SPECIFICATION
FOR
APPROVAL

( ) **Preliminary Specification**
(◆) **Final Specification**

Title	10.1" HD TFT LCD

Customer	
MODEL	

SUPPLIER	LG Display Co., Ltd.
*MODEL	LP101WH 4
Suffix	SLP2

*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	
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PREPARED BY	
J. G. Lee / Engineer	

Product Engineering Dept.
LG Display Co., Ltd

Contents

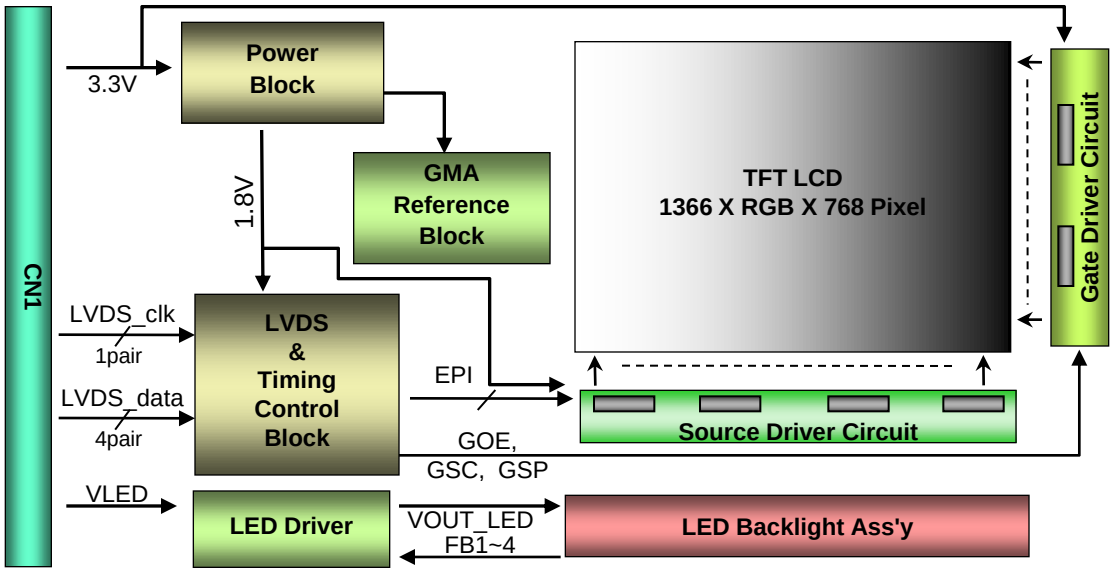
RECORD OF REVISIONS

Revision No	Revision Date	Page	Description	EDID ver
0.0	2012.08.17		First Draft	-
0.1	2012.08.29		Update the drawing	
1.0	2012.09.11	14	Typ Brightness, Contrast Ratio	

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	8-bit, 16,777,216 colors
Luminance, White	380 cd/m^2(Typ)
Power Consumption	Logic : 0.55W(typ.@Mosaic), Back Light : 2.1W (typ.@ I_{LED}= 17.5mA)
Weight	125g (Max., LCM only)
Display Operating Mode	Transmissive mode, normally Black
Surface Treatment	Anti-Glare treatment (3H) of the front polarizer

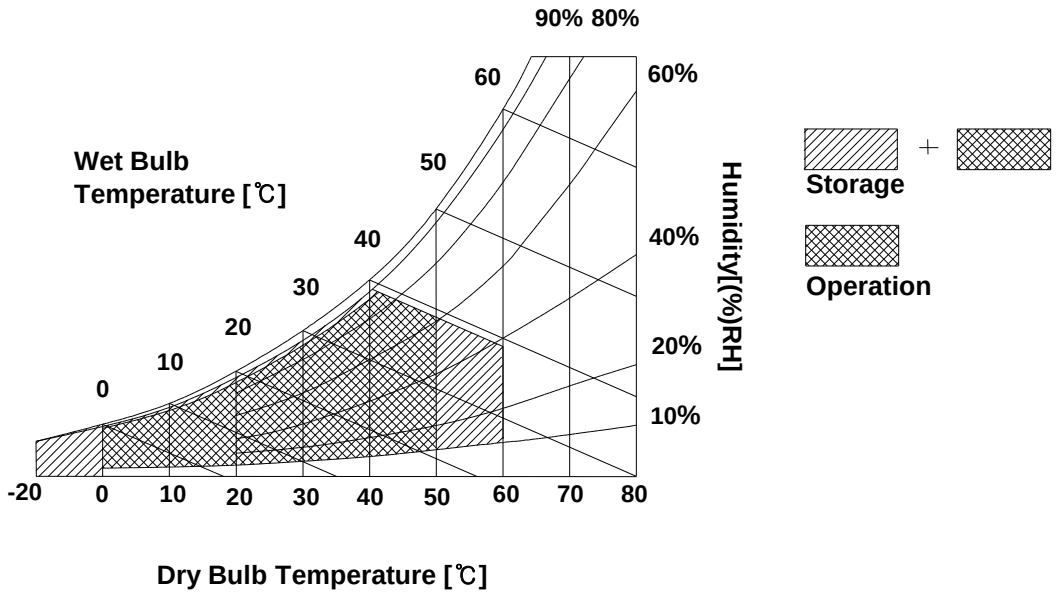
2. Absolute Maximum Ratings

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.



3. Electrical Specifications

3-1. Electrical Characteristics

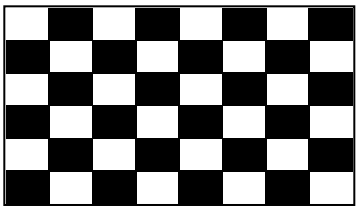
The LP101WH (TBD) requires two power inputs. One is employed to power the LCD electronics and to drive the TFT array and liquid crystal. The second input which powers the LED BL.

Table 2. ELECTRICAL CHARACTERISTICS

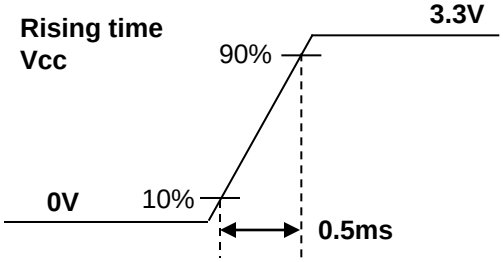
Parameter	Symbol	Values			Unit	Notes
		Min	Typ	Max		
LOGIC :						
Power Supply Input Voltage	VCC	3.0	3.3	3.6	V_{DC}	1
Power Supply Input Current	I_{CC} Mosaic	-	166	194	mA	2
Power Consumption	Pc	-	0.55	0.64	Watt	2
Power Supply Inrush Current	I_{CC_P}	-	-	2000	mA	4
Differential Impedance	Zm	90	100	110	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 per string	I_{LED}		17.5		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

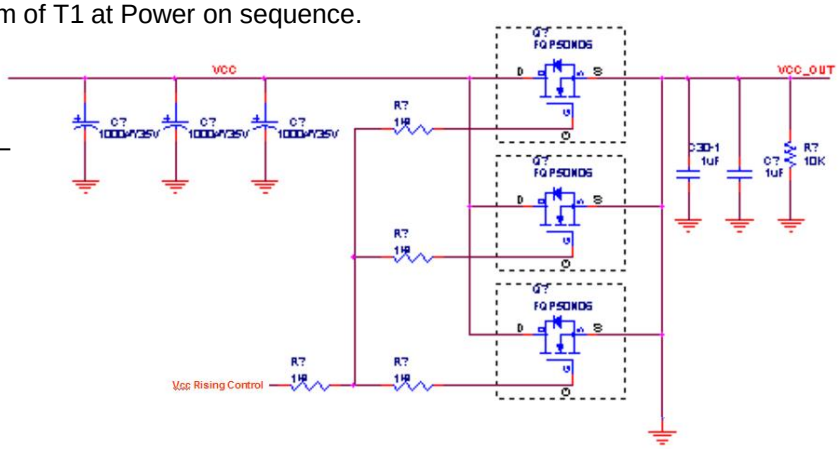
Note)

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.

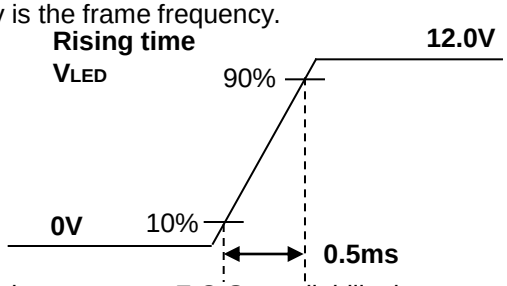


3. This Spec. is the max load condition for the cable impedance designing.
4. The below figures are the measuring Vcc condition and the Vcc control block LGD used. The Vcc condition is same the minimum of T1 at Power on sequence.





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.



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.

3-2. Interface Connections

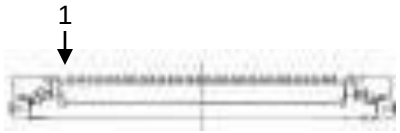
This LCD employs two interface connections, a 40pin connector is used for the module electronics interface and the other connector is used for the integral backlight system.
The electronics interface connector is a model 20474-040E-12 manufactured by I-PEX.

Table 3. MODULE CONNECTOR PIN CONFIGURATION (CN1)

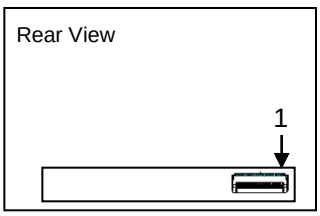
Pin	Symbol	Description	Notes
1	NC	No Connection	
2	VCC	Power Supply, 3.3V typ.	
3	VCC	Power Supply, 3.3V typ.	
4	VDD_EDID	DDC 3.3V Power	
5	NC	No Connection(Reserved)	
6	LCD_I2C_CLK	DDC Clock	
7	LCD_I2C_DATA	DDC Data	
8	ORX0-	Negative LVDS differential data input	
9	ORX0+	Positive LVDS differential data input	
10	GND	Ground	
11	ORX1-	Negative LVDS differential data input	
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	
17	ORXC-	Negative LVDS differential clock input	
18	ORXC+	Positive LVDS differential clock input	
19	GND	Ground	
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	

[Connector]
20474-040E-12, 40pin

[Connector pin arrangement]

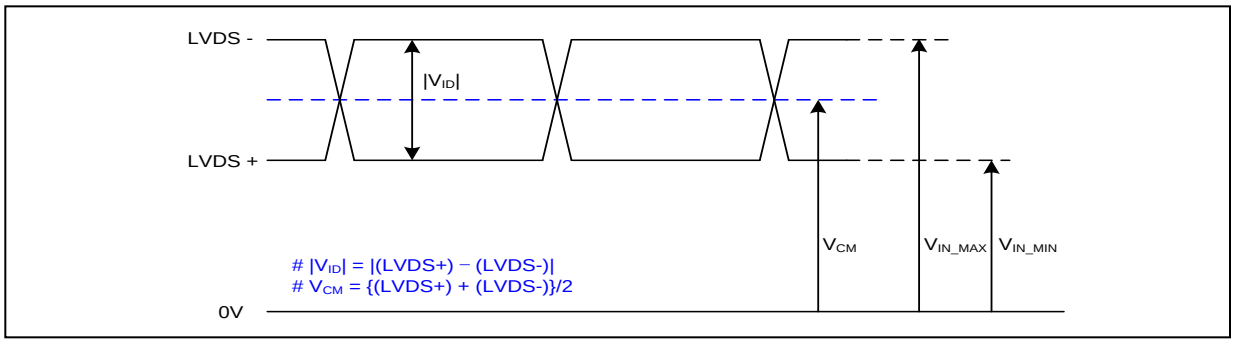


[LCD Module Rear View]



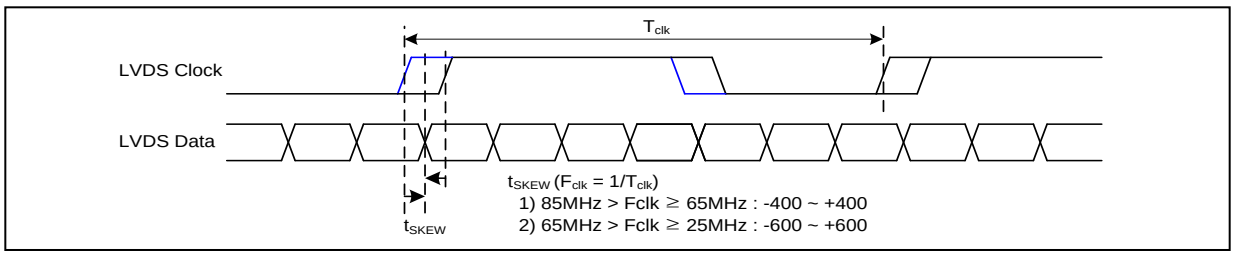
3-3. LVDS Signal Timing Specifications

3-3-1. DC Specification

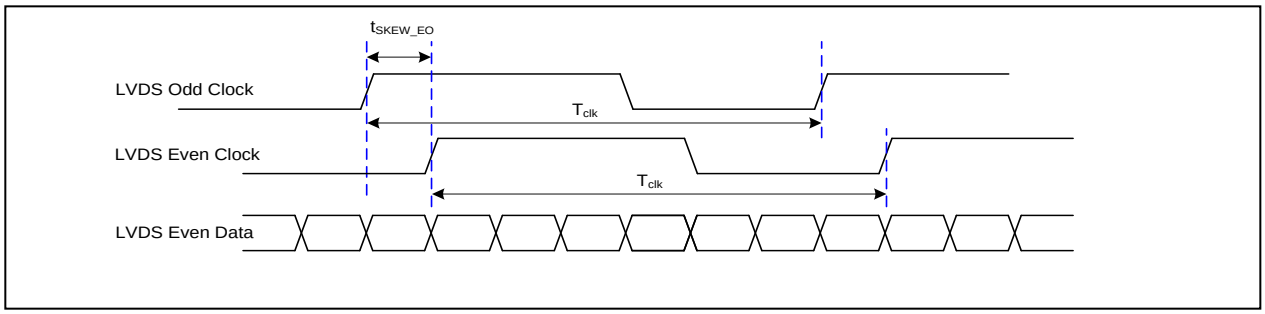


Description	Symbol	Min	Max	Unit	Notes
LVDS Differential Voltage	$\|V_{ID}\|$	100	600	mV	-
LVDS Common mode Voltage	V_{CM}	0.6	1.8	V	-
LVDS Input Voltage Range	V_{IN}	0.3	2.1	V	-

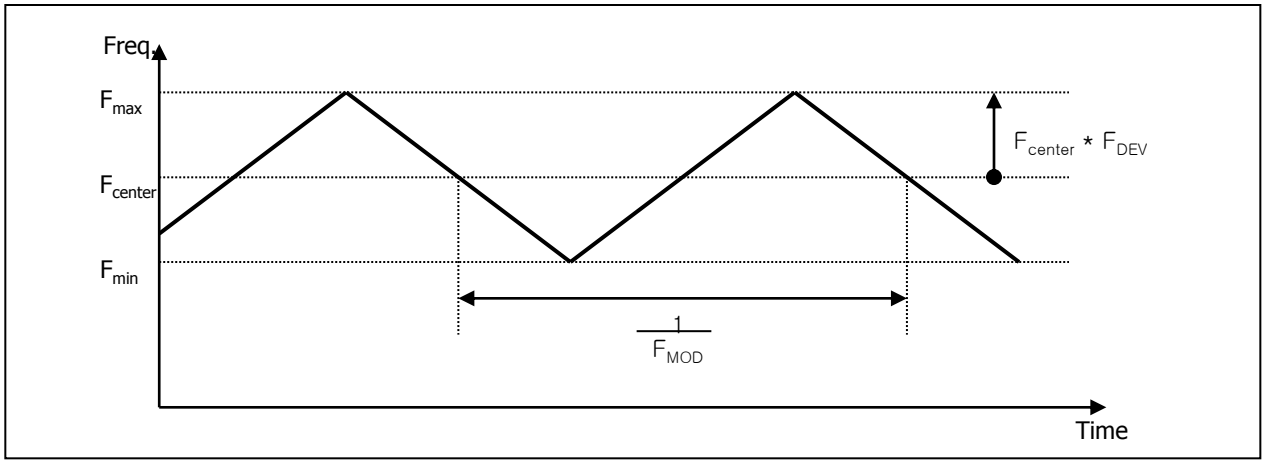
3-3-2. AC Specification



Description	Symbol	Min	Max	Unit	Notes
LVDS Clock to Data Skew Margin	t_{SKEW}	- 400	+ 400	ps	85MHz > 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	-



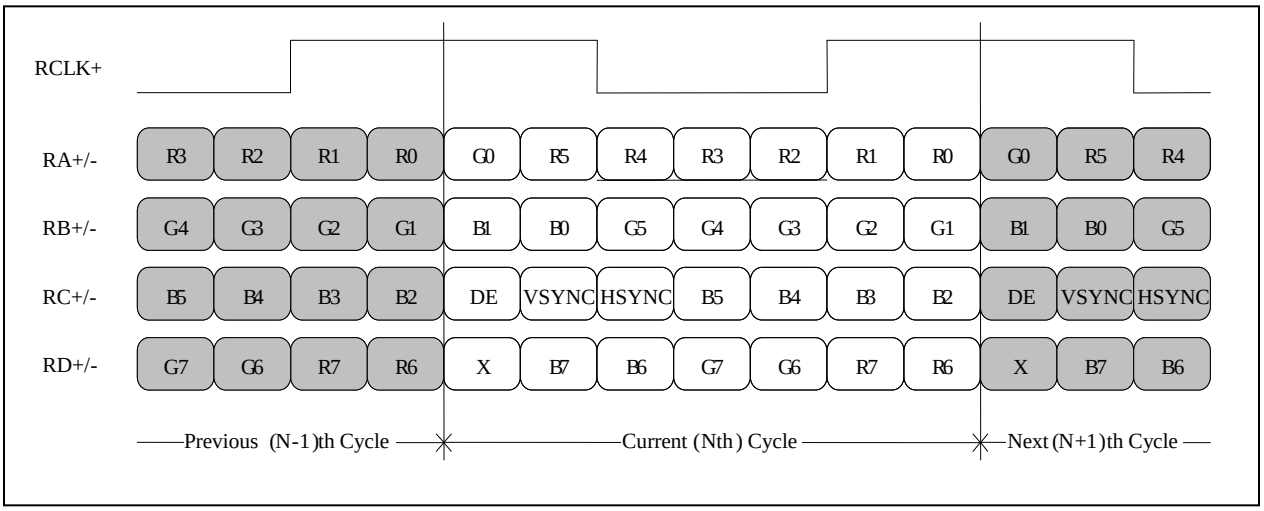
< Clock skew margin between channel >



< Spread Spectrum >

3-3-3. Data Format

- LVDS 1 Port



< LVDS Data Format >

3-4. Signal Timing Specifications

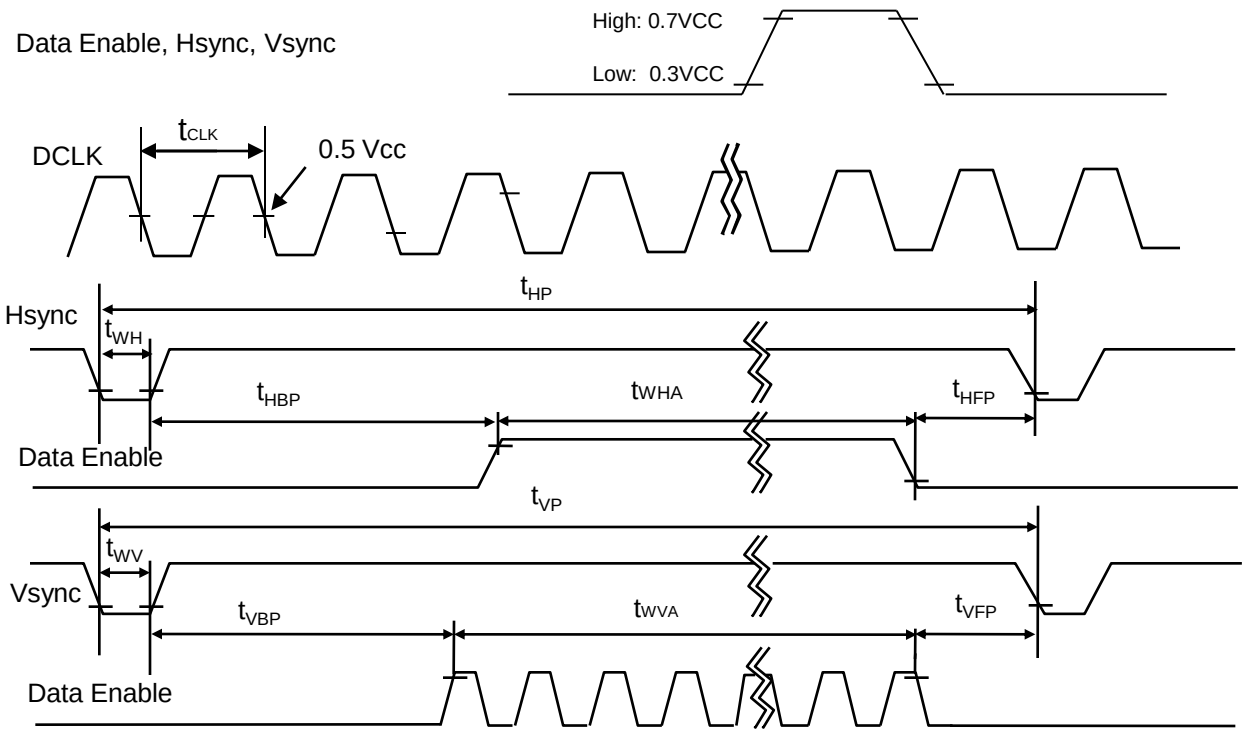
This is the signal timing required at the input of the User connector. All of the interface signal timing should be satisfied with the following specifications and specifications of LVDS Tx/Rx for its proper operation.

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	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 : VCC =3.3V



3-6. Color Input Data Reference

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

Table 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		
	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	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		

3-7. Power Sequence

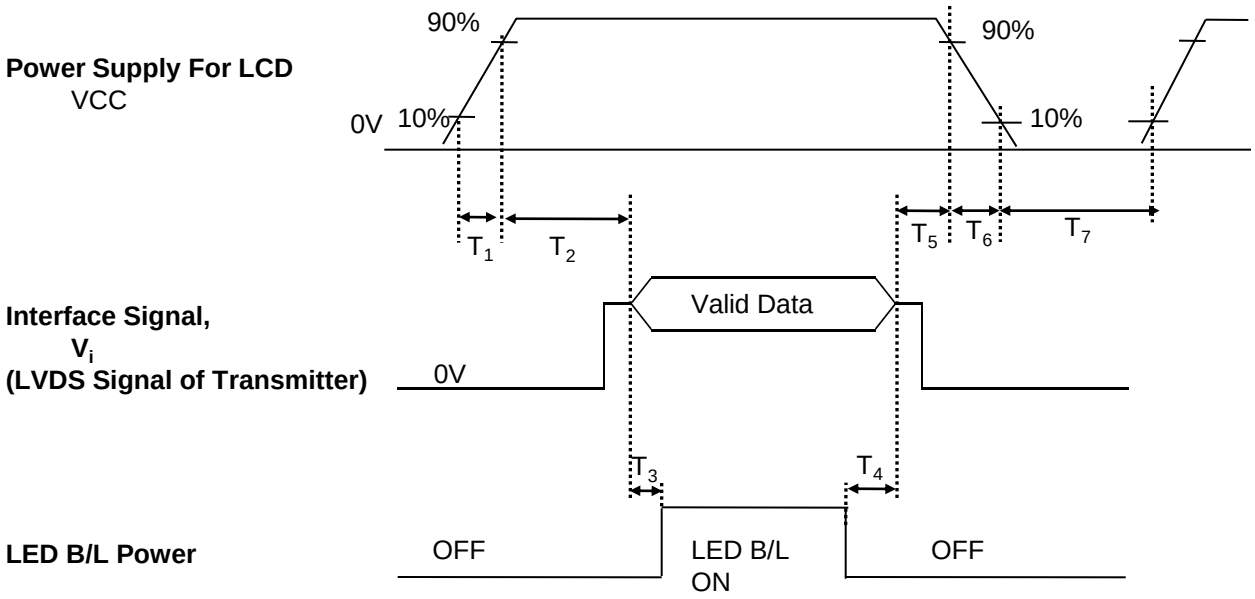


Table 8. POWER SEQUENCE TABLE

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.

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

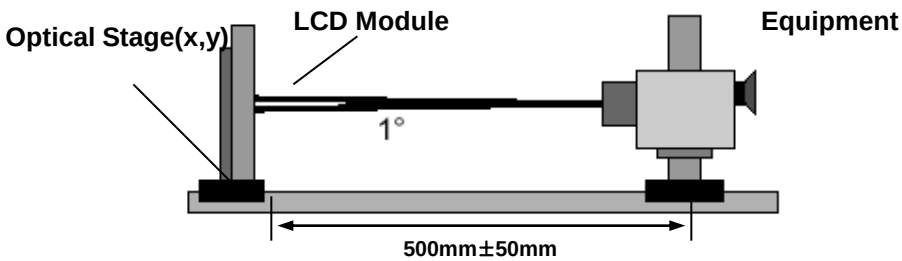


Table 9. OPTICAL CHARACTERISTICS Ta=25°C, VCC=3.3V, fv=60Hz, f_{CLK}= 72(TBD)MHz, ILED = 17.5mA

Parameter		Symbol	Condition	Min	Typ	Max	Units	Notes
Average Luminance		LAVE	5 Points (ILED= 17.5mA)	340	380	-	cd/㎡	2
Luminance variation		δ WHITE	5points	-	1.20	1.40		
			13 point	-	1.40	1.60		3
C/R		-	Center 1 Point	500	700	-	-	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

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.

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

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.

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

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.

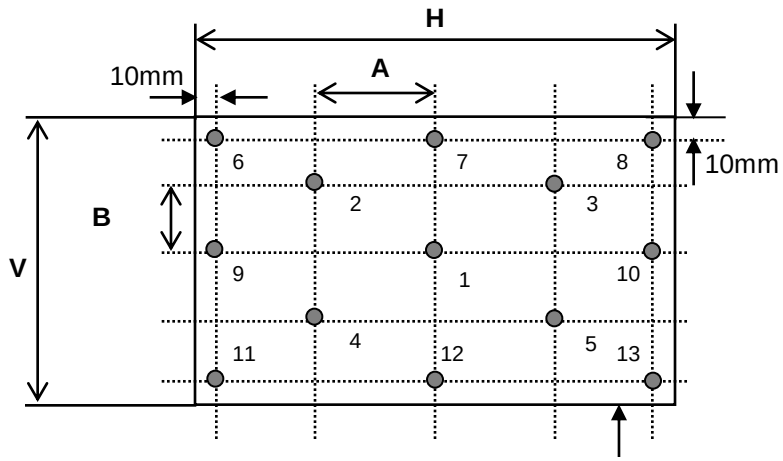
5. Viewing angle is the angle at which the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface. For more information see FIG 4.

6. Gray scale specification * f_V = 60Hz

Gray Level	Luminance [%] (Typ)
L0	0.11
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

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”.

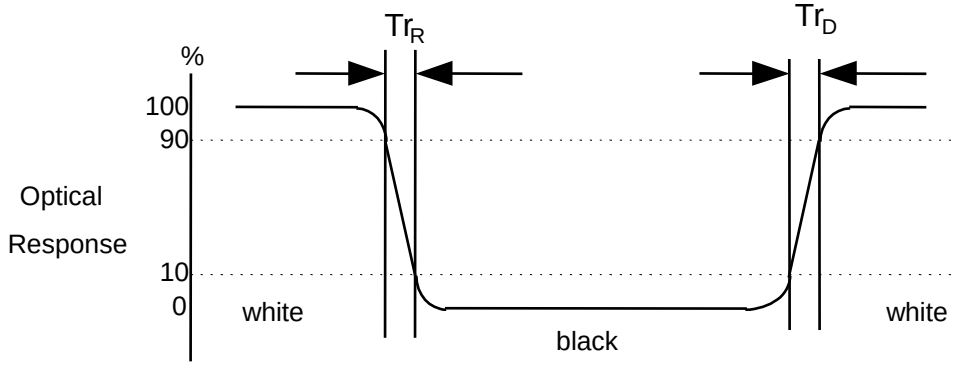
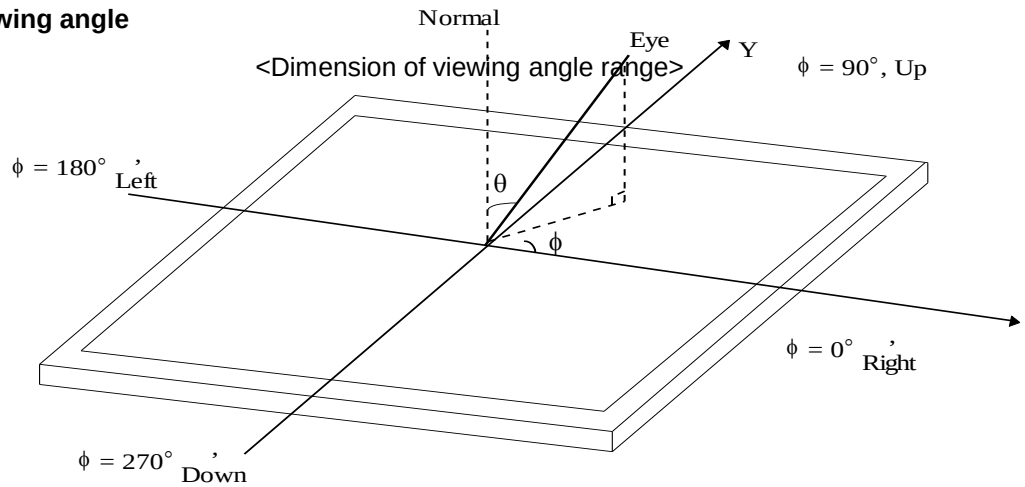


FIG. 4 Viewing angle

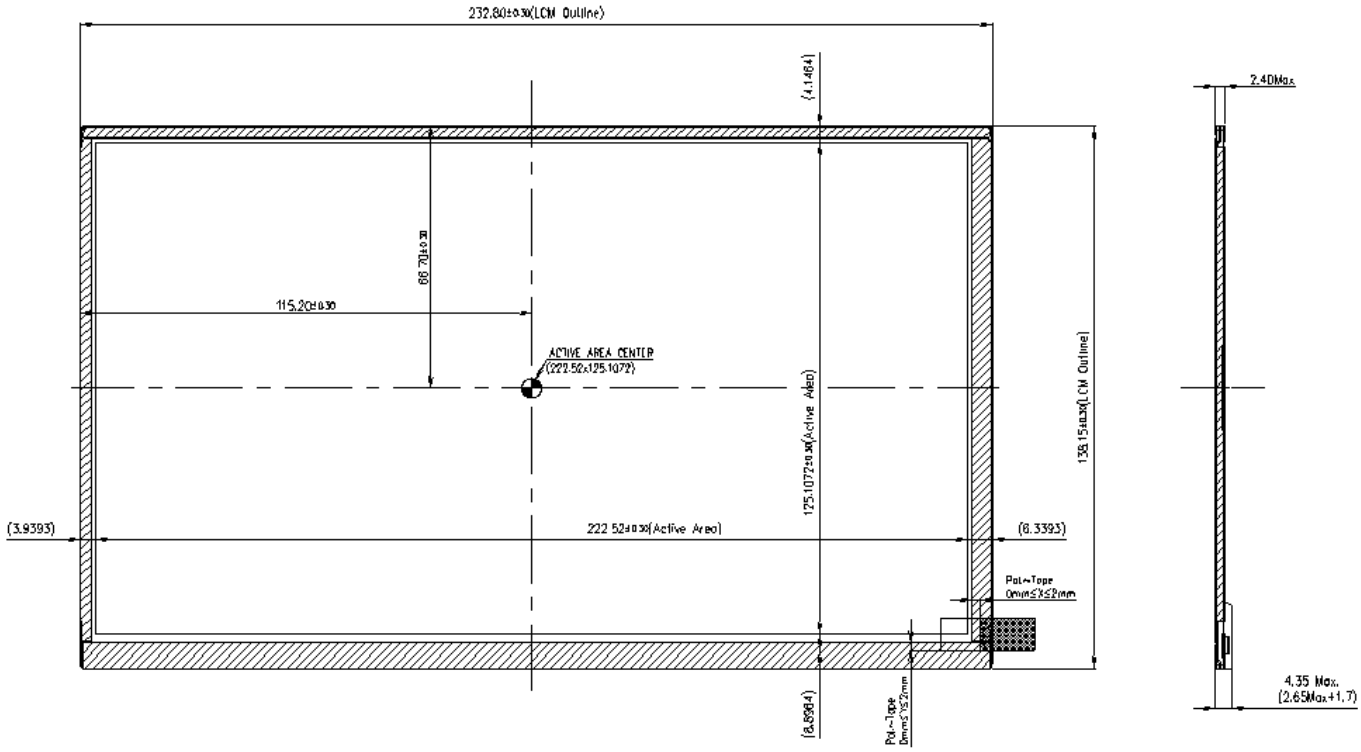


5. Mechanical Characteristics

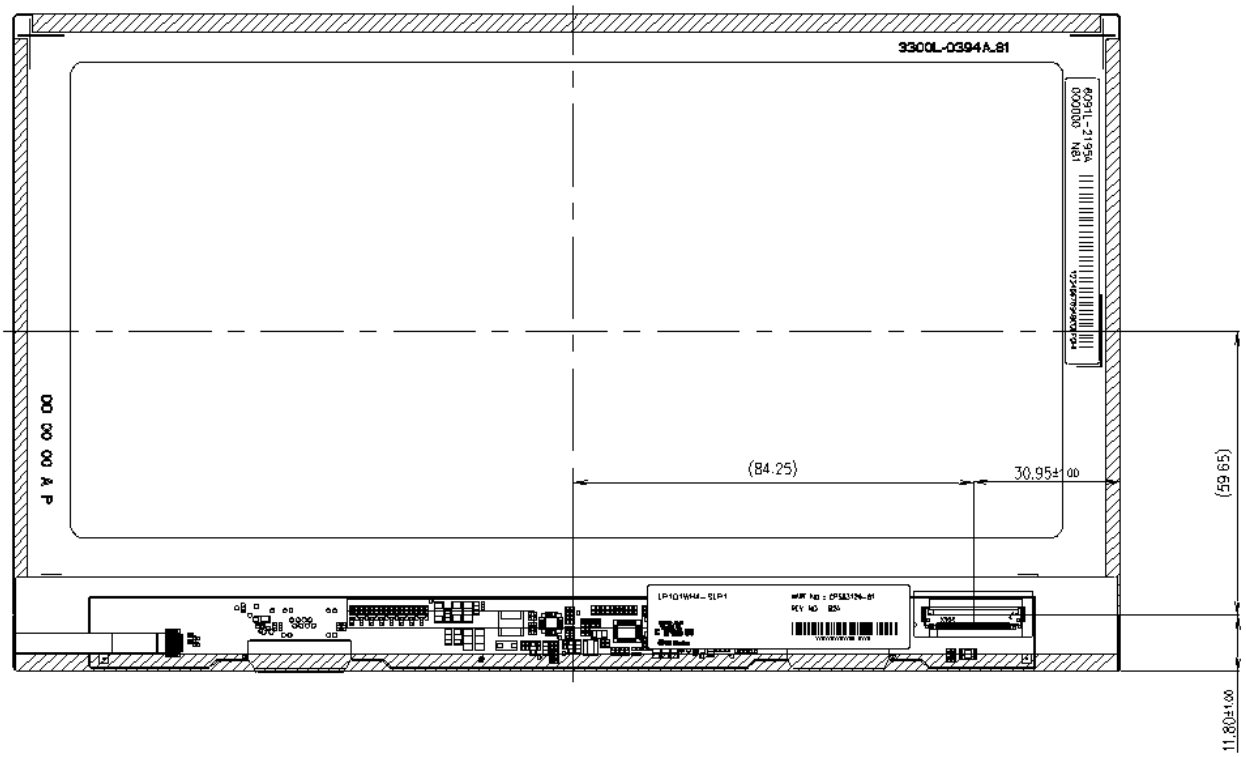
The contents provide general mechanical characteristics for the model LP101WH (TBD). In addition the figures in the next page are detailed mechanical drawing of the LCD.

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	

<FRONT VIEW>



<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)
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.

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 03D0h	**D0**	11010000
	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 : 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
	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)
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 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
Timing Descriptor #2	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
Timing Descriptor #3	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

	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)	2	**32**	00110010
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)		**45**	01000101