深圳市国显科技有限公司

Shenzhen K&D Technology Co. Ltd

■ **Preliminary Specification**
☐ **Approval Specification**

SPECIFICATION FOR LCD MODULE

Customer : _____

Product Model: KD080D24-39TH-B001

Sample code: _____

Designed by	Checked by	Approved by
Jiaping Zhong	Junhao He	Junhua Zhang

Final Approval by Customer

☐ LCM Machinery OK **Checked By** _____ ☐ LCM Display OK **Checked By** _____	☐ LCM OK ☐ NG，Problem survey: **Approved By** _____

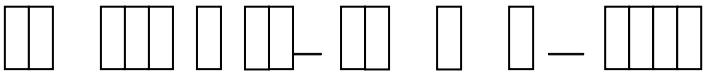
※**The specification of "TBD" should refer to the measured value of sample . If there is difference between the design specification and measured value, we naturally shall negotiate and agree to**

Revision History

Version	Contents	Date	Note
A0	Original	2017.10.10	

Contents

1. Numbering System



No	Definition	Specifications
(1)	TFT LCM Productor No.	KD ---- King Display Technology Co. Ltd
(2)	Display monitor opposite angle line size	Unit :mmm (takes three integers)
(3)	Productor Types	D ---- PMP / Tablet PC G ----GPS M ----MP P ----Mobile-Phone N ----Net Book 。。。
(4)	Productor Development Series No.	By two figures characters expression from 01 to 99
(5)	Interface PIN Number	By two figures characters expression from 01 to 99
(6)	With Touch Panel Or Not	T----With T/P ； N----Without T/P
(7)	LCD Type	A----AUO ； M----CMI ； C----CPT；B----BOE； L----LG；W----Wintek；H----HSD；S----Century T----Tianma ； Y----Hydis ； I----INNOLUX ； U---Samsung； V---- IVO； P---- Panasonic
(8)	Productor Development edition No.	By The English litters : A 1~ Z999

2. Scope

This specification applies to the TFT LCD module which is designed and manufactured by LCM Factory of Shenzhen K&D Technology Co. Ltd.

3. Normative Reference

GB/T4619-1996 《 Liquid Crystal Display Test Method》

GB/T2424 《Basic environmental Testing Procedures for Electric and Electronic Products.》

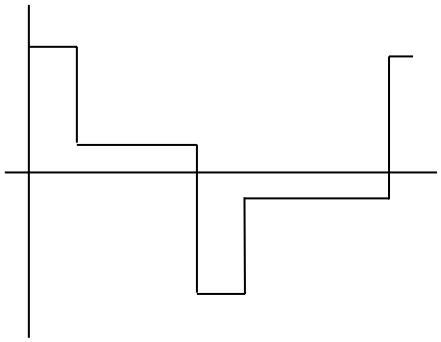
GB/T2423 《Basic Testing Procedures for Electric and Electronic Products》

IEC61747-1 《SIXTH PARTGB2828`2829-87《National Standard of PRC》

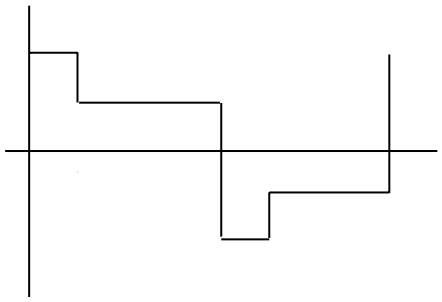
4. Definitions

4.1 Definitions of Vop

The definitions of threshold voltage Vth1, Vth2 the following typical waveforms are applied on liquid crystal by the method of equalized voltage for each duty and bias.



【 selected waveform 】



【 non-selected waveform 】

① Vth1: The voltage which the brightness of segment indicates 50% of saturated value on the conditions of selected waveform

(f_f=80Hz, Φ=10° θ=270° at 25℃)

② Vth2: The voltage which the brightness of segment indicates 50% of saturated value on the conditions of non-selected waveform

(f_f=80Hz, Φ=10° θ=270° at 25℃)

③ Vop: (Vth1(50%)+Vth2(50%))/2 (f_f=80Hz, Φ=10° θ=270° at 25℃)

4.2 Definition of Response Time Tr, Td

①Tr: The time required which the brightness of segment becomes 10% from 100% when waveform is switched to selected one from non-selected one. (f_f=80Hz, Φ=10°θ=270°at 25℃)

②Td: The time required which the brightness of segment becomes 90% from 10% when waveform is switched to selected one from selected one. (f_f=80Hz, Φ=10°θ=270°at 25℃)

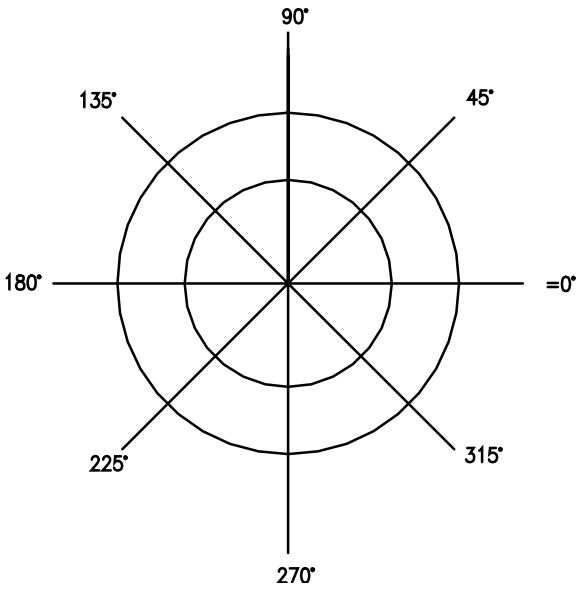
4.3 Definition of Contrast Ratio Cr

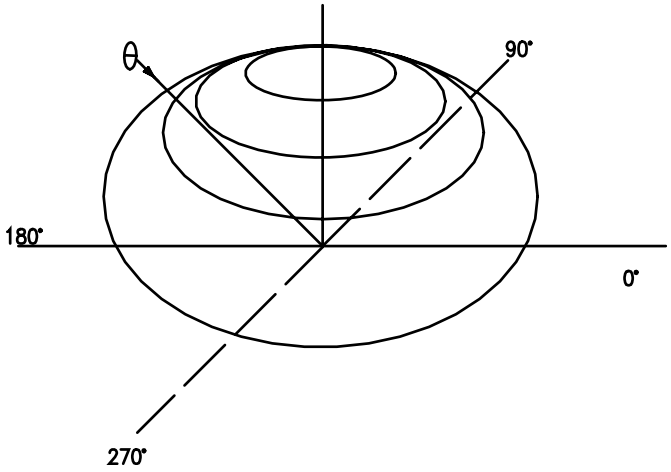
Cr=A/B

① A: Segments brightness in case of non-selected waveform

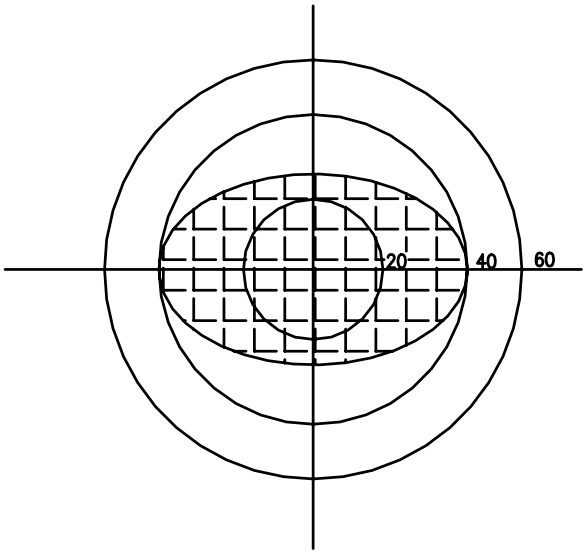
② B: Segments brightness in case of selected waveform

4.4 Definition of Angle and Viewing Range



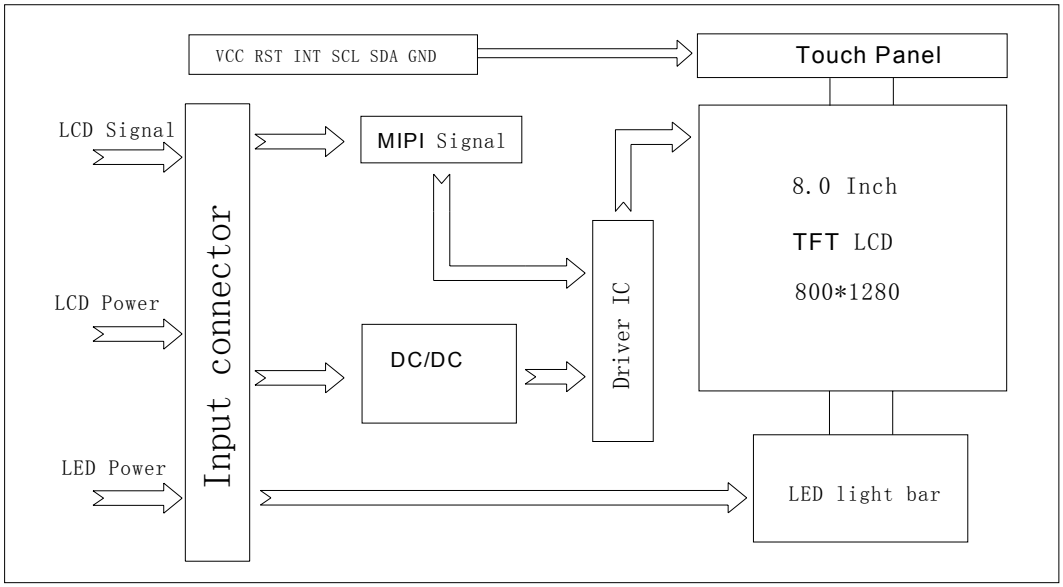


Angular Graph: Constrast Ratio



Such as:
Viewing Angle Range:
80(Cr>2) Horizontal
70(Cr>2) Vertical

5. Block Diagram



6. Technology Specifications

6.1 Features

This single-display module is suitable for use in MID products. The LCD adopts one backlight with High brightness 21-lamps white LED. Construction: 8.0” a-Si color TFT-LCD , White LED backlight and TP.

6.2 General Specifications

No.	Item	Specification
1	LCD size	8.0 inch
2	Resolution	800 (RGB)X1280
3	Display mode	Normally Black
4	Pixel pitch	0.8625(W)X0.8625(H) mm
5	Active area	107.64 (W)X172.22(H) mm
6	Module size（with TP）	123.50(W)X204.70(H)X4.16(D)mm
7	Pixel arrangement	RGB-stripe
8	Interface	MIPI
9	Backlight power consumption	1.70W
10	Panel power consumption	TBD
11	Weight	TBD
12	Luminance for LCM (typ.)	297cd/m^2 (with TP) 350cd/m^2 (w/o TP)
13	PPI(Pixels Per Inch)	188.69

6.3 Interface Pin Connection

Pin No.	Symbol	Function	Remarks
1	FMARK	Tearing Effect PIN	
2-3	VCC	Power supply **(3.3V)**	
4	LOGIC(1.8V)	Power supply **(1.8V)**	
5	RESET(1.8V)	Global reset signal (1.8V)	
6-7	GND	Digital Ground	
8	MIPI0-	MIPI data pair0 negative signal	
9	MIPI0+	MIPI data pair 0 positive signal	
10	GND	Digital Ground	
11	MIPI1-	MIPI data pair 1 negative signal	
12	MIPI1+	MIPI data pair 1 positive signal	
13	GND	Digital Ground	
14	MIPI_CLK-	MIPI CLK negative signal	
15	MIPI_CLK+	MIPI CLK positive signal	
16	GND	Digital Ground	
17	MIPI2-	MIPI data pair 2 negative signal	
18	MIPI2+	MIPI data pair 2 positive signal	
19	GND	Digital Ground	
20	MIPI3-	MIPI data pair3 negative signal	
21	MIPI3+	MIPI data pair 3 positive signal	
22	GND	Digital Ground	
23	LCDID	ID(+1.8V)	
24-25	GND	Digital Ground	
26	NC	NC	
27	FB1	LED Cathode (Negative)	
28	FB2	LED Cathode (Negative)	
29	FB3	LED Cathode (Negative)	
30	NC	NC	
31-32	VLED	LED Anode (Positive)	
33	NC	NC	

34	TP_INT1V8	TP_INT1V8	
35	TP_SDA1V8	TP_SDA1V8	
36	TP_SCL1V8	TP_SCL1V8	
37	TP_RESET	TP_RESET	
38	TP_GND	TP_GND	
39	TP_VDD2V8	TP_VDD2V8	

6.4 Absolute Max. Rating

Item	Symbol	Values		Unit
		Min.	Max.	
Power Voltage	VCC	-0.3	+5.0	V
	LOGIC	-0.3	+4.5	V
Input Signal Voltage	V_I	-0.3	VCC	V
Operation Temperature	T_{OP}	-10	50	℃
Storage Temperature	T_{ST}	-20	60	℃

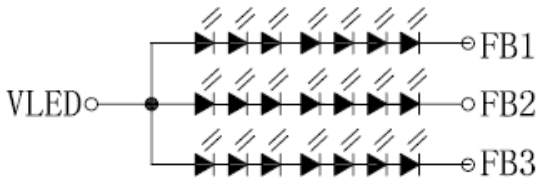
6.5 Typical Operation Conditions

Item	Symbol	Values			Unit
		Min.	Typ.	Max.	
Power Voltage	VCC	2.5	3.3	4.8	V
	LOGIC	1.65	1.8	3.3	V
Current Consumption	I_{VCC}	-	90	-	mA
	I_{LOGIC}		TBD		
	I_{LED}	--	60	-	mA

6.6 LED Back Light Specification (21 White Chips)

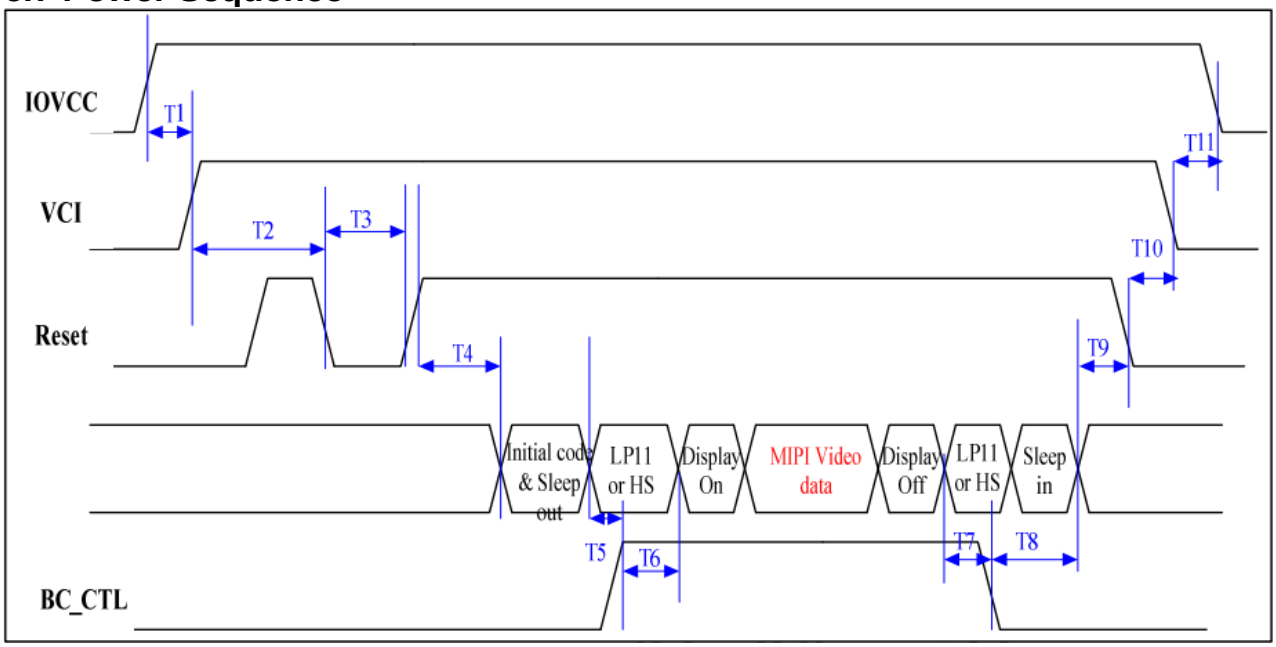
Item	Symbol	Condition	Min	Typ	Max	Unit
Forward Voltage	Vf	If=60mA	19.6		22.4	V
Uniformity (with L/G)	ΔB_p	If=60mA	75	80	-	%
Luminance for LCM （with TP）	/	If=60mA	255	297	-	cd/m^2

LED circuit:



Backlight 21pcs LED Circuit

6.7 Power Sequence



Power on/off Timing													
		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	unit
Value	min	1	1	1	50	120	50	50	50	10	1	1	ms
	max												

6.8 Optical Specifications

Item	Symbol	Condition	Values			Unit	Remark
			Min.	Typ.	Max.		
Viewing angle (CR≥ 10)	θ_L	Φ=180° (9 o'clock)	-	80	-	degree	Note 1
	θ_R	Φ=0°(3 o'clock)	-	80	-		
	θ_T	Φ=90° (12 o'clock)	-	80	-		
	θ_B	Φ=270° (6 o'clock)	-	80	-		
Response time Rise+Fall	T_{RT}	Normal θ=Φ=0°	-	20	35	msec	Note 3
Contrast ratio	CR		-	700	-	-	Note 4
Color chromaticity	W_X		0.270	0.300	0.330	-	Note 2 Note 5 Note 6
	W_Y		0.280	0.310	0.340	-	
	R_X		0.584	0.624	0.664	-	
	R_Y		0.300	0.340	0.380	-	
	G_X		0.282	0.322	0.362	-	
	G_Y		0.527	0.567	0.607	-	
	B_X		0.104	0.144	0.184	-	
	B_Y		0.033	0.073	0.113	-	
NTSC			-	59	-	%	
Luminance (with TP)	L		272	297	-	-	Note 6
Luminance (w/o TP)	L		320	350	-	-	Note 6
Luminance uniformity	Y_U		75	80	-	%	Note 6,7 (9-point)

Note 1: Definition of viewing angle range

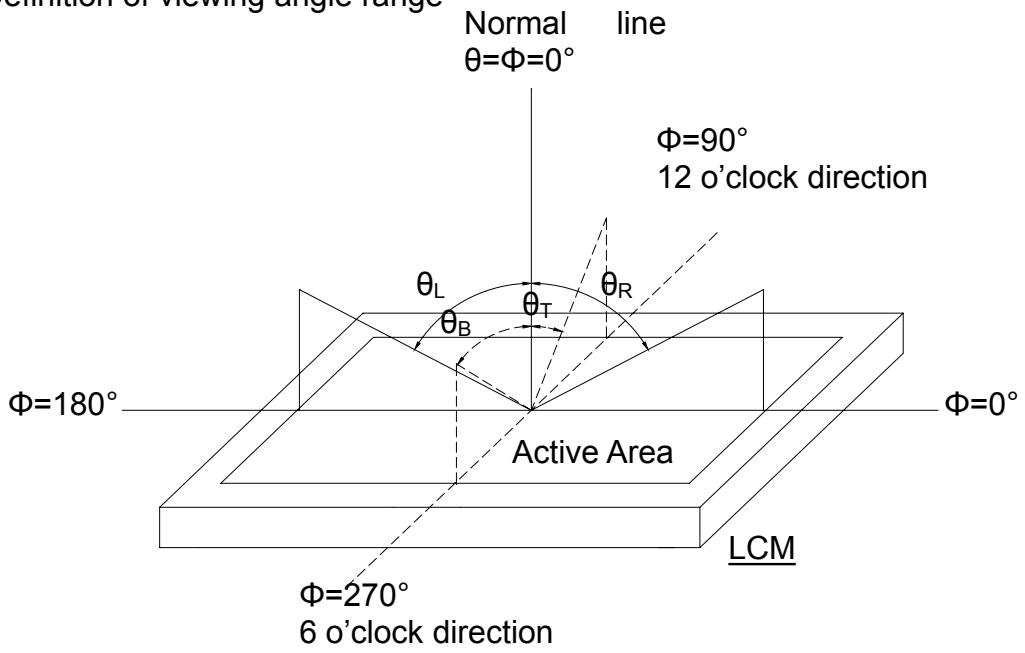


Fig. 4-1 Definition of viewing angle

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. (Viewing angle is measured by ELDIM-EZ contrast/Height :1.2mm ,Response time is measured by Photo detector TOPCON BM-5A, other items are measured by BM-7A/Field of view: 1° /Height: 500mm.)

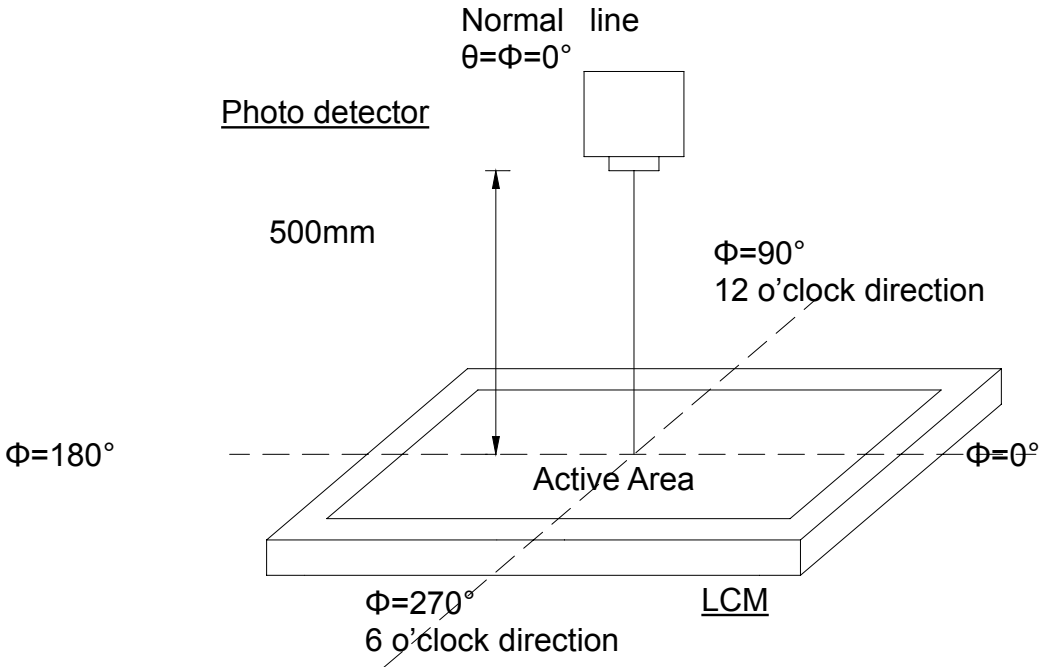


Fig. 4-2 Optical measurement system setup

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%.

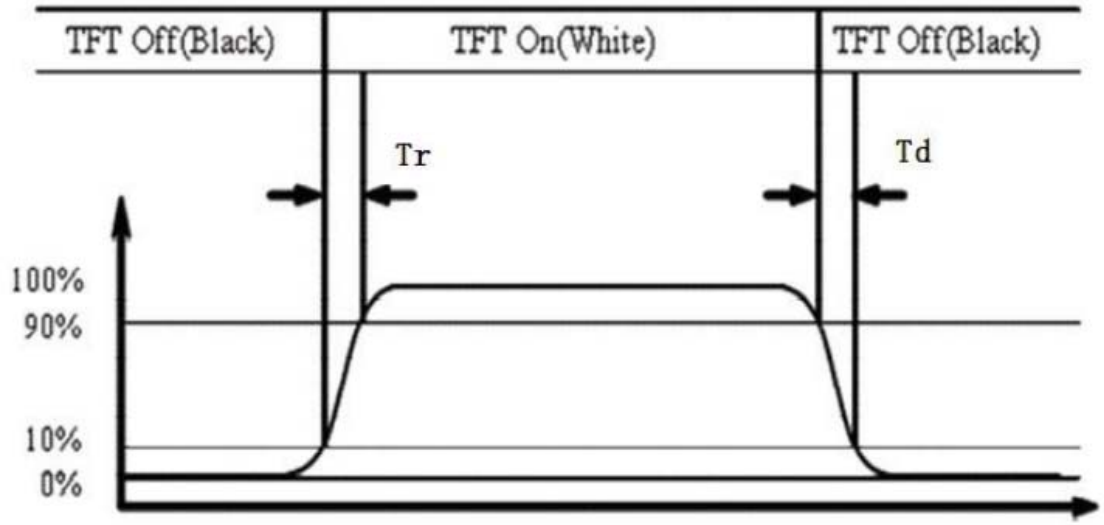


Fig. 4- 3 Definition of response time

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: All input terminals LCD panel must be ground while measuring the center area of the panel. The LED driving condition is I_{LED}=75mA.

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

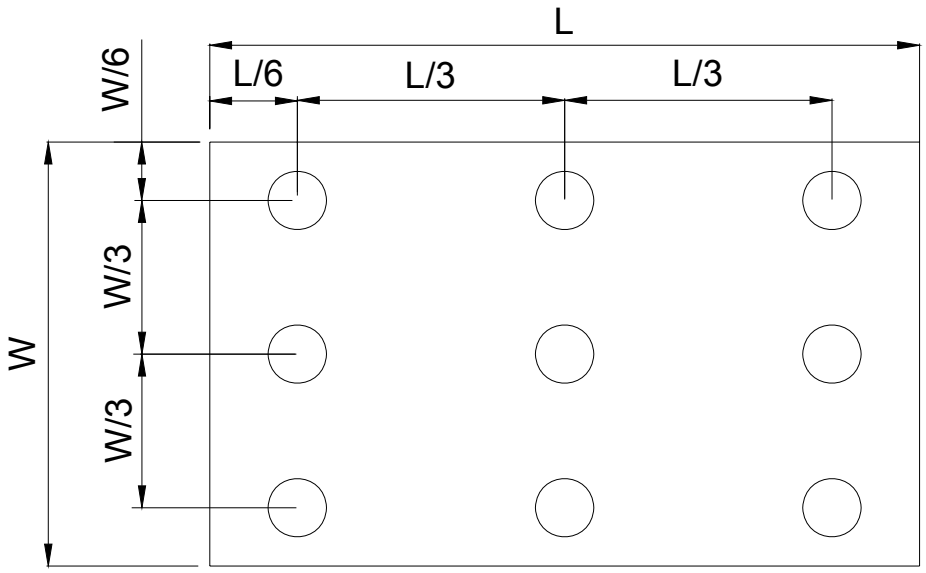


Fig. 4-4 Definition of measuring points

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

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

7. Reliability Test Conditions And Methods

Item	Test Conditions	Remark
High Temperature Storage	Ta = 70℃ 96 hrs	
Low Temperature Storage	Ta =-20℃ 96hrs	
High Temperature Operation	Ts = 60℃ 96hrs	
Low Temperature Operation	Ta = -10℃ 96hrs	
Operate at High Temperature and Humidity	40℃, 90%RH max. 96 hrs	Operation
Thermal Shock	-20℃~ +70℃ 10 cycles 1Hrs/cycle	Non-operation
Electrostatic Discharge	Contact=±4KV, class B Air=±8KV, class B	

8. Handling Precautions

8.1 Mounting Method

The LCD panel of K&D LCD module consists of two thin glass plates with polarizes which easily be damaged. And since the module in so constructed as to be fixed by utilizing fitting holes in the printed circuit board.

Extreme care should be needed when handling the LCD modules.

8.2 Caution Of LCD Handling And Cleaning

When cleaning the display surface, Use soft cloth with solvent [recommended below] and wipe lightly

- Isopropyl alcohol
- Ethyl alcohol

Do not wipe the display surface with dry or hard materials that will damage the polarizer surface.

Do not use the following solvent:

- Water
- Aromatics

Do not wipe ITO pad area with the dry or hard materials that will damage the ITO patterns

Do not use the following solvent on the pad or prevent it from being contaminated:

- Soldering flux
- Chlorine (Cl) , Salfur (S)

If goods were sent without being silicon coated on the pad, ITO patterns could be damaged due to the corrosion as time goes on.

If ITO corrosion happen by miss-handling or using some materials such as Chlorine (Cl), Salfur (S) from customer, Responsibility is on customer.

8.3 Caution Against Static Charge

The LCD module use C-MOS LSI drivers, so we recommended that you:

Connect any unused input terminal to Vdd or Vss, do not input any signals before power is turned on, and ground your body, work/assembly areas, assembly equipment to protect against static electricity.

8.4 Packing

- Module employ LCD elements and must be treated as such.
- Avoid intense shock and falls from a height.
- To prevent modules from degradation, do not operate or store them exposed direct to sunshine or high temperature/humidity

8.5 Caution For Operation

- It is an indispensable condition to drive LCD's within the specified voltage limit since the higher voltage then the limit cause the shorter LCD life.
- An electrochemical reaction due to direct current causes LCD's undesirable

deterioration, so that the use of direct current drive should be avoided.

- Response time will be extremely delayed at lower temperature then the operating temperature range and on the other hand at higher temperature LCD's how dark color in them. However those phenomena do not mean malfunction or out of order with LCD's, which will come back in the specified operation temperature.
- If the display area is pushed hard during operation, some font will be abnormally displayed but it resumes normal condition after turning off once.
- A slight dew depositing on terminals is a cause for electro-chemical reaction resulting in terminal open circuit.

  Usage under the maximum operating temperature, 50%Rh or less is required.

8.6 Storage

In the case of storing for a long period of time for instance, for years for the purpose or replacement use, the following ways are recommended.

- Storage in a polyethylene bag with the opening sealed so as not to enter fresh air outside in it . And with no desiccant.
- Placing in a dark place where neither exposure to direct sunlight nor light's keeping the storage temperature range.
- Storing with no touch on polarizer surface by the anything else.

  [It is recommended to store them as they have been contained in the inner container at the time of delivery from us

8.7 Safety

- It is recommendable to crash damaged or unnecessary LCD's into pieces and wash off liquid crystal by either of solvents such as acetone and ethanol, which should be burned up later.
- When any liquid leaked out of a damaged glass cell comes in contact with your hands, please wash it off well with soap and water

9. Precaution For Use

9.1

A limit sample should be provided by the both parties on an occasion when the both parties agreed its necessity. Judgment by a limit sample shall take effect after the limit sample has been established and confirmed by the both parties.

9.2

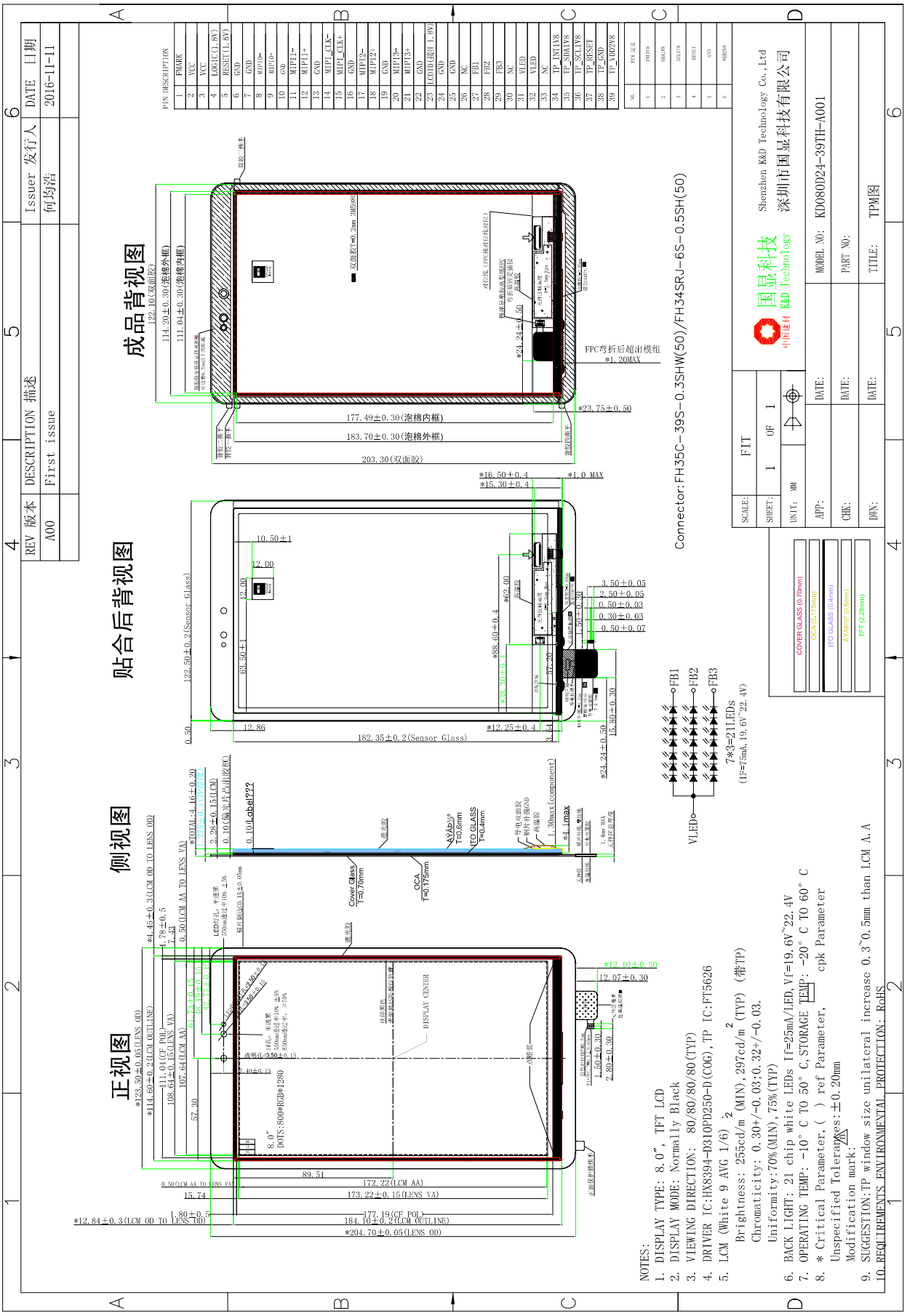
On the following occasions, the handing of problem should be decided through discussion and agreement between responsible of the both parties.

- When a question is arisen in this specification
- When a new problem is arisen which is not specified in this specifications
- When an inspection specifications change or operating condition change in customer is reported to K&D , and some problem is arisen in this specification due to the change
- When a new problem is arisen at the customer's operating set for sample evaluation in the customer site.

10. Package Drawing

TBD

11. Outline Dimension



12. bar code label and packing chest label

TBD

13. HSF Requirements

■ ROHS ☐ 无卤 ☐ REACH