**LG Display**

Product Specification

# SPECIFICATION
# FOR
# APPROVAL

(   )   **Preliminary Specification**

( ◆ )   **Final Specification**

| Title | 14.0" Full HD  TFT LCD |
|---|---|

| Customer | |
|---|---|
| MODEL | |

| SUPPLIER | LG Display Co., Ltd. |
|---|---|
| *MODEL | LP140WF1 |
| Suffix | SPK1 |

*When you obtain standard approval,
 please use the above model name without suffix

| APPROVED BY | SIGNATURE |
|---|---|
| ___/___ | ___ |
| ___/___ | ___ |
| ___/___ | ___ |

Please return 1 copy for your confirmation with
your signature and comments.

| APPROVED BY | SIGNATURE |
|---|---|
| ___ | ___ |
| **REVIEWED BY** | |
| ___ | ___ |
| **PREPARED BY** | |
| ___ | ___ |

**Products Engineering Dept.**
**LG Display Co., Ltd**

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## RECORD OF REVISIONS

| Revision No | Revision Date | Page | Description | EDID ver. |
|---|---|---|---|---|
| 0.0 | - | - | Preliminary Specification | V0.0 |
| 1.0 | Oct. 02. 2013 | - | Final Specification | V1.0 |
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Product Specification

## 1. General Description

The LP140WF1 is a Color Active Matrix Liquid Crystal Display with an integral LED backlight system. The matrix employs a-Si Thin Film Transistor as the active element. It is a transmissive type display operating in the normally black mode. This TFT-LCD has 14.0 inches diagonally measured active display area with FHD resolution (1920 horizontal by 1080 vertical pixel array). Each pixel is divided into Red, Green and Blue sub-pixels or dots which are arranged in vertical stripes. Gray scale or the brightness of the sub-pixel color is determined with a 6-bit gray scale signal for each dot, thus, presenting a palette of more than 262,144 colors. The LP140WF1 has been designed to apply the interface method that enables low power, high speed, low EMI. The LP140WF1 is intended to support applications where thin thickness, low power are critical factors and graphic displays are important. In combination with the vertical arrangement of the sub-pixels, the LP140WF1 characteristics provide an excellent flat display for office automation products such as Notebook PC.
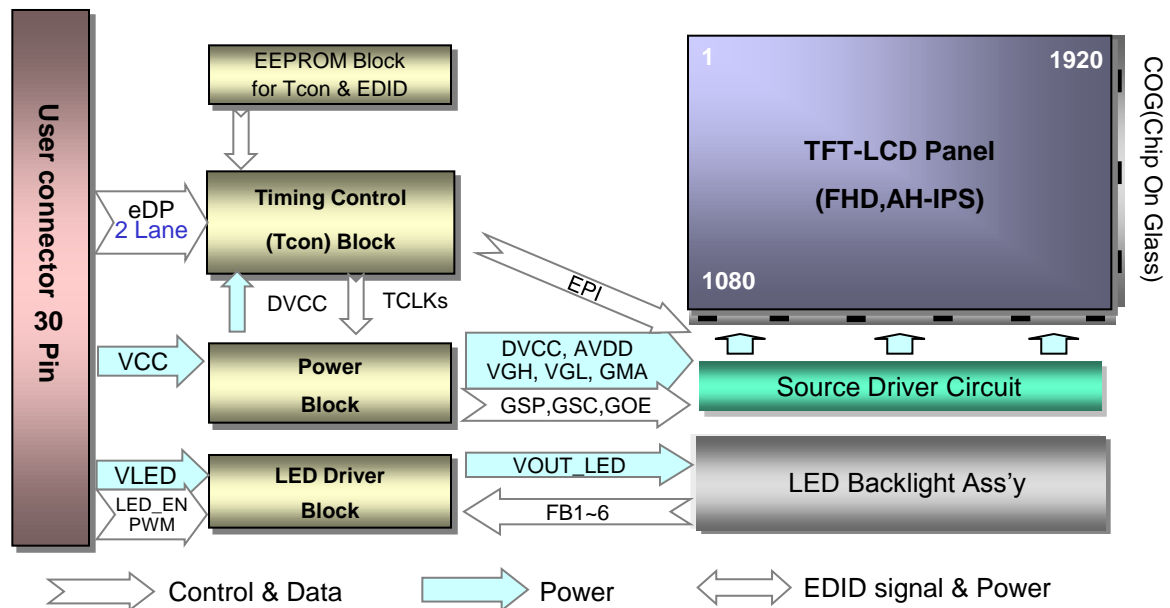


## General Features

| | |
|---|---|
| Active Screen Size | 14.0 inches diagonal |
| Outline Dimension | 320.4 (H, Typ.) × 205.1 (V, Typ.) × 3.0 (D, Max.)  [mm] (with Bracket & PCB Board) |
| Pixel Pitch | 0.1611 mm x 0.1611 mm |
| Pixel Format | 1920 horiz. By 1080 vert. Pixels RGB strip arrangement |
| Color Depth | 6-bit, 262,144 colors |
| Luminance, White | 300 cd/m$^2$ (Typ. 5 point) |
| Power Consumption | Total 5.0W (Typ.) Logic : 1.0W (Typ. @ Mosaic), B/L : 4.0W (Typ. @VLED12V) |
| Weight | 300 g (Max.) / 290 g (Typ.) |
| Display Operating Mode | Normally Black |
| Surface Treatment | Anti glare treatment (3H) of the front Polarizer |
| RoHS Compliance | Yes |
| BFR / PVC / As  Free | Yes for all |

**LG Display**

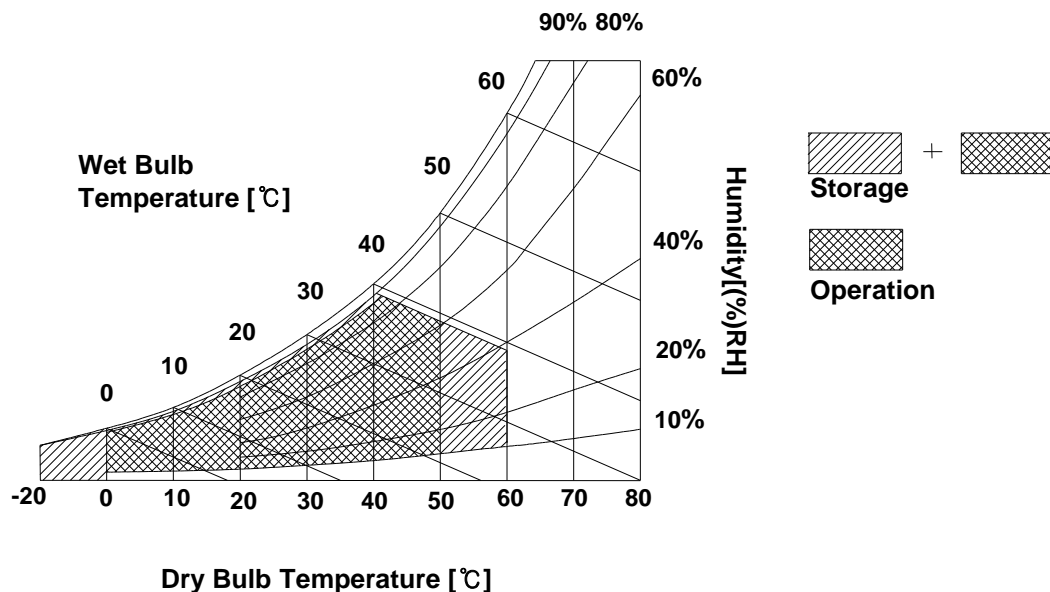Product Specification

## 2. Absolute Maximum Ratings

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

**Table 1.  ABSOLUTE MAXIMUM RATINGS**

| Parameter | Symbol | Values | | Units | Notes |
|-----------|--------|--------|-----|-------|-------|
| | | Min | Max | | |
| Power Input Voltage | VCC | -0.3 | 4.0 | Vdc | at $25 \pm 5°C$ |
| Operating Temperature | TOP | 0 | 50 | °C | 1 |
| Storage Temperature | HST | -20 | 60 | °C | 1 |
| Operating Ambient Humidity | HOP | 10 | 90 | %RH | 1 |
| Storage Humidity | HST | 10 | 90 | %RH | 1 |

Note : 1. Temperature and relative humidity range are shown in the figure below.
Wet bulb temperature should be 39°C Max, and no condensation of water.
Note : 2. Storage Condition is guaranteed under packing condition.



**Dry Bulb Temperature [℃]**

## 3. Electrical Specifications

## 3-1. Electrical Characteristics

The LP140WF1 requires two power inputs.  The first logic is employed to power the LCD electronics and to drive the TFT array and liquid crystal. The second backlight is the input about LED BL with LED Driver.

**Table 2.  ELECTRICAL CHARACTERISTICS**

| Parameter | | Symbol | Values | | | Unit | Notes |
|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | | |
| LOGIC : | | | | | | | |
| Power Supply Input Voltage | | $V_{CC}$ | 3.0 | 3.3 | 3.6 | V | 1 |
| Power Supply Input Current | Mosaic | $I_{CC}$ | - | 320 | 365 | mA | 2 |
| Power Consumption | | $P_{CC}$ | - | 1.0 | 1.2 | W | 2 |
| Power Supply Inrush Current | | $I_{CC\_P}$ | - | - | 1500 | mA | 3 |
| Differential Impedance | | $Z_m$ | 90 | 100 | 110 | Ω | 4 |
| BACKLIGHT : ( with LED Driver) | | | | | | | |
| LED Power Input Voltage | | $V_{LED}$ | 6.0 | 12.0 | 21.0 | V | 5 |
| LED Power Input Current | | $I_{LED}$ | - | 335 | 345 | mA | 6 |
| LED Power Consumption | | $P_{LED}$ | - | 4.0 | 4.1 | W | 6 |
| LED Power Inrush Current | | $I_{LED\_P}$ | - | - | 1500 | mA | 7 |
| PWM Duty Ratio | | | 5 | - | 100 | % | 8 |
| PWM Jitter | | - | 0 | - | 0.2 | % | 9 |
| PWM Impedance | | $Z_{PWM}$ | 20 | 40 | 60 | kΩ | |
| PWM Frequency | | $F_{PWM}$ | 200 | - | 1000 | Hz | 10 |
| PWM High Level Voltage | | $V_{PWM\_H}$ | 3.0 | - | 3.6 | V | |
| PWM Low Level Voltage | | $V_{PWM\_L}$ | 0 | - | 0.3 | V | |
| LED_EN Impedance | | $Z_{PWM}$ | 20 | 40 | 60 | kΩ | |
| LED_EN High Voltage | | $V_{LED\_EN\_H}$ | 3.0 | - | 3.6 | V | |
| LED_EN Low Voltage | | $V_{LED\_EN\_L}$ | 0 | - | 0.3 | V | |
| Life Time | | | 15,000 | - | - | Hrs | 11 |

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Note)
1. The measuring position is the connector of LCM and the test conditions are under 25℃, fv = 60Hz, Black pattern.
2. The specified Icc current and power consumption are under the Vcc = 3.3V , 25℃, fv = 60Hz condition and Mosaic pattern.
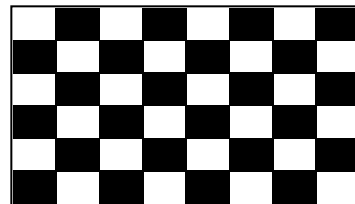
2. This Spec. is the max load condition for the cable impedance designing.
3. The below figures are the measuring Vcc condition and the Vcc control block LGD used.
   The Vcc condition is same as the minimum of T1 at Power on sequence.

**Rising time Vcc**
90%
3.3V
0V 10%
0.5ms
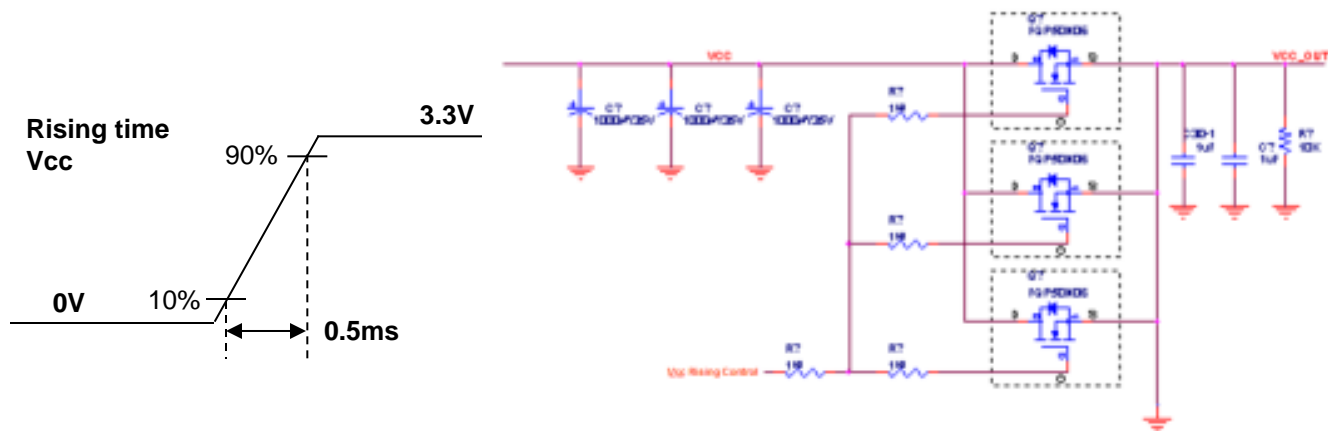
4. This impedance value is needed for proper display and measured form eDP Tx to the mating connector.
5. The measuring position is the connector of LCM and the test conditions are under 25℃.
6. The current and power consumption with LED Driver are under the Vled = 12.0V , 25℃, Dimming of Max luminance and White pattern with the normal frame frequency operated(60Hz).
7. The below figures are the measuring Vled condition and the Vled control block LGD used. VLED control block is same with Vcc control block.

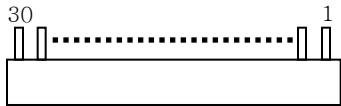**Rising time VLED**
90%
12.0V
0V 10%
0.5ms
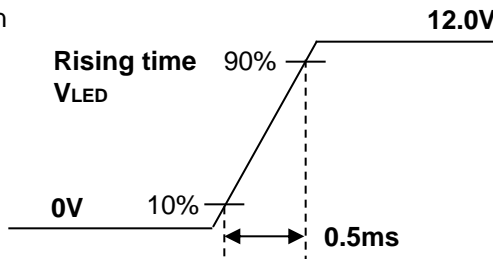
8. The operation of LED Driver below minimum dimming ratio may cause flickering or reliability issue.
9. If Jitter of PWM is bigger than maximum, it may induce flickering.
10. This Spec. is not effective at 100% dimming ratio as an exception because it has DC level equivalent to 0Hz. In spite of acceptable range as defined, the PWM Frequency should be fixed and stable for more consistent brightness control at any specific level desired.
11. The life time is determined as the time at which brightness of LCD is 50% compare to that of minimum value specified in table 7. under general user condition.

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## 3-2. Interface Connections

This LCD employs two interface connections, a 30 pin connector used for the module electronics interface and the other connector used for the integral backlight system.

**Table 3. MODULE CONNECTOR PIN CONFIGURATION (CN1)**

| Pin | Symbol | Description | Notes |
|-----|--------|-------------|-------|
| 1 | NC | No Connect | **[Interface Chip]** |
| 2 | GND | High Speed (Main Link) Ground | 1. LCD : |
| 3 | Lane1_N | Complement Signal-Lane 1 | Parade, DP643 (LCD Controller |
| 4 | Lane1_p | True Signal-Main Lane 1 | Including eDP Receiver. |
| 5 | GND | High Speed (Main Link) Ground | |
| 6 | Lane0_N | Complement Signal-Lane 0 | **[Connector]** |
| 7 | Lane0_p | True Signal-Main Lane 0 | GT05Q-30S-H10, LSM, 30, 0.5 |
| 8 | GND | High Speed (Main Link) Ground | |
| 9 | AUX_P | True Signal-Auxiliary Channel | **[Connector pin arrangement]** |
| 10 | AUX_N | Complement Signal-Auxiliary Channel | |
| 11 | GND | High Speed (Main Link) Ground | |
| 12 | VCC | LCD Logic and driver power (3.3V Typ.) | |
| 13 | VCC | LCD Logic and driver power (3.3V Typ.) | [LCD Module Rear View] |
| 14 | NC | No Connect | |
| 15 | GND | Ground | |
| 16 | GND | Ground | |
| 17 | HPD | HPD signal pin | |
| 18 | GND | LED Backlight Ground | |
| 19 | GND | LED Backlight Ground | |
| 20 | GND | LED Backlight Ground | |
| 21 | GND | LED Backlight Ground | [LGD P-Vcom Share pin] |
| 22 | LED_EN | LED Backlight On/Off | 1. Pin for P-Vcom : #24, #25 |
| 23 | PWM | System PWM Signal input for dimming | 2. P-Vcom Address : 01010000 |
| 24 | NC | NO Connect | |
| 25 | NC | NO Connect | |
| 26 | VLED | LED Backlight Power (6.0V-21V) | |
| 27 | VLED | LED Backlight Power (6.0V-21V) | |
| 28 | VLED | LED Backlight Power (6.0V-21V) | |
| 29 | VLED | LED Backlight Power (6.0V-21V) | |
| 30 | NC | NO Connect | |

## 3-3. eDP Signal Timing Specifications

### 3-3-1. DC Specification

The VESA Display Port related AC specification is compliant with the VESA Display Port Standard v1.1a.
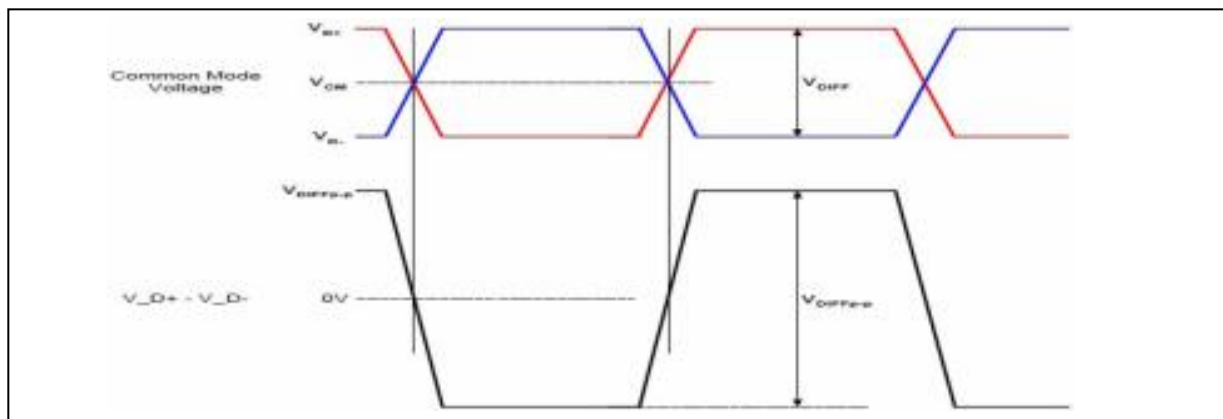


| Description | Symbol | Min | Max | Unit | Notes |
|---|---|---|---|---|---|
| Differential peak-to-peak Input voltage | VDIFF p-p | 120 | - | mV | For high bit rate |
| | | 40 | - | | For reduced bit rate |
| Rx DC common mode voltage | VCM | 0 | 2.0 | V | - |

### 3-3-2. AC Specification

The VESA Display Port related AC specification is compliant with the VESA Display Port Standard v1.1a.

| Description | Symbol | Min | Typ | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| Unit Interval for high bit rate (2.7Gbps/lane) | UI_High_Rate | - | 370 | - | ps | Range is nominal ±350ppm. DisplayPort Link Rx does not require local crystal for link clock generation |
| Unit Interval for high bit rate (1.62Gbps/lane) | UI_Low_Rate | - | 617 | - | ps | |
| Lane-to-Lane skew | V Rx-SKEW-INTER_PAIR | - | - | 5200 | ps | - |
| Lane intra-pair skew | V Rx-SKEW-INTRA_PAIR | - | - | 100 | ps | For high bit rate |
| | | - | - | 300 | ps | For reduced bit rate |

## 3-4. Signal Timing Specifications

This is the signal timing required at the input of the User connector.  All of the interface signal timing should be satisfied with the following specifications and specifications of eDP Tx/Rx for its proper operation.

**Table 6.  TIMING TABLE**

| ITEM | Symbol | | Min | Typ | Max | Unit | Note |
|---|---|---|---|---|---|---|---|
| DCLK | Frequency | $f_{CLK}$ | - | 140.1 | - | MHz | |
| Hsync | Period | $t_{HP}$ | - | 2092 | - | tCLK | |
| | Width | $t_{WH}$ | - | 36 | - | | |
| | Width-Active | $t_{WHA}$ | - | 1920 | - | | |
| Vsync | Period | $t_{VP}$ | - | 1116 | - | tHP | |
| | Width | $t_{WV}$ | - | 5 | - | | |
| | Width-Active | $t_{WVA}$ | - | 1080 | - | | |
| Data Enable | Horizontal back porch | $t_{HBP}$ | - | 76 | - | tCLK | |
| | Horizontal front porch | $t_{HFP}$ | - | 60 | - | | |
| | Vertical back porch | $t_{VBP}$ | - | 28 | - | tHP | |
| | Vertical front porch | $t_{VFP}$ | - | 3 | - | | |

**Appendix)** all reliabilities are specified for timing specification based on refresh rate of  60Hz. However, LP156WF4 has a good actual performance even at lower refresh rate (e.g. 40Hz or 50Hz)  for power saving mode, whereas LP156WF4 is secured only for function under lower refresh rate. 60Hz at Normal mode, 50Hz, 40Hz at Power save mode. Don't care Flicker level (power save mode).

## 3-5. Signal Timing Waveforms

Condition : VCC =3.3V
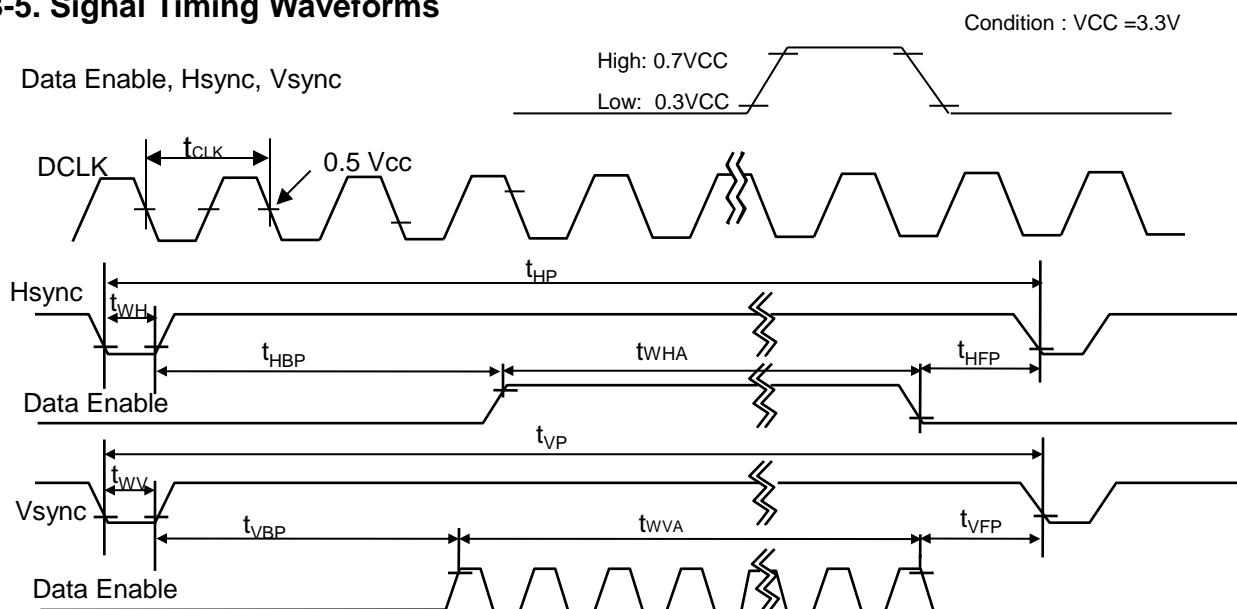
## 3-6. Color Input Data Reference

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

**Table 5. COLOR DATA REFERENCE**

| Color | | Input Color Data | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | RED | | | | | | GREEN | | | | | | BLUE | | | | | | |
| | | MSB | | | | | LSB | MSB | | | | | LSB | MSB | | | | | LSB | |
| | | R 5 | R 4 | R 3 | R 2 | R 1 | R 0 | G 5 | G 4 | G 3 | G 2 | G 1 | G 0 | B 5 | B 4 | B 3 | B 2 | B 1 | B 0 |
| Basic Color | Black | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Green | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Blue | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Cyan | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Magenta | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Yellow | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 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 |
| RED | RED (00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | RED (01) | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | ... | | | ... | | | | | | ... | | | | | | ... | | | |
| | RED (62) | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | RED (63) | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| GREEN | GREEN (00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | GREEN (01) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | ... | | | ... | | | | | | ... | | | | | | ... | | | |
| | GREEN (62) | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | GREEN (63) | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| BLUE | BLUE (00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | BLUE (01) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | ... | | | ... | | | | | | ... | | | | | | ... | | | |
| | BLUE (62) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 |
| | BLUE (63) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |

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## 3-7. Power Sequence
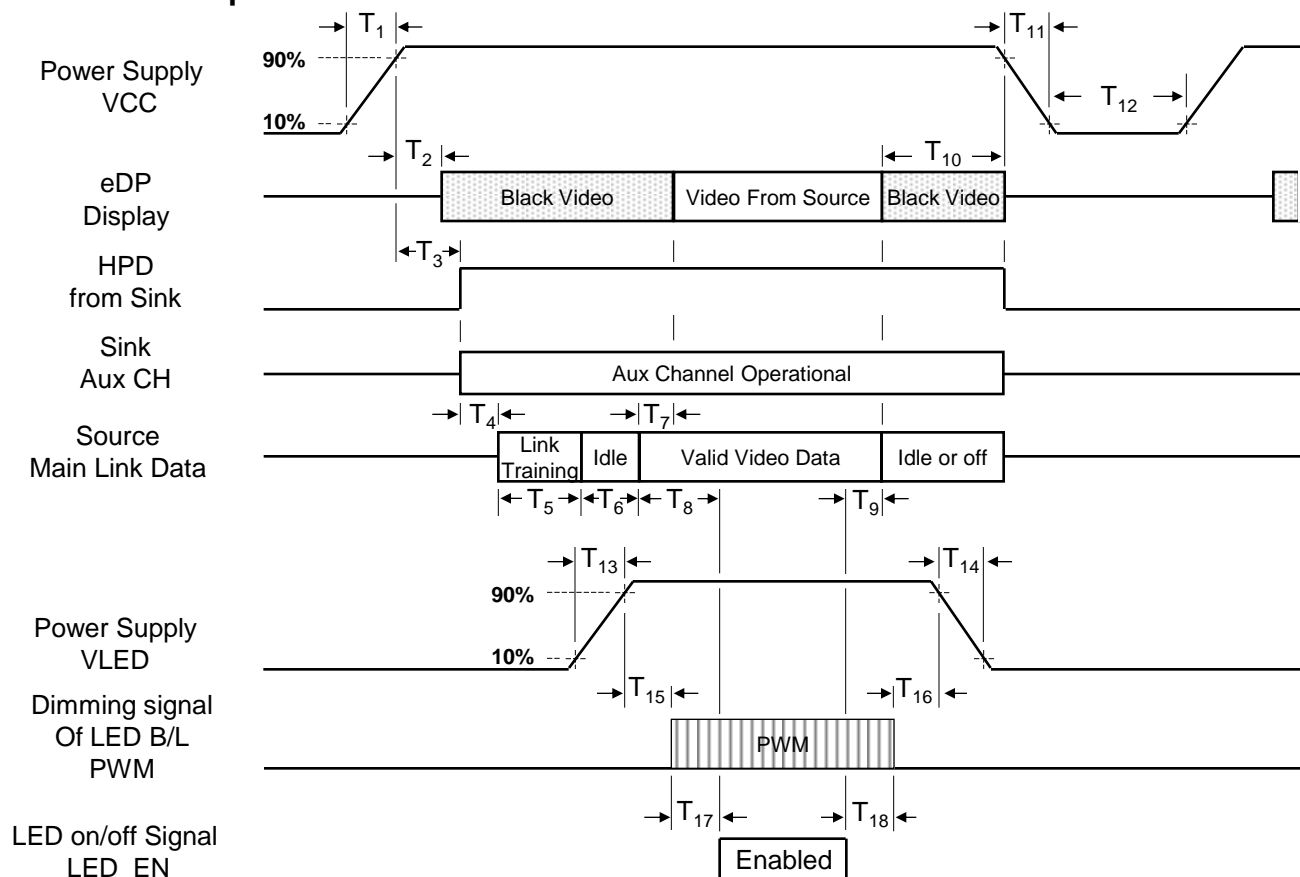


### Table 6.  POWER SEQUENCE TABLE

| Timing | Required By | Limits Min | Limits Max | Units | Notes | Timing | Required By | Limits Min | Limits Max | Units | Notes |
|--------|-------------|-----|-----|-------|-------|--------|-------------|-----|-----|-------|-------|
| $T_1$ | Source | 0.5 | 10 | ms | - | $T_{10}$ | Source | 0 | 500 | ms | - |
| $T_2$ | Sink | 0 | 200 | ms | - | $T_{11}$ | Source | - | 10 | ms | - |
| $T_3$ | Sink | 0 | 200 | ms | - | $T_{12}$ | Source | 500 | - | ms | VESA recommend Min 500ms |
| $T_4$ | Source | - | - | ms | - | | | | | | |
| $T_5$ | Source | - | - | ms | - | $T_{13}$ | Source | 0.5 | 10 | ms | - |
| $T_6$ | Source | - | - | ms | - | $T_{14}$ | Source | 0.5 | 10 | ms | |
| $T_7$ | Sink | 0 | 50 | ms | - | $T_{15}$ | Source | 10 | - | ms | - |
| $T_8$ | Source | - | - | ms | LGD recommend Min 200ms | $T_{16}$ | Source | 10 | - | ms | - |
| | | | | | | $T_{17}$ | Source | 0 | - | ms | - |
| $T_9$ | Source | - | - | ms | - | $T_{18}$ | Source | 0 | - | ms | - |

Note)  1. Do not insert the mating cable when system turn on.

2. Valid Data have to meet "3-3. eDP Signal Timing Specifications"

3. Video Signal, LED_EN and PWM need to be on pull-down condition on invalid status.

4. LGD recommend the rising sequence of VLED after the Vcc and valid status of Video Signal turn on.

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## 4. Optical Specification

Optical characteristics are determined after the unit has been 'ON' and stable for approximately 30 minutes in a dark environment at 25°C. The values specified are at an approximate distance 50cm from the LCD surface at a viewing angle of $\Phi$ and $\Theta$ equal to 0°.
FIG. 1 presents additional information concerning the measurement equipment and method.
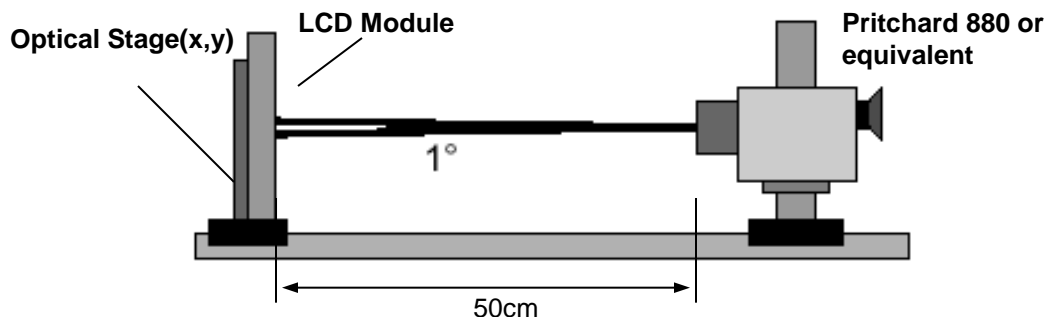
**FIG. 1 Optical Characteristic Measurement Equipment and Method**



**Table 9.  OPTICAL CHARACTERISTICS**

Ta=25°C, VCC=3.3V, fᵥ=60Hz, f$_{CLK}$= 69MHz

| Parameter | Symbol | Min | Typ | Max | Units | Notes |
|---|---|---|---|---|---|---|
| Contrast Ratio | CR | 400 | 700 | - | | 1 |
| Surface Luminance, white | L$_{WH}$ | 255 | 300 | - | cd/m² | 2 |
| Luminance Variation | $\delta$ WHITE | - | 1.4 | 1.6 | | 3 |
| Response Time | Tr$_R$+ Tr$_D$ | - | 35 | 50 | ms | 4 |
| Color Coordinates | | | | | | |
| RED | RX | 0.610 | 0.640 | 0.670 | | |
| | RY | 0.315 | 0.345 | 0.375 | | |
| GREEN | GX | 0.305 | 0.335 | 0.365 | | |
| | GY | 0.595 | 0.625 | 0.655 | | |
| BLUE | BX | 0.120 | 0.150 | 0.180 | | |
| | BY | 0.022 | 0.052 | 0.082 | | |
| WHITE | WX | 0.283 | 0.313 | 0.343 | | |
| | WY | 0.299 | 0.329 | 0.359 | | |
| Viewing Angle | | | | | | 5 |
| x axis, right(Φ=0°) | Θr | 80 | | - | degree | |
| x axis, left (Φ=180°) | Θl | 80 | | - | degree | |
| y axis, up (Φ=90°) | Θu | 80 | | - | degree | |
| y axis, down (Φ=270°) | Θd | 80 | | - | degree | |
| Gray Scale | | | | | | 6 |

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Note)

1. Contrast Ratio (CR) is defined mathematically as

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

2. Surface luminance is the average of 5 point across the LCD surface 50cm from the surface with all pixels displaying white. For more information see FIG 1.

$$\text{LWH} = \text{Average}(L1, L2, \dots L5)$$

3. The variation in surface luminance , The panel total variation ($\delta$ WHITE) is determined by measuring LN at each test position 1 through 13 and then defined as following numerical formula. For more information see FIG 2.

$$\delta \text{ WHITE} = \text{Maximum}(L1, L2, \dots L13) / \text{Minimum}(L1, L2, \dots L13)$$

4. Response time is the time required for the display to transition from white to black (rise time, TrR) and from black to white (Decay Time, TrD). For additional information see FIG 3.

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 surface.  For more information see FIG 4.

6. Gray scale specification                                                           * fV = 60Hz

| Gray Level | Luminance [%] (Typ) |
|------------|---------------------|
| L0 | 0.13 |
| L7 | 0.70 |
| L15 | 4.53 |
| L23 | 10.80 |
| L31 | 20.30 |
| L39 | 33.00 |
| L47 | 49.00 |
| L55 | 73.00 |
| L63 | 100.00 |

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### FIG. 2 Luminance

<Measuring point for Average Luminance & measuring point for Luminance variation>



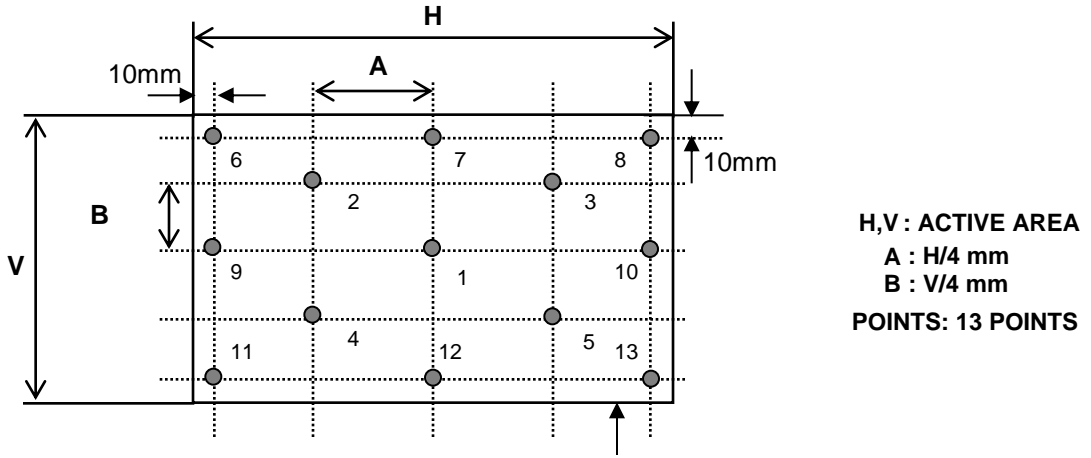**H,V : ACTIVE AREA**
**A : H/4 mm**
**B : V/4 mm**
**POINTS: 13 POINTS**

### FIG. 3 Response Time

The response time is defined as the following figure and shall be measured by switching the input signal for "black" and "white".
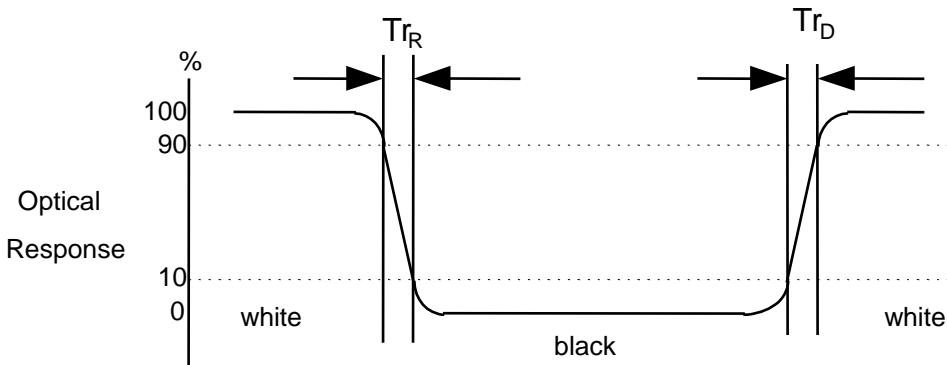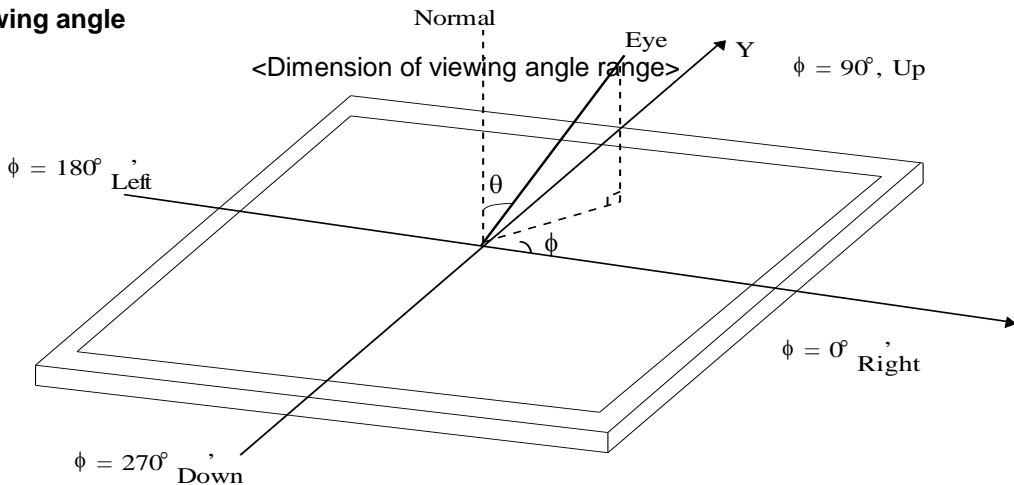


### FIG. 4 Viewing angle

<Dimension of viewing angle range>



$\phi = 90°$, Up
$\phi = 180°$ Left'
$\phi = 0°$ Right'
$\phi = 270°$ Down'
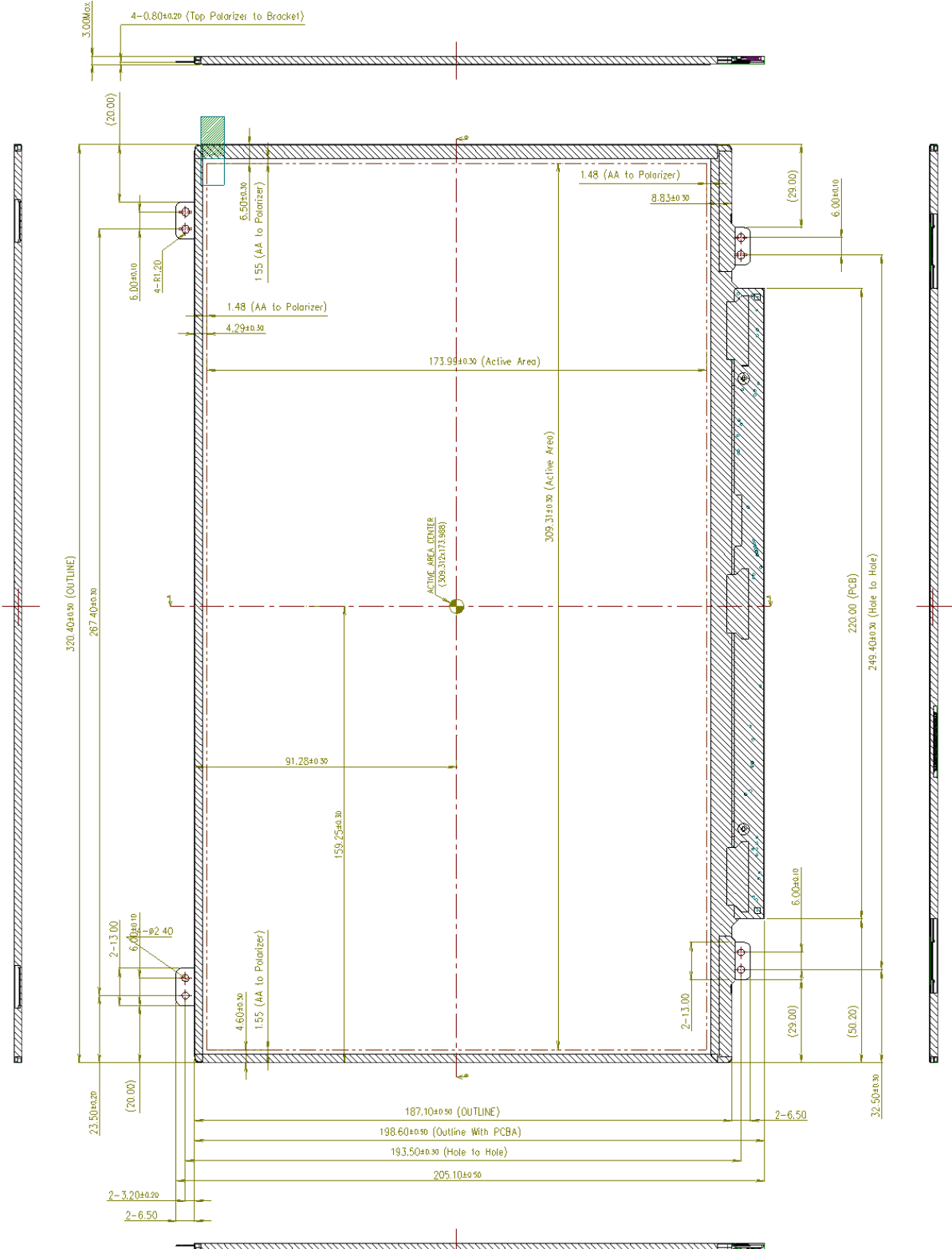
## 5. Mechanical Characteristics

The contents provide general mechanical characteristics for the model LP156WF4. In addition the figures in the next page are detailed mechanical drawing of the LCD.

| | | |
|---|---|---|
| Outline Dimension | Horizontal | 320.4 ± 0.5mm |
| | Vertical | 205.1 ± 0.5mm (with Bracket & PCB Board) |
| | Thickness | 3.0mm (max.) |
| Bezel Area | Horizontal | 312.50± 0.5mm |
| | Vertical | 177.10 ± 0.5mm |
| Active Display Area | Horizontal | 309.31 ± 0.3mm |
| | Vertical | 173.99 ± 0.3mm |
| Weight | 300 g (Max.) / 290 g (Typ.) | |
| Surface Treatment | Anti-Glare treatment of the front polarizer | |
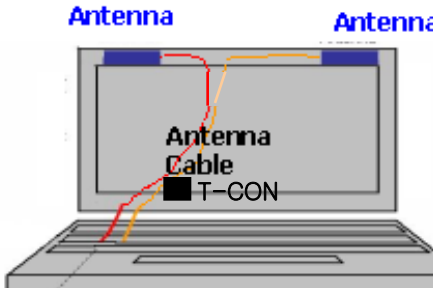
**LG Display**

Product Specification

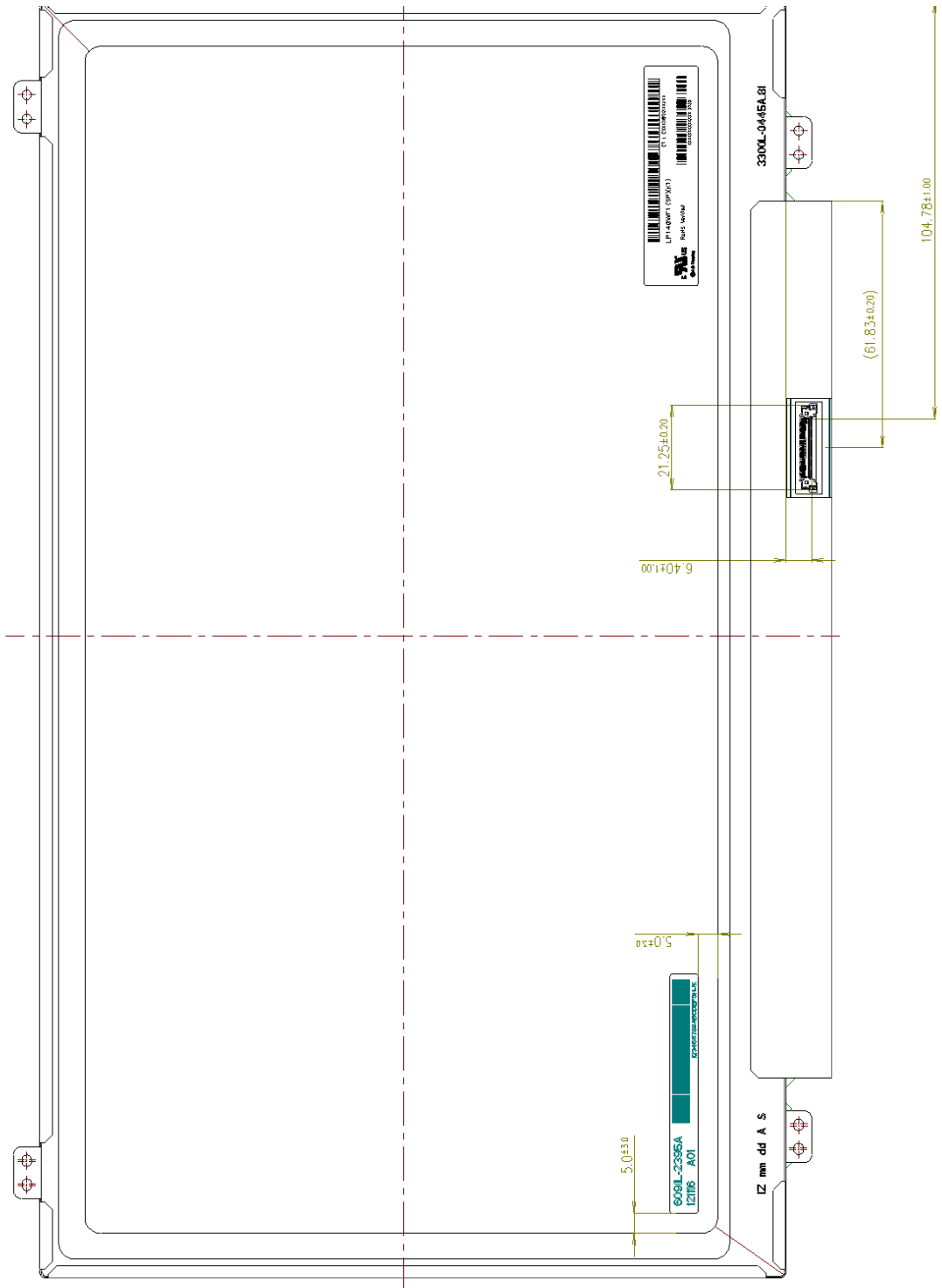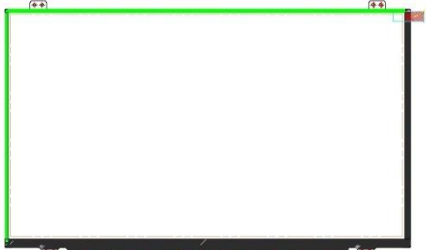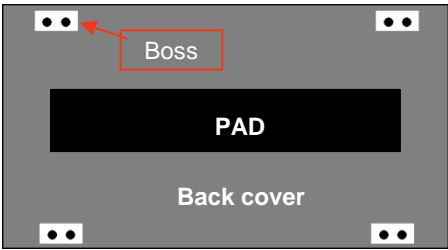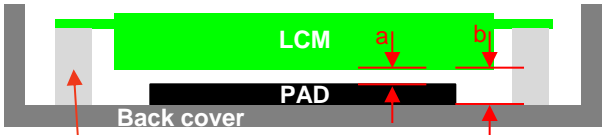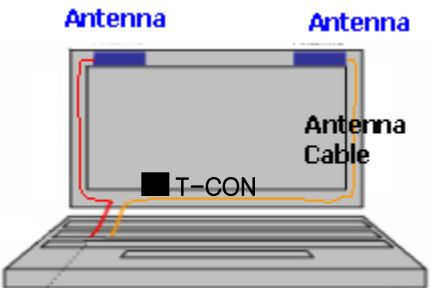<FRONT VIEW>                                        Note) Unit:[mm], General tolerance: ± 0.5mm

Product Specification

<REAR VIEW>                                    Note) Unit:[mm], General tolerance: ± 0.5mm

Product Specification
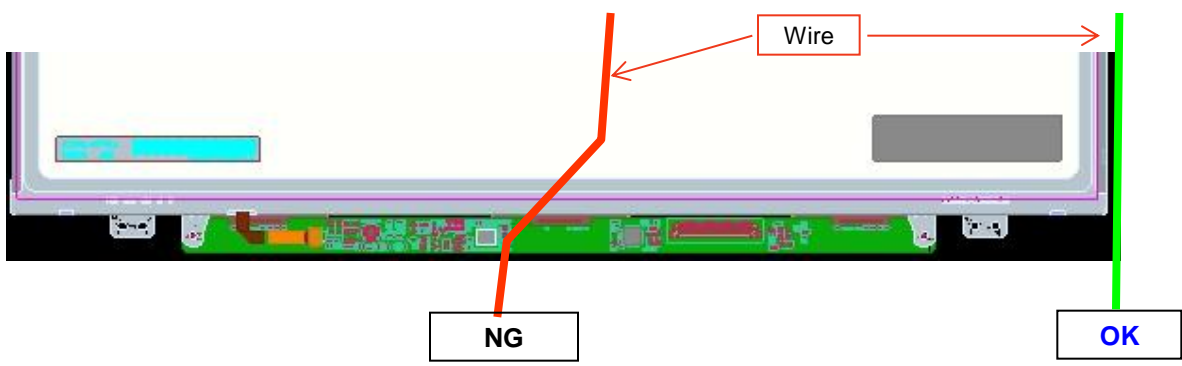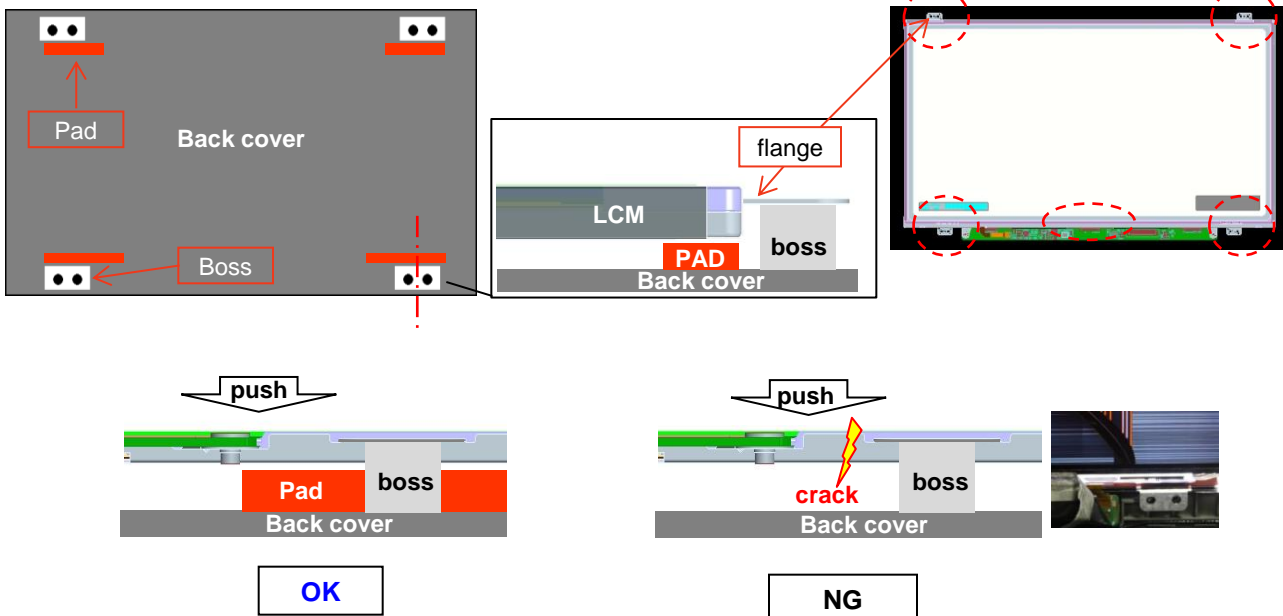
**LGD Proposal for system cover design.(Appendix)**

| 1 | **Gap check for securing the enough gap between LCM and System back cover.** |
|---|---|



**LCM**  a  b
**PAD**
**Back cover**

Boss

◆ a : min 0mm
◆ b : min 0.3mm, Max 1.0mm

Boss

**PAD**

**Back cover**

| Define | 1.Rear side of LCM is sensitive against external stress, and previous check about interference is highly needed. |
|---|---|
| | 2.In case there is something from system cover comes into the boundary above,mechanical interference may cause the FOS defects.<br>(Eg: Ripple, White spot..) |

| 2 | **Check if antenna cable is sufficiently apart from T-CON of LCD Module.** |
|---|---|

Antenna    Antenna    Antenna    Antenna

Antenna Cable    Antenna Cable

T-CON    T-CON

OK    NG

| Define | 1.If system antenna is overlapped with T-CON,it might be cause the noise |
|---|---|

**LGD Proposal for system cover design.(Appendix)**

| 3 | Checking the path of the System wire |
|---|---|



Wire

**NG**          **OK**

| Define | 1.If Wire path overlapped with LCM, it is happened white spot, COF problem, etc. |
|---|---|
| | 2.OK ➜ Wire path design to system side.<br>   NG ➜ Wire path overlapped with LCM. |

| 4 | Add pad to Prevent panel crack against external load  (push) |
|---|---|



Pad        **Back cover**

flange

**LCM**

**boss**

**PAD**

**Back cover**

Boss

**push**          **push**

**Pad**   **boss**       **crack**   **boss**

**Back cover**        **Back cover**

**OK**          **NG**

| Define | 1. At flat type LCM, panel is easily cracked at flange area during push, assemble. |
|---|---|
| | 2. Add pad, it prevent panel crack |

Product Specification

**LGD Proposal for system cover design.(Appendix)**

| 5 | Check the rib or Bracket on back cover |
|---|---|

LCM
Back cover
OK
Rib

LCM
Back cover
OK
Bracket

LCM
Back cover
NG

LCM
Back cover
CO

| Define | 1.It is necessary that the height of back cover rib or bracket is higher than LCM height. It can prevent direct compression of panel at LCM edge. |
| | 2."¬" shape bracket is stronger than "I" shape one. |

| 6 | Check the gap between front cover and LCM(glass) |
|---|---|

a
Front cover
LCM
Back cover

[OK] a ≥ 0.3mm
[CO] 0.3mm ≥ a ≥ 0.1mm
[NG] a ≤ 0.1mm

| Define | 1. Ripple can be happened by little gap between glass and front cover. |

**LG Display**

Product Specification

## LGD Proposal for system cover design.(Appendix)

| 7 | Check the rib or Bracket on back cover |
|---|---|



**Front cover**

**LCM**

**Back cover**

**OK**

Light leakage

**LCM**

**Back cover**

**NG**
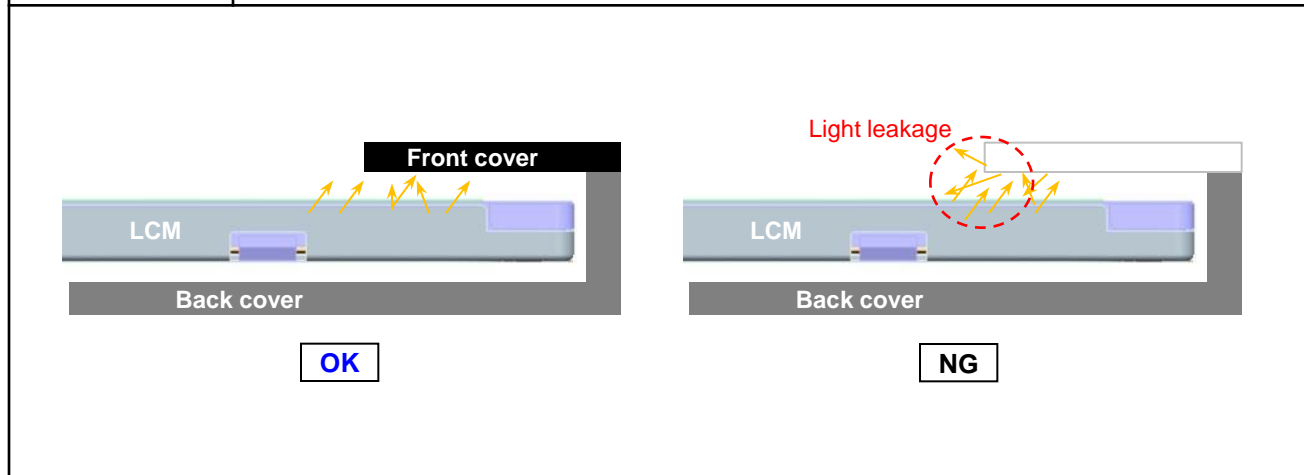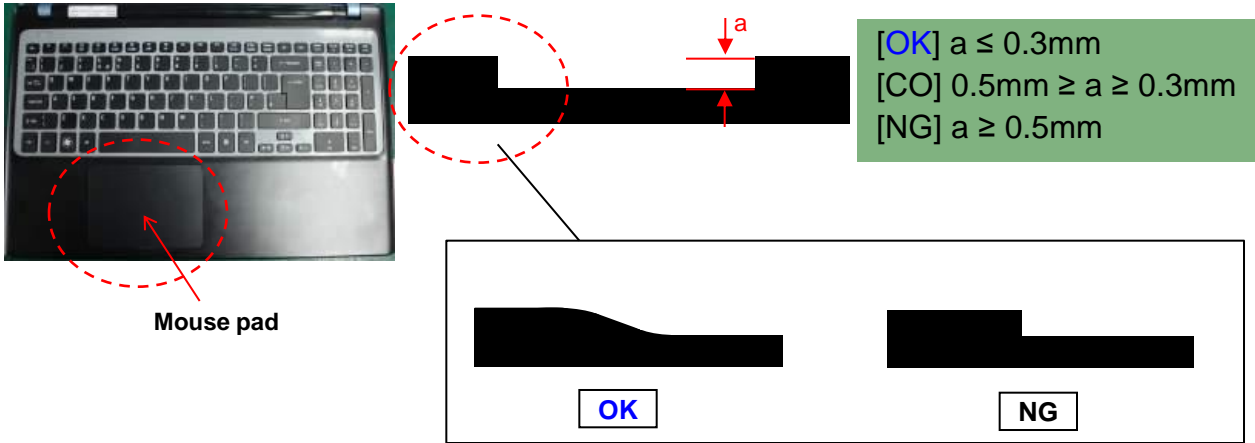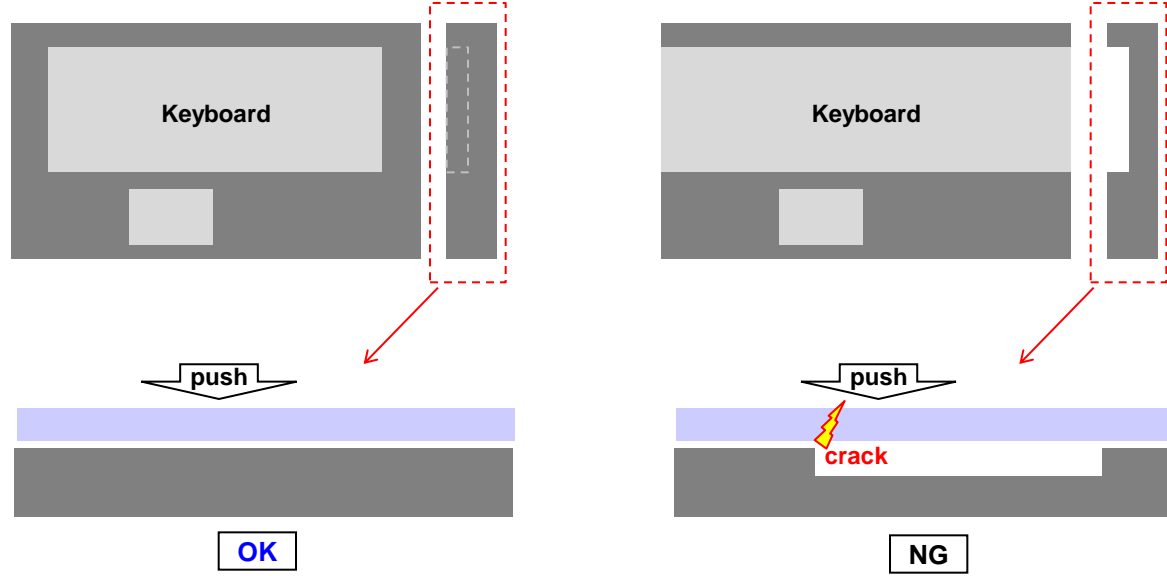
| Define | 1.If it is possible, shrink to apply front cover of white color. |
|---|---|
| | 2. White color can caused light leakage |

| 8 | Check the wire position(path) |
|---|---|



**Back cover**

**OK**

**Back cover**

**NG**
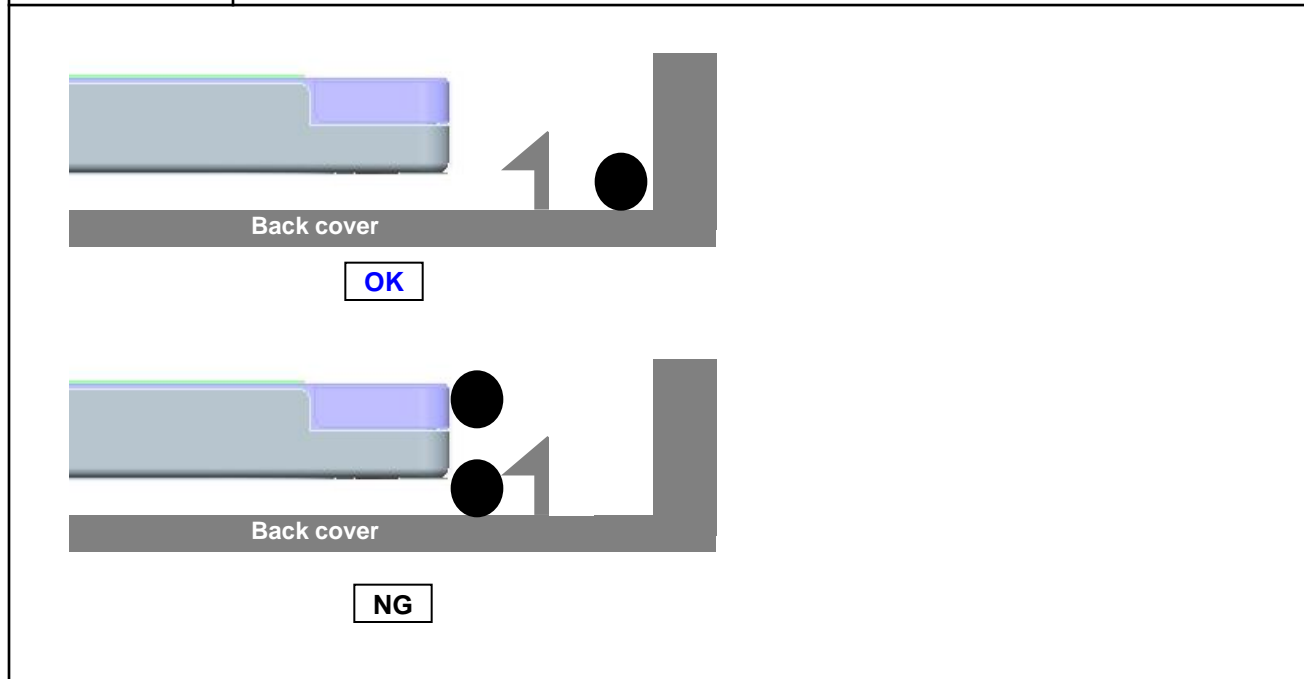
| Define | 1. It is necessary that wire is posited out of hook, not posited near hook,. |
|---|---|
| | 2. If wire is posited near hook, it can be happened assemble error and panel crack during assemble front cover |

**LGD Proposal for system cover design.(Appendix)**

| 9 | Check mouse pad (touch pad) depth and shape of edge |
|---|---|

a

[OK] a ≤ 0.3mm
[CO] 0.5mm ≥ a ≥ 0.3mm
[NG] a ≥ 0.5mm

**Mouse pad**

OK     NG

| Define | 1.Mouse pad step is deep, it is caused panel crack by external load. |
|---|---|
| | 2. The edge shape must be smooth. |

| 10 | Check the step of keyboard area |
|---|---|

Keyboard

Keyboard

push

push

crack

OK     NG

| Define | 1. The step of keyboard at the side edge of main body, it is caused panel crack |
|---|---|

## 6. Reliability

Environment test condition

| No. | Test Item | Conditions |
|-----|-----------|------------|
| 1 | High temperature storage test | Ta= 60°C, 240h |
| 2 | Low temperature storage test | Ta= -20°C, 240h |
| 3 | High temperature operation test | Ta= 50°C, 50%RH, 240h |
| 4 | Low temperature operation test | Ta= 0°C, 240h |
| 5 | Vibration test (non-operating) | Sine wave, 5 ~ 150Hz, 1.5G, 0.37oct/min<br>3 axis, 30min/axis |
| 6 | Shock test (non-operating) | - No functional or cosmetic defects following a shock to all 6 sides delivering at least 180 G in a half sine pulse no longer than 2 ms to the display module<br>- No functional defects following a shock delivering at least 200 g in a half sine pulse no longer than 2 ms to each of 6 sides. Each of the 6 sides will be shock tested with one each display, for a total of 6 displays |
| 7 | Altitude                    operating<br>storage / shipment | 0 ~ 10,000 feet (3,048m) 24Hr<br>0 ~ 40,000 feet (12,192m) 24Hr |

{ Result Evaluation Criteria }
 There should be no change which might affect the practical display function when the display quality test is conducted under normal operating condition.

Product Specification

## 7. International Standards

### 7-1. 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.
 d) IEC 60950-1, The International Electrotechnical Commission (IEC).
  Information Technology Equipment - Safety - Part 1 : General Requirements

### 7-2. Environment

 a) RoHS, Directive 2011/65/EU of the European Parliament and of the council of 8 June 2011

Product Specification

## 8. Packing

### 8-1. 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.

### 8-2. Packing Form

a) Package quantity in one box :30 ea

b) Box Size : 478 × 365 × 288 mm

c) Box Label :

```
┌─────────────────────────────────┐
│  LP140WF1        │    SPK1       │
├──────────────────┴───────────────┤
│        711939-292                 │
├──────────┬────────────────────────┤
│  30 PCS  │  001/01-01             │
├──────────┴────────────────────────┤
│  MADE IN KOREA   │ RoHS Verified  │
├───────────────────────────────────┤
│  ║█║║█║║█║║█║║█║║█║                │
│      XXXXXXXXXXXXX  XXX           │
└───────────────────────────────────┘
```

### 8-3. CT Code

LP140WF1 (SP)(K1)　　CT : CDSYH01XXXXXXX
RoHS Verified
XXXXXXXXXXXX XXX

CT : C AAAA XX XX XX XXX

HP Assembly Code (A.Code)

| A.Code | HP P/N |
|--------|--------|
| DSYH | 711939-292 |

## 9. PRECAUTIONS

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

### 9-1. MOUNTING PRECAUTIONS

(1) You must mount a module using holes arranged in four corners or four sides.
(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 the surface 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 are detrimental to the polarizer.)
(7) When the surface becomes dusty, please wipe gently with absorbent cotton or other soft materials like chamois soaks with petroleum benzene. 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) When handling the LCD module, it needs to handle with care not to give mechanical stress to the PCB and Mounting Hole area."

### 9-2. OPERATING PRECAUTIONS

(1) The spike noise causes the mis-operation of circuits. It should be lower than following voltage :
V=± 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 lower temperature, it becomes lower.)
And in lower temperature, response time(required time that brightness is stable after turned on) becomes longer.
(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 minimized the interference.

**G LG Display**

## 9-3. 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.

## 9-4. PRECAUTIONS FOR STRONG LIGHT EXPOSURE

Strong light exposure causes degradation of polarizer and color filter.

## 9-5. 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.

## 9-6. HANDLING PRECAUTIONS FOR PROTECTION FILM

(1) 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) The protection film is attached to the polarizer with a small amount of glue. If some stress is applied to rub the protection film against the polarizer during the time you peel off the film, the glue is apt to remain on the polarizer.
   Please carefully peel off the protection film without rubbing it against the polarizer.
(3) 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 polarizer after the protection film is peeled off.
(4) You can remove the glue easily. When the glue remains on the polarizer surface or its vestige is recognized, please wipe them off with absorbent cotton waste or other soft material like chamois soaked with normal-hexane.

**LG Display**

Product Specification

# APPENDIX A. Enhanced Extended Display Identification Data (EEDID™)   1/3

| | Byte (Dec) | Byte (Hex) | Field Name and Comments | Value (Hex) | Value (Bin) |
|---|---|---|---|---|---|
| *Header* | 0 | 00 | Header | 00 | 00000000 |
| | 1 | 01 | Header | FF | 11111111 |
| | 2 | 02 | Header | FF | 11111111 |
| | 3 | 03 | Header | FF | 11111111 |
| | 4 | 04 | Header | FF | 11111111 |
| | 5 | 05 | Header | FF | 11111111 |
| | 6 | 06 | Header | FF | 11111111 |
| | 7 | 07 | Header | 00 | 00000000 |
| *Vendor / Product EDID Version* | 8 | 08 | ID Manufacture Name                                        LGD | 30 | 00110000 |
| | 9 | 09 | ID Manufacture Name | E4 | 11100100 |
| | 10 | 0A | ID Product Code                                        040Ah | 0A | 00001010 |
| | 11 | 0B | ( Hex. LSB first ) | 04 | 00000100 |
| | 12 | 0C | ID Serial No. - Optional ("00h" If not used, Number Only and LSB First) | 00 | 00000000 |
| | 13 | 0D | ID Serial No. - Optional ("00h" If not used, Number Only and LSB First) | 00 | 00000000 |
| | 14 | 0E | ID Serial No. - Optional ("00h" If not used, Number Only and LSB First) | 00 | 00000000 |
| | 15 | 0F | ID Serial No. - Optional ("00h" If not used, Number Only and LSB First) | 00 | 00000000 |
| | 16 | 10 | Week of Manufacture - Optinal                                        00 weeks | 00 | 00000000 |
| | 17 | 11 | Year of Manufacture                                        2013 years | 17 | 00010111 |
| | 18 | 12 | EDID structure version # =  1 | 01 | 00000001 |
| | 19 | 13 | EDID revision # = 4 | 04 | 00000100 |
| *Display Parameters* | 20 | 14 | Video input Definition = Input is a Digital Video signal Interface , Colo Bit Depth : 6 Bits per Primary Color , Digital Video Interface Standard Supported: DisplayPort is supported | 95 | 10010101 |
| | 21 | 15 | Horizontal Screen Size (Rounded cm) = 31 cm | 1F | 00011111 |
| | 22 | 16 | Vertical Screen Size (Rounded cm) = 17 cm | 11 | 00010001 |
| | 23 | 17 | Display Transfer Characteristic (Gamma) = (gamma*100)-100 = Example:(2.2*100)-100=120 | 78 | 01111000 |
| | 24 | 18 | Feature Support [ Display Power Management(DPM) : Standby Mode is supported, Suspend Mode is not supported, Active Off = Very Low Power is supported ,Supportted Color Encoding Formats : RGB 4:4:4 & YCrCb 4:4:4 ,Other Feature Support Flags : No_sRGB, Preferred Timing Mode, No_Display is continuous frequency (Multi-mode_Base EDID and Extension Block).] | EA | 11101010 |
| *Panel Color Coordinates* | 25 | 19 | Red/Green Low Bits (RxRy/GxGy) | DC | 11011100 |
| | 26 | 1A | Blue/White Low Bits (BxBy/WxWy) | 95 | 10010101 |
| | 27 | 1B | Red X       Rx = 0.640 | A3 | 10100011 |
| | 28 | 1C | Red Y       Ry = 0.345 | 58 | 01011000 |
| | 29 | 1D | Green X   Gx = 0.335 | 55 | 01010101 |
| | 30 | 1E | Green Y   Gy = 0.625 | A0 | 10100000 |
| | 31 | 1F | Blue X      Bx = 0.150 | 26 | 00100110 |
| | 32 | 20 | Blue Y      By = 0.052 | 0D | 00001101 |
| | 33 | 21 | White X   Wx = 0.313 | 50 | 01010000 |
| | 34 | 22 | White Y   Wy = 0.329 | 54 | 01010100 |
| *Established Timings* | 35 | 23 | Established timing 1 ( Optional_00h if not used) | 00 | 00000000 |
| | 36 | 24 | Established timing 2 ( Optional_00h if not used) | 00 | 00000000 |
| | 37 | 25 | Manufacturer's timings ( Optional_00h if not used) | 00 | 00000000 |
| *Standard Timing ID* | 38 | 26 | Standard timing ID1 ( Optional_01h if not used) | 01 | 00000001 |
| | 39 | 27 | Standard timing ID1 ( Optional_01h if not used) | 01 | 00000001 |
| | 40 | 28 | Standard timing ID2 ( Optional_01h if not used) | 01 | 00000001 |
| | 41 | 29 | Standard timing ID2 ( Optional_01h if not used) | 01 | 00000001 |
| | 42 | 2A | Standard timing ID3 ( Optional_01h if not used) | 01 | 00000001 |
| | 43 | 2B | Standard timing ID3 ( Optional_01h if not used) | 01 | 00000001 |
| | 44 | 2C | Standard timing ID4 ( Optional_01h if not used) | 01 | 00000001 |
| | 45 | 2D | Standard timing ID4 ( Optional_01h if not used) | 01 | 00000001 |
| | 46 | 2E | Standard timing ID5 ( Optional_01h if not used) | 01 | 00000001 |
| | 47 | 2F | Standard timing ID5 ( Optional_01h if not used) | 01 | 00000001 |
| | 48 | 30 | Standard timing ID6 ( Optional_01h if not used) | 01 | 00000001 |
| | 49 | 31 | Standard timing ID6 ( Optional_01h if not used) | 01 | 00000001 |
| | 50 | 32 | Standard timing ID7 ( Optional_01h if not used) | 01 | 00000001 |
| | 51 | 33 | Standard timing ID7 ( Optional_01h if not used) | 01 | 00000001 |
| | 52 | 34 | Standard timing ID8 ( Optional_01h if not used) | 01 | 00000001 |
| | 53 | 35 | Standard timing ID8 ( Optional_01h if not used) | 01 | 00000001 |

## Product Specification

# APPENDIX A. Enhanced Extended Display Identification Data (EEDID™)   2/3

| | Byte (Dec) | Byte (Hex) | Field Name and Comments | | Value (Hex) | Value (Bin) |
|---|---|---|---|---|---|---|
| Timing Descriptor #1 | 54 | 36 | Pixel Clock/10,000 (LSB) | 140.1 MHz @ 60 Hz | BA | 10111010 |
| | 55 | 37 | Pixel Clock/10,000 (MSB) | | 36 | 00110110 |
| | 56 | 38 | Horizontal Active (HA)    (lower 8 bits) | 1920 pixels | 80 | 10000000 |
| | 57 | 39 | Horizontal Blanking (HB)  (lower 8 bits) | 172 pixels | AC | 10101100 |
| | 58 | 3A | Horizontal Active (HA) / Horizontal Blanking (HB) (upper 4:4bits) | | 70 | 01110000 |
| | 59 | 3B | Vertical Avtive (VA) | 1080 lines | 38 | 00111000 |
| | 60 | 3C | Vertical Blanking (VB) (DE Blanking typ.for DE only panels) | 36 lines | 24 | 00100100 |
| | 61 | 3D | Vertical Active (VA) / Vertical Blanking (VB)  (upper 4:4bits) | | 40 | 01000000 |
| | 62 | 3E | Horizontal Front Porch in pixels (HF)  (lower 8 bits) | 60 pixels | 3C | 00111100 |
| | 63 | 3F | Horizontal Sync Pulse Width in pixels  (HS)  (lower 8 bits) | 36 pixels | 24 | 00100100 |
| | 64 | 40 | Vertical Front Porch in lines (VF) : Vertical Sync Pluse Width in lines (VS)  (lower 4 bits)    3 lines : 5 lines | | 35 | 00110101 |
| | 65 | 41 | Horizontal Front Porch/ Sync Pulse Width/ Vertical Front Porch/ Sync Pulse Width (upper 2bits) | | 00 | 00000000 |
| | 66 | 42 | Horizontal Vedio Image Size (mm) (lower 8 bits) | 309 mm | 35 | 00110101 |
| | 67 | 43 | Vertical Vedio Image Size    (mm) (lower 8 bits) | 175 mm | AF | 10101111 |
| | 68 | 44 | Horizontal Image Size / Vertical Image Size   (upper 4 bits) | | 10 | 00010000 |
| | 69 | 45 | Horizontal Border = 0 (Zero for Notebook LCD) | | 00 | 00000000 |
| | 70 | 46 | Vertical Border = 0   (Zero for Notebook LCD) | | 00 | 00000000 |
| | 71 | 47 | Non-Interlace, Normal display, no stereo, Digital Separate [ Vsync_NEG, Hsync_POS (outside of V-sync) ] | | 1A | 00011010 |
| Timing Descriptor #2 | 72 | 48 | Pixel Clock/10,000 (LSB) | 93.4 MHz @ 40 Hz | 7C | 01111100 |
| | 73 | 49 | Pixel Clock/10,000 (MSB) | | 24 | 00100100 |
| | 74 | 4A | Horizontal Active (HA)    (lower 8 bits) | 1920 pixels | 80 | 10000000 |
| | 75 | 4B | Horizontal Blanking (HB)  (lower 8 bits) | 172 pixels | AC | 10101100 |
| | 76 | 4C | Horizontal Active (HA) / Horizontal Blanking (HB) (upper 4:4bits) | | 70 | 01110000 |
| | 77 | 4D | Vertical Avtive (VA) | 1080 lines | 38 | 00111000 |
| | 78 | 4E | Vertical Blanking (VB) (DE Blanking typ.for DE only panels) | 36 lines | 24 | 00100100 |
| | 79 | 4F | Vertical Active (VA) / Vertical Blanking (VB)  (upper 4:4bits) | | 40 | 01000000 |
| | 80 | 50 | Horizontal Front Porch in pixels (HF)  (lower 8 bits) | 60 pixels | 3C | 00111100 |
| | 81 | 51 | Horizontal Sync Pulse Width in pixels  (HS)  (lower 8 bits) | 36 pixels | 24 | 00100100 |
| | 82 | 52 | Vertical Front Porch in lines (VF) : Vertical Sync Pluse Width in lines (VS)  (lower 4 bits)    3 lines : 5 lines | | 35 | 00110101 |
| | 83 | 53 | Horizontal Front Porch/ Sync Pulse Width/ Vertical Front Porch/ Sync Pulse Width (upper 2bits) | | 00 | 00000000 |
| | 84 | 54 | Horizontal Vedio Image Size (mm) (lower 8 bits) | 309 mm | 35 | 00110101 |
| | 85 | 55 | Vertical Vedio Image Size    (mm) (lower 8 bits) | 175 mm | AF | 10101111 |
| | 86 | 56 | Horizontal Image Size / Vertical Image Size   (upper 4 bits) | | 10 | 00010000 |
| | 87 | 57 | Horizontal Border = 0 (Zero for Notebook LCD) | | 00 | 00000000 |
| | 88 | 58 | Vertical Border = 0   (Zero for Notebook LCD) | | 00 | 00000000 |
| | 89 | 59 | Non-Interlace, Normal display, no stereo, Digital Separate [ Vsync_NEG, Hsync_POS (outside of V-sync) ] | | 1A | 00011010 |
| Timing Descriptor #3 | 90 | 5A | Blank for nvDPS | | 00 | 00000000 |
| | 91 | 5B | Blank for nvDPS | | 00 | 00000000 |
| | 92 | 5C | Blank for nvDPS | | 00 | 00000000 |
| | 93 | 5D | Blank for nvDPS | | 00 | 00000000 |
| | 94 | 5E | Blank for nvDPS | | 00 | 00000000 |
| | 95 | 5F | Blank for nvDPS | | 00 | 00000000 |
| | 96 | 60 | Blank for nvDPS | | 00 | 00000000 |
| | 97 | 61 | Blank for nvDPS | | 00 | 00000000 |
| | 98 | 62 | Blank for nvDPS | | 00 | 00000000 |
| | 99 | 63 | Blank for nvDPS | | 00 | 00000000 |
| | 100 | 64 | Blank for nvDPS | | 00 | 00000000 |
| | 101 | 65 | Blank for nvDPS | | 00 | 00000000 |
| | 102 | 66 | Blank for nvDPS | | 00 | 00000000 |
| | 103 | 67 | Blank for nvDPS | | 00 | 00000000 |
| | 104 | 68 | Blank for nvDPS | | 00 | 00000000 |
| | 105 | 69 | Blank for nvDPS | | 00 | 00000000 |
| | 106 | 6A | Blank for nvDPS | | 00 | 00000000 |
| | 107 | 6B | Blank for nvDPS | | 00 | 00000000 |

Product Specification

## APPENDIX A. Enhanced Extended Display Identification Data (EEDID™)   3/3

| | Byte (Dec) | Byte (Hex) | Field Name and Comments | | Value (Hex) | Value (Bin) |
|---|---|---|---|---|---|---|
| *Timing Descriptor #4* | 108 | 6C | Detailed Timing Descriptions #4 | | 00 | 00000000 |
| | 109 | 6D | Flag | | 00 | 00000000 |
| | 110 | 6E | Reserved | | 00 | 00000000 |
| | 111 | 6F | For Brightness Table and Power consumption | | 02 | 00000010 |
| | 112 | 70 | Flag | | 00 | 00000000 |
| | 113 | 71 | PWM % [7:0] @ Step 0 | 5 % @ 15 nit | 0C | 00001100 |
| | 114 | 72 | PWM % [7:0] @ Step 5 | 20 % @ 60 nit | 33 | 00110011 |
| | 115 | 73 | PWM % [7:0] @ Step 10 | 100 % @ 300 nit | FF | 11111111 |
| | 116 | 74 | Nits [7:0] @ Step 0 | | 0F | 00001111 |
| | 117 | 75 | Nits [7:0] @ Step 5 | | 3C | 00111100 |
| | 118 | 76 | Nits [7:0] @ Step 10 | | 96 | 10010110 |
| | 119 | 77 | Panel Electronicx Power @ 32 x 32 Chess Pattern = 1000 mW | | 19 | 00011001 |
| | 120 | 78 | Backlight Power @ 60 nits = 870 mW | | 16 | 00010110 |
| | 121 | 79 | Backlight Power @ Step 10 = 4000 mW | | 32 | 00110010 |
| | 122 | 7A | Nits @ 100% PWM Duty = 300 nit | | 96 | 10010110 |
| | 123 | 7B | Flag | | 00 | 00000000 |
| | 124 | 7C | Flag | | 00 | 00000000 |
| | 125 | 7D | Flag | | 00 | 00000000 |
| *Checksum* | 126 | 7E | Extension flag (# of optional 128 panel ID extension block to follow, Typ = 0) | | 00 | 00000000 |
| | 127 | 7F | Check Sum (The 1-byte sum of all 128 bytes in this panel ID block shall = 0) | | FB | 11111011 |