Date : 2010/11/15

Product Specification

8.0" COLOR TFT-LCD MODULE

Model Name： **A080XN01 V0**

Planned Lifetime:	From 2011/Jan To 2012/Jan
Phase-out Control:	From 2011/July To 2011/Dec
EOL Schedule:	2012/Jan

< □ >Preliminary Specification
< >Final Specification

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

Record of Revision

Version	Revise Date	Page	Content
0.0	2010/11/15	All	First Draft.

Contents

A. General Information

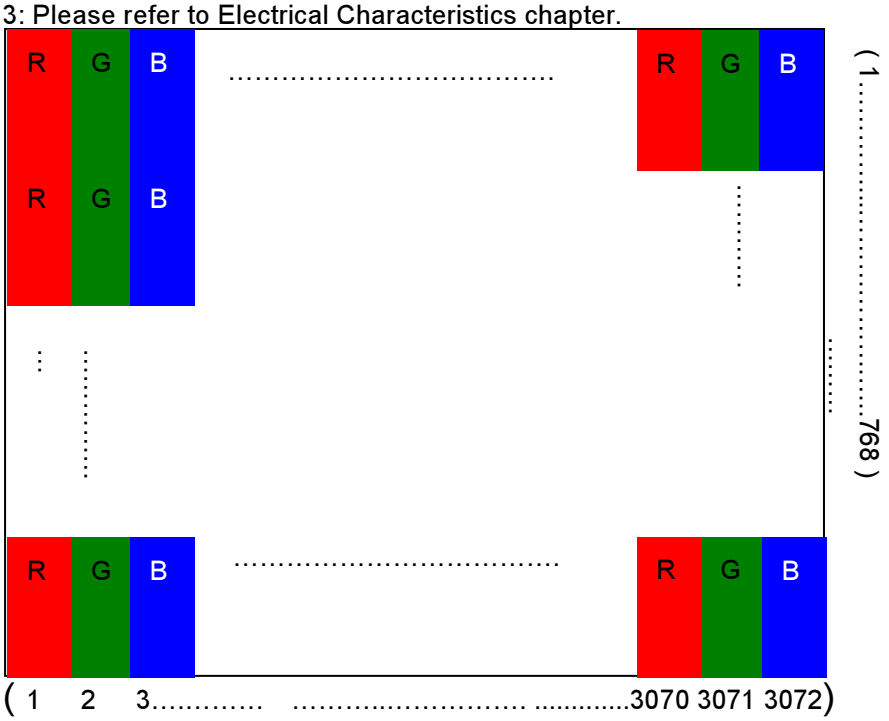
This product is for CE Brand Tablet application.

NO.	Item	Unit	Specification	Remark
1	Screen Size	inch	8(Diagonal)	
2	Display Resolution	dot	1024RGB(W)x768(H)	
3	Overall Dimension	mm	162.048(W) x 121.536(H)	Note 1
4	Active Area	mm	0.15825(W)x0.15825(H)	
5	Pixel Pitch	mm	0.159(W)x0.159(H)	
6	Color Configuration	--	R. G. B. Stripe	Note 2
7	Color Depth	--	16.2M Colors	Note 3
8	NTSC Ratio	%	45	
9	Display Mode	--	Normally Black	
10	Panel surface Treatment	--	Anti-Glare, 3H	
11	Weight	g	TBD	
12	Panel Power Consumption	mW	TBD	Note 4
13	Backlight Power Consumption	W	1.8	
14	Viewing direction		9 o'clock	

Note 1: Not include blacklight cable and FPC. Refer next page to get further information.

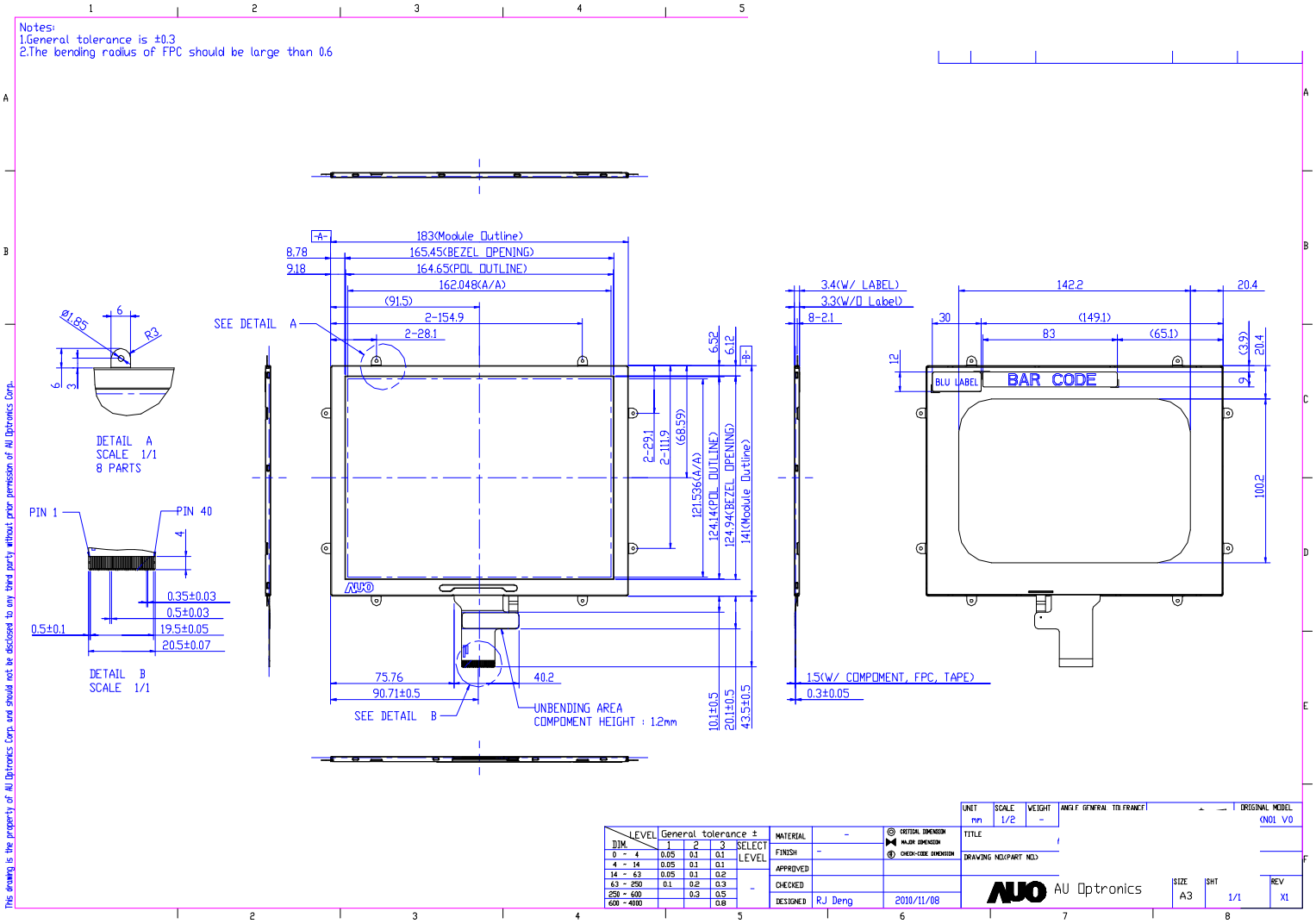
Note 2: Below figure shows dot stripe arrangement.

Note 3: Please refer to Electrical Characteristics chapter.



B. Outline Dimension

1. TFT-LCD Module – Front View



2. TFT-LCD Module – Rear View

C. Electrical Specifications

1. TFT LCD Panel Pin Assignment

Recommended connector : **FH12A-40S-0.5SH(55)**

NO.	Symbol	I/O	Description	Remark
1	VCOM	P	Common electrode driving voltage	
2	VDDIO	P	Digital interface supply voltage of digital	
3	VGL	P	Negative power supply voltage for Gate driver	
4	VGH	P	Positive power supply voltage for Gate driver	
5	U/D	I	Up/Down selection. 0:Enable,1:Disable	Note1
6	R/L	I	Left/Right selection. 0:Enable,1:Disable	Note1
7	GRB	I	H/W global reset. 0:Enable,1:Disable	
8	STB	I	H/W Standby mode. 0:Enable,1:Disable	
9	GND	P	Ground	
10	NC	-	For test , do not connect(Please leave it open)	
11	NC	-	For test , do not connect(Please leave it open)	
12	CABC_EN	I	CABC function enable. 0:Disable,1:Enable	Note2
13	VDPA	P	Positive power supply voltage for analog power	
14	VDNA	P	Negative power supply voltage for analog power	
15	VDDIO	P	Digital interface supply voltage of digital	
16	RxCLK-	I	LVDS receiver signal clock	
17	RxCLK+	I		
18	GND	P	Ground	
19	RxIN0-	I	LVDS receiver signal channel 0	
20	RxIN0+	I	LVDS Differential Data Input (R0, R1, R2, R3, R4, R5, G0)	
21	GND	P	Ground	
22	RxIN1-	I	LVDS receiver signal channel 1	
23	RxIN1+	I	LVDS Differential Data Input (G1, G2, G3, G4, G5, B0, B1)	
24	GND	P	Ground	
25	RxIN2-	I	LVDS receiver signal channel 2	
26	RxIN2+	I	LVDS Differential Data Input (B2, B3, B4, B5, HS, VS, DE)	
27	GND	P	Ground	
28	RxIN3-	I	LVDS receiver signal channel 3,	
29	RxIN3+	I	LVDS Differential Data Input (R6, R7, G6, G7, B6, B7, RSV)	
30	GND	P	Ground	
31	DRV_BLU	O	OUTPUT_PWM_SIGNAL output via an output buffer	
32	VCOM	I	Common electrode driving voltage	
33	GND	P	Ground	
34	LEDN	P	LED cathode	

35	LEDN	P	LED cathode	
36	LEDN	P	LED cathode	
37	LEDP	P	LED anode	
38	LEDP	P	LED anode	
39	LEDP	P	LED anode	
40	GND	P	Ground	

I: Input; P: Power

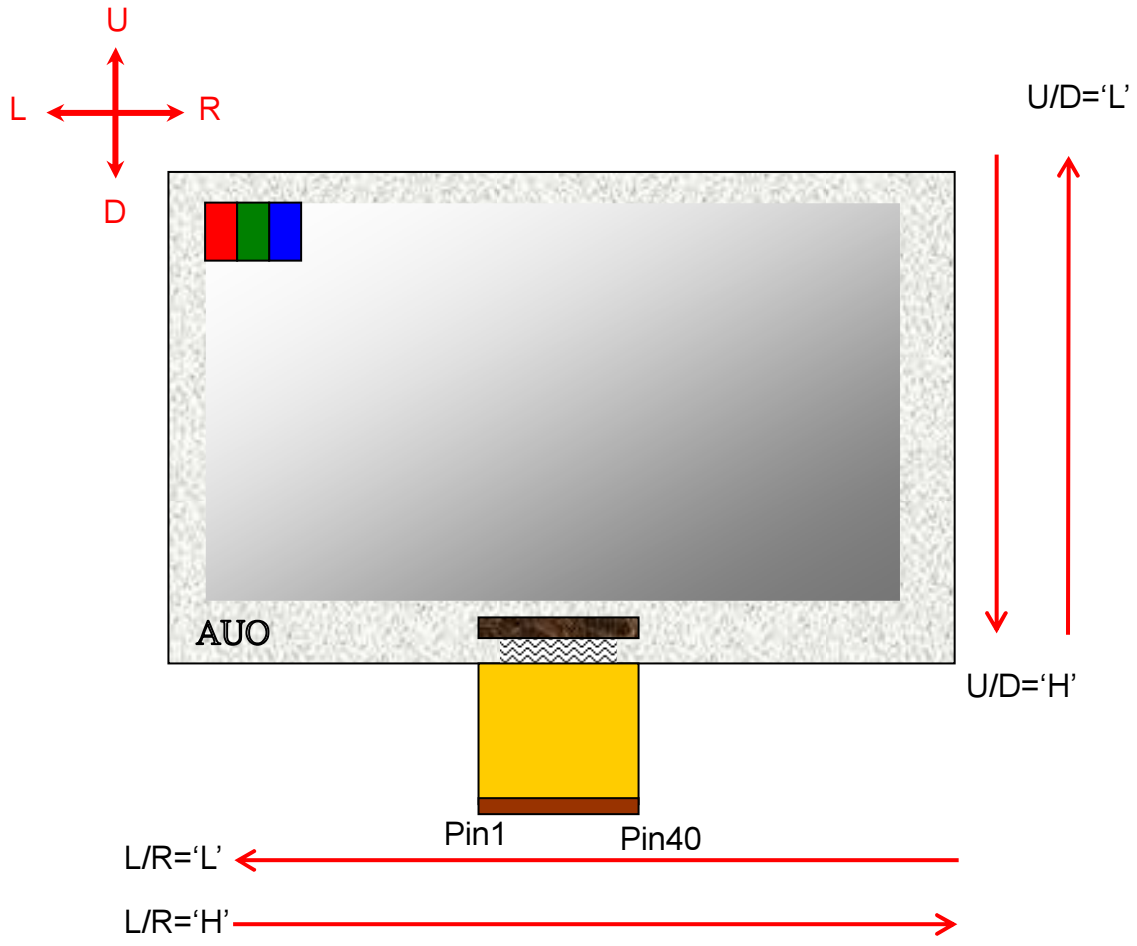
Note1: Global reset, normally pulled high.

Suggest to connecting with an RC (R=10K ohm, C=1uF)reset circuit for stability.

Normally pull high.

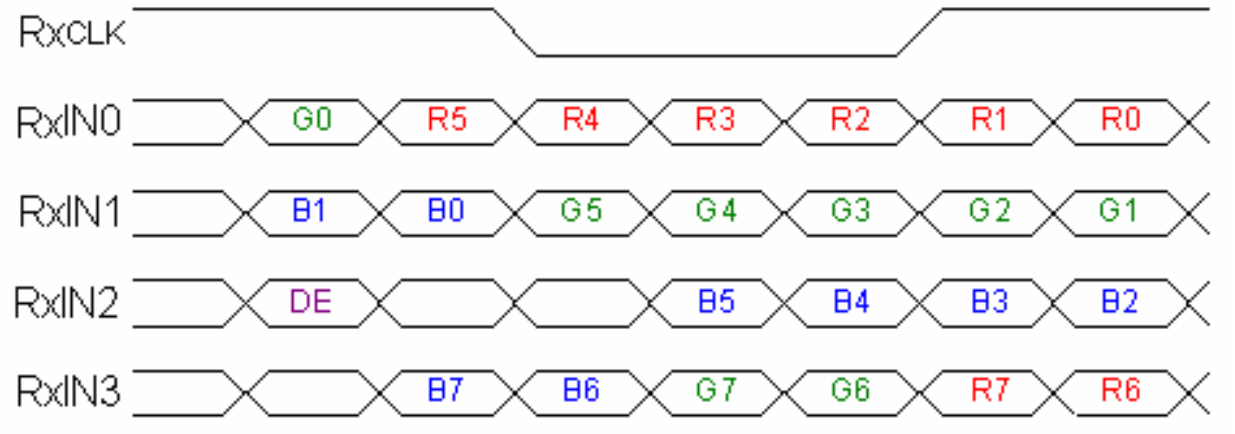
Note2:

U/D	Direction	L/R	Direction
H	U→ D	H	L → R
L	D → U	L	R → L



2. The Input Data Format

(NS format , DE mode only)



Signal Name	Description	Remark
R7~R0	Red Data 7 ~ Red Data 0	Red-pixel Data For 8Bits LVDS input MSB: R7 ; LSB: R0
G7~G0	Green Data 7 ~ Green Data 0	Green-pixel Data For 8Bits LVDS input MSB: G7 ; LSB: G0
B7~B0	Blue Data 7 ~ Blue Data 0	Blue-pixel Data For 8Bits LVDS input MSB: B7 ; LSB: B0
RxCLKIN	LVDS Data Clock	
DE	Data Enable Signal	When the signal is high, the pixel data shall be valid to be displayed.

3. Absolute Maximum Ratings

Item	Symbol	Condition	Min.	Max.	Unit	Remark
Power Voltage	VDDIO	GND=0	-0.5	5	V	
	VDPA	GND=0	-0.5	6	V	
	VDNA	GND=0	-6	0.5	V	
	VGH	GND=0	-0.3	45	V	
	VGL	GND=0	-20	+0.3	V	
	VGH－VGL		-	40	V	
Operating temperature	Topa		-10	60	℃	
Storage temperature	Tstg		-20	70	℃	

Note 1: 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.

Note 2: Functional operation should be restricted under ambient temperature (25℃).

4. Electrical DC Characteristics

a. DC Charateristics

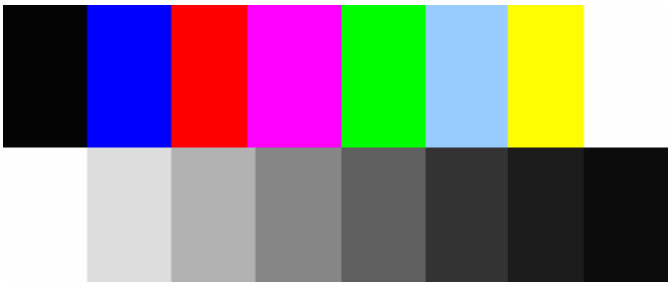
Item		Symbol	Min.	Typ.	Max.	Unit	Remark
Power supply		VDDIO	3	3.3	3.6	V	
		VDPA	-4.5	5	5.5	V	
		VDNA	-5.5	-5	--	V	
		VGH	21	22	23	V	
		VGL	-10.5	-10	-9.5	V	
VCOM		Vcdc	--	-1.2	--	V	Note 1
Input signal voltage	H Level	Vih	0.7xVDDIO	--	VDDIO	V	
	L Level	Vil	0	--	0.3xVDDIO	V	
Pull-up/down impedance		Rin	--	250k	--		

Note 1:VCOM < 0

b. Current Consumption (AGND=GND=0V)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Input current for VDDIO	IVDDIO	VDDIO=3.3V	-	TBD	TBD	mA	Note 1
Input current forVDPA	IVDPA	VDPA=5V	-	TBD	TBD	mA	Note 1
Input current for VDNA	IVDNA	VDNA=-5V	-	TBD	TBD	mA	Note 1
Input current for VGH	IVGH	VGH=20V	-	TBD	TBD	mA	Note 1
Inpur current for VGL	IVGL	VGL=-10V	-	TBD	TBD	mA	Note 1
Input Leakage Current	Iin	Digital input pins	-	-	±1	uA	Note 2

Note 1: The test pattern use the following pattern.



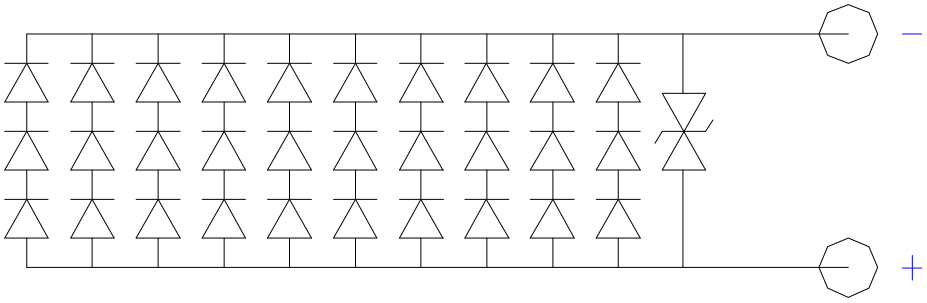
Note 2: except for pull-up, pull-down pins.

c. Backlight Driving Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED Lightbar current	I_L	-	200	-	mA	Note 1, 2
Power consumption	P		1.89	-	W	
LED Lightbar life time		15,000	-	-	Hr	Note 1, 2, 3, 4

Note 1: LED backlight is LED lightbar type(30 pcs of LED).

Note 2: Definition of “LED Lifetime”: brightness is decreased to 50% of the initial value. LED Lifetime is restricted under normal condition, ambient temperature = 25℃ and LED lightbar current= 200mA



Note 3: The value is only for reference.

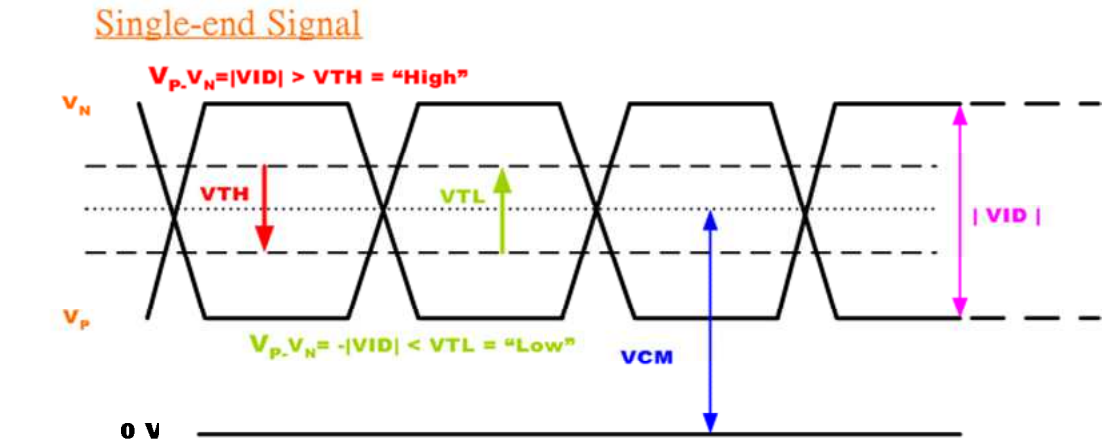
Note 4: If it operates with LED lightbar voltage more than 200mA, it maybe decreases LED lifetime.

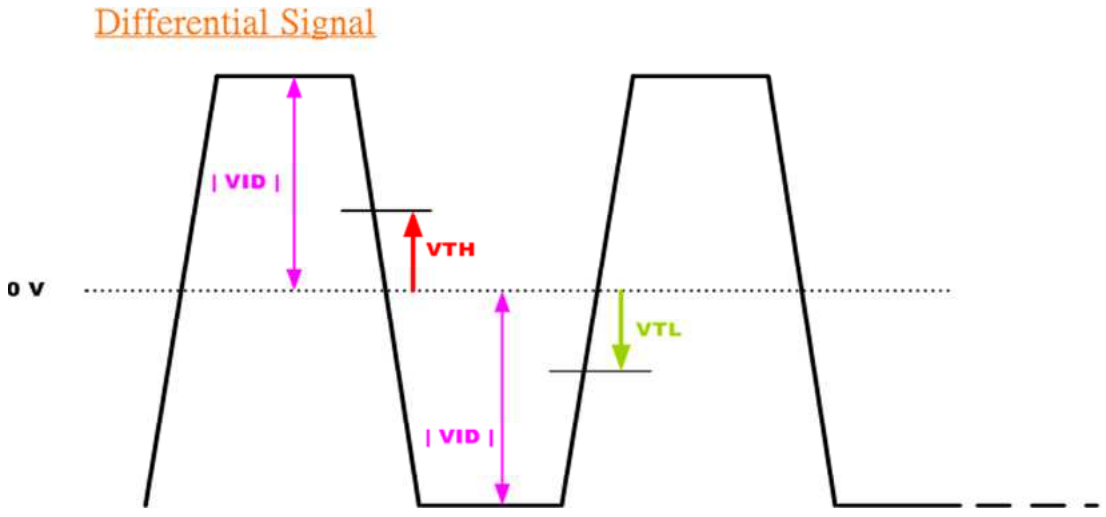
5. LVDS DC Characteristics

A. DC Characteristic

Symbol	Item	Min.	Typ.	Max.	Unit	Remark
VTH	Differential Input High Threshold	-	-	100	[mV]	VCM=1.25V
VTL	Differential Input Low Threshold	100	-	-	[mV]	VCM=1.25V
| VID |	Input Differential Voltage	100	350	600	[mV]	
VICM	Differential Input Common Mode Voltage	1.1	-	1.45	[V]	VTH/VTL=+-100mV

Input signals shall be low or Hi-Z state when VDD is off.



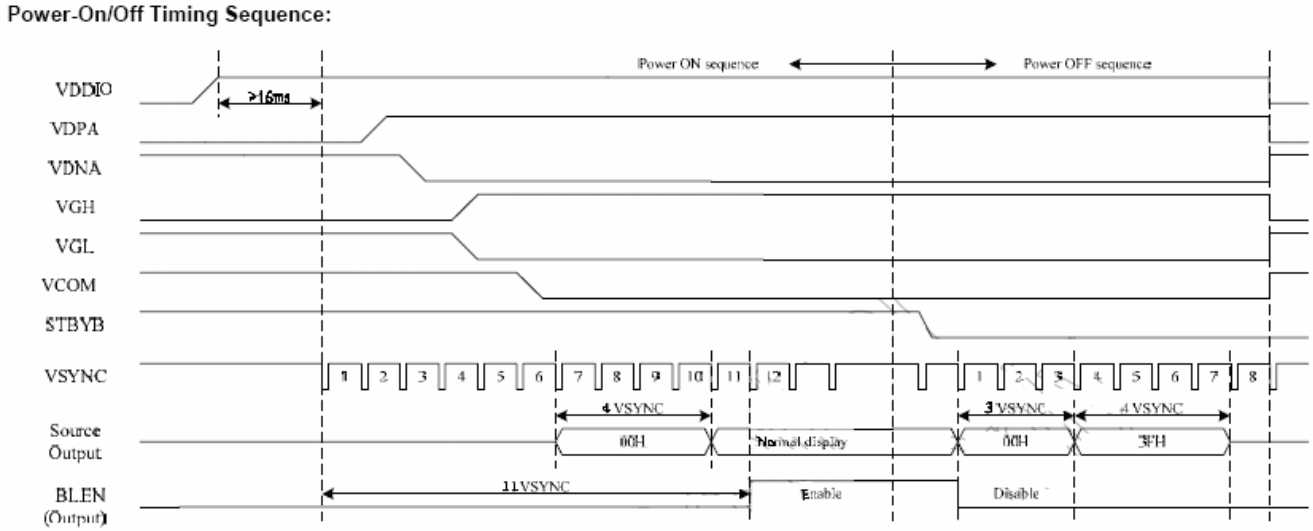


B. Input Timing Setting

Parameter	Symbol	Min.	Typ.	Max.	Unit.	Remark
DCLK frequency	Fdclk	52	65	71	MHz	Frame rate=60Hz
Hsync period (= Thd + Thbl)	Th	1114	1344	1400	DCLK	
Active Area	Thd	--	1024	--	DCLK	
Horizontal blanking	Thbl	90	320	376	DCLK	
Vsync period (= Tvd + Tvbl)	Tv	778	806	845	Th	
Active lines	Tvd	--	768	--	Th	
Vertical blanking	Tvbl	10	38	77	Th	

c. Recommended Power On/OFF Sequence

Power-On/Off Timing Sequence:



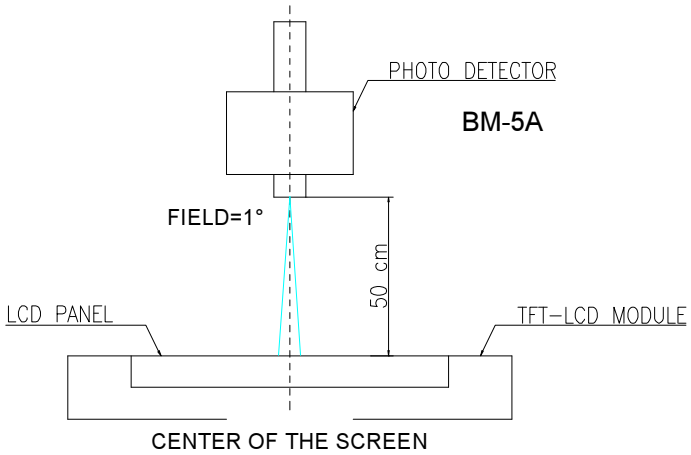
D. Optical Specification

All optical specification is measured under typical condition (Note 1, 2)

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Response Time Rise Fall		Tr Tf	θ=0°	-- --	15 10	18 12.5	ms ms	Note 3
Contrast ratio		CR	At optimized viewing angle		700	--		Note 4
Viewing Angle	Top Bottom Left Right		CR≧10		75 75 55 55		deg.	Note 5
Brightness		Y_L	V_L = 12V	240	300	--	cd/m^2	Note 6
Chromaticity	White	X	θ=0°	0.26	0.31	0.36		
		Y	θ=0°	0.26	0.31	0.36		
	Red	X	θ=0°	TBD	TBD	TBD		
		Y	θ=0°	TBD	TBD	TBD		
	Green	X	θ=0°	TBD	TBD	TBD		
		Y	θ=0°	TBD	TBD	TBD		
	Blue	X	θ=0°	TBD	TBD	TBD		
		Y	θ=0°	TBD	TBD	TBD		
Uniformity		ΔY_L	%	70	75	--	%	Note 7

Note 1 : To be measured in the dark room. Ambient temperature =25℃, and LED lightbar current I_L = 180mA.

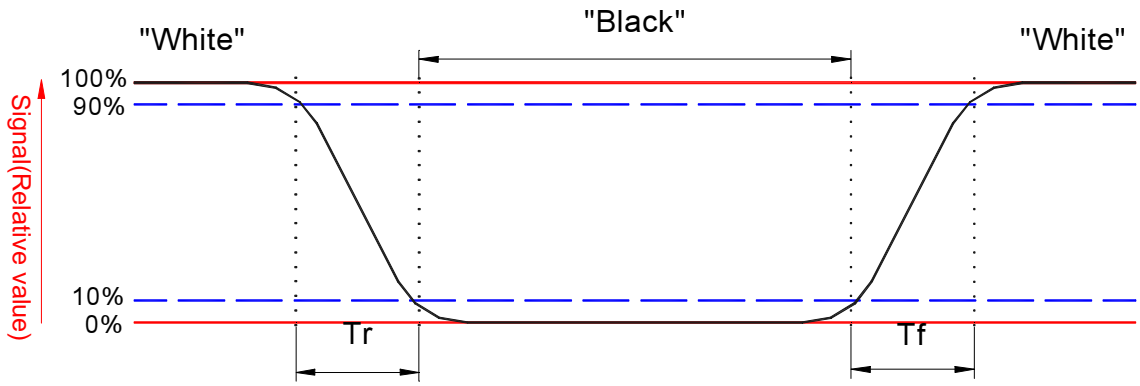
Note 2 :To be measured on the center area of panel with a viewing cone of 1°by Topcon luminance meter BM-5A, after 15 minutes operation.



Note 3: 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.

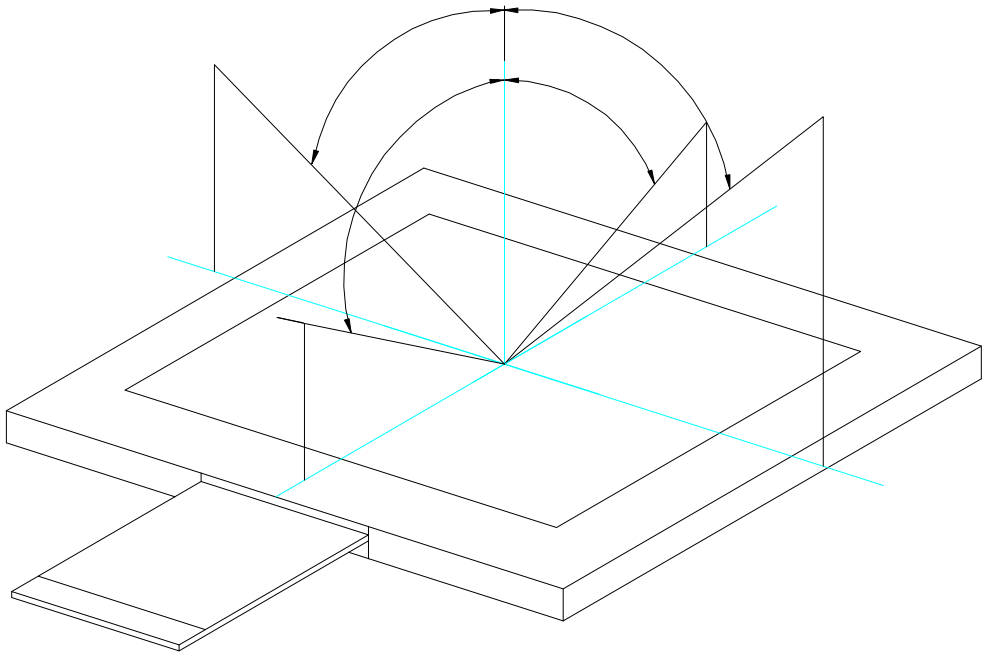


Note 4.Definition of contrast ratio:

Contrast ratio is calculated with the following formula.

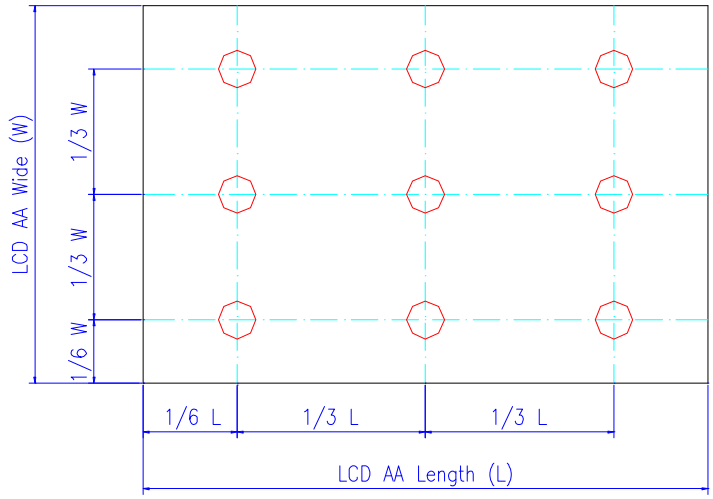
$$\text{Contrast ratio (CR)} = \frac{\text{Photo detector output when LCD is at "White" status}}{\text{Photo detector output when LCD is at "Black" status}}$$

Note 5. Definition of viewing angle, θ, Refer to figure as below.



Note 6. Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

Note 7: Luminance Uniformity of these 9 points is defined as below:



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

E. Reliability Test Items

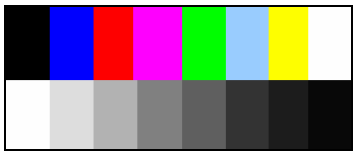
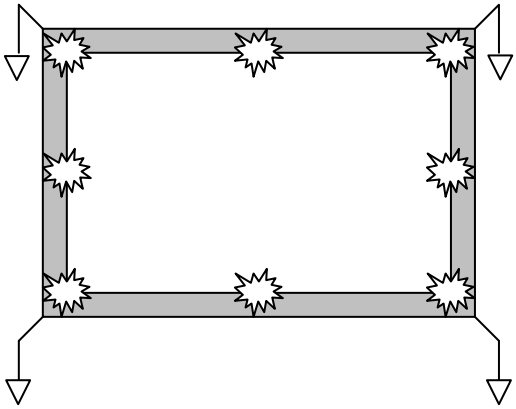
No.	Test items	Conditions	Remark
1	High Temperature Storage	Ta= 60□ 240Hrs	
2	Low Temperature Storage	Ta= -20□ 240Hrs	
3	High Ttemperature Operation	Tp= 50□ 240Hrs	
4	Low Temperature Operation	Ta= 0□ 240Hrs	
5	High Temperature & High Humidity	Tp= 40□. 90% RH 240Hrs	Operation
6	Heat Shock	-20□~60□, 100 cycle, 1Hrs/cycle	Non-operation
7	Electrostatic Discharge	Contact = ± 4 kV, class B Air = ± 8 kV, class B	Note 4
8	Image Sticking	25□, 4hrs	Note 5
9	Vibration	Frequency range : 10~55Hz Stoke : 1.5mm Sweep : 10 ~ 55 ~ 10Hz 2 hours for each direction of X,Y,Z (6 hours for total)	Non-operation JIS C7021, A-10 condition A : 15 minutes
10	Mechanical Shock	100G . 6ms, ±X,±Y,±Z 3 times for each direction	Non-operation JIS C7021, A-7 condition C
11	Vibration (With Carton)	Random vibration: $0.015G^2$/Hz from 5~200Hz –6dB/Octave from 200~500Hz	IEC 68-34
12	Drop (With Carton)	Height: 60cm 1 corner, 3 edges, 6 surfaces	
13	Pressure	5kg, 5sec	Note 6

Note 1: Ta: Ambient Temperature. Tp: Panel Surface Temperature

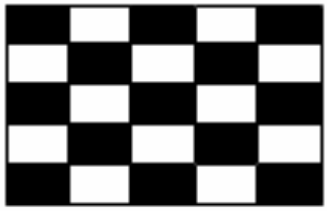
Note 2: In the standard conditions, there is not display function NG issue occurred. All the cosmetic specification is judged before the reliability stress.

Note 3: All the cosmetic specification is judged before the reliability stress.

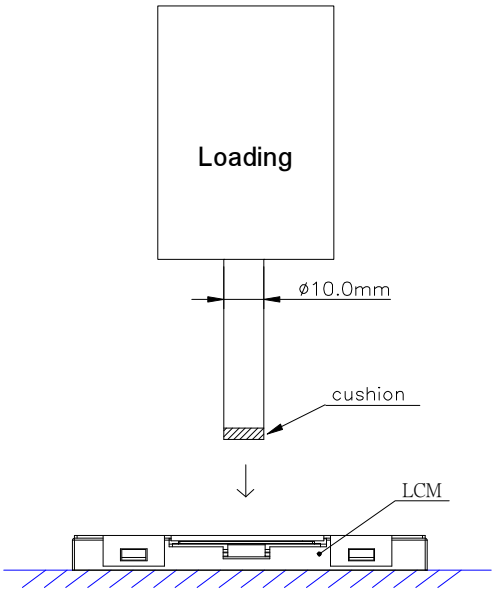
Note4 : All test techniques follow IEC6100-4-2 standard.

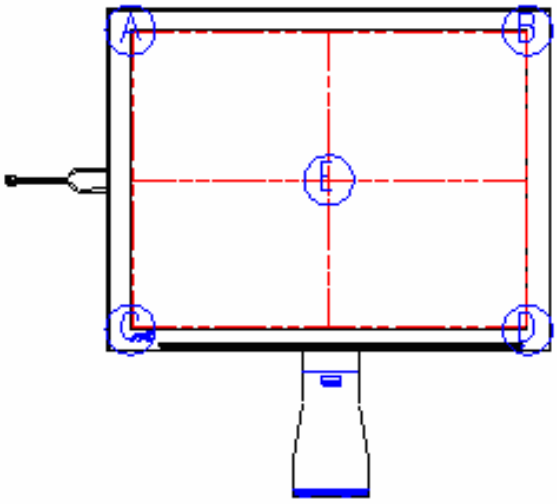
Test Condition		Note
Pattern		
Procedure And Set-up	Contact Discharge：330Ω, 150pF, 1sec, 8 point, 10 times/point Air Discharge：330Ω, 150pF, 1sec, 8 point, 10 times/point 	
Criteria	B – Some performance degradation allowed. No data lost. Self-recoverable hardware failure.	
Others	1. Gun to Panel Distance 2. No SPI command, keep default register settings.	

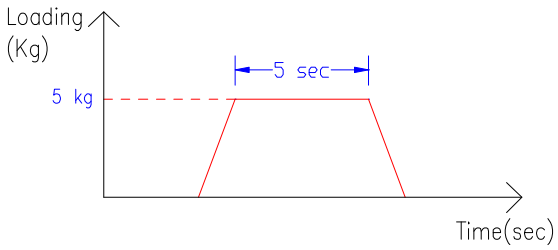
Note 5: Operate with 5x5 chess board pattern as figure and lasting time and temperature as the conditions. Then judge with 50% gray level after waiting 20 min, the mura is less than JND 2.5.



Note 6: The panel is tested as figure. The jig is ϕ 10 mm made by Cu with rubber and the loading speed is 3mm/min on position A~E. After the condition, no glass crack will be found and panel function check is OK.(no guarantee LC mura、LC bubble)





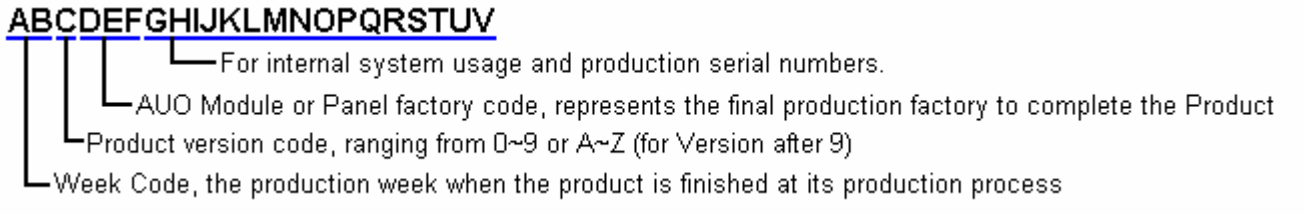


F. Packing and Marking

1. Packing Form

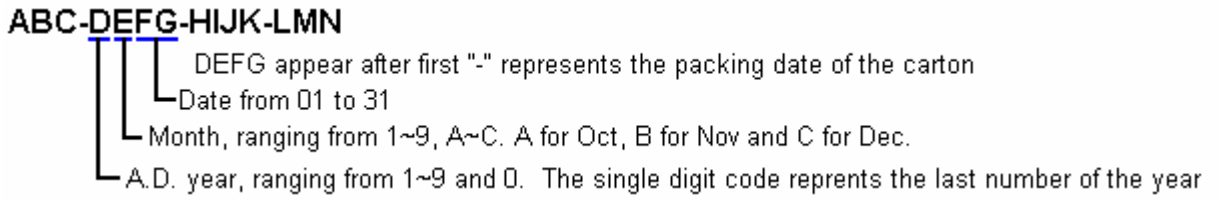
2. Module/Panel Label Information

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 and printed with code 39/128 with the following definition:



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 apparing in the following format:



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

G. Application Note

1. Application Circuit

TBD

2. CABC function block

TBD

H. Precautions

1. Do not twist or bend the module and prevent the unsuitable external force for display module during assembly.
2. Adopt measures for good heat radiation. Be sure to use the module with in the specified temperature.
3. Avoid dust or oil mist during assembly.
4. Follow the correct power sequence while operating. Do not apply the invalid signal, otherwise, it will cause improper shut down and damage the module.
5. Less EMI: it will be more safety and less noise.
6. Please operate module in suitable temperature. The response time & brightness will drift by different temperature.
7. Avoid to display the fixed pattern (exclude the white pattern) in a long period, otherwise, it will cause image sticking.
8. Be sure to turn off the power when connecting or disconnecting the circuit.
9. Polarizer scratches easily, please handle it carefully.
10. Display surface never likes dirt or stains.
11. A dewdrop may lead to destruction. Please wipe off any moisture before using module.
12. Sudden temperature changes cause condensation, and it will cause polarizer damaged.
13. High temperature and humidity may degrade performance. Please do not expose the module to the direct sunlight and so on.
14. Acetic acid or chlorine compounds are not friends with TFT display module.
15. Static electricity will damage the module, please do not touch the module without any grounded device.
16. Do not disassemble and reassemble the module by self.
17. Be careful do not touch the rear side directly.
18. No strong vibration or shock. It will cause module broken.
19. Storage the modules in suitable environment with regular packing.
20. Be careful of injury from a broken display module.
21. Please avoid the pressure adding to the surface (front or rear side) of modules, because it will cause the display non-uniformity or other function issue.