□ Tentative Specification
□ Preliminary Specification
■ Approval Specification

MODEL NO.: S400HJ6
SUFFIX: LE8

Revision : <u>C2</u>
Customer :

APPROVED BY   SIGNATURE

<u>Name / Title</u>
Note

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

Approved By	Checked By	Prepared By
Roger Huang	ChihFan Ting	Anita Lai

CONTENTS

REVISION HISTORY

Version	Date	Page(New)	Section	Description
Ver. 2.0	Jul.28, 2017	ALL	ALL	Approval Specification was first issued.

1. GENERAL DESCRIPTION

1.1 OVERVIEW

S400HJ6-LE8 is a 40" TFT Liquid Crystal Display PID module with LED Backlight unit and 2ch-LVDS interface. This module supports 1920 x 1080 Full HDTV format and can display 16.7M colors (8-bit). The driving board module for backlight isn't built-in.

1.2 FEATURES

- High brightness 480 nits
- High contrast ratio 4800:1
- Fast response time Gray to gray average 9.5 ms
- High color saturation NTSC 72%
- Full HDTV (1920 x 1080 pixels) resolution, true HDTV format
- DE (Data Enable) only mode
- LVDS (Low Voltage Differential Signaling) interface
- Optimized response time for 50Hz/60Hz frame rate
- Ultra wide viewing angle : Super MVA technology
- Viewing Angle : 178(H)/178(V) (CR ≥ 10) VA Technology
- RoHs compliance
- T-con input frame rate: 50Hz/60Hz, output frame rate: 50Hz/60Hz

1.3 GENERAL SPECIFICATIONS

Item	Specification	Unit	Note
Active Area	878.112 (H) x 485.352 (V) (39.5" diagonal)	mm	(1)
Bezel Opening Area	881.112 (H) x488.352(V)	mm	
Driver Element	a-si TFT active matrix	-	-
Pixel Number	1920 x R.G.B. x 1080	pixel	-
Pixel Pitch (Sub Pixel)	0.15245 (H) x 0.4494 (V)	mm	-
Pixel Arrangement	RGB vertical stripe	-	-
Display Colors	16.7M colors (8-bit)	color	-
Display Operation Mode	Transmissive mode / Normally black	-	-
Surface Treatment	Anti-Glare coating(Haze 1%) , Hardness 3H	-	(2)
Rotation Function	Unachievable		(3)
Display Orientation	Signal input with "INX"		(3)

Note (1) Please refer to the attached drawings in chapter 9 for more information about the front and back outlines.

Note (2) The spec. of the surface treatment is temporarily for this phase. INX reserves the rights to change this feature.

Note (3)

Back Side	Front Side
	INX
X+C Board	
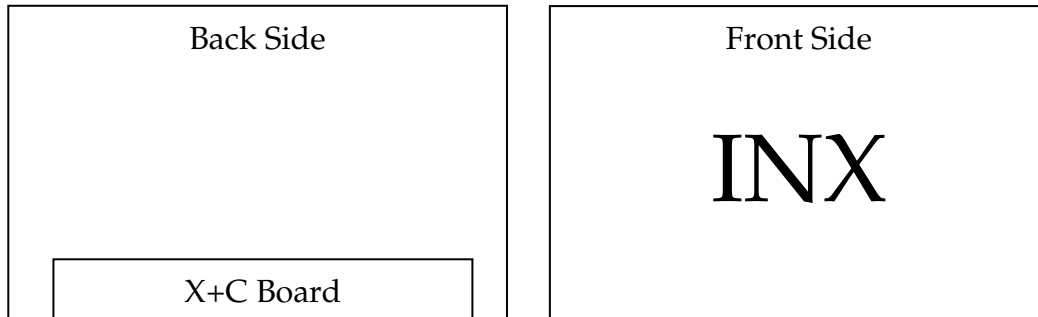
1.4 MECHANICAL SPECIFICATIONS

Item		Min.	Typ.	Max.	Unit	Note
Module Size	Horizontal (H)	892.1	893.1	894.1	mm	(1)
	Vertical (V)	503.4	504.4	505.4	mm	(1)
	Depth (D)	21.28	22.28	23.28	mm	(2)
	Depth (D)	16.38	17.38	18.38	mm	(3)
Weight			7300		Kg	

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

Note (2) Module Depth is between bezel to Rear

Note (3) Module Depth is between bezel to X_ cover.

2. ABSOLUTE MAXIMUM RATINGS

2.1 ABSOLUTE RATINGS OF ENVIRONMENT

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Storage Temperature	TST	-20	+60	℃	(1)
Operating Ambient Temperature	TOP	0	50	℃	(1), (2)
Shock (Non-Operating)	SNOP	-	50	G	(3), (5)
Vibration (Non-Operating)	VNOP	-	1.0	G	(4), (5)

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

(a) 90 %RH Max. (Ta ≦ 40 ℃).

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

(c) No condensation.

Note (2) Thermal management should be considered in final product design to prevent the surface temperature of display area from being over 65 ℃. The range of operating temperature may degrade in case of improper thermal management in final product design.

Note (3) 11 ms, half sine wave, 1 time for ± X, ± Y, ± Z.

Note (4) 10 ~ 200 Hz, 30 min, 1 time each X, Y, Z.

Note (5) 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.
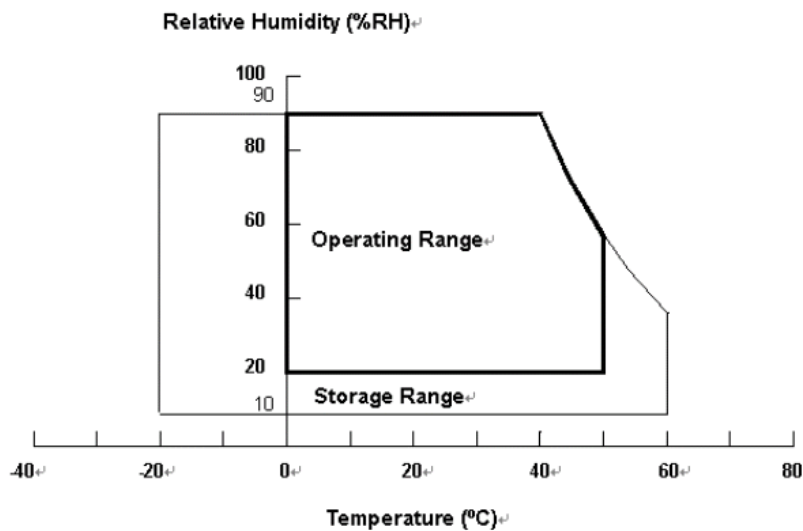
2.2 PACKAGE STORAGE

When storing modules as spares for a long time, the following precaution is necessary.

(a) Do not leave the module in high temperature, and high humidity for a long time, It is highly recommended to store the module with temperature from 0 to 35 ℃ at normal humidity without condensation.

(b) The module shall be stored in dark place. Do not store the TFT-LCD module in direct sunlight or fluorescent light.

2.3 ELECTRICAL ABSOLUTE RATINGS

2.3.1 TFT LCD MODULE

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Power Supply Voltage	VCC	-0.3	13.5	V	(1)
Logic Input Voltage	VIN	-0.3	3.6	V	

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

3. ELECTRICAL CHARACTERISTICS

3.1 TFT LCD MODULE

(Ta = 25 ± 2 ℃)

Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Power Supply Voltage		V_{CC}	10.8	12	13.2	V	(1)
Rush Current		I_{RUSH}	—	—	3	A	(2)
Power Consumption	White Pattern	P_T	—	6.8	7.5	W	(3)
	Black Pattern	P_T	—	4.3	4.8	W	
	Horizontal Stripe	P_T	—	6.5	7.1	W	
Power Supply Current	White Pattern		—	0.58	0.7	A	
	Black Pattern		—	0.36	0.44	A	
	Horizontal Stripe		—	0.54	0.68	A	
LVDS interface	Differential Input High Threshold Voltage	V_{TH}	—	—	+100	mV	(4)
	Differential Input Low Threshold Voltage	V_{TL}	-100	—	—	mV	
	Common Input Voltage	V_{CM}	1.0	1.2	1.4	V	
	Differential input voltage (single-end)	$|V_{ID}|$	100	—	600	mV	
	Terminating Resistor	R_T	—	100	—	ohm	
CMIS interface	Input High Threshold Voltage	V_{IH}	2.7	—	3.3	V	
	Input Low Threshold Voltage	V_{IL}	0	—	0.7	V	

Note (1) The module should be always operated within the above ranges. The ripple voltage should be controlled under 10% of Vcc (Typ.)

Note (2) Measurement Conditions :

Vcc rising time is 470us
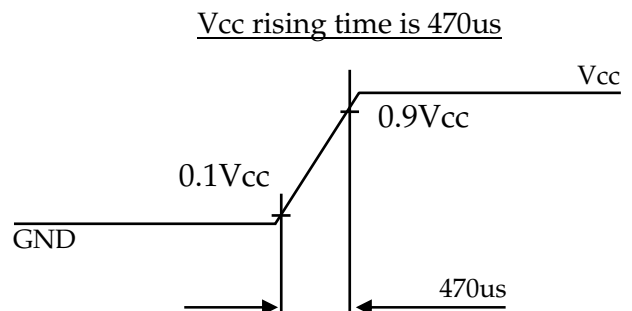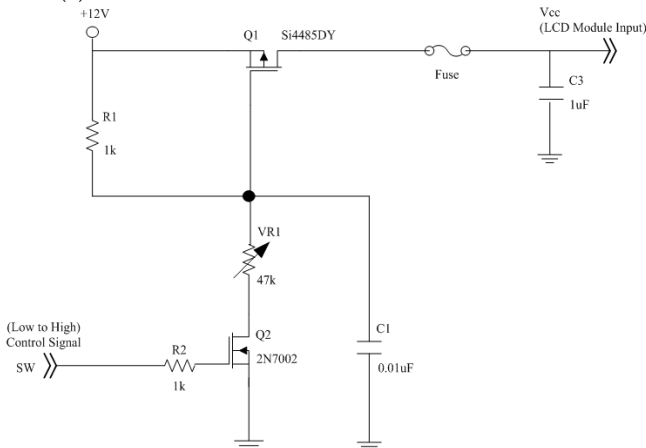
Note (3) The specified power supply current is under the conditions at Vcc = 12 V, Ta = 25 ± 2 ℃, fv = 60 Hz, whereas a power dissipation check pattern below is displayed.
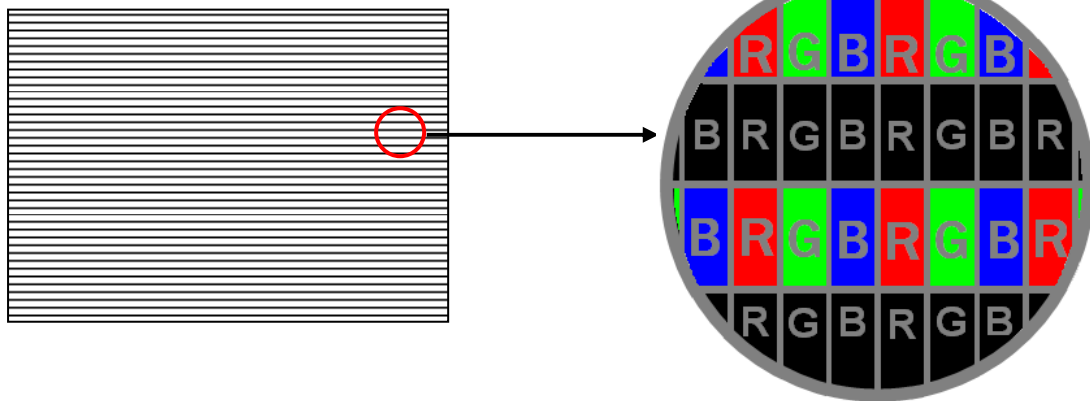
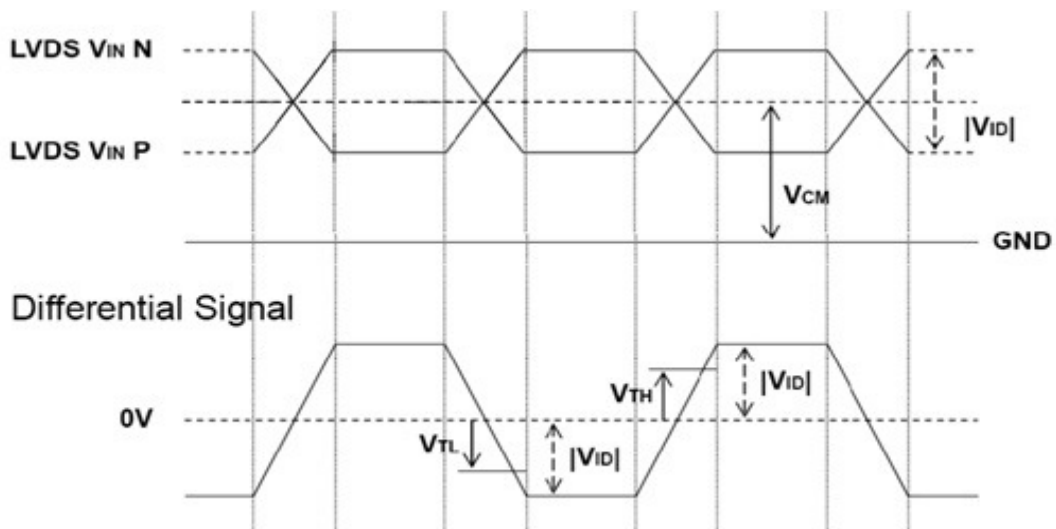a. White Pattern

b. Black Pattern

Active Area

Active Area

c. Horizontal Pattern

Note (4) The LVDS input characteristics is shown as below : The position of measurement is TCON LVDS input pin.

The differential voltage must be higher than VTH and lower than VTL to ensure that the receiver indicates a valid logic state at its output.

3.2 BACKLIGHT CONVERTER UNIT

3.2.1 LED LIGHT BAR CHARACTERISTICS

The backlight unit contains 1 pcs LED light bar, and each light bar has 8 string LED.   (Ta = 25 ± 2 °C)

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
One String Current	I_L	95	100	105	mA	(1)
One String Voltage	V_W	32.8	—	38.08	V_{DC}	(2) I_L =100mA
One String Voltage Variation	$\triangle Vw$			2	V_{DC}	
Power Consumption	P_{BL}		28.94		W	(2) I_L =100mA
Life time	—	30,000	-	-	Hrs	(3)

Note (1) Dimming Ratio=100%

Note (2) The power consumption is only calculate the power of light bar.

Note (3) The lifetime is defined as the time which luminance of the LED decays to 50% compared to the initial value,

Operating condition: Continuous operating at Ta = 25±2℃ , IL =100 mA..

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4. INTERFACE PIN CONNECTION

4.1 TFT LCD MODULE

CNF1 Connector Pin Assignment: [187059-51221(P-Two) , WF23-402-5133(FCN)]

Matting connector : [FI-RE51HL (JAE)]

Pin	Name	Description	Note
1	N.C.	No Connection	
2	N.C.	No Connection	
3	N.C.	No Connection	
4	N.C.	No Connection	(2)
5	N.C.	No Connection	
6	N.C.	No Connection	
7	SELLVDS	LVDS data format Selection	(3), (4)
8	N.C.	No Connection	(2)
9	N.C	No Connection	(2)
10	N.C.	No Connection	(2)
11	GND	Ground	
12	ORX0-	Odd pixel Negative LVDS differential data input. Channel 0	
13	ORX0+	Odd pixel Positive LVDS differential data input. Channel 0	
14	ORX1-	Odd pixel Negative LVDS differential data input. Channel 1	
15	ORX1+	Odd pixel Positive LVDS differential data input. Channel 1	(5)
16	ORX2-	Odd pixel Negative LVDS differential data input. Channel 2	
17	ORX2+	Odd pixel Positive LVDS differential data input. Channel 2	
18	GND	Ground	
19	OCLK-	Odd pixel Negative LVDS differential clock input.	(5)
20	OCLK+	Odd pixel Positive LVDS differential clock input.	
21	GND	Ground	
22	ORX3-	Odd pixel Negative LVDS differential data input. Channel 3	(5)
23	ORX3+	Odd pixel Positive LVDS differential data input. Channel 3	
24	N.C.	No Connection	
25	N.C.	No Connection	
26	GND	Ground	(2)
27	GND	Ground	
28	ERX0-	Even pixel Negative LVDS differential data input. Channel 0	(5)
29	ERX0+	Even pixel Positive LVDS differential data input. Channel 0	

| 30	ERX1-	Even pixel Negative LVDS differential data input. Channel 1	
31	ERX1+	Even pixel Positive LVDS differential data input. Channel 1	
32	ERX2-	Even pixel Negative LVDS differential data input. Channel 2	
33	ERX2+	Even pixel Positive LVDS differential data input. Channel 2	
34	GND	Ground	
35	ECLK-	Even pixel Negative LVDS differential clock input	(5)
36	ECLK+	Even pixel Positive LVDS differential clock input	
37	GND	Ground	
38	ERX3-	Even pixel Negative LVDS differential data input. Channel 3	(5)
39	ERX3+	Even pixel Positive LVDS differential data input. Channel 3	
40	N.C.	No Connection	
41	N.C.	No Connection	
42	GND	Ground	(2)
43	GND	Ground	
44	GND	Ground	
45	GND	Ground	
46	GND	Ground	
47	N.C.	No Connection	(2)
48	VCC	Power input (+12V)	
49	VCC	Power input (+12V)	
50	VCC	Power input (+12V)	
51	VCC	Power input (+12V)	

Note (1) LVDS connector pin order is defined as below.
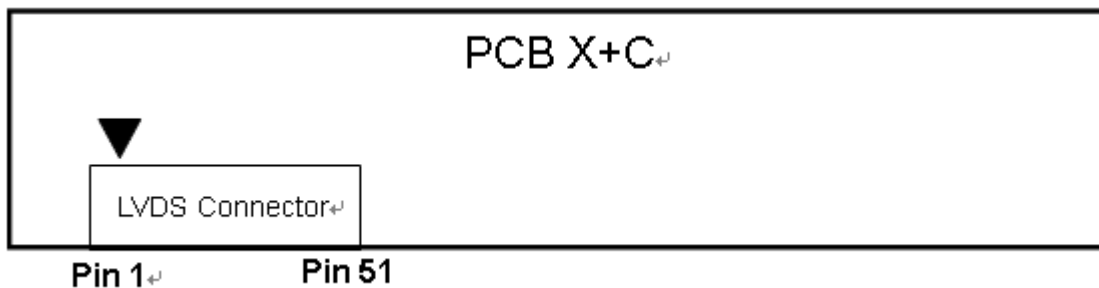
Note (2) Reserved for internal use. Please leave it open.

Note (3)

| SELLVDS	Mode
L	JEIDA
H(default)	VESA

L : Connect to GND, H : Connect to Open or +3.3V

Note (4) Interface optional pin has internal scheme as following diagram. Customer should keep the interface voltage level requirement which including panel board loading as below.
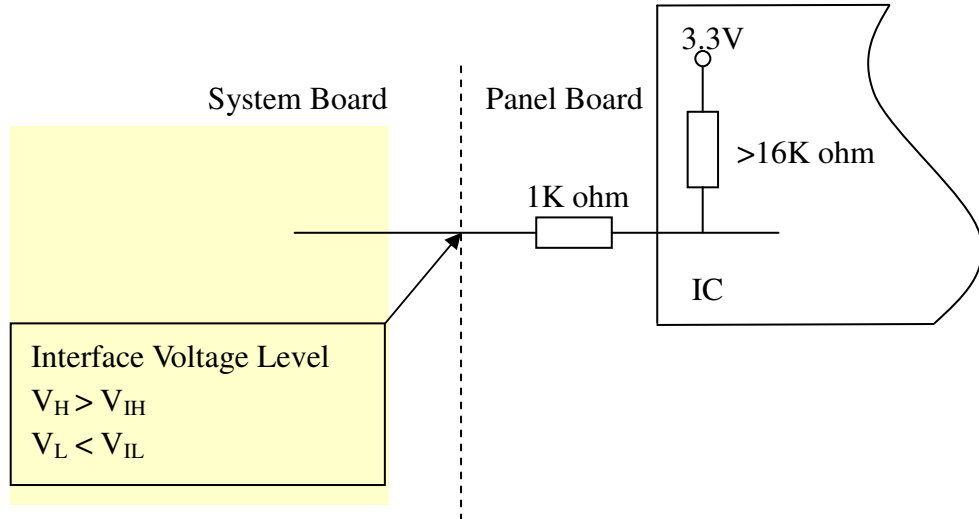
Note (5) Two pixel data send into the module for every clock cycle. The first pixel of the frame is odd pixel and the second pixel is even pixel.

Note (6) LVDS connector mating dimension range request is 0.93mm~1.0mm as below
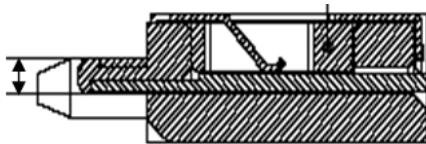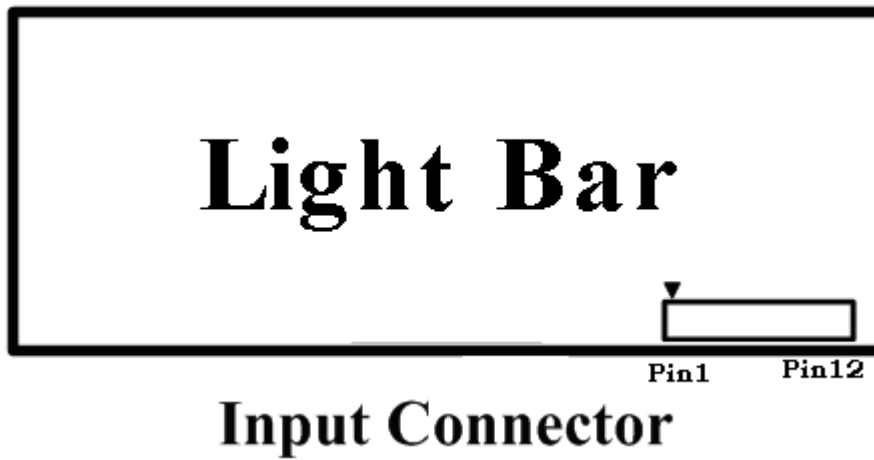
4.2 BACKLIGHT UNIT

4.2.1 LIGHT BAR UNIT

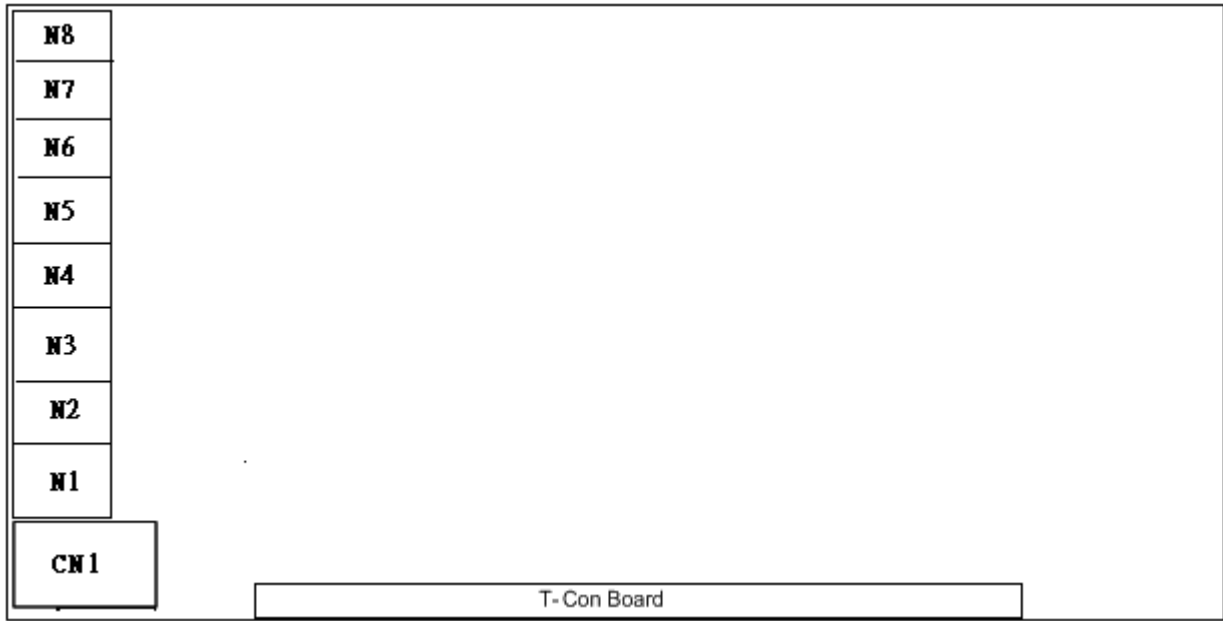T The pin configuration for the housing and the leader wire is shown in the table below.

CN1 Connector Type : WM13-406-123N (FCN)

Pin No.	Symbol	Description
1	N1	Negative of LED string
2	N2	
3	N3	
4	N4	
5	N5	
6	N6	
7	N7	
8	N8	
9	NC	NC
10	VLED+	Positive of LED string
11	VLED+	
12	VLED+	

Note (1) Light Bar Input connector pin order defined as follows
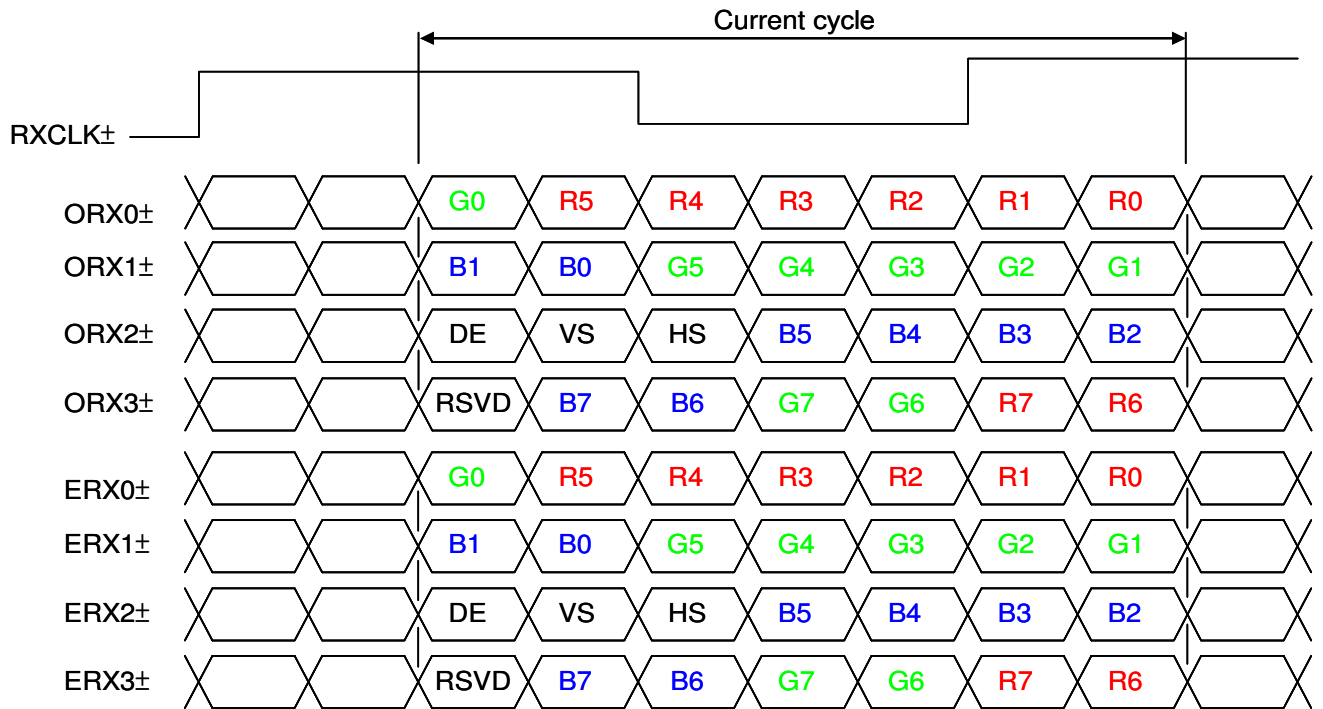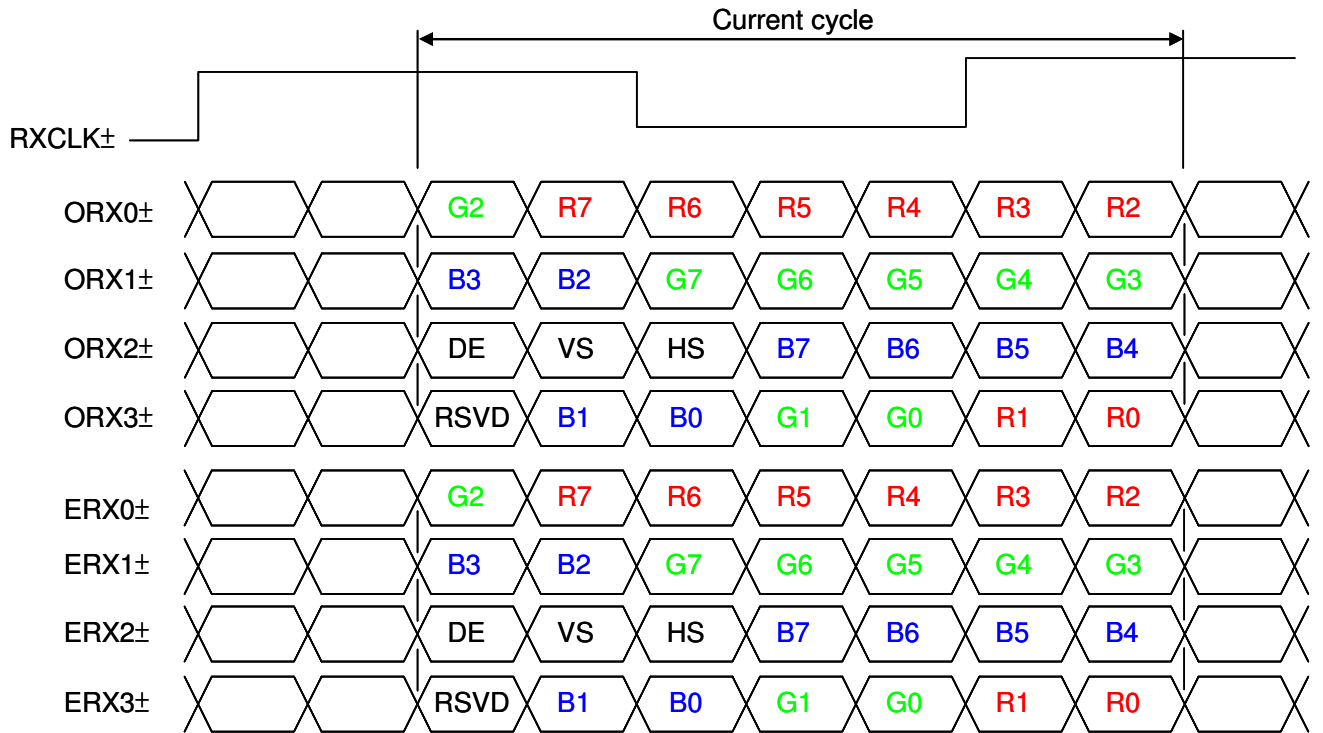
REAR SIDE

4.3 LVDS INTERFACE

VESA Format : SELLVDS = H or Open

JEIDA Format : SELLVDS = L

R0~R7	Pixel R Data (7; MSB, 0; LSB)	DE	Data enable signal
G0~G7	Pixel G Data (7; MSB, 0; LSB)	DCLK	Data clock signal
B0~B7	Pixel B Data (7; MSB, 0; LSB)		

Note (1) RSVD (reserved) pins on the transmitter shall be "H" or "L".

4.4 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 the color versus data input.

Color		Data Signal																								
		Red								Green								Blue							
		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	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 (253)	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 (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
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
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Green (253)	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 (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
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
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Blue (253)	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 (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

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

5. INTERFACE TIMING

5.1 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
LVDS Receiver Clock	Frequency	F_{clkin} (=1/TC)	60	74.25	80	MHz	
	Input cycle to cycle jitter	T_{rcl}	—	—	200	ps	(3)
	Spread spectrum modulation range	F_{clkin_mod}	F_{clkin}-2%	—	F_{clkin}+2%	MHz	(4)
	Spread spectrum modulation frequency	F_{SSM}	—	—	200	KHz	
LVDS Receiver Data	Receiver Skew Margin	T_{RSKM}	-400	—	400	ps	(5)
Vertical Active Display Term	Frame Rate	F_{r5}	47	50	53	Hz	
		F_{r6}	57	60	63	Hz	
	Total	Tv	1090	1125	1480	Th	Tv=Tvd+Tvb
	Display	Tvd	1080	1080	1080	Th	
	Blank	Tvb	10	45	400	Th	
Horizontal Active Display Term	Total	Th	1030	1100	1325	Tc	Th=Thd+Thb
	Display	Thd	960	960	960	Tc	
	Blank	Thb	70	140	365	Tc	

Note (1) Please make sure the range of frame rate has follow the below equation：

Fclkin(max) ≧ Fr6 ✕ Tv ✕ Th

Fr5 ✕ Tv ✕ Th ≧ Fclkin(min)

Note (2) This module is operated in DE only mode and please follow the input signal timing diagram as below :
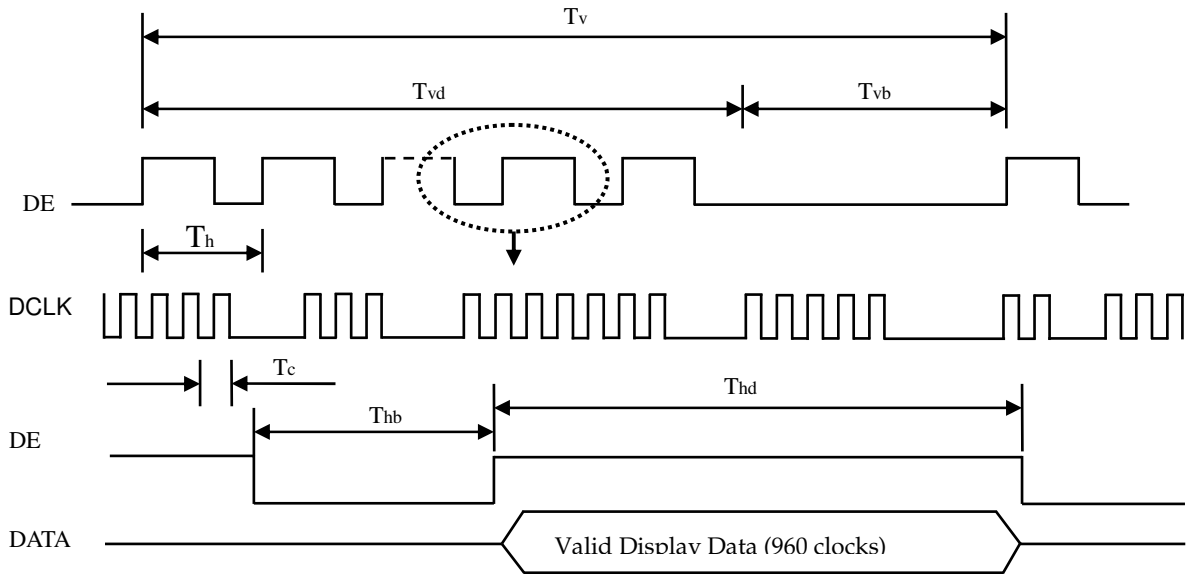
Note (3) The input clock cycle-to-cycle jitter is defined as below figures. Trcl =∣ T_1 – T ∣
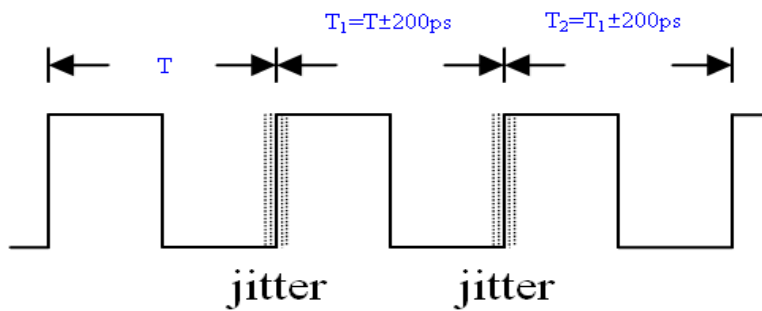
Note (4) The SSCG (Spread spectrum clock generator) is defined as below figures.
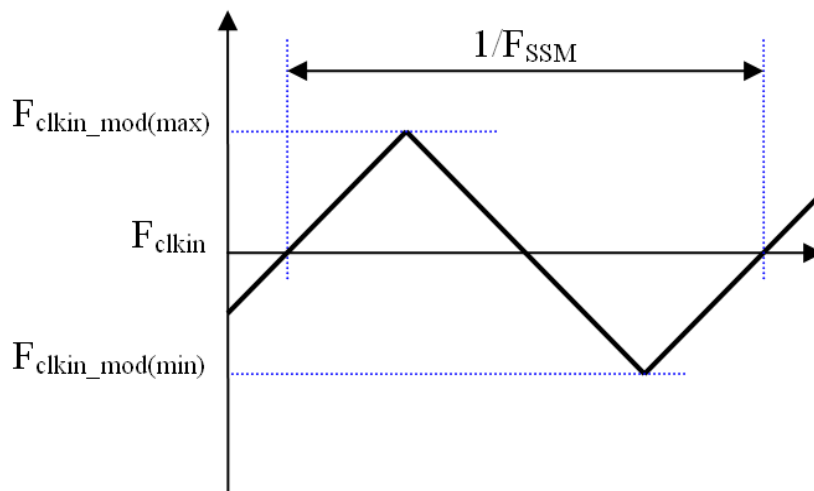
Note (5) The LVDS timing diagram and the receiver skew margin is defined and shown in following figure.
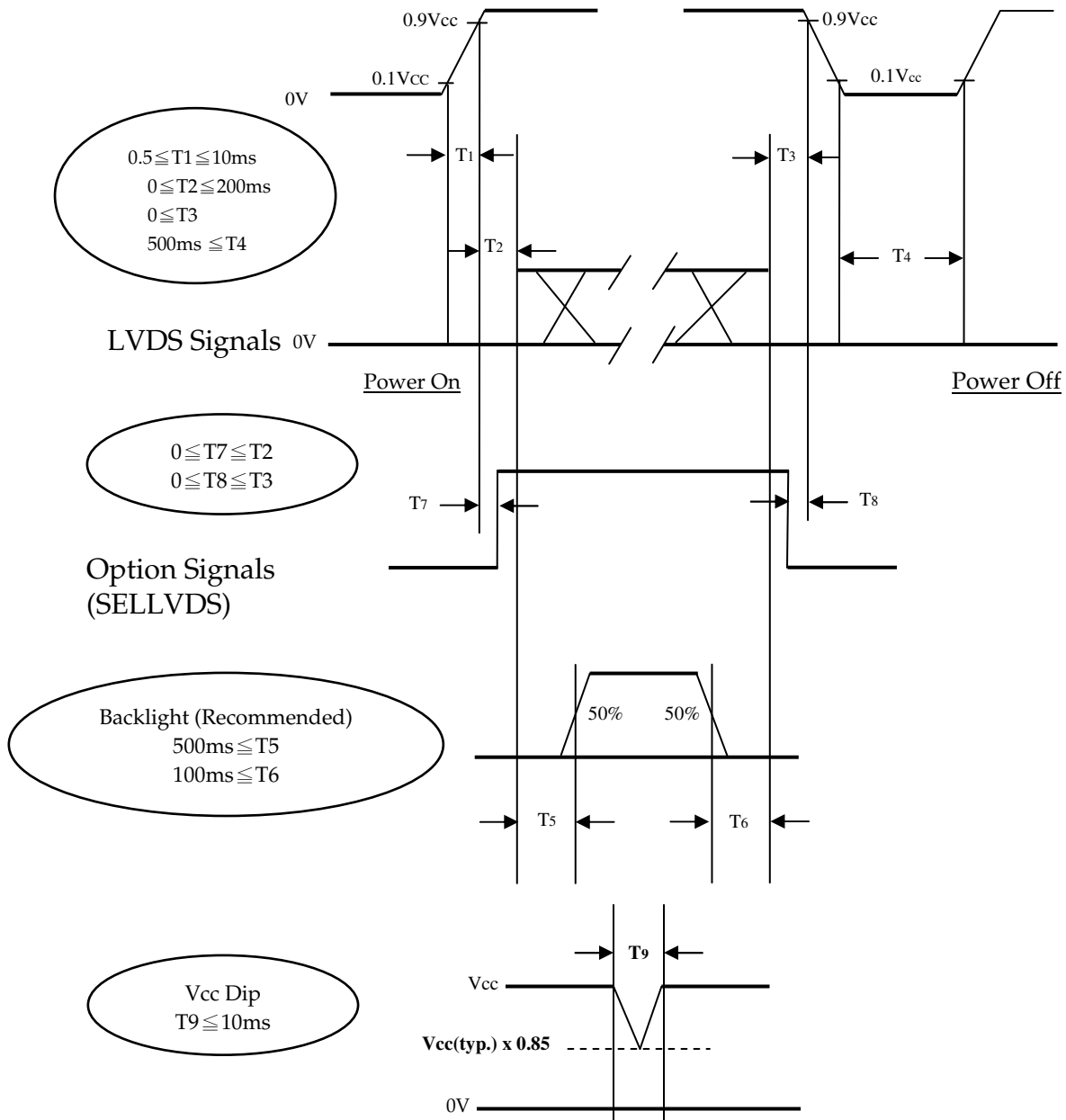
LVDS RECEIVER INTERFACE TIMING DIAGRAM
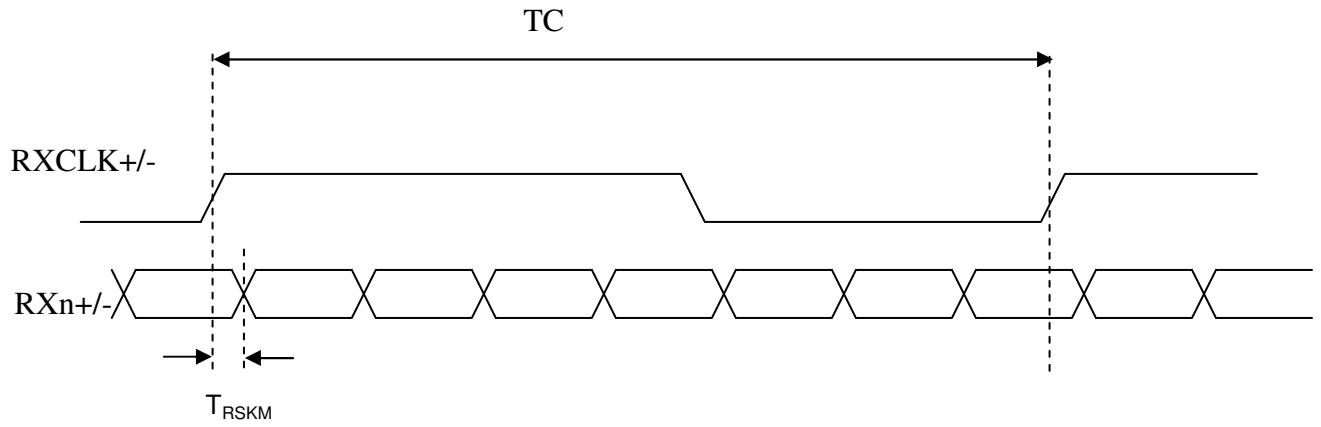
5.2 POWER ON/OFF SEQUENCE

(Ta = 25 ± 2 ℃)

To prevent a latch-up or DC operation of LCD module, the power on/off sequence should be as the diagram below.

0.9Vcc
0.9Vcc
0.1Vcc
0.1Vcc
0V

$0.5 \leq T1 \leq 10ms$
$0 \leq T2 \leq 200ms$
$0 \leq T3$
$500ms \leq T4$

$T1$
$T3$
$T2$
$T4$

LVDS Signals 0V

Power On
Power Off

$0 \leq T7 \leq T2$
$0 \leq T8 \leq T3$

$T7$
$T8$

Option Signals (SELLVDS)

Backlight (Recommended)
$500ms \leq T5$
$100ms \leq T6$

50%
50%

$T5$
$T6$

$T9$
Vcc
Vcc(typ.) x 0.85

Vcc Dip
$T9 \leq 10ms$

0V

Note (1) The supply voltage of the external system for the module input should follow the definition of Vcc.

Note (2) Apply the LED voltage within the LCD operation range. When the backlight turns on before the LCD operation or the LCD turns off before the backlight turns off, the display may momentarily become abnormal screen.

Note (3) In case of VCC is in off level, please keep the level of input signals on the low or high impedance.
If T2<0, that maybe cause electrical overstress failure.

Note (4) T4 should be measured after the module has been fully discharged between power off and on period.

Note (5) Interface signal shall not be kept at high impedance when the power is on.

Note (6) Vcc must decay smoothly when power-off.

---

6. OPTICAL CHARACTERISTICS

6.1 TEST CONDITIONS

Item	Symbol	Value	Unit
Ambient Temperature	Ta	25±2	ºC
Ambient Humidity	Ha	50±10	%RH
Supply Voltage	VCC	12±1.2	V
Input Signal	According to typical value in "3. ELECTRICAL CHARACTERISTICS"		
Vertical Frame Rate	Fr	60	Hz

The LCD module should be stabilized at given temperature for 1 hour to avoid abrupt temperature change during measuring in a windless room.
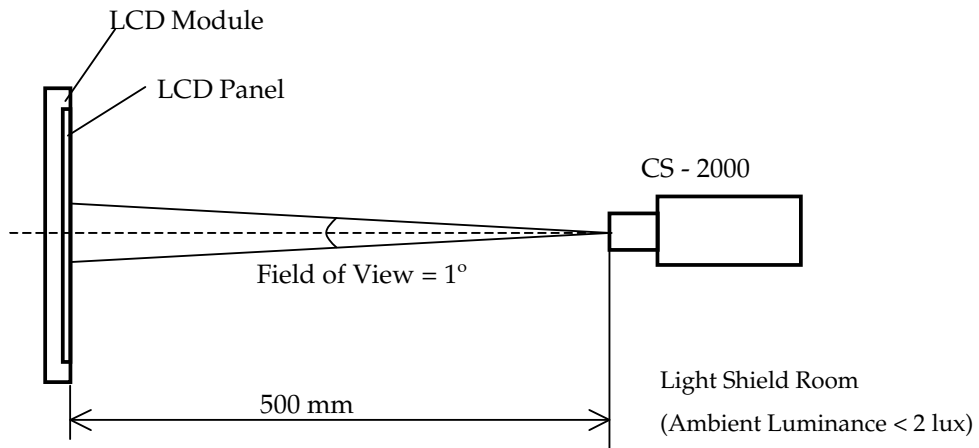
6.2 OPTICAL SPECIFICATIONS

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 7.1.

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR		3360	4800	-	-	(2)
Response Time		Gray to gray			9.5	19	ms	(3)
Center Luminance of White		L_C		380	480	-	cd/m^2	(4)
White Variation		δW				1.3	-	(6)
Cross Talk		CT		-		4	%	(5)
Color Chromaticity	Red	Rx	θ_x=0°, θ_Y=0° Viewing angle at normal direction	Typ.-0.03	0.645	Typ.+0.03	-	
		Ry			0.332		-	
	Green	Gx			0.313		-	
		Gy			0.617		-	
	Blue	Bx			0.155		-	
		By			0.047		-	
	White	Wx			0.280		-	
		Wy			0.290		-	
	Correlated color temperature			-	10000	-	K	
	Color Gamut	C.G.		-	72	-	%	NTSC
Viewing Angle	Horizontal	θ_x+	CR≥10	80	89	-	Deg.	(1)
		θ_x-		80	89	-		
	Vertical	θ_Y+		80	89	-		
		θ_Y-		80	89	-		

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

Viewing angles are measured by Autronic Conoscope Cono-80 (or Eldim EZ-Contrast 160R).
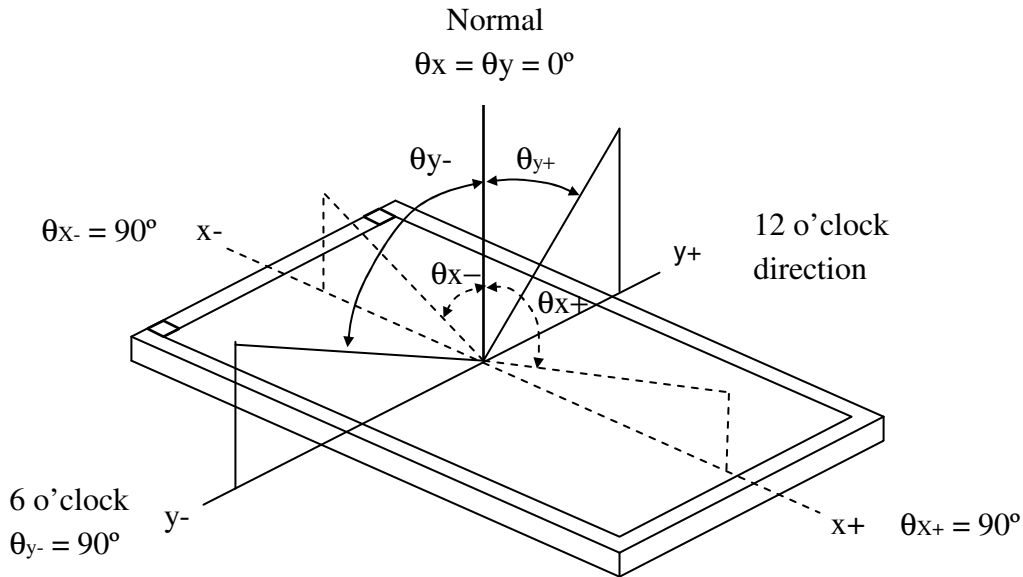
Note (2) Definition of Contrast Ratio (CR) :

The contrast ratio can be calculated by the following expression.

$$\text{Contrast Ratio (CR)} = \frac{\text{Surface Luminance of L255}}{\text{Surface Luminance of L0}}$$

L255: Luminance of gray level 255

L 0: Luminance of gray level 0

CR = CR (5), where CR (X) is corresponding to the Contrast Ratio of the point X at the figure in Note (6).

Note (3) Definition of Gray-to-Gray Switching Time :
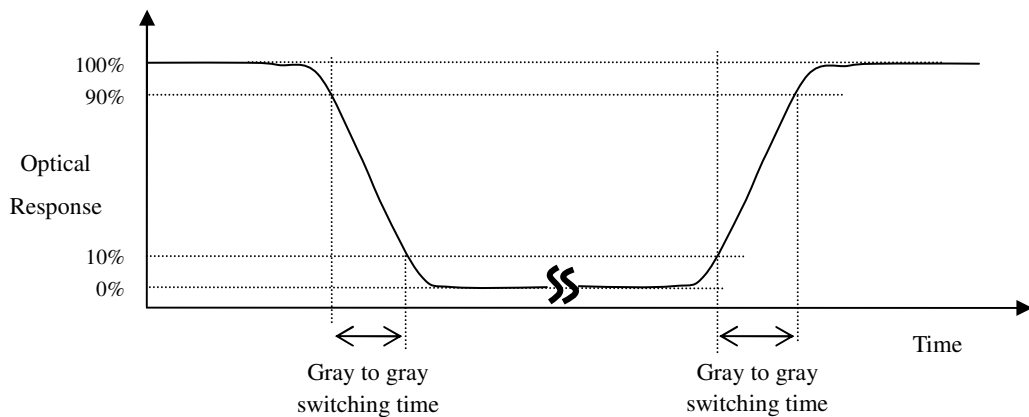
The driving signal means the signal of gray level 0, 31, 63, 95, 127, 159, 191, 223 and 255.

Gray to gray average time means the average switching time of gray level 0, 31, 63, 95, 127, 159, 191, 223 and 255 to each other.

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

      Measure the luminance of gray level 255 at center point and 5 points

      LC = L (5), where L (X) is corresponding to the luminance of the point X at the figure in Note (6).

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

      $CT = | YB - YA | / YA \times 100 (\%)$

      Where:

Y_A = Luminance of measured location without gray level 255 pattern (cd/m2)

Y_B = Luminance of measured location with gray level 255 pattern (cd/m2)
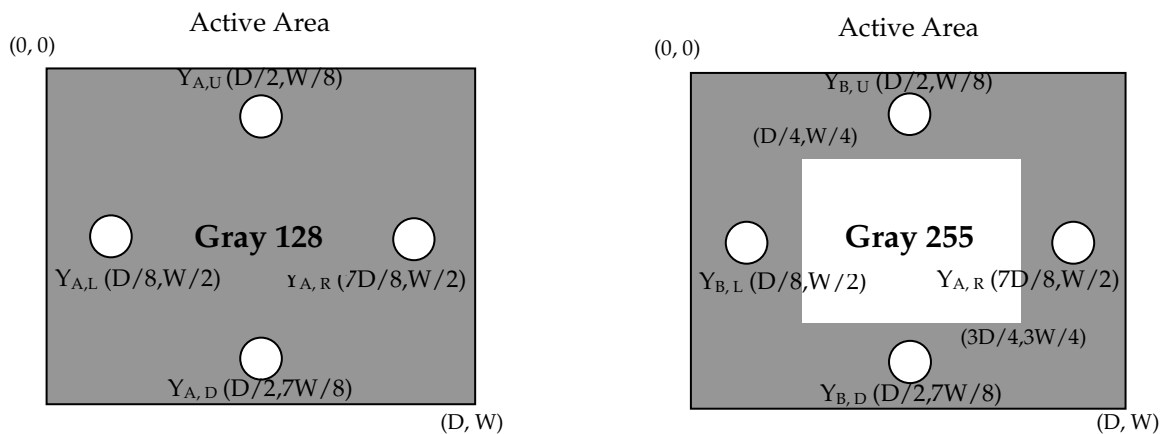
Note (6) Definition of White Variation (δW) :

      Measure the luminance of gray level 255 at 5 points

$$\delta W = \frac{Maximum\,[L\,(1), L\,(2), L\,(3), L\,(4), L\,(5)]}{Minimum\,[L\,(1), L\,(2), L\,(3), L\,(4), L\,(5)]}$$
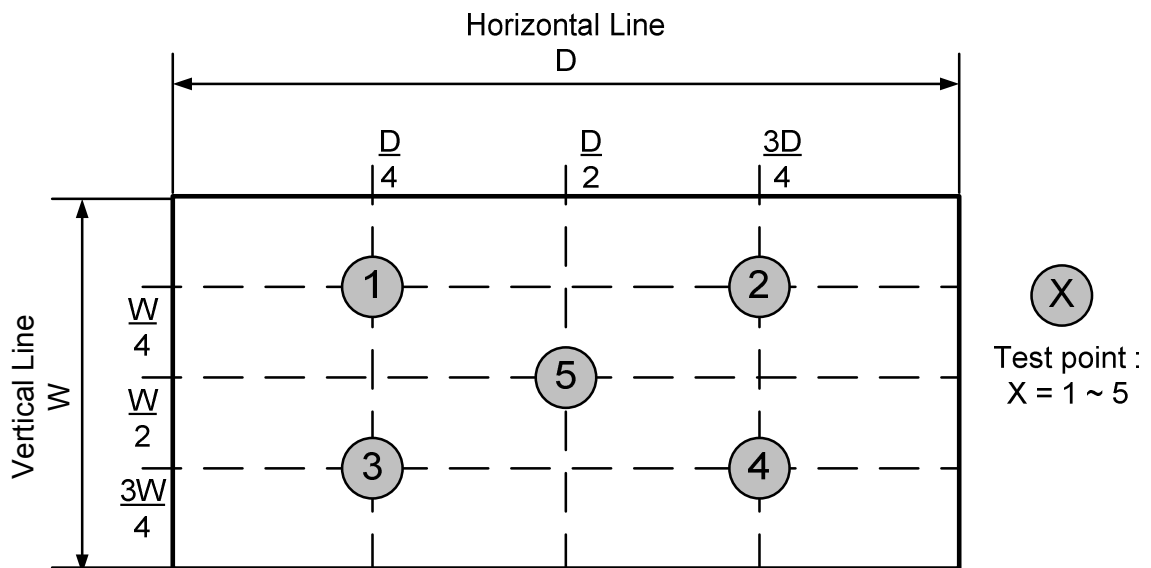
7. PRECAUTIONS

7.1 ASSEMBLY AND HANDLING PRECAUTIONS

[1] Do not apply rough force such as bending or twisting to the module during assembly.

[2] Do not apply pressure or impulse to the module to prevent the damage of LCD panel and Backlight.

[3] Bezel of Set can not press or touch the panel surface. It will make light leakage or scrape.

[4] It should be attached to the system firmly using all mounting holes.

[5] It is recommended to assemble or to install a module into the user's system in clean working areas. The dust and oil may cause electrical short or worsen the polarizer, do not press or scratch the surface harder than a HB pencil lead.

[6] Use finger-stalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.

[7] Protection film for polarizer on the module should be slowly peeled off just before use so that the electrostatic charge can be minimized.

[8] Do not disassemble the module.

[9] Always follow the correct power-on sequence when the LCD module is turned on. This can prevent the damage and latch-up of the CMOS LSI chips.

[10] Do not plug in or pull out the I/F connector while the module is in operation, pins of I/F connector should not be touched directly with bare hands. Do not adjust the variable resistor located on the module.

[11] Moisture can easily penetrate into LCD module and may cause the damage during operation.

[12] When storing modules as spares for a long time, the following precaution is necessary.

  [12.1] Do not leave the module in high temperature, and high humidity for a long time. It is highly recommended to store the module with temperature from 0 to 35℃ at normal humidity (under 70%) without condensation.

  [12.2] The module shall be stored in dark place. Do not store the TFT-LCD module in direct sunlight or fluorescent light.

[13] When ambient temperature is lower than 10ºC, the display quality might be reduced. For example, the response time will become slow, and the starting voltage of LED will be higher than that of room temperature.

7.2 SAFETY PRECAUTIONS

To optimize PID module's lifetime and functions, operating conditions should be followed as below

[1] Normal operating condition

    [1.1] Temperature : 20±15℃

    [1.2] Humidity : 55±20%

    [1.3] Well-ventilated place is suggested to set up PID module and system.

    [1.4] Display pattern : regular switched patterns or moving pictures.

        [1.4.1] Periodical power-off or screen saver is needed after long-term static display.

        [1.4.2] Moving picture or black pattern is strongly recommended for screen saver.

[2] Operating requirements of PID modules and systems to prevent uneven display under long-term operating.

    [2.1] PID suitable operating time : under 24 hours a day or less.

        (* The moving picture can be allowed for 24 hours a day)

    [2.2] Periodical display contents should be changed from static image to moving picture.

        [2.2.1] Different background and image colors changed respectively, and changed colors periodically.

        [2.2.2] Background and image with large different luminance displayed at the same time should be avoided.

[3] The startup voltage of a Backlight may cause an electrical shock while assembling with the converter. Do not disassemble the module or insert anything into the Backlight unit.

[4] Do not connect or disconnect the module in the "Power On" condition.

[5] Do not exceed the absolute maximum rating value. (supply voltage variation, input voltage variation, variation in part contents and environmental temperature…) Otherwise the module may be damaged.

[6] If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, skin or clothes, it has to be washed away thoroughly with soap.

[7] Module should be turned clockwise (regular front view perspective) when used in portrait mode.

[8] Ultra-violet ray filter is necessary for outdoor operation.

[9] Only when PID module is operated under right operating conditions, lifetime in this spec can be guaranteed. After the module's end of life, it is not harmful in case of normal operation and storage.

7.3 SAFETY STANDARDS

The LCD module should be certified with safety regulations as follows:

Regulatory	Item	Standard
Information Technology equipment	UL	UL 60950-1,2nd Ed, 2014
	cUL	CSA C22.2 No.60950-1-07, 2nd Ed,2014-10
	CB	IEC60950-1:2005+ A1:2009+ A2:2013 / EN60950-1:2006+ A11:2009+ A1:2010+ A12:2011+ A2:2013
Audio/Video Apparatus	UL	UL 60065, 7th Edition, 2013
	cUL	CAN/CSA-C22.2 No. 60065-03, 1st Edition + A1:2006 + A2:2012
	CB	IEC 60065:2001 (Seventh Edition)+ A1:2005+A2:2010 / EN60065:2002+ A1:2006+ A11:2008+ A2:2010+ A12:2011

If the module displays the same pattern for a long period of time, the phenomenon of image sticking may be occurred.
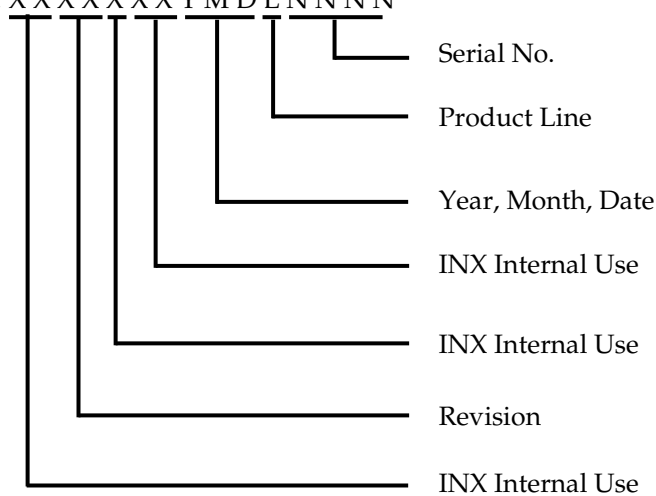
8. DEFINITION OF LABELS

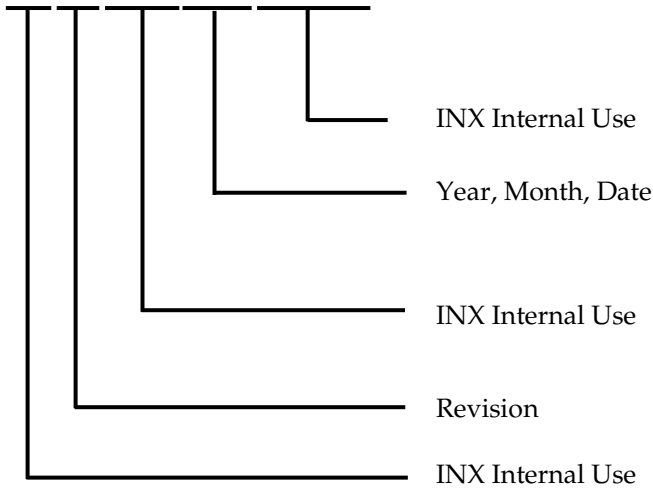### 8.1 MODULE LABEL

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

```
INNOLUX                                    cULus
                                           MADE IN CHINA
         S400HJ6-LE8 Rev. XX
                                           LEOO(CAPG/CANO/VIRO)
         ‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
         X X X X X X X Y M D L N N N N      RoHS
```
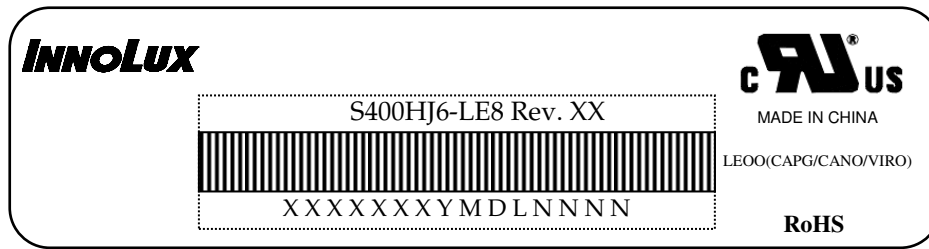
(a)   Model Name: S400HJ6-LE8

(b)   Revision: Rev. XX, for example: A0, A1… B1, B2… or C1, C2…etc.

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

Serial No.

Product Line

Year, Month, Date

INX Internal Use

INX Internal Use

Revision

INX Internal Use

Serial ID includes the information as below:

(a)   Manufactured Date: Year: 0~9, for 2010~2019

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

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

(b)   Revision Code: Cover all the change

(c)   Serial No.: Manufacturing sequence of product

(d)   Product Line: 1 → Line1, 2 → Line 2, …etc.

8.2 CARTON LABEL

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

P.O. NO. _____

Parts ID. _____

Model Name ___ S400HJ6-LE8 _____

Carton ID. ‖‖‖‖‖‖‖‖‖ Quantities ___

XXXXXXXXXXXXX

Made In Taiwan (Made In China)

Model Name: S400HJ6– LE8

Carton ID: X X X X X X X Y M D X X X X

                                INX Internal Use

                                Year, Month, Date

                                INX Internal Use

                                Revision

                                INX Internal Use

Serial ID includes the information as below :

Manufactured Date:

        Year: 2010=0, 2011=1, 2012=2…etc.

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

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

Revision Code: Cover all the change

9. PACKAGING

9.1 PACKAGING SPECIFICATIONS

    (1) 12 LCD TV modules / 1 Box

    (2) BOX DIMENSIONS : 975(L)X567(W)X625(H) mm

    (3) Weight: approximately 88 Kg

9.2 PACKAGING METHOD

Figures 9-1 and 9-2 are the packing method
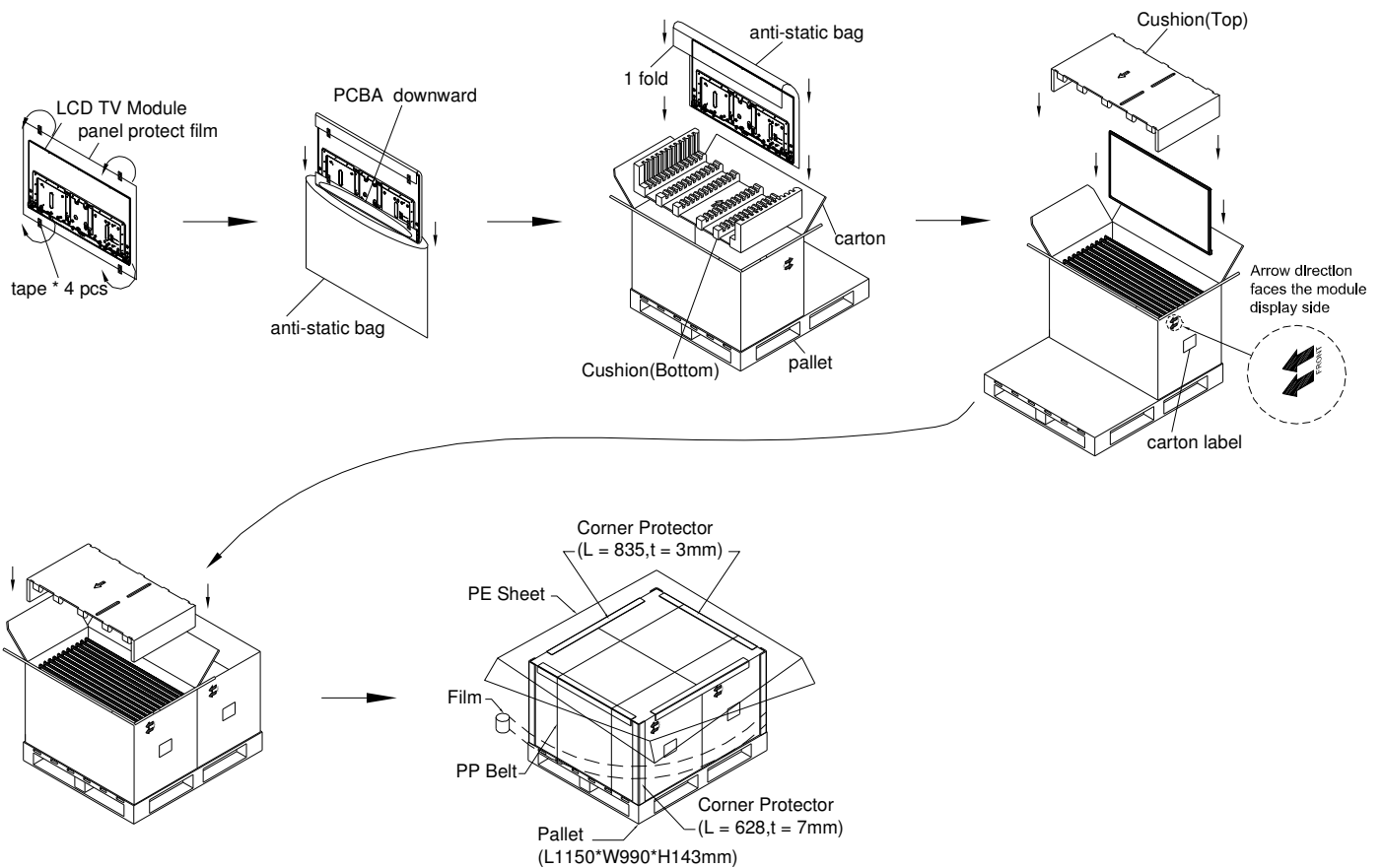
Figure 9-1 packing method

Sea / Land Transportation (40ft HQ Container) 1+1+1 Layer

Corner Protector (L = 835,t = 3mm)
PE Sheet
Film
Film
Film
PP Belt
Corner Protector (L = 628,t = 7mm)
Pallet (L1150*W990*H143mm)
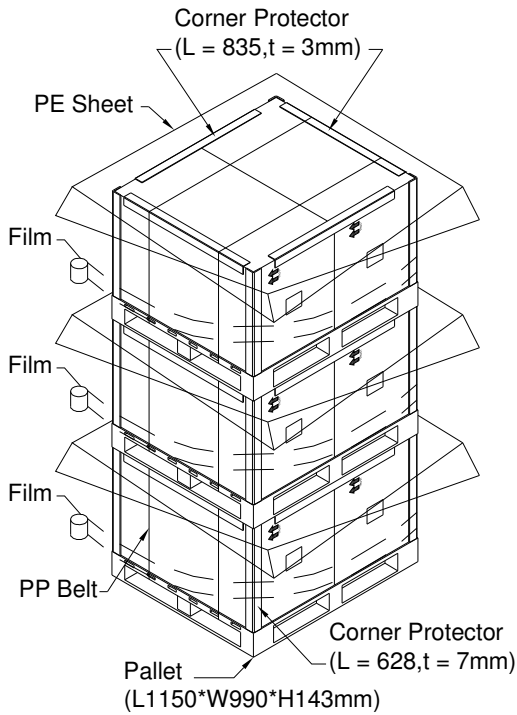
Sea / Land Transportation (40ft Container) 1+1 Layer

Corner Protector (L = 835,t = 3mm)
PE Sheet
Film
Film
PP Belt
Corner Protector (L = 628,t = 7mm)
Pallet (L1150*W990*H143mm)
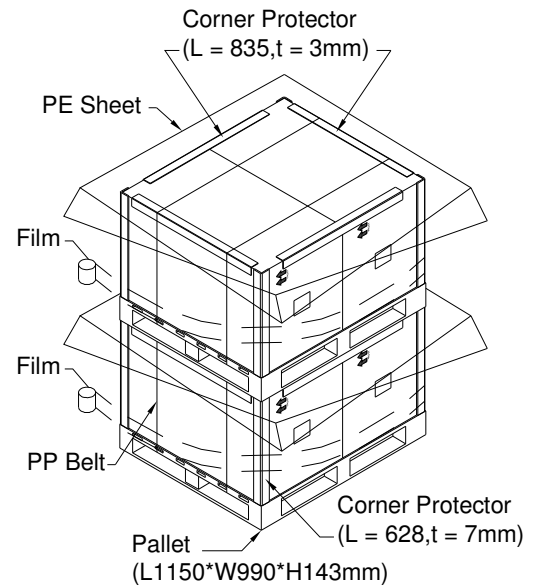
Air Transportation 1 Layer

Corner Protector (L = 835,t = 3mm)
PE Sheet
Film
PP Belt
Corner Protector (L = 628,t = 7mm)
Pallet (L1150*W990*H143mm)
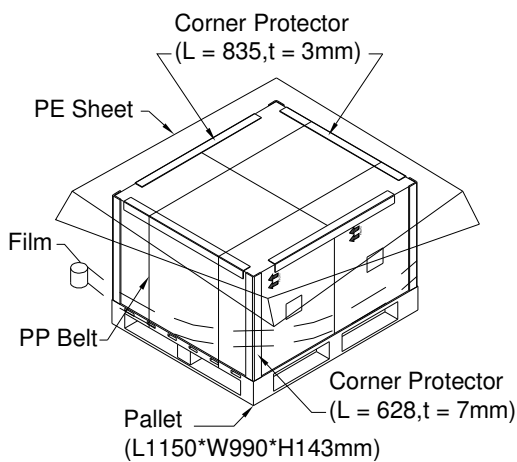
Figure 9-2 packing method

9.3 UN-PACKAGING METHOD (type-A)

Un-packaging method is shown as following figures.
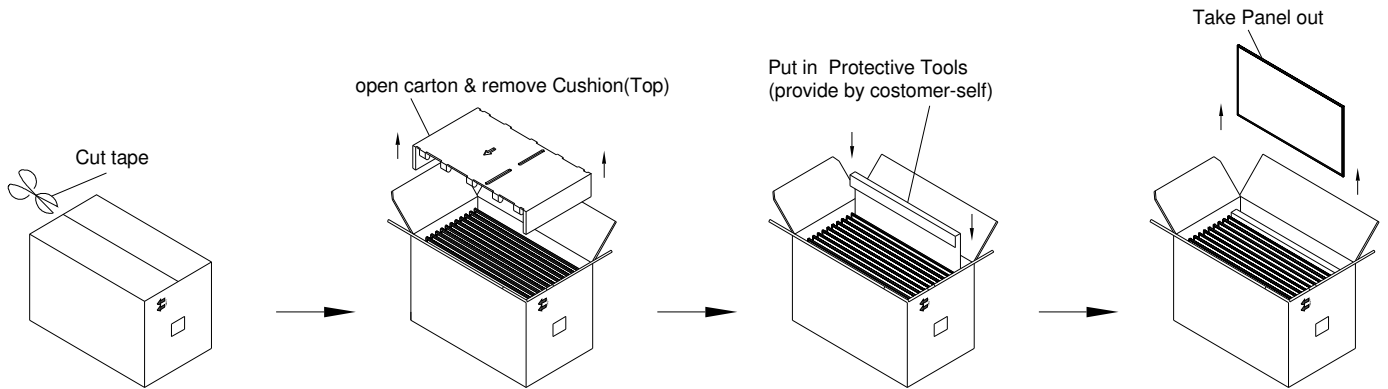
Figure 9-3 un-packing method

10. MECHANICAL CHARACTERISTIC