



**WINSTAR Display Co.,Ltd.**  
**華凌光電股份有限公司**



# Winstar Display Co., LTD

## 華凌光電股份有限公司



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### SPECIFICATION

**CUSTOMER :** \_\_\_\_\_

**MODULE NO.:** WF43GTIBEDBT0#

|  |  |
|--|--|
| <p><b>APPROVED BY:</b><br/>( FOR CUSTOMER USE ONLY )</p> | <p><b>PCB VERSION:</b> _____</p> <p><b>DATA:</b> _____</p> |
|--|--|

| SALES BY                       | APPROVED BY | CHECKED BY | PREPARED BY |
|--------------------------------|-------------|------------|-------------|
|                                |             |            | 葉虹蘭         |
| <b>ISSUED DATE: 2017/01/24</b> |             |            |             |

**RECORDS OF REVISION**

DOC. FIRST ISSUE

| VERSION | DATE       | REVISED PAGE NO. | SUMMARY   |
|---------|------------|------------------|---|
| 0       | 2013/11/04 |                  | First issue   |
| A       | 2013/11/26 |                  | Modify the brightness specifications                                |
| B       | 2014/04/09 |                  | Modify Package Specification.                                       |
| C       | 2015/03/31 |                  | Add size, Surface & Resistance Touch Panel General Specifications.. |
| D       | 2015/04/27 |                  | Modify Pixel Data Format & Block Diagram.                           |
| E       | 2015/04/27 |                  | Modify Reliability.   |
| F       | 2016/01/21 |                  | Modify Static electricity test                                      |
| G       | 2016/08/10 |                  | Modify Vibration test.  |
| H       | 2016/10/04 |                  | Modify Summary.   |
|         | 2017/01/24 |                  | Modify tape.  |

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# 1.Module Classification Information

W F 43 G T I B E D B T O #  
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬

|   |   |   |   |         |   |  |   |         |   |         |   |         |
|---|---|---|---|---------|---|--|---|---------|---|---------|---|---------|
| ① | Brand : WINSTAR DISPLAY CORPORATION   |   |   |         |   |  |   |         |   |         |   |         |
| ② | Display Type : F→TFT Type, J→Custom TFT   |   |   |         |   |  |   |         |   |         |   |         |
| ③ | Display Size : 4.3" TFT   |   |   |         |   |  |   |         |   |         |   |         |
| ④ | Model serials no.   |   |   |         |   |  |   |         |   |         |   |         |
| ⑤ | Backlight Type :  | F→CCFL, White<br>S→LED, High Light White  |   |         |   | T→LED, White<br>Z→Nichia LED, White  |   |         |   |         |   |         |
| ⑥ | LCD Polarize Type/<br>Temperature range/<br>Gray Scale Inversion<br>Direction   | A→Transmissive, N.T, IPS TFT<br>C→Transmissive, N. T, 6:00 ;<br>F→Transmissive, N.T,12:00 ;<br>I→Transmissive, W. T, 6:00<br>K→Transflective, W.T,12:00<br>L→Transmissive, W.T,12:00<br>N→Transmissive, Super W.T, 6:00 |   |         |   | Q→Transmissive, Super W.T, 12:00<br>R→Transmissive, Super W.T, O-TFT<br>V→Transmissive, Super W.T, VA TFT<br>X→Transmissive, W.T, VA TFT<br>Y→Transmissive, W.T, IPS TFT<br>Z→Transmissive, W.T, O-TFT |   |         |   |         |   |         |
| ⑦ | A : TFT LCD<br>B : TFT+FR+CONTROL BOARD<br>C : TFT+FR+A/D BOARD<br>D : TFT+FR+A/D BOARD+CONTROL BOARD<br>E : TFT+FR+POWER BOARD |   |   |         |   | F : TFT+CONTROL BOARD<br>G : TFT+FR<br>H : TFT+D/V BOARD<br>I : TFT+FR+D/V BOARD<br>J : TFT+POWER BD   |   |         |   |         |   |         |
| ⑧ | Resolution:   |   |   |         |   |  |   |         |   |         |   |         |
|   | A   | 128160  | B | 320234  | C | 320240   | D | 480234  | E | 480272  | F | 640480  |
|   | G   | 800480  | H | 1024600 | I | 320480   | J | 240320  | K | 800600  | L | 240400  |
|   | M   | 1024768   | N | 128128  | P | 1280800  | Q | 480800  | R | 640320  | S | 480128  |
|   | T   | 800320  | U | 8001280 | V | 176220   | W | 1280398 | X | 1024250 | Y | 1920720 |
|   | Z   | 800200  | 2 | 1024324 | 3 | 7201280  |   |         |   |         |   |         |
| ⑨ | D: Digital L : LVDS M:MIPI  |   |   |         |   |  |   |         |   |         |   |         |
| ⑩ | Interface : N:without control board A:8Bit B:16Bit H: HDMI I:I2C Interface<br>R:RS232 S:SPI Interface U:USB                     |   |   |         |   |  |   |         |   |         |   |         |
| ⑪ | TS : N : Without TS T : resistive touch panel C : capacitive touch panel (G-F-F)<br>G : capacitive touch panel(G-G)             |   |   |         |   |  |   |         |   |         |   |         |
| ⑫ | Version   |   |   |         |   |  |   |         |   |         |   |         |
| ⑬ | Special Code  | #:Fit in with ROHS directive regulations  |   |         |   |  |   |         |   |         |   |         |

## **2.Summary**

TFT 4.3" is a TN transmissive type color active matrix TFT liquid crystal display that use amorphous silicon TFT as switching devices. This module is a composed of a TFT\_LCD module, It is usually designed for indusrial application and this module follows RoHs,

### **3. General Specifications**

| <b>Item</b>                    | <b>Dimension</b>                  | <b>Unit</b> |
|--------------------------------|-----------------------------------|-------------|
| Size                           | 4.3                               | inch        |
| Dot Matrix                     | 480 x RGBx272(TFT)                | dots        |
| Module dimension               | 106.7 x 83.98 x 8.2               | mm          |
| Active area                    | 95.04 x 53.856                    | mm          |
| Dot pitch                      | 0.066 x 0.198                     | mm          |
| LCD type                       | TFT, Normally White, Transmissive |             |
| View Direction                 | 12 o'clock                        |             |
| Gray Scale Inversion Direction | 6 o'clock                         |             |
| Backlight Type                 | LED, Normally White               |             |
| Controller IC                  | SSD1963                           |             |
| Interface                      | Digital 8080 family MPU           |             |
| With /Without TP               | With RTP                          |             |
| Surface                        | Anti-Glare                        |             |

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

## 4. 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

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



# 5. Electrical Characteristics

## 5.1. Operating conditions:

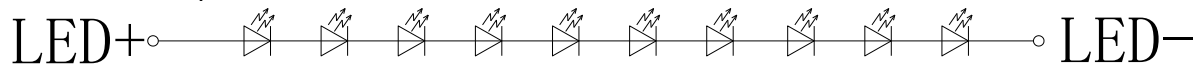
| Item                   | Symbol | Condition | Min | Typ | Max | Unit | Remark |
|------------------------|--------|-----------|-----|-----|-----|------|--------|
| Supply Voltage For LCM | VDD    | —         | 3.0 | 3.3 | 3.5 | V    |        |
| Supply Current For LCM | IDD    | —         | —   | 200 | 300 | mA   | Note1  |

Note1: This value is test for VDD=3.3V , Ta=25 °C only

## 5.2. LED driving conditions

| Parameter         | Symbol | Min. | Typ.   | Max. | Unit | Remark     |
|-------------------|--------|------|--------|------|------|------------|
| LED current       | -      | -    | 20     | -    | mA   | -          |
| Power Consumption | -      | 600  | 640    | 680  | mW   | -          |
| LED voltage       | VBL+   | 30   | 32     | 34   | V    | Note 1     |
| LED Life Time     | -      | -    | 50,000 | -    | Hr   | Note 2,3,4 |

Note 1 : There are 1 Groups LED



Note 2 : Ta = 25 °C

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

Note 4 : The single LED lamp case

## 6.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    |           |

# 7. Interface timing

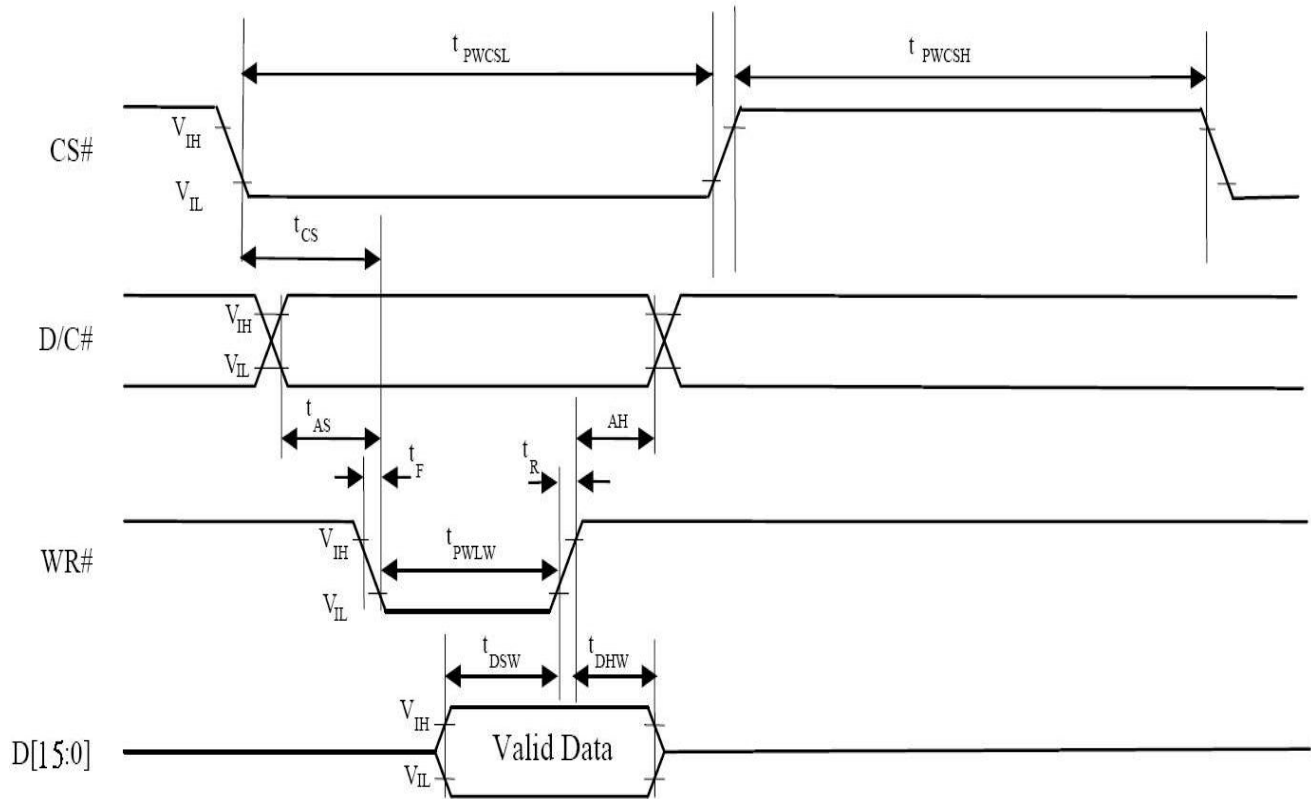
## 7.1. 8080 Mode

The 8080 mode MCU interface consist of CS#, D/C#, RD#, WR#, Data Bus and TE signals (Please refer to Table 6-1 for pin multiplexed with 6800 mode). This interface use WR# to define a write cycle and RD# for read cycle. If the WR# goes low when the CS# signal is low, the data or command will be latched into the system at the rising edge of WR#. Similarly, the read cycle will start when RD# goes low and end at the rising edge of RD#.

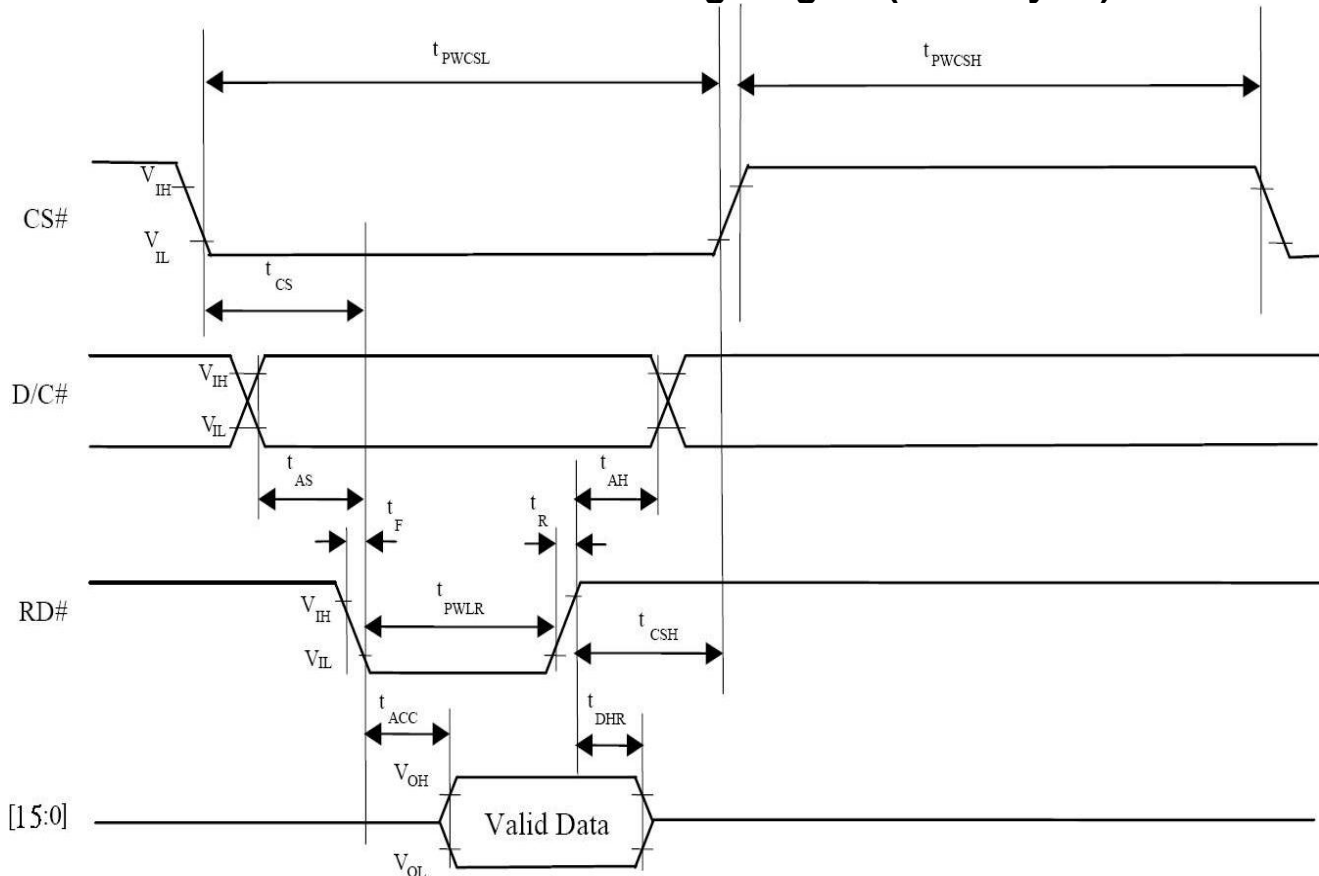
## 7.2. 8080 Mode Write Cycle

| Symbol | Parameter                            | Min                      | Typ | Max                                | Unit |    |
|--------|--------------------------------------|--------------------------|-----|------------------------------------|------|----|
| fMCLK  | System Clock Frequency               | 1                        | -   | 110                                | MHz  |    |
| tMCLK  | System Clock Period                  | 1/ fMCLK                 | -   | -                                  | ns   |    |
| tPWCSH | Control Pulse High Width             | Write                    | 13  | 1.5* tMCLK<br>3.5* tMCLK           | -    | ns |
|        |                                      | Read                     | 30  |                                    |      |    |
| tPWCSL | Control Pulse Low Width              | Write (next write cycle) | 13  | 1.5* tMCLK<br>9* tMCLK<br>9* tMCLK | -    | ns |
|        |                                      | Write (next read cycle)  | 80  |                                    |      |    |
|        |                                      | Read                     | 80  |                                    |      |    |
| tAS    | Address Setup Time                   | 1                        | -   | -                                  | ns   |    |
| tAH    | Address Hold Time                    | 2                        | -   | -                                  | ns   |    |
| tDSW   | Write Data Setup Time                | 4                        |     |                                    | ns   |    |
| tDHW   | Write Data Hold Time                 | 1                        | -   | -                                  | ns   |    |
| tPWLW  | Write Low Time                       | 12                       |     |                                    | ns   |    |
| tDHR   | Read Data Hold Time                  | 1                        | -   | -                                  | ns   |    |
| tACC   | Access Time                          | 32                       |     |                                    | ns   |    |
| tPWLR  | Read Low Time                        | 36                       | -   | -                                  | ns   |    |
| tR     | Rise Time                            | -                        |     | 0.5                                | ns   |    |
| tF     | Fall Time                            | -                        | -   | 0.5                                | ns   |    |
| tCS    | Chip select setup time               | 2                        | -   | -                                  | ns   |    |
| tCSH   | Chip select hold time to read signal | 3                        | -   | -                                  | ns   |    |

### 7.3. Parallel 8080-series Interface Timing Diagram(Write Cycle)



### 7.4. Parallel 8080-series Interface Timing Diagram(Read Cycle)



### 7.5. Pixel Data Format

| Interface            | Cycle           | D[15] | D[14] | D[13] | D[12] | D[11] | D[10] | D[9] | D[8] | D[7] | D[6] | D[5] | D[4] | D[3] | D[2] | D[1] | D[0] |
|----------------------|-----------------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|------|------|------|------|------|
| 16 bits (565 format) | 1 <sup>st</sup> | R5    | R4    | R3    | R2    | R1    | G5    | G4   | G3   | G2   | G1   | G0   | B5   | B4   | B3   | B2   | B1   |
| 16 bits              | 1 <sup>st</sup> | R7    | R6    | R5    | R4    | R3    | R2    | R1   | R0   | G7   | G6   | G5   | G4   | G3   | G2   | G1   | G0   |
|                      | 2 <sup>nd</sup> | B7    | B6    | B5    | B4    | B3    | B2    | B1   | B0   | R7   | R6   | R5   | R4   | R3   | R2   | R1   | R0   |
|                      | 3 <sup>rd</sup> | G7    | G6    | G5    | G4    | G3    | G2    | G1   | G0   | B7   | B6   | B5   | B4   | B3   | B2   | B1   | B0   |
| 8 bits               | 1 <sup>st</sup> |       |       |       |       |       |       |      |      | R7   | R6   | R5   | R4   | R3   | R2   | R1   | R0   |
|                      | 2 <sup>nd</sup> |       |       |       |       |       |       |      |      | G7   | G6   | G5   | G4   | G3   | G2   | G1   | G0   |
|                      | 3 <sup>rd</sup> |       |       |       |       |       |       |      |      | B7   | B6   | B5   | B4   | B3   | B2   | B1   | B0   |

# 8. Optical Characteristics

| Item  | Symbol | Condition.                     | Min                            | Typ. | Max. | Unit              | Remark            |          |
|---|--------|--------------------------------|--------------------------------|------|------|-------------------|-------------------|----------|
| Response time                                     | Tr     | $\theta=0^\circ, \Phi=0^\circ$ | -                              | 10   | 20   | ms                | Note 3            |          |
|   | Tf     |                                | -                              | 15   | 30   | ms                |                   |          |
| Contrast ratio                                    | CR     | At optimized viewing angle     | 400                            | 500  | -    | -                 | Note 4            |          |
| Color Chromaticity                                | White  | Wx                             | $\theta=0^\circ, \Phi=0^\circ$ | 0.26 | 0.31 | 0.36              | -                 | Note 2,5 |
|   |        | Wy                             |                                | 0.28 | 0.33 | 0.38              | -                 |          |
| Viewing angle<br>(Gray Scale Inversion Direction) | Hor.   | $\Theta_R$                     | $CR \geq 10$                   | 60   | 70   | -                 | Deg.              | Note 1   |
|   |        | $\Theta_L$                     |                                | 60   | 70   | -                 |                   |          |
|   | Ver.   | $\Phi_T$                       |                                | 40   | 50   | -                 |                   |          |
|   |        | $\Phi_B$                       |                                | 60   | 70   | -                 |                   |          |
| Brightness  | -      | -                              | 280                            | 350  | -    | cd/m <sup>2</sup> | Center of display |          |

Ta=25±2°C, IL=20mA

Note 1: Definition of viewing angle range

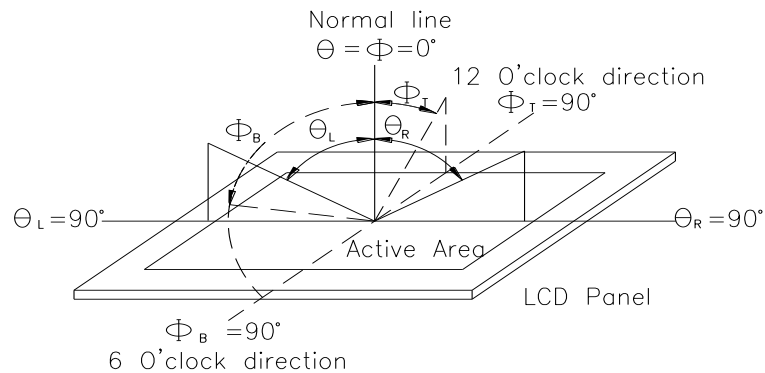


Fig. 8.1. Definition of viewing angle

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-7 or BM-5 luminance meter 1.0° field of view at a distance of 50cm and normal direction.

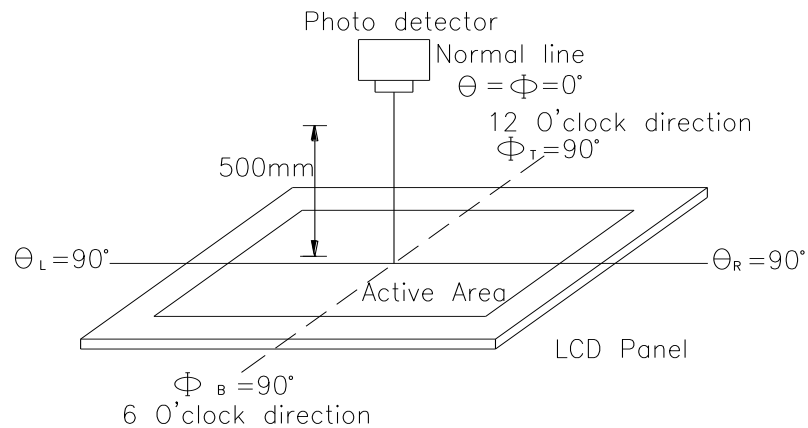
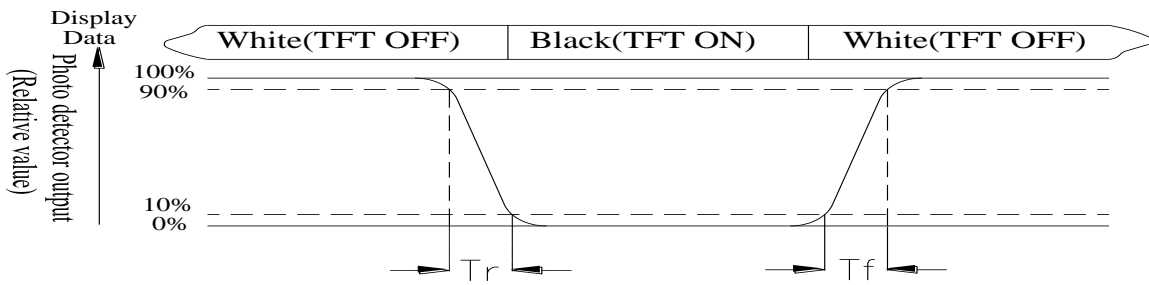


Fig. 8.2. Optical measurement system setup

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: White  $V_i = V_{i50} \pm 1.5V$

Black  $V_i = V_{i50} \pm 2.0V$

" $\pm$ " means that the analog input signal swings in phase with VCOM signal.

" $\pm$ " means that the analog input signal swings out of phase with VCOM signal.

The 100% transmission is defined as the transmission of LCD panel when all the input terminals of module are electrically opened.

Note 6: Definition of color chromaticity (CIE 1931)

Color coordinates measured at the center point of LCD

Note 7: Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

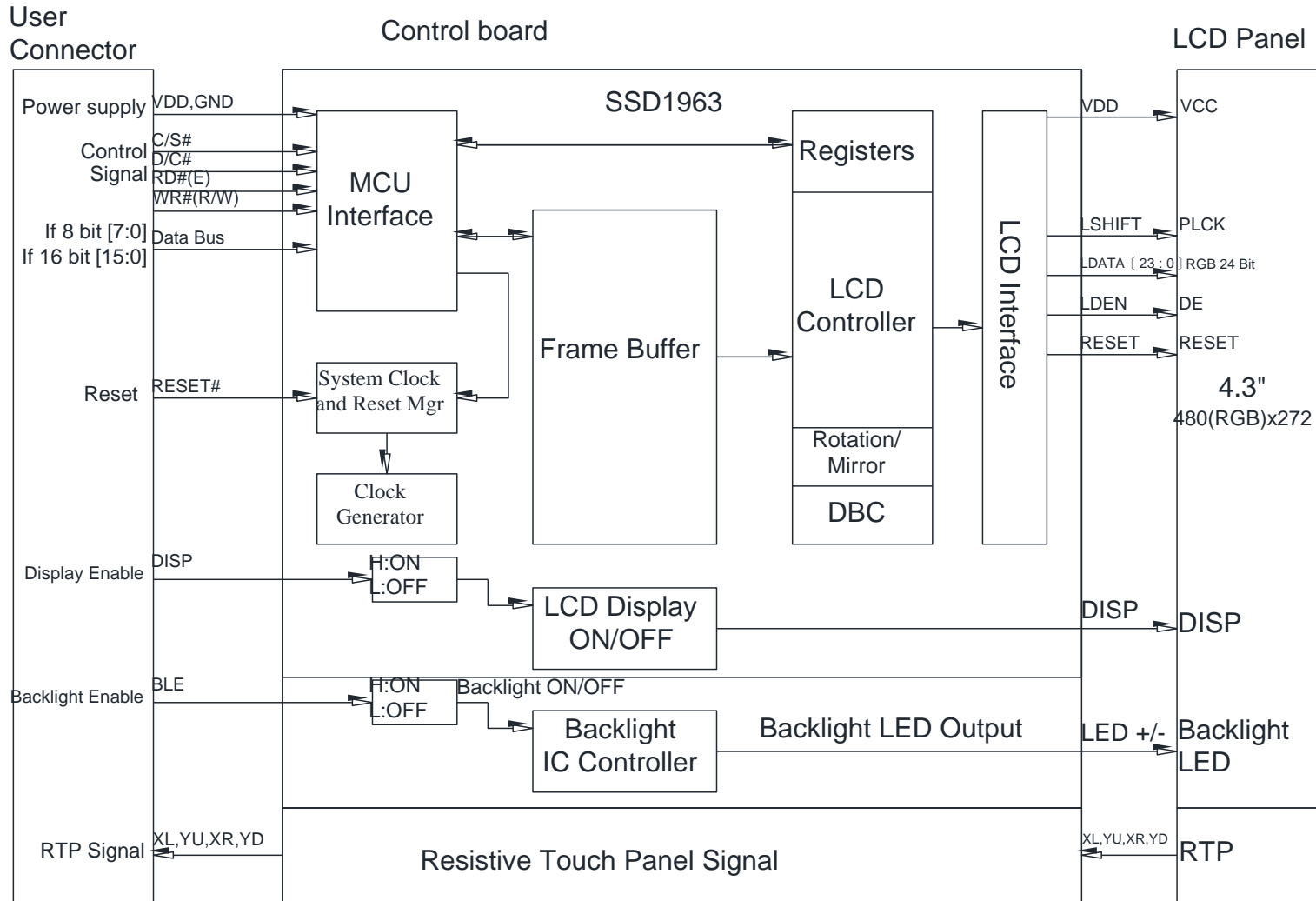
# 9. Interface

## 9.1. LCM PIN Definition

| Pin  | Symbol | Function                                   | Remark |
|------|--------|--|--------|
| 1    | GND-   | Power ground                               |        |
| 1    | VDD    | Power Supply                               |        |
| 3    | BL_E   | Enable to light the Backlight              |        |
| 4    | D/C    | Data/Command select                        |        |
| 5    | WR     | write strobe signal                        |        |
| 6    | RD     | read strobe signal                         |        |
| 7-22 | D0-D15 | Data bus. Pins not used should be floating |        |
| 23   | NC     | No connection                              |        |
| 24   | NC     | No connection                              |        |
| 25   | CS     | Chip select                                |        |
| 26   | RST    | Master synchronize reset                   |        |
| 27   | NC     | No connection                              |        |
| 28   | XR     | Right electrode                            |        |
| 29   | YD     | Bottom electrode                           |        |
| 30   | XL     | Left electrode                             |        |
| 31   | YU     | Top electrode                              |        |
| 32   | DIP_ON | Display on/off                             |        |

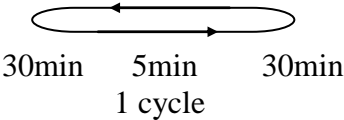


# 10. Block Diagram



# 11. Reliability

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

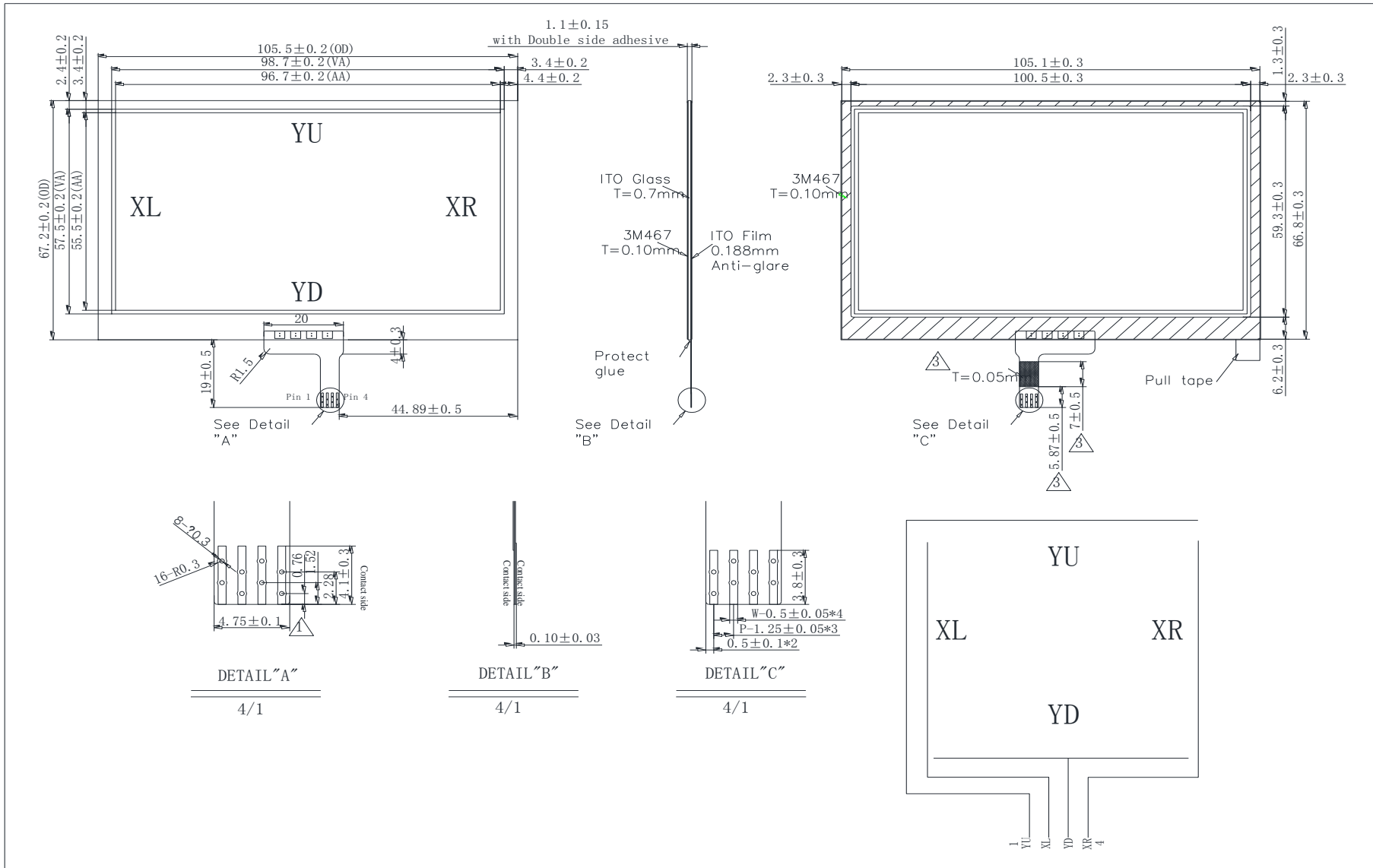
| Environmental Test                   |   |   |      |
|--------------------------------------|---|---|------|
| Test Item                            | Content of Test   | Test Condition  | Note |
| High Temperature storage             | Endurance test applying the high storage temperature for a long 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/ 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             | <p>The sample should be allowed stand the following 10 cycles of operation</p> <p style="text-align: center;">-20°C    25°C    70°C</p>  <p style="text-align: center;">30min    5min    30min</p> <p style="text-align: center;">1 cycle</p> | -20°C /70°C<br>10 cycles  | —    |
| Vibration test                       | Endurance test applying the vibration during transportation and using.  | Total fixed amplitude : 1.5mm<br>Vibration Frequency : 10~55Hz<br>One cycle 60 seconds to 3 directions of X,Y,Z for 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.

# 12.Touch Panel Information



### 12.1. Resistance Touch Panel General Specifications

| Item  | Description                 |
|---|-----------------------------|
| Driving condition                                   | DC5V                        |
| Operating force                                     | 60~150g                     |
| Linearity max                                       | $\leq \pm 1.5\%$            |
| Insulating resistance                               | $> 20M\Omega \cdot 25V(DC)$ |
| Light transparence                                  | 70%                         |
| Structure type                                      | ITO Film/ITO Glass(F/G)     |
| Surface Hardness                                    | 3H typ                      |
| Pen Hitting Durability<br>(with the silicon rubber) | $> 1000,000$ times          |
| X resistance  | 200~1200 $\Omega$           |
| Yresistance   | 200~900 $\Omega$            |



# 14.Initial Code For Reference

```
void Initial_SSD1963()
{

    Write_Command(0x01);
    Delay_ms(10);
    Write_Command(0xe0);
    Write_Parameter(0x01);
    Delay_ms(5);
    Write_Command(0xe0);
    Write_Parameter(0x03);
    Delay_ms(5);

    Write_Command(0xb0);
    Write_Parameter(0x08);
    Write_Parameter(0x80);
    Write_Parameter(0x01);
    Write_Parameter(0xdf);
    Write_Parameter(0x01);
    Write_Parameter(0x0f);
    Write_Parameter(0x00);

    Write_Command(0xf0);
    Write_Parameter(0x00);

    Write_Command(0x3a);
    Write_Parameter(0x50);

    Write_Command(0xe2);
    Write_Parameter(0x1d);
    Write_Parameter(0x02);
    Write_Parameter(0x54);

    Write_Command(0xe6);
    Write_Parameter(0x01);
    Write_Parameter(0x33);
    Write_Parameter(0x33);

    Write_Command(0xb4);
    Write_Parameter(0x02);
    Write_Parameter(0x0d);
    Write_Parameter(0x00);
    Write_Parameter(0x1d);
    Write_Parameter(0x00);
    Write_Parameter(0x00);
    Write_Parameter(0x00);
```

**Write\_Parameter(0x00);**

**Write\_Command(0xb6);**

**Write\_Parameter(0x01);**

**Write\_Parameter(0x20);**

**Write\_Parameter(0x00);**

**Write\_Parameter(0x10);**

**Write\_Parameter(0x00);**

**Write\_Parameter(0x00);**

**Write\_Parameter(0x00);**

**Write\_Command(0x2a);**

**Write\_Parameter(0x00);**

**Write\_Parameter(0x00);**

**Write\_Parameter(0x01);**

**Write\_Parameter(0xdf);**

**Write\_Command(0x2b);**

**Write\_Parameter(0x00);**

**Write\_Parameter(0x00);**

**Write\_Parameter(0x01);**

**Write\_Parameter(0x0f);**

**Write\_Command(0x29);**

**Write\_Command(0x2c);**

**}**



# LCM Sample Estimate Feedback Sheet

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

Page: 1

## 1、Panel Specification :

- 1. Panel Type :  Pass  NG , \_\_\_\_\_
- 2. View Direction :  Pass  NG , \_\_\_\_\_
- 3. Numbers of Dots :  Pass  NG , \_\_\_\_\_
- 4. View Area :  Pass  NG , \_\_\_\_\_
- 5. Active Area :  Pass  NG , \_\_\_\_\_
- 6. Operating Temperature :  Pass  NG , \_\_\_\_\_
- 7. Storage Temperature :  Pass  NG , \_\_\_\_\_
- 8. Others : \_\_\_\_\_

## 2、Mechanical Specification :

- 1. PCB Size :  Pass  NG , \_\_\_\_\_
- 2. Frame Size :  Pass  NG , \_\_\_\_\_
- 3. Material of Frame :  Pass  NG , \_\_\_\_\_
- 4. Connector Position :  Pass  NG , \_\_\_\_\_
- 5. Fix Hole Position :  Pass  NG , \_\_\_\_\_
- 6. Backlight Position :  Pass  NG , \_\_\_\_\_
- 7. Thickness of PCB :  Pass  NG , \_\_\_\_\_
- 8. Height of Frame to PCB :  Pass  NG , \_\_\_\_\_
- 9. Height of Module :  Pass  NG , \_\_\_\_\_
- 10. Others :  Pass  NG , \_\_\_\_\_

## 3、Relative Hole Size :

- 1. Pitch of Connector :  Pass  NG , \_\_\_\_\_
- 2. Hole size of Connector :  Pass  NG , \_\_\_\_\_
- 3. Mounting Hole size :  Pass  NG , \_\_\_\_\_
- 4. Mounting Hole Type :  Pass  NG , \_\_\_\_\_
- 5. Others :  Pass  NG , \_\_\_\_\_

## 4、Backlight Specification :

- 1. B/L Type :  Pass  NG , \_\_\_\_\_
- 2. B/L Color :  Pass  NG , \_\_\_\_\_
- 3. B/L Driving Voltage (Reference for LED Type) :  Pass  NG , \_\_\_\_\_
- 4. B/L Driving Current :  Pass  NG , \_\_\_\_\_
- 5. Brightness of B/L :  Pass  NG , \_\_\_\_\_
- 6. B/L Solder Method :  Pass  NG , \_\_\_\_\_
- 7. Others :  Pass  NG , \_\_\_\_\_

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winstar

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

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**5、Electronic Characteristics of Module :**

- |                              |                               |                                     |
|------------------------------|-------------------------------|-------------------------------------|
| 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 , _____ |

**6、Summary :**

Sales signature : \_\_\_\_\_

Customer Signature : \_\_\_\_\_

Date : \_\_\_\_ / \_\_\_\_ / \_\_\_\_