

# SPECIFICATION FOR APPROVAL

- ( ) Preliminary Specification  
(◆) Final Specification

|       |                  |
|-------|------------------|
| Title | 10.1" HD TFT LCD |
|-------|------------------|

|          |      |
|----------|------|
| Customer | Acer |
| MODEL    | WT3  |

|          |                      |
|----------|----------------------|
| SUPPLIER | LG Display Co., Ltd. |
| *MODEL   | LP101WH4             |
| Suffix   | SLAA                 |

\*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   |
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**Product Engineering Dept.  
LG Display Co., Ltd**

## Product Specification

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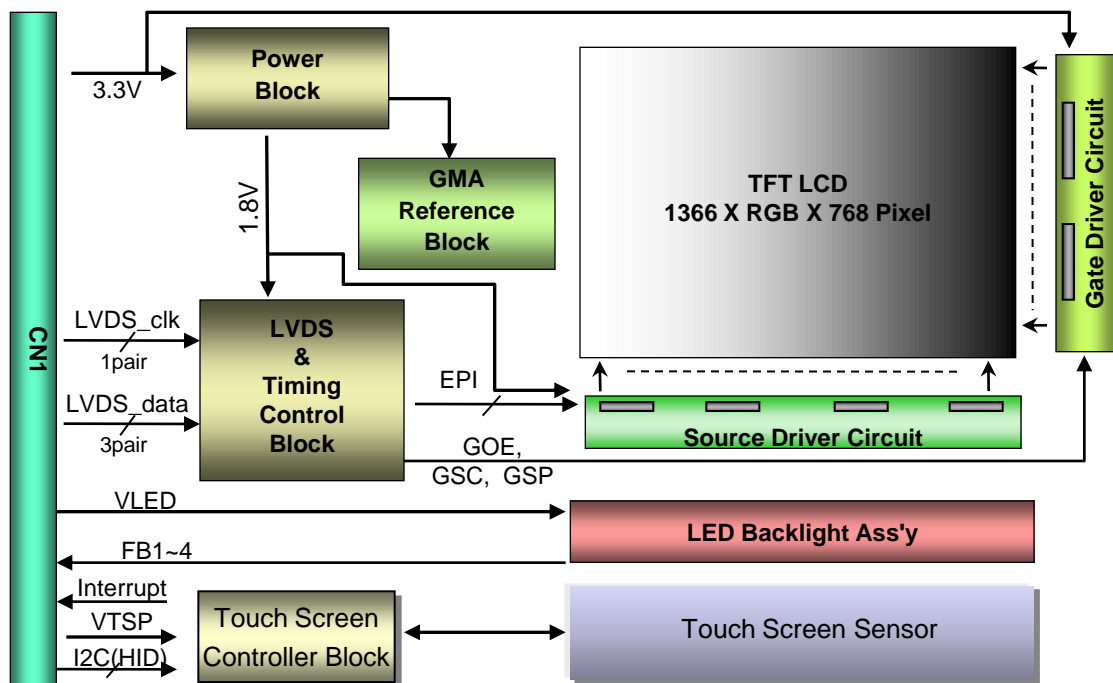
## 1. General Description

The LP101WH4 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 10.1inches diagonally measured active display area with HD resolution(1366 horizontal by 768 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 8-bit gray scale signal for each dot, thus, presenting a palette of more than 16,777,216 colors.

The LP101WH4 has been designed to apply the interface method that enables low power, high speed, low EMI.

The LP101WH4 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 LP101WH4 characteristics provide an excellent flat display

LP101WH4 is the 'Total solution' model. It means it includes LCM & TSP  
(TSP is assembled by a 'Direct Bonding' method)



## Product Specification

### General Features

#### LCM

|                        |   |   |
|------------------------|---|---|
| Active Screen Size     | 10.1 inches diagonal  |   |
| Outline Dimension      | LCM   | 232.8±0.3 (H) × 138.15±0.3 (V) × 2.40 mm (max.) |
| Pixel Pitch            | 0.05430 mm × 0.16290 mm   |   |
| Pixel Format           | 1366 horiz. by 768 vert. Pixels RGB strip arrangement   |   |
| Color Depth            | 8-bit, 1,6,777,216 colors   |   |
| Luminance, White       | 315 cd/m <sup>2</sup> (Typ., @I <sub>LED</sub> =15mA) (w/ Touch)<br>350 cd/m <sup>2</sup> (Typ., @I <sub>LED</sub> =15mA) (w/o Touch) |   |
| Power Consumption      | Logic   | 0.55 W(typ. @Mosaic)                            |
|                        | B/L   | 1.56 W (typ. @ I <sub>LED</sub> = 15mA)         |
| Weight                 | LCM   | 150g (max.)                                     |
| Display Operating Mode | Transmissive mode, normally Black   |   |
| Surface Treatment      | Glare, low reflective treatment of the front polarizer, 2H  |   |

#### TSP

|                         |  |  |
|-------------------------|--|--|
| Active Screen Size      | 10.1 inches diagonal                                     |  |
| TSP Outline Dimension   | 254.3±0.1 (H) × 158.0±0.1 (V) × 1.2 mm (max. with resin) |  |
| Sensor Active area      | 227.52(H) × 130.11(V) mm                                 |  |
| Cover View Area         | 223.72(H) × 126.31(V) mm                                 |  |
| Sensor Chanel Pitch     | 4.34mm (X) x 5.48mm (Y), Flooded-X Pattern               |  |
| Number of Sensor Chanel | 30ea(X) x 42ea(Y)  |  |
| Power Consumption       | 0.36W (typ. @ VTSP=5V, 1-finger)                         |  |
| Weight                  | 90g (max.)   |  |
| Display Operating Mode  | Transmissive mode, normally Black                        |  |
| Surface Treatment       | AF Coating (8H)  |  |
| Substrate               | type   | Projected Capacitive Add-on Touch Sensor Film, GF2 |
|                         | Input Method   | Single & Multi Finger                              |
| Cover Glass             | Gorilla 0.55t  |  |

## Product Specification

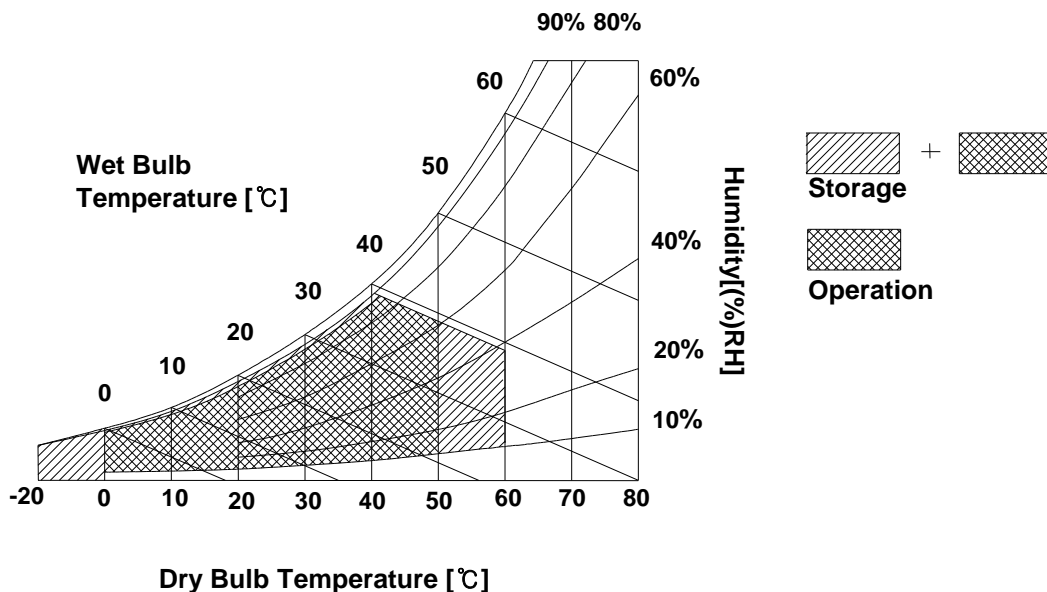
### 2. Absolute Maximum Ratings

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                  |                 |             |
| LCM Power Input Voltage    | VCC               | -0.3   | 4.0                  | V <sub>DC</sub> | at 25 ± 5°C |
| DDC Power Input Voltage    | V <sub>EDID</sub> | -0.3   | 6.5                  | V               |             |
| Touch Power Input Voltage  | V <sub>TSP</sub>  | -0.3   | 5.5V                 | V <sub>DC</sub> | at 25 ± 5°C |
| LVDS Input Voltage         | V <sub>SI</sub>   | -0.25  | 2.5                  | V               |             |
| EDID I2C Input Voltage     | V <sub>I2C</sub>  | -0.3   | V <sub>EDID</sub> +1 | V               |             |
| Touch Logic Voltage        | V <sub>IO</sub>   | -0.3   | 3.7                  | V               |             |
| Operating Temperature      | T <sub>OP</sub>   | 0      | 50                   | °C              | 1           |
| Storage Temperature        | HST               | -20    | 60                   | °C              | 1           |
| Operating Ambient Humidity | H <sub>OP</sub>   | 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.



## Product Specification

### 3. Electrical Specifications

#### 3-1. Electrical Characteristics

LP101WH4 model requires 3 kinds of Power input to operate a LCM normally.  
First one is to operate the LCD electronical components & TFT & Liquid crystal  
Second one is to operate the LED Back Light  
Third one is to operate the TSP

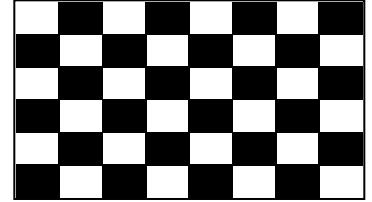
**Table 2. ELECTRICAL CHARACTERISTICS**

| Parameter                            | Symbol            | Values   |      |      | Unit            | Notes |
|--------------------------------------|-------------------|----------|------|------|-----------------|-------|
|                                      |                   | Min      | Typ  | Max  |                 |       |
| LOGIC :                              |                   |          |      |      |                 |       |
| Power Supply Input Voltage           | VCC               | 3.0      | 3.3  | 3.6  | V <sub>DC</sub> | 1     |
| Power Supply Input Current           | I <sub>CC</sub>   | -        | 166  | 194  | mA              | 2     |
| Power Consumption                    | P <sub>c</sub>    | -        | 0.55 | 0.66 | Watt            | 2     |
| Power Supply Inrush Current          | I <sub>CC_P</sub> | -        | -    | 2000 | mA              | 3     |
| Differential Impedance               | Z <sub>m</sub>    | 90       | 100  | 110  | Ohm             | 4     |
| EDID Input Voltage                   | V <sub>EDID</sub> | 3.0      | 3.3  | 3.6  | V               |       |
| EDID Input Current                   | I <sub>EDID</sub> |          |      | 10   | mA              |       |
| LED Backlight : (without LED Driver) |                   |          |      |      |                 |       |
| Operating Current per string         | I <sub>LED</sub>  |          | 15   |      | mA              | 5     |
| LED Power Consumption                | P <sub>LED</sub>  |          | 1.56 | 1.59 | W               | 6     |
| LED Vf                               |                   |          | 2.9  | 2.95 | V               |       |
| Life Time                            |                   | 12,000   | -    | -    | Hrs             | 7     |
| Touch Panel                          |                   |          |      |      |                 |       |
| Power Supply Input Voltage           | V <sub>TSP</sub>  | 3.6      | 5    | 5.5  | V               |       |
| Power Supply Input Current           | I <sub>TSP</sub>  | 1-finger | 71   | 82   | mA              |       |
|                                      |                   | 5-finger | 65   | 75   | mA              |       |
|                                      |                   | Idle     | 20   |      | mA              |       |
| Power Consumption                    | P <sub>TSP</sub>  |          | 0.36 | 0.41 | Watt            | 8     |

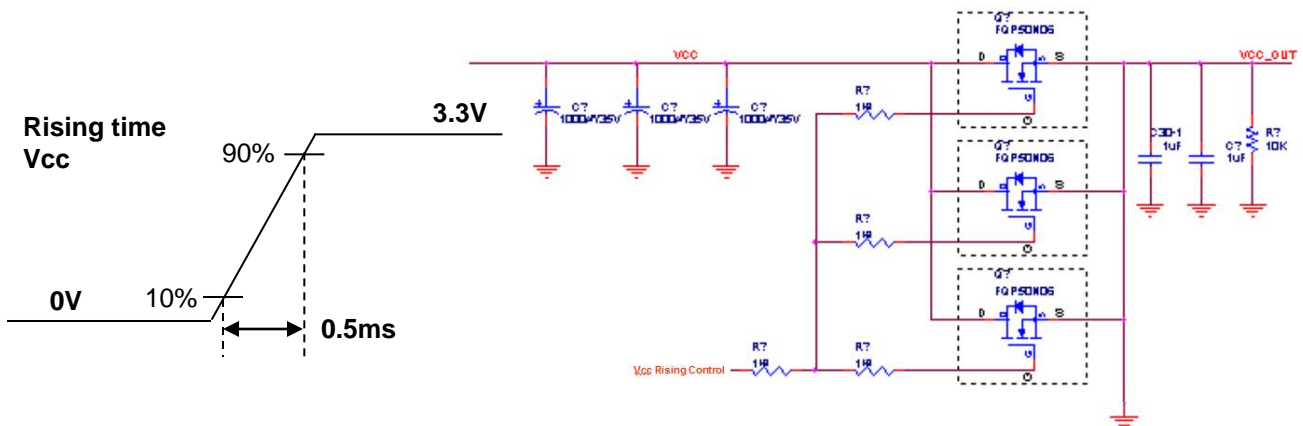
## Product Specification

Note)

1. The measuring position is the connector of LCM and the test conditions are under  $25^{\circ}\text{C}$ ,  $f_v = 60\text{Hz}$ , Mosaic pattern.
2. The specified  $I_{CC}$  current and power consumption are under the  $V_{CC} = 3.3\text{V}$ ,  $25^{\circ}\text{C}$ ,  $f_v = 60\text{Hz}$  condition whereas Mosaic pattern is displayed and  $f_v$  is the frame frequency.



3. The below figures are the measuring  $V_{CC}$  condition and the  $V_{CC}$  control block LGD used.  
The  $V_{CC}$  condition is same the minimum of T1 at Power on sequence.



4. This impedance value is needed to proper display and measured from LVDS Tx to the mating connector.
5. The typical operating current is for the typical surface luminance ( $L_{WH}$ ) in optical characteristics.  
 $I_{LED}$  is the current of each LEDs' string, LED backlight has strings on it.
6. The LED power consumption shown above does not include power of external LED driver circuit for typical current condition.
7. The life time is determined as the time at which the typical brightness of LCD is 50% compare to that of initial value at the typical LED current. These LED backlight has 4 strings on it and the typical current of LED's string is base on 15mA.
8. The specified ITSP current and power consumption (PTSP) are under the  $V_{TSP} = 5\text{V}$ ,  $25^{\circ}\text{C}$ , 100Hz at 1-finger and Active mode.



## Product Specification


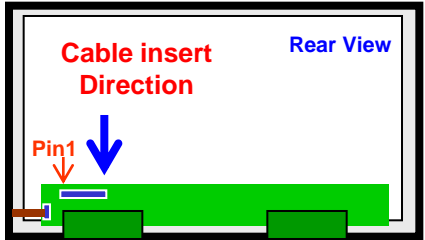
## 3-2. Interface Connections

### 3-2-1. LCD Control Board Connection

This LCD employs two interface connections, a 39pin connector is used for the module electronics interface and the other connector is used for the integral backlight system.

The electronics interface connector is a model FH35C-39S-0.3SHW manufactured by HIROSE.

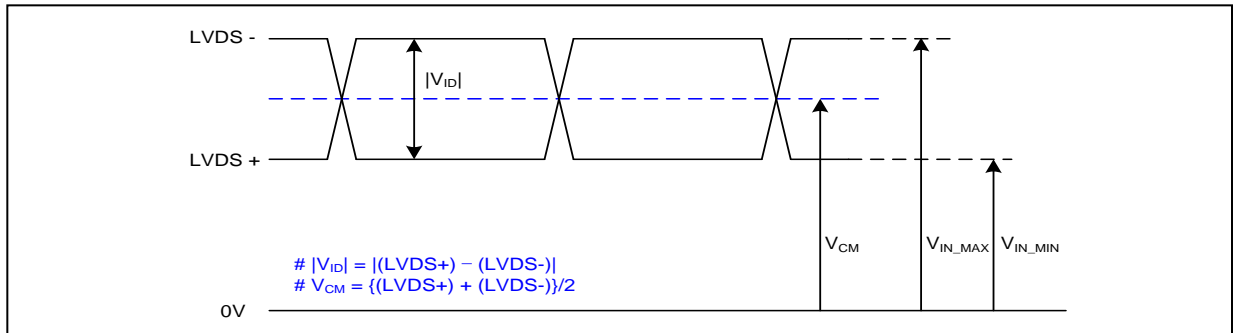
**Table 3. MODULE CONNECTOR PIN CONFIGURATION (CN1)**

| Pin | Symbol             | Description   | Notes   |
|-----|--------------------|---|---|
| 1   | NC                 | No Connection.  | <b>[Connector]</b><br>FH35C-39S-0.3SHW(Hirose), 39pin<br><br><b>[Connector pin arrangement]</b><br><br>[LCD Module Rear View] |
| 2   | VCC                | Power Supply, 3.3V Typ.                               |   |
| 3   | VCC                | Power Supply, 3.3V Typ.                               |   |
| 4   | V EDID             | DDC 3.3V power  |   |
| 5   | NC                 | No Connection (Reserved – LCD panel self test enable) |   |
| 6   | Clk EDID           | DDC Clock   |   |
| 7   | DATA EDID          | DDC Data  |   |
| 8   | R <sub>IN</sub> 0- | Negative LVDS differential data input                 |   |
| 9   | R <sub>IN</sub> 0+ | Positive LVDS differential data input                 |   |
| 10  | GND                | Ground  |   |
| 11  | R <sub>IN</sub> 1- | Negative LVDS differential data input                 |   |
| 12  | R <sub>IN</sub> 1+ | Positive LVDS differential data input                 |   |
| 13  | GND                | Ground  |   |
| 14  | R <sub>IN</sub> 2- | Negative LVDS differential data input                 |   |
| 15  | R <sub>IN</sub> 2+ | Positive LVDS differential data input                 |   |
| 16  | GND                | Ground  |   |
| 17  | CLKIN-             | Negative LVDS differential clock input                |   |
| 18  | CLKIN+             | Positive LVDS differential clock input                |   |
| 19  | GND                | Ground  |   |
| 20  | R <sub>IN</sub> 3- | Negative LVDS differential data input                 |   |
| 21  | R <sub>IN</sub> 3+ | Positive LVDS differential data input                 |   |
| 22  | GND                | Ground  |   |
| 23  | VTSP               | Power Supply, 3.6V ~ 5.5V                             |    |
| 24  | VTSP               | Power Supply, 3.6V ~ 5.5V                             |   |
| 25  | GND                | Ground  |   |
| 26  | I2C_CLK            | I2C Clock for Touch                                   |   |
| 27  | I2C_Data           | I2C Data for Touch                                    |   |
| 28  | Interrupt          | MCU(Host) Alert                                       |   |
| 29  | RST                | Reset for Touch                                       |   |
| 30  | NC                 | No Connection   |   |
| 31  | NC                 | No Connection   |   |
| 32  | VCD4               | LED Cathode Feedback 4                                |   |
| 33  | VCD3               | LED Cathode Feedback 3                                |   |
| 34  | VCD2               | LED Cathode Feedback 2                                |   |
| 35  | VCD1               | LED Cathode Feedback 1                                |   |
| 36  | NC                 | No Connection   |   |
| 37  | VLED               | Power Supply for LED [Anode]                          |   |
| 38  | VLED               | Power Supply for LED [Anode]                          |   |
| 39  | VLED               | Power Supply for LED [Anode]                          |   |

## Product Specification

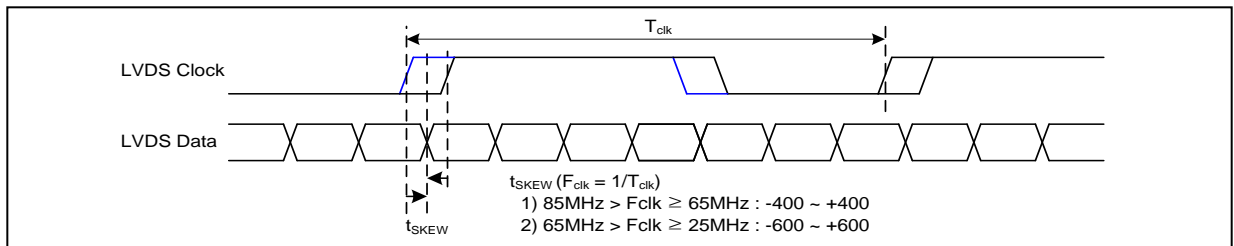
### 3-3. LVDS Signal Timing Specifications

#### 3-3-1. DC Specification



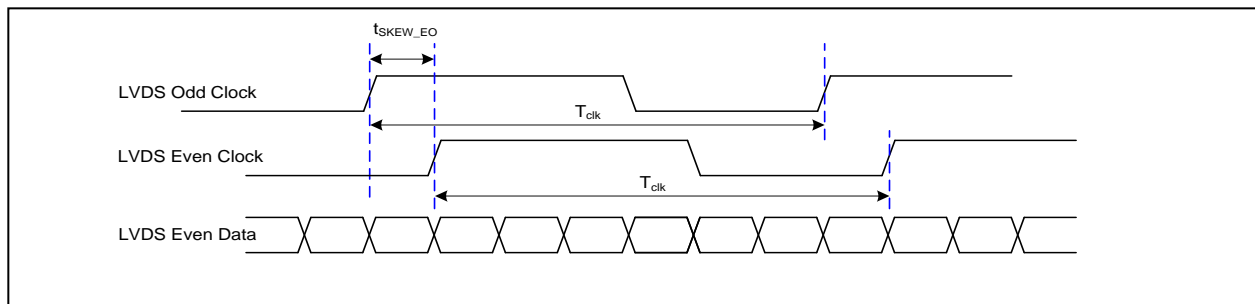
| Description               | Symbol     | Min | Max | Unit | Notes |
|---------------------------|------------|-----|-----|------|-------|
| LVDS Differential Voltage | $ V_{ID} $ | 100 | 600 | mV   | -     |
| LVDS Common mode Voltage  | $V_{CM}$   | 0.6 | 1.8 | V    | -     |
| LVDS Input Voltage Range  | $V_{IN}$   | 0.3 | 2.1 | V    | -     |

#### 3-3-2. AC Specification

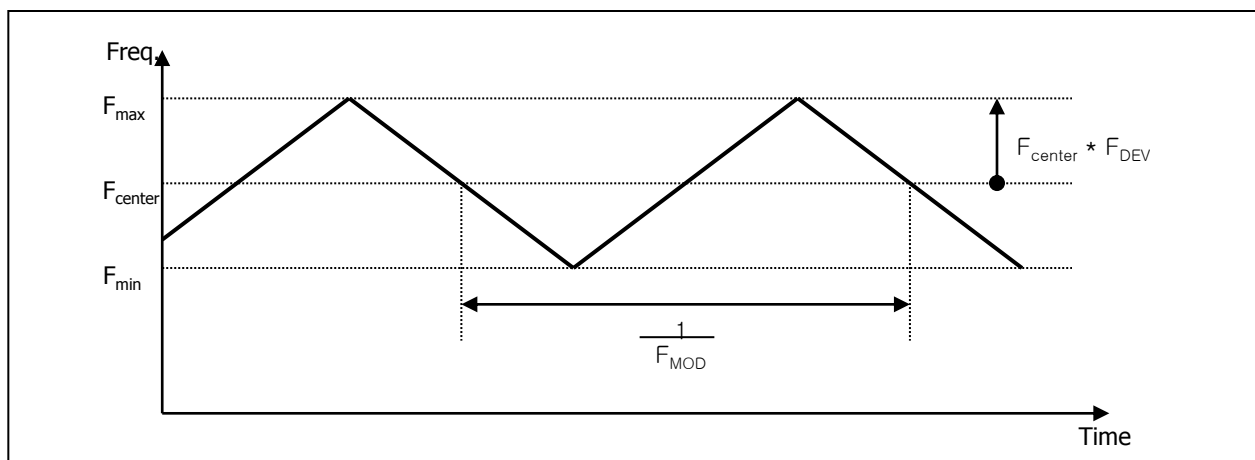


| Description  | Symbol         | Min   | Max     | Unit      | Notes                        |
|--|----------------|-------|---------|-----------|------------------------------|
| LVDS Clock to Data Skew Margin                         | $t_{SKEW}$     | - 400 | + 400   | ps        | $85MHz > F_{clk} \geq 65MHz$ |
|  | $t_{SKEW}$     | - 600 | + 600   | ps        | $65MHz > F_{clk} \geq 25MHz$ |
| LVDS Clock to Clock Skew Margin (Even to Odd)          | $t_{SKEW\_EO}$ | - 1/7 | + 1/7   | $T_{clk}$ | -                            |
| Maximum deviation of input clock frequency during SSC  | $F_{DEV}$      | -     | $\pm 3$ | %         | -                            |
| Maximum modulation frequency of input clock during SSC | $F_{MOD}$      | -     | 200     | KHz       | -                            |

## Product Specification



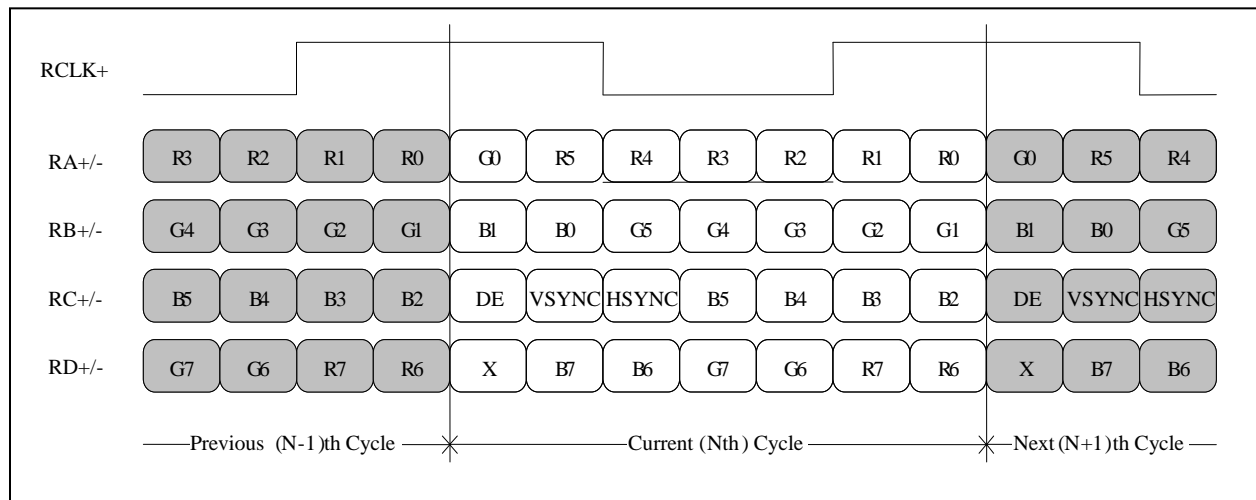
< Clock skew margin between channel >



< Spread Spectrum >

### 3-3-3. Data Format

#### - LVDS 1 Port



< LVDS Data Format >

### 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 LVDS Tx/Rx for its proper operation.

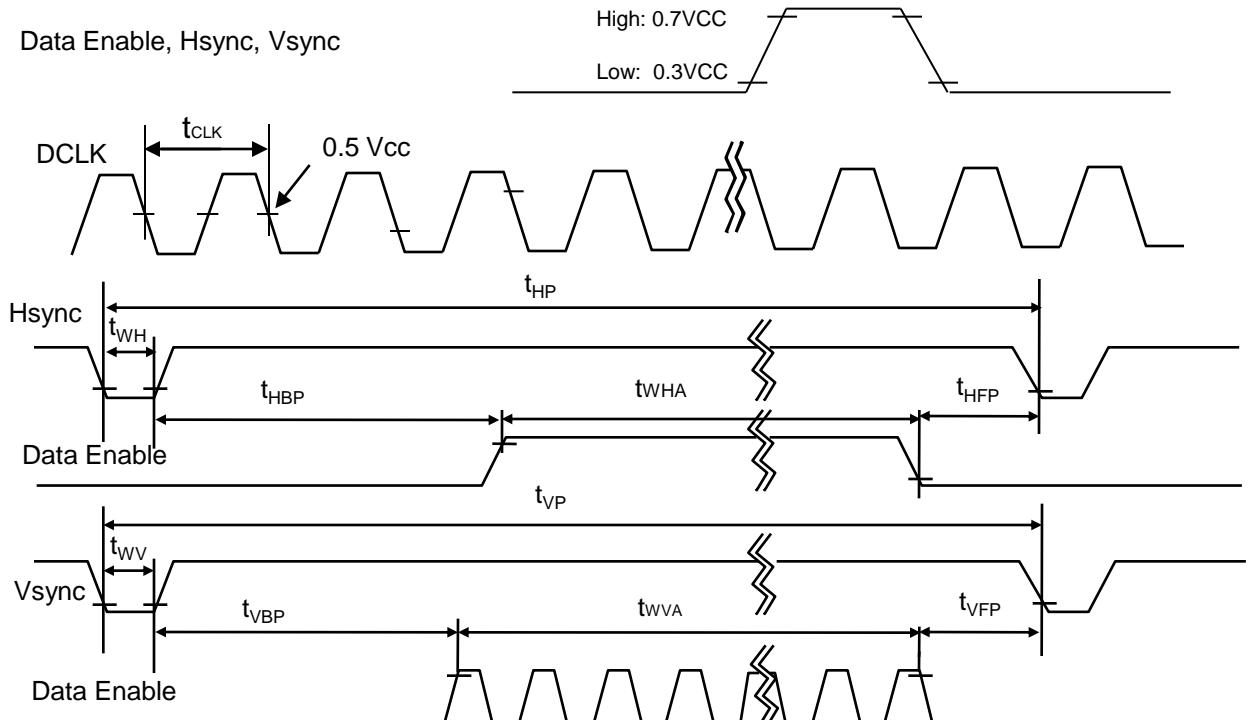
**Table 5. TIMING TABLE**

| ITEM        | Symbol                 | Min       | Typ  | Max  | Unit | Note |
|-------------|------------------------|-----------|------|------|------|------|
| DCLK        | Frequency              | $f_{CLK}$ | 69   | 72   | 75   | MHz  |
| Hsync       | Period                 | $t_{HP}$  | 1470 | 1526 | 1542 | Tclk |
|             | Width                  | $t_{WH}$  | 24   | 32   | 40   |      |
|             | Width-Active           | $t_{WHA}$ | -    | 1366 | -    |      |
| Vsync       | Period                 | $t_{VP}$  | 779  | 790  | 801  | tHP  |
|             | Width                  | $t_{VW}$  | 2    | 5    | 8    |      |
|             | Width-Active           | $t_{VWA}$ | -    | 768  | -    |      |
| Data Enable | Horizontal back porch  | $t_{HBP}$ | 72   | 80   | 88   | tCLK |
|             | Horizontal front porch | $t_{HFP}$ | 8    | 48   | 48   |      |
|             | Vertical back porch    | $t_{VBP}$ | 8    | 14   | 20   | tHP  |
|             | Vertical front porch   | $t_{VFP}$ | 1    | 3    | 5    |      |

### 3-5. Signal Timing Waveforms

Condition :  $V_{CC} = 3.3V$

Data Enable, Hsync, Vsync



## Product Specification

### 3-6. Color Input Data Reference

The brightness of each primary color (red, green and blue) is based on the 8-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.

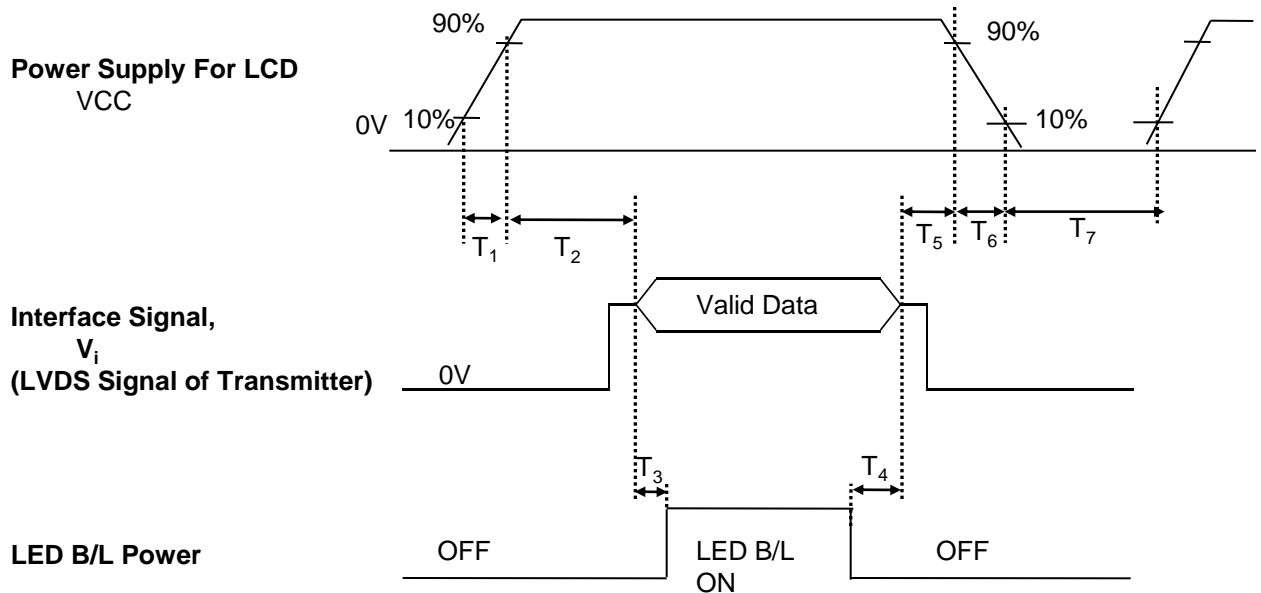
**Table 7. COLOR DATA REFERENCE**

| Color       |             | Input Color Data |    |    |    |     |    |    |    |       |    |    |    |     |    |    |    |      |    |    |    |     |    |    |    |   |
|-------------|-------------|------------------|----|----|----|-----|----|----|----|-------|----|----|----|-----|----|----|----|------|----|----|----|-----|----|----|----|---|
|             |             | RED              |    |    |    |     |    |    |    | GREEN |    |    |    |     |    |    |    | BLUE |    |    |    |     |    |    |    |   |
|             |             | MSB              |    |    |    | LSB |    |    |    | MSB   |    |    |    | LSB |    |    |    | MSB  |    |    |    | LSB |    |    |    |   |
|             |             | R7               | R6 | R5 | R4 | R3  | R2 | R1 | R0 | R7    | R6 | R5 | R4 | R3  | R2 | R1 | R0 | R7   | R6 | R5 | R4 | R3  | R2 | R1 | R0 |   |
| 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  | 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 (00)    | 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 (01)    | 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 (254)   | 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 (00)  | 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 (01)  | 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 (254) | 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 (00)   | 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 (01)   | 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  |   |

## Product Specification

### 3-7. Power Sequence

#### 3-7-1. Power Sequence for LCM



**Table 8. POWER SEQUENCE TABLE**

| Parameter      | Value |      |      | Units |
|----------------|-------|------|------|-------|
|                | Min.  | Typ. | Max. |       |
| T <sub>1</sub> | 0.5   | -    | 10   | (ms)  |
| T <sub>2</sub> | 0     | -    | 50   | (ms)  |
| T <sub>3</sub> | 200   | -    | -    | (ms)  |
| T <sub>4</sub> | 200   | -    | -    | (ms)  |
| T <sub>5</sub> | 0     | -    | 50   | (ms)  |
| T <sub>6</sub> | 0     | -    | 10   | (ms)  |
| T <sub>7</sub> | 400   | -    | -    | (ms)  |

Note)

1. Valid Data is Data to meet "3-3. Signal Timing Specifications"
2. Please avoid floating state of interface signal at invalid period.
3. When the interface signal is invalid, be sure to pull down the power supply for LCD VCC to 0V.
4. LED B/L power must be turn on after power supply for LCD and interface signal are valid.

Product Specification

### 3-7-2. Power Sequence for Touch

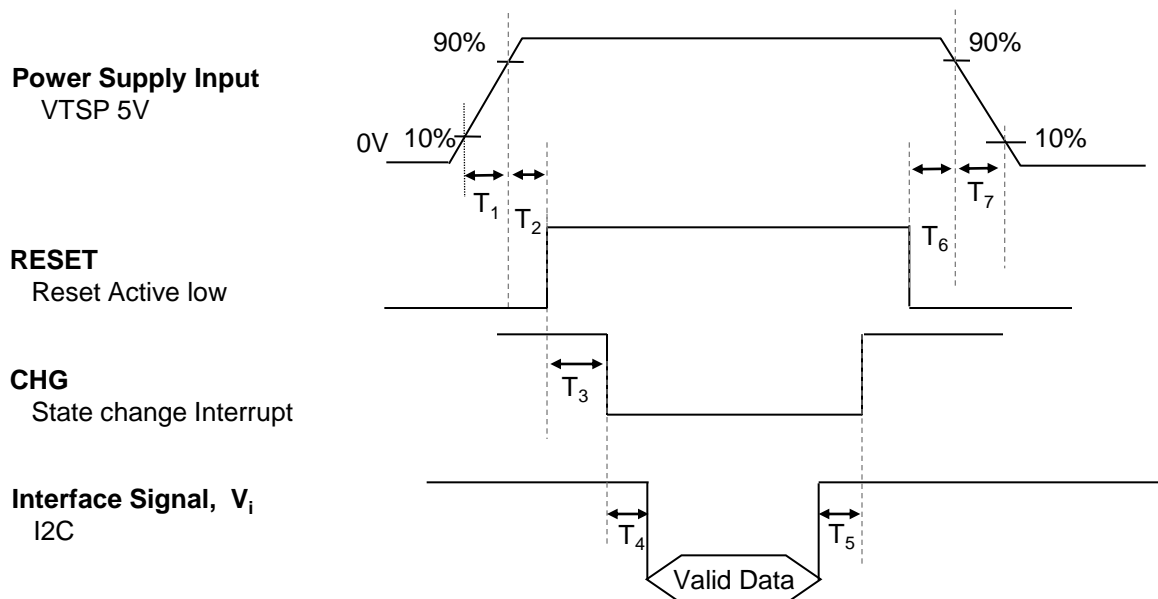


Table 9. POWER SEQUENCE TABLE

| Parameter | Value |      |      | Units |
|-----------|-------|------|------|-------|
|           | Min.  | Typ. | Max. |       |
| $T_1$     | 0.5   | -    | 10   | ms    |
| $T_2$     | 10    | -    | -    | ns    |
| $T_3$     | -     | 154  | -    | ms    |
| $T_4$     | 0.1   | -    | -    | ms    |
| $T_5$     | -     | -    | 0.5  | ms    |
| $T_6$     | 0     | -    | -    | ns    |
| $T_7$     | -     | -    | 10   | ms    |

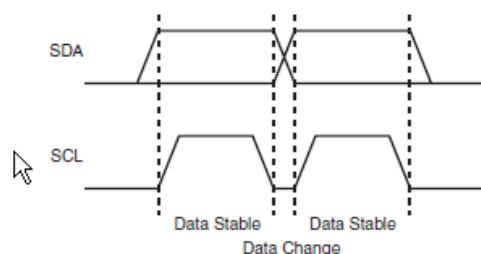
#### Transferring Data Bits

Each data bit transferred on the bus is accompanied by a pulse on the clock line. The level of the data line must be stable when the clock line is high ; the only exception to this rule is for generating START and STOP conditions.

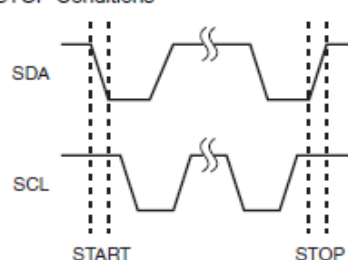
#### START and STOP conditions

START and STOP conditions are signaled by changing the level of the SDA line when the SCL line is high.

Data Transfer



START and STOP Conditions



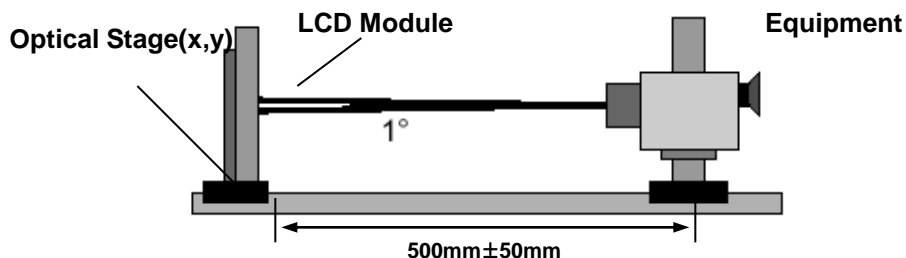
## Product Specification

### 4. Optical Specification

Optical characteristics are determined after the unit has been 'ON' and stable for approximately 20 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, fCLK= 72MHz, ILED = 15mA

| Parameter                    |            | Symbol             | Condition             | Min       | Typ   | Max   | Units | Notes |
|------------------------------|------------|--------------------|-----------------------|-----------|-------|-------|-------|-------|
| Average Luminance With Touch |            | LAVE               | 5 Points (ILED= 15mA) | 268       | 315   | -     | cd/m² | 2     |
| Average Luminance W/o Touch  |            |                    |                       | 297       | 350   |       |       |       |
| Luminance variation          |            | δ <sub>WHITE</sub> | 5points               | -         | 1.20  | 1.40  |       |       |
|                              |            |                    | 13 point              | -         | 1.40  | 1.60  |       | 3     |
| C/R                          |            | -                  | Center 1 Point        | 500       | 800   | -     | -     | 1     |
| Response time                |            |                    | -                     | -         | 25    | -     | ms    | 4     |
| Viewing angle                | Horizontal | Θ                  | φx(Left,Right)        | ±80       | ±85   | -     | °     | 5     |
|                              | Vertical   | Θ                  | φyu(Up)               | 80        | 85    | -     |       |       |
|                              |            | Θ                  | φyd(Down)             | 80        | 85    | -     |       |       |
| Color Coordinates            |            | RED                | RX                    | 0.567     | 0.597 | 0.627 |       |       |
|                              |            |                    | RY                    | 0.324     | 0.354 | 0.384 |       |       |
|                              |            | GREEN              | GX                    | 0.305     | 0.335 | 0.365 |       |       |
|                              |            |                    | GY                    | 0.537     | 0.567 | 0.597 |       |       |
|                              |            | BLUE               | BX                    | 0.121     | 0.151 | 0.181 |       |       |
|                              |            |                    | BY                    | 0.089     | 0.119 | 0.149 |       |       |
|                              |            | WHITE              | WX                    | 0.283     | 0.313 | 0.343 |       |       |
|                              |            |                    | WY                    | 0.299     | 0.329 | 0.359 |       |       |
| Gray Scale                   |            | -                  | -                     | Gamma 2.2 |       |       |       | 6     |



## Product Specification

Note)

1. Contrast Ratio(CR) is defined mathematically as

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

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.

$$L_{WH} = \text{Average}(L_1, L_2, \dots L_5)$$

3. The variation in surface luminance , The panel total variation ( $\delta_{WHITE}$ ) is determined by measuring  $L_N$  at each test position 1 through 17 and then defined as followed numerical formula.  
For more information see FIG 2.

$$\delta_{WHITE} = \frac{\text{Maximum}(L_1, L_2, \dots L_{13})}{\text{Minimum}(L_1, L_2, \dots L_{13})}$$

4. Response time is the time required for the display to transition from white to black (rise time,  $Tr_R$ ) and from black to white(Decay Time,  $Tr_D$ ). 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

\*  $f_V = 60\text{Hz}$

| Gray Level | Luminance [%] (Typ) |
|------------|---------------------|
| L0         | 0.11                |
| L15        | 0.22                |
| L31        | 0.89                |
| L47        | 2.59                |
| L63        | 5.58                |
| L79        | 9.93                |
| L95        | 15.4                |
| L111       | 21.6                |
| L127       | 28.7                |
| L143       | 35.7                |
| L159       | 43.3                |
| L175       | 51.3                |
| L191       | 59.9                |
| L207       | 67.3                |
| L223       | 75.3                |
| L239       | 85.4                |
| L255       | 100.0               |

Product Specification

FIG. 2 Luminance

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

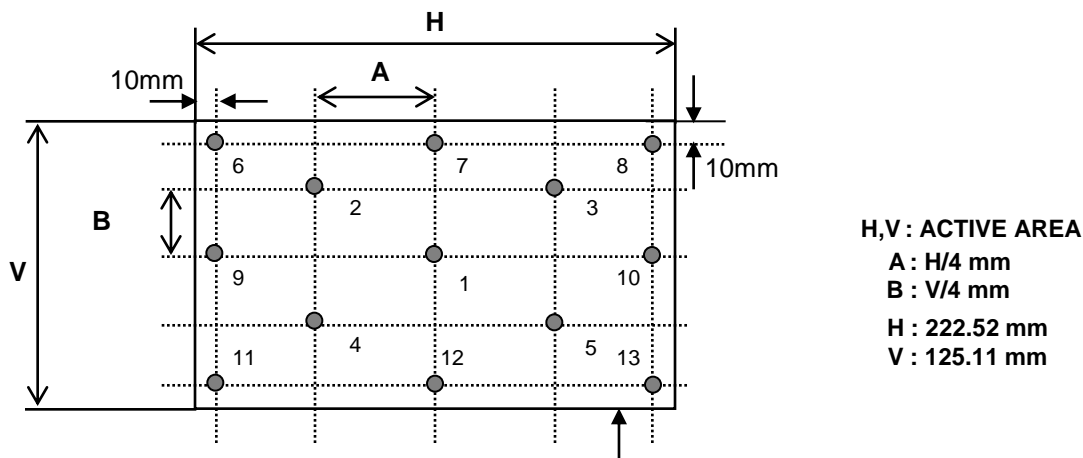


FIG. 3 Response Time

Active Area

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

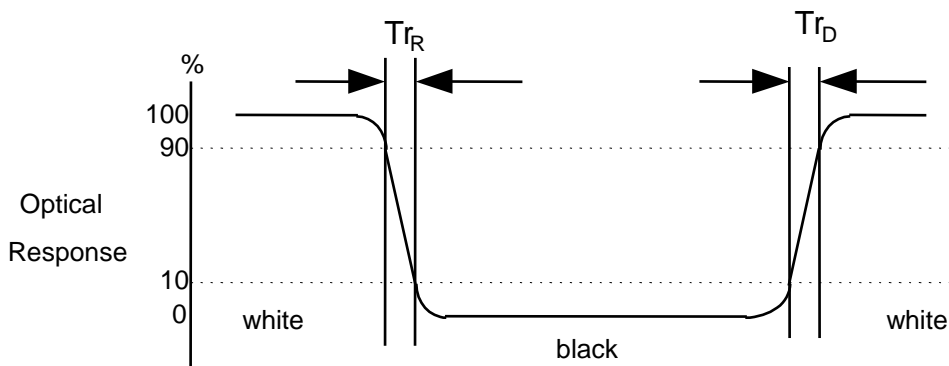
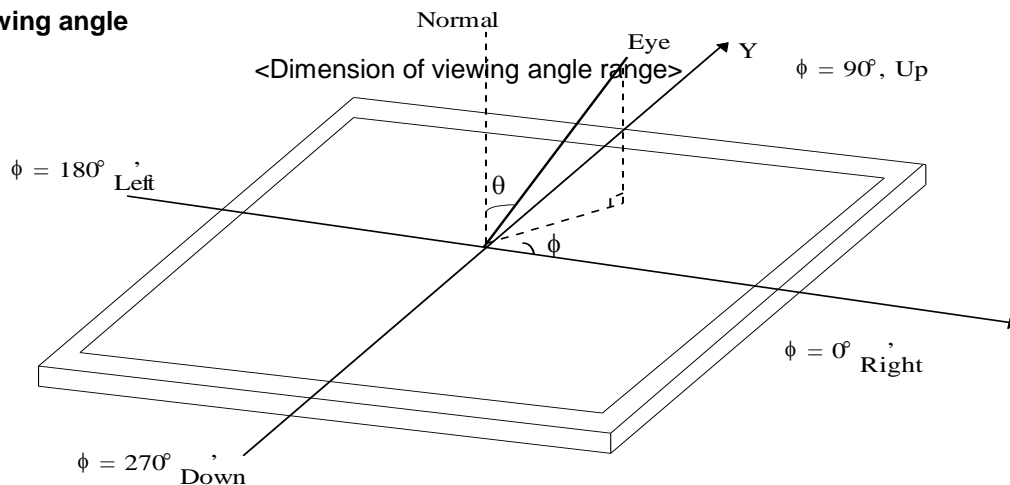


FIG. 4 Viewing angle



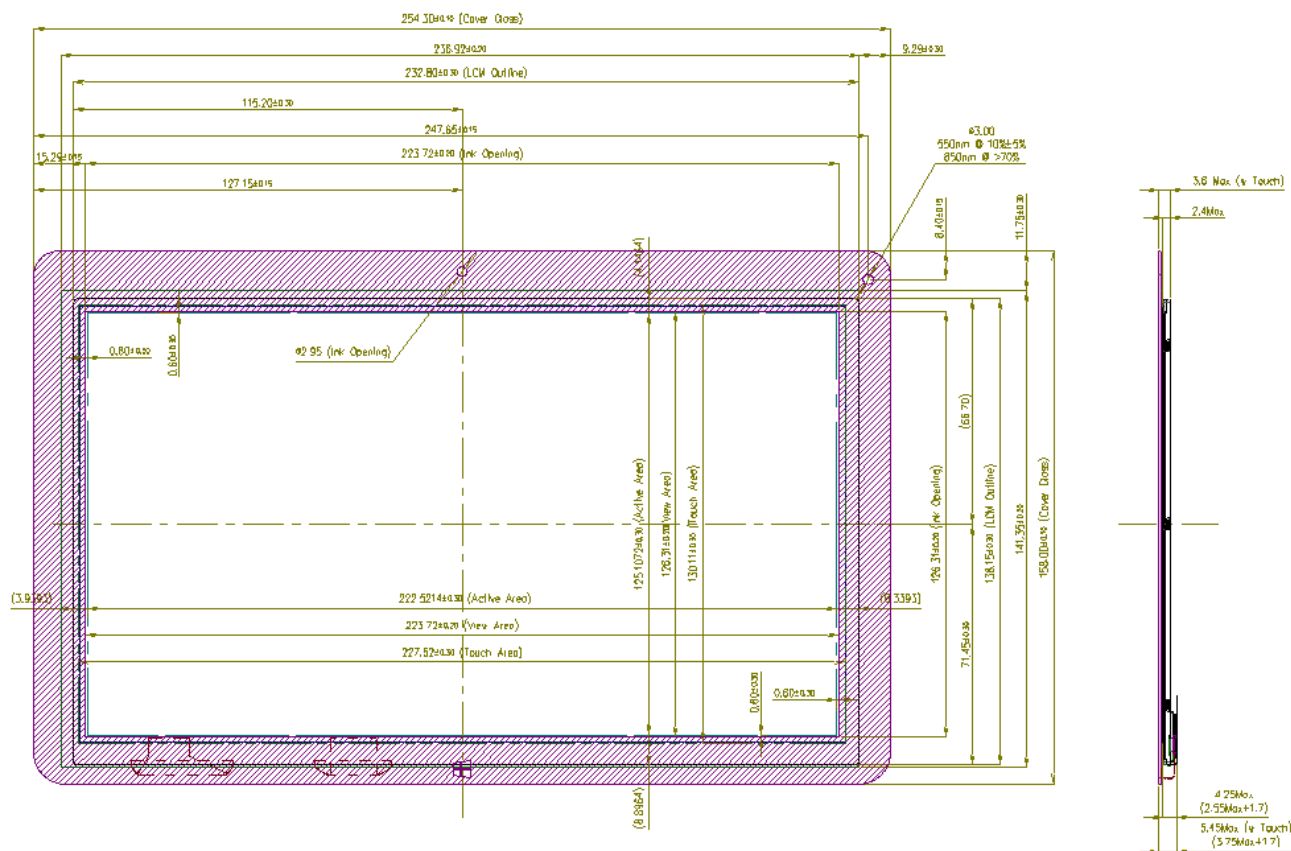
Product Specification

## 5. Mechanical Characteristics

The contents provide general mechanical characteristics for the model LP101WH (TBD). In addition the figures in the next page are detailed mechanical drawing of the LCD.

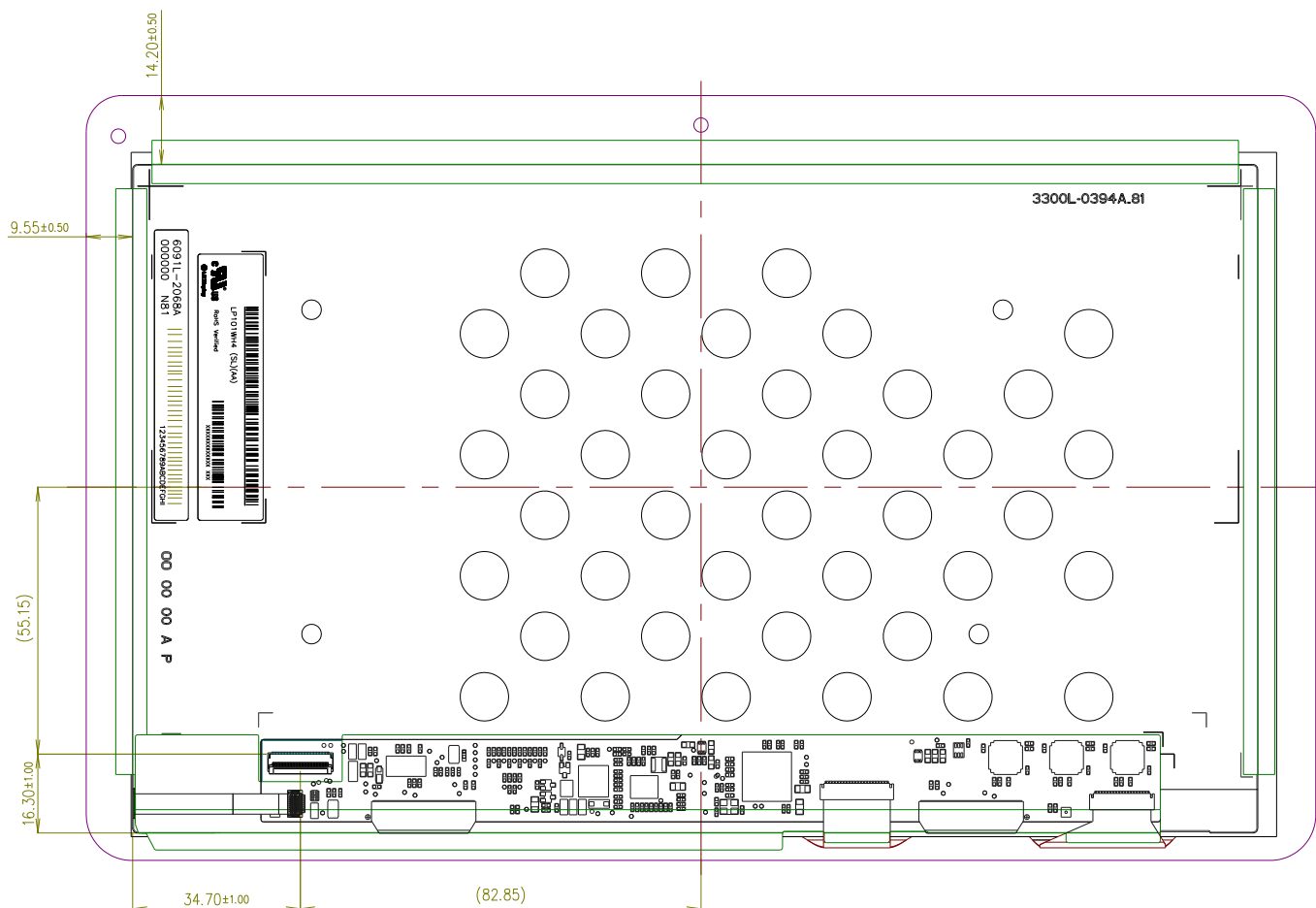
|                     |  |   |
|---------------------|--|---|
| Outline Dimension   | Horizontal   | 232.8 ± 0.3mm (without bracket length)  |
|                     | Vertical   | 138.15 ± 0.3mm (without bracket length) |
|                     | Thickness  | 2.40mm (max.)                           |
| Bezel Area          | Horizontal   | TBD                                     |
|                     | Vertical   | TBD                                     |
| Active Display Area | Horizontal   | 222.5214mm                              |
|                     | Vertical   | 125.1072mm                              |
| Touch Screen Panel  | Horizontal   | 254.3mm                                 |
|                     | Vertical   | 158.00mm                                |
|                     | Thickness  | 1.20mm (max)                            |
| Weight              | 150g (Max.) w/o Touch, 240g (Max) w/ Touch   |   |
| Surface Treatment   | LCD : Glare, low reflective treatment of the front polarizer, 2H<br>Touch : AF Coating, 8H |   |
| Viewing Angle       | Viewing Angle(When Active area can be seen) ≤ 30°  |   |

<FRONT VIEW>



**Product Specification**

**<REAR VIEW>**



## Product Specification

**6. Key Part List**

| NO | ITEM     | Description      | Specification                            |
|----|----------|------------------|--|
| 1  | SW0663   | T-Con            | Siliconworks, LVDS, EPI, 66BGA           |
| 2  | SW9402   | Source Driver IC | Siliconworks, EPI, 1026ch, 6/8bit        |
| 3  | SW8026   | Gate Driver IC   | Siliconworks, 384ch                      |
| 4  | SM4033   | PMIC             | 6 in 1, buck                             |
| 5  | mXT1386E | Touch Control IC | Atmel, mXT1386E(MCU) + mXT154E(ROIC) 3ea |

Product Specification

## 7. Reliability

### 7-1. 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, 10 ~ 500 ~ 10Hz, 1.5G, 0.37oct/min<br>3 axis, 1hour/axis                              |
| 6   | Shock test (non-operating)                  | Half sine wave, 180G, 2ms<br>one shock of each six faces(I.e. run 180G 6ms<br>for all six faces) |
| 7   | Altitude<br>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.

Touch sensor should be at room temperature for 24 hours when the reliability test finished.

When the reliability test is over, touch sensor need to be calibrated.

After calibration and execute the function test.

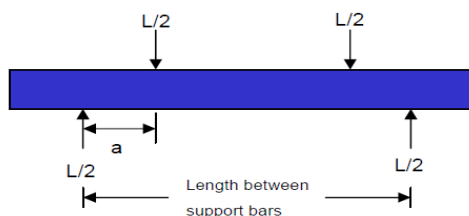
In the standard condition, it should be no touch abnormal function.

### 7-2. Mechanical test condition

| No. | Test Item            | Conditions                    | Pass Criteria | Notes        |
|-----|----------------------|-------------------------------|---------------|--------------|
| 1   | 4-point Bending Test | ASTM C158 4point bending test | ≥ 300MPa      | 1), a ≥ 25mm |
| 2   | FPC Pulling Test     | 25mm/min, pulling angle : 90° | ≥ 500g/cm     | 2)           |

Note 1)

ASTM C158 4point bending test is a common test method used to measure edge strength of glass.



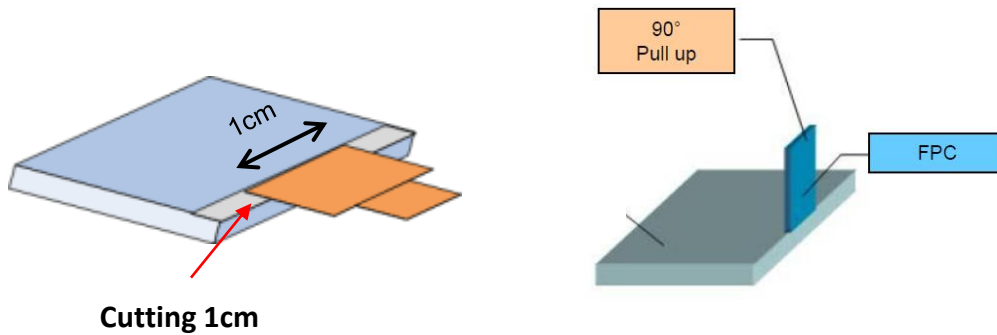
For linear stress/force relation  
 $\text{Stress} = (3 \cdot L \cdot a) / (b \cdot h^2)$   
 where  
 L = Load  
 a = distance from support bar to load bar  
 b = width of sample  
 h = height (thickness) of sample

## Product Specification

Note 2)

It should be cut FPC as 1cm width before FPC pulling test

FPC pulling test condition is peeling speed 25mm/min, pull-up angle 90°.



## 8. Touch Function Specifications

### 8-1. Test Equipment : K-9601 or equivalent

K-9601 is LGD's standard equipment for touch function test.

Test Pattern & condition observe Win8 Touch Test requirement.



### 8-2. Touch function specification

Touch function is satisfied with Win8 Touch requirement.



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

### 9-2. EMC

- a) ANSI C63.4 "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electrical Equipment in the Range of 9kHz to 40GHz. "American National Standards Institute(ANSI), 1992
- b) C.I.S.P.R "Limits and Methods of Measurement of Radio Interface Characteristics of Information Technology Equipment." International Special Committee on Radio Interference.
- c) EN 55022 "Limits and Methods of Measurement of Radio Interface Characteristics of Information Technology Equipment." European Committee for Electrotechnical Standardization.(CENELEC), 1998  
( Including A1: 2000 )

## Product Specification

### 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)

E : MONTH

D : YEAR

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.

#### 10-2. Packing Form

a) Package quantity in one box : 40 pcs

b) Box Size : 478\*365\*328 mm

## 11. PRECAUTIONS

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

### 11-1. 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 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 soaked 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.

### 11-2. OPERATING PRECAUTIONS

- (1) The spike noise causes the mis-operation of circuits. It should be lower than following voltage :  
 $V = \pm 200\text{mV}$  (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 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) 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.

**Product Specification**
**EDID Data for ACER \_ ver. 0.0**

2012/8/2

|  | Byte<br>(Dec) | Byte<br>(Hex) | Field Name and Comments   | Value<br>(Hex) | Value<br>(Bin) |
|--|---------------|---------------|---|----------------|----------------|
| <b>Header</b>                            | 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       |
| <b>Vendor / Product<br/>EDID Version</b> | 7             | 07            | Header  | 00             | 00000000       |
|  | 8             | 08            | ID Manufacture Name LGD   | 30             | 00110000       |
|  | 9             | 09            | ID Manufacture Name   | E4             | 11100100       |
|  | 10            | 0A            | ID Product Code 03C8h   | C8             | 11001000       |
|  | 11            | 0B            | ( Hex. LSB first )  | 03             | 00000011       |
|  | 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       |
| <b>Display<br/>Parameters</b>            | 17            | 11            | Year of Manufacture 2012 years  | 16             | 00010110       |
|  | 18            | 12            | EDID structure version # = 1  | 01             | 00000001       |
|  | 19            | 13            | EDID revision # = 4   | 04             | 00000100       |
|  | 20            | 14            | Video input Definition = Input is a Digital Video signal Interface , Colo Bit Depth : 8 Bits per Primary Color , Digital Video Interface Standard Supported: Digital Interface is not defined   | A0             | 10100000       |
|  | 21            | 15            | Horizontal Screen Size (Rounded cm) = 22 cm   | 16             | 00010110       |
| <b>Panel Color<br/>Coordinates</b>       | 22            | 16            | Vertical Screen Size (Rounded cm) = 13 cm   | 0D             | 00001101       |
|  | 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 not supported, Suspend Mode is not supported, Active Off = Very Low Power is not supported ,Supported Color Encoding Formats : RGB 4:4:4 ,Other Feature Support Flags : No_sRGB, Preferred Timing Mode, No_Display is continuous frequency (Multi-mode_Base EDID and Extension Block).] | 02             | 00000010       |
|  | 25            | 19            | Red/Green Low Bits (RxRy/GxGy)  | ED             | 11101101       |
|  | 26            | 1A            | Blue/White Low Bits (BxBY/WxWy)   | E5             | 11100101       |
|  | 27            | 1B            | Red X Rx = 0.597  | 98             | 10011000       |
|  | 28            | 1C            | Red Y Ry = 0.354  | 5A             | 01011010       |
|  | 29            | 1D            | Green X Gx = 0.335  | 55             | 01010101       |
|  | 30            | 1E            | Green Y Gy = 0.567  | 91             | 10010001       |
|  | 31            | 1F            | Blue X Bx = 0.151   | 26             | 00100110       |
| <b>Established<br/>Timing</b>            | 32            | 20            | Blue Y By = 0.119   | 1E             | 00011110       |
|  | 33            | 21            | White X Wx = 0.313  | 50             | 01010000       |
|  | 34            | 22            | White Y Wy = 0.329  | 54             | 01010100       |
|  | 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       |
| <b>Standard Timing ID</b>                | 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       |

Product Specification

|                      | Byte<br>(Dec) | Byte<br>(Hex) | Field Name and Comments   | Value<br>(Hex) | Value<br>(Bin) |
|----------------------|---------------|---------------|---|----------------|----------------|
| Timing Descriptor #1 | 54            | 36            | Pixel Clock/10,000 (LSB) 72 MHz @ 59.7 Hz   | 20             | 00100000       |
|                      | 55            | 37            | Pixel Clock/10,000 (MSB)  | 1C             | 00011100       |
|                      | 56            | 38            | Horizontal Active (HA) (lower 8 bits) 1366 pixels   | 56             | 01010110       |
|                      | 57            | 39            | Horizontal Blanking (HB) (lower 8 bits) 160 pixels  | A0             | 10100000       |
|                      | 58            | 3A            | Horizontal Active (HA) / Horizontal Blanking (HB) (upper 4:4bits)   | 50             | 01010000       |
|                      | 59            | 3B            | Vertical Active (VA) 768 lines  | 00             | 00000000       |
|                      | 60            | 3C            | Vertical Blanking (VB) (DE Blanking typ.for DE only panels) 22 lines  | 16             | 00010110       |
|                      | 61            | 3D            | Vertical Active (VA) / Vertical Blanking (VB) (upper 4:4bits)   | 30             | 00110000       |
|                      | 62            | 3E            | Horizontal Front Porch in pixels (HF) (lower 8 bits) 48 pixels  | 30             | 00110000       |
|                      | 63            | 3F            | Horizontal Sync Pulse Width in pixels (HS) (lower 8 bits) 32 pixels   | 20             | 00100000       |
|                      | 64            | 40            | Vertical Front Porch in lines (VF) : Vertical Sync Pulse 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 Video Image Size (mm) (lower 8 bits) 223 mm  | DF             | 11011111       |
|                      | 67            | 43            | Vertical Video Image Size (mm) (lower 8 bits) 125 mm  | 7D             | 01111101       |
|                      | 68            | 44            | Horizontal Image Size / Vertical Image Size (upper 4 bits)  | 00             | 00000000       |
| Timing Descriptor #2 | 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_NEG (outside of V-sync) ]       | 19             | 00011001       |
|                      | 72            | 48            | Flag  | 00             | 00000000       |
|                      | 73            | 49            | Flag  | 00             | 00000000       |
|                      | 74            | 4A            | Flag  | 00             | 00000000       |
|                      | 75            | 4B            | Data Type Tag (Descriptor Defined by manufacturer )   | 00             | 00000000       |
|                      | 76            | 4C            | Flag  | 00             | 00000000       |
|                      | 77            | 4D            | Descriptor Defined by manufacturer  | 00             | 00000000       |
|                      | 78            | 4E            | Descriptor Defined by manufacturer  | 00             | 00000000       |
|                      | 79            | 4F            | Descriptor Defined by manufacturer  | 00             | 00000000       |
|                      | 80            | 50            | Descriptor Defined by manufacturer  | 00             | 00000000       |
|                      | 81            | 51            | Descriptor Defined by manufacturer  | 00             | 00000000       |
|                      | 82            | 52            | Descriptor Defined by manufacturer  | 00             | 00000000       |
|                      | 83            | 53            | Descriptor Defined by manufacturer  | 00             | 00000000       |
|                      | 84            | 54            | Descriptor Defined by manufacturer  | 00             | 00000000       |
| Timing Descriptor #3 | 85            | 55            | Descriptor Defined by manufacturer  | 00             | 00000000       |
|                      | 86            | 56            | Descriptor Defined by manufacturer  | 00             | 00000000       |
|                      | 87            | 57            | Descriptor Defined by manufacturer  | 00             | 00000000       |
|                      | 88            | 58            | Descriptor Defined by manufacturer  | 00             | 00000000       |
|                      | 89            | 59            | Descriptor Defined by manufacturer  | 00             | 00000000       |
|                      | 90            | 5A            | Flag  | 00             | 00000000       |
|                      | 91            | 5B            | Flag  | 00             | 00000000       |
|                      | 92            | 5C            | Flag  | 00             | 00000000       |
|                      | 93            | 5D            | Data Type Tag ( Alphanumeric Data String (ASCII String) )   | FE             | 11111110       |
|                      | 94            | 5E            | Flag  | 00             | 00000000       |
|                      | 95            | 5F            | Alphanumeric Data String (ASCII String) L   | 4C             | 01001100       |
|                      | 96            | 60            | Alphanumeric Data String (ASCII String) G   | 47             | 01000111       |
|                      | 97            | 61            | Alphanumeric Data String (ASCII String)   | 20             | 00100000       |
|                      | 98            | 62            | Alphanumeric Data String (ASCII String) D   | 44             | 01000100       |
|                      | 99            | 63            | Alphanumeric Data String (ASCII String) i   | 69             | 01101001       |
|                      | 100           | 64            | Alphanumeric Data String (ASCII String) s   | 73             | 01110011       |
|                      | 101           | 65            | Alphanumeric Data String (ASCII String) p   | 70             | 01110000       |
|                      | 102           | 66            | Alphanumeric Data String (ASCII String) l   | 6C             | 01101100       |
|                      | 103           | 67            | Alphanumeric Data String (ASCII String) a   | 61             | 01100001       |
|                      | 104           | 68            | Alphanumeric Data String (ASCII String) y   | 79             | 01111001       |
|                      | 105           | 69            | Manufacturer P/N(If<13 char--> 0Ah, then terminate with ASC II code 0Ah,set remaining char = 20h)             | 0A             | 00001010       |
|                      | 106           | 6A            | Manufacturer P/N(If<13 char--> 0Ah, then terminate with ASC II code 0Ah,set remaining char = 20h)             | 20             | 00100000       |
|                      | 107           | 6B            | Manufacturer P/N(If<13 char--> 0Ah, then terminate with ASC II code 0Ah,set remaining char = 20h)             | 20             | 00100000       |

## Product Specification

|                             | Byte<br>(Dec) | Byte<br>(Hex) | Field Name and Comments  | Value<br>(Hex) | Value<br>(Bin) |
|-----------------------------|---------------|---------------|--|----------------|----------------|
| <i>Timing Descriptor #4</i> | 108           | <b>6C</b>     | Flag   | <b>00</b>      | 00000000       |
|                             | 109           | <b>6D</b>     | Flag   | <b>00</b>      | 00000000       |
|                             | 110           | <b>6E</b>     | Flag   | <b>00</b>      | 00000000       |
|                             | 111           | <b>6F</b>     | Data Type Tag ( Alphanumeric Data String (ASCII String) )                      | <b>FE</b>      | 11111110       |
|                             | 112           | <b>70</b>     | Flag   | <b>00</b>      | 00000000       |
|                             | 113           | <b>71</b>     | Alphanumeric Data String (ASCII String) L                                      | <b>4C</b>      | 01001100       |
|                             | 114           | <b>72</b>     | Alphanumeric Data String (ASCII String) P                                      | <b>50</b>      | 01010000       |
|                             | 115           | <b>73</b>     | Alphanumeric Data String (ASCII String) 1                                      | <b>31</b>      | 00110001       |
|                             | 116           | <b>74</b>     | Alphanumeric Data String (ASCII String) 0                                      | <b>30</b>      | 00110000       |
|                             | 117           | <b>75</b>     | Alphanumeric Data String (ASCII String) 1                                      | <b>31</b>      | 00110001       |
|                             | 118           | <b>76</b>     | Alphanumeric Data String (ASCII String) W                                      | <b>57</b>      | 01010111       |
|                             | 119           | <b>77</b>     | Alphanumeric Data String (ASCII String) H                                      | <b>48</b>      | 01001000       |
|                             | 120           | <b>78</b>     | Alphanumeric Data String (ASCII String) 4                                      | <b>34</b>      | 00110100       |
|                             | 121           | <b>79</b>     | Alphanumeric Data String (ASCII String) -                                      | <b>2D</b>      | 00101101       |
|                             | 122           | <b>7A</b>     | Alphanumeric Data String (ASCII String) S                                      | <b>53</b>      | 01010011       |
|                             | 123           | <b>7B</b>     | Alphanumeric Data String (ASCII String) L                                      | <b>4C</b>      | 01001100       |
|                             | 124           | <b>7C</b>     | Alphanumeric Data String (ASCII String) A                                      | <b>41</b>      | 01000001       |
|                             | 125           | <b>7D</b>     | Alphanumeric Data String (ASCII String) A                                      | <b>41</b>      | 01000001       |
| <i>Chec</i>                 | 126           | <b>7E</b>     | Extension flag (# of optional 128 panel ID extension block to follow, Typ = 0) | <b>00</b>      | 00000000       |
|                             | 127           | <b>7F</b>     | Check Sum (The 1-byte sum of all 128 bytes in this panel ID block shall = 0)   | <b>4D</b>      | 01001101       |