CUSTOMER APPROVAL SHEET

Company Name	
MODEL	**A080SN02 V0**
CUSTOMER APPROVED	Title : Name :

☐ APPROVAL FOR SPECIFICATIONS ONLY (Spec. Ver.___)
☐ APPROVAL FOR SPECIFICATIONS AND ES SAMPLE (Spec. Ver.___)
☐ APPROVAL FOR SPECIFICATIONS AND CS SAMPLE (Spec. Ver.___)
☐ CUSTOMER REMARK :

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Product Specification

8.0″ COLOR TFT-LCD MODULE

Model Name：	**A080SN02 V0**
Planned Lifetime:	From 2009/Apr. To 2010/Sept.
Phase-out Control:	From 2010/Oct. To 2010/Dec.
EOL Schedule:	2010/Dec.

< > Preliminary Specification

< ◆ > Final Specification

Note: The content of this specification is subject to change without prior notice.

Record of Revision

Version	Revise Date	Page	Content
0.0	2009/3/13		First draft
0.1	2009/3/31	9	Update lightbar driving condition
		13	Modify brightness, and I_L current
0.2	2009/07/13	8	Current consumption updated.
		13~16	Update 3D optical measuring definition and spec.
		20	Update Module drawing
0.3	2009/08/11	13	Update Contrast Ratio
		22	Update Module drawing
0.4	2009/08/13	13	Update Chromaticity

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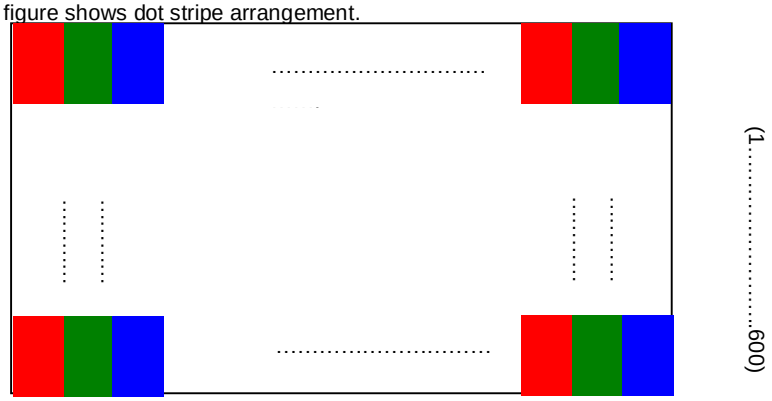
A. Physical specifications

NO.	Item	Specification	Remark
1	Screen size（inch）	8 (Diagonal)	
1	Display resolution（dot）	800RBG (W) x 600(H)	
2	Overall dimension（mm）	179.3(W)×139.2(H) × 7 / 10 (D)	Note. 1
3	Active area（mm）	162 (W) x 121.5 (H)	
4	Dot pitch（um）	202.5 (W) x 202.5(H)	
5	Color configuration	R, G, B Stripe	Note. 2
6	Weight（g）	(415.1)	
7	Panel surface treatment	LR	

Note 1: Refer to F. Outline Dimension. Include FPC.

Note 2: Below figure shows dot stripe arrangement.



(1 2 3.....798 799 800)

B. Electrical specifications

1. Pin assignment

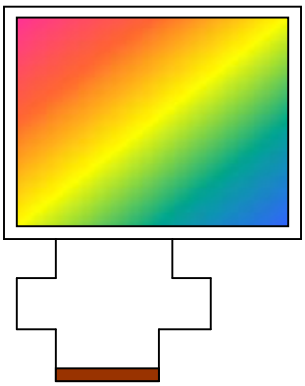
Recommended connector : FH19SC-45S-0.5SH(05)

Pin no	Symbol	Type	Description	Remark
1	VDD	PI	DC-DC circuit supply voltage	
2	VDD	PI	DC-DC circuit supply voltage	
3	DUMMY	NC	No connection. Please leave it open	
4	GND	G	Ground for digital circuit	
5	GND	G	Ground for digital circuit	
6	DR0	I	Red Data input; LSB	
7	DR1	I	Red Data input	
8	DR2	I	Red Data input	
9	DR3	I	Red Data input	
10	DR4	I	Red Data input	
11	DR5	I	Red Data input	
12	DR6	I	Red Data input	
13	DR7	I	Red Data input; MSB	
14	GND	G	Ground for digital circuit	
15	DG0	I	Green Data input; LSB	
16	DG1	I	Green Data input	
17	DG2	I	Green Data input	
18	DG3	I	Green Data input	
19	DG4	I	Green Data input	
20	DG5	I	Green Data input	
21	DG6	I	Green Data input	
22	DG7	I	Green Data input; MSB	
23	GND	G	Ground for digital circuit	
24	DB0	I	Blue Data input; LSB	
25	DB1	I	Blue Data input	
26	DB2	I	Blue Data input	
27	DB3	I	Blue Data input	
28	DB4	I	Blue Data input	
29	DB5	I	Blue Data input	
30	DB6	I	Blue Data input	
31	DB7	I	Blue Data input; MSB	
32	GND	G	Ground for digital circuit	

33	DCLK	I	Data clock Input	
34	GND	G	Ground for digital circuit	
35	DISP	I	Display on/off control pin. Normally pull high. DISP = “1”, Display on. DISP = “0”, Display off.	
36	GND	G	Ground for digital circuit	
37	VSYNC	I	Vertical synchronizing signal	
38	GND	G	Ground for digital circuit	
39	HSYNC	I	Horizontal synchronizing signal	
40	GND	G	Ground for digital circuit	
41	DE	I	Data enable input. Active level is high.	
42	GND	G	Ground for digital circuit	
43	3D_SWITCH	I	Switch selection for 3D display 3D_SWITCH = “1”, 3D operation mode. 3D_SWITCH = “0”, 2D operation mode.	
44	3D_CLK	I	60 Hz signal for 3D display	
45	GND	G	Ground for digital circuit	

I：Digital signal input, G：GND, PI：Power input, NC：DUMMY

Note: Definition of scanning direction, Refer to figure as below：



Pin1 Pin45

2. Absolute maximum ratings

Items	Symbol	Condition	Min.	Max.	Unit	Remark
Power supply	VDD	GND=0	-0.3	5.0	V	Note 1,2

Note 1: Functional operation should be restricted under ambient temperature (25℃).

Note 2: Maximum ratings are those values beyond which damages to the device may occur. Functional operation should be restricted to the limits in the Electrical Characteristics chapter.

3. Electrical DC characteristics

3.1 Recommended operating conditions (GND=0V)

Item		Symbol	Min.	Typ.	Max.	Unit	Remark
Power supply		VDD	3.0	3.3	3.6	V	
Input Signal	H Level	V_{IH}	0.7* VDD	-	VDD	V	
	L Level	V_{IL}	GND	-	0.3* VDD	V	

3.2. Current Consumption (GND=0V)

Parameter	Symbol	Condition	Mode	Min	Typ.	Max.	Unit	Remark
Input Current for VDD	I_{VDD}	VDD=3.3V	2D	-	165	190	mA	Note 1, 2
			3D	-	190	220		
	I_{VDD} (STANDBY)	VDD=3.3V	-	-	4	8	mA	Note 3

Note 1:Test Condition is under typical Electrical DC and AC characteristics.

Note 2: Test pattern is the following picture.

Note 3: In standby mode, all digital signals are stopped. Ex. DCLK,DE,3D_CLK...etc.

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3.3 Backlight driving conditions(Note 1)

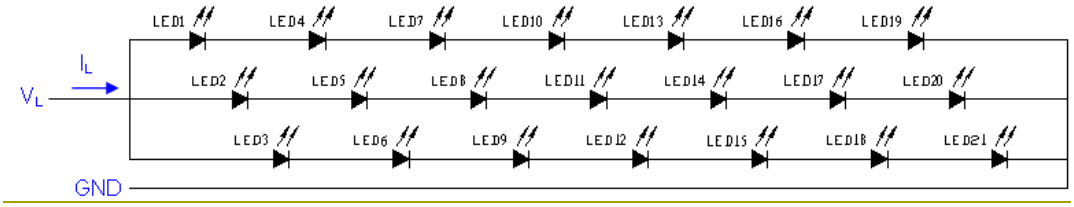
3.3.a 3D MODE

Parameter	Symbol	Min.	Typ.	Max.(Note1)	Unit	Remark
LIGHT-BAR current	I_L	-	300	315	mA	
LIGHT-BAR voltage	V_L		(23.45)	26.81	V	I_L=300 (Note 2)
Power consumption	W		(7.39)	8.44	W	I_L=300 (Note 3)
LED lightbar life time		10000	-	-	Hr	Note4, 5

3.3.b 2D MODE

Parameter	Symbol	Min.	Typ.	Max.(Note1)	Unit	Remark
LIGHT-BAR current	I_L	-	120	315	mA	
LIGHT-BAR voltage	V_L		(21.56)	24.64	V	I_L=120 (Note 2)
Power consumption	W		(2.72)	3.10	W	I_L=120 (Note 3)

Note 1: LED backlight is 21 LEDs (3 parallel, 7pcs series for each parallel).



Note 2: The voltage capacity of LED driver IC must be over max. of LED Voltage.

Note 3: The Power consumption with power leakage 5%.

Note. 4: Definition of “LED lightbar” : brightness is decreased to 50% of the initial value. LED lifetime is restricted under normal condition, ambient temperature = 25℃ and LED lightbar current = 100*3mA

Note. 5: If it operates with LED light bar current more than 105*3mA, it maybe decreases LED life time.

格式化: 字型色彩: 自動
格式化: 內文, 靠左
格式化: 字型色彩: 自動
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格式化: 字型色彩: 自動
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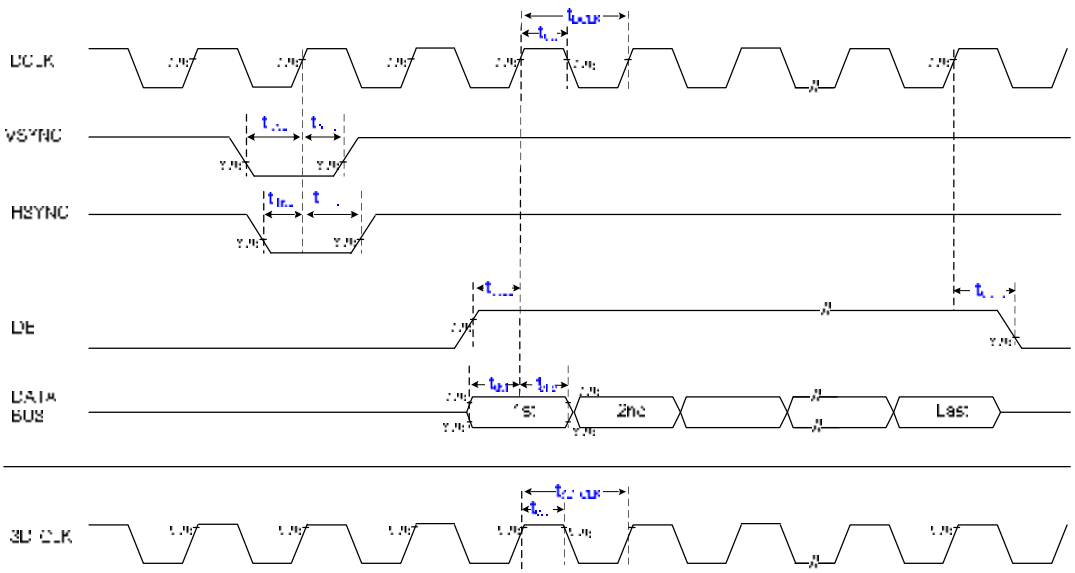
4. Input timing AC characteristic

(VDD=3.0 ~3.6V, TA=25℃)

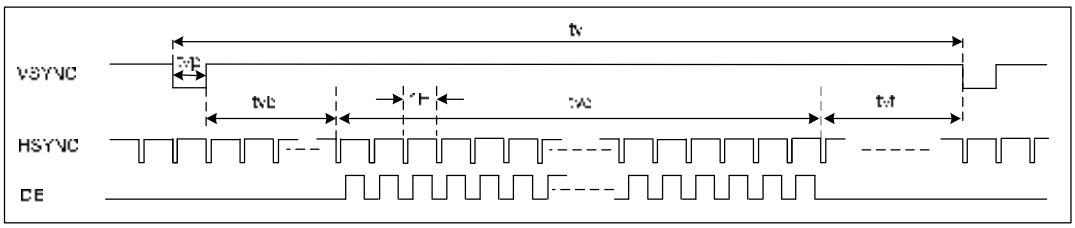
Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
DCLK duty cycle	--	40	50	60	%	t_{cw} / t_{DCLK} x100%
3D_CLK duty cycle	--	49	50	51	%	t_{cwh} / t_{3D_CLK} x100%
DE setup time	t_{desu}	10	--	--	ns	
DE hold time	t_{dehd}	10	--	--	ns	
Data setup time	t_{dst}	10	--	--	ns	
Data hold time	t_{dhd}	10	--	--	ns	
VSYNC setup time	t_{vsu}	10	--	--	ns	
VSYNC hold time	t_{vhd}	10	--	--	ns	
HSYNC setup time	t_{hsu}	10	--	--	ns	
HSYNC hold time	t_{hhd}	10	--	--	ns	



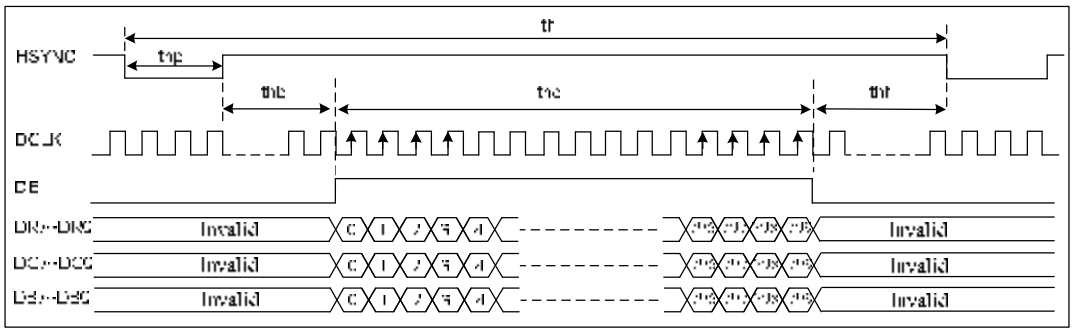
5. Input timing format

5.1 2D timing

Vertical Timing of Input

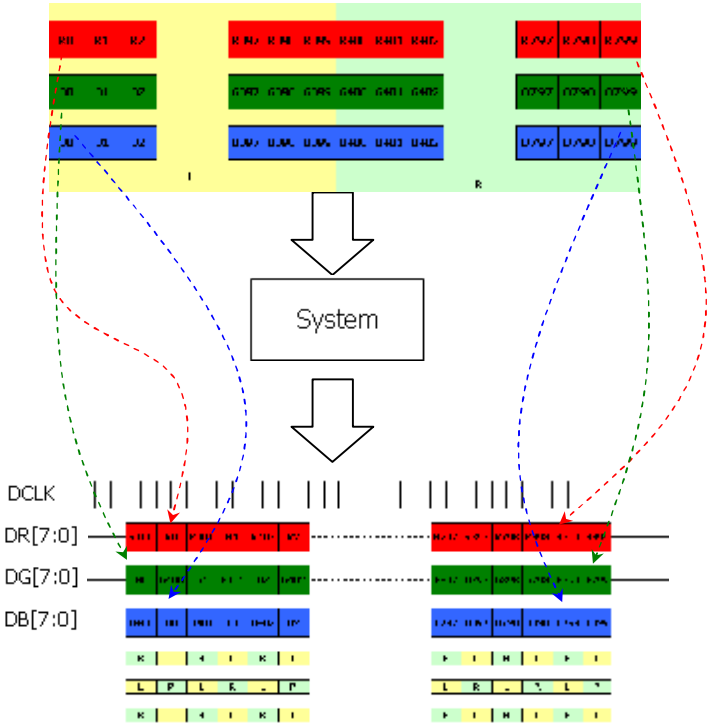


Horizontal Timing of Input



PARAMETER	Symbol	Min	Typ	Max	Unit
Clock frequency	1/tc	-	39.6	50	MHz
Hsync frequency	1/th	-	39.6	-	KHz
Vsync frequency	1/tv	-	60	-	Hz
3D_CLK frequency	1/tclk	58	60	62	Hz
Horizontal Signal					
Horizontal cycle	th	876	1000	1232	DCLK
Horizontal display period	thd	800	800	800	DCLK
Horizontal front porch	thf	40	112	290	DCLK
Horizontal pulse width	thp	1	48	65	DCLK
Horizontal back porch	thb	35	40	77	DCLK
Vertical Signal					
Vertical cycle	tv	630	660	958	H
Vertical display period	tvd	600	600	600	H
Vertical front porch	tvf	10	21	300	H
Vertical pulse width	tvp	1	3	20	H
Vertical back porch	tvb	19	36	38	H

5.2 3D data arrangement



C. Optical specification (Note 1, 2, 3)

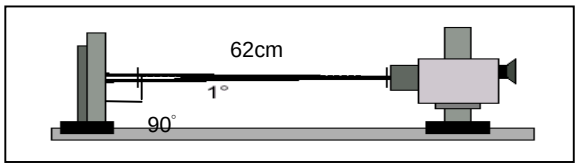
Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Response time							Note 4
Rise	Tr	θ =0°	-	15	50	ms	
Fall	Tf		-	20	60	ms	
2D Contrast ratio	CR	θ =0°	500	800	-		Note 5
3D Contrast ratio	CR	θ = optimal measuring position	600	900	-		Note 6
Viewing angle							Note7
Top	φ_T	CR≧10	70	80	-	deg.	
Bottom	φ_B		70	80	-		
Left	φ_L		70	80	-		
Right	φ_R		70	80	-		
Brightness	Y_L	θ =0°, I_L=120mA	250	300		cd/m^2	Note 8
	Y_L	θ =±3°, I_L=300mA	200	250			
2D Luminance Uniformity			60	80		%	Note 9
3D Luminance Uniformity		By CCD	60	80		%	Note 10
Color Chromaticity	Wx	θ =0°	0.26	0.31	0.36		
	Wy	θ =0°	0.28	0.33	0.38		
	Rx	θ =0°	0.55	0.60	0.65		
	Ry	θ =0°	0.28	0.33	0.38		
	Gx	θ =0°	0.26	0.31	0.36		
	Gy	θ =0°	0.54	0.59	0.64		
	Bx	θ =0°	0.1	0.15	0.2		
	By	θ =0°	0.03	0.08	0.13		

Cross Talk		θ = optimal measuring position	-	5	10	%	Note 11
		θ = optimal measuring position	-	5	10	%	Note 12
Brightness Difference		θ = optimal measuring position	-	6	9	%	Note 13
		θ = optimal measuring position	-	6	9	%	Note 14
Viewing Freedom		θ = optimal measuring position $\pm 1^{\circ}$	-	12	15	%	Note 15
		θ = optimal measuring position $\pm 1^{\circ}$	-	12	15	%	Note 16

Note 1. Ambient temperature =25℃.

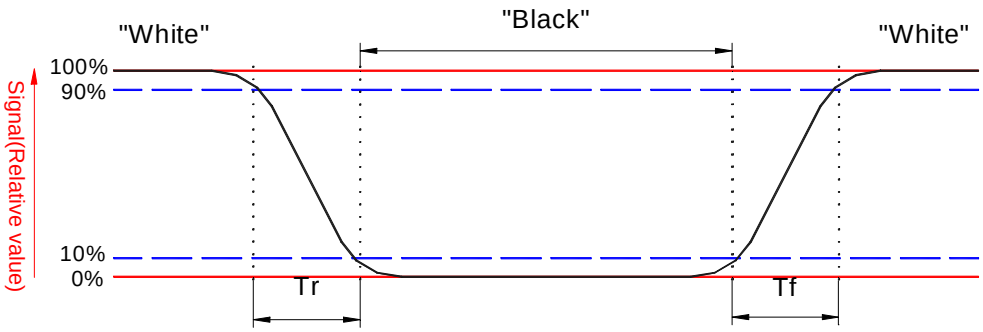
Note 2. To be measured in the dark room.

Note 3.To be measured on the center area of panel with a field angle of 1° for 2D, 0.2° for 3D by Topcon luminance meter SR3, after 10 minutes operation, except for optical performance at 3D mode



Note 4. Definition of response time:

The output signals of photo detector are measured when the input signals are changed from “black” to “white”(falling time) and from “white” to “black”(rising time), respectively. The response time is defined as the time interval between the 10% and 90% of amplitudes. Refer to figure as below.

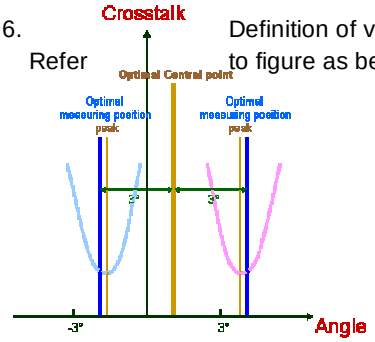


Note 5. Definition of contrast ratio:

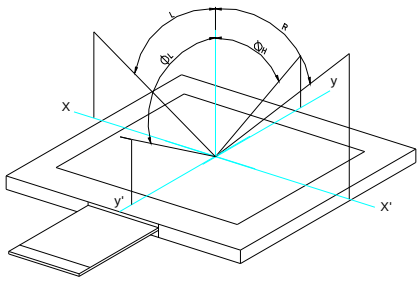
Contrast ratio is calculated with the following formula.

$$\text{Contrast ratio (CR)} = \frac{\text{Photo detector output when LCD is at “White” state}}{\text{Photo detector output when LCD is at “Black” state}}$$

Note 6. Definition of viewing angle:
Refer to figure as below.



Note 7. Definition of viewing angle:
Refer to figure as below.

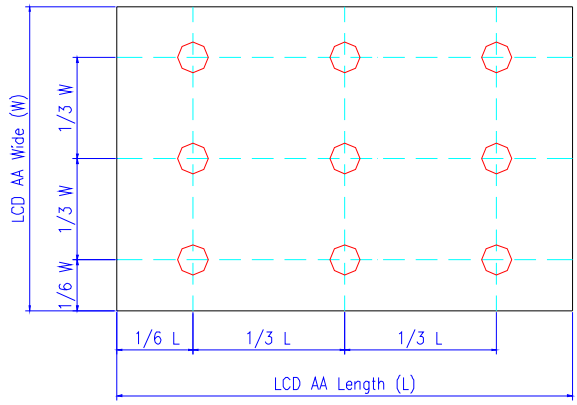


6 o'clock direction
Φ_L=90°

Note 8. Measured at the center area of the panel in gray level 255

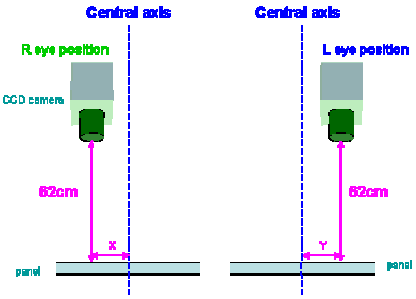
Note 9. Definition of luminance uniformity

$$\text{Luminance Uniformity} = \frac{\text{Min. Brightness of nine point}}{\text{Max. Brightness of nine point}}$$

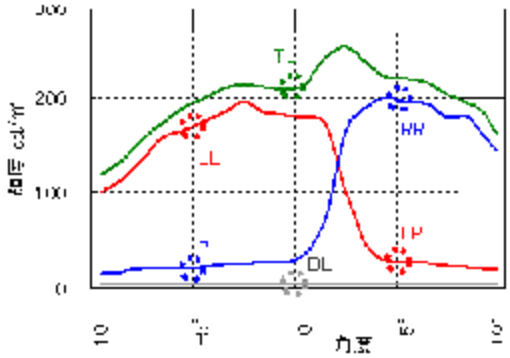


Note 10. Definition of viewing angle:

Refer to figure as below.



X = 3.25 - 62 * Tan(Shift Angle)
Y = 3.25 + 62 * Tan(Shift Angle)



Note11 Definition: RL / LL

Note12 Definition: |LL-RR| / RR

Note13 Definition: |LL-RR| / LL

Note14 Definition: LR / RR

Note15 Definition: RL / LL

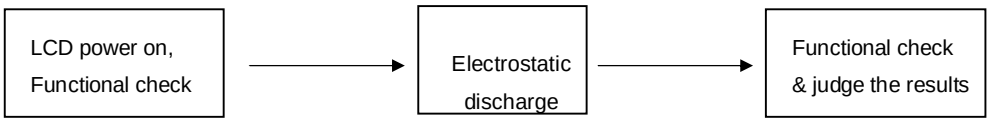
Note16 Definition: RL / LL

D. Reliability test items

No.	Test items	Conditions	Remark
1	High temperature storage	Ta= 80℃ 240Hrs	Note 1
2	Low temperature storage	Ta= -25℃ 240Hrs	
3	High temperature operation	Ta= 60℃ 240Hrs	
4	Low temperature operation	Ta= -10℃ 240Hrs	
5	High temperature and high humidity	Ta= 60℃. 90% RH 240Hrs	Operation
6	Heat shock	-25℃~80℃/50 cycle 2Hrs/cycle	Non-operation
7	Electrostatic discharge	Air-mode : +/- 8 kV Contact-mode : +/- 4 kV	Note.2, Note 3
8	Vibration	Frequency range : 10~55Hz Stoke : 1.5mm Sweep : 10~55Hz~10Hz 2 hours for each direction of X,Y,Z (6 hours for total)	Non-operation JIS C7021, A-10 condition A
9	Mechanical shock	100G . 6ms, ±X,±Y,±Z 3 times for each direction	Non-operation JIS C7021, A-7 condition C
10	Vibration (with carton)	Random vibration: $0.015G^2$/Hz from 5~200Hz –6dB/Octave from 200~500Hz	IEC 68-34
11	Drop (with carton)	Height: 60cm 1 corner, 3 edges, 6 surfaces	
12	Pressure test (For LC Bubble issue)	Test Pin : diameter = 9mm. 5 kgf tested at the center of active area for 5 sec	Note.4

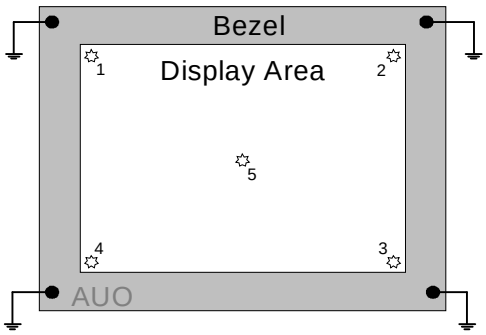
Note1: Ta: Ambient temperature.

Note 2. ESD Testing Flow as the below



Note 3. ESD testing method.

1. Ambient: 24~26℃, 56~65%RH
2. Instruments:NoisekenESS-2000,
3. Operation System: “CX40FL-B” and adapter “A080SN02 V0”
4. Test Mode: Operating mode, test pattern: colorbar+8Gray scale
5. Test Method:
   a. Contact Discharge: +/- 4 KV, 150pF(330Ω) 1sec, 5 points, 10 times/point
   b. Air Discharge: +/- 8 KV, 150pF(330Ω) 1sec, 5 points, 10 times/point
6. Test point:



7. The metal casing is connected to power supply ground (0V) at four corners.

Note4: This test is for LC Bubble issue verification, we adopt 5 kgf force at the center of active area for 5 sec while LCD is at OFF status. After this testing, there won’t be permanent LC Bubbles occurred at the testing area.

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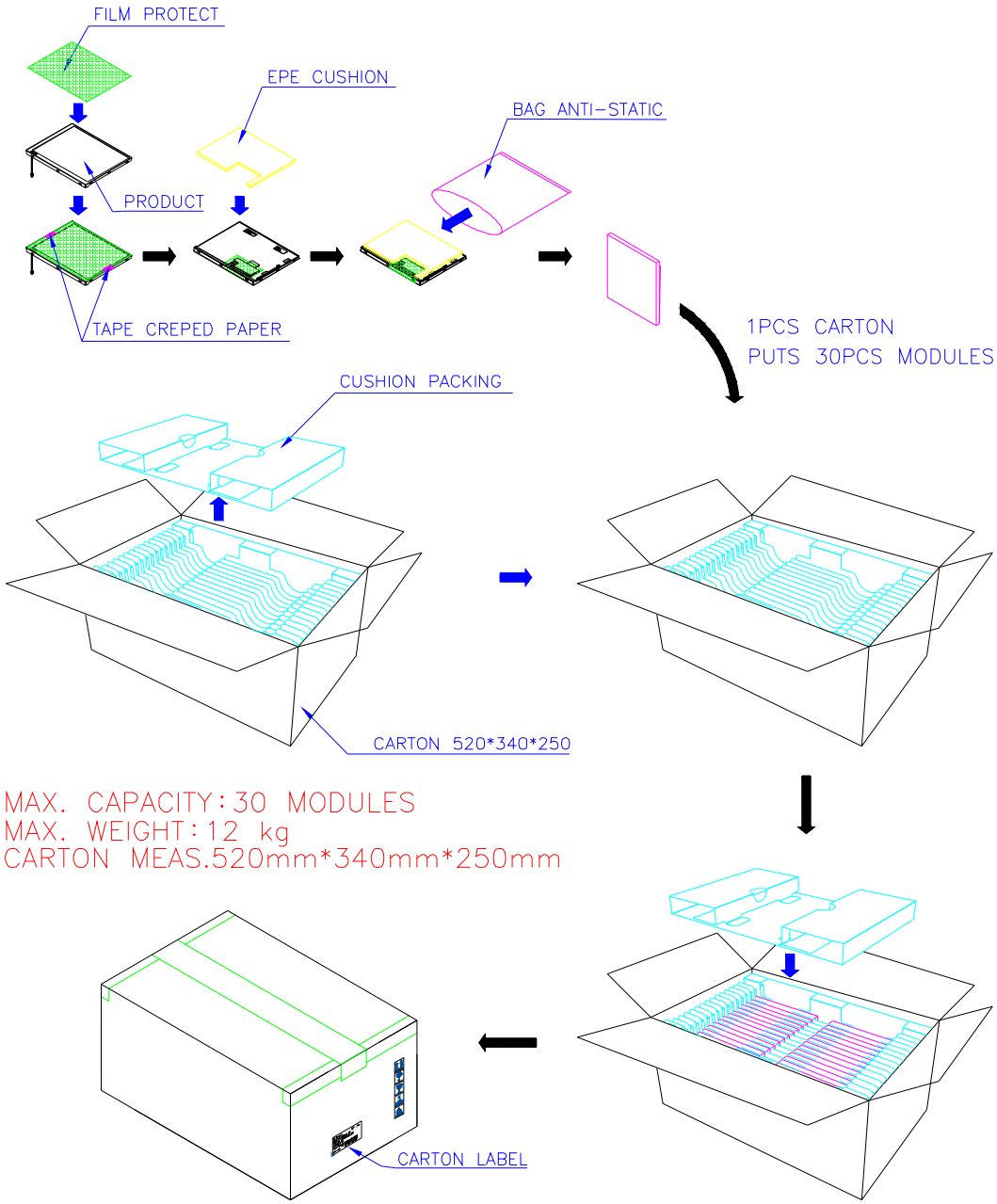
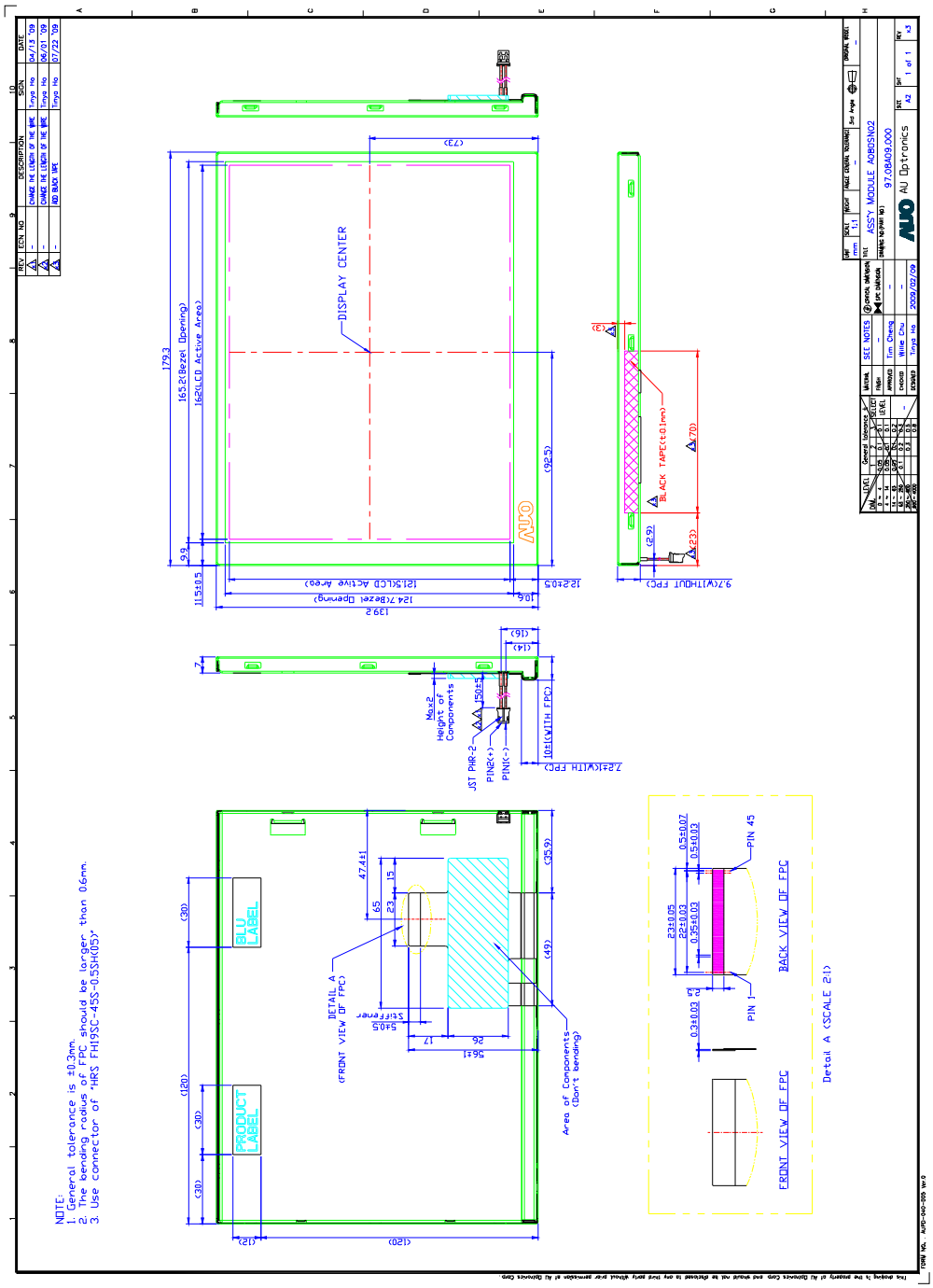
E. Packing form

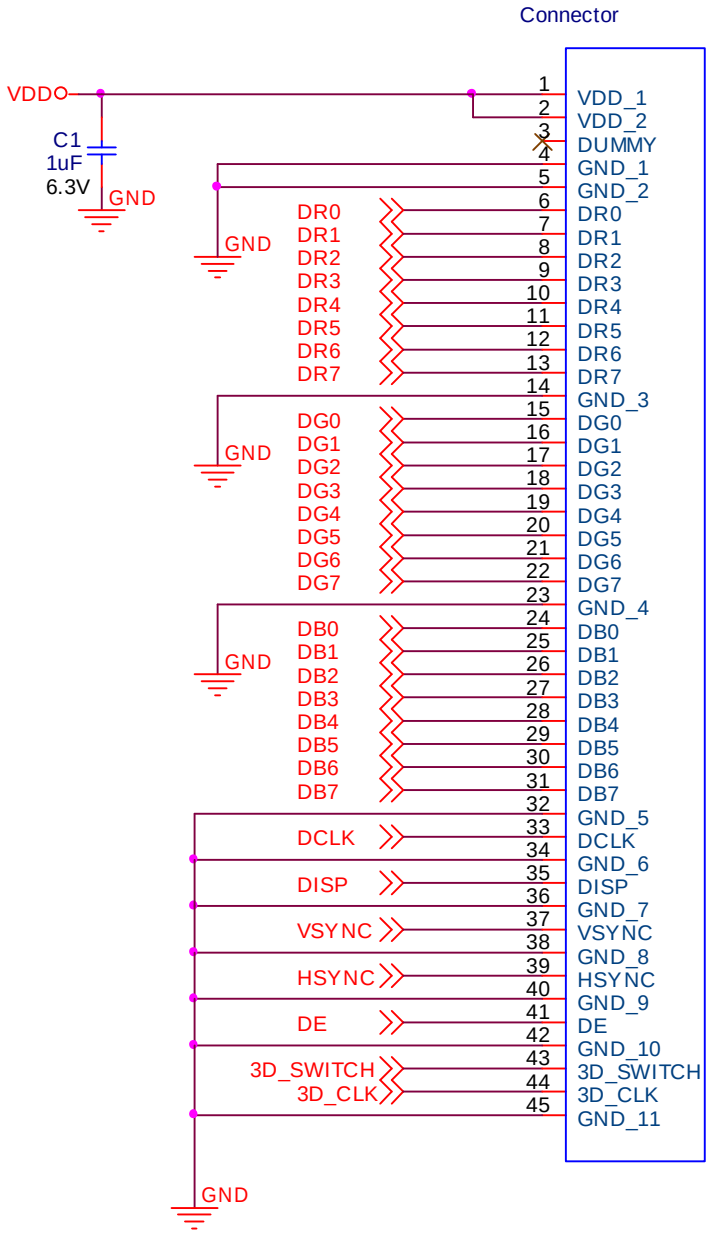


F. Outline Dimension



G. Application note

1. Application circuit



2. Power on/off sequence

The LCD adopts high voltage driver IC, so it could be permanently damaged under a wrong power on/off sequence. The suggested LCD power on/off sequence is below：