

SPECIFICATION

CUSTOMER PART NO. : XEA-068A01-DI9509-G020

PRODUCT NO. : TCXD068IBLMT-39A

VERSION : Ver 1.2

ISSUED DATE : 2023-3-8

This module uses ROHS material

FOR CUSTOMER: _____

☐ : APPROVAL FOR SPECIFICATION

☒ : APPROVAL FOR SAMPLE

DATE	APPROVED BY

Xinli Optoelectronics :

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1. Record of Revision

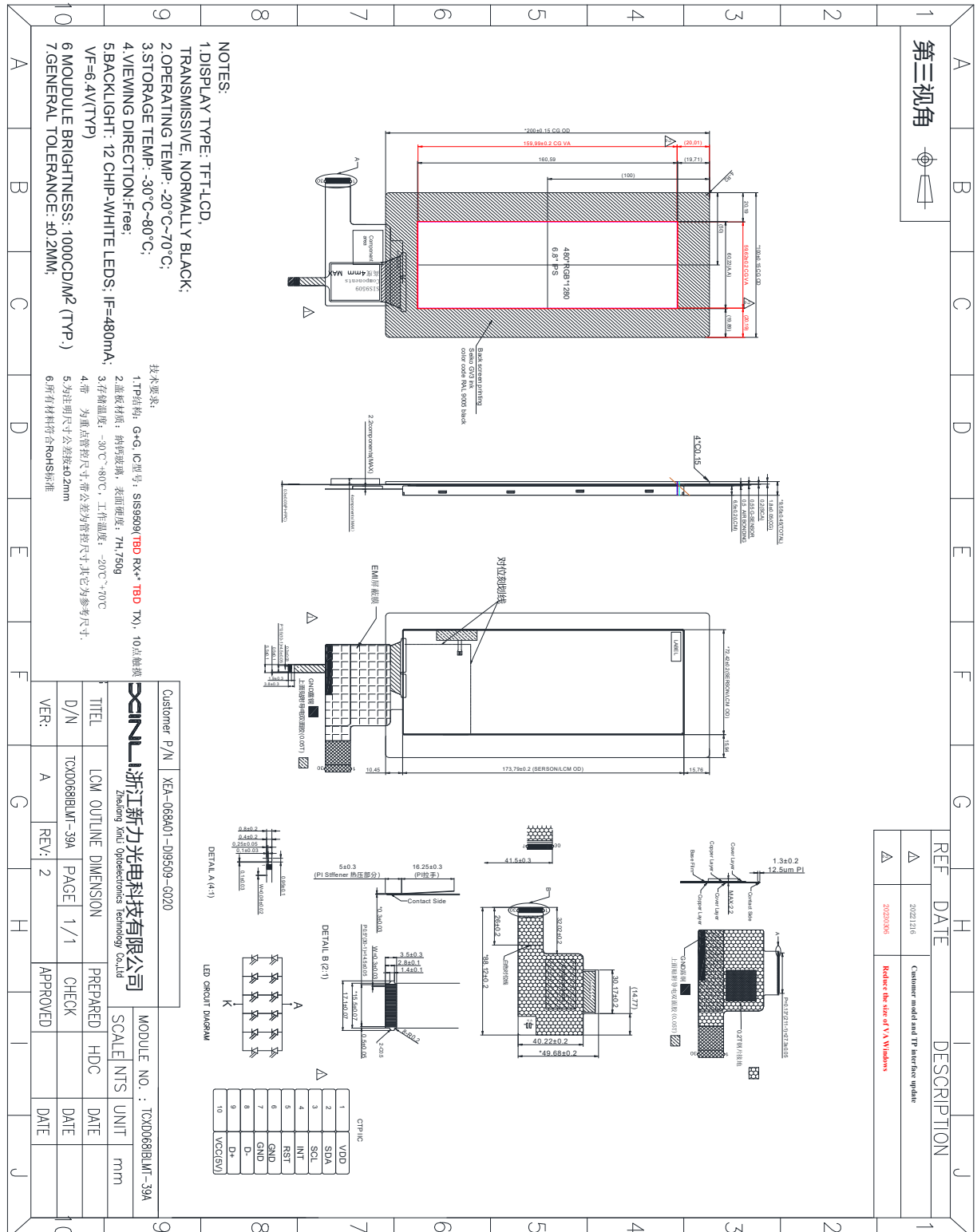
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2. General Description and Features

The 6.8 inch Module named TCXD068IBLMT-39A is a-Si TFT-LCD module, which is the type of transmissive. It is consisted of TFT-LCD Panel, Driver IC, FPC 、Touch and Back-Light. Features of this product are listed in the following table.

NO	Item	Contents	Unit
(1)	Module Outline	100(H)*200(V)*9.55(T)	mm
(2)	LCD Active area	60.22(H)*160.59(V)	mm
(3)	CG VA	59.62(H)*159.99(V)	mm
(4)	Dot Number	480*3(RGB)*1280	/
(5)	Dot size	41.82*125.46	um
(6)	LCD type	Normally Black,Transmissive	/
(7)	Display Color	16.7M	/
(8)	Viewing direction	ALL	O'clock
(9)	Drive IC	SC7705	
(10)	Power Supply	3.3 (TYP)	V
(11)	Interface	FPC 0.5mm_Pitch 30 pin	/
(12)	Interface type	MIPI interface	/
(13)	Module weight	TBD	g

3. Mechanical Dimension

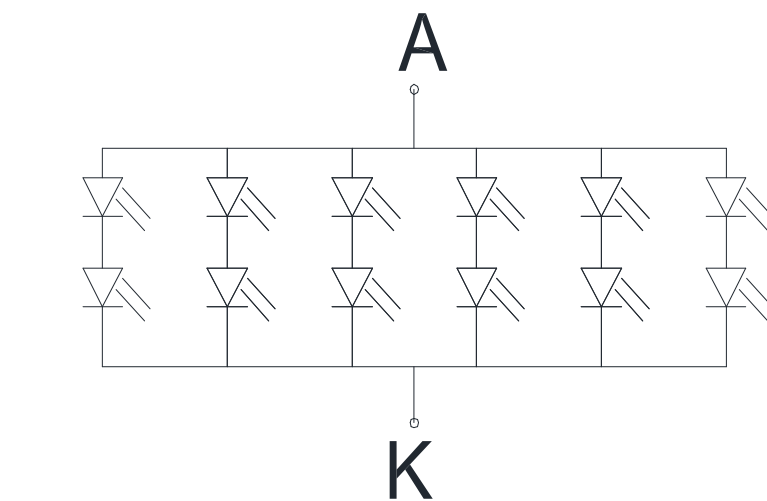
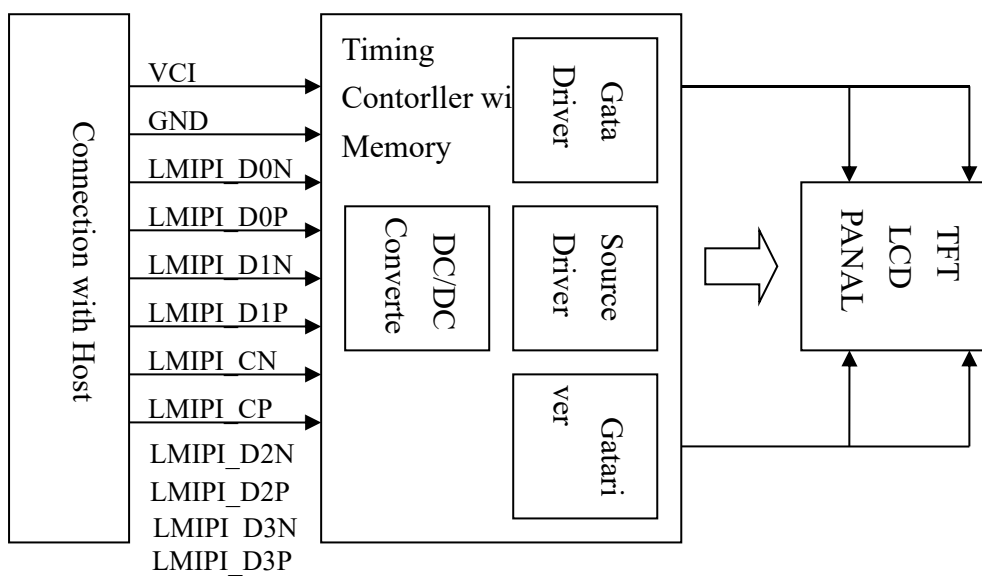


4. Interface Pin Connection

LCM interface Pin

NO	Symbol	Level	Description
1	GND	P	Power ground
2	VCI	P	Power voltage
3	VCI	P	Power voltage
4	VCI	P	Power voltage
5	GND	P	Power ground
6	RESET	I	Reset pin
7	TE	P	Tearing effect output signal
8	GND	P	Power ground
9	GND	P	Power ground
10	D3N	I	MIPI data input
11	D3P	I	MIPI data input
12	GND	P	Power ground
13	D2N	I	MIPI data input
14	D2P	I	MIPI data input
15	GND	P	Power ground
16	CLKN	I	MIPI clock input
17	CLKP	I	MIPI clock input
18	GND	P	Power ground
19	D1N	I	MIPI data input
20	D1P	I	MIPI data input
21	GND	P	Power ground
22	D0N	I	MIPI data input
23	D0P	I	MIPI data input
24	GND	P	Power ground
25	ID1	O	Pull down to Ground with 1K resistor
26	ID2	O	Pull down to Ground with 1K resistor
27	LEDK	P	Backlight Ground
28	LEDK	P	Backlight Ground
29	LEDA	P	Backlight Anode
30	LEDA	P	Backlight Anode

5. Block Diagram



6. Maximum Rating

Item	Symbol	Rating	Unit
Operating temperature	Top	-20 to 70	°C
Storage temperature	Tst	-30 to 80	°C
Booster power supply	VCI	-0.3~ 3.6	V

7. Electrical Characteristics

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Power voltage		VCI	-	2.5	2.8	3.3	V
Logic input signal Voltage	H level	V_{IH1}	-	$0.7*VCI$	-	VCI	V
	L level	V_{IL1}		0	-	$0.3*VCI$	V

8. Backlight Characteristics

Item	syb	Min	Typ	Max	Unit	Condition
Voltage	Vf	5.4	6.4	6.8	V	IF=480mA
Luminance(module)	Lv	-	1000	-	cd/m2	
Number of LED	-	12			pcs	

9. Timing Characteristics

9.1. DSI DC Characteristics

LP Mode

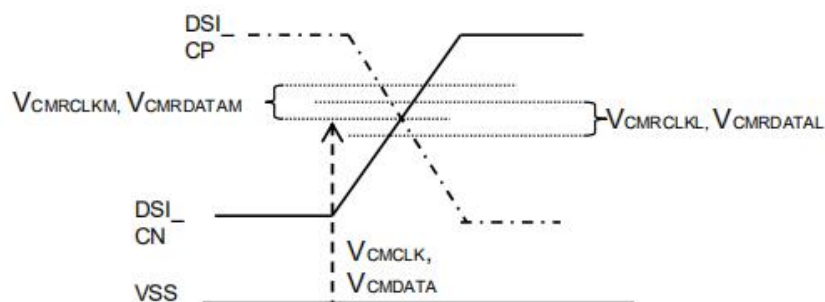
Parameter	Symbol	Conditions	Spec.			Unit
			Min.	Typ.	Max.	
Logic high level input voltage	V_{IHLPCD}	LP-CD	450	-	1350	mV
Logic low level input voltage	V_{ILLPCD}	LP-CD	0	-	200	mV
Logic high level input voltage	V_{IHLPRX}	LP-RX(CLK, D0)	880	-	1350	mV
Logic low level input voltage	V_{ILLPRX}	LP-RX(CLK, D0)	0	-	550	mV
Logic low level input voltage	$V_{ILLPRXULP}$	LP-RX(CLK ULP mode)	0	-	300	mV
Logic high level output voltage	V_{OHLPTX}	LP-TX(D0)	1.1	-	1.3	V
Logic low level output voltage	V_{OLLPTX}	LP-TX(D0)	-50	-	50	mV
Logic high level input current	I_{IH}	LP-CD, LP-RX	-	-	10	μ A
Logic low level input current	I_{IL}	LP-CD, LP-RX	-10	-	-	μ A
Input pulse rejection	SGD	DSI-CLK+/-, DSI-D0+/-1	-	-	300	Vps



Input glitch rejections of low-power receivers

High Speed Mode

Parameter	Symbol	Conditions	Spec.			Unit
			Min.	Typ.	Max.	
Input common mode	V_{CMCLK} V_{CMDATA}	DSI_CP/DSI_CN DSI_D0P/DSI_D0P	70	-	330	mV
Input common mode variation <450 MHz	$V_{CMRCLKL}$ $V_{CMRDATAL}$	DSI_CP/DSI_CN DSI_D0P/DSI_D0P	-50	-	50	mV
Input common mode variation >450 MHz	$V_{CMRCLKM}$ $V_{CMRDATAM}$	DSI_CP/DSI_CN DSI_D0P/DSI_D0P	-	-	100	mV
Low-level differential Input threshold	V_{THLCLK} $V_{THLDATA}$	DSI_CP/DSI_CN DSI_D0P/DSI_D0P	-70	-	-	mV
High-level differential Input threshold	V_{THHCLK} $V_{THHDATA}$	DSI_CP/DSI_CN DSI_D0P/DSI_D0P	-	-	70	mV
Single ended input low voltage	V_{ILHS}	DSI_CP/DSI_CN DSI_D0P/DSI_D0P	-40	-	-	mV
Single ended input high voltage	V_{IHHS}	DSI_CP/DSI_CN DSI_D0P/DSI_D0P	-	-	460	mV
Differential input termination resistor	R_{TERM}	DSI_CP/DSI_CN DSI_D0P/DSI_D0P	80	100	125	Ω
Single-ended threshold voltage for termination enable	V_{TERMEN}	DSI_CP/DSI_CN DSI_D0P/DSI_D0P	-	-	450	mV
Termination capacitor	C_{TERM}	DSI_CP/DSI_CN DSI_D0P/DSI_D0P	-	-	-	pF



Differential voltage range and Command mode voltage

9.2.AC characteristics

DSI Interface Timing Characteristics

High Speed Mode

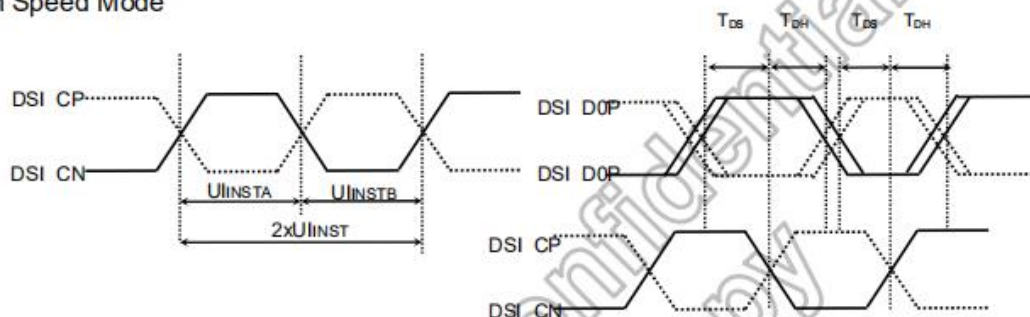
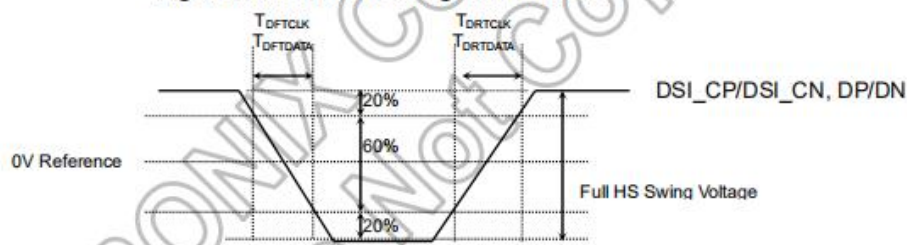


Figure 7.4: DSI clock timing Characteristics



Rising and falling time on clock and data channel

(VSSA=0V, IOVCC=1.65V to 3.3V, VCI=2.5V to 3.3V, TA = -30 to 70°C)

Signal	Item	Symbol	Spec.			Unit
			Min.	Typ.	Max.	
DSI_CP/ DSI_CN	Double UI instantaneous	2xUIINST	TBD	-	25	ns
	UI instantaneous	UIINSTA UIINSTB	TBD	-	12.5	ns
DP/DN	Data to clock setup time	T _{DS}	0.15xUI	-	-	ps
	Data to clock hold time	T _{DH}	0.15xUI	-	-	ps
DSI_CP/ DSI_CN	Differential rise time for clock	T _{DRTCLK}	150	-	0.3UI	ps
	Differential fall time for clock	T _{DFTCLK}	150	-	0.3UI	ps
DP/DN	Differential rise time for data	T _{DRTDATA}	150	-	0.3UI	ps
	Differential fall time for data	T _{DFTDATA}	150	-	0.3UI	ps

DSI High Speed Mode characteristics

Low Power Mode

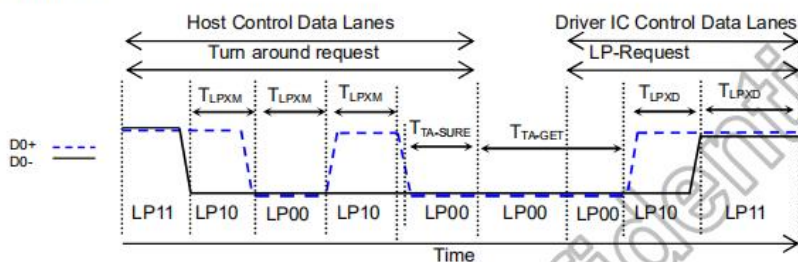
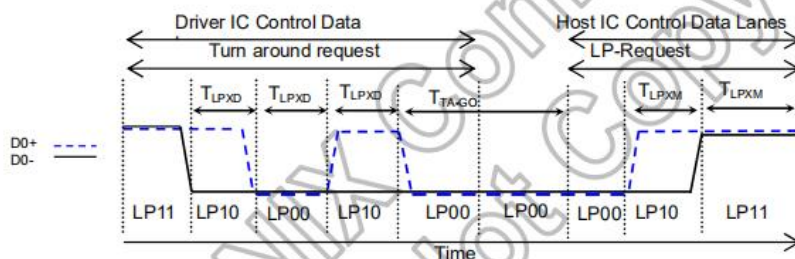


Figure 7.6: BTA from HOST to Display module Timing

(VSSA=0V, IOVCC=1.65V to 3.3V, VCI=2.3V to 3.3V, $T_A = -30$ to 70°C)

Signal	Item	Symbol	Spec.			Unit
			Min.	Typ.	Max.	
DSI_D0P/ DSI_D0P	Length of LP-00/LP01/LP10/LP11 Host → Display module	T_{LPXM}	50	-	-	ns
	Length of LP-00/LP01/LP10/LP11 Display module → Host	T_{LPXD}	50	-	-	ns
	Time-out before the MPU start driver	$T_{TA-SURE}$	T_{LPXD}	-	$2 \times T_{LPXD}$	ns
	Time to drive LP-00 by display module	T_{TA-GET}	$5 \times T_{LPXD}$	-	-	ns
	Time to drive LP-00 after turnaround request Host	T_{TAGO}	$4 \times T_{LPXD}$	-	-	ns

DSI Low Power Mode characteristics

10. Application Circuit

Please consult our technical department for detail information.

11. Initial Code

Please consult our technical department for detail information.

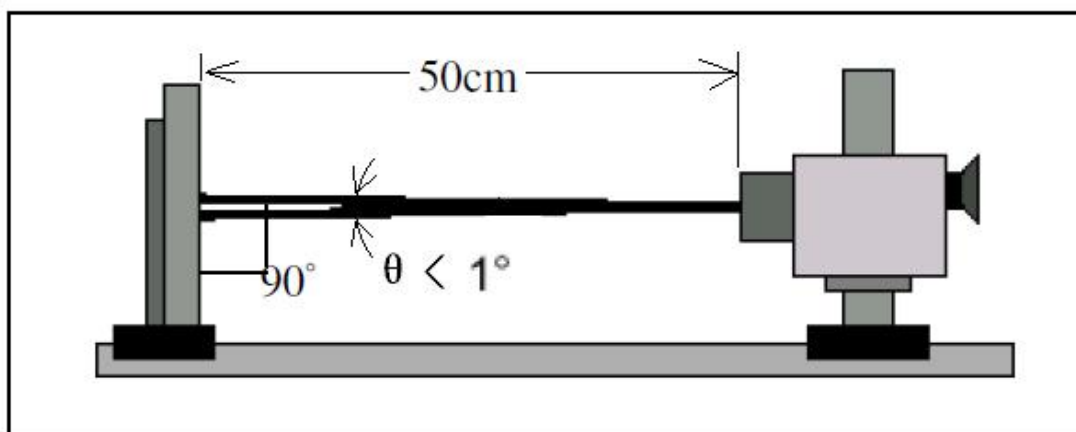
12. Electro-Optical Characteristics

Item		Symbol	Condition	Min	Typ	Max	Unit	Note
Response time		Tr+Tf	$\theta = 0^\circ$ $\phi = 0^\circ$ Ta=25°C	-	25	35	ms	4
Uniformity (Five point)		δ WHITE		70	80	-	%	7
Contrast ratio		Cr		1000	(1500)	-	-	3,5
Surface Luminance		Lv		-	1000	-	-	3,7
Viewing angle range		θ	$\phi = 90^\circ$	70	80	-	deg	6
			$\phi = 270^\circ$	70	80	-	deg	
			$\phi = 0^\circ$	70	80	-	deg	
			$\phi = 180^\circ$	70	80	-	deg	
Color filter chromaticity (x, y)	White	X	$\theta = \phi = 0^\circ$	-0.025	TBD	+0.025		7
		Y			TBD			
	Red	X			TBD			
		Y			TBD			
	Green	X			TBD			
		Y			TBD			
	Blue	X			TBD			
		Y			TBD			

Note 1: Ambient temperature=25°C±2°C

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

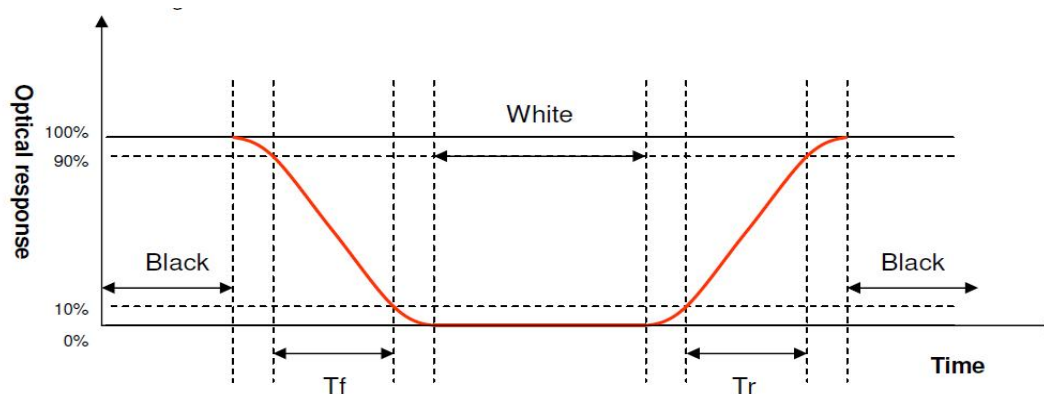
Note 3: To be measured at the center area of panel with a viewing cone of 1 by Topcon luminance meter BM-7A, after 10 minutes operation (module).



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:

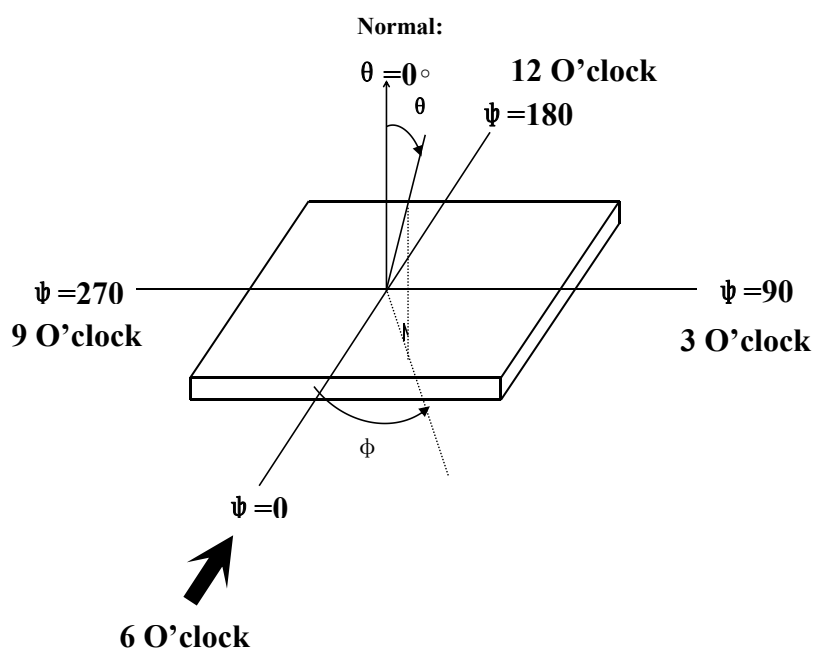
Contrast ratio is calculated with the following formula:

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

Note 6. Definition of viewing angle

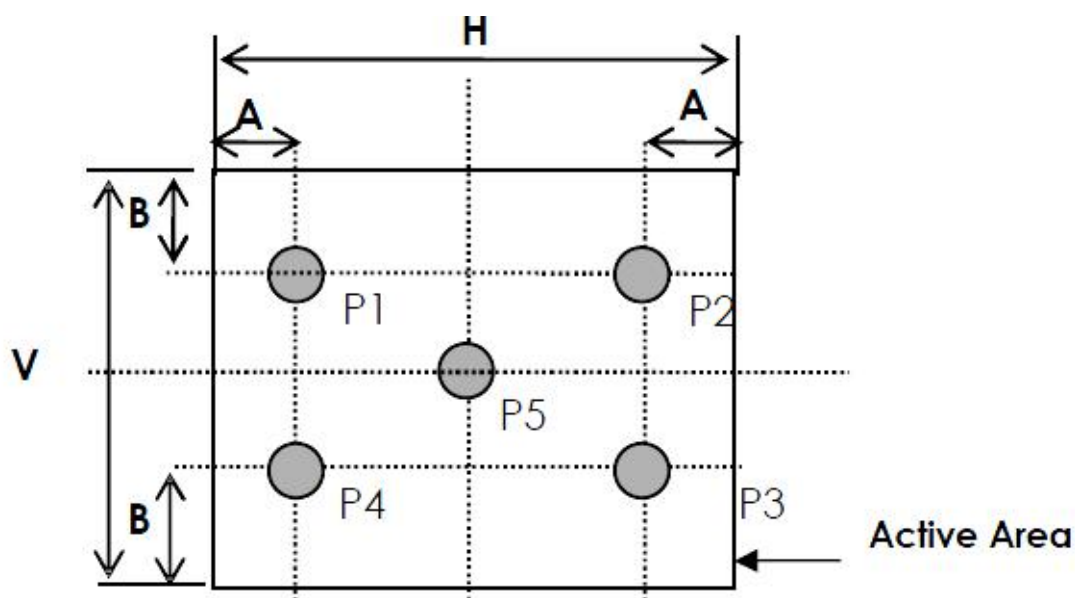
Viewing angle is the angle at which the contrast ratio is greater than 10 for TFT module. The angles are determined for the horizontal or x axis and the vertical or y axis

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 $\varnothing=7\text{mm}$, 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%

L_v = Surface Luminance with all white pixels (P5)

13. Reliability Test

			°C,
			°C,
			°C,
			°C,
			°C, %
		<p>-20°C ← → 70°C 60min ← → 60min ←————→ 20 cycle</p>	°C °C,
			Ω Ω

14. Precautions for Operation and Storage

1、 Precautions for Operation

2、 Precautions for Storage

◦ ◦

◦

3、Warranty period

15.Package Specification

TBD.