



Product Specification

Customer: _____

Model Name: H070IWS50I7040

Date: 2022.12.31

Version: V0

Preliminary Specification

Final Specification

For Customer's Acceptance

Approved by	Comment

Approved by	Reviewed by	Prepared by

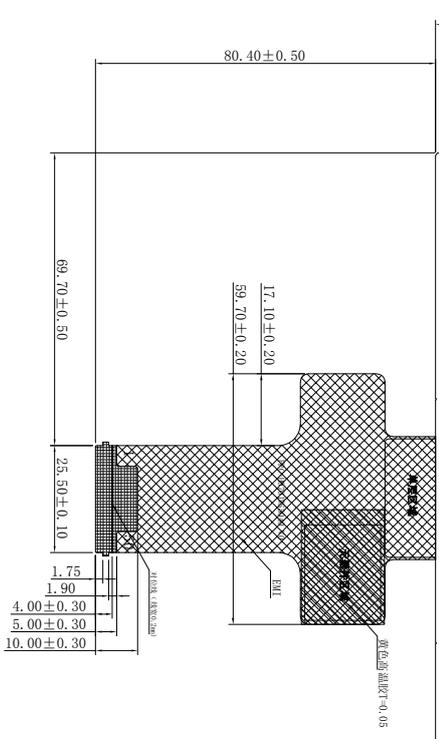
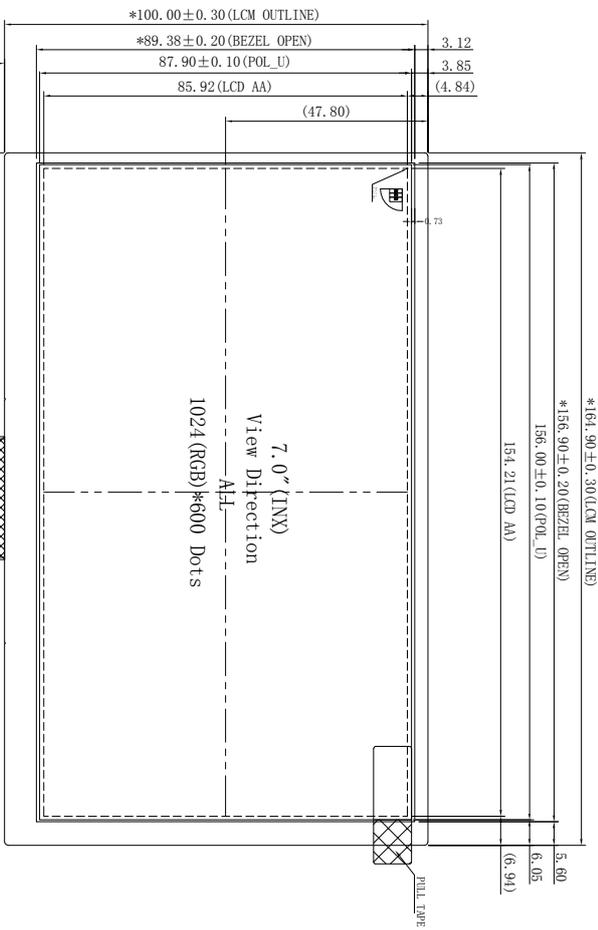


2. General Description and Features

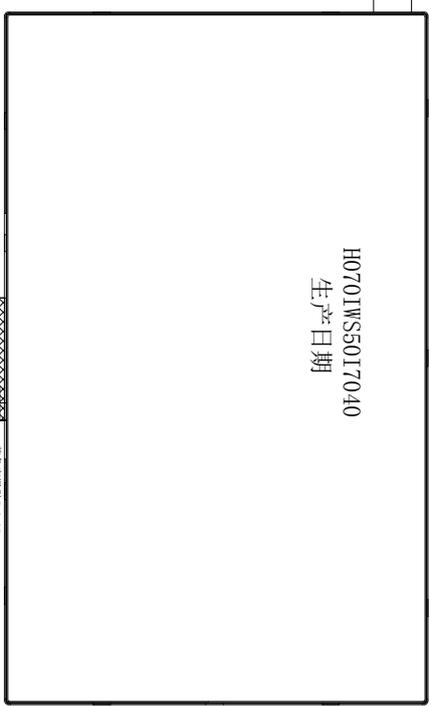
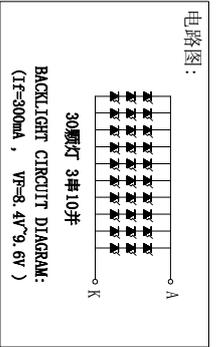
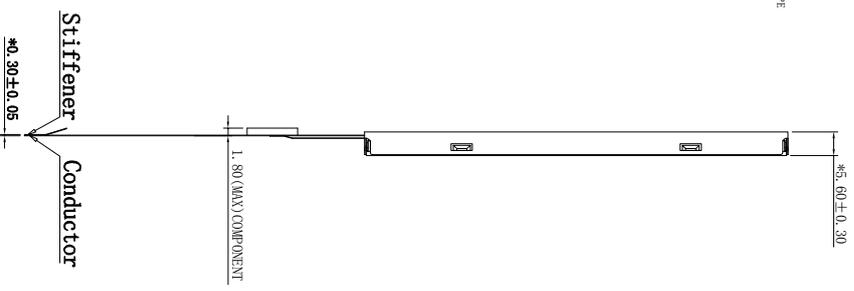
The 7.0 inch Module named H070IWS50I7040 is a-Si TFT-LCD module, which is the type of transmissive. It is consisted of TFT-LCD Panel, one Driver IC, one FPC and one Back-Light unit. Features of this product are listed in the following table.

NO	Item	Contents	Unit
(1)	Module Outsize	164.90 x 100.00 x 5.6	mm
(2)	LCD Active area	154.21 x 85.92	mm
(3)	Dot Number	1024 x 3(RGB) x 600	/
(4)	Dot size	0.1506(W)x 0.1432(H)	mm
(5)	LCD type	TFT Transmissive	/
(6)	Display Color	16.7M	/
(7)	Viewing direction	ALL	O'clock
(8)	Backlight Type	30-chip LED	/
(9)	Power Supply	3.3 (TYP)	V
(10)	Interface	FPC 0.5mm_Pitch 50 pin	/
(11)	Interface type	RGB interface(24 Bit)	/
(12)	Module weight	TBD	g

3. Mechanical Dimension



- NOTES:
1. DISPLAY TYPE: 7.0 INCH TFT /Normally Black Transmissive
 2. BACKLIGHT: 30 CHIP WHITE LED, IN PARALLEL
 3. OPERATING TEMP: -30° C~+85° C
 4. STORAGE TEMP: -40° C~+85° C
 5. RESOLUTION: 1024RGBx600
 6. LCD IC: HX8282+HX8696
 7. Typical Luminance (9 AVG): 650cd/m2 (MIN), 700cd/m2 (TYP)
 8. " () "reference dimension. " * "critical dimension
 9. RoHS Compliant



50	(SMD/C/SMD)
49	NC
48	NC(CSD)
47	NC(OA0)
46	NC(SD0)
45	NC
44	DE
43	CSD
42	B7
41	B6
40	B5
39	B4
38	B3
37	B2
36	B1
35	B0
34	CSD
33	DELK
32	CSD
31	G7
30	G6
29	G5
28	G4
27	G3
26	G2
25	G1
24	G0
23	CSD
22	R7
21	R6
20	R5
19	R4
18	R3
17	R2
16	R1
15	R0
14	CSD
13	STDB
12	RESET
11	LR
10	UD
9	DYD0
8	NC
7	LEDA
6	LEDA
5	NC
4	LEBK
3	LEBK
2	LEBK
1	NC

INTERFACE	RGB Interface	MODEL NAME TFT Display Module	PART NO. H0701WS4017040
	FPC Connector		
VIEWING DIRECTION	ALL	CHMD	TOLERANCE UNLESS SPECIFIED ±0.1
Gray Scale DIRECTION	FREE	PROJECTION 3RD ANGLE	UNIT MM SCALE 1:1





4. Interface Pin Connection

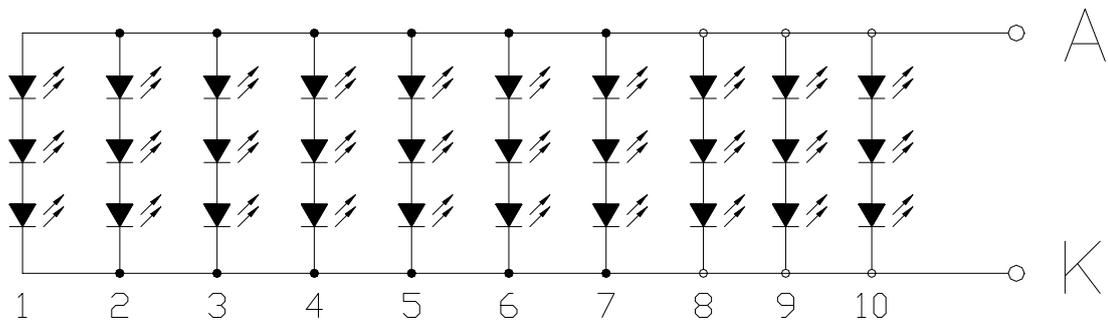
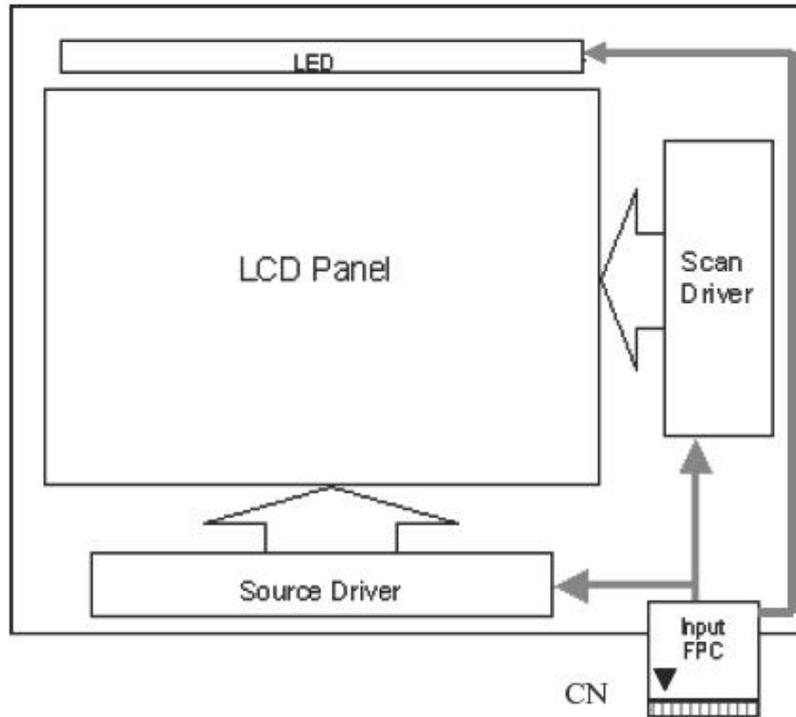
NO	Symbol	Level	Description
1	NC		Not connect
2	LEDK	P	Blacklight ground
3	LEDK	P	Blacklight ground
4	LEDK	P	Blacklight ground
5	NC	-	Not connect
6	LEDA	p	Blacklight anode
7	LEDA	p	Blacklight anode
8	NC	-	Not connect
9	DVDD	p	Power supply
10	UD	I	Gate Up or Down scan control. Normally pull low. UPDN = "L", STV2 output vertical start pulse and UD pin output logical "0" to Gate driver. UPDN = "H", STV1 output vertical start pulse and UD pin output logical "1" to Gate driver.
11	LR	I	Source Right or Left sequence control. Normally pull high. SHLR = "L", shift left: last data = S1_S2_S3....._S1536 = first data. SHLR = "H", shift right: first data = S1_S2_S3....._S1536 = last data.
12	RESET	I	Global reset pin.
13	STBYB	I	Standby mode control.
14	GND	p	Power ground
15	R0	I	Red data
16	R1	I	Red data
17	R2	I	Red data
18	R3	I	Red data
19	R4	I	Red data
20	R5	I	Red data
21	R6	I	Red data
22	R7	I	Red data
23	GND	p	Power ground



24	G0	I	Green data
25	G1	I	Green data
26	G2	I	Green data
27	G3	I	Green data
28	G4	I	Green data
29	G5	I	Green data
30	G6	I	Green data
31	G7	I	Green data
32	GND	P	Power ground
33	DCLK	I	Clock Input
34	GND	P	Power ground
35	B0	I	Blue data
36	B1	I	Blue data
37	B2	I	Blue data
38	B3	I	Blue data
39	B4	I	Blue data
40	B5	I	Blue data
41	B6	I	Blue data
42	B7	I	Blue data
43	GND	P	Power ground
44	DE	I	Data Input Enable. Active High to enable the data input bus under “DE Mode”. Normally pull low.
45	NC	-	Not connect
46	NC(SDA)	-	Not connect
47	NC(SCL)	-	Not connect
48	NC (CSB)	-	Not connect
49	NC	-	Not connect
50	GND	P	Power ground



5. Block Diagram



LED 电路图



6. Maximum Rating

Item	Symbol	Rating	Unit
Operating temperature	Top	-30 to 85	°C
Storage temperature	Tst	-40 to 85	°C
Power Voltage	VDD	-0.3~3.96	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	Min.	Typ.	Max.	Unit	
Power Voltage	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}	0	-	0.3*VDD	V

8. Backlight Characteristics

Item	syb	Min	Typ	Max	Unit	Condition
Voltage	Vf	-	9	-	V	IF=300mA
Number of LED	-	30			pcs	-
Power Consumption	PWF	-	2700	-	mW	-
LED life-span	-	-	(20000)	-	Hrs	-



9. Timing Characteristics

Parameter	Symbol	Condition	Spec.			Unit
			Min.	Typ.	Max.	
VDD power on slew rate	T _{POR}	From 0V to 90% VDD	-	-	20	ms
GRB pulse width	T _{GRB}	-	50	-	-	μs
DCLK cycle time	T _{cpk}	-	14	-	-	ns
DCLK pulse duty	T _{cdw}	-	40	50	60	%
VSD setup time	T _{vst}	-	5	-	-	ns
VSD hold time	T _{vhd}	-	5	-	-	ns
HSD setup time	T _{hst}	-	5	-	-	ns
HSD hold time	T _{hhd}	-	5	-	-	ns
Data setup time	T _{dsu}	D0[7:0], D1[7:0], D2[7:0] to DCLK	5	-	-	ns
Data hold time	T _{dhd}	D0[7:0], D1[7:0], D2[7:0] to DCLK	5	-	-	ns
DE setup time	T _{dsu}	-	5	-	-	ns
DE hold time	T _{dhd}	-	5	-	-	ns
Output stable time	T _{ssst}	10% to 90% target voltage. CL=90pF, R=10KΩ (Cascade)	-	-	6	μs
		Dual gate	-	-	3	

Table 10.1: TTL mode AC electrical characteristics

DE mode

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK frequency @Frame rate=60hz	fclk	40.8	51.2	67.2	Mhz
Horizontal display area	thd	1024			DCLK
HSYNC period time	th	1114	1344	1400	DCLK
HSYNC blanking	thb+thfp	90	320	376	DCLK
Vertical display area	tvd	600			H
VSYNC period time	tv	610	635	800	H
VSYNC blanking	tvb+tvfp	10	35	200	H

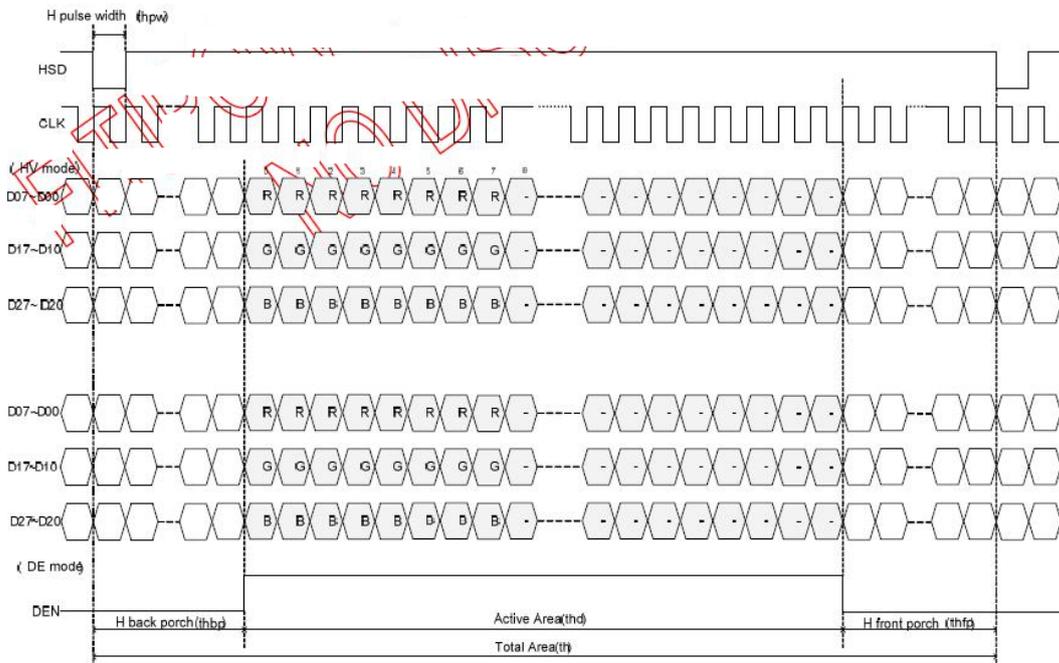
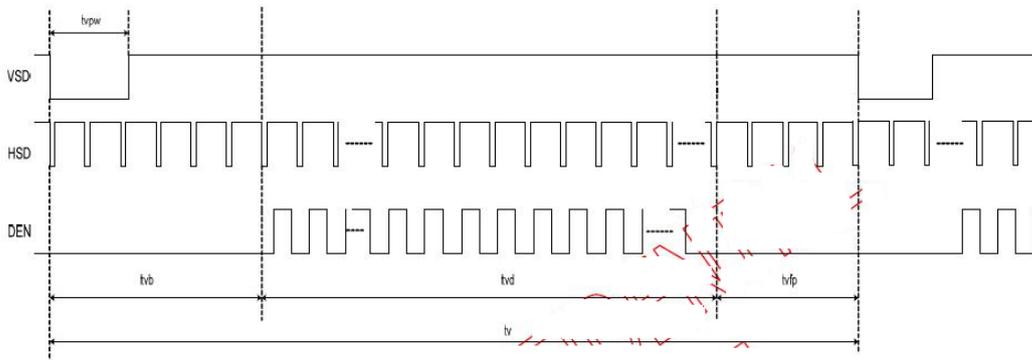
HV mode(1)

HV mode					
Horizontal input timing					
Parameter	Symbol	Value			Unit
Horizontal display area	thd	1024			DCLK
DCLK frequency@Frame rate=60hz	fclk	Min.	Typ.	Max.	Mhz
		44.9	51.2	63	
1 Horizontal Line	th	1200	1344	1400	DCLK
HSYNC pulse width	thpw	Min.	1		
		Typ.	-		
		Max.	140		
HSYNC back porch	thbp	160	160	160	
HSYNC front porch	thfp	16	160	216	



HV mode(2)

Vertical input timing					
Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Vertical display area	tvd	600			H
VSYNC period time	tv	624	635	750	H
VSYNC pulse width	tvpw	1	—	20	H
VSYNC back porch	tvb	23	23	23	H
VSYNC front porch	tvfp	1	12	127	H





10. Application Circuit

Please consult our technical department for detail information.

11. Initial Code

Please consult our technical department for detail information.



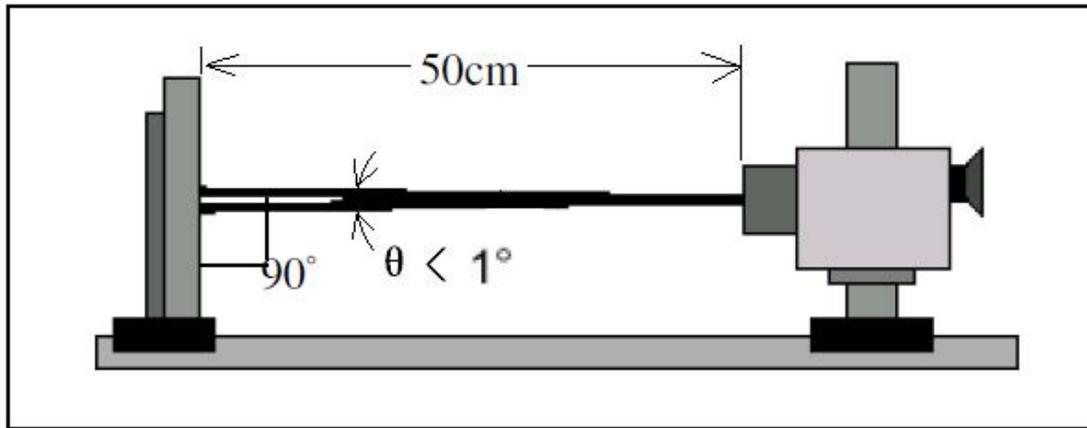
12. Electro-Optical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit	Note
Transmission (without pol)	T		-	3.93	-	%	
Response time	Tr	$\theta = 0^\circ$	-	4	-	ms	4
	Tf	$\phi = 0^\circ$	-	12	-	ms	
Uniformity (Five point)	δ	Ta=25°C	-	75	-	%	7
	WHITE						
Contrast ratio	Cr		800	1000	-	-	3,5
Surface Luminance	Lv		650	700	-	-	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.

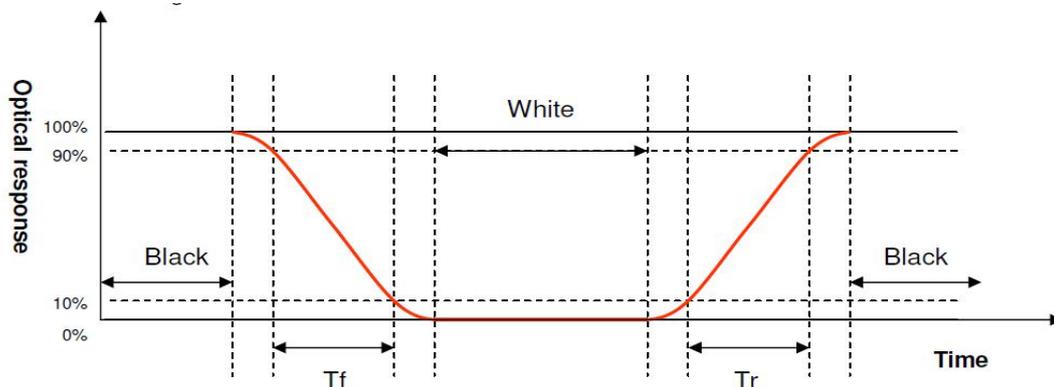
Note 3: To be measured at the center area of panel with a viewing cone of 1 by Topcon luminance meter BM-7A, after 10 minutes operation (module).



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.



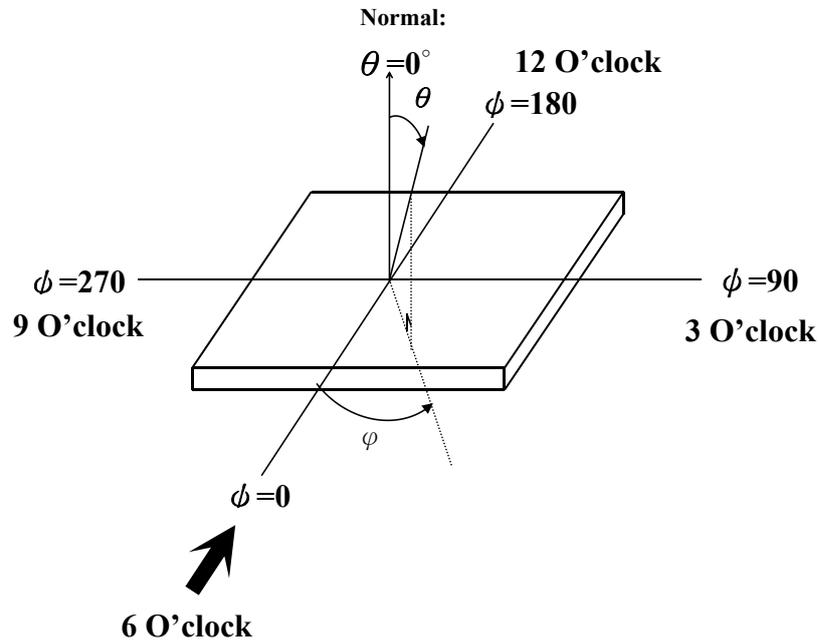
Note 5. Definition of contrast ratio:

Contrast ratio is calculated with the following formula:

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

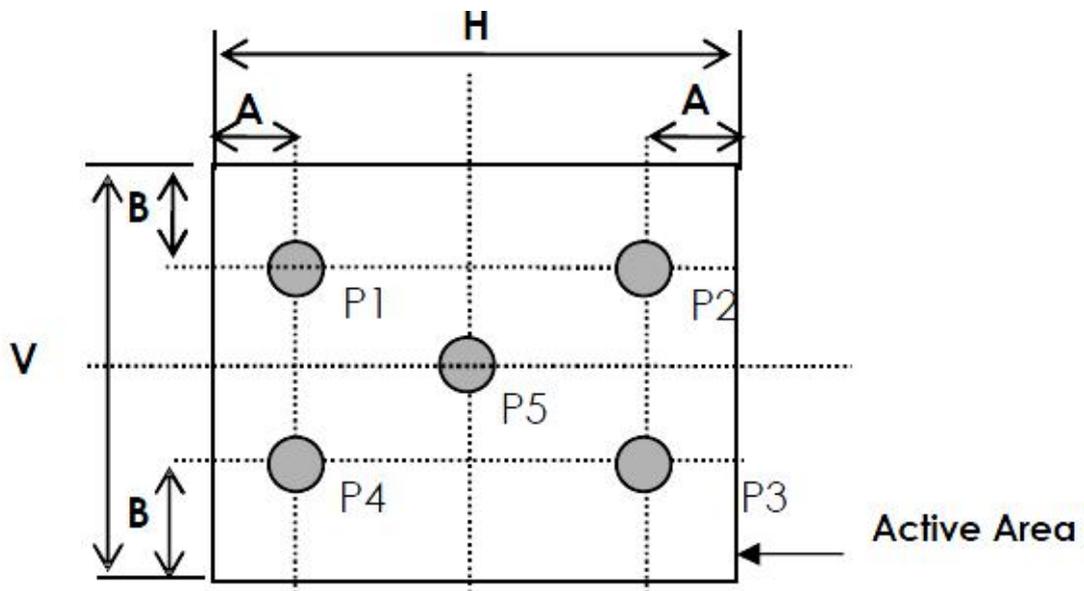
Note 6. Definition of viewing angle

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

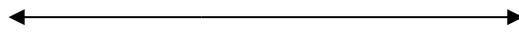
Uniformity definition= [min of 5point/max of 5points]x100%

L_v = Average Surface Luminance with all white pixels (P₁, P₂, P₃, P₄, P₅)



13. 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	+85°C 96Hours
2	Low temperature storage	Endurance test applying the low storage temperature for a long time	-40°C 96Hours
3	High temperature operation	Endurance test applying the electric stress under high temperature for a long time	+85°C 96Hours
4	Low temperature operation	Endurance test applying the electric stress under low temperature for a long time	-30°C 96Hours
5	High temperature /humidity storage	Endurance test applying the high temperature and high humidity storage for a long time	60°C,90% RH, 240H
6	Temperature Cycle (Non operation)	Endurance test applying the low and high temperature cycle $-30^{\circ}\text{C} \leftarrow \rightarrow 25^{\circ}\text{C} \leftarrow \rightarrow 85^{\circ}\text{C}$ $30\text{min} \leftarrow \rightarrow 5\text{min} \leftarrow \rightarrow 30\text{min}$  one cycle	-30°C/85°C, 10 cycles

14. 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 moist



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 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.

15. Package Specification

TBD