SPECIFICATION

PRODUCT NO. : TCXD030IBLON-1
VERSION : Ver 1.0
ISSUED DATE : 2022-3-31

FOR CUSTOMER： _____

■：APPROVAL FOR SPECIFICATION
□：APPROVAL FOR SAMPLE

DATE	APPROVED BY

Xinli Optoelectronics ：

Presented by	Reviewed by	Organized by

Note:

1.Xinli Optoelectronics reserves the right to make changes without further notice to any products herein to improve reliability, function or design.

1. Revision Recode

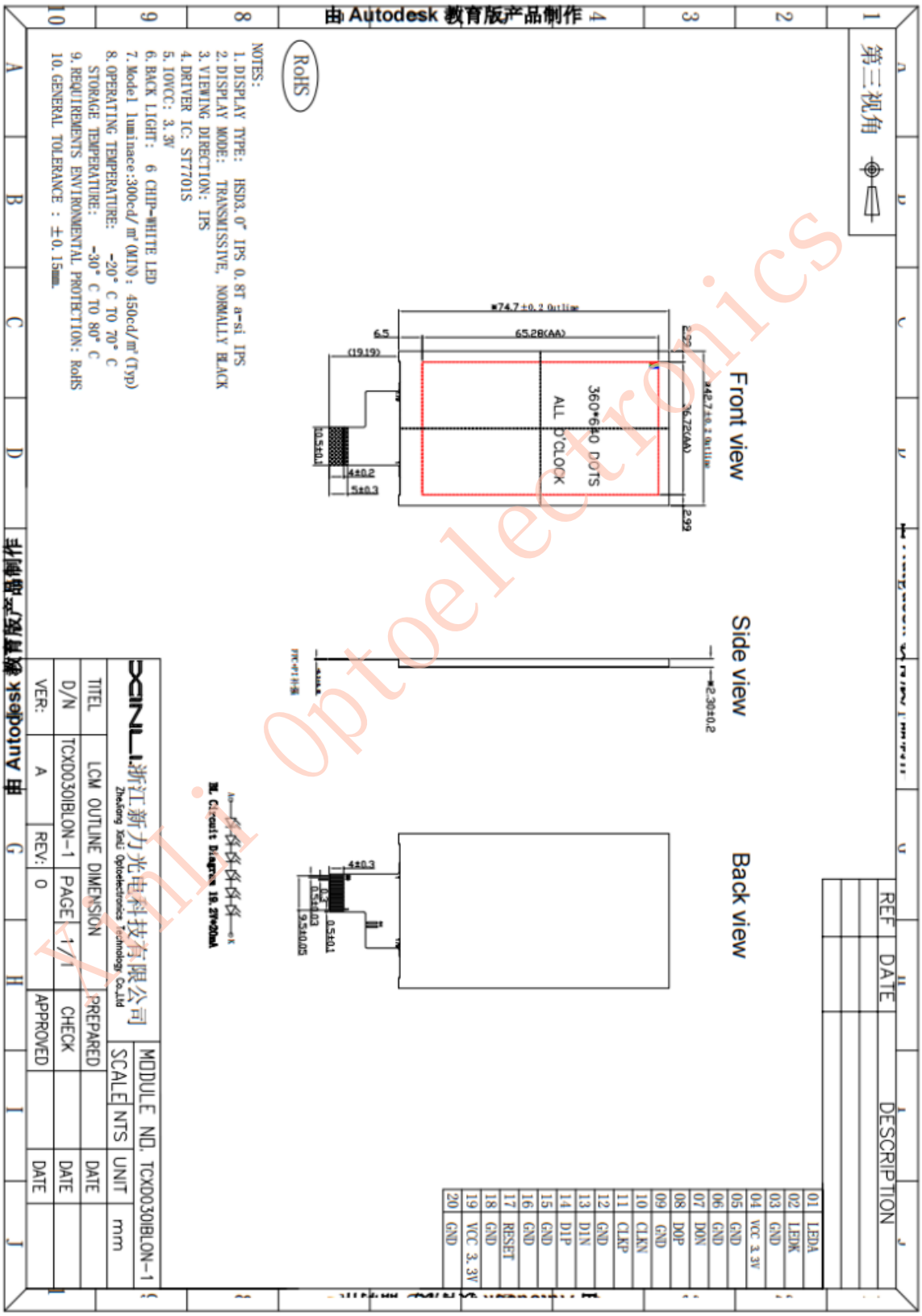
Revision	Description	Date
1.0	Initial Release	2022/3/31

2. General Description and Features

The 3.0 inch Module named TCXD030IBLON-1 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. Features of this product are listed in the following table.

NO	Item	Contents	Unit
(1)	Module Outline	42.7(H)*74.7(V)*2.3(T)	mm
(2)	LCD Active area	36.72(H)*65.28(V)	mm
(3)	Dot Number	360(RGB)*640(V)	/
(4)	Dot size	28.75*86.25	um
(5)	LCD type	TFT Transmissive	/
(6)	Display Color	16.7M	/
(7)	Viewing direction	ALL	O'clock
(8)	Power Supply	3.3(TYP)	V
(9)	Interface type	2-laneMIPI	/
(10)	Module weight	TBD	g

3. Mechanical Dimension

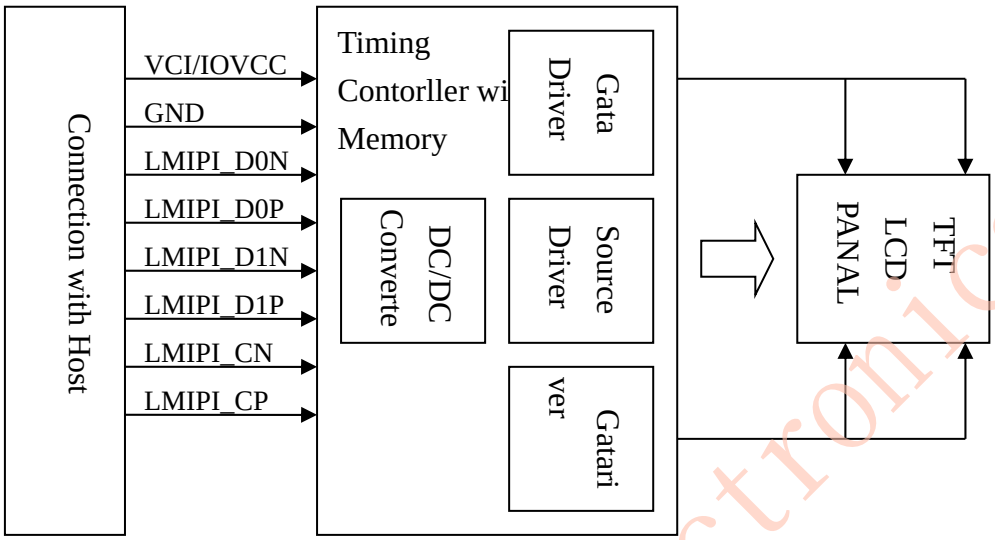


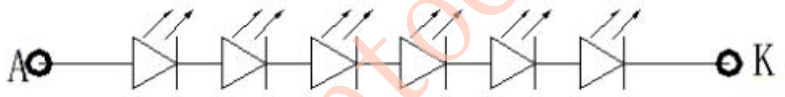
4. Interface Pin Connection

LCM interface Pin

No.	Symbol	I/O	Function	Remark
1	LEDA	P	Backlight anode	
2	LEDK	P	Backlight ground	
3	GND	P	Ground	
4	VCC(3.3V)	P	POWER(3.3V)	
5	GND	P	Ground	
6	GND	P	Ground	
7	D0N	P	MIPI-DSI data Lane 0 negative-end input/output pin	
8	DOP	I	MIPI-DSI data Lane 0 positive-end input/output pin	
9	GND	P	Ground	
10	CLKN	I	MIPI-DSI clock Lane negative-end input pin	
11	CLKP	I	MIPI-DSI clock Lane positive-end input pin	
12	GND	P	Ground	
13	D1N	I	MIPI-DSI data Lane 1 negative-end input/output pin	
14	D1P	I	MIPI-DSI data Lane 1 positive-end input/output pin	
15	GND	P	Ground	
16	GND	P	Ground	
17	RESET	I	Reset signal	
18	GND	P	Ground	
19	VCC(3.3V)	P	POWER(3.3V)	
20	GND	P	Ground	

5. Block Diagram





BL Circuit Diagram 19.2V*20mA

6. Maximum Rating

Item	Symbol	Rating	Unit
Operating temperature	Top	-20 to 70	℃
Storage temperature	Tst	-30 to 80	℃
power supply	VCC	-0.3 ~ +4.6V	V
Supply Voltage (Logic)	IOVCC	-0.3 ~ +4.6V	V

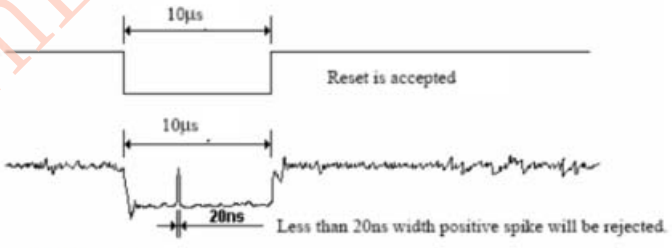
7. Electrical Characteristics

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Voltage		VCI	-	2.5	2.8	3.6	V
Supply Voltage (Logic)		IOVCC		1.65	1.8	3.6	V
Logic input signal Voltage	H level	V_{IH1}	-	0.7*IOVCC	-	IOVCC	V
	L level	V_{IL1}		GND	-	0.3*IOVCC	V

8.Backlight Characteristics

Item	syb	Min	Typ	Max	Unit	Condition
Voltage	Vin	16.8	19.2	19.8	V	-
Led current	Iled	-	20	-	mA	
Number of LED	-	6			pcs	

9.Timing Characteristics



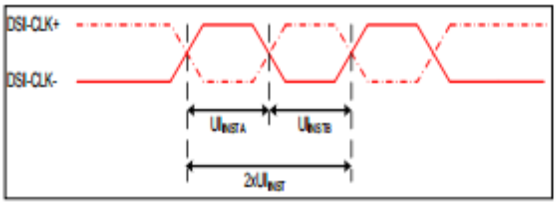
5. When Reset applied during Sleep In Mode.

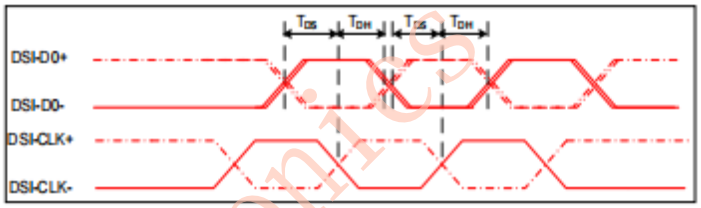
6. When Reset applied during Sleep Out Mode.

7. It is necessary to wait 5msec after releasing RESX before sending commands. Also Sleep Out command cannot be sent for 120msec.

10.Electro-Optical Characteristics

10.1 High Speed Mode

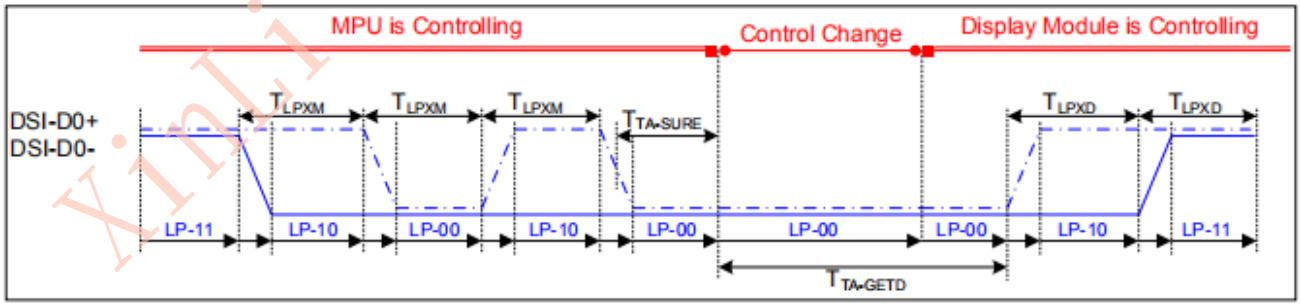


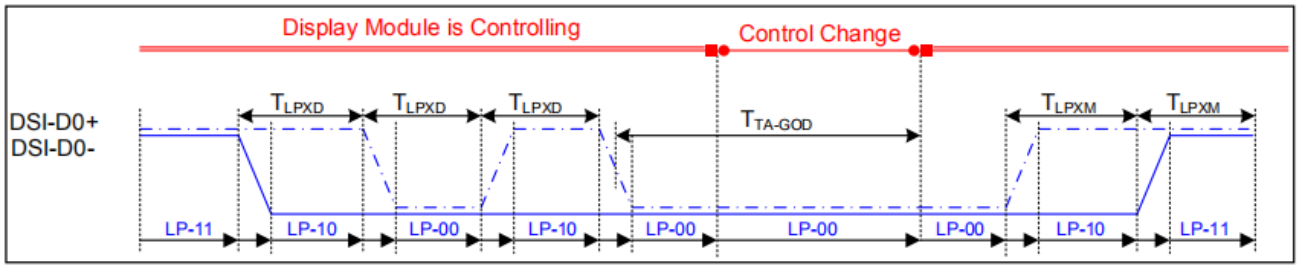


VDDI=1.8,VDD=2.8, AGND=DGND=0V, Ta=25 ℃

Signal	Symbol	Parameter	MIN	MAX	Unit	Description
DSI-CLK+/-	$2xUI_{INSTA}$	Double UI instantaneous	2.5	25	ns	
DSI-CLK+/-	UI_{INSTA} UI_{INSTB}	UI instantaneous halfs	1.25	12.5	ns	UI = UI_{INSTA}= UI_{INSTB}
DSI-Dn+/-	tDS	Data to clock setup time	0.15	-	UI	
DSI-Dn+/-	tDH	Data to clock hold time	0.15	-	UI	

10.2 Lowe Power Mode





VDDI=1.8, VDD=2.8, AGND=DGND=0V, Ta=25 ℃

Signal	Symbol	Parameter	MIN	MAX	Unit	Description
DSI-D0+/-	TLPXM	Length of LP-00,LP-01, LP-10 or LP-11 periods MPU→Display Module	50	75	ns	Input
DSI-D0+/-	TLPXD	Length of LP-00,LP-01, LP-10 or LP-11 periods MPU→Display Module	50	75	ns	Output
DSI-D0+/-	TTA-SURED	Time-out before the MPU start driving	T_{LPXD}	$2xT_{LPXD}$	ns	Output
DSI-D0+/-	TTA-GETD	Time to drive LP-00 by display module	$5xT_{LPXD}$		ns	Input
DSI-D0+/-	TTA-GOD	Time to drive LP-00 after turnaround request-MPU	$4xT_{LPXD}$		ns	Output

11. Application Circuit

Please consult our technical department for detail information.

12. Initial Code

Please consult our technical department for detail information.

13. Electro-Optical Characteristics

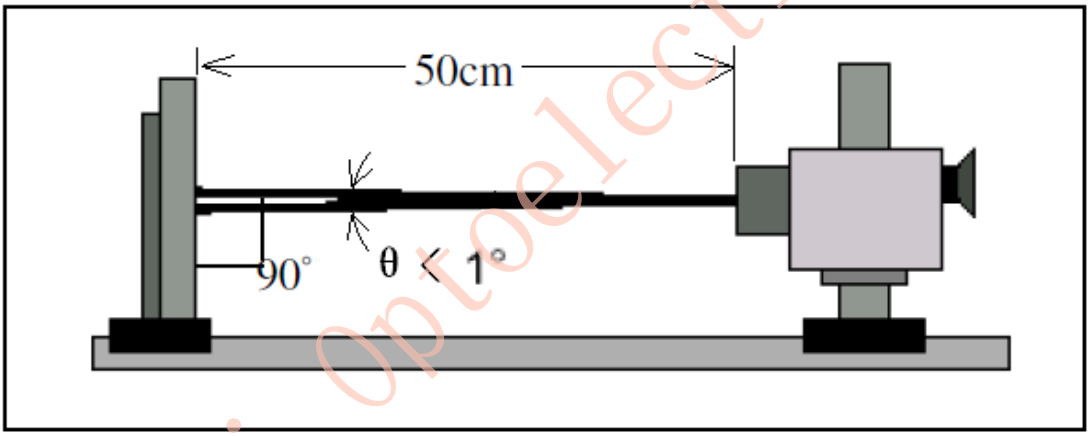
Item		Symbol	Condition	Min	Typ	Max	Unit	Note
Response time		Tr+Tf	θ =0° ∅=0° Ta=25℃	-	30	45	ms	4
Uniformity （Five point）		δ WHITE		80	-	-	%	**7**
Contrast ratio		Cr		600	800	-	-	**3 ,5**
Surface Luminance		Lv		-	400	-	-	**3 ,7**
Viewing angle range		θ	∅ = 90°	-	80	-	deg	**6**
			∅ = 270°	-	80	-	deg	
			∅ = 0°	-	80	-	deg	
			∅ = 180°	-	80	-	deg	
	White	X	θ = ϕ = 0°	-	TBD	-	–	**7**
		Y		-	TBD	-		

Color filter chromaticity (x, y)	Red	X	θ = ϕ = 0°	-	TBD	-		
		Y		-	TBD	-		
	Green	X	θ = ϕ = 0°	-	TBD	-		
		Y		-	TBD	-		
	Blue	X	θ = ϕ = 0°	-	TBD	-		
		Y		-	TBD	-		

Note 1: Ambient temperature=25℃±2℃

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

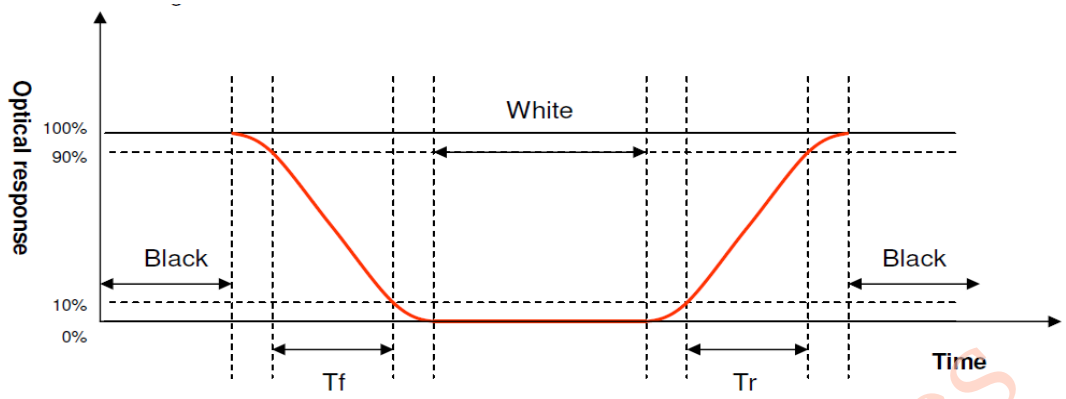
Note 3: To be measured at the center area of panel with a viewing cone of 1 by Topcon luminance meter BM-7A, after 10 minutes operation (module).



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.



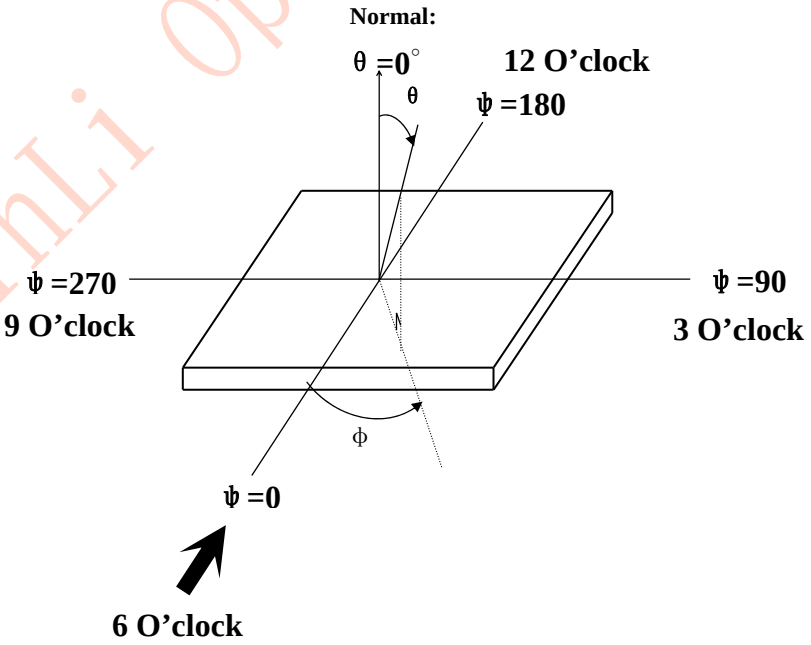
Note 5. Definition of contrast ratio:

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

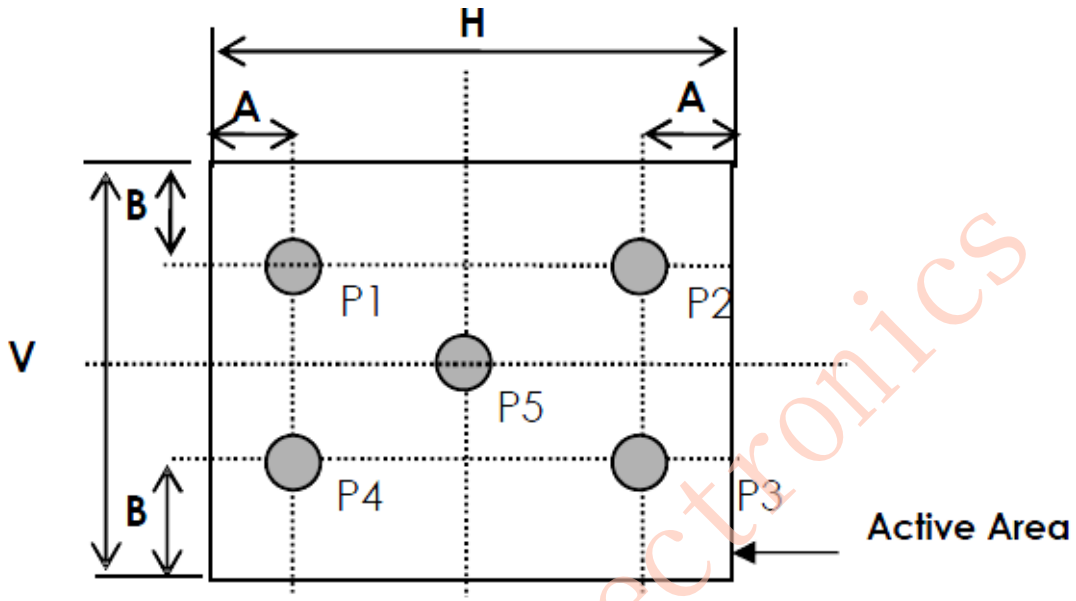
Viewing angle is the angle at which the contrast ratio is greater than 2, for TFT module the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface.



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, P_4, P_5)

14. Reliability Test

This standard reliability test is done only for the first lot of MP products. Customer and supplier must hold a discussion if other reliability test is requested by customer.

NO.	Test Item	Description	Test Condition
1	High temperature storage	Endurance test applying the high storage temperature for a long time	80℃,96 H
2	Low temperature storage	Endurance test applying the low storage temperature for a long time	-30℃,96H
3	High temperature operation	Endurance test applying the electric stress under high temperature for a long time	70℃,96H
4	Low temperature operation	Endurance test applying the electric stress under low temperature for a long time	-20℃,96H
5	High temperature /humidity operation	Endurance test applying the high temperature and high humidity storage for a long time	60℃,90% RH, 96H
6	Temperature Cycle (Non operation)	Endurance test applying the low and high temperature cycle -20℃← →70℃ 30min← →30min 12 cycle	-20℃/70℃, 12 cycles

15. 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 moisten 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 immediately.

(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 environmental 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 before using them is recommended.

(4)Do not leave any article on the LCD module surface for an extended period of time.

3. Warranty period

Warrants for a period of 12 Months from the shipping data when stored or used under normal condition.

16.Package Specification

TBD