



**RAYSTAR**

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## RFF70VG-1IW-DHS

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### SPECIFICATION

CUSTOMER:

|             |  |
|-------------|--|
| APPROVED BY |  |
| PCB VERSION |  |
| DATE        |  |

FOR CUSTOMER USE ONLY

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

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<br>A  | 2019/08/16<br>2019/10/22 |                  | First issue<br>Modify Electrical<br>Characteristics<br>(Note2) |

# Contents

1.Module Classification Information

2.Summary

3.General Specification

4.Interface

5.Contour Drawing

6.Absolute Maximum Ratings

7.Electrical Characteristics

8.Optical Characteristics

9.Reliability

10.Touch Panel Information

11.Other

# 1.Module Classification Information

|          |          |          |           |           |          |          |          |          |          |          |          |          |
|----------|----------|----------|-----------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|
| <b>R</b> | <b>F</b> | <b>F</b> | <b>70</b> | <b>VG</b> | <b>-</b> | <b>1</b> | <b>I</b> | <b>W</b> | <b>-</b> | <b>D</b> | <b>H</b> | <b>S</b> |
| 1        | 2        | 3        | 4         | 5         | -        | 6        | 7        | 8        | -        | 9        | 10       | 11       |

| Item | Description                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                        |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | R : Raystar Optonics 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 : 7.0" 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<br>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)                                                                                                                                                                                                                            |

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## 2.Summary

TFT 7.0" is a TN transmissive type color active matrix TFT liquid crystal display that uses amorphous silicon TFT as switching devices. This module is composed of a TFT\_LCD module. It is usually designed for industrial application and this module follows RoHS.

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### 3.General Specifications

- Size: 7.0 inch
- Dot Matrix: 800 x RGBx480(TFT) dots
- Module dimension: 165.0(W) x 100(H) x 26.4(D) mm
- Active area: 154.08 x 85.92 mm
- Dot pitch: 0.0642 x 0.179 mm
- LCD type: TFT, Normally White, Transmissive
- View Direction: 12 o'clock
- Gray Scale Inversion Direction: 6 o'clock
- Aspect Ratio: 16:9
- Controller IC: TFP401 or equivalent
- Backlight Type: LED, Normally White
- TFT Interface: HDMI
- RTP Interface: USB
- With /Without TP: With RTP
- Surface: Anti-Glare

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

## 4.Interface

### 4.1. LCM PIN Definition(CON6)

| Pin | Symbol | Function                               | Remark |
|-----|--------|----------------------------------------|--------|
| 1   | NC     | No connection                          |        |
| 2   | 5V     | Raspberry Pi:Power 5V                  |        |
| 3   | GPIO02 | Raspberry Pi:GPIO02                    |        |
| 4   | 5V     | Raspberry Pi:Power 5V                  |        |
| 5   | GPIO03 | Raspberry Pi:GPIO03                    |        |
| 6   | GND    | Raspberry Pi:GND                       |        |
| 7   | GPIO04 | Raspberry Pi:GPIO04                    |        |
| 8   | GPIO14 | Raspberry Pi:GPIO14                    |        |
| 9   | GND    | Raspberry Pi:GND                       |        |
| 10  | GPIO15 | Raspberry Pi:GPIO15                    |        |
| 11  | GPIO17 | Raspberry Pi:GPIO17                    |        |
| 12  | GPIO18 | Raspberry Pi:GPIO18 (Backlight Enable) |        |
| 13  | GPIO27 | Raspberry Pi:GPIO27                    |        |
| 14  | GND    | Raspberry Pi:GND                       |        |
| 15  | GPIO22 | Raspberry Pi:GPIO22                    |        |
| 16  | GPIO23 | Raspberry Pi:GPIO23                    |        |
| 17  | NC     | No connection                          |        |
| 18  | GPIO24 | Raspberry Pi:GPIO24                    |        |
| 19  | GPIO10 | Raspberry Pi:GPIO10                    |        |
| 20  | GND    | Raspberry Pi:GND                       |        |
| 21  | GPIO09 | Raspberry Pi:GPIO09                    |        |
| 22  | GPIO25 | Raspberry Pi:GPIO25                    |        |
| 23  | GPIO11 | Raspberry Pi:GPIO11                    |        |
| 24  | GPIO08 | Raspberry Pi:GPIO08                    |        |
| 25  | GND    | Raspberry Pi:GND                       |        |
| 26  | GPIO07 | Raspberry Pi:GPIO07                    |        |
| 27  | ID_SD  | Raspberry Pi:ID_SD                     |        |
| 28  | ID_SC  | Raspberry Pi:ID_SC                     |        |
| 29  | GPIO05 | Raspberry Pi:GPIO05                    |        |

|    |        |                     |  |
|----|--------|---------------------|--|
| 30 | GND    | Raspberry Pi:GND    |  |
| 31 | GPIO06 | Raspberry Pi:GPIO06 |  |
| 32 | GPIO12 | Raspberry Pi:GPIO12 |  |
| 33 | GPIO13 | Raspberry Pi:GPIO13 |  |
| 34 | GND    | Raspberry Pi:GND    |  |
| 35 | GPIO19 | Raspberry Pi:GPIO19 |  |
| 36 | GPIO16 | Raspberry Pi:GPIO16 |  |
| 37 | GPIO26 | Raspberry Pi:GPIO26 |  |
| 38 | GPIO20 | Raspberry Pi:GPIO20 |  |
| 39 | GND    | Raspberry Pi:GND    |  |
| 40 | GPIO21 | Raspberry Pi:GPIO21 |  |

#### 4.2. LCM PIN Definition (CON5)

| Pin | Symbol | Function                                          | Remark |
|-----|--------|---------------------------------------------------|--------|
| 1   | 3.3V   | TFT Module Power limit can only output 3.3V,100mA | Note1  |
| 2   | 5V     | Raspberry Pi:Power 5V                             |        |
| 3   | GPIO02 | Raspberry Pi:GPIO02                               |        |
| 4   | 5V     | Raspberry Pi:Power 5V                             |        |
| 5   | GPIO03 | Raspberry Pi:GPIO03                               |        |
| 6   | GND    | Raspberry Pi:GND                                  |        |
| 7   | GPIO04 | Raspberry Pi:GPIO04                               |        |
| 8   | GPIO14 | Raspberry Pi:GPIO14                               |        |
| 9   | GND    | Raspberry Pi:GND                                  |        |
| 10  | GPIO15 | Raspberry Pi:GPIO15                               |        |
| 11  | GPIO17 | Raspberry Pi:GPIO17                               |        |
| 12  | GPIO18 | Raspberry Pi:GPIO18 (Backlight Enable)            |        |
| 13  | GPIO27 | Raspberry Pi:GPIO27                               |        |
| 14  | GND    | Raspberry Pi:GND                                  |        |
| 15  | GPIO22 | Raspberry Pi:GPIO22                               |        |
| 16  | GPIO23 | Raspberry Pi:GPIO23                               |        |
| 17  | 3.3V   | TFT Module Power limit can only output 3.3V,100mA | Note1  |
| 18  | GPIO24 | Raspberry Pi:GPIO24                               |        |



|    |        |                     |  |
|----|--------|---------------------|--|
| 19 | GPIO10 | Raspberry Pi:GPIO10 |  |
| 20 | GND    | Raspberry Pi:GND    |  |
| 21 | GPIO09 | Raspberry Pi:GPIO09 |  |
| 22 | GPIO25 | Raspberry Pi:GPIO25 |  |
| 23 | GPIO11 | Raspberry Pi:GPIO11 |  |
| 24 | GPIO08 | Raspberry Pi:GPIO08 |  |
| 25 | GND    | Raspberry Pi:GND    |  |
| 26 | GPIO07 | Raspberry Pi:GPIO07 |  |
| 27 | ID_SD  | Raspberry Pi:ID_SD  |  |
| 28 | ID_SC  | Raspberry Pi:ID_SC  |  |
| 29 | GPIO05 | Raspberry Pi:GPIO05 |  |
| 30 | GND    | Raspberry Pi:GND    |  |
| 31 | GPIO06 | Raspberry Pi:GPIO06 |  |
| 32 | GPIO12 | Raspberry Pi:GPIO12 |  |
| 33 | GPIO13 | Raspberry Pi:GPIO13 |  |
| 34 | GND    | Raspberry Pi:GND    |  |
| 35 | GPIO19 | Raspberry Pi:GPIO19 |  |
| 36 | GPIO16 | Raspberry Pi:GPIO16 |  |
| 37 | GPIO26 | Raspberry Pi:GPIO26 |  |
| 38 | GPIO20 | Raspberry Pi:GPIO20 |  |
| 39 | GND    | Raspberry Pi:GND    |  |
| 40 | GPIO21 | Raspberry Pi:GPIO21 |  |

Note1: The 3.3V supply current is limited; please pay special attention to use

#### 4.3. POWER JACK

| Pin No. | Symbol | I/O | Function          | Remark |
|---------|--------|-----|-------------------|--------|
| 1       | 5V     | P   | Power Supply (5V) |        |
| 2       | GND    | P   | Ground            |        |
| 3       | NC     |     | No connection     |        |

\*Display need to use power jack to power on due to HDMI port not able to fulfill the supply current

#### 4.4. HDMI

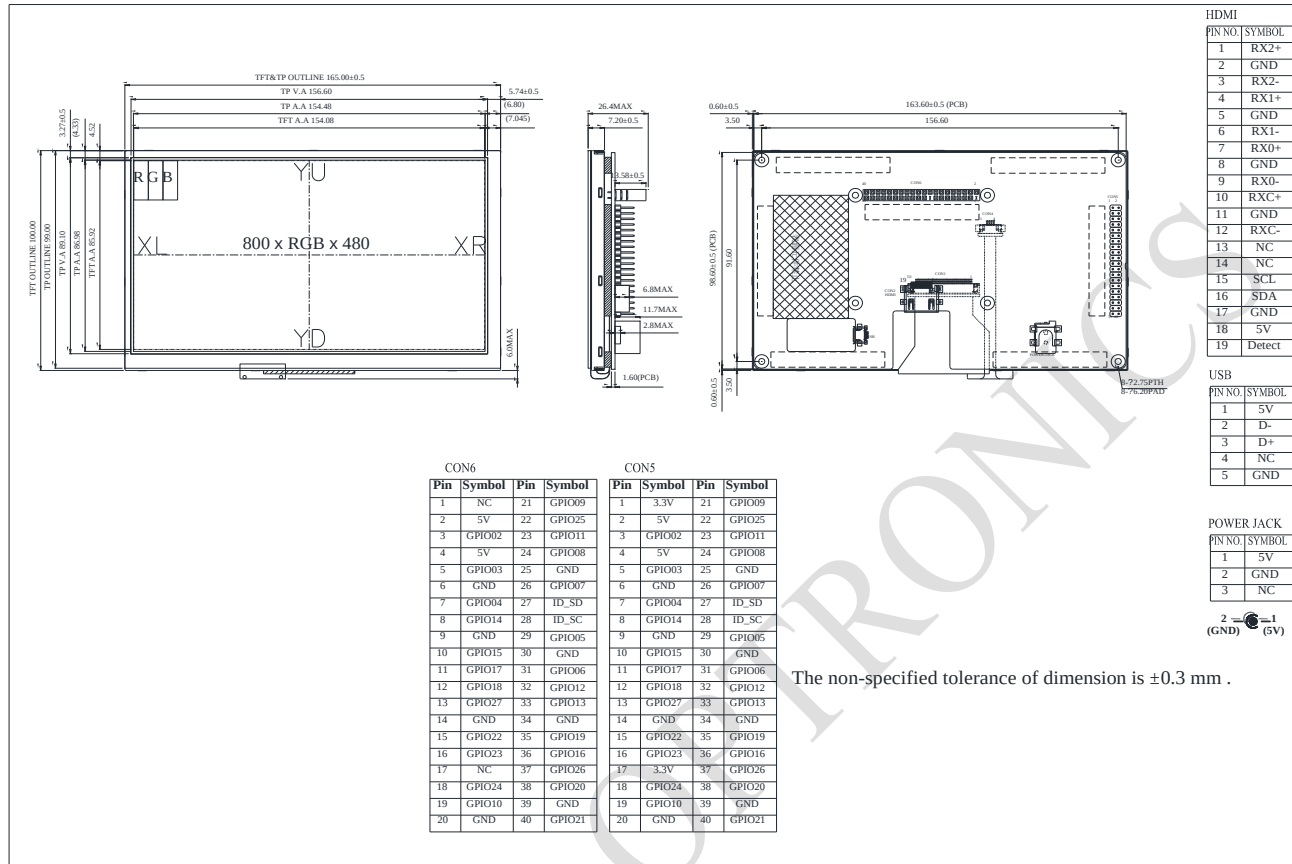
| Pin No. | Symbol | I/O | Function                        | Remark |
|---------|--------|-----|---------------------------------|--------|
| 1       | Rx2+   | I   | +LVDS Differential Data Input   |        |
| 2       | GND    | P   | Ground                          |        |
| 3       | Rx2-   | I   | -LVDS Differential Data Input   |        |
| 4       | Rx1+   | I   | +LVDS Differential Data Input   |        |
| 5       | GND    | P   | Ground                          |        |
| 6       | Rx1-   | I   | -LVDS Differential Data Input   |        |
| 7       | Rx0+   | I   | +LVDS Differential Data Input   |        |
| 8       | GND    | P   | Ground                          |        |
| 9       | Rx0-   | I   | -LVDS Differential Data Input   |        |
| 10      | RxC+   | I   | +LVDS Differential Clock Input  |        |
| 11      | GND    | P   | Ground                          |        |
| 12      | RxC-   | I   | -LVDS Differential Clock Input  |        |
| 13-14   | NC     | -   | No connection                   |        |
| 15      | SCL    | I/O | DDC(Data Display Channel) Clock |        |
| 16      | SDA    | I/O | DDC(Data Display Channel) Data  |        |
| 17      | GND    | P   | Ground                          |        |
| 18      | 5V     | P   | Power Supply                    |        |
| 19      | Detect | I/O | Hot plug detect                 |        |

I: input, O: output, P: Power

#### 4.5. USB

| Pin No. | Symbol | I/O | Function      | Remark |
|---------|--------|-----|---------------|--------|
| 1       | 5V     | P   | Power Supply  |        |
| 2       | D-     | I/O | USB Data -    |        |
| 3       | D+     | I/O | USB Data +    |        |
| 4       | NC     | -   | No connection |        |
| 5       | GND    | P   | Ground        |        |

## 5. Contour Drawing



## 6. 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  $60^{\circ}\text{C}$

## 7. Electrical Characteristics

### 7.1. Operating conditions:

| Item                   | Symbol | Condition | Min | Typ    | Max | Unit | Remark |
|------------------------|--------|-----------|-----|--------|-----|------|--------|
| Supply Voltage For LCM | VDD    | —         | 4.9 | 5      | 5.1 | V    | -      |
| Supply Current For LCM | IDD    | —         | —   | 640    | 940 | mA   | Note 1 |
| LED Life Time          | —      | —         | —   | 50,000 | —   | Hr   | Note 4 |

Note 1 : This value is test for VDD =5.0V , Ta=25℃ only

Note 2 : Please make sure to support enough current.

Note3 : Touch Panel driver is base on the mouse driver program and through USB port connect to PC or embedded board.Can only support the single touch.

Note 4: The “LED life time” is defined as the module brightness decrease to 50% original brightness at Ta=25℃ and IL =180mA. The LED lifetime could be decreased if operating IL is lager than 180mA.

## 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  | $\theta=0^\circ$ 、 $\phi=0^\circ$ | 0.26 | 0.31 | 0.36 | -                 | Note 2,6,7        |
|                                                   | Wy     |                                   | 0.28 | 0.33 | 0.38 | -                 |                   |
| Viewing angle<br>(Gray Scale Inversion Direction) | Hor.   | $\theta_R$                        | 60   | 70   | -    | Deg.              | Note 1            |
|                                                   |        | $\theta_L$                        | 60   | 70   | -    |                   |                   |
|                                                   | Ver.   | $\phi_T$                          | 40   | 50   | -    |                   |                   |
|                                                   |        | $\phi_B$                          | 60   | 70   | -    |                   |                   |
| Brightness                                        | -      | -                                 | 240  | 320  | -    | cd/m <sup>2</sup> | Center of display |
| Uniformity                                        | (U)    | -                                 | 70   | -    | -    | %                 | Note 5            |

Ta=25±2℃, IL=180mA

Note 1: Definition of viewing angle range

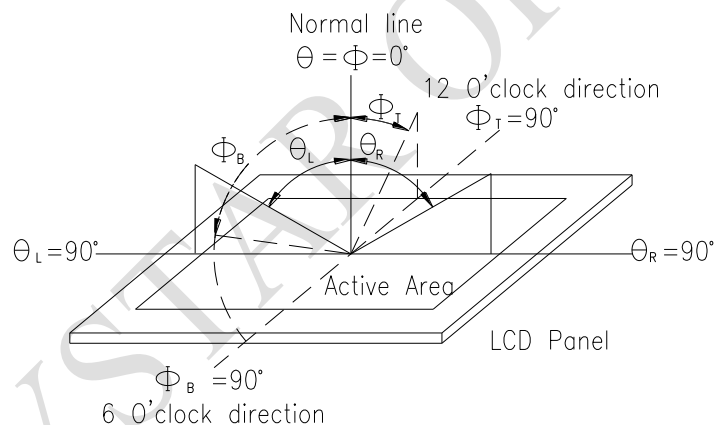
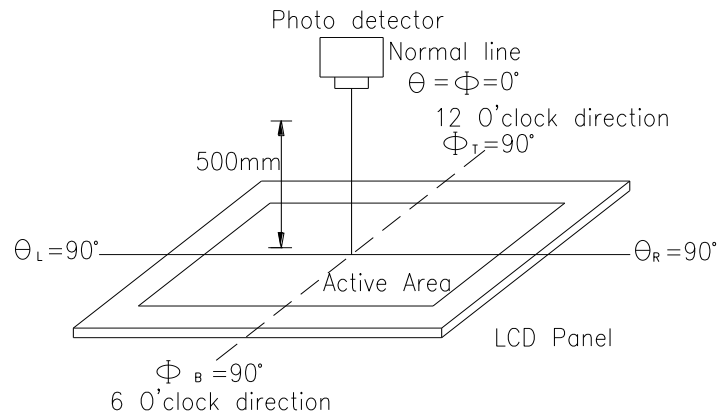


Fig. 8.1. Definition of viewing angle

Note 2: Test equipment setup:

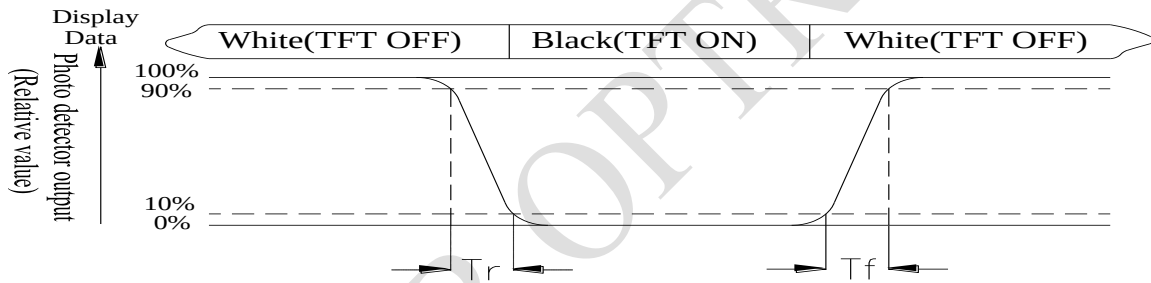
After stabilizing and leaving the panel alone at a driven temperature for 10 minutes, the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. Optical specifications are measured by Topcon BM-7 or BM-5 luminance meter 1.0° field of view at a distance of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

Luminance Uniformity (U) =  $L_{min}/L_{max} \times 100\%$

L = Active area length

W = Active area width

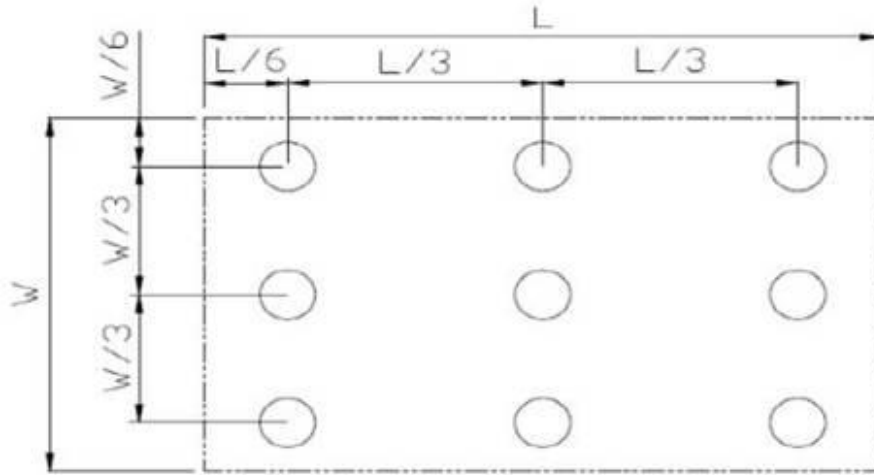


Fig8.3. Definition of uniformity

**Note 6: Definition of color chromaticity (CIE 1931)**

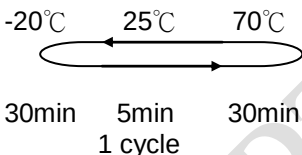
Color coordinates measured at the center point of LCD

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



## 9. Reliability

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

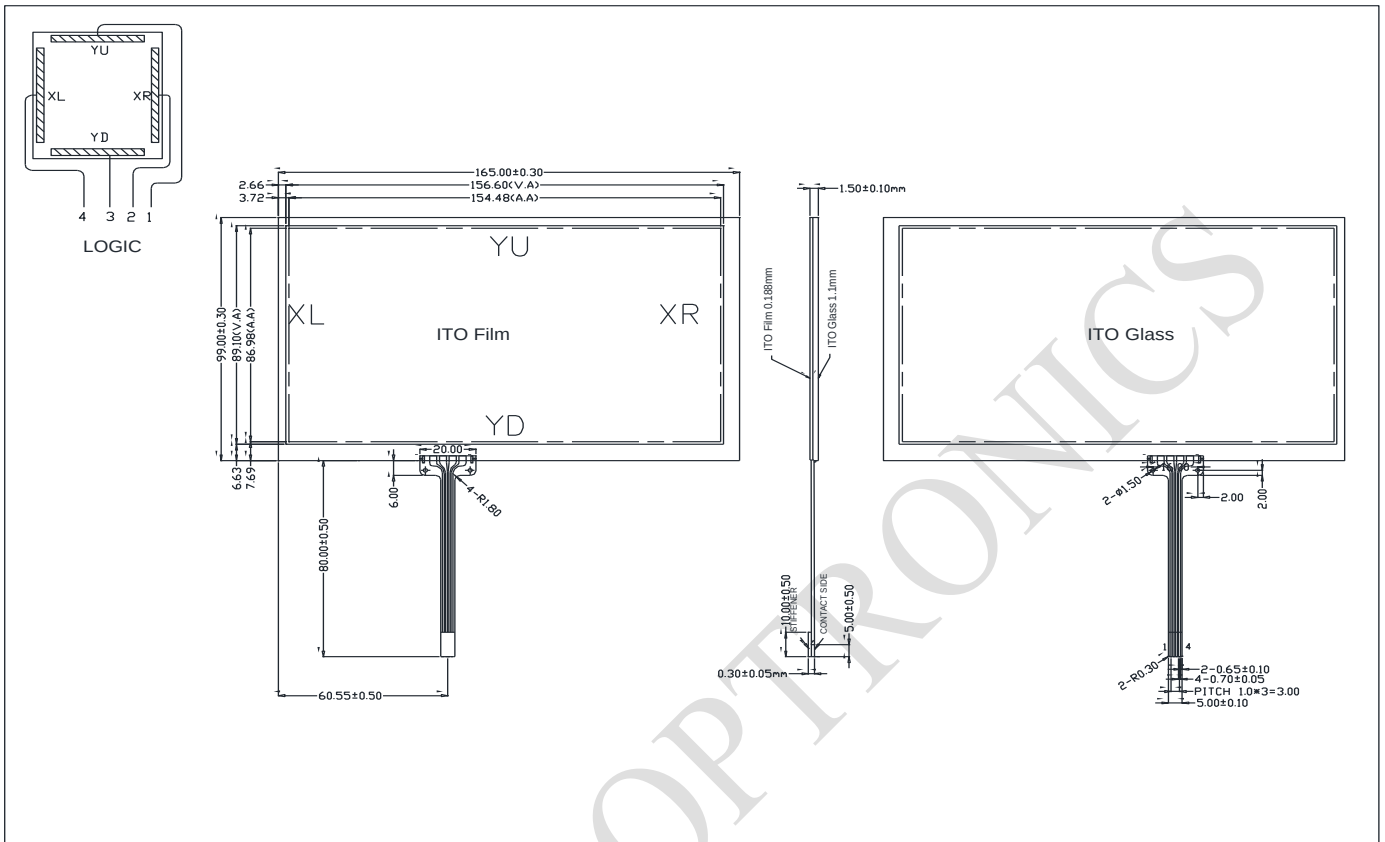
| Environmental Test                   |                                                                                                                                                                  |                                                                                                                                                      |      |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| 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>  | -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.

## 10.Touch Panel Information



**Resistance Touch Panel General Specifications**

| Item                                                | Description                    |
|-----------------------------------------------------|--------------------------------|
| Driving condition                                   | DC3~7V                         |
| Operating force                                     | 30~80g                         |
| Linearity max                                       | $\leq \pm 1.5\%$               |
| Insulating resistance                               | $> 10\text{M}\Omega$ , 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 Axis resistance                                   | 430~910 $\Omega$               |
| Y Axis resistance                                   | 150~530 $\Omega$               |

| <b>LCM Sample Estimate Feedback Sheet</b>                                                                           |                               |                                     |
|---------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------|
| <b>Module Number :</b> _____                                                                                        |                               |                                     |
| <b>1 、 <u>Panel Specification</u> :</b>                                                                             |                               |                                     |
| 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 : _____                                                                                                   |                               |                                     |
| <b>2 、 <u>Mechanical Specification</u> :</b>                                                                        |                               |                                     |
| 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 , _____ |
| <b>3 、 <u>Relative Hole Size</u> :</b>                                                                              |                               |                                     |
| 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 , _____ |
| <b>4 、 <u>Backlight Specification</u> :</b>                                                                         |                               |                                     |
| 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 , _____ |

&gt;&gt; Go to page 2 &lt;&lt;

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

**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 :**    /    /