InnoLux
群創光電股份有限公司

☐ Tentative Specification
☐ Preliminary Specification
■ Approval Specification

MODEL NO.: V320BJ7

SUFFIX: PE1

Revision : <u>C1</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
Chao-Chun Chung	Perry Lin	Apple Wen

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REVISION HISTORY

| Version	Date	Page(New)	Section	Description
Ver 0.0	2013/09/12	All	All	The tentavie spec was 1st issued.
Ver 0.1	2013/10/07	12	5.1	LVDS Pin Define (Pin 8 & 27)
		18	6.1	Vertical Active Display Term : Tv & Tvb
Ver 1.0	2013/10/31	All	All	The preliminary spec was 1st issued.
Ver 2.0	2013/11/29	All	All	The approval spec was 1st issued.

1. GENERAL DESCRIPTION

1.1 OVERVIEW

V320BJ7-PE1 is a 32″ TFT Liquid Crystal Display product with driver ICs and 1ch-LVDS interface. This product supports 1366 x 768 HDTV format and can display 16.7M colors (8-bit). The backlight unit is not built in.

1.2 FEATURES

CHARACTERISTICS ITEMS	SPECIFICATIONS
Screen Diagonal [in]	32″
Pixels [lines]	1366 × 768
Active Area [mm]	697.685(H) × 392.256(V)
Sub-Pixel Pitch [mm]	0.17025(H) × 0.51075(V)
Pixel Arrangement	RGB Vertical Stripe
Weight [g]	Typ. 850
Physical Size [mm]	Typ. 716.685×409.856
Display Mode	Transmissive Mode / Normallly Black
Contrast Ratio	Typ. 1400 (Typical value measure by INX's Module)
Glass thickness (Array / CF) [mm]	0.5 / 0.5
Viewing Angle (CR>10)	Horizontal & Vertical : 178° atφ=0°,90°,180°,270° (Typical value measured by INX's module)
Color Chromaticity	R = (0.622,0.338) G = (0.306,0.569) B = (0.136,0.143) W= (0.317,0.364) * Please refer to "color chromaticity" in 7.2
Cell Transparency [%]	Typ. 6.86% * Please refer to "Transmittance" in 7.2
Polarizer Surface Treatment	Semi-Glare (Low Haze Type) (Haze;1.3±1.1%, Pencil hardness;2H)
Rotation Function	Unachievable
Display Orientation	Signal input with "INX"
RoHs Compliance	

Back Side

X+C Board

Front Side

INX
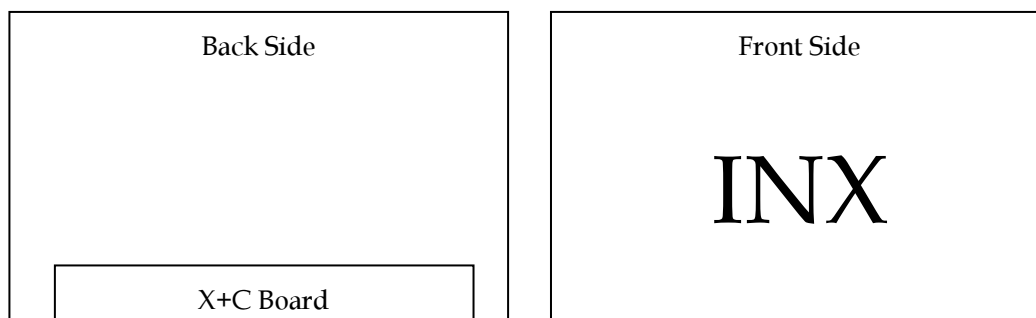
1.3 MECHANICAL SPECIFICATIONS

Item	Min.	Typ.	Max.	Unit	Note
Weight	-	886	-	g	-
I/F connector mounting position	The mounting inclination tolerance of the connector is ±0.5mm from 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

+/- 0.5mm
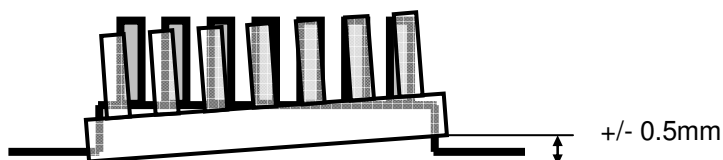
2. ABSOLUTE MAXIMUM RATINGS

2.1 ABSOLUTE RATINGS OF ENVIRONMENT

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Storage Temperature	TST	-20	+60	℃	(1) With INX Module
Operating Ambient Temperature	TOP	0	50	℃	(1), (2) With INX Module

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. (Ta > 40 ℃).

(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 ℃. The range of operating temperature may degrade in case of improper thermal management in final product design.
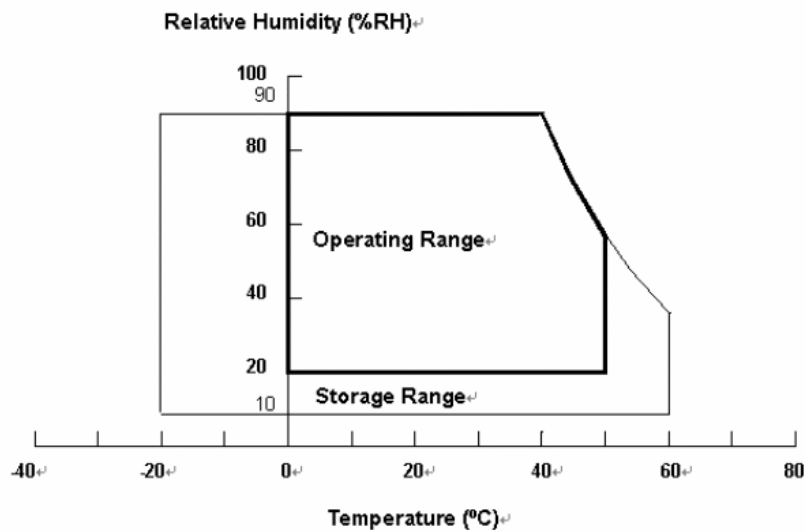
2.2 ABSOLUTE RATINGS OF ENVIRONMENT (OPEN CELL)

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 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 OPEN CELL

(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}	—	—	1.89	A	(2)
Power consumption	White Pattern	P_T	—	7.02	8.33	W	(3)
	Black Pattern	P_T	—	3.55	4.25		
	Horizontal Stripe	P_T	—	7.02	8.33		
Power Supply Current	White Pattern	P_T	—	0.58	0.69	A	
	Black Pattern	P_T	—	0.29	0.35		
	Horizontal Stripe	P_T	—	0.58	0.69		
LVDS interface	Differential Input High Threshold Voltage	V_{LVTH}	+100	—	+300	mV	(4)
	Differential Input Low Threshold Voltage	V_{LVTL}	-300	—	-100	mV	
	Common Input Voltage	V_{CM}	1.0	1.2	1.4	V	
	Differential input voltage	$|V_{ID}|$	200	—	600	mV	
	Terminating Resistor	R_T	—	100	—	ohm	
CMOS 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 condition :
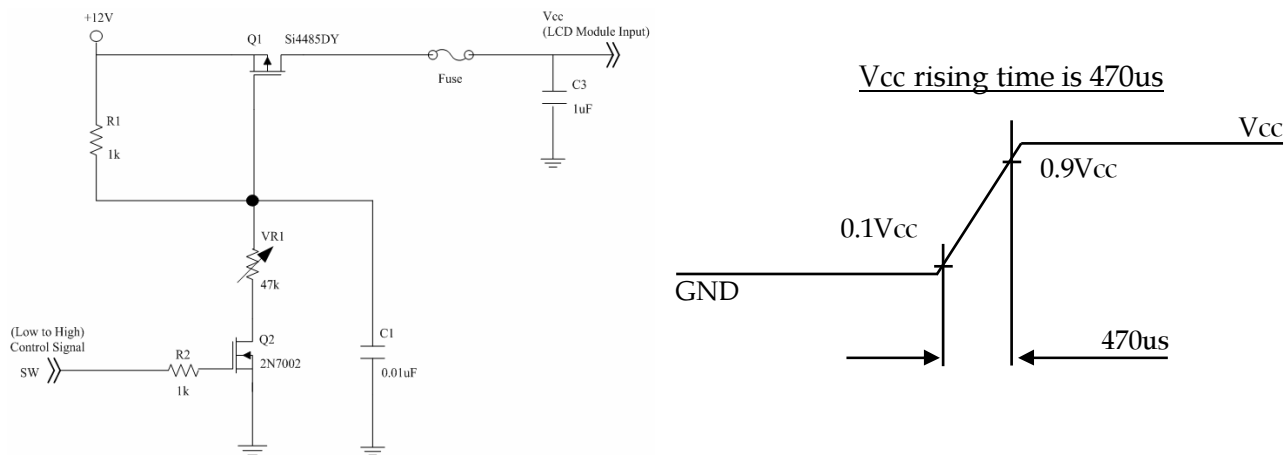
Note (3) The specified power supply current is under the conditions at Vcc = 12 V, Ta = 25 ± 2 °C, f_v = 60 Hz, whereas a power
dissipation check pattern below is displayed.

a. White Pattern

Active Area

b. Black Pattern
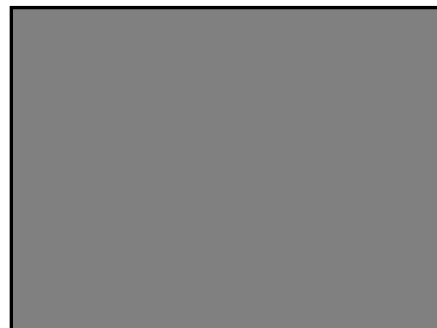
Active Area

c. Horizontal Stripe

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

4. INPUT TERMINAL PIN ASSIGNMENT

4.1 TFT LCD OPEN CELL

TFT LCD PANEL

(1366x3x768)

X+C Board

INPUT CONNECTOR,

P-TWO 187114-30091 or Foxconn GS23301-1321S-7H

| Vcc | SELLVDS | RXO(+/-)
RX1(+/-)
RX2(+/-)
RX3(+/-)
CLK(+/-) | SCL | SDA | GND |

5. INPUT TERMINAL PIN ASSIGNMENT

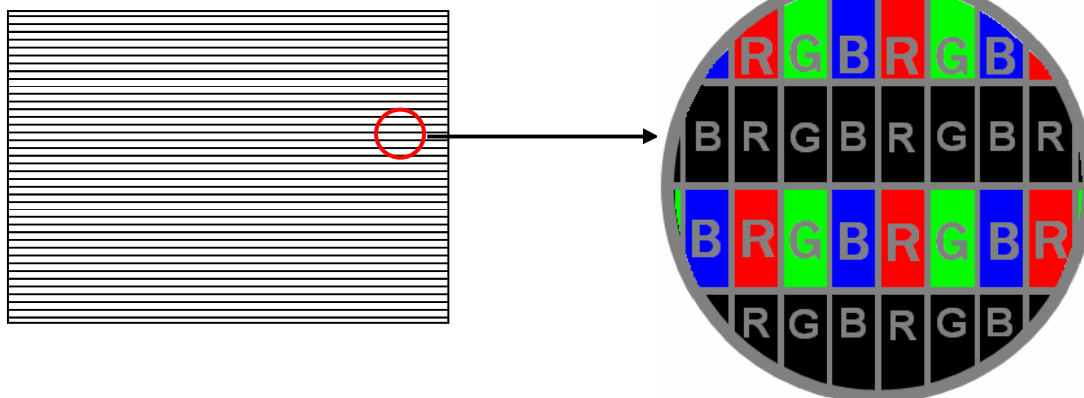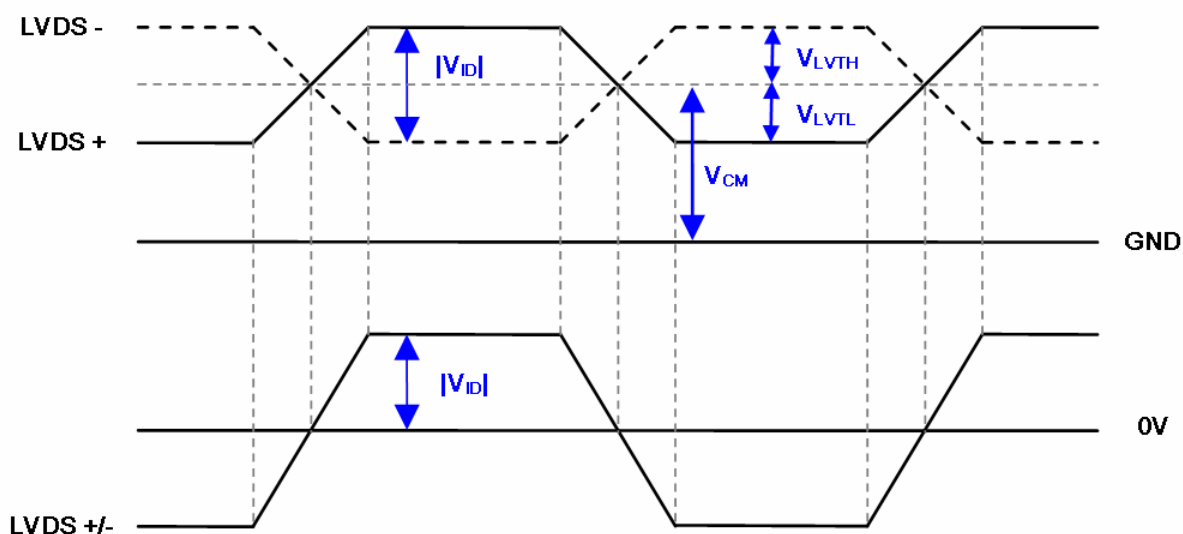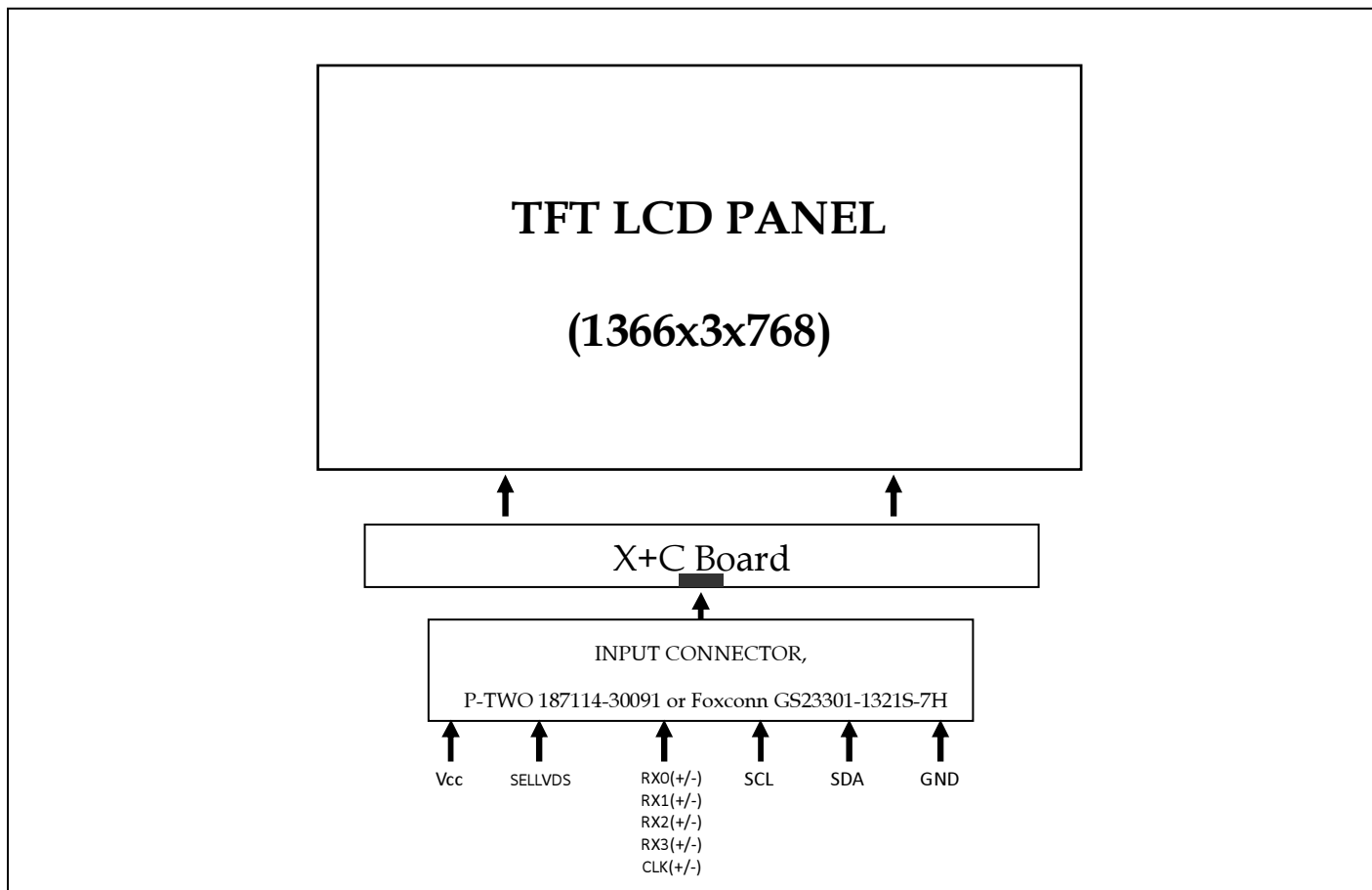### 5.1 TFT LCD OPEN CELL INPUT

CNF1 Connector Pin Assignment (187114-30091 (P-TWO) , GS23301-1321S-7H (Foxconn))

Matting connector : FI-X30H (JAE)

Pin	Name	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	WP	Write Protection	(2)
9	SELLVDS	LVDS data format Selection	(3)(4)
10	NC	No connection	(2)
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	Aging	Aging Mode	(2)
28	SCL	I2C clock (For Vcom tunning)	
29	SDA	I2C data (For Vcom tunning)	
30	GND	Ground	

Note (1) LVDS connector pin orderdefined as below

PCB

LVDS Connector

Pin 1   Pin 30
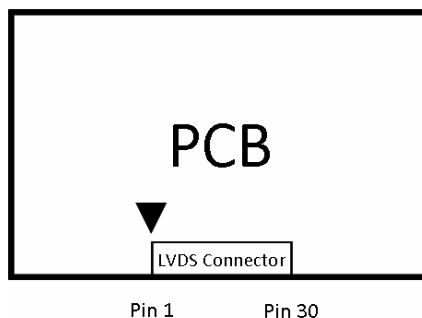
Note (2) Reserved for internal use. Please leave it open.

Note (3) Connect to +3.3V: JEIDA Format, Connect to GND or Open : VESA Format.

SELLVDS	Mode
H	JEIDA
L (default)	VESA

L : Connect to GND or Open, H: Connect to +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.
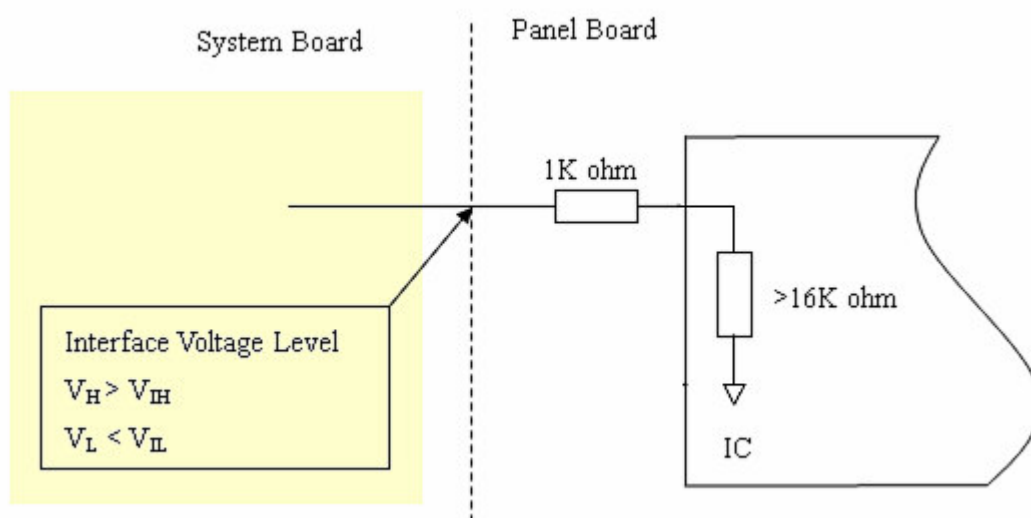
Note (5) LVDS connector mating dimension range request is 0.93mm~1.0mm as below.

5.2 LVDS INTERFACE

VESA Format : SELLVDS = L

JEIDA Format : SELLVDS = H

VESA LVDS format

JEIDA LVDS format

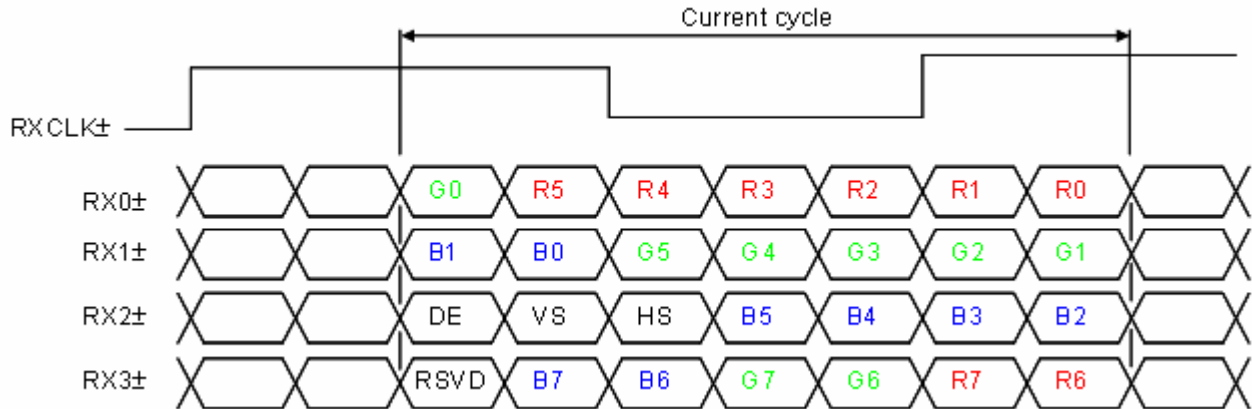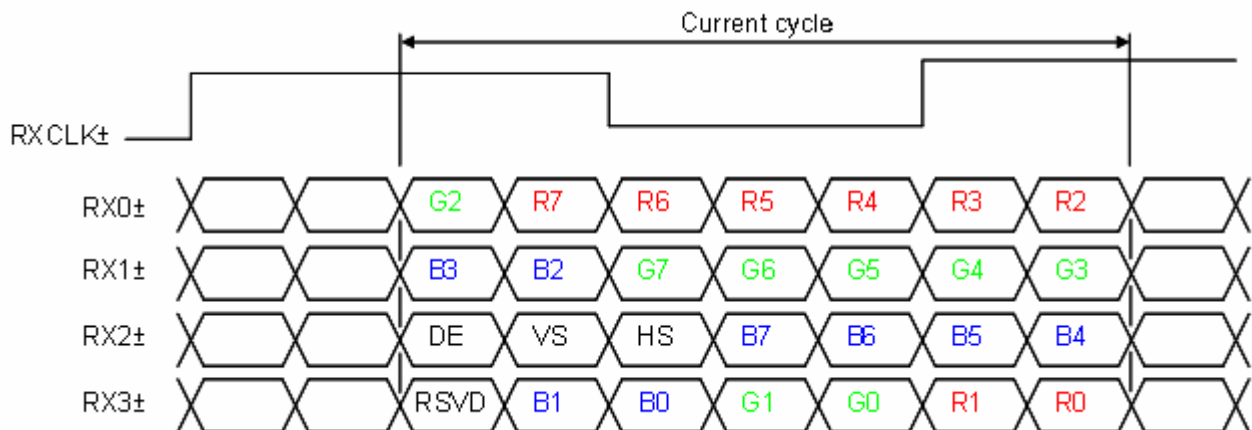| R0~R7	Pixel R Data (7; MSB, 0; LSB)	DE	Data enable signal
G0~G7	Pixel G Data (7; MSB, 0; LSB)	DCLK	Data clock signal
B0~B7	Pixel B Data (7; MSB, 0; LSB)		

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
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	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

5.4 FLICKER (Vcom) ADJUSTMENT

(1) Adjustment Pattern :

The adjustment pattern is shown as below. If customer needs below pattern, please directly contact with

INX account FAE. The pattern is sub-pixel inversion with 128 gray level.

Frame N   Frame N+1
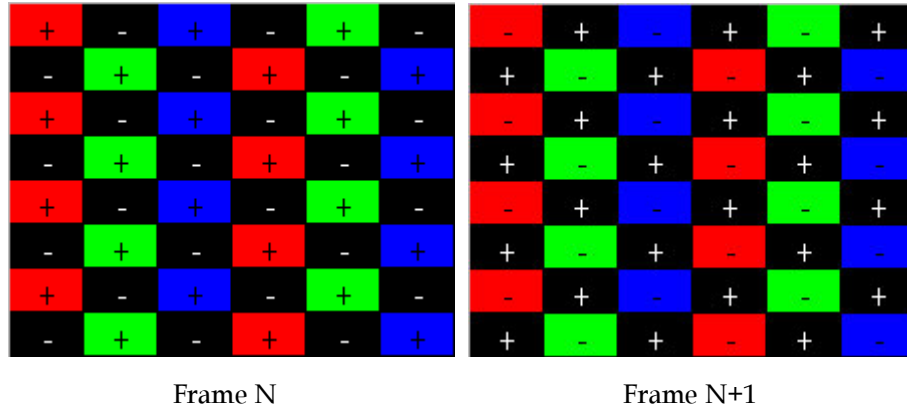
(2) Adjustment method: (Digital V-com)

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.

c. Document: Auto V-com adjustment suggestion OI.

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_{clkin} (=1/TC)	60	76	82	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	(6)
		F_{r6}	57	60	63	Hz	
	Total	Tv	778	806	1050	Th	Tv=Tvd+Tvb
	Display	Tvd	768	768	768	Th	—
	Blank	Tvb	10	38	282	Th	—
Horizontal Active Display Term	Total	Th	1446	1560	1936	Tc	Th=Thd+Thb
	Display	Thd	1366	1366	1366	Tc	—
	Blank	Thb	80	194	570	Tc	—

Note (1) Please make sure the range of pixel clock has follow the below equation :
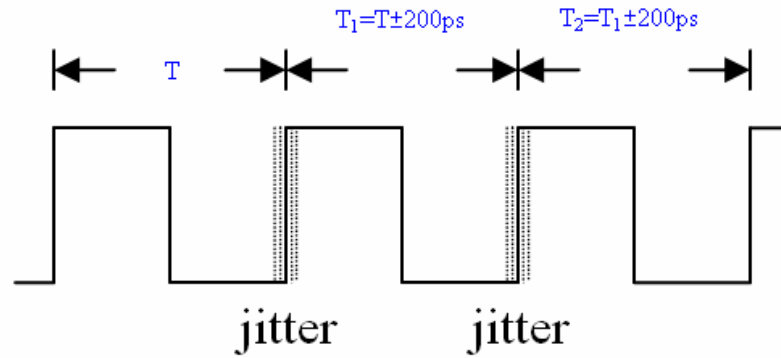
$$Fclkin(max) \geq Fr6 \times Tv \times Th$$
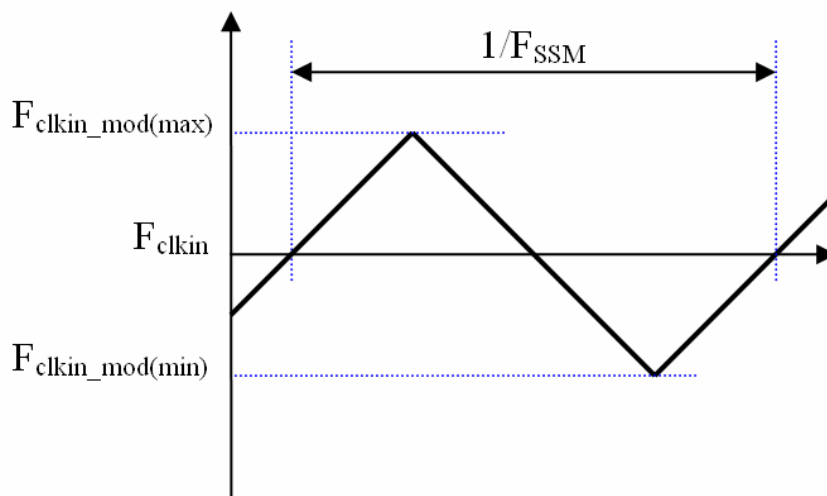
$$Fr5 \times Tv \times Th \geq Fclkin (min)$$

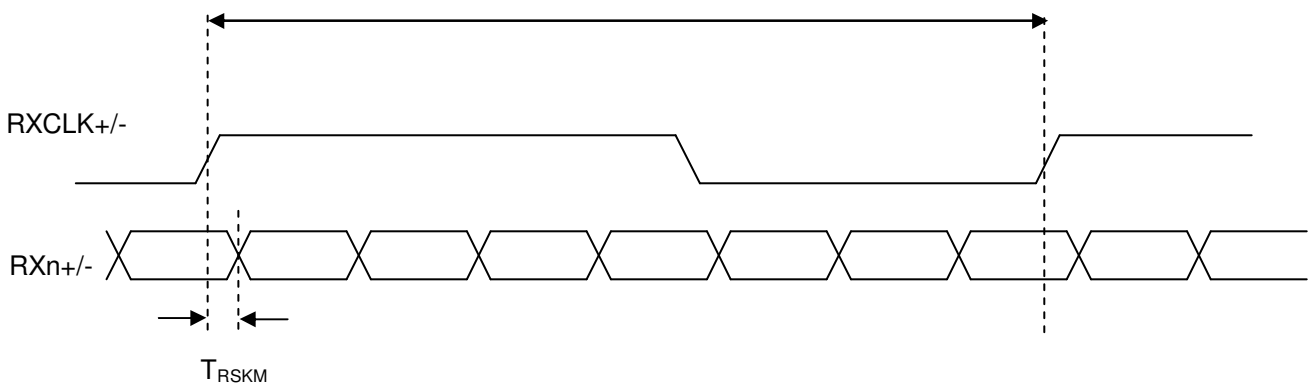Note (2) This module is operated in DE only mode and please follow the input signal timing diagram below :
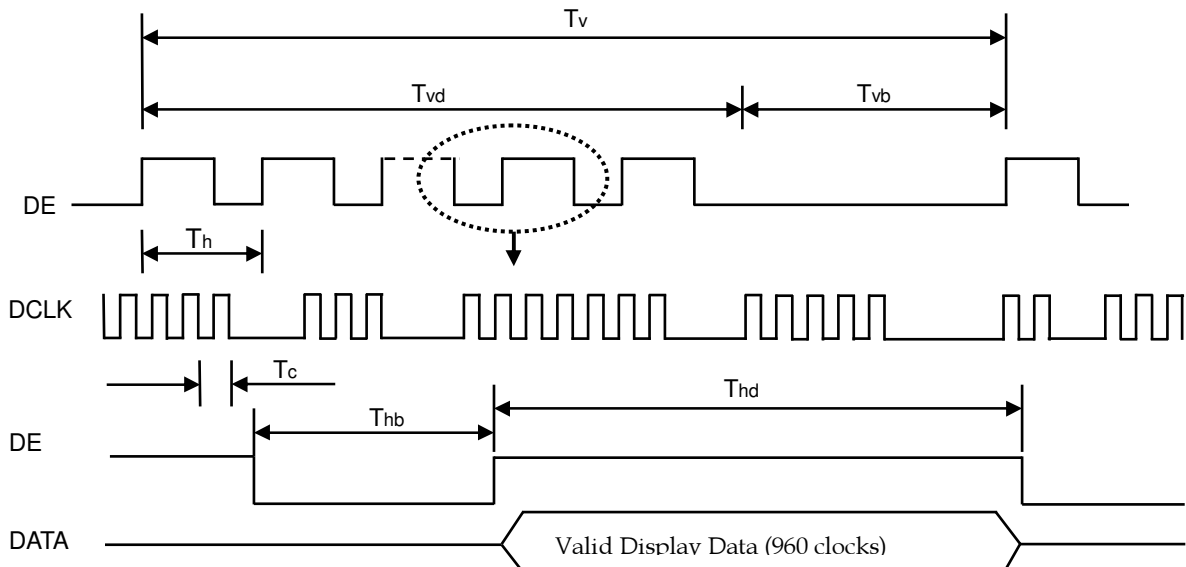
Note (3) The input clock cycle-to-cycle jitter is defined as below figures. Trcl = | T_1 – T |

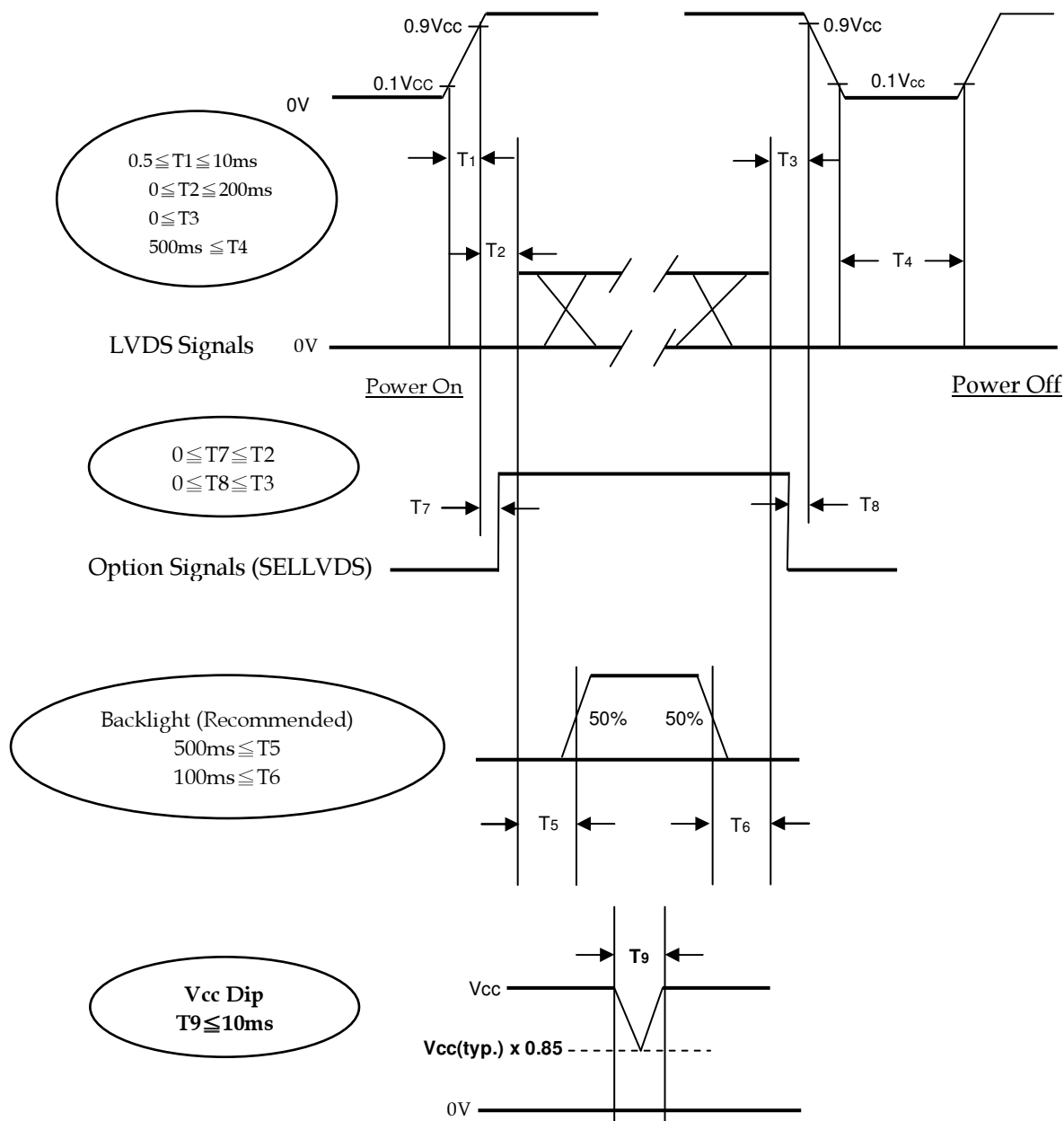Note (4) The SSCG (Spread spectrum clock generator) is defined as below figures.

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

6.2 POWER ON/OFF SEQUENCE

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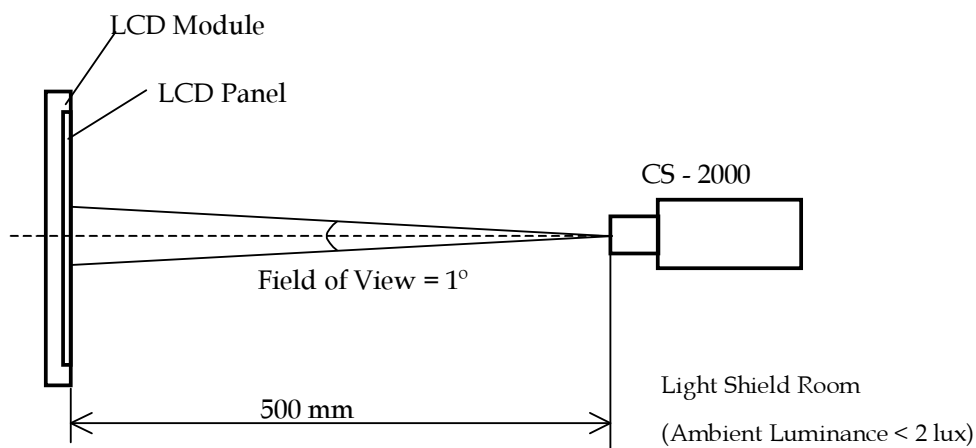
Note (6) Vcc must decay smoothly when power-off.

7. OPTICAL CHARACTERISTICS

7.1 TEST CONDITIONS

Item	Symbol	Value	Unit
Ambient Temperature	Ta	25 ±2	°C
Ambient Humidity	Ha	50 ±10	%RH
Vertical Frame Rate	Fr	60	Hz
Supply Voltage	V_{CC}	12.0 ±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.

LCD Module

LCD Panel

CS - 2000

Field of View = 1°

500 mm

Light Shield Room

(Ambient Luminance < 2 lux)

7.2 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.

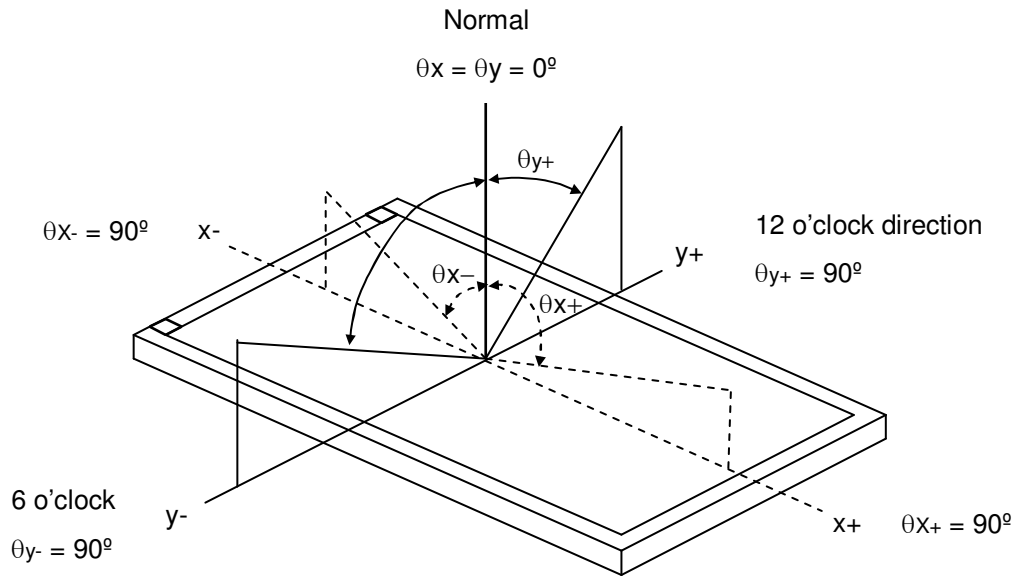| Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Color Chromaticity	Red	Rcx	$\theta_x=0°$, $\theta_Y=0°$ Viewing Angle at Normal Direction Standard light source "C"	-0.03	0.622	+0.03	-	(0)
		Rcy			0.338		-	
	Green	Gcx			0.306		-	
		Gcy			0.569		-	
	Blue	Bcx			0.136		-	
		Bcy			0.143		-	
	White	Wcx			0.317		-	
		Wcy			0.364		-	
Transmittance		T%	$\theta_x=0°$, $\theta_Y=0°$ With INX Module@60Hz		6.86	-	%	(5)
Transmittance Variation		δT				1.3		(6)
Contrast Ratio		CR			1400	-	-	(1),(3)
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. W, R,G, B are with signal input. BLU (V320BJ?-LE?) 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 (?) 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)

Normal
θx = θy = 0º

θy+

12 o'clock direction
θy+ = 90º

θx- = 90º   x-

θx−

θx+

y+

6 o'clock
y-
θy- = 90º

x+   θx+ = 90º

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

The contrast ratio can be calculated by the following expression.
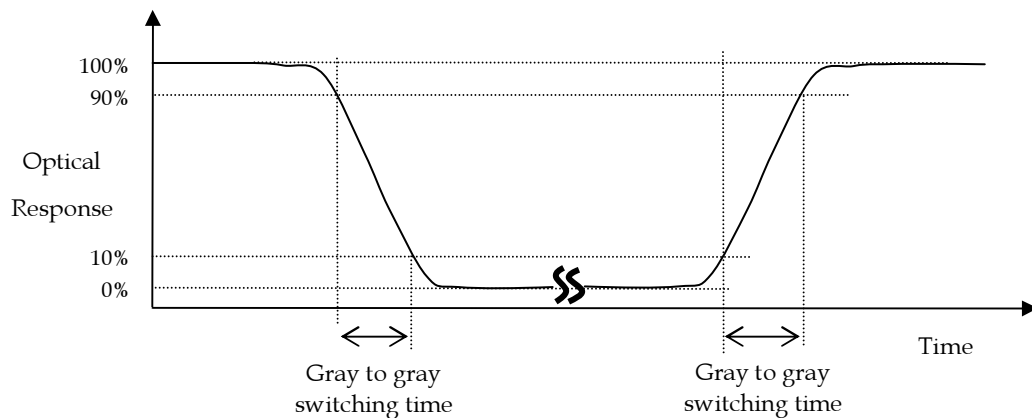
$$\text{Contrast Ratio (CR)} = \frac{\text{Surface Luminance of L255}}{\text{Surface Luminance of L0}}$$

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 (4) 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.

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.

$$T(X) = \frac{L1023\ (X)\ of\ LCD\ module}{Luminance\ (X)\ of\ BLU} \times 100\%$$
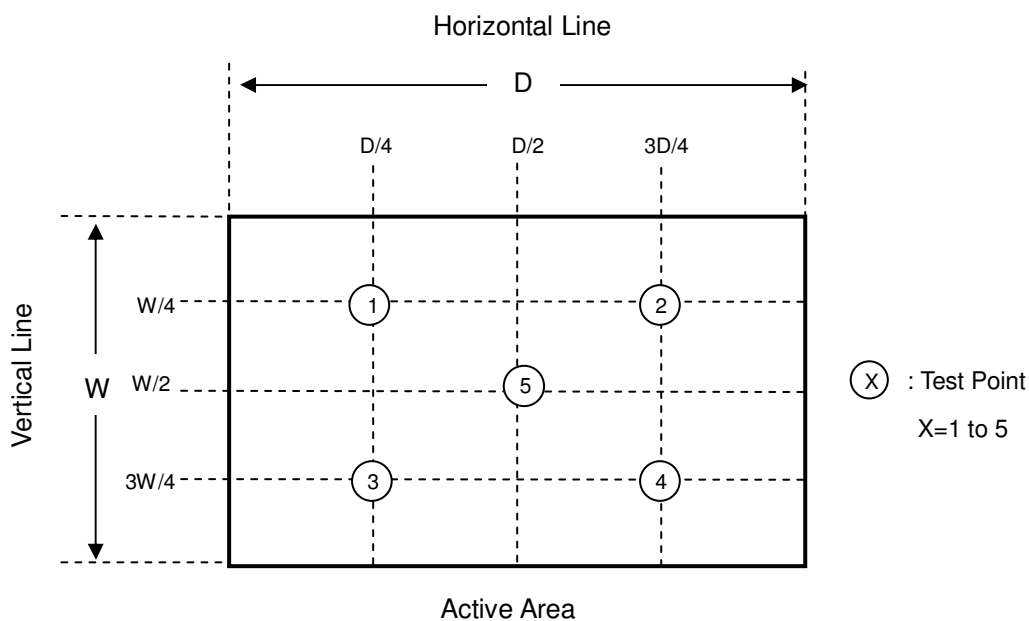
L1023: Luminance of gray level 1023

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.

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

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

8. PRECAUTIONS

8.1 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 10ºC, 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 LVDS 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 LVDS 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.

8.2 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.

8.3 UL FOLLOW UP SERVICE

    [1]   When UL follow up service is going, any requirements for the following files could be replied by InnoLux quickly.

          ・X+C Board

9. DEFINITION OF LABELS

9.1 OPEN CELL LABEL

The barcode nameplate is pasted on each open cell as illustration for INX internal control.
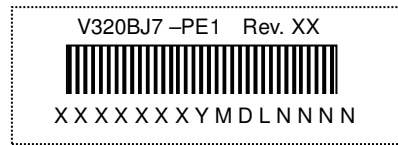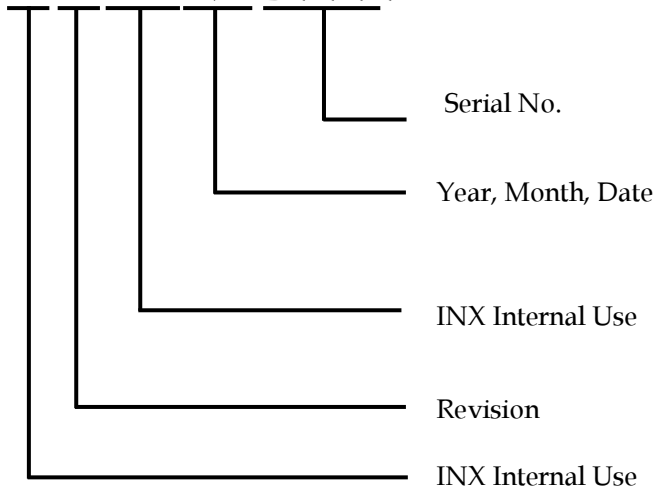
```
V320BJ7 –PE1   Rev. XX
|||||||||||||||||||||||||||
X X X X X X X Y M D L N N N N
```

Figure.9-1 Serial No. Label on SPWB and Cell

Model Name : V320BJ7-PE1

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

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

Serial No.

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

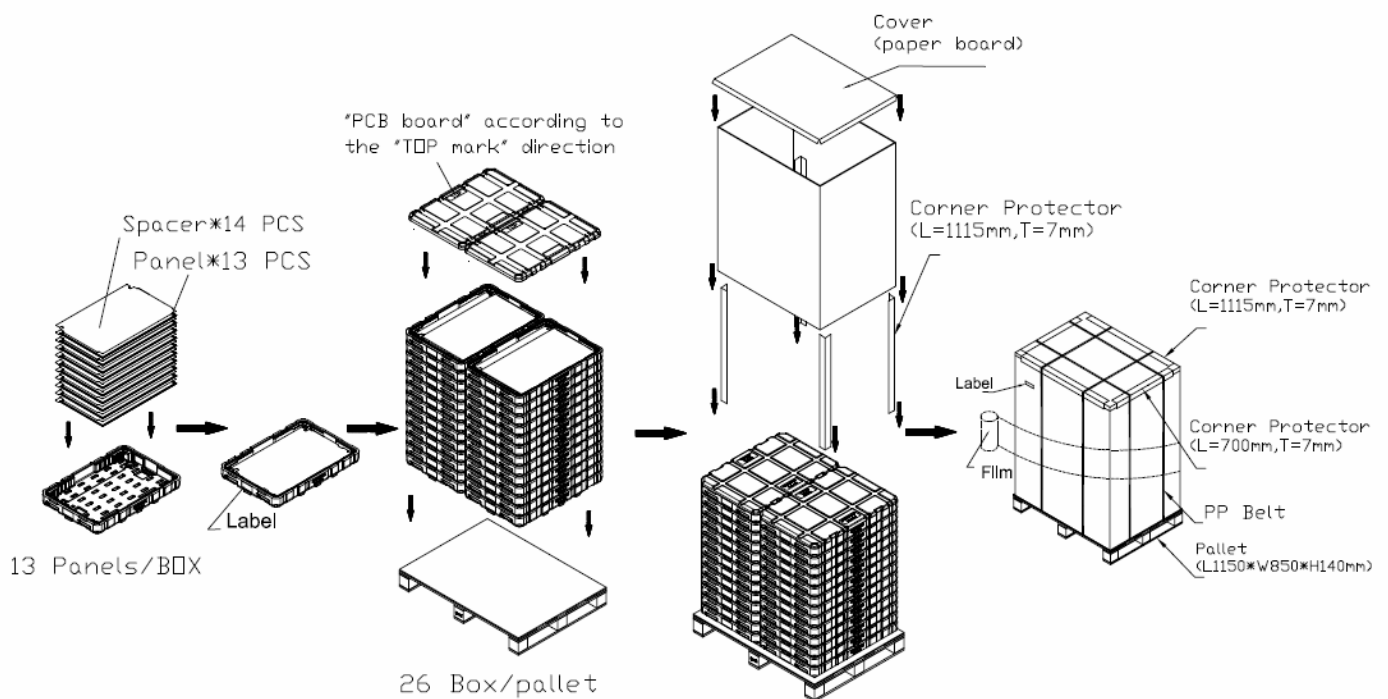Serial No.: Manufacturing sequence of product

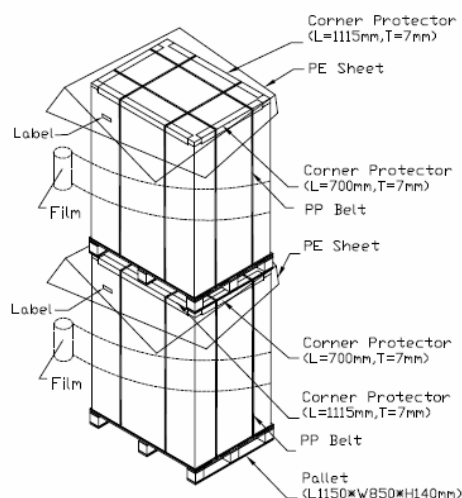## 10. PACKAGING

10.1 PACKAGING SPECIFICATIONS

Hard Box :

(1) 13 PCS LCD TV Panels / 1 Box

(2) Box dimensions : 810(L) X 555(W) X 92.5(H)mm

(3) Weight : approximately 14.8 Kg

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

10.2 PACKAGING METHOD

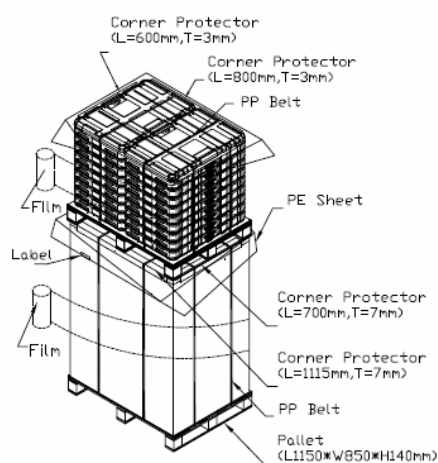Packing method (Hard Box) is shown in following figures.

INNOLUX
群創光電股份有限公司

Sea / Land Transportation
(40ft HQ Container)

Sea / Land Transportation

Air Transportation

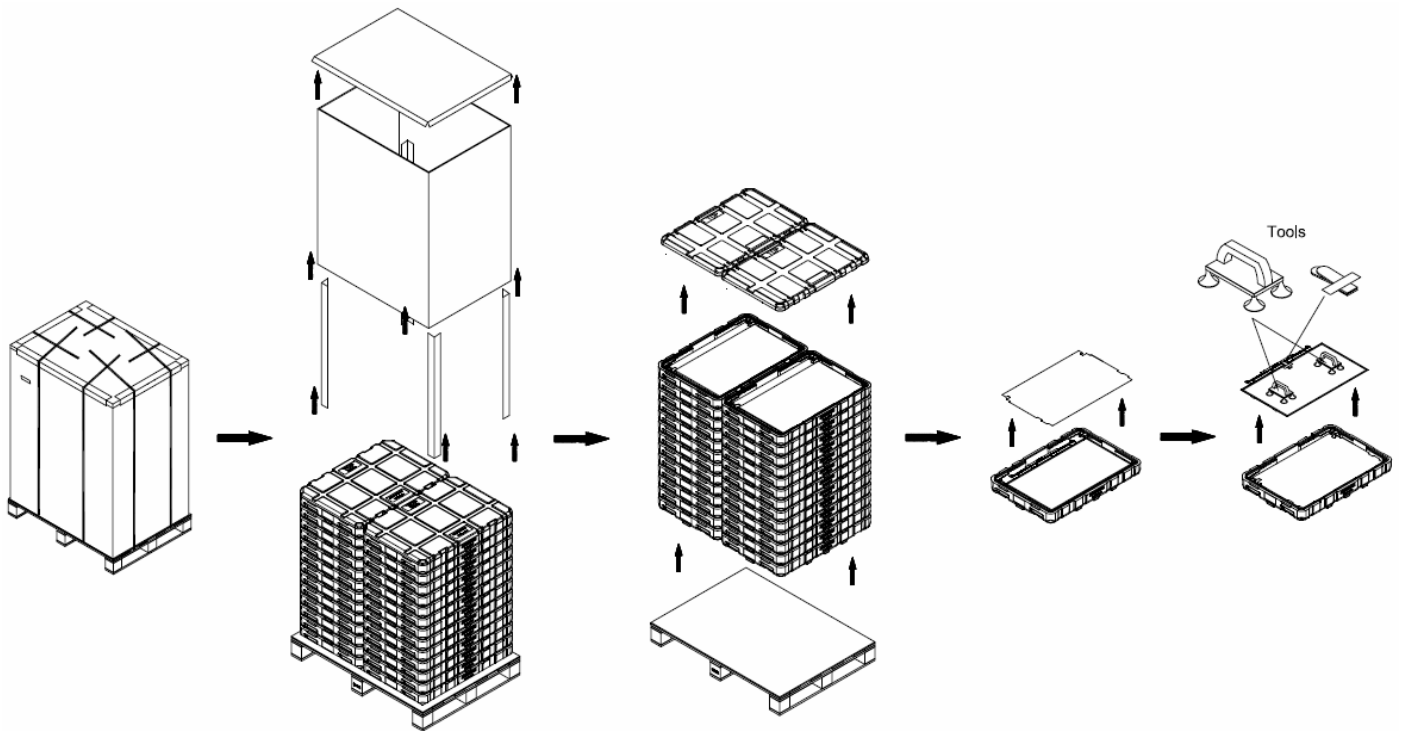26 Boxes/Pallet+26 Boxes/Pallet

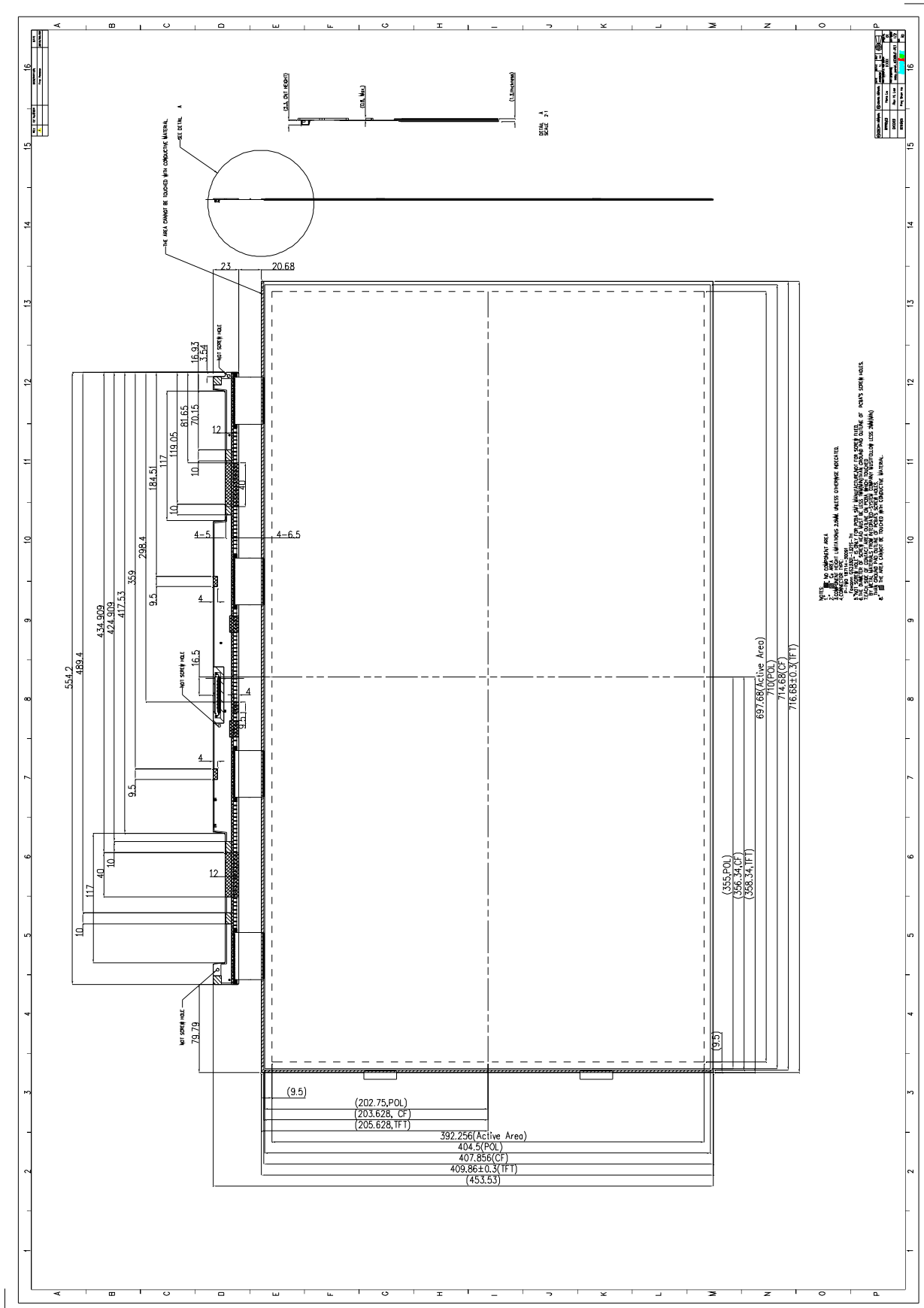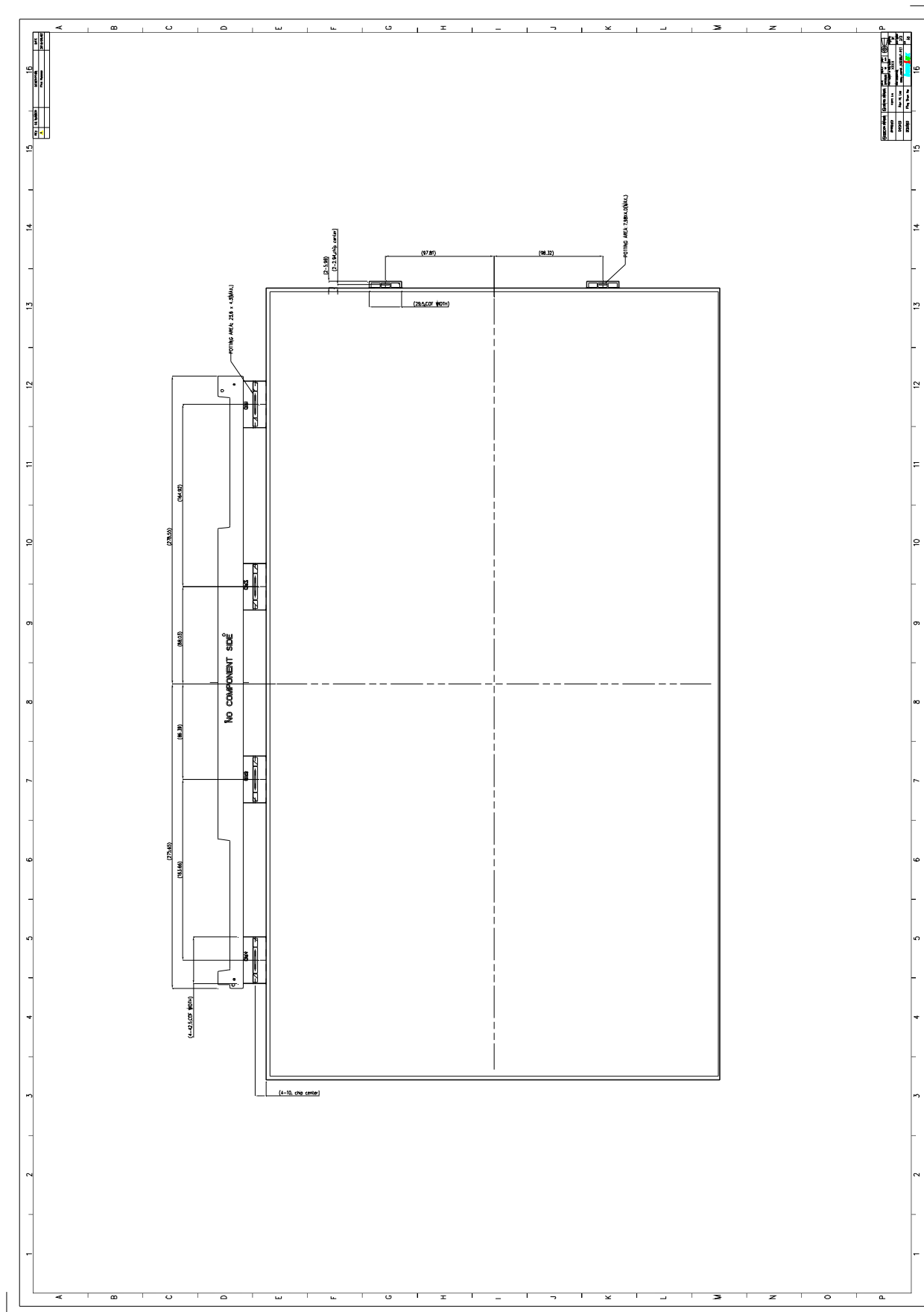26 Boxes/Pallet+18 Boxes/Pallet
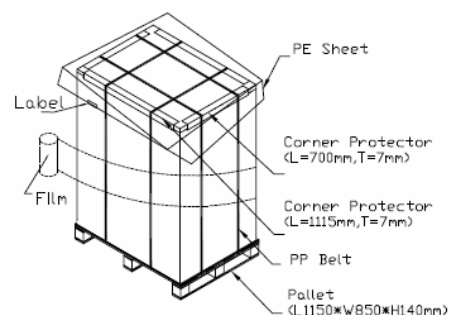
26 Boxes/Pallet

10.3 UN-PACKAGING METHOD

Un-packaging method is shown as following figures.

11. MECHANICAL CHARACTERISTIC

进出口料报关信息表（供应商填写）

注：此表在填写的时候可以调整列宽和行高，但不能更改此表的结构，具体填写参数请参照《报关信息要素》。

创维物料编号（由客户填写）	供应商代码（由供应商填写）	商品中文名称（按规范填写）	规格型号	品牌	生产厂家	净重（G）	原产国	功/频率	电压(耐压)	容量	材质	结构类型	主要参数	是单层还是多层？	用途/功能描述		是否加密	备注1	备注2
7701-13200-1080	CH046	液晶屏	V320BJ7-PE1	INNOLUX	群創光電	880	中國					32寸，帶 X Board，不帶 CNV.			液晶电视显示部件	無觸控功能		V320BJ7-PE1是32寸 1366x 768 標清电视液晶玻璃，2通道LVDS 接口，可显示16.7M色彩	

填写单位：				填写人：	