☐ Tentative Specification
☐ Preliminary Specification
■ Approval Specification

MODEL NO.: V650DJ5

SUFFIX: QS2

Revision : E2
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

CONTENTS

REVISION HISTORY

Version	Date	Page (New)	Section	Description
0.0	Aug.18 2014	All	All	Tentative Specification Ver 0.0 was first issued
1.0	Dec.25.2015	All	All	Preliminary Specification Ver 1.0 was first issued
2.0	Jan..25.2016	All	All	Approval Specification Ver 2.0 was first issued

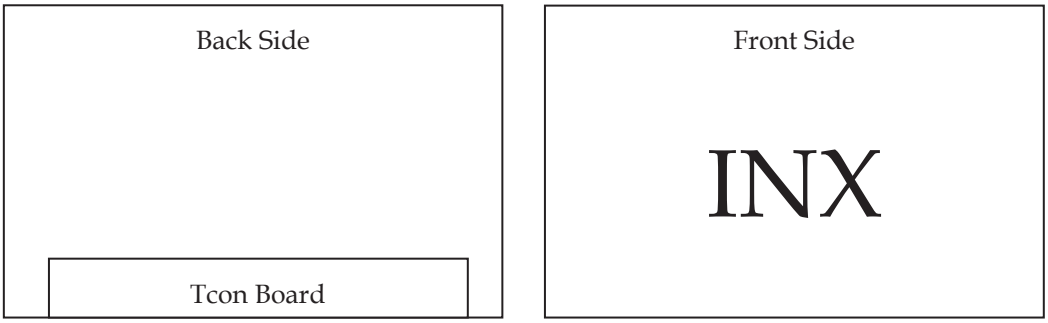
1. GENERAL DESCRIPTION

1.1 OVERVIEW

V650DJ5-QS2 is a 65" TFT Liquid Crystal Display TV product with driver ICs and USIT interfaces. This product supports 3840 x 2160 HDTV format and can display true 1.07G colors (8-bit). The backlight unit is not built in.

1.2 FEATURES

CHARACTERISTICS ITEMS	SPECIFICATIONS
Pixels [lines]	3840 x 2160
Active Area [mm]	1428.48(H) x 803.52(V)
Sub-Pixel Pitch [mm]	0.124 (H) x 0.372 (V)
Pixel Arrangement	RGB vertical stripe
Weight [g]	3360
Physical Size [mm]	1440.48 (W) x 816.02 (H) x (1.329)(D) Typ
Display Mode	Transmissive mode / Normally black
Contrast Ratio	5000:1 Typ. (Typical value measured at INX's module)
Glass thickness (Array / CF) [mm]	0.5 / 0.5
Viewing Angle (CR>10)	+89/-89(H),+89/-89(V) Typ. (Typical value measured by INX's module)
Color Chromaticity	R=(0.663, 0.325) G=(0.271, 0.593) B=(0.136, 0.095) W=(0.303, 0.346) * Please refer to "color chromaticity" in 6.2
Cell Transparency [%]	(5.06%)Typ. * Please refer to "Center Transmittance" in 6.2
Polarizer Surface Treatment	AGLR (Haze<1% ,LR=2%) ,Hardness: 3H
Rotation Function	unachievable
Display Orientation	Signal input with "INX"

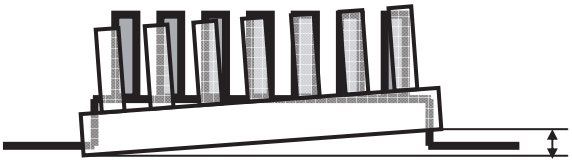


1.3 MECHANICAL SPECIFICATIONS

Item	Min.	Typ.	Max.	Unit	Note
Weight	3192	3360	3528	g	-
I/F connector mounting position	The mounting inclination of the connector makes the screen center within ± 0.5mm as the horizontal.				(2)

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

Note (2) Connector mounting position



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), (3)
Operating Ambient Temperature	T_{OP}	0	50	°C	(1), (2), (3)

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

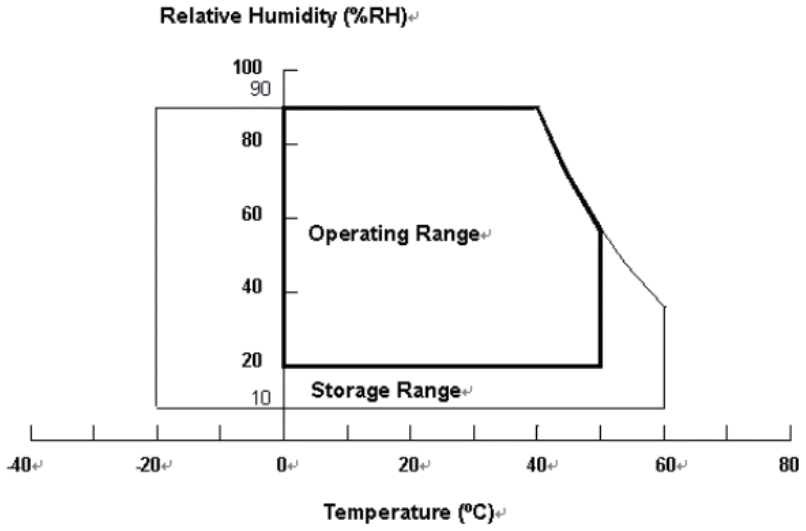
(a) 90 %RH Max. (Ta ≦ 40 °C).

(b) Wet-bulb temperature should be 39 °C 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 °C. The range of operating temperature may degrade in case of improper thermal management in final product design.

Note (3) The rating of environment is base on LCD module. Leave LCD cell alone, this environment condition can't be guaranteed. Except LCD cell, the customer has to consider the ability of other parts of LCD module and LCD module process.



2.2 ABSOLUTE RATINGS OF ENVIRONMENT (OPEN CELL)

Recommended Storage Condition: With shipping package.

Recommended Storage temperature range: 25±5 ℃

Recommended Storage humidity range: 50±10%RH

Recommended Shelf life: a month

2.3 ELECTRICAL ABSOLUTE RATINGS

2.3.1 TFT OPEN CELL

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Voltage for gate driver	VGH	-0.3	+42	V	
Voltage for gate driver	VGL	-25	0.3	V	
Voltage range for gate driver	VGH-VGL	-0.3	42	V	
Logic input Voltage for gate driver	VDD	-0.3	+6.0	V	
Voltage for data driver	VDDA	-0.3	20.4	V	
Voltage for data driver	VDDAML(R)	-0.3	11.3	V	
Voltage for data driver	VDDA-VDDAML(R)	-0.3	11.3	V	
Voltage for data driver	VDDAML(R)	8.097	9.141	V	
Logic input Voltage for data driver	VDD1V8	-0.3	2.2	V	
Logic input Voltage for data driver	VDD1V9	-0.3	2.2	V	
Voltage for data driver	Input signals	-0.3	2.2472	V	(1)

Note(1) USIT_DATA0P/N, USIT_DATA1P/N,SFC

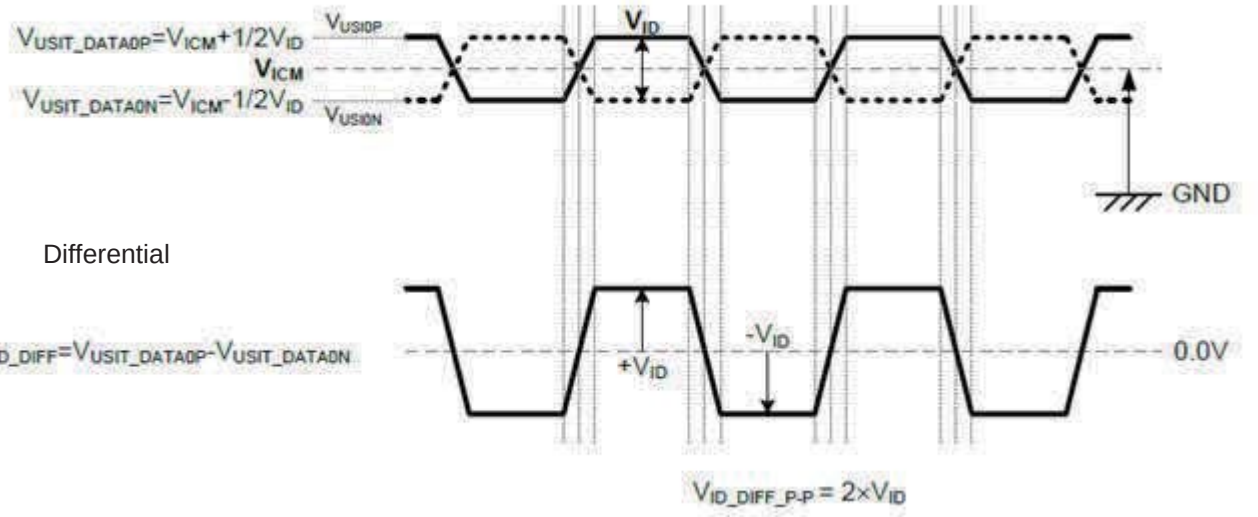
3. ELECTRICAL CHARACTERISTICS

3.1 TFT OPEN CELL (Ta = 25 ± 2 °C)

Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Voltage for gate driver		VGH	28.8	29	29.2	28.8	
Voltage for gate driver		VGL	-10.2	-10	-9.8	-10.2	
Voltage range for gate driver		VGH-VGL	-	-	40	-	
Logic input Voltage for gate driver		VDD	3.25	3.3	3.35	3.25	
Voltage for data driver		VDDA	17.6	17.7	17.8	17.6	
Voltage for data driver		VDDAML(R)	8.097	8.841	9.141	8.097	
Voltage for data driver		GM1,	16.452	16.512	16.572	16.452	
Voltage for data driver		GM9	9.281	9.341	9.401	9.281	
Voltage for data driver		GM10.	7.837	7.897	7.957	7.837	
Voltage for data driver		GM18	0.3482	0.4082	0.4682	0.3482	
Logic input Voltage for data driver		VDD1V8	1.9272	1.9472	1.9672	1.9272	
Logic input Voltage for data driver		VDD1V9	1.9386	1.9586	1.9786	1.9386	
USIT Interface	Input offset voltage	0.3	0.45	0.6	0.3	V	(1)
	Differential input data voltage	160	-	600	160	mV	
	Differential input data peak to peak voltage	320	-	1200	320	mV	(2)
	Internal termination resistor	Typ-15%	110	Typ+15%	Typ-15%	ohm	
	USIT-data frequency	330	-	805	330	MHZ	
		0.66	-	1.610	0.66	Gbps	
	USIT-clock period	6.21	-	15.15	6.21	ns	
	USIT_SSCG	-0.5	-	+0.5	-0.5	%	
		30	-	33	30	kHz	

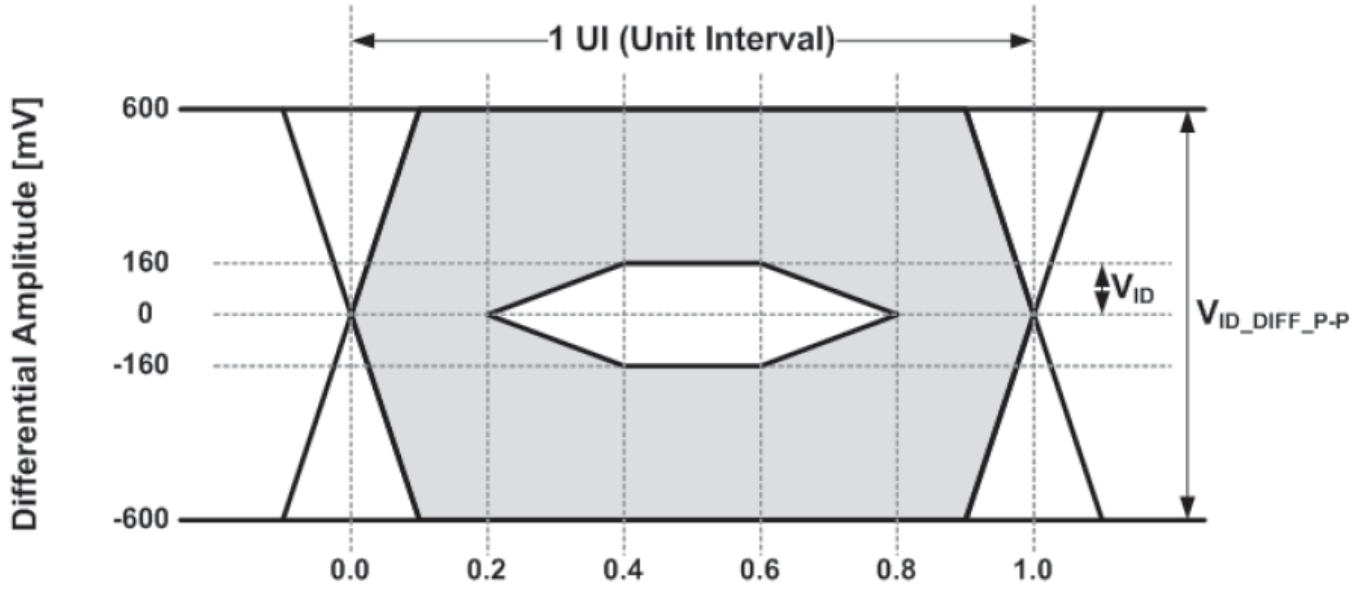
Note(1)

Single-ended

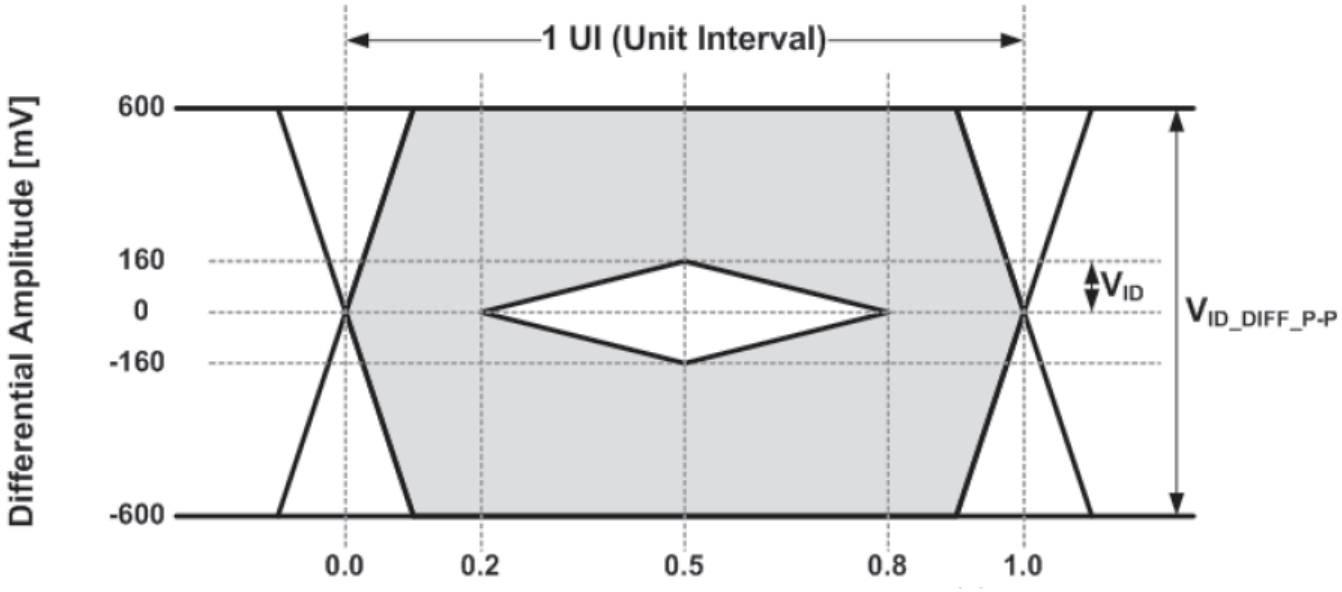


Differential

Note(2) USI-T Eye diagram

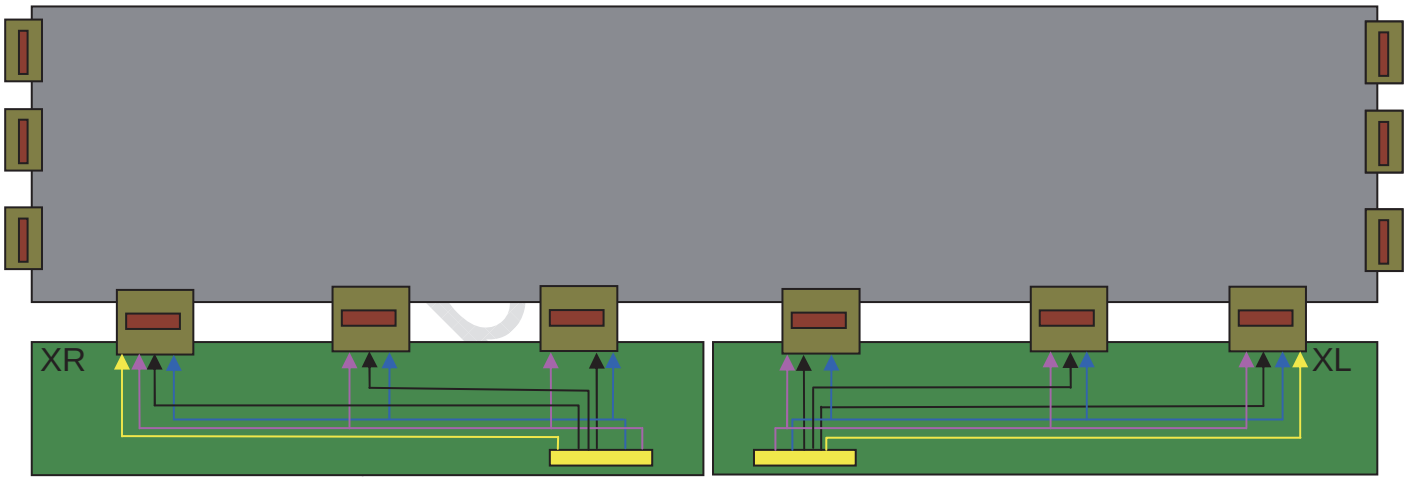


(a) Eye diagram without a Driver IC



(b) Eye diagram with a Driver IC

3.2 CIRCUIT AND WIRING DIAGRAM



USI-T signal
Control signals of data drivers.
Voltages of data drivers.
Control signals and voltages of scan drivers.

4. INPUT TERMINAL PIN ASSIGNMENT

4.1 TFT LCD OPEN CELL INPUT

CN3 Connector Pin Assignment (05002HR-H96VE) :

Pin	Name	Description	Note
1	FB_12	TCON_READY	
2	NC	No Connection	
3	VDDA	VAA voltage	
4	VDDA	VAA voltage	
5	VDDA	VAA voltage	
6	VDDA	VAA voltage	
7	GM1	Gamma voltage	
8	GM9	Gamma voltage	
9	VDDAML	Half VAA Voltage	
10	GM10	Gamma voltage	
11	GM18	Gamma voltage	
12	VDD1V8	Logic power	
13	VDD1V9	Logic power	
14	NC	No Connection	
15	NC	No Connection	
16	GND	Ground	
17	SFC1	Shared Forward Channel Control	
18	GND	Ground	
19	US6O_N	USIT data signal -	
20	US6O_P	USIT data signal +	
21	GND	Ground	
22	NC	No Connection	
23	NC	No Connection	
24	GND	Ground	
25	US5O_N	USIT data signal -	
26	US5O_P	USIT data signal +	
27	GND	Ground	
28	NC	No Connection	
29	NC	No Connection	
30	GND	Ground	
31	US4O_N	USIT data signal -	
32	US4O_P	USIT data signal +	
33	GND	Ground	

34	NC	No Connection	
35	NC	No Connection	
36	GND	Ground	
37	US3O_N	USIT data signal -	
38	US3O_P	USIT data signal +	
39	GND	Ground	
40	NC	No Connection	
41	NC	No Connection	
42	GND	Ground	
43	US2O_N	USIT data signal -	
44	US2O_P	USIT data signal +	
45	GND	Ground	
46	NC	No Connection	
47	NC	No Connection	
48	GND	Ground	
49	US1O_N	USIT data signal -	
50	US1O_P	USIT data signal +	
51	GND	Ground	
52	NC	No Connection	
53	NC	No Connection	
54	GND	Ground	
55	NC	No Connection	
56	NC	No Connection	
57	GND	Ground	
58	NC	No Connection	
59	NC	No Connection	
60	GND	Ground	
61	NC	No Connection	
62	NC	No Connection	
63	GND	Ground	
64	NC	No Connection	
65	NC	No Connection	
66	GND	Ground	
67	NC	No Connection	
68	GND	Ground	
69	SPIF_MSI	Demura Flash IC DI(IO0)	
70	SO	Demura Flash IC DO(IO1)	

71	WP	Demura Flash IC /WP(IO2)	
72	HOLD	Demura Flash /HOLD(IO3)	
73	CLK	Demura Flash IC CLK	
74	SPIF_MCSN	Demura Flash IC /CS	
75	GND	Ground	
76	NC	No Connection	
77	NC	No Connection	
78	C_STV2	Scan driver start pulse	
79	C_STV	Scan driver start pulse	
80	CKV	Scan driver clock	
81	OE1	Scan driver output enable	
82	OE2	Scan driver output enable	
83	NC	No Connection	
84	NC	No Connection	
85	VGH	Scan driver voltage	
86	NC	No Connection	
87	VGL	Scan driver voltage	
88	NC	No Connection	
89	NC	No Connection	
90	VCM_TFT	VCOM voltage	
91	VCM_CF_C	VCOM voltage	
92	VDDAML	Half VAA Voltage	
93	VDD	Logic power	
94	VDD	Logic power	
95	GND	Ground	
96	FB_12	TCON_READY	

CN2 Connector Pin Assignment (05002HR-H96VE) :

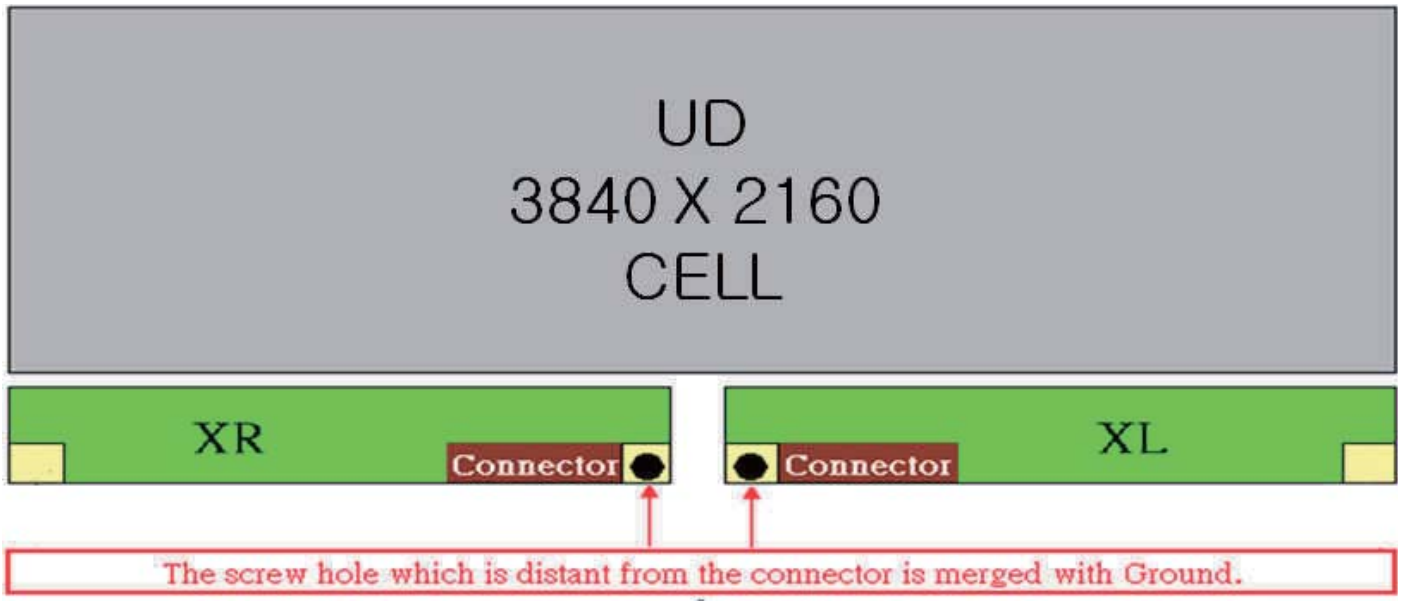
Pin	Name	Description	Note
1	FB_23	TCON_READY	
2	GND	Ground	
3	VDD	Logic power	
4	VDD	Logic power	
5	NC	No Connection	
6	VCM_CF_C	VCOM voltage	
7	VCM_TFT	VCOM voltage	
8	NC	No Connection	

9	NC	No Connection	
10	NC	No Connection	
11	NC	No Connection	
12	VGL	Scan driver voltage	
13	NC	No Connection	
14	VGH	Scan driver voltage	
15	NC	No Connection	
16	NC	No Connection	
17	OE2	Scan driver output enable	
18	OE1	Scan driver output enable	
19	CKV	Scan driver clock	
20	C_STV	Scan driver start pulse	
21	C_STV2	Scan driver start pulse	
22	NC	No Connection	
23	NC	No Connection	
24	NC	No Connection	
25	GND	Ground	
26	SFC2	Shared Forward Channel Control	
27	GND	Ground	
28	NC	No Connection	
29	NC	No Connection	
30	GND	Ground	
31	NC	No Connection	
32	NC	No Connection	
33	GND	Ground	
34	NC	No Connection	
35	NC	No Connection	
36	GND	Ground	
37	NC	No Connection	
38	NC	No Connection	
39	GND	Ground	
40	US12O_N	USIT data signal -	
41	US12O_P	USIT data signal +	
42	GND	Ground	
43	NC	No Connection	
44	NC	No Connection	
45	GND	Ground	

46	US11O_N	USIT data signal -	
47	US11O_P	USIT data signal +	
48	GND	Ground	
49	NC	No Connection	
50	NC	No Connection	
51	GND	Ground	
52	US10O_N	USIT data signal -	
53	US10O_P	USIT data signal +	
54	GND	Ground	
55	NC	No Connection	
56	NC	No Connection	
57	GND	Ground	
58	US9O_N	USIT data signal -	
59	US9O_P	USIT data signal +	
60	GND	Ground	
61	NC	No Connection	
62	NC	No Connection	
63	GND	Ground	
64	US8O_N	USIT data signal -	
65	US8O_P	USIT data signal +	
66	GND	Ground	
67	NC	No Connection	
68	NC	No Connection	
69	GND	Ground	
70	US7O_N	USIT data signal -	
71	US7O_P	USIT data signal +	
72	GND	Ground	
73	NC	No Connection	
74	NC	No Connection	
75	GND	Ground	
76	SFC1	Shared Forward Channel Control	
77	GND	Ground	
78	NC	No Connection	
79	NC	No Connection	
80	NC	No Connection	
81	GND	Ground	
82	NC	No Connection	

83	NC	No Connection	
84	VDD1V9	Logic power	
85	VDD1V8	Logic power	
86	GM18	Gamma voltage	
87	GM10	Gamma voltage	
88	VDDAMR	Half VAA voltage	
89	GM9	Gamma voltage	
90	GM1	Gamma voltage	
91	VDDA	VAA voltage	
92	VDDA	VAA voltage	
93	VDDA	VAA voltage	
94	VDDA	VAA voltage	
95	NC	No Connection	
96	FB_23	TCON_READY	

Note (1)The screw hole which is distant from the connector is merged with Ground

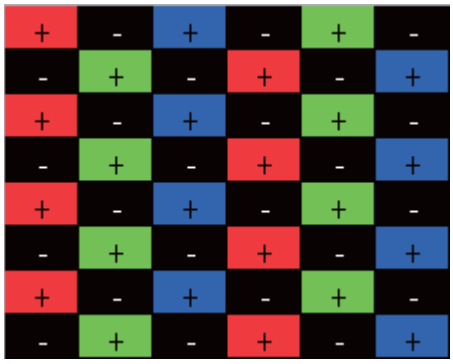


4.2 FLICKER (Vcom) ADJUSTMENT

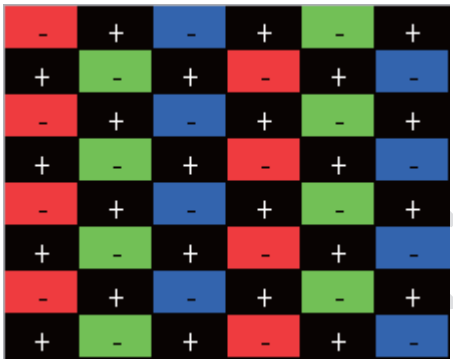
(1) Adjustment Pattern:

Column-inversion pattern was shown as below. If customer need below pattern, please directly contact with Account FAE.

Frame N



Frame N+1



(2) Adjustment method: (Digital V-com)

Programmable memory IC is used for Digital V-com adjustment in this model. INX provide Auto Vcom tools to adjust Digital V-com.The detail connection and setting instruction, please directly contact with Account FAE or refer INX Auto V-com adjustment OI. Below items is suggested to be ready before Digital V-com adjustment in customer LCM line.

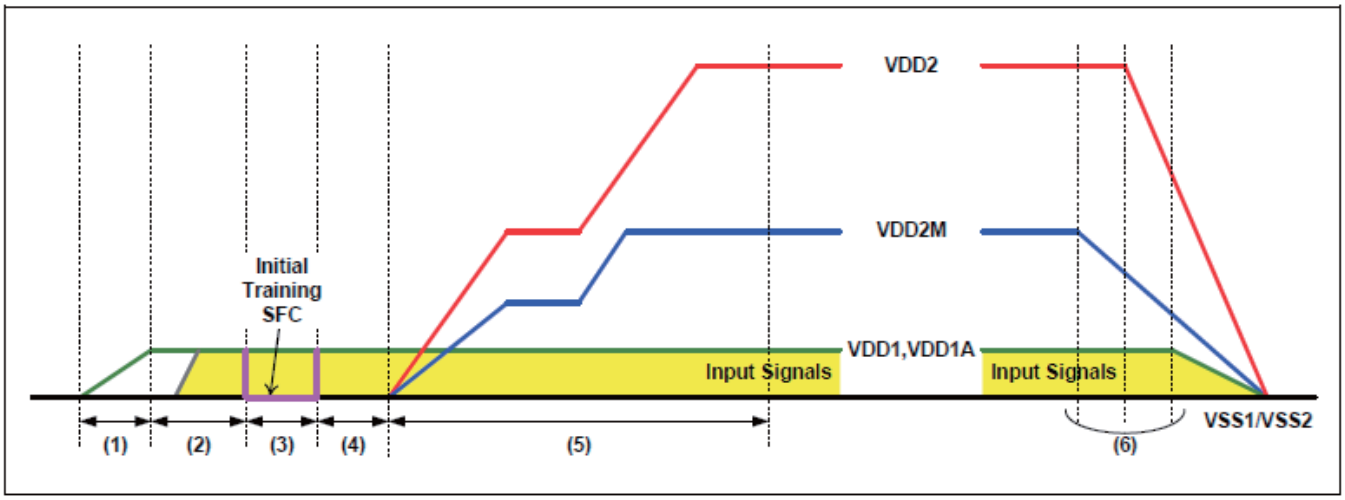
a. USB Sensor Board.

b. Programmable software

5. INTERFACE TIMING

5.3 Data Driver Power On/Off Sequence

To prevent the device from damage due to latch up, the power on/off sequence show below must be followed.



Note(1) VDD1 & VDD1A settling time (max. 5ms). All input signals set to GND level.

Note(2) VDD1 and VDD1A should be settled down before the falling edge of SFC input in this period. There is no time limit in this period.

Note(3) USI-T initialization period (min. 4500T to max. 40ms). Input signals must be stable.

Note(4) Delay time from the end of USI-T initialization period to the start of VDD2 (min. 30ms).

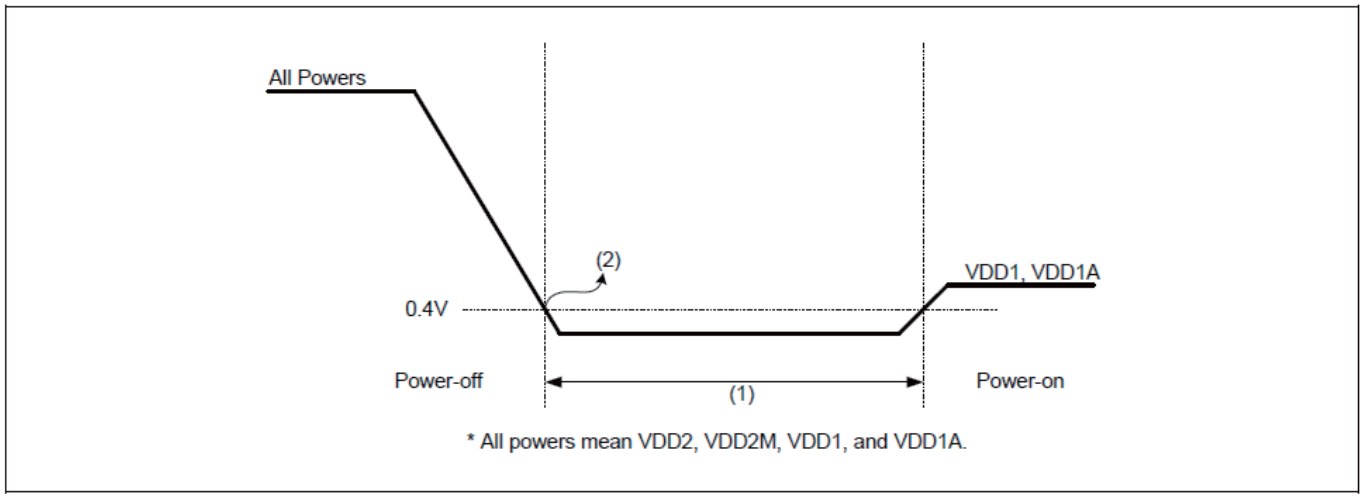
Rx logic is initialized in this period.

Note(5) VDD2 & VDD2M settling time (max. 0.5s).

Note(6) Power-off sequence begins at these points.

Power-off points of VDD1 and VDD1A are defined as minimum voltage of the recommended operation conditions.

5.3.1 Interval between Power-Off and Power-On Sequence



Note(1) Min, 0.8s.

Note(2) At this point, all powers must be less than or equal to 0.4V.

5.4 Gate Driver AC Characteristics

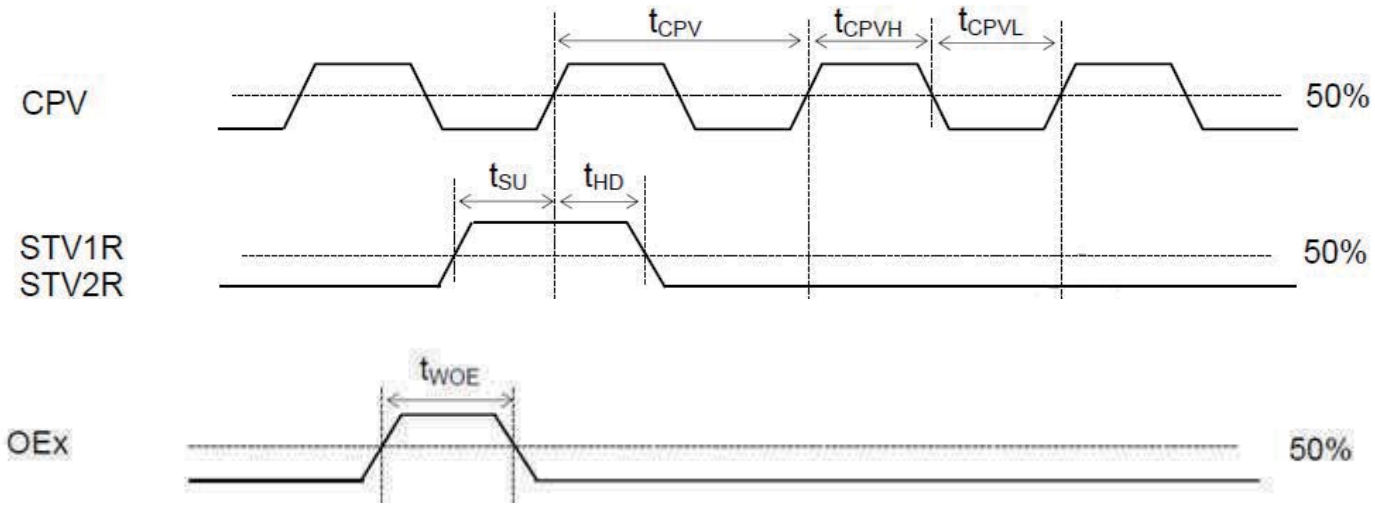
Parameter	Symbol	Condition	Spec.			Unit
			Min.	Typ.	Max.	
CPV period	t_{CPV}	--	5	-	-	us
CPV pulse width	t_{CPVH},t_{CPVL}	50% duty cycle	2.5	-	-	
OE1 & OE2 pulse width	t_{WOE}	-	0.5	-	-	
Data setup time	t_{SU}	-	0.5	-	-	
Data hold time	t_{HD}	-	0.5	-	-	

Note (1) T_A= 40°C to +85°C,VGH-VGL=12V to 40V,VDD=2.3V to 3.6V

Note (2) For pre-scan mode.

Note (3) Start pulse falling edge should not fall between OE rising edge and CPV rising edge

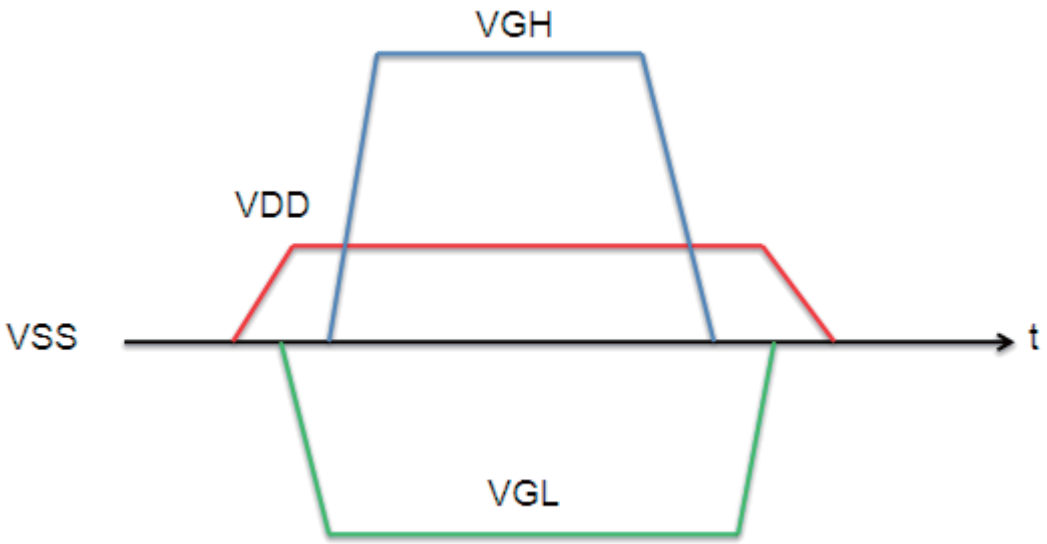
5.4.1 Waveform



5.4.2 Gate Driver Power On/Off Sequence

When power on : VDD → VGL → VGH

When power off : VGH → VGL → VDD

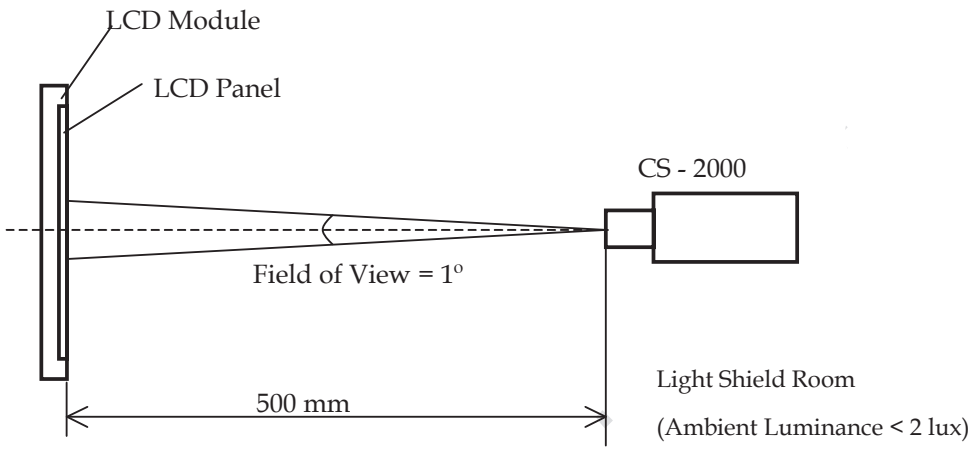


6. OPTICAL CHARACTERISTICS

6.1 TEST CONDITIONS

Item	Symbol	Value	Unit
Ambient Temperature	Ta	25±2	°C
Ambient Humidity	Ha	50±10	%RH
Supply Voltage	V_{CC}	12V±1.2	V
Input Signal	According to typical value in "3. ELECTRICAL CHARACTERISTICS"		

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 as below. 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
Color Chromaticity	Red	Rcx	θ_x=0°, θ_Y =0° Viewing Angle at Normal Direction Standard light source "C"	Typ. -0.03	0.663	Typ. +0.03	-	(0)
		Rcy			0.325		-	
	Green	Gcx			0.271		-	
		Gcy			0.593		-	
	Blue	Bcx			0.136		-	
		Bcy			0.095		-	
	White	Wcx			0.303		-	
		Wcy			0.346		-	
Center Transmittance		T%	θ_x=0°, θ_Y =0° with INX module	4.55	5.06		%	(1),(5)
Transmittance Variation		δT				1.3		(1),(6)
Contrast Ratio		CR		3500	5000	-	-	(1),(3)
Response Time		Gray to gray	θ_x=0°, θ_Y =0° with INX Module	-	6.5	13	ms	(1),(4)
Viewing Angle	Horizontal	θ_x+	CR>10 With INX module	80	89	-	Deg.	(1),(2)
		θ_x-		80	89	-		
	Vertical	θ_Y+		80	89	-		
		θ_Y-		80	89	-		

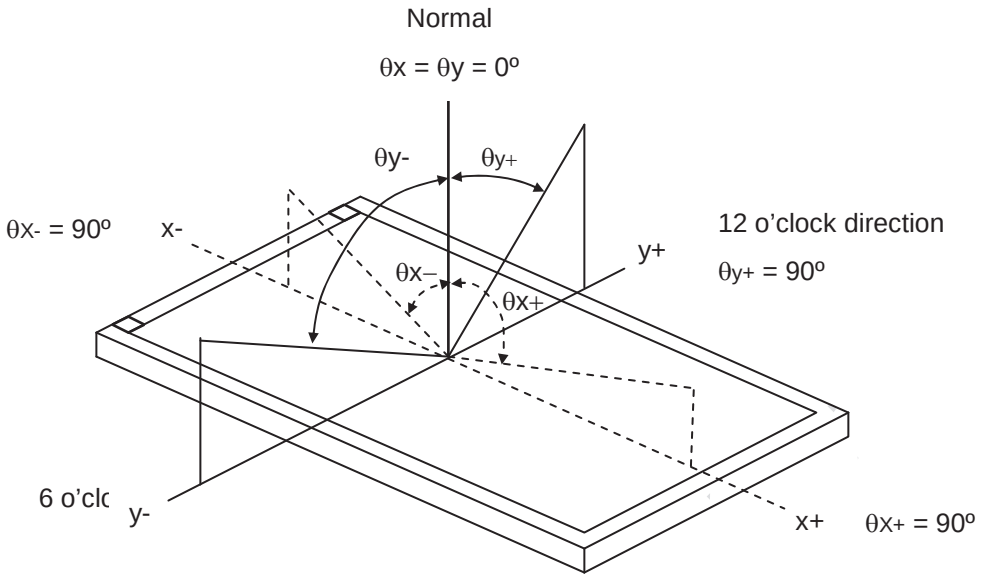
Note (0) Light source is the standard light source "C" which is defined by CIE and driving voltage are based on suitable gamma voltages. The calculating method is as following :

1. Measure Module's and BLU's spectrum at center point. White and R,G,B are with signal input. BLU (for V650DK3-KD2) is supplied by INX.
2. Calculate cell's spectrum.
3. Calculate cell's chromaticity by using the spectrum of standard light source "C".

Note (1) Light source is the BLU which supplied by INX (V650DK3-KD2) and the cell driving voltage are based on suitable gamma voltages.

Note (2) Definition of Viewing Angle (θx, θy) :

Viewing angles are measured by Autronic Conoscope Cono-80 (or Eldim EZ-Contrast 160R)



Note (3) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

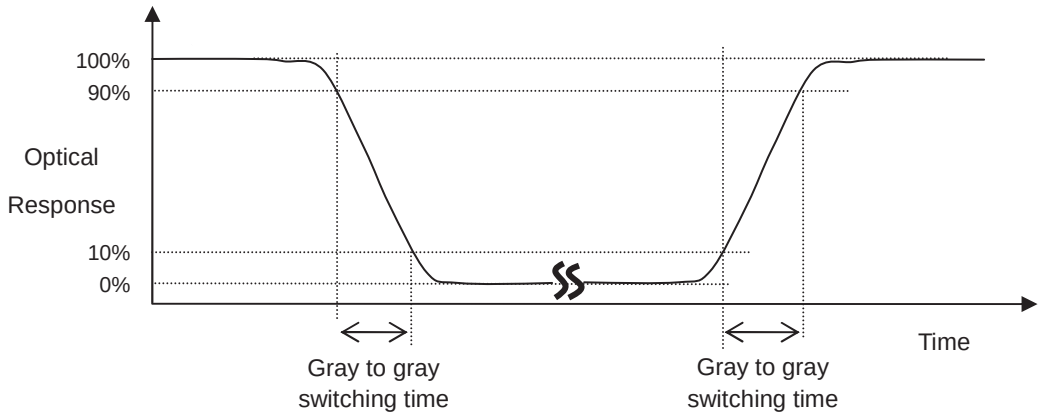
$$\text{Contrast Ratio (CR)} = \frac{\text{Surface Luminance of L1023}}{\text{Surface Luminance of L0}}$$

L1023 : Luminance of gray level 1023

L0 : 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 (5).

Note (4) Definition of Gray-to-Gray Switching Time:



The driving signal means the signal of gray level 0, 124, 252, 380, 508, 636, 764, 892 and 1023.

Gray to gray average time means the average switching time of gray level 0, 124, 252, 380, 508, 636, 764, 892 and 1023 to each other.

Note (5) Definition of Transmittance (T%) :

Measure the transmittance at 5 points.

Light source is the BLU which contains three diffuser sheets and the cell driving voltage are based on suitable gamma voltages.

Transmittance (T%) = Average $[T(1), T(2), T(3), T(4), T(5)]$

The transmittance of each point can be calculated by the following expression.

$$T(X) = \frac{L1023(X) \text{ of LCD module}}{\text{Luminance}(X) \text{ of BLU}} \times 100\%$$

L1023: Luminance of gray level 1023

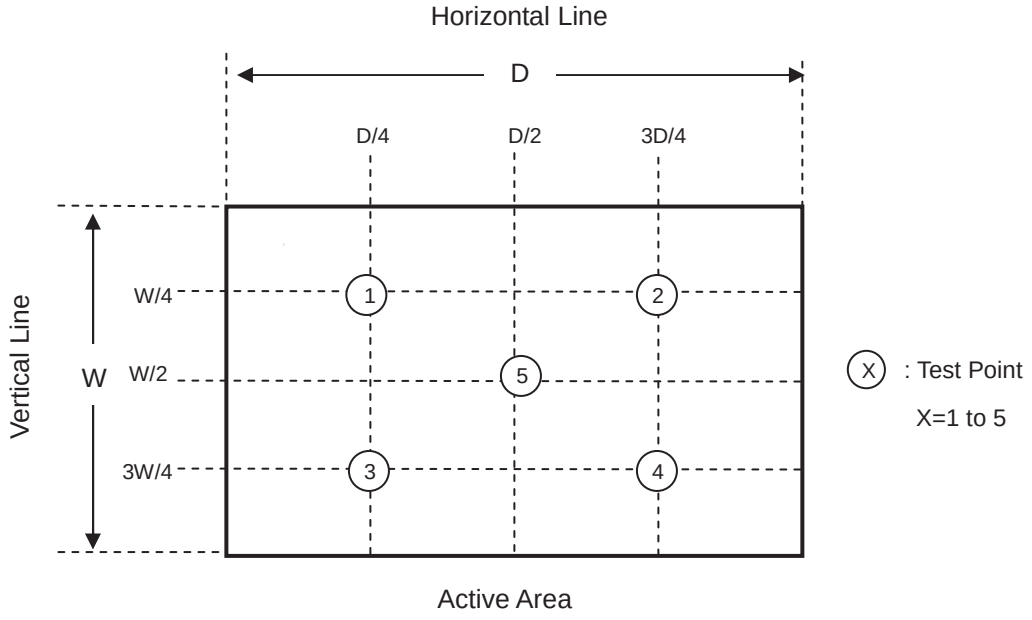
T(X) is corresponding to the point X1~X5 at the figure in Note (6).

Note (6) Definition of Transmittance Variation (δT) :

Measure the transmittance at 5 points.

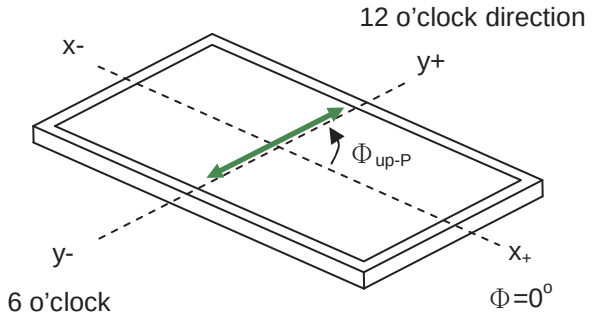
$$\text{Transmittance Variation } (\delta T) = \frac{\text{Maximum}[T(1), T(2), T(3), T(4), T(5)]}{\text{Minimum}[T(1), T(2), T(3), T(4), T(5)]}$$

T(X) is calculated as Note(5).



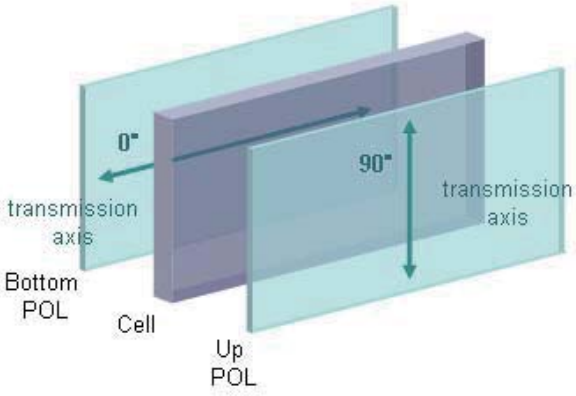
Note (7) This is a reference for designing the shutter glasses of 3D application. (VA case)

Definition of the transmission direction of the up polarizer ($\Phi_{up\text{-}P}$) on LCD Module:

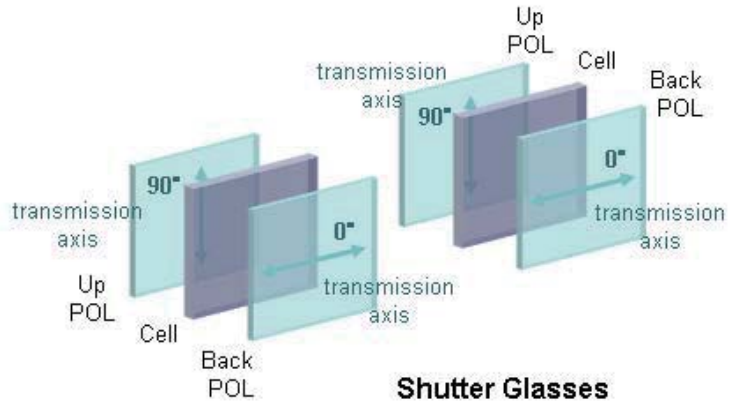


Up Polarizer

The transmission axis of the front polarizer of the shutter glasses should be parallel to this panel transmission direction to get a maximum 3D mode luminance.



LCD Module



Shutter Glasses

7. PRECAUTIONS

7.1 ASSEMBLY AND HANDLING PRECAUTIONS

[1] Do not apply improper or unbalanced force such as bending or twisting to open cells during assembly.

[2] It is recommended to assemble or to install an open cell into a customer's product in clean working areas. The dust and oil may cause electrical short to an open cell or worsen polarizers on an open cell.

[3] Do not apply pressure or impulse to an open cell to prevent the damage.

[4] Always follow the correct power-on sequence when an open cell is assembled and turned on. This can prevent the damage and latch-up of the CMOS LSI chips.

[5] Do not design sharp-pointed structure / parting line / tooling gate on the plastic part of a COF (Chip on film), because the burr will scrape the COF.

[6] If COF would be bended in assemble process, do not place IC on the bending corner.

[7] The gap between COF IC and any structure of BLU must be bigger than 2 mm. This can prevent the damage of COF IC.

[8] The bezel opening must have no burr and be smooth to prevent the surface of an open cell scraped.

[9] The bezel of a module or a TV set can not contact with force on the surface of an open cell. It might cause light leakage or scrape.

[10] In the case of no FFC or FPC attached with open cells, customers can refer the FFC / FPC drawing and buy them by self.

[11] It is important to keep enough clearance between customers' front bezel/backlight and an open cell. Without enough clearance, the unexpected force during module assembly procedure may damage an open cell.

[12] Do not plug in or unplug an I/F (interface) connector while an assembled open cell is in operation.

[13] Use a soft dry cloth without chemicals for cleaning, because the surface of the polarizer is very soft and easily scratched.

[14] Moisture can easily penetrate into an open cell and may cause the damage during operation.

[15] When storing open cells as spares for a long time, the following precaution is necessary.

[15.1] Do not leave open cells in high temperature and high humidity for a long time. It is highly recommended to store open cells in the temperature range from 0 to 35℃ at normal humidity without condensation.

[15.2] Open cells shall be stored in dark place. Do not store open cells in direct sunlight or fluorescent light environment.

[16] When ambient temperature is lower than 10°C, the display quality might be reduced.

[17] Unpacking (Cartons/Tray plates) in order to prevent open cells broken:

[17.1] Moving tray plates by one operator may cause tray plates bent which may induce open cells broken. Two operators carry one carton with their two hands. Do not throw cartons/tray plates, avoid any impact on cartons/tray plates, and put down & pile cartons/tray plates gently.

[17.2] A tray plate handled with unbalanced force may cause an open cell damaged. Trays should be completely put on a flat platform.

[17.3] To prevent open cells broken, tray plates should be moved one by one from a plastic bag.

[17.4] Please follow the packing design instruction, such as the maximum number of tray stacking to prevent the deformation of tray plates which may cause open cells broken.

[17.5] To prevent an open cell broken or a COF damaged on a tray, please follow the instructions below:

[17.5.1] Do not peel a polarizer protection film of an open cell off on a tray

[17.5.2] Do not install FFC or HDMI cables of an open cell on a tray

[17.5.3] Do not press the surface of an open cell on a tray.

[17.5.4] Do not pull X-board when an open cell placed on a tray.

[18] Unpacking (Hard Box) in order to prevent open cells broken:

[18.1] Moving hard boxes by one operator may cause hard boxes fell down and open cells broken by abnormal methods. Two operators carry one hard box with their two hands. Do handle hard boxes carefully, such as avoiding impact, putting down, and piling up gently.

[18.2] To prevent hard boxes sliding from carts and falling down, hard boxes should be placed on a surface with resistance.

[18.3] To prevent an open cell broken or a COF damaged in a hard box, please follow the instructions below:

[18.3.1] Do not peel a polarizer protection film of an open cell off in a hard box.

[18.3.2] Do not install FFC or HDMI cables of an open cell in a hard box.

[18.3.3] Do not press the surface of an open cell in a hard box.

[18.3.4] Do not pull X-board when an open cell placed in a hard box.

[19] Handling – In order to prevent open cells, COFs , and components damaged:

[19.1] The forced displacement between open cells and X-board may cause a COF damaged. Use a fixture tool for handling an open cell to avoid X-board vibrating and interfering with other components on a PCBA & a COF.

[19.2] To prevent open cells and COFs damaged by taking out from hard boxes, using vacuum jigs to take out open cells horizontally is recommended.

[19.3] Improper installation procedure may cause COFs of an open cell over bent which causes damages. As installing an open cell on a backlight or a test jig, place the bottom side of the open cell first on the backlight or the test jig and make sure no interference before fitting the open cell into the backlight/the test jig.

[19.4] Handle open cells one by one.

[20] Avoid any metal or conductive material to contact PCB components, because it could cause electrical damage or defect.

[21] The suggestion of removing polarizer-protection film is illustrated as following

[21.1] Scan COF on the left side (Figure 1)

Remove slowly and follow the direction : from left-up to right-down

[21.2] Scan COF on the right side (Figure 2)

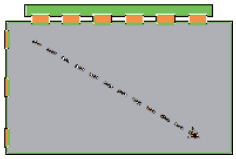
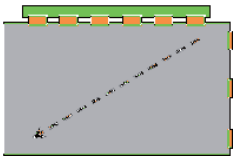
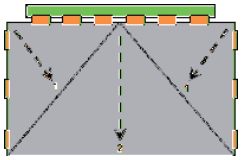
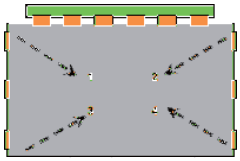
Remove slowly and follow the direction : from right-up to left-down

[21.3] Scan COF on the left and right side (Figure 3)

Remove slowly and follow the direction as marked by 1 and 2.

[21.4] Scan COF on the left and right side (Figure 4)

Remove slowly and follow the direction as marked by 1, 2, 3 and 4.

Figure 1	Figure 2	Figure 3	Figure 4
			

7.2 SAFETY PRECAUTIONS

[1] If the liquid crystal material leaks from the open cell, 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.

[2] After the end of life, open cells are not harmful in case of normal operation and storage.

8. DEFINITION OF LABELS

8.1 OPEN CELL LABEL

The barcode nameplate is pasted on each open cell as illustration for INX internal contro

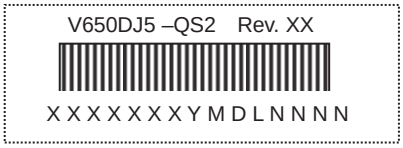
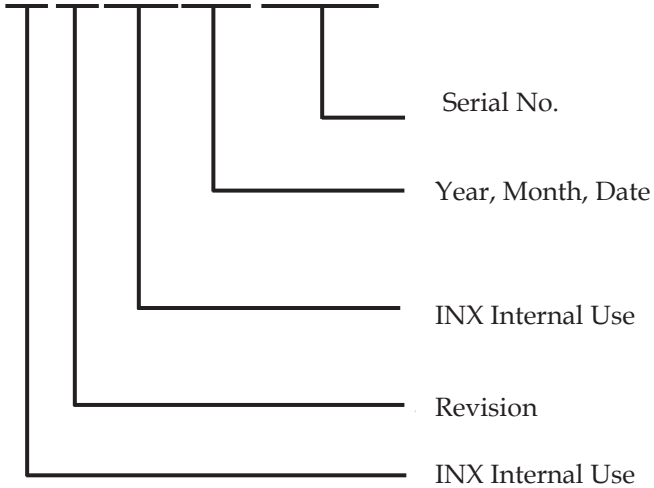


Figure.8-1 Serial No. Label on SPWB

Model Name : V650DJ5-QS2

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

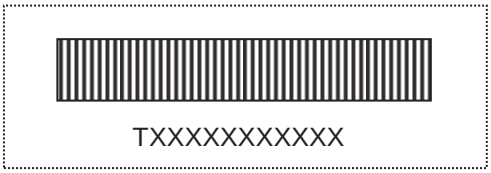
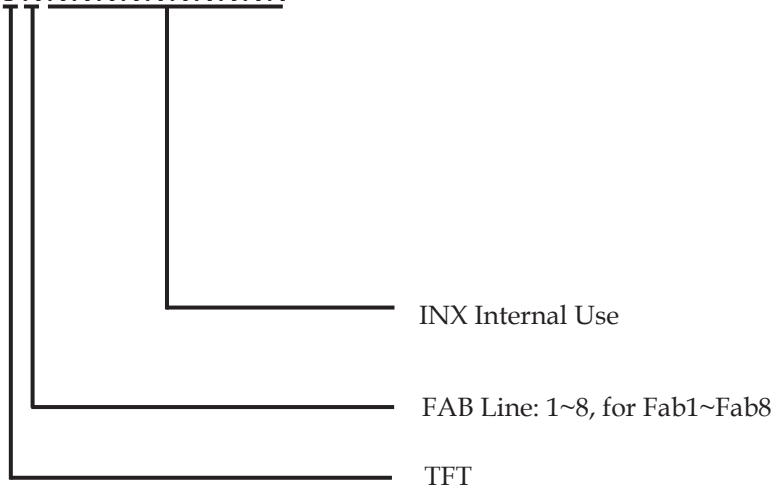


Figure.8-2 Panel ID Label on Cell

Panel ID Label includes the information as below:

Panel ID: T X X X X X X X X X X



9. PACKAGING

9.1 PACKAGING SPECIFICATIONS

(1) 8 LCD TV Panels / 1 Box

(2) Box dimensions : 1620 (L) X1020 (W) X108 (H) mm

(3) Weight : approximately 38.5 KG (8 PANELS PER BOX)

(4) 80 LCD TV Panels / 1 Group

(5) Without the outer carton, Boxes stack under the package architecture.

(6) Please fill up the container to avoid any cargo be damage.

(7) INX recommend for follow the same packing method as described in 9.2.

9.2 PACKAGING METHOD

Figures 9-1 ~ 9-2 are the packaging method

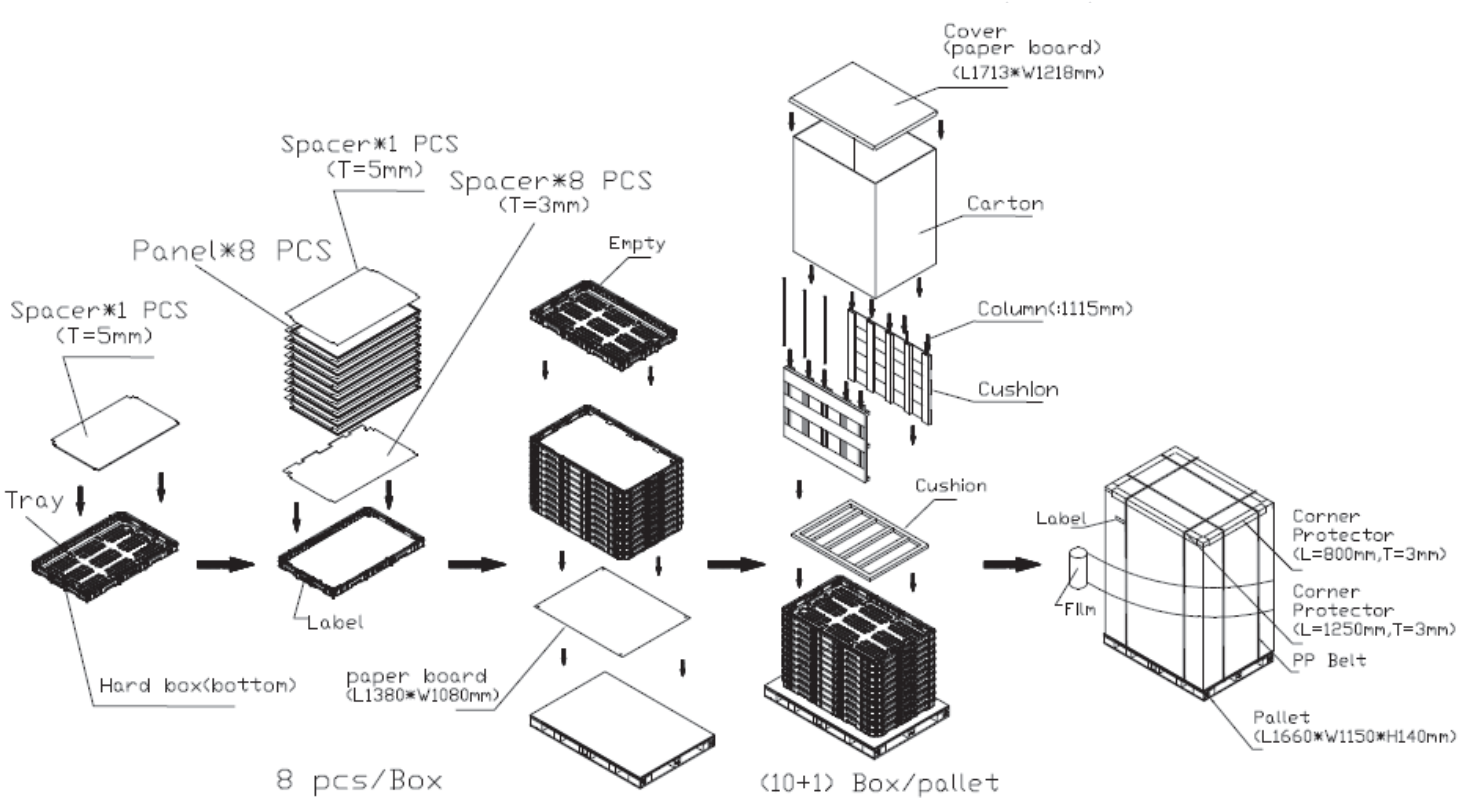


Figure.9-1 packaging method

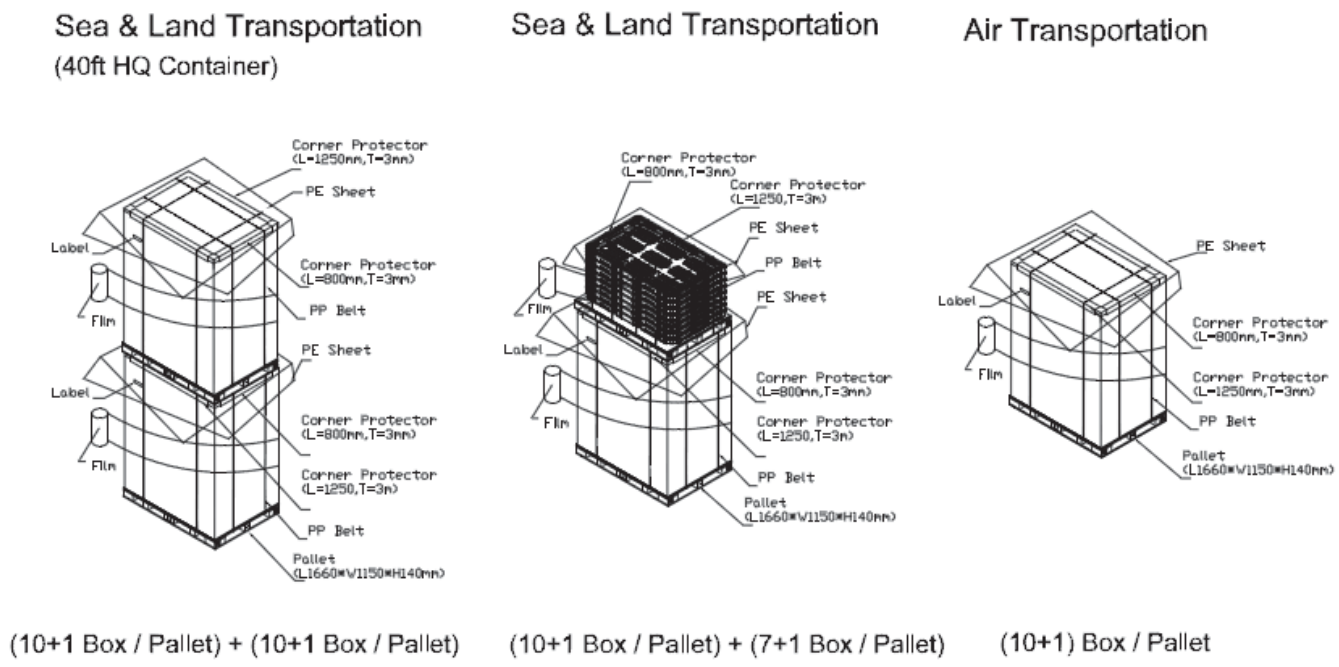


Figure.9-2 packing method

9.3 UN-PACKAGING METHOD

Figures 9-3 are the un-packaging method.

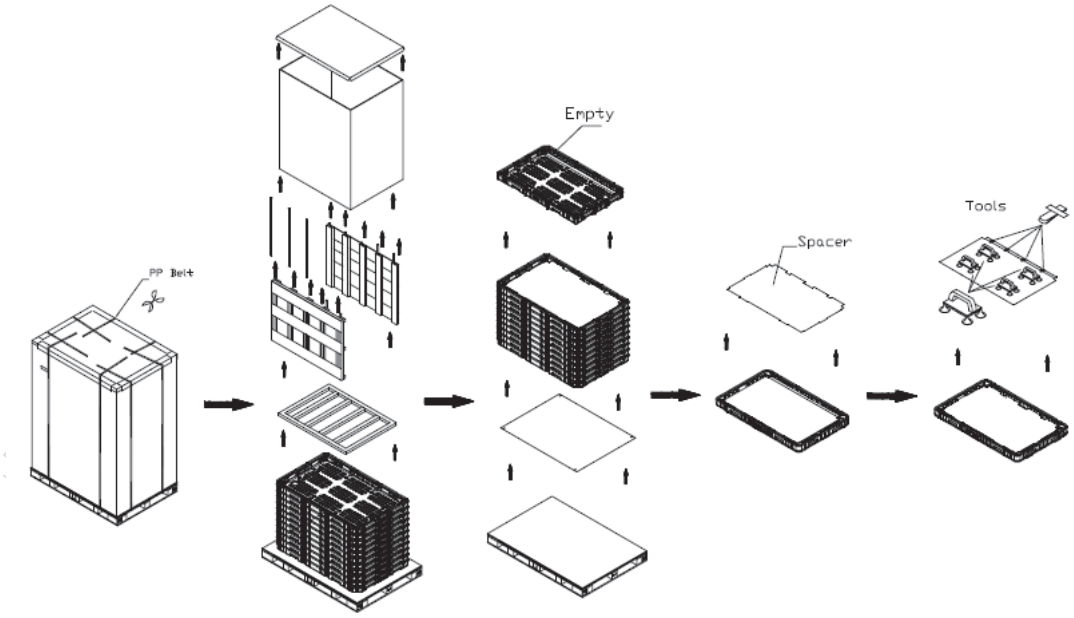


Figure.10-4 un-packaging method

10. MECHANICAL CHARACTERISTIC