Doc. Number:

□ Tentative Specification

■ Preliminary Specification

□ Approval Specification

MODEL NO.: DJ080IA

SUFFIX: 11A

Customer:

APPROVED BY SIGNATURE

Name / Title

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

Approved By	Checked By	Prepared By
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REVISION HISTORY

Version	Date	Page	Description
0.0	Jun,1,2015	All	Spec Ver.0.0 was first issued.
1.0	Aug,20,2015	Page 1 Page 2 Page 5 Page 7 Page 8 Page 9 Page 10 Page 11 Page 12	Page 1: Interface: 1-port LVDS (DE mode only). Page 2: Modify 2. Pin assignment . Page 5: Modify 3.1 Absolute Maximum Ratings: Note 5 Modify 3.1.1 Typical Operation Conditions: Internal Pull high/low resistor. Page 7: Modify 3.2 Power Sequence: VDD=3.0~3.6V a. Power on b. Power off. Page 8: Modify 3.3.1 AC Electrical Characteristics. Page 9: Modify 3.3.2 Input Clock and Timing Diagram Page10: Modify 3.3.3 DC Electrical Characteristics. Page11: Modify 3.3.4 Timing Modify 3.3.5 Data Input Format. Page12: Modify 3.3.6 Reset timing.
1.1	Nov,18,2015	Page 1 Page 6 Page 20 Page 21	Page 1: Modify Backlight power consumption and Panel power consumption. Page 6: Modify Current Consumption. Page 20: Modify Mechanical Drawing. Page 21: Modify Package Drawing.
1.2	Nov,18,2015	Page 13	Page 13: Optical Specification.
1.3	Dec,16,2015	Page 6	Page 6: Backlight Driving Conditions.
1.4	Apr, 11,2016	Page 5 Page 13	Page 5: Modify 3.1. LED Reverse Voltage. Page 13: Modify Luminance.
1.5	Aug,19,2016	Page 5 Page 7 Page 18-19 Page 21	Page 5: Modify Absolute Maximum Ratings of note. Page 7: Modify Power Sequence. Page 18-19: Modify Reliability Test Items. Page 21: Modify drawing.

1.6	Jan,19,2018	Page 1 Page 2-3 Page 6 Page 7 Page 8 Page 11 Page 12 Page 22 Page 23-24	Page 1: Modify backlight power consumption. Page 2-3: Modify Pin Assignment no. 1, 4, 23, 24, 26, 27, 29, 35, 36, 37. Page 6: Modify 3.1.2 Current Consumption: Current for driver remark. Page 7: Modify 3.1.3 Backlight Driving Condition: Voltage for LED backlight. Note7, 8, 9 description. Page 8: Modify 3.2 Power sequence. Page 11: Modify 3.3.3 DC Electrical Characteristics: Termination resistor. Page 12: Modify 3.3.5 Data Input Format Page 22: Modify 7. Mechanical Drawing. Page 23-24: Modify 8. Package Drawing.

Contents

1. General Specifications

No.	Item	Specification	Remark
1	LCD size	8 inch (Diagonal)	
2	Driver element	a-Si TFT active matrix	
3	Resolution	1280 × 3(RGB) × 720	
4	Display mode	Normally Black, Transmissive	
5	Dot pitch	0.138(W) × 0.138(H) mm	
6	Active area	176.64(W) × 99.36(H) mm	
7	Module size	192.8(W) × 116.9(H) ×6.4(D) mm	Note 1
8	Surface treatment	Anti-Glare	
9	Color arrangement	RGB-stripe	
10	Interface	1-port LVDS灶DE mode only炸	
11	Backlight power consumption	4.84W (Typ.)	
12	Panel power consumption	1.4W(Max)	
13	Weight	205 g (Max.)	

Note 1: Refer to Mechanical Drawing.

2. Pin Assignment

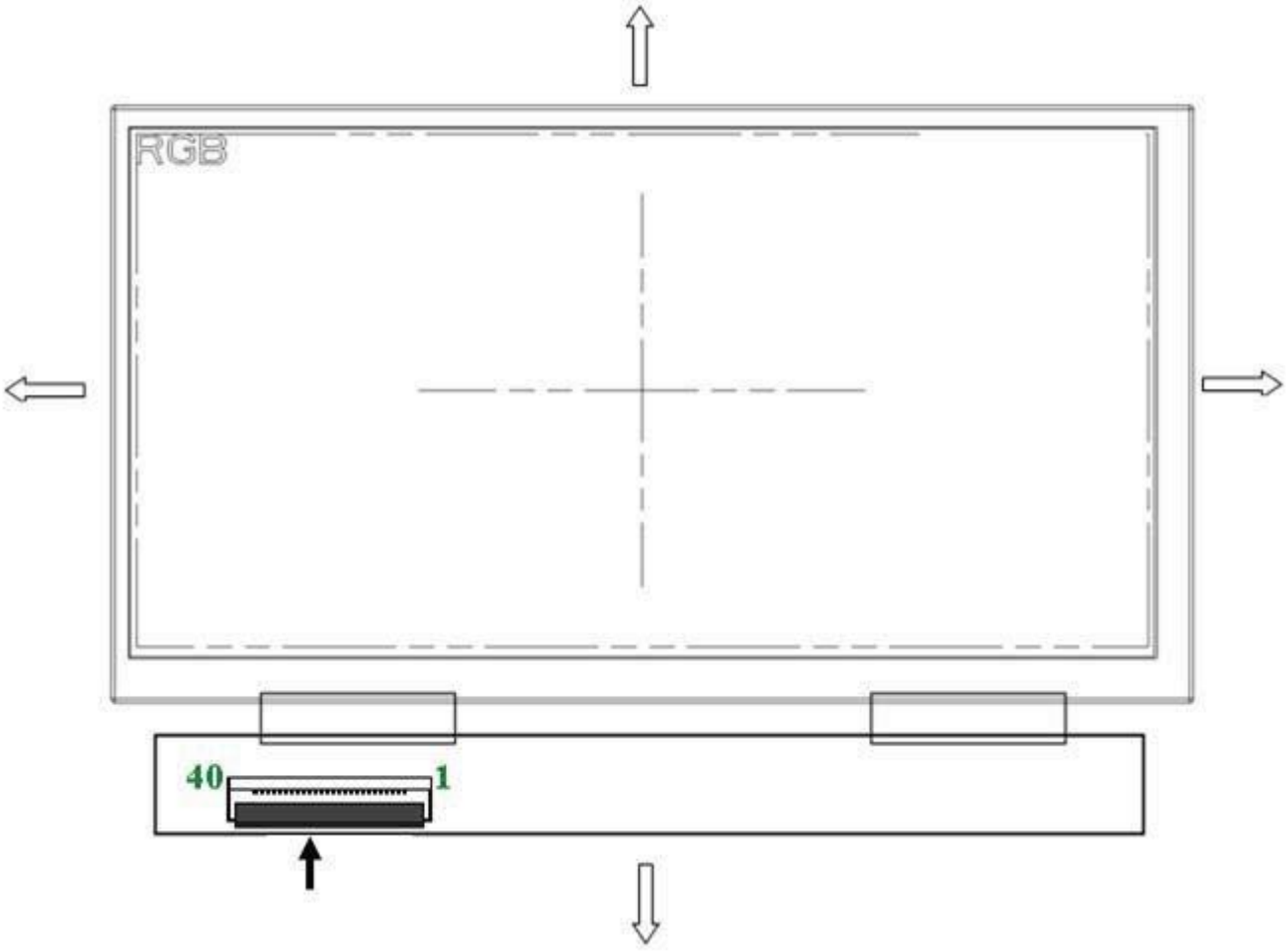
PCBa Connector is used for the module electronics interface. The recommended model is 20647-040E-01 manufactured by I-PEX.

Pin No.	Symbol	I/O	Pulled Internally (Note3)	Function	Remark
1	MODE	-	L	DE mode only. Normally display please set it Low.	
2	VDD	Power		External main and I/O power supply ; Power3V3	Note 2
3	VDD	Power		External main and I/O power supply : Power3V3	Note 2
4	BISTEN	-	L	BIST disable. Normally display please set it Low.	
5	RESET	Input	H	Global reset pin	Note 2
6	STBYB	Input	H	Standby mode setting pin	Note 2
7	GND	Power		Ground	
8	RXIN0-	Input		LVDS data 0-	
9	RXIN0+	Input		LVDS data 0+	
10	GND	Power		Ground	
11	RXIN01-	Input		LVDS data 1-	
12	RXIN01+	Input		LVDS data 1+	
13	GND	Power		Ground	
14	RXCLKIN-	Input		LVDS clk -	
15	RXCLKIN+	Input		LVDS clk +	
16	GND	Power		Ground	
17	RXIN02-	Input		LVDS data 2-	
18	RXIN02+	Input		LVDS data 2+	
19	GND	Power		Ground	
20	RXIN03-	Input		LVDS data 3-	
21	RXIN03+	Input		LVDS data 3+	
22	GND	Power		Ground	
23	SCL	-	L	Serial Interface clock input. If no use please connect to ground.	
24	SDA	-	L	Serial Interface address and data input/output. If no use please	

				connect to ground.	
25	GND	Power		Ground	
26	CSB	-	H	Serial Interface chip enable signal. If no use please set it High to disable.	
27	NTC GND	Power		LED Driver for NTC Function, If not use please keep floating or connect to ground.	
28	SELB(DINT)	Input	H	Input Input data format selection DINT = 1 : 8-bit (Default) DINT = 0 : 6-bit	
29	FCS	-	H	Function control by Hardware. For DINT, RL, TB, BIST control by main board please set it High.	
30	GND	Power		Ground	
31	LED-	Power		Negative backlight voltage	
32	LED-	Power		Negative backlight voltage	
33	L/R	Input	H	Horizontal shift direction (source output) selection. RL = 1: Left -> Right (Default) RL = 0: Right -> Left	
34	U/D	Input	H	Vertical shift direction (gate output) selection. TB = 1: Top ->Bottom (Default) TB = 0: Bottom ->Top	
35	NTC	Input		LED Driver for NTC Function, If not use please keep floating or connect to ground.	
36	ATREN	-	H	Auto reload OTP in operation mode every 64 frames.	
37	OTP_VDD	-	H	Keep floating or connect to VDD.	
38	NC	-		Keep floating.	
39	LED+	Power		Positive backlight voltage	
40	LED+	Power		Positive backlight voltage	

Note2 : Please follow "3.2 power sequence"
Note3 : Typical internal pull low / high resistor is 350 kΩ

Note: Definition of scanning direction.
Refer to the figure as below:



3. Operation Specifications

3.1. Absolute Maximum Ratings

(GND=0V, Note 4)

Item	Symbol			Unit	Remark
Power voltage	V_{DD}	-0.3	3.96	V	
Operation Temperature	T_{OP}	-30	85	℃	Note 4-1,2,3,4
Storage Temperature	T_{ST}	-40	90	℃	Note 4-1,2,3
LED Reverse Voltage	VR	-	-	V	Note 4-5
LED Forward Current	IF	-	150	mA	Each LED

Note 4: The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

Note 4-1: Ta = Ambient Temperature.

Note 4-2: This rating applies to all parts of the module and should not be exceeded.

Note 4-3: Maximum wet-bulb temperature is 58℃ . Condensation of dew must be avoided as electrical current leaks will occur, causing a degradation of performance specification.

Note 4-4: The operating temperature only guarantees operation of the LCM and doesn't guarantee all the contents of Electro-optical specification.

Note 4-5: Do not reverse the connection of LED

3.1.1. Typical Operation Conditions

(GND =0V)

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Power voltage	V_{DD}	3.0	3.3	3.6	V	Note 5
Input logic high voltage	V_{IH}	0.7 V_{DD}	-	V_{DD}	V	Note 6
Input logic low voltage	V_{IL}	GND	-	0.3 V_{DD}	V	
Internal Pull low / high resistor	RI	200	350	850	kΩ	Note 6

Note 5: V_{DD} setting should match the signals output voltage of customer's system board .
Note 6: RESET, STBYB, SELB(DINT), L/R, U/D

3.1.2. Current Consumption

(GND=0V)

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Current for Driver	I_{DD}		300	425	mA	V_{DD} = 3.3V @ full-white image

3.1.3. Backlight Driving Conditions

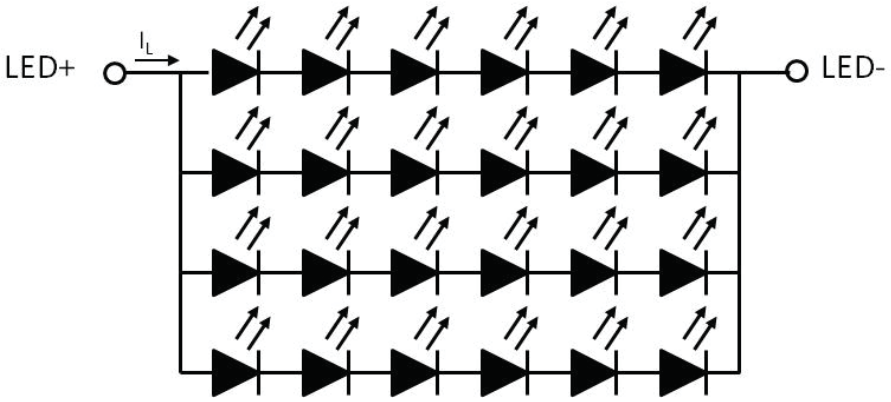
Backlight Driving Conditions

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Voltage for LED backlight	V_L	16.8	18.6	19.8	V	Note 7
Current for LED backlight	I_L		260		mA	Note 9
LED life time	-	20000			Hr	Note 8

Note 7: The LED Supply Voltage is defined by the number of LED at Ta= 25d˚ and I_f = 150mA

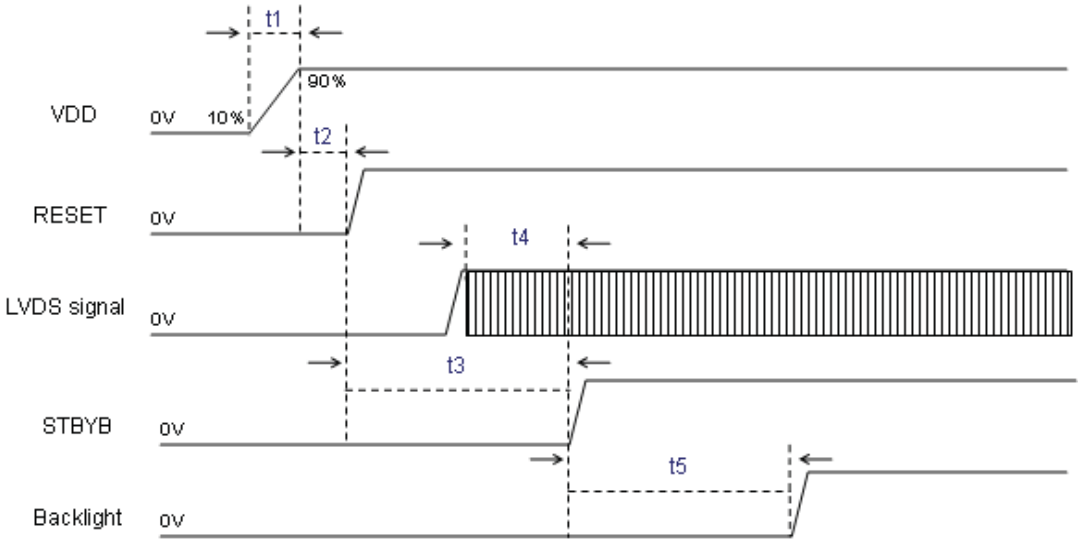
Note 8: The "LED life time" is defined as the module brightness decrease to 50% original brightness at Ta=25d˚ and I_L =260mA. The LED lifetime could be decreased if operating I_L is larger than 260mA.

Note9: Backlight Unit Schematic:

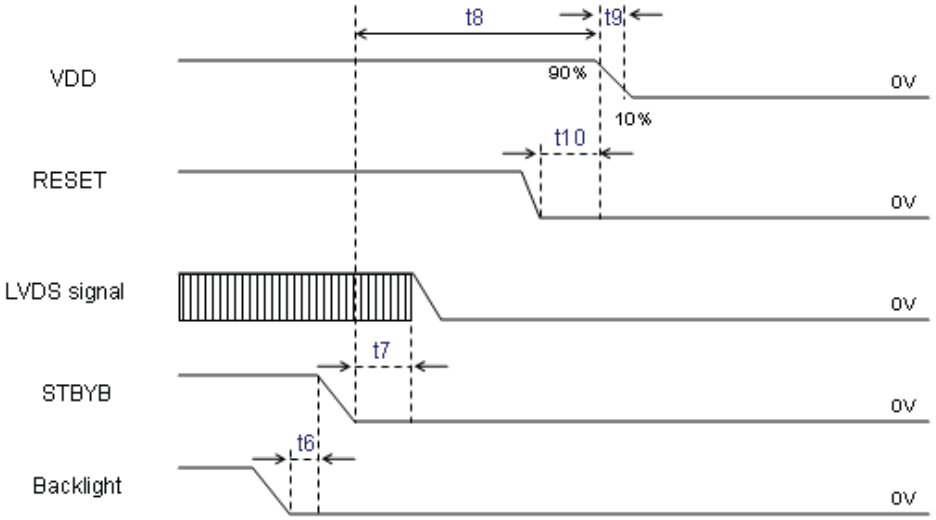


3.2. Power Sequence

a. Power on:



b. Power off:



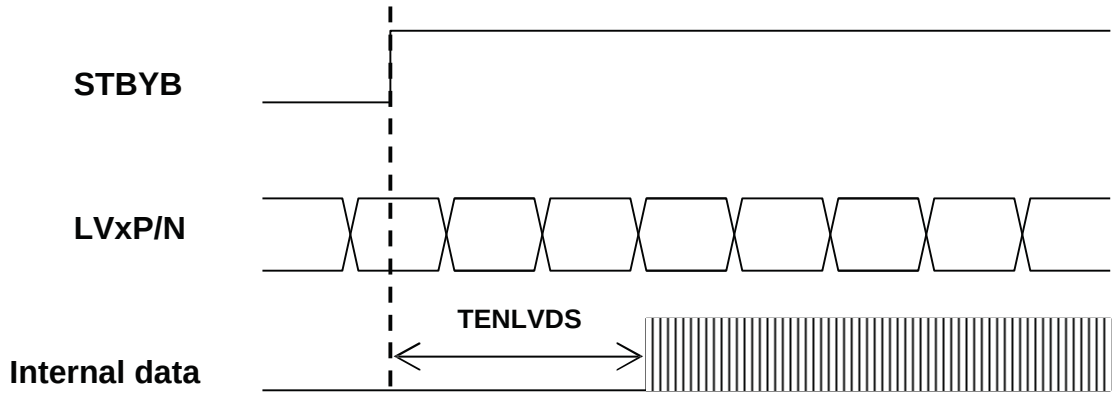
Symbol	SPEC.			Unit
	Min.	Typ.	Max.	
t1	0.5	5	--	ms
t2	30	40	--	us
t3	10	15	--	ms
t4	1	5	t3	ms
t5	100	117	--	ms
t6	0	25	--	ms
t7	118	119	t8	ms
t8	120	128	--	ms
t9	0.5	5	--	ms
t10	0	5	t8	ms

3.3. Timing Characteristics

3.3.1. AC Electrical Characteristics

Parameter	Symbol	Spec.			Unit	Remark
		Min.	Typ.	Max.		
Clock frequency	FLVCYC	10	-	85	MHz	Frame rate=60Hz
Clock Period	TLVCYC	11.76	-	100	Nsec	Frame rate=60Hz
1 data bit time	UI	-	1/7	-	TLVCY	
Clock high time	LVHW	2.9	4	4.1	UI	Note 10
Clock low time	LVLW	2.9	3	4.1	UI	
Position 1	TPOS1	-0.2	0	0.2	UI	
Position 0	TPOS0	0.8	1	1.2	UI	
Position 6	TPOS6	1.8	2	2.2	UI	
Position 5	TPOS5	2.8	3	3.2	UI	
Position 4	TPOS4	3.8	4	4.2	UI	
Position 3	TPOS3	4.8	5	5.2	UI	
Position 2	TPOS2	5.8	6	6.2	UI	
Input eye width	TEYEW	0.6	-	-	UI	
Input eye border	TEX	-	-	0.2	UI	
LVDS wake up time	TENLVD	-	-	150	ns	

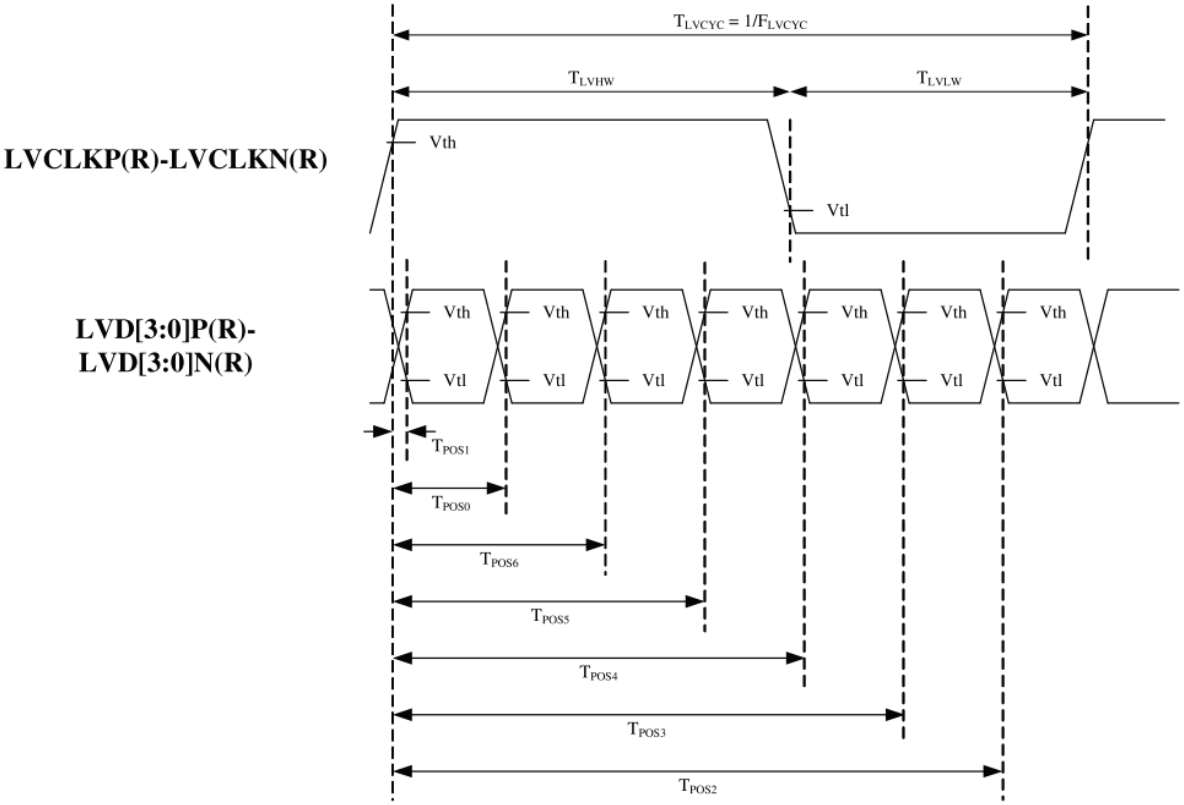
Note10：Please refer to “3.3.2 Input Clock and Data Timing Diagram”



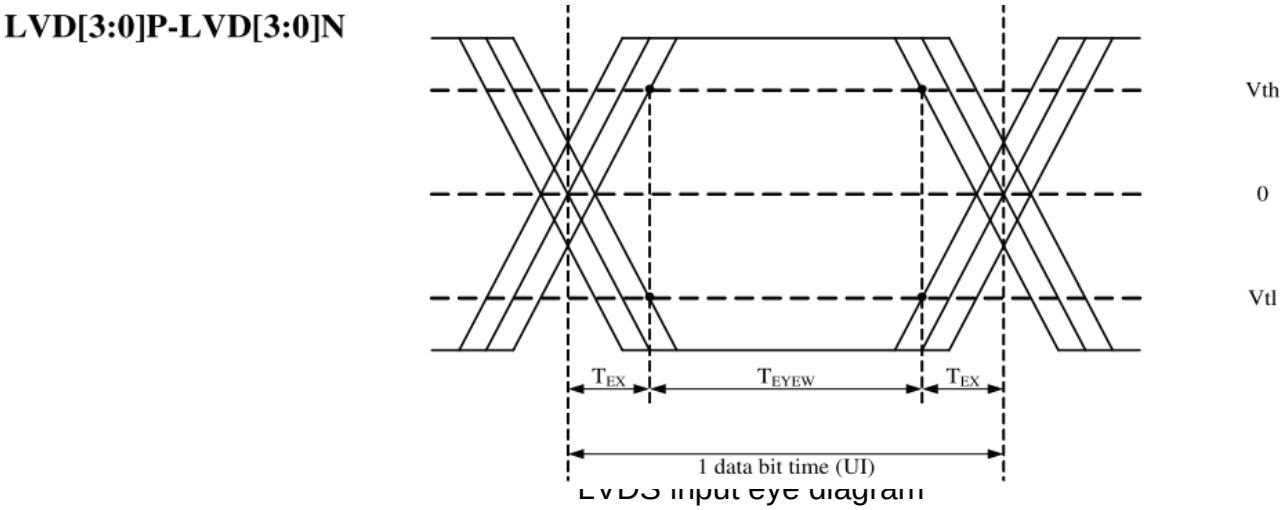
LVDS wake up time

3.3.2. Input Clock and Data Timing Diagram

LVDS input timing



Differential:

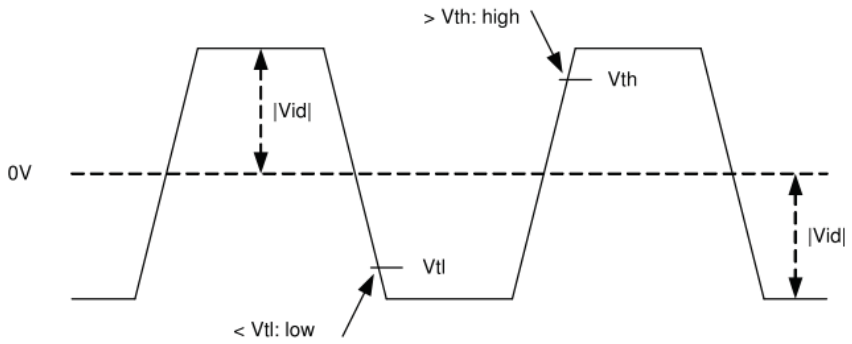


LVDS input eye diagram

3.3.3. DC Electrical Characteristics

Parameter	Symbol	Spec.			Unit	Remark
		Min.	Typ.	Max.		
Differential input high Threshold voltage	Vth	-	-	+0.1	V	Vcm=1.2V
Differential input low Threshold voltage	Vtl	-0.1	-	-	V	
Differential input common Mode voltage	Vcm	1	1.2	$1.8-\|V_{id}\|/2$	V	-
LVDS input voltage	V_{INLV}	0.7		1.8	V	
Differential input	|Vid|	0.2	-	0.6	V	-
Differential input leakage Current	Vleak	-10	-	+10	μA	-
Termination Resistor	Zid	95	100	105	Ω	-

Differential:
LVCLKP(R)-LVCLKN(R),
LVD[3:0]P(R)-
LVD[3:0]N(R)



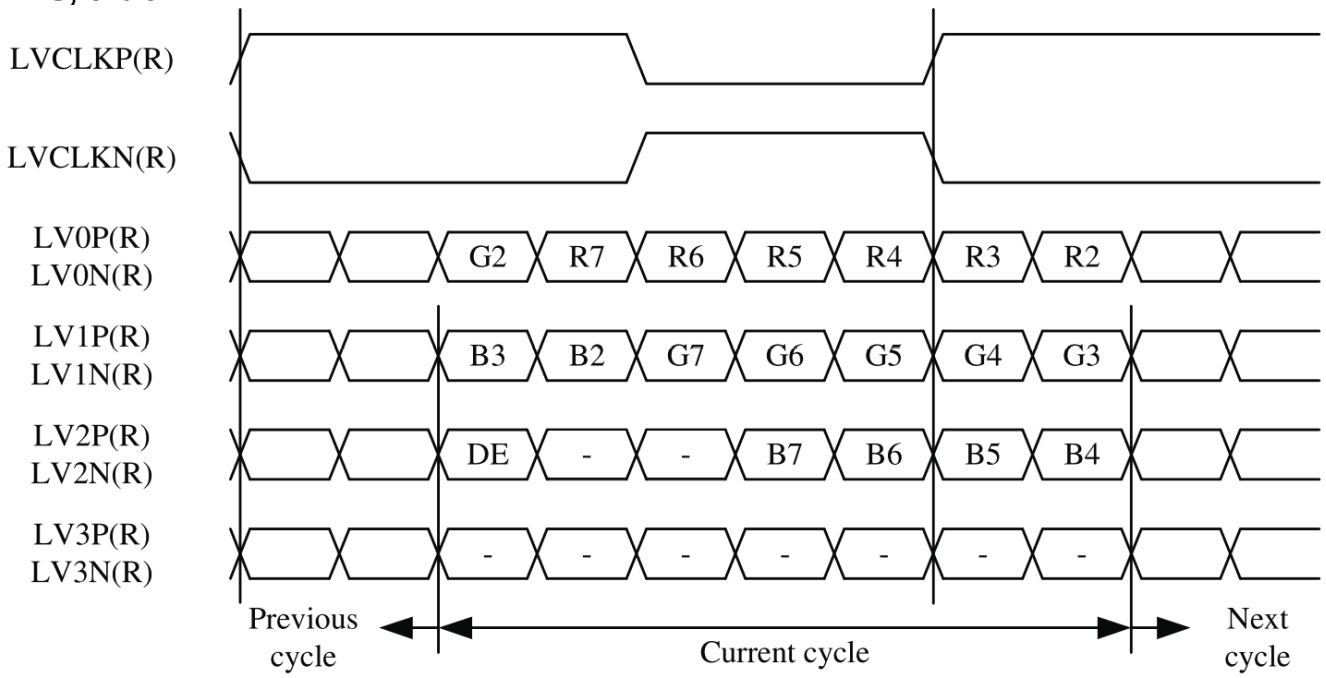
3.3.4. Timing

Parameter	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
DCLK Frequency	F DCLK	58.5	63.7	76.3	MHz	Frame rate=60Hz
Horizontal valid data	t hd		1280		DCLK	
H-blanking	t hb	56	60	192	DCLK	
1 Horizontal Line	t h	1336	1340	1472	DCLK	
Vertical valid data	t vd		720		H	
V-blanking	t vb	10	72	144	H	
1 Vertical field	t v	730	792	864	H	

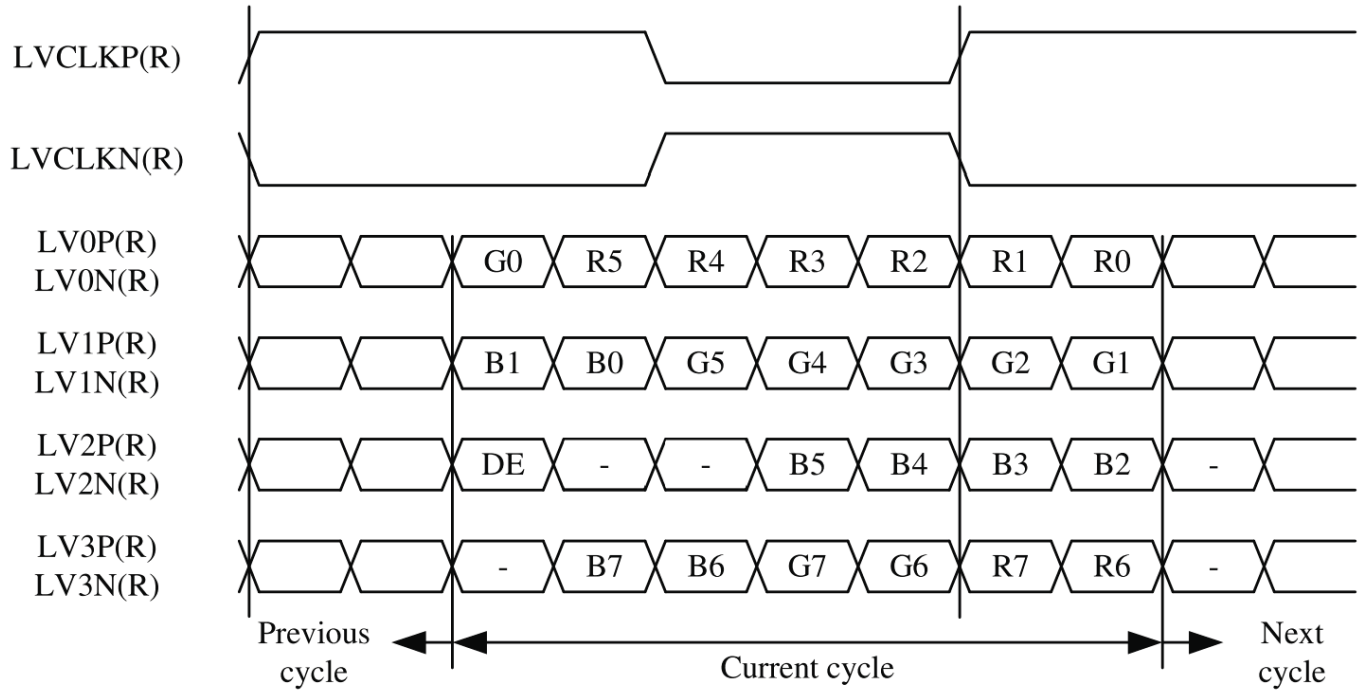
Note: DE mode only.

3.3.5. Data Input Format

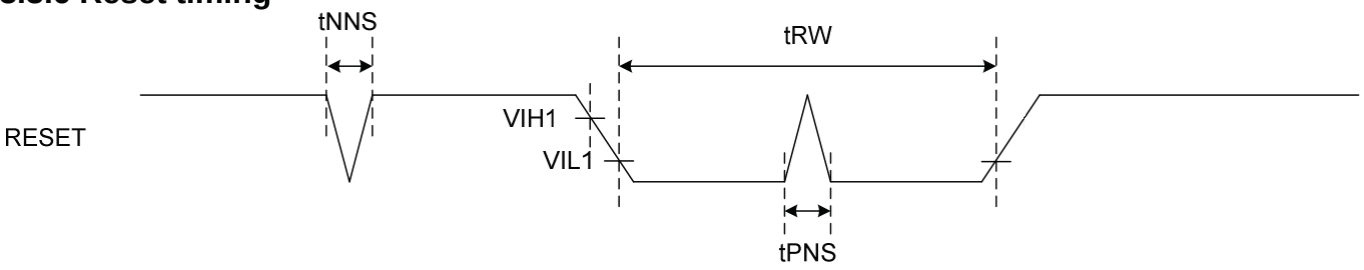
LVDS, 6-bit



LVDS, 8-bit, VESA format



3.3.6 Reset timing



(VDD=3.3V梯3.6V)

Signal	Parameter	Symbol	Spec.			Unit	Remark
			Min.	Typ.	Max.		
RESET	Reset pulse width	tRW	10	-	-	μs	-
	Positive spike noise width	tPNS	-	-	100	ns	-
	Negative spike noise width	tNNS	-	-	100	ns	-

4. Optical Specifications

Item	Symbol	Condition	Values			Unit	Remark
			Min.	Typ.	Max.		
Viewing angle (CR≥ 10)	θ_L	Φ=180° (9 o'clock)	-	85	-	degree	Note 10
	θ_R	Φ=0° (3 o'clock)	-	85	-		
	θ_T	Φ=90° (12 o'clock)	-	85	-		
	θ_B	Φ=270° (6 o'clock)	-	85	-		
Response time	T_{ON}	Normal θ=Φ=0°	-	15	20	msec	Note 13
	T_{OFF}		-	10	15	msec	
Contrast ratio	CR		600	1000	-	-	Note 11 Note 14
Color chromaticity (CIE 1931)	W_X		0.26	0.31	0.36	-	Note 11 Note 15
	W_Y		0.28	0.33	0.38	-	
NTSC (CIE 1931)			-	70	-	%	Note 11
Gamma	γ		-	2.2	-	-	Note 12
Luminance	L		600	750	-	cd/m²	Note 16
Luminance uniformity	Y_U		75	80	-	%	Note 17

Test Conditions:

1. V_{CC}=3.3V, I_L= 260mA (Backlight current), the ambient temperature is 25ɗ.

The test systems refer to Note 11 & Note12

Note 10: Definition of viewing angle range.
The view angel for Θ=85° is measured by BM-5A.

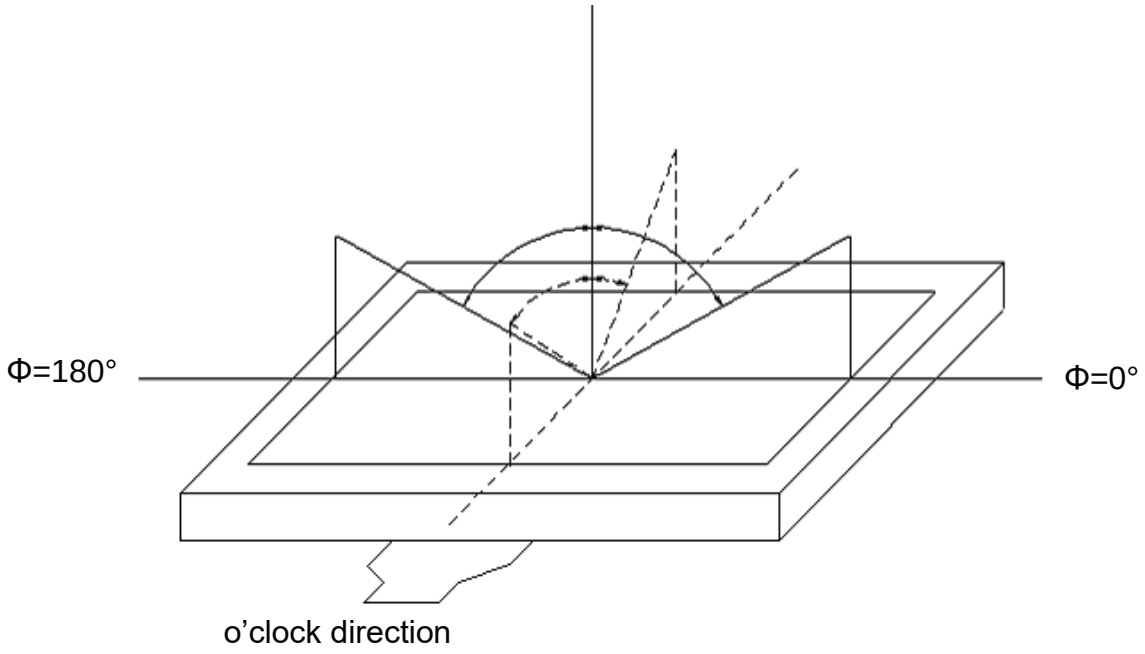


Fig. 4-1 Definition of viewing angle

Note 11: Definition of optical measurement system.
The backlight has been light on for 30 minutes then measured the optical properties at the center point of the LCD screen in dark room. The color chromaticity、contrast ratio are measured by DMS 803.

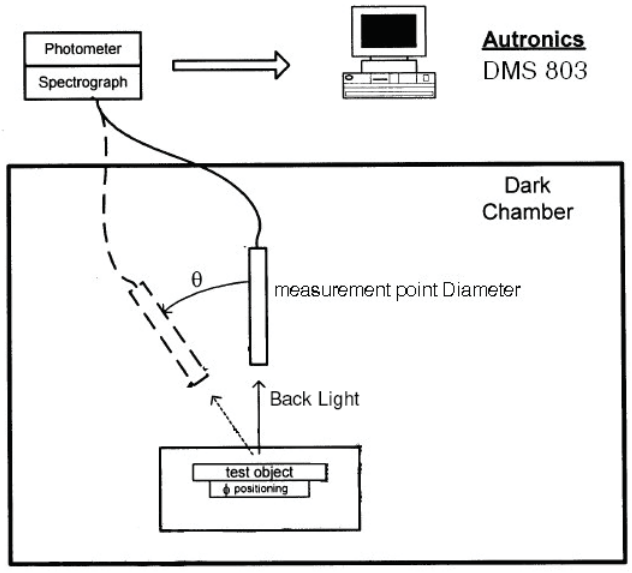


Fig. 4-2 Optical measurement system setup

Note 12: Definition of gamma curve measurement system.

The backlight has been light on for 30 minutes then measured the optical properties at the center point of the LCD screen in dark room. The gamma is measured by SR3. (Field of view: 1° /Height: 500mm.)

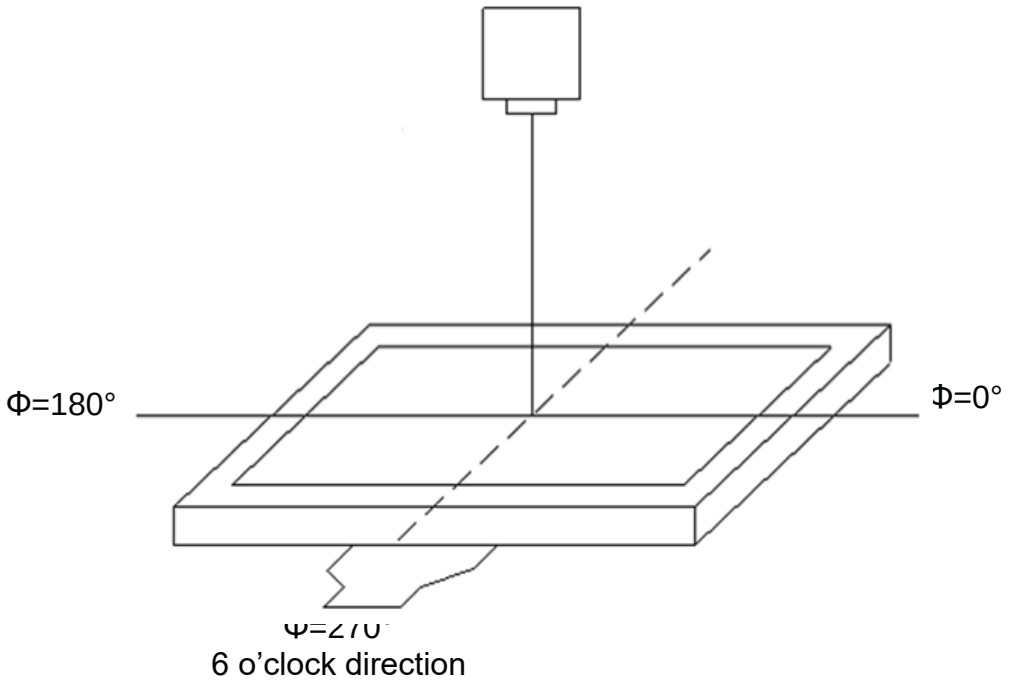


Fig. 4-3 Gamma curve measurement system setup

Note 13: Definition of response time

The response time is measured by photo detector of oscilloscope.

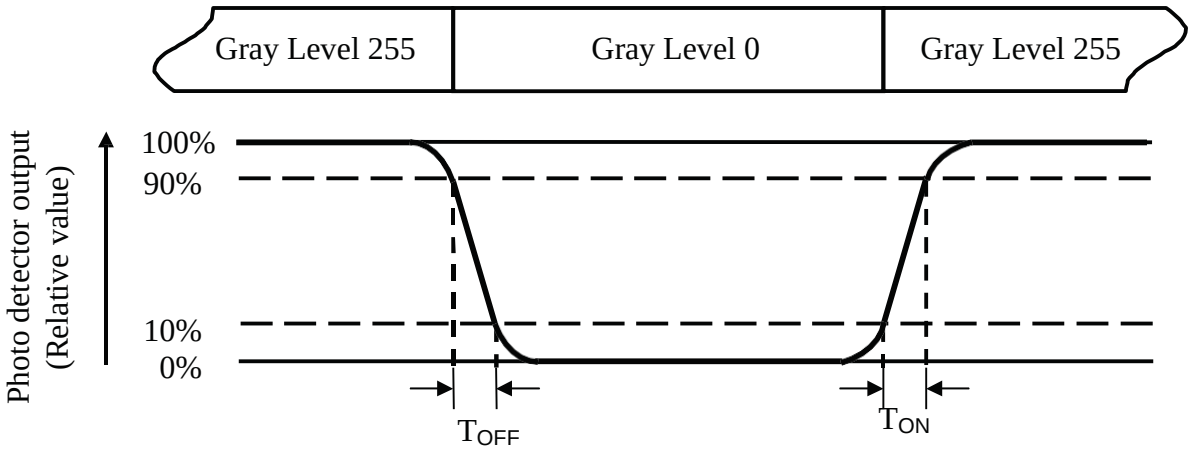


Fig. 4-4 Definition of response time

Note 14: Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note 15: Definition of color chromaticity (CIE1931)
Color coordinates measured at center point of LCD.

Note 16: All input terminals LCD panel must be ground while measuring the center area of the panel. The LED driving condition is IL=(260mA).

Note 17: Definition of luminance uniformity
Active area is divided into 9 measuring areas (Refer to Fig. 4-4).

$$Luminance\ \ Uniformity\ \ (Yu) = \frac{B_{min}}{B_{max}}$$

L----- Active area length W----- Active area width

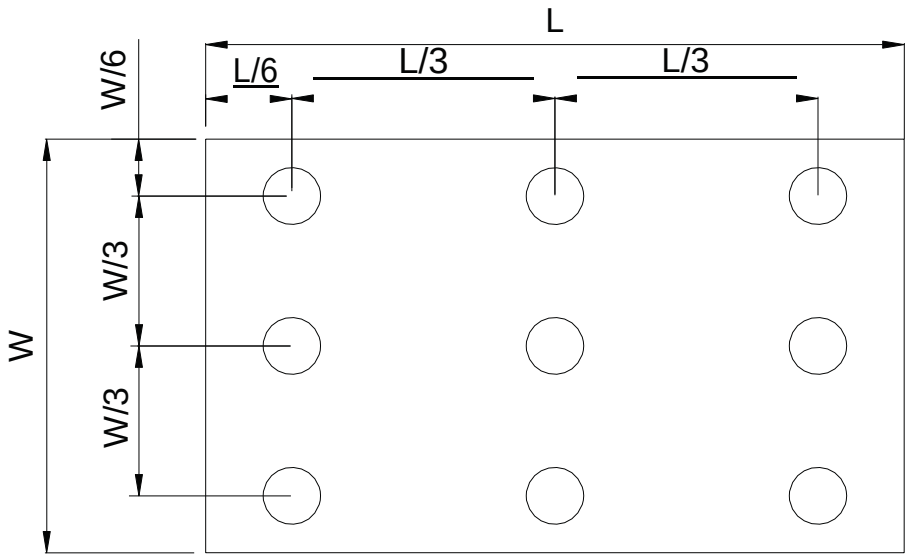


Fig. 4-5 Definition of measuring points

B_{max}: The measured maximum luminance of all measurement position.
B_{min} : The measured minimum luminance of all measurement position.

5. Reliability Test Items

Item	Test Conditions	Remark
High Temperature Storage Test	Ta=90ºC, 500 hours	Note 18 Note 19 Note 21
Low Temperature Storage Test	Ta=-40ºC, 500 hours	
High Temperature Operation Test	Tp=85ºC, 500 hours	
Low Temperature Operation Test	Tp=-30ºC, 500 hours	
High Temperature & High Humidity Operation Test	60ºC, RH 90%, 500 hours	
Thermal Shock	[(-30ºC 30min)→(85ºC 30min)]/cycle，(Ramp rate≦ 20ºC /min) , 100cycles	
ESD Test (Non-Operation)	Condition 1 : C = 150pF, R = 330Ω Contact Discharge, ± 8KV Condition 2 : C = 150pF, R = 330Ω, Air Discharge, ± 15KV	Note 18
Mechanical Shock	100G, 6ms, half sine wave, 3 times for each direction of ±X, ±Y, ±Z	Note 18 Note 20
Mechanical Vibration	Frequency: 10 ~55~10Hz;Sweep Mode: Log Sweep Sweep time: 1Oct/min; Acceleration: 1.5G;Test time:2 hr for each direction of X, Y, Z.	Note 18 Note 20
Packaging Vibration Test	1.47Grms X, Y, Z three axes (30min /axis) [Frequency：5Hz(0.015G2/Hz)， 100Hz(0.015G2/Hz)，200Hz(0.0037G2/Hz)]	
Packaging Drop Test	1corner, 3edges, 6faces (1 time/direction) <follow ISTA(1A) Height > 0kg≦ W <10kg：76cm, 10kg≦ W <19kg：61cm, 19kg≦ W <28kg：46cm, 28kg≦ W <45kg：31cm, 45kg≦ W ≦ 68kg：20cm	

Ta = Ambient Temperature, Tp = Panel Surface Temperature.

Note 18: Criteria: Normal display image with no Function NG, or line defects.

Note 19: Evaluation should be tested after storage at room temperature for more than two hour

Note 20: 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.

Note 21: A certain level of Mura (non-uniformity) of dark / black image will happen several days after high temperature testing (H.T.T.). There is a slowly part recovery over a long time (several months). Such a long exposure time like in H.T.T. will normally not happen in a real application. Therefore the test H.T.T. was introduced to simulate cycles with normal conditions in-between but with the same total exposure time what show a significant reduced Mura.

The root cause is related to tension generated due to different amount of shrinking in the stack of layers in the polarizer sheet. The effect is more significant on larger displays like this size. An investigation into alternative polarizer material showed that there is no better alternative currently available.

Note 22: Criteria Class B: Some performance degradation allowed. No data loss. Self - recoverable No hardware failures

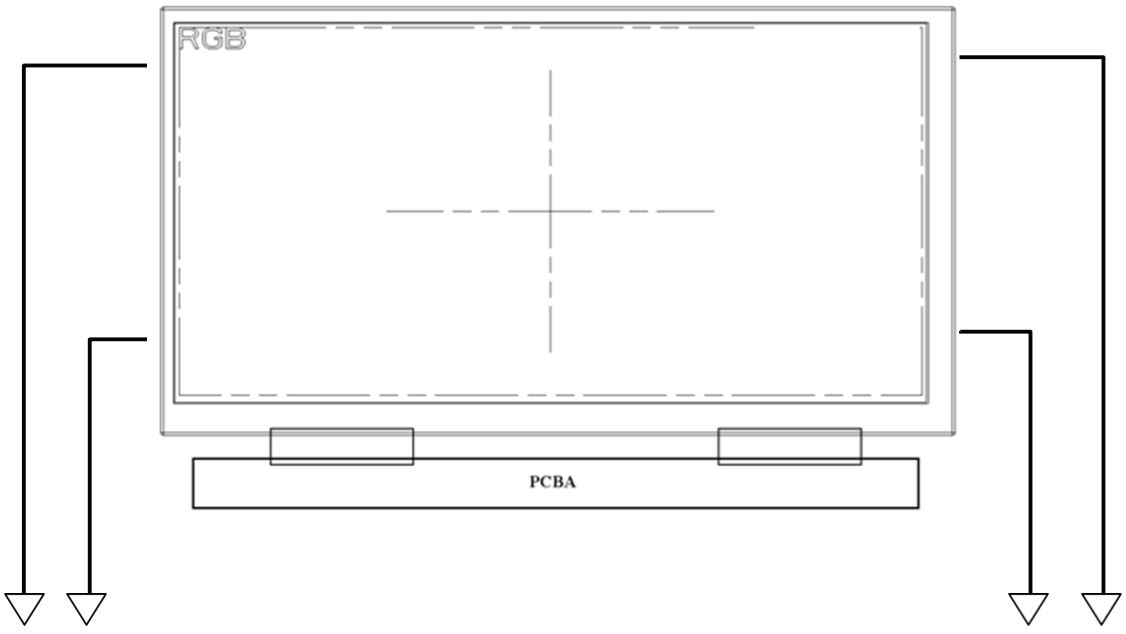


Fig. 5-1 Definition of grounding method

6. General Precautions

6.1. Safety

Liquid crystal is poisonous. Do not put it in your mouth. If liquid crystal touches your skin or cloths, wash it off immediately by using soap and water.

6.2. Handling

1. The LCD panel is plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.

2. The polarizer attached to the display is easily damaged. Please handle it carefully to avoid scratch or other damages.

3. To avoid contamination on the display surface, do not touch the module surface with bare hands.

4. Keep a space so that the LCD panels do not touch other components.

5. Put cover board such as acrylic board on the surface of LCD panel to protect panel from damages.

6. Transparent electrodes may be disconnected if you use the LCD panel under environmental conditions where the condensation of dew occurs.

7. Do not leave module in direct sunlight to avoid malfunction of the ICs.

6.3. Static Electricity

1. Be sure to ground module before turning on power or operating module.

2. Do not apply voltage which exceeds the absolute maximum rating value.

6.4. Storage

1. Store the module in a dark room where must keep at 25±10℃ and 65%RH or less.

2. Do not store the module in surroundings containing organic solvent or corrosive gas.

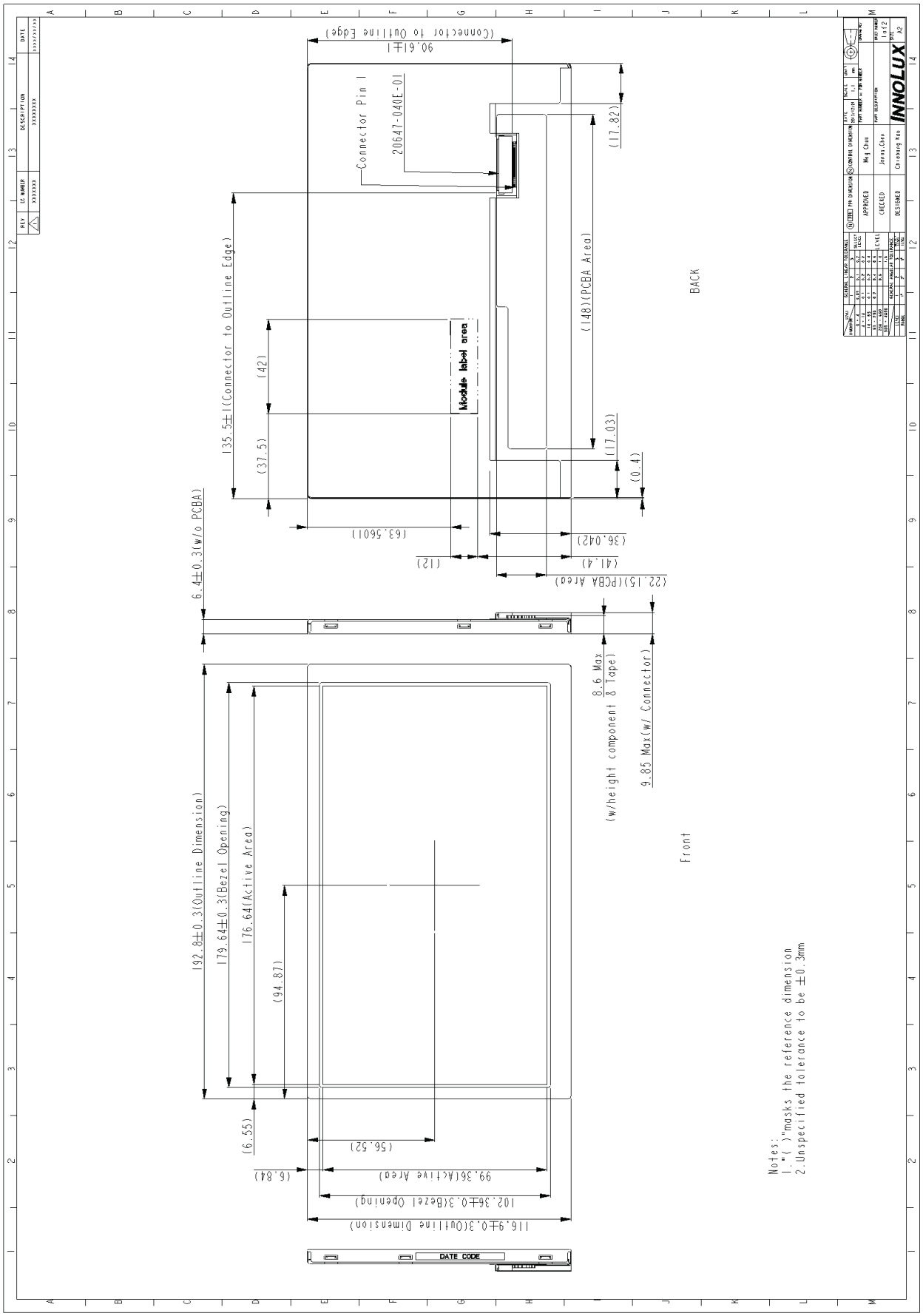
3. Store the module in an anti-electrostatic container or bag.

6.5. Cleaning

1. **Do not wipe the polarizer with dry cloth. It might cause scratch.**

2. **Only use a soft sloth with IPA to wipe the polarizer, other chemicals might permanent damage to the polarizer.**

7. Mechanical Drawing



8. Package Drawing

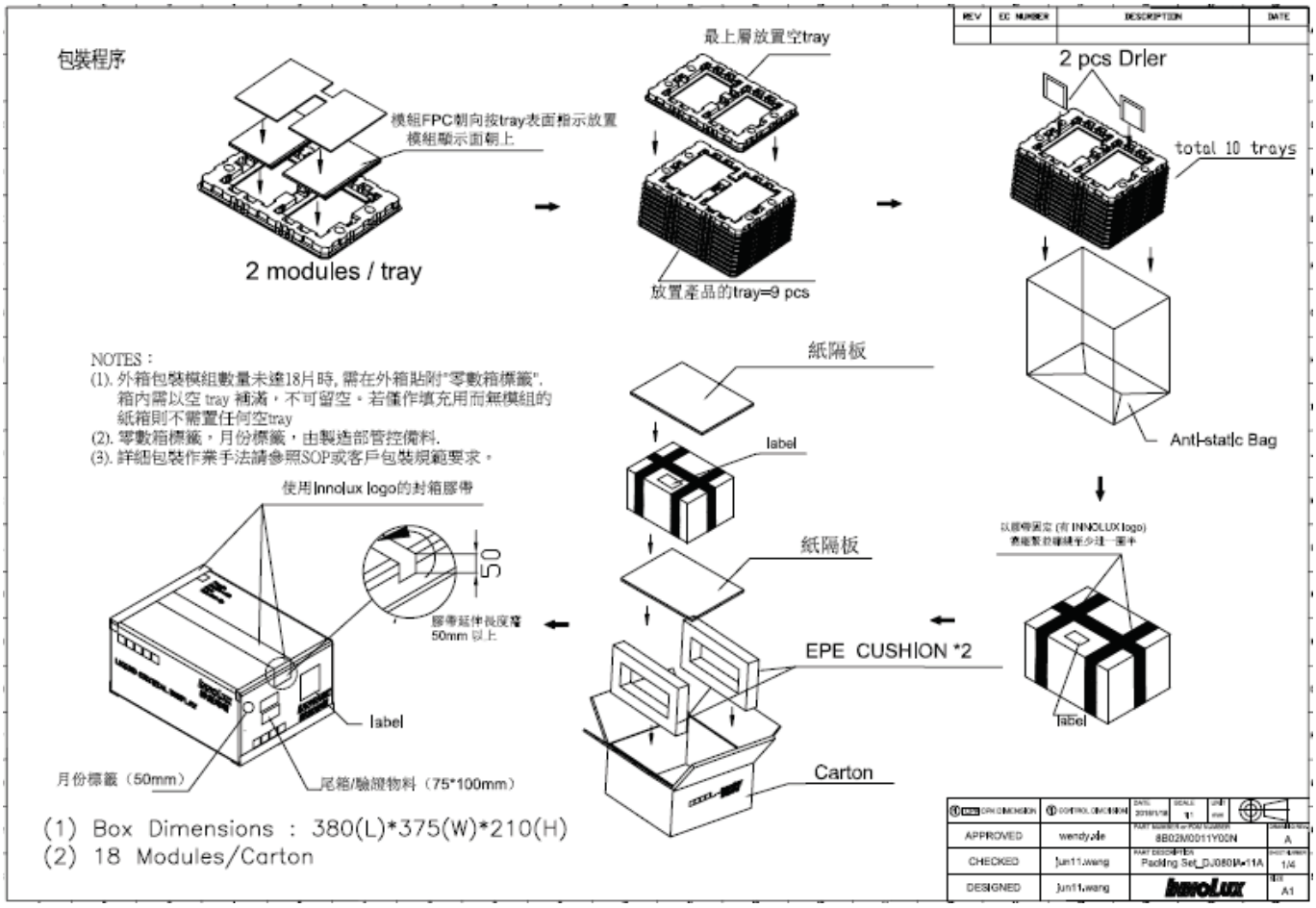
8.1 Packaging Material Table

No.	Item	Model (Material)	Dimensions (mm)	Unit Weight (kg)	Quantity	Remark
1	LCM Module	Model name	192.8×116.9×6.4	0.205	18	
2	Bag	LDPE	375*630	0.02	1	
3	Tray	PET	360*270	0.1586	10	
4	Cushion	EPE	363*181	0.037	2	
5	Carton	Corrugated paper	375*380*210	0.68	1	
6	Total weight	6.054KG				

8.2 Packaging Quantity

Total LCM quantity in Carton=18 pcs

8.3. Packaging Drawing



8.4. Shipping Drawing