Doc. Number:

☐ Tentative Specification
☐ Preliminary Specification
■ Approval Specification

MODEL NO.: N070ICG-LD1

Customer:

APPROVED BY **SIGNATURE**

Name / Title
Note

Please return 1 copy for your confirmation with your signature and comments.

Approved By	Checked By	Prepared By
KJ Cheng	Pam Liang	Phoebe Huang

- CONTENTS -

REVISION HISTORY

Version	Date	Page (New)	Section	Description
Final-spec 01	2012/04/09	All	All	Product spec was first issued.
Version 2.0	2014/12/08	4	2.1	Update Connector Type
		7	4.1	Update Function Block Diagram
		7	4.2	Update Pin3, Pin5, Pin 6 of PIN ASSIGNMENT to NC.
		22	7	Add Packing information
		25	8	Update Module Drawing

1. GENERAL DESCRIPTION

1.1 OVERVIEW

N070ICG-LD1 is a 7” (6.95” diagonal) TFT Liquid Crystal Display module with LED Backlight unit and 39 pins LVDS interface. This module supports 1280 x 800 WXGA mode.

1.2 GENERAL SPECIFICATI0NS

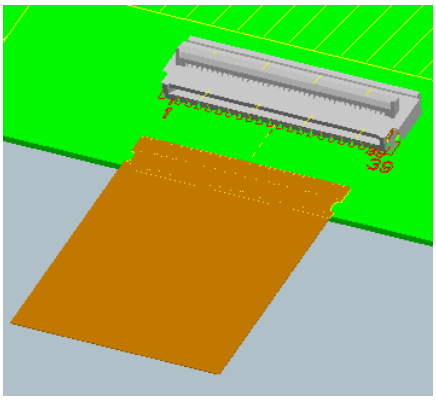
Item	Specification	Unit	Note
Screen Size	6.95” diagonal		
Driver Element	a-si TFT active matrix	-	-
Pixel Number	1280 x R.G.B. x 800	pixel	-
Pixel Pitch	0.117 (H) x 0.117 (V)	mm	-
Pixel Arrangement	RGB vertical stripe	-	-
Display Colors	16777216 (8 bit)	color	-
Transmissive Mode	Normally Black	-	-
Surface Treatment	Hard coating (3H), Glare	-	-
Luminance, White	400	Cd/m2	-

2. MECHANICAL SPECIFICATIONS

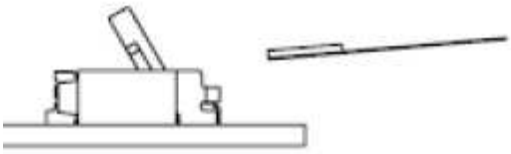
Item		Min.	Typ.	Max.	Unit	Note
Module Size	Horizontal (H)	160.8	161	161.2	mm	(1)
	Vertical (V)	106.8	107	107.2	mm	
	Thickness_ Top (T)	-	2.5	2.7	mm	
	Thickness_ Bottom (T)	-	4.26	4.46	mm	
	Thickness_ Bottom w/ Label(T)		4.39	4.59	mm	
Bezel Area	Horizontal	151.46	151.76	152.06	mm	
	Vertical	95.3	95.6	95.9	mm	
Active Area	Horizontal	149.46	149.76	150.06	mm	
	Vertical	93.3	93.6	93.9	mm	
Weight		-	85	95	g	

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

2.1 CONNECTOR TYPE



Insert the FPC with the conductive surface facing down. Insert the FPC so that it is perpendicular with respect to the connector.



Please refer Appendix Outline Drawing for detail design.

User's connector Part No: CviLux- CF38392D1R0-NH or equivalent.

3. ABSOLUTE MAXIMUM RATINGS

3.1 ABSOLUTE RATINGS OF ENVIRONMENT (Note1)

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Power voltage	VCCS	-0.3	5	V	
Storage Temperature	T_{ST}	-20	+70	ºC	(2)
Operating Ambient Temperature	T_{OP}	-10	+60	ºC	(2), (3)

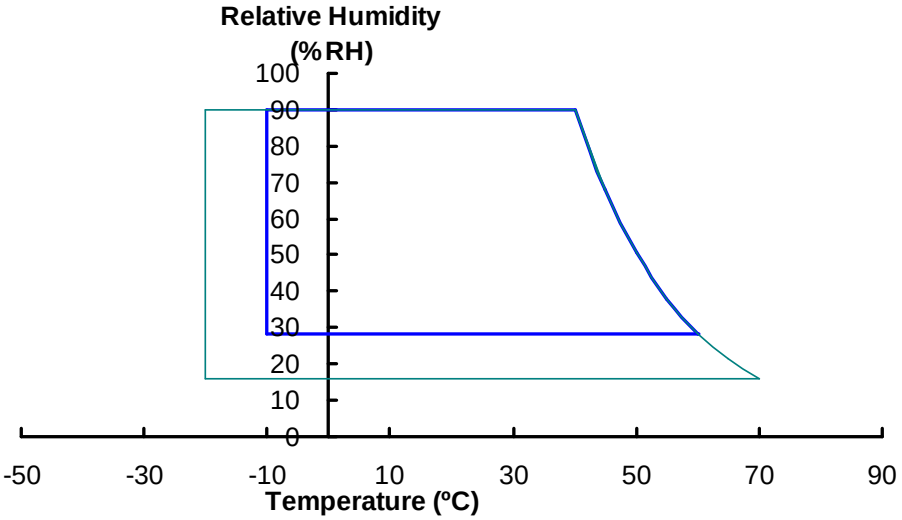
Note (1): The absolute maximum rating values of this product are not allowed to be exceeded at any times. A module should be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme condition, the module may be permanently destroyed.

Note (2) (a) 90 %RH Max. (Ta <= 40 ºC).

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

(c) No condensation.

Note (3) The temperature of panel surface should be -10 ºC min. and 70 ºC max.



3.2 ELECTRICAL ABSOLUTE RATINGS

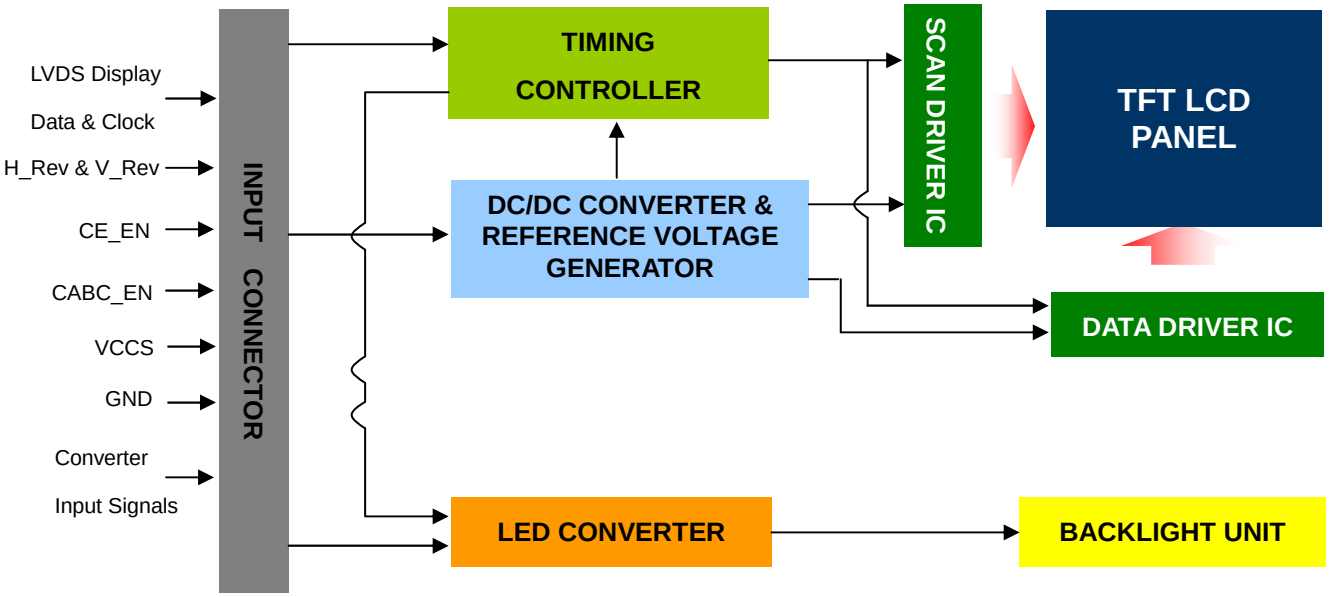
3.2.1 TFT LCD MODULE

Item	Symbol	Value			Unit	Note
		Min.	Typ	Max.		
Driver Digital Power	VCCS	-0.3	-	5	V	(1)
Data Driver Analog power	AVDD	-0.5	-	15	V	
TFT Turn-on Voltage	VGG	-0.3	-	40	V	(1)
TFT Turn-off Voltage	VEE	-20	-	0.3	V	(1)
Supply range, VGG-VEE	VGG-VEE	-0.3	-	40	V	(1)
Digital Input Voltage	Vi	-0.3	-	4	V	(1)
VCOM Voltage	VCOM	-	(4)	-	V	(1)

Note (1) Stresses beyond those listed in above “ELECTRICAL ABSOLUTE RATINGS” may cause permanent damage to the device. Normal operation should be restricted to the conditions described in “ELECTRICAL CHARACTERISTICS”.

4. ELECTRICAL SPECIFICATIONS

4.1 FUNCTION BLOCK DIAGRAM



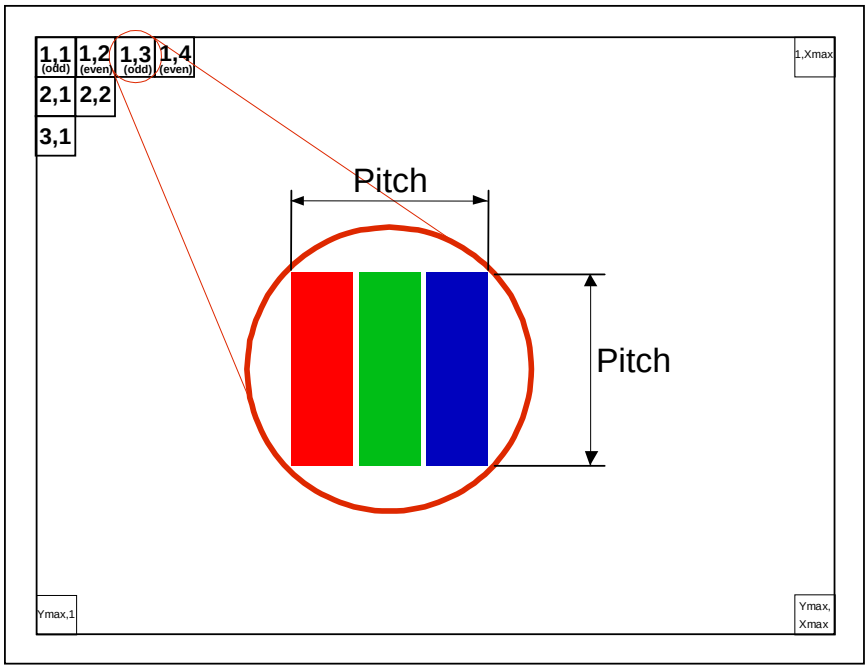
4.2. INTERFACE CONNECTIONS

PIN ASSIGNMENT

Pin	Symbol	Description	Remark
1	VCCS	Power Supply (3.3V typ.)	
2	VCCS	Power Supply (3.3V typ.)	
3	NC	No Connection	
4	NC	No Connection (Reserved for CMI test)	
5	NC	No Connection	
6	NC	No Connection	
7	Rxin0-	LVDS differential data input	R0-R5, G0
8	Rxin0+	LVDS differential data input	
9	VSS	Ground	
10	Rxin1-	LVDS differential data input	G1~G5, B0, B1
11	Rxin1+	LVDS differential data input	
12	VSS	Ground	
13	Rxin2-	LVDS Differential Data Input	B2-B5,HS,VS, DE
14	Rxin2+	LVDS Differential Data Input	
15	VSS	Ground	
16	RxCLK-	LVDS differential clock input	LVDS CLK
17	RxCLK+	LVDS differential clock input	
18	VSS	Ground	
19	Rxin3-	LVDS Differential Data Input	R[6], R[7], G[6], G[7], B[6], B[7]
20	Rxin3+	LVDS Differential Data Input	
21	VSS	Ground	
22	CE_EN	Color Engine Function Enable	(3)
23	NC	No Connection (Reserve)	

24	VSS	Ground	
25	NC	No Connection (Reserve)	
26	NC	No Connection (Reserve)	
27	VSS	Ground	
28	H_Rev	Reverse Scanning Display in Horizontal	(2)
29	V_Rev	Reverse Scanning Display in Vertical	(2)
30	LED_GND	LED Ground	
31	LED_GND	LED Ground	
32	LED_GND	LED Ground	
33	NC	No Connection (Reserve)	
34	LED_PWM	PWM Control Signal of LED Converter	
35	LED_EN	Enable Control Signal of LED Converter	(3)
36	CABC_EN	CABC Enable Input	(3)
37	LED_VCCS	LED Power Supply	
38	LED_VCCS	LED Power Supply	
39	LED_VCCS	LED Power Supply	

Note (1) The first pixel is odd as shown in the following figure.



Note (2) The scanning display setting of H_Rev and V_Rev function are as follows.

Pin	Hi	Lo or Open
H_Rev	From Right to Left in Horizontal	From Left to Right in Horizontal
V_Rev	From Bottom to Top in Vertical	From Top to Bottom in Vertical

Hi = High level, Lo = Low level.

Note (3) The setting of CE/CABC function are as follows.

Pin	Enable	Disable
CE_EN	Hi	Lo or Open
LED_EN	Hi	Lo or Open
CABC_EN	Hi	Lo or Open

Hi = High level, Lo = Low level.

4.3 ELECTRICAL CHARACTERISTICS

4.3.1 LCD ELETRONICS SPECIFICATION

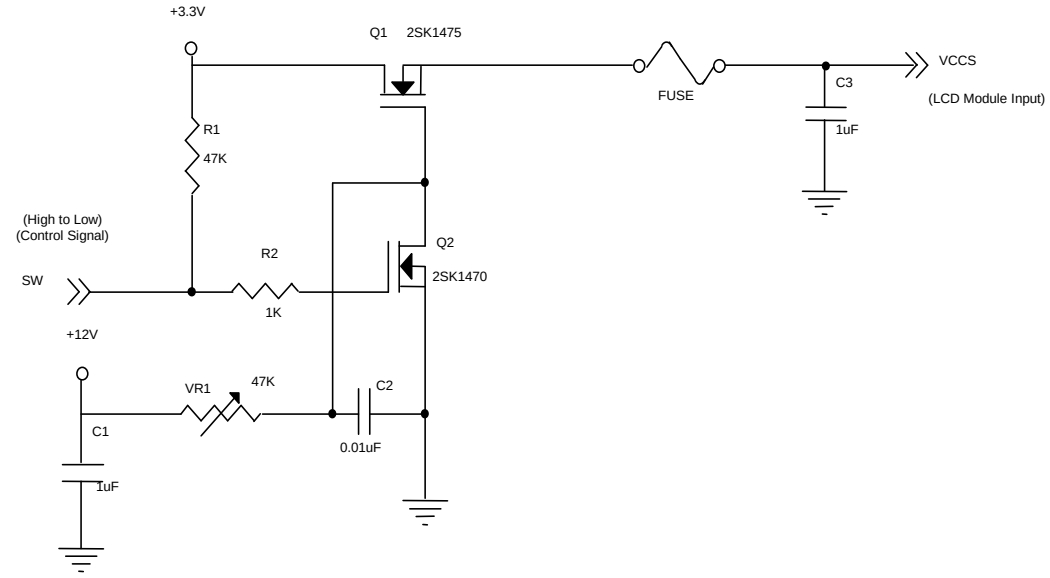
Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Power Supply Voltage		VCCS	3.0	3.3	3.6	V	(1)-
Ripple Voltage		V_{RP}	-	50	-	mV	(1)-
CABC_EN, CE_EN H_Rev, V_Rev Input Voltage	High Level	V_{IH}	(2.3)	-	(3.6)	V	
	Low Level	V_{IL}	(0)	-	(0.5)	V	
Inrush Current		I_{RUSH}	-	-	1.5	A	(1),(2)
Power Supply Current	Mosaic	Icc	-	(249)	(272)	mA	
	White		-	(273)	(300)	mA	

Note (1) The ambient temperature is Ta = 25 ± 2 ºC.

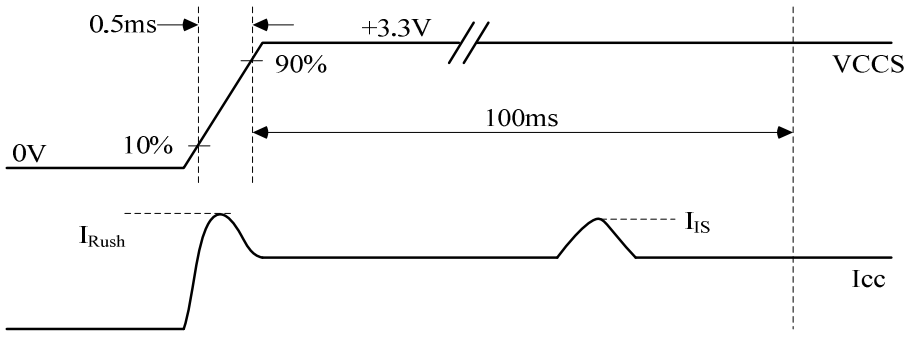
Note (2) I_{RUSH}: the maximum current when VCCS is rising

I_{IS}: the maximum current of the first 100ms after power-on

Measurement Conditions: Shown as the following figure. Test pattern: black.



VCCS rising time is 0.5ms



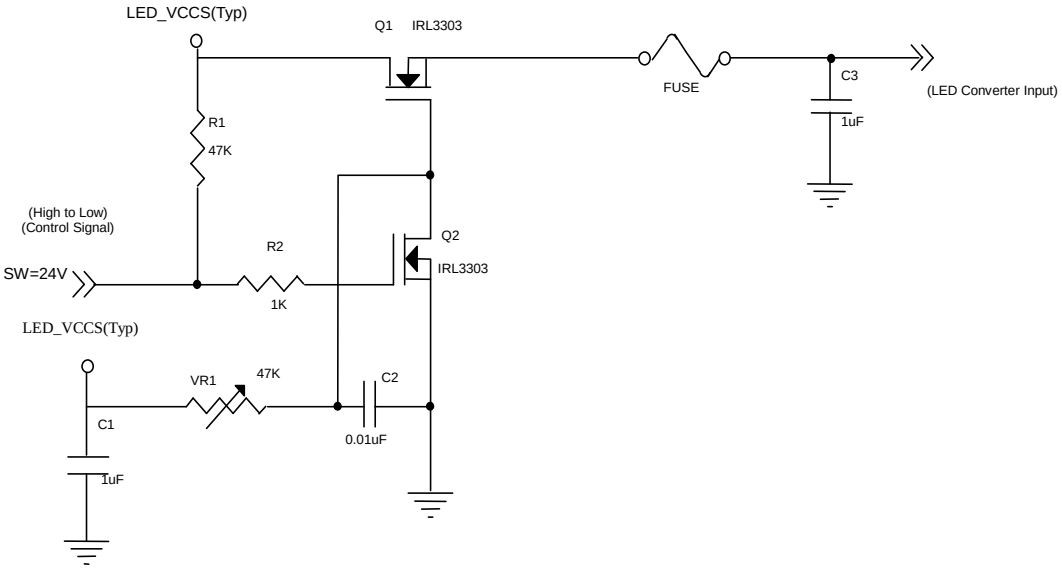
4.3.2 LED CONVERTER SPECIFICATION

Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Converter Input power supply voltage		LED_Vccs	(6.0)	(12.0)	(21.0)	V	
Converter Inrush Current		$ILED_{RUSH}$	-	-	(1.5)	A	(1)
EN Control Level	Backlight On		(2.3)	-	(5.0)	V	
	Backlight Off		0	-	(0.5)	V	
PWM Control Level	PWM High Level		(2.3)	-	(5.0)	V	
	PWM Low Level		0	-	(0.5)	V	
PWM Control Duty Ratio			(10)	-	100	%	
PWM Control Permissive Ripple Voltage		VPWM_pp	-	-	100	mV	
PWM Control Frequency		f_{PWM}	(190)	-	(20K)	Hz	(2)
LED Power Current	LED_VCCS =Typ.	ILED	(83)	(104)	(125)	mA	(3)

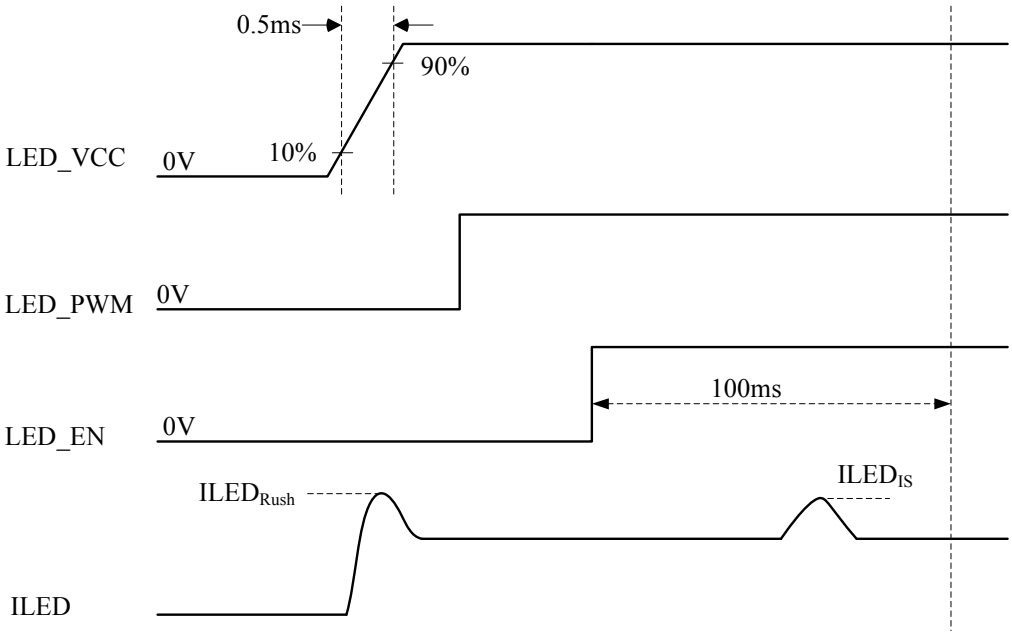
Note (1) $ILED_{RUSH}$: the maximum current when LED_VCCS is rising,

$ILED_{IS}$: the maximum current of the first 100ms after power-on,

Measurement Conditions: Shown as the following figure. LED_VCCS = Typ, Ta = 25 ± 2 ºC, f_{PWM} = 200 Hz, Duty=100%.



VLED rising time is 0.5ms



Note (2) If PWM control frequency is applied in the range less than 1KHz, the "waterfall" phenomenon on the screen may be found. To avoid the issue, it's a suggestion that PWM control frequency should follow the criterion as below.

PWM control frequency f_{PWM} should be in the range

$$(N + 0.33) * f \leq f_{PWM} \leq (N + 0.66) * f$$

N : Integer $(N \geq 3)$

f : Frame rate

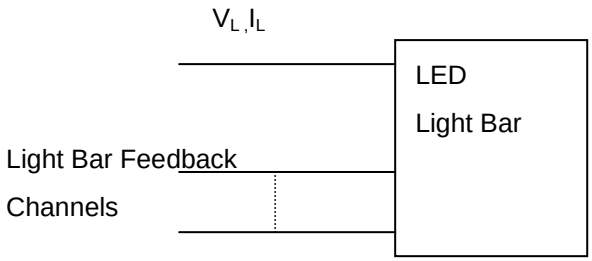
Note (3) The specified LED power supply current is under the conditions at "LED_VCCS = Typ.", Ta = 25 ± 2 ºC, f_{PWM} = 200 Hz, Duty=100%.

4.3.3 BACKLIGHT UNIT

Ta = 25 ± 2 ºC

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
LED Light Bar Power Supply Voltage	VL	22.5	26.1	27	V	(1)(2)(Duty100%)
LED Light Bar Power Supply Current	IL	40	42	44	mA	
Power Consumption	PL	0.9456	1.096	1.21	W	(3)
LED Life Time	L_{BL}	12000	-	-	Hrs	(4)

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



Note (2) For better LED light bar driving quality, it is recommended to utilize the adaptive boost converter with current balancing function to drive LED light-bar.

Note (3) $P_L = I_L \times V_L$ (Without LED converter transfer efficiency)

Note (4) The lifetime of LED is defined as the time when it continues to operate under the conditions at Ta = 25 ±2 °C and I_L = 20 mA(Per EA) until the brightness becomes ≦ 50% of its original value.

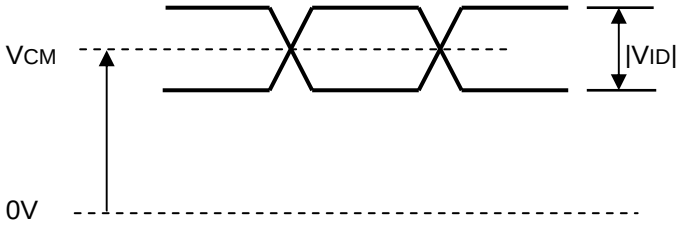
4.4 LVDS INPUT SIGNAL TIMING SPECIFICATIONS

4.4.1 LVDS DC SPECIFICATIONS

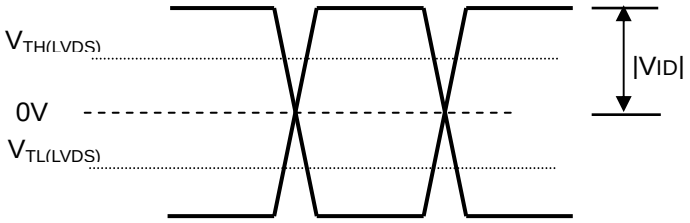
Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
LVDS Differential Input High Threshold	$V_{TH(LVDS)}$	-	-	+100	mV	(1), V_{CM}=1.2V
LVDS Differential Input Low Threshold	$V_{TL(LVDS)}$	-100	-	-	mV	(1) V_{CM}=1.2V
LVDS Common Mode Voltage	V_{CM}	1.125	-	1.375	V	(1)
LVDS Differential Input Voltage	$\|V_{ID}\|$	100	-	600	mV	(1)
LVDS Terminating Resistor	R_T	-	100	-	Ohm	-

Note (1) The parameters of LVDS signals are defined as the following figures.

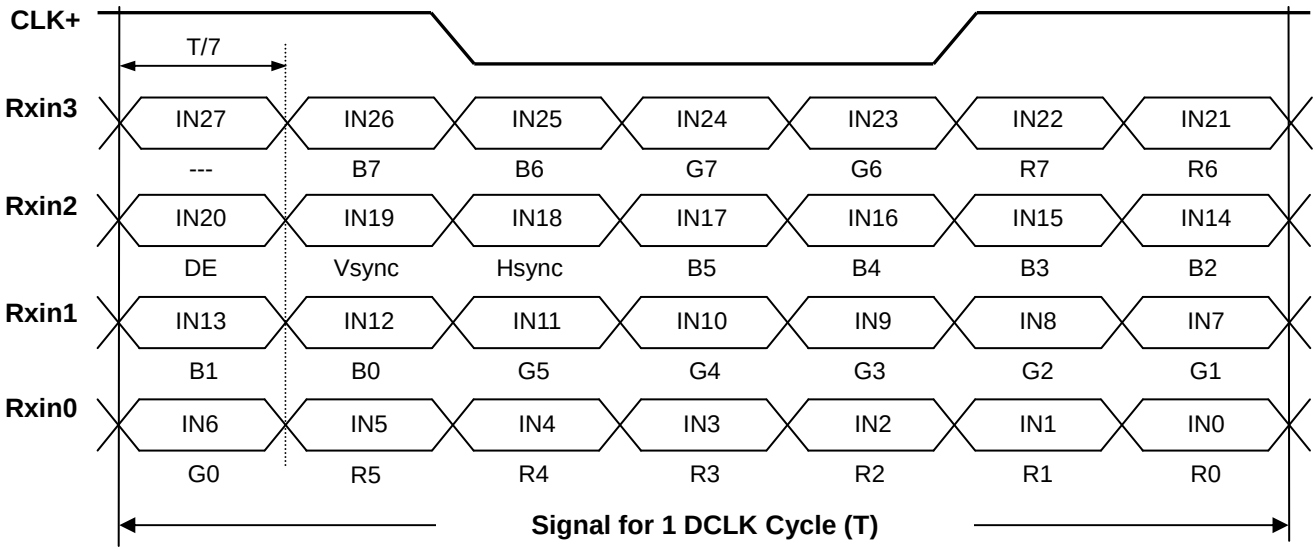
Single Ended



Differential



4.4.2 LVDS DATA FORMAT



4.4.3 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	…	R2	R1	R0	G7	G6	…	G2	G1	G0	B7	B6	…	B2	B1	B0
Basic Colors	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
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
	Red(1)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	Red(2)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Red(253)	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	Red(254)	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(255)	1	1	1	1	1	1	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
	Green(1)	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	Green(2)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Green(253)	0	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0	0	0
	Green(254)	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
	Green(255)	0	0	0	0	0	0	1	1	1	1	1	1	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
	Blue(1)	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	1	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Blue(253)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1
	Blue(254)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0
	Blue(255)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1

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

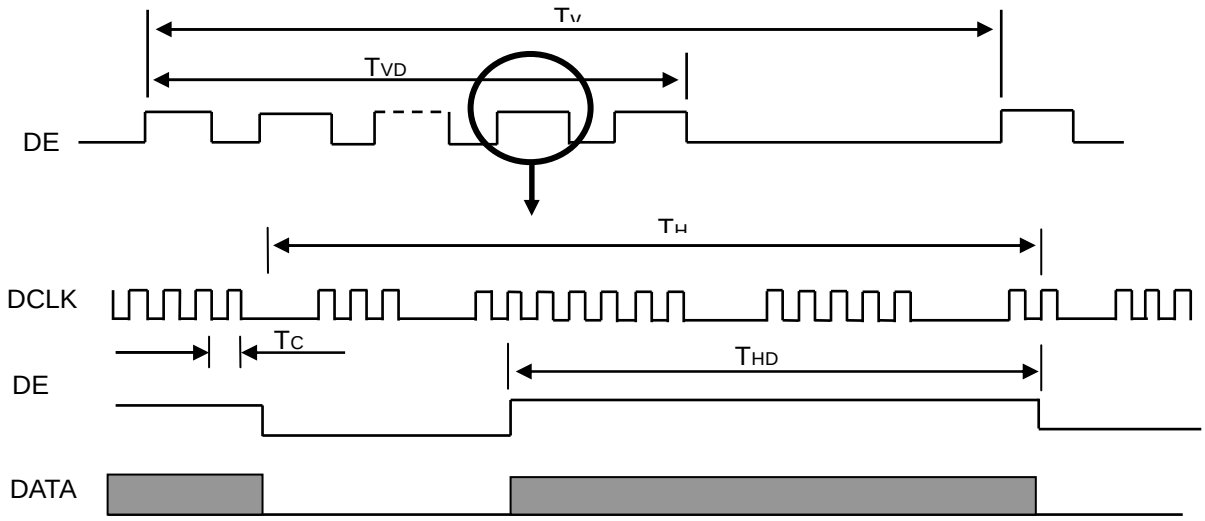
4.5 DISPLAY TIMING SPECIFICATIONS

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

Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
DCLK	Frequency	1/Tc	(67.55)	(71.11)	(78.22)	MHz	-
DE	Vertical Total Time	TV	(813)	(823)	(833)	TH	-
	Vertical Active Display Period	TVD	800	800	800	TH	-
	Vertical Active Blanking Period	TVB	TV-TVD	(23)	TV-TVD	TH	-
	Horizontal Total Time	TH	(1410)	(1440)	(1470)	Tc	-
	Horizontal Active Display Period	THD	1280	1280	1280	Tc	-
	Horizontal Active Blanking Period	THB	TH-THD	(160)	TH-THD	Tc	-

Note (1) Because this module is operated by DE only mode, Hsync and Vsync are ignored.

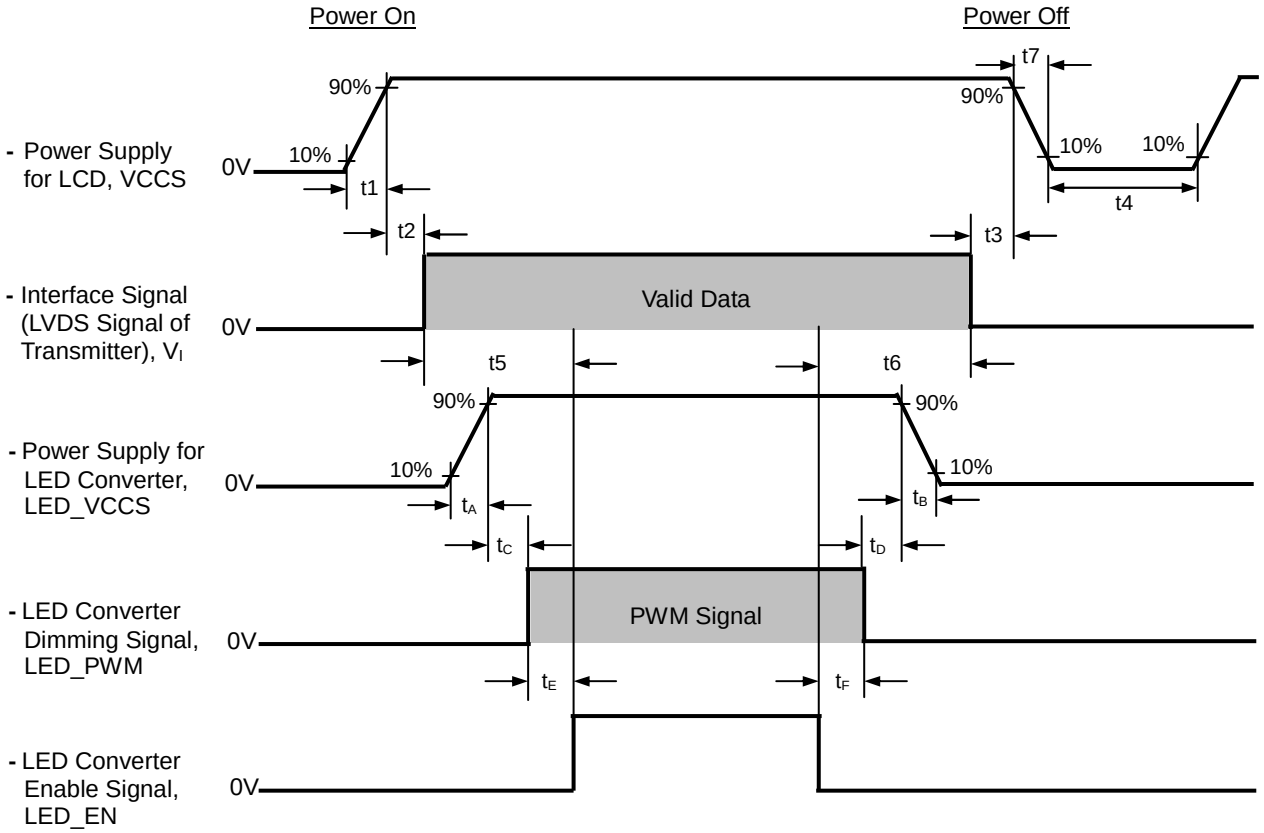
INPUT SIGNAL TIMING DIAGRAM



4.6 POWER ON/OFF SEQUENCE

The power sequence specifications are shown as the following table and diagram.

Symbol	Value			Unit	Note
	Min.	Typ.	Max.		
t1	0.5	-	10	ms	
t2	0	-	50	ms	
t3	0	-	50	ms	
t4	500	-	-	ms	
t5	200	-	-	ms	
t6	200	-	-	ms	
t7	0.5	-	10	ms	
t_A	0.5	-	10	ms	
t_B	0		10	ms	
t_C	10	-	-	ms	
t_D	10	-	-	ms	
t_E	10	-	-	ms	
t_F	10	-	-	ms	



Note (1) Please don't plug or unplug the interface cable when system is turned on.

Note (2) Please avoid floating state of the interface signal during signal invalid period.

Note (3) It is recommended that the backlight power must be turned on after the power supply for LCD and the interface signal is valid.

5. OPTICAL CHARACTERISTICS

5.1 TEST CONDITIONS

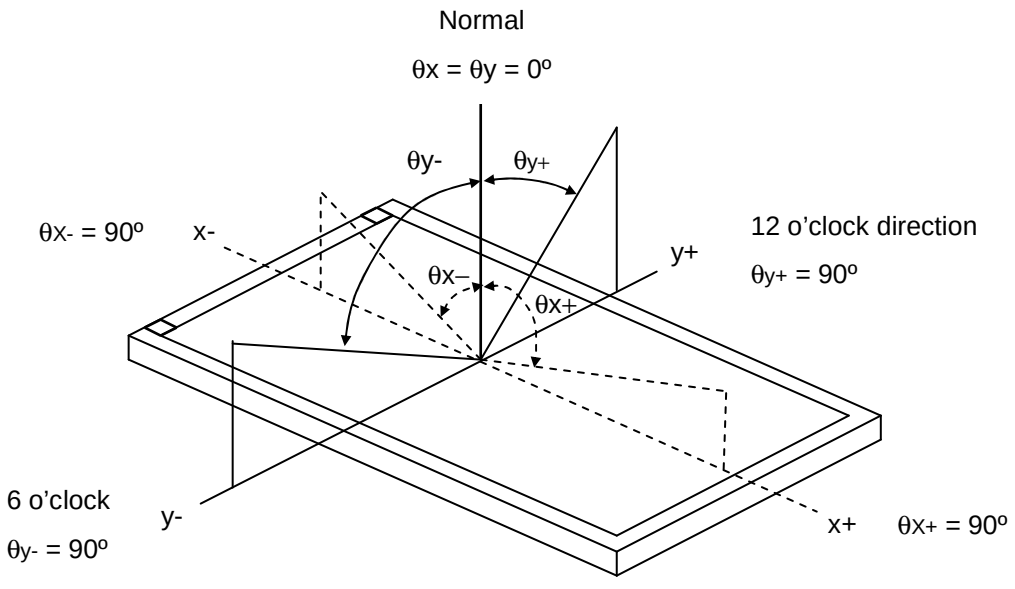
Item	Symbol	Value	Unit
Ambient Temperature	Ta	25±2	°C
Ambient Humidity	Ha	50±10	%RH
Supply Voltage	V_{CC}	3.3	V
Input Signal	According to typical value in “3. ELECTRICAL CHARACTERISTICS”		
LED Light Bar Input Current	I_L	40	mA

The measurement methods of optical characteristics are shown in Section 5.2. The following items should be measured under the test conditions described in Section 5.1 and stable environment shown in Note (5).

5.2 OPTICAL SPECIFICATIONS

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR	θ_x=0°, θ_Y =0° Viewing Normal Angle	600	800	-	-	(2), (5),(7)
Response Time		T_R		-	14	17	ms	(3),(7)
		T_F		-	11	14	ms	
Average Luminance of White		LAVE		340	400	-	cd/m^2	(4), (6),(7)
Color Chromaticity	White	Wx		-	(0.308)	-	-	(1),(7)
		Wy			(0.324)		-	
	Color Gamut	C.G		45	50	-	%	
Viewing Angle	Horizontal	θ_x+	CR≥10	80	89	-	Deg.	(1),(5), (7)
		θ_x-		80	89	-		
	Vertical	θ_Y+		80	89	-		
		θ_Y-		80	89	-		
White Variation of 9 Points		δW_{9p}	θ_x=0°, θ_Y =0°	70	80	-	%	(5),(6), (7)

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) = L63 / L0

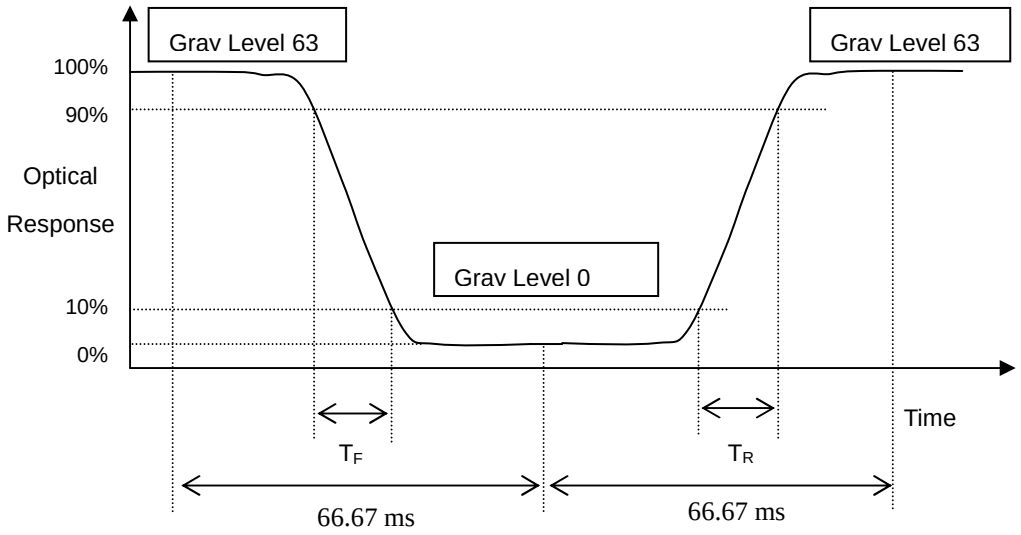
L63: Luminance of gray level 63

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 (6).

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



Note (4) Definition of Average Luminance of White (L_{AVE}):

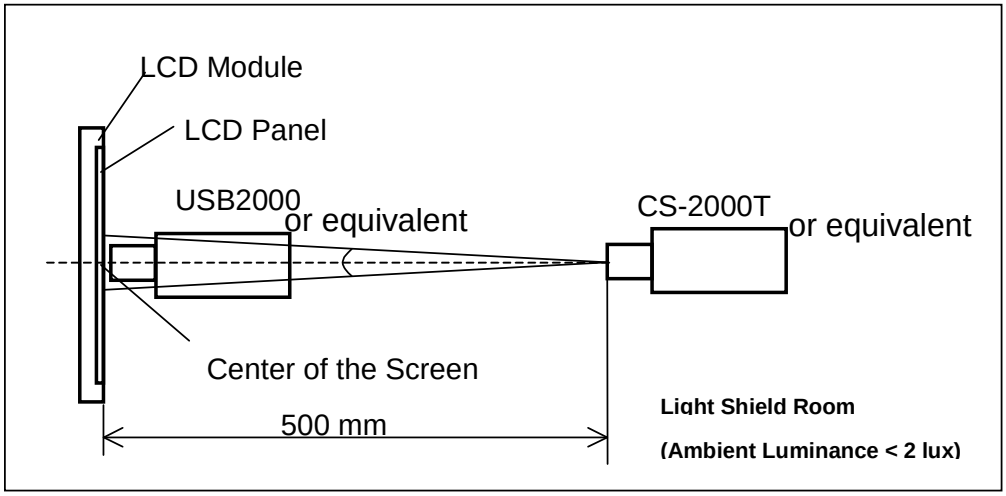
Measure the luminance of gray level 63 at 5 points

L_{AVE} = [L (1)+ L (2)+ L (3)+ L (4)+ L (5)] / 5

L (x) is corresponding to the luminance of the point X at Figure in Note (6)

Note (5) 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.

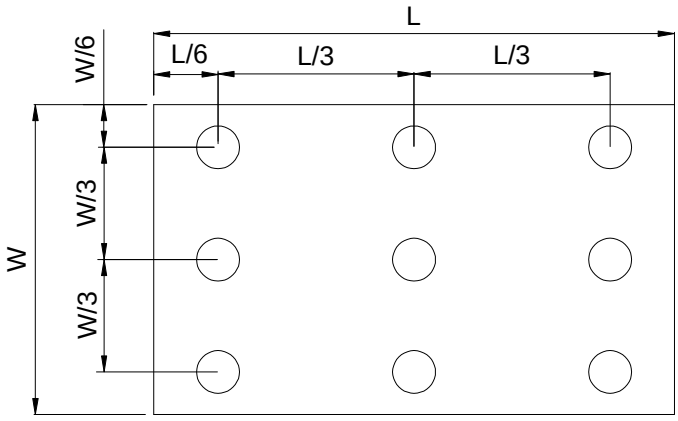


Note (6) Definition of White Variation (δW):

Active area is divided into 9 measuring areas (Refer to Fig. 4-4).Every measuring point is placed at the center of each measuring area.

$$Luminance\ \ Uniformity\ (Yu) = \frac{B_{min}}{B_{max}}$$

L-------Active area length W----- Active area width



Definition of measuring points

B_{max}: The measured maximum luminance of all measurement position.

B_{min}: The measured minimum luminance of all measurement position.

Note (7) The listed optical specifications refer to the initial value of manufacture, but the condition of the specifications after long-term operation will not be warranted.

6. RABILITY TEST ITEM

Test Item	Test Condition	Note
High Temperature Storage Test	70ºC, 240 hours	(1) (2)
Low Temperature Storage Test	-20ºC, 240 hours	
Thermal Shock Storage Test	-10ºC, 0.5hour←→60℃, 0.5hour; 100cycles, 1hour/cycle	
High Temperature Operation Test	60ºC, 240 hours	
Low Temperature Operation Test	-10ºC, 240 hours	
High Temperature & High Humidity Operation Test	60ºC, 90%RH, 240hours	
ESD Test (Operation)	± 2KV, Human Body Mode, 100pF/1500Ω	(1)
Shock (Non-Operating)	180G, 2ms, half sine wave,1 time for each direction of ±X,±Y,±Z	(1)(3)
Vibration (Non-Operating)	1.5G / 10-500 Hz, Sine wave, 60 min/cycle, 1cycle for each X, Y, Z	(1)(3)

Note (1) Criteria: Normal display image with no obvious non-uniformity and no line defect.

Note (2) Evaluation should be tested after storage at room temperature for more than two hour

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.

7. PACKING

7.1 PACKING SPECIFICATIONS

(1) 60pcs LCD modules / 1 Box

(2) Box dimensions: 435 (L) X 350 (W) X 275 (H) mm

(3) Weight: approximately 7.95Kg (60 modules per box)

7.2 CARTON

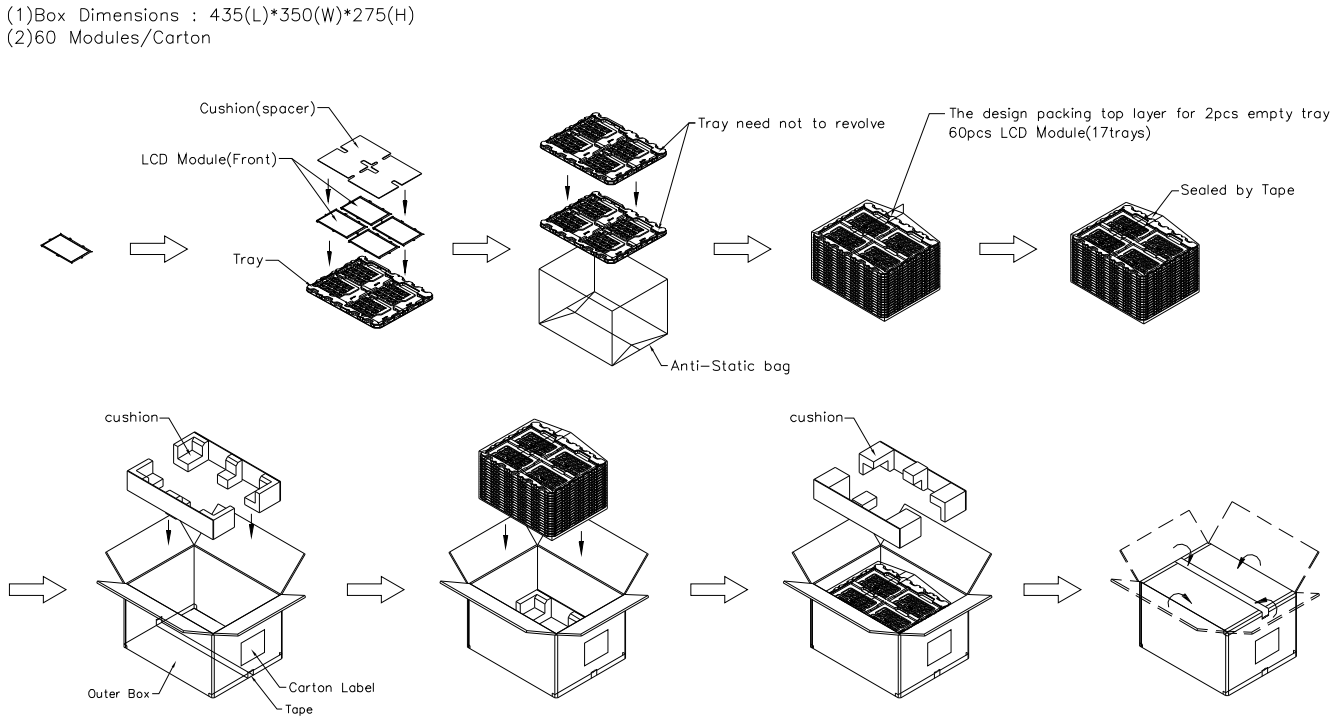


Figure. 7-2 Packing

7.3 PALLET

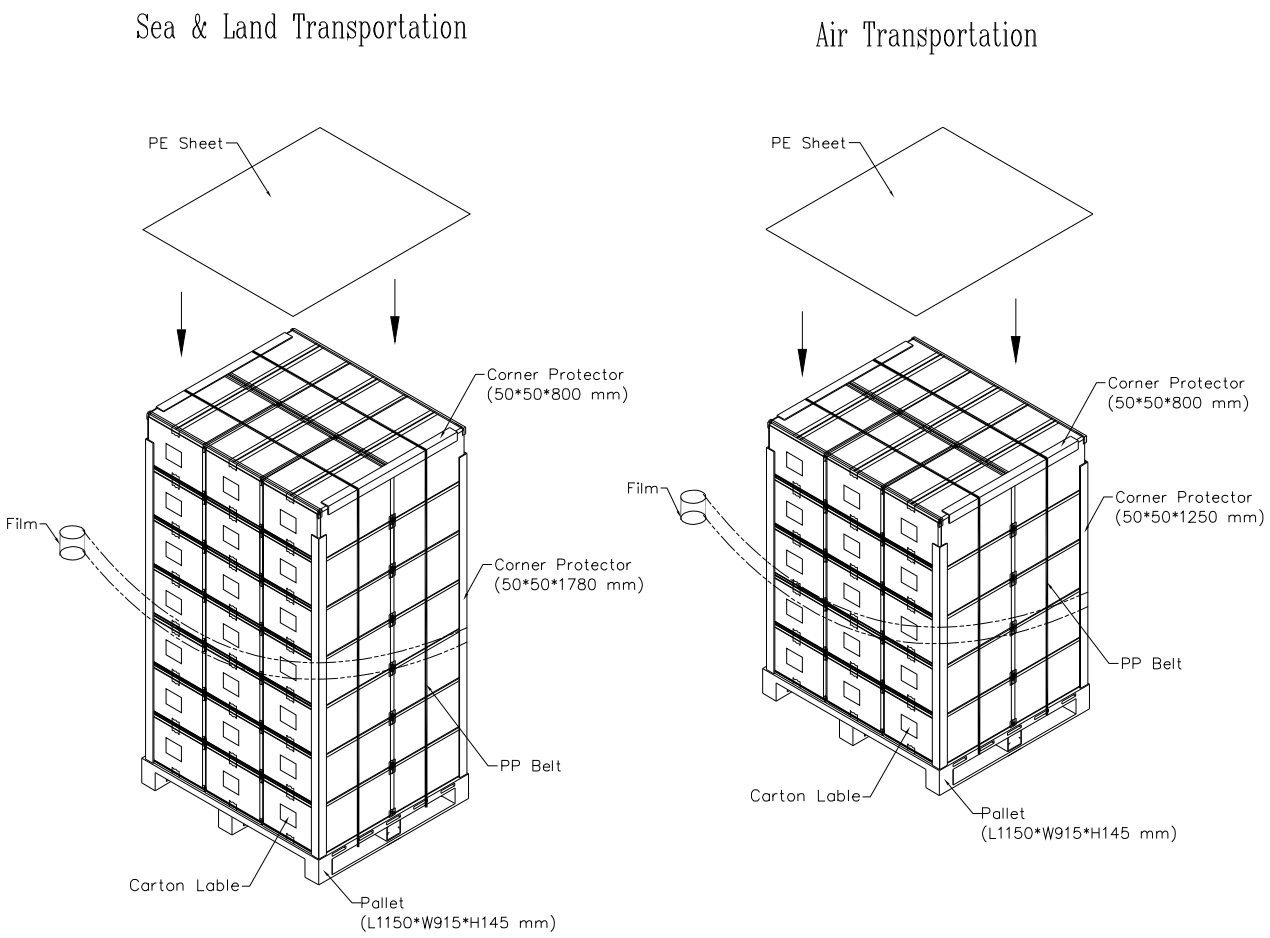


Figure. 7-3 Packing

7.4 UN-PACKAGING METHOD

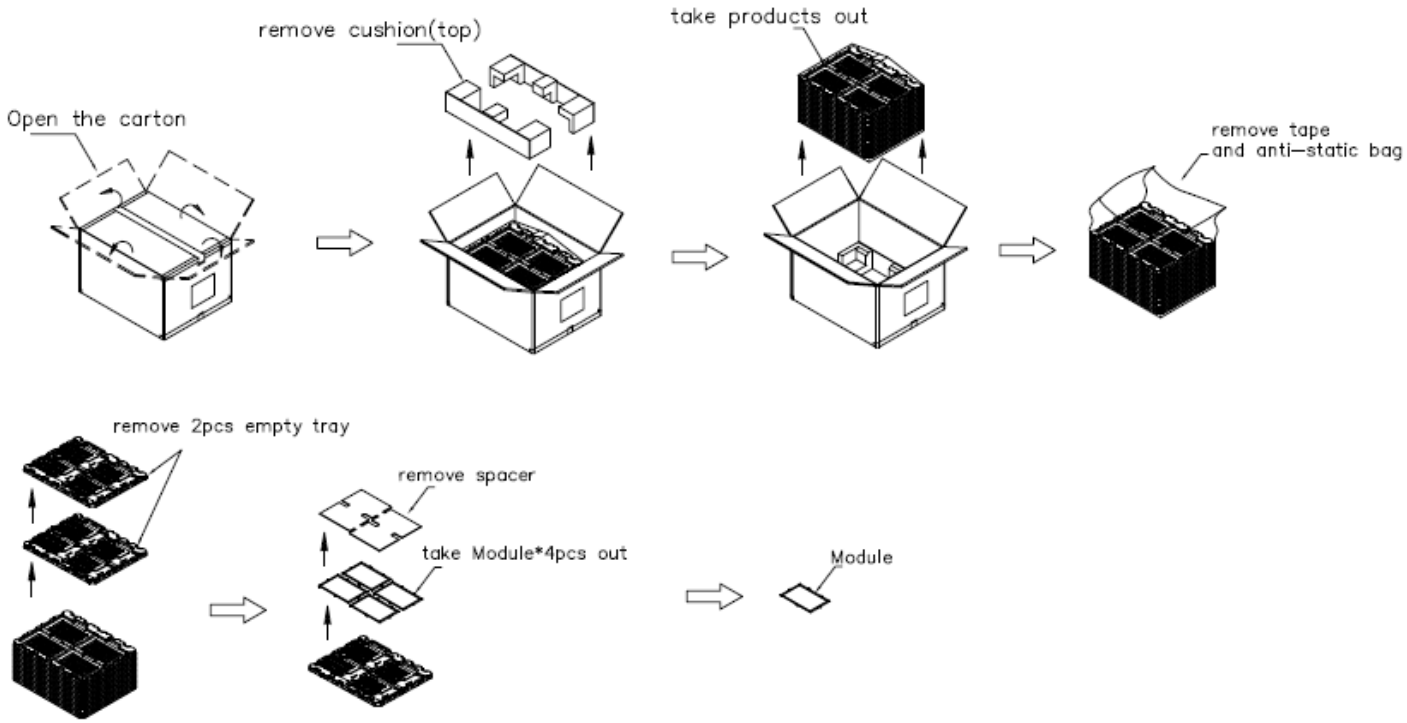
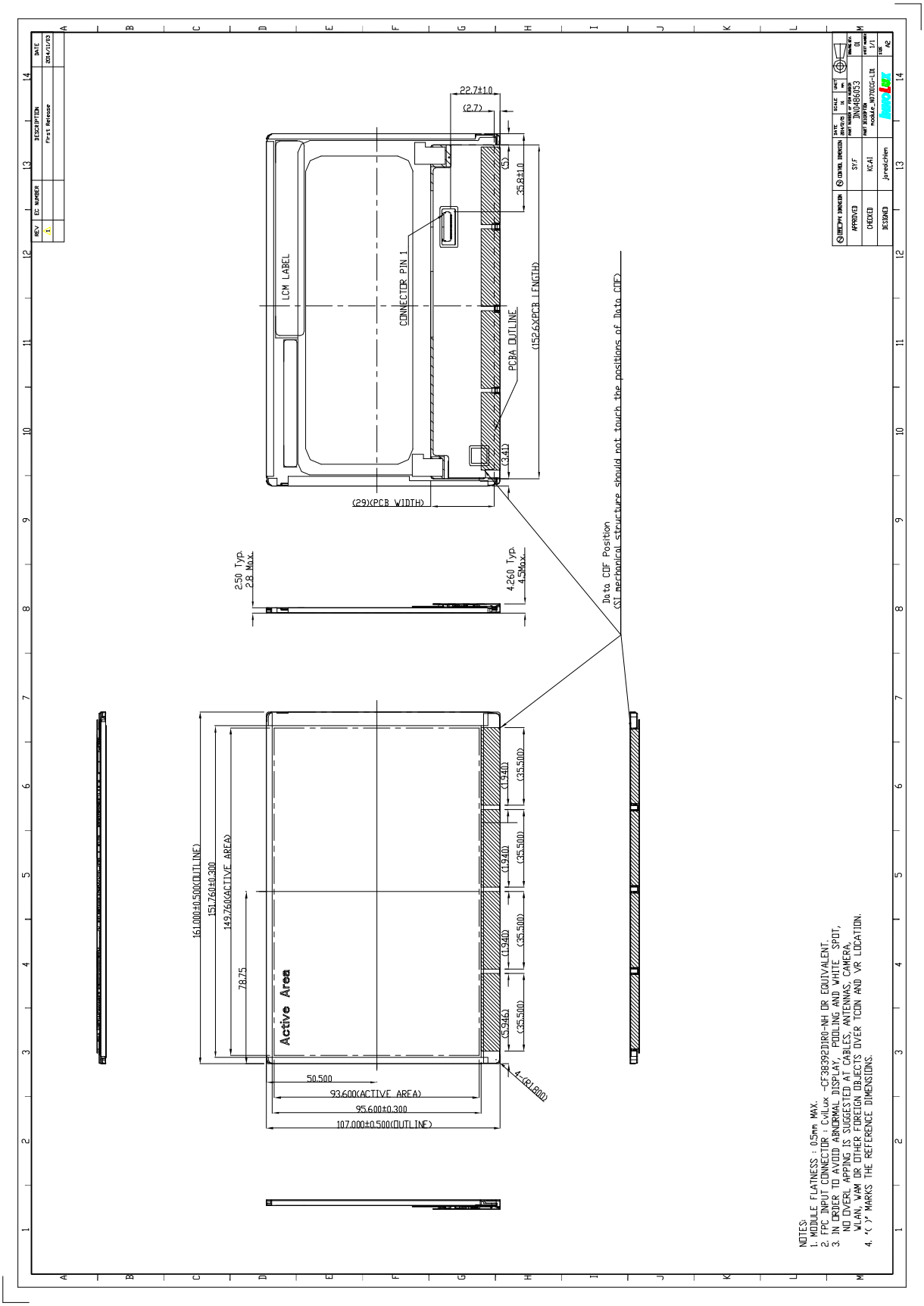


Figure. 7-4 Un-Packing

8. OUTLINE DRAWING



9. PRECAUTIONS

9.1 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 LED wire.

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

9.2 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 LED will be higher than the room temperature.

9.3 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.

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