深圳市晶彩世界科技有限公司

产品规格书

Product Type: 6.2" TFT LCD Module

LCD Nunmber: JCH062TN-01

MODULE NO.:

CUSTOMER APPROVED	PREPARE BY	CHECK BY	APPROVED BY
SUPPLIER APPROVED	PREPARE BY	CHECK BY	APPROVED BY

■ **Preliminary Specification**

□ **Final Specification**

Contents

Document Revision History

Change No.	Date	Subject And Reason	Version No.	Responser
1	2013.11.28	New	01	

1.General Description

NO.	Item	Specification	Remark
1	LCD size	6.2 inch(Diagonal)	
2	Driver element	a-Si TFT active matrix	
3	Resolution	800 × 3(RGB) × 480	
4	Display mode	Normally White, Transmissive	
5	Dot pitch	0.1719(W) × 0.1609(H) mm	
6	Active area	137.52(W) ×77.232(H) mm	
7	Module size	155.2(W) ×88.2(H) × 5.0(D) mm	Note1
8	Surface treatment	Anti-Glare	
9	Color arrangement	RGB-stripe	
10	Optimum Viewing Direction	6 O'clock	

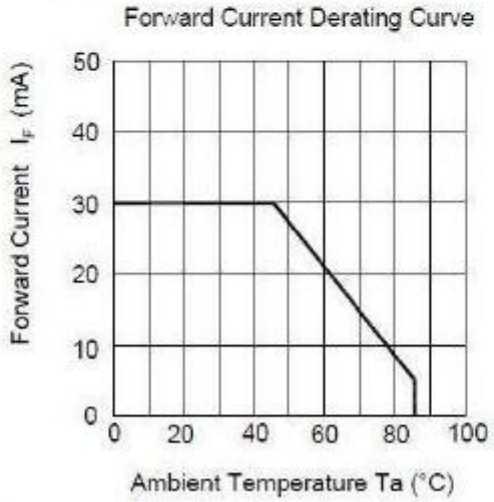
2. Pin Assignment

2. ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Min.	Max.	Unit	Note
Digital Supply Voltage	DVDD	-0.3	+5.0	V	
Analog Supply Voltage	AVDD	-0.5	+15	V	
Gate On Voltage	VDDG	-0.3	+40	V	
Gate Off Voltage	VEEG	-20	+0.3	V	
Gate On-Gate Off Voltage	VDDG-VEEG	-0.3	40	V	
Forward Current (per LED)	If	-	30	mA	
Reverse Voltage (per LED)	VR	-	5	V	
Pulse forward current (per LED)	Ifp	-	100	mA	1,2
Operation Temperature	T_{op}	-20	70	℃	3
Storage Temperature	T_{stg}	-30	80	℃	3

Note1 : Ifp Conditions : Pulse Width ≦10msec ; Duty ≦1/10

Note2: Each LED operating must under the condition as below drawing.
(Ambient Temperature /Allowable Forward Current)



Note3 : If users use the product out off the environmemtal operation range (temperature and humidity), it will have visual quality concerns.

3. ELECTRICAL CHARACTERISTICS

3.1 Typical operation conditions

Ta=25℃

Item	Symbol	Min.	Typ.	Max.	Unit.	Note.
Digital Supply Voltage	DVDD	3	3.3	3.6	V	
Analog Supply Voltage	AVDD	9.0	9.2	9.4	V	
Gate On Voltage	VDDG	17	18	19	V	
Gate Off Voltage	VEEG	-6.6	-6	-5.4	V	
Common Voltage	VCOM	3.8	(4)	4.2	V	1
Gamma Voltage	VR 1	-	(9.01)	-	V	2
	VR 2	-	(7.22)	-	V	2
	VR 3	-	(6.88)	-	V	2
	VR 4	-	(6.57)	-	V	2
	VR 5	-	(5.525)	-	V	2
	VR 6	-	(3.925)	-	V	2
	VR 7	-	(2.854)	-	V	2
	VR 8	-	(2.484)	-	V	2
	VR 9	-	(2.04)	-	V	2
	VR 10	-	(0.21)	-	V	2
Logic Input Voltage	VIH	0.7DVDD	-	DVDD	V	
	VIL	GND	-	0.3DVDD	V	

Note1：Please adjust VCOM to make the flicker level be minimum.

Note2：Gamma circuit for reference only

3.2 Current consumption

Item	Symbol	Condition	Min.	Typ.	Max.	Unit.	Note.
Gate on Current	IVDDG	VDDG =18 V	-	0.5	1	mA	1
Gate off Current	IVEEG	VEEG= -6 V	-	0.5	1	mA	1
Digital Current	IDVDD	DVDD = 3.3V	-	10	15	mA	1
Analog Current	IAVDD	AVDD = 9.2 V	-	30	35	mA	1
Total Power Consumption	PC		-	321	396	mW	1

Note1: Typ. specification：Gray-level test Pattern
Max. specification：Black test Pattern

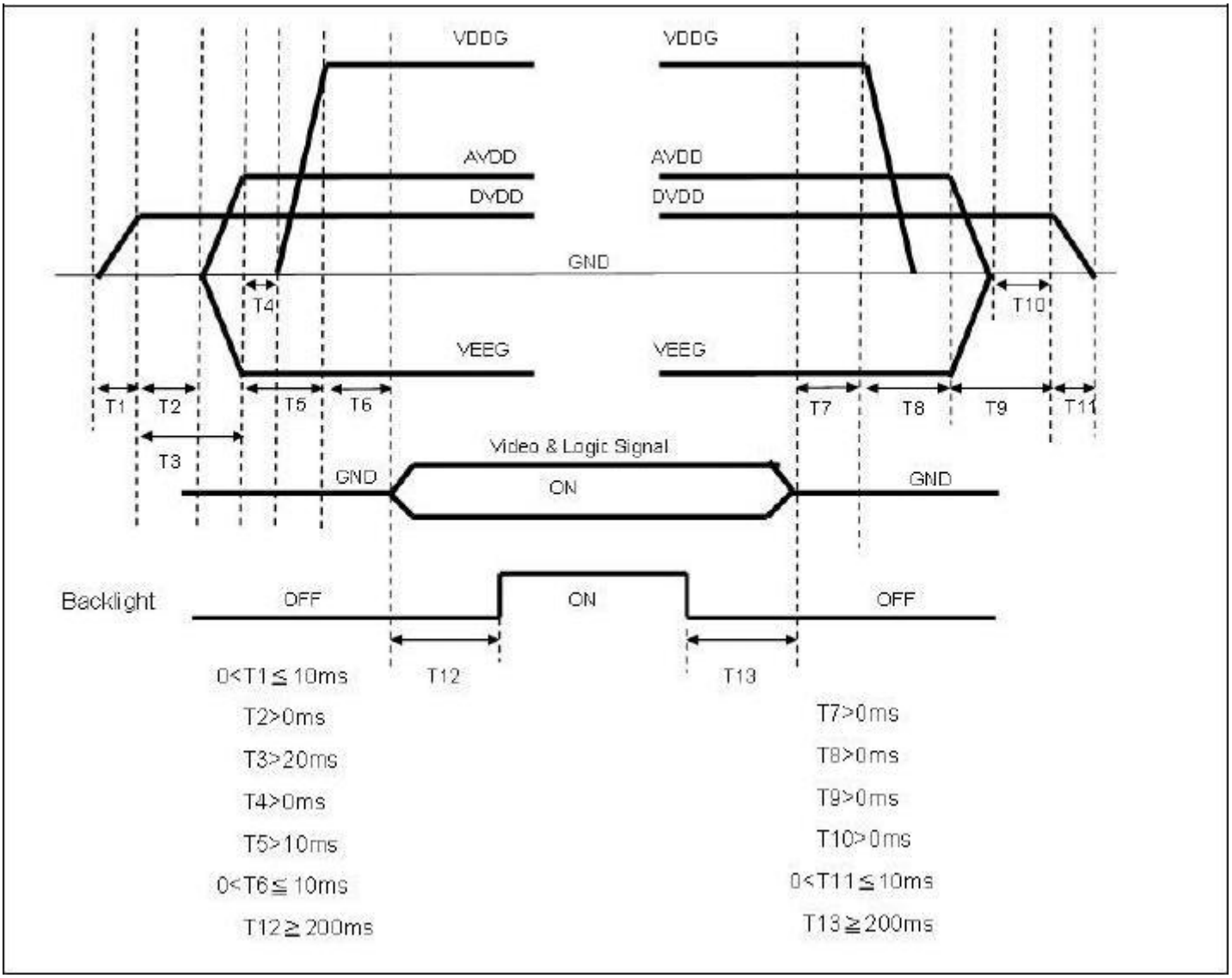
(a)Gray-level Pattern

(b)Black Pattern

3.3 Power、Signal sequence

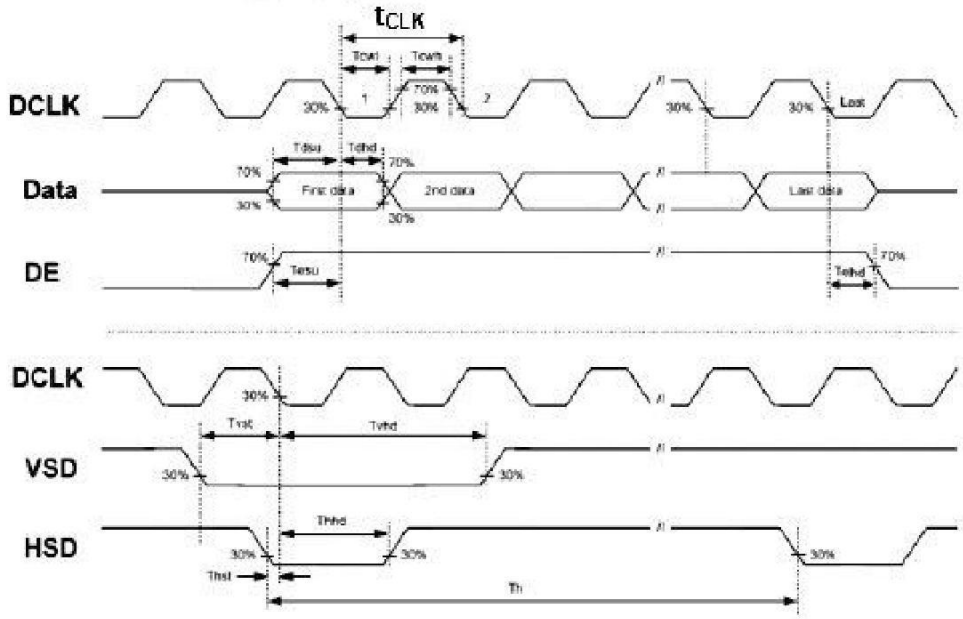
Power On：DVDD→AVDD/VEEG→VDDG→Video &Logic Signal→Backlight

Power Off：Backlight→ Video &Logic Signal→VDDG→AVDD/VEEG→DVDD


VDDG
VDDG
AVDD
AVDD
DVDD
DVDD
GND
T4
T10
VEEG
VEEG
T1
T2
T5
T6
T7
T8
T9
T11
T3
Video & Logic Signal
GND
ON
GND
Backlight
OFF
ON
OFF
T12
T13
0<T1≤10ms
T2>0ms
T3>20ms
T4>0ms
T5>10ms
0<T6≤10ms
T12≥200ms
T7>0ms
T8>0ms
T9>0ms
T10>0ms
0<T11≤10ms
T13≥200ms

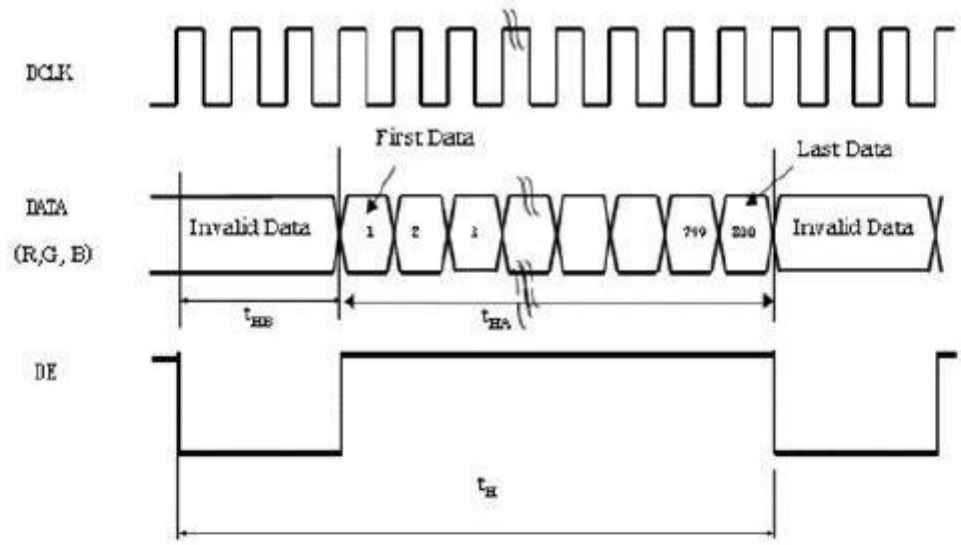
3.4 Timing characteristics of input signals

ITEM		SYMBOL	MIN.	TYP.	MAX.	UNIT	Note
DCLK	Dot Clock	$1/t_{CLK}$	26	30	35	MHz	
	DCLK pulse duty	Tcwh	40	50	60	%	
DE	Setup Time	Tesu	8	-	-	ns	
	Hold time	Tehd	8	-	-	ns	
	Horizontal Period	t_H	908	928	1000	t_{CLK}	
	Horizontal Valid	t_{HA}		800			
	Horizontal Blank	t_{HB}	108	128	200	t_{CLK}	
	Vertical Period	t_V	515	525	700	t_H	
	Vertical Valid	t_{VA}		480			
	Vertical Blank	t_{VB}	35	45	220	t_H	
SYNC	HSYNC Setup Time	Thst	8	-	-	ns	
	HSYNC Hold Time	Thhd	8	-	-	ns	
	VSYNC Setup Time	Tvst	8	-	-	ns	
	VSYNC Hold Time	Tvhd	8	-	-	ns	
	Horizontal Period	th	908	928	1000	tclk	
	Horizontal Pulse Width	thpw	-	48	-	tclk	thb + thpw=88DCLK is fixed
	Horizontal Back Porch	thb	-	40	-	tclk	
	Horizontal Front Porch	thfp	20	40	112	tclk	
	Horizontal Valid	thd		800			
	Vertical Period	tv	515	525	700	th	
	Vertical Pulse Width	tvpw	-	3	-	th	tvpw + tvb = 32th is fixed
	Vertical Back Porch	tvb	-	29	-	th	
	Vertical Front Porch	tvfp	3	13	188	th	
	Vertical Valid	tvd		480			
DATA	Setup Time	Tdsu	8	-	-	ns	
	Hold Time	Tdhd	8	-	-	ns	

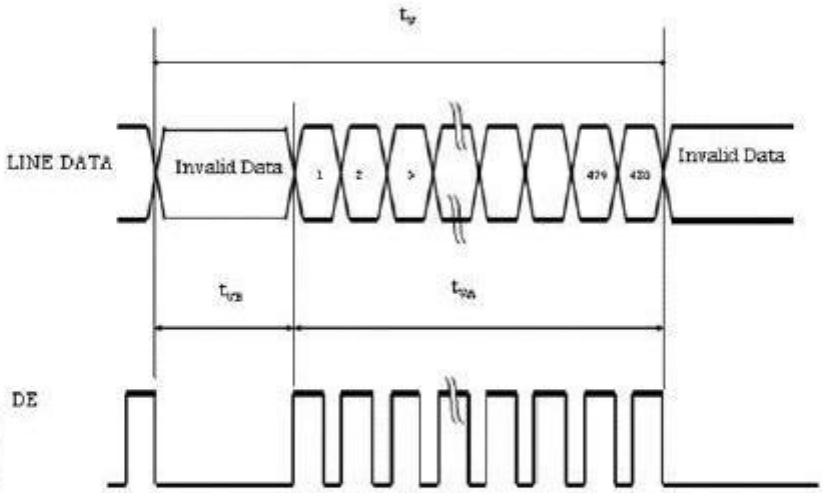


DE mode

Horizontal timing：

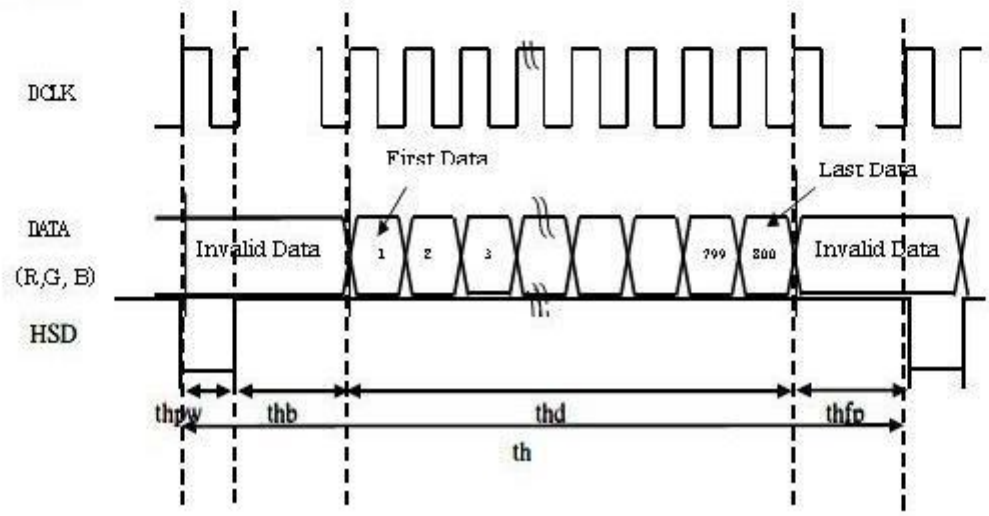


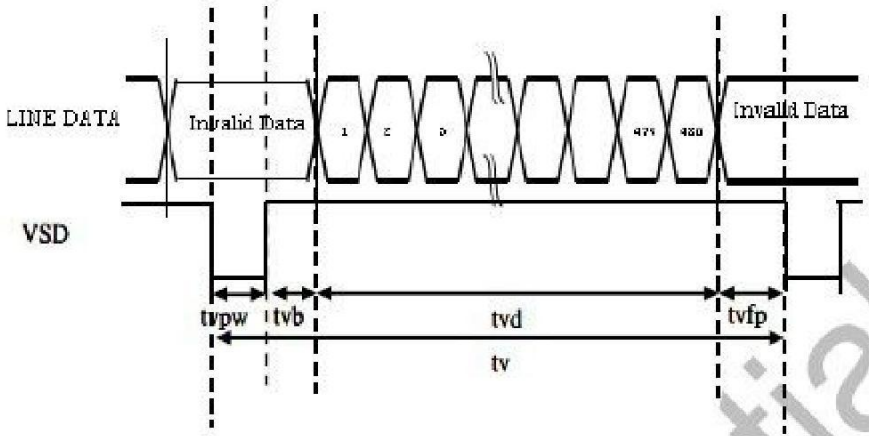
Vertical timing：



SYNC mode

Horizontal timing：





3. Operation Specifications

3.1. Absolute Maximum Rating

6.1 TFT LCD Module

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage	Vcc	3.0	3.3	3.6	V	
	V_{GH}	12	15	23	V	
	V_{GL}	-12	-7	-5	V	
	AV_{DD}	9.9	10	10.1	V	
VCOM	VCOMin	-	3.4	-	V	
Input signal voltage	V_{IH}	0.7 Vcc	-	Vcc	V	Note (1)
	V_{IL}	0	-	0.3 Vcc	V	
Current of power supply	I_{DD}	-	12.37	-	mA	Vcc =3.3V
	I_{ADD}	-	13.599	-	mA	AV_{DD}=10 V (Black)
	I_{GH}	-	0.099	-	mA	V_{GH}=15V
	I_{GL}	-	0.371	-	mA	V_{GL}= -7V
Input level of V1~V5	Vx	AVDD/2-		AVDD-0.1-	V	
Input level of V6~V10	Vx	0.1-		AVDD/2-	V	

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

Note (2): Be sure to apply the power voltage as the power sequence spec.

Note (3): DGND=AGND=0V,)

3.1.2. Current Consumption

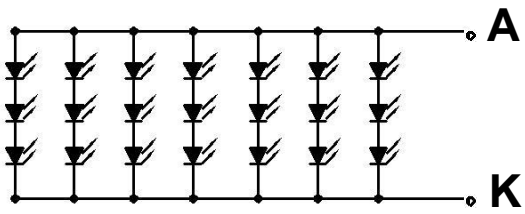
2.1.1 TFT LCD Module

Item	Symbol	Min.	Max.	Unit	Note
Power supply voltage	Vcc	-0.3	5.0	V	GND=0
	AV_{DD}	-0.5	15	V	AGND=0
	V_{COM}	0	6	V	
Logic Signal Input Level	V_I	-0.3	Vcc +0.3	V	

3.1.3 Back-light Unit:

PARAMETER	Sym.	Min.	Typ.	Max.	Unit	Test Condition	Note
LED Current	IF	–	140	–	mA	–	–
LED Voltage (Total)	VF	9	9.9	10.5	V	–	–
Life Time		–	25000	–	Hr.	I≦140mA	–
Color	White						

LED Circuit Diagram:

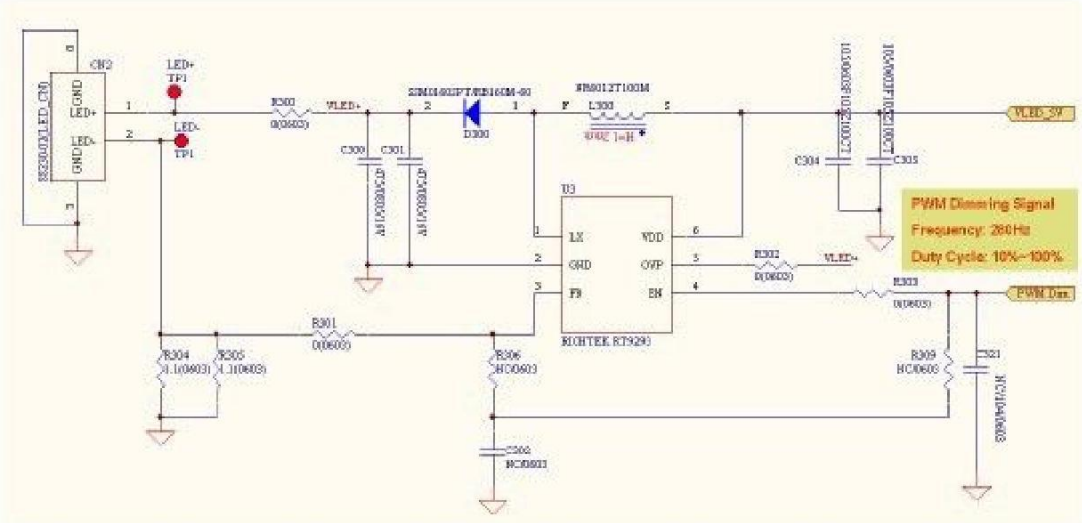


Note1:A:Anode(+) K:Cathode(-)

Note2:LED control must use the constant current control to avoid the lekage light and brightness quality issue.

Note3:Definition of the LED life time:Luminance will decay less than50%.

Note (3) Suggested Schematic of LED Back-Light Driver



I =0.3/(R304//R305)

Suggested Schematic of LED Back-Light Driver

INTERFACE PIN CONNECTION

5.1 TFT LCD Module

CN2 (Input signal): FPC Down Connector, (FH28-60S-0.5SH (HIROSE), 60pin,pitch = 0.5m

Terminal no.	Symbol	I/O	Function
1	AGND	P	Analog Ground
2	AVDD	P	Analog Power
3	VCC	P	Digital Power
4	R0	I	Data Input(LSB)
5	R1	I	Data Input
6	R2	I	Data Input
7	R3	I	Data Input
8	R4	I	Data Input
9	R5	I	Data Input
10	R6	I	Data Input
11	R7	I	Data Input(MSB)
12	G0	I	Data Input(LSB)
13	G1	I	Data Input
14	G2	I	Data Input
15	G3	I	Data Input
16	G4	I	Data Input
17	G5	I	Data Input
18	G6	I	Data Input
19	G7	I	Data Input(MSB)
20	B0	I	Data Input(LSB)
21	B1	I	Data Input
22	B2	I	Data Input
23	B3	I	Data Input
24	B4	I	Data Input
25	B5	I	Data Input
26	B6	I	Data Input
27	B7	I	Data Input(MSB)
28	DCLK	I	Clock input
29	DE	I	Data Enable signal
30	HSD	I	Horizontal sync input.Negative polarity
31	VSD	I	Vertical sync input.Negative polarity
32	MODE3	I	DE/SYNC mode select .normally pull high H:DE mode.L:HSD/VSD mode
33	RSTB	I	global reset pin.Active low to enter reset state.suggest to connecting with an RC reset circuit for stability .normally pull high.
34	STBYB	I	standby mode,normally pull high STBYB="1",normal operation STBYB="0",timming control ,soruce driver will turn off,all output are high-Z
35	SHLR	I	Source right or left sequence control.SHLR="L",shift left:last data=S1<-S2…S1200=first data SHLR="H",shift right:first data=S1->SS2…S1200=last data

Terminal no.	Symbol	I/O	Function
36	VCC	P	Digital Power
37	UPDN	I	gate up or down scan control. UPDN="L" , DOWN shift : G1->G2…->G480 ; UPDN="H", up shift: G1<-G2…<-G480
38	GND	P	Digital Ground
39	AGND	P	Analog Ground
40	AVDD	P	Analog Power
41	VCOMin	I	For external VCOM DC input (Adjustable)
42	DITH	I	Dithering setting: DITH="H" 6bit resolution (last 2 bits of input data truncated) (default setting) DITH="L" 8bit resolution
43	NC	-	Not connect For Test
44	NC	-	Not connect
45	V10	P	Gamma correction voltage reference
46	V9	P	Gamma correction voltage reference
47	V8	P	Gamma correction voltage reference
48	V7	P	Gamma correction voltage reference
49	V6	P	Gamma correction voltage reference
50	V5	P	Gamma correction voltage reference
51	V4	P	Gamma correction voltage reference
52	V3	P	Gamma correction voltage reference
53	V2	P	Gamma correction voltage reference
54	V1	P	Gamma correction voltage reference
55	NC	-	Not connect
56	VGH	P	Positive Power for TFT
57	VCC	P	Digital Power
58	VGL	P	Negative Power for TFT
59	GND	P	Digital Ground
60	NC	-	Not connect

5.2 Back-Light Unit

CN1 LED Power Source (**BHSR-02VS-1**) or equivalent

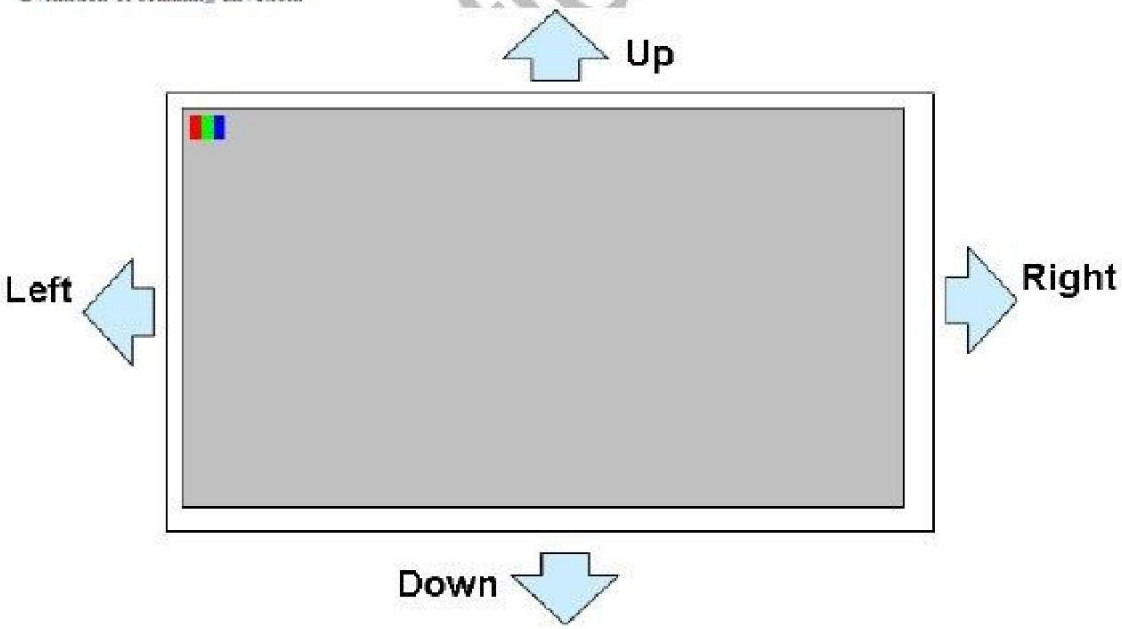
Mating Connector: (**SBHT-002T-P0.5**) or equivalent

Terminal no.	Symbol	Function	Color
1	VL	LED power supply (high voltage)	Black
2	GL	LED power supply (low voltage)	White

【Note1】Mating connector：HIROSE, FH28-60S-0.5SH, 60pin,pitch = 0.5mm
【Note2】SHLR：left or right setting
UPDN：up or down setting

SHLR	UPDN	Data shifting
DVDD	GND	Left→Right，Up→Down(default)
GND	GND	Right→Left，Up→Down
DVDD	DVDD	Left→Right，Down→Up
GND	DVDD	Right→Left，Down→Up

Definition of scanning direction.



4. Optical Characteristics

Item	Symbol	Conditions	Specifications			Unit	Note
			Min.	Typ.	Max.		
Contrast Ratio	CR	Normal θ=Φ=0°	600	700	--	--	(2),(4),(6)
Response time	Ton		--	6	12	ms	(3)
	Toff		--	14	28	ms	(3)
Color chromaticity	Wx		0.28	0.30	0.33	--	
	Wy		0.29	0.31	0.34	--	
Viewing angle (CR≥ 10)	θL	Φ=180°(9 o'clock)	65	75	--	degree	(1)
	θR	Φ=0°(3 o'clock)	65	75	--		
	θT	Φ=90°(12 o'clock)	60	70	--		
	θB	Φ=270°(6 o'clock)	60	70	--		
Uniformity	--	--	70	--	--	%	(7)
LCM luminance	YL	I=140mA	360	400		cd/m²	9 point AVG

Note:

4-1 Measuring Condition

0 **Measuring surrounding : dark room**

0 **Ambient temperature : 25±2℃**

■The measured value of luminace and color coordinate bases BM-7

4-2 Measuring Equipment

- **TOPCON BM-7**
- **Measuring spot size : field 2°**

(1) Definition of viewing angle range

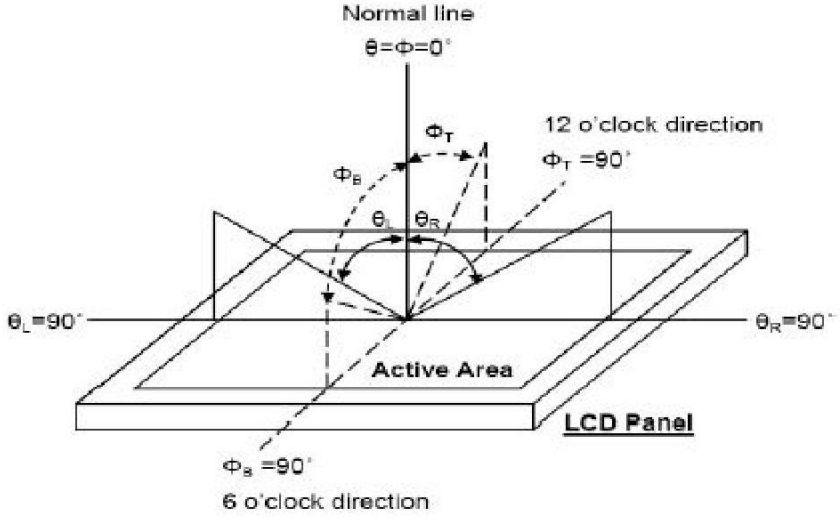


Fig. 4-3 Definition of viewing angle

(2) Test equipment setup:

After stabilizing and leaving the panel alone at a driven temperature for 10 minutes, the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. Optical specifications are measured by Topcon BM-7 luminance meter 1.0° field of view at a

distance of 50cm and normal direction.

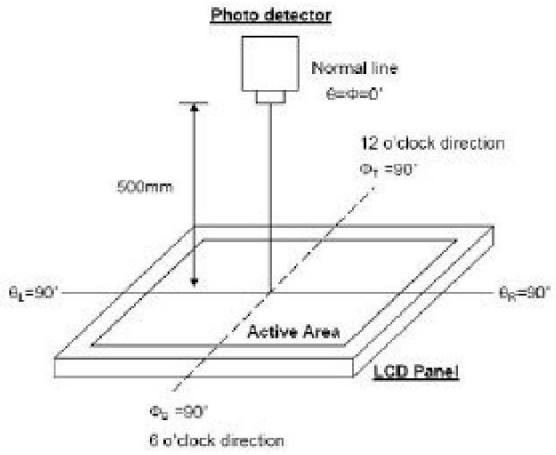


Fig. 4-4 Optical measurement system setup

(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, Tr, is the time between photo detector output intensity changed from 90_to 10_. And fall time, Tf, is the time between photo detector output intensity changed from10_to 90_.

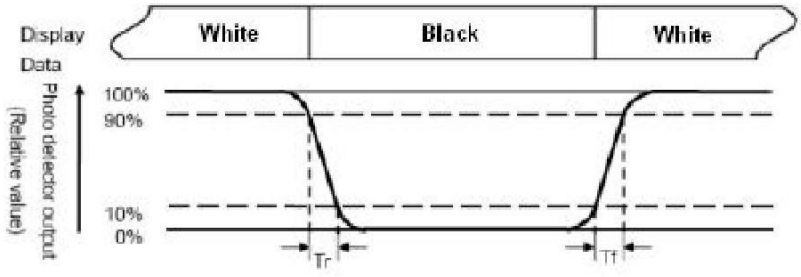


Fig. 8.3 Definition of response time

(4) Definition of contrast ratio:

The contrast ratio is defined as the following expression.

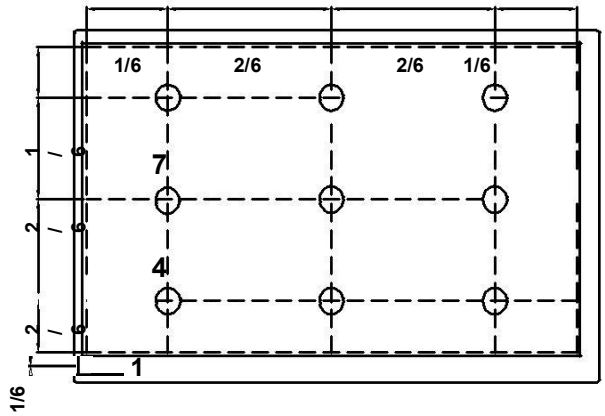
$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

(5) Definition of color chromaticity (CIE 1931) Color coordinates measured at the center point of LCD

(6) Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

(7) Uniformity (U) = $\frac{\text{Brightness (min)}}{\text{Brightness (max)}} \times 100\%$

Fig. 4-5 Definition of brightness uniformity



5. Quality Assurance

No.	Test Items	Test Condition	Note
1	High Temperature Storage Test	Ta=60_ Dry 96h	
2	Low Temperature Storage Test	Ta=-20_ Dry 96h	
3	High Temperature Operation Test	Ta=50_ Dry 96h	
4	Low Temperature Operation Test	Ta=-10_ Dry 96h	
5	High Temperature and High Humidity Operation Test	Ta=50_ 90%RH 96h	
6	Electro Static Discharge Test	Panel surface / FPC input Contact / Air_±200V machine mode_150pF_330Ω	Non-operating
7	Thermal Shock Test	-30_(0.5Hr) ~ +80_(0.5Hr) for 100 cycles	

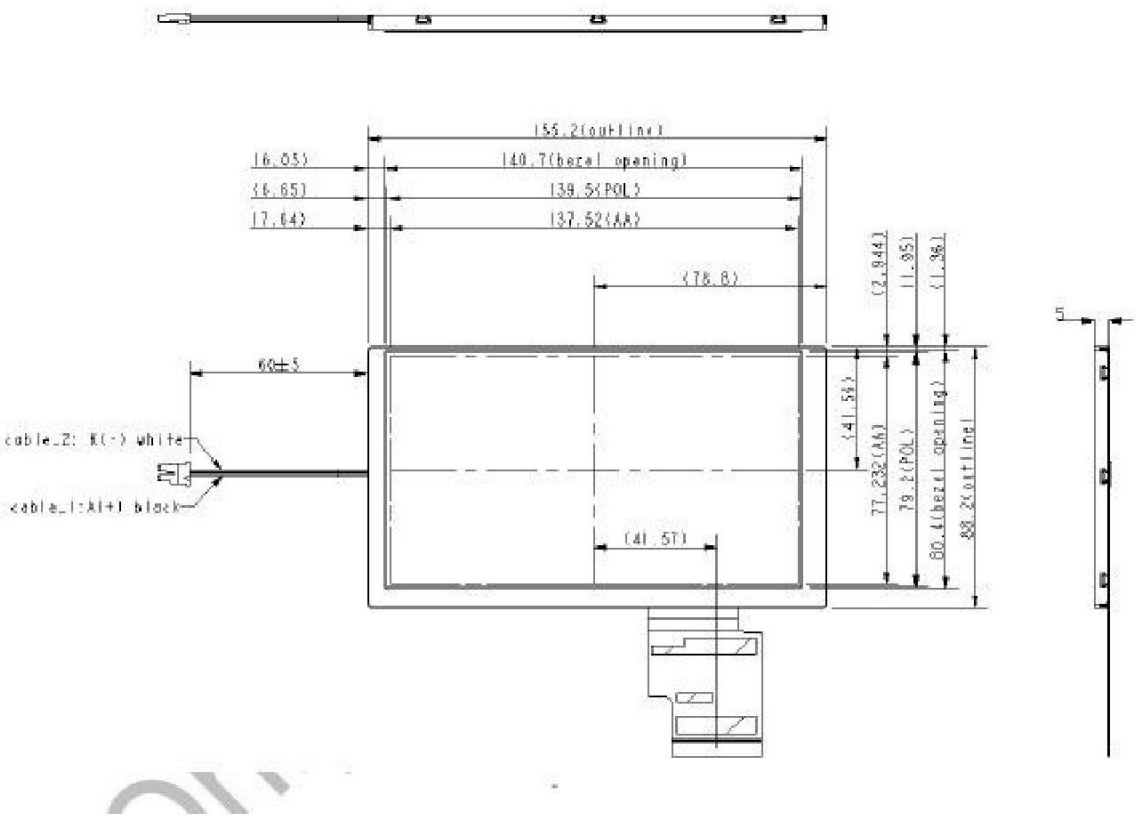
Note:

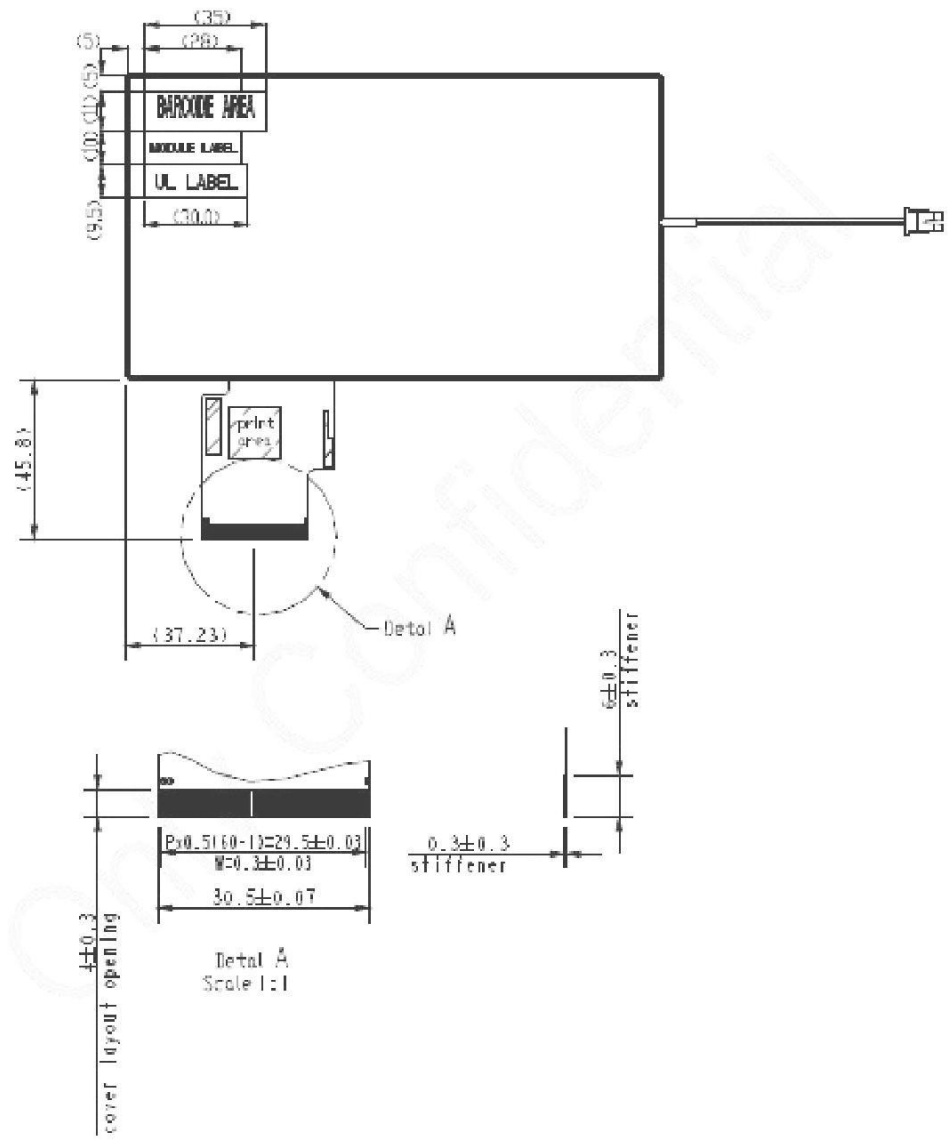
(1) The test samples have recovery time for 4 hours at room temperature before the function check. In the standard conditions, there is no display function NG issue occurred.

(2) All the cosmetic specifications are judged before the reliability stress.

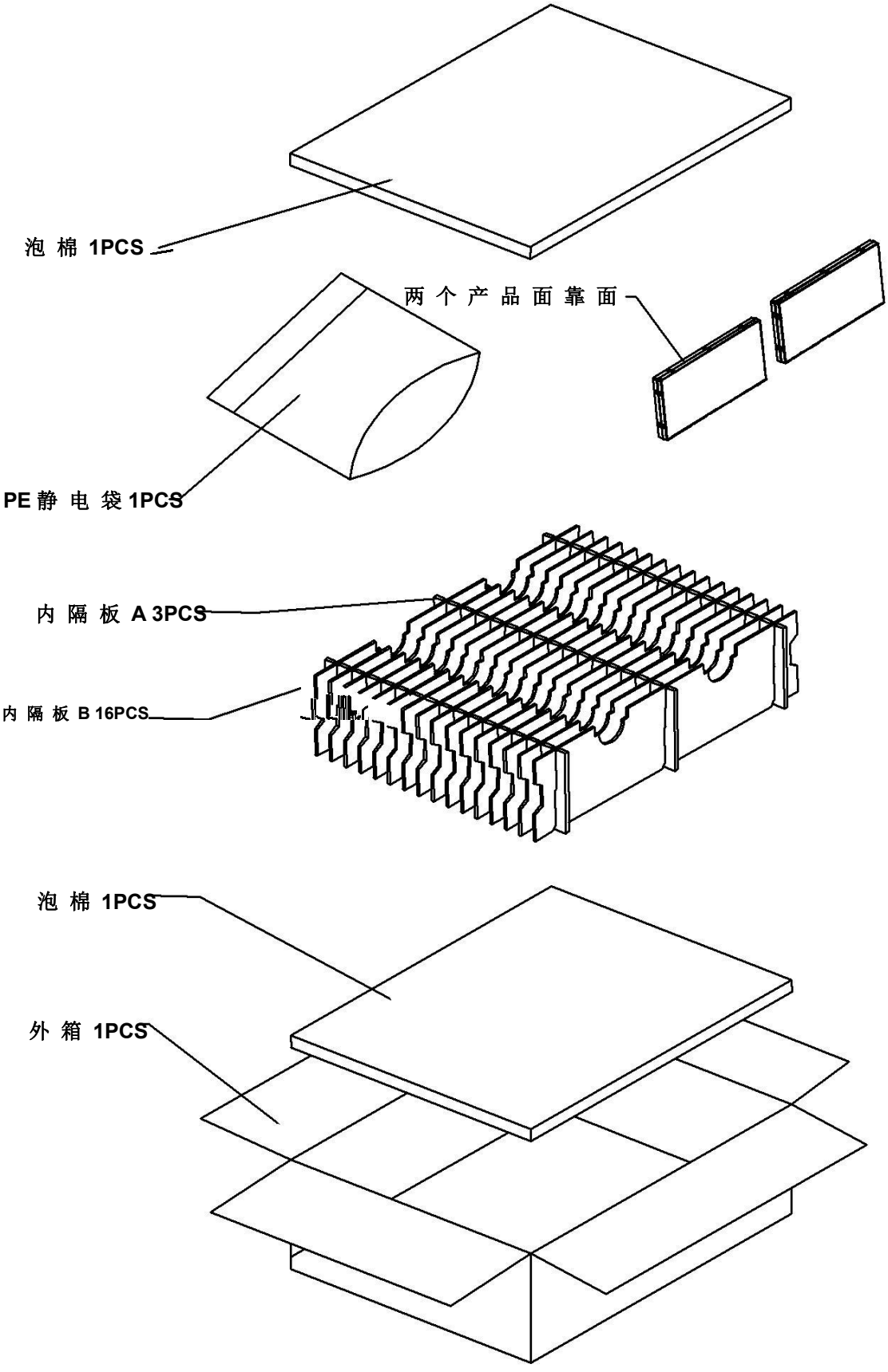
6. Outline dimension

(Unit : mm)





7.0 Packing form



8. General Precautions

8.1. 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.

8.2. 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.

8.3. 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.

8.4. 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.

8.5. 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.