                                                                      | $4^* T_{\text{LPX}}$                          |     |                                   | ns   |
| $T_{\text{TA-SURE}}$                       | Time-out before new TX side starts driving                                                                                                                                                                                        | $T_{\text{LPX}}$                              | -   | $2^* T_{\text{LPX}}$              | ns   |

Note: (1) For image transmission:

$T_{\text{CLK-POST}}$  min value = 164 when MIPI max frequency per lane = 0.53Gbps.

$T_{\text{CLK-POST}}$  min value = 112 when MIPI max frequency per lane = 1Gbps

8.2 MIPI DATA-CLOCK TIMING SPECIFICATION



| Symbol | Time (UI) | Voltage      |
|--------|-----------|--------------|
| 1      | 0         | 0            |
| 2      | 0.2       | +70mV (Min.) |
| 3      | 0.8       | +70mV (Min.) |
| 4      | 1         | 0            |
| 5      | 0.8       | -70mV (Min.) |
| 6      | 0.2       | -70mV (Min.) |
| x1     | 0.2       | -            |
| w      | 0.3       | -            |
| h1     | -         | +70mV (Min.) |
| h2     | -         | -70mV (Min.) |

## 9. Standard Specification for Reliability

### 9.1 Standard Specification for Reliability of LCD Module

| No | Test Item                                | Condition                                                                                                                                | Remarks                                                                                              |
|----|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| 1  | High Temperature Operation               | Ts = +70°C, 240 hours                                                                                                                    | IEC60068-21:2007<br>GB2423.2-2008                                                                    |
| 2  | Low Temperature Operation                | Ta = -20°C, 240 hours                                                                                                                    | IEC60068-2-1:2007<br>GB/2423.1-2008                                                                  |
| 3  | High Temperature Storage                 | Ta = +80°C, 240 hours                                                                                                                    | IEC60068-21:2007<br>GB/2423.2-2008                                                                   |
| 4  | Low Temperature Storage                  | Ta = -30°C, 240 hours                                                                                                                    | IEC60068-21:2007<br>GB/2423.1-2008                                                                   |
| 5  | Storage at High Temperature and Humidity | Ta = +60°C, 90% RH max, 240 hours                                                                                                        | IEC60068-2-78 :2001<br>GB/T2423.3—2006                                                               |
| 6  | Thermal Shock (non-operation)            | -20°C 30 min~+60°C 30 min,<br>Change time: 5min, 20 Cycle                                                                                | Start with cold temperature,<br>End with high temperature,<br>IEC60068-2-14:1984,<br>GB/2423.22-2002 |
| 7  | ESD                                      | C=150pF, R=330Ω, 5 point/panel<br>Air: ±8Kv, 5 times;<br>Contact: ±4Kv, 5 times<br>(Environment: 15°C~35°C,<br>30%~60% RH, 86Kpa~106Kpa) | IEC61000-4-2:2001<br>GB/T17626.2-2006                                                                |
| 8  | Package Drop Test                        | Height: 80cm,<br>1 corner, 3 edges, 6 surfaces                                                                                           | IEC60068-2-32:1990<br>GB/T2423.8—1995                                                                |

Note1: Ts is the temperature of panel's surface.

Note2: Ta is the ambient temperature of sample.

## 9.2 Testing Conditions and Inspection Criteria

For the final test, the testing sample must be stored at room temperature for 24 hours. After the tests listed in Table 9.2, standard specifications for reliability will be executed in order to ensure stability.

| No. | Item                | Test Model             | In section Criteria                                                                                                |
|-----|---------------------|------------------------|--------------------------------------------------------------------------------------------------------------------|
| 01  | Current Consumption | Refer To Specification | The current consumption should conform to the product specification.                                               |
| 02  | Contrast            | Refer To Specification | After the tests have been executed, the contrast must be larger than half of its initial value prior to the tests. |
| 03  | Appearance          | Visual inspection      | Defect free.                                                                                                       |

## 9.3 MTBF

|      |                                                                                                                                                                                                                                                                                         |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MTBF | Functions, performance, appearance, etc. shall be free from remarkable deterioration within 50,000 hours under ordinary operating and storage conditions room temperature ( $25\pm5^{\circ}\text{C}$ ), normal humidity ( $50\pm10\%$ RH), and in area not exposed to direct sun light. |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## **10. General Precautions**

### **10.1. Safety**

- Liquid crystal is poisonous. Do not put it in your mouth. If liquid crystal touches your skin or clothes, wash it off immediately by using soap and water.

### **10.2. Handling**

- The LCD panel is plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.
- The polarizer attached to the display is easily damaged. Please handle it carefully to avoid scratch or other damages.
- To avoid contamination on the display surface, do not touch the module surface with bare hands.
- Keep a space so that the LCD panels do not touch other components.
- Put cover board such as acrylic board on the surface of LCD panel to protect panel from damages.
- Transparent electrodes may be disconnected if you use the LCD panel under environmental conditions where the condensation of dew occurs.
- Do not leave module in direct sunlight to avoid malfunction of the ICs.

### **10.3. Static Electricity**

- Be sure to ground module before turning on power or operating module.
- Do not apply voltage which exceeds the absolute maximum rating value.

### **10.4. Storage**

- Store the module in a dark room where must keep at  $25\pm 10^{\circ}\text{C}$  and 65%RH or less.
- Do not store the module in surroundings containing organic solvent or corrosive gas.
- Store the module in an anti-electrostatic container or bag.

### **10.5. Cleaning**

- Do not wipe the polarizer with dry cloth. It might cause scratch.
- Only use a soft cloth with IPA to wipe the polarizer, other chemicals might permanent damage to the polarizer.

## **11.Specification of Quality Assurance**

This standard of Quality Assurance confirms to the quality of LCD module products supplied by Victronix.

### **11.1 Quality Test**

Before delivering, the supplier should conduct the following tests to confirm the quality of products.

- Electrical-Optical Characteristics: According to the individual specification to test the product.
- Appearance Characteristics: According to the individual specification to test the product.
- Reliability Characteristics: According to the definition of reliability on the specification for testing products.

### **11.2 Delivery Test**

Before delivering, the supplier should conduct the delivery test.

- Test method: According to MIL-STD105E.General Inspection Level II take a single Time.
- The defects classify of AQL as following:  
Major defect: AQL = 0.65  
Minor defect: AQL = 1.5  
Total defects: AQL = 1.5

### **11.3 Non-conforming Analysis & Deal With Manners**

#### **11.3.1 Non-conforming Analysis**

- Purchaser should provide the data detail of non-conforming sample and the non-conforming.
- After receiving the data detail from purchaser, the analysis of non-conforming should be finished within two weeks.
- If the analysis can't be finished on time, supplier must notice purchaser 3 days in advance.

### 11.3.2 Disposition of non-conforming

- If any product defect be found during assembling, supplier must change the good for every defect after confirmation.
- Both supplier and customer should analyze the reason and discuss the disposition of non-conforming when the reason of nonconforming is not sure.

## 11.4 Agreement items

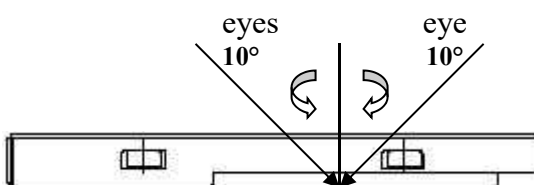
Both parties should negotiate together when the following problems happen.

- There is any problem of standard of quality assurance, and both sides should agree that it must be modified.
- There is any argument item which does not record in the standard of quality assurance.
- Any other special problem.

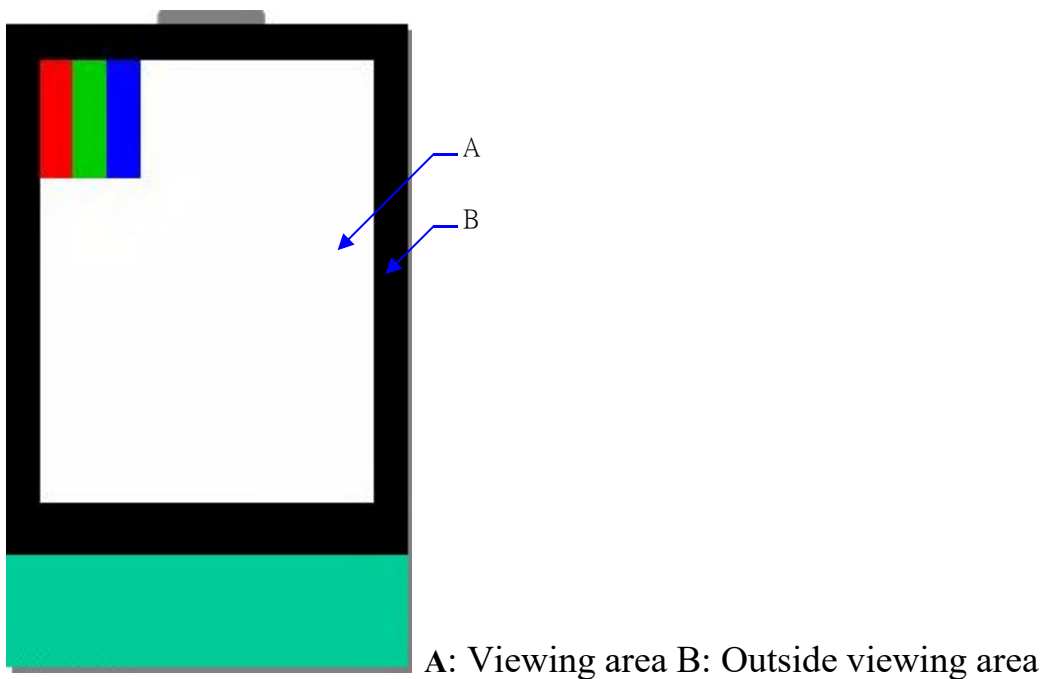
## 11.5 Standard of The Product Appearance Test

### 11.5.1 Manner of appearance test

- The test must be under 20W × 2 or 40W fluorescent light, and the distance of view must be at 30±5cm.
- When test the model of transmissive product must add the reflective plate.
- The test direction is base on around 10° of vertical line.
- Temperature: 25±5°C Humidity: 60±10%RH



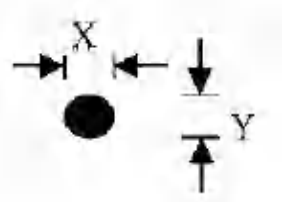
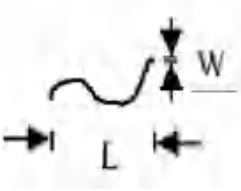
- Definition of area:

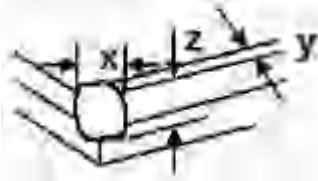


### **11.5.2 Basic principle**

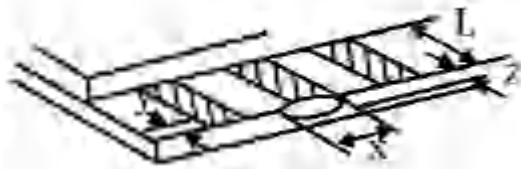
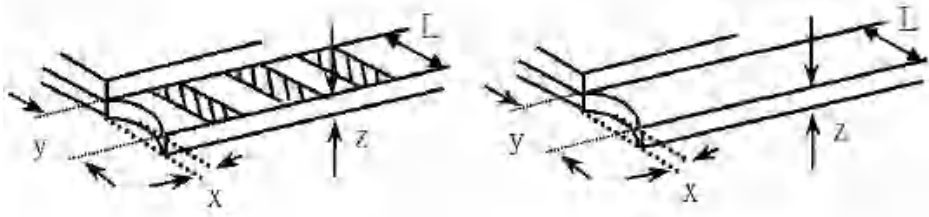
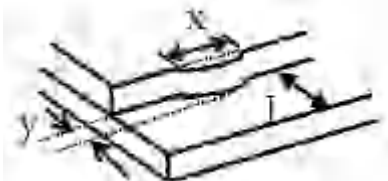
- When the standard can not be described, AQL will be applied.
- The sample of the lowest acceptable quality level must be negotiated by both supplier and customer when any dispute happened.
- New item must be added on time when it is necessary.

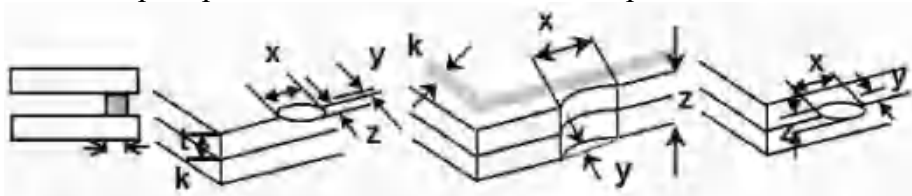
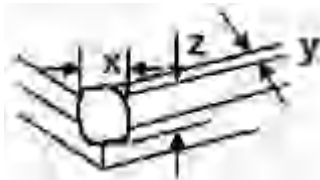
## 11.6 Inspection Specification

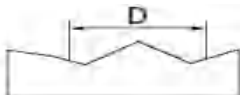
| NO.                     | Item                                                                        | Criterion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | AQL      |                 |                  |                 |                         |   |                         |   |                         |   |               |   |            |           |                 |     |               |                 |              |                      |   |              |                      |     |            |           |     |
|-------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------|------------------|-----------------|-------------------------|---|-------------------------|---|-------------------------|---|---------------|---|------------|-----------|-----------------|-----|---------------|-----------------|--------------|----------------------|---|--------------|----------------------|-----|------------|-----------|-----|
| 01                      | Electrical Testing                                                          | 1.1 Missing vertical, horizontal segment, segment contrast defect.<br>1.2 Missing character, dot or icon.<br>1.3 Display malfunction.<br>1.4 No function or no display.<br>1.5 Current consumption exceeds product specifications.<br>1.6 LCD viewing angle defect.<br>1.7 Mixed product types.<br>1.8 Flicker                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.65     |                 |                  |                 |                         |   |                         |   |                         |   |               |   |            |           |                 |     |               |                 |              |                      |   |              |                      |     |            |           |     |
| 02                      | Black or White spots or Bright spots or Color spots on LCD (Display only)   | 2.1 White and black or color spots on display $\leq 0.25\text{mm}$ , no more than Five spots.<br>2.2 Densely spaced: No more than three spots within 3mm.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1.5      |                 |                  |                 |                         |   |                         |   |                         |   |               |   |            |           |                 |     |               |                 |              |                      |   |              |                      |     |            |           |     |
| 03                      | LCD and Touch Panel black spots, white spots, contamination (non – display) | <div>3.1 Round type: As following drawing<br/><math>\Phi = (X+Y) / 2</math><div><table><tr><th>Size(mm)</th><th>Acceptable Q'ty</th></tr><tr><td><math>\Phi \leq 0.10</math></td><td>Accept no dense</td></tr><tr><td><math>0.10 &lt; \Phi \leq 0.20</math></td><td>2</td></tr><tr><td><math>0.20 &lt; \Phi \leq 0.25</math></td><td>2</td></tr><tr><td><math>0.25 &lt; \Phi \leq 0.30</math></td><td>1</td></tr><tr><td><math>0.30 &lt; \Phi</math></td><td>0</td></tr></table></div><p>* Densely spaced: No more than two spots within 3mm.</p></div> <div>3.2 Line type: (As following drawing)<div><table><tr><th>Length(mm)</th><th>Width(mm)</th><th>Acceptable Q'ty</th></tr><tr><td>---</td><td><math>W \leq 0.02</math></td><td>Accept no dense</td></tr><tr><td><math>L \leq 3.0</math></td><td><math>0.02 &lt; W \leq 0.05</math></td><td rowspan="2">2</td></tr><tr><td><math>L \leq 2.5</math></td><td><math>0.03 &lt; W \leq 0.08</math></td></tr><tr><td>---</td><td><math>0.08 &lt; W</math></td><td>Rejection</td></tr></table></div><p>* Densely spaced: No more than two lines within 3mm.</p></div> | Size(mm) | Acceptable Q'ty | $\Phi \leq 0.10$ | Accept no dense | $0.10 < \Phi \leq 0.20$ | 2 | $0.20 < \Phi \leq 0.25$ | 2 | $0.25 < \Phi \leq 0.30$ | 1 | $0.30 < \Phi$ | 0 | Length(mm) | Width(mm) | Acceptable Q'ty | --- | $W \leq 0.02$ | Accept no dense | $L \leq 3.0$ | $0.02 < W \leq 0.05$ | 2 | $L \leq 2.5$ | $0.03 < W \leq 0.08$ | --- | $0.08 < W$ | Rejection | 1.5 |
| Size(mm)                | Acceptable Q'ty                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |                 |                  |                 |                         |   |                         |   |                         |   |               |   |            |           |                 |     |               |                 |              |                      |   |              |                      |     |            |           |     |
| $\Phi \leq 0.10$        | Accept no dense                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |                 |                  |                 |                         |   |                         |   |                         |   |               |   |            |           |                 |     |               |                 |              |                      |   |              |                      |     |            |           |     |
| $0.10 < \Phi \leq 0.20$ | 2                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |                 |                  |                 |                         |   |                         |   |                         |   |               |   |            |           |                 |     |               |                 |              |                      |   |              |                      |     |            |           |     |
| $0.20 < \Phi \leq 0.25$ | 2                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |                 |                  |                 |                         |   |                         |   |                         |   |               |   |            |           |                 |     |               |                 |              |                      |   |              |                      |     |            |           |     |
| $0.25 < \Phi \leq 0.30$ | 1                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |                 |                  |                 |                         |   |                         |   |                         |   |               |   |            |           |                 |     |               |                 |              |                      |   |              |                      |     |            |           |     |
| $0.30 < \Phi$           | 0                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |                 |                  |                 |                         |   |                         |   |                         |   |               |   |            |           |                 |     |               |                 |              |                      |   |              |                      |     |            |           |     |
| Length(mm)              | Width(mm)                                                                   | Acceptable Q'ty                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |                 |                  |                 |                         |   |                         |   |                         |   |               |   |            |           |                 |     |               |                 |              |                      |   |              |                      |     |            |           |     |
| ---                     | $W \leq 0.02$                                                               | Accept no dense                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |                 |                  |                 |                         |   |                         |   |                         |   |               |   |            |           |                 |     |               |                 |              |                      |   |              |                      |     |            |           |     |
| $L \leq 3.0$            | $0.02 < W \leq 0.05$                                                        | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |                 |                  |                 |                         |   |                         |   |                         |   |               |   |            |           |                 |     |               |                 |              |                      |   |              |                      |     |            |           |     |
| $L \leq 2.5$            | $0.03 < W \leq 0.08$                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |                 |                  |                 |                         |   |                         |   |                         |   |               |   |            |           |                 |     |               |                 |              |                      |   |              |                      |     |            |           |     |
| ---                     | $0.08 < W$                                                                  | Rejection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |                 |                  |                 |                         |   |                         |   |                         |   |               |   |            |           |                 |     |               |                 |              |                      |   |              |                      |     |            |           |     |

| NO. | Item              | Criterion                                                                                                                                                                                                                                    |                         |                 | AQL |
|-----|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------|-----|
| 04  | Polarizer bubbles | If bubbles are visible, judge using black spot specifications, not easy to find, must check in specify direction                                                                                                                             | Size $\Phi$ (mm)        | Acceptable Q'ty | 1.5 |
|     |                   |                                                                                                                                                                                                                                              | $\Phi \leq 0.20$        | Accept no dense |     |
|     |                   |                                                                                                                                                                                                                                              | $0.20 < \Phi \leq 0.50$ | 3               |     |
|     |                   |                                                                                                                                                                                                                                              | $0.50 < \Phi \leq 1.00$ | 2               |     |
|     |                   |                                                                                                                                                                                                                                              | $1.00 < \Phi$           | 0               |     |
|     |                   |                                                                                                                                                                                                                                              | Total Q'ty              | 3               |     |
| 05  | Scratches         | Follow NO.3 -2 Line Type.                                                                                                                                                                                                                    |                         |                 |     |
| 06  | Chipped glass     | Symbols:<br>x: Chip length    y: Chip width    z: Chip thickness<br>k: Seal width    t: Glass thickness    a: LCD side length<br>L: Electrode pad length<br>6.1 General glass chip:<br>6.1.1 Chip on panel surface and crack between panels: |                         |                 | 1.5 |
|     |                   |                                                                                                                                                           |                         |                 |     |
|     |                   | z: Chip thickness                                                                                                                                                                                                                            | y: Chip width           | x: Chip length  |     |
|     |                   | $Z \leq 1/2t$                                                                                                                                                                                                                                | Not over viewing area   | $x \leq 1/8a$   |     |
|     |                   | $1/2t < z \leq 2t$                                                                                                                                                                                                                           | Not exceed 1/3k         | $x \leq 1/8a$   |     |
|     |                   | ⊙ Unit:    mm<br>⊙ If there are 2 or more chips, x is the total length of each chip<br>6.1.2 Corner crack:                                                                                                                                   |                         |                 |     |
|     |                   |                                                                                                                                                           |                         |                 |     |
|     |                   | z: Chip thickness                                                                                                                                                                                                                            | y: Chip width           | x: Chip length  |     |
|     |                   | $Z \leq 1/2t$                                                                                                                                                                                                                                | Not over viewing area   | $x \leq 1/8a$   |     |
|     |                   | $1/2t < z \leq 2t$                                                                                                                                                                                                                           | Not exceed 1/3k         | $x \leq 1/8a$   |     |
|     |                   | ⊙ Unit:    mm<br>⊙ If there are 2 or more chips, x is the total length of each chip                                                                                                                                                          |                         |                 |     |

| NO. | Item               | Criterion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | AQL                                      |
|-----|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| 08  | Cracked glass      | The LCD with extensive crack is not acceptable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1.5                                      |
| 09  | Backlight elements | 9.1 Illumination source flickers when lit.<br>9.2 Spots or scratches that appear when lit must be judged. Using LCD spot, lines and contamination standards.<br>9.3 Backlight doesn't light or color is wrong.                                                                                                                                                                                                                                                                                                                                                                                           | 1.5<br>1.5<br>0.65                       |
| 10  | Bezel              | Bezel must comply with product specifications.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1.5                                      |
| 11  | PCB、COB            | 11.1 COB seal may not have pinholes larger than 0.2mm or contamination.<br>11.2 COB seal surface may not have pinholes through to the IC.<br>11.3 The height of the COB should not exceed the height indicated in the assembly diagram.<br>11.4 There may not be more than 2mm of sealant outside the seal area on PCB. And there should be no more than three places.<br>11.5 Parts on PCB must be the same as on the production characteristic chart, There should be no wrong parts, missing parts or excess parts.<br>11.6 The jumper on the PCB should conform to the product characteristic chart. | 1.5<br>1.5<br>1.5<br>1.5<br>0.65<br>0.65 |
| 12  | FPC                | 12.1 FPC terminal damage $\leq$ 1/2 FPC terminal width and can not affect the function , we judge accept.<br>12.2 FPC alignment hole damage $\leq$ 1/2 alignment area and can not affect the function , we judge accept.                                                                                                                                                                                                                                                                                                                                                                                 | 1.5<br>1.5                               |
| 13  | Soldering          | 13.1 No cold solder joints, missing solder connections, oxidation or icicle.<br>13.2 No short circuits in components on PCB or FPC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1.5<br>0.65                              |

| NO.                   | Item           | Criterion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | AQL           |                |                   |                       |               |                |               |                |                   |            |               |                |          |           |               |            |     |
|-----------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------|-------------------|-----------------------|---------------|----------------|---------------|----------------|-------------------|------------|---------------|----------------|----------|-----------|---------------|------------|-----|
| 07                    | Glass crack    | <p>Symbols:<br/>x: Chip length      y: Chip width      z: Chip thickness<br/>k: Seal width      t: Glass thickness    a: LCD side length<br/>L: Electrode pad length</p> <p>7.2 Protrusion over terminal:<br/>7.2.1 Chip on electrode pad:</p>  <table><tr><td>y: Chip width</td><td>x: Chip length</td><td>z: Chip thickness</td></tr><tr><td><math>y \leq 0.5\text{mm}</math></td><td><math>x \leq 1/8a</math></td><td><math>0 &lt; z \leq t</math></td></tr></table> <p>7.2.2<br/>Non-conductive portion:</p>  <table><tr><td>y: Chip width</td><td>x: Chip length</td><td>z: Chip thickness</td></tr><tr><td><math>y \leq L</math></td><td><math>x \leq 1/8a</math></td><td><math>0 &lt; z \leq t</math></td></tr></table> <p>⊙ If there chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications.<br/>⊙ If the product will be heat sealed by the customer, the alignment mark must not be damaged.</p> <p>7.2.3 Substrate protuberance and internal crack</p>  <table><tr><td>y: width</td><td>x: length</td></tr><tr><td><math>y \leq 1/3L</math></td><td><math>X \leq a</math></td></tr></table> | y: Chip width | x: Chip length | z: Chip thickness | $y \leq 0.5\text{mm}$ | $x \leq 1/8a$ | $0 < z \leq t$ | y: Chip width | x: Chip length | z: Chip thickness | $y \leq L$ | $x \leq 1/8a$ | $0 < z \leq t$ | y: width | x: length | $y \leq 1/3L$ | $X \leq a$ | 1.5 |
| y: Chip width         | x: Chip length | z: Chip thickness                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |               |                |                   |                       |               |                |               |                |                   |            |               |                |          |           |               |            |     |
| $y \leq 0.5\text{mm}$ | $x \leq 1/8a$  | $0 < z \leq t$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |               |                |                   |                       |               |                |               |                |                   |            |               |                |          |           |               |            |     |
| y: Chip width         | x: Chip length | z: Chip thickness                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |               |                |                   |                       |               |                |               |                |                   |            |               |                |          |           |               |            |     |
| $y \leq L$            | $x \leq 1/8a$  | $0 < z \leq t$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |               |                |                   |                       |               |                |               |                |                   |            |               |                |          |           |               |            |     |
| y: width              | x: length      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |                |                   |                       |               |                |               |                |                   |            |               |                |          |           |               |            |     |
| $y \leq 1/3L$         | $X \leq a$     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |                |                   |                       |               |                |               |                |                   |            |               |                |          |           |               |            |     |

| NO.               | Item                                   | Criterion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | AQL               |               |                |            |                                        |               |                   |               |                |            |                                        |               |     |
|-------------------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------|----------------|------------|----------------------------------------|---------------|-------------------|---------------|----------------|------------|----------------------------------------|---------------|-----|
| 14                | Touch Panel<br>Chipped<br>glass        | <div> <div> <p>Symbols:</p> <p>x: Chip length      y: Chip width      z: Chip thickness</p> <p>k: Seal width      t: Touch Panel Total thickness      a: LCD side length</p> <p>L: Electrode pad length</p> <p>14.1 General glass chip:</p> <p>14.1.1 Chip on panel surface and crack between panels:</p>  <table> <tr> <td>z: Chip thickness</td> <td>y: Chip width</td> <td>x: Chip length</td> </tr> <tr> <td><math>Z \leq t</math></td> <td><math>\leq 1/2 k</math> and not over viewing area</td> <td><math>x \leq 1/8a</math></td> </tr> </table> <p>⊙ Unit: mm</p> <p>⊙ If there are 2 or more chips, x is the total length of each chip</p> <p>14.1.2 Corner crack:</p>  <table> <tr> <td>z: Chip thickness</td> <td>y: Chip width</td> <td>x: Chip length</td> </tr> <tr> <td><math>z \leq t</math></td> <td><math>\leq 1/2 k</math> and not over viewing area</td> <td><math>x \leq 1/8a</math></td> </tr> </table> <p>⊙ Unit: mm</p> <p>⊙ If there are 2 or more chips, x is the total length of each chip</p> </div> </div> | z: Chip thickness | y: Chip width | x: Chip length | $Z \leq t$ | $\leq 1/2 k$ and not over viewing area | $x \leq 1/8a$ | z: Chip thickness | y: Chip width | x: Chip length | $z \leq t$ | $\leq 1/2 k$ and not over viewing area | $x \leq 1/8a$ | 1.5 |
| z: Chip thickness | y: Chip width                          | x: Chip length                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                   |               |                |            |                                        |               |                   |               |                |            |                                        |               |     |
| $Z \leq t$        | $\leq 1/2 k$ and not over viewing area | $x \leq 1/8a$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |               |                |            |                                        |               |                   |               |                |            |                                        |               |     |
| z: Chip thickness | y: Chip width                          | x: Chip length                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                   |               |                |            |                                        |               |                   |               |                |            |                                        |               |     |
| $z \leq t$        | $\leq 1/2 k$ and not over viewing area | $x \leq 1/8a$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |               |                |            |                                        |               |                   |               |                |            |                                        |               |     |

| NO.       | Item                                          | Criterion                                                                                                                                                                                                                                                                                                        | AQL             |                 |                 |                 |                    |   |                    |   |           |   |                                                                                                                                                                       |
|-----------|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------|-----------------|-----------------|--------------------|---|--------------------|---|-----------|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 15        | Touch Panel(Fish eye、dent and bubble on film) | <table><tr><th>SIZE(mm)</th><th>Acceptable Q'ty</th></tr><tr><td><math>\Phi \leq 0.2</math></td><td>Accept no dense</td></tr><tr><td><math>0.2 &lt; D \leq 0.4</math></td><td>5</td></tr><tr><td><math>0.4 &lt; D \leq 0.5</math></td><td>2</td></tr><tr><td><math>0.5 &lt; D</math></td><td>0</td></tr></table> | SIZE(mm)        | Acceptable Q'ty | $\Phi \leq 0.2$ | Accept no dense | $0.2 < D \leq 0.4$ | 5 | $0.4 < D \leq 0.5$ | 2 | $0.5 < D$ | 0 |   |
|           |                                               | SIZE(mm)                                                                                                                                                                                                                                                                                                         | Acceptable Q'ty |                 |                 |                 |                    |   |                    |   |           |   |                                                                                                                                                                       |
|           |                                               | $\Phi \leq 0.2$                                                                                                                                                                                                                                                                                                  | Accept no dense |                 |                 |                 |                    |   |                    |   |           |   |                                                                                                                                                                       |
|           |                                               | $0.2 < D \leq 0.4$                                                                                                                                                                                                                                                                                               | 5               |                 |                 |                 |                    |   |                    |   |           |   |                                                                                                                                                                       |
|           |                                               | $0.4 < D \leq 0.5$                                                                                                                                                                                                                                                                                               | 2               |                 |                 |                 |                    |   |                    |   |           |   |                                                                                                                                                                       |
| $0.5 < D$ | 0                                             |                                                                                                                                                                                                                                                                                                                  |                 |                 |                 |                 |                    |   |                    |   |           |   |                                                                                                                                                                       |
|           |                                               |                                                                                                                                                                                                                                                                                                                  |                 |                 |                 |                 |                    |   |                    |   |           |   |                                                                                                                                                                       |
|           |                                               |                                                                                                                                                                                                                                                                                                                  |                 |                 |                 |                 |                    |   |                    |   |           |   |                                                                                                                                                                       |
|           |                                               |                                                                                                                                                                                                                                                                                                                  |                 |                 |                 |                 |                    |   |                    |   |           |   |                                                                                                                                                                       |
|           |                                               |                                                                                                                                                                                                                                                                                                                  |                 |                 |                 |                 |                    |   |                    |   |           |   |                                                                                                                                                                       |
| 16        | Touch Panel Newton ring                       | Newton ring dimension $\leq 1/2$ touch panel area and not affect font and line distortion( $\leq 2.5\%$ ) , it is acceptable.                                                                                                                                                                                    | 1.5             |                 |                 |                 |                    |   |                    |   |           |   |                                                                                                                                                                       |
| 17        | Touch Panel Linearity                         | Less than 1.5% is acceptable.                                                                                                                                                                                                                                                                                    | 1.5             |                 |                 |                 |                    |   |                    |   |           |   |                                                                                                                                                                       |
| 18        | LCD Ripple                                    | Touch the touch panel , can not see the LCD ripple.<br>Pen: R 1.0mm silicon rubber.<br>Operation Force: 80g                                                                                                                                                                                                      | 1.5             |                 |                 |                 |                    |   |                    |   |           |   |                                                                                                                                                                       |
| 19        | General appearance                            | 19.1 Pin type must match type in specification sheet.                                                                                                                                                                                                                                                            | 0.65            |                 |                 |                 |                    |   |                    |   |           |   |                                                                                                                                                                       |
|           |                                               | 19.2 LCD pin loose or missing pins.                                                                                                                                                                                                                                                                              | 0.65            |                 |                 |                 |                    |   |                    |   |           |   |                                                                                                                                                                       |
|           |                                               | 19.3 Product packaging must the same as specified on packaging specification sheet.                                                                                                                                                                                                                              | 0.65            |                 |                 |                 |                    |   |                    |   |           |   |                                                                                                                                                                       |
|           |                                               | 19.4 Product dimension and structure must conform to product specification sheet.                                                                                                                                                                                                                                | 0.65            |                 |                 |                 |                    |   |                    |   |           |   |                                                                                                                                                                       |

## 12.Packing Method

--TBD