SPECIFICATION

PRODUCT NO. : *X050DTLN-55*

VERSION **: Ver 1.0**

FOR CUSTOMER：_____

□: **APPROVAL FOR SPECIFICATION**

■: **APPROVAL FOR SAMPLE**

DATE	APPROVED BY

1. Record of Revision

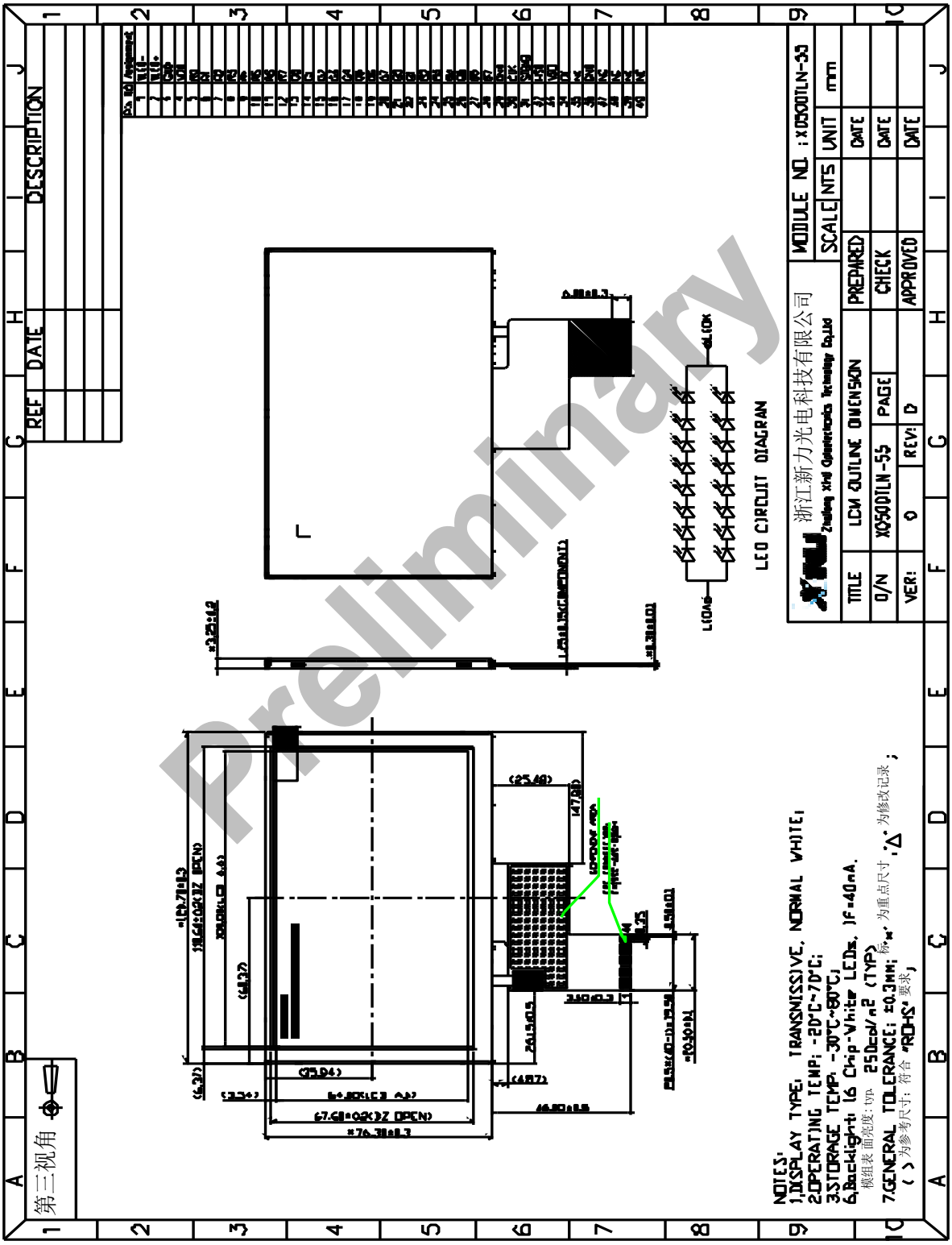
Revision	Description	Date
1.0	Initial Release	2015/6/15

2. General Description and Features

The 5.0 inch Module named X050DTLN-55 is a-Si TFT-LCD module, which is the type of transmissive. It is consisted of TFT-LCD Panel, one Driver IC, one FPC and one Back-Light unit. Features of this product are listed in the following table.

NO	Item	Contents	Unit
(1)	Module Outline	120.7(H)*76.3(V)*3.25(T)	mm
(2)	LCD Active area	108(H)*64.8(V)	mm
(3)	Dot Number	800*3(RGB)*480	/
(4)	Dot size	0.135(H)*0.135(V)	mm
(5)	LCD type	TFT Transmissive	/
(6)	Display Color	262K	/
(7)	Viewing direction	ALL(O-FILM)	O'clock
(8)	Backlight Type	16 Chip-White LEDs	/
(9)	Power Supply	3.3(TYP)	V
(10)	Drive IC	Source: ILI6122 Gate: ILI5960	/
(11)	Interface	FPC 0. 5mm_Pitch 40pin	/
(12)	Interface type	24 bit RGB interface	/
(13)	Module weight	TBD	g

3. Mechanical Dimension



4. Interface Pin Connection

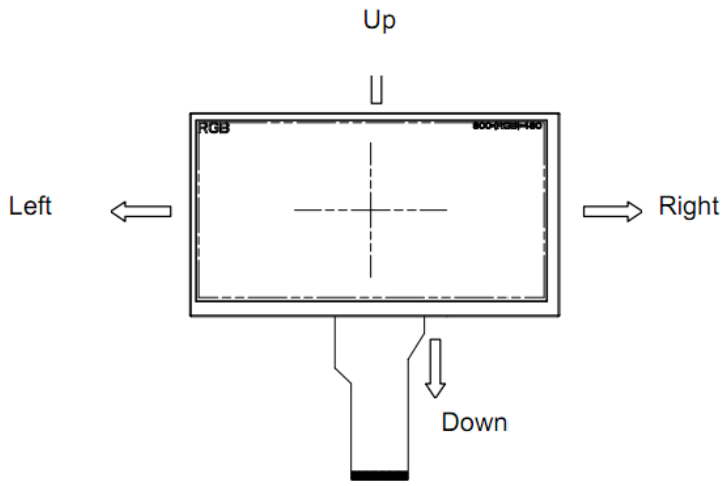
No.	Symbol	I/O	Function	Remark
1	VLED-	P	Power supply for LED-K	
2	VLED+	P	Power supply for LED-A	
3	GND	P	Ground	
4	VDD	P	Power supply for the system(3.3V)	
5	R0	I	Red Data input 0	
6	R1	I	Red Data input 1	
7	R2	I	Red Data input 2	
8	R3	I	Red Data input 3	
9	R4	I	Red Data input 4	
10	R5	I	Red Data input 5	
11	R6	I	Red Data input 6	
12	R7	I	Red Data input 7	
13	G0	I	Green Data input 0	
14	G1	I	Green Data input 1	
15	G2	I	Green Data input 2	
16	G3	I	Green Data input 3	
17	G4	I	Green Data input 4	
18	G5	I	Green Data input 5	
19	G6	I	Green Data input 6	
20	G7	I	Green Data input 7	
21	B0	I	Blue Data input 0	
22	B1	I	Blue Data input 1	
23	B2	I	Blue Data input 2	
24	B3	I	Blue Data input 3	
25	B4	I	Blue Data input 4	
26	B5	I	Blue Data input 5	
27	B6	I	Blue Data input 6	
28	B7	I	Blue Data input 7	
29	GND	P	Ground	
30	DCLK	I	Write signal and Write data out when it is low	

31	STBYB	I	Standby mode control.	
32	HSYNC	I	Horizontal Synchronous Signal	
33	VSYNC	I	Vertical Synchronous Signal	
34	DEN	I	Data Enable	
35	NC	-	Not Connect	
36	GND	P	Ground	
37	NC	-	Not Connect	
38	NC	-	Not Connect	
39	NC	-	Not Connect	
40	NC	-	Not Connect	

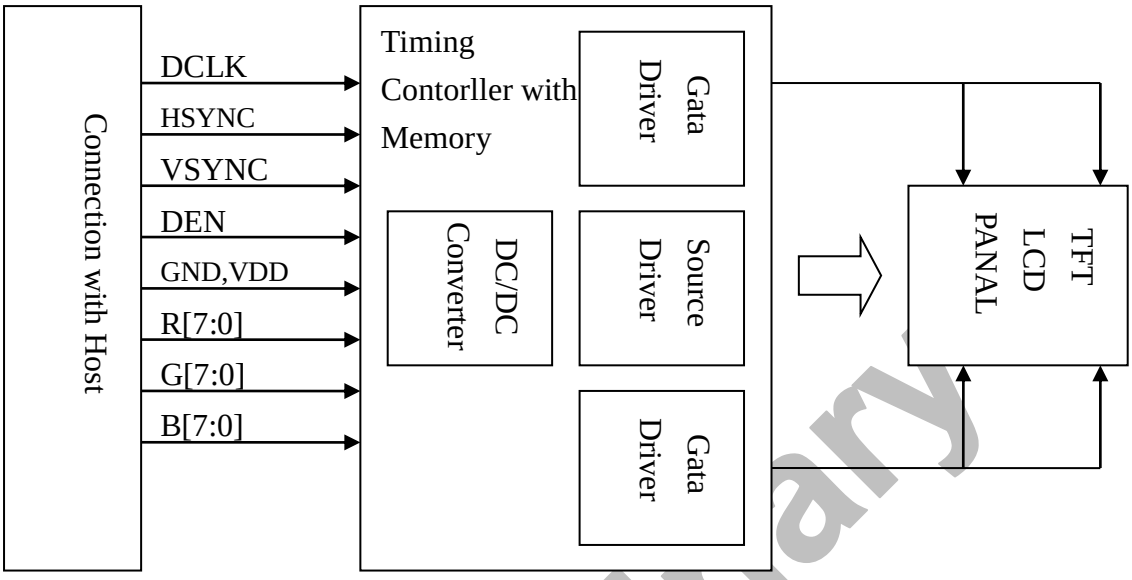
Note: scanning mode:

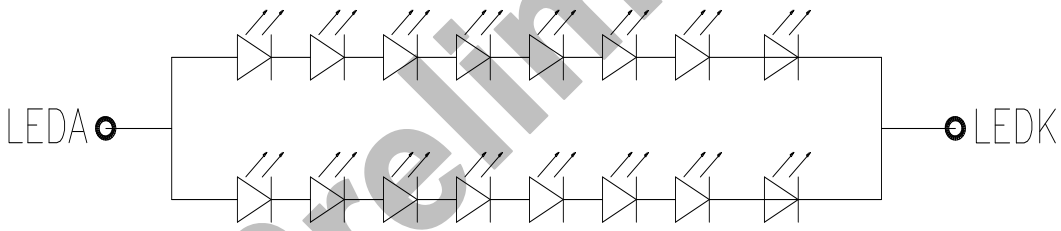
Down to Up

Right to Left



5. Block Diagram





LED CIRCUIT DIAGRAM

6. Maximum Rating

Item	Symbol	Rating	Unit
Operating temperature	Top	-20 to 70	℃
Storage temperature	Tst	-30 to 80	℃
power supply	VDD	-0.3V ~ 4.6	V

NOTE:

If the module was used these absolute maximum ratings as above, it may be damaged permanently. Using the module within the following electrical characteristic conditions are also exceeded, the module will malfunction and cause poor reliability. VDD>GND must be maintained.

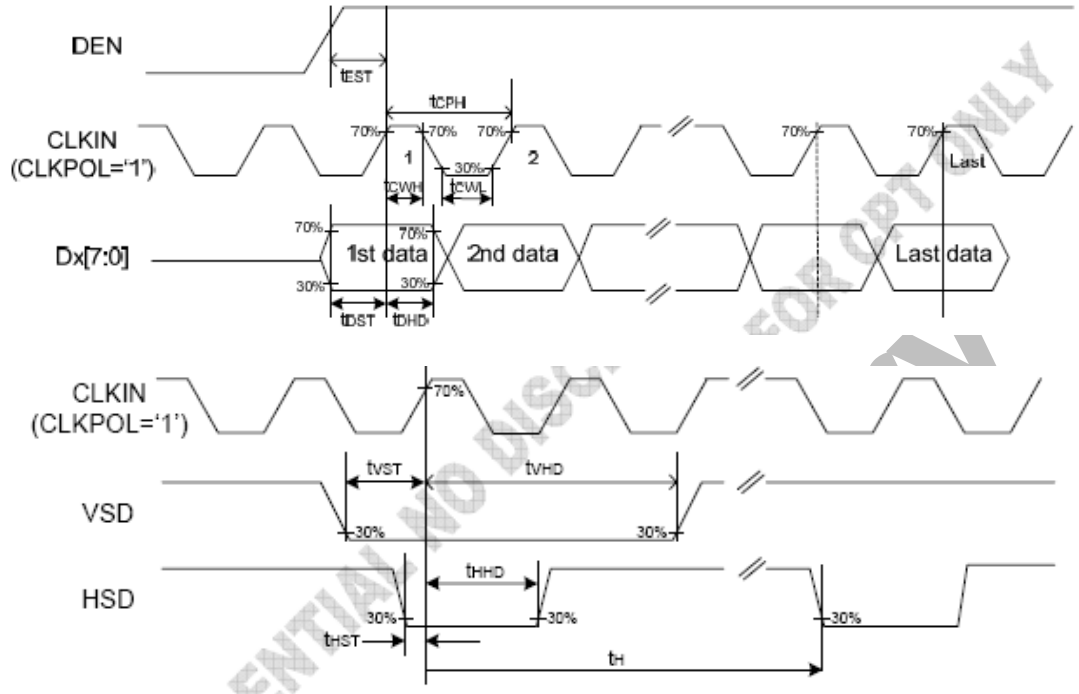
7. Electrical Characteristics

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
power supply		VDD	-	3.0	3.3	3.6	V
Logic input signal Voltage	H level	V_{IH}		0.7*VDD	-	VDD	V
	L level	V_{IL}		GND	-	0.3*VDD	V

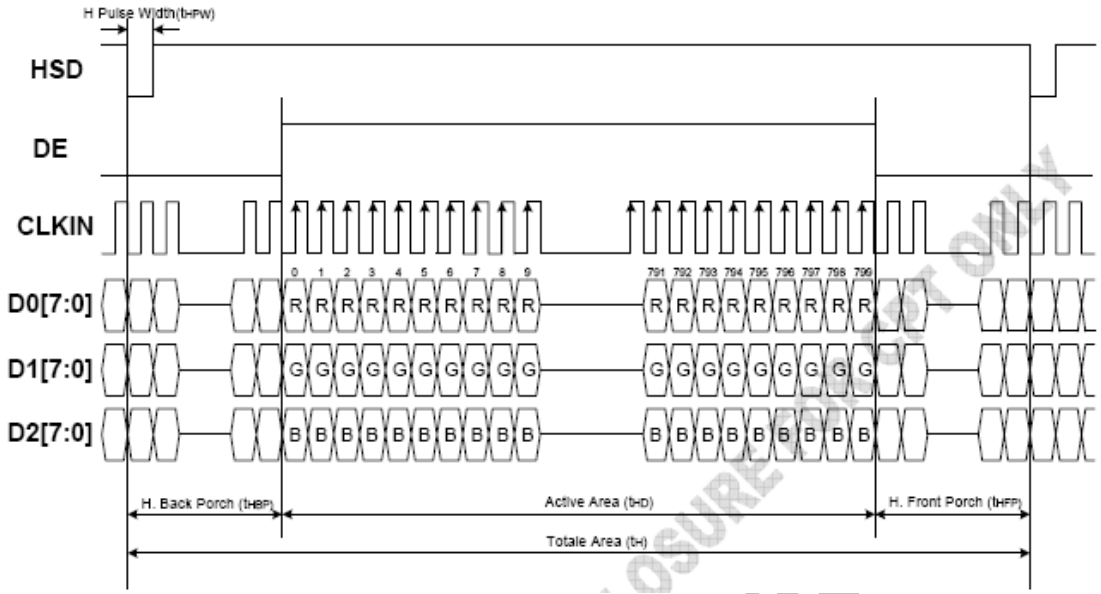
8. Backlight Characteristics

Item	syb	Min	Typ	Max	Unit	Condition
Voltage	Vf	21.6	22.4	24	V	IF=40mA
Number of LED	-	16			pcs	-
Power Consumption	PWF	864	896	960	mW	-
Connection mode	P&S	2P8S			-	-
LED life-span	-	-	(20000)	-	Hrs	-

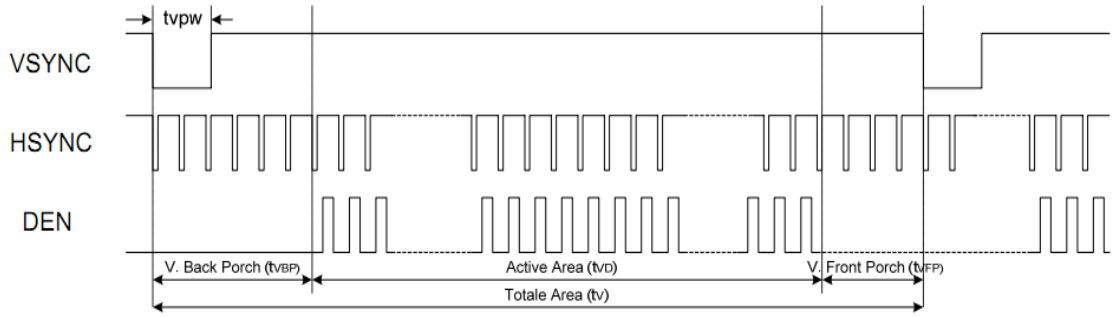
9. AC Electrical Characteristics



Parameter	Symbol	SPEC			Unit	Conditions
		Min.	Typ.	Max.		
DCLK cycle timeh	Tcph	20	-	-	ns	
DCLK pulse duty	Tcwh	40	50	60	%	
VSD setup time	Tvst	8	-	-	ns	
VSD hold time	Tvhd	8	-	-	ns	
HSD setup time	Thst	8	-	-	ns	
HSD hold time	Thhd	8	-	-	ns	
Data setup time	Tdsu	8	-	-	ns	R[7:2], G[7:2], B[7:2] to DCLK
Data hold time	Tdhd	8	-	-	ns	R[7:2], G[7:2], B[7:2] to DCLK
DEN setup time	Tesu	8	-	-	ns	
DEN hold time	Tehd	8	-	-	ns	
CLKIN frequency	Fclk	-	33.3	50	MHz	VDD=3.0 ~ 3.6V

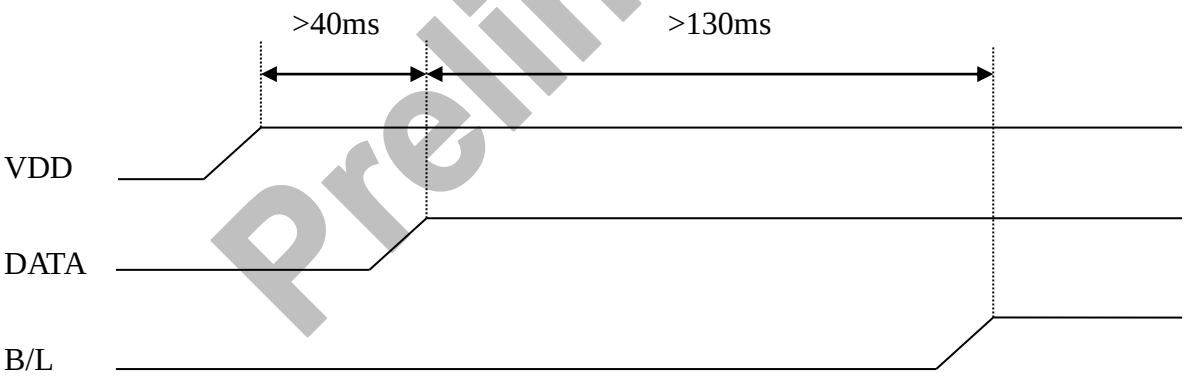


Horizontal Input Timing						
Parameter		Symbol	Value			Unit
			Min.	Typ.	Max.	
Horizontal display area		t_{HD}	-	800	-	DCLK
DCLK frequency		f_{CLK}	-	33.3	50	MHz
1 Horizontal line period		t_H	862	1056	1200	DCLK
HSYNC pulse width	Min.	t_{HPW}	-	1	-	DCLK
	Typ.		-	-	-	DCLK
	Max.		-	40	-	DCLK
HSYNC back porch	SYNC	t_{HBP}	46	46	46	DCLK
HSYNC front porch	SYNC	t_{HFP}	16	210	354	DCLK

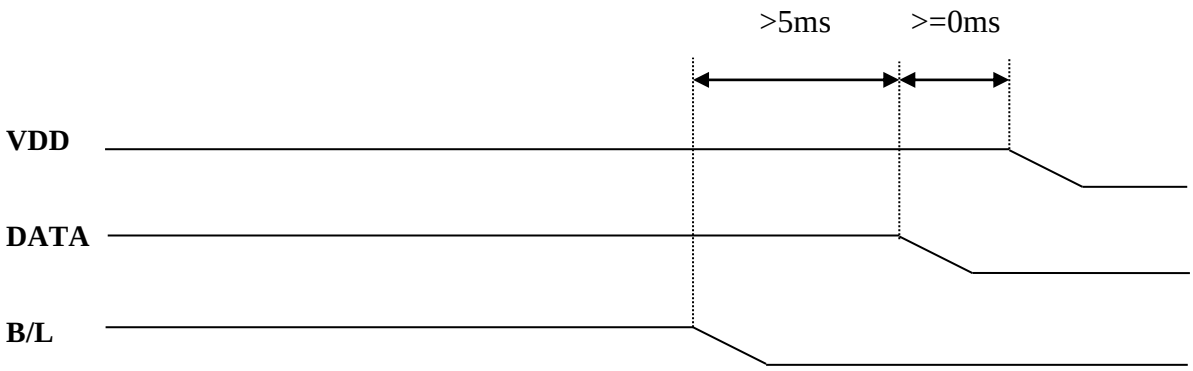


Vertical Input Timing					
Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Vertical display area	t_{VD}	-	480	-	HSYNC
VSD period time	t_V	510	525	650	HSYNC
VSD pulse width	t_{VPW}	1	-	20	HSYNC
VSD back porch	t_{VBP}	23	23	23	HSYNC
VSD front porch	tV_{FP}	7	22	147	HSYNC

Power on sequence



Power OFF sequence



Note: Data include R0~R7, B0~B7, G0~G7, DCLK, HSYNC,VSYNC,DEN

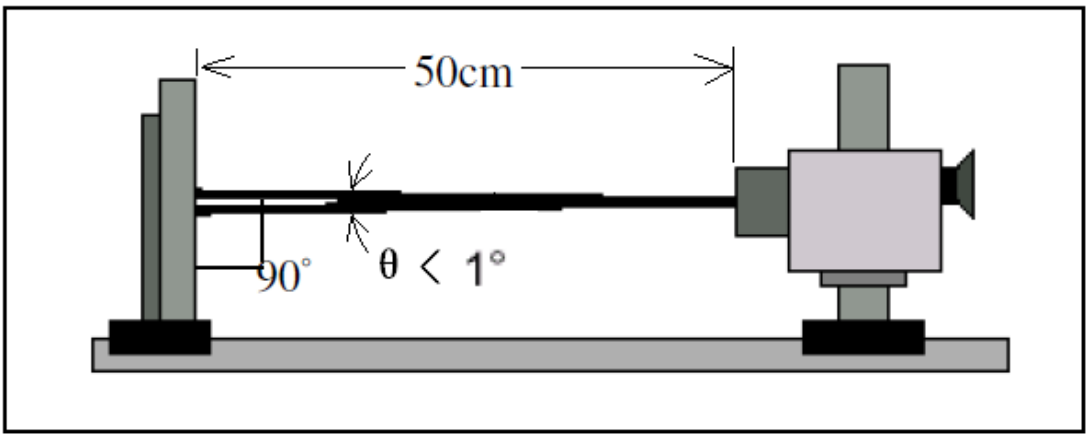
10. Electro-Optical Characteristics

Item		Symbol	Condition	Min	Typ	Max	Unit	Note
Transmission (with pol)		T		-	4.66	-	%	
Response time		Tr	θ =0°	-	2	-	ms	4
		Tf	∅=0°	-	6	-	ms	
Uniformity （Five point）		δ WHITE	Ta=25℃	-	75	-	%	7
Contrast ratio		Cr		-	500	-	-	3 ,5
Surface Luminance		Lv		-	250	-	-	3 ,7
Viewing angle range		θ	∅ = 90°	-	(75)	-	deg	6
			∅ = 270°	-	(75)	-	deg	
			∅ = 0°	-	(75)	-	deg	
			∅ = 180°	-	(75)	-	deg	
Color filter chromaticity (x, y)	White	X	θ = ϕ = 0°	TBD	TBD	TBD	−	7
		Y		TBD	TBD	TBD		
	Red	X	θ = ϕ = 0°	TBD	TBD	TBD		
		Y		TBD	TBD	TBD		
	Green	X	θ = ϕ = 0°	TBD	TBD	TBD		
		Y		TBD	TBD	TBD		
	Blue	X	θ = ϕ = 0°	TBD	TBD	TBD		
		Y		TBD	TBD	TBD		
NTSC		S	-	-	50	-	%	

Note 1: Ambient temperature=25℃±2℃

Note 2: To be measured in the dark room with backlight unit.

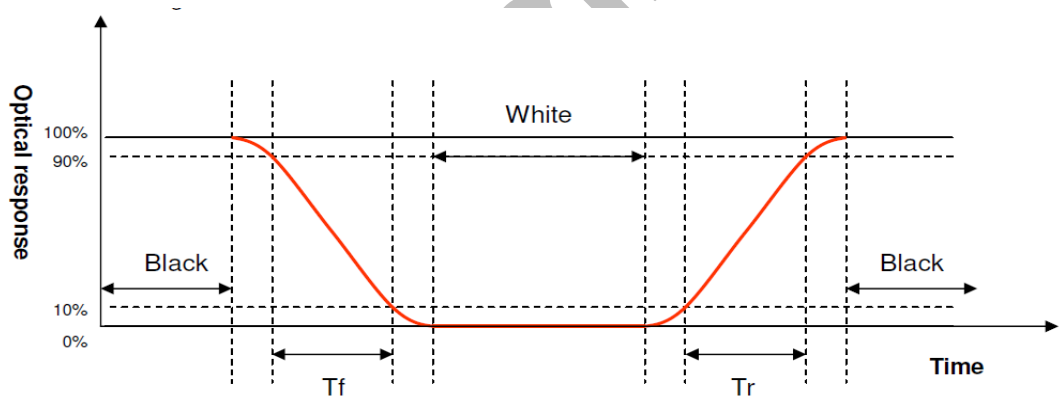
Note 3: To be measured at the center area of panel with a viewing cone of 1 by Topcon luminance meter BM-7A, after 10 minutes operation (module).



Note 4: Definition of response time:

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

Refer to figure as below.



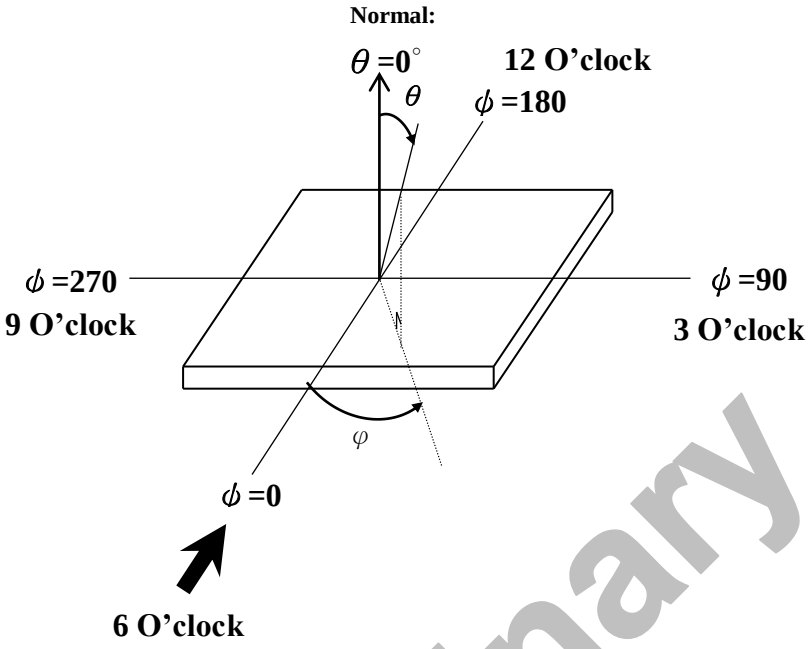
Note 5. Definition of contrast ratio:

Contrast ratio is calculated with the following formula:

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

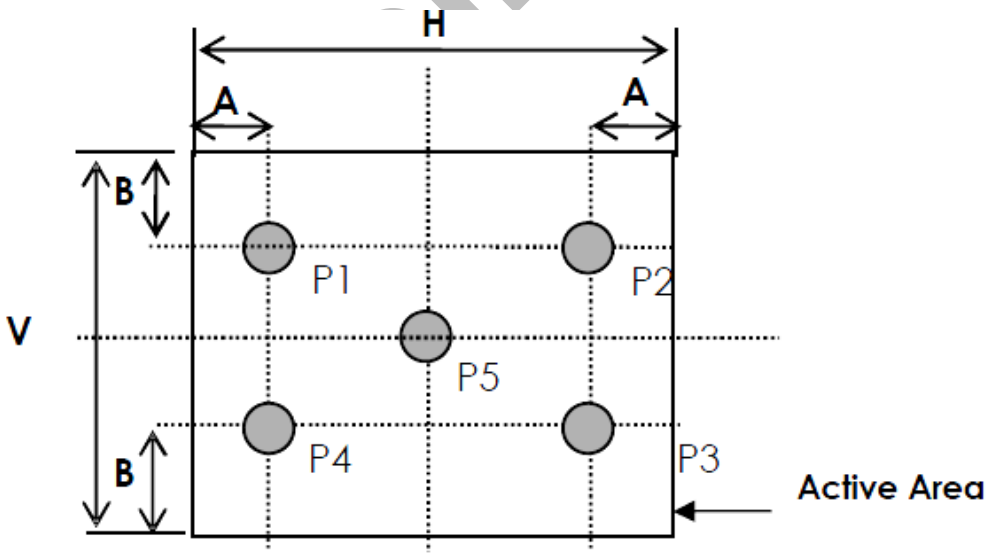
Note 6. Definition of viewing angle

Viewing angle is the angle at which the contrast ratio is greater than 2, for TFT module the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface.



Note 7. Surface luminance is the LCD surface from the surface with all pixels displaying white. Refer to figure as below.

Measuring method for Contrast ratio, surface luminance, Luminance uniformity， CIE (x, y) chromaticity



A : 5 mm B : 5 mm H,V : Active Area

Light spot size Æ=7mm, 500mm distance from the LCD surface to detector lens

measurement instrument is TOPCON's luminance meter BM-7A

Uniformity definition= [min of 5point/max of 5points]x100%

Lv = Average Surface Luminance with all white pixels (P_1, P_2, P_3, P4, P_5)

11.Precautions for Operation and Storage

1. Precautions for Operation (1)Since LCD panel made of glass,in order to prevent from glass broken or color tone change,please do not apply any mechanical shock or impact or excessive force to it when installing the LCD module. (2)If LCD panel is broken and liquid crystal substance leaks out and contact your skin or clothes,please immediately wash it off by using soap and water. (3)The polarizer on the LCD surface is soft and easily scratched.Please be careful when handling. (4)If LCD surface becomes contaminated,please wipe it off gently by using mois ten soft cloth with normal hexane,do not use acetone,ketone,ethanol, alcohol or water.If there is saliva or water on the LCD surface,please wipe it off immediate ly. (5)When handing LCD module,please be sure that the body and the tools are properly grounded.And do not touch I/F pins with bare hands or contaminate I/F pins. (6)Do not attempt to disassemble or process the LCD module. (7)LCD module should be used under recommended operating conditions shown in chapter 6 and 7. (8)Response time will be extremely slower at lower temperature than at specified temperature and LCD will show different color when at higher temperature.The phenomenon will disappear when returning to specified condition. (9)Foggy dew,moisture condensation or water droplets deposited on surface and contact terminals will cause polarizer stain or damage,the deteriorated display quality and electrochemical reaction then leads to the shorter life time and permanent damage to the module probably.Please pay attention to the enviro nmental temperature and humidity. 2. Precautions for Storage (1)Please store LCD module in a dark place,avoid exposure to sunlight,the light of fluorescent lamp or any ultraviolet ray. (2)Keep the environment temperature at between 10℃and 35 ℃ and at normal humidity.Avoid high

temperature,high humidity or temperature below 0℃.

(3)That keeps the LCD modules stored in the container shipped from supplier be fore using them is recommended.