SPECIFICATION
FOR
APPROVAL

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

Title	9.7" XGA TFT LCD

Customer	HP
MODEL	

SUPPLIER	LG Display Co., Ltd.
*MODEL	LP097X02
Suffix	SLL1

*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
J. K. Kim / S.Manager	
REVIEWED BY	
G. W. Do / Manager	
PREPARED BY	
H. H. Lee / Engineer	

Product Engineering Dept.
LG Display Co., Ltd

Contents

RECORD OF REVISIONS

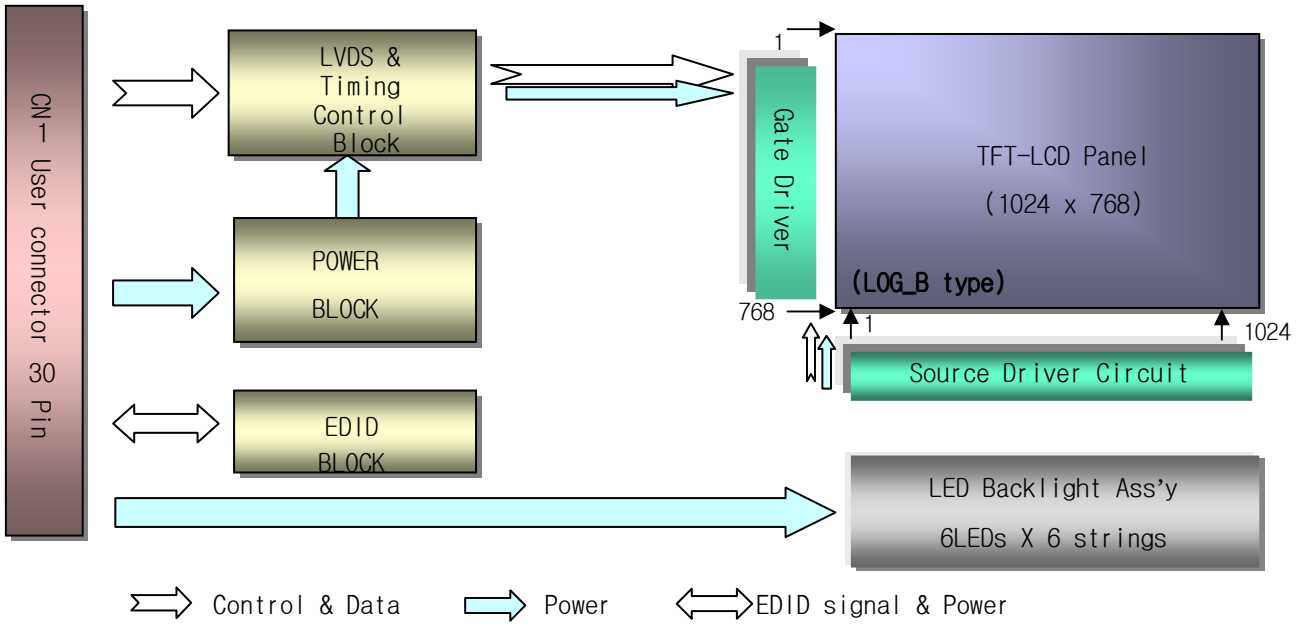
Revision No	Revision Date	Page	Description	EDID ver
0.1	2010.7.21		First draft	0.1
0.2	2010.8.17	P4,17	Update drawing & thickness	0.1
		P6	Change the Life time : 10,000hrs→15,000hrs	
0.3	2010.8.31	P13	Update color coordinates	0.1
0.4	2010.9.20	P10	Change the signal timing spec.	0.1
0.5	2010.9.27	P17,18	Update drawing (remove 1 case top tab)	0.1
0.6	2010.10.14	P10	Change timing (100Mhz→96Mhz)	
		P24~26	Change EDID due to timing change	0.3
0.7	2010.10.15	P4,16	Change the thickness spec. by adding shield can	0.3
0.8	2010.11.08	P4~13	Change the LED current (19mA → 15mA)	0.3
		P4	Change the thickness spec.	

1. General Description

The LP097X02 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 9.7 inches diagonally measured active display area with XGA resolution(1024 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 6-bit gray scale signal for each dot, thus, presenting a palette of more than 262,144 colors.

The LP097X02 has been designed to apply the interface method that enables low power, high speed, low EMI.

The LP097X02 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 LP097X02 characteristics provide an excellent flat display for office automation products such as Notebook PC.



General Features

Active Screen Size	9.7 inches diagonal
Outline Dimension	210.53 (H) × 166.53 (V) × 3.55 mm (max.) ※ PCB area : 5.82mm (max.)
Pixel Pitch	0.192 mm × 0.192 mm
Pixel Format	1024 horiz. by 768 vert. Pixels RGB strip arrangement
Color Depth	6-bit, 262,144 colors
Luminance, White	300 cd/m^2(Typ., @I_{LED}=15mA)
Power Consumption	Logic : 0.8W(typ.@Mosaic), Back Light : 1.6W (typ.@ I_{LED}= 15mA)
Weight	160g (Max.)
Display Operating Mode	Transmissive mode, normally Black
Surface Treatment	Glare, hard coating treatment of the front polarizer, 3H

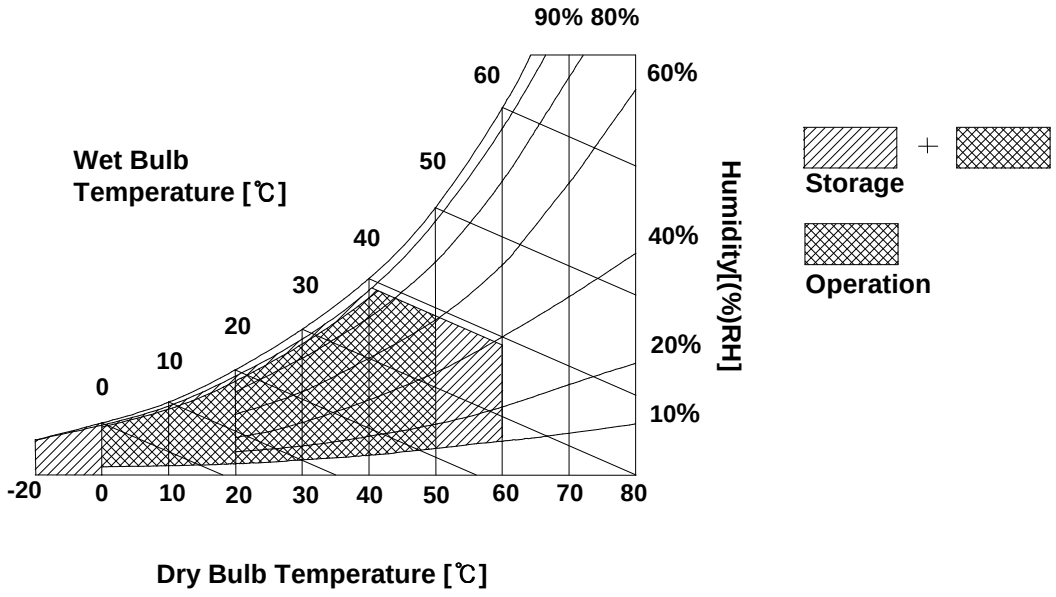
2. Absolute Maximum Ratings

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

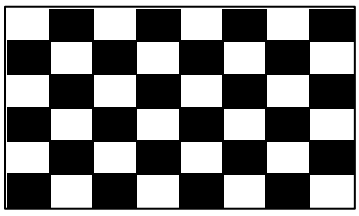
The LP097X02 requires two power inputs. One is employed to power the LCD electronics and to drive the TFT array and liquid crystal. The second input which powers the LED BL.

Table 2. ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Values			Unit	Notes
		Min	Typ	Max		
MODULE :						
Power Supply Input Voltage	VCC	3.0	3.3	3.6	V_{DC}	
Power Supply Input Current	I_{CC} Mosaic	-	240	280	mA	1
Power Consumption	Pc	-	0.8	0.92	Watt	1
Differential Impedance	Zm	90	100	110	Ohm	2
LED Backlight : (Without LED Driver)						
LED Driver input Voltage (on system)	VLED			12	V	3
Operating Current per string	I_{LED}		15	15.5	mA	4
Power Consumption	P_{BL}		1.6	1.7	Watt	5
Life Time		15,000	-	-	Hrs	6

Note)

1. The specified 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.

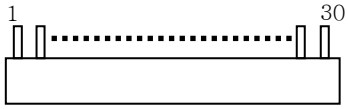


2. This impedance value is needed to proper display and measured form LVDS Tx to the mating connector.
3. **LED input voltage must be input below than 12V to operate normally for LED Driver.**
4. The typical operating current is for the typical surface luminance (L_{WH}) in optical characteristics.
5. The LED power consumption shown above does not include power of external LED driver circuit for typical current condition.
6. The life time is determined as the time at which brightness of lamp is 50% compare to that of initial value at the typical lamp current.

3-2. Interface Connections

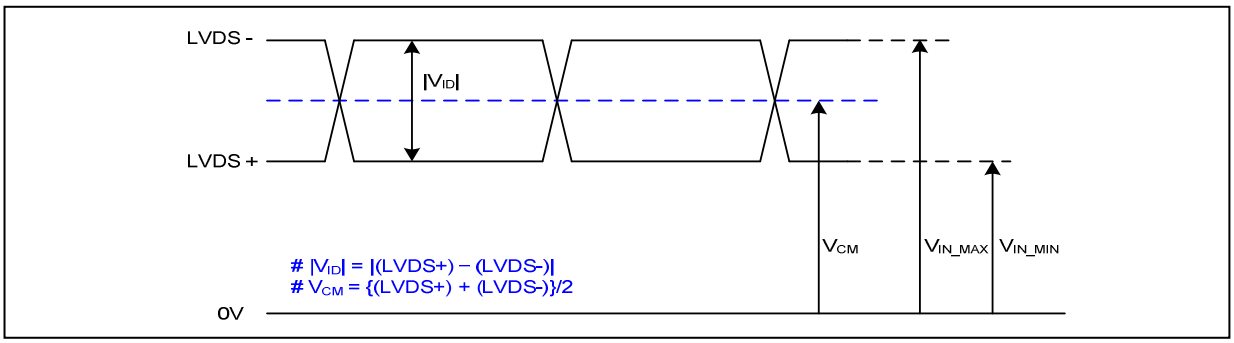
This LCD employs two interface connections, a 30 pin connector is used for the module electronics interface and the other connector is used for the integral backlight system.
The electronics interface connector is a model 20474-030E-12 manufactured by I-PEX.

Table 3. MODULE CONNECTOR PIN CONFIGURATION (CN1)

Pin	Symbol	Description	Notes
1	GND	Ground	[LVDS Receiver] SiliconWorks, SW0627B [Connector] I-PEX 20474-030E–1# [Mating Connector] I-PEX 20472-030T-10 series or equivalent (micro-coax type) [Connector pin arrangement] LCD front view 
2	VCC	Power Supply, 3.3V Typ.	
3	VCC	Power Supply, 3.3V Typ.	
4	V EEDID	DDC 3.3V power	
5	GSP	GSP	
6	Clk EEDID	DDC Clock	
7	DATA EEDID	DDC Data	
8	RIN 0-	Negative LVDS differential data input	
9	RIN 0+	Positive LVDS differential data input	
10	GND	Ground	
11	RIN 1-	Negative LVDS differential data input	
12	RIN 1+	Positive LVDS differential data input	
13	GND	Ground	
14	RIN 2-	Negative LVDS differential data input	
15	RIN 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	NC	No Connection	
21	Vled	LED Anode (Positive)	
22	Vled	LED Anode (Positive)	
23	NC	No Connection	
24	Vfb1	LED Cathode (Negative)	
25	Vfb2	LED Cathode (Negative)	
26	Vfb3	LED Cathode (Negative)	
27	Vfb4	LED Cathode (Negative)	
28	Vfb5	LED Cathode (Negative)	
29	Vfb6	LED Cathode (Negative)	
30	NC	No Connection	

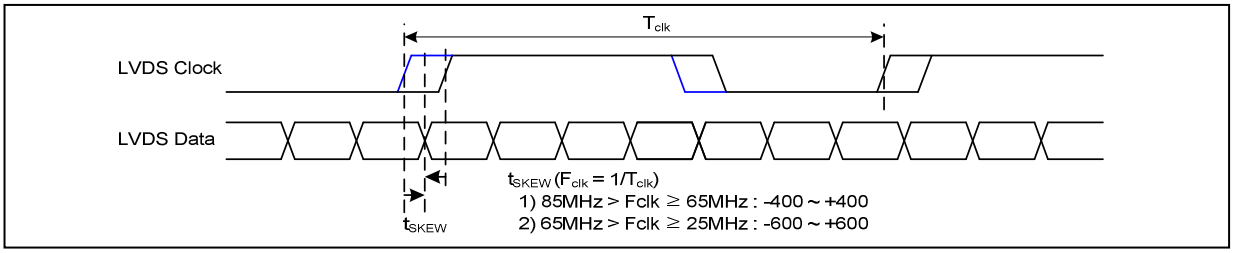
3-3. LVDS Signal Timing Specifications

3-3-1. DC Specification

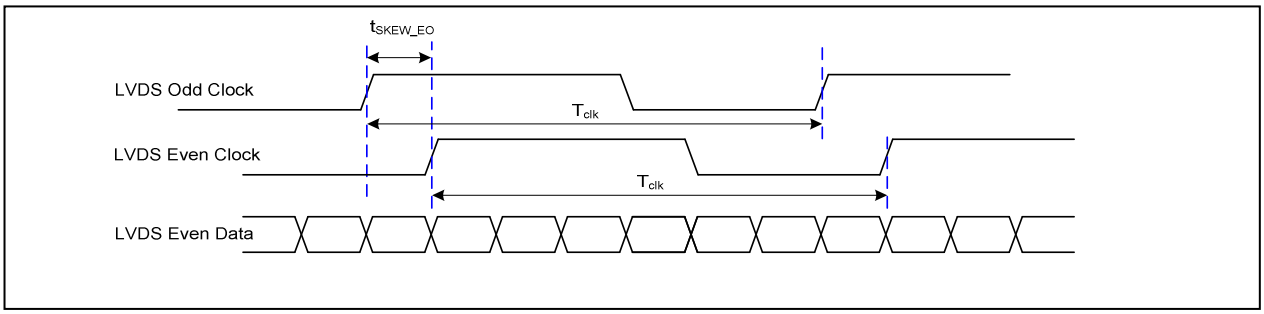


Description	Symbol	Min	Max	Unit	Notes
LVDS Differential Voltage	$\|V_{ID}\|$	100	600	mV	-
LVDS Common mode Voltage	V_{CM}	0.6	1.8	V	-
LVDS Input Voltage Range	V_{IN}	0.3	2.1	V	-

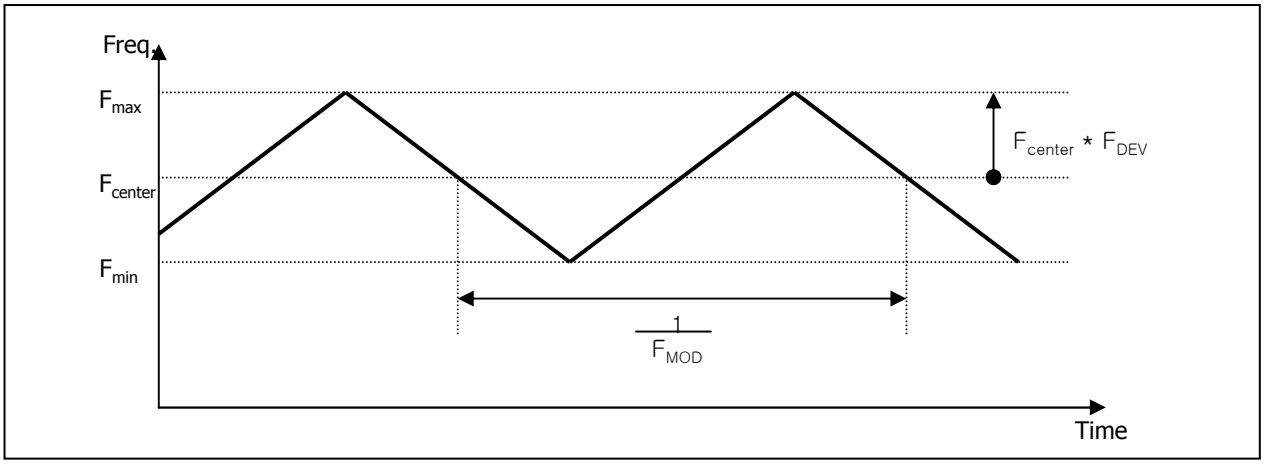
3-3-2. AC Specification



Description	Symbol	Min	Max	Unit	Notes
LVDS Clock to Data Skew Margin	t_{SKEW}	- 240	+ 240	ps	105MHz > Fclk ≥ 95MHz
	t_{SKEW}	- 400	+ 400	ps	85MHz > Fclk ≥ 65MHz
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	-



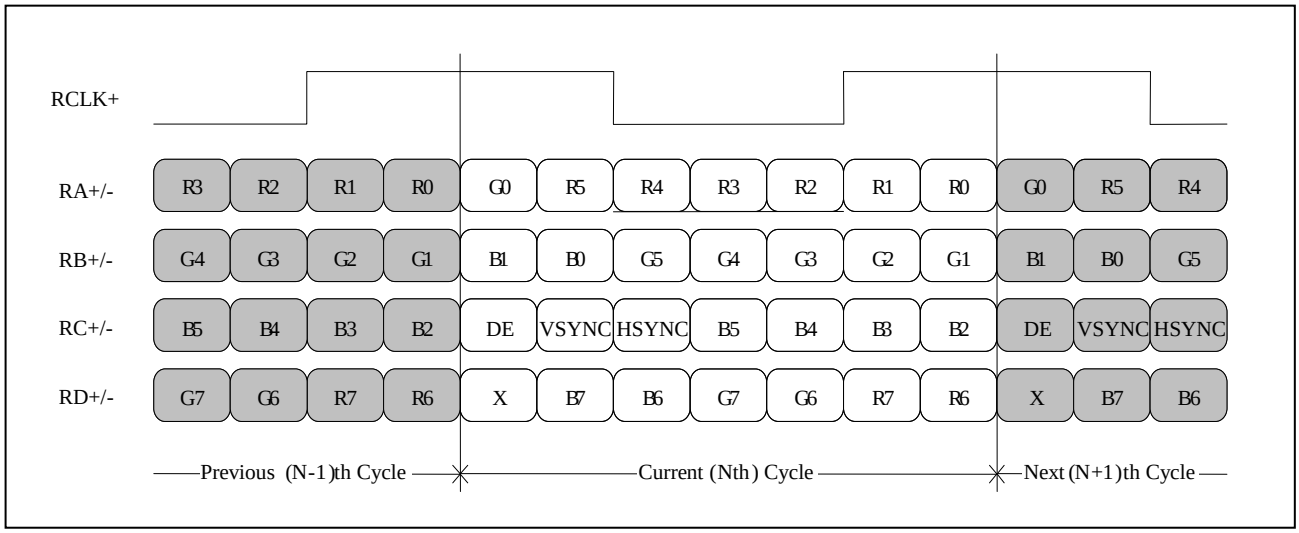
< Clock skew margin between channel >



< Spread Spectrum >

3-3-3. Data Format

-. LVDS 1 Port



< LVDS Data Format >

3-4. Signal Timing Specifications

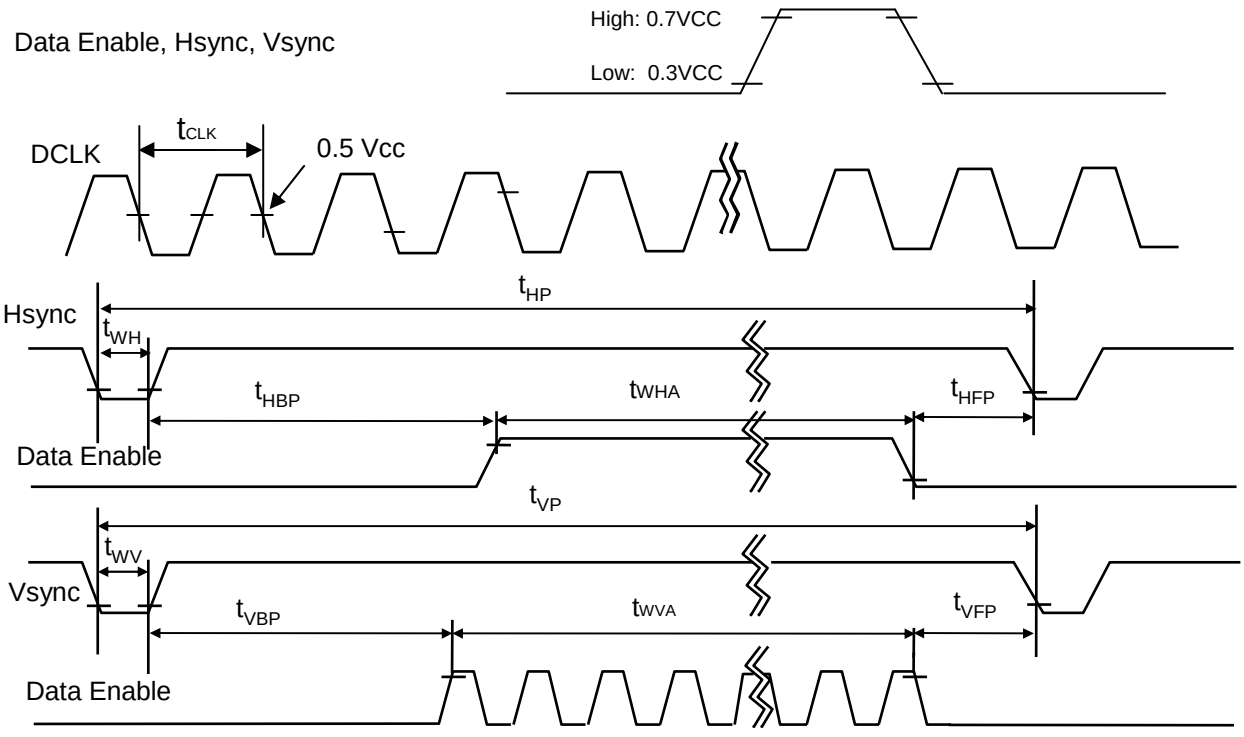
This is the signal timing required at the input of the User connector. All of the interface signal timing should be satisfied with the following specifications and specifications of LVDS Tx/Rx for its proper operation.

Table 6. TIMING TABLE

ITEM	Symbol		Min	Typ	Max	Unit	Note
DCLK	Frequency	f_{CLK}	95.0	96.0	98.0	MHz	
Hsync	Active	t_{WHA}	1024	1024	1024	Tclk	
	Period	t_{HP}	2000	2024	2223		
	Width-Active	t_{WH}	316	328	400		
Vsync	Active	t_{WVA}	768	768	768	tHP	
	Period	t_{VP}	785	791	824		
	Width-Active	t_{WV}	5	7	17		
Data Enable	Horizontal back porch	t_{HBP}	380	400	560	tCLK	
	Horizontal front porch	t_{HFP}	260	272	320		
	Vertical back porch	t_{VBP}	4	6	12	tHP	
	Vertical front porch	t_{VFP}	5	10	32		

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
		R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1	B0
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

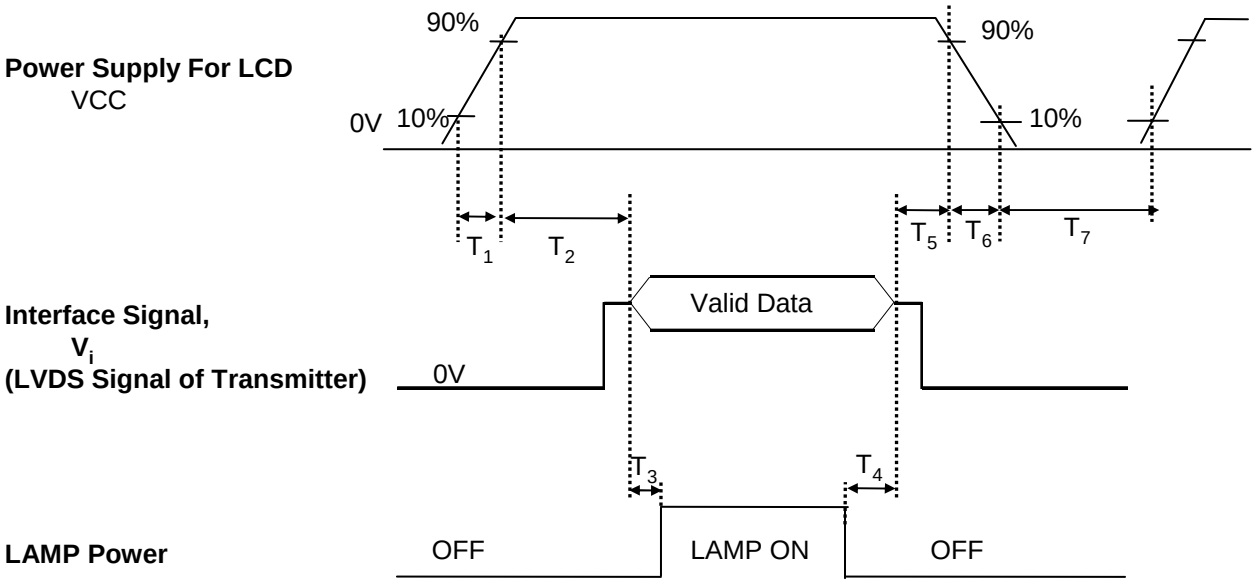


Table 8. POWER SEQUENCE TABLE

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. LVDS 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. Lamp 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

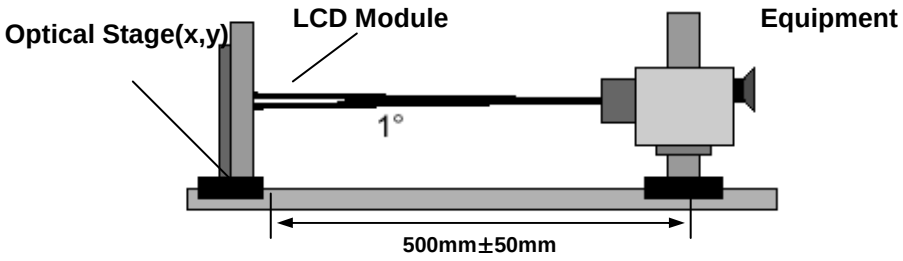


Table 9. OPTICAL CHARACTERISTICS

Ta=25°C, VCC=3.3V, fv=60Hz, f_{CLK}= 96.0MHz, ILED = 15mA

Parameter		Symbol	Condition	Min	Typ	Max	Units	Notes
Average Luminance		LAVE	5 Points (ILED= 15mA)	255	300	-	cd/㎡	2
Luminance variation		δ_{WHITE}	5points	-	1.20	1.40	%	
			17 point	-	1.40	1.60	%	3
C/R		-	Center 1 Point	500	600	-	-	1
Response time			-	-	35	50	㎳	4
Viewing angle	Horizontal	Θ	ϕx(Left,Right)	±80	±89	-	°	5
	Vertical	Θ	ϕyu(Up)	80	89	-		
		Θ	ϕyd(Down)	80	89	-		
Color Coordinates		RED	RX	0.583	0.613	0.643		
			RY	0.318	0.348	0.378		
		GREEN	GX	0.305	0.335	0.365		
			GY	0.530	0.560	0.590		
		BLUE	BX	0.120	0.150	0.180		
			BY	0.104	0.134	0.164		
		WHITE	WX	0.283	0.313	0.343		
			WY	0.299	0.329	0.359		
Cross Talk		DSHA	-	-	-	4.0	%	Fig.5
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 13 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.

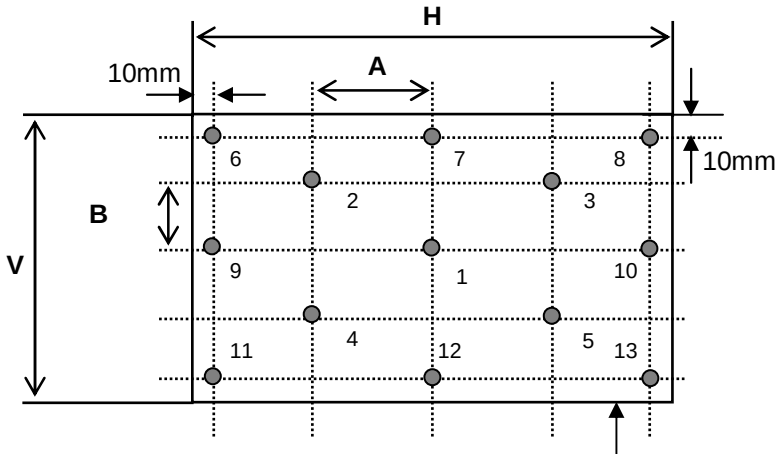
5. Viewing angle is the angle at which the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface. For more information see FIG 4.

6. Gray scale specification * f_V = 60Hz

Gray Level	Luminance [%] (Typ)
L0	0.18
L7	1.25
L15	4.30
L23	9.80
L31	19.2
L39	34.2
L47	53.5
L55	74.5
L63	100

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”.

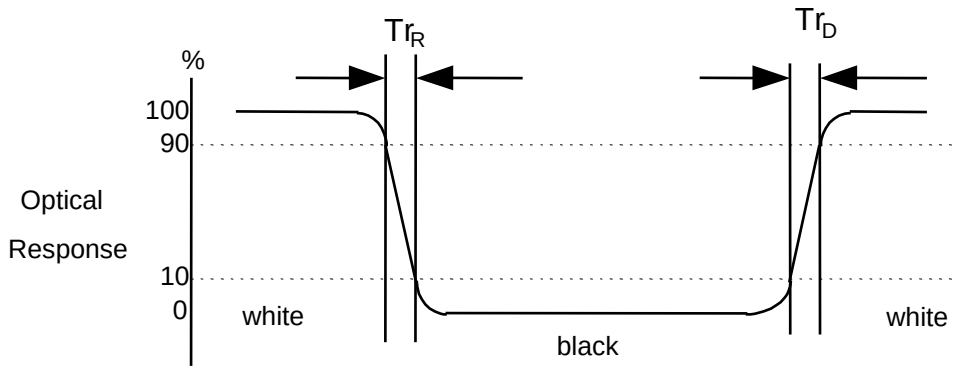


FIG. 4 Viewing angle

<Dimension of viewing angle range>

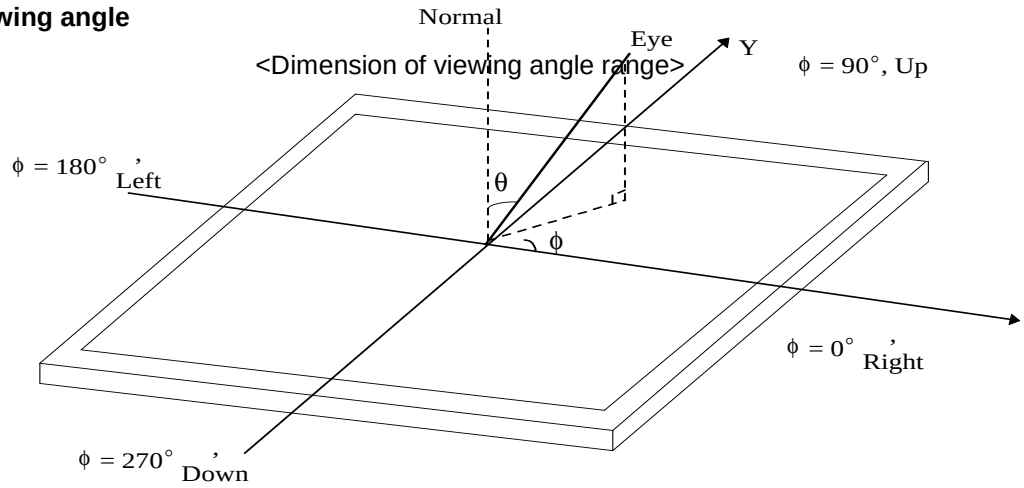


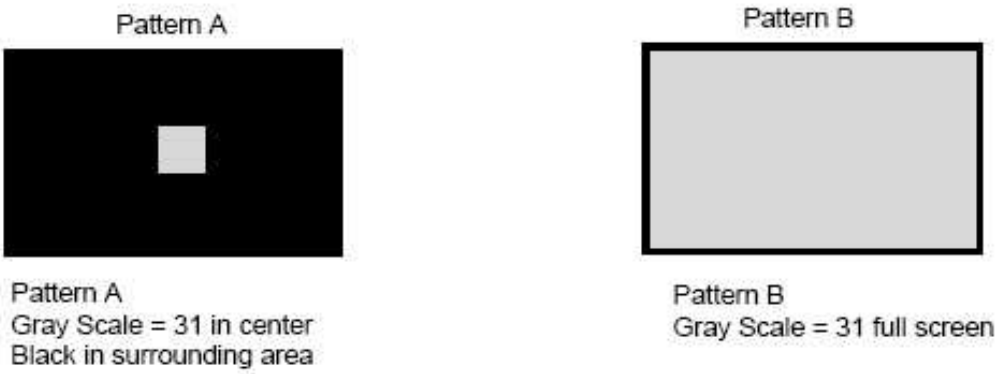
FIG. 5 Cross talk

No visual cross-talk will be allowed. Two luminance values are measured at center spot with 50 x 50 pixels. The cross-talk, D_{SHA}, is defined as,

$$D_{SHA} = (L_B - L_A)/L_B \cdot 100\%,$$

Where, L_A = Luminance in Pattern A

L_B = Luminance in Pattern B.

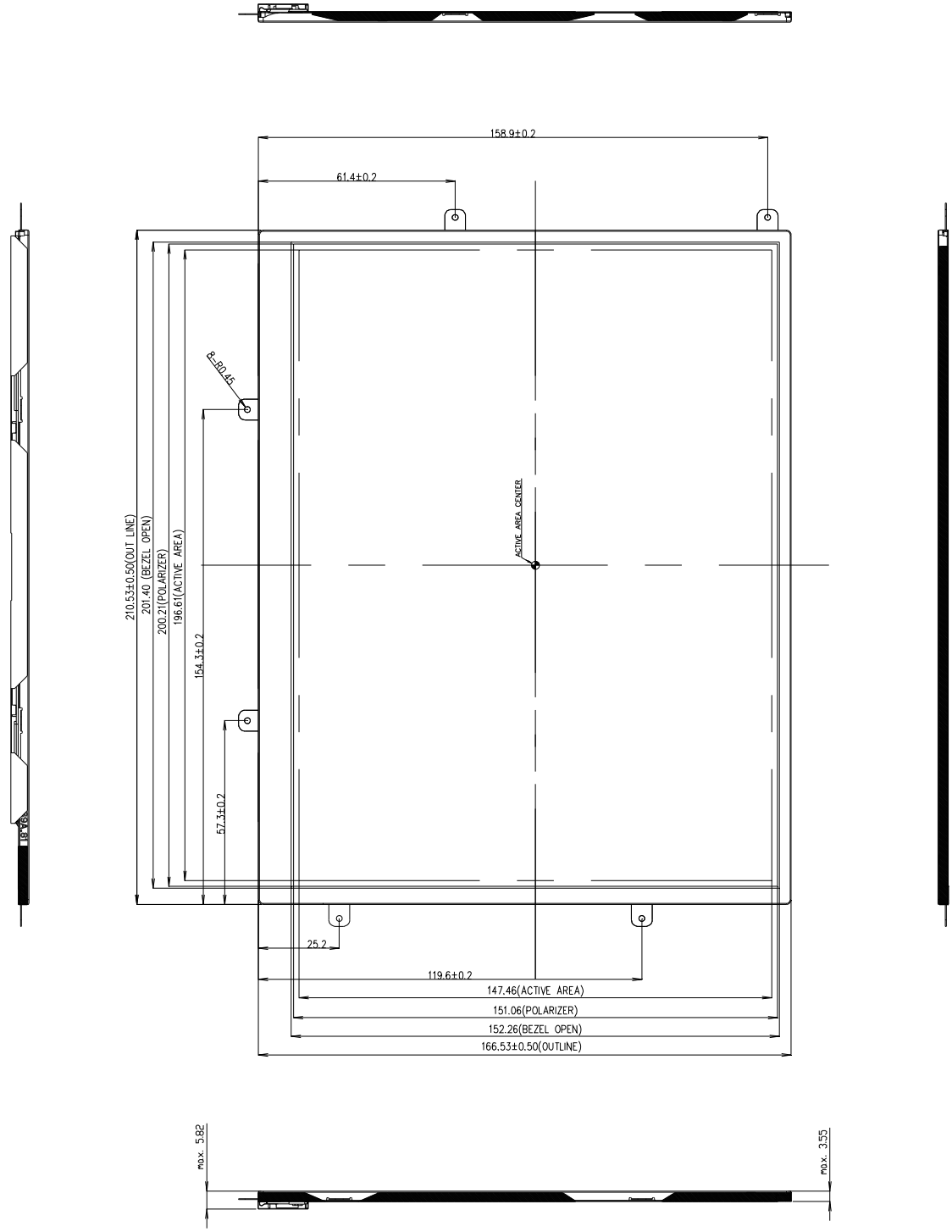


5. Mechanical Characteristics

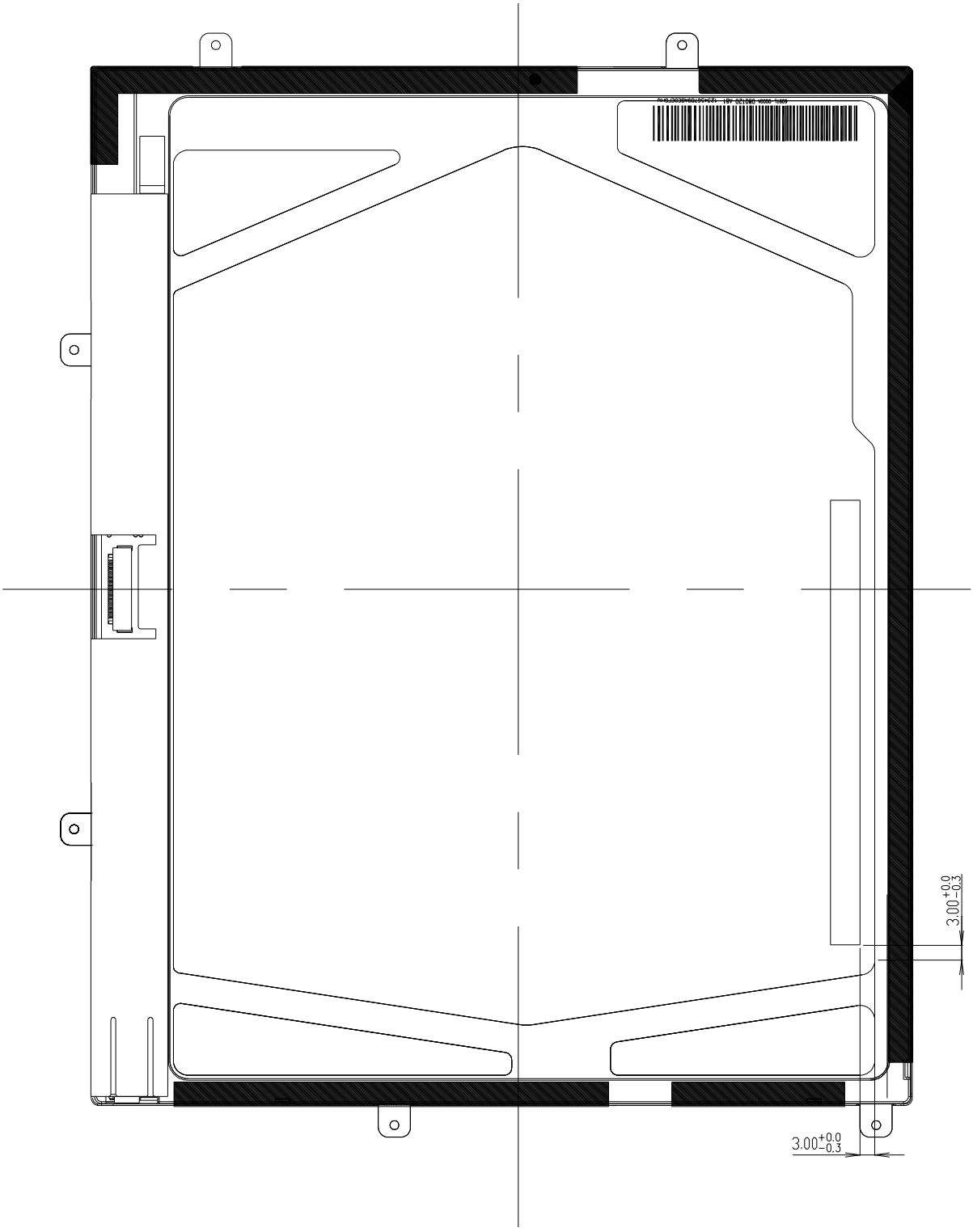
The contents provide general mechanical characteristics for the model LP097X02. In addition the figures in the next page are detailed mechanical drawing of the LCD.

Outline Dimension	Horizontal	210.53 ± 0.50mm (without bracket length)
	Vertical	166.53 ± 0.50mm (without bracket length)
	Thickness	3.55mm (max.) ※ PCB area : 5.82mm (max.)
Bezel Area	Horizontal	201.40mm
	Vertical	152.26mm
Active Display Area	Horizontal	196.608mm
	Vertical	147.456mm
Weight	160g (Max.)	
Surface Treatment	Glare, hard coating treatment of the front polarizer, 3H	

<FRONT VIEW>


158.9±0.2
61.4±0.2
8-R0.45
ACTIVE AREA CENTER
210.53±0.50(OUT LINE)
201.40 (BEZEL OPEN)
200.21(POLARIZER)
196.61(ACTIVE AREA)
154.3±0.2
57.3±0.2
25.2
119.6±0.2
147.46(ACTIVE AREA)
151.06(POLARIZER)
152.26(BEZEL OPEN)
166.53±0.50(OUTLINE)
max. 5.82
max. 3.55

<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 60950-1:2003, First Edition, Underwriters Laboratories, Inc.,
Standard for Safety of Information Technology Equipment.
b) CAN/CSA C22.2, No. 60950-1-03 1st Ed. April 1, 2003, Canadian Standards Association,
Standard for Safety of Information Technology Equipment.
c) EN 60950-1:2001, First Edition,
European Committee for Electrotechnical Standardization(CENELEC)
European Standard for Safety of Information Technology Equipment.

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	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Mark	1	2	3	4	5	6	7	8	9	0

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 : 40 pcs

b) Box Size : 365mm × 478mm × 328mm

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.

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

	Byte (Dec)	Byte (Hex)	Field Name and Comments	Value (Hex)	Value (Bin)
Header	0	00	Header	00	00000000
	1	01	Header	FF	11111111
	2	02	Header	FF	11111111
	3	03	Header	FF	11111111
	4	04	Header	FF	11111111
	5	05	Header	FF	11111111
	6	06	Header	FF	11111111
	7	07	Header	00	00000000
Vendor / Product EDID Version	8	08	ID Manufacture Name LGD	30	00110000
	9	09	ID Manufacture Name	E4	11100100
	10	0A	ID Product Code 02E5	E5	11100101
	11	0B	(Hex. LSB first)	02	00000010
	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 2010 years	14	00010100
	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 : Color Bit Depth is undefined , Digital Video Interface Standard Supported: Digital Interface is not defined	80	10000000
	21	15	Horizontal Screen Size (Rounded cm) = 20 cm20 cm	14	00010100
	22	16	Vertical Screen Size (Rounded cm) = 15 cm15 cm	0F	00001111
	23	17	Display Transfer Characteristic (Gamma) = (gamma*100)-100 = Example:(2.2*100)-100=120 = 2.2 Gamma	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 & YCrCb 4:4:4 ,Other Feature Support Flags : No_sRGB, Preferred Timing Mode, No_Display is continuous frequency (Multi-mode_Base EDID and Extension Block).]	0A	00001010
Panel Color Coordinates	25	19	Red/Green Low Bits (RxRy/GxGy)	00	00000000
	26	1A	Blue/White Low Bits (BxBy/WxWy)	05	00000101
	27	1B	Red X Rx = 00	00	00000000
	28	1C	Red Y Ry = 00	00	00000000
	29	1D	Green X Gx = 00	00	00000000
	30	1E	Green Y Gy = 00	00	00000000
	31	1F	Blue X Bx = 00	00	00000000
	32	20	Blue Y By = 00	00	00000000
	33	21	White X Wx = 0.313	50	01010000
	34	22	White Y Wy = 0.329	54	01010100
Established Timin	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

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

	Byte (Dec)	Byte (Hex)	Field Name and Comments	Value (Hex)	Value (Bin)
Timing Descriptor #1	54	**36**	Pixel Clock/10,000 (LSB) 96 MHz @ 60Hz	**80**	10000000
	55	**37**	Pixel Clock/10,000 (MSB)	**25**	00100101
	56	**38**	Horizontal Active (lower 8 bits) 1024 Pixels	**00**	00000000
	57	**39**	Horizontal Blanking(Thp-HA) (lower 8 bits) 1000 Pixels	**E8**	11101000
	58	**3A**	Horizontal Active / Horizontal Blanking(Thp-HA) (upper 4:4bits)	**43**	01000011
	59	**3B**	Vertical Avtive 768 Lines	**00**	00000000
	60	**3C**	Vertical Blanking (Tvp-HA) (DE Blanking typ.for DE only panels) 32 Lines	**20**	00100000
	61	**3D**	Vertical Active : Vertical Blanking (Tvp-HA) (upper 4:4bits)	**30**	00110000
	62	**3E**	Horizontal Sync. Offset (Thfp) 272 Pixels	**10**	00010000
	63	**3F**	Horizontal Sync Pulse Width (HSPW) 328 Pixels	**48**	01001000
	64	**40**	Vertical Sync Offset(Tvfp) : Sync Width (VSPW) 10 Lines : 7 Lines	**A7**	10100111
	65	**41**	Horizontal Vertical Sync Offset/Width (upper 2bits)	**00**	00000000
	66	**42**	Horizontal Image Size (mm) 200 mm	**C8**	11001000
	67	**43**	Vertical Image Size (mm) 150 mm	**96**	10010110
	68	**44**	Horizontal Image Size / Vertical Image Size	**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)]	**18**	00011000
Timing Descriptor #2	72	**48**	Pixel Clock/10,000 (LSB) 96 MHz @ 60Hz	**80**	10000000
	73	**49**	Pixel Clock/10,000 (MSB)	**25**	00100101
	74	**4A**	Horizontal Active (lower 8 bits) 1024 Pixels	**00**	00000000
	75	**4B**	Horizontal Blanking(Thp-HA) (lower 8 bits) 1000 Pixels	**E8**	11101000
	76	**4C**	Horizontal Active / Horizontal Blanking(Thp-HA) (upper 4:4bits)	**43**	01000011
	77	**4D**	Vertical Avtive 768 Lines	**00**	00000000
	78	**4E**	Vertical Blanking (Tvp-HA) (DE Blanking typ.for DE only panels) 32 Lines	**20**	00100000
	79	**4F**	Vertical Active : Vertical Blanking (Tvp-HA) (upper 4:4bits)	**30**	00110000
	80	**50**	Horizontal Sync. Offset (Thfp) 272 Pixels	**10**	00010000
	81	**51**	Horizontal Sync Pulse Width (HSPW) 328 Pixels	**48**	01001000
	82	**52**	Vertical Sync Offset(Tvfp) : Sync Width (VSPW) 10 Lines : 7 Lines	**A7**	10100111
	83	**53**	Horizontal Vertical Sync Offset/Width (upper 2bits)	**00**	00000000
	84	**54**	Horizontal Image Size (mm) 200 mm	**C8**	11001000
	85	**55**	Vertical Image Size (mm) 150 mm	**96**	10010110
	86	**56**	Horizontal Image Size / Vertical Image Size	**00**	00000000
	87	**57**	Horizontal Border = 0 (Zero for Notebook LCD)	**00**	00000000
	88	**58**	Vertical Border = 0 (Zero for Notebook LCD)	**00**	00000000
	89	**59**	Non-Interlace, Normal display, no stereo, Digital Separate [Vsync_NEG, Hsync_NEG (outside of V-sync)]	**18**	00011000
Timing Descriptor #3	90	**5A**	Blank for nvDPS	**00**	00000000
	91	**5B**	Blank for nvDPS	**00**	00000000
	92	**5C**	Blank for nvDPS	**00**	00000000
	93	**5D**	Blank for nvDPS	**00**	00000000
	94	**5E**	Blank for nvDPS	**00**	00000000
	95	**5F**	Blank for nvDPS	**00**	00000000
	96	**60**	Blank for nvDPS	**00**	00000000
	97	**61**	Blank for nvDPS	**00**	00000000
	98	**62**	Blank for nvDPS	**00**	00000000
	99	**63**	Blank for nvDPS	**00**	00000000
	100	**64**	Blank for nvDPS	**00**	00000000
	101	**65**	Blank for nvDPS	**00**	00000000
	102	**66**	Blank for nvDPS	**00**	00000000
	103	**67**	Blank for nvDPS	**00**	00000000
	104	**68**	Blank for nvDPS	**00**	00000000
	105	**69**	Blank for nvDPS	**00**	00000000
	106	**6A**	Blank for nvDPS	**00**	00000000
	107	**6B**	Blank for nvDPS	**00**	00000000

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

	Byte (Dec)	Byte (Hex)	Field Name and Comments	Value (Hex)	Value (Bin)
Timing Descriptor #4	108	6C	Detailed Timing Descriptions #4	00	00000000
	109	6D	Flag	00	00000000
	110	6E	Reserved	00	00000000
	111	6F	For Brightness Table and Power consumption	00	00000000
	112	70	Flag	00	00000000
	113	71	PWM % [7:0] @ Step 0 6 % @ 0 nit	00	00000000
	114	72	PWM % [7:0] @ Step 5 27 % @ 60 nit	00	00000000
	115	73	PWM % [7:0] @ Step 10 100 % @ 0 nit	00	00000000
	116	74	Nits [7:0] @ Step 0	00	00000000
	117	75	Nits [7:0] @ Step 5	00	00000000
	118	76	Nits [7:0] @ Step 10	00	00000000
	119	77	Panel Electronicx Power @ 32 x 32 Chess Pattern = 0 mW	00	00000000
	120	78	Backlight Power @ 60 nits = 0 mW	00	00000000
	121	79	Backlight Power @ Step 10 = 0 mW	00	00000000
	122	7A	Nits @ 100% PWM Duty = 0 nit	00	00000000
	123	7B	Flag	00	00000000
	124	7C	Flag	00	00000000
	125	7D	Flag	00	00000000
Check	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)	EA	11101010