



**RAYSTAR**

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## RFC570S-AIW-DNN

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### SPECIFICATION

CUSTOMER:

|                    |  |
|--------------------|--|
| <b>APPROVED BY</b> |  |
| <b>PCB VERSION</b> |  |
| <b>DATE</b>        |  |

FOR CUSTOMER USE ONLY

| <b>SALES BY</b> | <b>APPROVED BY</b> | <b>CHECKED BY</b> | <b>PREPARED BY</b> |
|-----------------|--------------------|-------------------|--------------------|
|                 |                    |                   |                    |

Release DATE:

TFT Display Inspection Specification: <https://www.raystar-optronics.com/download/products.htm>

Precaution in use of TFT module: <https://www.raystar-optronics.com/download/declaration.htm>

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## Revision History

| VERSION | DATE       | REVISED PAGE NO. | Note                              |
|---------|------------|------------------|-----------------------------------|
| 0       | 2015/10/14 |                  | First issue                       |
| A       | 2015/11/04 |                  | Modify Initial Code               |
| B       | 2016/01/21 |                  | Modify Static<br>electricity test |
| C       | 2016/08/11 |                  | Modify Vibration test             |
| D       | 2017/08/24 |                  | Remove Package<br>Specification   |
| E       | 2019/07/01 |                  | Add Uniformity                    |

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# 1.Module Classification Information

|          |          |          |           |           |          |          |          |          |          |          |          |          |
|----------|----------|----------|-----------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|
| <b>R</b> | <b>F</b> | <b>C</b> | <b>57</b> | <b>0S</b> | <b>-</b> | <b>A</b> | <b>I</b> | <b>W</b> | <b>-</b> | <b>D</b> | <b>N</b> | <b>N</b> |
| 1        | 2        | 3        | 4         | 5         | -        | 6        | 7        | 8        | -        | 9        | 10       | 11       |

| Item | Description   |  |
|------|---|--|
| 1    | R : Raystar Optronics Inc.  |  |
| 2    | Display Type : F→TFT Type, J→ Custom TFT  |  |
| 3    | Solution: A: 128x160    B:320x234    C:320x240    D:480x234    E:480x272<br>F:800x480    G:640x480    H:1024x600    I:320x480    J:240x320<br>K:1280x800    L:240x400    M:1024x768    N:128x128    O:480x800<br>P:640x320    Q:800x600    S:480x128    T:800x320 |  |
| 4    | Display Size : 5.7" TFT   |  |
| 5    | Version Code.   |  |
| 6    | Model Type:<br>A : TFT LCD<br>E : TFT+FR+CONTROL BOARD<br>J : TFT+FR+A/D BOARD<br>N : TFT+FR+A/D BOARD+CONTROL BOARD<br>S : TFT+FR+POWER BOARD (DC TO DC)<br>1 : TFT+CONTROL BOARD  | 6 : TFT+FR<br>H : TFT+D/V BOARD<br>I : TFT+FR+D/V BOARD<br>B : TFT+POWER BD  |
| 7    | Polarizer Type,<br>Temperature range,<br>View direction   | I→Transmissive, W. T, 6:00 ;    C→Transmissive, N. T, 6:00<br>L→Transmissive, W.T,12:00 ;    F→Transmissive, N.T,12:00<br>Y→Transmissive,W.T, IPS TFT ;<br>A→Transmissive, N.T, IPS TFT<br>Z→Transmissive, W.T, O-TFT<br>R→Transmissive, Super W.T, O-TFT<br>N→Transmissive, Super W.T, 6:00;<br>Q→Transmissive, Super W.T, 12:00<br>V→Transmissive, Super W.T, VA TFT |
| 8    | Backlight   | W : LED, White                      H : LED, High Light White  |
|      |   | F : CCFL, White  |
| 9    | Driver Method   | D: Digital    A: Analog    L : LVDS    M:MIPI  |
| 10   | Interface   | N : without control board    A : 8Bit    B : 16Bit<br>S:SPI Interface    R: RS232    U:USB    I: I2C   |
| 11   | TS  | N : Without TS    S : resistive touch panel<br>C : capacitive touch panel capacitive touch panel (G-F-F)<br>G : capacitive touch panel(G-G)  |

## 2.Summary

This technical specification applies to 5.7' Mono TFT-LCD panel. The 5.7' Mono TFT-LCD panel is designed for camcorder, digital camera application and other electronic products which require high quality flat panel displays. This module follows RoHS.

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### 3.General Specifications

- Size: 5.7 inch
- Dot Matrix: 320 x 240 dots
- Module dimension: 160.0 x 109.0 x 7.0 mm
- Active area: 115.2 x 86.4 mm
- Dot pitch: 0.36 x 0.36 mm
- LCD type: TFT, Positive, Transmissive
- View Direction: 12 o'clock
- Gray Scale Inversion Direction: 6 o'clock
- Aspect Ratio: 4:3
- Gray Scale: 16 Gray scale (4BPP)/ 4 Gray scale (2BPP)/ 2 Gray scale (1BPP)
- Driver IC: ST7511U
- Backlight Type: LED, Normally White
- With /Without TP: Without TP
- Surface: Glare

\* Mono tone slight changed by temperature and driving voltage.

## 4.Interface

### 4.1. LCM PIN Definition

| Pin | Symbol       | Function             | Remark |
|-----|--------------|----------------------|--------|
| 1   | GND          | System ground        |        |
| 2   | VDD          | Power Supply : +3.3V |        |
| 3   | NC           | No connect           |        |
| 4   | A0           | Data/Command select  |        |
| 5   | /WR(R/W)     | Write strobe signal  |        |
| 6   | /RD(E)       | Read strobe signal   |        |
| 7   | DB0          | Data bus             |        |
| 8   | DB1          | Data bus             |        |
| 9   | DB2          | Data bus             |        |
| 10  | DB3          | Data bus             |        |
| 11  | DB4          | Data bus             |        |
| 12  | DB5          | Data bus             |        |
| 13  | DB6          | Data bus             |        |
| 14  | DB7          | Data bus             |        |
| 15  | /CS          | Chip select          |        |
| 16  | /RESET(RSTB) | Hardware reset       |        |
| 17  | IF0          | Mode select          | Note1  |
| 18  | IF1          |                      |        |
| 19  | NC           | No connect           |        |
| 20  | NC           | No connect           |        |
| 21  | NC           | No connect           |        |
| 22  | NC           | No connect           |        |

Note1:

| Setting |     | MCU Type                 | Interface Pin Function |    |     |     |                        |
|---------|-----|--------------------------|------------------------|----|-----|-----|------------------------|
| IF1     | IF0 |                          | CSB                    | A0 | RWR | ERD | D[7:0]                 |
| L       | L   | Parallel 8080 series MCU | CSB                    | A0 | /WR | /RD | D[7:0]                 |
| L       | H   | Parallel 6800 series MCU |                        |    | R/W | E   | D[7:0]                 |
| H       | H   | Serial 4-Line series MCU |                        |    | -   | -   | D7=SCL, D0=SDA, D[6:1] |
| H       | L   | Serial 3-Line series MCU |                        |    | -   | -   | are not used           |

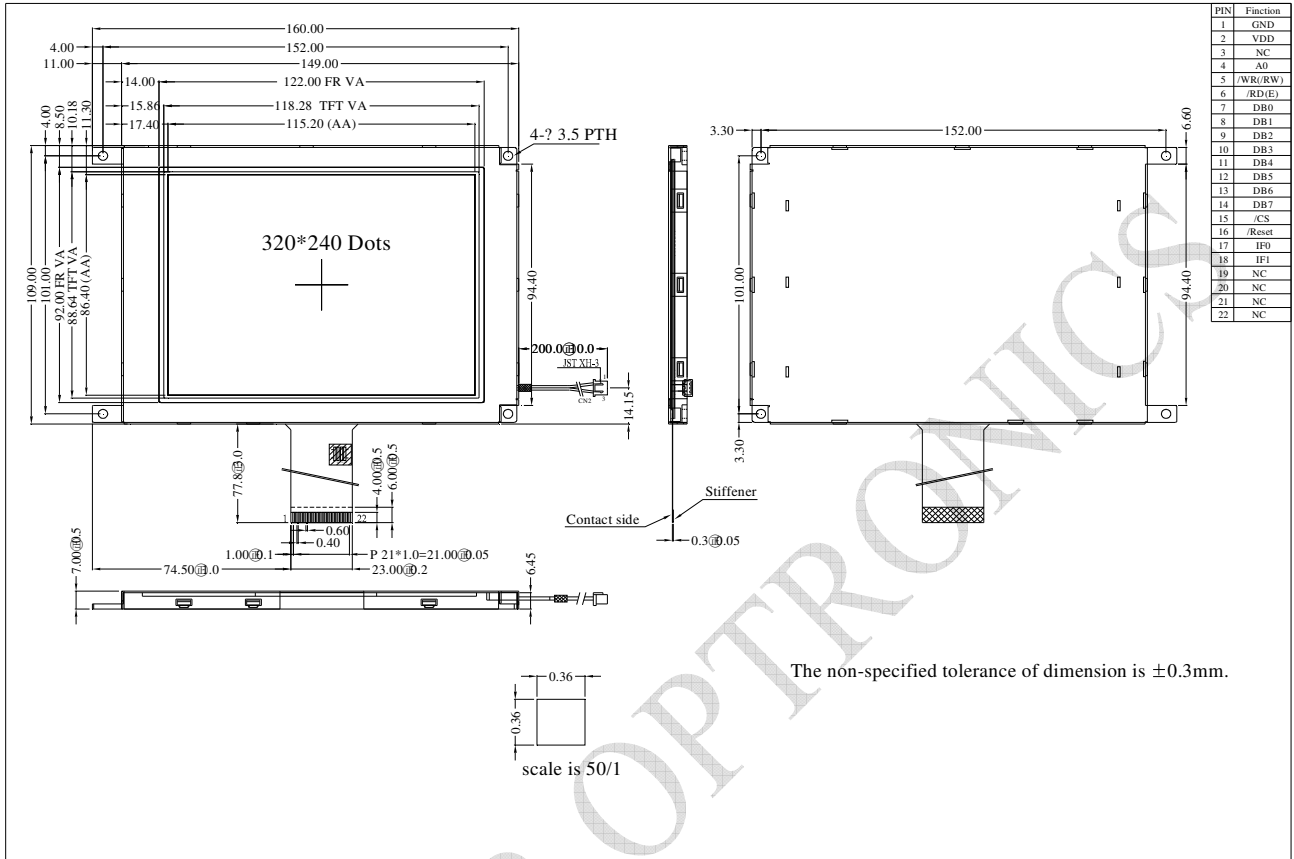
The un-used pins are marked as “-” and should be connected to “H” by VDDI.

### 4.2. Backlight Unit Section(CN2)

LED Light Bar connector is used for the the integral backlight system. The recommended model is “JST XH-3” manufactured by JST.

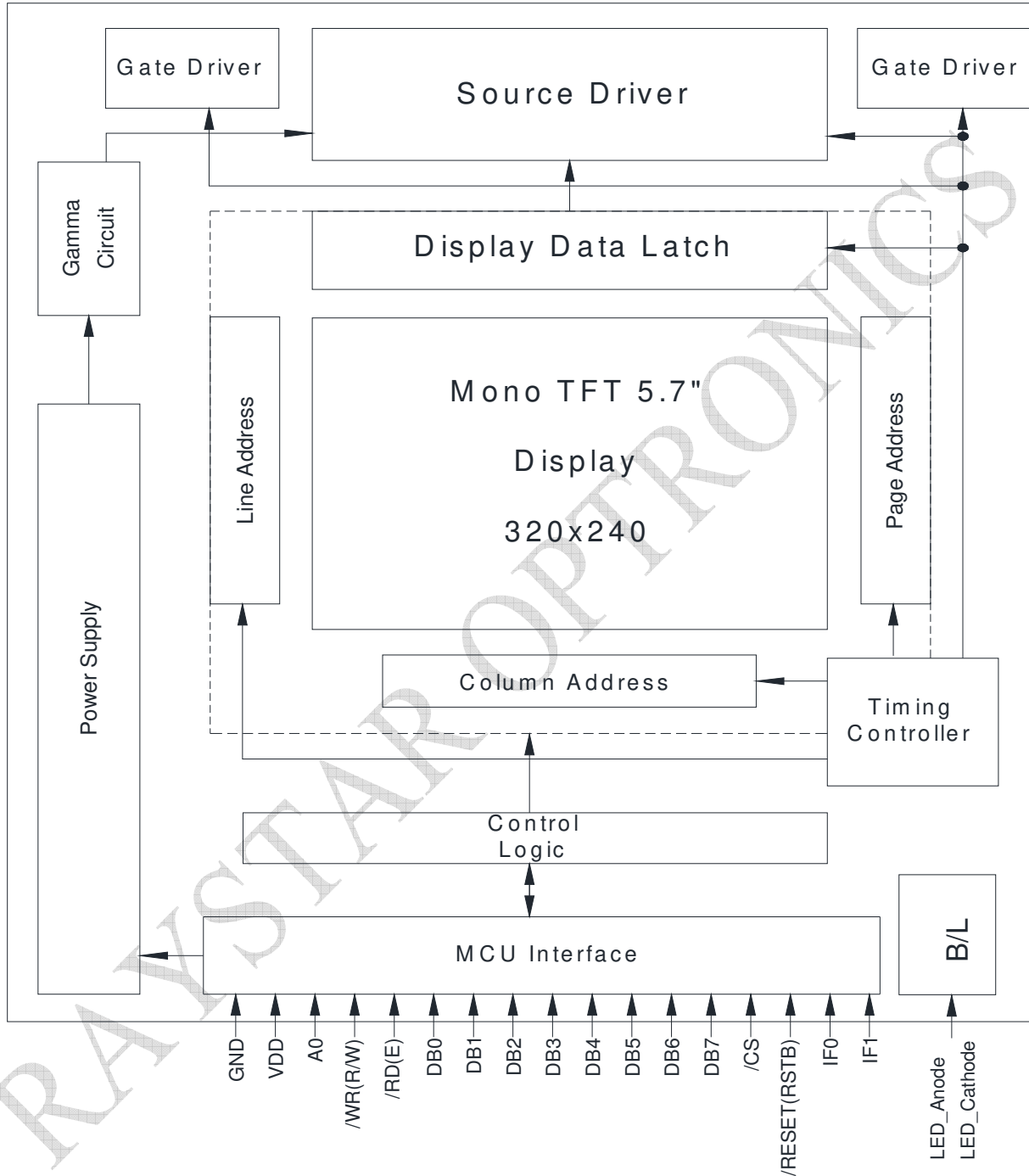
| Pin No. | Symbol            | I/O | Function                            | Remark |
|---------|-------------------|-----|-------------------------------------|--------|
| 1       | V <sub>LED+</sub> | P   | Power for LED backlight anode (A)   | Red    |
| 3       | V <sub>LED-</sub> | P   | Power for LED backlight cathode (K) | White  |

# 5. Contour Drawing





## 6. Block Diagram



## 7. Absolute Maximum Ratings

| Item                  | Symbol | Min | Typ | Max | Unit |
|-----------------------|--------|-----|-----|-----|------|
| Operating Temperature | TOP    | -20 | —   | +70 | °C   |
| Storage Temperature   | TST    | -30 | —   | +80 | °C   |

Note: Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above

- Temp.  $\leq 60^{\circ}\text{C}$ , 90% RH MAX. Temp.  $> 60^{\circ}\text{C}$ , Absolute humidity shall be less than 90% RH at  $60^{\circ}\text{C}$

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## 8. Electrical Characteristics

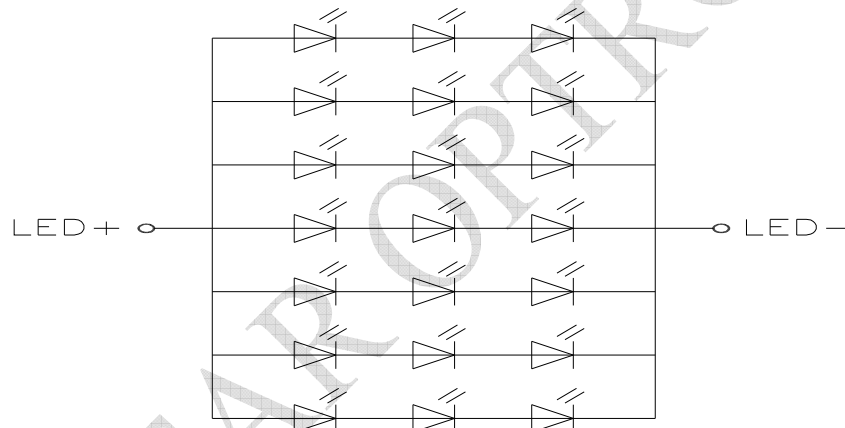
### 8.1. Operating conditions:

| Item                   | Symbol | Condition | Min | Typ | Max | Unit | Remark |
|------------------------|--------|-----------|-----|-----|-----|------|--------|
| Supply Voltage For LCM | VDD    | —         | 3.0 | 3.3 | 3.6 | V    |        |
| Supply Current For LCM | IDD    | —         | —   | 20  | 30  | mA   | Note1  |
| Power Consumption      | —      | —         | —   | 66  | 108 | mW   |        |

Note1: This value is test for VDD=3.3V only

### 8.2. LED driving conditions

| Parameter         | Symbol | Min. | Typ.   | Max. | Unit | Remark     |
|-------------------|--------|------|--------|------|------|------------|
| LED current       |        | -    | 140    | -    | mA   |            |
| Power Consumption |        | 1120 | -      | 1386 | mW   |            |
| LED voltage       | VLED+  | 8.0  | 9.0    | 9.9  | V    | Note 1     |
| LED Life Time     |        | -    | 50,000 | -    | Hr   | Note 2,3,4 |



Note 1 : Power supply the back light specification

Note 2 :  $T_a = 25\text{ }^\circ\text{C}$

Note 3 : Brightness to be decreased to 50% of the initial value

Note 4 : The single LED lamp case

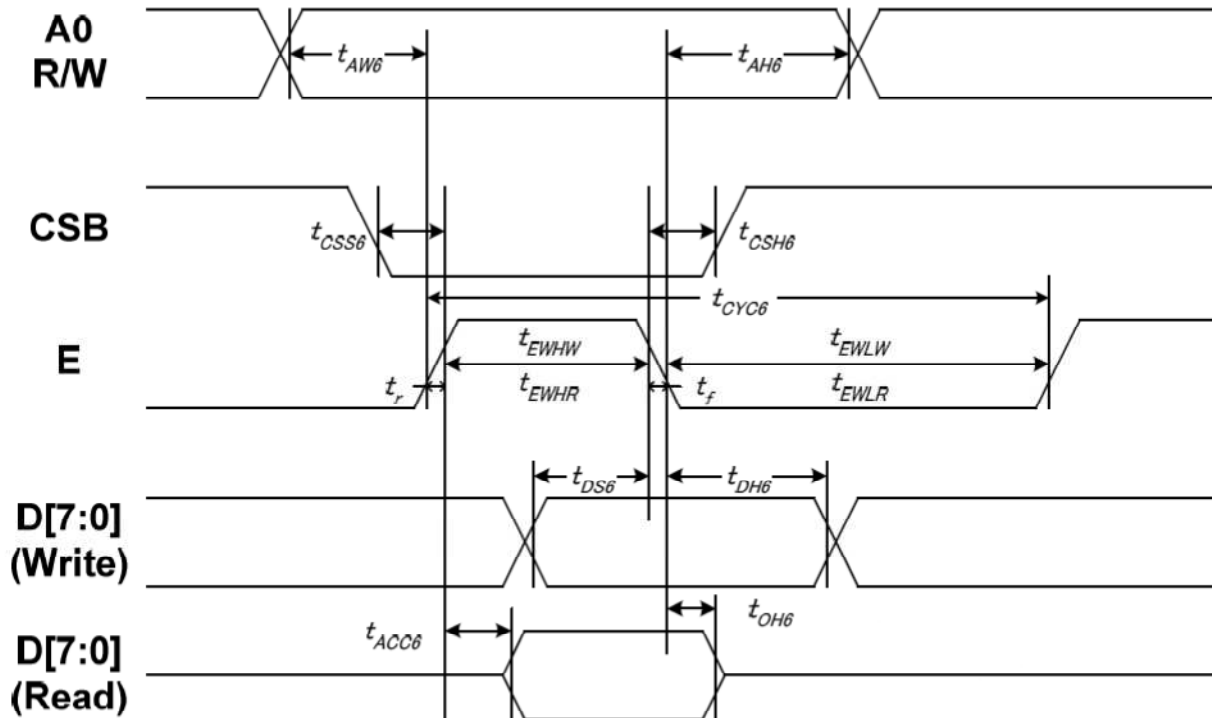
## 9.DC CHARATERISTICS

| Parameter                | Symbol   | Rating |     |        | Unit | Condition |
|--------------------------|----------|--------|-----|--------|------|-----------|
|                          |          | Min    | Typ | Max    |      |           |
| Low level input voltage  | $V_{IL}$ | 0      | -   | 0.3VDD | V    |           |
| High level input voltage | $V_{IH}$ | 0.7VDD | -   | VDD    | V    |           |

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# 10.AC Characteristics

## 10.1. System Bus Timing for 6800 Series MPU

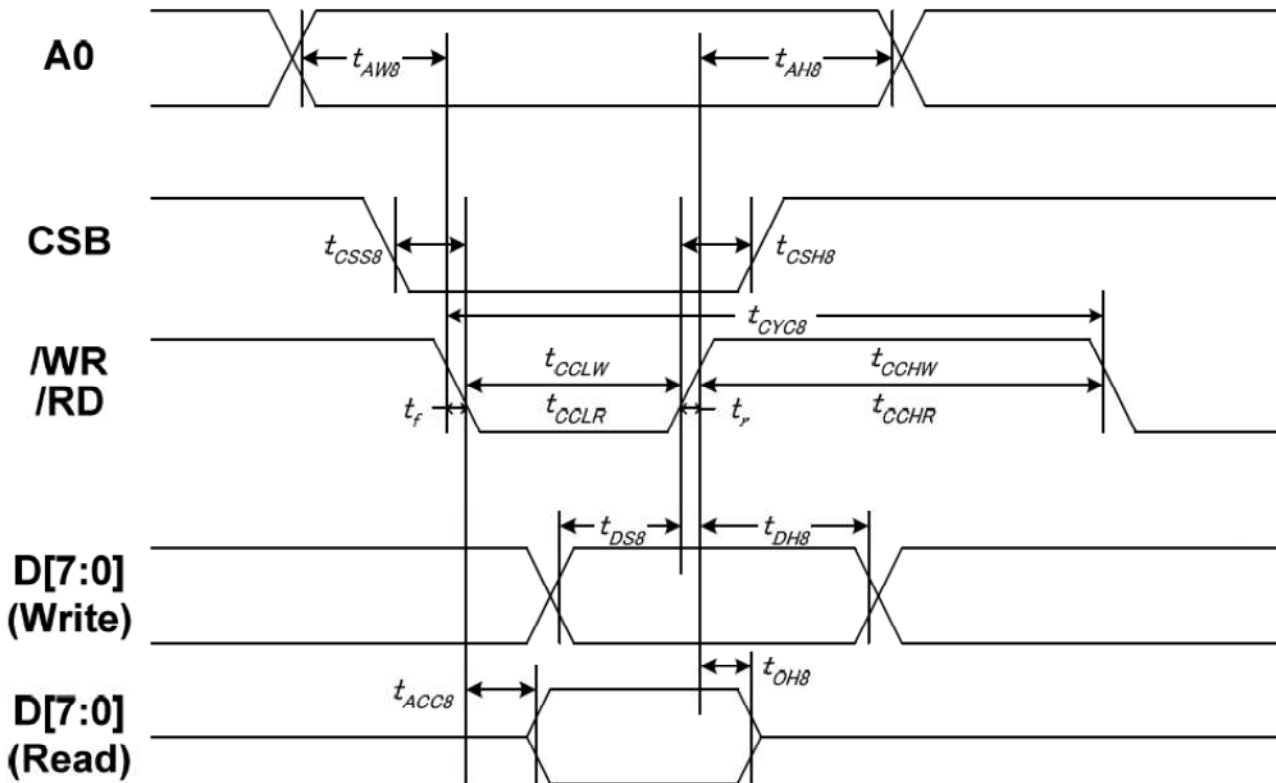


| Item                          | Signal     | Symbol      | Condition   | Min | Max | Unit |
|-------------------------------|------------|-------------|-------------|-----|-----|------|
| Address setup time            | A0         | $t_{AW6}$   | -           | 10  | -   | ns   |
| Address hold time             |            | $t_{AH6}$   | -           | 0   | -   |      |
| System cycle time             | E          | $t_{CYC6}$  | -           | 200 | -   |      |
| Enable L pulse width (WRITE)  |            | $t_{EHLW}$  | -           | 100 | -   |      |
| Enable H pulse width (WRITE)  |            | $t_{EHWLW}$ | -           | 100 | -   |      |
| Enable L pulse width (READ)   |            | $t_{EHLR}$  | -           | 130 | -   |      |
| Enable H pulse width (READ)   |            | $t_{EWHR}$  | -           | 130 | -   |      |
| CSB setup time                |            | CSB         | $t_{CSS6}$  | -   | 100 |      |
| CSB hold time                 | $t_{CSH6}$ |             | -           | 100 | -   |      |
| Write data setup time         | D[7:0]     | $t_{DS6}$   | -           | 70  | -   |      |
| Write data hold time          |            | $t_{DH6}$   | -           | 20  | -   |      |
| Read data access time         |            | $t_{ACC6}$  | CL = 100 pF | -   | 80  |      |
| Read data output disable time |            | $t_{OH6}$   | CL = 100 pF | 15  | 80  |      |

Note:

1. The input signal rise time and fall time ( $t_r$ ,  $t_f$ ) is specified at 15 ns or less. When the system cycle time is extremely fast,  $(t_r + t_f) \leq (t_{CYC8} - t_{CCLW} - t_{CCHW})$  for  $(t_r + t_f) \leq (t_{CYC8} - t_{CCLR} - t_{CCHR})$  are specified.
2. All timing is specified using 20% and 80% of VDDI as the reference.
3.  $t_{CCLW}$  and  $t_{CCLR}$  are specified as the overlap between CSB being "L" and /WR and /RD being at the "L" level. CSB and /WR (or /RD) cannot act at the same time and CSB should be 100ns wider than /WR (or /RD).

### 10.2. System Bus Timing for 8080 Series MPU

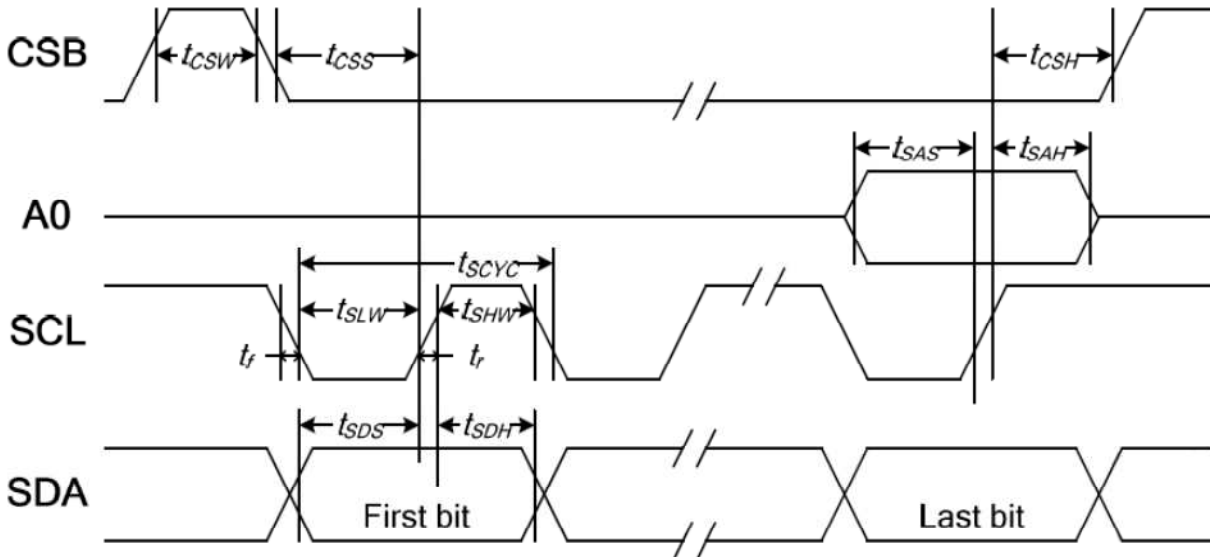


| Item                          | Signal | Symbol | Condition   | Min | Max | Unit |
|-------------------------------|--------|--------|-------------|-----|-----|------|
| Address setup time            | A0     | tAW8   | -           | 10  | -   | ns   |
| Address hold time             |        | tAH8   | -           | 0   | -   |      |
| System cycle time             |        | tCYC8  | -           | 200 | -   |      |
| /WR L pulse width (WRITE)     | /WR    | tCCLW  | -           | 100 | -   |      |
| /WR H pulse width (WRITE)     |        | tCCHW  | -           | 100 | -   |      |
| /RD L pulse width (READ)      | /RD    | tCCLR  | -           | 120 | -   |      |
| /RD H pulse width (READ)      |        | tCCHR  | -           | 120 | -   |      |
| CSB setup time                | CSB    | tCSS8  | -           | 100 | -   |      |
| CSB hold time                 |        | tCSH8  | -           | 100 | -   |      |
| Write data setup time         | D[7:0] | tDS8   | -           | 70  | -   |      |
| Write data hold time          |        | tDH8   | -           | 20  | -   |      |
| Read data access time         | D[7:0] | tACC8  | CL = 100 pF | -   | 80  |      |
| Read data output disable time |        | tOH8   | CL = 100 pF | 15  | 80  |      |

Note:

- The input signal rise time and fall time ( $t_r$ ,  $t_f$ ) is specified at 15 ns or less. When the system cycle time is extremely fast,  $(t_r + t_f) \leq (t_{CYC8} - t_{CCLW} - t_{CCHW})$  for  $(t_r + t_f) \leq (t_{CYC8} - t_{CCLR} - t_{CCHR})$  are specified.
- All timing is specified using 20% and 80% of VDDI as the reference.
- $t_{CCLW}$  and  $t_{CCLR}$  are specified as the overlap between CSB being "L" and /WR and /RD being at the "L" level. CSB and /WR (or /RD) cannot act at the same time and CSB should be 100ns wider than /WR (or /RD).

10.3. System Bus Timing for 4-Line Serial Interface

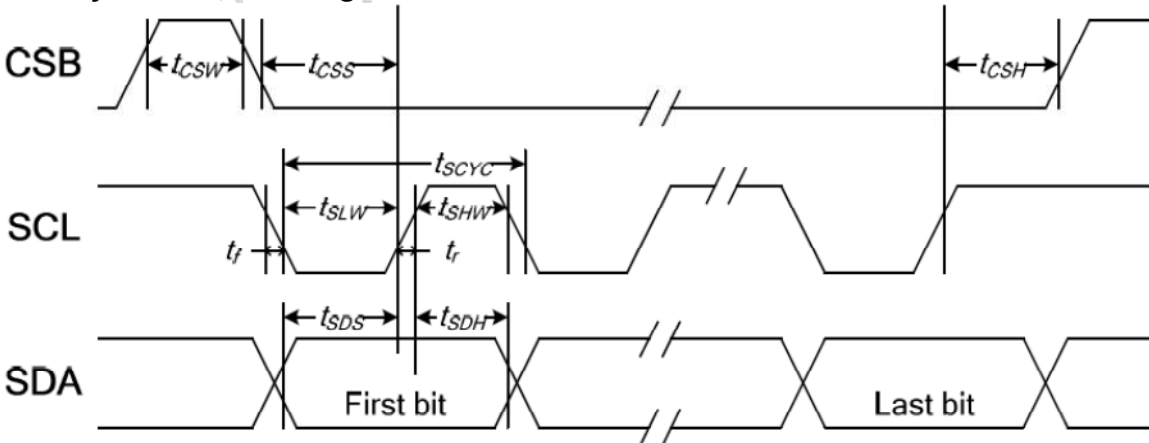


| Item                | Signal | Symbol | Condition | Min | Max | Unit |
|---------------------|--------|--------|-----------|-----|-----|------|
| Serial clock period | SCL    | tSCYC  | -         | 80  | -   | ns   |
| SCL "H" pulse width |        | tSHW   | -         | 40  | -   |      |
| SCL "L" pulse width |        | tSLW   | -         | 40  | -   |      |
| Address setup time  | A0     | tSAS   | -         | 40  | -   |      |
| Address hold time   |        | tSAH   | -         | 40  | -   |      |
| Data setup time     | SDA    | tSDS   | -         | 15  | -   |      |
| Data hold time      |        | tSDH   | -         | 20  | -   |      |
| CSB-SCL time        | CSB    | tCSS   | -         | 40  | -   |      |
| CSB-SCL time        |        | tCSH   | -         | 40  | -   |      |
| CSB "H" pulse width |        | tCSW   | -         | 15  | -   |      |

Note:

1. The input signal rise and fall time (tr, tf) are specified at 15 ns or less.
2. All timing is specified using 20% and 80% of VDDI as the standard.

10.4. System Bus Timing for 3-Line Serial Interface



| Item                | Signal | Symbol | Condition | Min | Max | Unit |
|---------------------|--------|--------|-----------|-----|-----|------|
| Serial clock period | SCL    | tSCYC  | -         | 80  | -   | ns   |
| SCL "H" pulse width |        | tSHW   | -         | 40  | -   |      |
| SCL "L" pulse width |        | tSLW   | -         | 40  | -   |      |
| Data setup time     | SDA    | tSDS   | -         | 15  | -   |      |
| Data hold time      |        | tSDH   | -         | 20  | -   |      |
| CSB-SCL time        | CSB    | tCSS   | -         | 40  | -   |      |
| CSB-SCL time        |        | tCSH   | -         | 40  | -   |      |
| CSB "H" pulse width |        | tCSW   | -         | 15  | -   |      |

Note:

1. The input signal rise and fall time ( $t_r$ ,  $t_f$ ) are specified at 15 ns or less.
2. All timing is specified using 20% and 80% of VDDI as the standard.

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## 11. Optical Characteristics

| Item  | Symbol | Condition.                        | Min          | Typ. | Max. | Unit              | Remark            |
|---|--------|-----------------------------------|--------------|------|------|-------------------|-------------------|
| Response time                                     | Tr     | $\theta=0^\circ$ 、 $\Phi=0^\circ$ | -            | 20   | 30   | .ms               | Note 3            |
|   | Tf     |                                   | -            | 10   | 15   | .ms               |                   |
| Contrast ratio                                    | CR     | At optimized viewing angle        | -            | 800  | -    | -                 | Note 4            |
| Viewing angle<br>(Gray Scale Inversion Direction) | Hor.   | $\Theta_R$                        | $CR \geq 10$ | 60   |      | Deg.              | Note 1            |
|   |        | $\Theta_L$                        |              | 60   |      |                   |                   |
|   | Ver.   | $\Phi_T$                          |              | 60   |      |                   |                   |
|   |        | $\Phi_B$                          |              | 50   |      |                   |                   |
| Brightness  | -      | -                                 | 900          | 1000 | -    | cd/m <sup>2</sup> | Center of display |
| Uniformity  | (U)    | -                                 | 75           | -    | -    | %                 | Note5             |

Ta=25±2°C, IL=140mA

Note 1: Definition of viewing angle range

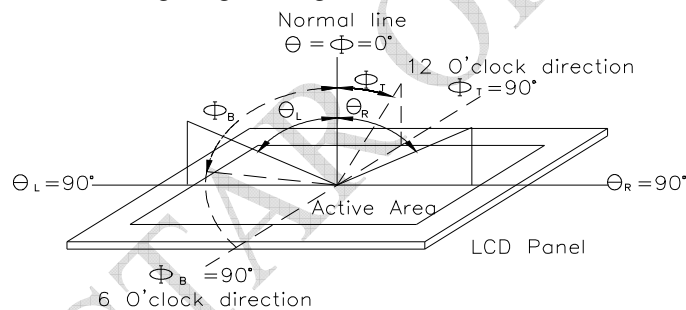


Fig.11.1. Definition of viewing angle

Note 2: Test equipment setup:

After stabilizing and leaving the panel alone at a driven temperature for 10 minutes, the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. Optical specifications are measured by Topcon BM-7orBM-5 luminance meter 1.0° field of view at a distance of 50cm and normal direction.

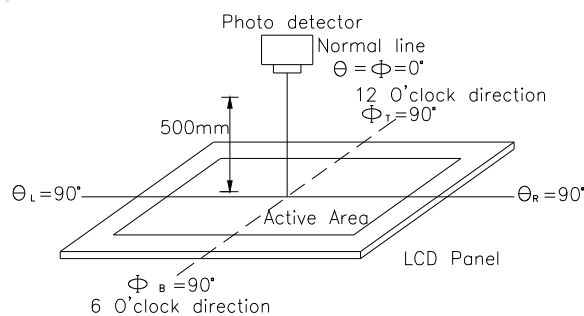
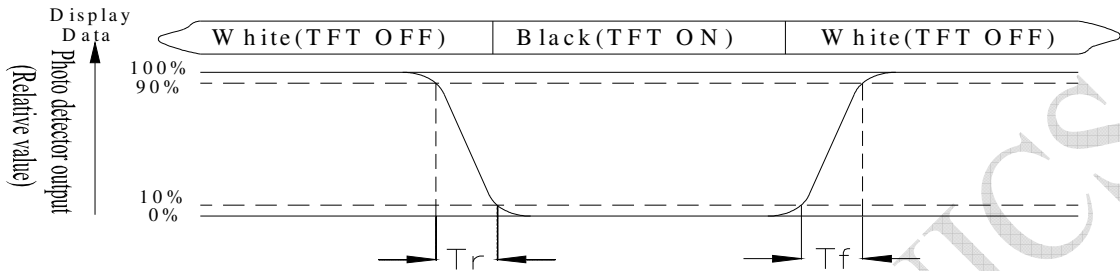


Fig. 11.2. Optical measurement system setup

Note 3: Definition of Response time:

The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time,  $T_r$ , is the time between photo detector output intensity changed from 90% to 10%. And fall time,  $T_f$ , is the time between photo detector output intensity changed from 10% to 90%



Note 4: Definition of contrast ratio:

The contrast ratio is defined as the following expression.

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note 5: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (reference the picture in below). Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity (U)} = \text{Lmin/Lmax} \times 100\%$$

L = Active area length

W = Active area width

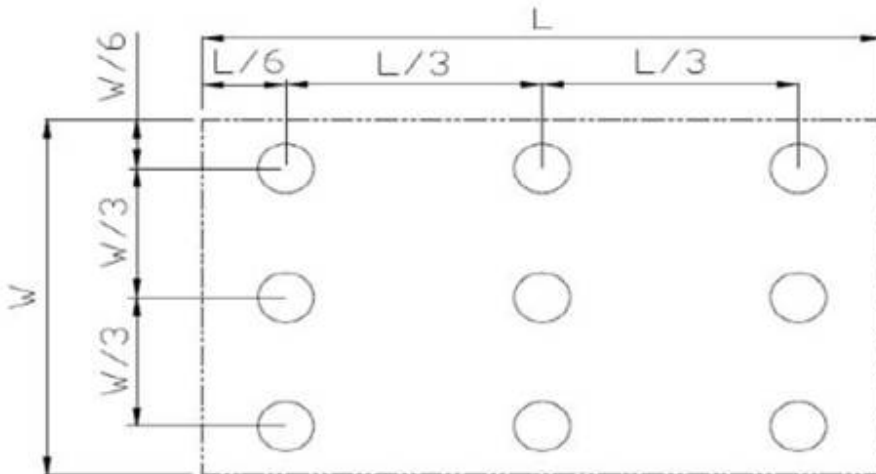
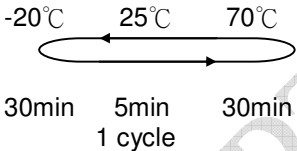


Fig11.3. . Definition of uniformity

Note 6: Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

## 12. Reliability

Content of Reliability Test (Wide temperature, -20°C~70°C)

| Environmental Test                      |  |  |      |
|---|--|--|------|
| Test Item                               | Content of Test  | Test Condition   | Note |
| High Temperature storage                | Endurance test applying the high storage temperature for a long time.  | 80°C<br>200hrs   | 2    |
| Low Temperature storage                 | Endurance test applying the low storage temperature for a long time.   | -30°C<br>200hrs  | 1,2  |
| High Temperature Operation              | Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.   | 70°C<br>200hrs   | —    |
| Low Temperature Operation               | Endurance test applying the electric stress under low temperature for a long time.   | -20°C<br>200hrs  | 1    |
| High Temperature/<br>Humidity Operation | The module should be allowed to stand at 60°C,90%RH max  | 60°C,90%RH<br>96hrs  | 1,2  |
| Thermal shock resistance                | The sample should be allowed stand the following 10 cycles of operation<br><br><div style="text-align: center;">  <p>-20°C      25°C      70°C</p> <p>30min    5min    30min</p> <p>1 cycle</p> </div> | -20°C/70°C<br>10 cycles  | —    |
| Vibration test                          | Endurance test applying the vibration during transportation and using.   | Total fixed amplitude : 3<br>1.5mm<br>Vibration Frequency :<br>10~55Hz<br>One cycle 60<br>seconds to 3<br>directions of X,Y,Z for<br>Each 15 minutes | 3    |
| Static electricity test                 | Endurance test applying the electric stress to the terminal.   | VS=±600V(contact)<br>,±800v(air),<br>RS=330Ω<br>CS=150pF<br>10 times   | —    |

Note1: No dew condensation to be observed.

Note2: The function test shall be conducted after 4 hours storage at the normal Temperature and humidity after remove from the test chamber.

Note3: The packing have to including into the vibration testing.

## 13.Initial Code For Reference

```
void Initial_code()
{
    Write_Command(0xae);
    Write_Data(0xa5);

    Write_Command(0x61);
    Write_Data(0x8f);
    Write_Data(0x04);
    Write_Data(0xa5);
    Write_Data(0xa5);

    Write_Command(0x62);
    Write_Data(0x36);
    Write_Data(0x0b);
    Write_Data(0x0b);
    Write_Data(0xa5);

    Write_Command(0x33);
    Write_Data(0x07);
    Write_Data(0x2c);
    Write_Data(0x09);
    Write_Data(0x2a);

    Write_Command(0x63);
    Write_Data(0x09);
    Write_Data(0x17);
    Write_Data(0xa5);
    Write_Data(0xa5);

    Write_Command(0x91);
    Write_Data(0x00);
    Write_Data(0x16);
    Write_Data(0x1B);
    Write_Data(0x1C);
    Write_Command(0x92);
    Write_Data(0x1E);
    Write_Data(0x1F);
    Write_Data(0x20);
    Write_Data(0x21);
    Write_Command(0x93);
    Write_Data(0x23);
    Write_Data(0x24);
    Write_Data(0x26);
    Write_Data(0x28);
    Write_Command(0x94);
    Write_Data(0x2B);
    Write_Data(0x2F);
}
```

```
Write_Data(0x34);  
Write_Data(0x3f);  
Write_Command(0x99);  
Write_Data(0x00);  
Write_Data(0x16);  
Write_Data(0x1B);  
Write_Data(0x1C);  
Write_Command(0x9a);  
Write_Data(0x1E);  
Write_Data(0x1F);  
Write_Data(0x20);  
Write_Data(0x21);  
Write_Command(0x9b);  
Write_Data(0x23);  
Write_Data(0x24);  
Write_Data(0x26);  
Write_Data(0x28);  
Write_Command(0x9c);  
Write_Data(0x2B);  
Write_Data(0x2F);  
Write_Data(0x34);  
Write_Data(0x3F);
```

```
Write_Command(0x12);  
Write_Data(0xa5);
```

```
Write_Command(0x24);  
Write_Data(0x01);  
Write_Data(0xa5);  
Write_Data(0xa5);  
Write_Data(0xa5);
```

```
Write_Command(0x22);  
Write_Data(0x00);  
Write_Data(0xa5);  
Write_Data(0xa5);  
Write_Data(0xa5);
```

```
Write_Command(0x15);  
Write_Data(0xa5);
```

```
_nop_();
```

```
}
```

**LCM Sample Estimate Feedback Sheet**

**Module Number :** \_\_\_\_\_

**1 、 Panel Specification :**

|                            |                               |                                     |
|----------------------------|-------------------------------|-------------------------------------|
| 1. Panel Type :            | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 2. View Direction :        | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 3. Numbers of Dots :       | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 4. View Area :             | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 5. Active Area :           | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 6. Operating Temperature : | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 7. Storage Temperature :   | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 8. Others :                | _____                         |                                     |

**2 、 Mechanical Specification :**

|                             |                               |                                     |
|-----------------------------|-------------------------------|-------------------------------------|
| 1. PCB Size :               | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 2. Frame Size :             | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 3. Material of Frame :      | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 4. Connector Position :     | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 5. Fix Hole Position :      | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 6. Backlight Position :     | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 7. Thickness of PCB :       | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 8. Height of Frame to PCB : | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 9. Height of Module :       | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 10. Others :                | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |

**3 、 Relative Hole Size :**

|                             |                               |                                     |
|-----------------------------|-------------------------------|-------------------------------------|
| 1. Pitch of Connector :     | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 2. Hole size of Connector : | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 3. Mounting Hole size :     | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 4. Mounting Hole Type :     | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 5. Others :                 | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |

**4 、 Backlight Specification :**

|   |                               |                                     |
|---|-------------------------------|-------------------------------------|
| 1. B/L Type :                                     | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 2. B/L Color :                                    | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 3. B/L Driving Voltage (Reference for LED Type) : | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 4. B/L Driving Current :                          | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 5. Brightness of B/L :                            | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 6. B/L Solder Method :                            | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 7. Others :                                       | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |

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|  |                               |                                     |
|--|-------------------------------|-------------------------------------|
| <b>Module Number :</b> _____   |                               |                                     |
| <b>5 · <u>Electronic Characteristics of Module</u> :</b>   |                               |                                     |
| 1.Input Voltage :  | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 2.Supply Current :   | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 3.Driving Voltage for LCD :  | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 4.Contrast for LCD :   | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 5.B/L Driving Method :   | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 6.Negative Voltage Output :  | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 7.Interface Function :   | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 8.LCD Uniformity :   | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 9.ESD test :   | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 10.Others :  | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| <b>6 · <u>Summary</u> :</b>  |                               |                                     |
| <p style="text-align: right;"> <b>Sales signature :</b> _____<br/> <b>Customer Signature :</b> _____      <b>Date :</b>   /   / _____         </p> |                               |                                     |