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# SPECIFICATION

**Customer:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**By:** \_\_\_\_\_

SJD Confirmation

Confirmed By: \_\_\_\_\_

Prepared By: \_\_\_\_\_

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**Record of Revision**

<b>Version</b>	<b>Revise Date</b>	<b>Page</b>	<b>Content</b>
Final-spec.01	2015/22/07	ALL	Initial Release

## 1、 General Specifications

No.	Item	Specification	Remark
1	LCD size	4.3 inch(Diagonal)	
2	Driver element	a-Si TFT active matrix	
3	Resolution	480 × 3 (RGB) × 272	
4	Display mode	Normally White, Transmissive	
5	Dot pitch	0.066(W) × 0.198(H) mm	
6	Active area	95.04(W) × 53.856(H) mm	
7	Module size	105.5(W) × 67.2(H) × 2.9(D) mm	Note 1
8	Surface treatment	Anti-Glare	
9	Color arrangement	RGB-stripe	
10	Interface	Digital	
11	Backlight Power consumption	TBD W(Typ.)	
12	Panel Power consumption	TBD W (Typ.)	
13	Weight	TBD (Typ.)	

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. The recommended model is “FH19SC-40S-0.5SH” manufactured by HIROSE.

No	Symbol	I/O/P	Description	Remark
1	VLED-	p	Power for LED backlight cathode	
2	VLED+	p	Power for LED backlight anode	
3	GND	P	Power Ground	
4	VDD	P	Power voltage (3.3V)	
5	R0	O	Red data (LSB)	
6	R1	O	Red data	
7	R2	O	Red data	
8	R3	O	Red data	
9	R4	O	Red data	
10	R5	O	Red data	
11	R6	O	Red data	
12	R7	O	Red data (MSB)	
13	G0	O	Green data (LSB)	
14	G1	O	Green data	
15	G2	O	Green data	
16	G3	O	Green data	
17	G4	O	Green data	
18	G5	O	Green data	
19	G6	O	Green data	
20	G7	O	Green data (MSB)	
21	B0	O	Blue data (LSB)	
22	B1	O	Blue data	
23	B2	O	Blue data	
24	B3	O	Blue data	
25	B4	O	Blue data	
26	B5	O	Blue data	
27	B6	O	Blue data	
28	B7	O	Blue data (MSB)	
29	GND	P	Power Ground	
30	CLK	O	Pixel clock	
31	DISP	O	Display on/off	
32	NC	O	No connection	
33	NC	O	No connection	
34	DE	O	Data Enable	
35	NC	-	No Connect	

36	GND	P	Power Ground	
37	XR	I/O	Right electrode - differential analog	
38	YD	I/O	Bottom electrode - differential analog	
39	XL	I/O	Left electrode - differential analog	
40	YU	I/O	Top electrode - differential analog	

I: input, O: output, P: Power

### 3、 Operation Specifications

#### 3.1、 Absolute Maximum Ratings

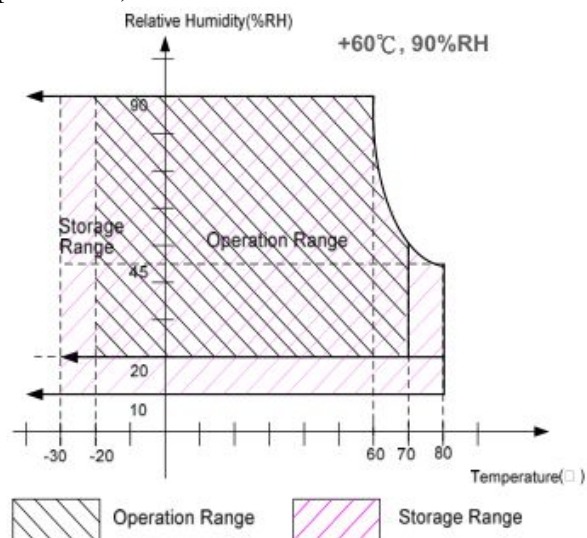
(Note 1)

Item	Symbol	Values		Unit	Remark
		Min.	Max.		
Power voltage	$V_{DD}$	-0.5	5.0	V	
Input signal voltage	Logic input	-0.5	5.0	mA	
Operation temperature	$T_{OP}$	-20	70	°C	Note 3,4
Storage temperature	$T_{ST}$	-30	80	°C	Note 3,4
LED Reverse Voltage	$V_R$	-	1.2	V	Each LED Note 2
LED Forward Current	IF	-	25	mA	Each LED

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

Note 2:  $V_R$  Conditions: Zener Diode 20mA

Note 3: 90% RH Max. (Max wet temp. is 60°C) Maximum wet-bulb temperature is at 60°C or less. And No condensation (no drops of dew)



Note 4: In case of temperature below 0°C, the response time of liquid crystal (LC) becomes slower and the color of panel darker than normal one.

### 3.2、Typical operation conditions

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Power voltage	$V_{DD}$	3.1	3.3	3.5	V	
Current for Driver	$I_{V_{DD}}$	-	TBD	25	mA	$V_{DD} = 3.3V$
Input logic high voltage	$V_{IH}$	0.8V <sub>DD</sub>	-	$V_{DD}$	V	Note 1
Input logic low voltage	$V_{IL}$	GND	-	00.2V <sub>DD</sub>	V	Note 1

Note1: CLK, DE, R0~ R7, G0~ G7, B0~ B7.

### 3.3、Backlight Driving Conditions

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Voltage for LED Backlight	$V_L$	19.6	21	22.4	V	Note 2
Current for LED Backlight	$I_L$	18	20	22	mA	
LED life time	-	20,000	-	-	Hr	Note 1

Note 1: The “LED life time” is defined as the module brightness decrease to 50%

original brightness that the ambient temperature is 25°C and  $I_L = 20mA$ . The

LED lifetime could be decreased if operating  $I_L$  is larger than 20 mA.

Note 2: The LED Supply Voltage is defined by the number of LED at  $T_a = 25^\circ C$  and

$I_L = 20mA$ .

### 3.4、Timing Characteristics

#### 3.4.1. Timing Conditions

Parallel DE mode RGB input timing table

Parameter	Symbol	Value			Unit	Remark
		Min.	Typ.	Max.		
CLK frequency	fclk	7	9	12	MHZ	
DEV period time	$T_v$	277	288	400	H	
DEV display area	$T_{vd}$	272			H	
DEV blanking	$T_{vb}$	5	16	128	H	
DEH period time	$T_h$	520	525	800	CLK	

DEH display area	Thd	480			CLK	
DEH blanking	Thb	40	45	320	CLK	
CLK cycle time	Tclk	83	110	143	ns	
Clock width of high level	Tcwh	40	50	60	%	
Clock width of low level	Tcwl	40	50	60	%	
Clock rising time	Tfck		-	9	ns	
Clock falling time	Tfck		-	9	ns	
Data Setup Time	Tdesu	10	-	-	ns	
Data Hold Time	Tdehd	10	-	-	ns	
DE Setup Time	Tdesu	10	-	-	ns	
DE Hold Time	Tdehd	10	-	-	ns	

### 3.5、Optical Specifications

Item	Symbol	Condition	Values			Unit	Remark
			Min.	Typ.	Max.		
Viewing angle (CR ≥ 10)	θ L	Φ=180°(9 o'clock)	60	700	-	degree	Note1
	θ R	Φ=0°(3 o'clock)	60	70	-		
	θ T	Φ=90°(12 o'clock)	40	50	-		
	θ B	Φ=270°(6 o'clock)	60	70	-		
Response time	T <sub>ON</sub>	Normal θ =Φ=0°	-	10	20	msec	Note3
	T <sub>OFF</sub>		-	15	30	msec	Note3
Contrast ratio	CR		400	500	-	-	Note4
Color chromaticity	W <sub>X</sub>		0.26	0.31	0.36	-	Note2 Note5
	W <sub>Y</sub>		0.28	0.33	0.38	-	Note6
Luminance	L		270	300	-	Cd/m <sup>2</sup>	Note6
Luminance uniformity	Y <sub>U</sub>		70	75	-	%	Note7

Test Conditions:

1. V DD =3.3V, I L =20mA (Backlight current), the ambient temperature is 25°C.
2. The test systems refer to Note 2.



Note 1: Definition of viewing angle range

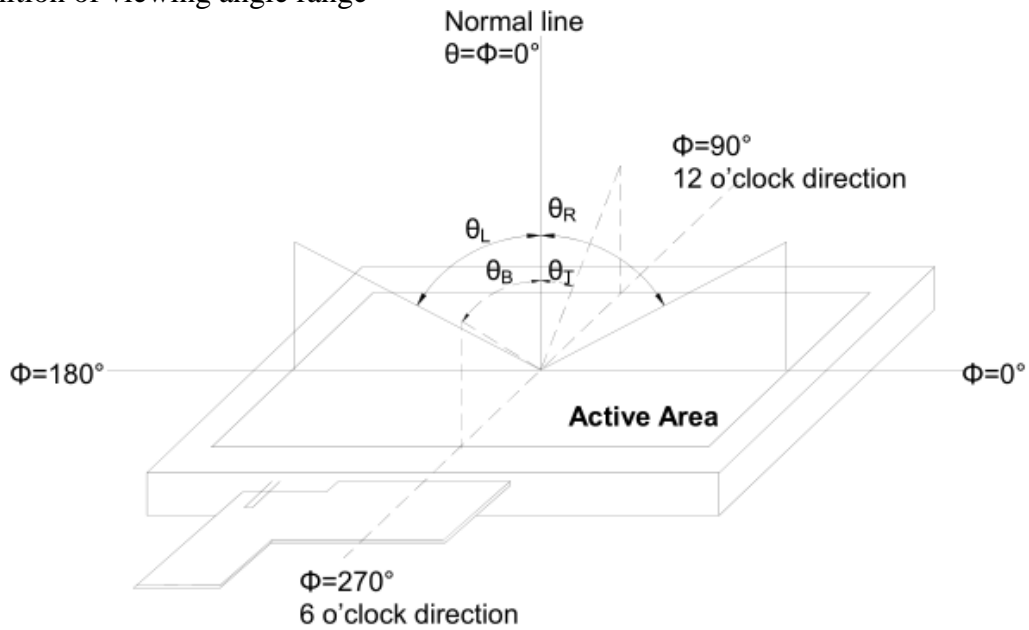


Fig. 4-1 Definition of viewing angle

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.)

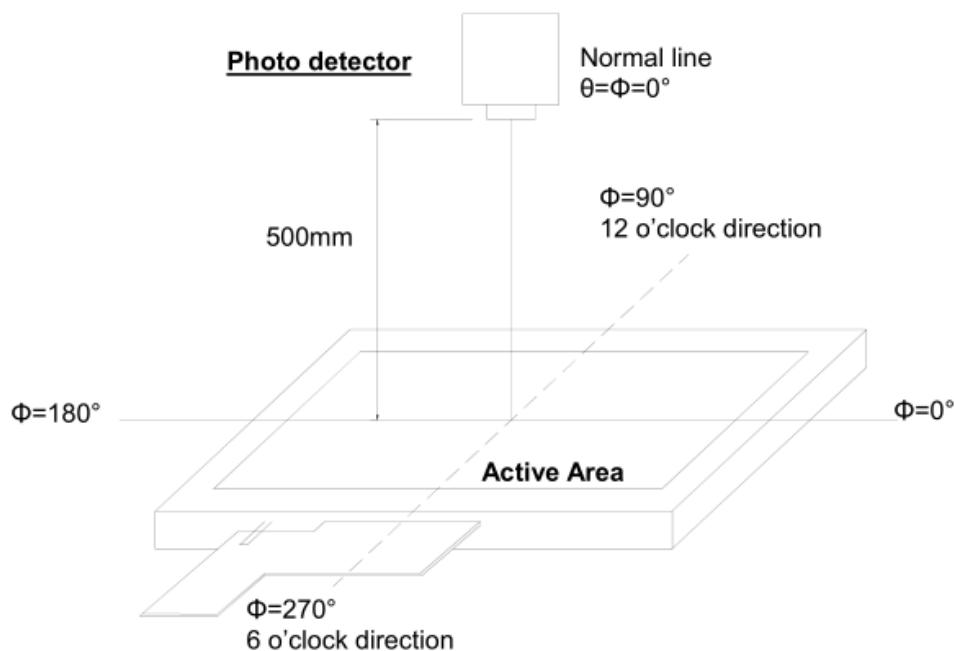
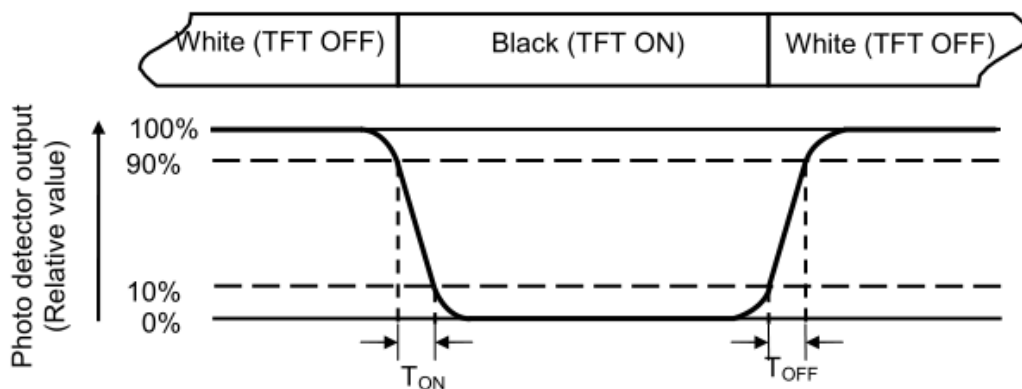


Fig. 4-2 Optical measurement system setup

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%.



while measuring the center area of  
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: All input terminals LCD panel must be ground the panel. The LED driving condition is I L =20mA.

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.

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

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

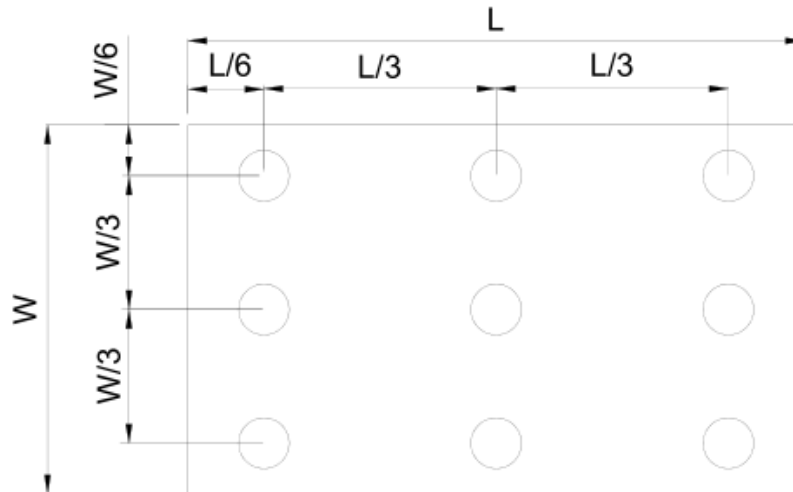


Fig. 4-4 Definition of measuring points

B max : The measured maximum luminance of all measurement position.

B min : The measured minimum luminance of all measurement position.

#### 4、Reliability Test Items

(Note3)

Item	Test Conditions	Remark
High Temperature Storage	Ta = 80°C 240 hrs	Note 1,Note 4
Low Temperature Storage	Ta = -30°C 240hrs	Note 1,Note 4
High Temperature Operation	Ts = 70°C 240hrs	Note 1,Note 4
Low Temperature Operation	Ta = -20°C 240hrs	Note 1,Note 4
Operate at High Temperature and Humidity	+60°C, 90%RH 240 hrs	Note5
Thermal Shock	-30°C/30 min ~ +80°C/30 min for a total 100 cycles, Start with cold temperature and end with high temperature	Note 4
Vibration Test	Frequency range:10~55Hz Stroke:1.5mm Sweep:10Hz~55Hz~10Hz 2 hours for each direction of X. Y. Z. (6 hours for total)	
Mechanical Shock	100G 6ms,±X, ±Y, ±Z 3 times for each direction	
Package Vibration Test	Random Vibration : 0.015G*G/Hz from 5-200HZ, -6dB/Octave from 200-500HZ 2 hours for each direction of X. Y. Z. (6 hours for total)	
Package Drop Test	Height:60 cm 1 corner, 3 edges, 6 surfaces	
Electro Static Discharge	± 2KV, Human Body Mode, 100pF/1500Ω	

Note 1:  $T_a$  is the ambient temperature of samples.

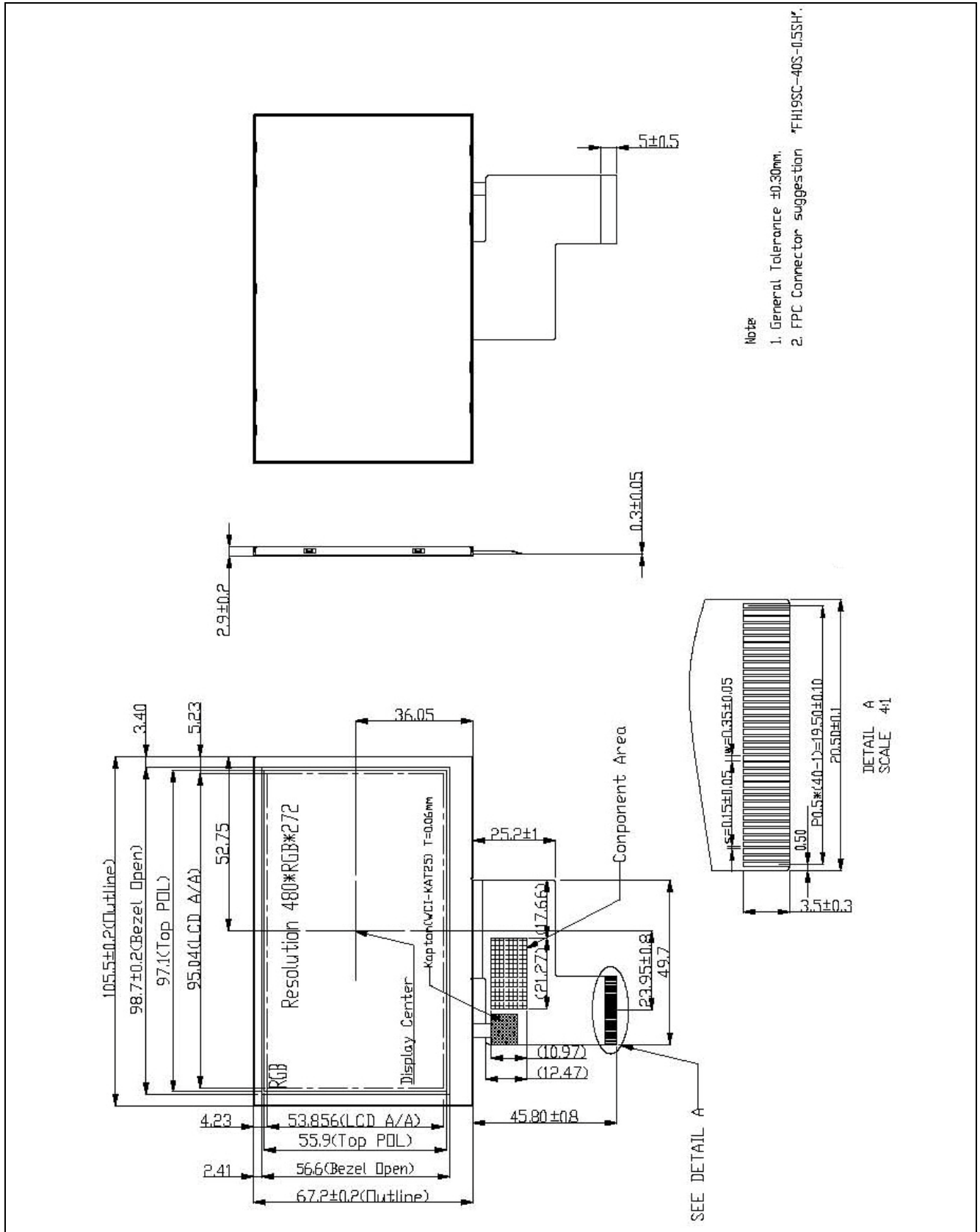
Note 2:  $T_s$  is the temperature of panel's surface.

Note 3: In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but doesn't guarantee all the cosmetic specification.

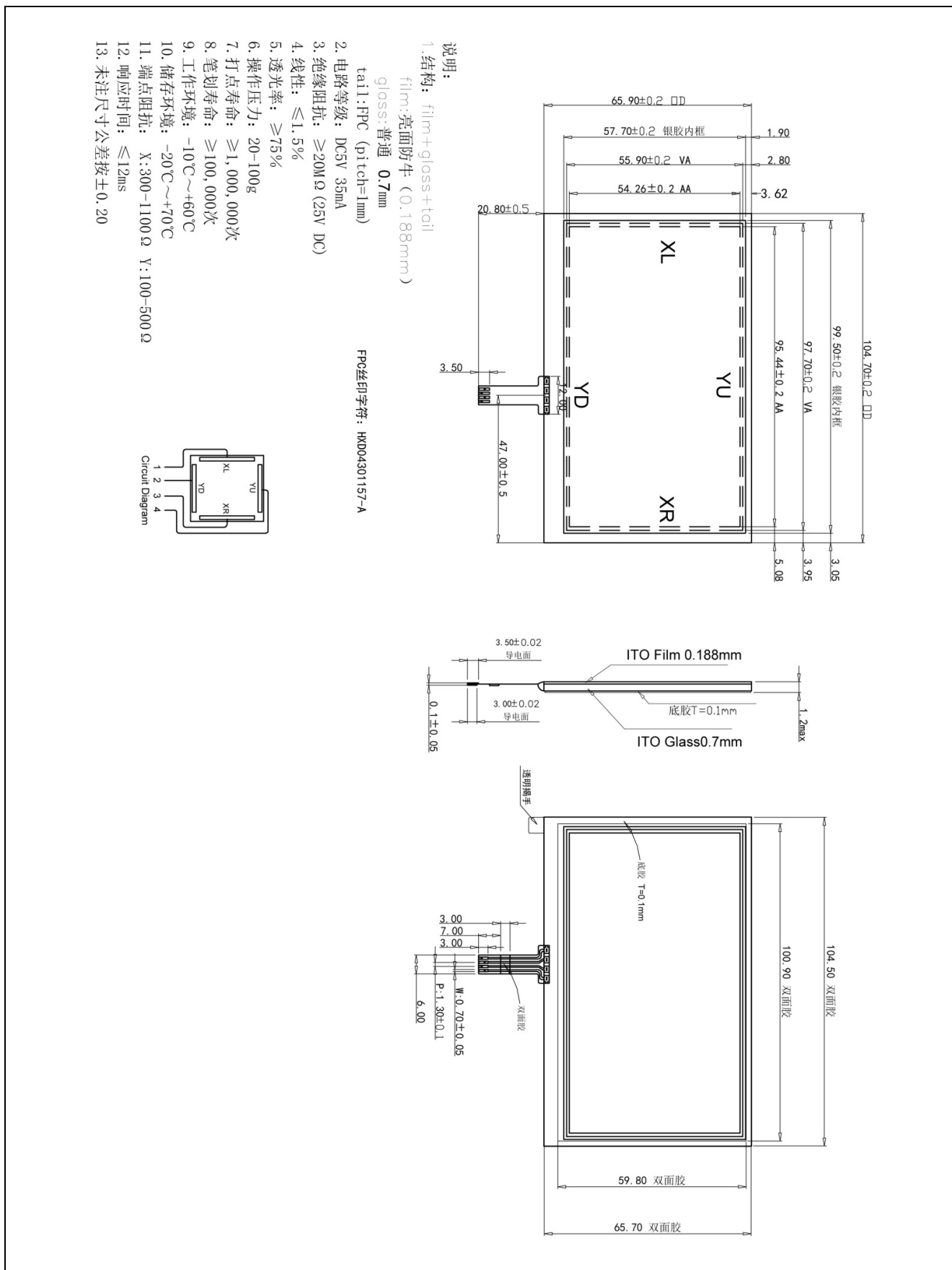
Note 4: Before cosmetic and function tests, the product must have enough recovery time, at least 2 hours at room temperature.

## 5. Mechanical Drawing

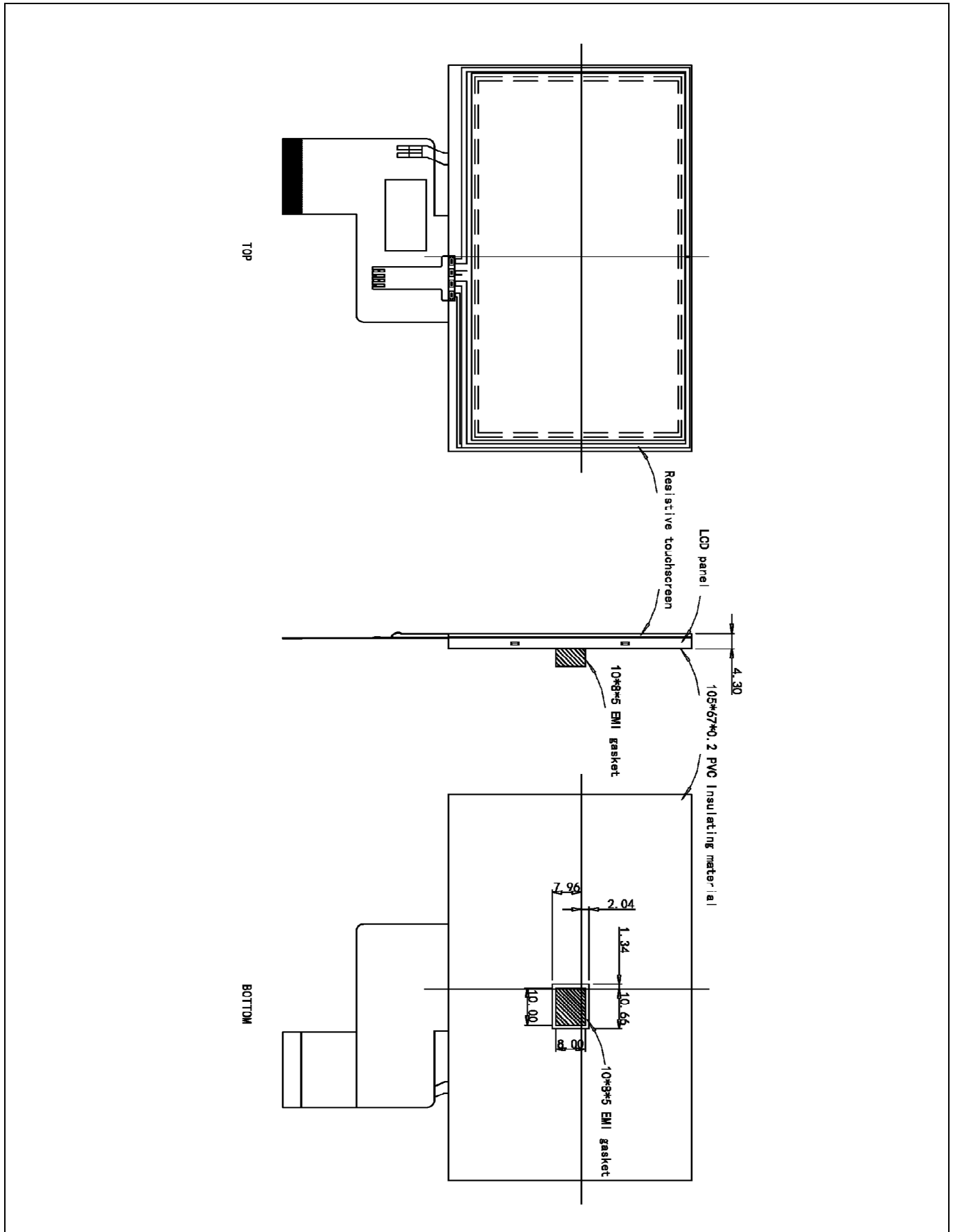
### 5.1、LCD Mechanical Drawing



## 5.2、Resistive Touch screen Mechanical Drawing



**5.2、LCD and Resistive Touch screen Mechanical Drawing**



## 6、 Package Drawing

### 6.1、 Packaging Material Table

No.	Item	Model (Material)	Dimensions (mm)	Unit Weight (kg)	Quantity (pcs)	Remark
1	LCM Module	XCY043QC40A	105.5 × 67.2 × 2.9	TBD	160	
2	Partition	BC Corrugated paper	512 × 349 × 106	1.102	2	
3	Corrugated Bar	BC Corrugated paper	349 × 173	0.030	8	
4	Dust-Proof Bag	PE	700 × 530	0.060	1	
5	Corrugated Board-1	BC Corrugated Paper	510 × 343	0.130	2	
6	Corrugated Board-2	BC Corrugated Paper	1152 × 512	0.260	1	
7	A/S Bag	PE	132 × 117	0.002	160	
8	Carton	Corrugated paper	530 × 355 × 255	1.100	1	
9	Total weight	TBD				

### 6.2、 Packaging Quantity

(1) LCM quantity per Partition: 2Rows x 40quantity per Row = 80 pcs
(2) Total LCM quantity in Carton: 2 layer x 80 pcs per Partition = 160 pcs

## 7、 Packing drawing

**TBD.**