



**RAYSTAR**

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## RFC570M-EIW-DRN

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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:

## Revision History

| VERSION | DATE       | REVISED PAGE NO. | Note               |
|---------|------------|------------------|--------------------|
| 0       | 2015/03/26 |                  | First issue        |
| A       | 2015/04/28 |                  | Modify Reliability |

RAYSTAR OPTRONICS

# Contents

1. Module Classification Information
2. Summary
3. General Specification
4. Interface
5. Contour Drawing
6. Absolute Maximum Ratings
7. Electrical Characteristics
8. DC Characteristics
9. AC Characteristics
10. Waveform
11. Optical Characteristics
12. Reliability
13. Other

# 1. Module Classification Information

|          |          |          |           |           |   |          |          |          |   |          |          |          |
|----------|----------|----------|-----------|-----------|---|----------|----------|----------|---|----------|----------|----------|
| <b>R</b> | <b>F</b> | <b>C</b> | <b>57</b> | <b>0M</b> | - | <b>E</b> | <b>I</b> | <b>W</b> | - | <b>D</b> | <b>R</b> | <b>N</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:320x400<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<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)  |

## 2.Summary

This technical specification applies to 5.7' color TFT-LCD panel. The 5.7' color 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.

RAYSTAR OPTRONICS

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### 3. General Specifications

- Size: 5.7 inch
- Dot Matrix: 320 x RGBx240(TFT)
- Module dimension: 141.12(W) x 101.55(H) x 13.5 (D) mm
- Active area: 115.2 x 86.4 mm
- Dot pitch: 0.12 x 0.36 mm
- LCD type: TFT, Normally White, Transmissive
- View Direction: 12 o'clock
- Gray Scale Inversion Direction: 6 o'clock
- Backlight Type: LED, Normally White
- Interface: RS232, 19200 Baud rate
- With /Without TP: Without TP
- Surface: No Anti-Glare

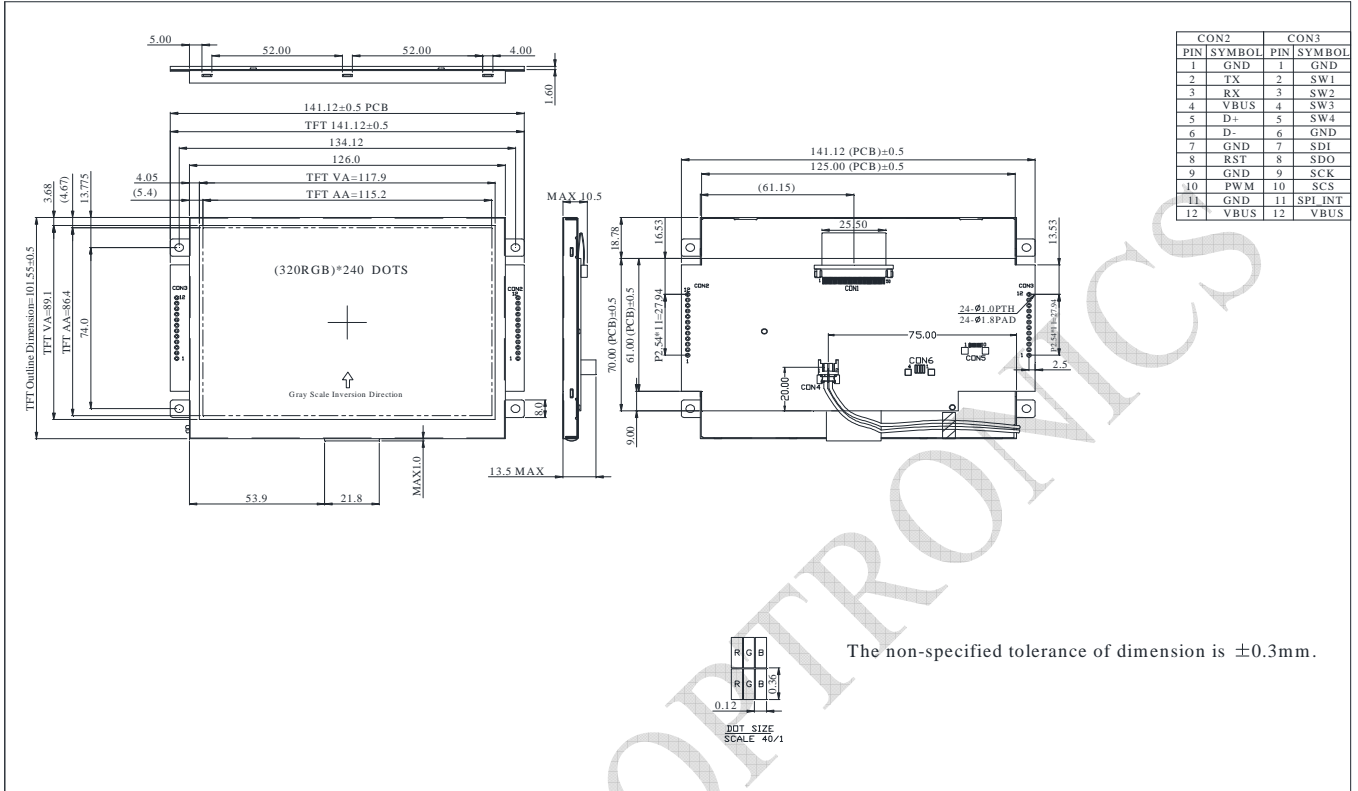
\*Color tone slight changed by temperature and driving voltage

## 4.Interface

| CON 2 |        |              |                        |
|-------|--------|--------------|------------------------|
| Pin   | Symbol | I/O          | Function               |
| 1     | GND    | Power Supply | Power Ground           |
| 2     | TX     | O            | RS232 Transmit pin     |
| 3     | RX     | I            | RS232 Receive pin      |
| 4     | VBUS   | Power Supply | Power supply : 5V      |
| 5     | D+     | I/O          | USB Data +             |
| 6     | D-     | I/O          | USB Data -             |
| 7     | GND    | Power Supply | Power Ground           |
| 8     | /REST  | I            | Reset (active Low)     |
| 9     | GND    | Power Supply | Power Ground           |
| 10    | PWM    | O            | Pulse width modulation |
| 11    | GND    | Power Supply | Power Ground           |
| 12    | VBUS   | Power Supply | Power supply : 5V      |

| CON 3 |         |              |                       |
|-------|---------|--------------|-----------------------|
| Pin   | Symbol  | I/O          | Function              |
| 1     | GND     | Power Supply | Power Ground          |
| 2     | SW1     | I            | Switch ( active low)  |
| 3     | SW2     | I            | Switch ( active low)  |
| 4     | SW3     | I            | Switch ( active low)  |
| 5     | SW4     | I            | Switch ( active low)  |
| 6     | GND     | Power Supply | Power Ground          |
| 7     | SDI     | I            | Serial Data Input     |
| 8     | SDO     | O            | Serial Data Output    |
| 9     | SCK     | I            | Serial Clock          |
| 10    | CS      | I            | Serial Chip selection |
| 11    | SPI_INT | O            | Serial Interrupt      |
| 12    | VBUS    | Power Supply | Power supply : 5V     |

# 5. Contour Drawing



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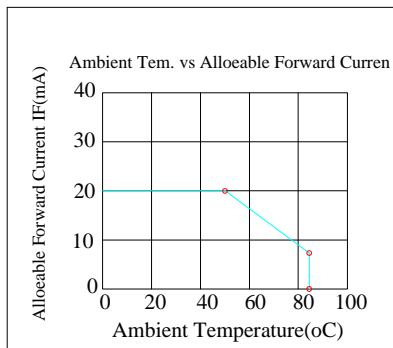


## 6. Absolute Maximum Ratings

| 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

- 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    | —         | 4.5 | 5    | 5.5 | V    | —                |
| Supply Current For LCM | IDD    | —         | —   | 521  | —   | mA   | Note 1           |
| Power Consumption      | —      | VDD=5V    | —   | 2605 | —   | mW   | VDD=5V<br>Note 2 |

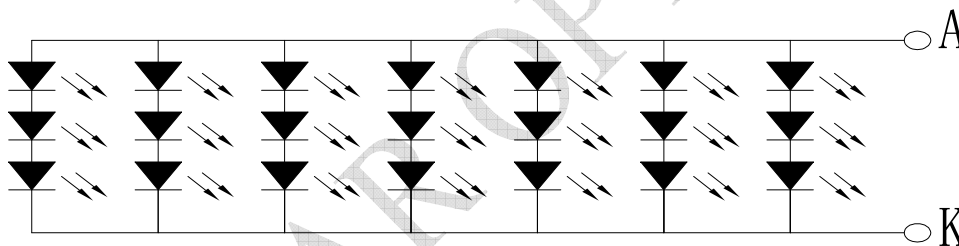
Note 1 : This value is test for VDD=5V , Ta=25 °C only

Note 2 : Power consumption is include Backlight driver system

### 7.2. LED driving conditions (LED Driver system build in )

| Parameter         | Symbol | Min. | Typ.   | Max. | Unit | Remark     |
|-------------------|--------|------|--------|------|------|------------|
| LED current       |        | -    | 140    | -    | mA   |            |
| Power Consumption |        | 1260 | -      | 1470 | mW   |            |
| LED voltage       | VBL+   | 9.0  | -      | 10.5 | 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

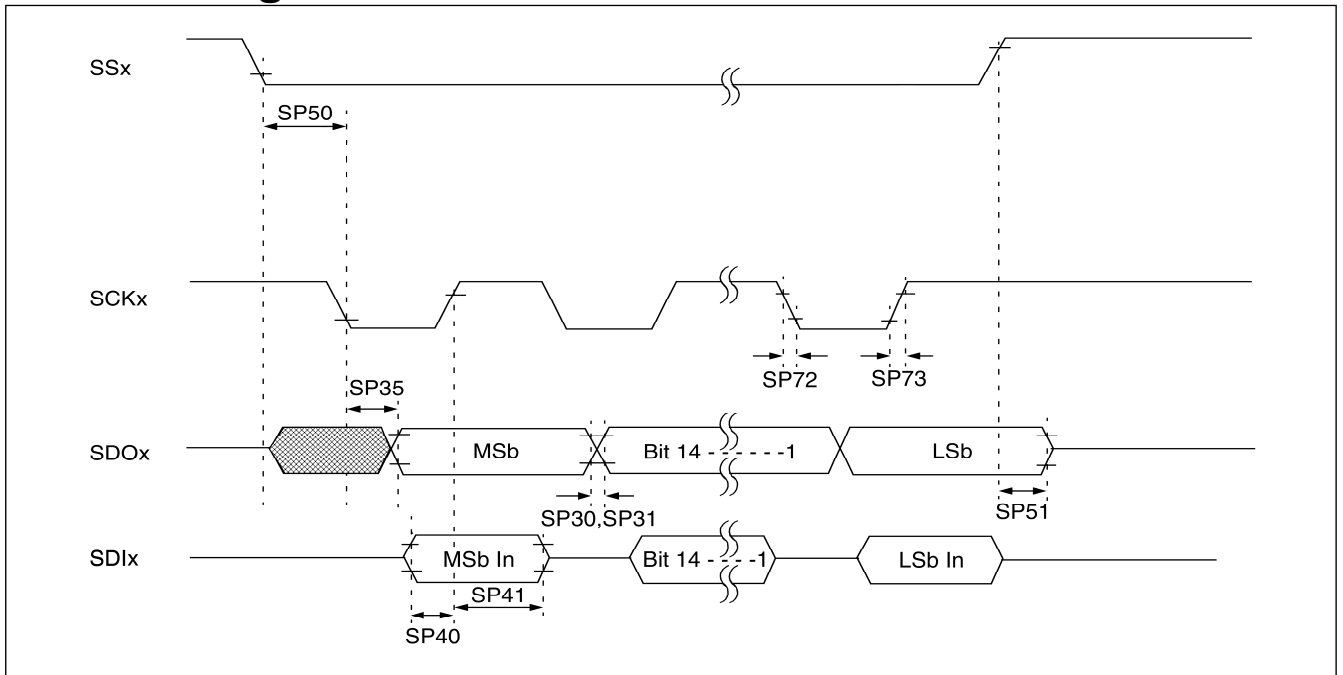
Note 4 : The single LED lamp case

## 8.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    |           |

RAYSTAR OPTRONICS

## 9.SPI Timing Characteristics



| AC CHARACTERISTICS |                       |   | Standard Operating Conditions: 2.0V to 3.6V<br>(unless otherwise stated)<br>Operating temperature $-40^{\circ}\text{C} \leq T_A \leq +85^{\circ}\text{C}$ for Industrial |                    |     |       |            |
|--------------------|-----------------------|---|--|--------------------|-----|-------|------------|
| Param No.          | Symbol                | Characteristic  | Min  | Typ <sup>(1)</sup> | Max | Units | Conditions |
| SP70               | TscL                  | SCKx Input Low Time   | 250  | —                  | —   | ns    |            |
| SP71               | Tsch                  | SCKx Input High Time  | 250  | —                  | —   | ns    |            |
| SP72               | TscF                  | SCKx Input Fall Time <sup>(2)</sup>   | —  | 10                 | 25  | ns    |            |
| SP73               | TscR                  | SCKx Input Rise Time <sup>(2)</sup>   | —  | 10                 | 25  | ns    |            |
| SP30               | TdoF                  | SDOx Data Output Fall Time <sup>(2)</sup>                                       | —  | 10                 | 25  | ns    |            |
| SP31               | TdoR                  | SDOx Data Output Rise Time <sup>(2)</sup>                                       | —  | 10                 | 25  | ns    |            |
| SP35               | Tsch2doV,<br>TscL2doV | SDOx Data Output Valid after SCKx Edge  | —  | —                  | 30  | ns    |            |
| SP40               | TdiV2sch,<br>TdiV2scL | Setup Time of SDIx Data Input to SCKx Edge                                      | 20   | —                  | —   | ns    |            |
| SP41               | Tsch2diL,<br>TscL2diL | Hold Time of SDIx Data Input to SCKx Edge                                       | 20   | —                  | —   | ns    |            |
| SP50               | Tssl2sch,<br>Tssl2scL | $\overline{\text{SSx}}$ to SCKx $\uparrow$ or SCKx Input                        | 120  | —                  | —   | ns    |            |
| SP51               | TssH2doZ              | $\overline{\text{SSx}}$ $\uparrow$ to SDOx Output High-Impedance <sup>(3)</sup> | 10   | —                  | 50  | ns    |            |
| SP52               | Tsch2ssH<br>TscL2ssH  | $\overline{\text{SSx}}$ after SCKx Edge   | 50   | —                  | —   | ns    |            |

# 10. Instructions Table

## 10.1. UART Mode

### Text Mode

Instruction of text mode

|         |    |         |         |        |        |    |        |    |        |    |        |        |    |        |        |        |           |         |         |         |
|---------|----|---------|---------|--------|--------|----|--------|----|--------|----|--------|--------|----|--------|--------|--------|-----------|---------|---------|---------|
| 1       | 2  | 3       | 4       | 5      | 6      | 7  | 8      | 9  | 10     | 11 | 12     | 13     | 14 | 15     | 16     | 17     | 18        | 19      | 20      | 21      |
| SB<br>1 | PL | SB<br>2 | SB<br>3 | M<br>D | W<br>R | TR | X<br>H | XL | Y<br>H | YL | S<br>R | S<br>G | SB | B<br>R | B<br>G | B<br>B | TA<br>SDA | EB<br>1 | EB<br>2 | EB<br>3 |

### Graphic Mode

Instruction of Graphic mode:

|     |    |     |     |    |    |    |    |    |    |    |    |     |     |     |     |
|-----|----|-----|-----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|
| 1   | 2  | 3   | 4   | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13  | 14  | 15  | 16  |
| SB1 | PL | SB2 | SB3 | MD | RR | XH | XL | YH | YL | PH | PL | EB1 | EB2 | EB3 | SB1 |

### Pixel Mode

Instruction of Pixel mode

|     |    |     |     |    |    |    |    |    |    |    |    |    |     |     |     |
|-----|----|-----|-----|----|----|----|----|----|----|----|----|----|-----|-----|-----|
| 1   | 2  | 3   | 4   | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14  | 15  | 16  |
| SB1 | PL | SB2 | SB3 | MD | RR | XH | XL | YH | YL | PR | PG | PB | EB1 | EB2 | EB3 |

### Geometry Mode

Instruction of geometry mode

|         |    |         |         |        |        |             |             |             |             |             |             |             |             |    |    |    |    |         |         |         |
|---------|----|---------|---------|--------|--------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----|----|----|----|---------|---------|---------|
| 1       | 2  | 3       | 4       | 5      | 6      | 7           | 8           | 9           | 10          | 11          | 12          | 13          | 14          | 15 | 16 | 17 | 18 | 19      | 20      | 21      |
| SB<br>1 | PL | SB<br>2 | SB<br>3 | M<br>D | R<br>R | X<br>S<br>H | X<br>S<br>L | Y<br>S<br>H | Y<br>S<br>L | X<br>E<br>H | X<br>E<br>L | Y<br>E<br>H | Y<br>E<br>L | LS | LR | LG | LB | EB<br>1 | EB<br>2 | EB<br>3 |

### Clean Mode

Instruction of Clean Mode

|     |    |         |         |    |     |     |     |     |     |     |     |     |     |     |     |
|-----|----|---------|---------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1   | 2  | 3       | 4       | 5  | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  |
| SB1 | PL | SB<br>2 | SB<br>3 | MD | XSH | XSL | YSH | YSL | XEH | XEL | YEH | YEL | EB1 | EB2 | EB3 |

### PWM Mode

Instruction of Pixel mode

|     |    |     |     |    |    |     |     |     |     |     |     |     |
|-----|----|-----|-----|----|----|-----|-----|-----|-----|-----|-----|-----|
| 1   | 2  | 3   | 4   | 5  | 6  | 7   | 8   | 9   | 10  | 11  | 12  | 13  |
| SB1 | PL | SB2 | SB3 | MD | PS | PFH | PFL | PDH | PDL | EB1 | EB2 | EB3 |

### Backlight Mode

Instruction of Clean Mode

|     |    |     |     |    |    |    |    |    |    |    |    |    |     |     |     |
|-----|----|-----|-----|----|----|----|----|----|----|----|----|----|-----|-----|-----|
| 1   | 2  | 3   | 4   | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14  | 15  | 16  |
| SB1 | PL | SB2 | SB3 | MD | RR | XH | XL | YH | YL | PR | PG | PB | EB1 | EB2 | EB3 |

## 10.2. SPI Mode

### Text Mode

Instruction of text mode

|      |         |    |    |    |    |    |    |    |    |    |    |    |    |        |           |
|------|---------|----|----|----|----|----|----|----|----|----|----|----|----|--------|-----------|
| 1    | 2       | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15     | 16        |
| 0x31 | SB<br>3 | MD | WR | TR | XH | XL | YH | YL | SR | SG | SB | BR | BG | B<br>B | TA<br>SDA |

### Graphic Mode

Instruction of Graphic mode:

|      |     |    |    |    |    |    |    |    |    |
|------|-----|----|----|----|----|----|----|----|----|
| 1    | 2   | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 |
| 0x31 | SB3 | MD | RR | XH | XL | YH | YL | PH | PL |

### Pixel Mode

Instruction of Pixel mode

|      |     |    |    |    |    |    |    |    |    |    |
|------|-----|----|----|----|----|----|----|----|----|----|
| 1    | 2   | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 |
| 0x31 | SB3 | MD | RR | XH | XL | YH | YL | PR | PG | PB |

### Geometry Mode

Instruction of geometry mode

|      |         |    |    |         |     |         |     |         |     |         |     |    |    |    |    |
|------|---------|----|----|---------|-----|---------|-----|---------|-----|---------|-----|----|----|----|----|
| 1    | 2       | 3  | 4  | 5       | 6   | 7       | 8   | 9       | 10  | 11      | 12  | 13 | 14 | 15 | 16 |
| 0x31 | SB<br>3 | MD | RR | XS<br>H | XSL | YS<br>H | YSL | XE<br>H | XEL | YE<br>H | YEL | LS | LR | LG | LB |

### Clean Mode

Instruction of Clean Mode

|      |     |    |     |     |     |     |     |     |     |     |
|------|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1    | 2   | 3  | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  |
| 0x31 | SB3 | MD | XSH | XSL | YSH | YSL | XEH | XEL | YEH | YEL |

### PWM Mode

Instruction of Pixel mode

|      |     |    |    |     |     |     |     |
|------|-----|----|----|-----|-----|-----|-----|
| 1    | 2   | 3  | 4  | 5   | 6   | 7   | 8   |
| 0x31 | SB3 | MD | PS | PFH | PFL | PDH | PDL |

### Backlight Mode

Instruction of Clean Mode

|      |     |    |    |    |    |    |    |    |    |    |
|------|-----|----|----|----|----|----|----|----|----|----|
| 1    | 2   | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 |
| 0x31 | SB3 | MD | RR | XH | XL | YH | YL | PR | PG | PB |

## 11. Optical Characteristics

| Item               | Symbol | Condition.                        | Min        | Typ. | Max. | Unit              | Remark            |            |
|--------------------|--------|-----------------------------------|------------|------|------|-------------------|-------------------|------------|
| Response time      | Tr     | $\theta=0^\circ$ 、 $\Phi=0^\circ$ | -          | 15   | 30   | .ms               | Note 3,5          |            |
|                    | Tf     |                                   | -          | 35   | 50   | .ms               |                   |            |
| Contrast ratio     | CR     | At optimized viewing angle        | 150        | 250  | -    | -                 | Note 4,5          |            |
| Color Chromaticity | White  | $\theta=0^\circ$ 、 $\Phi=0^\circ$ | Wx         | 0.27 | 0.32 | 0.37              |                   | Note 2,6,7 |
|                    |        |                                   | Wy         | 0.32 | 0.37 | 0.42              |                   |            |
| Viewing angle      | Hor.   | $CR \geq 10$                      | $\Theta R$ | 60   | 70   |                   | Deg.              | Note 1     |
|                    |        |                                   | $\Theta L$ | 60   | 70   |                   |                   |            |
|                    | Ver.   |                                   | $\Phi T$   | 40   | 50   |                   |                   |            |
|                    |        |                                   | $\Phi B$   | 60   | 70   |                   |                   |            |
| Brightness         | -      | -                                 | 400        | 500  |      | cd/m <sup>2</sup> | Center of display |            |

Ta=25±2°C, IL=140mA

Note 1: Definition of viewing angle range

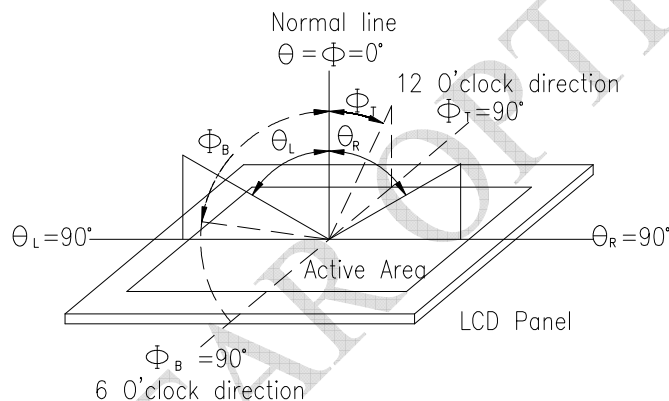


Fig. 11.1. Definition of viewing angle

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.

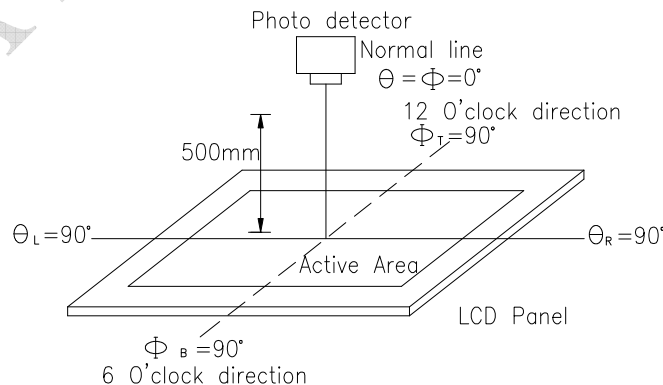
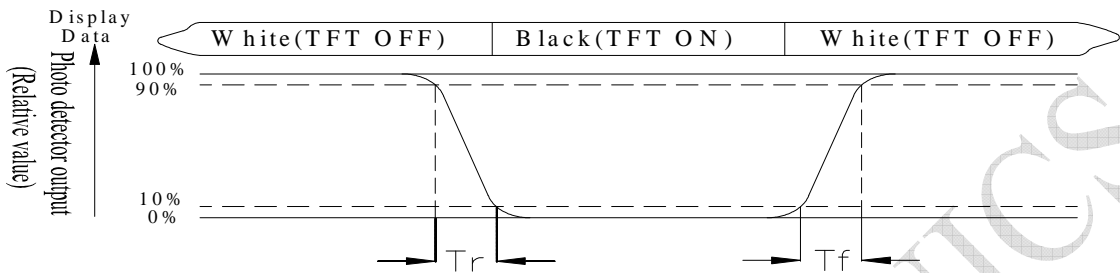


Fig. 11.2. Optical measurement system setup

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

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

“±” means that the analog input signal swings in phase with VCOM signal.

“±” 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)

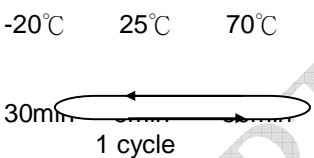
Color coordinates measured at the center point of LCD

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



## 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/ 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</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 : 15mm<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=800V,<br>RS=1.5kΩ<br>CS=100pF<br>1 time   | —    |

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.

**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 , _____ |

>> **Go to page 2** <<

|   |                               |                                     |
|---|-------------------------------|-------------------------------------|
| <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;">Sales signature : _____</p> <p style="text-align: right;">Customer Signature : _____      <u>Date</u> :   /   /</p> |                               |                                     |