

SPECIFICATION

PRODUCT NO. : TCXD080ABLON-9

VERSION : Ver 1.1

ISSUED DATE : 2020-12-05

This module uses ROHS material

FOR CUSTOMER: _____

: APPROVAL FOR SPECIFICATION

: APPROVAL FOR SAMPLE

DATE	APPROVED BY

Xinli Optoelectronics :

Presented by	Reviewed by	Organized by

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2. General Description and Features

The 8.0 inch Module named TCXD080ABLON-9 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 Outsize	192.80 x 116.90 x 6.4	mm
(2)	LCD Active area	176.64 x 99.36	mm
(3)	Dot Number	1280 x 3(RGB) x 720	/
(4)	Pixel pitch	0.1380(W)x 0.1380(H)	mm
(5)	LCD type	TFT Transmissive	/
(6)	Display Color	16.7M	/
(7)	Viewing direction	Free	O'clock
(8)	Backlight Type	21-chip LED	/
(9)	Power Supply	3.3 (TYP)	V
(10)	Interface	FPC 0.5mm_Pitch 40 pin	/
(11)	Interface type	LVDS interface	/
(12)	Module weight	TBD	g

4. Interface Pin Connection

FOG:

Manufacturer/Type: F31L-1A7H1-21040(IRISO)

Pin No.	Symbol	Description	Remarks
1	NC/BIST	I/O internal test pin, dummy for normal mode; pull high bist mode. When it is not used, Connecting to GND is recommended, don't floating	-
2	NC	Dummy	-
3	SHLR	Horizontal scan direction control. "H" Left to Right; "L" Right to Left. H:3.0V~3.6V; L:0V~0.4V	-
4	UPDN	Vertical scan direction control. "H" Down to Up; "L" Up to Down. H:3.0V~3.6V; L:0V~0.4V	-
5	VDD	System supply voltage. (3.3Vtyp.) 3.0V~3.6V current capacity > 1.5A	-
6	NC	Dummy	-
7	GND	Ground	-
8	CLKP	Positive LVDS differential clock input.	-
9	CLKN	Negative LVDS differential clock input.	-
10	GND	Ground	-
11	PIND0	Positive LVDS differential input.	-
12	NIND0	Negative LVDS differential input.	-
13	GND	Ground	-
14	PIND1	Positive LVDS differential input.	-
15	NIND1	Negative LVDS differential input.	-
16	GND	Ground	-
17	PIND2	Positive LVDS differential input.	-
18	NIND2	Negative LVDS differential input.	-
19	GND	Ground	-

20	PIND3	Positive LVDS differential input.	-
21	NIND3	Negative LVDS differential input.	-
22	GND	Ground	-
23	NC	Dummy	-
24	VDD	System supply voltage. (3.3Vtyp.)3.0V~3.6V current capacity>1.5A	-
25	NC/VPP	Dummy	-
26	GND	Ground	-
27	NC/AVDD	Dummy	-
28	NCAVDD	Dummy	-
29	NC	Dummy	-
30	NC/CSB	Dummy	
31	NC/SCL	Dummy	
32	NC/SDA	Dummy	-
33	NC/ATREN	Dummy	-
34	GND	Ground	-
35	NC	Dummy	-
36	NC/VGH	Dummy	-
37	NC	Dummy	-
38	NC/VGL	Dummy	-
39	NC	Dummy	-
40	NC	Dummy	-

BLG:

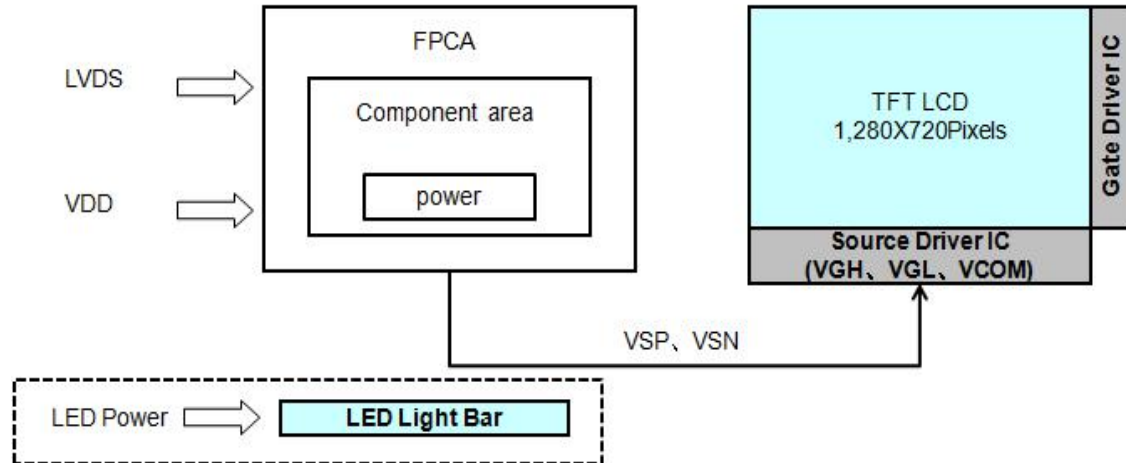
Manufacturer/Type: FH28-10S-0.5SH (HIROSE)

NO	Symbol	Level	Description
1	A1	P	VLED+ Anode
2	A2	P	VLED+ Anode
3	A3	P	VLED+ Anode
4	NC	-	No connection
5	THER+	I	Thermistor +
6	THER-	I	Thermistor -
7	NC	-	No connection
8	C3	P	VLED- Cathode
9	C2	P	VLED- Cathode
10	C1	P	VLED- Cathode

Note (1) H: 3.0V~3.6V; L/NC: 0~0.4V;

SHLR	UPDN	Scan direction
H	H	Data scan from left to right; Gate scan from down to up
L	H	Data scan from right to left; Gate scan from down to up
H	L	Data scan from left to right; Gate scan from up to down
L	L	Data scan from right to left; Gate scan from up to down

5. Block Diagram



6. Maximum Rating

Item	Symbol	Rating	Unit
Operating temperature	Top	-30 to 85	°C
Storage temperature	Tst	-40 to 90	°C
Logic Supply Voltage	V _{DD}	-0.3~4.0	V
Logic Input Signal Voltage	V _{signal}	-0.3~V _{DD}	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. V_{DD}>GND must be maintained.

7. Electrical Characteristics

Signal Electrical Characteristics For LVDS Receiver

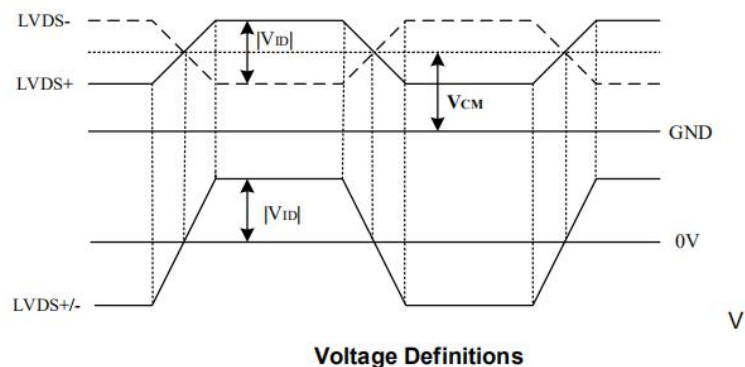
The built-in LVDS receiver is compatible with (ANSI/TIA/TIA-644) standard.

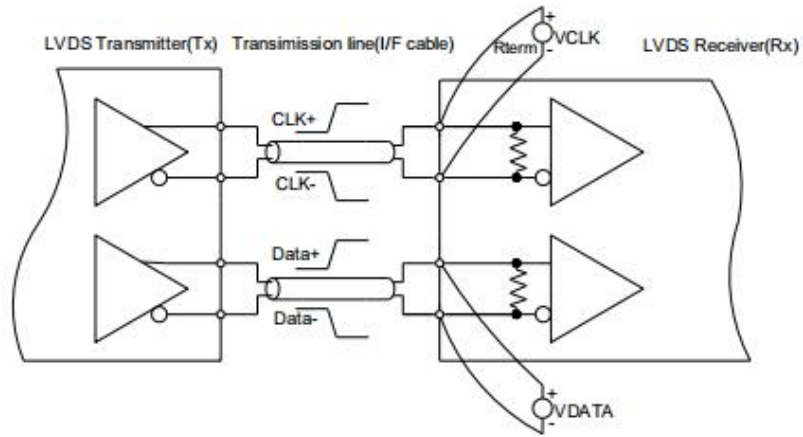
LVDS Receiver Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Differential Input High Threshold	V _{th}	-	-	+100	mV	V _{CM} =+1.2V
Differential Input Low Threshold	V _{tl}	-100	-	-	mV	-
Magnitude Differential Input Voltage	V _{ID}	100	-	600	mV	-
Common Mode Voltage	V _{CM}	1	1.2	1.7- V _{ID} /2	V	-

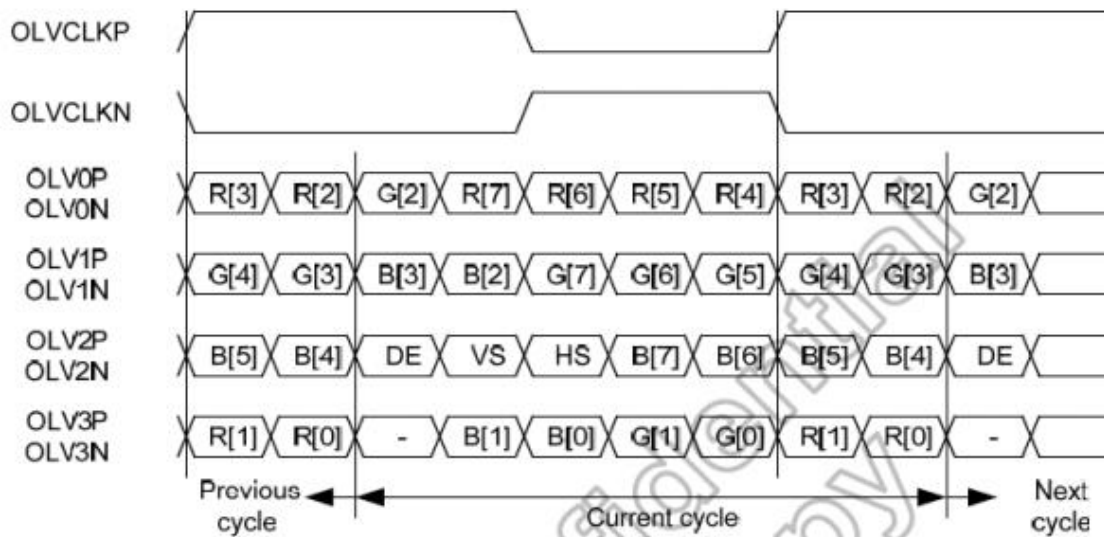
Note (1) Input signals shall be low or Hi- resistance state when V_{DD} is off.

Note (2) All electrical characteristics for LVDS signal are defined and shall be measured at the interface connector of LCD.



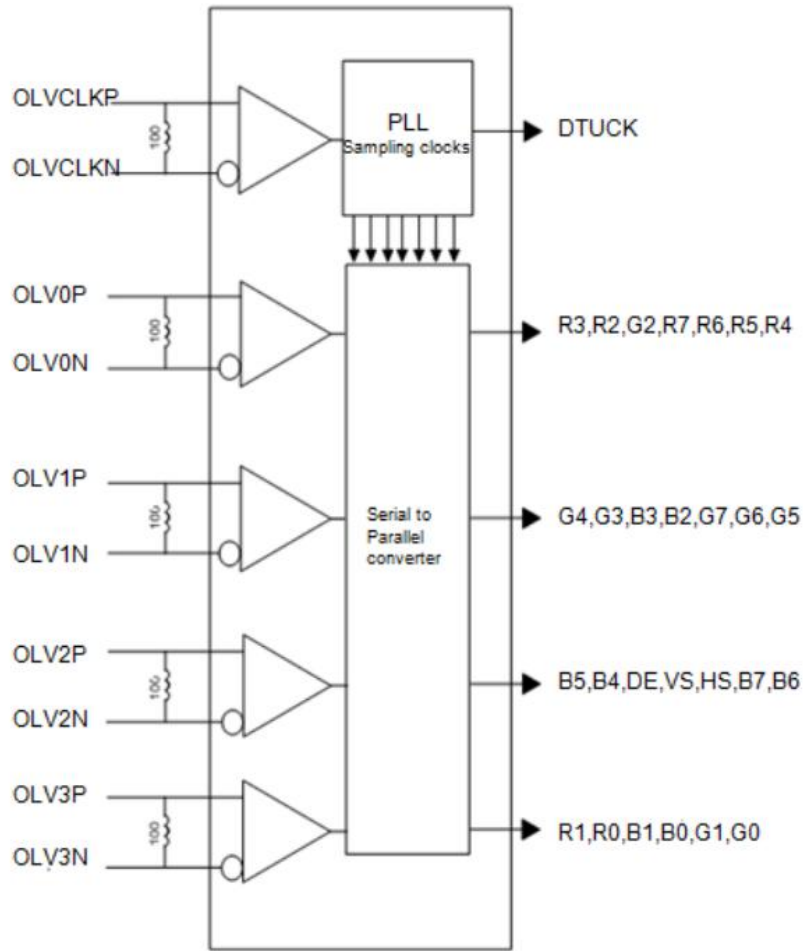


Measurement System



Data Mapping

LVDS Receiver Internal Circuit



LVDS Receiver Internal Circuit

Interface Timings

Interface Timings

Parameter	Symbol	Min.	Typ.	Max.	Unit	
LVDS Clock Frequency	Fclk	69.49	71.15	75.54	MHz	
HSYNC	Period	TH	1524	1540	1566	Clocks
	Horizontal display area	THD	1280			Clocks
	Blanking	THBP+ THFP	244	260	286	Clocks
VSYNC	Period	TV	760	770	804	HS
	Vertical display area	TVD	720			HS
	Blanking	TVBP + TVFP	40	50	84	HS
Frame Rate	F _v	-	60	-	Hz	

Note1: $HT * VT * \text{Frame Frequency} \leq 75.54 \text{ MHz}$

Note2: All reliabilities are specified for timing specification based on refresh rate of 60Hz.

Input Power Specifications

Input power specifications are as follows.

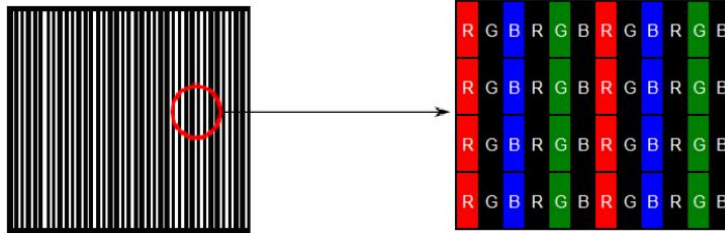
Input Power Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note	
<i>System Power Supply</i>							
LCD Drive Voltage (Logic)	V _{DD}	3	3.3	3.6	V	(1),(2)	
VDD Current	V stripe Pattern	I _{DD}	-	-	212	mA	(1),(4)
VDD Power Consumption	V stripe Pattern	P _{DD}	-	-	700	mW	

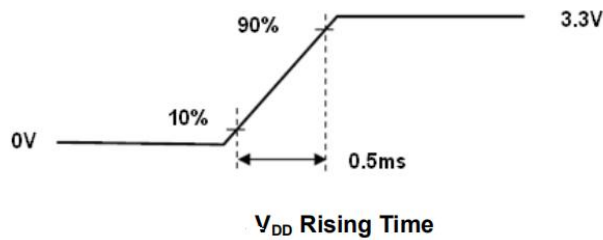
Note (1) All of the specifications are guaranteed under normal conditions. Normal conditions are defined as follow: Temperature: 25°C, Humidity: 55± 10%RH.

Note (2) All of the absolute maximum ratings specified in the table, if exceeded, may cause faulty operation or unrecoverable damage. It is recommended to follow the typical value.

Note (3) The specified V_{DD} current and power consumption are measured under the V_{DD} = 3.3 V, FV= 60 Hz condition and V-Stripe pattern.

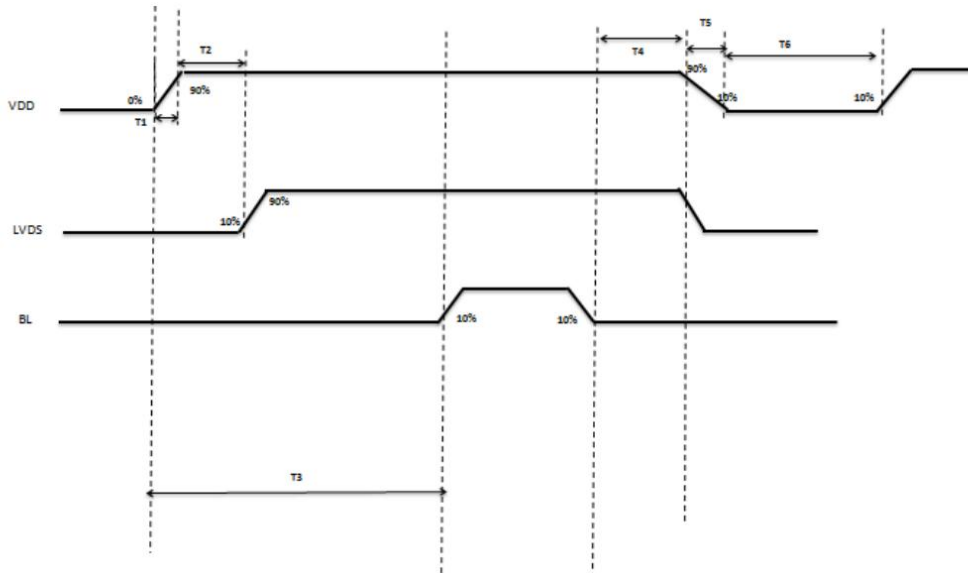


Note (4) The figures below is the measuring condition of V_{DD}. Rush current can be measured when T_{RUSH} is 0.5 ms.



Power ON/OFF Sequence

1. Interface signals are also shown in the chart. Signals from any system shall be Hi-resistance state or low level when VDD voltage is off.
2. When system first start up, should keep the VDD high time longer than 200ms, otherwise may cause image sticking when VDD drop off.



Power Sequencing Requirements

Parameter	Symbol	Min.	Typ.	Max.	Unit
VDD rising time 0%~90%	T1	1	-	10	ms
VDD90% to LVDS10%	T2	2	-	-	ms
VDD rising time 0%to BL10%	T3	190	-	-	ms
BL Off to VDD off	T4	90	-	-	ms
VDD falling time	T5	-	-	1	s
VDD restart time	T6	1	-	-	s

8. Backlight Characteristics

Item	syb	Min	Typ	Max	Unit	Condition
Voltage	Vf	18.9	21.0	23.8	V	IF=360mA
Number of LED	-	21			pcs	-
Power Consumption	PFW	-	7.56	8.57	mW	-
LED life-span	-	30000	-	-	Hrs	-

9. Application Circuit

Please consult our technical department for detail information.

10. Initial Code

Please consult our technical department for detail information.

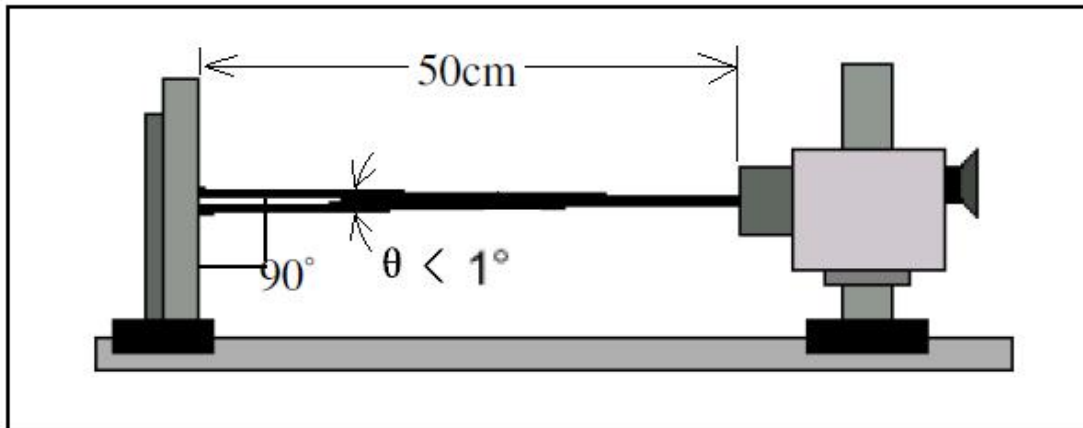
11. Electro-Optical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit	Note
Transmission (with pol)	T		2.9	3.3	-	%	
Response time	Tr+Tf	$\theta = 0^\circ$	-	-	35	ms	4
Uniformity (Five point)	δ WHITE	$\phi = 0^\circ$ Ta=25°C	-	80	-	%	7
Contrast ratio	Cr		800	900	-	-	3,5
NTSC	-		70	75			
Surface Luminance	Lv		-	1000	-	-	3,7
Viewing angle range	θ	$\phi = 90^\circ$	80	85	-	deg	6
		$\phi = 270^\circ$	80	85	-	deg	
		$\phi = 0^\circ$	80	85	-	deg	
		$\phi = 180^\circ$	80	85	-	deg	
Color filter chromaticity (x, y)	White	X	$\theta = \phi = 0^\circ$	TBD	TBD	TBD	7
		Y		TBD	TBD	TBD	
	Red	X	$\theta = \phi = 0^\circ$	TBD	TBD	TBD	
		Y		TBD	TBD	TBD	
	Green	X	$\theta = \phi = 0^\circ$	TBD	TBD	TBD	
		Y		TBD	TBD	TBD	
	Blue	X	$\theta = \phi = 0^\circ$	TBD	TBD	TBD	
		Y		TBD	TBD	TBD	

Note 1: Ambient temperature=25°C±2°C

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

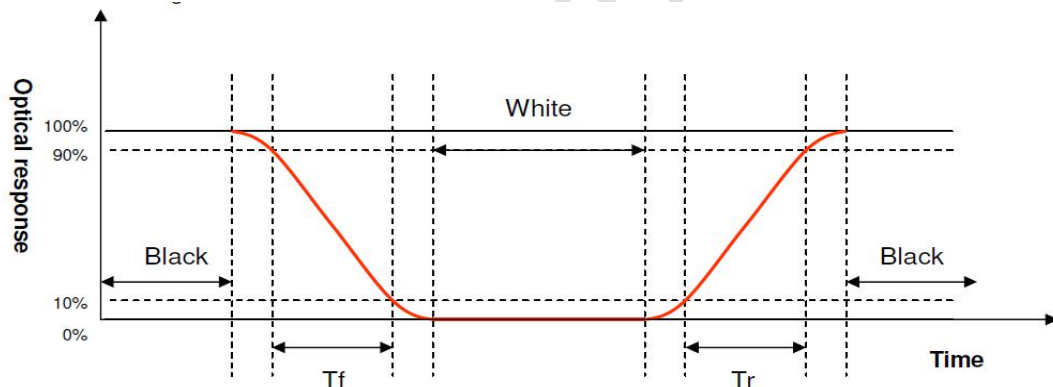
Note 3: To be measured at the center area of panel with a viewing cone of 1 by Topcon luminance meter BM-7A, after 10 minutes operation (module).



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.



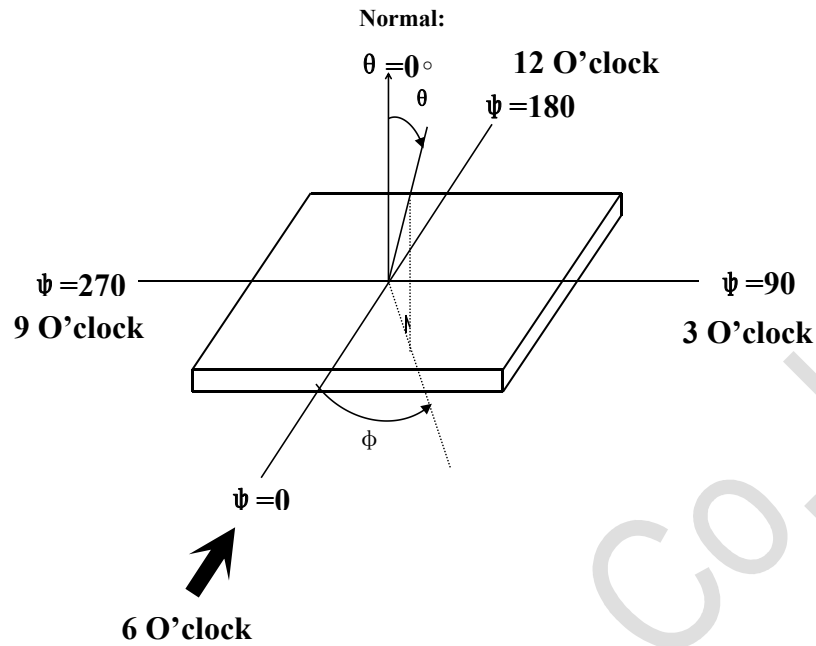
Note 5. Definition of contrast ratio:

Contrast ratio is calculated with the following formula:

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

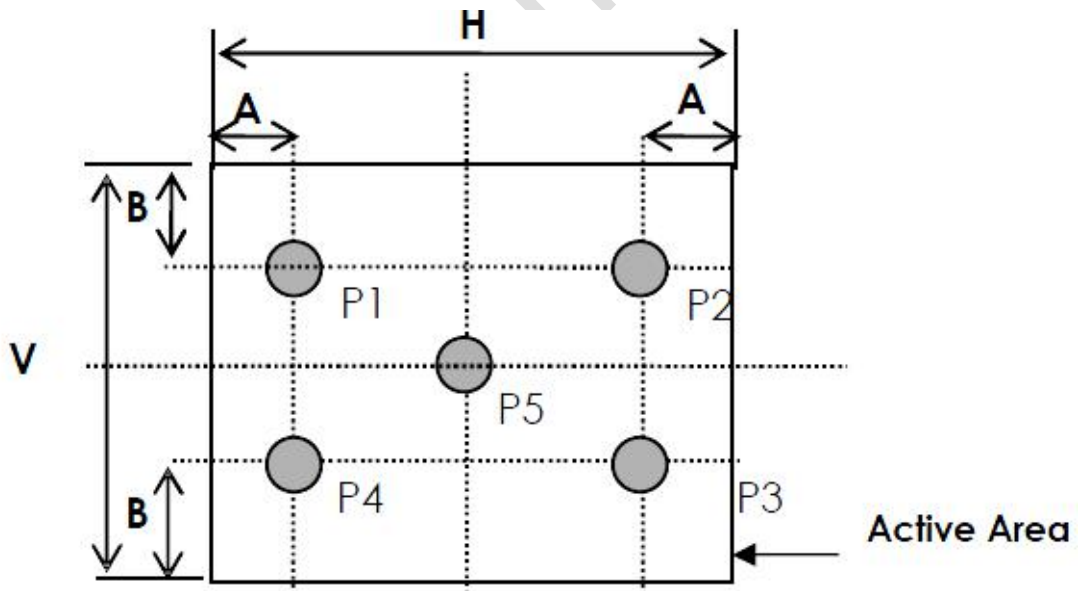
Note 6. Definition of viewing angle

Viewing angle is the angle at which the contrast ratio is greater than 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 $\varnothing=7\text{mm}$, 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 = Average Surface Luminance with all white pixels (P₁, P₂, P₃, P₄, P₅)

12. 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	90°C,504 H
2	Low temperature storage	Endurance test applying the low storage temperature for a long time	-40°C,504H
3	High temperature operation	Endurance test applying the electric stress under high temperature for a long time	85°C,504H
4	Low temperature operation	Endurance test applying the electric stress under low temperature for a long time	-30°C,504H
5	High temperature /humidity storage	Endurance test applying the high temperature and high humidity storage for a long time	60°C,90% RH,504H
6	ESD Test	Contact: $\pm 8KV$, 150pF(330Ohm) Air: $\pm 15KV$, 150pF(330Ohm)	

13. 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 handling 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°C and 35 °C and at normal humidity. Avoid high temperature, high humidity or temperature below 0°C.

(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 date when stored or used under normal condition.

14. Package Specification

TBD