

LCD MODULE
SPECIFICATION

Model:	UE035FW-HH25-L008
Version:	V1.0
Date:	20171106

- ☐ Preliminary Specification 样品规格书
- ☒ Final Specification 量产规格书

Customer Confirmation 客户确认

Approved by	Notes

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VIEWE Confirmation 优奕确认

Prepared by	Reviewed by	Approved by

REVISION HISTORY

Revision 版本号	Date 日期	Contents of Revision Change 修改内容	Remark 备注
V1.0	2017.11.06	Preliminary release	

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1. GENERAL INFORMATION

1.1 Features

- 1) Display Format: 3.5 FWGA Vertical Stripe (480*854)
- 2) Interface : MIPI 2Lane
- 3) Driver IC : JD9161
- 4) Operation Temperature : -20~70℃
- 5) Storage Temperature : -30~80℃
- 6) Backlight Type: White LED
- 7) Display mode: Normally White,

1.2 Mechanical Specification

Item 项目	Specification 规格	Unit 单位	Remark 备注
Pixel Driving element	IPS TFT	-	
Screen Size	3.47	Inch	Diagonal
Resolution	480(W)*3(RGB)*854(H)	Dots	
Interface	MIPI	-	4lane
Module Power Consumption	0.63	Watt	Typ.
Active Area	43.2(H)*76.86(V)	mm	
VActive VArea	44.7(W)*78.36(H)	mm	
Pixel pitch (W*H)	0.09(V)*0.09(V)	mm	
Module Size (W*H*D)	50.16 (H)*86.3(V)*2.2(T)	mm	Tolerance: ±0.2
Luminance	320	cd/m ²	Typ.
Viewing Direction	6	O'clock	-
Display Color	16.7M	Colors	24bits

2. ABSOLUTE MAXIMUM RATINGS

Item 项目	Symbol 符号	Min. 最小值	Max. 最大值	Unit 单位	Remark 备注
Power supply1 voltage	VDD	-0.3	3.6	V	Note1
Power supply2 voltage	IOVDD	-0.3	3.6	V	
LED forward current	I _F	-0.001	30	mA	For each led,Note1
LED Reverse Voltage	V _R	-	5	V	For each led,Note1
Operating temperature	T _{op}	-20	60	°C	Note1,2
Storage temperature	T _{st}	-30	70	°C	Note1,2
Humidity	H _{st}	10	90	%RH	Note1,3

(Ta=+25°C,GND=0V)

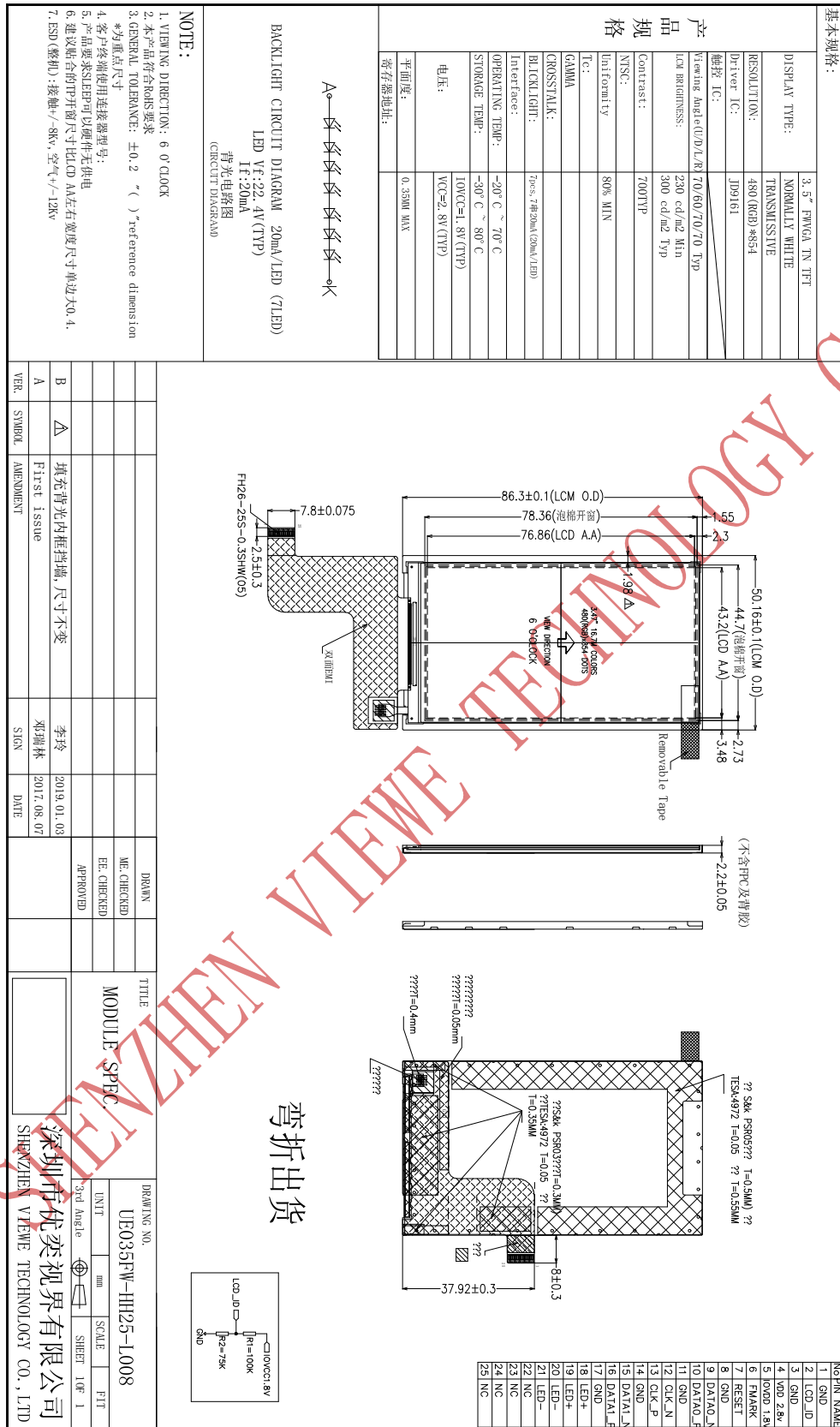
Note1: If the module exceeds the absolute maximum ratings, it may be damaged permanently. Also if the module operates with the absolute maximum ratings for a long time, the reliability may drop.

Note2: 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.

Note3: Temp. ≤ 60°C , 90% RH MAX.

Temp. > 60°C , Absolute humidity shall be less than 90% RH .

3. MECHANICAL DRAWING



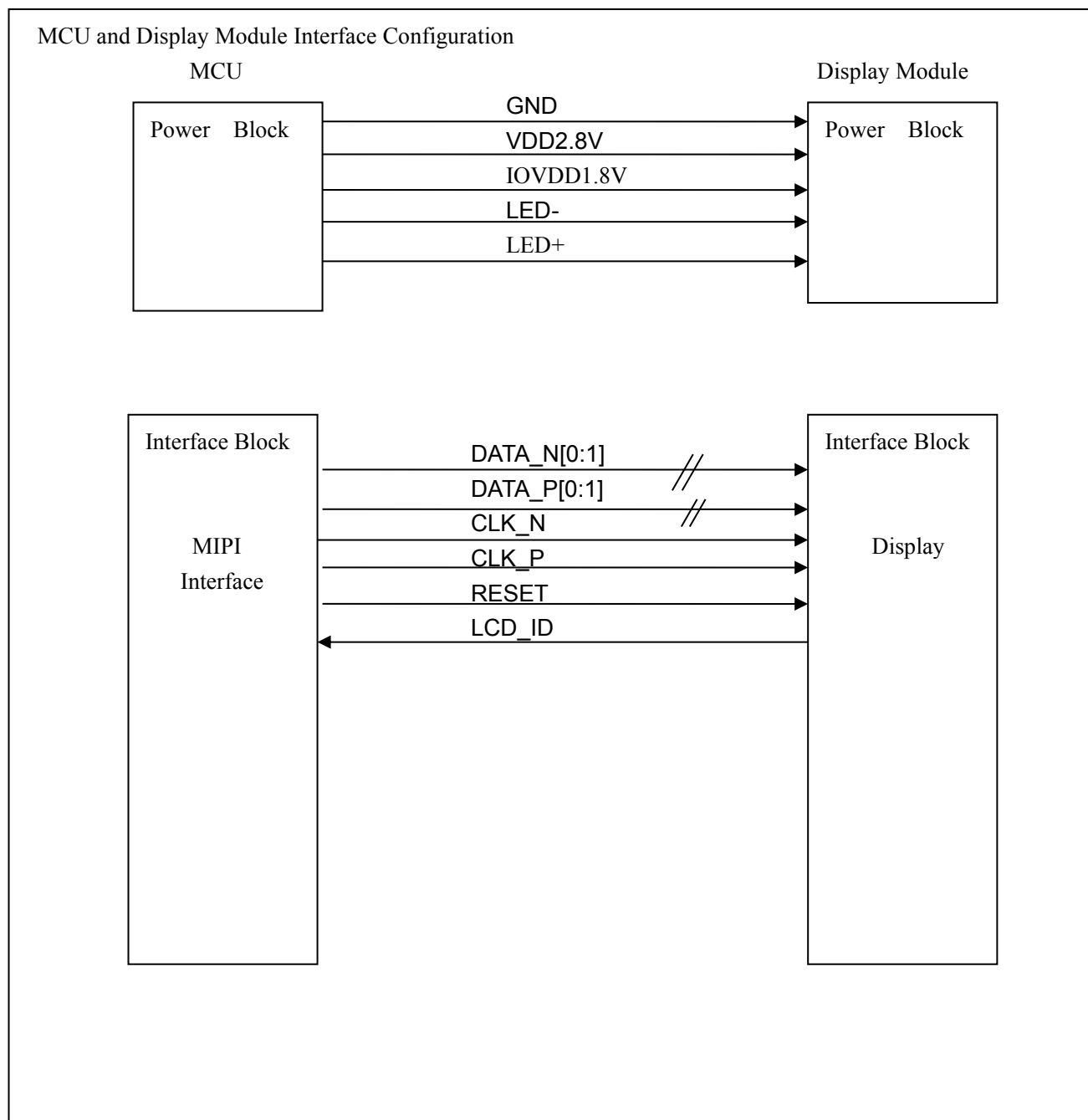
4. I/O CONNECTION & BLOCK DIAGRAM

4.1 I/O Connection

LCM Pin	Symbol	I/O	Description
1	GND	P	Power Ground
2	LCD_ID	O	ID Select
3	GND	P	Power Ground
4	VDD2.8V	P	Power supply to the internal logic power regulator(2.8V)
5	IOVDD1.8V	P	Power supply for digital circuits and IO pads1.8V
6	FMARK	O	Tearing effect output pin to synchronize MCU to frame writing
7	RESET	I	The signal will reset the LCM, Signal is active low.
8	GND	P	Power Ground
9	DATA0_N	I	DSI-D0-differential data signals for MIPI interface
10	DATA0_P	I	DSI-D0+ differential data signals for MIPI interface
11	GND	P	Power Ground
12	CLK_N	I	DSI-CLK- differential data signals for MIPI interface
13	CLK_P	I	DSI-CLK+ differential data signals for MIPI interface
14	GND	P	Power Ground
15	DATA1_N	I	DSI-D1-differential data signals for MIPI interface
16	DATA1_P	I	DSI-D1+ differential data signals for MIPI interface
17	GND	P	Power Ground
18-19	LED+	P	Power Supply for LED anode
20-21	LED-	P	Power Supply for LED cathode
22-25	NC	-	Dummy

I: Input; O: Output; P: Power

4.2 Block Diagram



5. ELECTRICAL CHARACTERISTICS

5.1 TFT-LCD Panel Driving Section

Item	Symbol	Values			Unit	Remarks
		Min.	Typ.	Max.		
Power Voltage Supply1	VDD2.8V	2.5	2.8	3.3	V	-
Power Voltage Supply2	IOVDD1.8V	1.65	1.8	3.3	V	-
Backlight Luminance	Lv	-	300	-	cd/m2	-
Backlight Forward Voltage	Vf	-	22.4	-	V	-
LED Forward Current	If	-	20	-	MA	Note

(Ta=+25°C,GND=0V)

Note1:Measurement Conditions (Video Mode): Full Screen Red Pattern,VDD=2.8V,60Hz Refresh.

Note2: $P_{LCM} = P_{VDD} + P_{BL}$, About P_{BL} information, inference to 5.2 Back Light Driving Section.

5.2 Back Light Driving Section

Item 项目	Symbol 符号	Min. 最小值	Typ. 典型值	Max. 最大值	Unit 单位	Remark 备注
Forward Voltage	V_F	-	22.4	-	V	Note1
Forward Current	I_F	-	20	-	mA	Note1
Backlight Power consumption	P_{BL}	-	0.38	-	Watt	Note1
LED life time	-	30000	-	-	Hours	Note2
LED Quantity		7			PCS	

(Ta=+25°C,GND=0V)

Note1: The LED driving condition is defined for each LED module (6 LED Serial, 1 LED Parallel)。

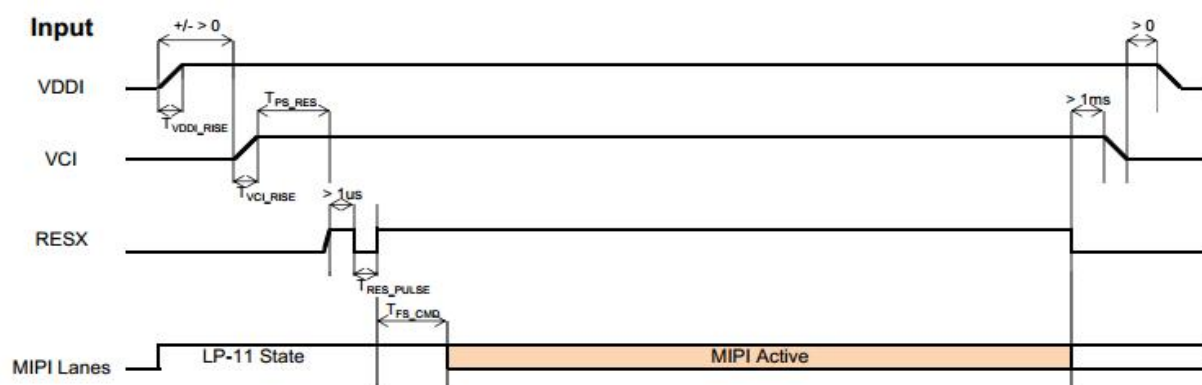
For each LED : $I_F=20mA$, $V_F=3.2V$ (Typ.), $T_a=25^\circ C$ 。

Note2:The “LED life time” is defined as the module brightness decrease to 50% of original brightness at $I_{LED}=20mA$ (Per Led). The LED life time could be decreased if operating I_{LED} is larger than 20mA.



5.3 Power On/Off Sequence

5.3.1 Power On Sequence



Symbol	Characteristics	Min.	Typ.	Max.	Units
T_{VDDI_RISE}	VDDI Rise time	20	-	-	us
T_{VCI_RISE}	Case A: VCI Rise time	200	-	-	us
	Case B: VCI Rise time	40			
T_{PS_RES}	VDDI/VCI on to Reset high	5	-	-	ms
T_{RES_PULSE}	Reset low pulse time	10	-	-	us
T_{FS_CMD}	Reset to first command	10	-	-	ms

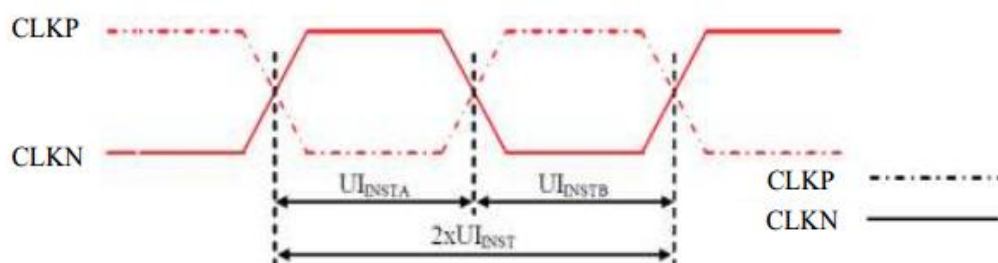
5.3.2 Power Off Sequence

The uncontrolled power off means a situation when a battery is removed without the controlled power off sequence. There will not be any damages for the display module, or the display module will not cause any damages for the host or lines of the interface. At an uncontrolled power off event, the ILI9881C-0D will force the display to become blank and will not have any abnormal visible effects within 1 second on the display and remains blank until the Power On Sequence powers it up.

5.4 Timing Characteristics

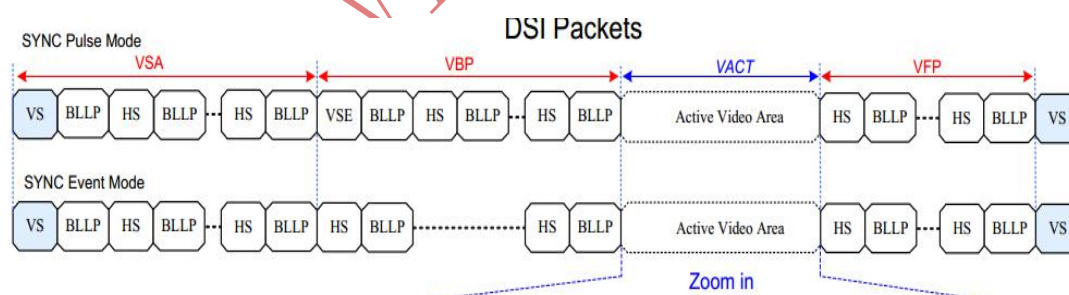
5.4.1 AC Characteristics

Signal	Symbol	Parameter	Min	Max	Unit
CLKP/N	$2xU_{INST}$	Double UI instantaneous	Note 2	25	ns
CLKP/N	U_{INSTA}, U_{INSTB} (Note 1)	UI instantaneous Half	Note 2	12.5	ns

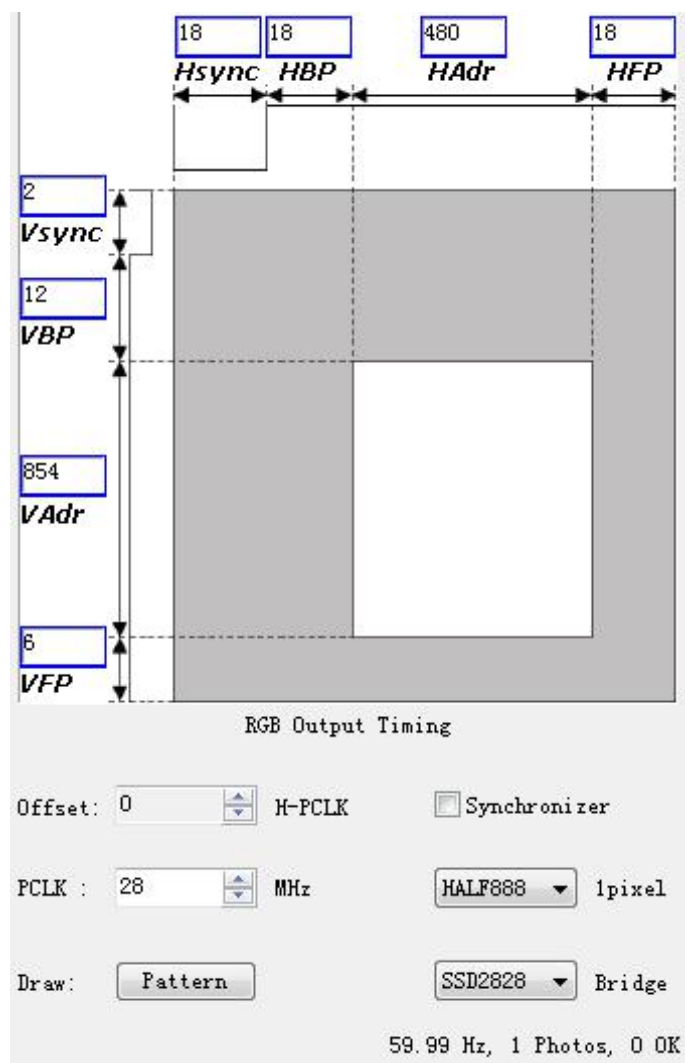


5.5 Timing Diagram

5.5.1 Horizontal Timings



5.5.2 Vertical Timings



5.5.3 Timing Parameters

Parameter	Symbol	Value			Unit
		Min.	Typ.	MAX.	
Bit rate per lane	BRPHY	80	-	1000	Mbps
Active pixel per line	HACT	-	480	-	Pixels
Horizontal back porch	tHBP	-	18	-	DCLK
Horizontal sync active	tHSA	-	18	-	DCLK
Horizontal front porch	tHFP	-	18	-	DCLK
Active pixel per frame	VACT	-	854	-	H
Vertical back porch	tVBP	-	12	-	H
Vertical sync active	tVSA	-	2	-	H
Vertical front porch	tVFP	-	6	-	H

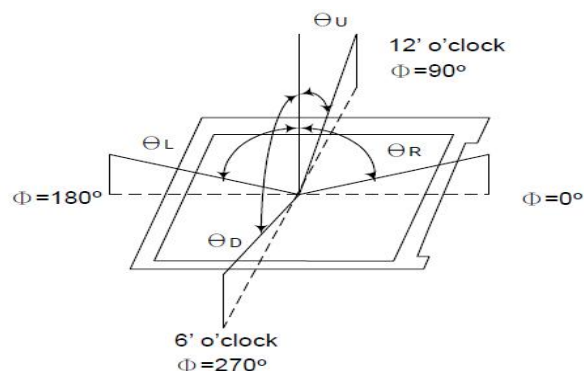
6. OPTICAL CHARACTERISTICS

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast Ratio (Center point)		C/R	-	400	500	-	-	Note(1)
Luminance uniformity		U_w	$\theta = 0$. Normal viewing angle B/L On Note(1)	80	-	-	%	Note(2)
Response Time		$T_r + T_f$		-	20	30	ms	Note(3)
Color Chromaticity (CIE 1931)	White	W_x			0.2868			Note(5)
		W_y			0.3253			
	Red	R_x			0.6248			
		R_y			0.3153			
	Green	G_x		-0.02	0.3252	+0.02		
		G_y			0.6257			
	Blue	B_x			0.1339			
		B_y			0.0934			
Viewing Angle	Hor.	$\phi 3R$	$C/R \geq 10$		70	-	Deg	Note(4)
		$\phi 9L$			70	-		
	Ver.	$\phi 12U$			70	-		
		$\phi 6D$		-	60	-		

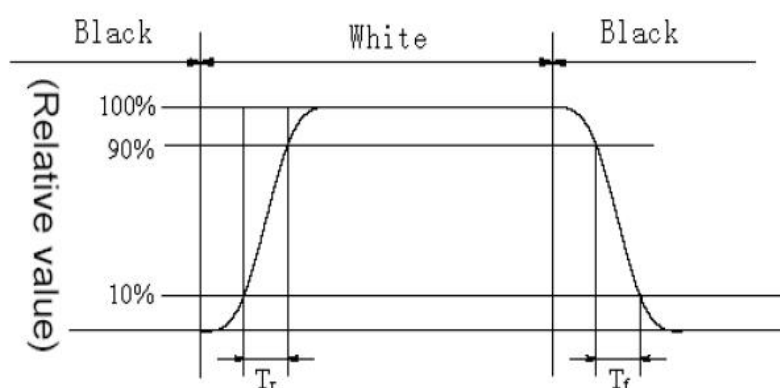
Test Conditions:

1. VDD=2.8V, $I_F=40mA$ (Backlight current), the ambient temperature is +25°C.
2. The test systems refer to Note 8.

Note1: Definition of Viewing Angle: The viewing angle range that the $CR > 10$

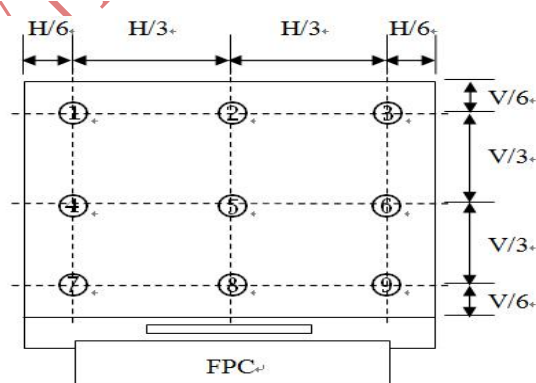


Note2: Definition of Response time: Sum of T_R and T_F



Note 3: Definition of Luminance Uniformity: Active area is divided into 9 measuring areas, every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity} = \frac{\text{Min Luminance of white among 9-points}}{\text{Max Luminance of white among 9-points}} \times 100\%$$



Note4: Definition of Contrast Ratio (CR): measured at the center point of panel

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

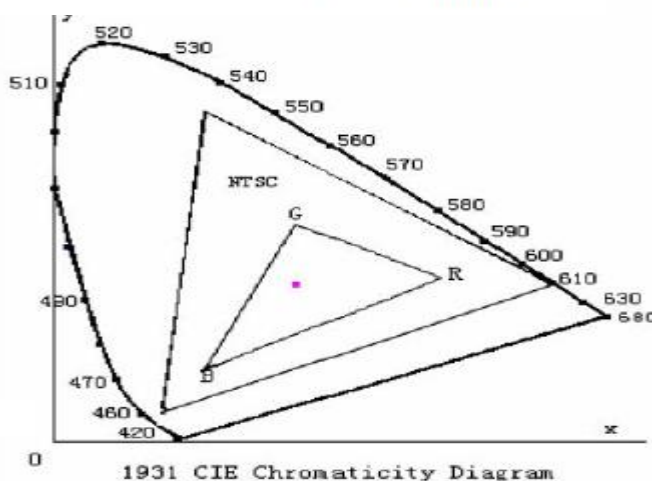
Note 5: Definition of Luminance: Center Luminance of white is defined as luminance values of 1 point average across the LCD surface.

Note 6: Definition of Color Chromaticity (CIE 1931)

Color coordinates of white & red, green, blue measured at center point of LCD.

Note 7: Definition of NTSC ratio:

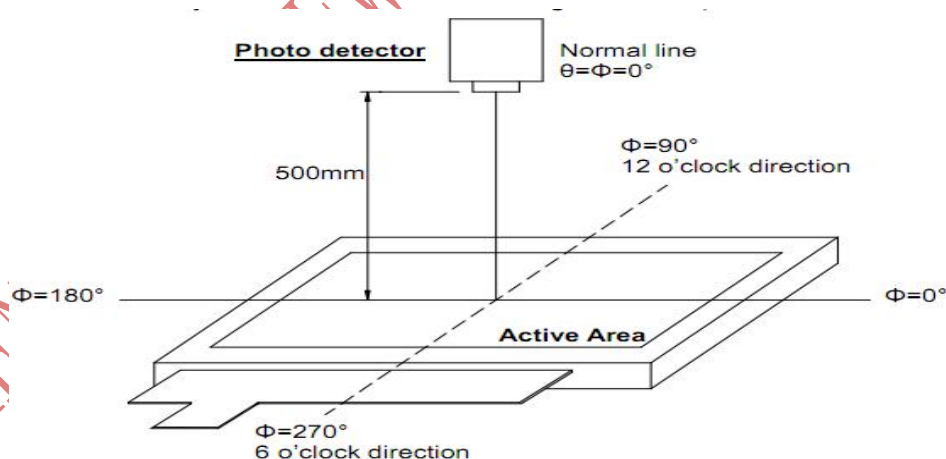
$$\text{NTSC ratio} = \frac{\text{Area of RGB triangle}}{\text{Area of NTSC triangle}}$$



Note 8: Definition of measurement system.

optical

The optical characteristics should be measured in dark room. After 5 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, Field of view: 1°/Height: 500mm.)



7. RELIABILITY

Item 项目	Test Condition 测试条件	Remark 备注
High Temperature Storage	Ta =+70°C / 96Hours	Note1,2,3
Low Temperature Storage	Ta =-30°C / 96Hours	Note1,2,3
High Temperature Operating	Ta =+60°C / 96Hours	Note1,2,3
Low Temperature Operating	Ta =-20°C / 96Hours	Note1,2,3
Temperature Cycle storage Test	-20°C/30min ↔+70°C /30min for 30cycles, Transfer time less than 5min	Note2,3
Thermal humidity storage Test	60°C x 90%RH / 96Hours	Note2,3
Package Vibration Test	Frequency: 10Hz~55Hz, Amplitude: 1.5mm, 1 hrs for each direction of X, Y, Z	Note2
Packing shock test	Drop to the ground from 60cm height, 1 corner, 3 edges, 6 surfaces.	Note2

Inspection after Test:

Note1: Ta is the ambient temperature of samples.

Note 2: 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 3: Before cosmetic and function tests, the product must have enough recovery time, at least 2 hours at room temperature.

8. PACKAGE DRAWING

