产品规格书

Product Type: 10.1"TFT LCD Module

LCD Nunmber: EE101IA-01D

HLY MODULE NO.: HC-101I35025NB

CUSTOMER APPROVED	PREPARE BY	CHECK BY	APPROVED BY
SUPPLIER APPROVED	PREPARE BY	CHECK BY	APPROVED BY
	Xianguang Zeng		Hengjun Wei

■ Preliminary Specification

□ Final Specification

Contents

Document Revision History				
Change No.	Date	Subject And Reason	Version No.	Responser
1	2013.03.06	New	01	Xianguang Zeng
2	2013.04.24	修改标签	02	Mei Shen

1.General Description

NO.	Item	Specification	Remark
1	LCD size	10.1.inch(Diagonal)	
2	Driver element	a-Si TFT active matrix	
3	Resolution	1280 × 3(RGB) × 800	
4	Display mode	Normally White, Transmissive	
5	Dot pitch	0.0565(W) × 0.1695(H) mm	
6	Active area	216.96(W) × 135.6(H) mm	
7	Module size	229.46(W) ×149.1(H) × 2.5 (D) mm	
8	Surface treatment	Hard Coating(3H)	
9	Color arrangement	RGB-stripe	
10	Interface	LVDS	
11	View direction(Gray Inversion)	free	

2. Pin Assignment

2.1. TFT LCD Panel Driving Section

A 40pin connector is used for the module electronics interface. The recommended model is F62240-H1210A manufactured by Vigorconn.

Pin No.	Symbol	I/O	Function	Remark
1	VCOM	P	Common Voltage	
2	VDD	P	Power Supply	
3	VDD	P	Power Supply	
4	NC	---	No connection	
5	NC	---	No connection	
6	NC	---	No connection	
7	GND	P	Ground	
8	Rxin0-	I	-LVDS Differential Data Input	R0-R5. G0
9	Rxin0+	I	+LVDS Differential Data Input	
10	GND	P	Ground	
11	Rxin1-	I	-LVDS Differential Data Input	G1~G5. B0.B1
12	Rxin1+	I	+LVDS Differential Data Input	
13	GND	P	Ground	
14	Rxin2-	I	-LVDS Differential Data Input	B2-B5.HS.VS. DE
15	Rxin2+	I	+LVDS Differential Data Input	
16	GND	P	Ground	
17	RxCLK-	I	-LVDS Differential Clock Input	LVDS CLK
18	RxCLK+	I	+LVDS Differential Clock Input	
19	GND	P	Ground	
20	Rxin3-	I	-LVDS Differential Data Input	R6. R7. G6. G7. B6. B7
21	Rxin3+	I	+LVDS Differential Data Input	
22	GND	P	Ground	
23	NC	---	No connection	
24	NC	---	No connection	
25	GND	P	Ground	
26	NC	---	No connection	

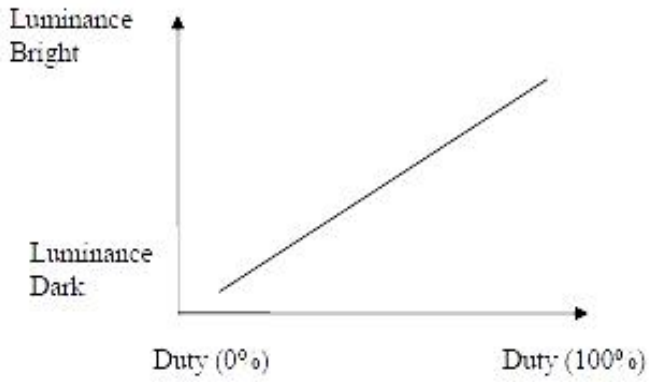
27	LED_PWM	O	CABC controller signal output for backlight	Note2
28	NC	---	No connection	
29	AVDD	P	Power for Analog Circuit	
30	GND	P	Ground	
31	LED-	P	LED Cathode	
32	LED-	P	LED Cathode	
33	NC	---	No connection	
34	NC	---	No connection	
35	VGL	P	Gate OFF Voltage	
36	NC	---	No connection	
37	CABC_EN	I	CABC Enable Input	Note1
38	VGH	P	Gate ON Voltage	
39	LED+	P	LED Anode	
40	LED+	P	LED Anode	

I: input, O: output, P: Power

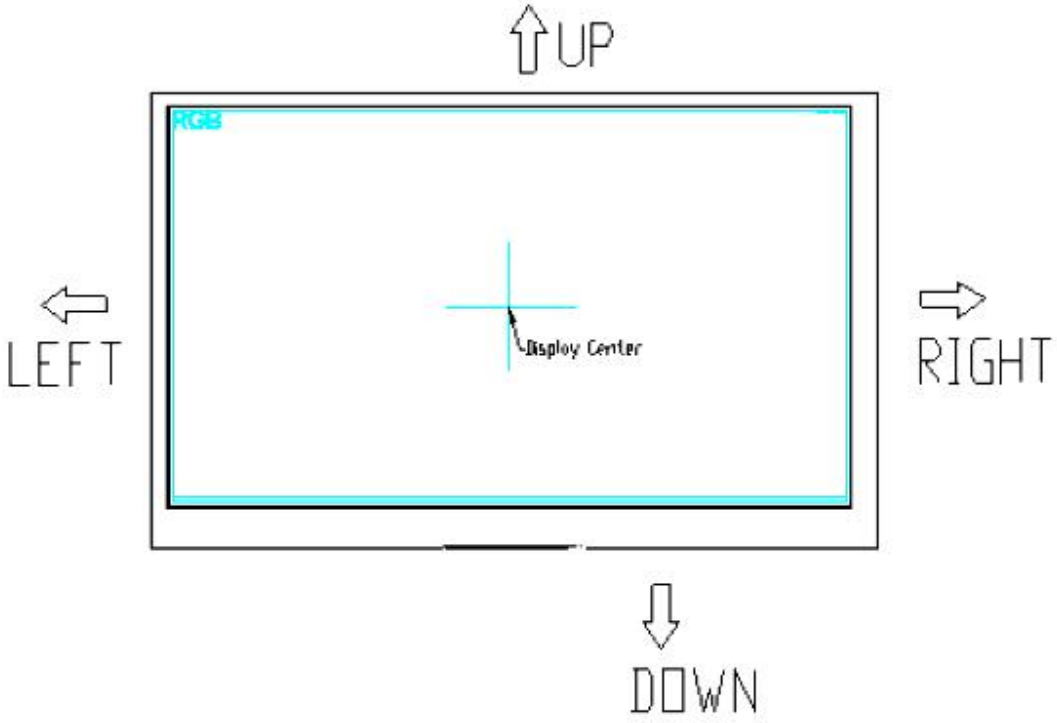
Note1: The setting of CABC function are as follows.

Pin	Enable	Disable
CABC_EN	High Voltage	Low Voltage or open

Note2: LED_PWM is used to adjust backlight brightness.



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



3. Operation Specifications

3.1. Absolute Maximum Ratings

(Note 1)

Item	Symbol	Values		Unit	Remark
		Min.	Max.		
Power voltage	VDD	-0.3	3.9	V	
	AVDD	-0.3	14	V	
	V_{GH}	-0.3	42.0	V	
	V_{GL}	-19	0.3	V	
	V_{GH}-V_{GL}	12	40.0	V	
Operation Temperature	T_{OP}	-0	50	℃	
Storage Temperature	T_{ST}	-20	60	℃	

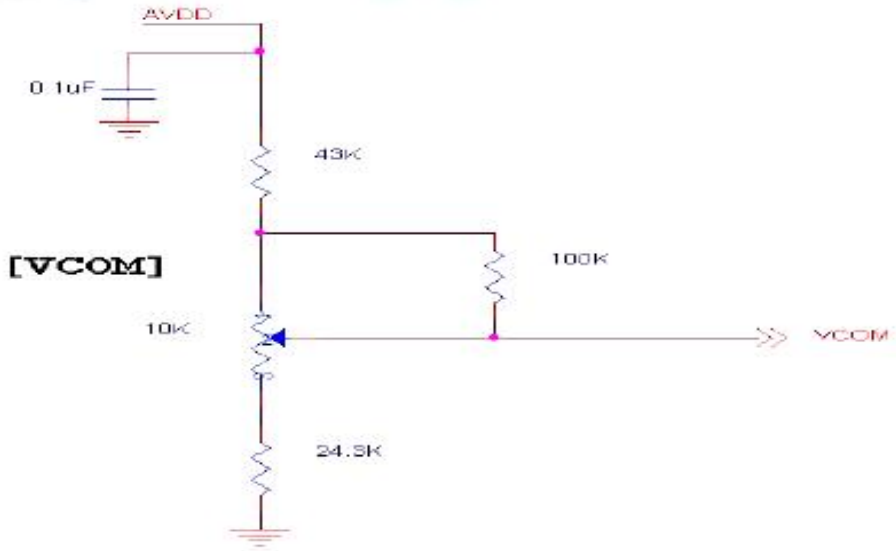
Note 1: The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

3.2. Typical Operation Conditions

(Note 1)

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Power voltage	VDD	2.3	2.5	2.7	V	Note 2
	AVDD	8.0	8.2	8.4	V	
	V_{GH}	21.7	22	22.3	V	
	V_{GL}	-7.3	-7	-6.7	V	
Input signal voltage	VCOM	3.0	3.3	3.6	V	Note 4
Input logic high voltage	V_{IH}	0.8 VDD	-	3.6	V	Note 3
Input logic low voltage	V_{IL}	0	-	0.2 DV_{DD}	V	

Note 1: Be sure to apply VDD and V_{GL} to the LCD first, and then apply V_{GH}.
Note 2: VDD setting should match the signals output voltage (refer to Note 3) of customer's system board.
Note 4: Typical VCOM is only a reference value, it must be optimized according to each LCM. Be sure to use VR.

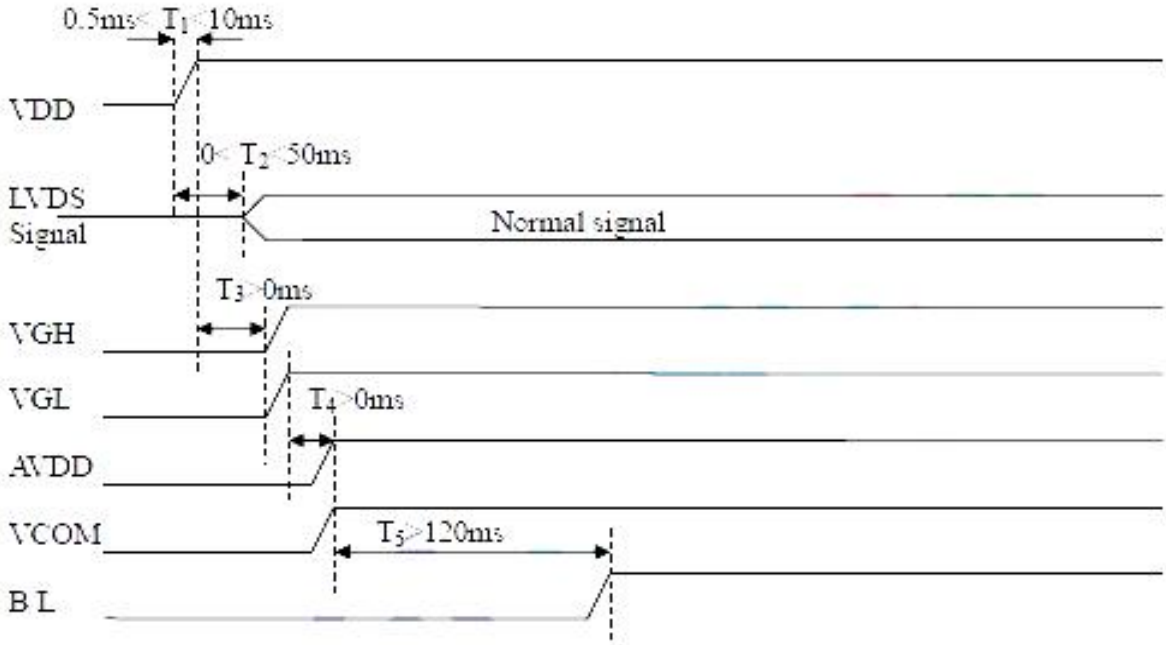


. 3.2.1 Back-light Unit:

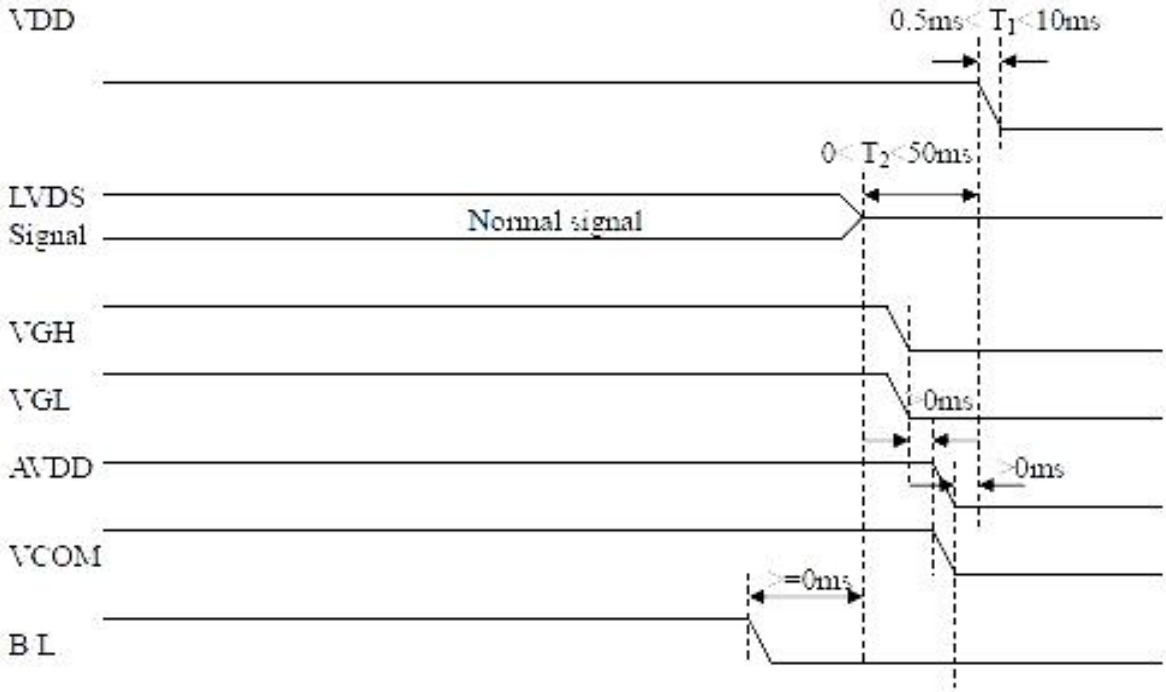
PARAMETER	Sym.	Min.	Typ.	Max.	Unit	Test Condition	Note
LED Current	IF	-	260	-	mA	-	-
LED Voltage (Total)	VF	9	9.9	10.5	V	-	-
Life Time		-	25000	-	Hr.	I≦240mA	-
Color	White						

3.3. Power Sequence

a. Power on:



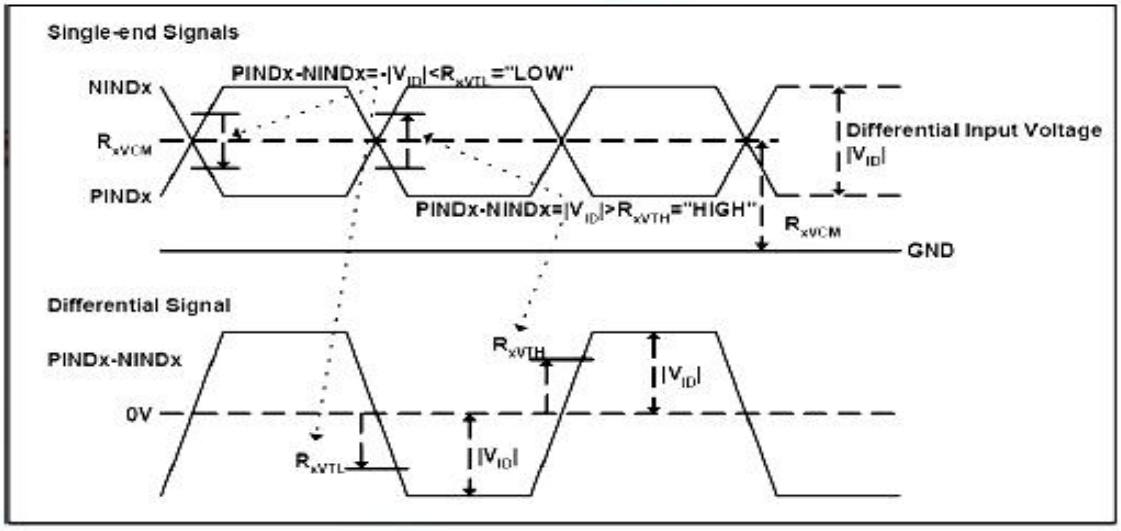
b. Power off:



、3.4. LVDS Signal Timing Characteristics

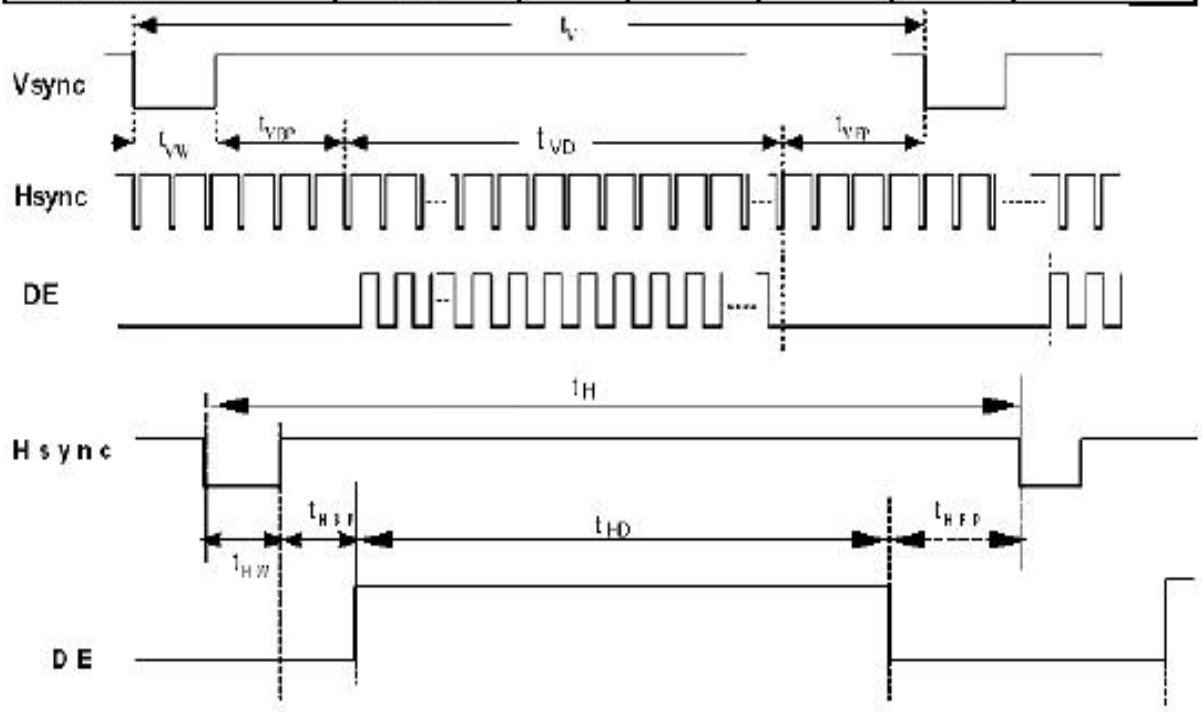
3.4.1 AC Electrical Characteristics

Parameter	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
LVDS Differential input high Threshold voltage	R_{xVTH}	-	-	+100	mV	R_{XVCM}=1.2V
LVDS Differential input low Threshold voltage	R_{xVTL}	-100	-	-	mV	
LVDS Differential input common mode voltage	R_{xVCM}	0.7	-	1.6	V	
LVDS Differential voltage	$\|V_{ID}\|$	100	-	600	mV	

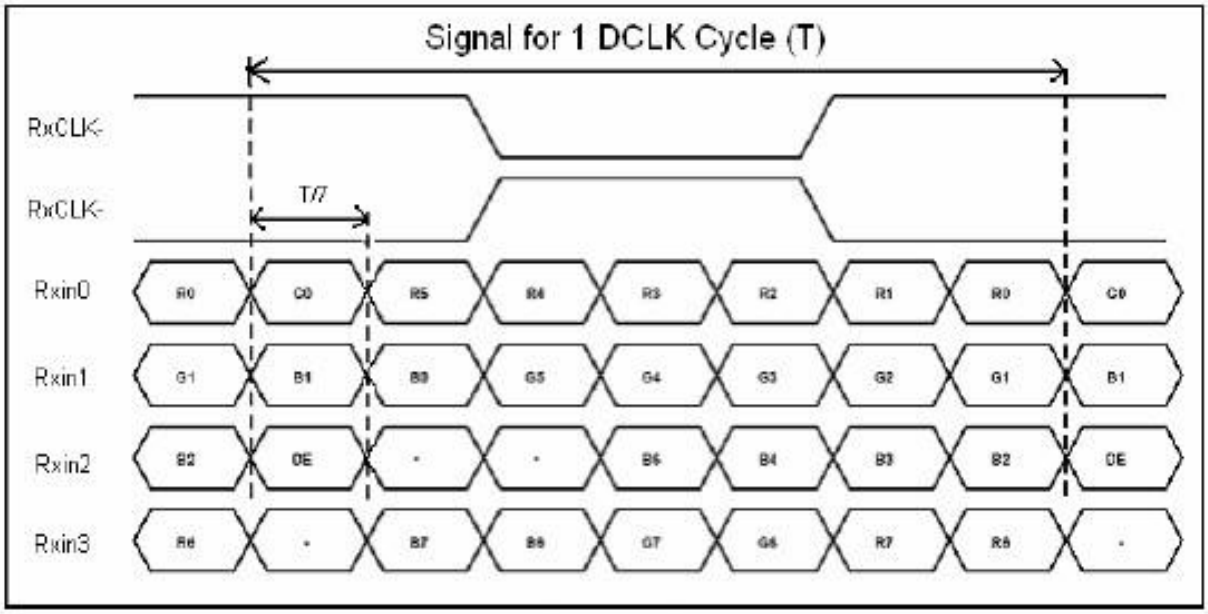


3.4.2 Timing Table

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Clock Frequency	1/Tc	(68.9)	71.1	(73.4)	MHz	Frame rate =60Hz
Horizontal display area	t_{HD}		1280		Tc	
HS period time	t_H	(1410)	1440	(1470)	Tc	
HS Width +Back Porch +Front Porch	t_{HW}+ t_{HBP} +t_{HFP}	(60)	160	(190)	Tc	
Vertical display area	t_{VD}		800		t_H	
VS period time	t_V	(815)	823	(833)	t_H	
VS Width +Back Porch +Front Porch	t_{VW}+ t_{VBP} +t_{VFP}	(15)	23	(33)	t_H	



3.4.3. LVDS Data input Format



4. Optical Characteristics

Item	Symbol	Conditions	Specifications			Unit	Note
			Min.	Typ.	Max.		
Contrast Ratio	CR	Normal θ=Φ=0°	600	800	--	--	(2),(4),(6)
Response time	Ton		--	10	20	ms	(3)
	Toff		--	15	30	ms	(3)
Color chromaticity	Wx		0.27	0.29	0.32	--	
	Wy		0.31	0.33	0.36	--	
Viewing angle (CR≥ 10)	θL	Φ=180° (9 o' clock)	75	85	--	degree	(1)
	θR	Φ=0° (3 o' clock)	75	85	--		
	θT	Φ=90° (12 o' clock)	75	85	--		
	θB	Φ=270° (6 o' clock)	75	85	--		
Uniformity	--	--	80	--	--	%	(7)
LCM luminance	YL	I=240mA	--	350		cd/㎡	9 point AVG

Note:

4-1 Test Condition

- DVDD=3.3V, thte ambient temperature is 25±2℃
- The test systems refer to Note 2
- The measured value of luminace and color coordinate bases HFH's BM-7

4-2 Measuring Equipment

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

(1) Definition of viewing angle range

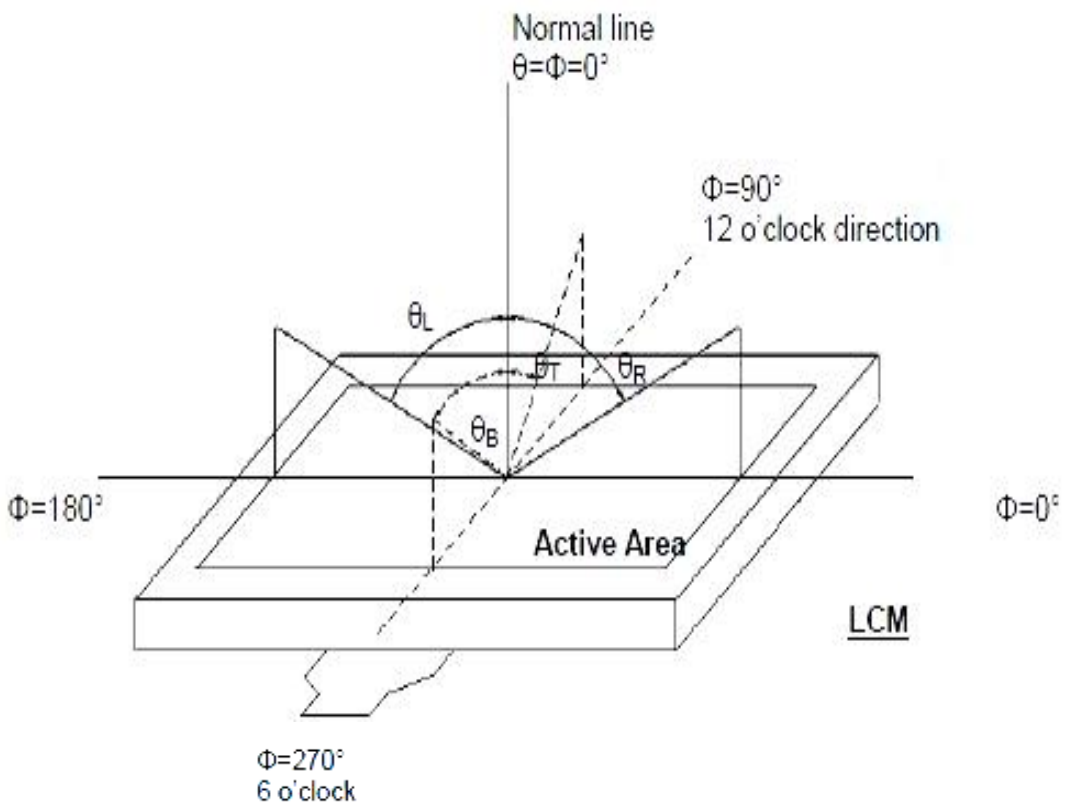


Fig. 4-3 Definition of viewing angle

(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.

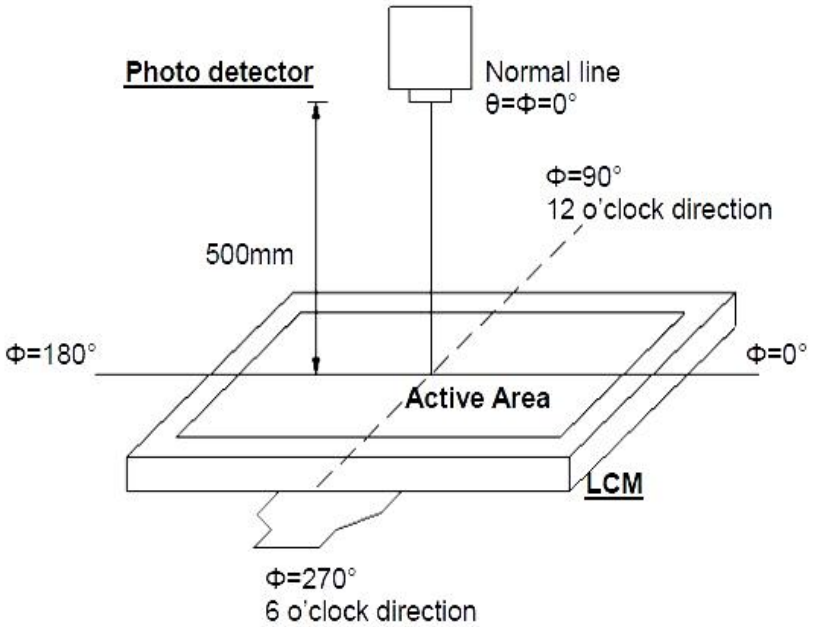
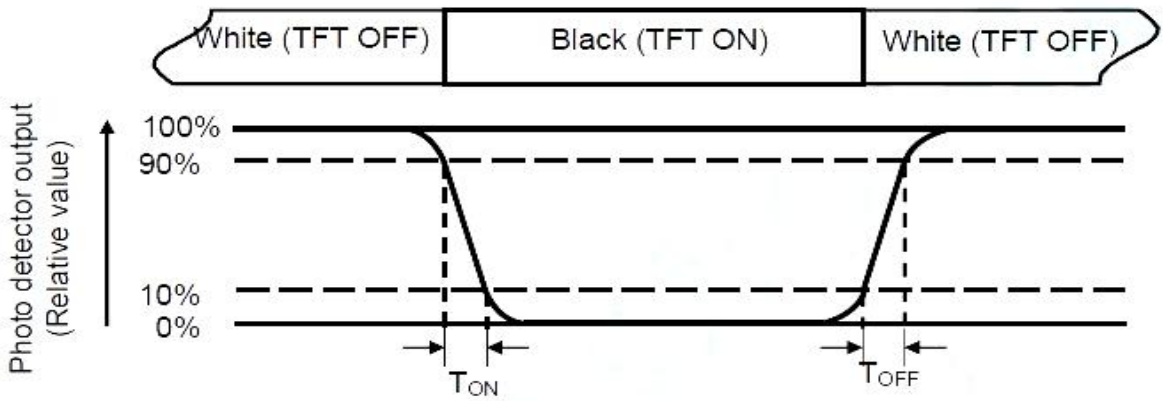


Fig. 4-4 Optical measurement system setup

(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_.



(4) Definition of contrast ratio:
The contrast ratio is defined as the following expression.

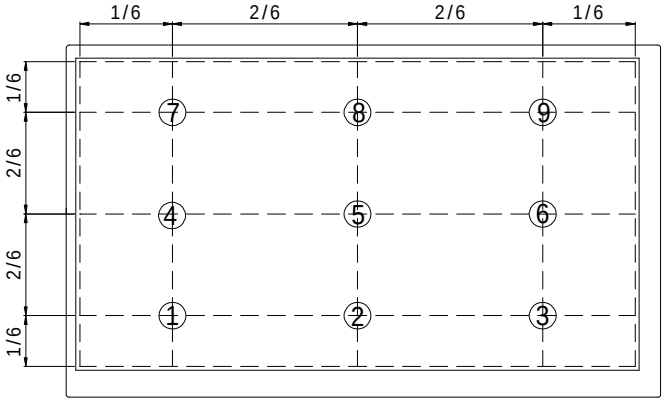
$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the “White” state}}{\text{Luminance measured when LCD on the “Black” state}}$$

(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.

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

Fig. 4-5 Definition of brightness uniformity



5. Quality Assurance

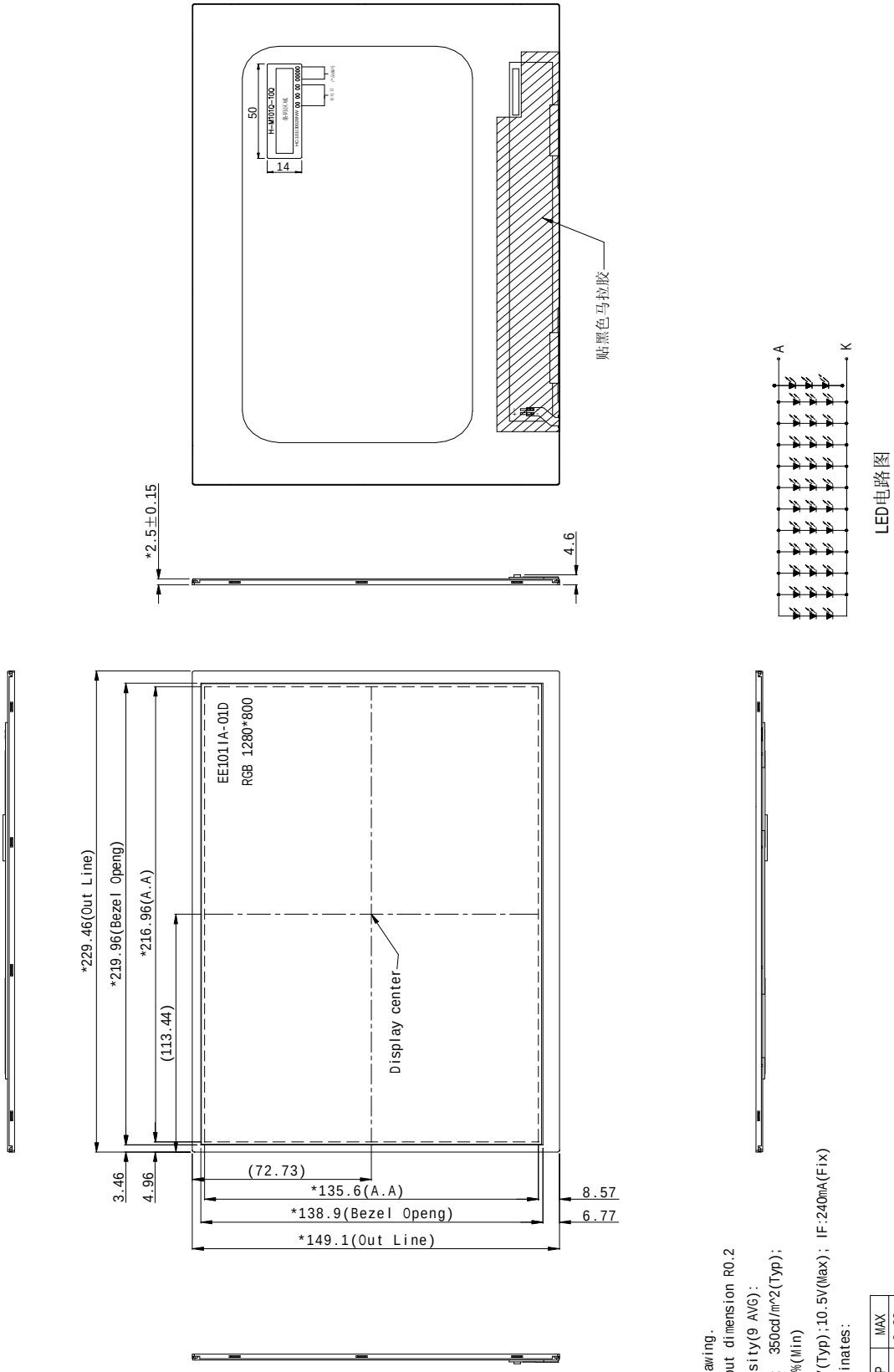
No.	Test Items	Test Condition	Note
1	High Temperature Storage Test	Ta=60_ Dry 96h	
2	Low Temperature Storage Test	Ta=-20_ Dry 96h	
3	High Temperature Operation Test	Ta=50_ Dry 96h	
4	Low Temperature Operation Test	Ta=-10_ Dry 96h	
5	High Temperature and High Humidity Operation Test	Ta=40_ 90%RH 96h	
6	Electro Static Discharge Test	± 2KV, Human Body Mode, 100pF/1500Ω	Non-operating
7	Thermal Shock Test	-10_(0.5Hr) ~ +50_(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



RoHS

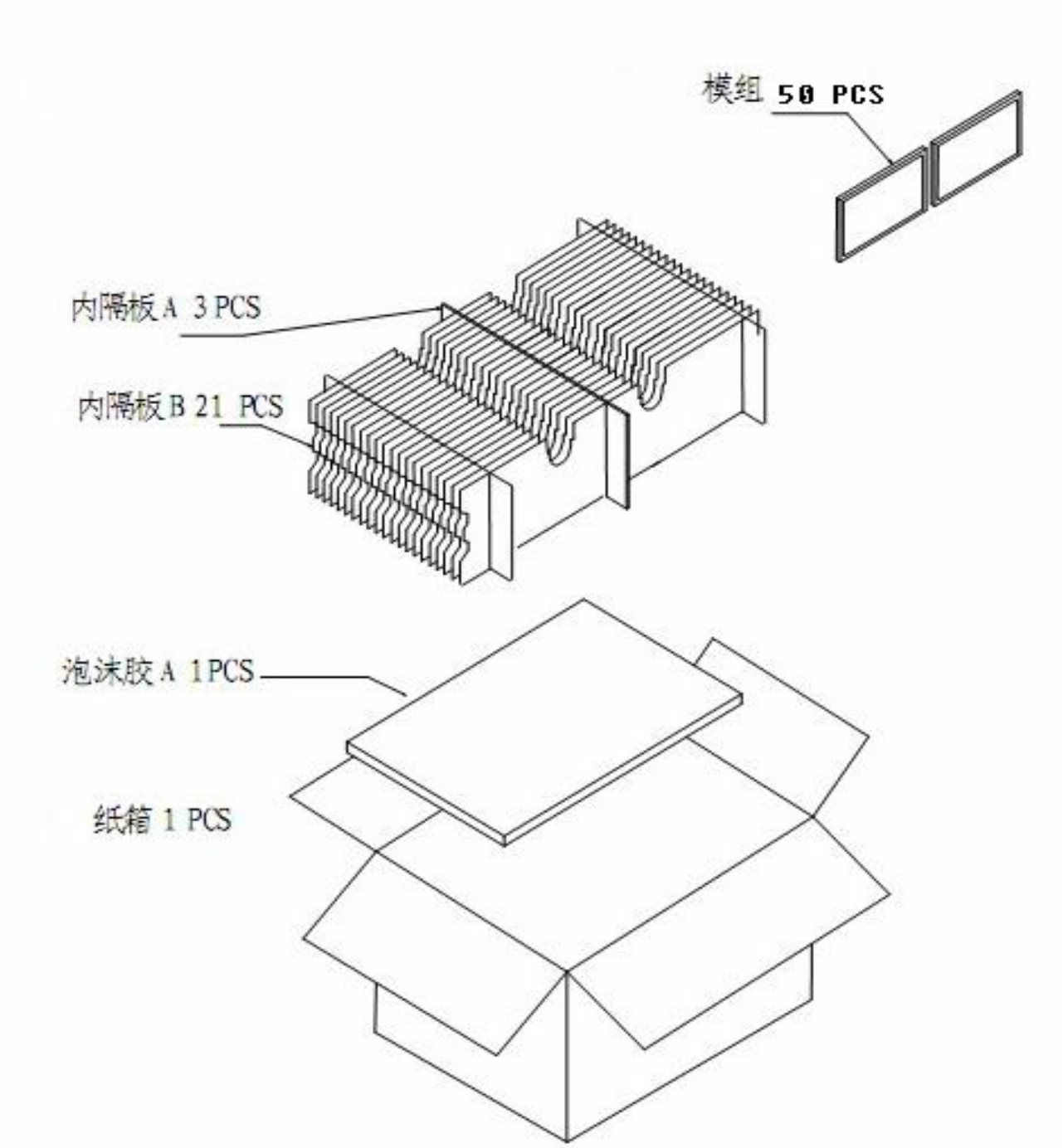
Notes:

1. Unit:mm
2. Do not scale drawing.
3. All radii without dimension R0.2
4. Luminous instensity(9 AVG):
   280cd/m^2(Min); 350cd/m^2(Typ);
5. Uniformity : 75%(Min)
   VF:9V(Min);9.9V(Typ);10.5V(Max); IF:240mA(Fix)
6. The color coordinates:

	MIN	TYP	MAX
x	0.27	0.29	0.32
y	0.31	0.33	0.36

7. ⚠ Modification rev.number
8. draft angle 1.0°
9. Genral Tolerance: ±0.2
10. Mark mold cavity indentification in recess approximately where indicated.
11. "*" For important dimension;( ) for reference dimention
12. RoHS must be complied.(Use Lead-free process)

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.