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|                                                                                           |                                                                                               |                                                                |
|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| <br>优瑞泰克 | <b>深圳市优瑞泰克科技有限公司</b><br><b>SHENZHEN YOURITECH TECHNOLOGY CO.,LTD</b><br>Product Specification | <b>ET215FH03-T</b><br><b>2025-02-20</b><br><b>PAGE 1 OF 12</b> |
|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------|

|                      |                                                                                     |
|----------------------|-------------------------------------------------------------------------------------|
| Project No.<br>项目编号  | ET215FH03-T                                                                         |
| Customer<br>客户名称     |                                                                                     |
| Module No.<br>客户型号   |                                                                                     |
| Product type<br>产品内容 | <b>Standard LCD Module</b><br><b>TFT: 1920*RGBx1080Dots</b><br><b>21.5" TFT LCD</b> |

|                          |  |
|--------------------------|--|
| 客户确认Customer Approval    |  |
| 项目负责人Project Manager     |  |
| 品质主管Director of Quality  |  |
| 采购工程师Purchasing Engineer |  |

|             |            |             |
|-------------|------------|-------------|
| PREPARED BY | CHECKED BY | APPROVED BY |
|             |            |             |
|             |            |             |

## 1. Introduction

### 1.1 Scope of application

This specification applies to the LCD module that is supplied by YOURITECH TECHNOLOGY CO., LTD. This LCD module should be designed for mobile phone use.

LCD specification: Dots 1920xRGBx1080.

As to basic specification of the driver IC, refer to the IC specification and data book.

All material & processing of the LCD module should be Lead Free.

### 1.2 TFT features:

Structure: TFT PANNEL+IC +FPC+BL;

ALL O'CLOCK Type LCD

1920 dot-segment and 1080 dot-common outputs;

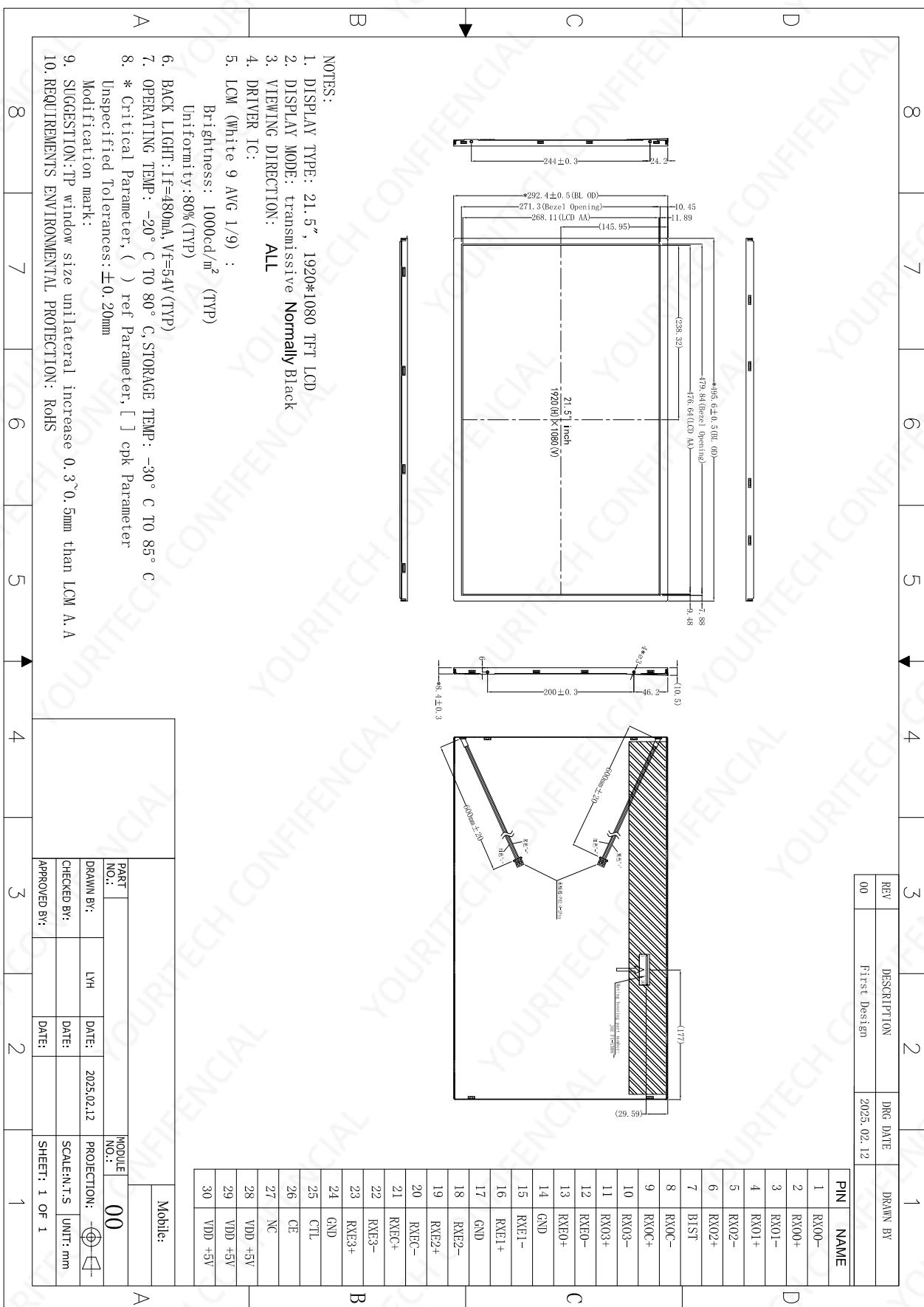
16.7M Color can be selected by software;

White LED back light;

LVDS interface

## 2. LCM General specification

| ITEM              | Standard value                 | Unit |
|-------------------|--------------------------------|------|
| LCD Type          | Normally Black                 | --   |
| Drive element     | TFT active matrix              | --   |
| Number of pixels  | 1920*3RGB(H)X1080(V)           | Dots |
| Pixel arrangement | RGB stripe                     | --   |
| Pixel Pitch (W*H) | 0.24825(W)x 0.24825(H)         | mm   |
| Active area       | 476.64(H) × 268.11 (V)         | mm   |
| Viewing direction | ALL O'CLOCK                    | --   |
| TFT Driver IC     | --                             | --   |
| TFT interface     | LVDS Interface                 | --   |
| Approx. Weight    | TBD                            | g    |
| LCM Size(W*H*T)   | 495.60(W) x292.40(H) x10.50(T) | mm   |
| Touch structure   | --                             | --   |
| Touch Driver IC   | --                             | --   |
| Touch Interface   | --                             | --   |



### 3.Absolute Maximum Rating

| Characteristics           | Symbol           | Min. | Max. | Unit |
|---------------------------|------------------|------|------|------|
| LCM Operating Temperature | T <sub>OPR</sub> | -20  | +80  | °C   |
| LCM Storage Temperature   | T <sub>STG</sub> | -30  | +85  | °C   |
| Humidity                  | RH               | --   | 90   | %    |

### 4.Electrical Characteristics

#### 4.1 TFT DC Characteristics

| Characteristics           | Symbol | Min. | Typ. | Max. | Unit | Note |
|---------------------------|--------|------|------|------|------|------|
| Supply Voltage for(DC/DC) | VDD    | --   | 5    | --   | V    | --   |

#### 4.2 Back-Light Unit Characeristics

| Characteristics     | Symbol         | Min. | Type   | Max. | Unit              | Notes  |
|---------------------|----------------|------|--------|------|-------------------|--------|
| Forward Voltage     | V <sub>F</sub> | --   | 54     | --   | V                 | --     |
| Forward current     | I <sub>F</sub> | --   | 480    | --   | mA                | --     |
| Luminance(With LCD) | L <sub>V</sub> | --   | 1000   | --   | cd/m <sup>2</sup> | --     |
| LED life time       | N/A            | --   | 30,000 | --   | Hr                | Note 1 |

## 5. Module Function Description

### LCD PIN Description:

| Pin No | Symbol | Function                                     | Remark                         |
|--------|--------|----------------------------------------------|--------------------------------|
| 1      | RXO0-  | Negative Transmission data of Pixel 0 (ODD)  |                                |
| 2      | RXO0+  | Positive Transmission data of Pixel 0 (ODD)  |                                |
| 3      | RXO1-  | Negative Transmission data of Pixel 1 (ODD)  |                                |
| 4      | RXO1+  | Positive Transmission data of Pixel 1 (ODD)  |                                |
| 5      | RXO2-  | Negative Transmission data of Pixel 2 (ODD)  |                                |
| 6      | RXO2+  | Positive Transmission data of Pixel 2 (ODD)  |                                |
| 7      | BIST   | Bist function                                | Optional: <u>Bist</u> function |
| 8      | RXOC-  | Negative Transmission Clock (ODD)            |                                |
| 9      | RXOC+  | Positive Transmission Clock (ODD)            |                                |
| 10     | RXO3-  | Negative Transmission data of Pixel 3 (ODD)  |                                |
| 11     | RXO3+  | Positive Transmission data of Pixel 3 (ODD)  |                                |
| 12     | RXE0-  | Negative Transmission data of Pixel 0 (EVEN) |                                |
| 13     | RXE0+  | Positive Transmission data of Pixel 0 (EVEN) |                                |
| 14     | GND    | Power Ground                                 |                                |
| 15     | RXE1-  | Negative Transmission data of Pixel 1 (EVEN) |                                |
| 16     | RXE1+  | Positive Transmission data of Pixel 1 (EVEN) |                                |
| 17     | GNG    | Power Ground                                 |                                |
| 18     | RXE2-  | Negative Transmission data of Pixel 2 (EVEN) |                                |
| 19     | RXE2+  | Positive Transmission data of Pixel 2 (EVEN) |                                |
| 20     | RXEC-  | Negative Transmission Clock (EVEN)           |                                |
| 21     | RXEC+  | Positive Transmission Clock (EVEN)           |                                |
| 22     | RXE3-  | Negative Transmission data of Pixel 3 (EVEN) |                                |
| 23     | RXE3+  | Positive Transmission data of Pixel 3 (EVEN) |                                |
| 24     | GND    | Power Ground                                 | Note 1                         |
| 25     | CTL    | (*CTL DVR)                                   |                                |
| 26     | CE     | (*CE_DVR)                                    |                                |
| 27     | NC     |                                              |                                |
| 28     | VDD    | Power Supply: +5V                            |                                |
| 29     | VDD    |                                              |                                |
| 30     | VDD    |                                              |                                |

Note 1 : This pin should be connected with GND.

## 6. Timing Characteristics

### LVDS INPUT SIGNAL SPECIFICATIONS

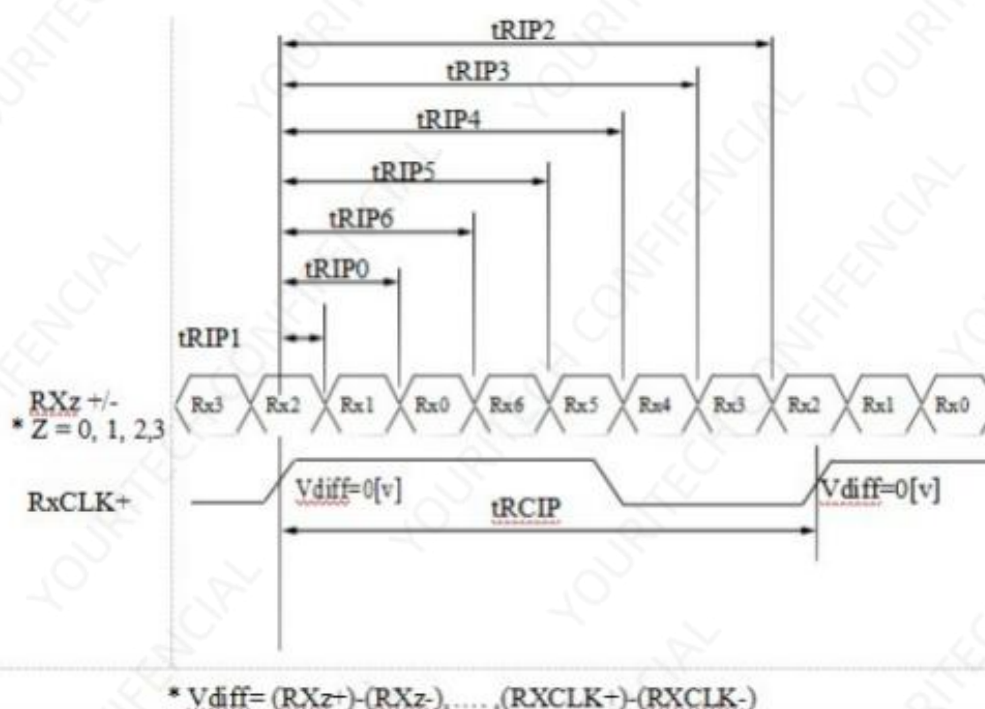
1 The GV215FHM-N10 is operated by the DE only.

| Item                      |           | symbols | Min   | Typ   | Max   | unit   |
|---------------------------|-----------|---------|-------|-------|-------|--------|
| clock                     | Frequency | 1/Tc    | 63    | 74.25 | 88    |        |
|                           | High Time | -       | -     | 4/7Tc | -     |        |
|                           | Low Time  | -       | -     | 3/7Tc |       |        |
| Frame period              |           | Tv      | 1100  | 1125  |       | line   |
|                           |           |         | 55    | 60    | 65    | Hz     |
|                           |           |         | 15.38 |       | 18.18 | ms     |
| vertical Display period   |           | Tvd     |       | 1080  | -     | line   |
| one line scanning period  |           |         |       | 1100  | 1120  | clocks |
| Horizontal Display period |           |         |       | 960   | -     | clocks |

2 The specification of the LVDS Rx interface timing parameter is shown in

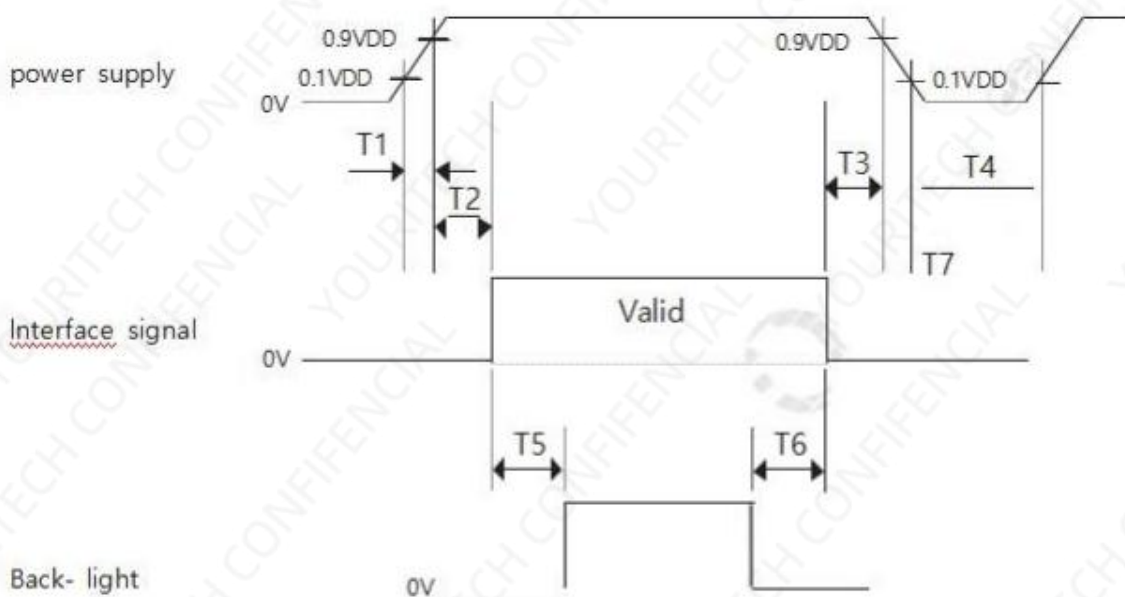
<LVDS Rx Interface Timing Specification>

| Item         | Symbol | Min             | Typ         | Max             | Unit | Remark |
|--------------|--------|-----------------|-------------|-----------------|------|--------|
| CLKIN Period | tRCIP  | 10.76           | 13.46       | 16.15           | nsec |        |
| Input Data 0 | tRIP1  | -0.4            | 0.0         | +0.4            | nsec |        |
| Input Data 1 | tRIP0  | tRCIP/7-0.4     | tRCIP/7     | tRCIP/7+0.4     | nsec |        |
| Input Data 2 | tRIP6  | 2 × tRCIP/7-0.4 | 2 × tRCIP/7 | 2 × tRCIP/7+0.4 | nsec |        |
| Input Data 3 | tRIP5  | 3 × tRCIP/7-0.4 | 3 × tRCIP/7 | 3 × tRCIP/7+0.4 | nsec |        |
| Input Data 4 | tRIP4  | 4 × tRCIP/7-0.4 | 4 × tRCIP/7 | 4 × tRCIP/7+0.4 | nsec |        |
| Input Data 5 | tRIP3  | 5 × tRCIP/7-0.4 | 5 × tRCIP/7 | 5 × tRCIP/7+0.4 | nsec |        |
| Input Data 6 | tRIP2  | 6 × tRCIP/7-0.4 | 6 × tRCIP/7 | 6 × tRCIP/7+0.4 | nsec |        |



3 POWER SEQUENCE

To prevent a latch-up or DC operation of the LCD module, the power on/off sequence shall be as shown in below



- $0.5 \text{ ms} < T1 < 10 \text{ ms}$
- $0 < T2 < 50 \text{ ms}$
- $0 < T3 < 50 \text{ ms}$
- $1 \text{ sec} < T4$
- $200 \text{ ms} < T5$
- $200 \text{ ms} < T6$

#### Notes:

when the power supply  $v_{DD}$  is 0v, keep the level of input signals on the low or keep high impedance.

Do not keep the interface signal high impedance when power is on.

- Back Light must be turn on after power for logic and interface signal are valid.
- T7 decreases smoothly, there is none re-bouncing voltage.
- During changing the resolution or mode changing, the logic power/ back-light/interface signal should be turned off as shown above; after the changing, power on as shown above.

## 7.Optical Characteristics

| Parameter                  |            | Symbol        | Condition                                                | Min.  | Typ.  | Max.  | Unit              | Remark             |
|----------------------------|------------|---------------|----------------------------------------------------------|-------|-------|-------|-------------------|--------------------|
| Viewing Angle range        | Horizontal | $\Theta_3$    | CR > 10                                                  | 85    | 89    | -     | Deg.              | Note 1             |
|                            |            | $\Theta_9$    |                                                          | 85    | 89    | -     | Deg.              |                    |
|                            | Vertical   | $\Theta_{12}$ |                                                          | 85    | 89    | -     | Deg.              |                    |
|                            |            | $\Theta_6$    |                                                          | 85    | 89    | -     | Deg.              |                    |
| Luminance Contrast ratio   |            | CR            | $\Theta = 0_s$<br>(Center)<br>Normal<br>Viewing<br>Angle |       | 1000  |       | cd/m <sup>2</sup> | Note 2             |
| white luminance uniformity |            | Tr            |                                                          | -     | 80    | -     | %                 | Note 3             |
| Reproduction of color      | White      | $W_x$         |                                                          | 0.281 | 0.313 | 0.343 | -                 | Note 4<br>(BOE BL) |
|                            |            | $W_y$         |                                                          | 0.299 | 0.329 | 0.359 | -                 |                    |
|                            | Red        | $R_x$         |                                                          | -     | TBD   | -     | -                 |                    |
|                            |            | $R_y$         |                                                          | -     | TBD   | -     | -                 |                    |
|                            | Green      | $G_x$         |                                                          | -     | TBD   | -     | -                 |                    |
|                            |            | $G_y$         |                                                          | -     | TBD   | -     | -                 |                    |
|                            | Blue       | $B_x$         |                                                          | -     | TBD   | -     | -                 |                    |
|                            |            | $B_y$         |                                                          | -     | TBD   | -     | -                 |                    |
| Response Time              | GTG        | $T_g$         |                                                          |       | 14    | 20    | ms                | Note 5             |
| Cross Talk                 |            | CT            |                                                          | -     | -     | 2.0   | %                 | Note 6             |

**Note :**

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

$$CR = \frac{\text{Luminance when displaying a white raster}}{\text{Luminance when displaying a black raster}}$$

3. Luminance of LCD module shall be made without signal input. Cell transmittance is defined mathematically, BLU provided by BOEDT.

|               |   |                         |
|---------------|---|-------------------------|
|               |   | Luminance of LCD Module |
| Transmittance | = | Luminance of BLU        |

4. The color chromaticity coordinates specified in Table 5. shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.

5. Response time  $T_g$  is the average time required for display transition by switching the input signal as below table and is based on Frame rate  $f_v = 60\text{Hz}$  to optimize.

Each time in below table is defined as appendix Figure 3 and shall be measured by switching the input signal for "any level of gray(bright)" and "any level of gray(dark)"

6. Cross-Talk of one area of the LCD surface by another shall be measured by comparing the luminance ( $Y_A$ ) of a 25mm diameter area, with all display pixels set to a gray level, to the

luminance ( $Y_B$ ) of that same area when any adjacent area is driven dark. (See Figure 4 shown in Appendix).

## 8. Reliability Test Item

| No. | Test Item                              | Test Condition                                          | Notes                                                                                                                                                                                                                                   |
|-----|----------------------------------------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | High Temp. Storage                     | +85°C / 96H                                             | 1. Functional test is OK.<br>Missing Segment, short,<br>unclear segment<br>non-display, display abnormally<br>and liquid crystal leakage<br>un-allowed.<br>2. No low<br>temperature bubbles, end seal<br>loose and fall, frame rainbow. |
| 2   | Low Temp. Storage                      | -30°C / 96H                                             |                                                                                                                                                                                                                                         |
| 3   | High Temp. Operating                   | +80°C / 96H                                             |                                                                                                                                                                                                                                         |
| 4   | Low Temp. Operating                    | -20°C / 96H                                             |                                                                                                                                                                                                                                         |
| 5   | High Temperature<br>/ Humidity storage | 60°C x 90%RH / 96H                                      |                                                                                                                                                                                                                                         |
| 6   | Thermal and cold shock                 | Static state, -20°C (30min) ~80°C<br>(30min), 10 cycles |                                                                                                                                                                                                                                         |

## 9. Packing Method---TBD

- END -