■ Tentative Specification
☐ Preliminary Specification
☐ Approval Specification

MODELNAME:YH080MS4001
Version:LN01

Customer: Common

APPROVED BY **SIGNATURE**

Name / Title
Note

Please return 1 copy for your confirmation with your signature and comments.

Approved By	Checked By	Prepared By

Record of Revision

Version	Revise Date	Page	Content
Pre-Spec. 01	2021/06/18		Initial Release.
Fin-Spec. 02	2021/09/29		Update detail parameters

Contents

1. General Specifications

No.	Item	Specification	Remark
1	LCD size	8.0 inch(Diagonal)	
2	Driver element	a-Si TFT active matrix	
3	Resolution	1024 x 3(RGB) x 600	
4	Display mode	Normally White	
5	Active area	176.64(W) x 99.36(H)mm	
6	LCM size	192.8(W) x 116.9(H) x 6.4(D)mm	Note 1
7	View Direction	75/75/70/75	L/R/U/D
8	Interface (LCM)	40pin LVDS	
9	Contrast Ratio	700	
10	Luminous	400 cd/m2 (Typ)	
11	Operating Temperature	-30~80	℃
12	Storage Temperature	-30~80	℃

Note 1: Refer to Mechanical Drawing.

2. Pin Assignment

2.1. TFT LCD Panel Driving Section

FPC Connector is used for the module electronics interface.

Pin No.	Symbol	I/O	Function	Note
1	VCOM	P	Common Voltage	
2	VDD	P	Power Voltage for digital circuit	
3	VDD	P	Power Voltage for digital circuit	
4	NC	---	No connection	
5	Reset	I	Global reset pin	Note1
6	U/D	I	Vertical inversion	Note2
7	L/R	I	Horizontal inversion	Note2
8	STBYB	I	Standby mode, Normally pulled high STBYB = “1”, normal operation STBYB = “0”, timing controller, source driver will turn off, all output are High-Z	
9	GND	P	Ground	
10	RXCLKIN-	I	- LVDS differential data input	
11	RXCLKIN+	I	+ LVDS differential data input	
12	GND	P	Ground	
13	RXIN0-	I	- LVDS differential data input	
14	RXIN0+	I	+ LVDS differential data input	
15	GND	P	Ground	
16	RXIN1-	I	- LVDS differential data input	
17	RXIN1+	I	+ LVDS differential data input	
18	GND	P	Ground	
19	RXIN2-	I	- LVDS differential clock input	
20	RXIN2+	I	+ LVDS differential clock input	
21	GND	P	Ground	
22	RXIN3-	I	- LVDS differential data input	
23	RXIN3+	I	+ LVDS differential data input	
24	GND	P	Ground	
25	SELB	I	6bit/8bit mode selection	Note3
26	GND	P	Ground	
27	AVDD	P	Power for Analog Circuit	
28	GND	P	Ground	
29	VGH	P	Gate ON Voltage	
30	NC	---	No connection	
31	NC	---	No connection	
32	VGL	P	Gate off Voltage	
33	GND	P	Ground	
34	NC	---	No connection	

Pin No.	Symbol	I/O	Function	Note
35	LED-	P	LED Cathode	
36	LED-	P	LED Cathode	
37	NC	---	No connection	
38	NC	---	No connection	
39	LED+	P	LED Anode	
40	LED+	P	LED Anode	

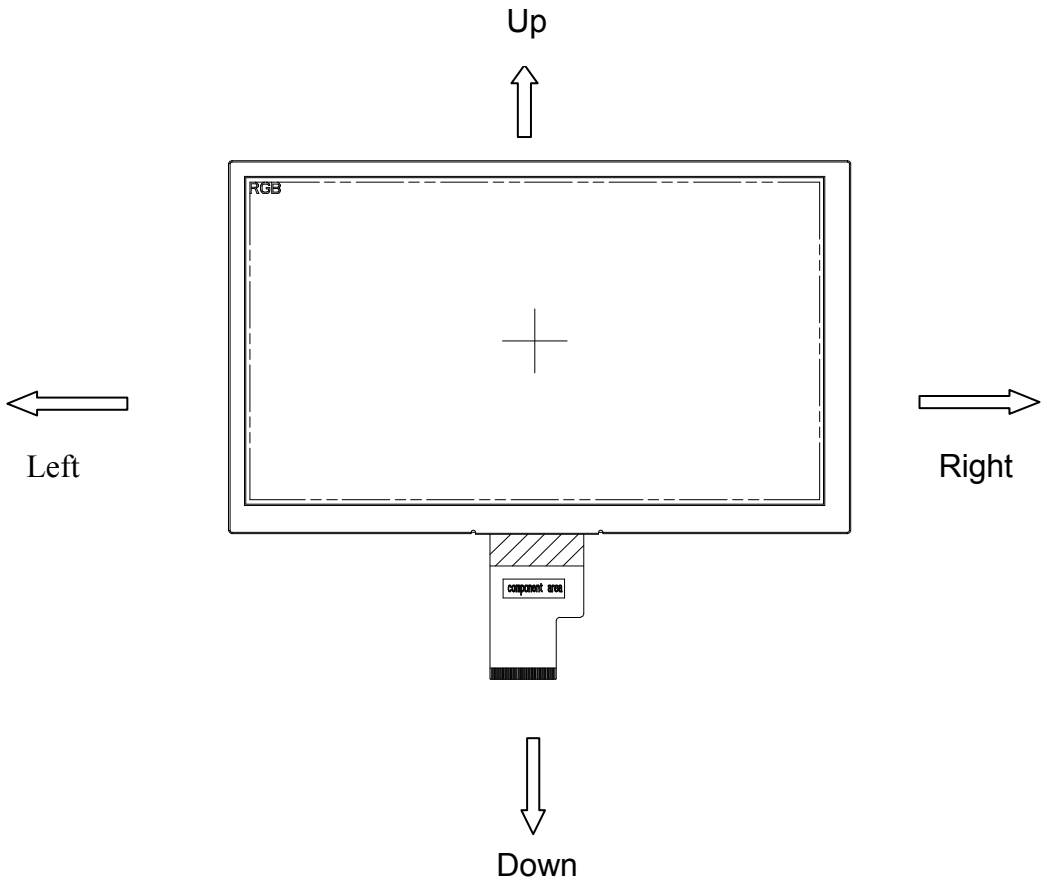
I: input O: Output P: Power

Note1：Global reset pin: Active low to enter reset mode. Suggest connecting with an RC reset circuit for stability. Normally pull high. (R=10KΩ, C=0.1μF)

Note2：When L/R="0", set right to left scan direction.
When L/R="1", set left to right scan direction.
When U/D="0", set top to bottom scan direction.
When U/D="1", set bottom to top scan direction.

Note3：If LVDS input data is 6 bits, SELB must be set to High;
If LVDS input data is 8 bits, SELB must be set to Low.

Note: Definition of scanning direction.
Refer to the figure as below:



3. Operation Specifications

3.1. Absolute Maximum Rating

(GND=AV_{SS}=0V, Note 1)

Item	Symbol	Values		Unit	Remark
		Min.	Max.		
Power voltage	V_{DD}	-0.3	5.0	V	
	AV_{DD}	6.5	13.5	V	
	V_{GH}	-0.3	42	V	
	V_{GL}	-20.0	0.3	V	
	V_{GH}-V_{GL}	-	40.0	V	
Operation Temperature	T_{OP}	-30	80	℃	
Storage Temperature	T_{ST}	-30	80	℃	

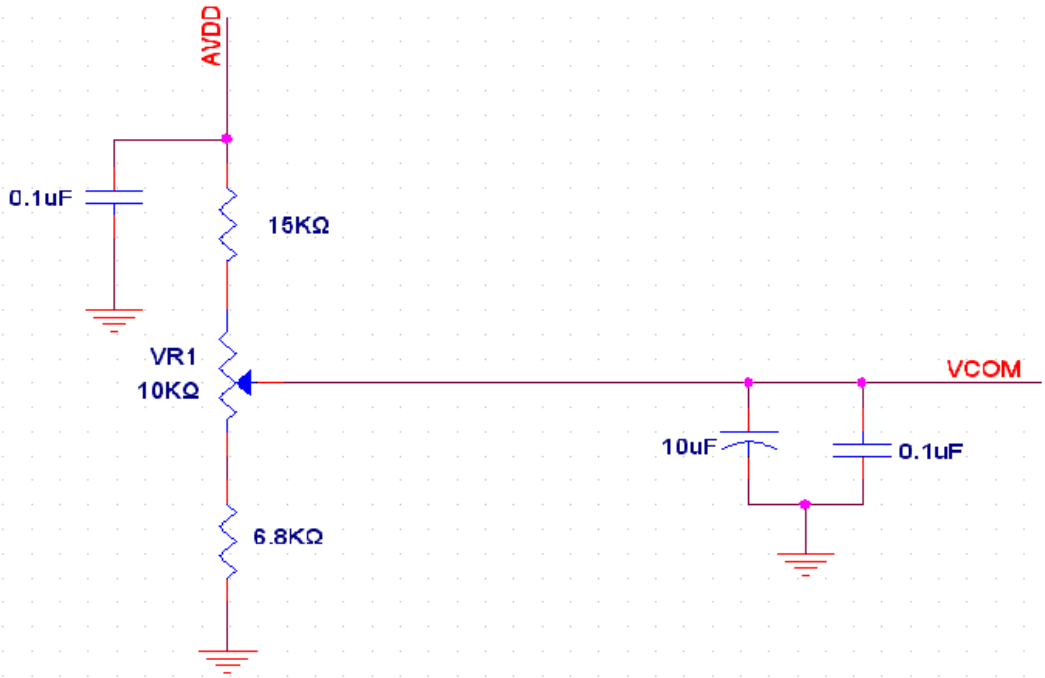
Note 1: The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

3.1.1. Typical Operation Conditions

(GND=AV_{SS}=0V, Note 1)

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Power voltage	V_{DD}	3.0	3.3	3.6	V	Note 2
	AV_{DD}	10.8	11	11.5	V	
	V_{GH}	16.0	19.9	24.0	V	
	V_{GL}	-9.8	-6.8	-3.8	V	
Input signal voltage	V_{COM}	3.4	(3.67)	4.0	V	Note 3
Input logic high voltage	V_{IH}	0.7V_{CC}	-	V_{CC}	V	Note 4
Input logic low voltage	V_{IL}	0	-	0.3V_{CC}	V	

Note 1: Be sure to apply V_{CC} and V_{GL} to the LCD first, and then apply V_{GH}.
Note 2: V_{CC} setting should match the signals output voltage (refer to Note 3) of customer's system board .
Note 3:Typical Vcom is only a reference value, it must be optimized according to each LCM. Please use VR and base on below application circuit.
Note 4: RESET,STBYB,SELB,L/R,U/D.



3.1.2. Current Consumption

(GND=AV_{SS}=0V)

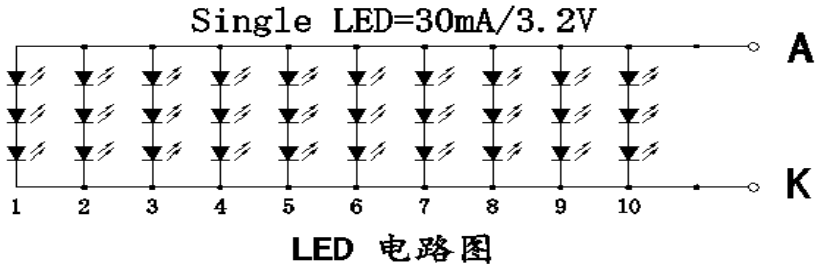
Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Current for Driver	I_{GH}	-	0.25	1.0	mA	V_{GH} =19.9V
	I_{GL}	-	0.25	1.0	mA	V_{GL} = -6.8V
	I_{DD}	-	38	60	mA	DV_{DD} =3.3V
	IAV_{DD}	-	20	30	mA	AV_{DD} =11V

3.1.3. Backlight Driving Conditions

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Voltage for LED backlight	V_L	8.7	9.6	10.5	V	Note 1
Current for LED backlight	I_L	-	300	350	mA	30mA/LED
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 I_L = 300mA.

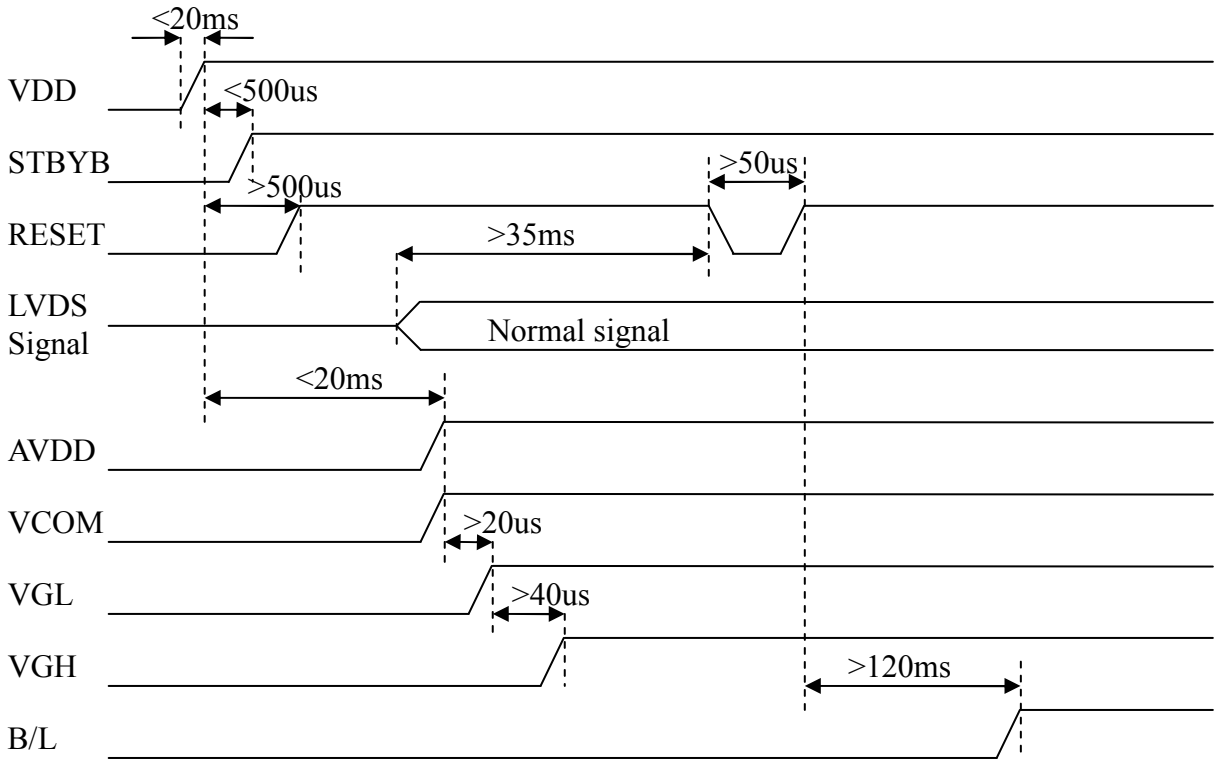
Note 2: The “LED life time” is defined as the module brightness decrease to 50% original brightness at Ta=25℃ and I_L =300mA. The LED lifetime could be decreased if operating I_L is lager than 300mA.



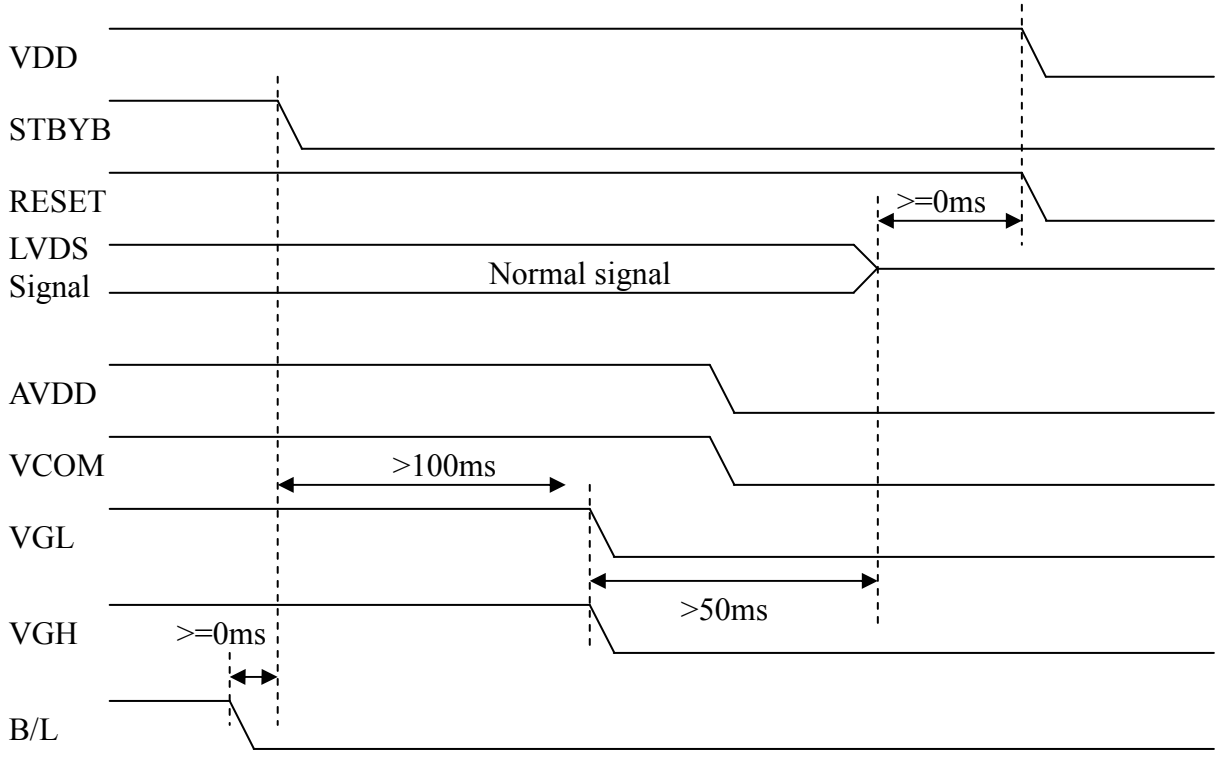
LED 电路图

3.2. Power Sequence

a. Power on:



b. Power off:

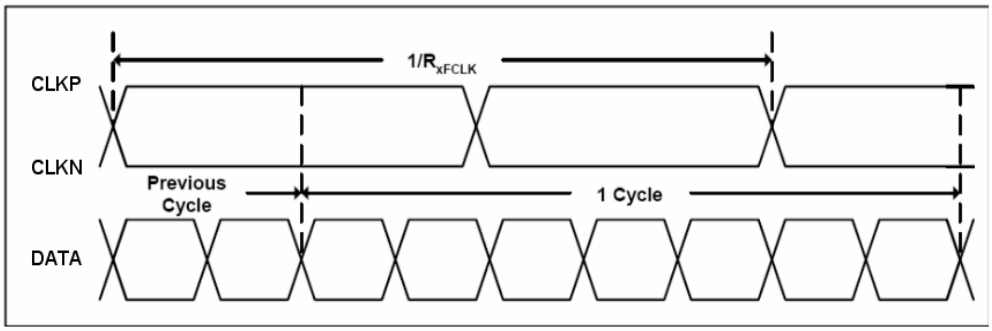


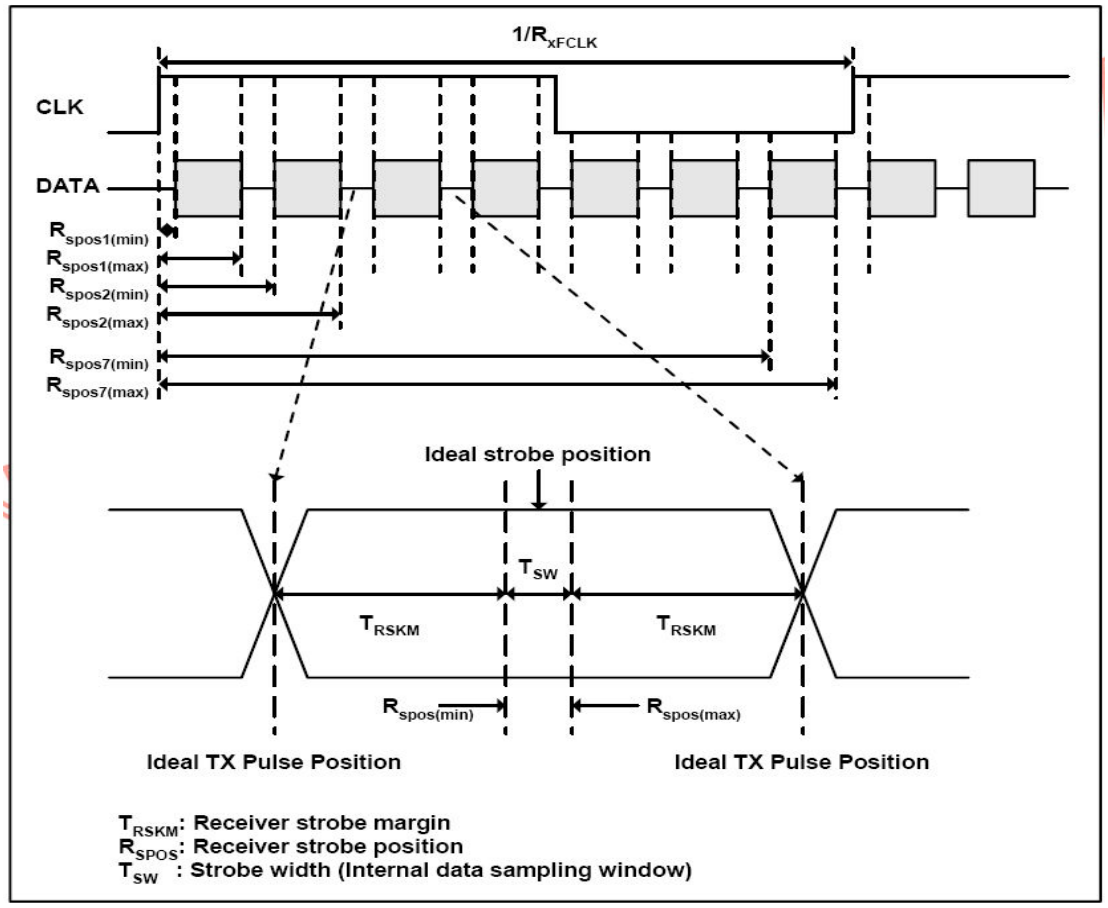
3.3. Timing Characteristics

3.3.1. AC Electrical Characteristics

Parameter	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Clock frequency	R_{xFCLK}	20	-	71	MHz	
Input data skew margin	T_{RSKM}	500	-	-	ps	
Clock high time	T_{LVCH}	-	$4/(7* R_{xFCLK})$	-	ns	
Clock low time	T_{LVCL}	-	$3/(7* R_{xFCLK})$	-	ns	

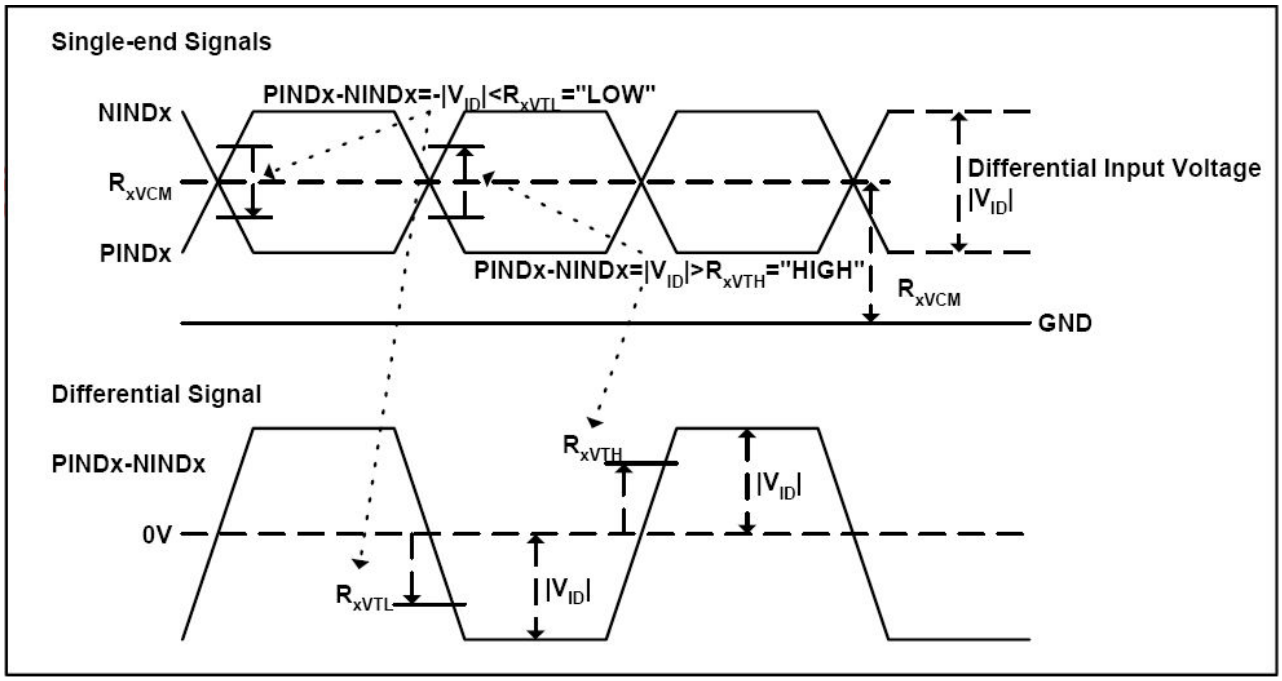
3.3.2. Input Clock and Data Timing Diagram





3.3.3. DC Electrical Characteristics

Parameter	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Differential input high Threshold voltage	R_{xVTH}	-	-	+0.1	V	R_{XVCM}=1.2V
Differential input low Threshold voltage	R_{xVTL}	-0.1	-	-	V	
Input voltage range (singled-end)	R_{xVIN}	0	-	2.4	V	
Differential input common mode voltage	R_{xVCM}	$\|V_{ID}\|/2$	-	$2.4-\|V_{ID}\|/2$	V	
Differential voltage	$\|V_{ID}\|$	0.2	-	0.6	V	
Differential input leakage current	RV_{xliz}	-10	-	+10	uA	

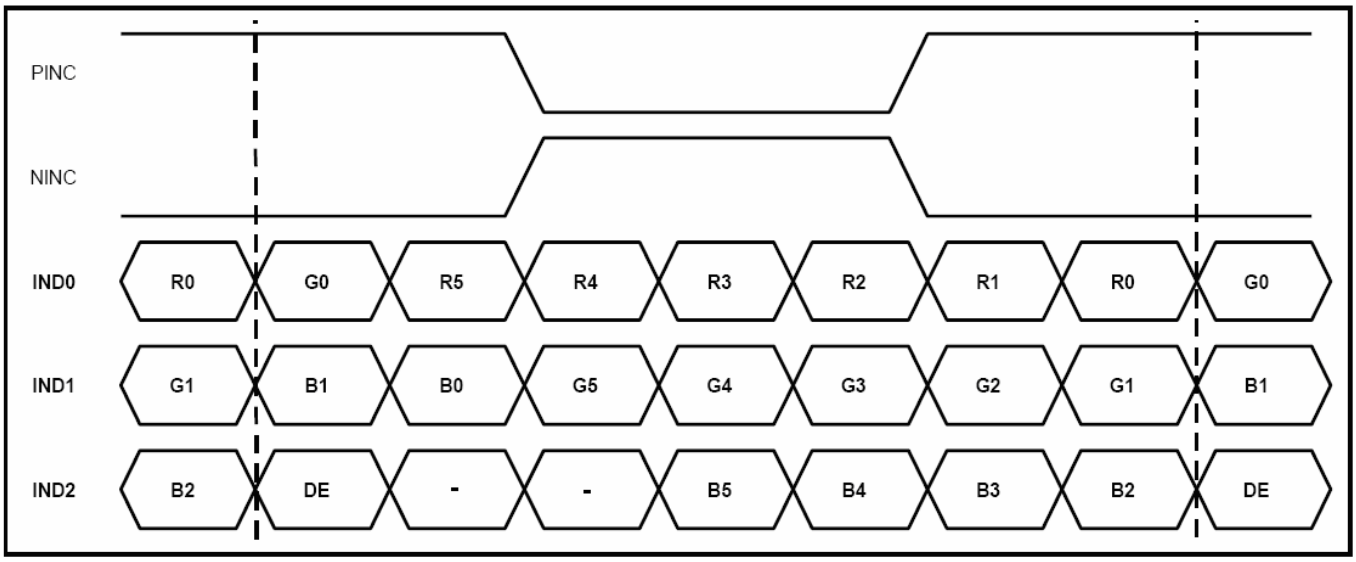


3.3.4. Timing

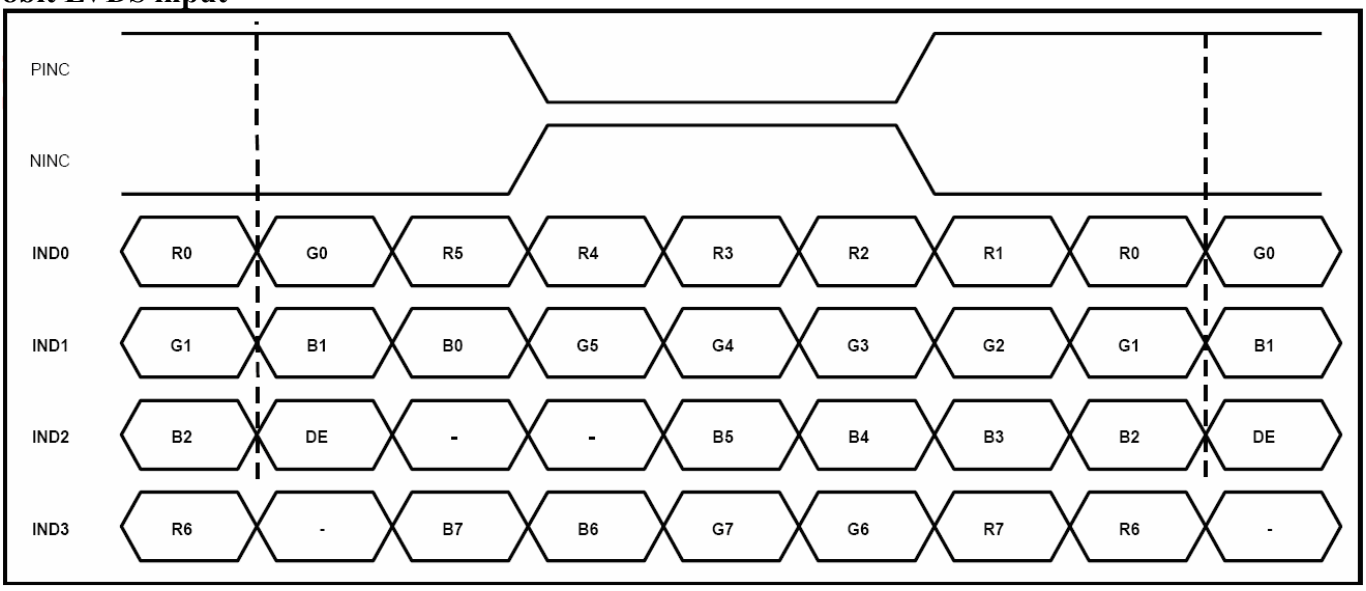
Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Clock Frequency	fclk	40.8	51.2	67.2	MHz	Frame rate =60Hz
Horizontal display area	thd		1024		DCLK	
HS period time	th	1114	1344	1400	DCLK	
HS Blanking	thb	90	320	376	DCLK	
Vertical display area	Thb+thfp		600		H	
VS period time	tv	610	635	800	H	
VS Blanking	Tvb+tvfp	10	35	200	H	

3.3.5. Data Input Format

6bit LVDS input



8bit LVDS input



Note: Support DE timing mode only, SYNC mode not supported.

4. Optical Specifications

Item	Symbol	Condition	Values			Unit	Remark
			Min.	Typ.	Max.		
Viewing angle (CR≥ 10)	θ_L	Φ=180°(9 o'clock)	65	75	-	degree	Note 1
	θ_R	Φ=0°(3 o'clock)	65	75	-		
	θ_T	Φ=90°(12 o'clock)	60	70	-		
	θ_B	Φ=270°(6 o'clock)	65	75	-		
Response time	T_{ON}	Normal θ=Φ=0°	-	10	20	msec	Note 3
	T_{OFF}		-	20	30	msec	Note 3
Contrast ratio	CR		500	700		-	Note 4
Color chromaticity	W_X		0.26	0.28	0.36	-	Note 2 Note 5 Note 6
	W_Y		0.26	0.29	0.38	-	
Luminance	L		350	400	-	cd/m²	Note 6
Luminance uniformity	Y_U		70	75	-	%	Note 7

Test Conditions:

1. V_{CC}=3.3V, I_L=300mA (Backlight current), the ambient temperature is 25℃.
2. The test systems refer to Note 2.

Note 1: Definition of viewing angle range

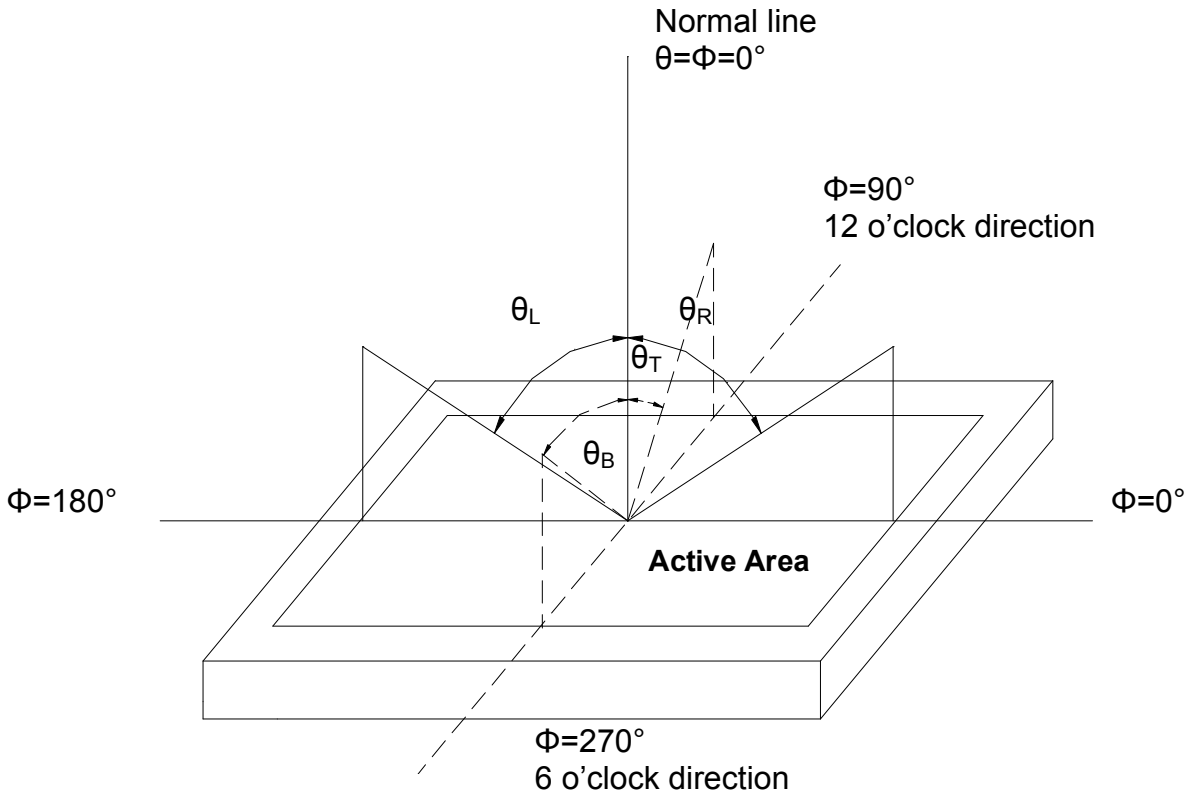


Fig. 4-1 Definition of viewing angle

Note 2: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 30 minutes operation, the optical properties are measured at the center point of the LCD screen. (Response time is measured by Photo detector TOPCON BM-7, other items are measured by BM-5A/Field of view: 1° /Height: 500mm.)

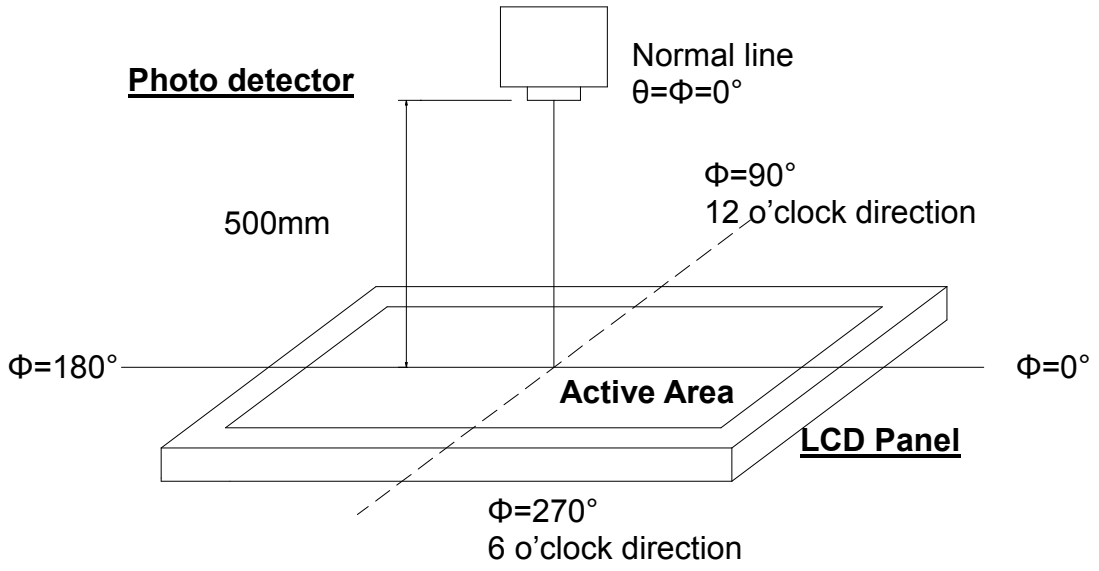


Fig. 4-2 Optical measurement system setup

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%.

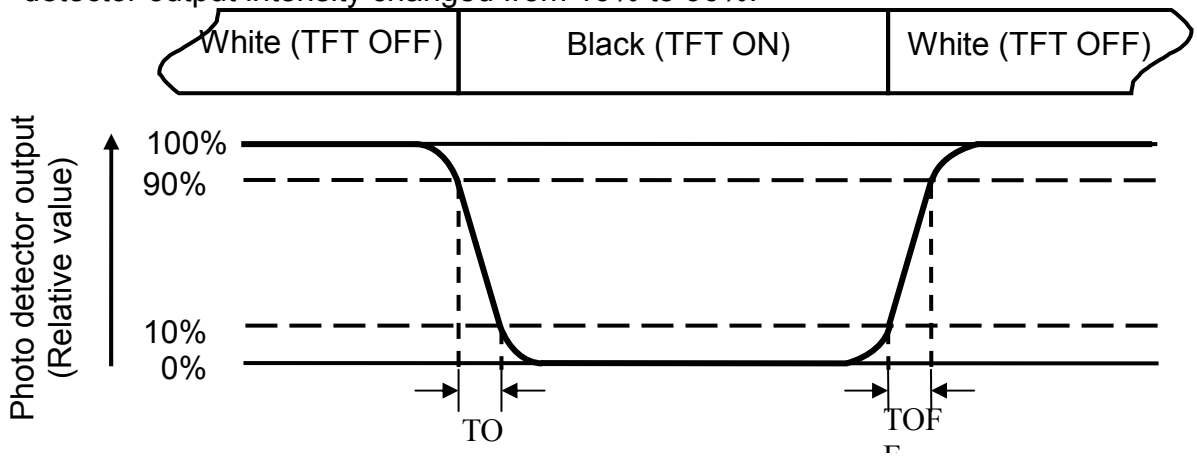


Fig. 4-3 Definition of response time

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 color chromaticity (CIE1931)
Color coordinates measured at center point of LCD.

Note 6: Definition of luminance:
Measured at the center area of the panel when LCD panel is driven at "white" state. The LED driving condition is I_L=300mA .

Note 7: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (Refer to Fig. 4-4).Every measuring point is placed at the center of each measuring area.

$$Luminance\ \ Uniformity\ (Yu) = \frac{B_{min}}{B_{max}}$$

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

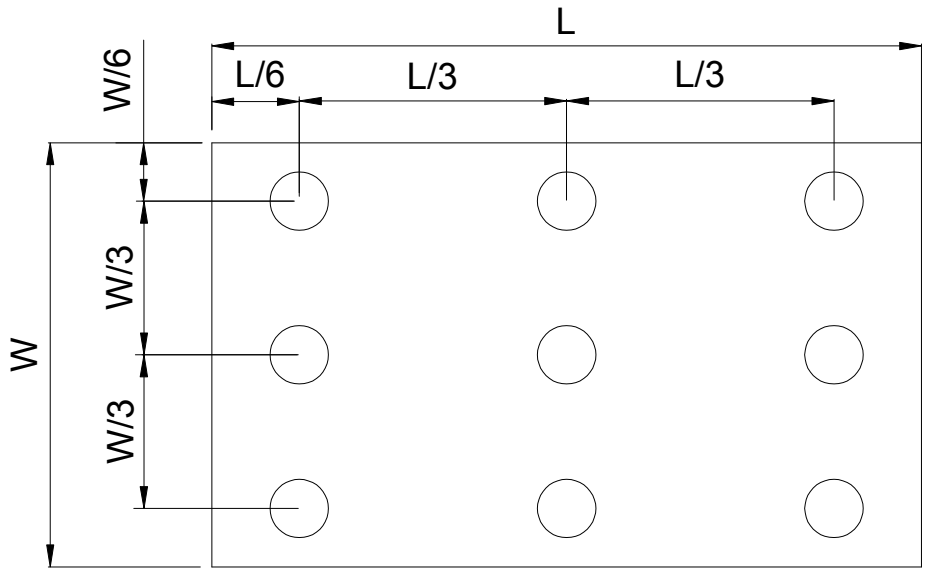


Fig. 4-4 Definition of measuring points

B_{max}: The measured maximum luminance of all measurement position.
B_{min}: The measured minimum luminance of all measurement position.

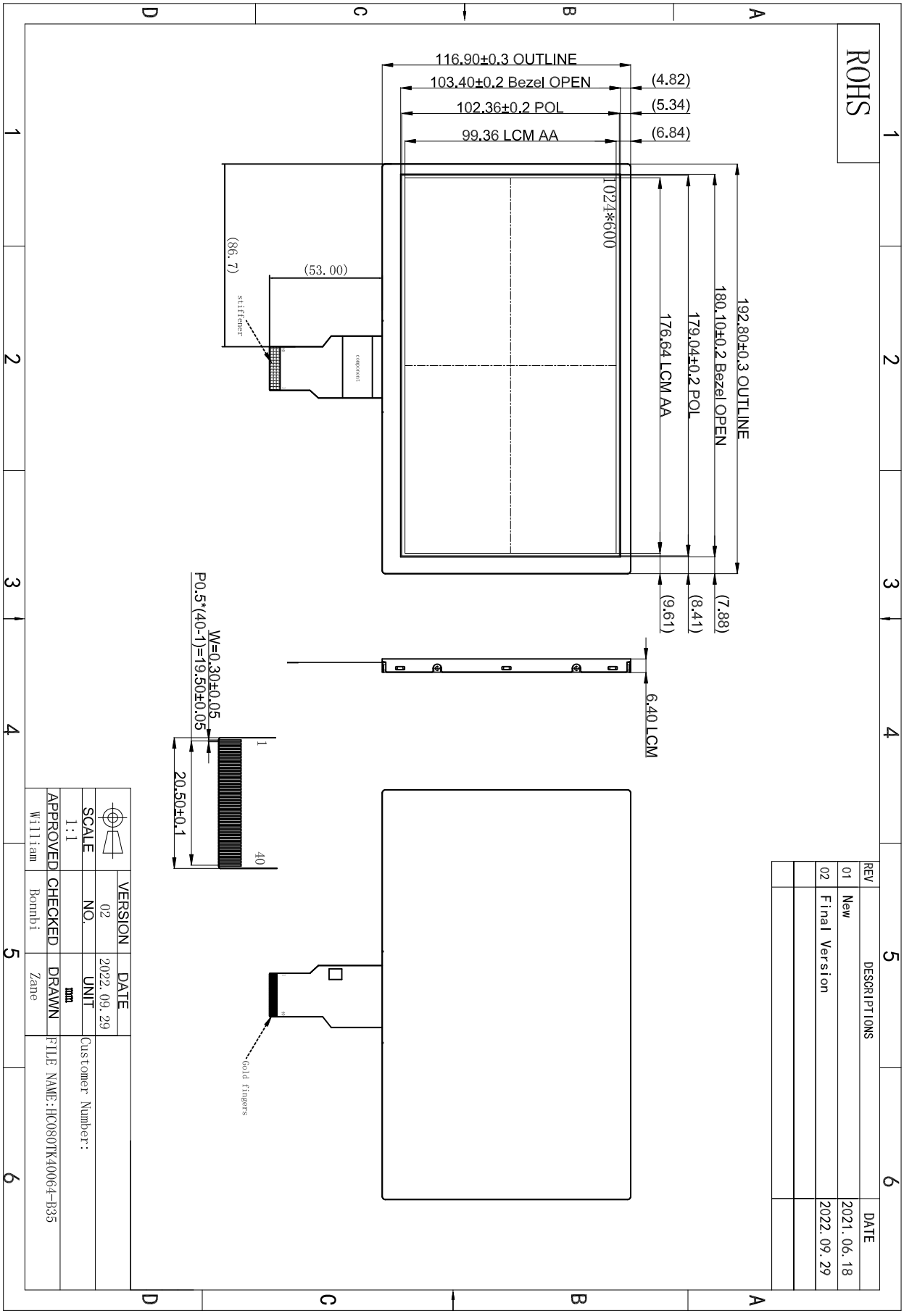
5 . Reliability Specification 产品可靠性

No.	Test Items	Test Condition	Note
1	High Temperature Storage	80℃, 240hrs	Note 1, 2
2	Low Temperature Storage	-30℃, 240hrs	Note 1, 2
3	High Temperature Operation	80℃, 240hrs	Note 1, 2
4	Low Temperature Operation	-30℃, 240hrs	Note 1, 2
5	High Temperature and High Humidity Storage	60℃, 90%RH, 240hrs	Note 1, 2
6	Thermal Shock	-20℃/0.5h ~ +70℃/0.5h for a total 100 cycles	Note 1, 2
7	Electro Static Discharge	C=150pF,R=330Ω, 5point/panel Air:±4Kv, 5times	Note 2
8	Package Drop Test	Height:60cm,1 corner,3 edges,6 surfaces	Note 2

Note 1: The test samples have recovery time for 2 hours at room temperature before the function check. In the standard conditions, there is no display function NG issue occurred.

Note 2: After the reliability test, the product only guarantees operation, but don't guarantee all of the cosmetic specification.

6. Mechanical Drawing



7. General Precautions

7.1. Safety

Liquid crystal is poisonous. Do not put it in your mouth. If liquid crystal touches your skin or clothes, wash it off immediately by using soap and water.

7.2. Handling

1. The LCD panel is plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.
2. The polarizer attached to the display is easily damaged. Please handle it carefully to avoid scratch or other damages.
3. To avoid contamination on the display surface, do not touch the module surface with bare hands.
4. Keep a space so that the LCD panels do not touch other components.
5. Put cover board such as acrylic board on the surface of LCD panel to protect panel from damages.
6. Transparent electrodes may be disconnected if you use the LCD panel under environmental conditions where the condensation of dew occurs.
7. Do not leave module in direct sunlight to avoid malfunction of the ICs.

7.3. Static Electricity

1. Be sure to ground module before turning on power or operating module.
2. Do not apply voltage which exceeds the absolute maximum rating value.

7.4. Storage

1. Store the module in a dark room where must keep at 25±10℃ and 65%RH or less.
2. Do not store the module in surroundings containing organic solvent or corrosive gas.
3. Store the module in an anti-electrostatic container or bag.

7.5. Cleaning

1. Do not wipe the polarizer with dry cloth. It might cause scratch.
2. Only use a soft sloth with IPA to wipe the polarizer, other chemicals might permanent damage to the polarizer.

8. Package

8.1. Packaging Material Table

No.	Item	Model (Material)	Dimensions(mm)	Quantity	Remark	
1	LCM Module	YH080MS4002 -LRN01	192.8*116.9*6.4	30pcs		
2	Blister Box	/	504.9*338.9*20	16pcs		
3	PE Bag	/	900*800	1pcs		
4	Carton	/	530*360*248	1pcs		

8.2. Packaging Drawing