SPECIFICATION

Customer: _____

Model Name: TI057FIA10

SPEC NO.: _____

Date: 2023.08.23

Version: V01

■ Preliminary Specification

□ Final Specification

For Customer's Acceptance

Approved by	Comment

Approved by	Reviewed by	Prepared by

SPEC NO.: TI1057FIA10 Date: 2023/08/23

CONTENT

SPEC NO.: TI1057FIA10 Date: 2023/08/23

1. GENERAL SPECIFICATION

1.1. Description

The HX57-V1.0 is a 5.72-inch LCD Cell with thin film transistors as active elements and contains pixels. This model is composed of a single 5.72 (16:9) inches transmissive type main TN-LCD panel. The resolution of the panel is 1920(RGB) x 1080 pixels and can display up to 16.7M color.

1.2. Feature

-TM type for main TN-LCD panel

-LVDS interface

1.3. Application

-Display terminals for digital product

1.4. General Specification

No.	Item	Specification	Unit	Remark
1	LCD Size	5.72(digital)	inch	-
2	Panel Type	LTPS	-	-
3	Resolution	1920 (RGB) x 1080	pixel	-
4	Display Mode	Normally white,Transmissive	-	-
5	Display Number of	16.7M	-	-
6	Viewing Direction	FREE	-	-
7	Contrast Ratio	1500	-	-
8	Luminance	1000	cd/m^2	-
9	Module Size	134(H) x 84.5(V)*4.6	mm	Note
10	Active Area	126.20(H) x 70.99(V)	mm	Note
11	Pixel Pitch		mm	-
12	Weight	135	g	-
13	Driver IC	ST5892B	-	-
14	Interface	LVDS	-	-
15	Operating Temperature	-20~70	℃	-
16	Storage Temperature	-30~80	℃	-

Note: Please refer to the mechanical drawing.

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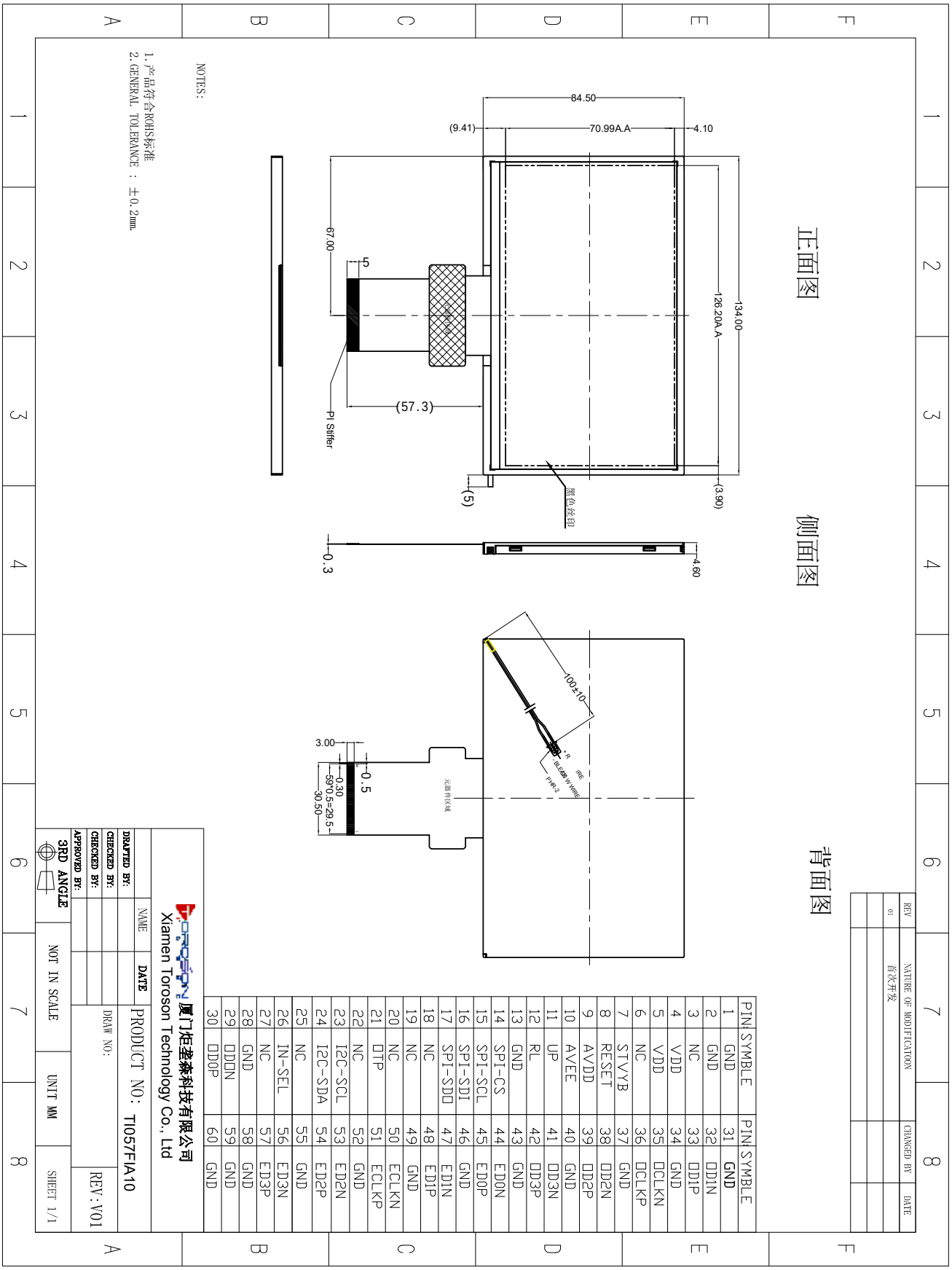
2. MECHANICAL DRAWING



3. INTERFACE ASSIGNMENT

Pin NO.	Symbol	Function
1	GND	GROUND
2	GND	GROUND
3	NC	No connection
4	VCC	Power supply 3.3V
5	VCC	Power supply 3.3V
6	NC	No connection
7	STBYB	STBYB = "H", normal operation(default)
8	RESET	Reset signal input terminal
9	VSP	Positive input analog power for driver IC use 5~7V
10	VSN	Negative input analog power for driver IC use -5~-7V
11	UD	Gate up or down scan control
12	LR	Source right or left sequence control
13	GND	GROUND
14	SPI_CS	Chip select input pin
15	SPI_SCL	Serial clock
16	SPI_SDA	Serial DATA input signal
17	NC	No connection
18	NC	No connection
19	NC	No connection
20	NC	No connection
21	NC	No connection
22	NC	No connection
23	I2C_SCL	Serial clock
24	I2C_SDA	Serial DATA input signal
25	NC	No connection
26	I2C/SPI_SET	I2C/SPI_SET NC=SPI 3.3V=I2C
27	NC	No connection
28	GND	GROUND
29	OD0N	data Lane
30	OD0P	data Lane
31	GND	GROUND
32	OD1N	data Lane
33	OD1P	data Lane
34	GND	GROUND
35	OCLKN	Clock Lan
36	OCLKP	Clock Lan
37	GND	GROUND
38	OD2N	data Lane

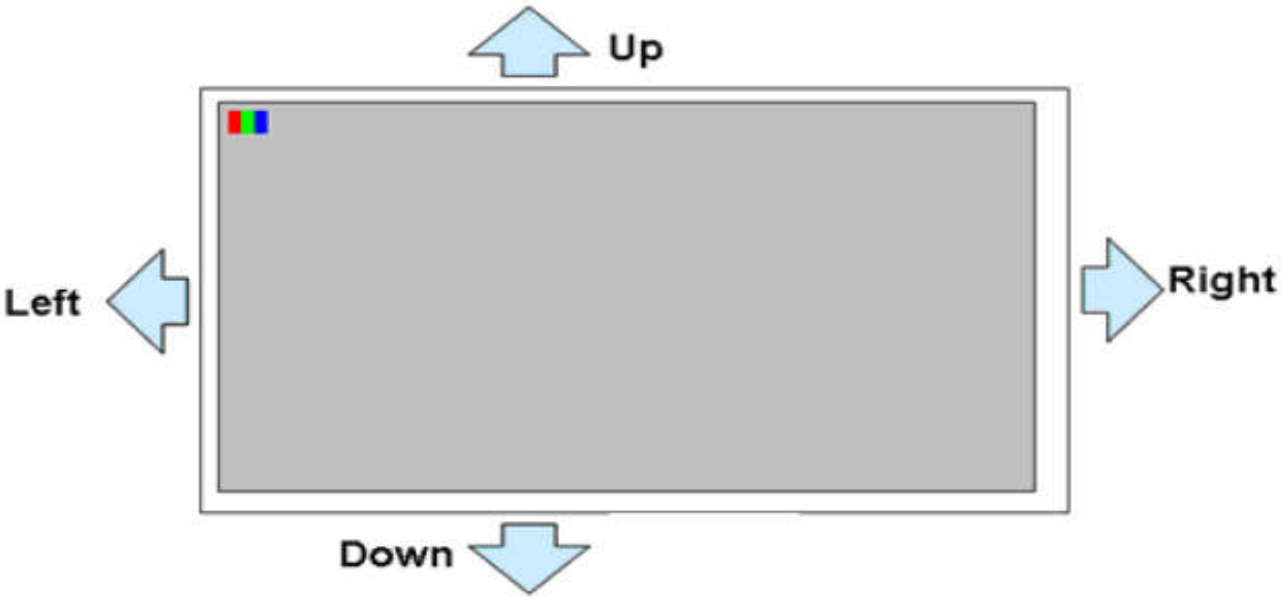
39	OD2P	data Lane
40	GND	No connection
41	OD3N	data Lane
42	OD3P	data Lane
43	GND	GROUND
44	ED0N	data Lane
45	ED0P	data Lane
46	GND	GROUND
47	ED1N	data Lane
48	ED1P	data Lane
49	GND	GROUND
50	ECLKN	Clock Lan
51	ECLKP	Clock Lan
52	GND	GROUND
53	ED2N	data Lane
54	ED2P	data Lane
55	GND	GROUND
56	ED3N	data Lane
57	ED3P	data Lane
58	GND	GROUND
59	GND	GROUND
60	GND	GROUND

Remarks：

1、if LVDS input data is 6bits,SELB must must be set to High
if LVDS input data is 8bit , SELB must be set to Low

2、U/D and L/R control function

U/D	L/R	FUNCTION
0	1	Normal display
0	0	Inverse Left and Right
1	1	Inverse Up and Down
1	0	Inverse Left and Right Inverse Up and Down



4. ELECTRICAL SPECIFICATION

4.1. POWER SUPPLY

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage	Vcc	2.8	3.3	3.6	V	
	V_{GH}		15		V	
	V_{GL}	-	-11.5	-	V	
	AV_{DD}	-	-	-	V	
VCOM	V_{Com}	-2	-1.498	0	V	Note 1

Note 1: Please adjust VCOM to make the flicker level be minimum.

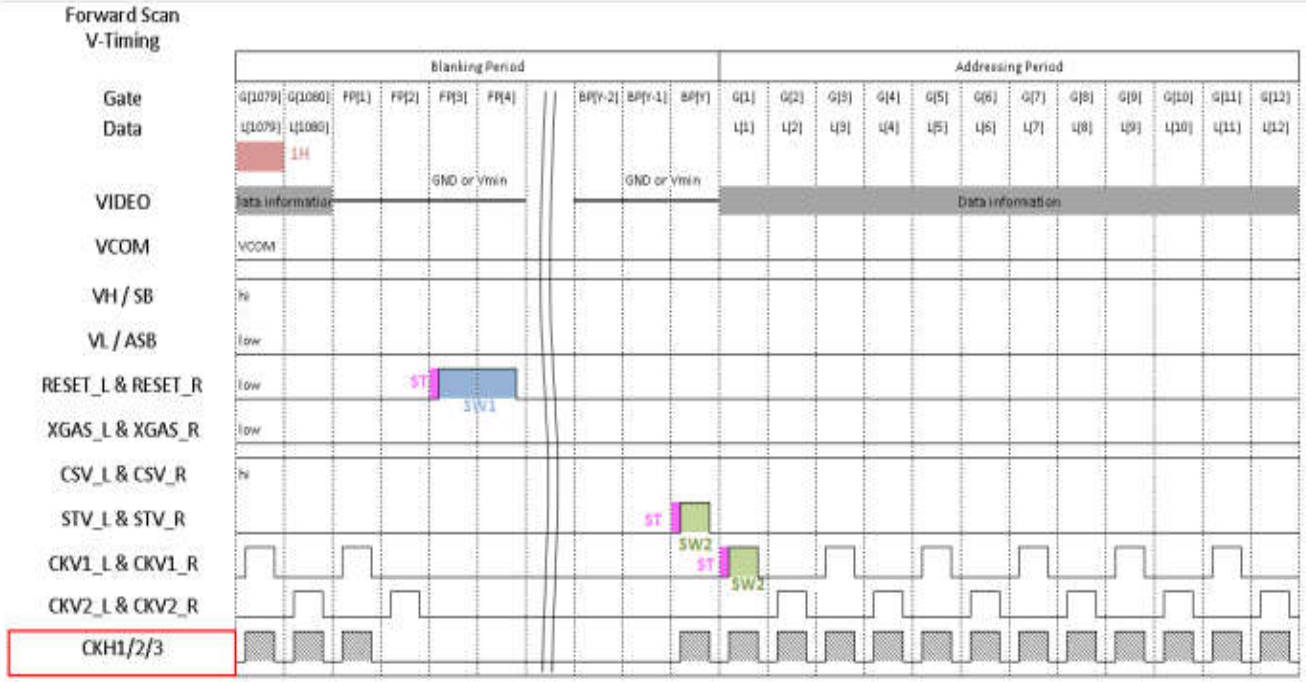
4.2. DC Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Input signal Voltage	V_{iH}	0.7Vcc	-	Vcc	V	Note(1)
	V_{iL}	0	-	0.3 Vcc	V	
Current of power supply	IDD	-	38	45	mA	VCC=3.3V
	I_{ADD}	-	-	-	mA	-
	I_{GH}	-	0.5	1	mA	V_{GH}=15V
	I_{GL}	-	0.5	1	mA	V_{GL}=-11.5V

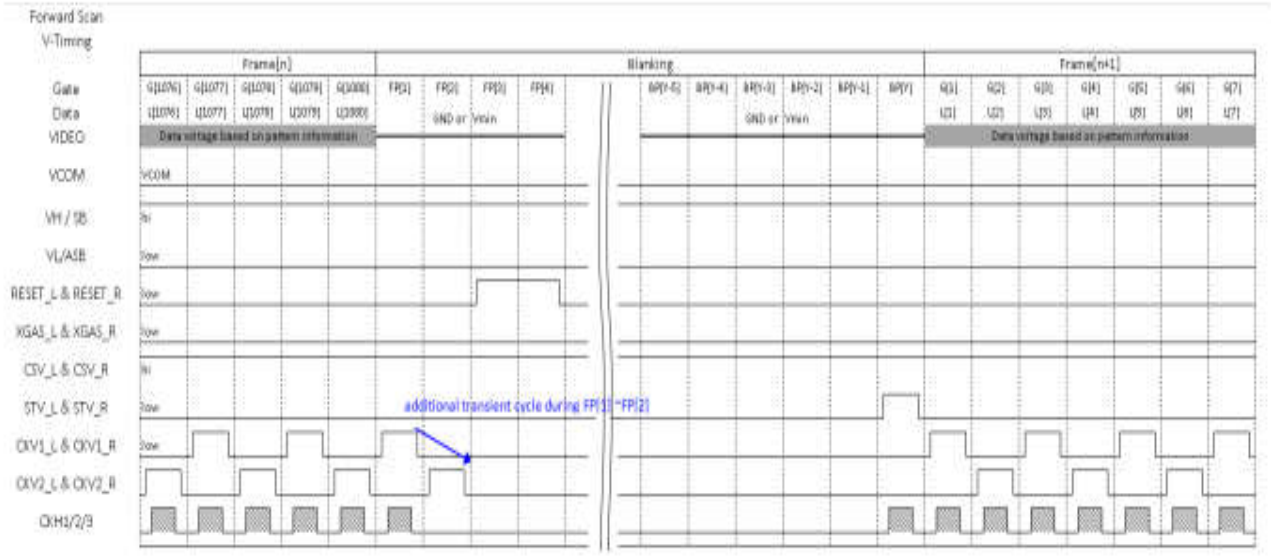
Note (1): HSYNC, VSYNC, DE, Digital Data

4.3.PowerSequence ON/OFF

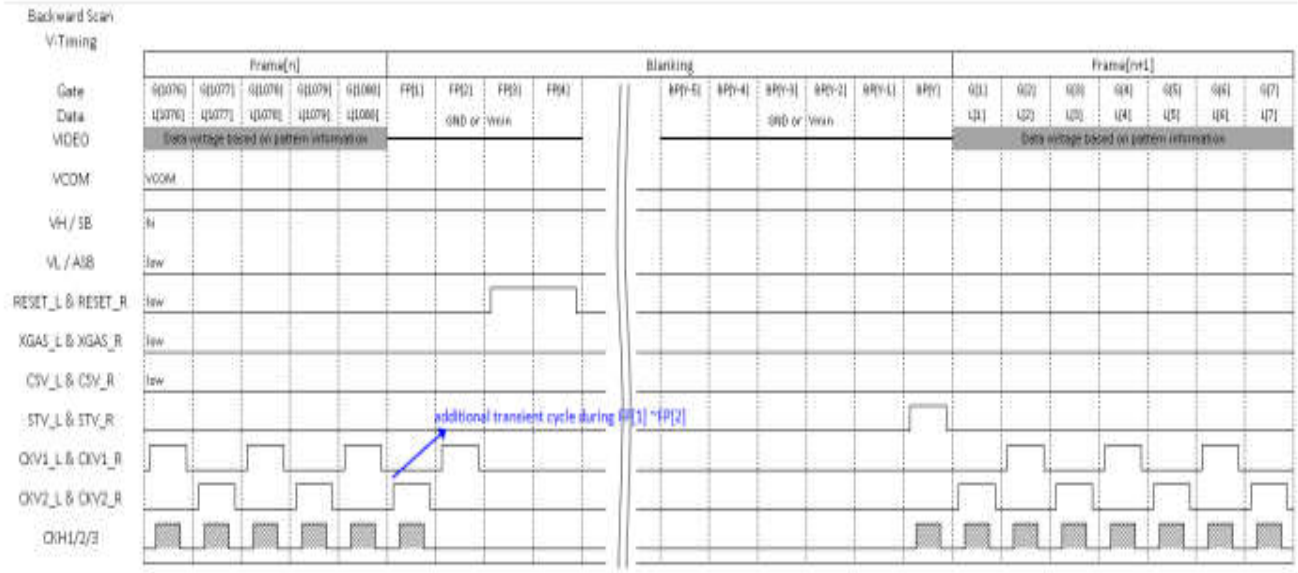
4.4. TIMING SPECIFICATION



3.3 .2 Active driving mode (Backward scan, default setting)



3.3 .4 Two Frame Timing (Backward scan)



3.3 .5 Passive driving mode (include XGAS function, DC VCOM)

- Inversion type: Frame inversion
- XGAS: keep Low level
- CKH(1~3): keep High level
- VIDEO1 / 2 / 3 / 4 : -8V~10V adjust, step: 10V/128=0.08V
- VCOM: 0V~-2V adjust, step: 2V/100=0.02V
- Other signals: keep original setting

4.5 BACKLIGHT SPECIFICATION

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Voltage for LED backlight	V_L	12	14	17	V	Note 1
Current for LED backlight	I_L	-	200	-	mA	
LED life time	-	20,000	-	-	Hr	Note 2

Note 1: The LED Supply Voltage is defined by the number of LED at Ta=25℃ and IL=200mA

Note 2: The "LED life time" is defined as the module bightness decrease to 50% original brightness at Ta=25℃ and IL=200mA.The LED lifetime could be decreased if operating IL is lager than 200mA.

4.6. Backlight Absolute Maximun Ratings

Parameter	Symbol	Condition	Value	Unit
Peak Forward Voltage	V_{FM}	IF=300mA	11	V
Peak Forward Current	I_{FP}	0.1MSEC	100	mA
Reverse Voltage	V_R	-	5	V
Power Dissipation	P_d	IF=200mA	4650	mW

4. 6Optical Specifications

Item	Symbol	Condition	Values			Unit	Remark
			Min.	Typ.	Max.		
Viewing angle (Cr≥ 10)	θ_L	Φ=180°(9 o'clock)	80	89	-	degree	Note 1
	θ_R	Φ=0°(3 o'clock)	80	89	-		
	θ_T	Φ=90°(12 o'clock)	80	89	-		
	θ_B	Φ=270°(6 o'clock)	80	89	-		
Response time	T_{ON}	Normal θ=Φ=0°	-	10	20	msec	Note 3
	T_{OFF}		-	15	30	msec	Note 3
Contrast ratio	C_R		1000	1500	-	-	Note 4
Color chromaticity	W_X		0.26	0.31	0.36	-	Note 2 Note 5
	W_Y		0.28	0.33	0.38	-	Note 6
Luminance	L		800	1000	-	cd/m2	Note 6
Luminance uniformity	Y_U		75%	80%			Note 7
NTSC	-		53%	58%			Note 7

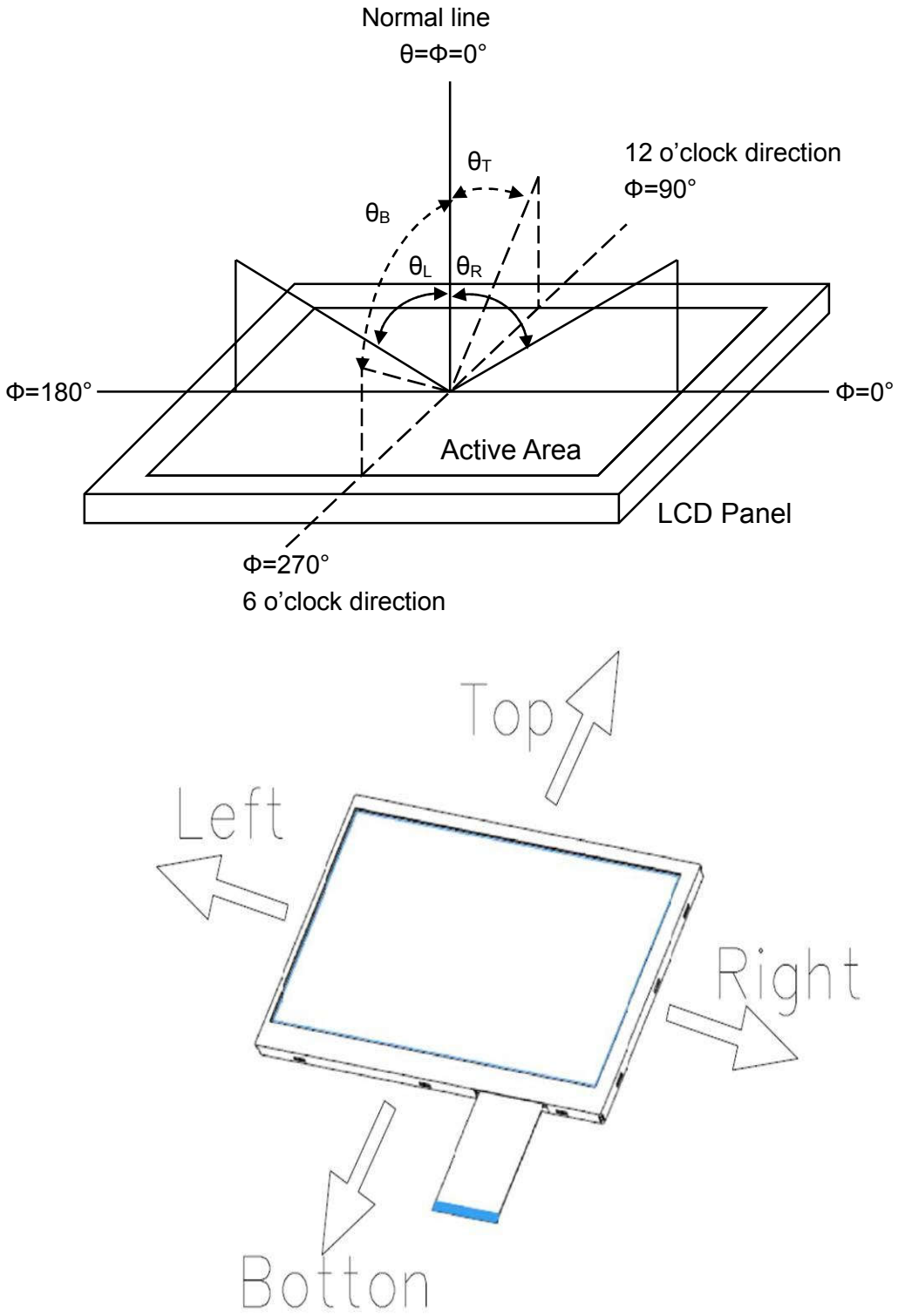


Fig. 2 Definition of viewing angle for display

Note 2: Definition of optical measurement system

The optical characteristics should be measured in a dark room with ambient temperature T_a=+25℃. The optical properties are measured at the center point of the LCD screen after 5 minutes operation. (Equipment: Photo detector TOPCON BM-5AS Field of view: 1°/Height: 500mm.)

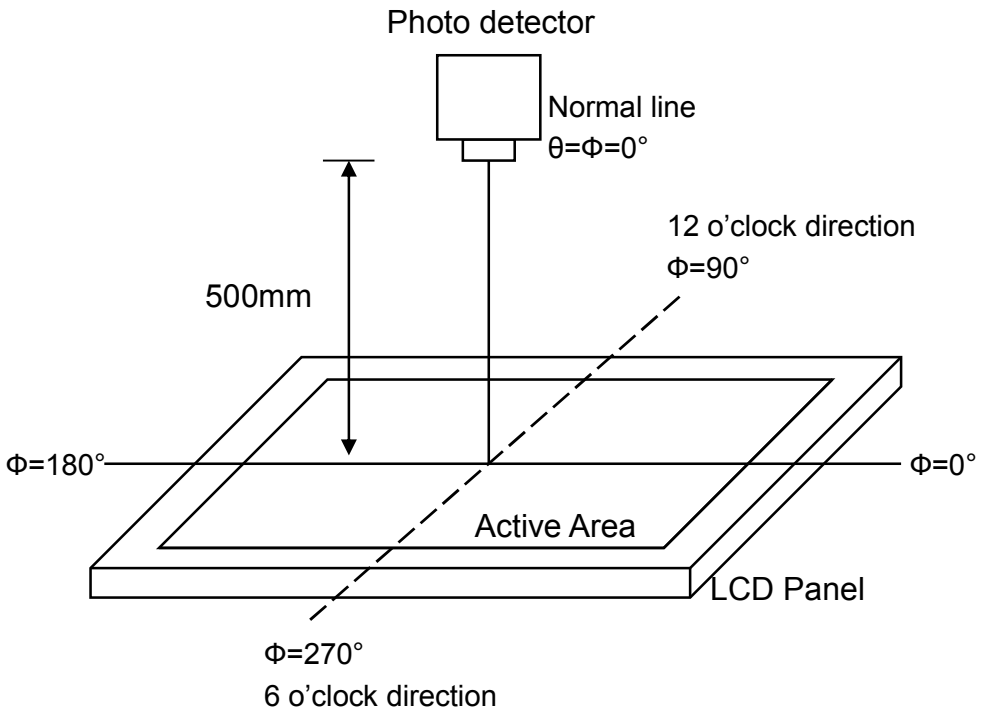


Fig. 3 Optical measurement system setup

Note 3: Definition of response time

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time (T_{on}) is the time between photo detector output intensity changed from 90% to 10%, and fall time (T_{off}) is the time between photo detector output intensity changed from 10% to 90%.

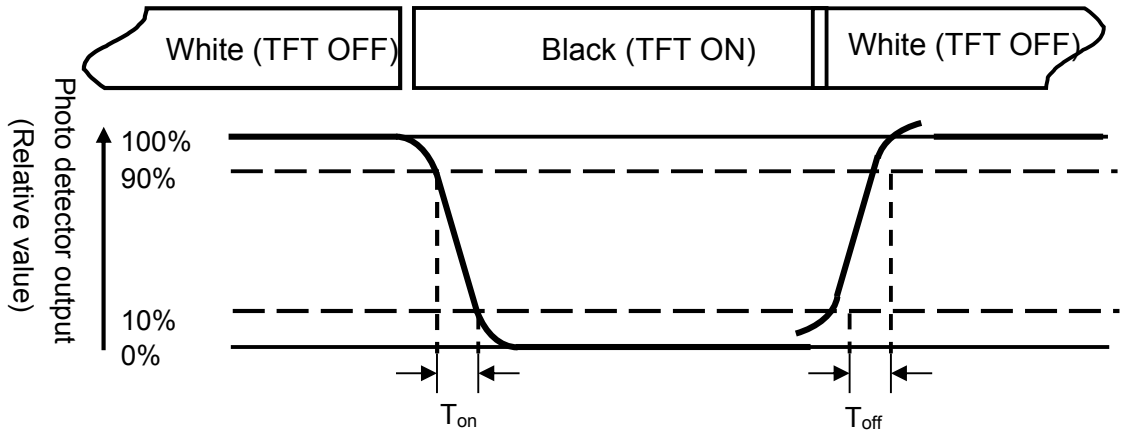


Fig. 4 Definition of response time

Note 4: Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note 5: Definition of luminance

Measured at the center area of the panel when LCD panel is driven at “white” state.

Note 6: Definition of color chromaticity (CIE1931)

Color coordinates measured at the center point of LCD when panel is driven at “White”, “Red”, “Green” and “Blue” state respectively.

Note 7: Definition of luminance uniformity

To test for uniformity, the tested area is divided into 3 rows and 3 columns. The measurement spot is placed at the center of each circle as below.

$$\text{Luminance Uniformity } (U_L) = \frac{L_{min}}{L_{max}}$$

L-------Active area length W----- Active area width

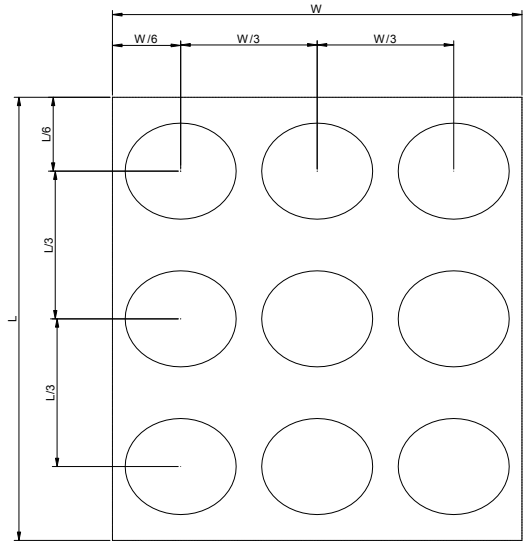


Fig. 5 Definition of luminance uniformity

L_{min} : The measured minimum luminance of all measurement position.

L_{max} : The measured maximum luminance of all measurement position.

Note 9: Definition of Flicker

Flicker is the pattern usually used to describe the visual sensation produced by a rapidly varying light intensity. There should be no visible flicker in normal direction of the display when the following figure are loaded. The figure is composed of interlaced black and white lines.

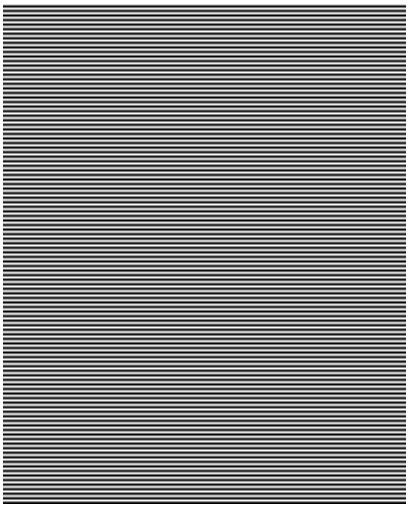


Fig.6 Flicker checker pattern

Note 10: Definition of crosstalk

There should be no visible in normal direction of the display when the following figures are loaded.

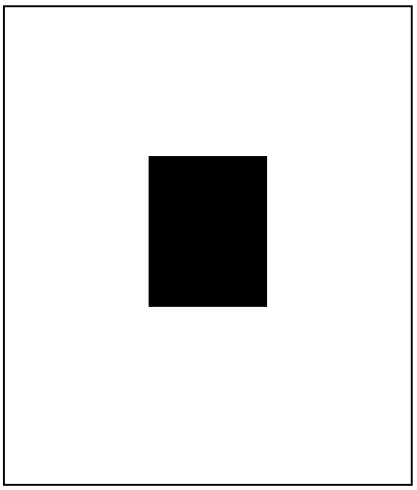


Fig.7 Crosstalk checker pattern

6. RELIABILITY TESTS

ITEM	CONDITION	CRITERION
Operating Temperature Test	High Temperature: +70±2 ºC,96hrs Low Temperature: -20±2 ºC, 96hrs	No defects in display and operational functions
Storage Temperature Test	High Temperature: +80 ±3ºC, 120hrs Low Temperature: -30±3ºC, 120hrs	No defects in display and operational functions
High Temp &High Humidity	50 ºC, 90RH, 96hrs	No defects in display and operational functions
Thermal Shock Test	-20 ºC (0.5 hrs) ←→+70 ºC(0.5 hrs) 10 cycles	No defects in display and operational functions
Vibration Test	Package Operating Time: 60 minutes exposure for each Y direction Sweep Frequency:10~55Hz (1 min) Amplitude: 1.5mm Speed:20m/s2	No defects in display and operational functions
Package Drop Test	Height :1.0m (Weight≦10kg); 60cm(Weight≧10kg) 1 corner,3 edges,6 surfaces	No defects in display and operational functions
Electro Static Discharge	± 2KV, Human Body Mode, 100pF/1500Ω ± 8KV, Air Mode, 100pF/1500Ω	No defects in display and operational functions

NOTE:

1) The samples must be free from defect before test, must be restored at room condition at least for 2 hours after reliability test before any inspection.

2) Before test the function of TP, the sample must be placed in room temperature for 24hrs after RA test.

7. PACKAGE DRAWING

TBD

8. PRECAUTIONS

8.1. HANDLING

9.1.1. Polarizer Cleaning, Petroleum ether (or N-hexane) is recommended for cleaning the front/rear polarizers and reflectors, acetone, toluene and ethanol are not allowed to avoid damaging the surface.

9.1.2. Body grounding, must wear Anti-ESD wrist strap while pick up LCDs.

9.1.3. FPC Soldering, less than 300℃/3S, solder must be grounding on grounding bench.

9.1.4. If use electric Screwdriver to do assembly, screwdriver must be grounding.

8.2. STORAGE

9.2.1. Keep in a sealed polyethylene bag.
9.2.2. Keep in a dark place.
9.2.3. Keep in temperature between 0℃ and 35℃.
.

8.3. SAFETY

If liquid crystal leak out of a damaged glass cell, **DO NOT** put it in your mouth or touch eyes, if the liquid crystal touch your skin or clothes, please wash it off immediately using soap and water.

9. LIMITED WARRANTY

Unless otherwise agreed between BOHUA PHOTOELECTRONICS and customer, BOHUA PHOTOELECTRONICS will replace or repair any of its LCD modules which are found to be functionally defective when inspected in accordance with BOHUA PHOTOELECTRONICS LCD acceptance standards (copies available upon request) for a period of one year from date of shipments. Cosmetic/visual defects over specs must be returned to BOHUA PHOTOELECTRONICS within 30 days of shipment. Confirmation of such date shall be based on freight documents. The warranty liability of BOHUA PHOTOELECTRONICS limited to repair and/or replacement on the terms set forth above. BOHUA PHOTOELECTRONICS shall not be responsible for any subsequent or consequential events.

9.1. RETURNING LCM UNDER WARRANTY – TERMS AND CONDITIONS

9.1.1. No warranty can be granted if the precautions stated above have been disregarded. The typical examples of violations are :

- Broken LCD glass.
- Circuit modified in any way, including addition of components.

9.1.2. Module repairs will be invoiced to the customer upon mutual agreement. Modules must be returned with sufficient description of the failures or defects. Any connectors or cable installed by the customer must be removed completely without damaging the PCB's eyelet, conductors and terminals.