

# 产品规格书

## Product Specification

|                              |                         |                        |                         |
|------------------------------|-------------------------|------------------------|-------------------------|
| <b>Model Name</b><br>(产品名称)  |                         | <b>TFT-LCD Module</b>  |                         |
| <b>Part Number</b><br>(产品型号) |                         | <b>JT172FHI30R5L01</b> |                         |
| <b>Item</b> (项目)             | <b>Prepared</b><br>(拟制) | <b>Checked</b><br>(审核) | <b>Approved</b><br>(批准) |
| <b>Signature</b> (签名)        | 赖依                      | 林勇                     |                         |
| <b>Date</b> (日期)             | 2022-11-17              | 2022-11-17             |                         |
| <b>Note</b> (备注)             |                         |                        |                         |
| <b>Customer:</b><br>(客户)     |                         |                        |                         |
|                              |                         | <b>Signature</b> (签名)  |                         |
|                              |                         | <b>Date</b> (日期)       |                         |

### Revision Record

| Version | Issued Date | Page | Old Description | New Description |
|---------|-------------|------|-----------------|-----------------|
| 01      | 2022/11/17  | \    | Initial release | \               |
| 02      | 2022/08/09  | \    | Drawing change  |                 |
|         |             |      |                 |                 |
|         |             |      |                 |                 |

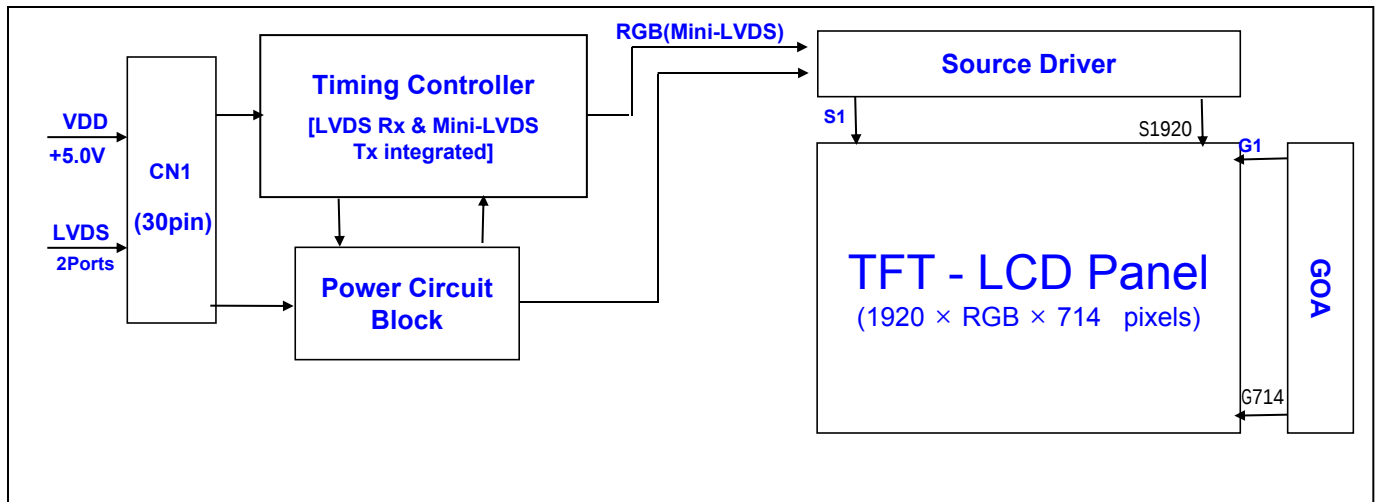
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## 1.0 GENERAL DESCRIPTION

### 1.1 Introduction

This is a color active matrix TFT LCD MDL using amorphous silicon TFT's (Thin Film Transistors) as an active switching devices. This Open Cell has a 17.2 inch diagonally measured active area with FHD resolutions (1920 horizontal by 714 vertical pixel array). Each pixel is divided into RED, GREEN, BLUE dots which are arranged in vertical stripe and this module can display 16.7M colors. The TFT-LCD panel is adapted for a low reflection and higher color type.



### 1.2 Features

- LVDS interface with 2 pixel / clock
  - High-speed response
  - Low color shift image quality
  - 8-bit color depth, display 16.7M colors
- Wide viewing angle  
DE (Data Enable) only mode  
HADS technology is applied for high display quality  
RoHS compliant

## 1.3 General Specification

< Table 1. General Specifications >

| Items                      | Specification              | Unit              | Note                                                   |
|----------------------------|----------------------------|-------------------|--------------------------------------------------------|
| Active Screen Size         | 17.2                       | inch              |                                                        |
| Number of Pixels           | 1920 X714                  | Pixel             |                                                        |
| Display Area               | 408.96 (H) x 152.1(V)      | mm                |                                                        |
| Bezel Opening              | 414.6(H) x 158(V)          | mm                |                                                        |
| Outline Dimension          | 439(H) x 179.3(V) x 19(D)  | mm                |                                                        |
| Luminance, White           | 500 (Center 1 point, Typ.) | cd/m <sup>2</sup> |                                                        |
| Power Supply Input Voltage | 12 (Typ)                   | V                 | Backlight                                              |
| Power Supply Voltage       | 5.0 (Typ)                  | V                 | OC                                                     |
| Power Consumption          | Total = 10.66 (Typ.)       | W                 | LCD Open Cell = 2.0 W(Typ.)<br>Backlight = 8.66W(Typ.) |
| Contrast Ratio             | 1000 : 1                   | --                |                                                        |
| Response time              | 14 (Typ.)(G to G)          | ms                |                                                        |
| Color temperature          | 7083                       | K                 |                                                        |
| Weight                     | 1.25 (Typ)                 | Kg                |                                                        |
| Operating Temperature      | 0 ~ 50                     |                   |                                                        |
| Storage Temperature        | -20 ~ 60                   |                   |                                                        |

## 2.0 ABSOLUTE MAXIMUM RATINGS

The followings are maximum values which, if exceed, may cause faulty operation or damage to the unit. The operational and non-operational maximum voltage and current values are listed in Table 2.

< Table 2. Open Cell Electrical Specifications >

[VSS=GND=0V]

| Parameter                  | Symbol           | Min.    | Max.    | Unit | Remark     |
|----------------------------|------------------|---------|---------|------|------------|
| Power Supply Voltage       | VDD              | -0.3    | 6.0     | V    | Ta = 25 °C |
| Logic Supply Voltage       | VIN              | VSS-0.3 | VDD+0.3 | V    |            |
| Operating Temperature      | T <sub>OP</sub>  | 0       | +50     | °C   | Note 1     |
| Storage Temperature        | T <sub>SUR</sub> | -20     | +60     | °C   |            |
|                            | T <sub>ST</sub>  | -20     | +60     | °C   |            |
| Operating Ambient Humidity | Hop              | 10      | 80      | %RH  |            |
| Storage Humidity           | Hst              | 10      | 80      | %RH  |            |

### 3.0 ELECTRICAL SPECIFICATIONS

#### 3.1 TFT LCD Open Cell

< Table 3. Open Cell Electrical Specifications >

[Ta =25 ± 2 °C]

| Parameter                   |                                           | Symbol | Values |     |      | Unit | Remark |
|-----------------------------|-------------------------------------------|--------|--------|-----|------|------|--------|
|                             |                                           |        | Min    | Typ | Max  |      |        |
| Power Supply Input Voltage  |                                           | VDD    | 4.5    | 5.0 | 5.5  | Vdc  |        |
| Power Supply Ripple Voltage |                                           | VRP    | -      | -   | 200  | mV   |        |
| Power Supply Current        |                                           | IDD    | -      | 400 | 1000 | mA   | Note 1 |
| Power Consumption           |                                           | PDD    | -      | 2   | 5    | Watt |        |
| Rush current                |                                           | IRUSH  | -      |     | 3.0  | A    | Note 2 |
| LVDS Interface              | Differential Input High Threshold Voltage | VLVTH  | +100   | -   | +300 | mV   |        |
|                             | Differential Input Low Threshold Voltage  | VLVTL  | -300   | -   | -100 | mV   |        |
|                             | Input Differential Voltage                | VID    | 200    | -   | 600  | mV   |        |
|                             | Differential input common mode voltage    | VCM    | 1.0    | 1.2 | 1.5  | V    |        |

Note 1 : The supply voltage is measured and specified at the interface connector of LCM.

The current draw and power consumption specified is for VDD=5.0V,

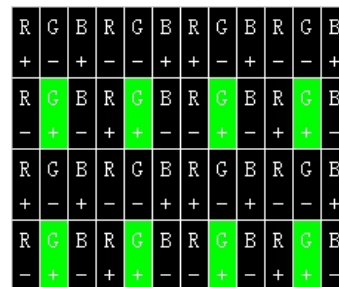
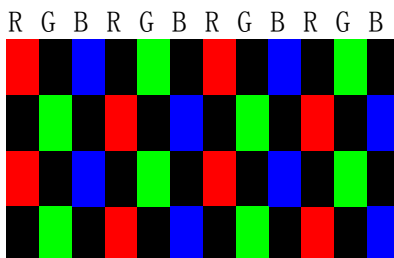
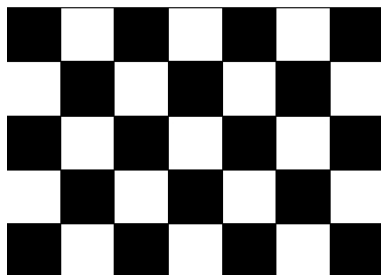
Frame rate  $f_v=60\text{Hz}$  and Clock frequency = 74.25MHz.

Test Pattern of power supply current

a) Typ : Mosaic 7X5 (L0/L255)

b) Max : Skip 1 dot Pattern

c) Flicker Pattern



Note 2 : The duration of rush current is about 2ms and rising time of Power Input is 1ms(min)

### 3.2 Backlight Unit

| Parameter                                 |                  | Min.   | Typ. | Max.  | Unit | Remarks   |
|-------------------------------------------|------------------|--------|------|-------|------|-----------|
| LED Light Bar Input Voltage Per Input Pin | V <sub>PIN</sub> | -      | 40.2 | 41.0  | V    | Duty 100% |
| LED Light Bar Input Current Per Input Pin | I <sub>PIN</sub> | -      | 216  | 282   | mA   | Note1,2,  |
| LED Power Consumption                     | P <sub>B/L</sub> | -      | 8.68 | 11.56 | W    | Note 3    |
| LED Life-Time                             | -                | 30,000 | -    |       | Hrs  | Note 4    |

LED bar consists of 56 LED packages, strings(parallel)\*(14 strings(parallel)\*4packages(serial)

Note1: There are one light bar ,and the specified current is input LED chip 100% duty current

Note2: The sense current of each input pin is 216mA

Note3:  $P_{B/L} = \text{Input pins} \times V_{P_{IN}} \times I_{P_{IN}}$

Note4: The lifetime is determined as the time at which luminance of LED become 50% of the initial brightness or not normal lighting at I<sub>PIN</sub>=216mA on condition of continuous operating at 25 ± 2 °C

## 4.0 INTERFACE CONNECTION

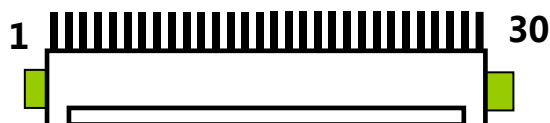
### 4.1 Open Cell Input Signal & Power (CN101)

- LVDS Connector : IS100-L300-C23(UJU), MSBKT2407P30HC(STM) or Equivalent.

< Table 4. Open Cell Input Connector Pin Configuration >

| Pin No | Symbol | Description                                  | Pin No | Symbol | Description                                  |
|--------|--------|----------------------------------------------|--------|--------|----------------------------------------------|
| 1      | RX00-  | Negative Transmission data of Pixel 0 (ODD)  | 16     | RXE1+  | Positive Transmission data of Pixel 1 (EVEN) |
| 2      | RX00+  | Positive Transmission data of Pixel 0 (ODD)  | 17     | GNG    | Power Ground                                 |
| 3      | RX01-  | Negative Transmission data of Pixel 1 (ODD)  | 18     | RXE2-  | Negative Transmission data of Pixel 2 (EVEN) |
| 4      | RX01+  | Positive Transmission data of Pixel 1 (ODD)  | 19     | RXE2+  | Positive Transmission data of Pixel 2 (EVEN) |
| 5      | RX02-  | Negative Transmission data of Pixel 2 (ODD)  | 20     | RXEC-  | Negative Transmission Clock (EVEN)           |
| 6      | RX02+  | Positive Transmission data of Pixel 2 (ODD)  | 21     | RXEC+  | Positive Transmission Clock (EVEN)           |
| 7      | GND    | Power Ground                                 | 22     | RXE3-  | Negative Transmission data of Pixel 3 (EVEN) |
| 8      | RXOC-  | Negative Transmission Clock (ODD)            | 23     | RXE3+  | Positive Transmission data of Pixel 3 (EVEN) |
| 9      | RXOC+  | Positive Transmission Clock (ODD)            | 24     | GND    | Power Ground                                 |
| 10     | RX03-  | Negative Transmission data of Pixel 3 (ODD)  | 25     | NC     | No. Connection                               |
| 11     | RX03+  | Positive Transmission data of Pixel 3 (ODD)  | 26     | NC     | No. Connection                               |
| 12     | RXE0-  | Negative Transmission data of Pixel 0 (EVEN) | 27     | NC     | No. Connection                               |
| 13     | RXE0+  | Positive Transmission data of Pixel 0 (EVEN) | 28     | VDD    | Power Supply: +5V                            |
| 14     | GND    | Power Ground                                 | 29     | VDD    |                                              |
| 15     | RXE1-  | Negative Transmission data of Pixel 1 (EVEN) | 30     | VDD    |                                              |

Note : Pin 24 should be connected with GND.

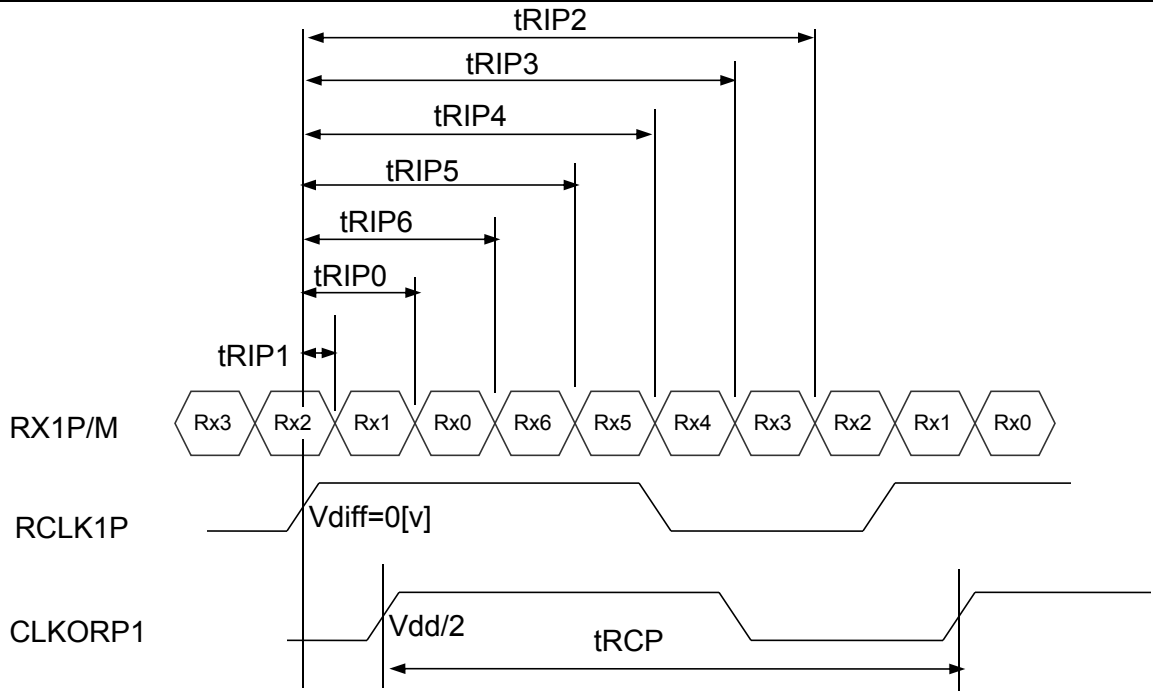


## 4.2 LVDS Rx Interface Timing Parameter

The specification of the LVDS Rx interface timing parameter is shown in Table 6.

<Table 6. LVDS Rx Interface Timing Specification>

| Item                       | Symbol | Min           | Typ  | Max          | Unit  | Remark        |
|----------------------------|--------|---------------|------|--------------|-------|---------------|
| CLKIN Period               | tRCP   | 14.8          | 18.5 | 22.2         | nsec  |               |
| Receiver Data Input Margin | tRMG   | -0.35         | -    | 0.35         | nsec  | fCLKIN=110MHz |
|                            |        | -0.40         | -    | 0.40         | nsec  | fCLKIN=95MHz  |
|                            |        | -0.45         | -    | 0.45         | nsec  | fCLKIN=85MHz  |
|                            |        | -0.60         | -    | 0.60         | nsec  | fCLKIN=65MHz  |
| Input Data 0               | tRIP1  | -   tRMG      | 0.0  | tRMG         | Clock |               |
| Input Data 1               | tRIP0  | T/7-   tRMG   | T/7  | T/7+   tRMG  | Clock |               |
| Input Data 2               | tRIP6  | 2 T/7-   tRMG | 2T/7 | 2T/7+   tRMG | Clock |               |
| Input Data 3               | tRIP5  | 3T/7-   tRMG  | 3T/7 | 3T/7+   tRMG | Clock |               |
| Input Data 4               | tRIP4  | 4T/7-   tRMG  | 4T/7 | 4T/7+   tRMG | Clock |               |
| Input Data 5               | tRIP3  | 5T/7-   tRMG  | 5T/7 | 5T/7+   tRMG | Clock |               |
| Input Data 6               | tRIP2  | 6T/7-   tRMG  | 6T/7 | 6T/7+   tRMG | Clock |               |



\* Vdiff = (RXz+)-(RXz-),..., (RXCLK+)-(RXCLK-)

## 5.0 SIGNAL TIMING SPECIFICATION

### 5.1 Timing Parameters (DE only mode)

< Table 8. Timing Table >

| Item                           |           | Symbols |                 | Min  | Typ   | Max  | Unit             |
|--------------------------------|-----------|---------|-----------------|------|-------|------|------------------|
| Clock                          | Frequency | 1/Tc    |                 | 60   | 74.25 | 78   | MHz              |
|                                | High Time | Tch     |                 | -    | 4/7Tc | -    |                  |
|                                | Low Time  | Tcl     |                 | -    | 3/7Tc | -    |                  |
| Frame Period                   |           | Tv      |                 | 1100 | 1125  | 1149 | lines            |
|                                |           |         |                 | 48.5 | 60    | 63   | Hz               |
| Horizontal Active Display Term |           | Valid   | t <sub>HV</sub> | -    | 960   | -    | t <sub>CLK</sub> |
|                                |           | Total   | t <sub>HP</sub> | 1060 | 1100  | 1200 | t <sub>CLK</sub> |
| Vertical Active Display Term   |           | Valid   | t <sub>VV</sub> | -    | 1080  | -    | t <sub>HP</sub>  |
|                                |           | Total   | t <sub>VP</sub> | 1100 | 1125  | 1149 | t <sub>HP</sub>  |

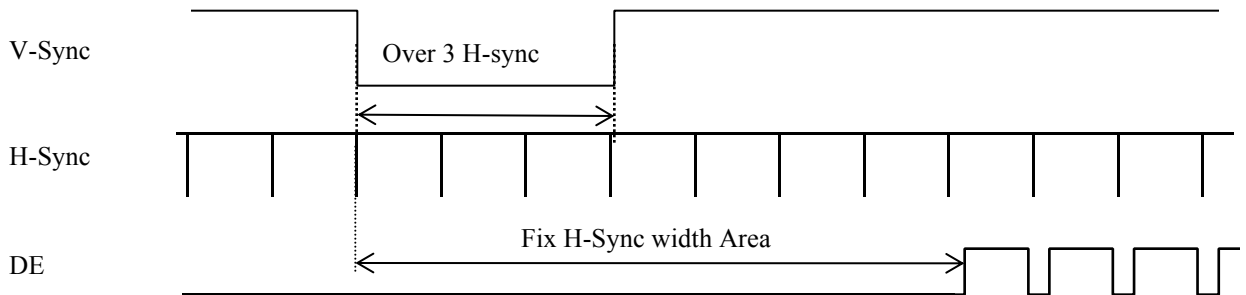
Notes: This product is DE only mode. The input of Hsync & Vsync signal does not have an effect on normal operation.

< Table 9. LVDS Input SSCG>

| Symbol             | Parameter                                             | Condition                                                    | Min  | Typ   | Max  | Unit |
|--------------------|-------------------------------------------------------|--------------------------------------------------------------|------|-------|------|------|
| F                  | LVDS Input frequency                                  | -                                                            | 60   | 74.25 | 78   | MHz  |
| T <sub>LVSK</sub>  | LVDS channel to channel skew                          | F=100MHz<br>V <sub>IC</sub> =1.2V<br>V <sub>ID</sub> =±400mV | -380 | -     | +380 | ps   |
| F <sub>LVMOD</sub> | Modulating frequency of input clock during SSC        |                                                              | 60   | -     | 85   | KHz  |
| F <sub>LVDEV</sub> | Maximum deviation of input clock frequency during SSC |                                                              | -3   | -     | +3   | %    |
| T <sub>CY-CY</sub> | Cycle to Cycle jitter                                 |                                                              | -    | -     | 100  | ps   |

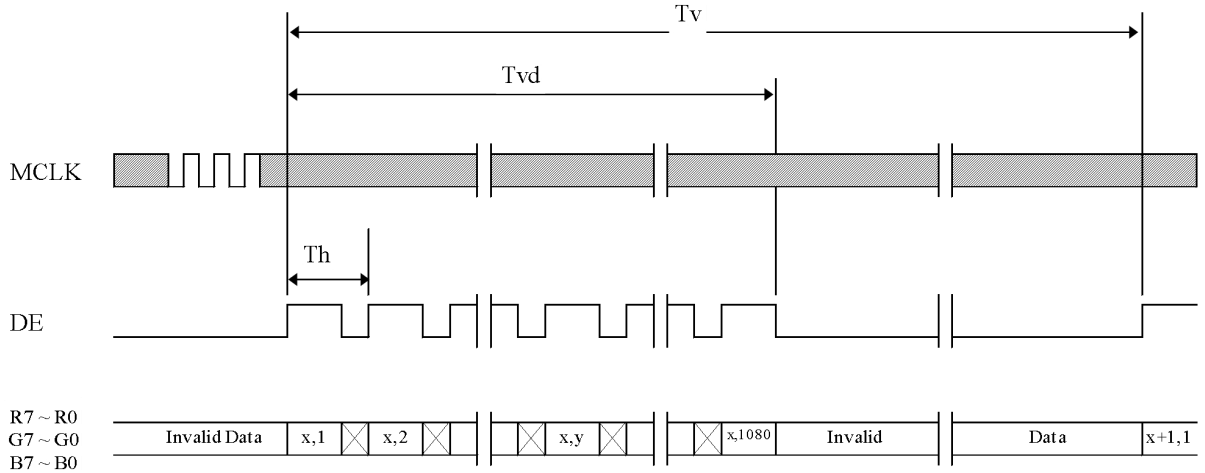
## 5.2 Signal Timing Waveform

### 5.2.1 Sync Timing Waveforms

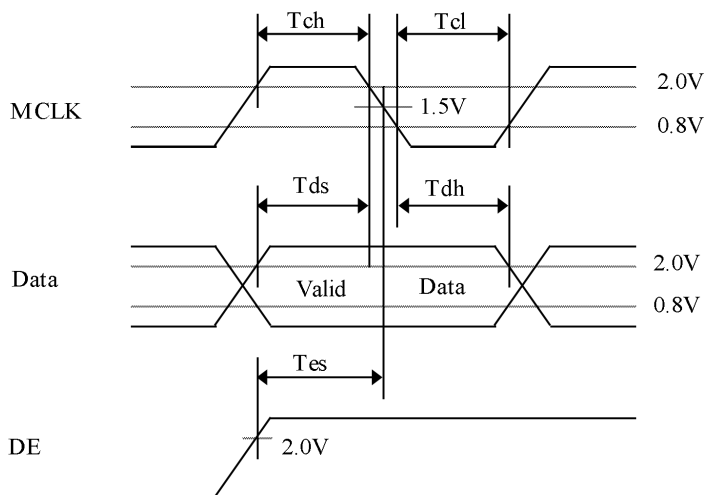
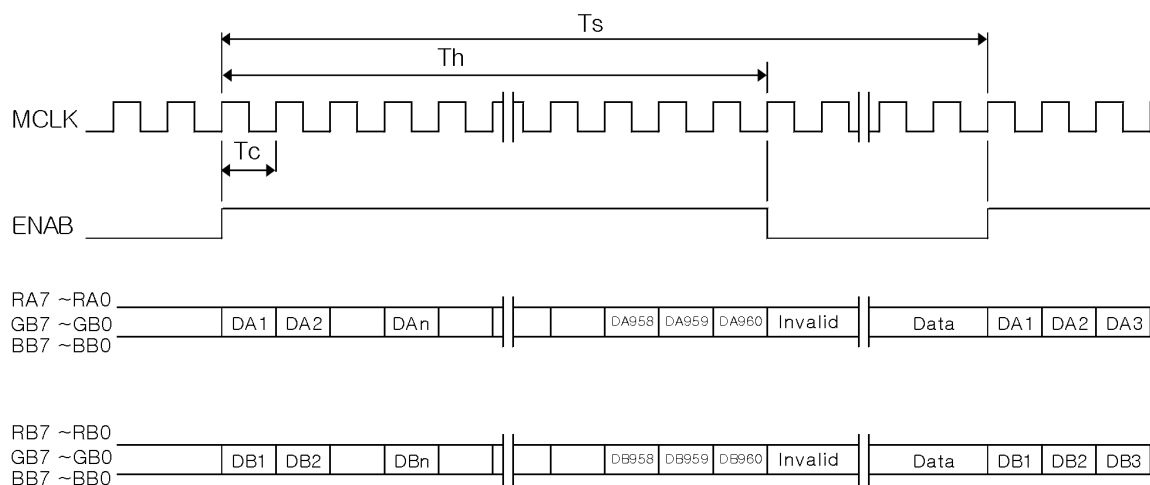


- 1) Need over 3 H-sync during V-Sync Low
- 2) Fix H-Sync width from V-Sync falling edge to first rising edge

### 5.2.2 Vertical Timing Waveforms

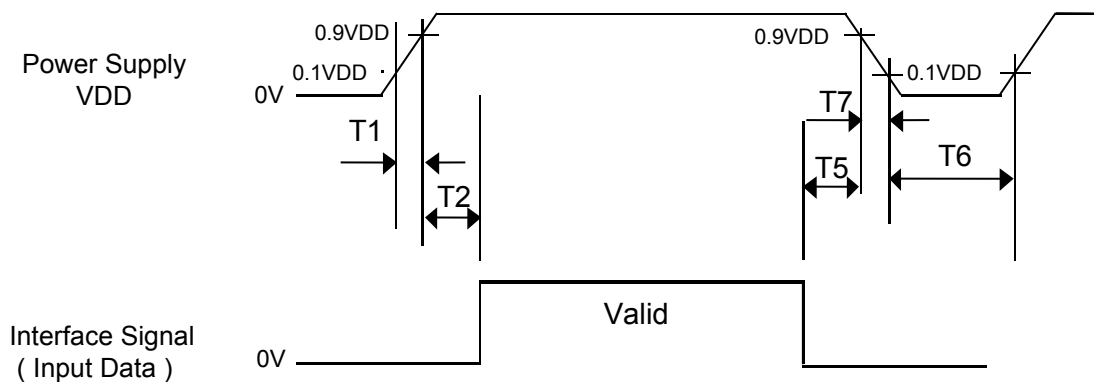


### 5.2.3 Horizontal Timing Waveforms



## 5.3 Power Sequence

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



< Table 11. Sequence Table >

| Parameter | Values     |     |            | Units     |
|-----------|------------|-----|------------|-----------|
|           | Min        | Typ | Max        |           |
| <b>T1</b> | <b>0.5</b> | -   | <b>20</b>  | <b>ms</b> |
| <b>T2</b> | <b>10</b>  | -   | <b>100</b> | <b>ms</b> |
| <b>T3</b> | <b>200</b> | -   | -          | <b>ms</b> |
| <b>T4</b> | <b>200</b> | -   | -          | <b>ms</b> |
| <b>T5</b> | <b>0</b>   | -   | -          | <b>ms</b> |
| <b>T6</b> | <b>1</b>   | -   | -          | <b>s</b>  |

- Notes:
1. Back Light must be turn on after power for logic and interface signal are valid.
  2. Even though T1 is out of SPEC, it is still ok if the inrush current of VDD is below the limit.
  3. When  $VDD < 0.9VDD$  (Typ.), Power off.
  4. T7 decreases smoothly, if there were rebounding voltage, it must smaller than 5 volts.

## 6.0 OPTICAL SPECIFICATIONS

The test of optical specifications shall be measured in a dark room (ambient luminance 1 lx and temperature=25 ±2°C) with the equipment of Luminance meter system (Goniometer system and PR730) and test unit shall be located at an approximate distance 180cm from the LCD surface at a viewing angle of  $\theta$  and  $\Phi$  equal to 0°. We refer to  $\theta_{\Phi=0}$  ( $=\theta_3$ ) as the 3 o'clock direction (the "right"),  $\theta_{\Phi=90}$  ( $=\theta_{12}$ ) as the 12 o'clock direction ("upward"),  $\theta_{\Phi=180}$  ( $=\theta_9$ ) as the 9 o'clock direction ("left") and  $\theta_{\Phi=270}$  ( $=\theta_6$ ) as the 6 o'clock direction ("bottom"). While scanning  $\theta$  and/or  $\Phi$ , the center of the measuring spot on the Display surface shall stay fixed. The measurement shall be executed after 30 minutes warm-up period. VDD shall be 12.0V at 25 °C. Optimum viewing angle direction is 6 o'clock.

< Table 12. Optical Table >

[VDD = 12.0V, Frame rate = 60Hz, Ta =25±2 °C]

| Parameter                  |            | Symbol        | Condition                                              | Min            | Typ    | Max            | Unit | Remark |
|----------------------------|------------|---------------|--------------------------------------------------------|----------------|--------|----------------|------|--------|
| Viewing Angle              | Horizontal | $\Theta_3$    | CR > 10                                                | 80             | 89     | -              | Deg. | Note 1 |
|                            |            | $\Theta_9$    |                                                        | 80             | 89     | -              | Deg. |        |
|                            | Vertical   | $\Theta_{12}$ |                                                        | 80             | 89     | -              | Deg. |        |
|                            |            | $\Theta_6$    |                                                        | 80             | 89     | -              | Deg. |        |
| Brightness                 |            | Lv            | $\Theta = 0$<br>(Center)<br>Normal<br>Viewing<br>Angle | 450            | 500    | -              | nit  |        |
| Contrast ratio             |            | CR            |                                                        | 700:1          | 1000:1 | -              |      | Note 2 |
| White luminance uniformity |            | $\Delta Y$    |                                                        | 75             | 80     | -              | %    | Note 3 |
| Reproduction of color      | White      | $W_x$         |                                                        | TYP.<br>- 0.03 | 0.2888 | TYP.<br>+ 0.03 |      | Note 4 |
|                            |            | $W_y$         |                                                        |                | 0.3165 |                |      |        |
|                            | Red        | $R_x$         |                                                        |                | 0.6488 |                |      |        |
|                            |            | $R_y$         |                                                        |                | 0.3165 |                |      |        |
|                            | Green      | $G_x$         |                                                        |                | 0.3243 |                |      |        |
|                            |            | $G_y$         |                                                        |                | 0.6179 |                |      |        |
|                            | Blue       | $B_x$         |                                                        |                | 0.1443 |                |      |        |
|                            |            | $B_y$         |                                                        |                | 0.0556 |                |      |        |
| Color Gamut                |            |               |                                                        | 68             | 72     | -              | %    |        |
| Cell Transmittance         |            |               |                                                        | TBD            | TBD    |                |      |        |
| Response Time              | G to G     | $T_g$         |                                                        | -              | 14     | 20             | ms   | Note 5 |

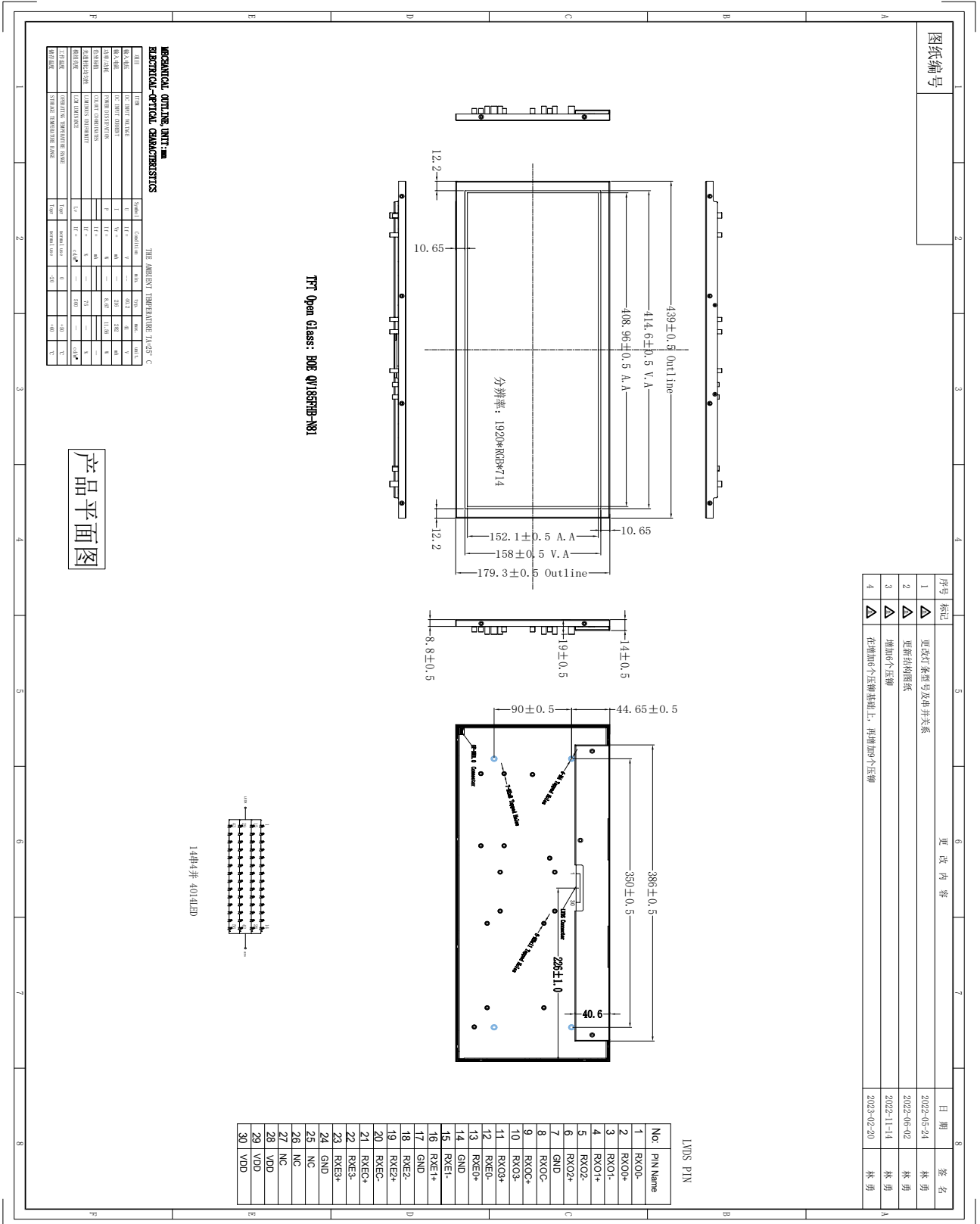
## 7. Mechanical Characteristics

The contents provide general mechanical characteristics. In addition the figures in the next page are detailed mechanical drawing of the LCD.

|                     |                |          |
|---------------------|----------------|----------|
| Outline Dimension   | Horizontal     | 439mm    |
|                     | Vertical       | 179.3mm  |
|                     | Depth          | 19.15mm  |
| Bezel Area          | Horizontal     | 414.6mm  |
|                     | Vertical       | 158mm    |
| Active Display Area | Horizontal     | 408.96mm |
|                     | Vertical       | 152.1mm  |
| Weight              | 1.25 kg (Typ.) |          |

Notes : Please refer to a mechanic drawing in terms of tolerance at the next page.

## 7.1 Dimension drawing



| 序号 | 标记 | 更改内容              | 日期         | 签名 |
|----|----|-------------------|------------|----|
| 1  | Δ  | 更改灯条编号及非并关系       | 2022-05-24 | 林勇 |
| 2  | Δ  | 更新结构图             | 2022-06-02 | 林勇 |
| 3  | Δ  | 增加个压脚             | 2022-11-14 | 林勇 |
| 4  | Δ  | 在增加6个压脚基础上，再增加个压脚 | 2023-02-20 | 林勇 |

## 8. Packing

TBD

## 9. DEFINITION OF LABELS