

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

**MODEL NO.: V400HJ6**

**SUFFIX: ME2**

Revision : C2

Customer:

APPROVED BY

SIGNATURE

Name / Title \_\_\_\_\_

Note

\_\_\_\_\_  
Please return 1 copy for your confirmation with your signature and

Approved By	Checked By	Prepared By
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## REVISION HISTORY

Version	Date	Page(New)	Section	Description
Ver. 2.0	Jan.6, 2016	All	All	The approval specification was first issued.

## 1. GENERAL DESCRIPTION

### 1.1 OVERVIEW

V400HJ6-ME2 is a 40" TFT Liquid Crystal Display 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).

### 1.2 FEATURES

- High brightness (300 nits)
- High contrast ratio (5000:1)
- Fast response time (Gray to gray average 9.5 ms)
- High color saturation (NTSC 72%)
- FHDTV (1920 x 1080 pixels) resolution, true HDTV format
- DE (Data Enable) only mode
- LVDS (Low Voltage Differential Signaling) interface
- Optimized response time for 50/60 Hz frame rate
- Ultra wide viewing angle : Super MVA technology
- RoHS compliance
- T-con input frame rate: 50Hz/60Hz, output frame rate: 50Hz/60Hz

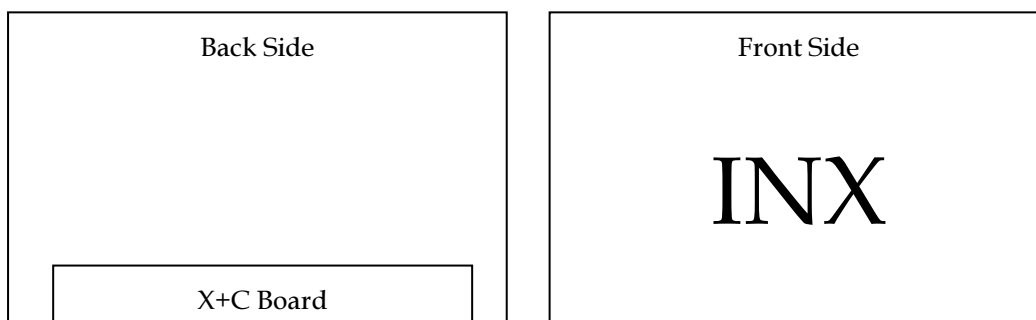
### 1.3 GENERAL SPECIFICATIONS

Item	Specification	Unit	Note
Active Area	878.112(H) x 485.352(V) (39.5" diagonal)	mm	(1)
Bezel Opening Area	879.9 (H) x 487.2 (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	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)



#### 1.4 MECHANICAL SPECIFICATIONS

Item		Min.	Typ.	Max.	Unit	Note
Module Size	Horizontal (H)	902.5	903.7	904.9	mm	(1), (2)
	Vertical (V)	512.6	513.8	515.0	mm	
	Depth (D)	15.9	17.4	18.9	mm	
Weight			7.3		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 real.

## 2. ABSOLUTE MAXIMUM RATINGS

### 2.1 ABSOLUTE RATINGS OF ENVIRONMENT

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Storage Temperature	TST	-20	+60	°C	(1)
Operating Ambient Temperature	TOP	0	50	°C	(1), (2)
Shock (Non-Operating)	SNOP	-	30	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. ( $T_a \leq 40\text{ }^{\circ}\text{C}$ ).

(b) Wet-bulb temperature should be 39 °C Max. ( $T_a > 40\text{ }^{\circ}\text{C}$ ).

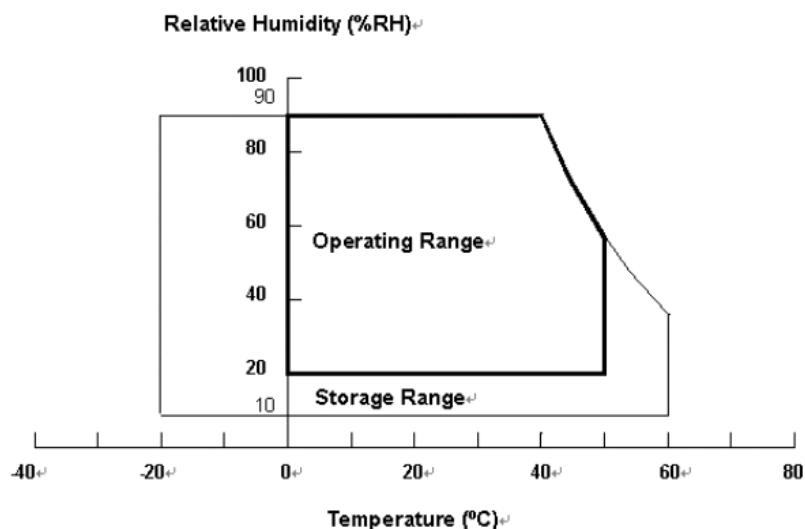
(c) No condensation.

Note (2) Thermal management should be considered in final product design to prevent the surface temperature of display area from being over 70 °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  $\pm X$ ,  $\pm Y$ ,  $\pm Z$ .

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 °C at normal humidity without condensation.
- (b) The module shall be stroed 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	
Logic Input Voltage	VIN	-0.3	3.6	V	

### 2.3.2 BACKLIGHT UNIT

Item	Symbol	Min.	Max.	Unit	Note
Light Bar Voltage	V <sub>W</sub>	-	60	V <sub>DC</sub>	(1)

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.



### 3. ELECTRICAL CHARACTERISTICS

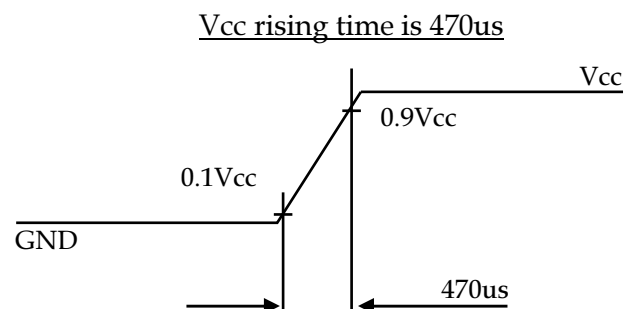
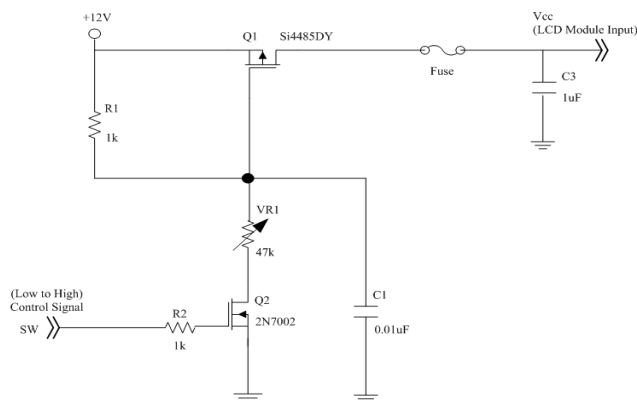
#### 3.1 TFT LCD MODULE

(Ta = 25 ± 2 °C)

Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Power Supply Voltage		V <sub>CC</sub>	10.8	12	13.2	V	(1)
Rush Current		I <sub>RUSH</sub>	—	—	3.5	A	(2)
Power consumption	White Pattern	P <sub>T</sub>	—	7.6	9.2	W	(3)
	Black Pattern	P <sub>T</sub>	—	4.6	5.5		
	Horizontal Stripe	P <sub>T</sub>	—	7.1	8.6		
Power Supply Current	White Pattern	—	—	0.63	0.77	A	
	Black Pattern	—	—	0.38	0.46		
	Horizontal Stripe	—	—	0.59	0.72		
LVDS interface	Differential Input High Threshold Voltage	V <sub>LVTH</sub>	+100	—	+300	mV	(4)
	Differential Input Low Threshold Voltage	V <sub>LVTL</sub>	-300	—	-100	mV	
	Common Input Voltage	V <sub>CM</sub>	1.0	1.2	1.4	V	
	Differential input voltage (single-end)	V <sub>ID</sub>	200	—	600	mV	
	Terminating Resistor	R <sub>T</sub>	—	100	—	ohm	
CMOS interface	Input High Threshold Voltage	V <sub>IH</sub>	2.7	—	3.3	V	
	Input Low Threshold Voltage	V <sub>IL</sub>	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 V<sub>CC</sub> (Typ.).

Note (2) Measurement condition :



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 check pattern below is displayed.

a. White Pattern



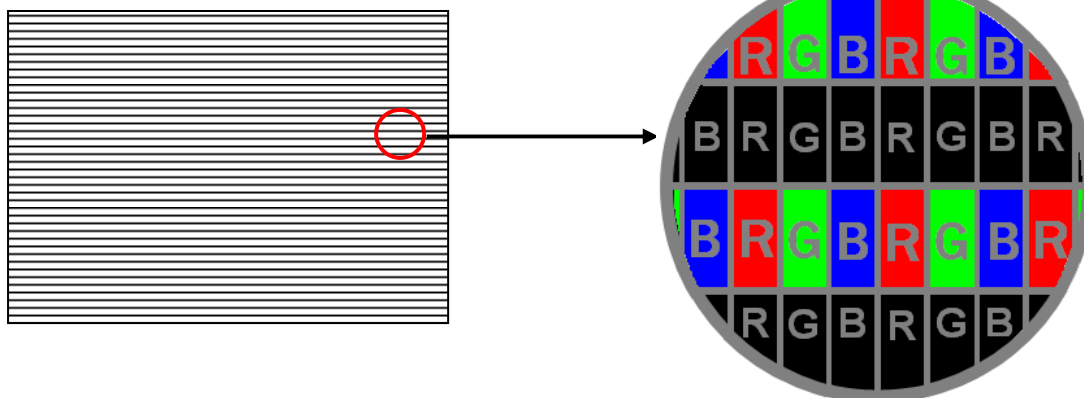
Active Area

b. Black Pattern

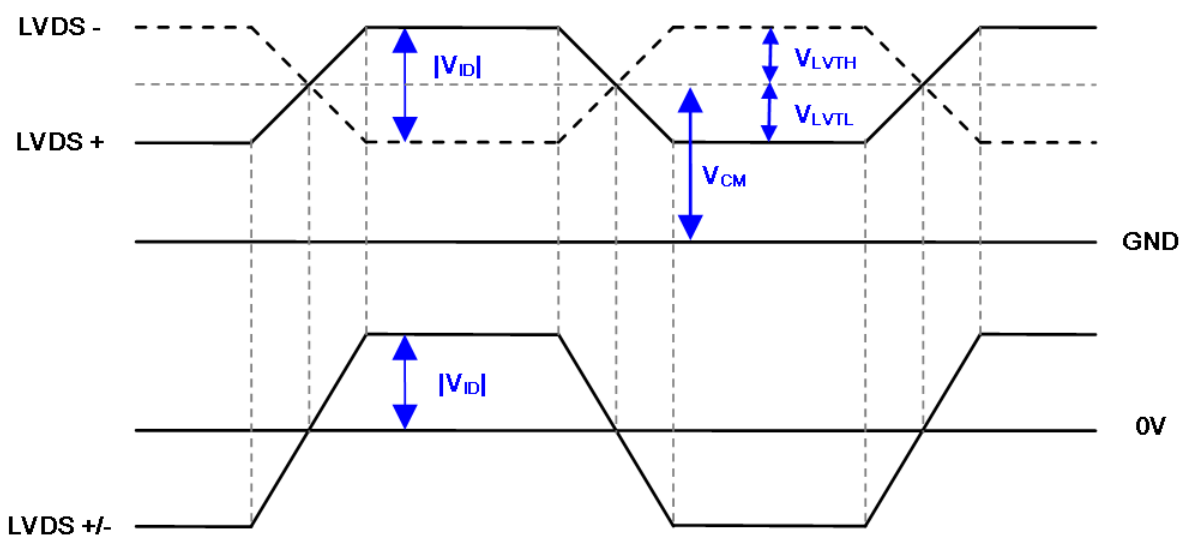


Active Area

c. Horizontal Stripe



Note (4) The LVDS input characteristics is shown as below :



## 3.2 BACKLIGHT UNIT

### 3.2.1 LED LIGHT BAR CHARACTERISTICS

The backlight unit contains 1 pcs LED light bar, and each light bar has 4 string LED. (Ta = 25 ± 2 °C)

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
One String Current	I <sub>L</sub>	216.2	230	243.8	mA	(1)
One String Voltage	V <sub>W</sub>	40.04	—	48.41	V <sub>DC</sub>	I <sub>L</sub> = 230mA
One String Voltage Variation	ΔV <sub>W</sub>			2	V <sub>DC</sub>	
Power Consumption	P <sub>BL</sub>		41		W	(2) I <sub>L</sub> = 230mA
Life time	—	30,000	—	—	Hrs	(3)

Note (1) Dimming Ratio=100%

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

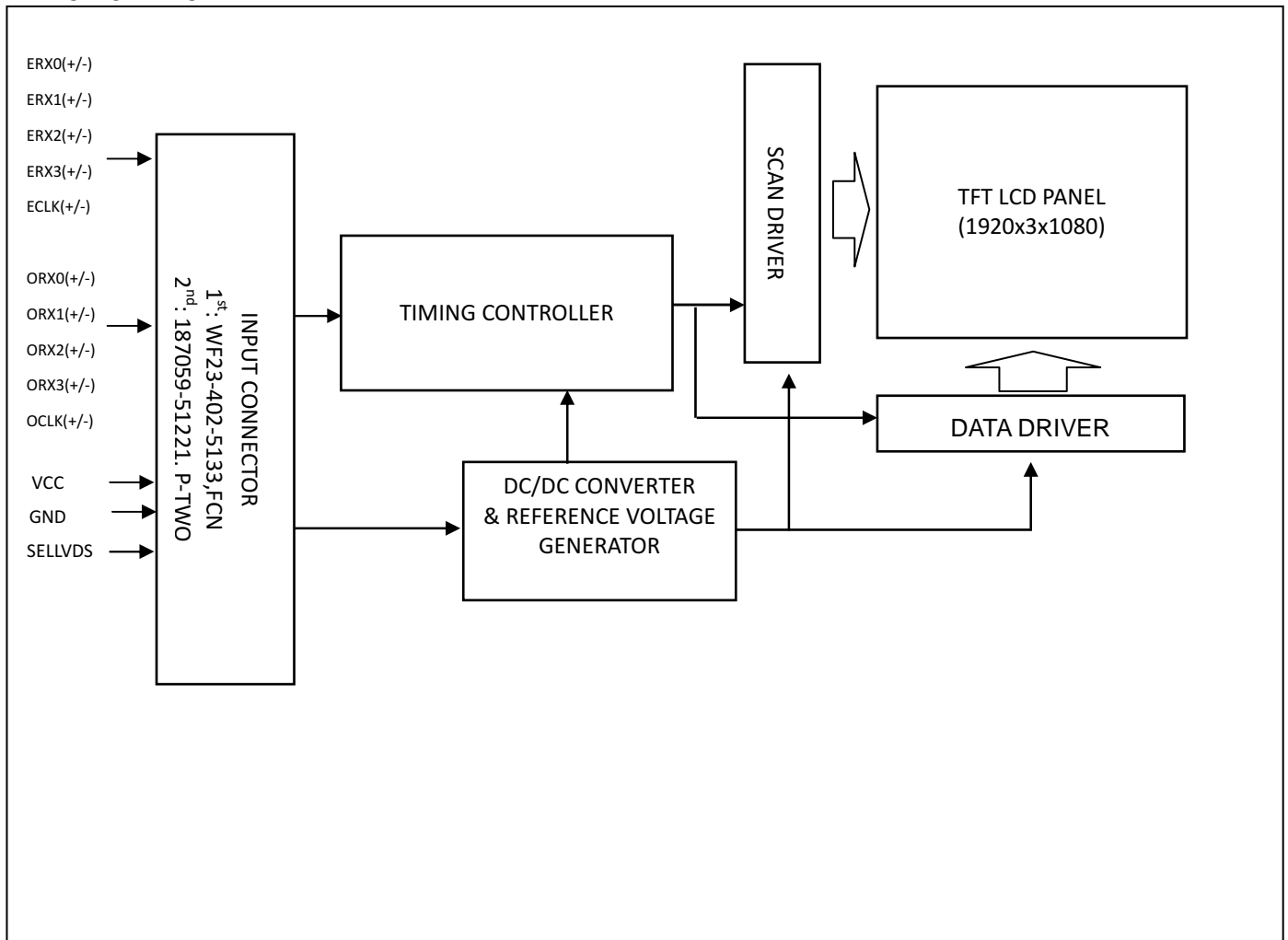
Note (3) The lifetime is defined as the time which luminance of the LED decays to 50% compared to the initial value,

Operating condition: Continuous operating at Ta = 25±2°C, IL = 230 mA.

## 4. BLOCK DIAGRAM OF INTERFACE

### 4.1 TFT LCD MODULE

#### TFT LCD OPEN CELL



## 5. INPUT TERMINAL PIN ASSIGNMENT

### 5.1 TFT LCD MODULE INPUT

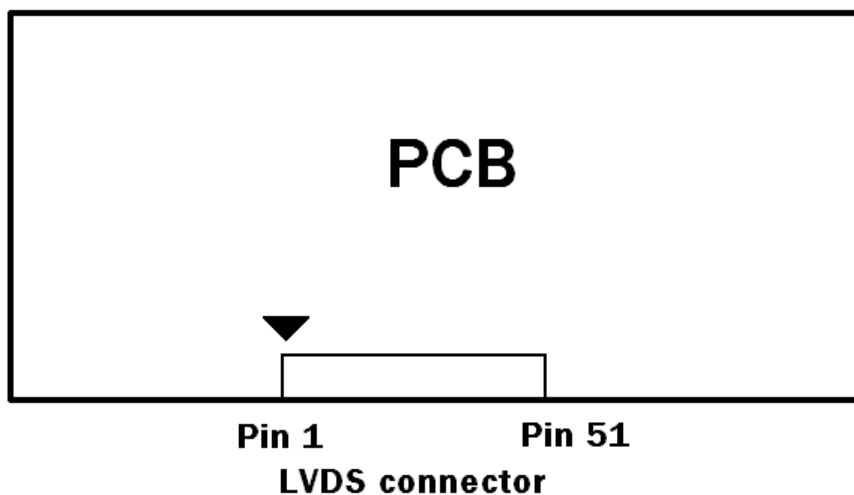
CNF1 Connector Pin No.: (WF23-402-5133 (FCN) , 187059-51221 (P-TWO))

Matting connector : FI-RE51HL (JAE)

Pin	Name	Description	Note
1	N.C.	No Connection	(2)
2	N.C.	No Connection	
3	N.C.	No Connection	
4	N.C.	No Connection	
5	N.C.	No Connection	
6	N.C.	No Connection	
7	SELLVDS	Input signal for LVDS Data Format Selection	(3)(4)
8	N.C.	No Connection	(2)
9	N.C.	No Connection	
10	N.C.	No Connection	
11	GND	Ground	
12	ORX0-	Odd pixel Negative LVDS differential data input. Channel 0	(5)
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	
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	(2)
25	N.C.	No Connection	
26	GND	Ground	
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	(2)
41	N.C.	No Connection	
42	GND	Ground	
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.



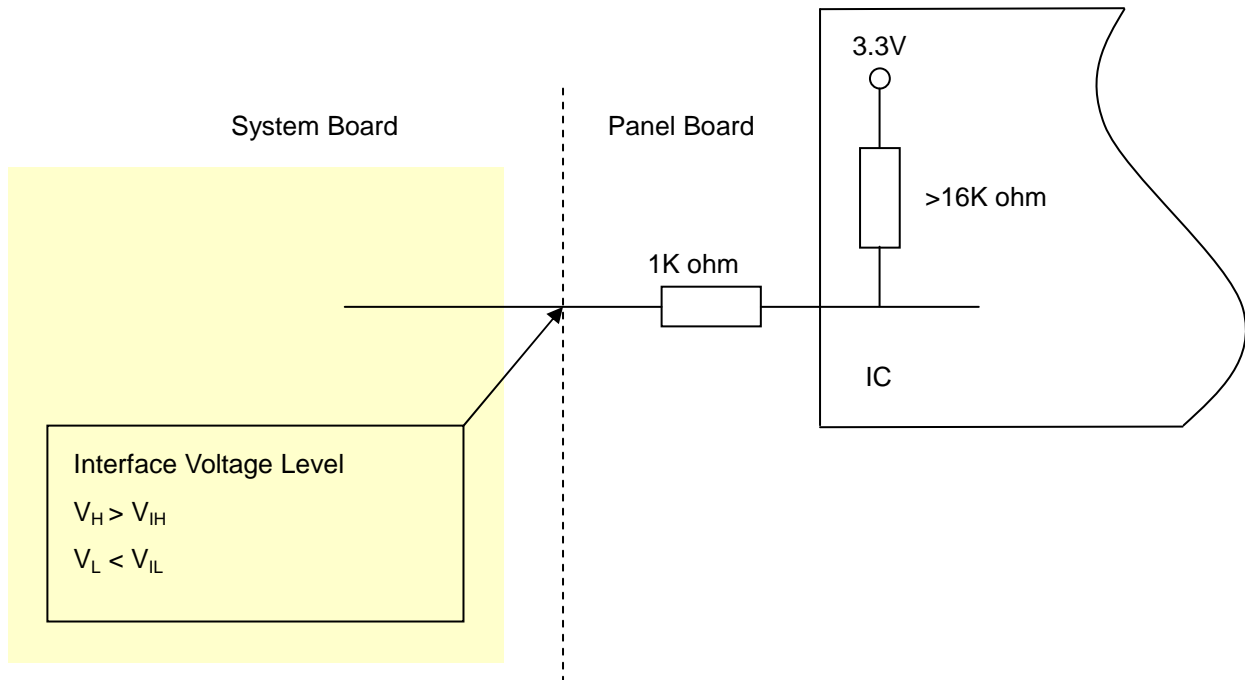
Note (2) Reserved for internal use. Please leave it open.

Note (3) LVDS format selection.

SELLVDS	Mode
L	JEIDA
H(default)	VESA

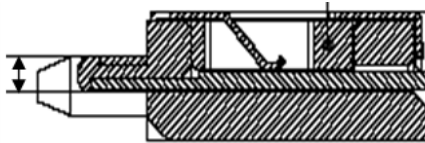
L : Connect to GND, H : Connect to Open or +3.3V

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.



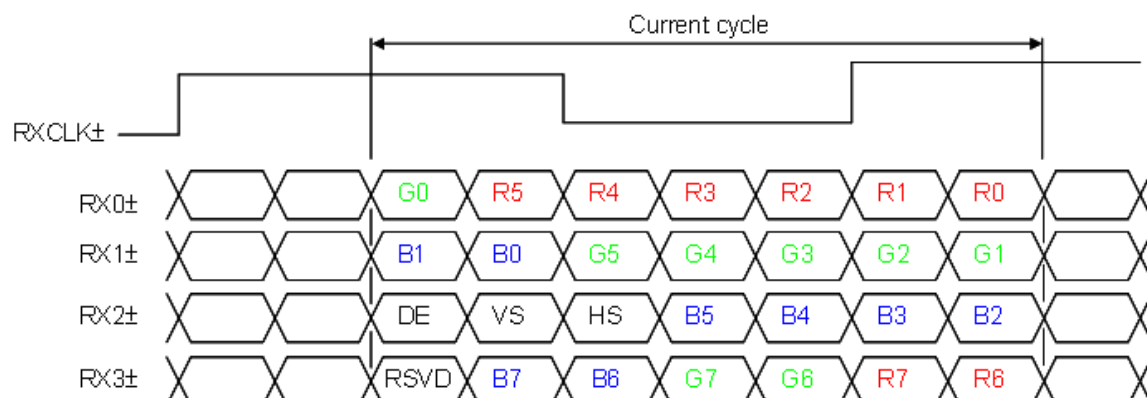
Note (5) Two pixel data send into the module for every clock cycle. The first pixel of the frame is odd pixel and the second pixel is even pixel.

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

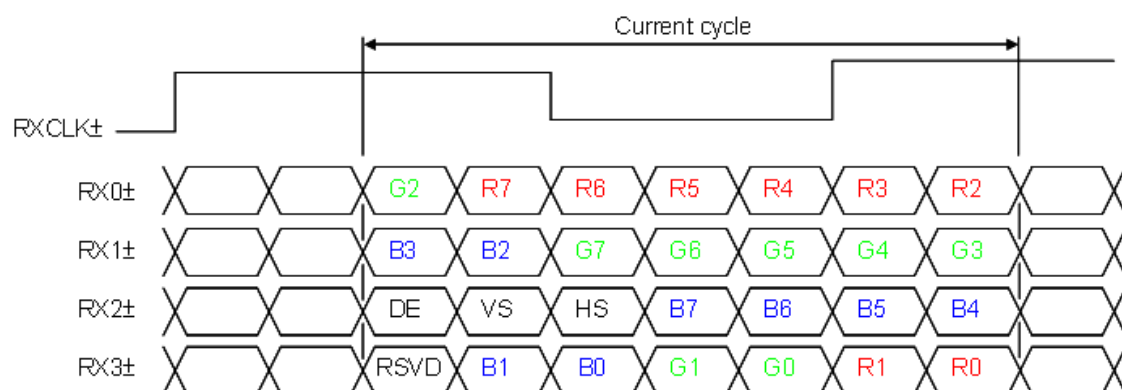


## 5.2 LVDS INTERFACE

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".



## 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 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
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	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	1	0	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

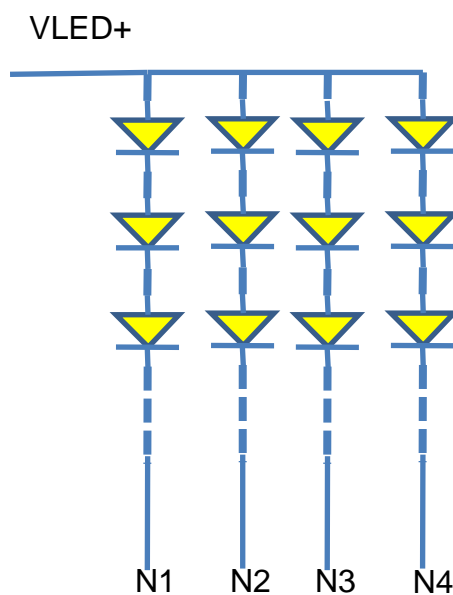
Note (1) 0: Low Level Voltage, 1: High Level Voltage

## 5.4 BACKLIGHT UNIT

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

Connector: WM13-406-063N (FCN) or CI1406M1HRK-NH(Cvilux)

pin	symbol	Description
1	N1	Negative of LED string
2	N2	Negative of LED string
3	N3	Negative of LED string
4	N4	Negative of LED string
5	VLED+	Positive of LED string
6	VLED+	Positive of LED string



## 6. INTERFACE TIMING

### 6.1 INPUT SIGNAL TIMING SPECIFICATIONS

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

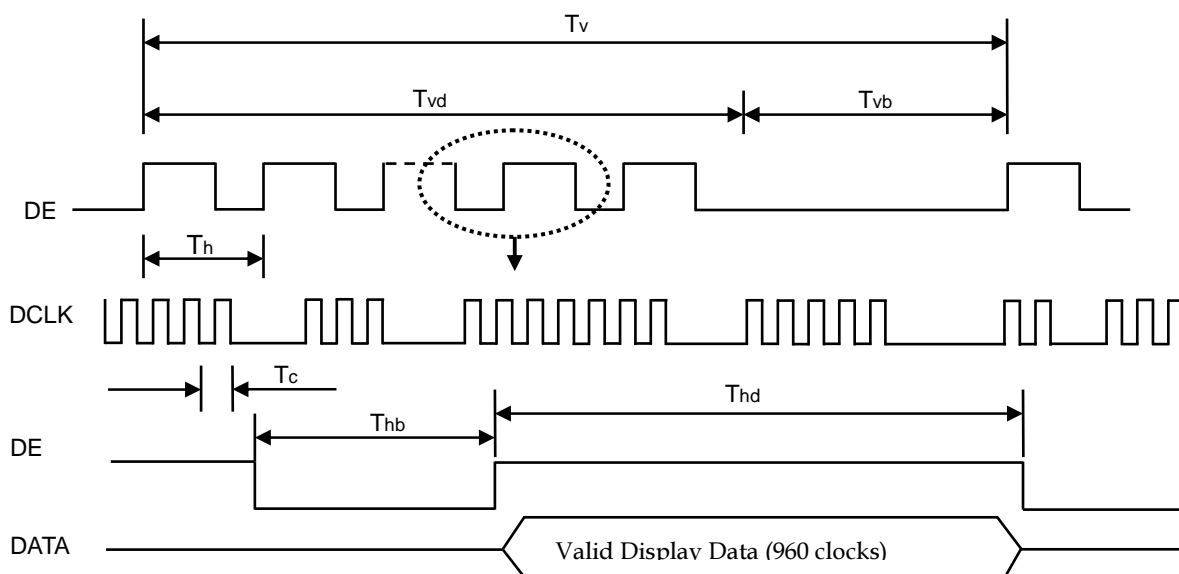
Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
LVDS Receiver Clock	Frequency	$F_{\text{clkin}}$ (=1/TC)	60	74.25	80	MHz	
	Input cycle to cycle jitter	$T_{\text{rdl}}$	—	—	200	ps	(3)
	Spread spectrum modulation range	$F_{\text{clkin\_mod}}$	$F_{\text{clkin}}-2\%$	—	$F_{\text{clkin}}+2\%$	MHz	(4)
	Spread spectrum modulation frequency	$F_{\text{SSM}}$	—	—	200	KHz	
LVDS Receiver Data	Receiver Skew Margin	$T_{\text{RSKM}}$	-400	—	400	ps	(5)
Vertical Active Display Term	Frame Rate	$F_{\text{r5}}$	47	50	53	Hz	(6)
		$F_{\text{r6}}$	57	60	63	Hz	
	Total	$T_{\text{v}}$	1090	1125	1480	Th	$T_{\text{v}}=T_{\text{vd}}+T_{\text{vb}}$
	Display	$T_{\text{vd}}$	1080	1080	1080	Th	—
	Blank	$T_{\text{vb}}$	10	45	400	Th	—
Horizontal Active Display Term	Total	$T_{\text{h}}$	1030	1100	1325	Tc	$T_{\text{h}}=T_{\text{hd}}+T_{\text{hb}}$
	Display	$T_{\text{hd}}$	960	960	960	Tc	—
	Blank	$T_{\text{hb}}$	70	140	365	Tc	—

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

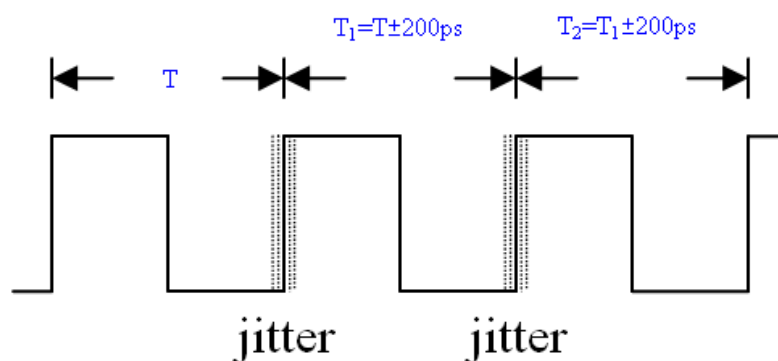
$$F_{\text{clkin}}(\text{max}) \geq F_{\text{r6}} \times T_{\text{v}} \times T_{\text{h}}$$

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

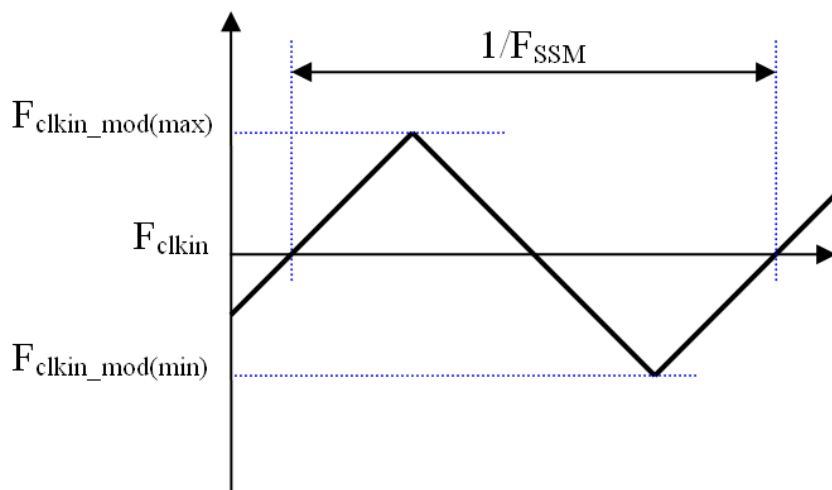
Note (2) This module is operated in DE only mode and please follow the input signal timing diagram below :



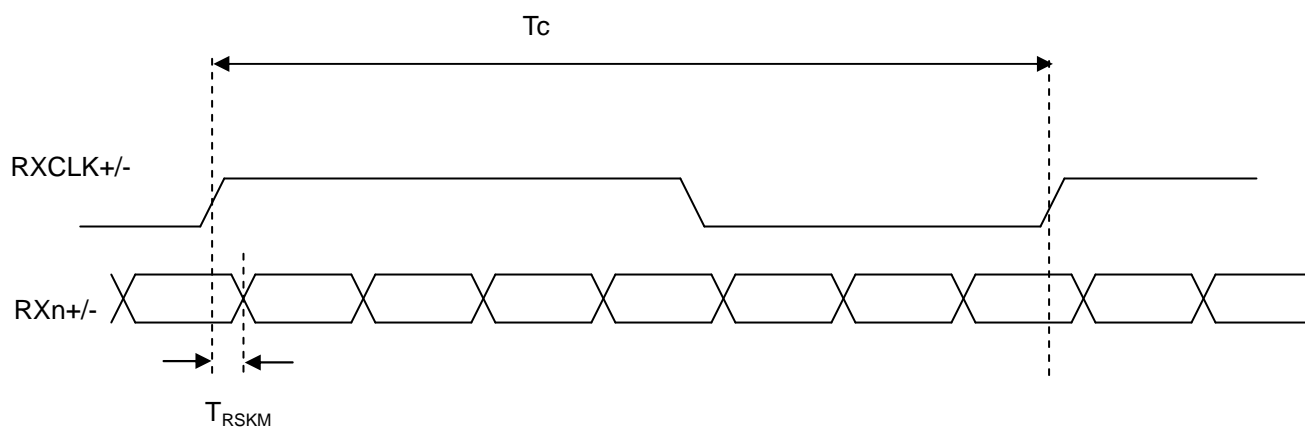
Note (3) The input clock cycle-to-cycle jitter is defined as below figures.  $Trcl = |T_1 - T|$



Note (4) The SSCG (Spread spectrum clock generator) is defined as below figures.



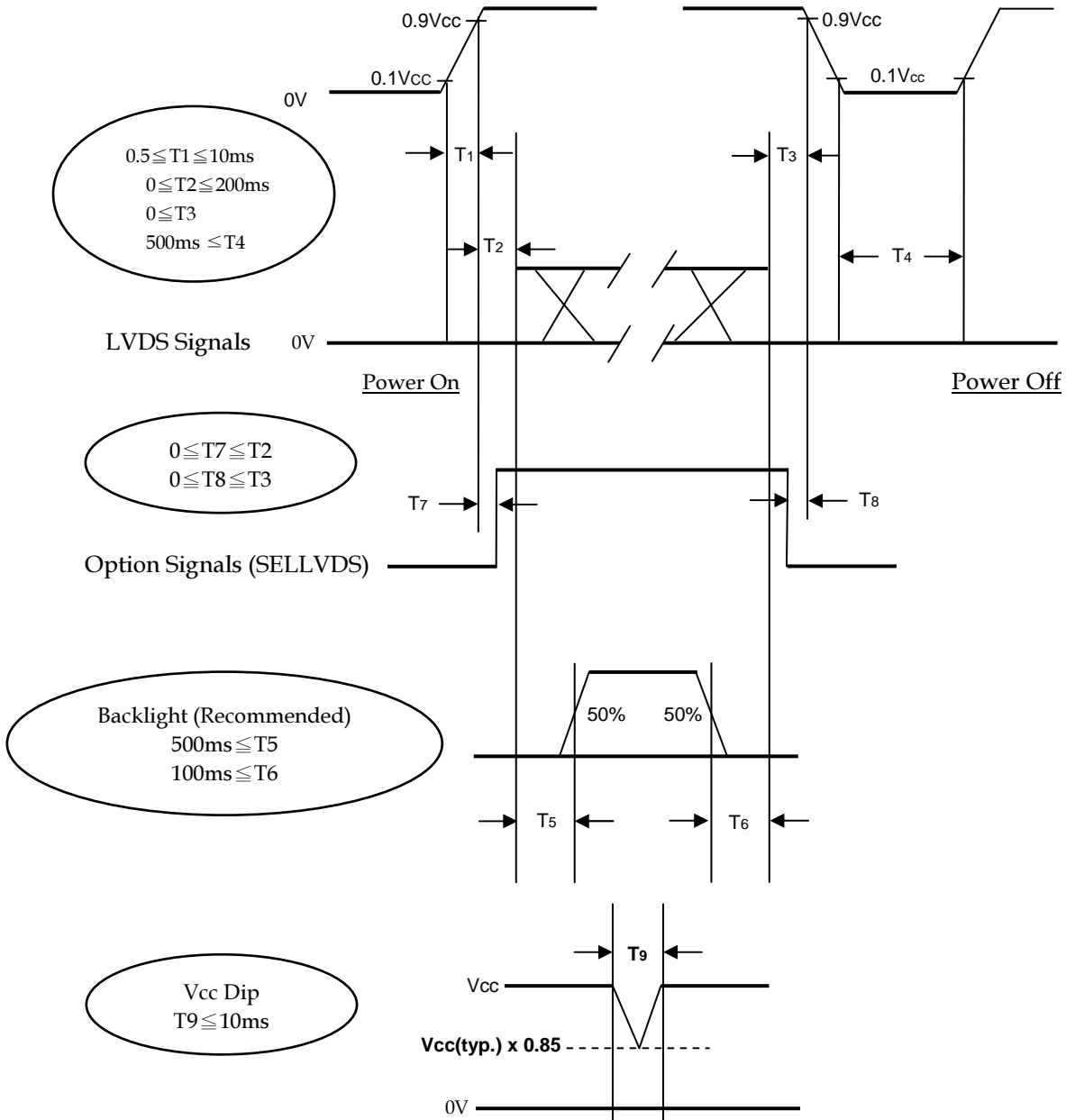
Note (5) The LVDS timing diagram and the receiver skew margin is defined and shown in following figure.



## 6.2 POWER ON/OFF SEQUENCE

( $T_a = 25 \pm 2^\circ\text{C}$ )

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



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.

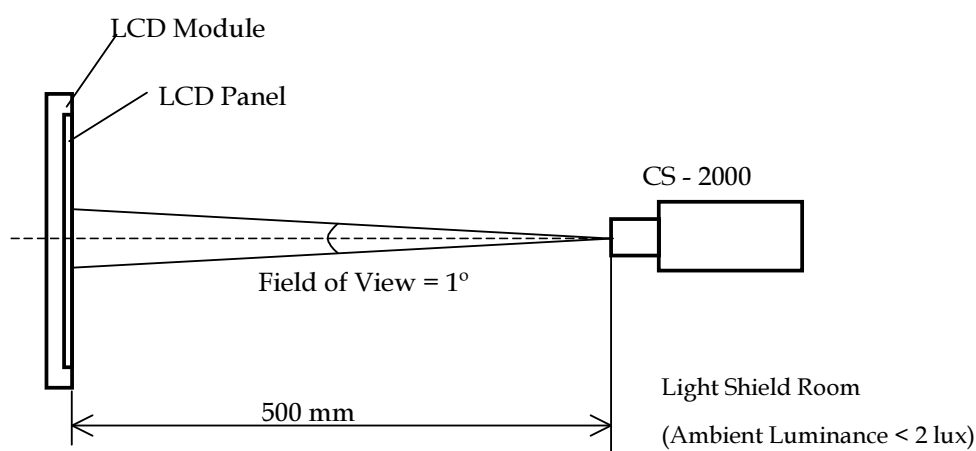
## 7. OPTICAL CHARACTERISTICS

### 7.1 TEST CONDITIONS

Item	Symbol	Value	Unit
Ambient Temperature	Ta	25 ±2	oC
Ambient Humidity	Ha	50 ±10	%RH
Supply Voltage	V <sub>CC</sub>	12 ±1.2	V
Input Signal	According to typical value in "3. ELECTRICAL CHARACTERISTICS"		
LED Current	I <sub>L</sub>	230 ± 6.9	mA
Vertical Frame Rate	Fr	60	Hz

Note : No guarantee level of water flow

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 should be executed after lighting backlight for 1 hour in a windless room.



## 7.2 OPTICAL SPECIFICATIONS

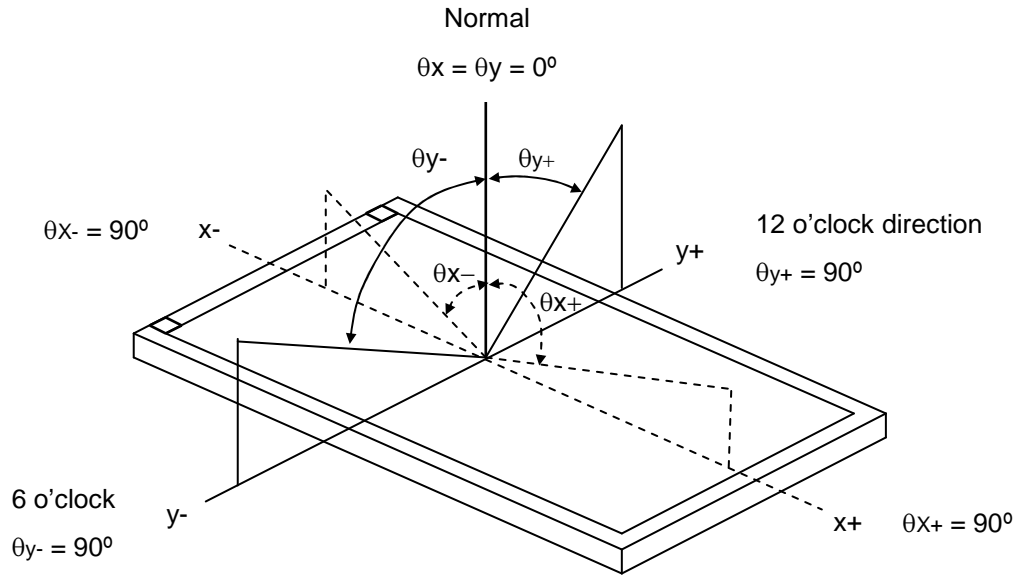
The relative measurement methods of optical characteristics are shown in 7.2. The following items should be measured under the test conditions described in 7.1 and stable environment shown in 7.1.

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR		3500	5000		-	(2)
Response Time (VA)		Gray to gray			9.5	19	ms	(3)
Center Luminance of White		L <sub>C</sub>		240	300		cd/m <sup>2</sup>	(4)
White Variation		δW				1.3	-	(6)
Cross Talk		CT				4	%	(5)
Color Chromaticity	Red	R <sub>x</sub>		Typ. -0.03	0.642	Typ. +0.03	-	-
		R <sub>y</sub>			0.336		-	
	Green	G <sub>x</sub>			0.307		-	
		G <sub>y</sub>			0.617		-	
	Blue	B <sub>x</sub>			0.150		-	
		B <sub>y</sub>			0.057		-	
	White	W <sub>x</sub>			0.280		-	
		W <sub>y</sub>			0.290		-	
	Correlated color temperature			-	10000	-	K	-
	Color Gamut			C.G.	-	72	-	%
Viewing Angle	Horizontal	θ <sub>x</sub> +	CR≥10	80	89	-	Deg.	(1)
		θ <sub>x</sub> -		80	89	-		
	Vertical	θ <sub>y</sub> +		80	89	-		
		θ <sub>y</sub> -		80	89	-		

Note (1) Definition of Viewing Angle (θ<sub>x</sub>, θ<sub>y</sub>) :

Viewing angles are measured by 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.

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

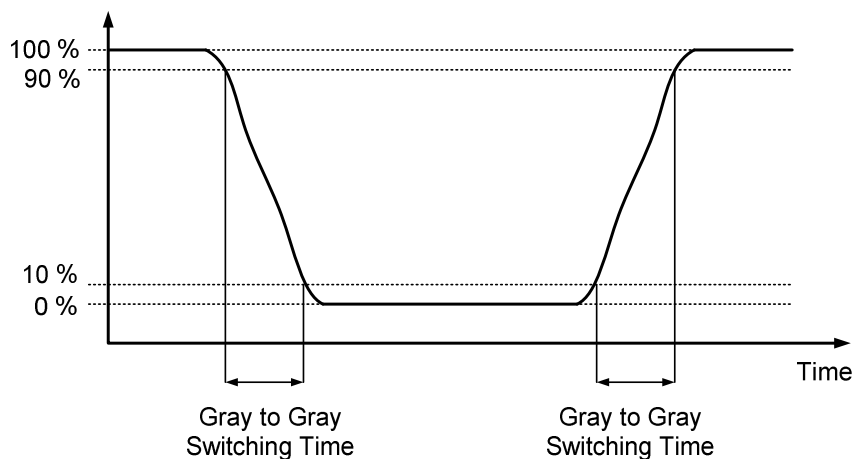
L255: Luminance of gray level 255

L0: Luminance of gray level 0

CR = CR (X), 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 (VA Model) :

### **Optical Response**



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.

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

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

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

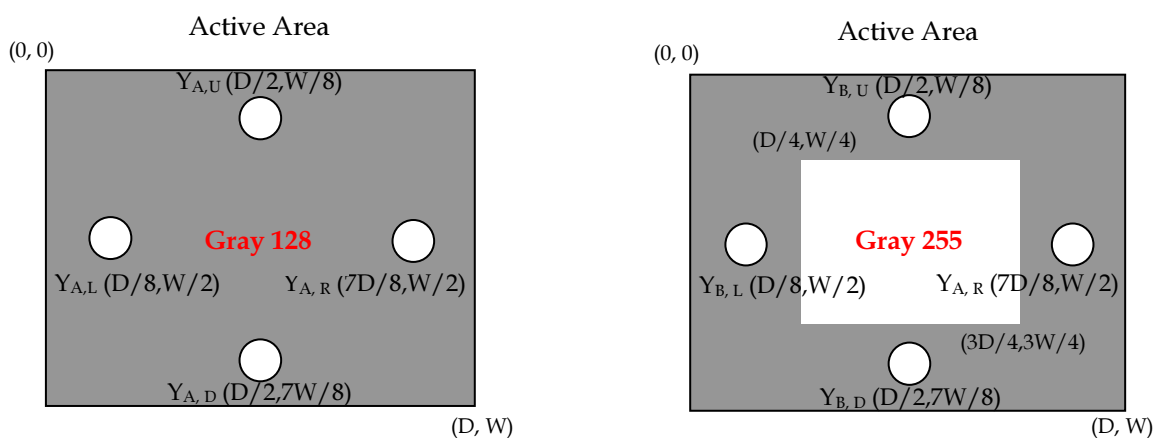
Note (5) Definition of Cross Talk (CT) : (VA Model)

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

Where :

$Y_A$  = Luminance of measured location without gray level 255 pattern (cd/m<sup>2</sup>)

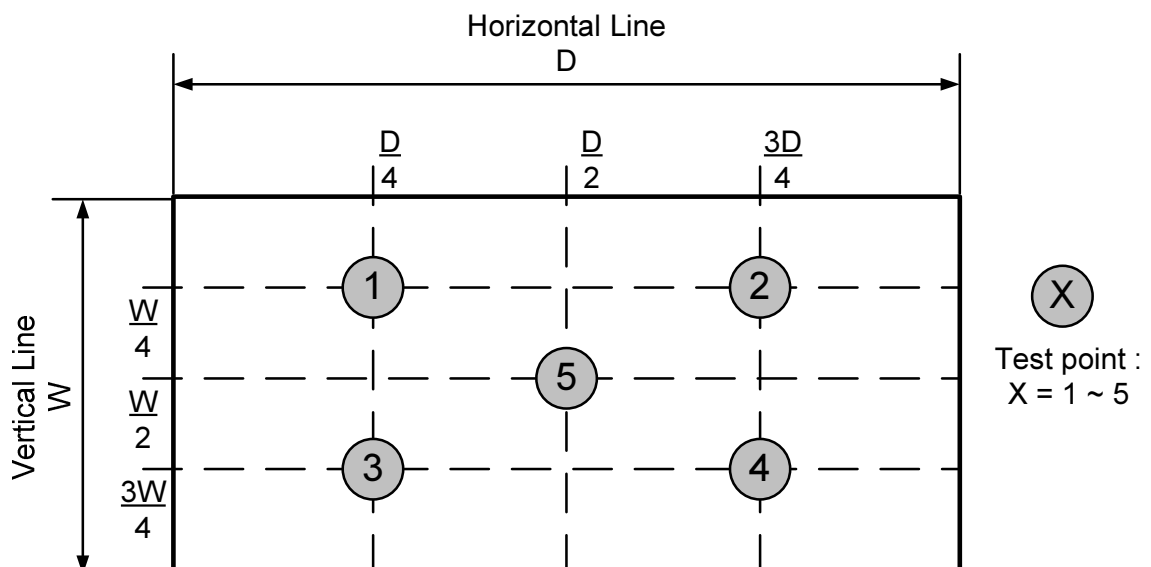
$Y_B$  = Luminance of measured location with gray level 255 pattern (cd/m<sup>2</sup>)



Note (6) Definition of White Variation ( $\delta W$ ) :

Measure the luminance of gray level 255 at 5 points

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



## 8. PRECAUTIONS

### 8.1 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 ] Bezel of Set can not press or touch the panel surface. It will make light leakage or scrape.
- [ 6 ] Do not plug in or pull out the I/F connector while the module is in operation.
- [ 7 ] Do not disassemble the module.
- [ 8 ] Use a soft dry cloth without chemicals for cleaning, because the surface of polarizer is very soft and easily scratched. Water, IPA (Isopropyl Alcohol) or Hexane are desirable cleaners. Do not use Ketone type materials (ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanent damage to the polarizer due to chemical reaction.
- [ 9 ] Moisture can easily penetrate into LCD module and may cause the damage during operation.
- [ 10 ] When storing modules as spares for a long time, the following precaution is necessary.
  - [ 10.1 ] 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.
  - [ 10.2 ] The module shall be stored in dark place. Do not store the TFT-LCD module in direct sunlight or fluorescent light.
- [ 11 ] 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 LED will be higher than that of room temperature.

### 8.2 SAFETY PRECAUTIONS

- [ 1 ] 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.
- [ 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.

## 8.3 SAFETY STANDARDS

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

Regulatory	Item	Standard
Information Technology equipment	UL	UL60950-1:2006 or Ed.2:2007
	cUL	CAN/CSA C22.2 No.60950-1-03 or 60950-1-07
	CB	IEC60950-1:2005 / EN60950-1:2006+ A11:2009
Audio/Video Apparatus	UL	UL60065 Ed.7:2007
	cUL	CAN/CSA C22.2 No.60065-03:2006 + A1:2006
	CB	IEC60065:2001+ A1:2005 / EN60065:2002 + A1:2006+ A11:2008

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

## 8.4 Condition of Acceptability for installed in End-product

Consideration is to be given to the following conditions of acceptability when this product is employed in the end-use equipment:

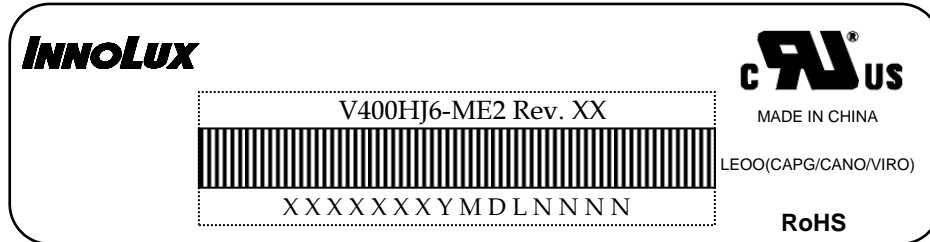
1. The product shall be installed in a suitable enclosure in accordance with the end-product requirements.
2. The product shall be used within the electrical ratings and be evaluated in the end-product.
3. The product is intended for factory wiring connections only.

Additional conditions of acceptability may be included in the UL report of each product, Please contact Innolux Corp. for further information.

## 9. DEFINITION OF LABELS

### 9.1 MODULE LABEL

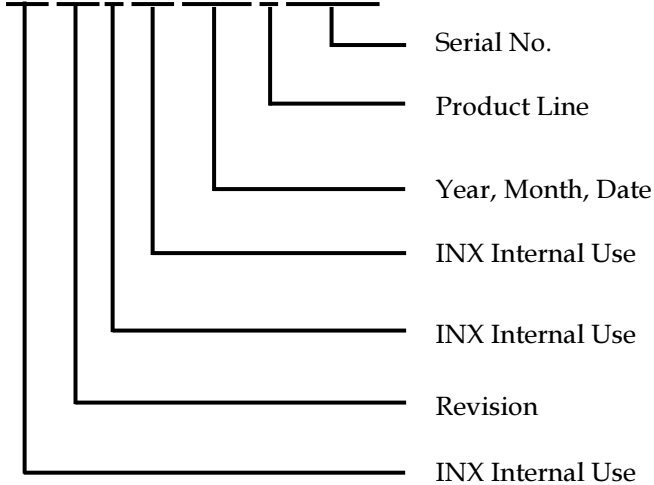
The barcode nameplate is pasted on each module as illustration, and its definitions are as following explanation.



Model Name: V400HJ6-ME2

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

Serial ID: X X X X X X Y M D L N N N N



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

Serial No.: Manufacturing sequence of product

Product Line: 1→Line1, 2→Line 2, ...etc.

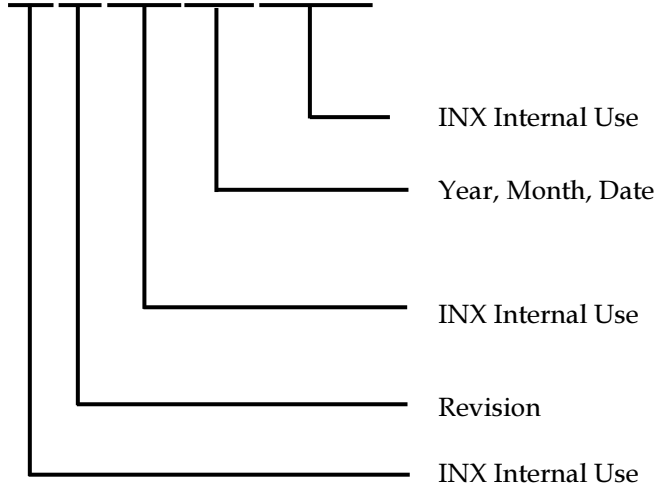
## 9.2 CARTON LABEL

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

P.O. NO. _____	
Parts ID. _____	
Model Name <u>V400HJ6-ME2</u>	
Carton ID. _____	Quantities _____
 XXXXXXXXXXXXXXXXXX	
Made In Taiwan (Made In China)	

Model Name: V400HJ6– ME2

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



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

## 10. PACKAGING

### 10.1 PACKAGING SPECIFICATIONS

- (1) 7 LCD TV modules / 1 Box
- (2) Box dimensions : 954(L) X 378 (W) X 625 (H)
- (3) Weight: approximately 56.7 Kg

### 10.2 PACKAGING METHOD

Figures 10-1 and 10-2 are the packing method

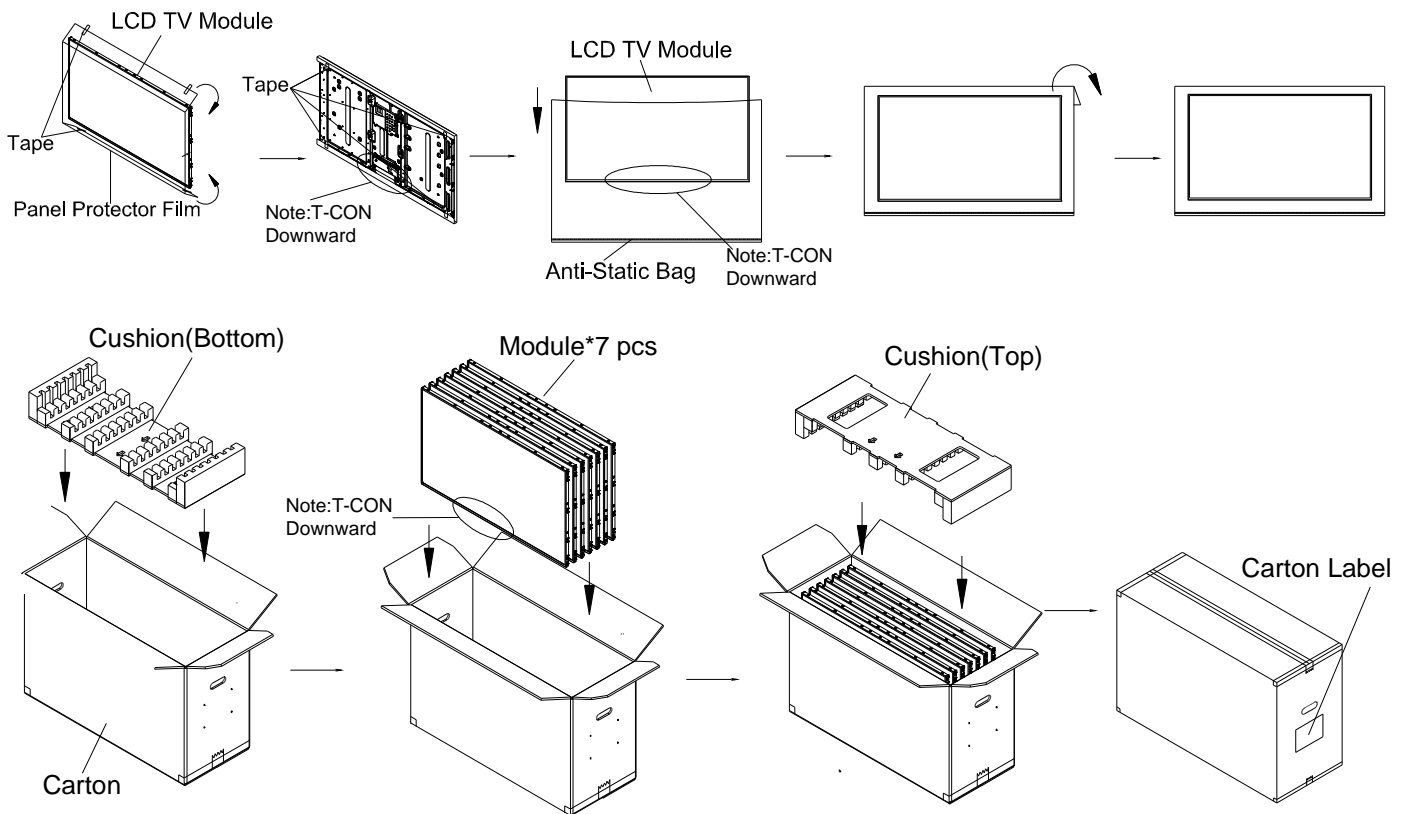
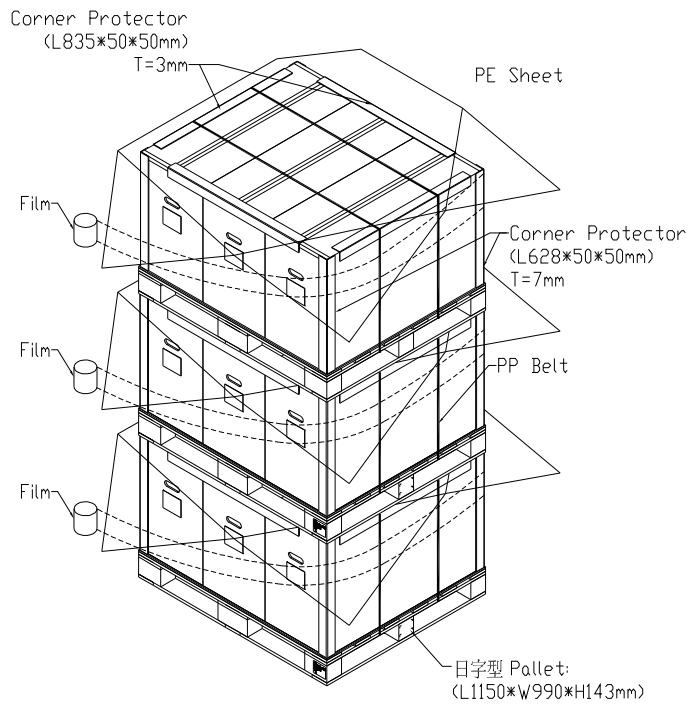
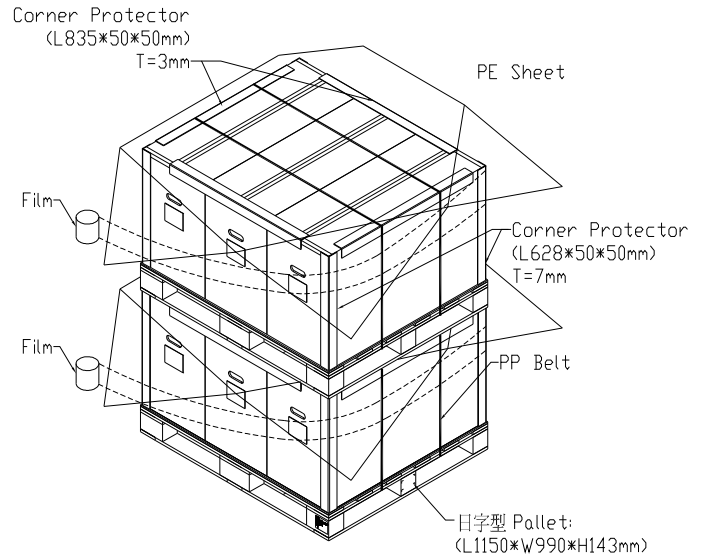


Figure 10-1 packing method

Sea / Land Transportation  
(40ft HQ Container)



Sea / Land Transportation  
(20ft / 40ft Container)



Air Transportation

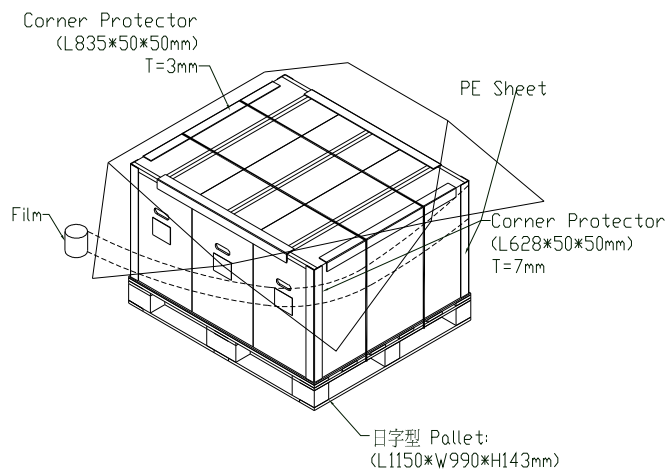


Figure 10-2 packing method



### 10.3 UN-PACKAGING METHOD

Figures 10-3 is the un-packing method

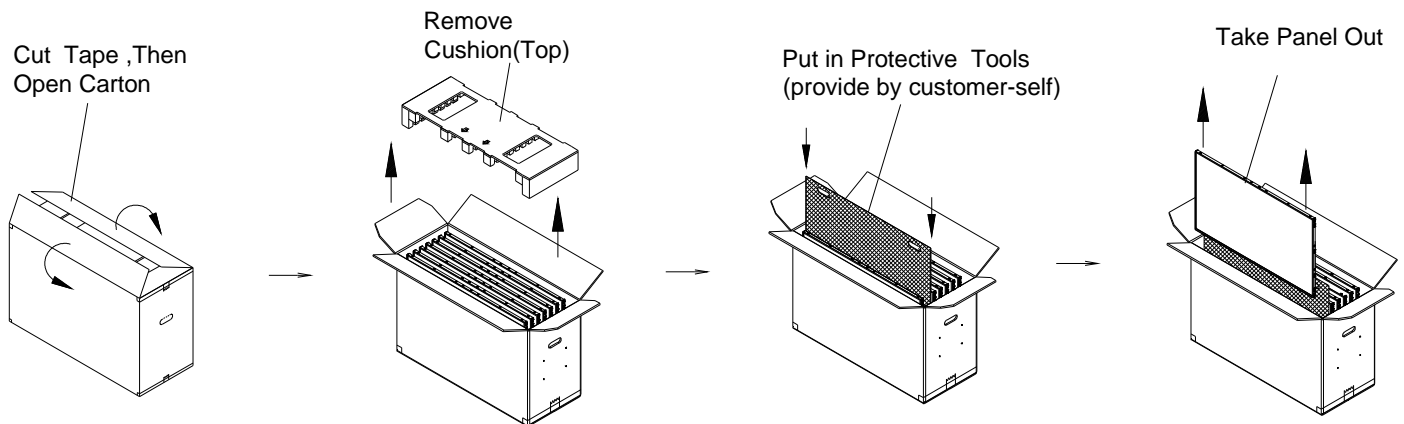


Figure 10-3 un-packing method

## 11 . MECHANICAL CHARACTERISTIC

