CUSTOMER APPROVAL SHEET

Company Name	
MODEL	C080EAN01.3
CUSTOMER APPROVED	Title : Name :

☐ **APPROVAL FOR SPECIFICATIONS ONLY (Spec. Ver. 0.0)**

☐ **APPROVAL FOR SPECIFICATIONS AND ES SAMPLE (Spec. Ver. 0.0)**

☐ **APPROVAL FOR SPECIFICATIONS AND CS SAMPLE (Spec. Ver. 0.0)**

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Doc. Version	0.0
Total Page	24
Date	2014/12/11

Product Specification

8.0” COLOR TFT-LCD MODULE

MODEL NAME: C080EAN01.3

Model Name:	**C080EAN01.3**
Planned Lifetime:	From 2015/Apr To 2018/Apr
Phase-out Control:	From 2017/Apr To 2018/Apr
EOL Schedule:	2018/Apr

< ◆ >Preliminary Specification

< >Final Specification

Note: The content of this specification is subject to change.

Record of Revision

Version	Revise Date	Page	Content
0.0	2014/12/11		First draft.

Contents

A. General Description

C080EAN01.3 is an a-Si type Thin Film Transistor Liquid crystal Display (TFT-LCD) with AHVA (Advanced Hyper-Viewing Angle) technology. This model is composed of a TFT-LCD, driver ICs, FPCA, and a backlight unit.

B. Features

- 8.0”-inch display
- 1280 RGB x 720 resolution in RGB stripe dot arrangement
- High brightness
- Interfaces: LVDS (8 bit, JEIDA, DE mode)
- AHVA – wide view technology
- RoHs compliance

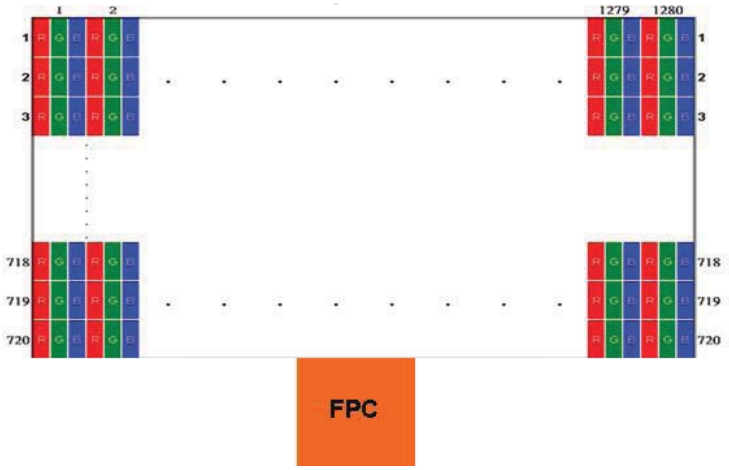
C. Physical Specifications

1. TFT LCD Panel

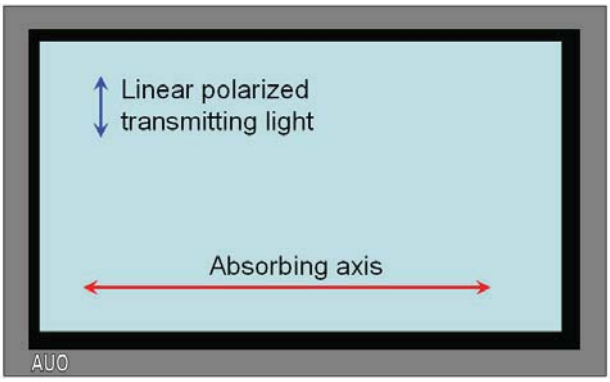
NO.	Item	Unit	Specification	Remark
1	Display Resolution	dot	1280 RGB(H)x 720(V)	
2	Active Area	mm	176.64 x 99.36	
3	Screen Size	inch	8.0(Diagonal)	
4	Dot Pitch	μm	138	
5	Color Configuration	–	R. G. B. Stripe	Note. 2
6	Color Depth	–	16.7 M colors	
7	Overall Dimension	mm	186.5 x 117.12 x 7.2	Note. 1
8	Weight	g	226 +/- 23	
9	Display Mode	–	Normally Black	
10	Surface Treatment	–	AG	

Note 1: FPCA is excluded

Note 2: Below figure shows dot stripe arrangement.

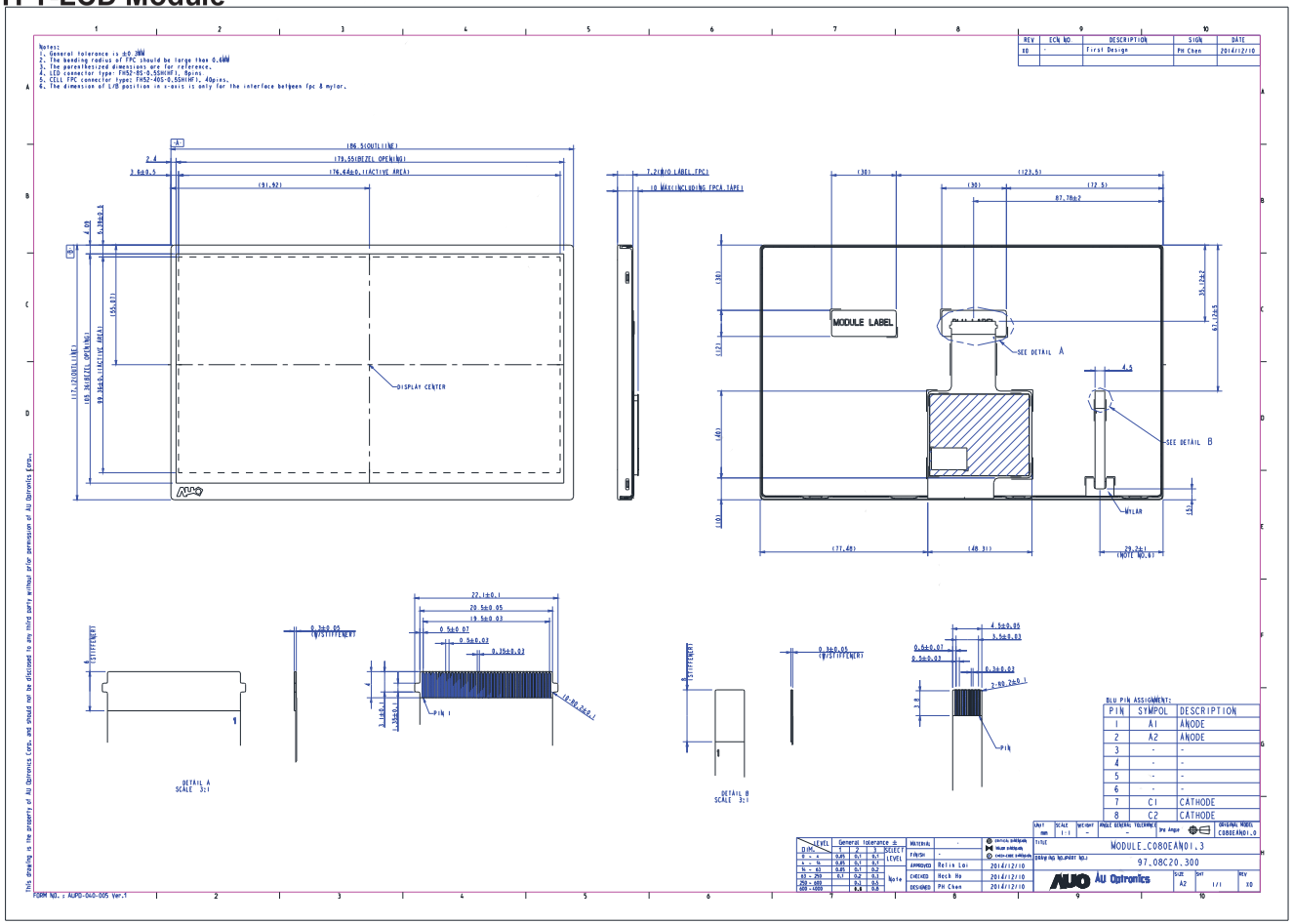


Note 3: Below figure shows absorbing axis



D. Outline Dimension

1. TFT-LCD Module



E. Electrical Specifications

1. TFT LCD Panel Pin Assignment

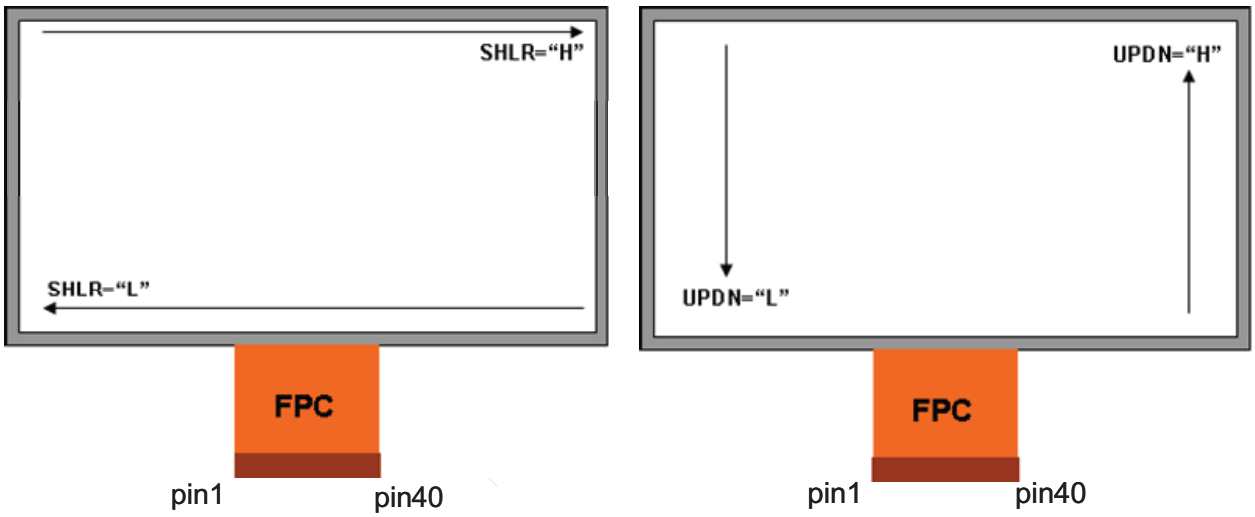
Recommended Connector: FH52-40S-0.5SH

No.	Pin Name	I/O	Description	Remarks
1	NC		Dummy	
2	SHLR	I	Horizontal scan direction control. “H” Left to Right; “L” Right to Left.	Note1
3	UPDN	I	Vertical scan direction control. “H” Down to Up; “L” Up to Down.	Note1
4	VDD	PI	Digital power supply voltage.	
5	GND	G	Digital Ground.	
6	GRB	I	Global reset pin. (Low active)	
7	NC		Dummy	
8	GND	G	Digital Ground.	
9	CLKP	I	Positive LVDS differential clock input.	
10	CLKN	I	Negative LVDS differential clock input.	
11	GND	G	Digital Ground.	
12	PIND0	I	Positive LVDS differential input.	
13	NIND0	I	Negative LVDS differential input.	
14	GND	G	Digital Ground.	
15	PIND1	I	Positive LVDS differential input.	
16	NIND1	I	Negative LVDS differential input.	
17	GND	G	Digital Ground.	
18	PIND2	I	Positive LVDS differential input.	
19	NIND2	I	Negative LVDS differential input.	
20	GND	G	Digital Ground.	
21	PIND3	I	Positive LVDS differential input.	
22	NIND3	I	Negative LVDS differential input.	
23	GND	G	Digital Ground.	
24	GND	G	Digital Ground.	
25	VDD	PI	Digital power supply voltage.	
26	VDD	PI	Digital power supply voltage.	
27	GND	G	Digital Ground.	
28	NC		Dummy	
29	VDDA	PI	Analog power supply voltage.	
30	VDDA	PI	Analog power supply voltage.	
31	VDDA	PI	Analog power supply voltage.	
32	VDDA	PI	Analog power supply voltage.	
33	VDDA	PI	Analog power supply voltage.	

34	NC		Dummy	
35	GNDA	G	Analog Ground.	
36	GNDA	G	Analog Ground.	
37	GNDA	G	Analog Ground.	
38	GNDA	G	Analog Ground.	
39	GNDA	G	Analog Ground.	
40	GNDA	G	Analog Ground.	

I: Digital signal input, O: Digital signal output, G: GND, PI: Power input

Note1



2. Differential Input Data Format

a. JEIDA format (DE mode)

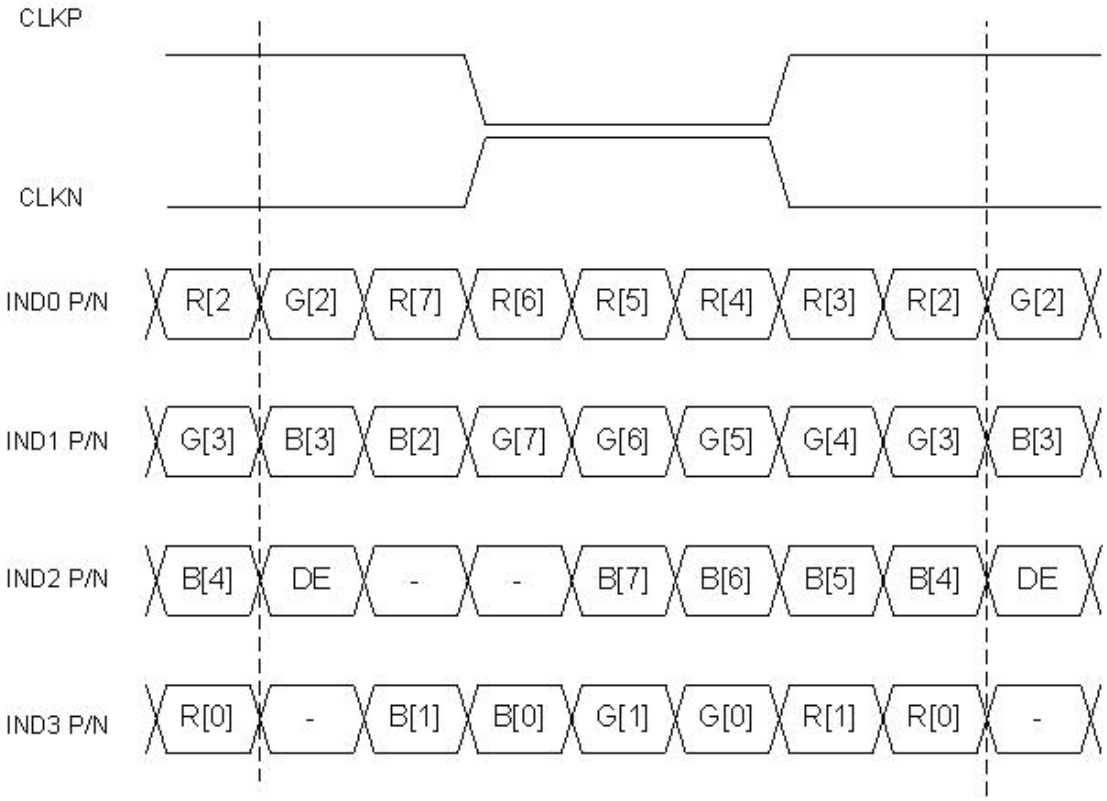
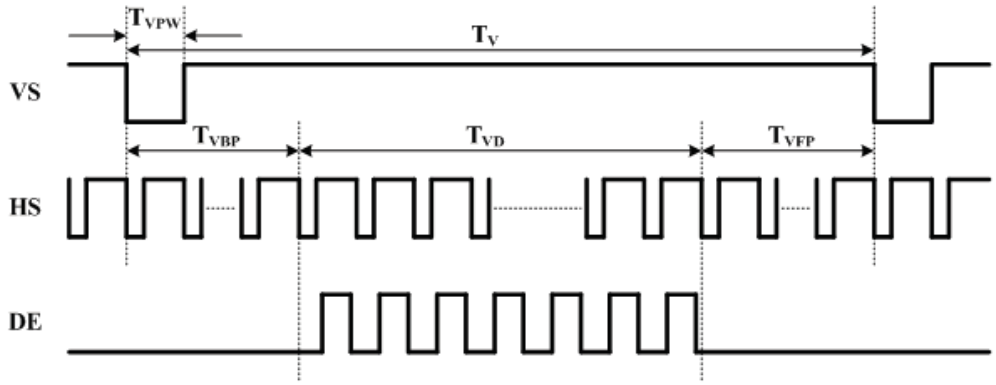
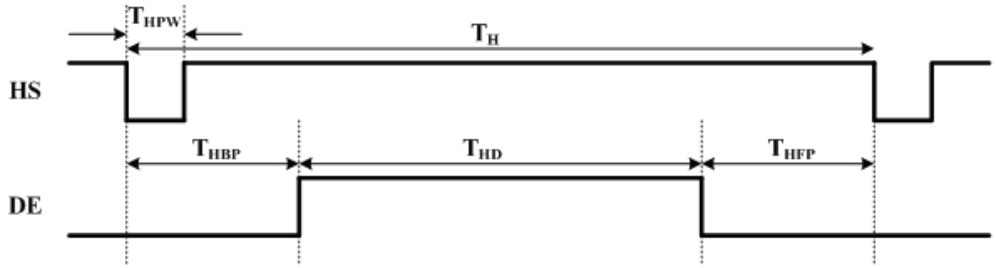


Fig. 1. LVDS input data JEIDA format

3. Input Timing Diagram





Parameter		Symbol	Min.	Typ.	Max.	Unit.	Remark
CLK Frequency		F_{CLK}	63	69	80	MHz	
HSYNC	**Period**	T_H	1388	1480	1569	CLK	
	Horizontal display area	T_{HD}		1280		CLK	
	Blanking	$T_{HBP} + T_{HFP}$	108	200	289	CLK	
VSYNC	**Period**	T_V	757	773	850	HS	
	Vertical display area	T_{VD}		720		HS	
	Blanking	$T_{VBP} + T_{VFP}$	37	53	130	HS	

4. Absolute Maximum Ratings

Items	Symbol	Values		Unit	Condition
		Min.	Max.		
Power Voltage	VDD	-0.5	5	V	GND = 0 V
	VDDA	-0.5	5	V	GND = 0 V
Operation Temperature	Topa	-30	85	°C	Ambient
Storage Temperature	Tstg	-40	95	°C	Ambient

Note 1: Functional operation should be restricted under normal ambient temperature.

5. DC Electrical Characteristics

The following items are measured under stable condition and suggested application circuit.

a. Power Specification

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Power Supply	VDD	3	3.3	3.6	V	Note 1
	IVDD	(25)	(30)	(35)	mA	Note 1
	IVDD inrush current		(300)	(500)	mA	
	VDDA	3	3.3	3.6	V	Note 1
	IVDDA	(180)	(350)	(550)	mA	Note 1
	IVDDA inrush current		(700)	(1000)		

Note 1: Test pattern is the following picture.

Fig. 3. Test pattern for power specification

b. Signal DC Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Input signal voltage	Vi	-0.3	-	VDD	V	Note 1
Input high level voltage	V_{IH}	0.7VDD	-	VDD	V	Note 1
Input low level voltage	V_{IL}	GND	-	0.3VDD	V	Note 1
Differential input high threshold	R_{XVTH}	0.1	-	-	V	Note 2
Differential input low threshold	R_{XVTL}	-	-	-0.1	V	Note 2
Input voltage range (singled-end)	R_{XVIN}	0	-	VDD-1.2+|VID|/2	V	Note 2
Input differential voltage	$\|V_{ID}\|$	0.2	-	0.6	V	Note 2
Differential Input Common Mode Voltage	R_{XVCM}	|VID|/2	-	VDD-1.2	V	Note 2

Note 1: TTL interface signal DC characteristics
Note 2: LVDS interface signal DC characteristic

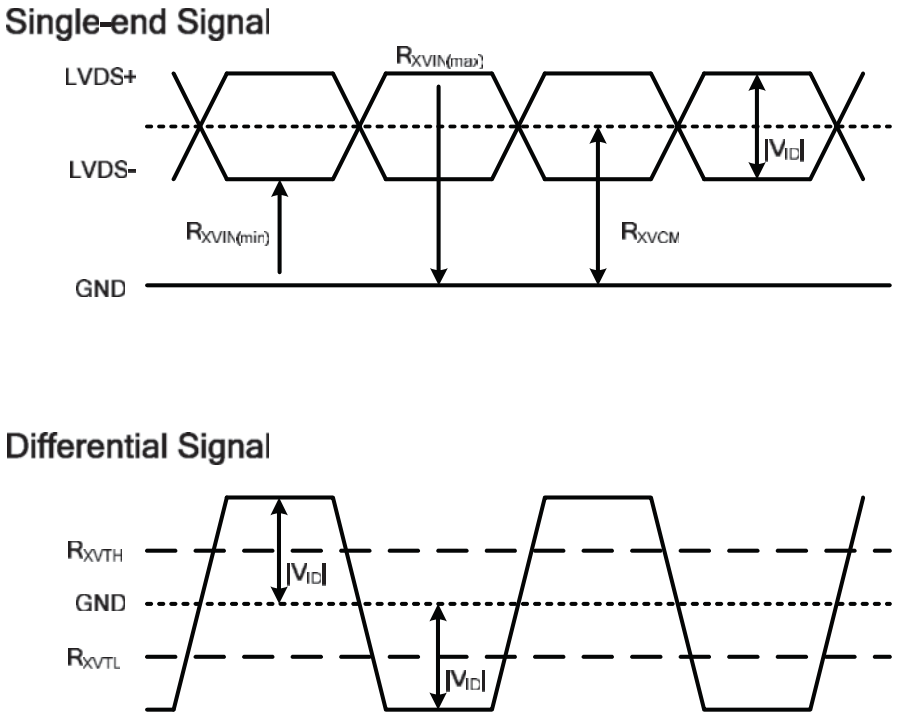


Fig. 4. LVDS DC characteristics diagram

C. Backlight Driving Conditions (Note 1)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED Supply Current	I_L		80	85	mA	Single serial (Note 2)
LED Supply Voltage	V_L		24	27.2	V	(Note 3)
LED Life Time	L_L	10,000			hr	Note 4

Note 1: LED backlight is 16 LEDs (2strings, 8pcs for each string). Ambient temperature is 25 ℃

Note 2: The LED supply power is for 2 string of LED.

Note 3: Be sure your system can provide enough voltage driving capability (larger than 28V is recommended) to provide 80mA for each LED or the brightness is possible to be below spec.

Note 4: The LED lifetime 10000hrs means , after normal use at 80mA, under +25℃, the brightness decreases to 50% of original level.

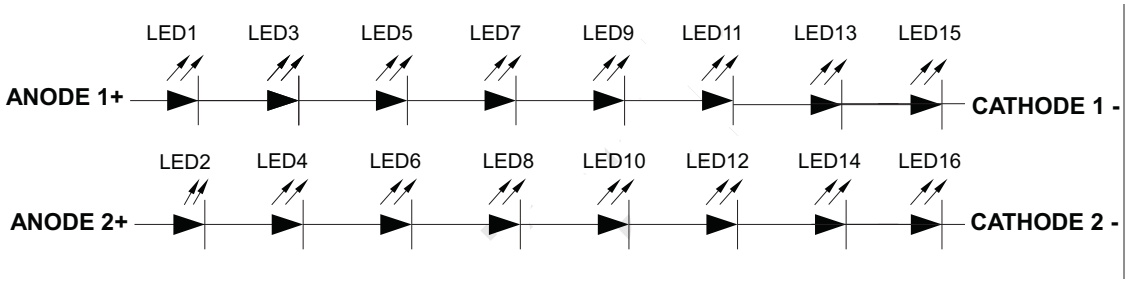


Fig. 5. Light bar structure

6. AC Electrical Characteristics

a. Input AC characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
VDD power on slew time	T_{POR}	1	-	15	ms	From 0V to 90% VDD
GRB active pulse width	T_{GRB}	1	-	20	ms	VDD=3.3V

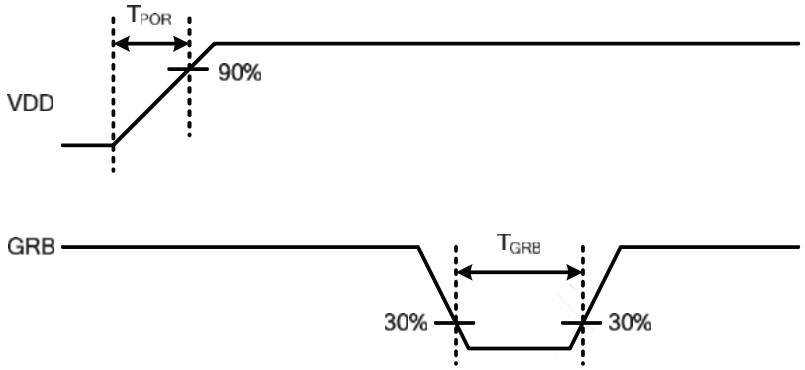


Fig. 6. VDD and GRB timing diagram

b. Differential signal AC characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Clock frequency	R_{XFCLK}	20	-	84	MHz	
Input Data Skew Margin	T_{RSKM}	400			ps	

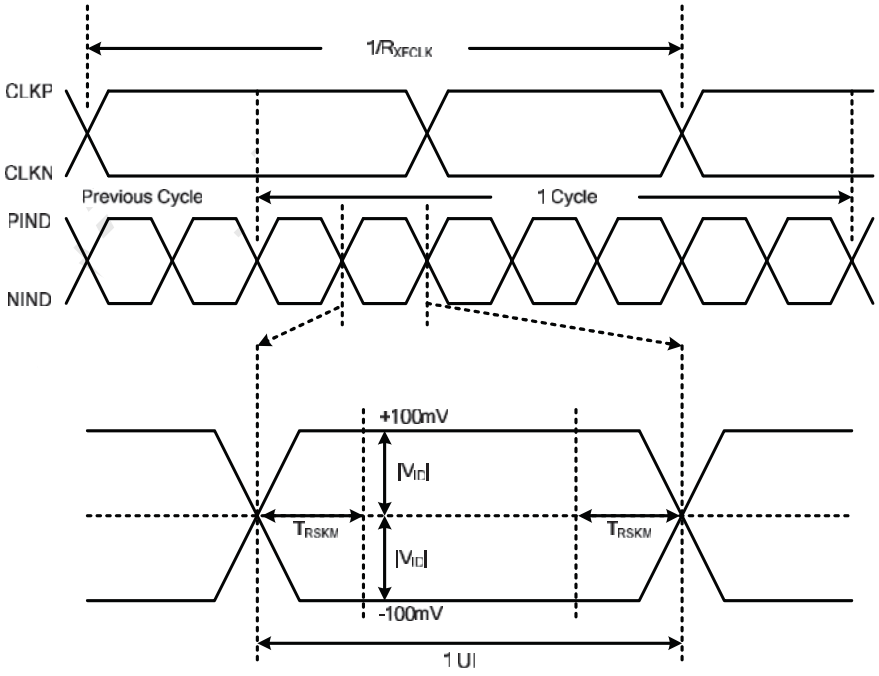


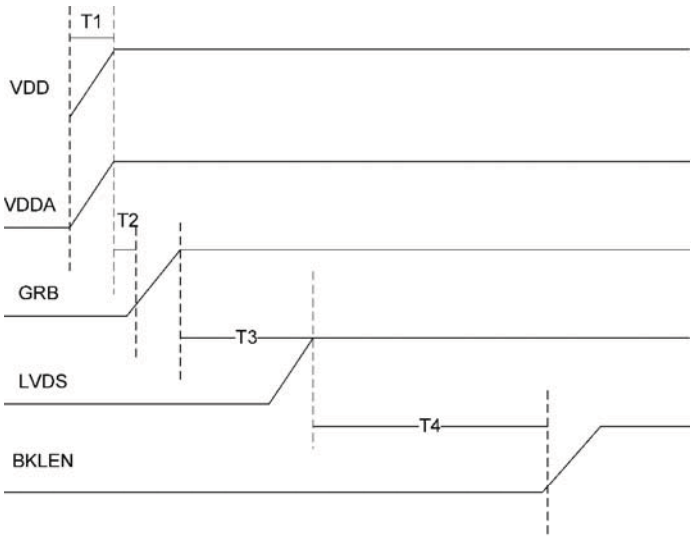
Fig. 7 LVDS AC characteristics diagram

7. 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 sequence is below:

a. Power on sequence:

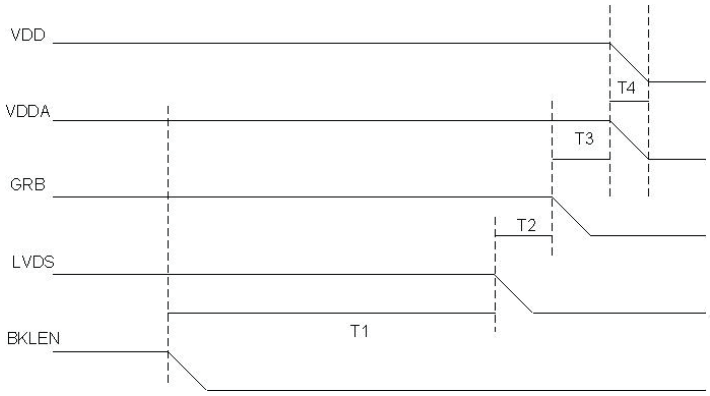
VDD&VDDA → GRB → LVDS → BKLEN:



Power on timing:

Parameter	Value			Units
	Min.	Typ.	Max.	
T1	1	-	15	ms
T2	1	-	-	ms
T3	1	-	300	ms
T4	300	350	-	ms

b. Power off sequence:
BKLEN → LVDS → GRB → VDD&VDDA



Power off timing:

Parameter	Value			Units
	Min.	Typ.	Max.	
T1	90	100	-	ms
T2	1	30	300	ms
T3	1	30	40	ms
T4	50	-	-	ms

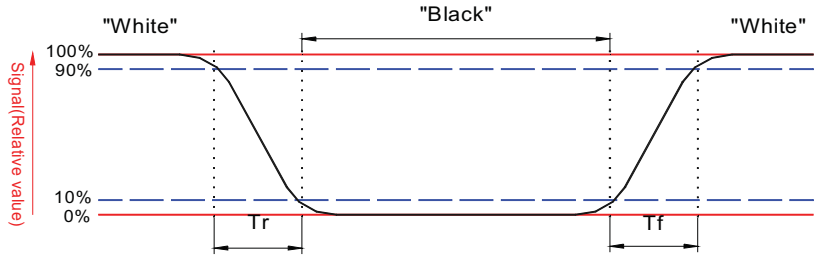
F. Optical specifications (Note 1, 2)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Response Time Rise	Tr	θ = 0°	-	-	20	ms	Note 3
Fall	Tf		-	-	20		
Viewing Angle Top Bottom Left Right		CR ≧ 10	-	80 80 80 80	-	deg.	Note 7, 9
Contrast ratio	CR	θ = 0°	800	1000	-		Note 5, 6
Brightness	Y_L	θ = 0°	400		-	cd/m^2	Note 8
White Chromaticity	X	θ = 0°	(0.267)	(0.307)	(0.347)		Note 10
	Y	θ = 0°	(0.287)	(0.327)	(0.367)		
Red Chromaticity	X	θ = 0°	(0.589)	(0.639)	(0.689)		
	Y	θ = 0°	(0.279)	(0.329)	(0.379)		
Green Chromaticity	X	θ = 0°	(0.263)	(0.313)	(0.363)		
	Y	θ = 0°	(0.557)	(0.607)	(0.657)		
Blue Chromaticity	X	θ = 0°	(0.099)	(0.149)	(0.199)		
	Y	θ=0°	(0.001)	(0.051)	(0.101)		
Uniformity		-	80	-		%	Note 10

Note 1: Measurement should be performed in the dark room, optical ambient temperature = 25 °C, and backlight current I_L = 80mA.

Note 2: To be measured in the center area of TFT-LCD with a field angle of 1° by Topcon luminance meter SR3, after 10 minutes operation and warm up 30 minutes.

Note 3: Definition of response time:
The output signals of photo detector are measured when the input signals are changed from “black state” to “white state” (falling time) and from “white state” to “black state” (rising time), respectively.



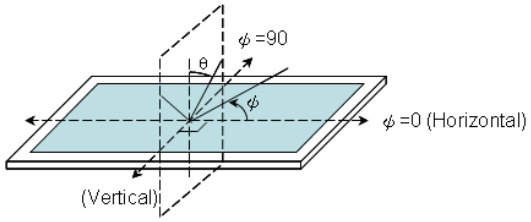
Note 4: Based on liquid crystal characteristics, the response time will become slower and the color of panel will become darker than the above optical specification when ambient temperature is below 25 °C.

Note 5: Contrast ratio is calculated with the following formula.

$$\text{Contrastratio} = \frac{\text{Photo detector output when LCD is at "White" state}}{\text{Photo detector output when LCD is at "Black" state}}$$

White : White : RGB data = ”11111111” (V1 = 12.4 V & V18 = 0.6 V)
Black : RGB data = ”00000000” (V9 = 6.9 V & V10 = 6.1 V)
The 100% transmission is defined as the transmission of LCD panel when all the input terminals of module are electrically opened

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

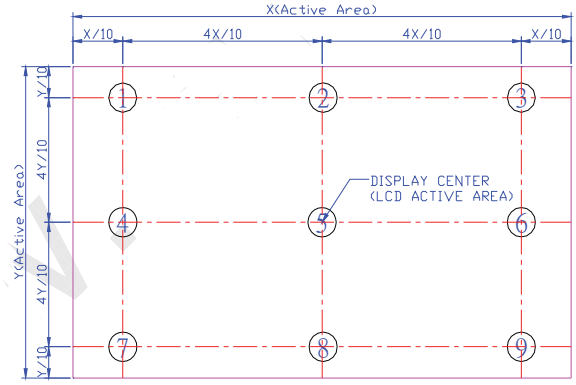


Note 7: Viewing angles are measured at the center of the panel when all the input terminals of LCD oanel are electrically opened.

Note 8: Brightness is measured at the center of the display.

Note 9: The viewing angles are measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

Note 10: Luminance Uniformity of these 9 points is defined as below: (1 : 4 : 4 : 1)



$$\text{Uniformity} = \frac{\text{minimum luminance in 9 points (1-9)}}{\text{maximum luminance in 9 points (1-9)}}$$

G. Reliability Test Items(Note 1~3)

No.	Test items	Conditions		Remark
1	High temperature storage	Ta= 95 °C	240 Hrs	
2	Low temperature storage	Ta= -40 °C	240 Hrs	
3	High temperature operation	Ta= 85 °C	240 Hrs	
4	Low temperature operation	Ta= -30 °C	240 Hrs	
5	High temperature and high humidity	Ta= 60 ℃, 90 % RH	240 Hrs	Operation
6	Heat shock	-30 °C ~ 85 ℃ / 100 cycles 1 Hrs/cycle		Non-operation
7	Shock	100 G, 6 ms, ±X, ±Y, ±Z 3 times for each direction		
8	Electrostatic Discharge	Contact = ± 4 kV, class B Air = ± 8 kV, class B		IEC61000-4-2
9	Vibration	Frequency range	8 ~ 33.3 Hz	JIS D1601,A10 Condition A
		Stoke	1.3 mm	
		Sweep	2.9 G, 33.3 ~ 400Hz	
		Cycle	15 min.	
		2 hours for each direction of X, Z 4 hours for Y direction		
10	Vibration (with carton)	Random vibration: 0.015 G^2/Hz from 5 ~ 200 Hz –6 dB/Octave from 200 ~ 500 Hz		IEC 68-34
11	Drop (with carton)	Height: 60 cm 1 corner, 3 edges, 6 surfaces		

Note 1: Ta: Ambient temperature
Note 2: In the standard condition, there is no display function NG issue occurred. All the cosmetic specification is judged before the reliability stress.
Note 3: I_L = 80mA

H. Packing and Marking

1. Packing Form

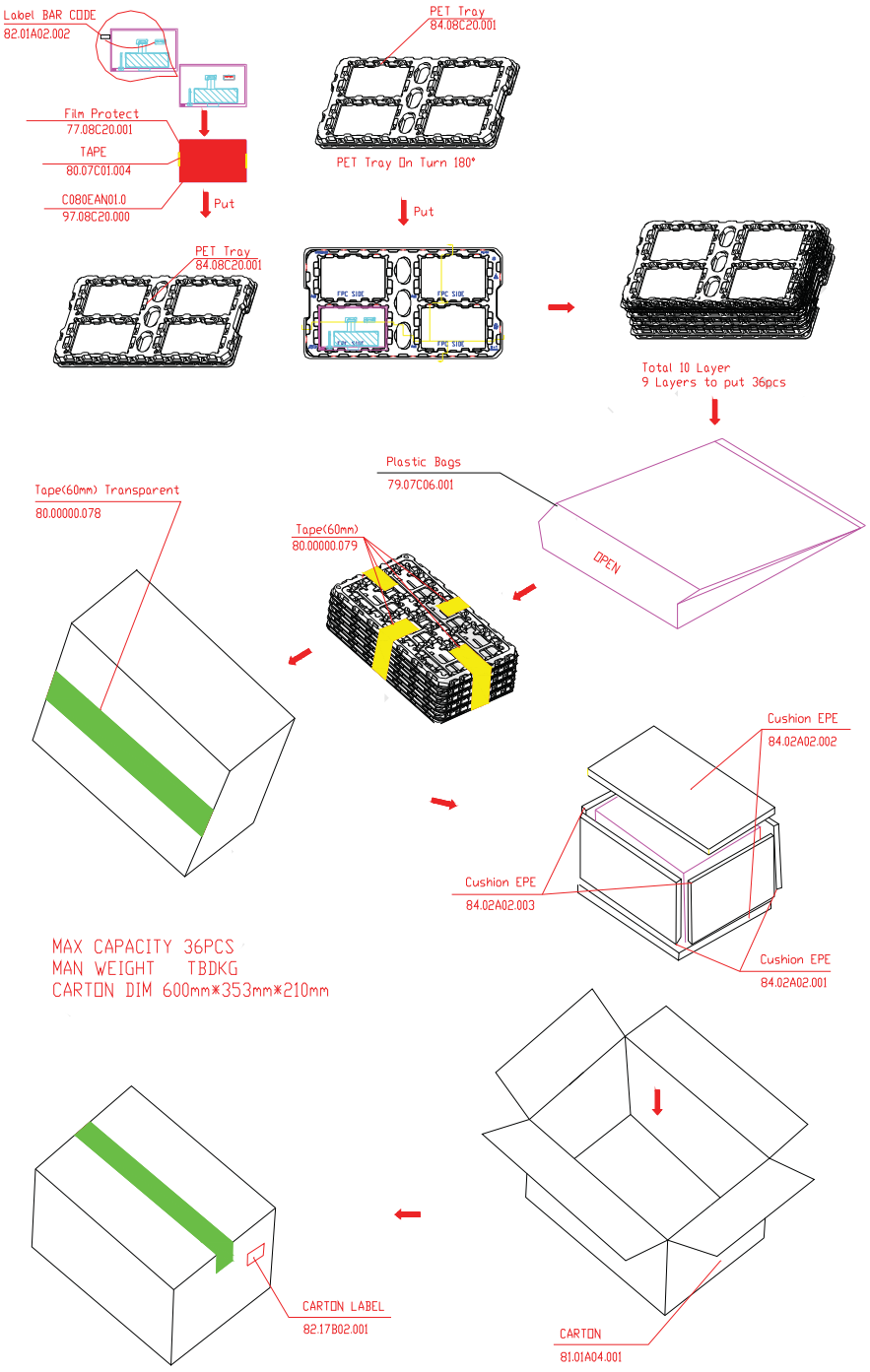
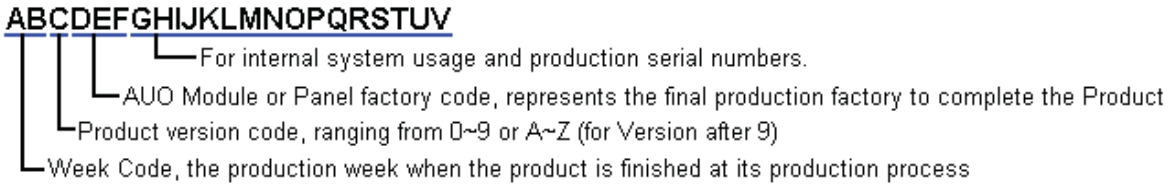


Fig. 10. Packing diagram

2. Module/Panel Label Information

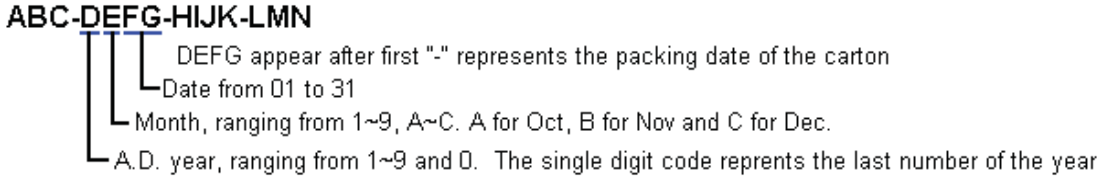
The module/panel (collectively called as the “Product”) will be attached with a label of Shipping Number which represents the identification of the Product at a specific location. Refer to the Product outline drawing for detailed location and size of the label. The label is composed of a 22-digit serial number with the following definition:



Example:
501M06ZL06123456781Z05:
Product Manufacturing Week Code: WK50
Product Version: Version 1
Product Manufacturing Factory: M06

3. Carton Label Information

The packing carton will be attached with a carton label where packing Q’ty, AUO Model Name, AUO Part Number, Customer Part Number (Optional) and a series of Carton Number in 13 or 14 digits are printed. The Carton Number is appearing in the following format:



Refer to the drawing of packing format for the location and size of the carton label.

4. Warehouse storage condition:

Room temperature: 25 +/- 5 degrees
Humidity: 30% ~ 70%