SPECIFICATION
FOR
APPROVAL

(   ) **Preliminary Specification**

(◆) **Final Specification**

Title	10.1" HD TFT LCD

Customer	Fujitsu
MODEL	

SUPPLIER	LG Display Co., Ltd.
*MODEL	LP101WH 4
Suffix	SLP1

*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
Mighty Peang / S.Manager	
REVIEWED BY	
W. J. Jeon / Manager	
PREPARED BY	
J .G. Lee / Engineer	

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

Contents

Product Specification

RECORD OF REVISIONS

| Revision No	Revision Date	Page	Description	EDID ver
0.0	2012.02.07		First Draft	-
0.1	2012.04.16		Pinmap, timing , 2D drawing	
0.2	2012.06.04	12	Color depth	
0.3	2012.06.20	14	Min Brightness, Color Gamut	
0.4	2012.08.17		EDID	0.1
0.5	2012.08.29		Update the drawing	

Product Specification

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
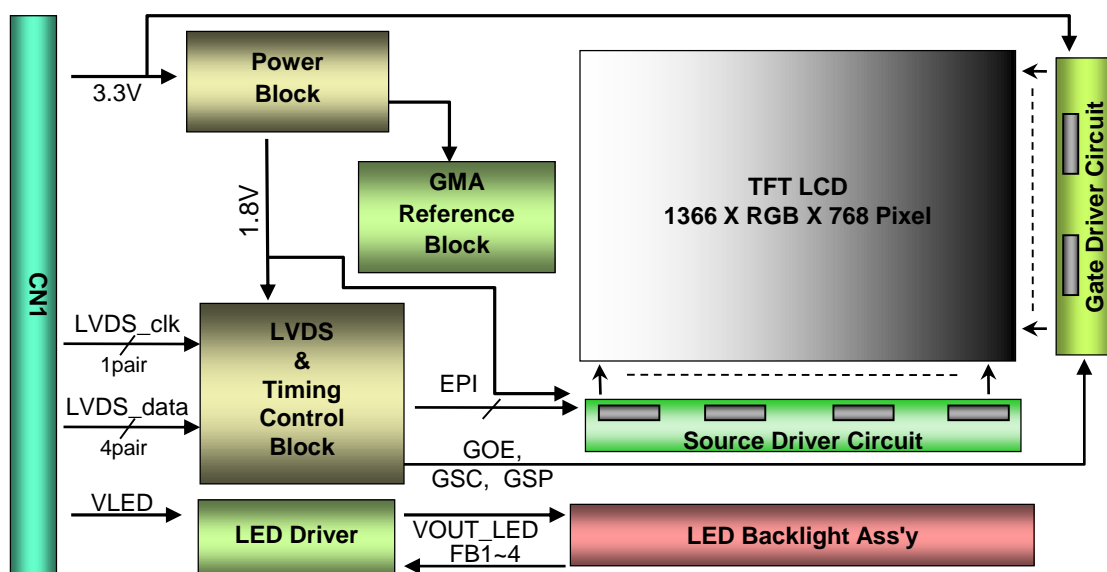
General Features

|	
Active Screen Size	10.1 inches diagonal
Outline Dimension	232.8±0.3 (H) × 138.15±0.3 (V) × 2.40 mm (max.)
Pixel Pitch	0.16290 mm × 0.16290 mm
Pixel Format	1366 horiz. by 768 vert. Pixels RGB strip arrangement
Color Depth	6-bit, 262,144 colors
Luminance, White	400 cd/m^2(Typ)
Power Consumption	Logic : 0.55 W(typ.@Mosaic), Back Light : 2.1 W (typ.@ I_{LED}= 17.5mA)
Weight	125g (Max)
Display Operating Mode	Transmissive mode, normally Black
Surface Treatment	Anti-Glare treatment (3H) of the front polarizer

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	V_{DC}	at 25 ± 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.

Dry Bulb Temperature [℃]
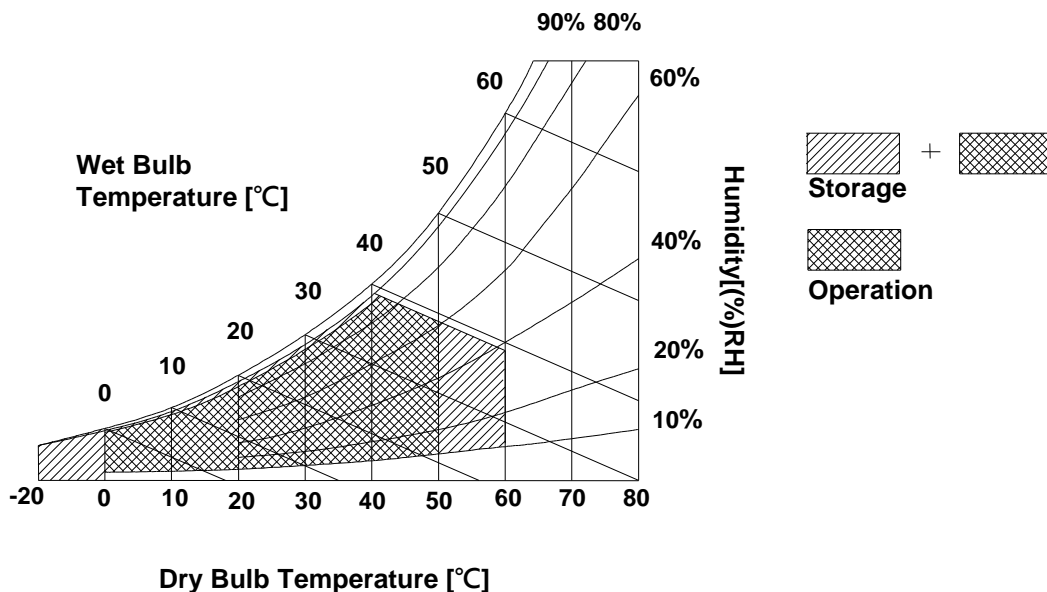
3. Electrical Specifications

3-1. Electrical Characteristics

The LP101WH (TBD) requires two power inputs. One is employed to power the LCD electronics and to drive the TFT array and liquid crystal. The second input which powers the LED BL.

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_{DC}	1
Power Supply Input Current	I_{CC}	Mosaic	-	166	194	mA	2
Power Consumption	Pc		-	0.55	0.64	Watt	2
Power Supply Inrush Current	I_{CC_P}		-	-	2000	mA	4
Differential Impedance	Zm		90	100	110	Ohm	5
EDID Input Voltage	V_{EDID}		3.0	3.3	3.6	V	
EDID Input Current	I_{EDID}				10	mA	6
LED Backlight : (with LED Drirver)							
LED Driver input Voltage	VLED		7	12	21	V	7
Operating Current	I_{LED}			175	192	mA	8
LED Power Consumption	P_{LED}			2.1	2.15	W	9
PWM Duty Ratio			5		100	%	10
PWM Jitter				-	0.3	%	11
PWM Frequency	F_{PWM}		200		1,000	Hz	12
PWM High Level Voltage	V_{PWM_H}		2.1			V	
PWM Low Level Voltage	V_{PWM_L}				0.8	V	
LED_EN High Voltage	V_{EN_H}		2.1			V	
Life Time			12,000	-	-	Hrs	13

LG Display
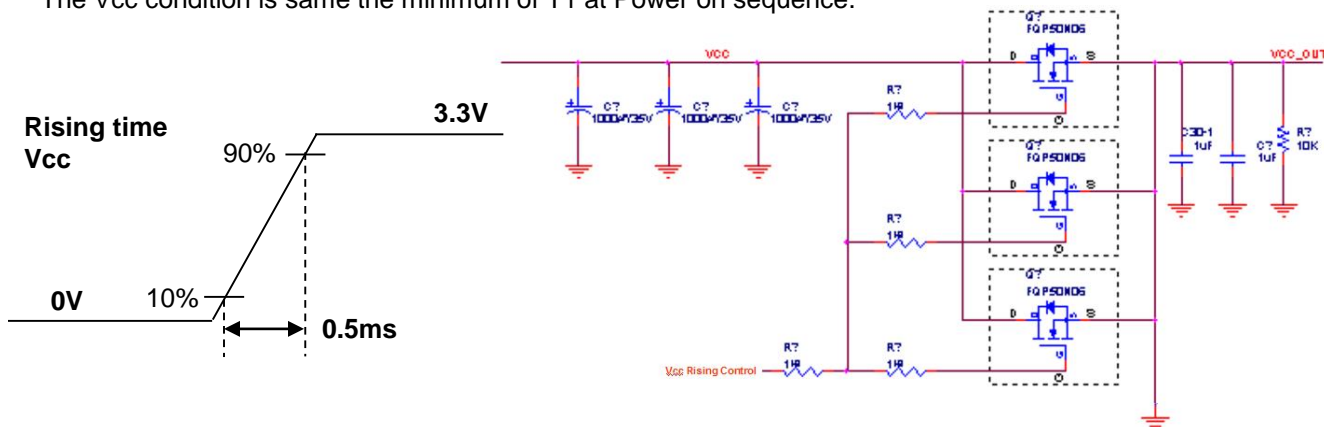
Product Specification

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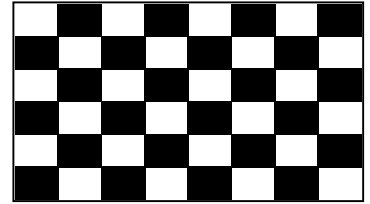
3. This Spec. is the max load condition for the cable impedance designing.
4. The below figures are the measuring Vcc condition and the Vcc control block LGD used. The Vcc condition is same the minimum of T1 at Power on sequence.

Rising time Vcc 3.3V 90% 0V 10% 0.5ms

5. This impedance value is needed to proper display and measured form LVDS Tx to the mating connector.
6. The specified IEDID current are under the Vcc = 3.3V @ frequency = 330Khz condition.
7. The measuring position is the connector of LCM and the test conditions are under 25℃.
8. The current and power consumption with LED Driver are under the Vled = 12.0V , 25℃, Dimming of Max luminance whereas White pattern is displayed and fv is the frame frequency.
9. 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 12.0V 90% 0V 10% 0.5ms
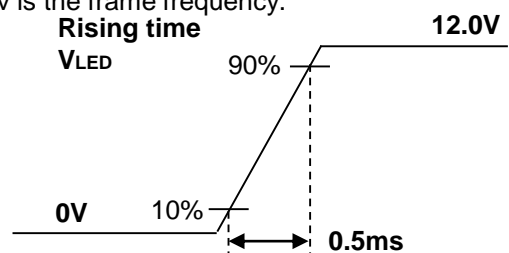
10. The operation of LED Driver below minimum dimming ratio may cause F.O.S or reliability issue.
11. If Jitter of PWM is bigger than maximum. It may cause flickering.
12. This Spec. is not effective at 100% dimming ratio as an exception because it has DC level equivalent to 0Hz. In spite of acceptable range as defined, the PWM Frequency should be fixed and stable for more consistent brightness control at any specific level desired.
13. 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.
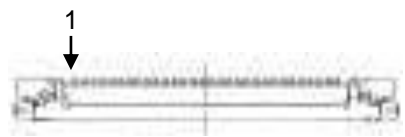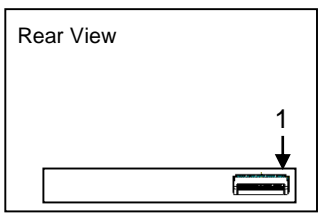
Product Specification

3-2. Interface Connections

This LCD employs two interface connections, a 40pin 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 20474-040E-12 manufactured by I-PEX.

Table 3. MODULE CONNECTOR PIN CONFIGURATION (CN1)

Pin	Symbol	Description	Notes
1	NC	No Connection	
2	VCC	Power Supply, 3.3V typ.	**[Connector]**
3	VCC	Power Supply, 3.3V typ.	20474-040E-12, 40pin
4	VDD_EDID	DDC 3.3V Power	
5	NC	No Connection(Reserved)	**[Connector pin arrangement]**
6	LCD_I2C_CLK	DDC Clock	1
7	LCD_I2C_DATA	DDC Data	
8	ORX0-	Negative LVDS differential data input	
9	ORX0+	Positive LVDS differential data input	
10	GND	Ground	
11	ORX1-	Negative LVDS differential data input	[LCD Module Rear View]
12	ORX1+	Positive LVDS differential data input	
13	GND	Ground	
14	ORX2-	Negative LVDS differential data input	
15	ORX2+	Positive LVDS differential data input	
16	GND	Ground	Rear View
17	ORXC-	Negative LVDS differential clock input	
18	ORXC+	Positive LVDS differential clock input	
19	GND	Ground	1
20	NC	No Connection	
21	NC	No Connection	
22	GND	Ground	
23	NC	No Connection	
24	NC	No Connection	
25	GND	Ground	
26	NC	No Connection	
27	NC	No Connection	
28	GND	Ground	
29	NC	No Connection	
30	NC	No Connection	
31	GND	Ground	
32	GND	Ground	
33	GND	Ground	
34	NC	Reserved (diag-loop)	
35	PWM	PWM for Luminance Control	
36	LED_EN	Backlight On/Off Control	
37	NC	No Connection	
38	VLED	LED Power Supply	
39	VLED	LED Power Supply	
40	VLED	LED Power Supply	

3-3. LVDS Signal Timing Specifications

3-3-1. DC Specification

$|V_{ID}| = |(LVDS+) - (LVDS-)|$
$V_{CM} = \{(LVDS+) + (LVDS-)\}/2$
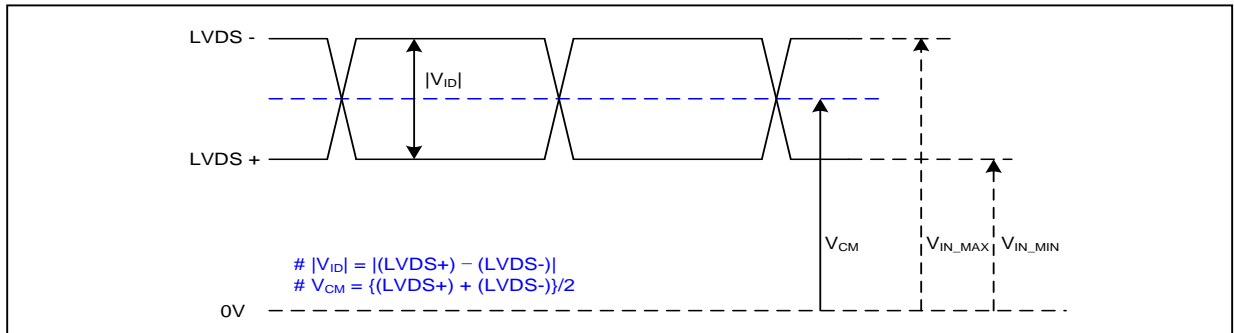
Description	Symbol	Min	Max	Unit	Notes
LVDS Differential Voltage	$|V_{ID}|$	100	600	mV	-
LVDS Common mode Voltage	V_{CM}	0.6	1.8	V	-
LVDS Input Voltage Range	V_{IN}	0.3	2.1	V	-

3-3-2. AC Specification

t_{SKEW} ($F_{clk} = 1/T_{clk}$)
1) 85MHz > Fclk ≥ 65MHz : -400 ~ +400
2) 65MHz > Fclk ≥ 25MHz : -600 ~ +600
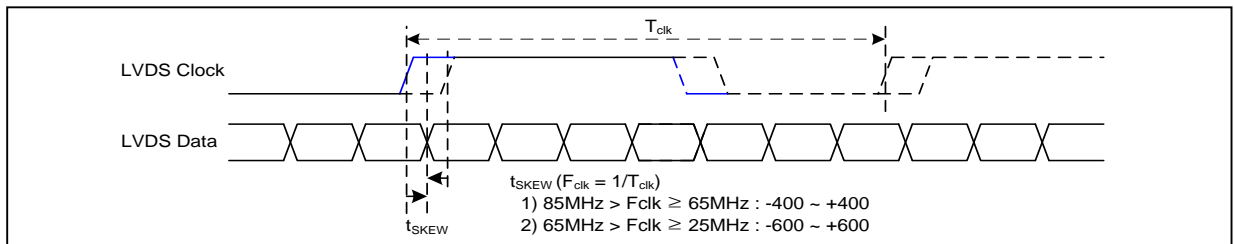
Description	Symbol	Min	Max	Unit	Notes
LVDS Clock to Data Skew Margin	t_{SKEW}	- 400	+ 400	ps	85MHz > Fclk ≥ 65MHz
	t_{SKEW}	- 600	+ 600	ps	65MHz > Fclk ≥ 25MHz
LVDS Clock to Clock Skew Margin (Even to Odd)	t_{SKEW_EO}	- 1/7	+ 1/7	T_{clk}	-
Maximum deviation of input clock frequency during SSC	F_{DEV}	-	± 3	%	-
Maximum modulation frequency of input clock during SSC	F_{MOD}	-	200	KHz	-

Product Specification
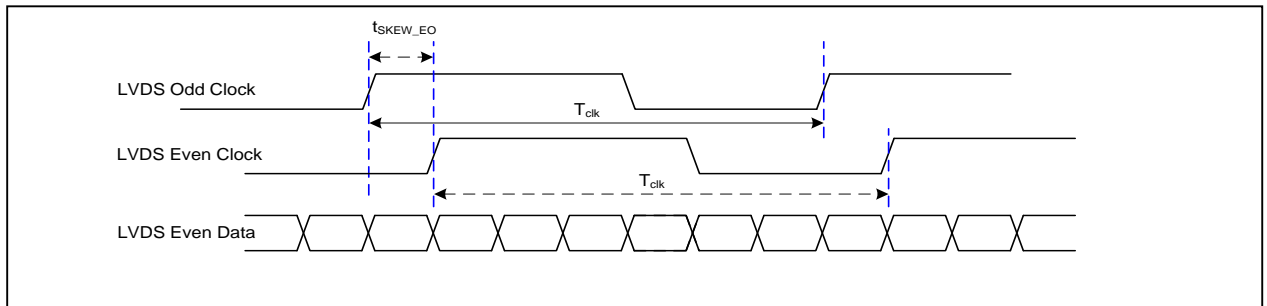
< Clock skew margin between channel >
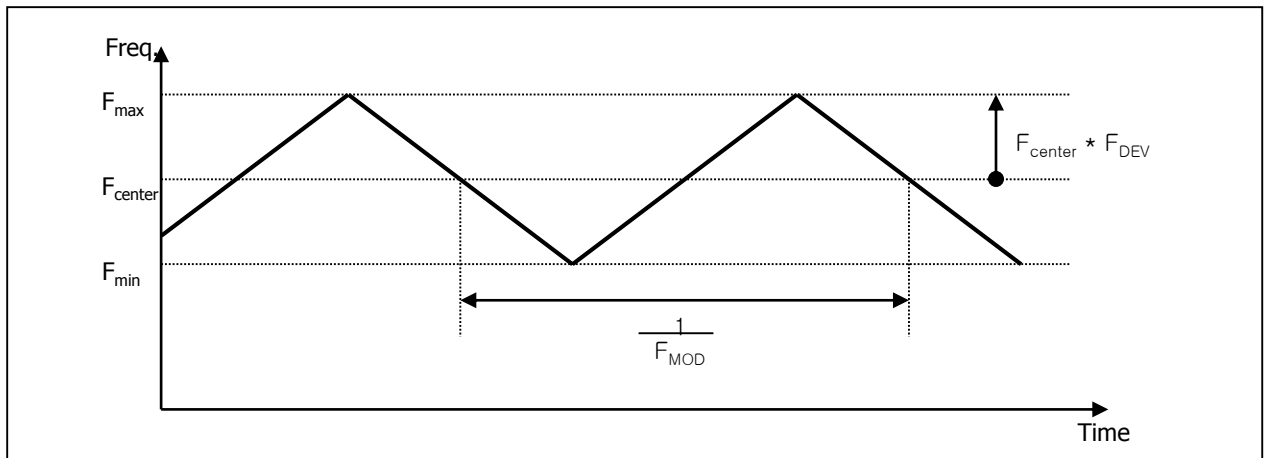
< Spread Spectrum >

3-3-3. Data Format

- LVDS 1 Port
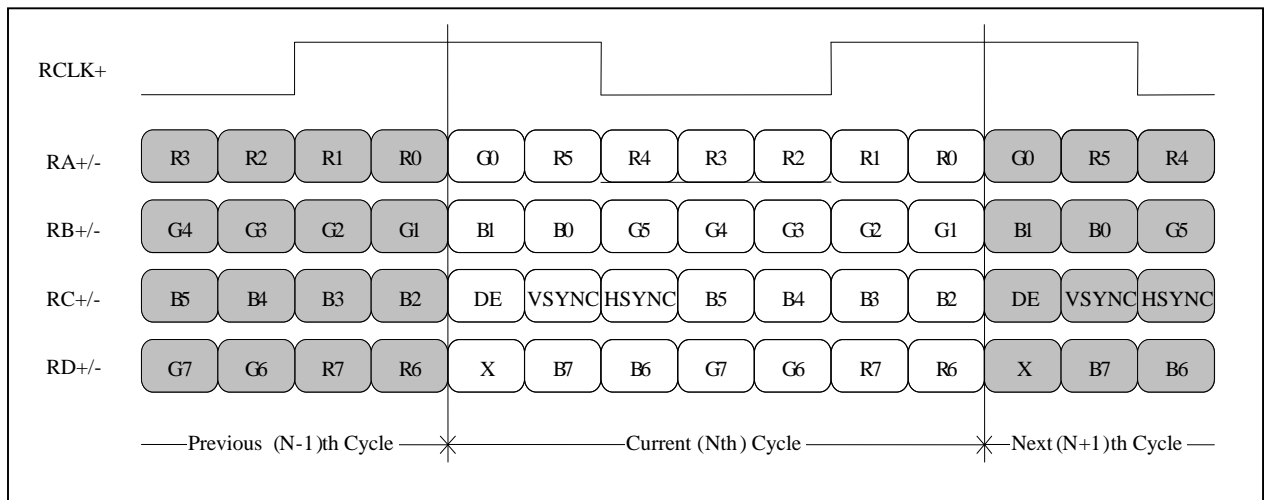
< LVDS Data Format >

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	1port
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	t_{HP}	
	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	t_{HP}	
	Vertical front porch	t_{VFP}	1	3	5		

3-5. Signal Timing Waveforms

Condition : VCC =3.3V

Data Enable, Hsync, Vsync
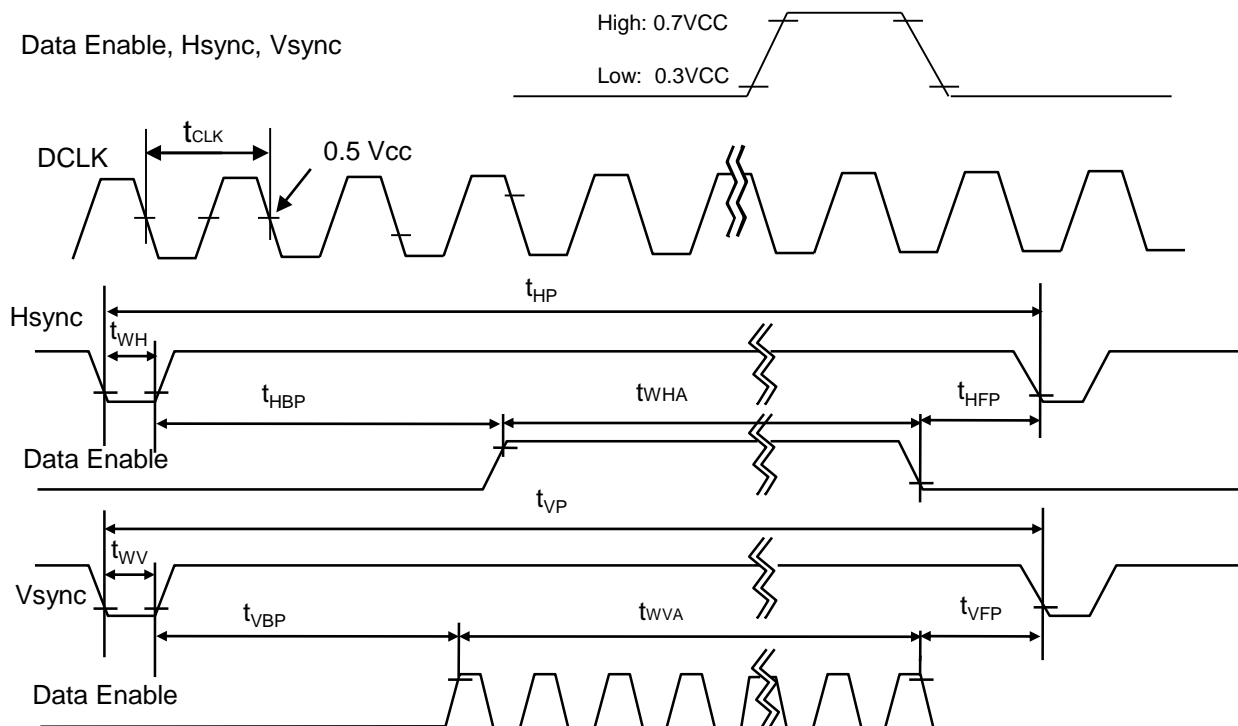
3-6. Color Input Data Reference

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 7. 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
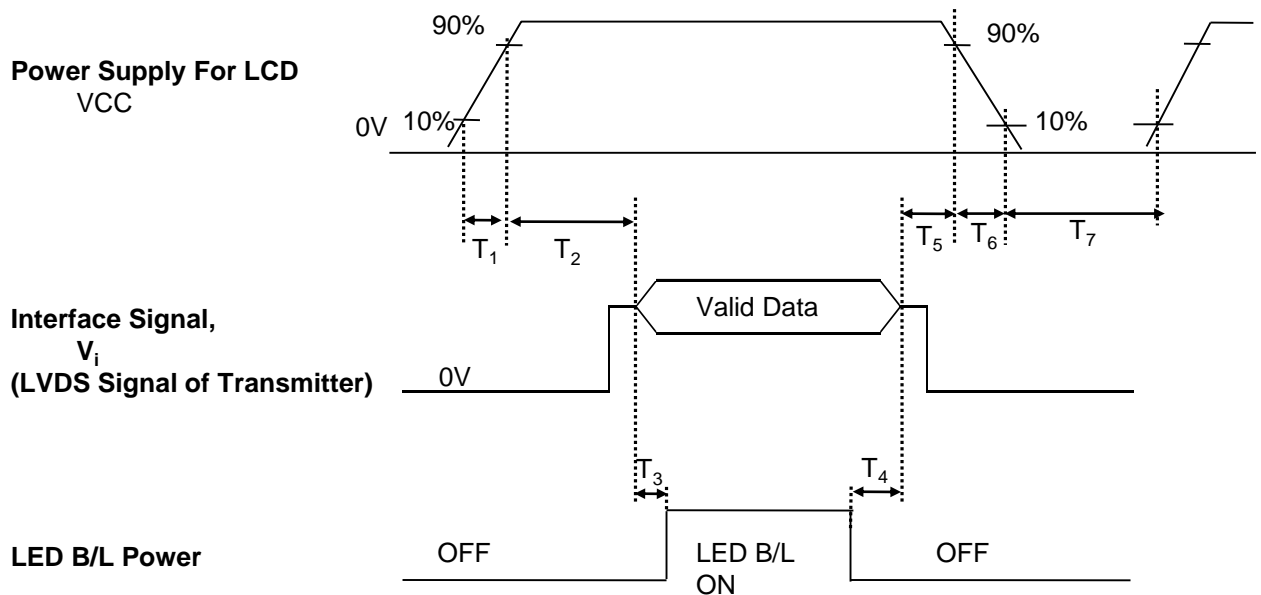
3-7. Power Sequence

Table 8. POWER SEQUENCE TABLE

Parameter	Value			Units
	Min.	Typ.	Max.	
T_1	0.5	-	10	(ms)
T_2	0	-	50	(ms)
T_3	200	-	-	(ms)
T_4	200	-	-	(ms)
T_5	0	-	50	(ms)
T_6	0	-	10	(ms)
T_7	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

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 Φ and Θ equal to 0°.
FIG. 1 presents additional information concerning the measurement equipment and method.

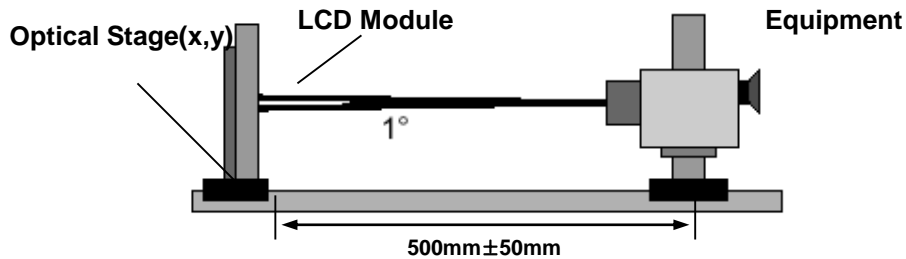### FIG. 1 Optical Characteristic Measurement Equipment and Method

Table 9. OPTICAL CHARACTERISTICS   Ta=25°C, VCC=3.3V, fv=60Hz, f$_{CLK}$= 72(TBD)MHz, ILED = 17.5mA

Parameter		Symbol	Condition	Min	Typ	Max	Units	Notes
Average Luminance		LAVE	5 Points (ILED= 17.5mA)	340	400	-	cd/㎡	2
Luminance variation		δ $_{WHITE}$	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		
Color Gamut		-	-		50		%	
Gray Scale		-	-	Gamma 2.2				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.

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

3. The variation in surface luminance , The panel total variation (δ_{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 = 60Hz

Gray Level	Luminance [%] (Typ)
L0	0.11
L7	0.89
L15	5.58
L23	15.40
L31	28.70
L39	43.30
L47	59.90
L55	75.30
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
H : 196.61 mm
V : 147.46 mm

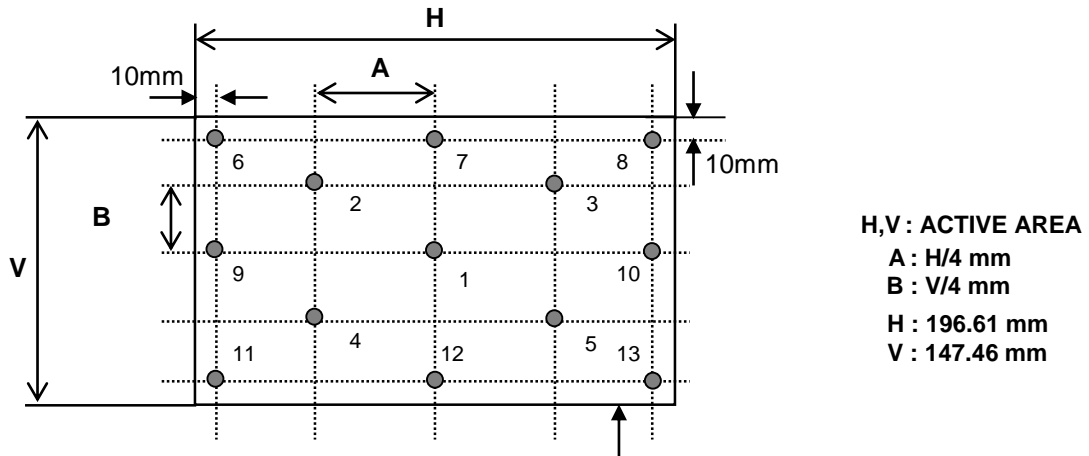### FIG. 3 Response Time

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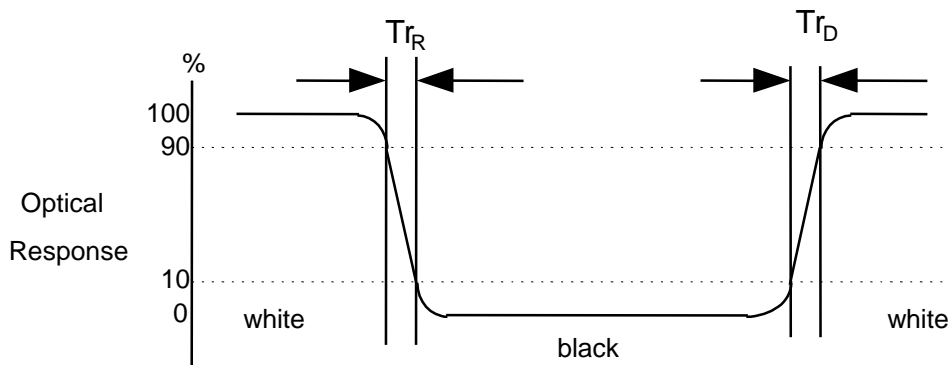

FIG. 4 Viewing angle

<Dimension of viewing angle range>

LG Display
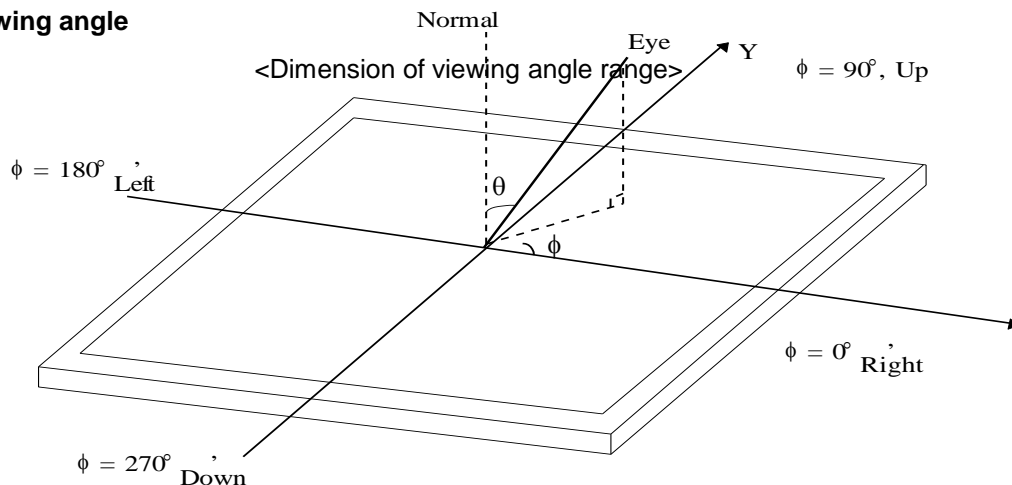
Product Specification

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
Weight	125g (Max.) w/o Touch	
Surface Treatment	LCD : Glare, low reflective treatment of the front polarizer, 2H	

Product Specification

<FRONT VIEW>

232.80±0.30(LCM Outline)

(4.1464)

2.40Max

66.70±0.30

115.20±0.30

ACTIVE AREA CENTER
(222.52x125.1072)

138.15±0.30(LCM Outline)

125.1072±0.30(Active Area)

(3.9393)

222.52±0.30(Active Area)

(6.3393)

Pol.~Tape
0mm≤X≤2mm

(8.8964)

Pol.~Tape
0mm≤Y≤2mm

4.35 Max.
(2.65Max+1.7)
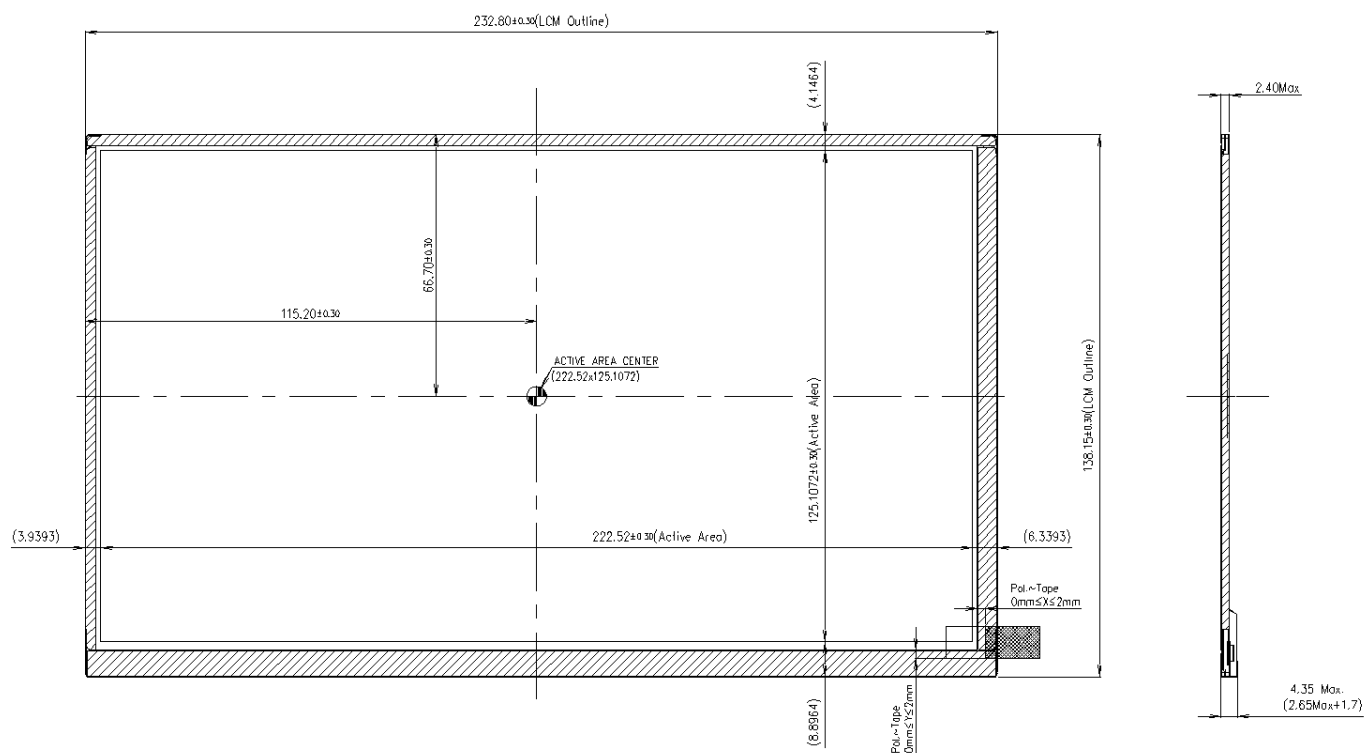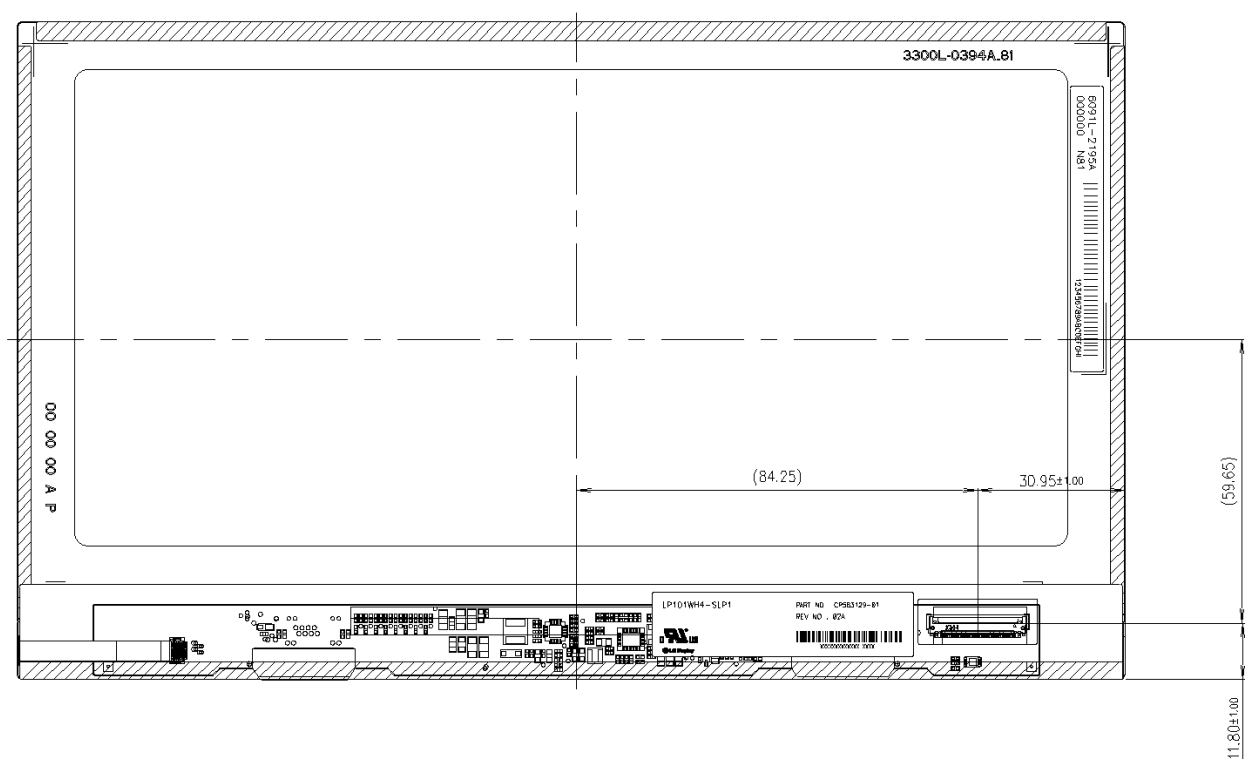
Product Specification

<REAR VIEW>

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, 10 ~ 500 ~ 10Hz, 1.5G, 0.37oct/min 3 axis, 1hour/axis
6	Shock test (non-operating)	Half sine wave, 180G, 2ms one shock of each six faces(I.e. run 180G 6ms for all six faces)
7	Altitude operating storage / shipment	0 ~ 10,000 feet (3,048m) 24Hr 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.

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. 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)

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 : 60 pcs

b) Box Size : 478*365*328 mm

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.

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.

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.

Product Specification

	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 0398h	98	10011000
	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
	17	11	Year of Manufacture 2012 years	16	00010110
	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: Digital Interface is not defined	90	10010000
	21	15	Horizontal Screen Size (Rounded cm) = 22 cm	16	00010110
	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 ,Supportted 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
Panel Color Coordinates	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
	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
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

Byte (Dec)	Byte (Hex)	Field Name and Comments		Value (Hex)	Value (Bin)
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 Avtive (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 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)	223 mm	DF	11011111
67	43	Vertical Vedio Image Size (mm) (lower 8 bits)	125 mm	7D	01111101
68	44	Horizontal Image Size / Vertical Image Size (upper 4 bits)		00	00000000
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
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 ASCⅡ code 0Ah,set remaining char = 20h)		0A	00001010
106	6A	Manufacturer P/N(If<13 char--> 0Ah, then terminate with ASCⅡ code 0Ah,set remaining char = 20h)		20	00100000
107	6B	Manufacturer P/N(If<13 char--> 0Ah, then terminate with ASCⅡ code 0Ah,set remaining char = 20h)		20	00100000

Left side vertical labels: Timing Descriptor #1 (rows 54–71), Timing Descriptor #2 (rows 72–89), Timing Descriptor #3 (rows 90–107)

Product Specification

	Byte (Dec)	Byte (Hex)	Field Name and Comments		Value (Hex)	Value (Bin)
Timing Descriptor #4	108	6C	Flag		00	00000000
	109	6D	Flag		00	00000000
	110	6E	Flag		00	00000000
	111	6F	Data Type Tag (Alphanumeric Data String (ASCII String))		FE	11111110
	112	70	Flag		00	00000000
	113	71	Alphanumeric Data String (ASCII String)	L	4C	01001100
	114	72	Alphanumeric Data String (ASCII String)	P	50	01010000
	115	73	Alphanumeric Data String (ASCII String)	1	31	00110001
	116	74	Alphanumeric Data String (ASCII String)	0	30	00110000
	117	75	Alphanumeric Data String (ASCII String)	1	31	00110001
	118	76	Alphanumeric Data String (ASCII String)	W	57	01010111
	119	77	Alphanumeric Data String (ASCII String)	H	48	01001000
	120	78	Alphanumeric Data String (ASCII String)	4	34	00110100
	121	79	Alphanumeric Data String (ASCII String)	-	2D	00101101
	122	7A	Alphanumeric Data String (ASCII String)	S	53	01010011
	123	7B	Alphanumeric Data String (ASCII String)	L	4C	01001100
	124	7C	Alphanumeric Data String (ASCII String)	P	50	01010000
	125	7D	Alphanumeric Data String (ASCII String)	1	31	00110001
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)		8E	10001110