TFT LCD Approval Specification

MODEL NO.: G150X1 –L02

Customer :_____

Approved by : _____

Note :

FOR MORE INFORMATION:
AZ DISPLAYS, INC.
75 COLUMBIA, ALISO VIEJO, CA 92656
Http://www.AZDISPLAYS.com

記錄	工作	審核	角色	投票
2006-12-19 15:56:54 CST	Approve by Dept. Mgr.(QA RA)	ys_lai(賴育賢 /54881/52755/43154)	Department Manager(QA RA)	Accept
2006-12-18 08:50:32 CST	Approve by Director	teren_lin(林添仁 /56910/36064)	Director	Accept

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REVISION HISTORY

Version	Date	Page (New)	Section	Description
Ver 2.0	Dec.15, '06	All	All	Approval Specification was first issued.

1. GENERAL DESCRIPTION

1.1 OVERVIEW

G150X1-L02 is a 15.0” TFT Liquid Crystal Display module with 2 CCFL Backlight units and 20 pins LVDS interface. This module supports 1024 x 768 XGA mode and can display 16.2M colors.

The PSWG is to establish a set of displays with standard mechanical dimensions and select electrical interface requirements for an industry standard 15.0” XGA LCD panel and the inverter module for Backlight is not built in.

1.2 FEATURES

- XGA (1024 x 768 pixels) resolution
- DE (Data Enable) only mode
- LVDS Interface with 1pixel/clock
- PSWG (Panel Standardization Working Group)
- Wide operating temperature.
- RoHS compliance

1.3 APPLICATION

-TFT LCD Monitor

-TFT LCD TV

- Factory Application
- Amusement
- Vehicle

1.4 GENERAL SPECIFICATI0NS

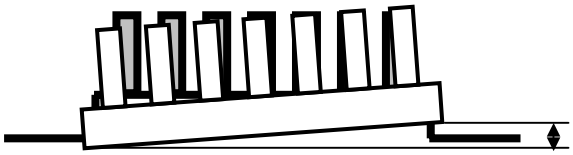
Item	Specification	Unit	Note
Active Area	304.128 (H) x 228.096(V) (15.0” diagonal)	mm	(1)
Bezel Opening Area	307.4(H) x 231.3(V)	mm	
Driver Element	a-Si TFT active matrix	-	-
Pixel Number	1024 x R.G.B x 768	pixel	-
Pixel Pitch	0.297(H) x 0.297(W)	mm	-
Pixel Arrangement	RGB vertical Stripe	-	-
Display Colors	16,194,277	color	-
Display Mode	Normally White	-	-
Surface Treatment	Hard Coating (3H), Anti-Glare (Haze 25)	-	-

1.5 MECHANICAL SPECIFICATIONS

Item		Min.	Typ.	Max.	Unit	Note
Module Size	Horizontal(H)	326.0	326.5	327.0	mm	(1)
	Vertical(V)	253.0	253.5	254.0	mm	
	Depth(D)	-	-	14.35	mm	(1)(2)
Weight		-	-	1100	g	-

Note (1) Please refer to the attached drawings for more information of front and back outline dimensions.

Note (2) The depth is without connector.



2. ABSOLUTE MAXIMUM RATINGS

2.1 ABSOLUTE RATINGS OF ENVIRONMENT

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Storage Temperature	T_{ST}	-40	80	ºC	(0), (1)
Operating Ambient Temperature	T_{OP}	-30	70	ºC	(0), (1), (2)

Test Item	Test Condition	Note
High Temperature Storage Test	80ºC, 240 hours	(1), (2)
Low Temperature Storage Test	-40ºC, 240 hours	
Thermal Shock Storage Test	-40ºC, 0.5hour←→80℃, 0.5hour; 100cycles, 1hour/cycle	
High Temperature Operation Test	70ºC, 240 hours	
Low Temperature Operation Test	-30ºC, 240 hours	
High Temperature & High Humidity Operation Test	60ºC, RH 90%, 240hours	
Heat Cycle Operation Test	-30ºC, 1hour←→70ºC, 1hour; 50cycles, 4hour/cycle	
ESD Test (Operation)	150pF, 330Ω, 1sec/cycle Condition 1 : panel contact, ±8KV Condition 2 : panel non-contact ±15KV	(2)
Shock (Non-Operating)	50G, 11ms, half sine wave, 1 time for ± X, ± Y, ± Z direction	(2), (3)
Vibration (Non-Operating)	1.5G, 10 ~ 500 Hz sine wave, 1.5mm Max, 30min/cycle, 1 cycles each X, Y, Z direction	(2), (3)

Note (0) All test conditions are as above table.

Note (1) Temperature and relative humidity range is shown in the figure below.

(a) 90 %RH Max. (Ta ≤ 40 ºC).

(b) Wet-bulb temperature should be 39 ºC Max. (Ta > 40 ºC).

(c) No condensation of water.

Note (2) No display malfunctions.

Note (3) At testing Vibration and Shock, the fixture in holding the module has to be hard and rigid enough so that the module would not be twisted or bent by the fixture.

Note (4) Temperature of panel display surface area should be 80 ºC Max.

2.2 ELECTRICAL ABSOLUTE RATINGS

2.2.1 TFT LCD MODULE

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Power Supply Voltage	V_{DD}	-0.3	4.0	V	

2.2.2 BACKLIGHT UNIT

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Lamp Voltage	V_L	-	2.5K	V_{RMS}	(1), (2), I_L = 8 mA
Lamp Current	I_L	-	8.5	mA_{RMS}	(1), (2)
Lamp Frequency	F_L	40	80	KHz	

Note (1) Permanent damage to the device may occur if maximum values are exceeded. Function operation should be restricted to the conditions described under Normal Operating Conditions.

Note (2) Specified values are for lamp (Refer to Section 3.2 for further information).

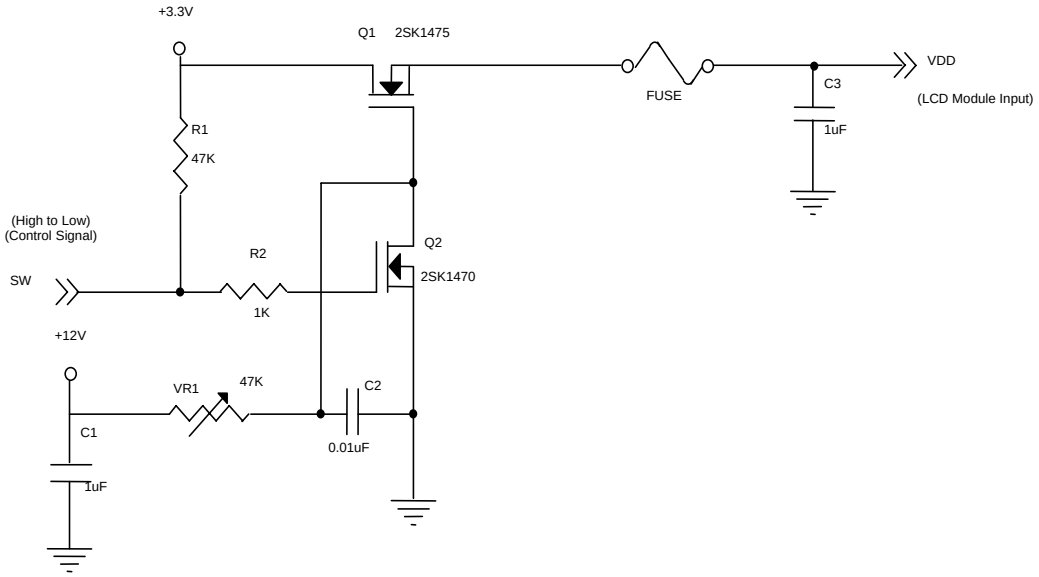
3. ELECTRICAL CHARACTERISTICS

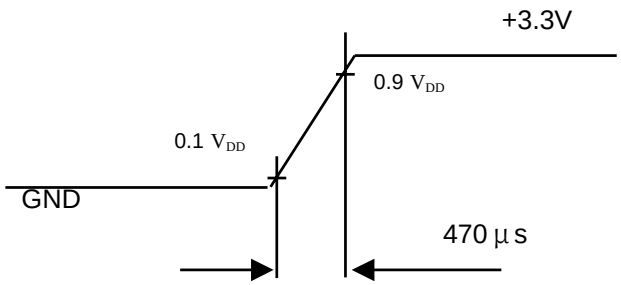
3.1 TFT LCD MODULE(1)

Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Power Supply Voltage		V_{DD}	3.0	3.3	3.6	V	-
Ripple Voltage		V_{RP}	-	-	100	mVp-p	
Rush Current		I_{RUSH}	-	-	2.0	A	(2)
Power Supply Current	White	Icc	-	500		mA	(3)a
	Black		-	750		mA	(3)b
Differential Input Voltage for LVDS Receiver Threshold	"H" Level	V_{IH}	-	-	100	mV	-
	"L" Level	V_{IL}	-100	-	-	mV	-
Terminating Resistor		R_T		100	-	Ohm	-

Note (1) The module should be always operated within above ranges.

Note (2) Measurement Conditions:





Note (3) The specified power supply current is under the conditions at V_{DD} =3.3V, Ta = 25 ± 2 ºC, DC Current and f_v = 60 Hz, whereas a power dissipation check pattern below is displayed.

a. White Pattern

Active Area

b. Black Pattern

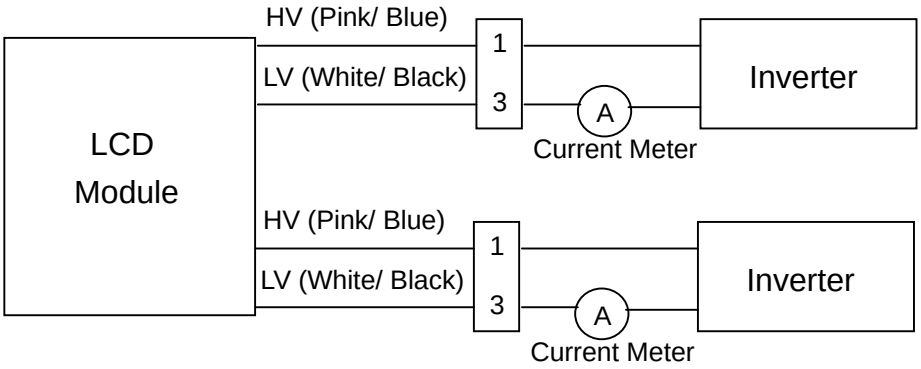
Active Area

3.2 BACKLIGHT UNIT

Ta = 25 ± 2 ºC

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Lamp Input Voltage	V_L	522	580	638	V_{RMS}	I_L = 8.0 mA
Lamp Current	I_L	2	8	8.5	mA_{RMS}	(1)
Lamp Turn On Voltage	V_S	--	--	1400 (0℃)	V_{RMS}	(2)
		--	--	1210 (25℃)	V_{RMS}	(2)
Operating Frequency	F_L	40	--	80	KHz	(3)
Lamp Life Time	L_{BL}	50000	--	--	Hrs	(5)
Power Consumption	P_L	4.18	4.64	5.1	W	(4), I_L = 8.0 mA

Note (1) Lamp current is measured by utilizing a high frequency current meter as shown below:



Note (2) The voltage that must be larger than Vs should be applied to the lamp for more than 1 second after startup. Otherwise, the lamp may not be turned on normally.

Note (3) The lamp frequency may generate interference with horizontal synchronous frequency from the display, and this may cause line flow on the display. In order to avoid interference, the lamp frequency should be detached from the horizontal synchronous frequency and its harmonics as far as possible.

Note (4) $P_L = I_L \times V_L$

Note (5) The lifetime of lamp is defined as the time when it continues to operate under the conditions at Ta = 25 ±2 °C and I_L =8.0mA_{RMS} until one of the following events occurs:

(a) When the brightness becomes ≤ 50% of its original value.

(b) When the effective ignition length becomes ≤ 80% of its original value. (Effective ignition length is defined as an area that the brightness is less than 70% compared to the center point.)

Note (6) The waveform of the voltage output of inverter must be area-symmetric and the design of the inverter must have specifications for the modularized lamp. The performance of the Backlight, such as lifetime or brightness, is greatly influenced by the characteristics of the DC-AC inverter for the lamp. All the parameters of an inverter should be carefully designed to avoid generating too much current leakage from high voltage output of the inverter. When designing or ordering the inverter please make sure that a poor lighting caused by the mismatch of the Backlight and the inverter (miss-lighting, flicker, etc.) never occurs. If the above situation is confirmed, the module should be operated in the same manners when it is installed in your instrument.

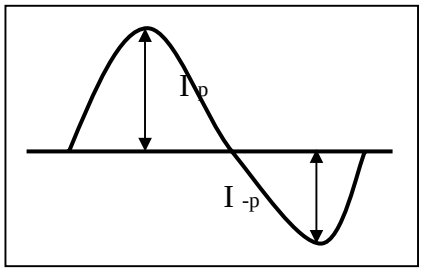
The output of the inverter must have symmetrical (negative and positive) voltage waveform and symmetrical current waveform.(Unsymmetrical ratio is less than 10%) Please do not use the inverter which has unsymmetrical voltage and unsymmetrical current and spike wave. Lamp frequency may produce interface with horizontal synchronous frequency and as a result this may cause beat on the display. Therefore lamp frequency shall be as away possible from the horizontal synchronous frequency and from its harmonics in order to prevent interference.

Requirements for a system inverter design, which is intended to have a better display performance, a better power efficiency and a more reliable lamp. It shall help increase the lamp lifetime and reduce its leakage current.

a. The asymmetry rate of the inverter waveform should be 10% below;

b. The distortion rate of the waveform should be within $\sqrt{2} \pm 10\%$;

c. The ideal sine wave form shall be symmetric in positive and negative polarities



* Asymmetry rate:

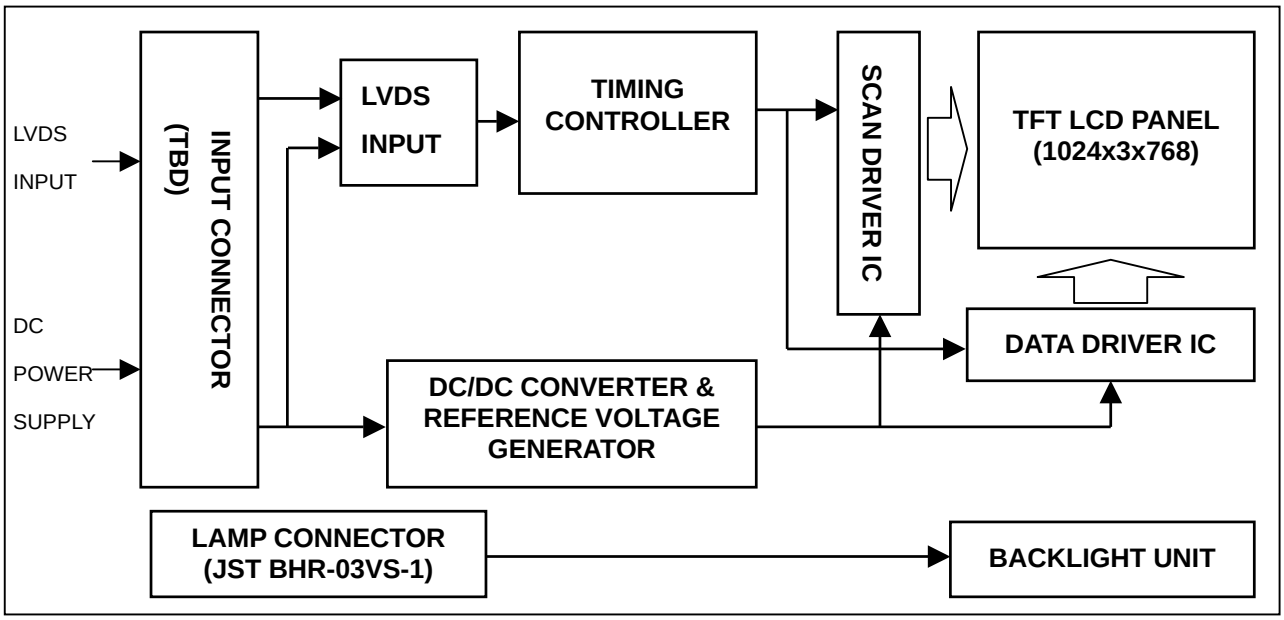
$$| I_p - I_{-p} | / I_{rms} * 100\%$$

* Distortion rate

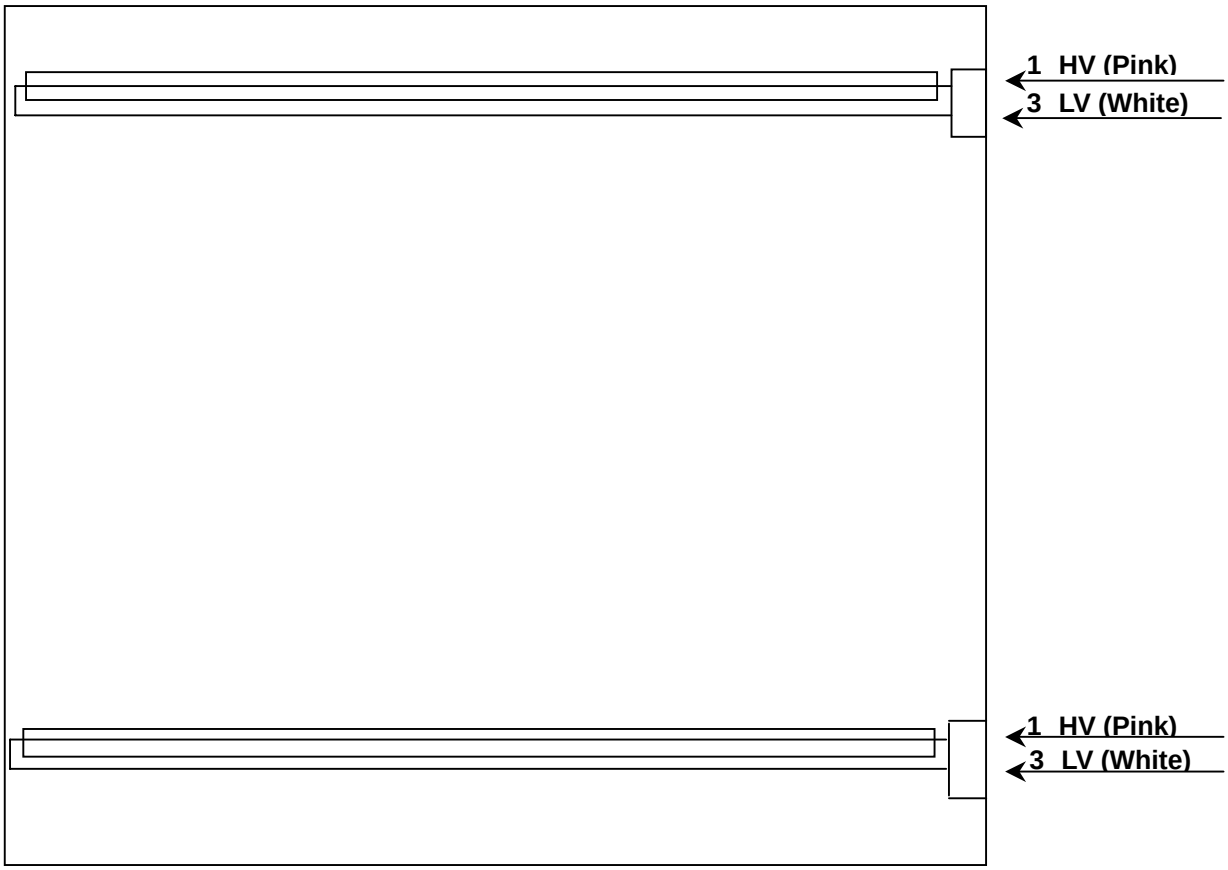
$$I_p \text{ (or } I_{-p}) / I_{rms}$$

4. BLOCK DIAGRAM

4.1 TFT LCD MODULE



4.2 BACKLIGHT UNIT



5. INPUT TERMINAL PIN ASSIGNMENT

5.1 TFT LCD MODULE

Pin No.	Symbol	Function	Polarity	Note
1	VDD	Power Supply +3.3V(typical)		
2	VDD	Power Supply +3.3V(typical)		
3	GND	Ground		
4	GND	Ground		
5	RX0-	LVDS Differential Data Input	Negative	
6	RX0+	LVDS Differential Data Input	Positive	
7	GND	Ground		
8	RX1-	LVDS Differential Data Input	Negative	
9	RX1+	LVDS Differential Data Input	Positive	
10	GND	Ground		
11	RX2-	LVDS Differential Data Input	Negative	
12	RX2+	LVDS Differential Data Input	Positive	
13	GND	Ground		
14	RXCLK-	LVDS Differential Data Input	Negative	
15	RXCLK+	LVDS Differential Data Input	Positive	
16	GND	Ground		
17	RX3-	LVDS Differential Data Input	Negative	
18	RX3+	LVDS Differential Data Input	Positive	
19	GND	Ground		
20	NC	tied to ground		

(1)Connector Part No.: [Hirose] DF14H-20P-1.25H

(2)Matching socket Part No.: [Hirose] DF14-20S-1.25C

5.2 BACKLIGHT UNIT

Pin	Symbol	Description	Color
1	HV	High Voltage	Pink/ Blue
3	LV	Ground	White/ Black

Note (1) Connector Part No.: BHR-03VS-1 (JST) or equivalent

Note (2) Matching Connector Part No.: TBD or equivalent

5.3 COLOR DATA INPUT ASSIGNMENT

The brightness of each primary color (red, green and blue) is based on the 8-bit gray scale data input for the color. The higher the binary input the brighter the color. The table below provides the assignment of color versus data input.

Color		Data Signal																							
		Red								Green								Blue							
		R7	R6	R5	R4	R3	R2	R1	R0	R7	R6	G5	G4	G3	G2	G1	G0	R7	R6	B5	B4	B3	B2	B1	B0
Basic Colors	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
Gray Scale Of Red	Red(0) / Dark	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)	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(2)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Red(252)	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(252)	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(252)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gray Scale Of Green	Green(0)/Dark	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(1)	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(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
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	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Green(252)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0
	Green(252)	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(252)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Gray Scale Of Blue	Blue(0) / Dark	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(1)	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(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
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	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Blue(252)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1
	Blue(252)	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(252)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

Note (1) 0: Low Level Voltage, 1: High Level Voltage

6. INTERFACE TIMING

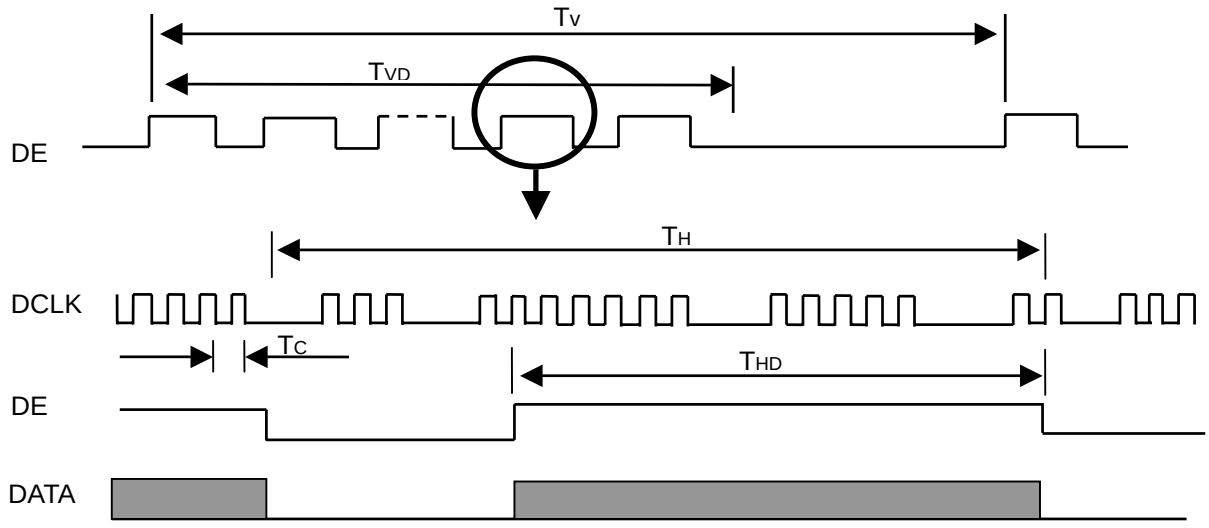
6.1 INPUT SIGNAL TIMING SPECIFICATIONS

The input signal timing specifications are shown as the following table and timing diagram.

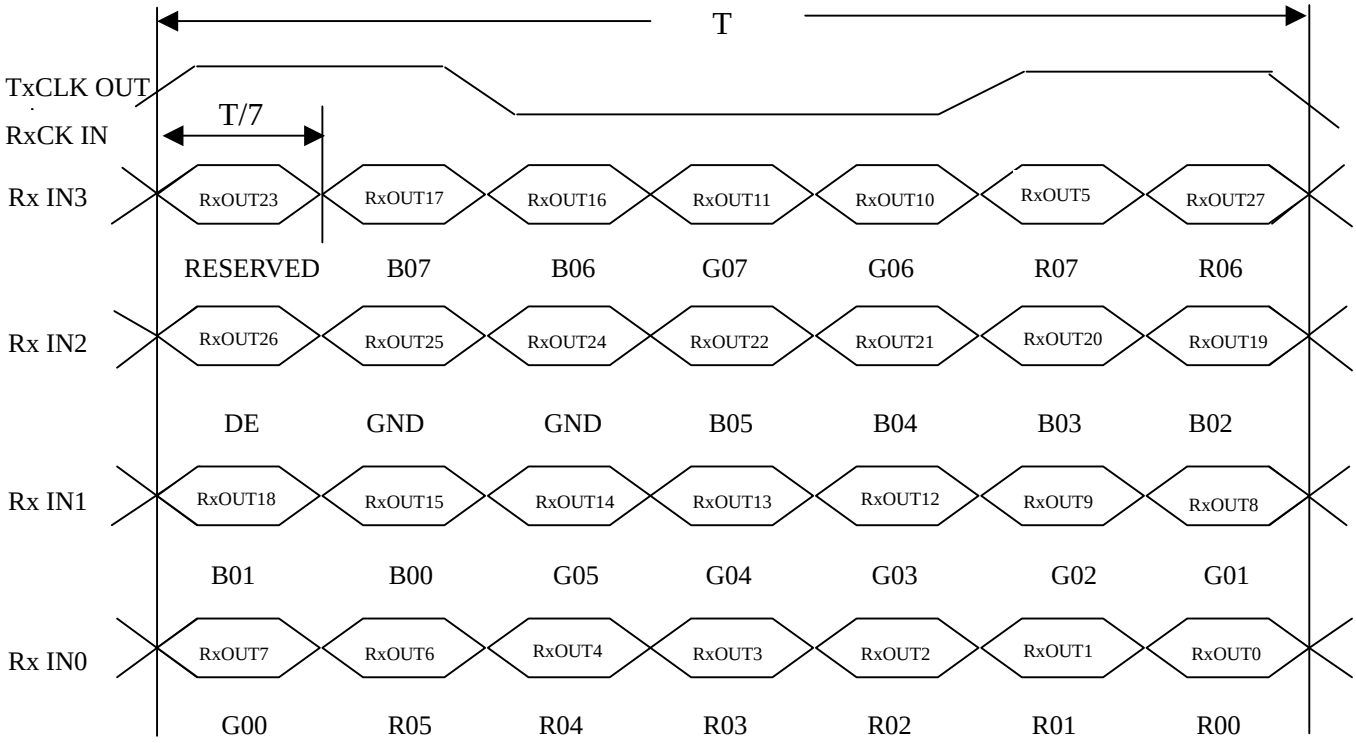
Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
DCLK	Pixel Clock	$1/T_C$	-	65	80	MHz	-
DE	Vertical Total Time	T_V	780	806	1200	T_H	-
	Vertical Address Time	T_{VD}	768	768	768	T_H	-
	Horizontal Total Time	T_H	1140	1344	1600	T_C	-
	Horizontal Address Time	T_{HD}	1024	1024	1024	T_C	-

Note (1) Because this module is operated by DE only mode, Hsync and Vsync input signals should be set to low logic level or ground. Otherwise, this module would operate abnormally.

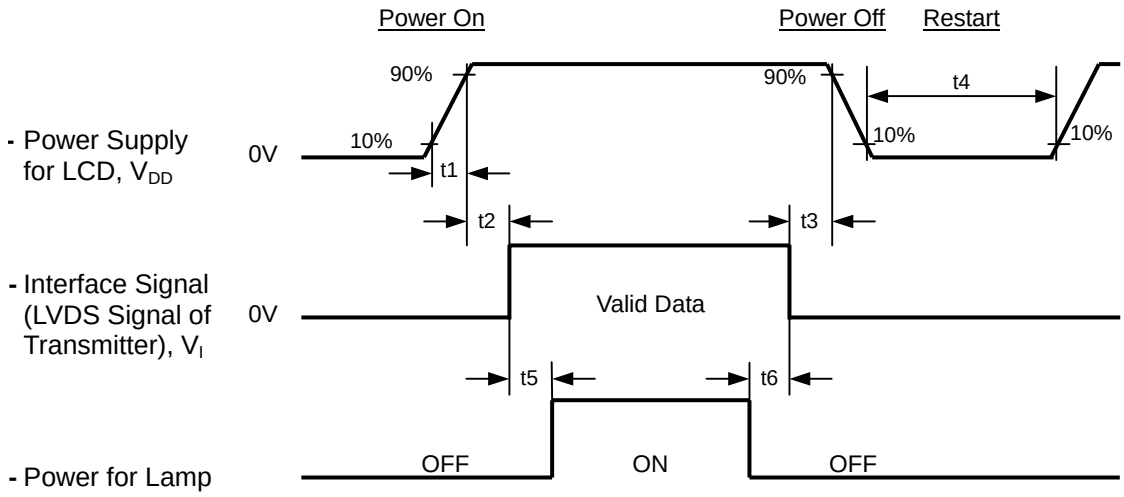
INPUT SIGNAL TIMING DIAGRAM



TIMING DIAGRAM of LVDS



6.2 POWER ON/OFF SEQUENCE



Timing Specifications:

$0.5 < t1 \leqq 10$ msec

$0 < t2 \leqq 50$ msec

$0 < t3 \leqq 50$ msec

$t4 \geqq 500$ msec

$t5 \geqq 200$ msec

$t6 \geqq 200$ msec

Note (1) Please avoid floating state of interface signal at invalid period.

Note (2) When the interface signal is invalid, be sure to pull down the power supply of LCD V_{DD} to 0 V.

Note (3) The Backlight inverter power must be turned on after the power supply for the logic and the interface signal is valid. The Backlight inverter power must be turned off before the power supply for the logic and the interface signal is invalid.

7. OPTICAL CHARACTERISTICS

7.1 TEST CONDITIONS

Item	Symbol	Value	Unit
Ambient Temperature	Ta	25±2	°C
Ambient Humidity	Ha	50±10	%RH
Supply Voltage	V_{DD}	3.3	V
Input Signal	According to typical value in "3. ELECTRICAL CHARACTERISTICS"		
Inverter Current	I_L	8.0	mA
Inverter Operating Frequency	F_L	51	KHz
Inverter	SUMIDA H05 5052		

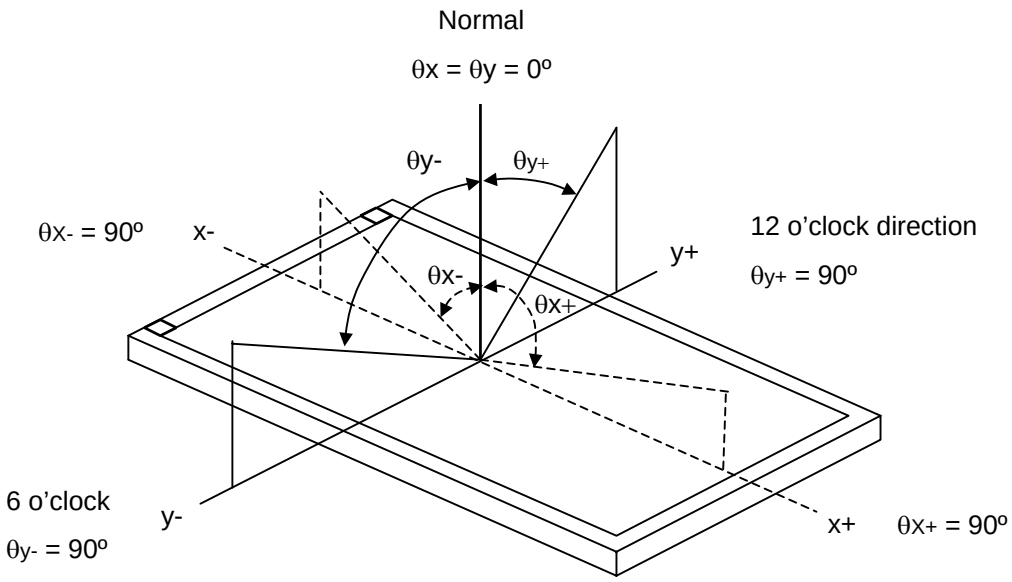
The measurement methods of optical characteristics are shown in Section 7.2. The following items should be measured under the test conditions described in Section 7.1 and stable environment shown in Note (4).

7.2 OPTICAL SPECIFICATIONS

The relative measurement methods of optical characteristics are shown in 7.2. The following items should be measured under the test conditions described in 7.1 and stable environment shown in Note (6).

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Color Chromaticity	Red	Rx	θ_x=0°, θ_Y =0° CS-1000T	Typ - 0.03	0.613	Typ+ 0.03		(1), (6)
		Ry			0.344			
	Green	Gx			0.302			
		Gy			0.567			
	Blue	Bx			0.144			
		By			0.102			
	White	Wx			0.313			
		Wy			0.329			
Center Luminance of White		L_C		400	450		cd/m^2	(4), (6)
Contrast Ratio		CR		480	700		-	(2), (6)
Response Time		T_R	θ_x=0°, θ_Y =0°	-	8	13	ms	(3)
		T_F		-	17	22		
White Variation		δW	θ_x=0°, θ_Y =0° BM-5A	-	1.25	1.4	-	(6), (7)
Cross Talk		CT		---	---	5.0	%	(5), (6)
Viewing Angle	Horizontal	θ_x+	CR ≧ 10 BM-5A	70	80		Deg.	(1),(6), (8)
		θ_x-		70	80			
	Vertical	θ_Y+		70	80			
		θ_Y-		70	80			

Note (1) Definition of Viewing Angle (θx, θy):



Note (2) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L255 / L0

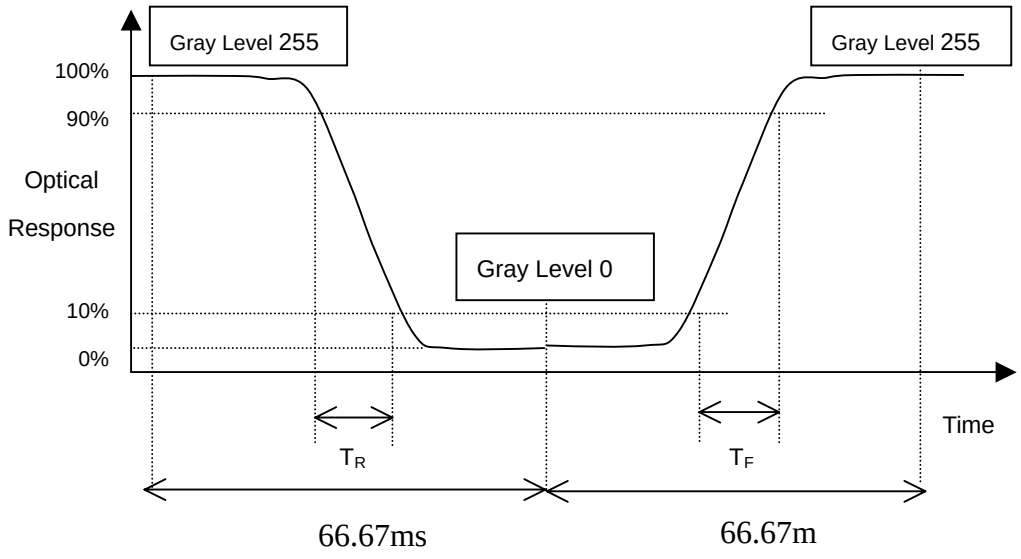
L255: Luminance of gray level 255

L 0: Luminance of gray level 0

CR = CR (1)

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note (5).

Note (3) Definition of Response Time (T_R, T_F):



Note (4) Definition of Luminance of White (L_C):

Measure the luminance of gray level 255 at center point

$L_C = L (5)$

L (x) is corresponding to the luminance of the point X at Figure in Note (7).

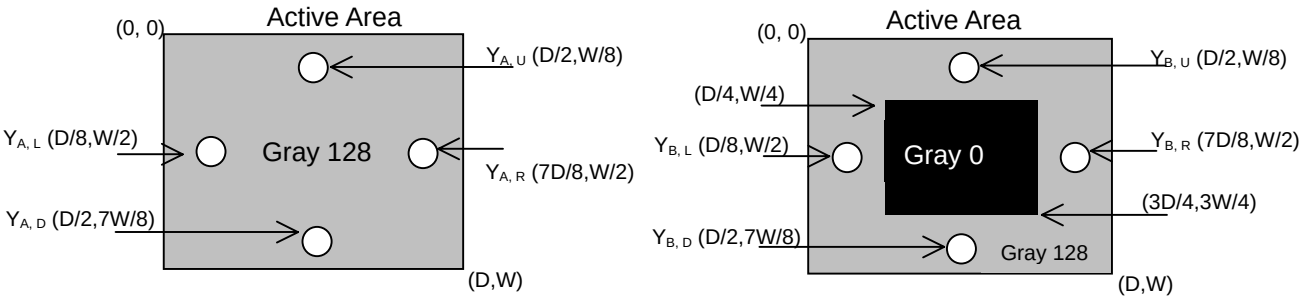
Note (5) Definition of Cross Talk (CT):

$CT = | Y_B – Y_A | / Y_A \times 100 (\%)$

Where:

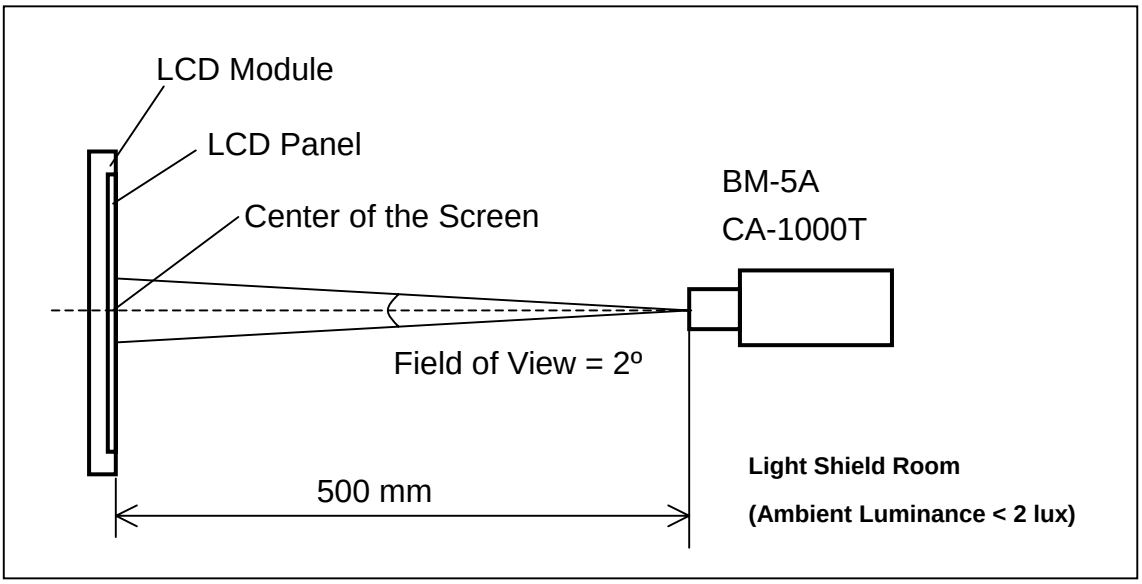
Y_A = Luminance of measured location without gray level 0 pattern (cd/m^2)

Y_B = Luminance of measured location with gray level 0 pattern (cd/m^2)



Note (6) Measurement Setup:

The LCD module should be stabilized at given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



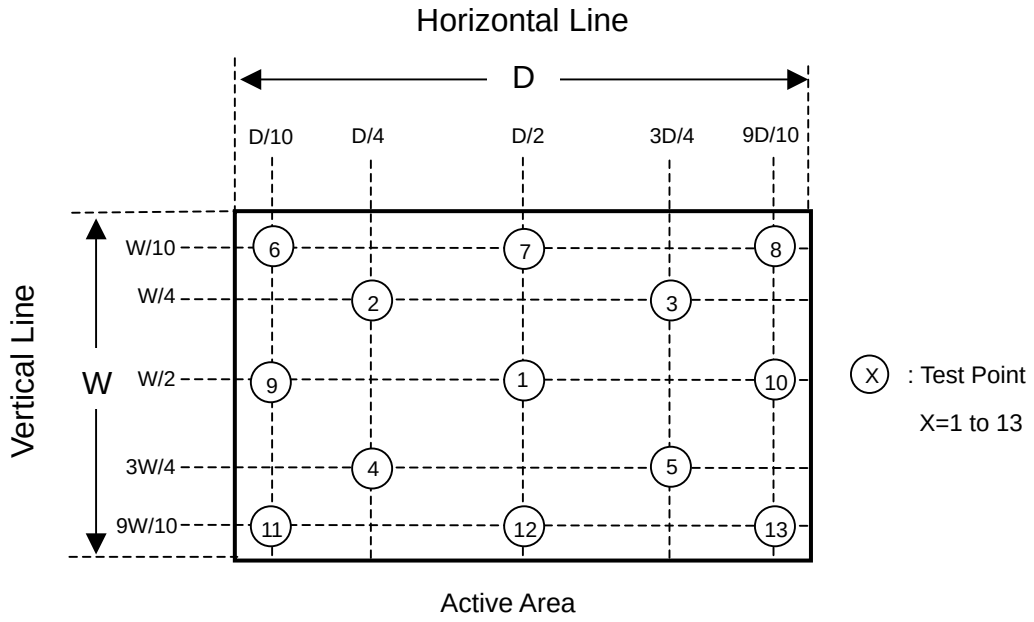
Note (7) Definition of luminance measured points:

Measure the luminance of gray level 255 at point L(1)

Definition of White Variation (δW):

Measure the luminance of gray level 255 at 9 points

$$\delta W = \frac{\text{Maximum [L (1), L (6), L (7), L (8), L (9), L (10), L (11), L (12), L (13)]}}{\text{Minimum [L (1), L (6), L (7), L (8), L (9), L (10), L (11), L (12), L (13)]}}$$



Note (8) TN type has Gray scale inversion occurs at $\theta_{y+} = 40^{o}$

8. PRECAUTIONS

8.1 HANDLING PRECAUTIONS

(1) The module should be assembled into the system firmly by using every mounting hole. Be careful not to twist or bend the module.

(2) While assembling or installing modules, it can only be in the clean area. The dust and oil may cause electrical short or damage the polarizer.

(3) Use fingerstalls or soft gloves in order to keep display clean during the incoming inspection and assembly process.

(4) Do not press or scratch the surface harder than a HB pencil lead on the panel because the polarizer is very soft and easily scratched.

(5) If the surface of the polarizer is dirty, please clean it by some absorbent cotton or soft cloth. Do not use Ketone type materials (ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanently damage the polarizer due to chemical reaction.

(6) Wipe off water droplets or oil immediately. Staining and discoloration may occur if they left on panel for a long time.

(7) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contacting with hands, legs or clothes, it must be washed away thoroughly with soap.

(8) Protect the module from static electricity, it may cause damage to the C-MOS Gate Array IC.

(9) Do not disassemble the module.

(10) Do not pull or fold the lamp wire.

(11) Pins of I/F connector should not be touched directly with bare hands.

8.2 STORAGE PRECAUTIONS

(1) High temperature or humidity may reduce the performance of module. Please store LCD module within the specified storage conditions.

(2) It is dangerous that moisture come into or contacted the LCD module, because the moisture may damage LCD module when it is operating.

(3) It may reduce the display quality if the ambient temperature is lower than 10 ºC. For example, the response time will become slowly, and the starting voltage of lamp will be higher than the room temperature.

8.3 OPERATION PRECAUTIONS

(1) Do not pull the I/F connector in or out while the module is operating.

(2) Always follow the correct power on/off sequence when LCD module is connecting and operating. This can prevent the CMOS LSI chips from damage during latch-up.

The startup voltage of Backlight is approximately 1000 Volts. It may cause electrical shock while assembling with inverter. Do not disassemble the module or insert anything into the Backlight unit.

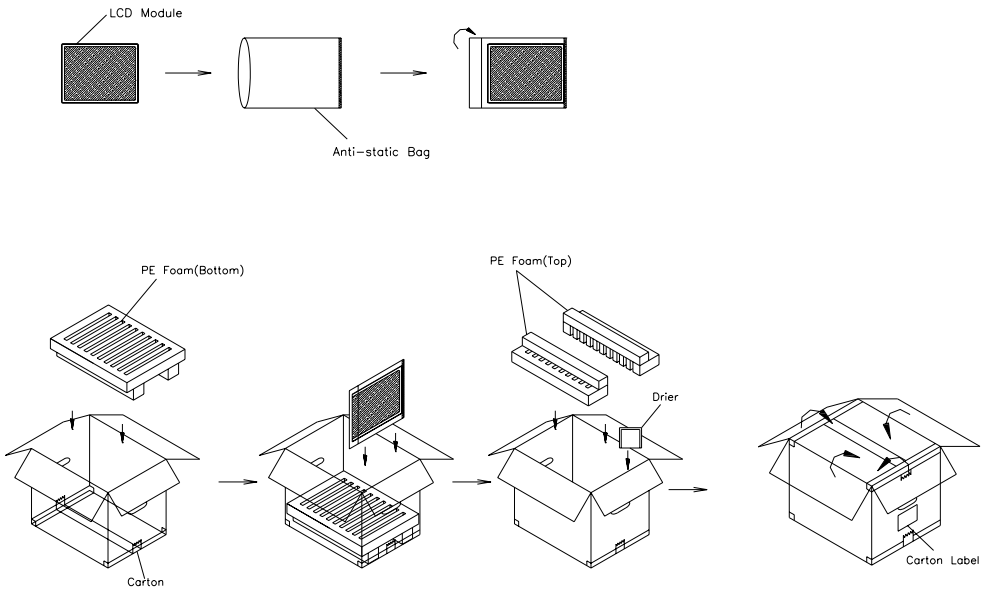
9. PACKAGING

9.1 PACKING SPECIFICATIONS

(1) 10 LCD modules / 1 Box

(2) Box dimensions : 511(L) X 420(W) X 360(H) mm

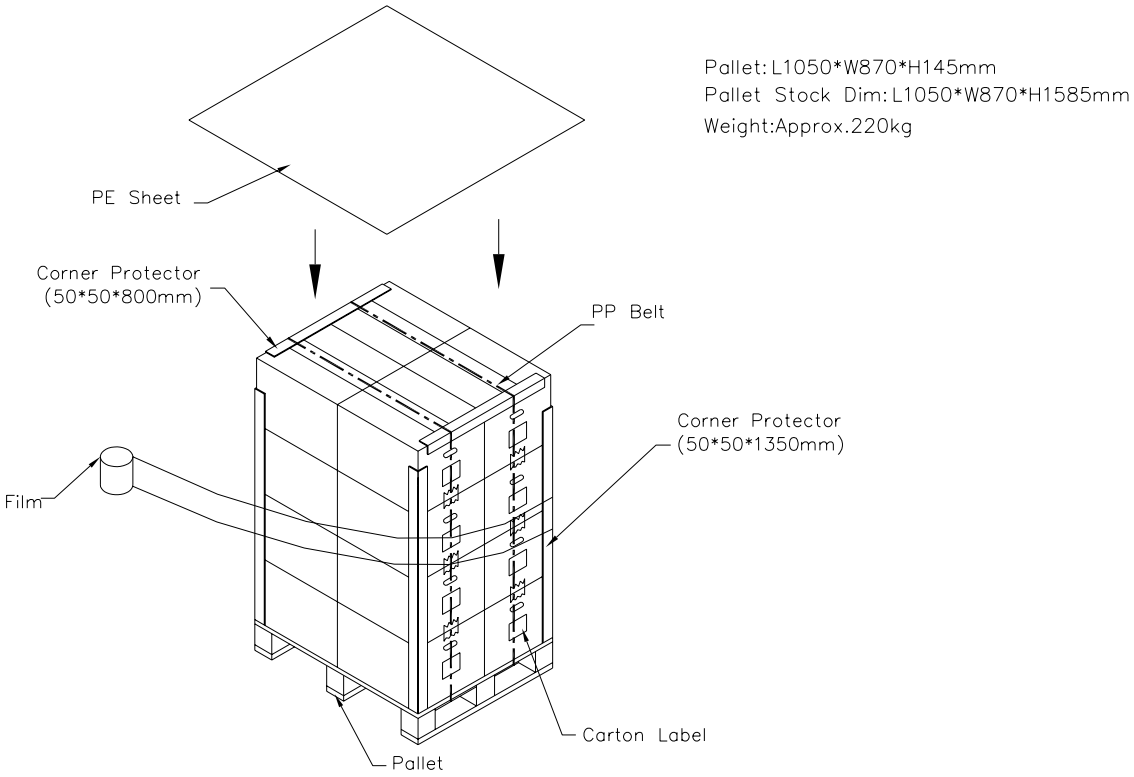
(3) Weight : approximately 12.7Kg (10 modules per box)



(1) 10 modules/1 box
(2) Carton dimensions : 511(L)x420(W)x360(H)mm
(3) Weight : approximately 12.7kg(10 modules per box).

Figures 9-1

9.2 PACKING Method

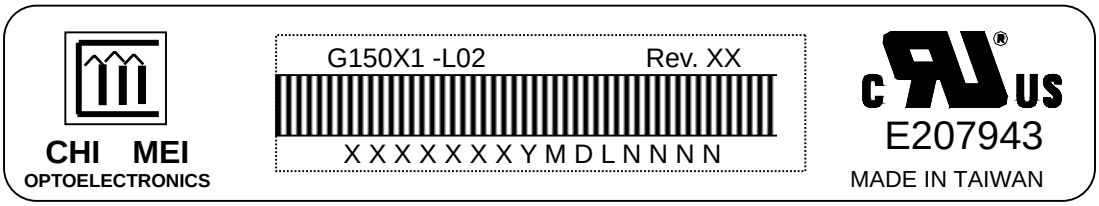


Figures 9-2

10. DEFINITION OF LABELS

10.1 CMO MODULE LABEL

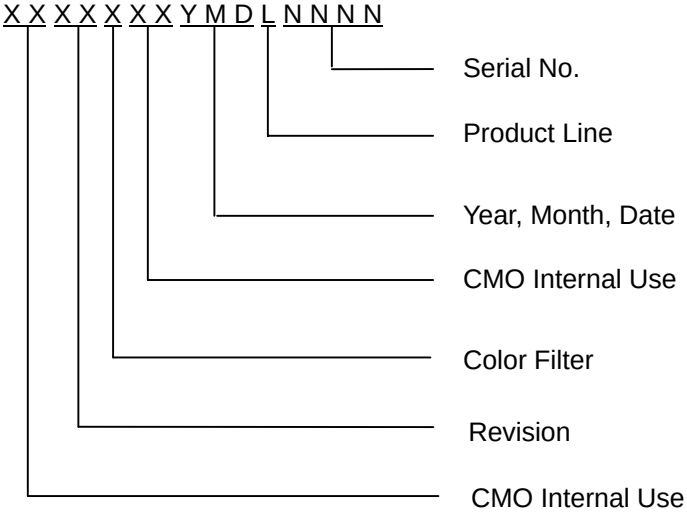
The barcode nameplate is pasted on each module as illustration, and its definitions are as following explanation.



(a) Model Name: G150X1 –L02

(b) Revision: Rev. XX, for example: C1, C2 …etc.

(c) Serial ID: X X X X X X X Y M D L N N N N



Serial ID includes the information as below:

(a) Manufactured Date: Year: 1~9, for 2000~2009

Month: 1~9, A~C, for Jan. ~ Dec.

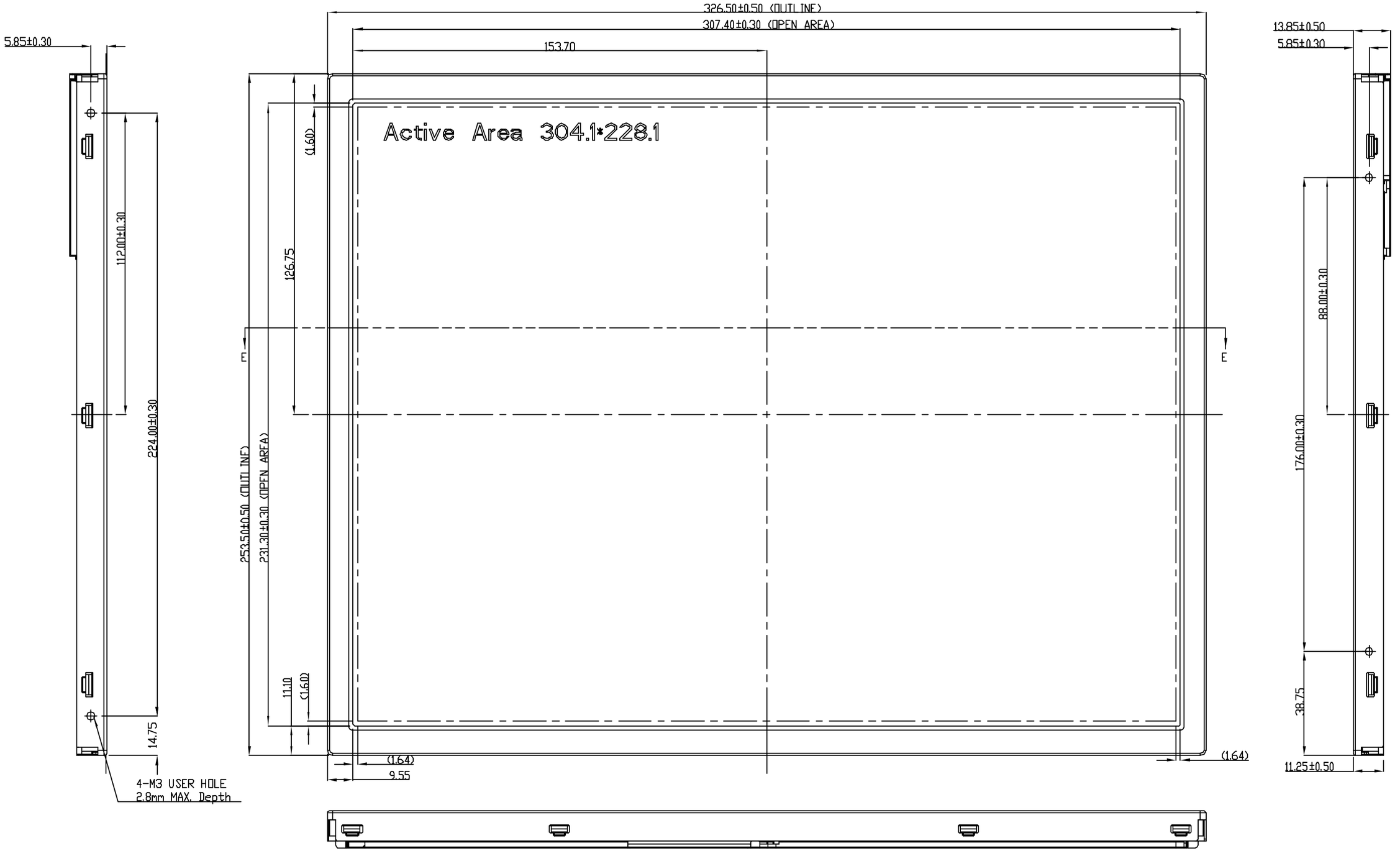
Day: 1~9, A~Y, for 1st to 31st, exclude I and O

(b) Revision Code: cover all the change

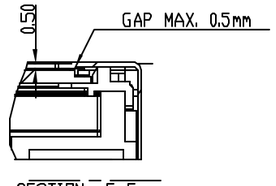
(c) Color Filter: 0 ->CMO, 2 -> Toppan

(d) Serial No.: Manufacturing sequence of product

(e) Product Line: 1 -> Line1, 2 -> Line 2, …etc.



NOTE:
1.OUTLINE TOLERANCE:±0.5mm.
2.I/F CONNECTOR: DF14H-20P-1.25H (Hirose)
3.LAMP CONNECTOR: BHR-03VS-1 (JST)
4.SIDE MOUNT HOLE ROTATIONAL TORQUE MUST BE MAX. 5kgf-cm.



SECTION E-E
SCALE 2:1

Mark	Description	Date	Changed_By	Approved_By	ECN No.	Remark

TITLE	ASSY_MODULE_G150X1					2D REV.	A
						3D REV.	2
Approved	JEMMY_CHANG	Drawing No.	G150141D1A				
Checked	RICKY_YANG	Part No.	MF0X50190L				
Drawer	JS_JIANG	Material	TBD		Sheet	1 / 2	A2
Designer	JS_JIANG	Date	22-May-2006	Scale	1:1	Unit:mm	

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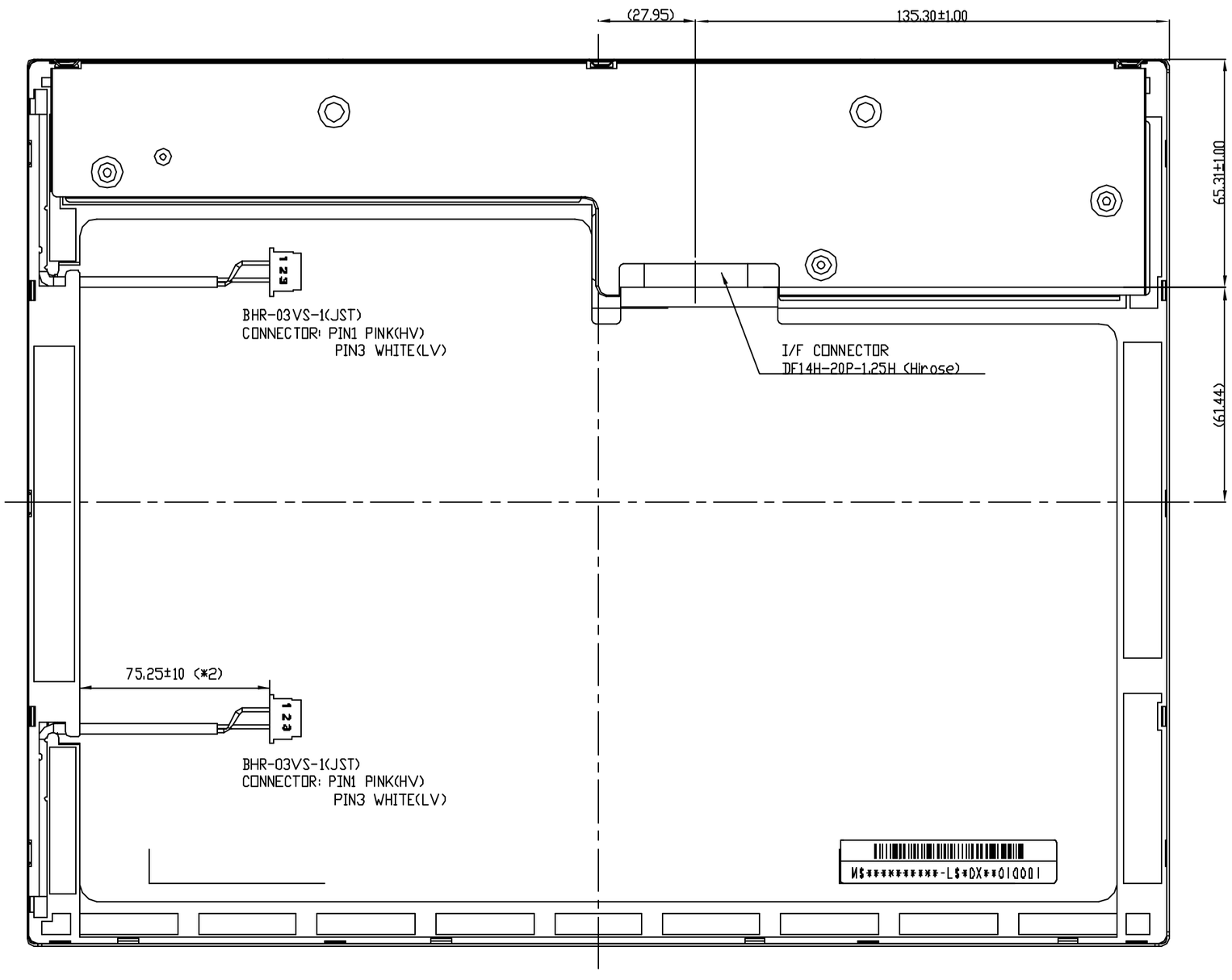

NOTE:
1.OUTLINE TOLERANCE:±0.5mm.
2.I/F CONNECTOR: DF14H-20P-1.25H (Hirose)
3.LAMP CONNECTOR: BHR-03VS-1 (JST)
4.SIDE MOUNT HOLE ROTATIONAL TORQUE MUST BE MAX. 5kgf-cm.

Mark	Description	Date	Changed_By	Approved_By	ECN No.	Remark

TITLE	ASSY_MODULE_G150X1					2D REV.	A
						3D REV.	2
Approved	JEMMY_CHANG	Drawing No.	G150141D1A				
Checked	ROCKY_YANG	Part No.	MF0X501901				
Drawer	JS_JIANG	Material	TBD		Sheet	2 / 2	A2
Designer	JS_JIANG	Date	22-May-2006	Scale	1:1	Unit:mm	

CHI MEI OPTOELECTRONICS CORP.