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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>ET036CR01-T</b><br><b>2025-01-20</b><br><b>PAGE 1 OF 13</b> |
|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------|

|                      |                                                                                  |
|----------------------|----------------------------------------------------------------------------------|
| Project No.<br>项目编号  | ET036CR01-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: 544*RGBx506Dots</b><br><b>3.6" 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.

LCD specification: Dots 544xRGBx506

As to basic specification of the driver IC, refer to the IC (ST72566-G6-E) specification and data book.

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

### 1.2 TFT features:

Structure: TFT PANNEL+IC +FPC1+BL;

ALL O'CLOCK Type LCD

544 dot-segment and 506 dot-common outputs;

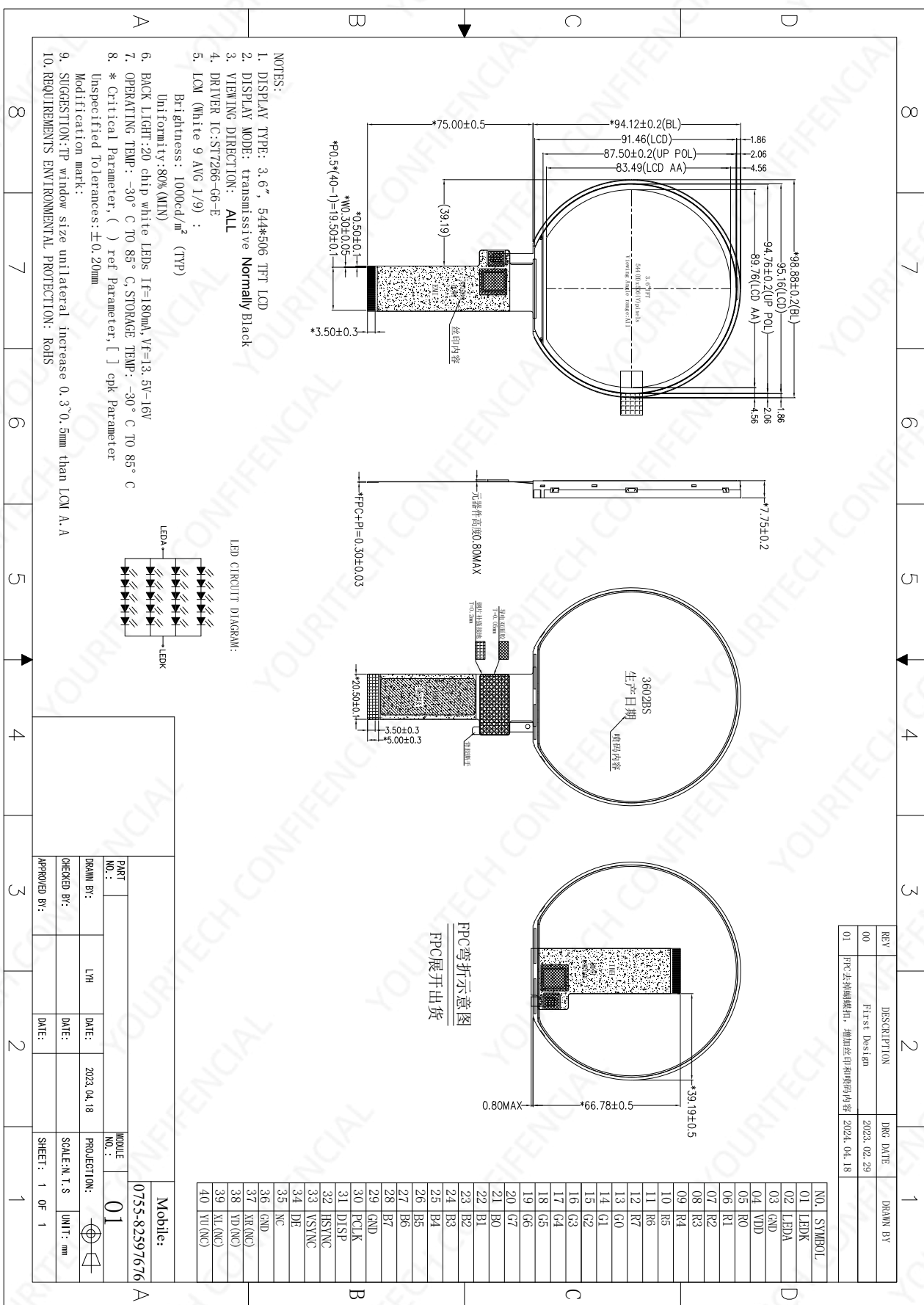
16.7M Color can be selected by software;

White LED back light;

24bit RGB interface

## 2. LCM General specification

| ITEM              | Standard value              | Unit |
|-------------------|-----------------------------|------|
| LCD Type          | Normally Black              | --   |
| Drive element     | TFT active matrix           | --   |
| Number of pixels  | 544*3RGB(H)X506(V)          | Dots |
| Pixel arrangement | RGB Vertical Stripe         | --   |
| Pixel Pitch (W*H) | 0.165 (H) x 0.165 (V)       | mm   |
| Active area       | 89.76(H) x 83.49(V)         | mm   |
| Viewing direction | ALL O'CLOCK                 | --   |
| TFT Driver IC     | ST72566-G6-E                | --   |
| TFT interface     | 24bit RGB Interface         | --   |
| LCM Size(W*H*T)   | 98.88(W) ×94.12(H) ×7.75(T) | mm   |
| Approx. Weight    | TBD                         | g    |
| Touch structure   | --                          | --   |
| Touch Driver IC   | --                          | --   |
| Touch Interface   | --                          | --   |



### 3.Absolute Maximum Rating

| Characteristics           | Symbol           | Min. | Max. | Unit |
|---------------------------|------------------|------|------|------|
| LCM Operating Temperature | T <sub>OPR</sub> | -30  | +85  | °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 |
|---------------------------|--------|------|------|------|------|
| Supply Voltage for(DC/DC) | VCC    | 2.6  | 2.8  | 3.3  | V    |

#### 4.2 Back-Light Unit Characeristics

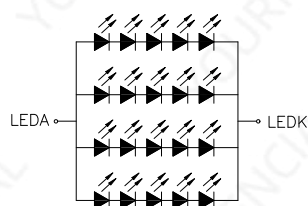
The back-light system is an edge-lighting type with 20 white LEDs. The characteristics of the back-light are shown in the following tables.

| Characteristics     | Symbol         | Min. | Type   | Max. | Unit              | Notes  |
|---------------------|----------------|------|--------|------|-------------------|--------|
| Forward Voltage     | V <sub>F</sub> | 13.5 | --     | 16   | V                 | --     |
| Forward current     | I <sub>F</sub> | --   | 180    | --   | mA                | --     |
| Luminance(With LCD) | L <sub>v</sub> | --   | 1000   | --   | cd/m <sup>2</sup> | --     |
| LED life time       | N/A            | --   | 20,000 | --   | Hr                | Note 1 |

Note:

- (1) The “LED life time” is defined as the module brightness decrease to 50% of original brightness at I<sub>L</sub>=45mA/LED. The LED life time could be decreased if operating I<sub>L</sub> is larger than 50mA/LED.

Backlight circuit diagram shown in below:



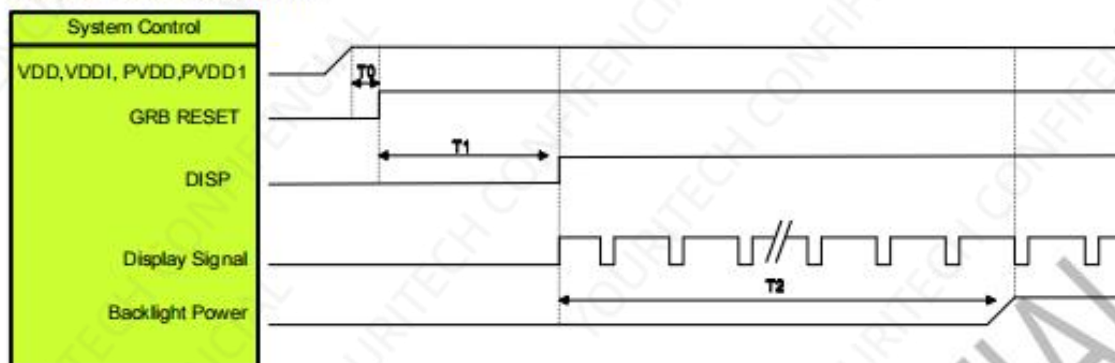
## 5. Module Function Description

| Pin No. | Symbol | Functional                          | Notes |
|---------|--------|-------------------------------------|-------|
| 1       | LEDK   | POWER SUPPLY- FOR BACKLIGHT cathode |       |
| 2       | LEDA   | POWER SUPPLY+ FOR BACKLIGHT ANODE   |       |
| 3       | GND    | Power Ground                        |       |
| 4       | VDD    | Power supply 2.6V ~ 3.3V            |       |
| 5       | R0     | Red data                            |       |
| 6       | R1     | Red data                            |       |
| 7       | R2     | Red data                            |       |
| 8       | R3     | Red data                            |       |
| 9       | R4     | Red data                            |       |
| 10      | R5     | Red data                            |       |
| 11      | R6     | Red data                            |       |
| 12      | R7     | Red data                            |       |
| 13      | G0     | Green data                          |       |
| 14      | G1     | Green data                          |       |
| 15      | G2     | Green data                          |       |
| 16      | G3     | Green data                          |       |
| 17      | G4     | Green data                          |       |
| 18      | G5     | Green data                          |       |
| 19      | G6     | Green data                          |       |
| 20      | G7     | Green data                          |       |
| 21      | B0     | Blue data                           |       |
| 22      | B1     | Blue data                           |       |
| 23      | B2     | Blue data                           |       |
| 24      | B3     | Blue data                           |       |
| 25      | B4     | Blue data                           |       |
| 26      | B5     | Blue data                           |       |
| 27      | B6     | Blue data                           |       |
| 28      | B7     | Blue data                           |       |
| 29      | GND    | Power Ground                        |       |
| 30      | PCLK   | Pixel clock signal in RGB I/F       |       |

|    |        |                                                                                                                             |  |
|----|--------|-----------------------------------------------------------------------------------------------------------------------------|--|
| 31 | DISP   | Standby mode, Normally pulled high.<br>STBYB = “1” , Normal operation<br>STBYB = “0” , Enter standby mode for power saving. |  |
| 32 | HSYNC  | Horizontal sync. Signal in RGB I/F                                                                                          |  |
| 33 | VSNC   | Vertical sync. Signal in RGB I/F                                                                                            |  |
| 34 | DE     | Data enable signal in RGB I/F mode 1                                                                                        |  |
| 35 | NC     | No Connection.                                                                                                              |  |
| 36 | GND    | Power Ground                                                                                                                |  |
| 37 | XR(NC) | No Connection.                                                                                                              |  |
| 38 | YD(NC) | No Connection.                                                                                                              |  |
| 39 | XL(NC) | No Connection.                                                                                                              |  |
| 40 | YU(NC) | No Connection.                                                                                                              |  |

## 6. Timing Characteristics

### 1.Power On Sequence

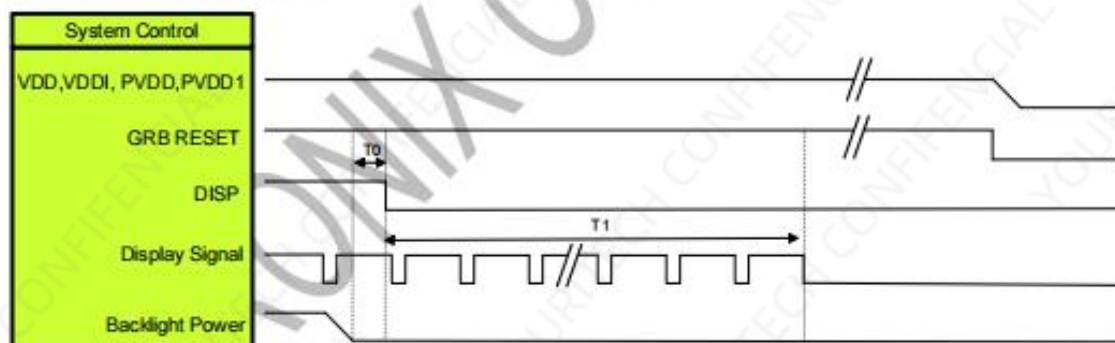


| Symbol | Description                                 | Min. Time | Unit |
|--------|---------------------------------------------|-----------|------|
| T0     | System power stability to GRB RESET signal  | 0         | ms   |
| T1     | GRB RESET= "High" to DISP="High"            | 10        | ms   |
| T2     | Display Signal output to Backlight Power on | 250       | ms   |

Note :

1. When DISP pull "H" or "L", IC will execute the internal power on or power off procedures .Please be careful about the timing of DISP and do not interrupt it during power on or power off procedure, otherwise unexpected errors will occur.
2. RGB interface Display signal: DCLK; VSYNC; HSYNC; DE; DR[7:0]; DG[7:0]; DB[7:0]
- 3: LVDS interface Display signal: DCLK P/N; RX[3:0] P/N

### 2.Power Off Sequence

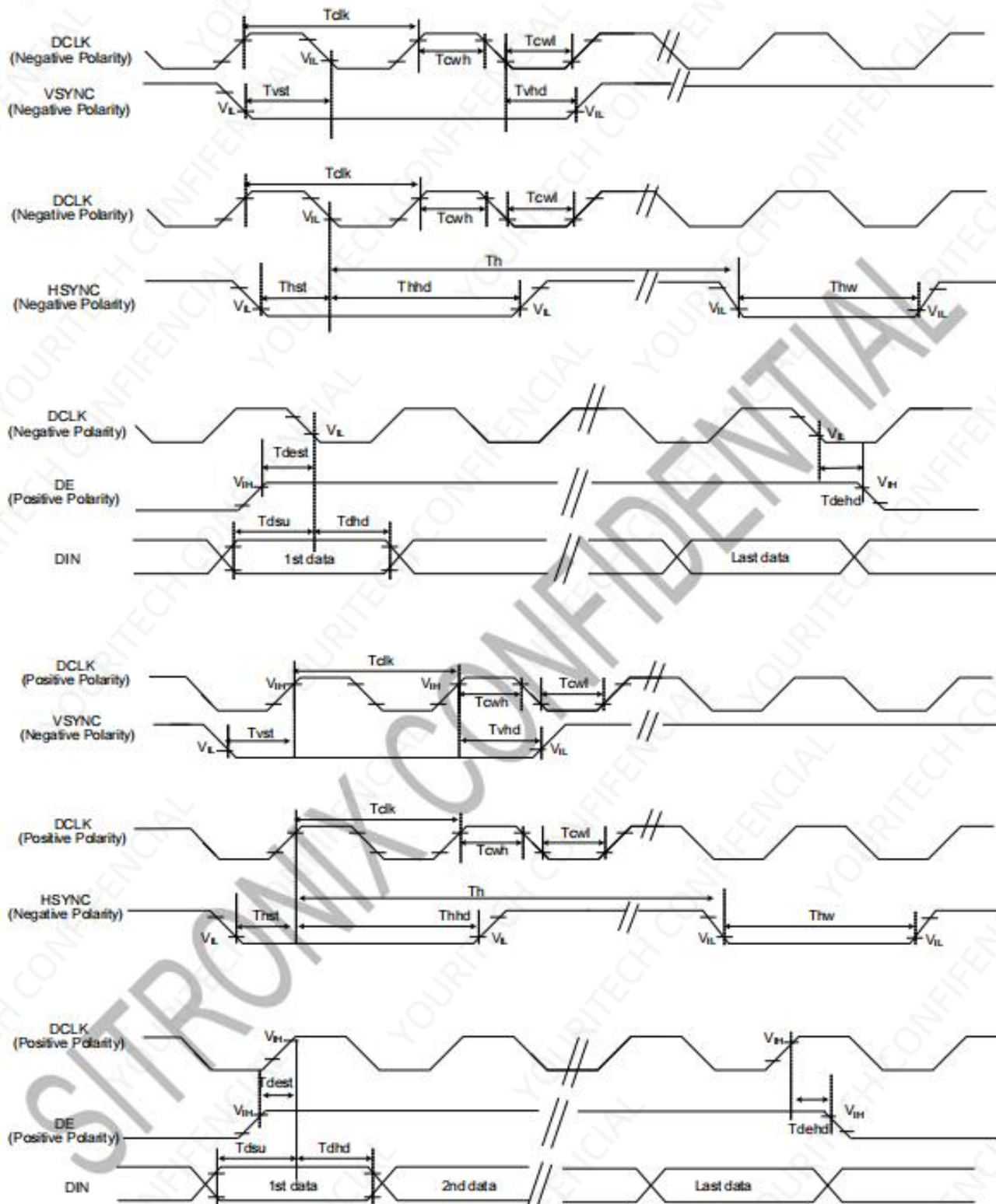


| Symbol | Description                                          | Min. Time | Unit |
|--------|------------------------------------------------------|-----------|------|
| T0     | Backlight Power off to DISP="Low"                    | 5         | ms   |
| T1     | DISP="Low" to IC internal voltage discharge complete | 100       | ms   |

Note :

1. When DISP pull "H" or "L", IC will execute the internal power on or power off procedures .Please be careful about the timing of DISP and do not interrupt it during power on or power off procedure, otherwise unexpected errors will occur.
2. RGB interface Display signal: DCLK; VSYNC; HSYNC; DE; DR[7:0]; DG[7:0]; DB[7:0]
- 3: LVDS interface Display signal: DCLK P/N; RX[3:0] P/N

## System Bus Timing for RGB Interface





深圳市优瑞泰克科技有限公司  
SHENZHEN YOURITECH TECHNOLOGY CO.,LTD  
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DC Electrical Characteristics (PVDD=VDD=VDDI= 3.3V, AGND= 0V, TA=25°C, Bare Chip)

| Item             | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|------------------|--------|------|------|------|------|------------|
| CLK Pulse Duty   | Tcw    | 40   | 50   | 60   | %    |            |
| VSYNC Setup Time | Tvst   | 10   | -    | -    | ns   |            |
| VSYNC Hold Time  | Tvhd   | 10   | -    | -    | ns   |            |
| HSYNC Setup Time | Thst   | 10   | -    | -    | ns   |            |
| HSYNC Hold Time  | Thhd   | 10   | -    | -    | ns   |            |
| Data Setup Time  | Tdsu   | 10   | -    | -    | ns   |            |
| Data Hold Time   | Tdhd   | 10   | -    | -    | ns   |            |
| DE Setup Time    | Tdest  | 10   | -    | -    | ns   |            |
| DE Hold Time     | Tdehd  | 10   | -    | -    | ns   |            |

## 7.Optical Characteristics

### Optical Specification

<Table 4. Optical Specifications >

| Parameter                        |            | Symbol        | Condition                                                    | Min.  | Typ.  | Max.  | Unit | Remark                                       |
|----------------------------------|------------|---------------|--------------------------------------------------------------|-------|-------|-------|------|----------------------------------------------|
| Viewing Angle range              | Horizontal | $\Theta_3$    | CR > 10                                                      | 80    | 85    | -     | Deg. | Note 1                                       |
|                                  |            | $\Theta_9$    |                                                              | 80    | 85    | -     | Deg. |                                              |
|                                  | Vertical   | $\Theta_{12}$ |                                                              | 80    | 85    | -     | Deg. |                                              |
|                                  |            | $\Theta_6$    |                                                              | 80    | 85    | -     | Deg. |                                              |
| Luminance Contrast ratio         |            | CR            | $\Theta = 0^\circ$<br>(Center)<br>Normal<br>Viewing<br>Angle | 1000  | 1200  | -     |      | Note 2                                       |
| Transmittance (pol)              |            | T(%)          |                                                              | 5.5   | 6.5   | -     | %    | @Silicate<br>BLU<br>POL:HC+A<br>PF<br>Note 3 |
| White luminance uniformity       |            | $\Delta Y$    |                                                              |       |       |       | %    |                                              |
| White Chromaticity               |            | $x_w$         |                                                              | 0.263 | 0.293 | 0.323 |      | CF<br>@C Light<br>Note 4                     |
|                                  |            | $y_w$         |                                                              | 0.306 | 0.336 | 0.366 |      |                                              |
| Reproduction of color            | Red        | $x_R$         |                                                              |       |       |       |      |                                              |
|                                  |            | $y_R$         |                                                              |       |       |       |      |                                              |
|                                  | Green      | $x_G$         |                                                              |       |       |       |      |                                              |
|                                  |            | $y_G$         |                                                              |       |       |       |      |                                              |
|                                  | Blue       | $x_B$         |                                                              |       |       |       |      |                                              |
|                                  |            | $y_B$         |                                                              |       |       |       |      |                                              |
| Response Time (Rising + Falling) |            | $T_{RT}$      | Ta= 25° C<br>$\Theta = 0^\circ$                              | -     | 30    | 40    | ms   | Note 5                                       |

### 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. Transmittance is the Value with Polarizer(HC+APF) & silicate BLU (Film structure is on Table 4.1)
4. The electro-optical response time measurements shall be made as **FIGURE 1** shown in Appendix. The times needed for the luminance to change from 10% to 90% is  $T_r$ , and 90% to 10% is  $T_f$ .

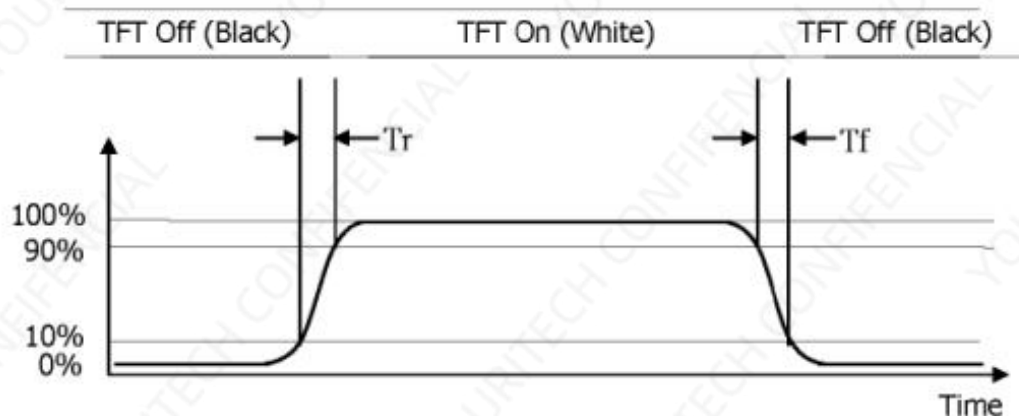


Figure1 Response Time Testing

## 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                   | +85°C / 96H                                             |                                                                                                                                                                                                                                         |
| 4   | Low Temp. Operating                    | -30°C / 96H                                             |                                                                                                                                                                                                                                         |
| 5   | High Temperature<br>/ Humidity storage | 60°C x 90%RH / 96H                                      |                                                                                                                                                                                                                                         |
| 6   | Thermal and cold shock                 | Static state, -30°C (30min) ~85°C<br>(30min), 10 cycles |                                                                                                                                                                                                                                         |

## 9. Packing Method---TBD

- END -