

LCD MODULE
SPECIFICATION

Model:	UE101WS-RB30-L005
Version:	V2.0
Date:	20180609

☐ 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

[illegible]

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1. GENERAL INFORMATION

1.1 Features

- 1) Pixel Arrangement: RGB Vertical Stripe
- 2) Interface Mode: MIPI
- 3) Driver IC: EK79007AD(Source) /EK73217BCGA(Gate)
- 4) Operation Temperature: -10~50°C
- 5) Storage Temperature: -20~60°C
- 6) Backlight Type: White LED
- 7) Display mode: Normally White,
- 8) Pixel Density: 117 PPI
- 9) LED life time: 30,000 Hours

1.2 Mechanical Specification

Item 项目	Specification 规格	Unit 单位	Remark 备注
Pixel Driving element	A-Si TFT	-	-
Screen Size	10.1/TN	Inch	Diagonal
Resolution	1024(W)*3(RGB)*600(H)	Dots	30PIN
Interface	MIPI	-	4lane
Module Power Consumption	1.716	Watt	Typ.
Active Area	222.72(W)*125.28(H)	mm	-
Pixel pitch (W*H)	0.2175(W)*0.2088(H)	mm	-
Module Size (W*H*D)	235(W)*143(H)*2.8(D)	mm	Tolerance: ±0.2
Luminance	400	cd/m ²	Typ.
Viewing Direction	6	O'clock	Gray inversion
Display Color	262K	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	-0.5	2	V	Note1
Power supply2 voltage	AVDD	-0.5	15	V	Note1
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}	-10	50	°C	Note1,2
Storage temperature	T _{st}	-20	60	°C	Note1,2
Humidity	H _{st}	10	90	%RH	Note1,3

(Ta=+25°C,GND=0V)

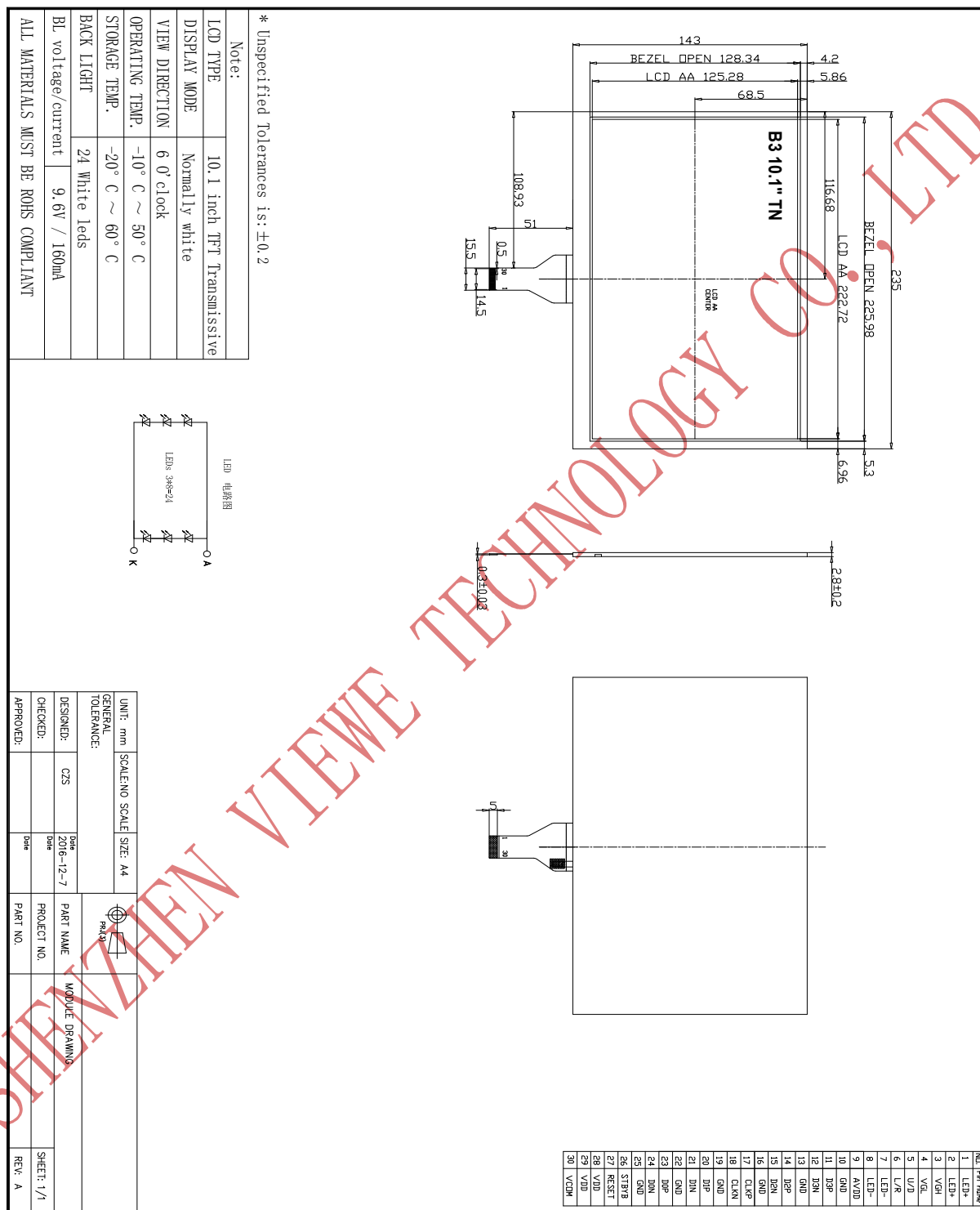
Note1:If the module exceeds the absolute maximum ratings, it may be damaged permanently. Also if the module operates with the absolute maximum ratings for a long time, the reliability may drop.

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 at 60°C.

3. MECHANICAL DRAWING



4. I/O CONNECTION & BLOCK DIAGRAM

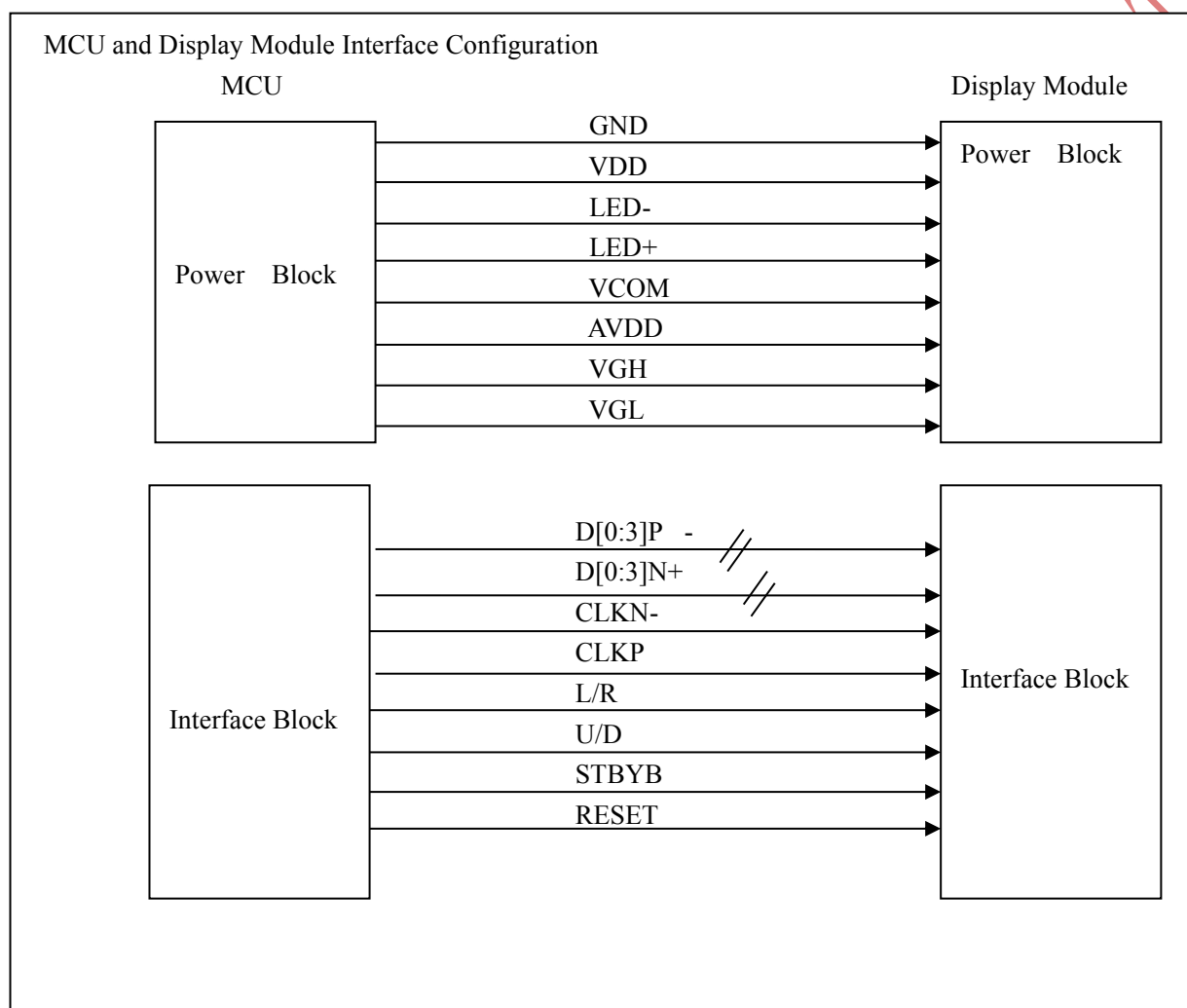
4.1 I/O Connection

Pin No. 序号	Symbol 符号	I/O	Description 描述
1-2	LED+	P	Power for Backlight Anode
3	VGH	P	TFT Gate On Voltage
4	VGL	P	TFT Gate Off Voltage
5	U/D	I	Vertical inversion
6	L/R	I	Horizontal inversion
7-8	LED-	P	Power for Back light Cathode
9	AVDD	P	Power for Analog Circuits
10	GND	P	Power Ground
11	D3P	I	MIPI differential data input
12	D3N	I	MIPI differential data input
13	GND	P	Power Ground
14	D2P	I	MIPI differential data input
15	D2N	I	MIPI differential data input
16	GND	P	Power Ground
17	CLKP	I	MIPI differential clock
18	CLKN	I	MIPI differential clock
19	GND	P	Power Ground
20	D1P	I	MIPI differential data
21	D1N	I	MIPI differential data
22	GND	P	Power Ground
23	D0P	I/O	MIPI differential data
24	D0N	I/O	MIPI differential data
25	GND	P	Power Ground
26	STBYB	I	Standby mode. Normally pulled high
27	RESET	I	Global reset pin

28-29	VDD	P	A power supply for digital circuits and IO pads(1.8V)
30	VCOM	P	LCD Common Voltage

I: Input; O: Output; P: Power

4.2 Block Diagram



5. ELECTRICAL CHARACTERISTICS

5.1 TFT-LCD Panel 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
Power Supply1 Voltage	VDD	1.6	1.8	2.2	V	-
Power Supply2 Voltage	AVDD	-	9.6	-	V	-
Power Supply3 Voltage	VGH	-	18	-	V	-
Power Supply4 Voltage	VGL	-	-6	-	V	-
Power Supply5 Voltage	VCOM	-	4	-	V	Note3
Power Supply Current	IVDD	-	100	-	mA	Note1
Logic Input High Voltage	V _{IH}	0.7VDD	-	VDD	V	-
Logic Input Low Voltage	V _{IL}	0	-	0.3VDD	V	-
Panel Power Consumption	P _{VDD}	-	0.18	-	Watt	Note1
Module Power Consumption	P _{LCM}	-	1.716	-	Watt	Note1,2

(Ta=+25°C,GND=0V)

Note1: Measurement Conditions (Video Mode): Full Screen Red Pattern, VDD=1.8V, 60Hz Refresh.

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

Note3: VCOM values reference only, must be adjusted to optimize display quality

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	-	9.6	-	V	Note1
Forward Current	I _F	-	160	-	mA	Note1
Backlight Power consumption	P _{BL}	-	1.536	-	Watt	Note1
LED life time	-	30000	-	-	Hours	Note2
LED Quantity			24		PCS	

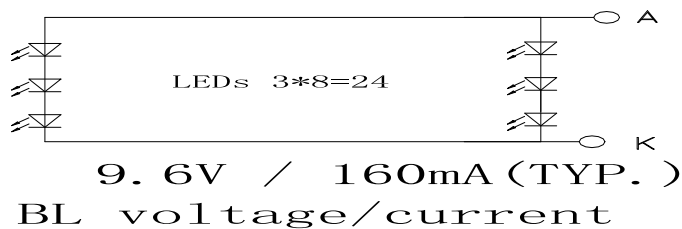
(Ta=+25°C,GND=0V)

Note1: The LED driving condition is defined for each LED module (3 LED Serial, 8 LED Parallel).

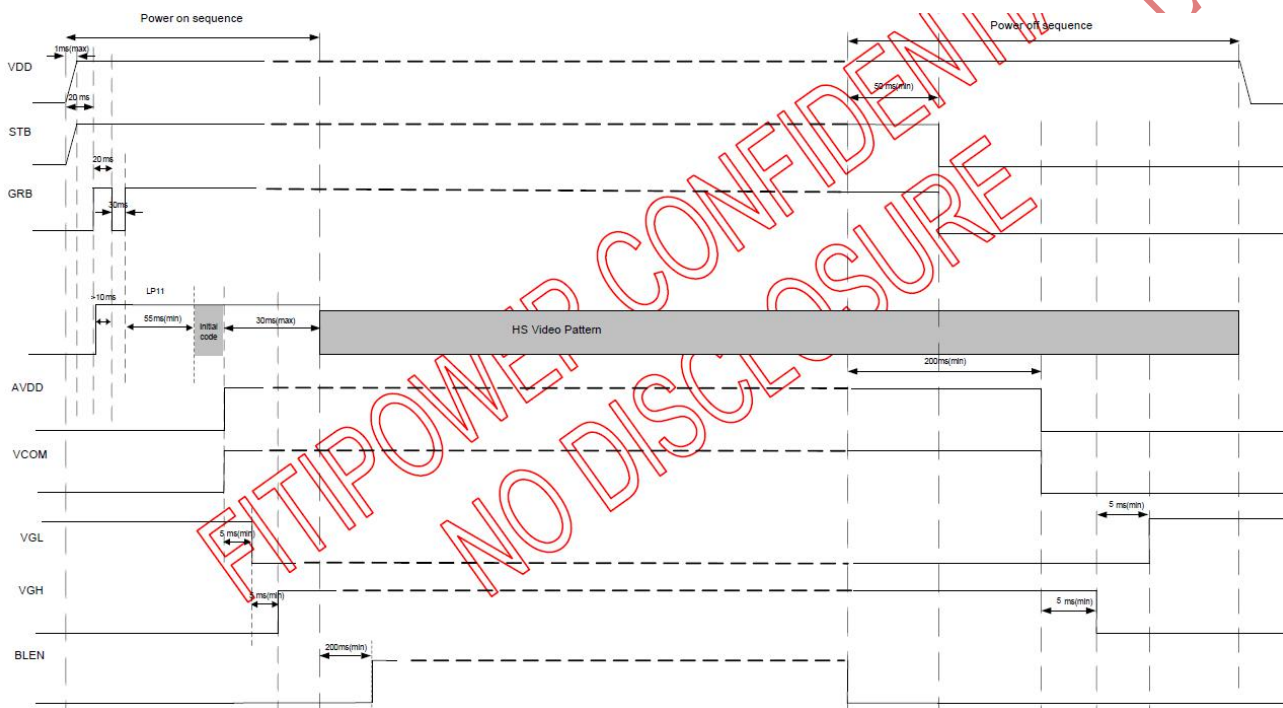
For each LED : I_F=20mA, V_F=3.2V(Typ.), Ta=25°C。

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.

LED 电路图



5.3 Power On/Off Sequence

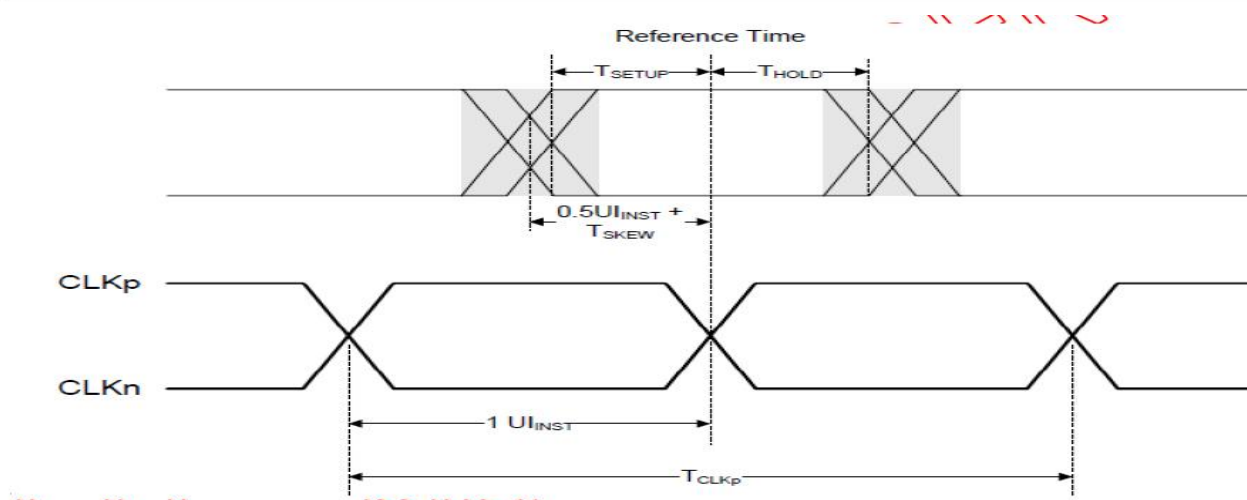


5.4 Timing Characteristics

5.4.1 AC Characteristics

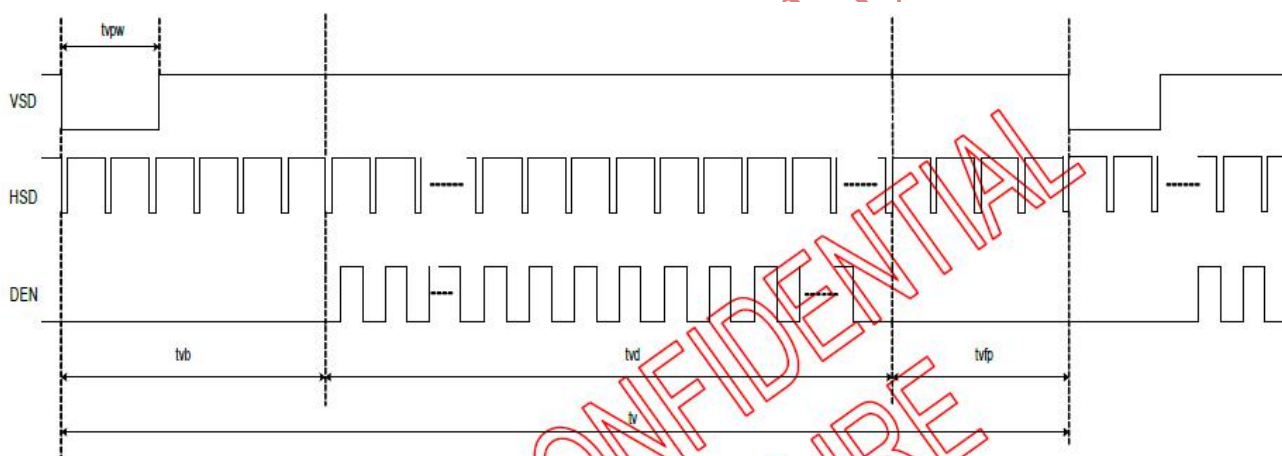
Parameter	Symbol	Min	Typ	Max	Units
UI instantaneous	U _{INST}	2	-	12.5	ns
Data to Clock Skew(measured at transmitter)	T _{SKW(TX)}	-0.15	-	0.15	U _{INST}
Data to Clock Setup time(measured at receiver)	T _{SETUP(RX)}	0.15	-	-	U _{INST}
Data to Clock Hold time(measured at receiver)	T _{HOLD(RX)}	0.15	-	-	U _{INST}
20%~80% rise time and fall time	T _R , T _F	150	-	0.3	ps
		-	-	-	U _{INST}

(Ta=+25°C,GND=0V)



5.5 Timing Diagram

5.5.1 Data input format



5.5.2 Timing Parameters

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK frequency @Frame rate=60hz	fclk	40.8	51.2	67.2	Mhz
Horizontal display area	thd	1024			DCLK
HSYNC period time	th	1114	1344	1400	DCLK
HSYNC blanking	thb+thfp	90	320	376	DCLK
Vertical display area	Tvd	600			H
VSYNC period time	Tv	610	635	800	H
VSYNC blanking	Tvb+Tvfp	10	35	200	H

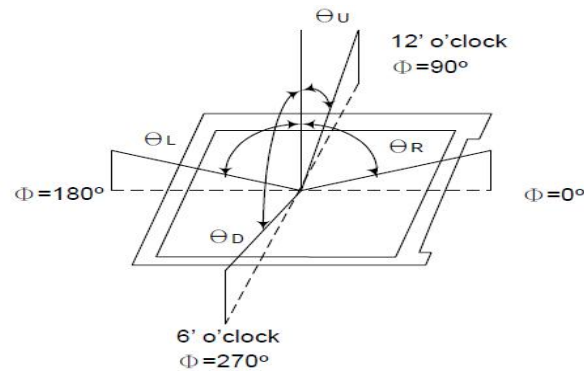
6. OPTICAL CHARACTERISTICS

Parameter 参数	Symbol 符号	Condition 条件	Min. 最小值	Typ. 典型值	Max. 最大值	Unit 单位	Remark 备注
Contrast Ratio	C/R	$\theta = 0^\circ$	500	600	-	-	Note(4)
NTSC Ratio	S	$\theta = 0^\circ$	-	50	-	%	Note(7)
Luminance	L	$\theta = 0^\circ$	-	400	-	cd/m ²	Note(5)
Luminance uniformity	U _W	$\theta = 0^\circ$	70	80	-	%	Note(3)
Response Time	T _R + T _F	25 °C	-	25	40	ms	Note(2)
Color Coordination	W _X	$\theta = 0^\circ$ (Center) Normal viewing angle B/L On	-0.03	0.298	+0.03	NTSC (x,y)	Note(6)
	W _Y			0.331			
	R _X			0.605			
	R _Y			0.327			
	G _X			0.297			
	G _Y			0.563			
	B _X			0.144			
	B _Y			0.169			
Viewing Angle	θ_L	C/R>10	-	80	-	Degree	Note(1)
	θ_R		-	80	-		
	θ_U		-	70	-		
	θ_D		-	60	-		

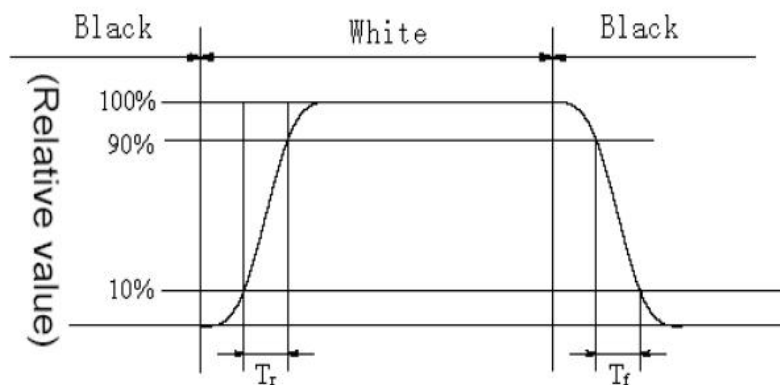
Test Conditions:

1. VDD=1.8V, 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

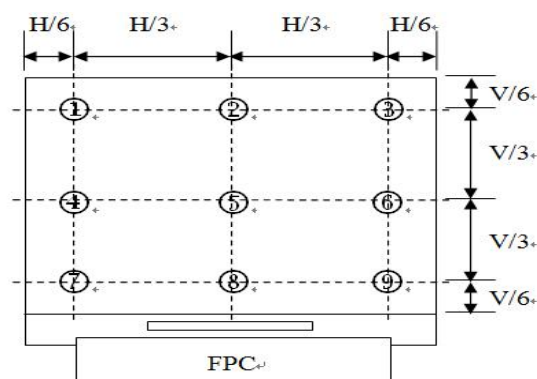


Note2: Definition of Response time: Sum of T_R and T_F



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

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

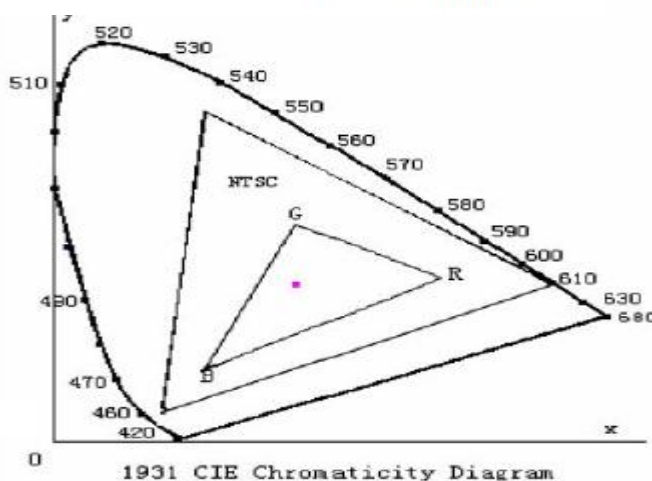
Note 5: Definition of Luminance: Center Luminance of white is defined as luminance values of 1 point average across the LCD surface.

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:

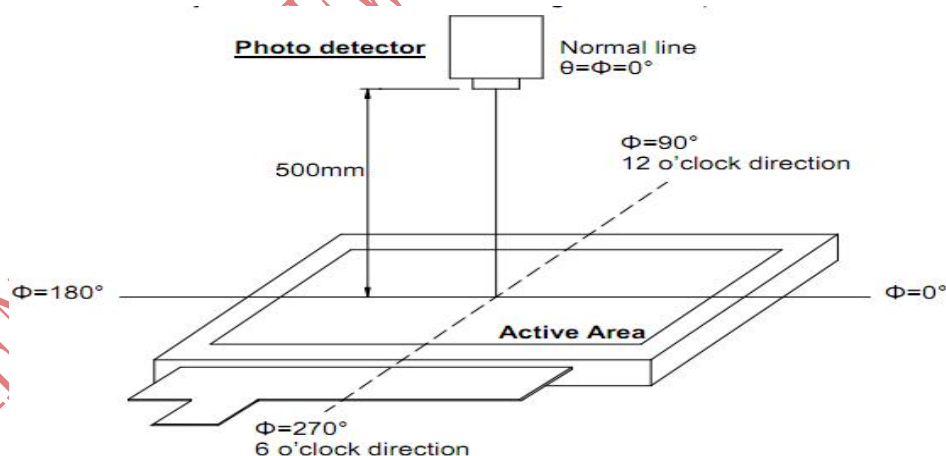
$$\text{NTSC ratio} = \frac{\text{Area of RGB triangle}}{\text{Area of NTSC triangle}}$$



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 =+60°C / 240Hours	Note1,2,3
Low Temperature Storage	Ta =-20°C / 240Hours	Note1,2,3
High Temperature Operating	Ta =+50°C / 240Hours	Note1,2,3
Low Temperature Operating	Ta =-10°C / 240Hours	Note1,2,3
Temperature Cycle storage Test	-20°C/30min ↔ +60°C /30min for 30cycles, Transfer time less than 5min	Note2,3
Thermal humidity storage Test	60°C x 90%RH / 240Hours	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

LCM产品(刀卡类)包装流程图

1. 0包装材料清单:

见受控BOM

2. 0包装方法说明:

