



RAYSTAR

RAYSTAR Optronics, Inc.
曜凌光電股份有限公司



曜凌光電股份有限公司 Raystar Optronics, Inc.

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RFH900B-AWW-LNN

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>

Revision History

| VERSION | DATE | REVISED PAGE NO. | Note |
|---------|--------------------------|------------------|---|
| 0 A | 2016/11/28 2020/09/14 | | First issue Modify Contour Drawing & LED driving conditions & Optical Characteristics Modify Interface. |

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1.Module Classification Information

| | | | | | | | | | | | | |
|----------|----------|----------|-----------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|
| R | F | H | 90 | 0B | - | A | W | W | - | L | N | N |
| 1 | 2 | 3 | 4 | 5 | - | 6 | 7 | 8 | - | 9 | 10 | 11 |

| Item | Description | |
|-------------|---|--|
| 1 | R : Raystar Optronics Inc. | |
| 2 | Display Type : F→TFT Type, J→ Custom TFT | |
| 3 | Solution: A: 128x160 B:320x234 C:320x240 D:480x234 E:480x272 F:800x480 G:640x480 H:1024x600 I:320x480 J:240x320 K:1280x800 L:240x400 M:1024x768 N:128x128 O:480x800 P:640x320 Q:800x600 S:480x128 T:800x320 | |
| 4 | Display Size : 9.0" TFT | |
| 5 | Version Code. | |
| 6 | Model Type: A : TFT LCD E : TFT+FR+CONTROL BOARD J : TFT+FR+A/D BOARD N : TFT+FR+A/D BOARD+CONTROL BOARD S : TFT+FR+POWER BOARD (DC TO DC) 1 : TFT+CONTROL BOARD | 6 : TFT+FR H : TFT+D/V BOARD I : TFT+FR+D/V BOARD B : TFT+POWER BD |
| 7 | Polarizer Type, Temperature range, View direction | I→Transmissive, W. T, 6:00 ; C→Transmissive, N. T, 6:00 L→Transmissive, W.T,12:00 ; F→Transmissive, N.T,12:00 Y→Transmissive,W.T, IPS TFT ; A→Transmissive, N.T, IPS TFT Z→Transmissive, W.T, O-TFT R→Transmissive, Super W.T, O-TFT N→Transmissive, Super W.T, 6:00; Q→Transmissive, Super W.T, 12:00 V→Transmissive, Super W.T, VA TFT |
| 8 | Backlight | W : LED, White H : LED, High Light White F : CCFL, White |
| 9 | Driver Method | D: Digital A: Analog L : LVDS M:MIPI |
| 10 | Interface | N : without control board A : 8Bit B : 16Bit S:SPI Interface R: RS232 U:USB I: I2C |
| 11 | TS | N : Without TS S : resistive touch panel C : capacitive touch panel capacitive touch panel (G-F-F) G : capacitive touch panel(G-G) |

2.Summary

TFT 9.0" is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This model is composed of a TFT LCD panel, a driving circuit and a back light system. This TFT LCD has a 9" (16:9) inch diagonally measured active display area with WSVGA (1024 horizontal by 600 vertical pixel) resolution.

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3. General Specifications

- Size: 9.0 inch
- Dot Matrix: 1024 x RGB x 600(TFT) dots
- Module dimension: 211.1(W) x 126.5(H) x5.7(D) mm
- Active area: 196.608 x 114.15 mm
- Dot pitch: 0.192 x 0.19025 mm
- LCD type: TFT, Normally White, Transmissive
- Backlight Type: LED, Normally White
- Viewing angle: 85/85/85/85
- Interface: LVDS
- With /Without TP: Without TP
- Surface: Anti-Glare
- Aspect Ratio: 16:9

*Color tone slight changed by temperature and driving voltage.

4.Interface

4.1. LCM PIN Definition

FPC connector is used for electronics interface. The recommended model is FH12A-40S-0.5SH manufactured by Hirose.

| Pin No. | Symbol | I/O | Function | Note |
|---------|----------|-----|---|-------|
| 1 | VCOM | P | Common Voltage | |
| 2 | Vcc | P | Power Voltage for digital circuit | |
| 3 | Vcc | P | Power Voltage for digital circuit | |
| 4 | NC | - | No connection | |
| 5 | Reset | I | Global reset pin | Note1 |
| 6 | U/D | I | Vertical inversion | Note2 |
| 7 | L/R | I | Horizontal inversion | Note2 |
| 8 | STBYB | I | Standby mode, Normally pulled high STBYB = "1", normal operation STBYB = "0", timing controller, source driver will turn off, all output are High-Z | |
| 9 | GND | P | Ground | |
| 10 | RXCLKIN- | I | - LVDS differential clock input | |
| 11 | RXCLKIN+ | I | + LVDS differential clock input | |
| 12 | GND | P | Ground | |
| 13 | RXIN0- | I | - LVDS differential data input | |
| 14 | RXIN0+ | I | + LVDS differential data input | |
| 15 | GND | P | Ground | |
| 16 | RXIN1- | I | - LVDS differential data input | |
| 17 | RXIN1+ | I | + LVDS differential data input | |
| 18 | GND | P | Ground | |
| 19 | RXIN2- | I | - LVDS differential data input | |
| 20 | RXIN2+ | I | + LVDS differential data input | |
| 21 | GND | P | Ground | |
| 22 | RXIN3- | I | - LVDS differential data input | |
| 23 | RXIN3+ | I | + LVDS differential data input | |
| 24 | GND | P | Ground | |
| 25 | SELB | I | 6bit/8bit mode selection | Note3 |
| 26 | GND | P | Ground | |
| 27 | AVDD | P | Power for Analog Circuit | |

| | | | | |
|-------|-----|---|------------------|--|
| 28 | GND | P | Ground | |
| 29 | VGH | P | Gate ON Voltage | |
| 30 | NC | - | No connection | |
| 31 | NC | - | No connection | |
| 32 | VGL | P | Gate off Voltage | |
| 33 | GND | P | Ground | |
| 34-40 | NC | - | No connection | |

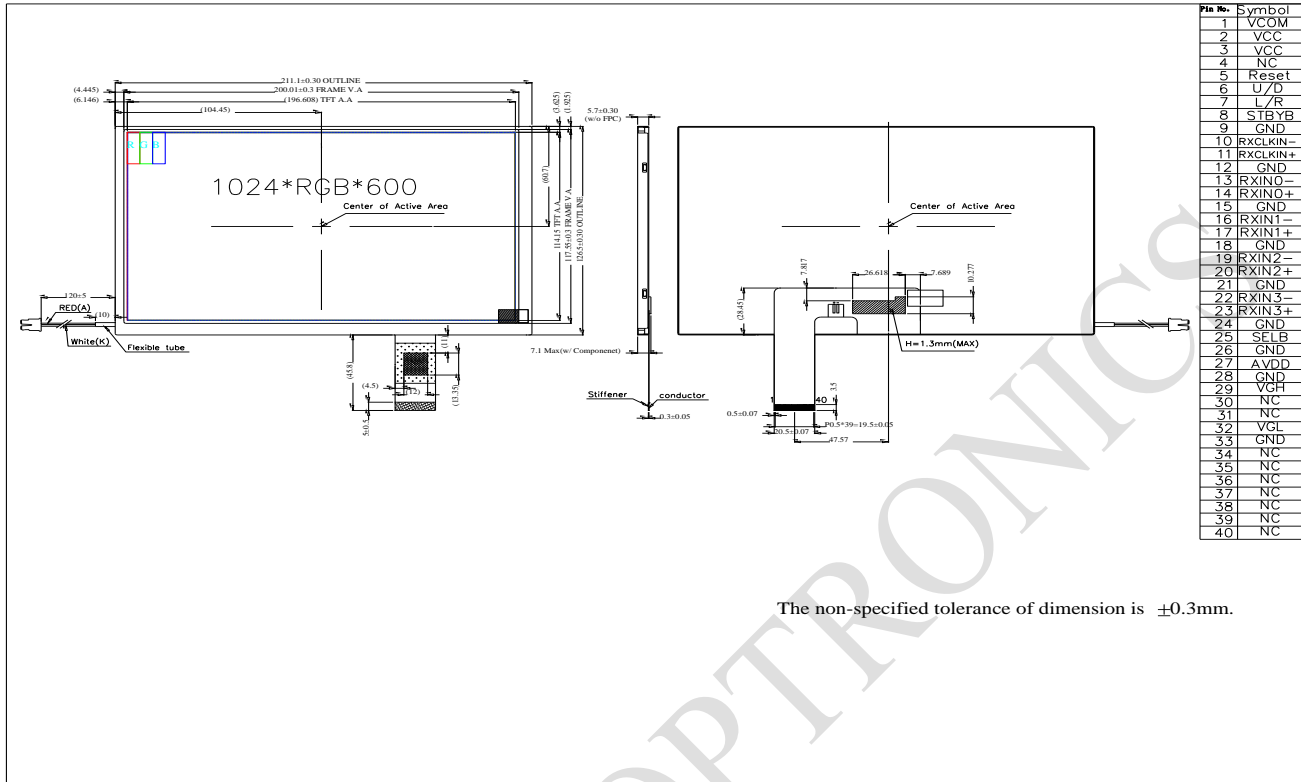
I: input O: Output P: Power

Note1 : Global reset pin: Active low to enter reset mode. Suggest connecting with an RC reset circuit for stability. Normally pull high. (R=10K Ω , C=0.1 μ F)
 Note: If RC is not added, users must follow the rule, T2 > 50ms on power on/off sequence.

Note2 : When L/R="0", set right to left scan direction.
 When L/R="1", set left to right scan direction.
 When U/D="0", set top to bottom scan direction.
 When U/D="1", set bottom to top scan direction.

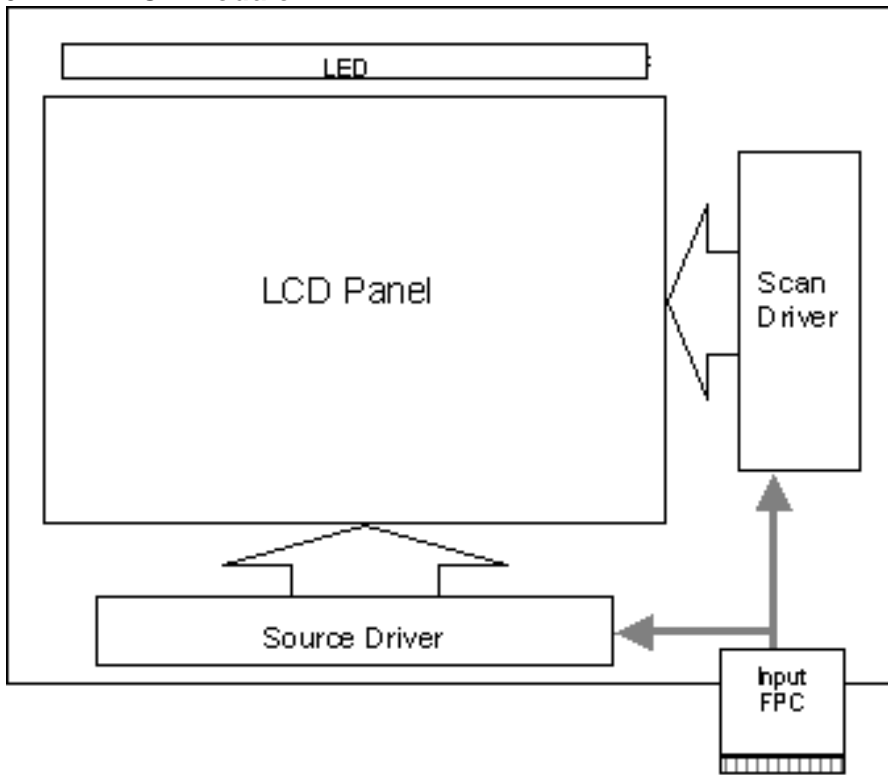
Note3 : If LVDS input data is 6 bits, SELB must be set to High;
 If LVDS input data is 8 bits, SELB must be set to Low.

5. Contour Drawing

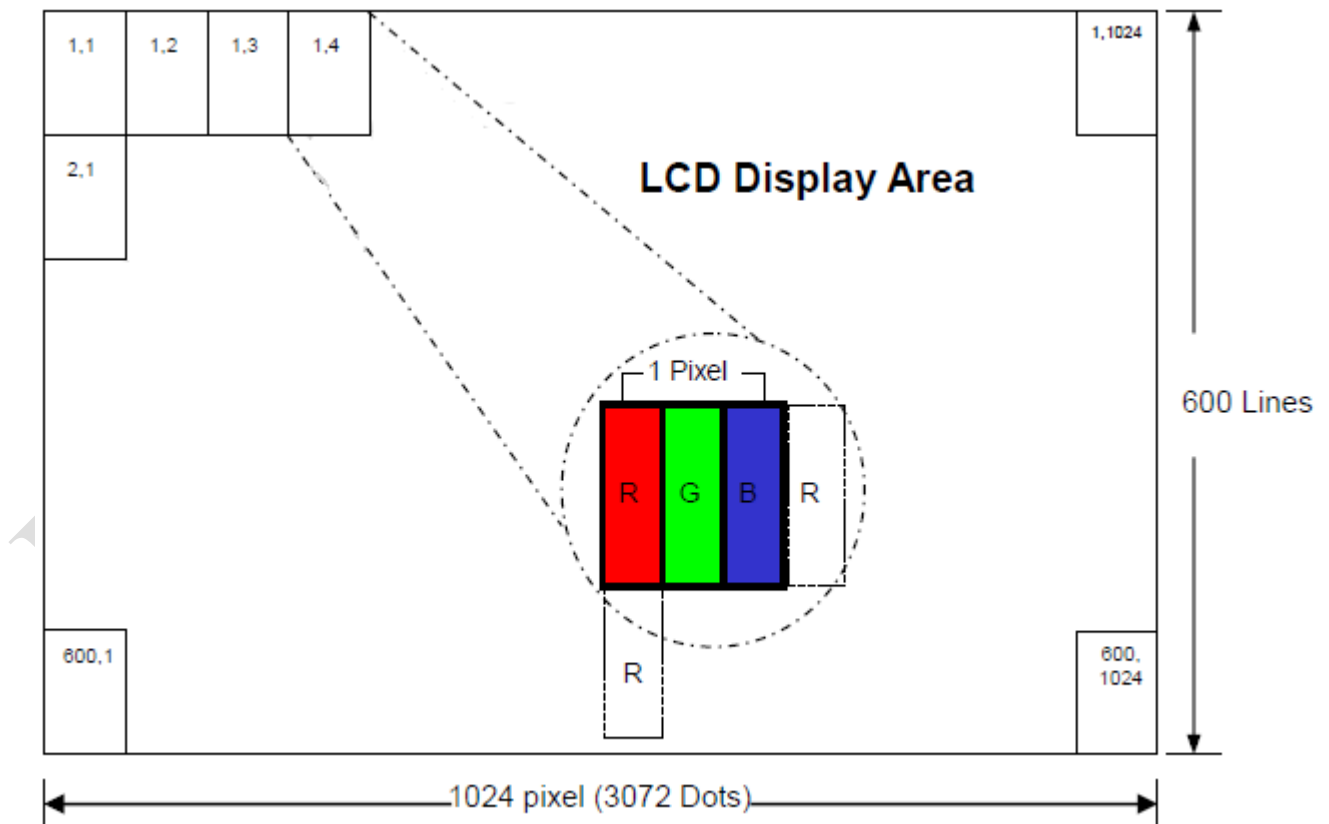


6. Block Diagram

6.1. TFT LCD Module

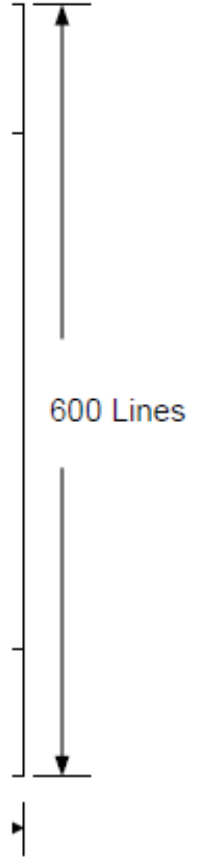


6.2. Pixel Format



6.3. Relationship Between Displayed Color and Input

| | Display | MSB | | | | LSB | | | | MSB | | | | LSB | | | | Gray scale Level | | | | | | | | | | |
|-----------------------------|------------|-------|----|----|----|-----|----|----|----|-----|----|----|----|-----|----|----|----|------------------|----|----|----|----|----|----|----|------------|------------|------|
| | | R7 | R6 | R5 | R4 | R3 | R2 | R1 | R0 | G7 | G6 | G5 | G4 | G3 | G2 | G1 | G0 | | B7 | B6 | B5 | B4 | B3 | B2 | B1 | B0 | | |
| Basic color | Black | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | - | | |
| | Blue | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | H | H | H | H | H | H | H | - | | |
| | Green | L | L | L | L | L | L | L | L | H | H | H | H | H | H | H | H | L | L | L | L | L | L | L | L | - | | |
| | Light Blue | L | L | L | L | L | L | L | L | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | - | | |
| | Red | H | H | H | H | H | H | H | H | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | - | | |
| | Purple | H | H | H | H | H | H | H | H | L | L | L | L | L | L | L | L | H | H | H | H | H | H | H | H | - | | |
| | Yellow | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | L | L | L | L | L | L | L | L | - | | |
| | White | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | - | | |
| Gray scale of Red | Black | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L0 | | |
| | Dark | L | L | L | L | L | L | L | H | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L1 | | |
| | | L | L | L | L | L | L | H | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L2 | | |
| | ↑ | : | | | | | | | | | | | | | | | | | | | | | | | | L3...L251 | | |
| | | ↓ | H | H | H | H | H | H | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L252 | |
| | | | H | H | H | H | H | H | L | H | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L253 | |
| | | Light | H | H | H | H | H | H | L | H | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L254 | |
| | H | | H | H | H | H | H | H | H | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | Red L255 | | |
| Gray scale of Green | Black | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L0 | | |
| | Dark | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | L | L | L | L | L | L | L | L | L1 | | |
| | | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | L | L | L | L | L | L | L | L | L | L2 | | |
| | ↑ | : | | | | | | | | | | | | | | | | | | | | | | | | L3...L251 | | |
| | | ↓ | L | L | L | L | L | L | L | L | H | H | H | H | H | L | L | L | L | L | L | L | L | L | L | L | L252 | |
| | | | L | L | L | L | L | L | L | L | H | H | H | H | H | L | H | L | L | L | L | L | L | L | L | L253 | | |
| | | Light | L | L | L | L | L | L | L | L | H | H | H | H | H | L | L | L | L | L | L | L | L | L | L | L | L254 | |
| | L | | L | L | L | L | L | L | L | H | H | H | H | H | H | L | L | L | L | L | L | L | L | L | L | Green L255 | | |
| Gray scale of Blue | Black | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L0 | | |
| | Dark | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | L | L1 | | |
| | | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | L | L | L2 | | |
| | ↑ | : | | | | | | | | | | | | | | | | | | | | | | | | L3...L251 | | |
| | | ↓ | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | H | H | H | H | L | L | L | L252 | |
| | | | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | H | H | H | H | L | H | L | L253 | |
| | | Light | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | H | H | H | H | L | L | L | L254 | |
| | L | | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | H | H | H | H | H | L | L | Blue L255 | | |
| Gray scale of White & Black | Black | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L0 | | |
| | Dark | L | L | L | L | L | L | L | H | L | L | L | L | L | L | H | L | L | L | L | L | L | H | L | L1 | | | |
| | | L | L | L | L | L | L | H | L | L | L | L | L | L | H | L | L | L | L | L | L | H | L | L | L2 | | | |
| | ↑ | : | | | | | | | | | | | | | | | | | | | | | | | | L3...L251 | | |
| | | ↓ | H | H | H | H | H | L | L | H | H | H | H | L | L | H | H | H | H | L | L | H | H | H | H | L | L | L252 |
| | | | H | H | H | H | H | L | H | H | H | H | H | L | H | H | H | H | H | L | H | H | H | H | H | L | H | L253 |
| | | Light | H | H | H | H | H | L | H | H | H | H | H | L | H | H | H | H | H | L | H | H | H | H | H | L | H | L254 |
| | H | | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | White L255 | |



7. Absolute Maximum Ratings

| Item | Symbol | Min | Typ | Max | Unit |
|-----------------------|--------|-----|-----|-----|------|
| Operating Temperature | TOP | -30 | — | +85 | °C |
| Storage Temperature | TST | -30 | — | +85 | °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°C

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8. Electrical Characteristics

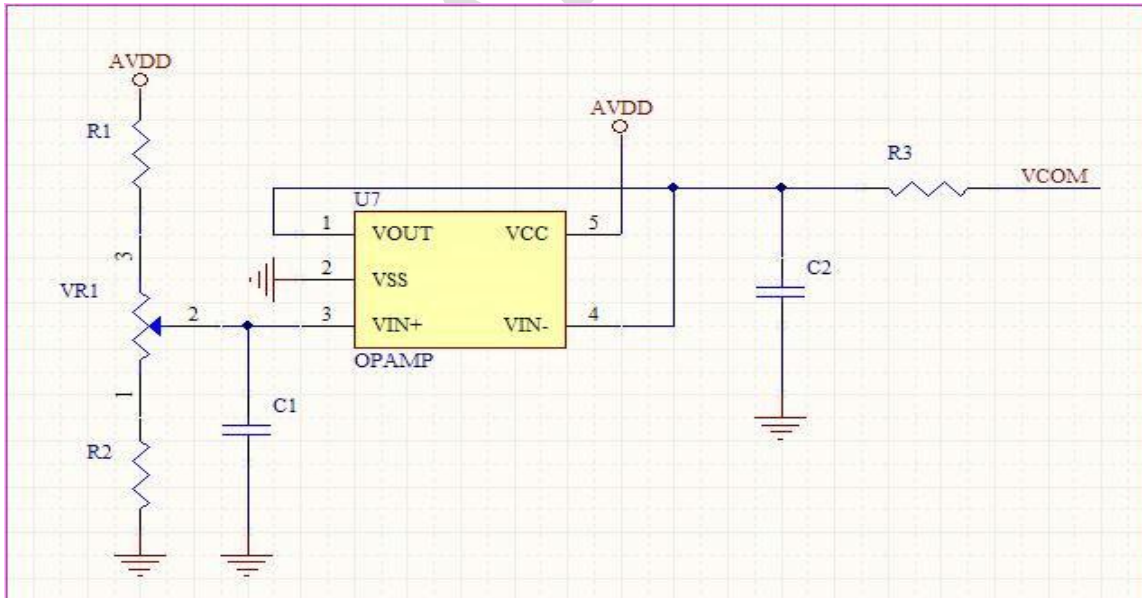
8.1. TFT LCD Power Voltage

| Item | Symbol | Min. | Typ. | Max. | Unit | Note |
|-------------------------|--------|---------|------|---------|------|-----------------------|
| Supply Voltage | VCC | 3.0 | 3.3 | 3.6 | V | |
| | VGH | 22 | 23 | 24 | V | Note (1) |
| | VGL | -9 | -10 | -11 | V | Note (2) |
| | AVDD | 12.3 | 12.6 | 12.9 | V | |
| | VCOM | 5.6 | 5.8 | 6 | V | Note (3) |
| Input signal voltage | ViH | 0.7 VDD | - | VDD | V | |
| | ViL | 0 | - | 0.3 VDD | V | |
| Current of power supply | ICC | - | 24 | - | mA | VDD =3.3V / Note (4) |
| | IADD | - | 41 | - | mA | AVDD=12.5V / Note (4) |
| | IGH | - | 0.7 | - | mA | VGH=23V / Note (4) |
| | IGL | - | 1.3 | - | mA | VGL=-10V / Note (4) |
| | Ivcom | - | 0.8 | -- | mA | VCOM=5.8V / Note (4) |

Note :

- (1) : VGH is TFT Gate operating Voltage.
- (2) : VGL is TFT Gate operating Voltage.
- (3) : VCOM must be adjusted to optimize display quality _ Flicker Pattern.
- (4) : @ White Pattern & 60Hz.

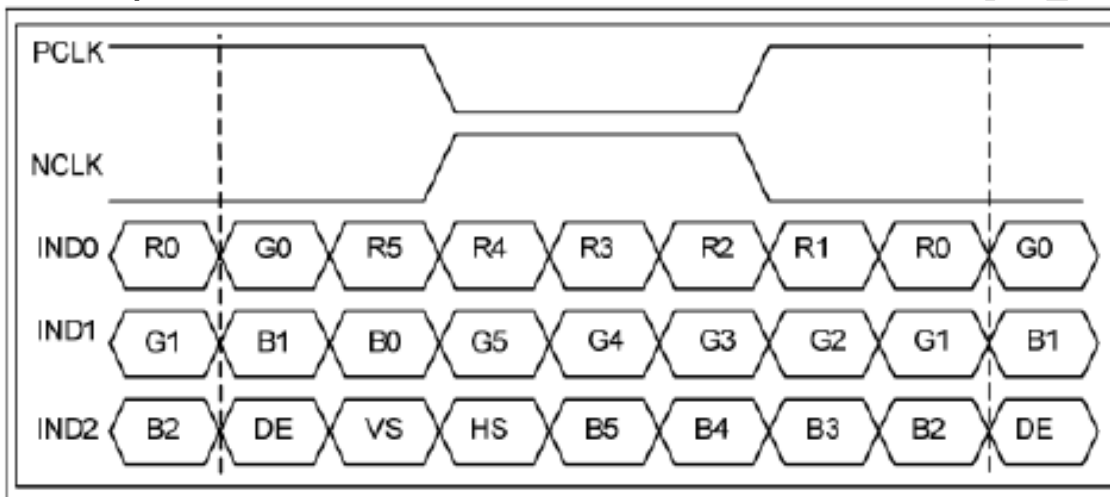
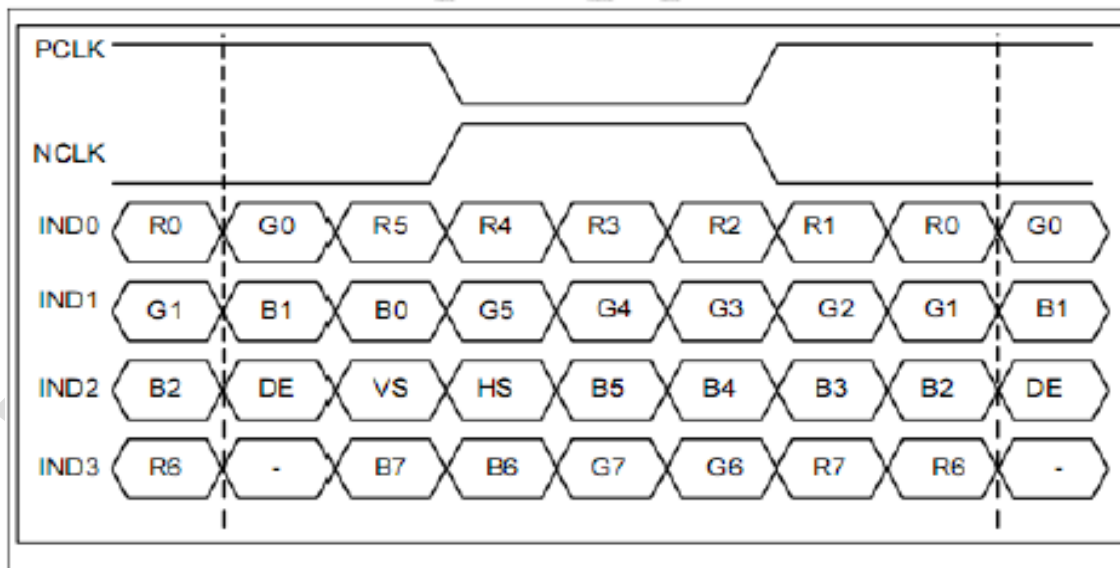
8.2. Vcom reference circuit



8.3.

Switching Characteristics for LVDS Receiver

| Item | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|--|------------|------|------|------|---------|---------------|
| Differential Input High Threshold | V_{th} | - | - | 100 | mV | $V_{CM}=1.2V$ |
| Differential Input Low Threshold | V_{tl} | -100 | - | - | mV | |
| Input Current Differential input Voltage | I_{IN} | -10 | - | +10 | μA | |
| | $ V_{ID} $ | 0.1 | - | 0.6 | V | |
| Common Mode Voltage Offset | V_{CM} | 0.7 | 1.2 | 1.6 | V | |

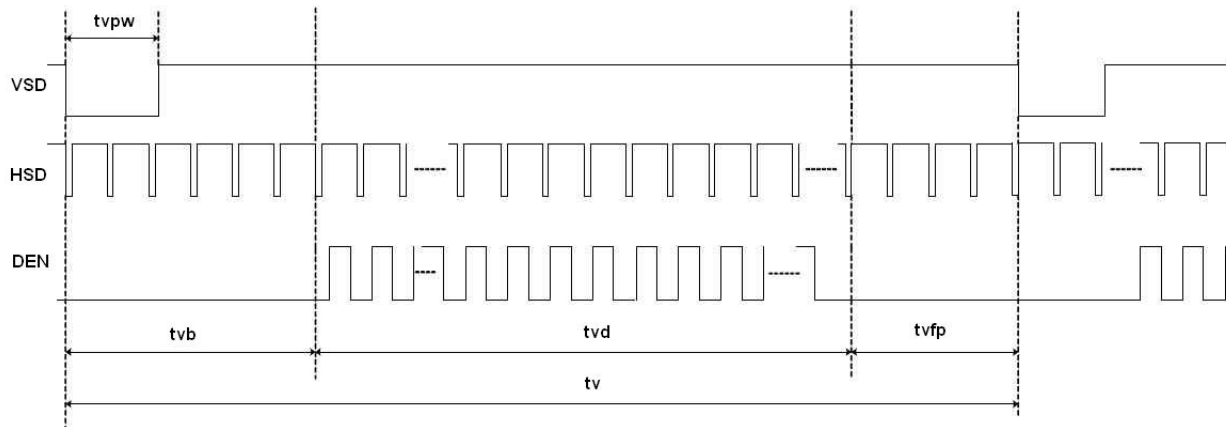
8.4. Bit LVDS input
6bit LVDS input

8Bit LVDS input


8.5. Interface Timing (DE mode)

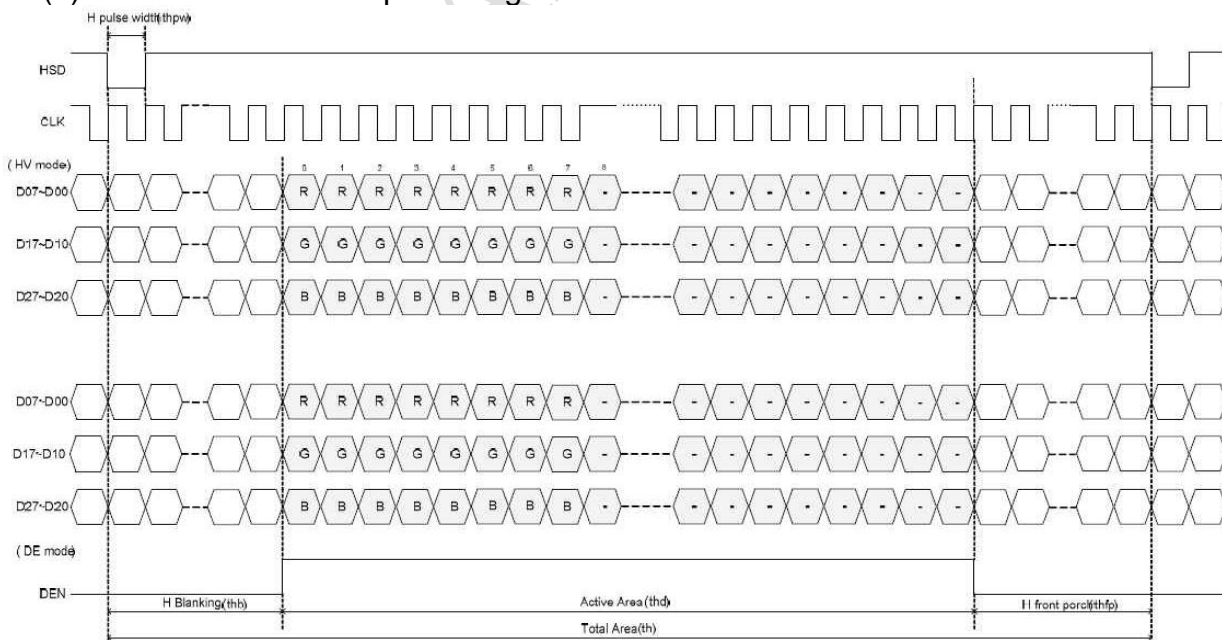
| Parameter | Symbol | Value | | | Unit |
|---------------------------------|----------|-------|------|------|------|
| | | Min. | Typ. | Max. | |
| DCLK frequency @Frame rate=60hz | fclk | 40.8 | 51.2 | 67.2 | Mhz |
| Horizontal display area | thd | 1024 | | | DCLK |
| HSYNC period time | th | 1114 | 1344 | 1400 | DCLK |
| HSYNC blanking | thb+thfp | 90 | 320 | 376 | DCLK |
| Vertical display area | tvd | 600 | | | H |
| VSYNC period time | tv | 610 | 635 | 800 | H |
| VSYNC blanking | tvb+tvfp | 10 | 35 | 200 | H |

Timing Diagram of Interface Signal (DE mode)

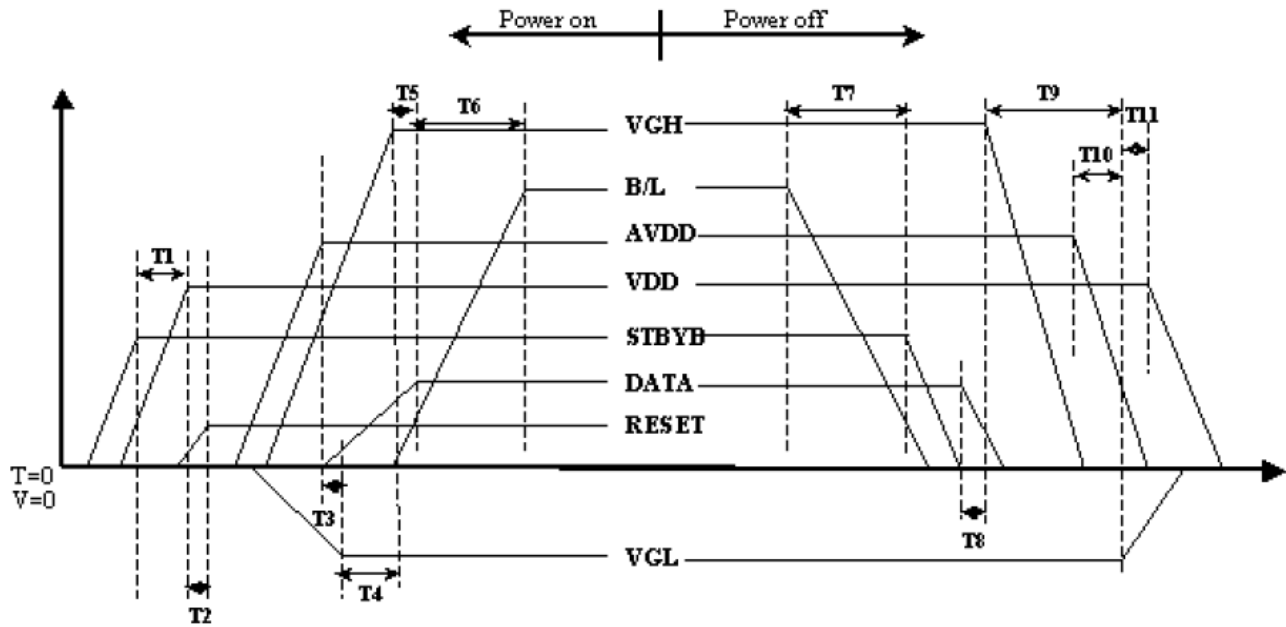
(1) Vertical input timing



(2) Horizontal Vertical input timing



8.6. Power On / Off Sequence



| Item | Min. | Typ. | Max. | Unit |
|------|------|------|------|------|
| T1 | 0 | -- | -- | ms |
| T2 | 50 | -- | -- | ms |
| T3 | 5 | -- | -- | ms |
| T4 | 10 | -- | -- | ms |
| T5 | 20 | -- | -- | ms |
| T6 | 50 | -- | -- | ms |
| T7 | 20 | -- | -- | ms |
| T8 | 10 | -- | -- | ms |
| T9 | 20 | -- | -- | ms |
| T10 | 10 | -- | -- | ms |
| T11 | 20 | -- | -- | ms |

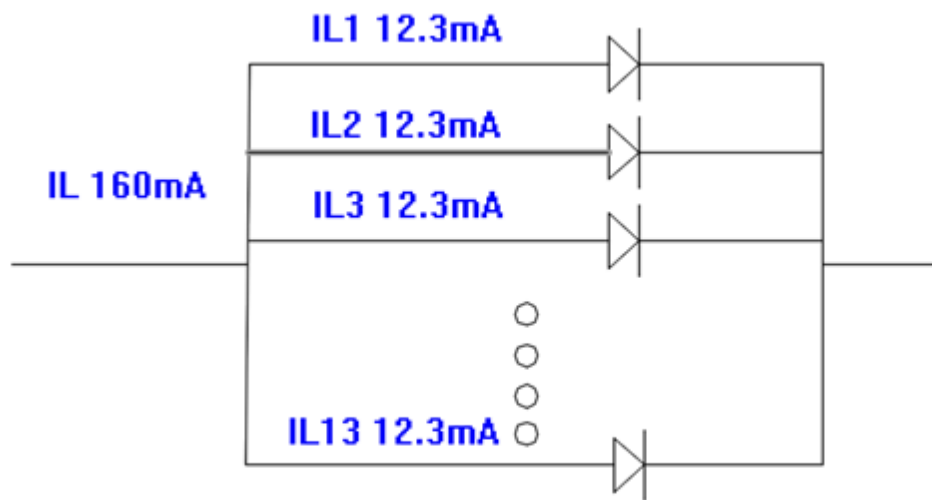
8.7. LED driving conditions

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Remark |
|---------------|--------|--------|------|------|------|------------|
| LED current | IF | - | 160 | - | mA | |
| LED voltage | VBL+ | - | 9 | 9.6 | V | Note 1 |
| LED Life Time | | 30,000 | - | - | Hr | Note 2,3,4 |

Note 1 : There are 1 Groups LED

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

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



Note 4 : The single LED lamp case

9. Optical Characteristics

| Item | Symbol | Condition. | Min | Typ. | Max. | Unit | Remark | |
|--------------------|--------|-----------------------------------|-----------------------------------|-------|-------|-------------------|-------------------|------------|
| Response time | Tr | $\theta=0^\circ$ 、 $\phi=0^\circ$ | - | 17 | 24 | ms | Note 3 | |
| | Tf | | - | 18 | 26 | ms | | |
| Contrast ratio | CR | At optimized viewing angle | 640 | 800 | - | - | Note 4 | |
| Color Chromaticity | White | Wx | $\theta=0^\circ$ 、 $\phi=0^\circ$ | 0.249 | 0.299 | 0.349 | - | Note 2,6.7 |
| | | Wy | | 0.276 | 0.326 | 0.376 | - | |
| Viewing angle | Hor. | Θ_R | $CR \geq 10$ | 80 | 85 | - | Deg. | Note 1 |
| | | Θ_L | | 80 | 85 | - | | |
| | Ver. | Φ_T | | 80 | 85 | - | | |
| | | Φ_B | | 80 | 85 | - | | |
| Brightness | - | - | 400 | 500 | - | cd/m ² | Center of display | |
| Uniformity | (U) | - | 70 | - | - | % | Note 5 | |

Ta=25±2°C,

Note 1: Definition of viewing angle

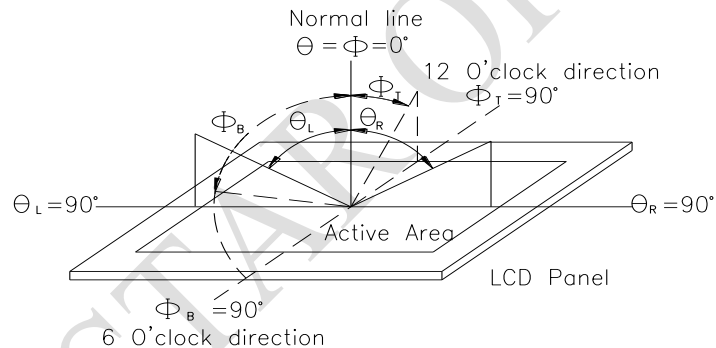


Fig. 9.1. Definition of viewing angle

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.

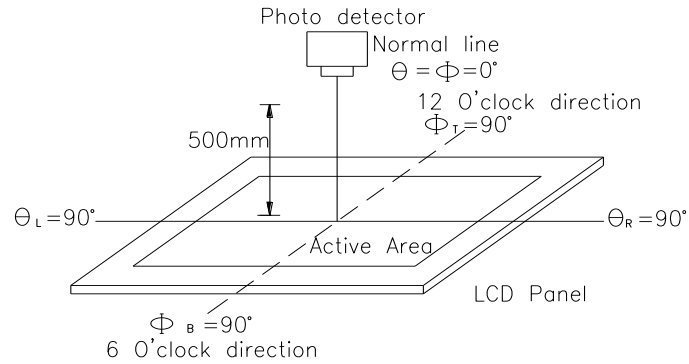
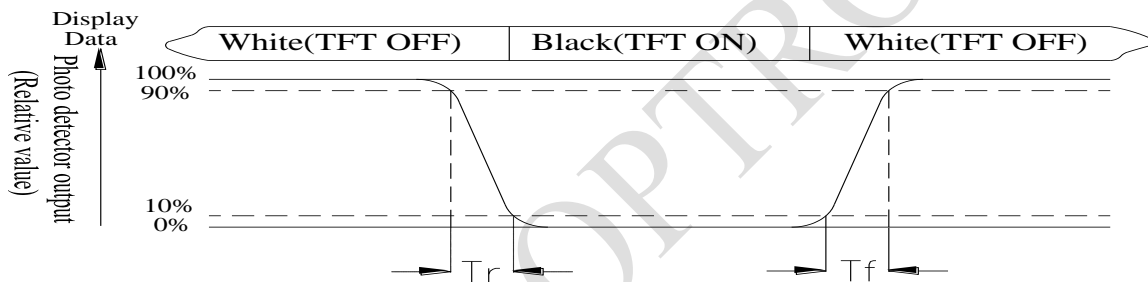


Fig. 9.2. Optical measurement system setup

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

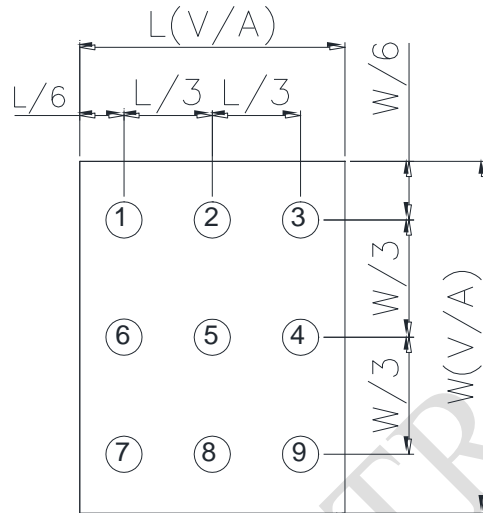


Fig9.3. Definition of uniformity

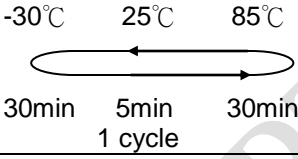
Note 6: Definition of color chromaticity (CIE 1931)

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.

10. Reliability

Content of Reliability Test (Super Wide temperature, -30°C~85°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. | 85°C 200hrs | 2 |
| Low Temperature storage | Endurance test applying the low storage temperature for a long time. | -30°C 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. | 85°C 200hrs | — |
| Low Temperature Operation | Endurance test applying the electric stress under low temperature for a long time. | -30°C 200hrs | 1 |
| High Temperature/ Humidity storage | The module should be allowed to stand at 60°C,90%RH max | 60°C,90%RH 96hrs | 1,2 |
| Thermal shock resistance | The sample should be allowed stand the following 10 cycles of operation <div style="text-align: center;">  <p>-30°C 25°C 85°C</p> <p>30min 5min 30min</p> <p>1 cycle</p> </div> | -30°C/85°C 10 cycles | — |
| Vibration test | Endurance test applying the vibration during transportation and using. | Total fixed amplitude : 3 1.5mm Vibration Frequency : 10~55Hz 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) ,±800v(air), RS=330Ω CS=150pF 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.

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** <<

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 : / /