



- ☐ Tentative Specification
- ☒ Preliminary Specification
- ☐ Approval Specification

MODEL NO.: V260B3
SUFFIX: LE2

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**REVISION HISTORY**

Version	Date	Page (New)	Section	Description
Ver 1.0	Apr. 14,'11	All	All	Preliminary Specification was first issued

1. GENERAL DESCRIPTION

1.1 OVERVIEW

V260B3-LE2 is a TFT Liquid Crystal Display module with LED Backlight unit and 1ch-LVDS interface. The display diagonal is 26". This module supports 1366 x 768 WXGA format and can display 16.7M colors (8-bit/color).

1.2 FEATURES

- Optimized Brightness 300nits
- Contrast Ratio (3000:1)
- Fast Response Time (Gray to Gray Average 8.5ms)
- Color Saturation NTSC 72%
- WXGA (1366 x 768 pixels) Resolution
- DE (Data Enable) Only Mode
- LVDS (Low Voltage Differential Signaling) Interface
- Viewing Angle: 176(H)/176(V) (CR>20) MVA Technology
- Color Reproduction (Nature Color)

1.3 APPLICATION

- TFT LCD TVs
- Optimized Brightness, Multi-Media Displays

1.4 GENERAL SPECIFICATIONS

Item	Specification	Unit	Note
Active Area	575.769 (H) x 323.712 (V) (26" Diagonal)	mm	(1)
Bezel Opening Area	580.2 (H) x 328.2 (V)	mm	
Driver Element	a-si TFT Active Matrix	-	-
Pixel Number	1366 x R.G.B. x 768	pixel	-
Pixel Pitch(Sub Pixel)	0.1405 (H) x 0.4215 (V)	mm	-
Pixel Arrangement	RGB Vertical Stripe	-	-
Power consumption	32W (LVDS input Power 6.72W + LED Backlight Power 24.95 W)		(2)
Display Colors	16.7M	color	-
Display Operation Mode	Transmissive Mode / Normally Black	-	-
Surface Treatment	Anti-Glare Coating (Haze 11%) Hard Coating (3H)	-	(3)

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

Note (2) Please refer sec 3.1 and 3.2 for more information of Power consumption

Note (3) The spec. of the surface treatment is temporarily for this phase. CMI reserves the rights to change this feature.

1.5 MECHANICAL SPECIFICATIONS

Item		Min.	Typ.	Max.	Unit	Note
Module Size Weight	Horizontal (H)	612	613	614	mm	Module Size
	Vertical (V)	360	361	362	mm	
	Depth (D)	9.3	10.3	11.3	mm	To Rear
		13.8	14.8	15.8	mm	To PCB Protector
	Weight		2610		g	

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

Note (2) Module Depth does not include connectors.

2. ABSOLUTE MAXIMUM RATINGS

2.1 ABSOLUTE RATINGS OF ENVIRONMENT

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Storage Temperature	T _{ST}	-20	+60	°C	(1)
Operating Ambient Temperature	T _{OP}	0	50	°C	(1), (2)
Shock (Non-Operating)	S _{NOP}	±X, ±Y ±Z	50	G	(3), (5)
			50		
Vibration (Non-Operating)	V _{NOP}	-	1.0	G	(4), (5)

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

(a) 90 %RH Max. ($T_a \leq 40$ °C).

(b) Wet-Bulb temperature should be 39 °C Max. ($T_a > 40$ °C).

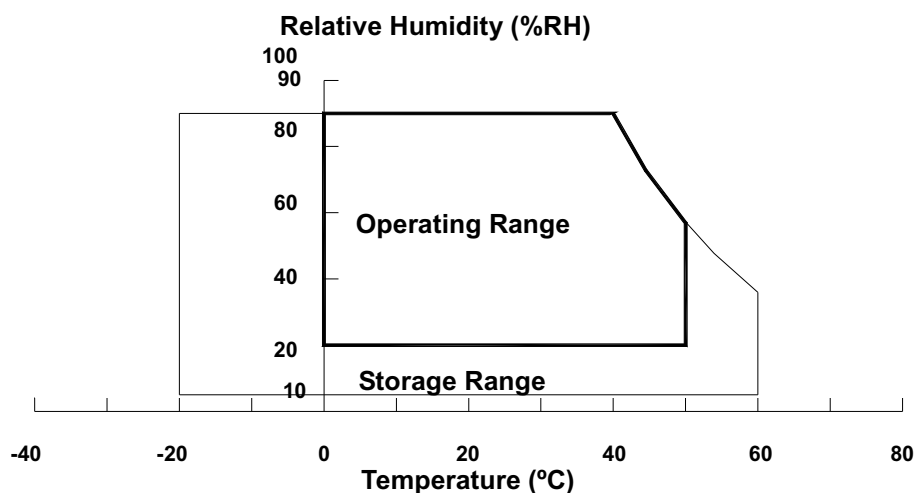
(c) No condensation.

Note (2) The maximum operating temperature is based on the test condition that the surface temperature of display area is less than or equal to 65 °C with LCD module alone in a temperature controlled chamber. Thermal management should be considered in final product design to prevent the surface temperature of display area from being over 65 °C. 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, 10 min, 1 time each X, Y, Z.

Note (5) At testing of 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 ELECTRICAL ABSOLUTE RATINGS**2.2.1 TFT LCD MODULE**

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Power Supply Voltage	V _{CC}	-0.3	13.5	V	(1)
Input Signal Voltage	V _{IN}	-0.3	3.6	V	

2.2.2 BACKLIGHT CONVERTER UNIT

Item	Symbol	Test Condition	Min.	Type	Max.	Unit	Note
Light Bar Voltage	V _W	Ta = 25 °C	-	-	40.8	V _{RMS}	
Converter Input Voltage	V _{BL}	-	0	-	30	V	(1)
Control Signal Level	-	-	-0.3	-	7	V	(1), (3)

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

Note (2) No moisture condensation or freezing.

Note (3) The control signals include On/Off Control.

3. ELECTRICAL CHARACTERISTICS

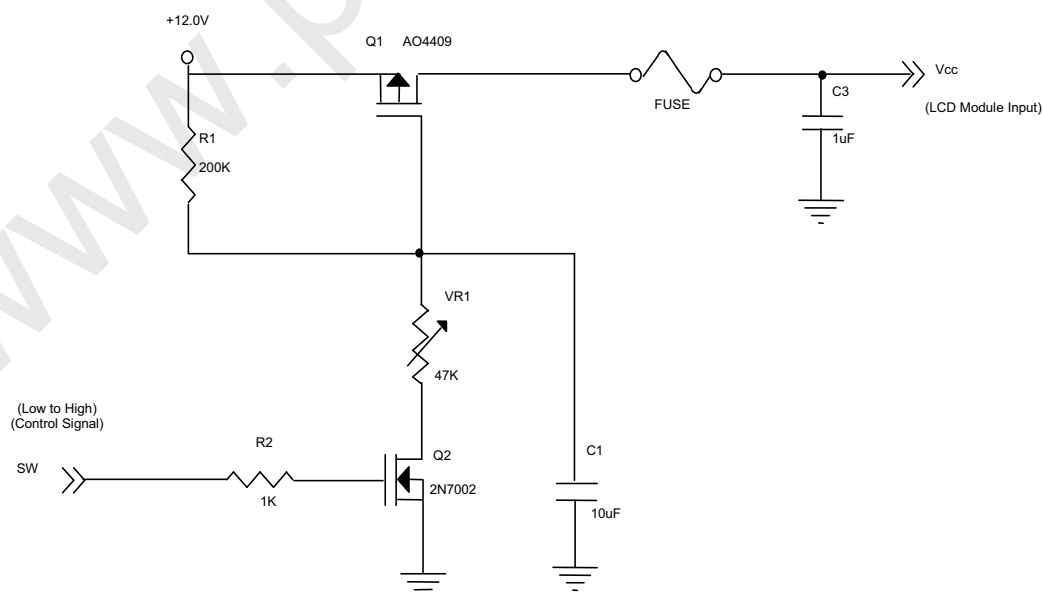
3.1 TFT LCD MODULE

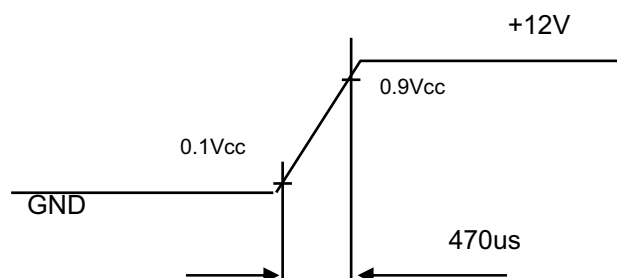
Ta = 25 ± 2 °C

Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Power Supply Voltage		V _{CC}	10.8	12	13.2	V	(1)
Rush Current		I _{RUSH}	—	—	2.53	A	(2)
Power Supply Current	White Pattern	—	—	0.45	--	A	(3)
	Horizontal Stripe	—	—	0.56	0.65	A	
	Black Pattern	—	—	0.36	--	A	
LVDS interface	Differential Input High Threshold Voltage	V _{LVTH}	+100	—	—	mV	(4)
	Differential Input Low Threshold Voltage	V _{LVTL}	—	—	-100	mV	
	Common Input Voltage	V _{CM}	1.0	1.2	1.4	V	
	Differential input voltage (Single-End)	V _{ID}	200	—	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 above ranges.

Note (2) Measurement Condition as below:



Vcc rising time is 470us

Note (3) The specified power supply current is under the conditions at $V_{cc} = 12\text{ V}$, $T_a = 25 \pm 2\text{ }^{\circ}\text{C}$, $f_v = 60\text{ Hz}$, whereas a power-dissipation checking pattern is displayed as below.

a. White Pattern



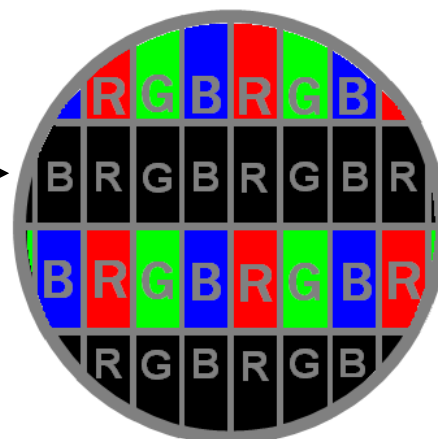
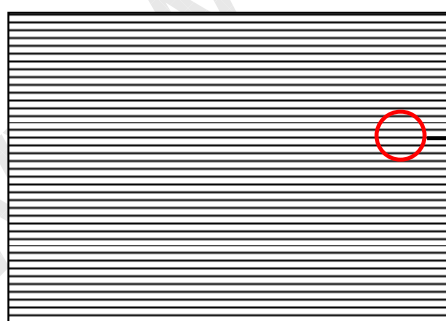
Active Area

b. Black Pattern

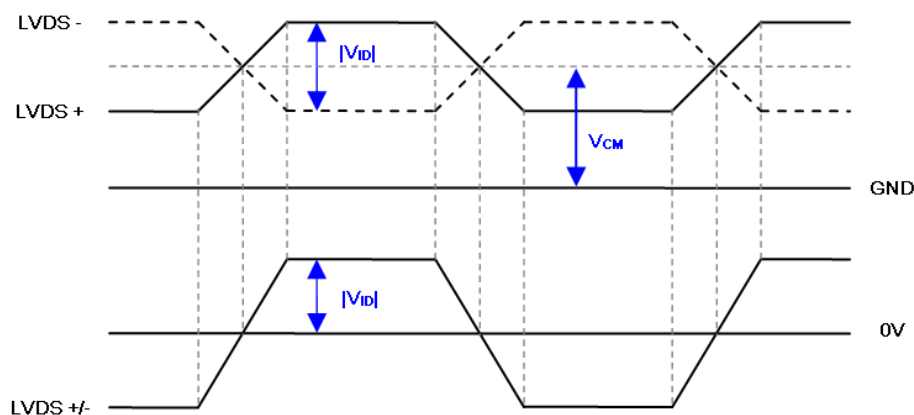


Active Area

c. Horizontal Pattern



Note (4) The LVDS input characteristics are as follows:



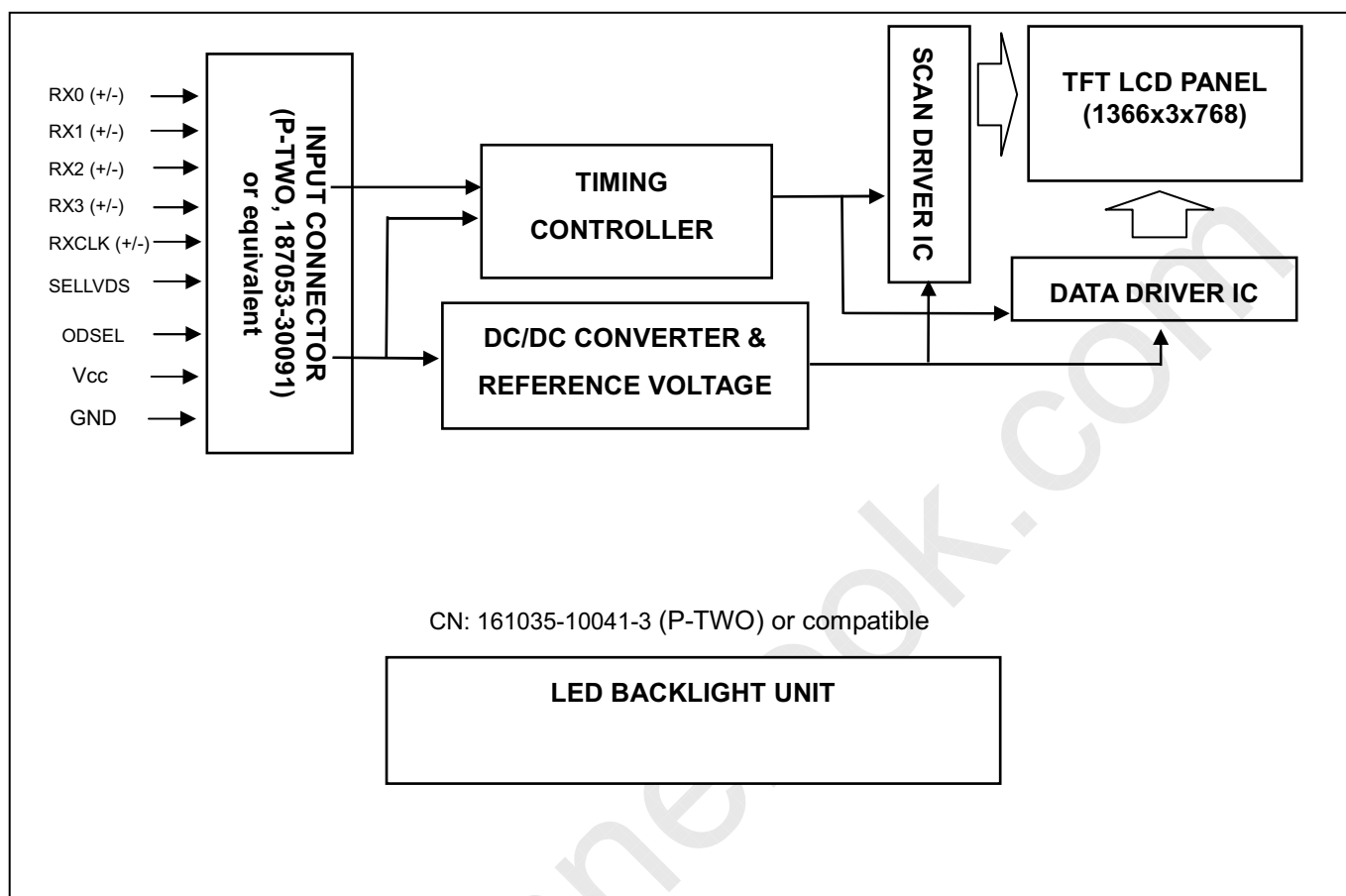
3.2 BACKLIGHT UNIT

3.2.1 LED LIGHT BARCHARACTERISTICS ($T_a = 25 \pm 2^\circ\text{C}$)

The backlight unit contains 1pcs light bar.

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Total Current (6 String)	I_f	-	720	763.2	mA	
One String Current	I_L	-	120	127.2	mA	
One String Voltage	V_W	29.7	-	39.6	V_{DC}	$I_L = 120\text{mA}$
One String Voltage Variation	ΔV_W	-	-	2	V	
Life time	-	30,000	-	-	Hrs	(1)

Note (1) 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 $T_a = 25 \pm 2^\circ\text{C}$, $I_L = 120\text{mA}$.

4. BLOCK DIAGRAM OF INTERFACE**4.1 TFT LCD MODULE**

5. INTERFACE PIN CONNECTION

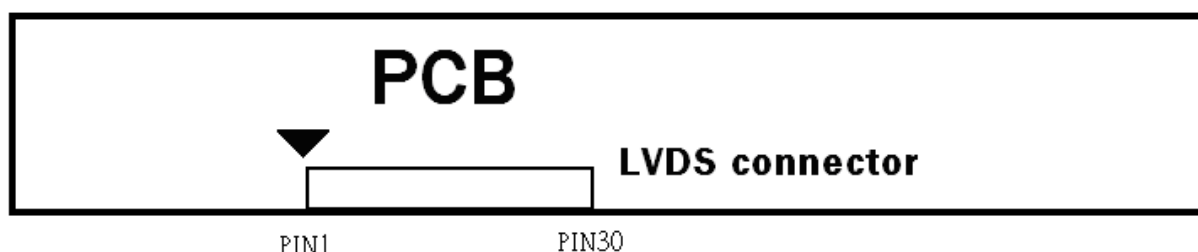
5.1 TFT LCD MODULE

CNF1 Connector Pin Assignment

Pin No.	Symbol	Description	Note
1	VCC	Power supply: +12V	
2	VCC	Power supply: +12V	
3	VCC	Power supply: +12V	
4	VCC	Power supply: +12V	
5	GND	Ground	
6	GND	Ground	
7	GND	Ground	
8	NC	No connection	(3)
9	SELLVDS	Select LVDS data format	(2),(4)
10	NC	No connection	(3)
11	GND	Ground	
12	RX0-	Negative transmission data of pixel 0	
13	RX0+	Positive transmission data of pixel 0	
14	GND	Ground	
15	RX1-	Negative transmission data of pixel 1	
16	RX1+	Positive transmission data of pixel 1	
17	GND	Ground	
18	RX2-	Negative transmission data of pixel 2	
19	RX2+	Positive transmission data of pixel 2	
20	GND	Ground	
21	RXCLK-	Negative of clock	
22	RXCLK+	Positive of clock	
23	GND	Ground	
24	RX3-	Negative transmission data of pixel 3	
25	RX3+	Positive transmission data of pixel 3	
26	GND	Ground	
27	NC	No connection	(3)
28	NC	No connection	(3)
29	NC	No connection	(3)
30	GND	Ground	

Note (1) Connector Part No.: P-TWO, 187053-30091 or compatible

The pin order of LVDS connector is defined as follows



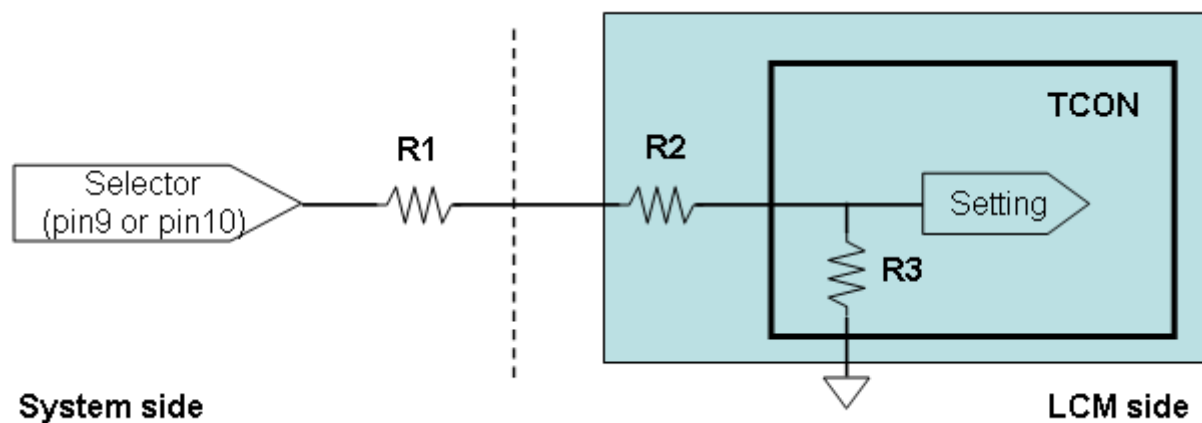
Note (2) Low = Open or connect to GND: VESA Format, High = Connect to +3.3V: JEIDA Format.

Please refer to 5.5 LVDS INTERFACE

Note (3) Reserved for internal use. Please left it open.

Note (4) LVDS signal pin connected to the LCM side followed the following diagram.

R1 in the system side should be less than 1K Ohm. ($R1 < 1K\ \Omega$)



**5.2 BACKLIGHT UNIT**

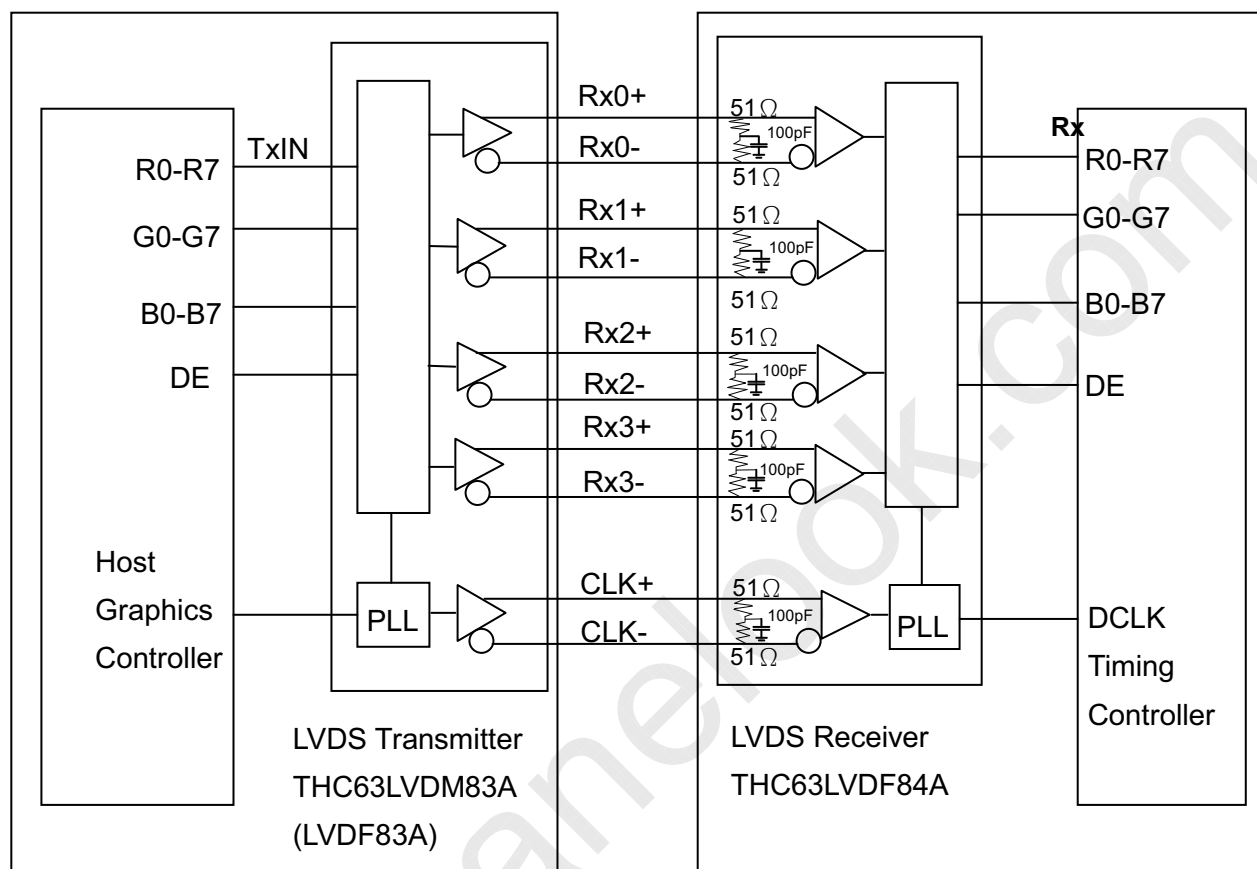
The pin configuration for the housing and the leader wire is shown in the table as below.

CN: 161035-10041-3 (P-TWO) or equivalent

Pin No	Symbol	Feature
1	VLED-	Negative of LED String
2	VLED-	
3	VLED-	
4	VLED-	
5	VLED-	
6	VLED-	
7	NC	NC
8	VLED+3	Positive of LED String
9	VLED+2	
10	VLED+1	

5.3 BLOCK DIAGRAM OF INTERFACE

CNF1



R0~R7 : Pixel R Data

G0~G7 : Pixel G Data

B0~B7 : Pixel B Data

DE : Data Enable Signal

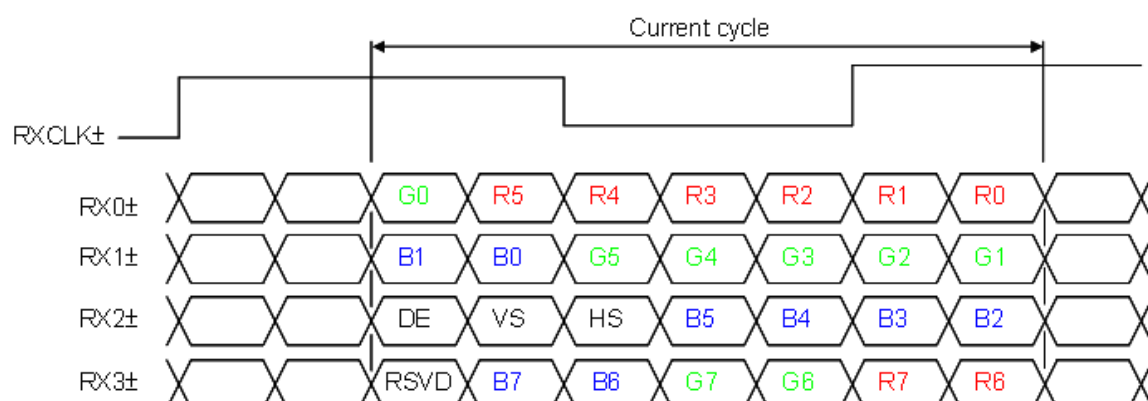
DCLK : Data clock signal

Note (1) The system must have the transmitter to drive the module.

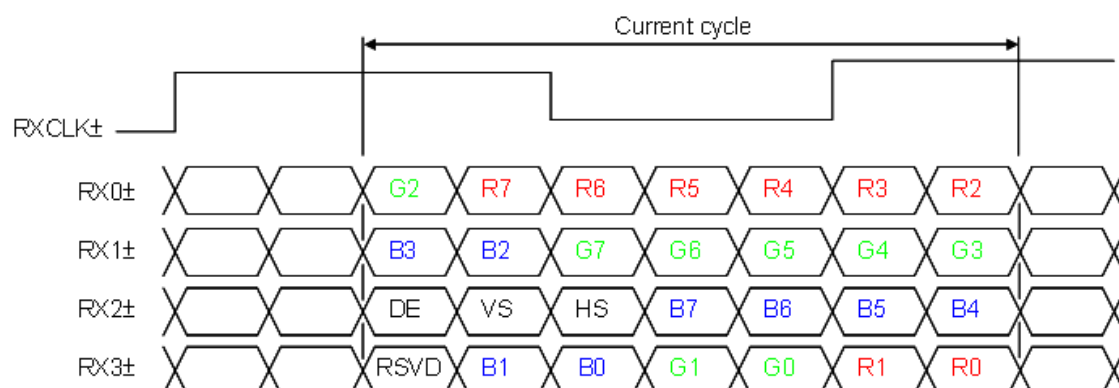
Note (2) LVDS cable impedance shall be 50 ohms per signal line or about 100 ohms per twist-pair line when it is used differentially.

5.4 LVDS INTERFACE

VESA LVDS format : (SELLVDS pin=L or open)



JEDIA LVDS format : (SELLVDS pin=H)



R0~R7: Pixel R Data (7; MSB, 0; LSB)

G0~G7: Pixel G Data (7; MSB, 0; LSB)

B0~B7: Pixel B Data (7; MSB, 0; LSB)

DE: Data enable signal

Notes (1) RSVD (reserved) pins on the transmitter shall be "H" or ("L" or OPEN)



5.5 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 below table 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
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	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	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
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	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	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

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
LVDS Receiver Clock	Frequency	$F_{\text{clkin}} (=1/TC)$	60	76	82	MHz	
	Input cycle to cycle jitter	T_{rcl}	—	—	200	ps	(3)
	Spread spectrum modulation range	$F_{\text{clkin_mod}}$	$F_{\text{clkin}}-2\%$	—	$F_{\text{clkin}}+2\%$	MHz	(4)
	Spread spectrum modulation frequency	F_{SSM}			200	KHz	
LVDS Receiver Data	Setup Time	T_{lvssu}	600	—	—	ps	(5)
	Hold Time	T_{lvhd}	600	—	—	ps	
Vertical Active Display Term	Frame Rate	F_{r5}	47	50	53	Hz	(6)
		F_{r6}	57	60	63	Hz	
	Total	T_{v}	778	806	888	Th	$T_{\text{v}}=T_{\text{vd}}+T_{\text{vb}}$
	Display	T_{vd}	768	768	768	Th	—
	Blank	T_{vb}	10	38	120	Th	—
Horizontal Active Display Term	Total	T_{h}	1442	1560	1936	Tc	$T_{\text{h}}=T_{\text{hd}}+T_{\text{hb}}$
	Display	T_{hd}	1366	1366	1366	Tc	—
	Blank	T_{hb}	76	194	570	Tc	—

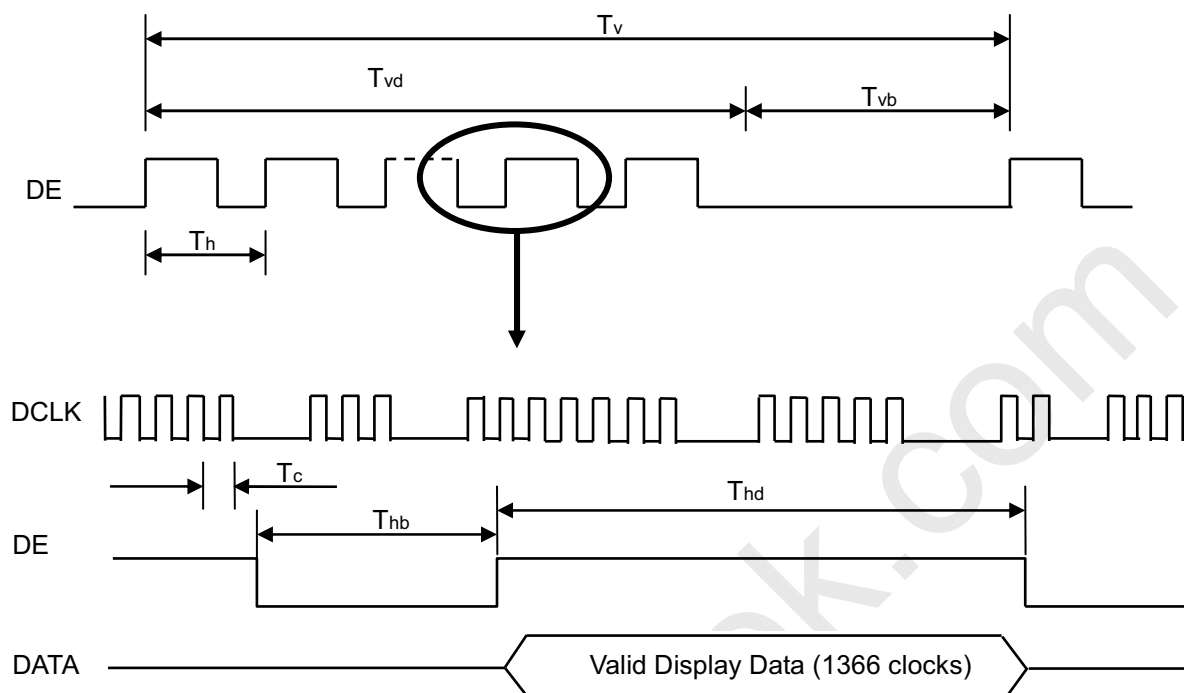
Note (1) Please make sure the range of pixel clock has followed the below equation :

$$F_{\text{clkin}}(\text{max}) \geq F_{\text{r6}} \times T_{\text{v}} \times T_{\text{h}}$$

$$F_{\text{r5}} \times T_{\text{v}} \times T_{\text{h}} \geq F_{\text{clkin}}(\text{min})$$

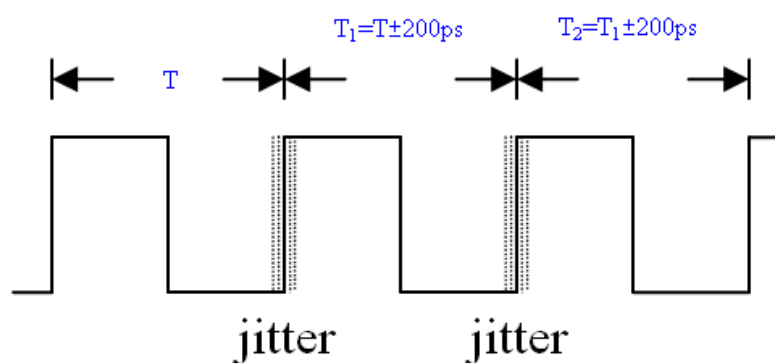
Note (2) This module is operated in DE only mode and please follow the input signal timing diagram as below :

INPUT SIGNAL TIMING DIAGRAM

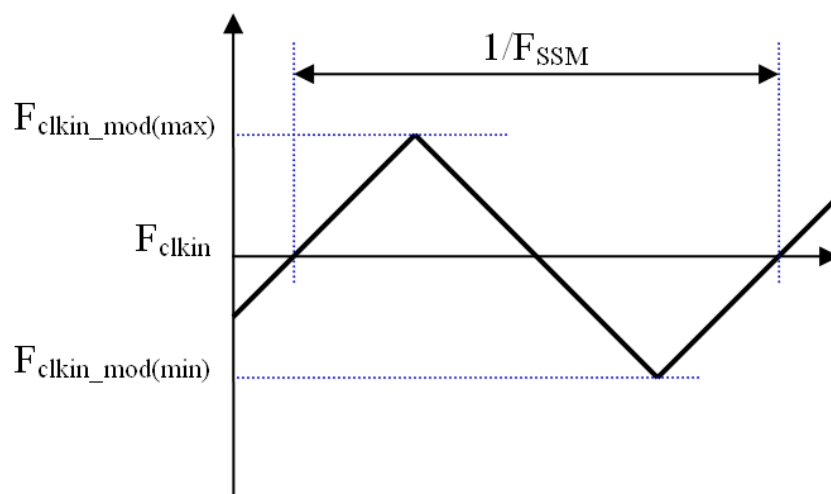


Note (3) The input of the clock cycle-to-cycle jitter is defined as below figure.

$$Trcl = |T_1 - T_1|$$

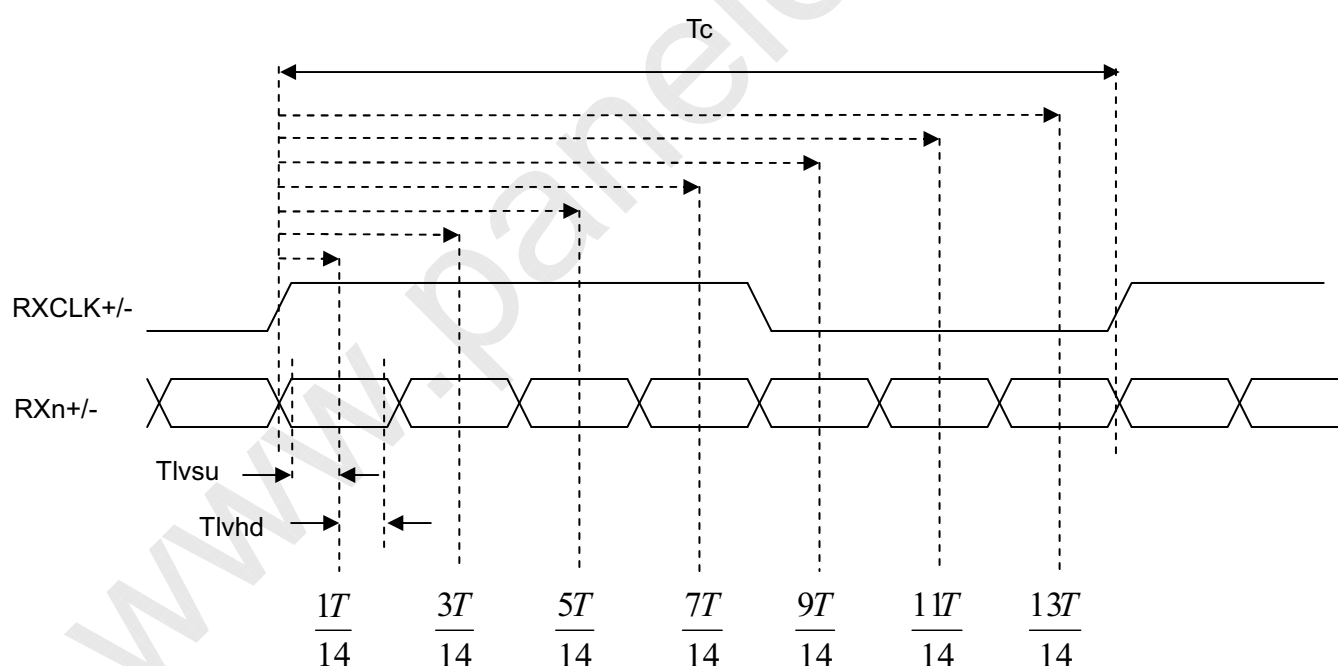


Note (4) The SSCG (Spread Spectrum Clock Generator) is defined as below figure.



Note (5) The LVDS timing diagram and setup/hold time is defined and showing as the following figure.

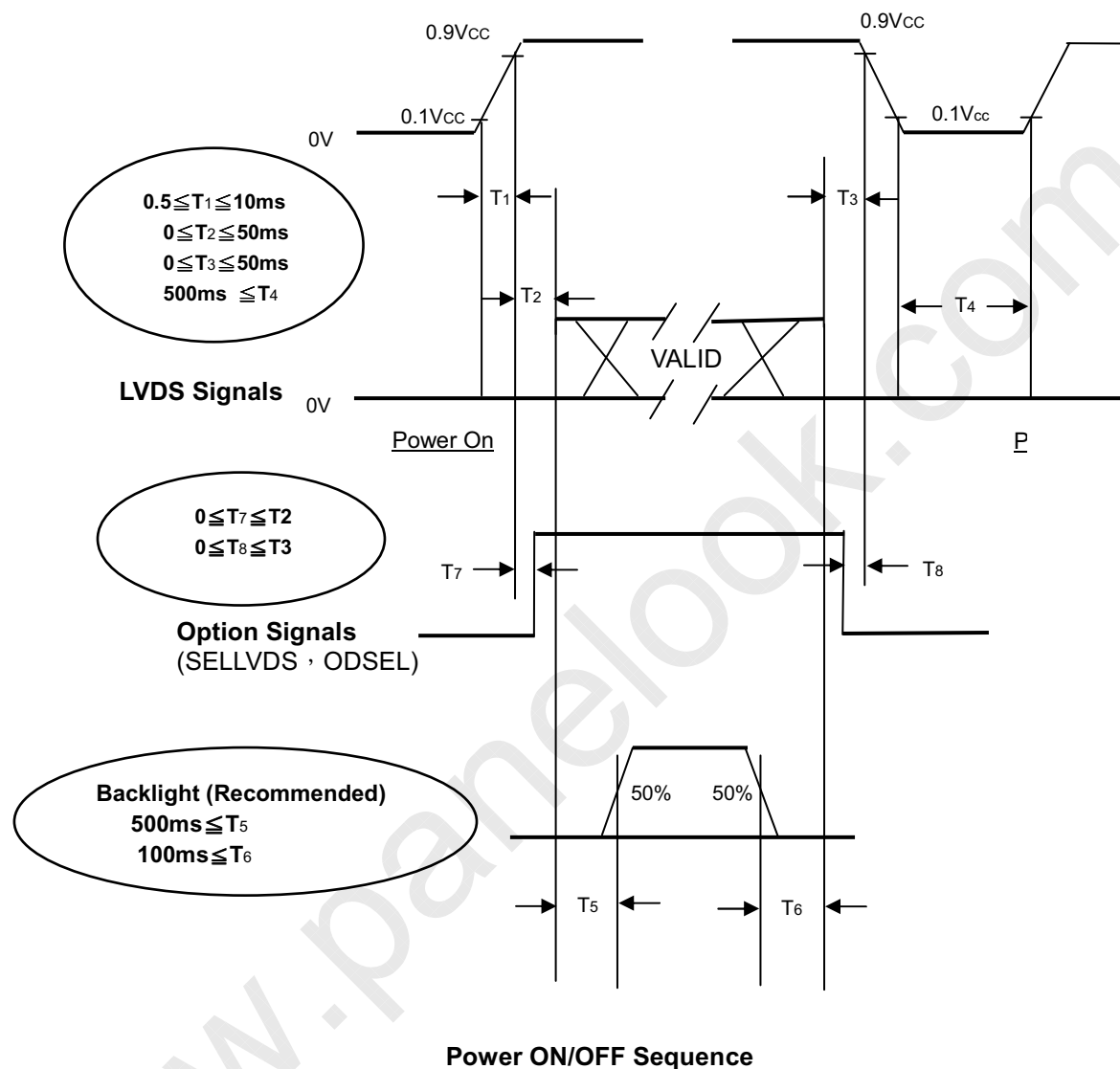
LVDS RECEIVER INTERFACE TIMING DIAGRAM



Note (6) (ODSEL) = H/L or open for 50/60 Hz frame rate. Please refer to 5.1 for detail information.

6.2 POWER ON/OFF SEQUENCE

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



Note (1) The supply voltage of the external system for the module input should follow the definition of V_{CC}.

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

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

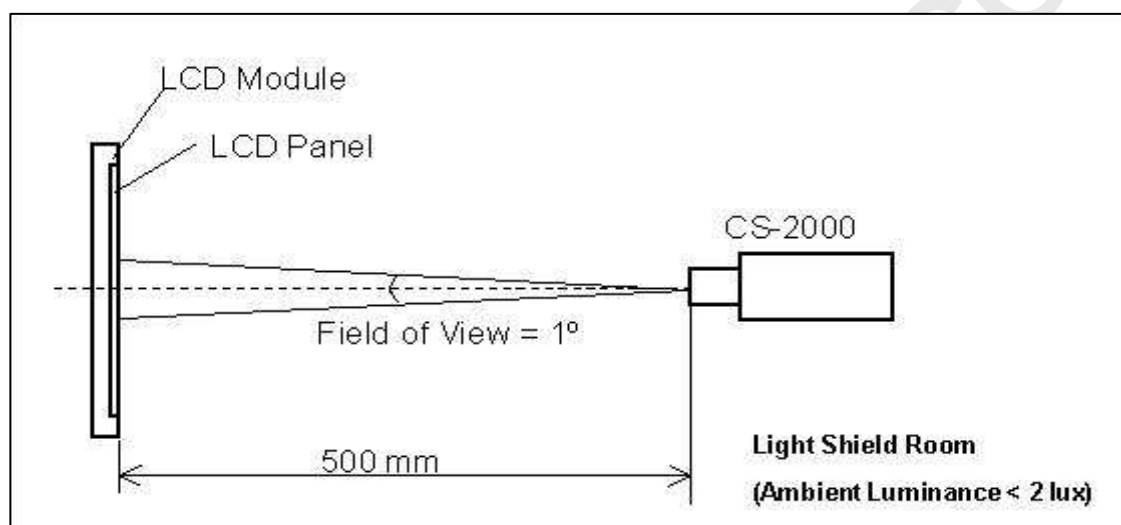
Note (4) T4 should be measured after the module has been fully discharged between power off and on period.

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

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 _{CC}	12V	V
Input Signal	According to typical value in "3. ELECTRICAL CHARACTERISTICS"		
LED Current	I _L	120±7.2	mA

The LCD module should be stabilized at given temperature for 1 hour to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement (CS-1000 or CA-210 calibrated by CS-2000) should be executed after lighting backlight for 1 hour in a windless room.



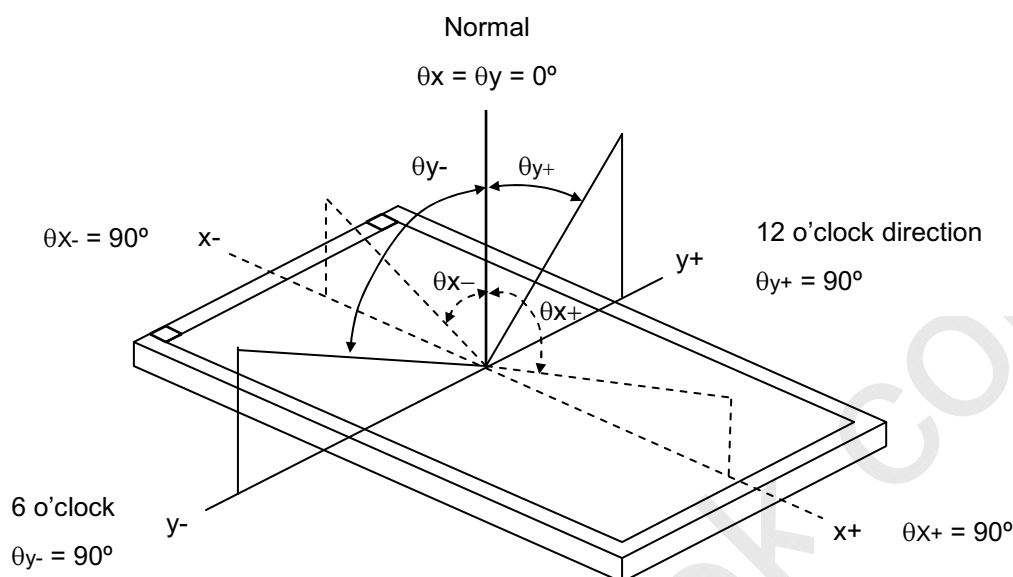
**7.2 OPTICAL SPECIFICATIONS**

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 7.1.

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR	$\theta_x=0^\circ, \theta_y=0^\circ$ Viewing Normal Angle	2000	3000		-	(2)
Response Time		Gray to Gray			8.5	-	ms	(3)
Center Luminance of White		L_c		(240)	(300)			(4)
White Variation		δW				1.3	-	(6)
Cross Talk		CT				4	%	(5)
Color Chromaticity	Red	Rx		Typ. -0.03	(0.633)	Typ. +0.03	-	Target
		Ry			(0.334)		-	
	Green	Gx			(0.301)		-	
		Gy			(0.630)		-	
	Blue	Bx			(0.153)		-	
		By			(0.057)		-	
	White	Wx			(0.280)			
		Wy			(0.290)			
	Color Gamut	CG			(72)		%	NTSC
Viewing Angle	Horizontal	θ_{x+}	$CR \geq 20$	80	88		Deg.	(1)
		θ_{x-}		80	88			
	Vertical	θ_{y+}		80	88			
		θ_{y-}		80	88			

Note (1) Definition of Viewing Angle (θ_x , θ_y):

Viewing angles are measured by Autronic Conoscope Cono-80



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

The contrast ratio can be calculated by the following expression.

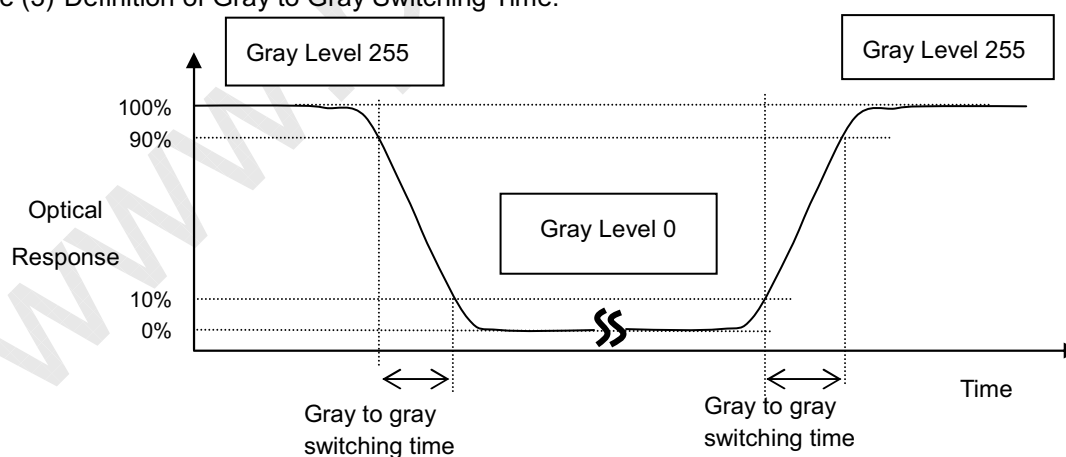
$$\text{Contrast Ratio (CR)} = L_{255} / L_0$$

L_{255} : 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 in the figure of Note (6).

Note (3) Definition of Gray to Gray Switching Time:



The driving signal means the signal of luminance 0%, 20%, 40%, 60%, 80%, and 100%.

Gray-to-Gray average time means the average switching time of luminance 0%, 20%, 40%, 60%, 80%, and 100% to each other.

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

Measure the luminance of gray level 255 at center point.

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

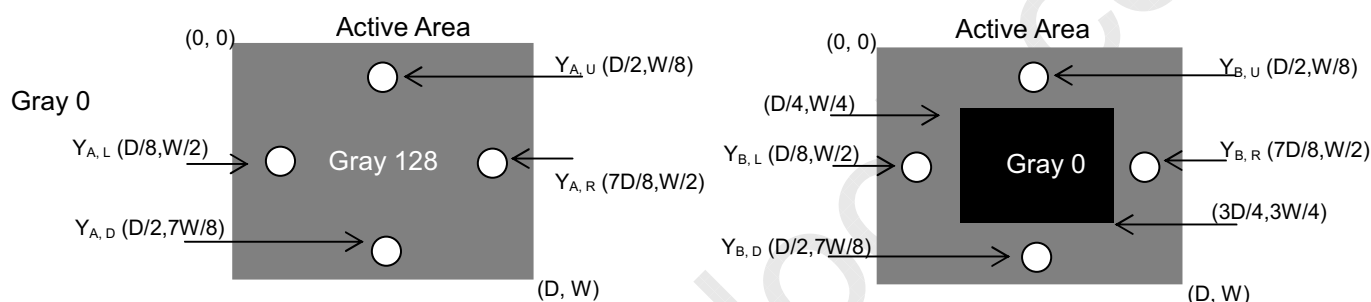
Note (5) Definition of Cross Talk (CT):

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

Where:

Y_A = Luminance of measured location without gray level 255 pattern (cd/m^2)

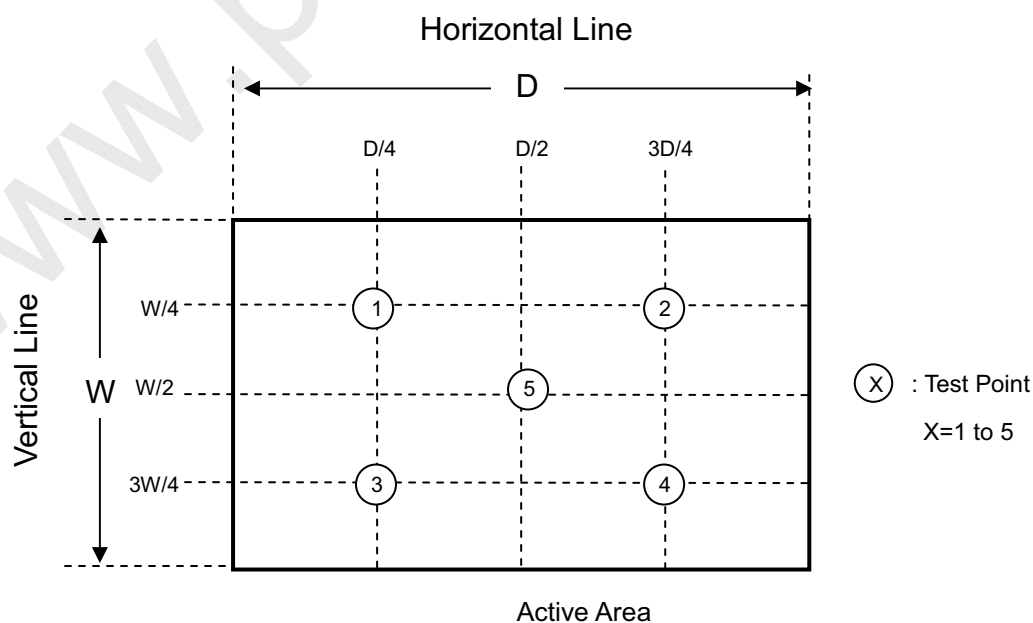
Y_B = Luminance of measured location with gray level 255 pattern (cd/m^2)



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

To measure the luminance of gray level 255 at 5 points

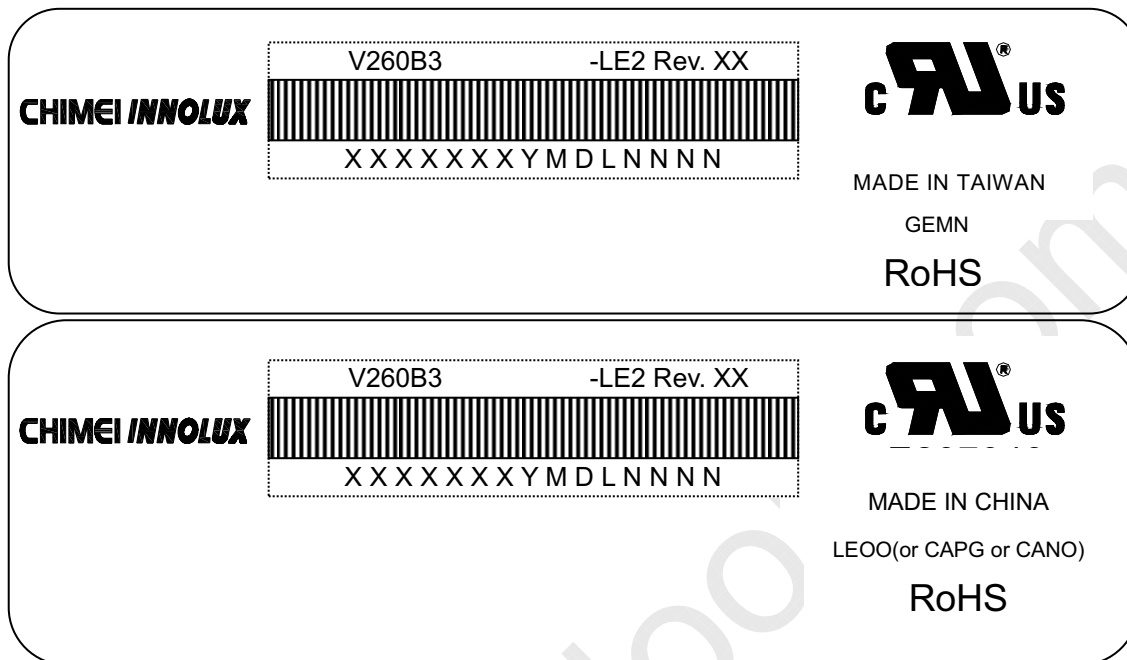
$$\delta W = \text{Maximum} [L(1), L(2), L(3), L(4), L(5)] / \text{Minimum} [L(1), L(2), L(3), L(4), L(5)]$$



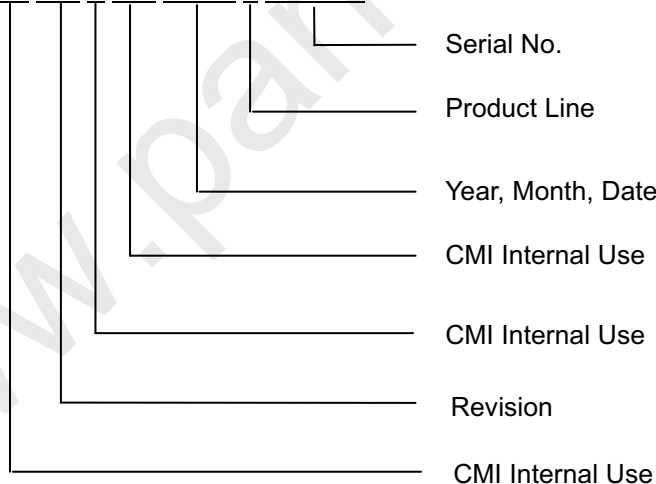
8. DEFINITION OF LABELS

8.1 CMI MODULE LABEL

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



- (a) Model Name: V260B3-LE2
 (b) Revision: Rev. XX, for example: A0, A1... B1, B2... or C1, C2...etc.
 (c) Serial ID: XXXXXXYYMDLLNNNN



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.

9. PACKAGING

9.1 PACKING SPECIFICATIONS

- (1) 11 LCD TV modules / 1 Box
- (2) Box dimensions : 698(L)x436(W)x452(H)mm
- (3) Weight : approximately 31.7 Kg (11 modules per box)

9.2 PACKING METHOD

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

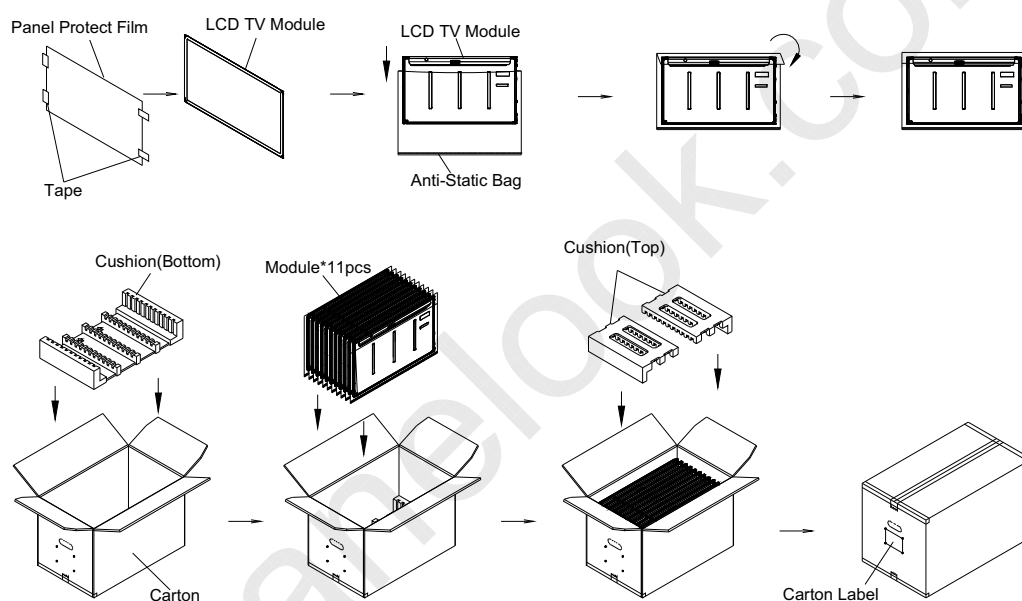
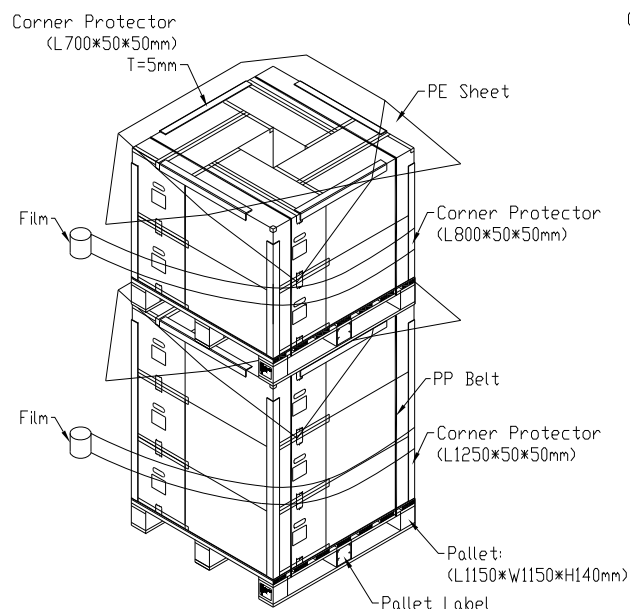


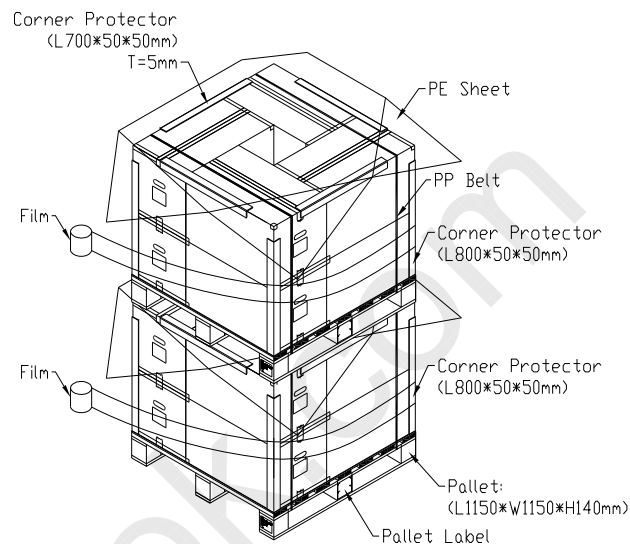
Figure.9-1 packing method



Sea / Land Transportation (40ft HQ Container)



Sea / Land Transportation (40ft Container)



Air Transportation

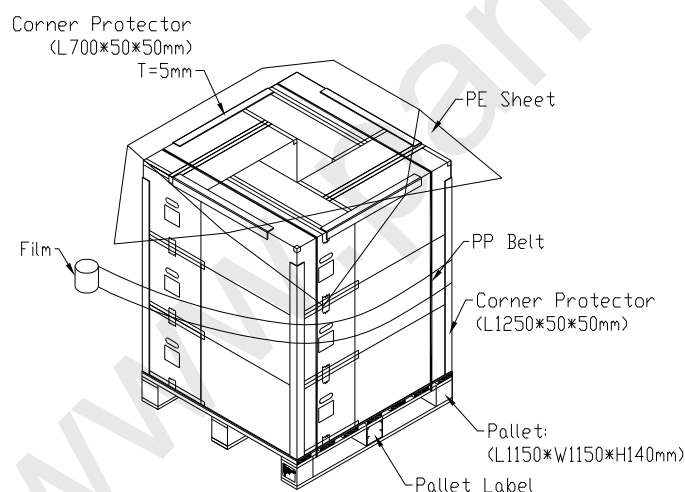


Figure.9-2 Packing method



10. PRECAUTIONS

10.1 ASSEMBLY AND HANDLING PRECAUTIONS

- (1) Do not apply rough force such as bending or twisting to the module during assembly.
- (2) 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.
- (3) Do not apply pressure or impulse to the module to prevent the damage of LCD panel and backlight.
- (4) Always follow the correct power-on sequence when the LCD module is turned on. This can prevent the damage and latch-up of the CMIS LSI chips.
- (5) Do not plug in or pull out the I/F connector while the module is in operation.
- (6) Do not disassemble the module.
- (7) Use a soft dry cloth without chemicals for cleaning, because the surface of polarizer is very soft and easily scratched.
- (8) Moisture can easily penetrate into LCD module and may cause the damage during operation.
- (9) High temperature or humidity may deteriorate the performance of LCD module. Please store LCD modules in the specified storage conditions.
- (10) When ambient temperature is lower than 10°C, the display quality might be reduced. For example, the response time will become slow, and the starting voltage of CCFL will be higher than that of room temperature.

10.2 SAFETY PRECAUTIONS

- (1) The startup voltage of a backlight is over 1000 Volts. It may cause an electrical shock while assembling with the inverter or converter. Do not disassemble the module or insert anything into the backlight unit.
- (2) 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.
- (3) After the module's end of life, it is not harmful in case of normal operation and storage.

10.3 STORAGE PRECAUTIONS

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

- (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°C at normal humidity without condensation.
- (2) The module shall be stored in dark place. Do not store the TFT-LCD module in direct sunlight or fluorescent light.

**11. REGULATORY STANDARDS****11.1 SAFETY**

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

Requirement	Standard	Remark
UL	UL60950-1:2006 or Ed.2:2007	
	UL60065 Ed.7:2007	
cUL/CSA	CAN/CSA C22.2 No.60950-1-03 or 60950-1-07	
	CAN/CSA C22.2 No.60065-03:2006 + A1:2006	
CB	IEC60950-1:2005 / EN60950-1:2006+ A11:2009	
	IEC60065:2001+ A1:2005 / EN60065:2002 + A1:2006 + A11:2008	

12. MECHANICAL CHARACTERISTIC

