# Datasheet

## LG Display

### LB070WV8-SL02

HD-10-141

# SPECIFICATION
# FOR
# APPROVAL

( ● ) **Preliminary Specification**
(    ) **Final Specification**

| Title | 7.0"W (800 X RGB X 480)   TFT- LCD |
|---|---|

| BUYER | |
|---|---|
| MODEL | |

| SUPPLIER | LG Display Co., Ltd. |
|---|---|
| MODEL | LB070WV8 |
| SUFFIX | SL02 |

| SIGNATURE | DATE |
|---|---|
| / | |
| / | |
| / | |

**Please return 1 copy for your confirmation
With your signature and comments.**

| APPROVED BY | DATE |
|---|---|
| Y. T. Woo / Chief Engineer | |
| **REVIEWED BY** | |
| B. C. Lee / Senior Engineer | |
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## Contents

# Record of Revisions

| Revision No. | Revision Date | Page | Description | Note |
|:---:|:---:|:---:|:---|:---:|
| 1.0 | Jun.02. 2014 | - | First Draft | |
| 1.1 | Oct. 10. 2014 | 24 | Added to an addendum (Note 2) | |
| | | 7 | Changed backlight power max voltage | |
| | | | Added to an addendum (Note 5) | |
| 1.2 | Apr. 28. 2017 | - | Datasheet for Fab. Transition model (Fab. P4 → P5) | |
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# 1. Summary

This module utilizes amorphous silicon thin film transistors and a 15:9 aspect ratio. The 7.0" active matrix liquid crystal display allows 16M colors to be displayed by LVDS interface is available.

# 2. Features

• Utilizes a panel with a 15:9 aspect ratio.
• The 7.0" screen produces a high resolution image that is composed of 384,000 pixel elements in a stripe arrangement.
• By adopting In Plane Switching (IPS) technology, provide a wide viewing angle.
• By adopting an active matrix drive, a picture with high contrast is realized.
• By using of COG mounting technology, the module became thin, light and compact.
• By adopting a high aperture panel, high transmittance color filter and high transmission polarizing plates, transmittance ratio is realized.
• Gray scale or the brightness of the sub-pixel color is determined with a 8-bit gray scale signal.
• By adopting LVDS interface, the module has a good performance in terms of EMI.
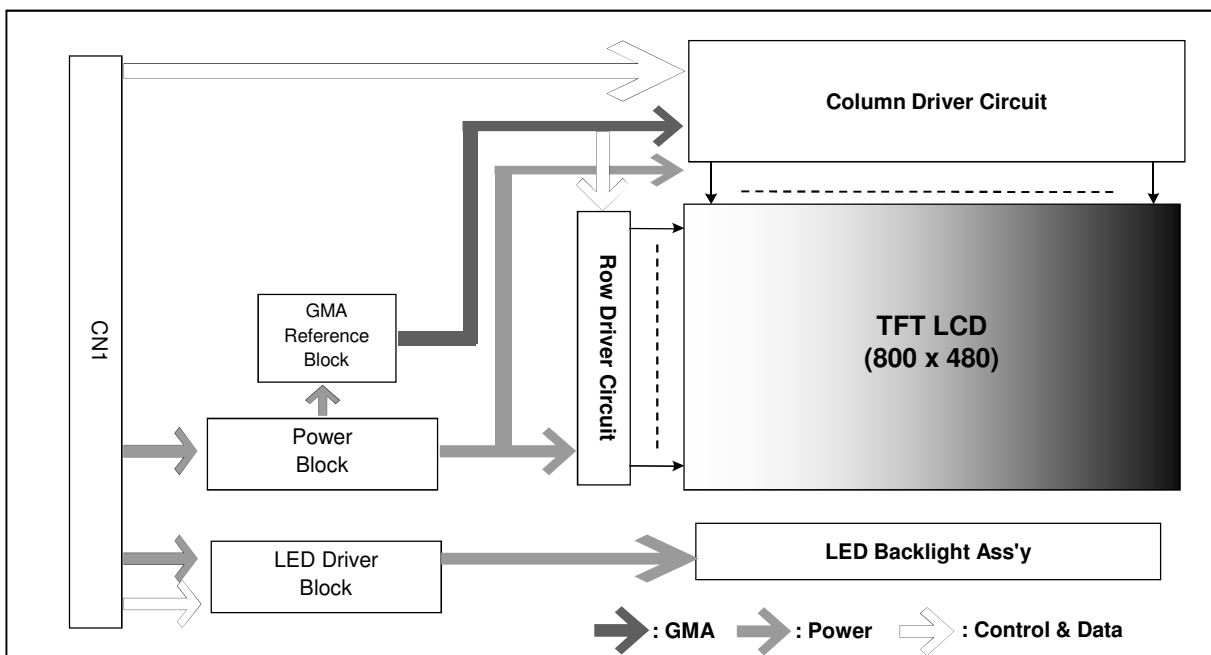
## 3. General Description

| Active Screen Size | 7.0 inches diagonal |
|---|---|
| Outline Dimension | 170 mm (H) × 106.3 mm (V) X 10 mm (D) (Typ.) |
| Pixel Pitch | 0.1905 mm x 0.1905 mm |
| Pixel Format | 800 horiz. by 480 vert. Pixels, RGB stripe arrangement |
| Color Depth | 8bit, 16M colors |
| Luminance, White | 450 cd/m$^2$ (Center 1point ,Typ.) |
| Viewing Angle (CR>10) | Viewing angle free ( R/L 178 (Min.), U/D 178 (Min.)) |
| Power Consumption | Total T.B.D. W (Typ.) [Logic= T.B.D. W, Backlight= 2.5W (BL_DIM=100%)] |
| Weight | 220.0g (MAX) |
| Display Mode | Transmissive mode, Normally Black |
| Surface Treatment | Anti-glare treatment of the front polarizer |

## 4. Absolute Maximum Ratings

The following items are maximum values which, if exceeded, may cause faulty operation or damage to the LCD module.

**Table 1.  ABSOLUTE MAXIMUM RATINGS**

| Parameter | | Symbol | Value | | Unit | Note |
|---|---|---|---|---|---|---|
| | | | **Min** | **Max** | | |
| Power Supply Voltage | LCD | $V_{CC}$ | -0.3 | 3.6 | V | |
| | Backlight | $V_{BL}$ | -0.3 | 12.6 | V | |
| Storage Temperature | | $T_{ST}$ | -30 | 85 | °C | 1 |
| Operating Temperature | | $T_{OP}$ | -30 | 80 | °C | 2,3, |

Note 1. Temperature and relative humidity range are shown in the figure below.
　　　　Wet bulb temperature should be Max. 58℃. Condensation of dew must be avoided,
　　　　because it may cause electrical current leakage, and deterioration of performance and quality.
　　2. The operating temperature means that LCD Module guarantees operation of the circuit.
　　　All the contents of Electro-optical specifications are guaranteed under the room temperature condition.
　　3. This temperature is ambient temperature with regard to the heat which is generated under operation
　　　of circuit and backlight on. (reference value)
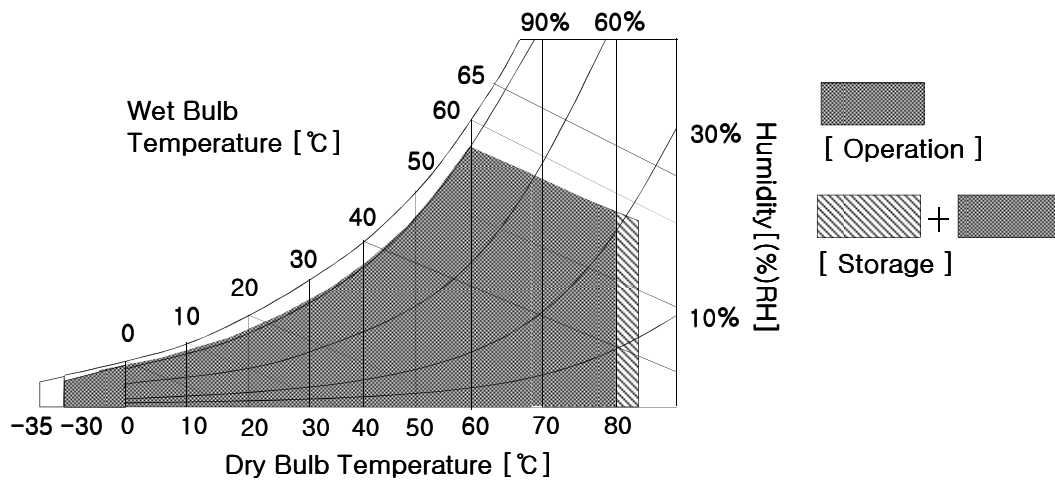
## 5. Electrical Specifications
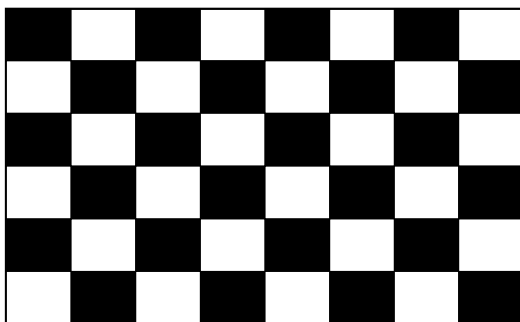
### 5-1. Electrical Characteristics

It requires two power inputs. One is employed to power for the LCD circuit. The other is used for the LED backlight.

**Table 2. LCD DRIVING CIRCUIT ELECTRICAL CHARACTERISTICS**

| Parameter | | Symbol | Value | | | Unit | Note |
|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | | |
| Power Supply Voltage | | $V_{LCD}$ | 3.0 | 3.3 | 3.6 | V | |
| Power Supply Current | Mosaic | $I_{LCD}$ | - | TBD | TBD | mA | 1 |
| | White | $I_{LCD}$ | - | TBD | TBD | mA | |
| Power Consumption | | $P_{LCD}$ | - | TBD | TBD | Watt | |
| Rush Current | | $I_{RUSH}$ | - | - | 1.5 | A | 2 |

Note 1. The specified current and power consumption are under the $V_{LCD}$=3.3V, Ta=25 ± 2°C, fv=60Hz condition whereas mosaic pattern(8 x 6) and white pattern are displayed and fv is the frame frequency.
  2. The duration of rush current is about 2ms and rising time of power input is 0.5ms (min.).
    ($V_{LCD}$=3.3V, Ta=25 ± 2°C, fv=60Hz)
  3. The recommended operating conditions show the ranges in which the device can operate normally. Operation beyond the limit of the recommended operation conditions is not assured, even though operating conditions are within the limit of the maximum ratings.

White : 255 Gray
Black :  0 Gray

White : 255 Gray

**Mosaic Pattern(8 x 6)**
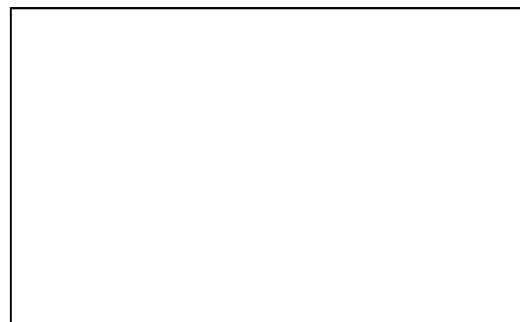
**White Pattern**

## Product Specification

### Table 3. BACKLIGHT ELECTRICAL CHARACTERISTICS

| Parameter | | | Symbol | Values | | | Unit | Note |
|---|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | | |
| Power Supply Voltage | | | $V_{BL}$ | 11 | 12 | 15 | V | 1 |
| Power Supply Current | | | $I_{BL}$ | - | 210 | 280 | mA | |
| Power Consumption | | | I | - | 2.5 | 3.5 | W | |
| Input & Control Signal | On/Off | On | Von | 2 | - | 12 | V | |
| | | Off | Voff | - | 0 | 0.5 | V | |
| | Brightness Adjust | | Dimming | 10 | | 100 | % | On Duty, 5 |
| | BL_DIM Frequency | | $F_{PWM}$ | 0.5 | 1 | 20 | KHz | 3 |
| | Pulse Duty Level (BL_DIM) | | $V_H$ | 2.7 | - | 3.3 | V | HIGH : on duty LOW : off duty |
| | | | $V_L$ | 0.0 | - | 0.3 | V | |
| Life Time | | | | 50,000 | | | Hrs | 4 |

Note 1. Electrical characteristics are determined after the unit has been 'ON' and stable for approximately 15 minutes at 25±2°C. The specified current and power consumption are under the typical supply Input voltage 12V(BL_DIM=100%), it is total power consumption.
2. The permissible forward current of LED vary with environmental temperature.

#### Ambient Temperature vs. Allowable Forward Current
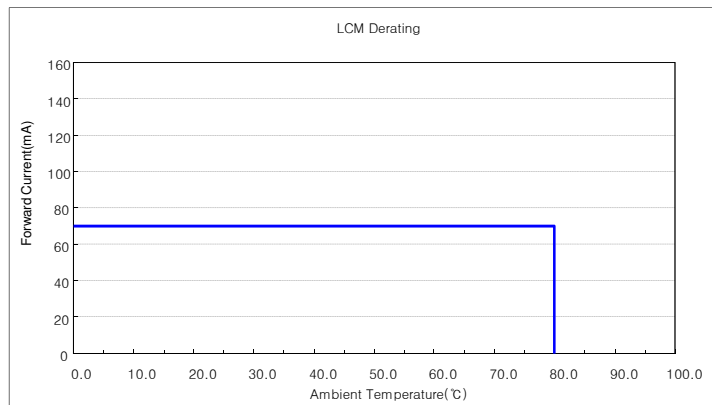


3. PWM frequency should be optimized for minimal wavy and audible noise.
4. The life time is determined as the time at which brightness of LED is 50% compare to that of initial value at the typical LED current.

## Product Specification

### 5-2. Interface Connections

This LCD module employs only one interface connections, 30-pin connector(CN1)

#### 5-2-1. User Connector(CN1) Pin Configuration

The electronics interface connector is a model  FI-X30SSLA (Manufactured by JAE)

**Table 4-1. USER CONNECTOR(CN1) PIN CONFIGURATION**

| Pin No | Name | I/O | Description | Note |
|--------|------|-----|-------------|------|
| 1 | VLED | I | Power Supply, 12V Typ. | |
| 2 | VLED | I | Power Supply, 12V Typ. | 3 |
| 3 | VLED | I | Power Supply, 12V Typ. | |
| 4 | NC | - | No Connection | 4 |
| 5 | GND | I | Ground | 1 |
| 6 | LED_EN | I | High(Typ.3.3V): Backlight On, Low(0V): Backlight Off | |
| 7 | PWM | I | PWM input for dimming control | |
| 8 | TP | I | Test Pin. It should be floating | |
| 9 | TP | I | Test Pin. It should be floating | |
| 10 | GND | I | Ground | 1 |
| 11 | RDP | I | Positive LVDS differential data input | |
| 12 | RDM | I | Negative LVDS differential data input | |
| 13 | GND | I | Ground | 1 |
| 14 | RCLKP | I | Positive LVDS differential clock input | |
| 15 | RCLKM | I | Negative LVDS differential clock input | |
| 16 | GND | I | Ground | 1 |
| 17 | RCP | I | Positive LVDS differential data input | |
| 18 | RCM | I | Negative LVDS differential data input | |
| 19 | GND | I | Ground | 1 |
| 20 | RBP | I | Positive LVDS differential data input | |
| 21 | RBM | I | Negative LVDS differential data input | |
| 22 | GND | I | Ground | 1 |
| 23 | RAP | I | Positive LVDS differential data input | |
| 24 | RAM | I | Negative LVDS differential data input | |
| 25 | GND | I | Ground | 1 |
| 26 | SHLI | I | Reverse scan L/R/U/D | 5 |
| 27 | GND | I | Ground | 1 |
| 28 | GND | I | Ground | |
| 29 | VCC | I | Power Supply for module, 3.3V Typ. | 2 |
| 30 | VCC | I | Power Supply for module, 3.3V Typ. | |

1. Connector

   1.1 LCD : FI-X30SSLA-HF

   1.2 Mating :

     FI-X30SSLA (Manufactured by JAE) or Equivalent

**Rear view of LCM**
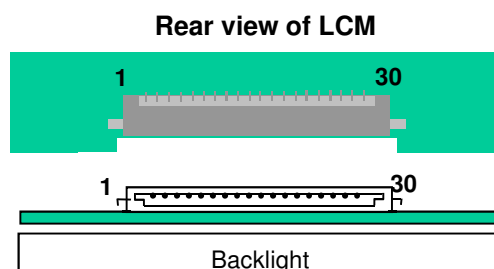
Note 1. All GND(ground) pins should be connected together.
    2. All VCC pins should be connected together.
    3. All VBL pins should be connected together.
    4. Make sure that NC pins should be floated.
    5. Display Direction as following pictures

| Pin Status | | Scanning Direction |
|---|---|---|
| SHLI | L | Left → Right (Up → Down) |
| | H | Right → Left (Down → Up) |

| SHLI | Display Image |
|---|---|
| L |  |
| H |  |

### 5-2-2. Connection between Host system and LVDS receiver

If input data is 8bit, connect MSB 2bit of R,G,B to TD0~TD5 pin of LVDS Tx. Refer to FIG 1 for more detail.

#### Fig 1. REQUIRED SIGNAL ASSIGNMENT FOR LVDS TRANSMITTER(THC63LVDM83R)
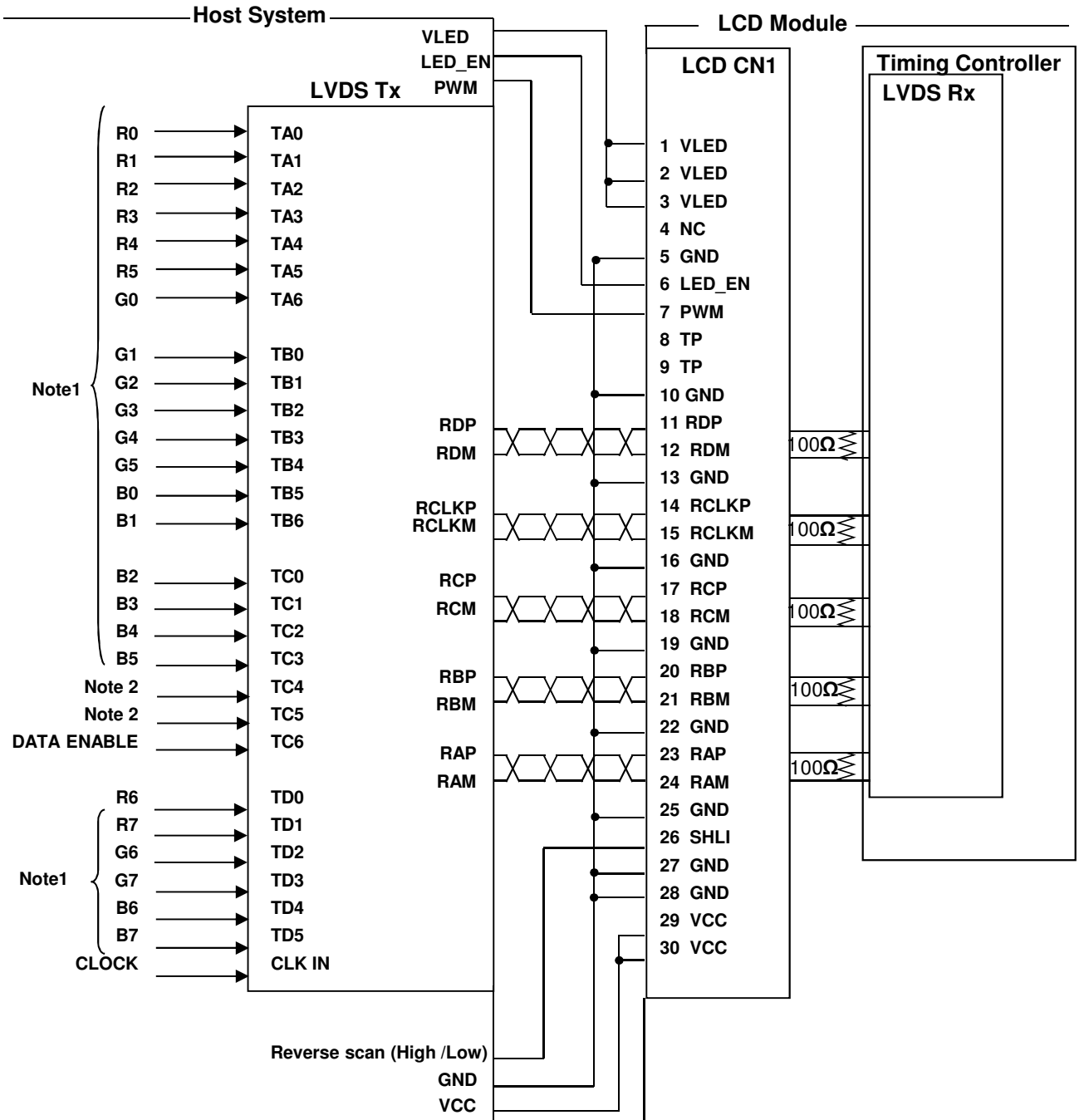
## 5-3. Signal Timing Specifications

Table 5 shows the signal timing required at the input of the LVDS transmitter. All of the interface signal timings should be satisfied with the following specification for normal operation.

### Table 5. SIGNAL TIMING CHARACTERISTICS

Ta=25℃

| Item | | Symbol | Min. | Typ. | Max. | Unit | Remarks |
|------|---|--------|------|------|------|------|---------|
| DCLK | Frequency | $f_{DOTCLK}$ | 31.95 | 33.26 | 34.60 | MHz | |
| | Period | $1/f_{DOTCLK}$ | 28.90 | 30.06 | 31.30 | ns | |
| Horizontal | Total Period | $t_H$ | 1024 | 1056 | 1088 | clk | |
| | Display Area Period | $t_{HDISP}$ | 800 | 800 | 800 | | |
| | Blank Period | $t_{HB}$ | 224 | 256 | 288 | | |
| Vertical | Total Period | $t_V$ | 520 | 525 | 530 | line | |
| | Display Area Period | $t_{VDISP}$ | 480 | 480 | 480 | | |
| | Blank Period | $t_{VB}$ | 40 | 45 | 50 | | |

Note:
 1. DE Only mode operation. The input of Hsync & Vsync signal does not
    have an effect on LCD normal operation.
 2. The performance of the electro-optical characteristics may be influenced by variance of the
    vertical refresh rates.

## 5-4. LVDS Signal Specifications

### 5-4-1. DC Specification



# $|V_{ID}| = |(LVDS+) - (LVDS-)|$
# $V_{CM} = \{(LVDS+) + (LVDS-)\}/2$
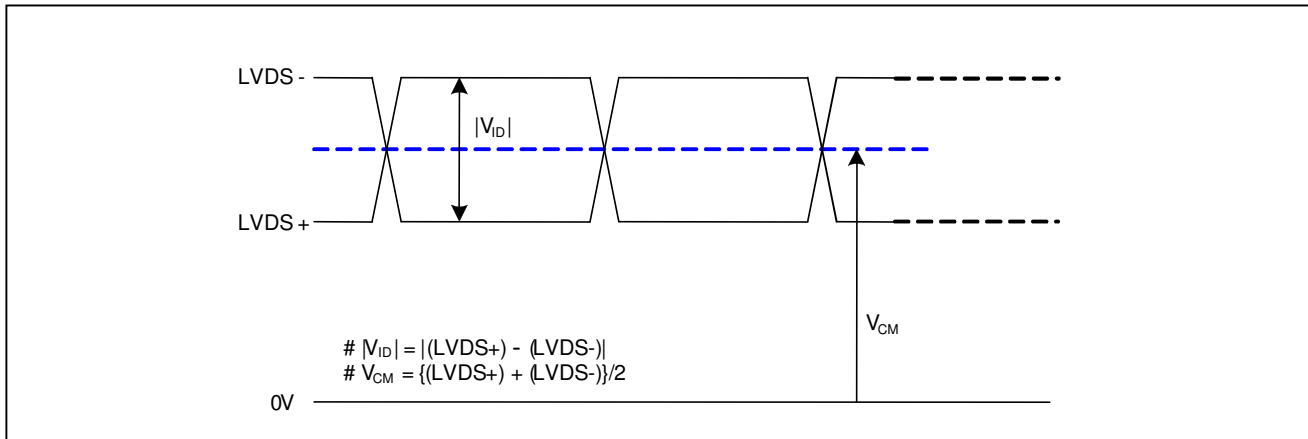
| Parameter | Symbol | Min | Typ | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| LVDS Differential Voltage | $|V_{ID}|$ | 200 | - | 600 | mV | - |
| LVDS Input Common Mode Voltage | $V_{CM}$ | $|V_{ID}|/2$ | 1.2 | VCC-$(|V_{ID}|)/2$ | V | - |
| Positive-going Input Threshold Voltage | $V_{TH}$ | - | - | 100 | mV | - |
| Negative-going Input Threshold Voltage | $V_{TL}$ | -100 | - | - | mV | - |
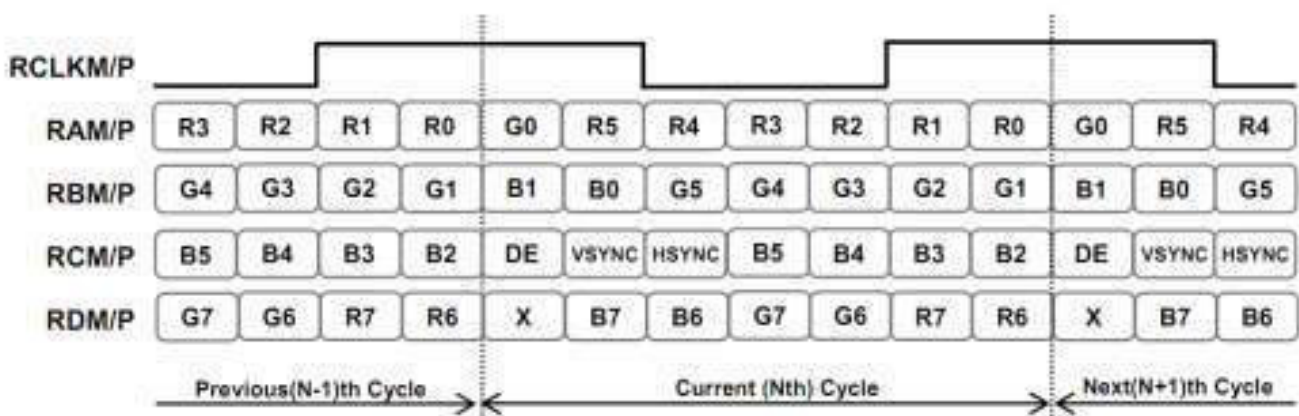
**Product Specification**

### 5-4-2. AC Specification

| Parameter | Symbol | Min | Typ | MAx | Unit |
|-----------|--------|-----|-----|-----|------|
| Input Data Position for Bit0 | $T_{RIP0}$ | - | 0 | - | ns |
| Input Data Position for Bit1 | $T_{RIP1}$ | - | T/7 | - | ns |
| Input Data Position for Bit2 | $T_{RIP2}$ | - | 2T/7 | - | ns |
| Input Data Position for Bit3 | $T_{RIP3}$ | - | 3T/7 | - | ns |
| Input Data Position for Bit4 | $T_{RIP4}$ | - | 4T/7 | - | ns |
| Input Data Position for Bit5 | $T_{RIP5}$ | - | 5T/7 | - | ns |
| Input Data Position for Bit6 | $T_{RIP6}$ | - | 6T/7 | - | ns |
| CLKOUT Period | $T_{RCOP}$ | - | T | - | ns |
| CLKOUT High Time | $T_{RCOH}$ | - | T/2 | - | ns |
| CLKOUT Low Time | $T_{RCOL}$ | - | T/2 | - | ns |

## 5-4-2. AC Specification

| Parameter | Symbol | Min | Max | Unit | Notes |
|---|---|---|---|---|---|
| LVDS Clock to Data Skew Margin | $t_{SKEW}$ | -400 | +400 | ps | 45MHz > $F_{clk}$ ≥ 25MHz |
| Maximum deviation of input clock frequency during SSC | $F_{DEW}$ | - | ±3 | % | - |
| Maximum modulation frequency of input clock during SSC | $F_{MOD}$ | - | 200 | KHz | - |



**LVDS Clock**

**LVDS Data**

$t_{SKEW}$

$t_{SKEW}$ ($F_{clk}$= 1/$T_{clk}$)
1) 45MHz > $F_{clk}$ ≥ 25MHz : -400 ~ +400

$T_{clk}$



**Freq.**

$F_{max}$

$F_{center}$

$F_{min}$

$F_{center}$ x $F_{DEV}$

1 / $F_{MOD}$

**Time**
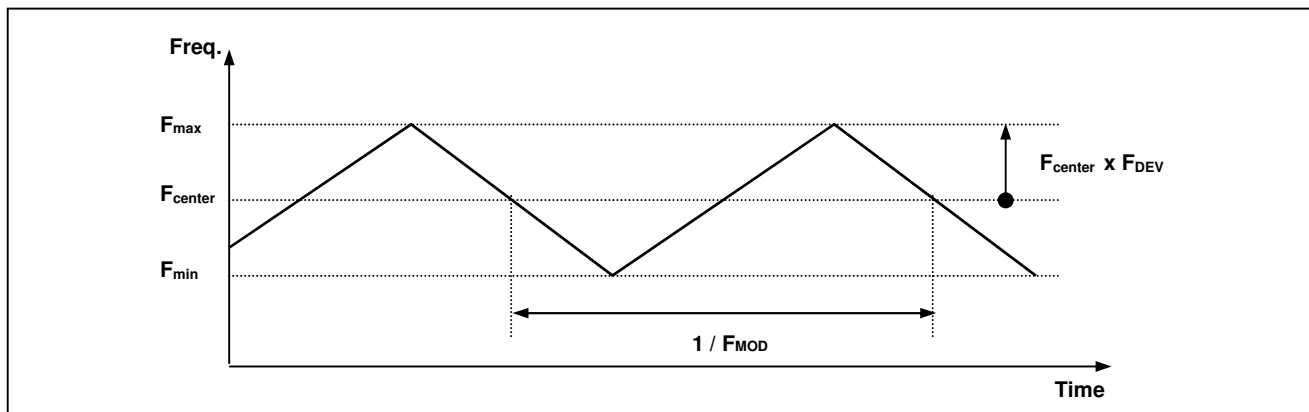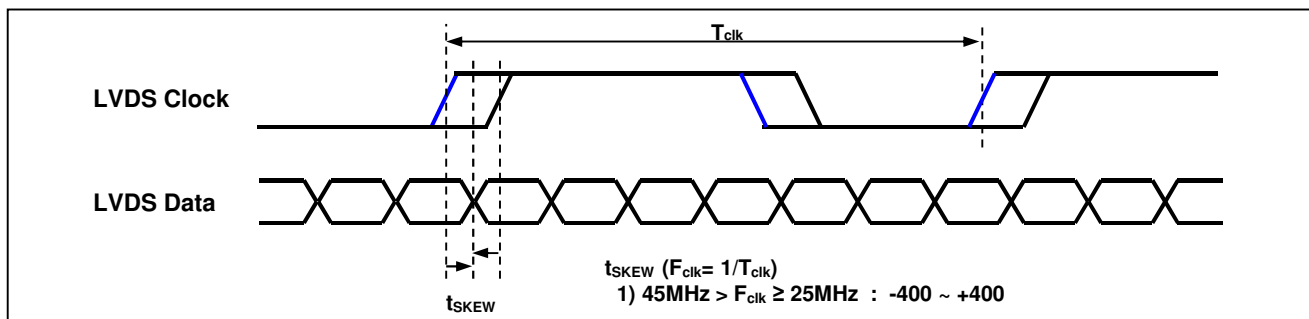
< Spread Spectrum >

## Product Specification

### 5-5. Color Data Reference

The brightness of each primary color(red, green, blue) is based on the 6bit gray scale data input for the color. The higher binary input, the brighter the color. Table 6 provides a reference for color versus data input.

**Table 6. COLOR DATA REFERENCE**

| Color | | RED (MSB) R7 R6 R5 R4 R3 R2 R1 R0 (LSB) | | GREEN (MSB) G7 G6 G5 G4 G3 G2 G1 G0 (LSB) | | BLUE (MSB) B7 B6 B5 B4 B3 B2 B1 B0 (LSB) | |
|---|---|---|---|---|---|---|---|
| | | **Input Color Data** | | | | | |
| Basic Color | Black | 0 0 0 0 0 0 0 0 | | 0 0 0 0 0 0 0 0 | | 0 0 0 0 0 0 0 0 | |
| | Red | 1 1 1 1 1 1 1 1 | | 0 0 0 0 0 0 0 0 | | 0 0 0 0 0 0 0 0 | |
| | Green | 0 0 0 0 0 0 0 0 | | 1 1 1 1 1 1 1 1 | | 0 0 0 0 0 0 0 0 | |
| | Blue | 0 0 0 0 0 0 0 0 | | 0 0 0 0 0 0 0 0 | | 1 1 1 1 1 1 1 1 | |
| | Cyan | 0 0 0 0 0 0 0 0 | | 1 1 1 1 1 1 1 1 | | 1 1 1 1 1 1 1 1 | |
| | Magenta | 1 1 1 1 1 1 1 1 | | 0 0 0 0 0 0 0 0 | | 1 1 1 1 1 1 1 1 | |
| | Yellow | 1 1 1 1 1 1 1 1 | | 1 1 1 1 1 1 1 1 | | 0 0 0 0 0 0 0 0 | |
| | White | 1 1 1 1 1 1 1 1 | | 1 1 1 1 1 1 1 1 | | 1 1 1 1 1 1 1 1 | |
| RED | RED (000) | 0 0 0 0 0 0 0 0 | | 0 0 0 0 0 0 0 0 | | 0 0 0 0 0 0 0 0 | |
| | RED (001) | 0 0 0 0 0 0 0 1 | | 0 0 0 0 0 0 0 0 | | 0 0 0 0 0 0 0 0 | |
| | ... | ... | | ... | | ... | |
| | RED (255) | 1 1 1 1 1 1 1 0 | | 0 0 0 0 0 0 0 0 | | 0 0 0 0 0 0 0 0 | |
| | RED (255) | 1 1 1 1 1 1 1 1 | | 0 0 0 0 0 0 0 0 | | 0 0 0 0 0 0 0 0 | |
| GREEN | GREEN (000) | 0 0 0 0 0 0 0 0 | | 0 0 0 0 0 0 0 0 | | 0 0 0 0 0 0 0 0 | |
| | GREEN (001) | 0 0 0 0 0 0 0 0 | | 0 0 0 0 0 0 0 1 | | 0 0 0 0 0 0 0 0 | |
| | ... | ... | | ... | | ... | |
| | GREEN (255) | 0 0 0 0 0 0 0 0 | | 1 1 1 1 1 1 1 0 | | 0 0 0 0 0 0 0 0 | |
| | GREEN (255) | 0 0 0 0 0 0 0 0 | | 1 1 1 1 1 1 1 1 | | 0 0 0 0 0 0 0 0 | |
| BLUE | BLUE (000) | 0 0 0 0 0 0 0 0 | | 0 0 0 0 0 0 0 0 | | 0 0 0 0 0 0 0 0 | |
| | BLUE (001) | 0 0 0 0 0 0 0 0 | | 0 0 0 0 0 0 0 0 | | 0 0 0 0 0 0 0 1 | |
| | ... | ... | | ... | | ... | |
| | BLUE (254) | 0 0 0 0 0 0 0 0 | | 0 0 0 0 0 0 0 0 | | 1 1 1 1 1 1 1 0 | |
| | BLUE (255) | 0 0 0 0 0 0 0 0 | | 0 0 0 0 0 0 0 0 | | 1 1 1 1 1 1 1 1 | |

## 5-6. Power Sequence

For LCD's normal operation, it is recommended to keep below power supply sequence.
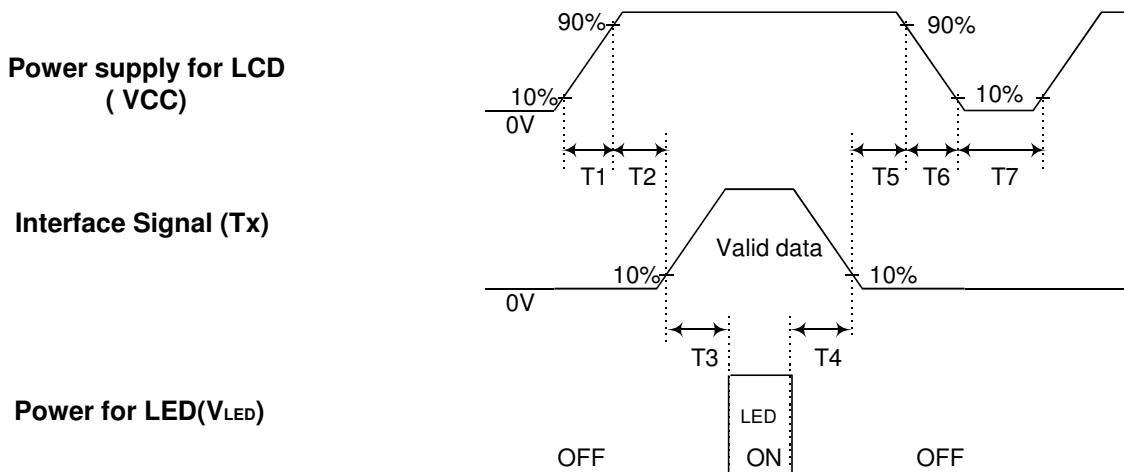


**Table 9. POWER SEQUENCE TABLE**

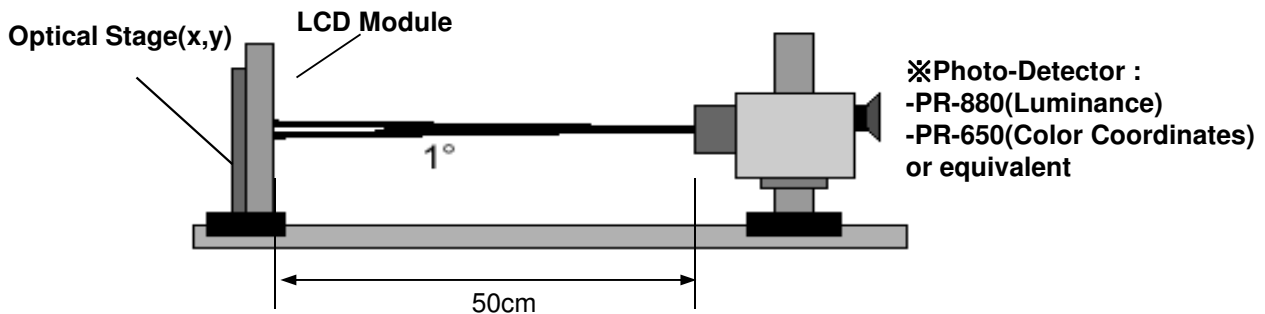| Parameter | Value | | | Units |
|:---:|:---:|:---:|:---:|:---:|
| | **Min.** | **Typ.** | **Max.** | |
| $T_1$ | - | - | 10 | (ms) |
| $T_2$ | 50 | - | - | (ms) |
| $T_3$ | 200 | - | - | (ms) |
| $T_4$ | 200 | - | - | (ms) |
| $T_5$ | 0 | - | 50 | (ms) |
| $T_6$ | - | - | 10 | (ms) |
| $T_7$ | 500 | - | - | (ms) |

Note)
   1. Please avoid floating state of interface signal at invalid period.
   2. When the interface signal is invalid, be sure to pull down the power supply for LCD VCC to 0V.
   3. Lamp power must be turn on after power supply for LCD and interface signal are valid.

## 6. Electro-optical Characteristics

Electro-optical characteristics are determined after the unit has been 'ON' and stable in a dark environment at 25±2°C. The values are specified at an approximate distance 50cm from the LCD surface at a viewing angle of and equal to 0°. Measured value at the center point of LCD panel after more than 15 minutes while backlight turning on.

It is presented additional information concerning the measurement equipment and method in FIG. 1.



**FIG. 3 Electro-optical Characteristic Measurement Equipment and Method**

**Table 8. ELECTRO-OPTICAL CHARACTERISTICS**          Ta=25±2°C, VCC=3.3V, fv=60Hz

| Parameter | | Symbol | | Value | | | Unit | Note |
|---|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | | |
| Contrast Ratio | | CR | | 560 | 800 | - | | 1 |
| Surface Luminance, white | | $L_{WH}$ | | 360 | 450 | - | cd/m² | 2 |
| Luminance Variation | | $\delta_{WHITE}$ | 9P | 80 | - | - | % | 3 |
| Response Time | Rise Time | $Tr_R$ | | - | 15 | 18 | ms | 4 |
| | Decay Time | $Tr_D$ | | - | 10 | 12 | ms | |
| Color Coordinates [CIE1931] | RED | Rx | | | (0.631) | | | 6 |
| | | Ry | | | (0.348) | | | |
| | GREEN | Gx | | | (0.332) | | | |
| | | Gy | | Typ -0.03 | (0.606) | Typ +0.03 | | |
| | BLUE | Bx | | | (0.146) | | | |
| | | By | | | (0.082) | | | |
| | WHITE | Wx | | | 0.305 | | | |
| | | Wy | | | 0.335 | | | |
| Color Gamut | | | | - | 60 | - | % | |
| Viewing Angle (CR>10) | x axis, right(φ=0°) | θr | | 89 | - | - | degree | 5 |
| | x axis, left (φ=180°) | θl | | 89 | - | - | | |
| | y axis, up (φ=90°) | θu | | 89 | - | - | | |
| | y axis, down (φ=270°) | θd | | 89 | - | - | | |
| Gray scale | | | | | 2.2 | | | 7 |

## Product Specification

Note 1. Contrast Ratio(CR) is defined mathematically as :

$$\text{Contrast Ratio} = \frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$$

It is measured at center 1-point.

2. Surface luminance are determined after the unit has been 'ON' and More than 15 Minute after lighting the backlight in a dark environment at 25±2°C. Surface luminance is the luminance value at center 1-point across the LCD surface 50cm from the surface with all pixels displaying white. For more information see the FIG. 4.

3. The Luminance Uniformity ($\delta_{WHITE}$) is determined by measuring LN at each test position 1 through 9. The Luminance Uniformity ($\delta_{WHITE}$) is defined as follows ;

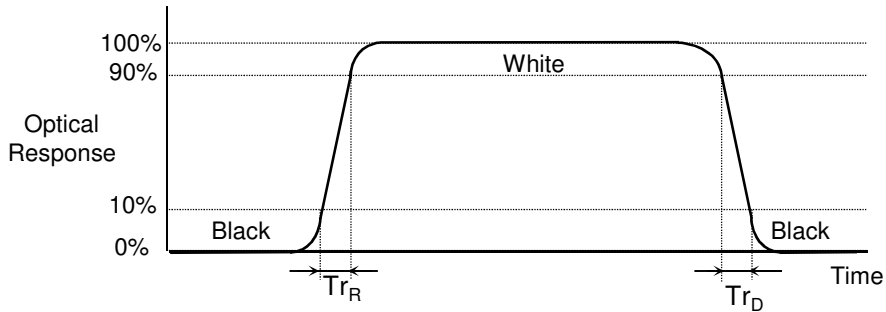$$\text{Panel total variation } (\delta_{WHITE}) = \frac{\text{Minimum}(L1, L2, L3, L4\ldots L9)}{\text{Maximum}(L1, L2, L3, L4\ldots L9)} \times 100\%$$

For more information see the FIG. 4.



@ H,V : ACTIVE AREA
A : H/5 mm
B : V/5 mm

[ POINTS: 9 POINTS ]
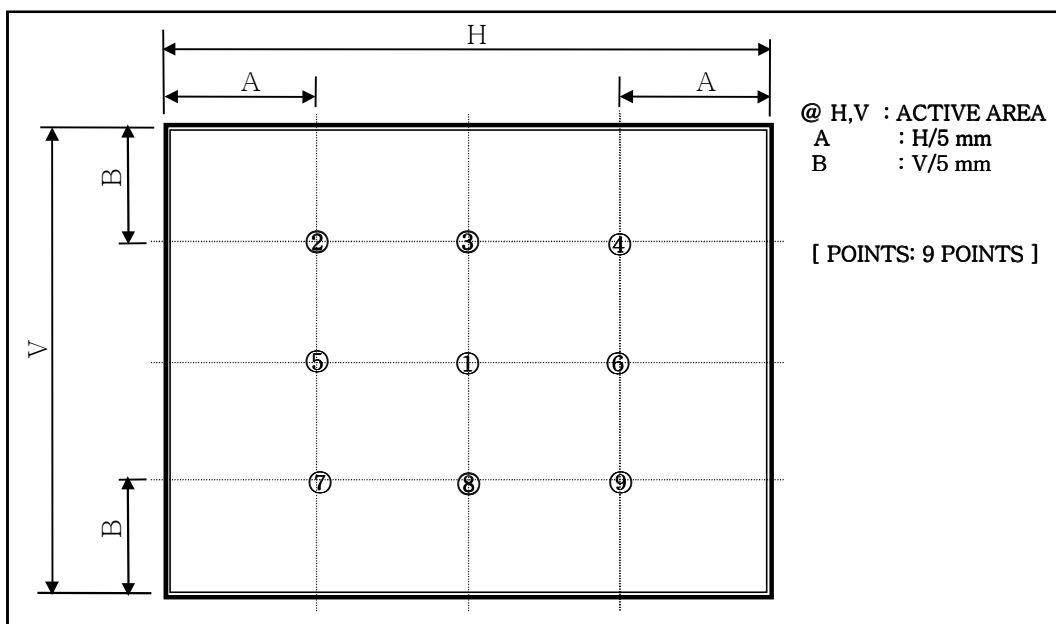
Note 4. Response time is obtained by measuring the transition time of photo detector output, when input signals are applied to make center point "black" and "white". For more information, see the FIG. 5.



**FIG. 5 Response Time**

5. Viewing angle is the angle at which the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD module surface. For more information, see the FIG. 6.
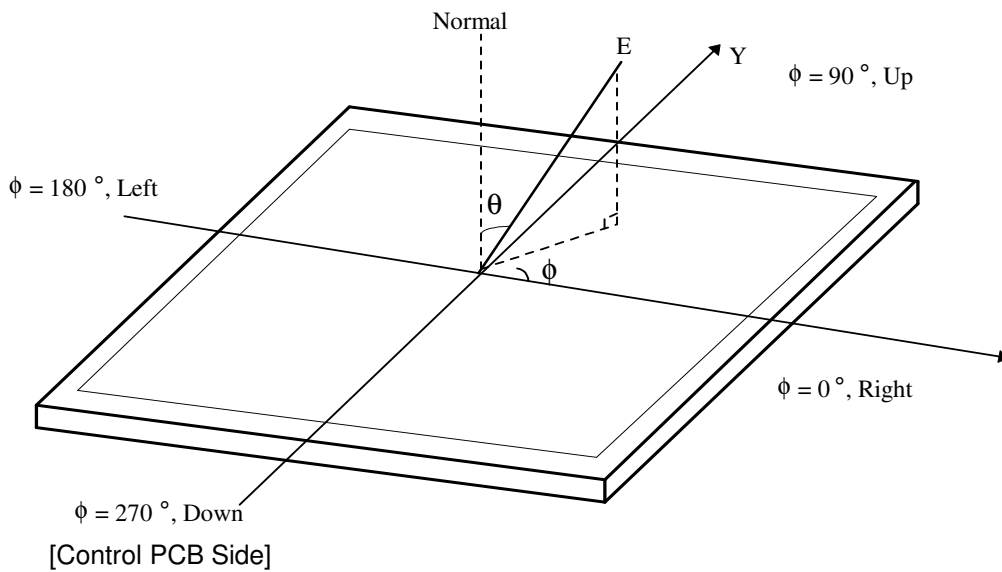


**FIG. 6 Viewing Angle**

6. Please see the Appendix V for more information about Color Coordinator

Note 7. Gray scale Specification

| Gray Level | Luminance [%] (Typ) |
|:---:|:---:|
| L0 | 0.09 |
| L15 | 0.28 |
| L31 | 0.97 |
| L47 | 2.31 |
| L63 | 4.41 |
| L79 | 7.03 |
| L95 | 9.70 |
| L111 | 13.50 |
| L127 | 18.0 |
| L143 | 22.8 |
| L159 | 28.3 |
| L175 | 34.6 |
| L191 | 41.9 |
| L207 | 50.4 |
| L223 | 64.9 |
| L239 | 85.0 |
| L255 | 100 |

## 7. Mechanical Characteristics

The contents provide general mechanical characteristics for this module. In addition the figures in the next page are detailed mechanical drawing of the LCD.

**Table 9. MECHANICAL CHARACTERISTICS**

| Parameter | | Value |
|---|---|---|
| Outline Dimension | Horizontal | 170 $\pm$ 0.3 mm |
| | Vertical | 106.3 $\pm$ 0.3 mm |
| | Depth | 10 $\pm$ 0.7 mm |
| Active Display Area | Horizontal | 152.4 mm |
| | Vertical | 91.44 mm |
| Weight | 220.0g (Max.) | |

**<FRONT VIEW>**

Note. Unit:[mm], General tolerance: ± 0.3mm



THE THICKNESS OF LCM LABEL IS NOT CONTAINED IN THE OUTLINE DIMENSION

(170.0)

THE THICKNESS(T=0.11) OF COVER SHIELD TAPE IS NOT CONTAINED IN THE OUTLINE DIMENSION

170±0.3(Outer Dimension)

86.45±0.6(Active Center)

3110T-1007A  81

(77.6)

155.2±0.5(Bezel Open)
152.4(ACTIVE AREA)

(47.12)

A/A Center

94.2±0.5(Bezel Open)
91.44(ACTIVE AREA)

106.3±0.3(Outer Dimension)

(106.3)

5.16

USER CABLE
USER CNT(FI-X30SSLA-HF(JAE))

6.7
8.2
10±0.7

**LG Display**

**\<REAR VIEW\>**

Note. Unit:[mm], General tolerance: ± 0.3mm

145.5±0.5

12.55±0.3

20.42±0.3

70±0.5

Mount'g

Mount'g

Mount'g

Mount'g

LB070WV8
(SL)(02)
Factory IDLGDNJ

RoHS Verified

MADE IN CHINA

LG Display

** **** * * 0647A

3550S-1424A 81

USER CNT(FI-X30SSLA-HF(JAE))

USER CABLE

6091L-2056A

3550B-1081A 81

** **** * * 2056A

User Mount'g sec.(4 EA)
Scale N/S

Use the M2 screw
Allowable Max. depth : 1.5mm

SYSTEM SCREW TORQUE : MAX 2.0 kgf*cm

NOTES

1. UNSPECIFIC SHAPE AND DIMENSION REFER TO OUTLINE DIMENSION DRAWING.
2. MUST BE FREE FROM BUOYING, STAIN, OMISSION, DEFORMATION AFTER ASSEMBLY.
3. SPECIPICATION OF EACH PART IS REFERD TO DRAWING OF EACH PART.
4. DESIGNER'S APPROVAL IS REQUIRED BEFORE MASS PRODUCTION.
5. UNSPECIFIED DIMENSIONAL TOLERANCES ARE ±0.3mm.
6. UNSPECIFIED ROUNDS ARE R=0.3mm.

## 8. Reliability

**Table 10. ENVIRONMENT TEST CONDITION**

| No | Test Item | Condition | Note |
|----|-----------|-----------|------|
| 1 | High Temperature Storage Test | Ta=85℃  240h | |
| 2 | Low Temperature Storage Test | Ta=-30℃  240h | |
| 3 | High Temperature Operation Test | Ta=80℃  240h | 1 |
| 4 | Low Temperature Operation Test | Ta=-30℃  240h | |
| 5 | High Humidity Operation Test | Ta=60℃/90%RH 240h | |
| 6 | Shock Test (non-operating) | Half sine wave, 100G, 11ms, 1 times shock of each six faces  (±X / ±Y / ±Z) | - |
| 7 | Vibration Test (non-operating) | Random, 10 ~ 300Hz, 1Grms,3 axis, 30min/axis | - |

Note 1. Result Evaluation Criteria:
    TFT-LCD panels should take place at room temperature for 24 hours after the reliability tests finish.
     In the standard condition, there should be no particular problems that may affect the display function.

Note. 2 This model has passed the reliability test with 10 Samples at 504h, 60℃/90%RH,
     which had proceeded for reference of Siemens.

## 9. International Standards

### 9-1. Safety

a) UL 60950-1, Underwriters Laboratories Inc.
   Information Technology Equipment - Safety - Part 1 : General Requirements
b) CAN/CSA  C22.2  No.60950-1-07, Canadian Standards Association.
   Information Technology Equipment - Safety - Part 1 : General Requirements.
c) EN 60950-1, European Committee for Electrotechnical Standardization (CENELEC).
   Information Technology Equipment - Safety - Part 1 : General Requirements.

### 9-2. Environment

a) RoHS, Directive 2002/95/EC of the European Parliament and of the council of 27 January 2003

## 10. Packing

## 10-1. Designation of Lot Mark

a) Lot Mark

| A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

A,B,C : SIZE(INCH)                    D : YEAR
E : MONTH                             F ~ M : SERIAL NO.

Note
1. YEAR

| Year | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|------|------|------|------|------|------|------|------|------|------|------|
| Mark | A | B | C | D | E | F | G | H | J | K |

2. MONTH

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Mark | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C |

b) Location of Lot Mark

   Serial No. is printed on the label. The label is attached to the backside of the LCD module.
   This is subject to change without prior notice.

## Product Specification

## 10-2. Packing Form

a) Package quantity in one box : 54 pcs
b) Box Size : 478 mm × 365 mm × 244 mm
c) Pallet Pattern : 3 x 2 x 4
d) Quantity in one pallet : 1,296 pcs
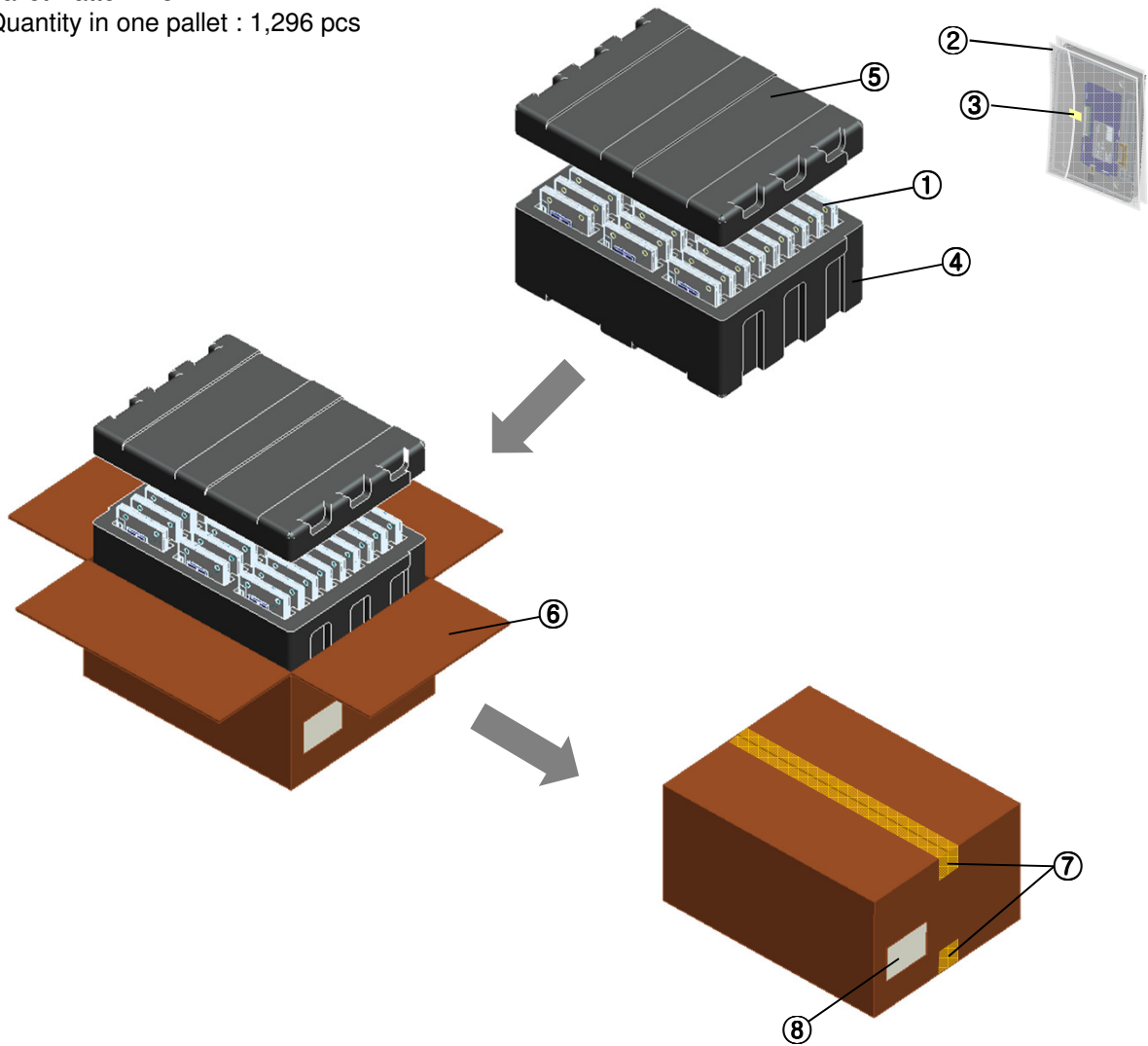
| NO. | Description | Material |
|:---:|:---:|:---:|
| 1 | Module | 54pcs/1 Box |
| 2 | Bag | PE, 187X144 |
| 3 | Tape | Yellow, 40*20 |
| 4 | Packing, Bottom | EPS |
| 5 | Packing, Top | EPS |
| 6 | Carton Box | PAPER SW |
| 7 | Tape | OPP 70MMx300m |
| 8 | Label | YUPO Paper 100x70 |

## 11. PRECAUTIONS

Please pay attention to the following when you use this TFT LCD module.

## 11-1. MOUNTING PRECAUTIONS

(1) You must mount a module using specified mounting structure. (Details refer to the drawings)
(2) You should consider the mounting structure so that uneven force(ex. Twisted stress) is not applied to the module.
And the case on which a module is mounted should have sufficient strength so that external force is not transmitted directly to the module.
(3) Please attach a transparent protective plate to the surface in order to protect the polarizer.
Transparent protective plate should have sufficient strength in order to the resist external force.
(4) You should adopt radiation structure to satisfy the temperature specification.
(5) Acetic acid type and chlorine type materials for the cover case are not desirable because the former generates corrosive gas of attacking the polarizer at high temperature and the latter causes circuit break by electro-chemical reaction.
(6) Do not touch, push or rub the exposed polarizers with glass, tweezers or anything harder than HB pencil lead. And please do not rub with dust clothes with chemical treatment.
Do not touch the surface of polarizer for bare hand or greasy cloth.(Some cosmetics deteriorate the polarizer.)
(7) When the surface becomes dusty, please wipe gently with absorbent cotton or other soft materials like chamois soaks with petroleum benzine. Normal-hexane is recommended for cleaning the adhesives used to attach front / rear polarizers. Do not use acetone, toluene and alcohol because they cause chemical damage to the polarizer.
(8) Wipe off saliva or water drops as soon as possible. Their long time contact with polarizer causes deformations and color fading.
(9) Do not open the case because inside circuits do not have sufficient strength.
(10) The metal case of a module should be contacted to electrical ground of your system.

## 11-2. OPERATING PRECAUTIONS

(1) The spike noise causes the mis-operation of circuits. It should be lower than following voltage :
V=$\pm$200mV(Over and under shoot voltage)
(2) Response time depends on the temperature.(In lower temperature, it becomes longer.)
(3) Brightness depends on the temperature. (In higher temperature, it becomes lower.)
(4) Be careful for condensation at sudden temperature change. Condensation makes damage to polarizer or electrical contacted parts. And after fading condensation, smear or spot will occur.
(5) When fixed patterns are displayed for a long time, remnant image is likely to occur.
(6) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimize the interference.

## 11-3. ELECTROSTATIC DISCHARGE CONTROL

Since a module is composed of electronic circuits, it is not strong to electrostatic discharge. Make certain that treatment persons are connected to ground through wrist band etc. And don't touch interface pin directly.


## 11-4. PRECAUTIONS FOR STRONG LIGHT EXPOSURE

Strong light exposure causes degradation of polarizer and color filter.


## 11-5. STORAGE

When storing modules as spares for a long time, the following precautions are necessary.
(1) Store them in a dark place. Do not expose the module to sunlight or fluorescent light. Keep the temperature between 5°C and 35°C at normal humidity.
(2) The polarizer surface should not come in contact with any other object.
   It is recommended that they be stored in the container in which they were shipped.


## 11-6. HANDLING PRECAUTIONS FOR PROTECTION FILM

(1) The protection film is attached to the bezel with a small masking tape or a double side tape.
   When the protection film is peeled off, static electricity is generated between the film and polarizer.
   This should be peeled off slowly and carefully by people who are electrically grounded and with well ion-blown equipment or in such a condition, etc.
(2) When the module with protection film attached is stored for a long time, sometimes there remains a very small amount of glue still on the bezel after the protection film is peeled off.
(3) You can remove the glue easily. When the glue remains on the bezel surface or its vestige is recognized, please wipe them off with absorbent cotton waste or other soft material like chamois soaked with normal-hexane.


## 11-7. PRECAUTIONS FOR ATTACHING THE TOUCH PANEL PROCESS

(1) When being touch panel laminate, Stems, Scratch, Stain and etc. can be occurred and then the operation should be with care. After being attached touch panel, It is not warranty for quality problems

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