

LCD MODULE
SPECIFICATION

Model:	UE101WX-RB40-A013-B
Version:	V1.0
Date:	20180629

☒ **Preliminary Specification** 样品规格书

☐ **Final Specification** 量产规格书

Customer Confirmation 客户确认

Approved by	Notes

Please return one of the copies of the specification with your signature to us within two weeks after you receive this document. If it is not returned, we will assume that you agree to the entire contents of this specification document.

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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	2018.06.29	Preliminary release	

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1. GENERAL INFORMATION

1.1 Features

- 1) Pixel Arrangement: RGB Vertical Stripe
- 2) Interface Mode: MIPI
- 3) Driver IC: JD9365AA
- 4) Operation Temperature: -20~60℃
- 5) Storage Temperature: -30~70℃
- 6) Backlight Type: White LED
- 7) Display mode: Normally Black
- 8) Pixel Density: 149PPI
- 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	Inch	Diagonal
Resolution	800(W)*3(RGB)*1280(H)	Dots	-
Interface	MIPI	-	4lane
Module Power Consumption	2.102	Watt	Typ.
Active Area	136.36(W)*217.58(H)	mm	-
Pixel pitch (W*H)	0.1692(W)*0.1692(H)	mm	-
CTP_Module Size (W*H*D)	165.4(W)*246.8(H)*4.67(D)	mm	-
Luminance	320	cd/m ²	Typ.
Viewing Direction	ALL	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	4.6	V	Note1
Power supply2 voltage	AVDD	-0.3	6.6	V	Note1
Power supply3 voltage	AVEE	-6.6	0.3	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}	-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 at 60°C.

3. MECHANICAL DRAWING

[illegible]

4. I/O CONNECTION & BLOCK DIAGRAM

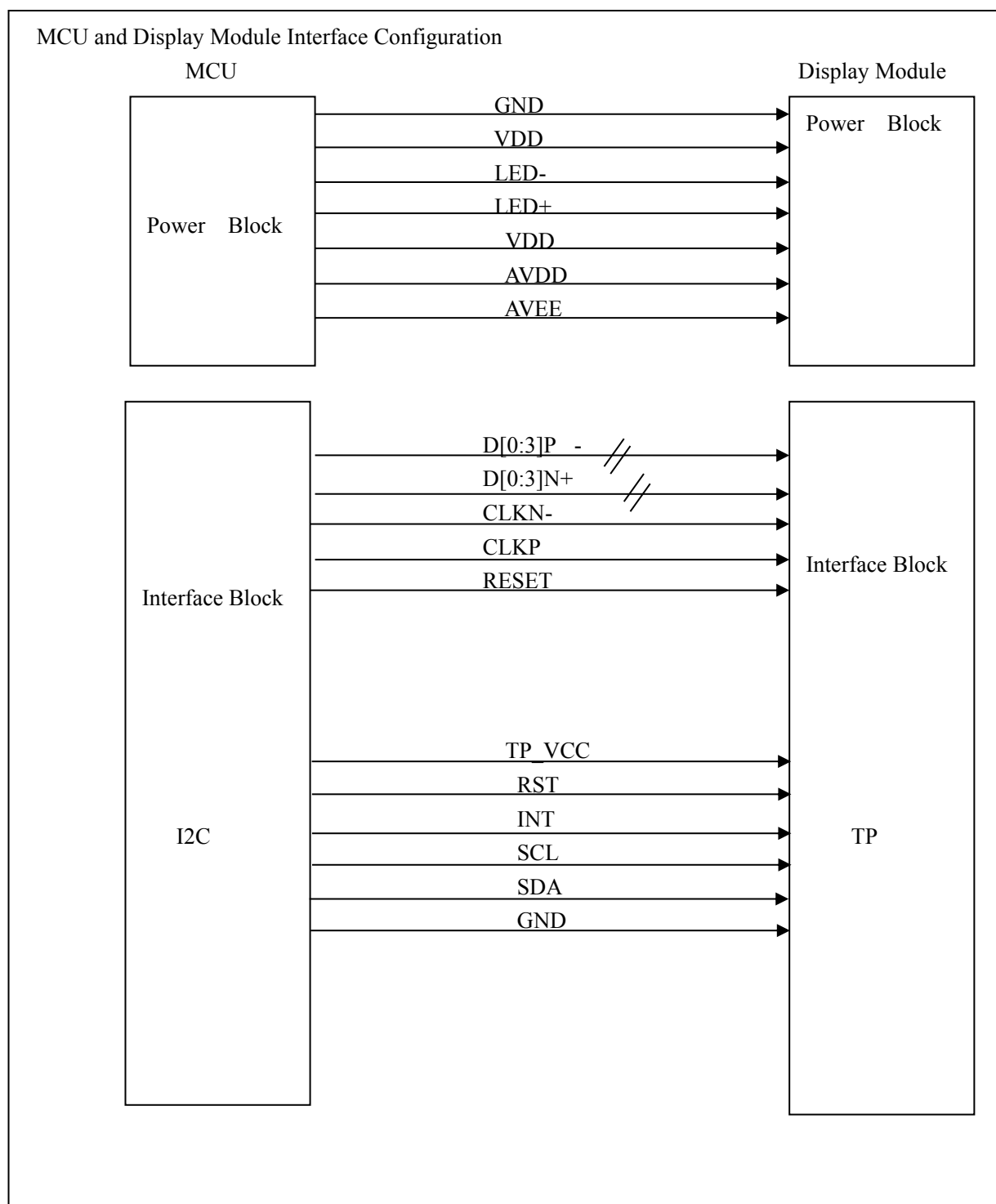
4.1 I/O Connection

Pin	Symbol	I/O	Description
1	Vcom(NC)	/	DUMMY
2~3	VDD	I	Power supply for digital circuits and IO pads(1.8V)
4	GND	P	Power Ground
5	RESET	I	Chip reset singal
6	NC	/	DUMMY
7	GND	P	Power Ground
8	MIPI TDN0	I	DSI-D0- differential data signals for MIPI interface
9	MIPI TDP	I	DSI-D0+ differential data signals for MIPI interface
10	GND	P	Power Ground
11	MIPI TDN1	I	DSI-D1- differential data signals for MIPI interface
12	MIPI TDP	I	DSI-D1+ differential data signals for MIPI interface
13	GND	P	Power Ground
14	MIPI TCN	I	DSI-CLK- differential clock signals for MIPI interface
15	MIPI TCP	I	DSI-CLK+ differential clock signals for MIPI interface
16	GND	P	Power Ground
17	MIPI TDN2	I	DSI-D2- differential data signals for MIPI interface
18	MIPI TDP	I	DSI-D2+ differential data signals for MIPI interface
19	GND	P	Power Ground
20	MIPI TDN3	I	DSI-D3- differential data signals for MIPI interface
21	MIPI TDP3	I	DSI-D3+ differential data signals for MIPI interface
22	GND	P	Power Ground
23~24	NC	/	DUMMY
25	GND	P	Power Ground
26~28	NC	/	DUMMY
29	VCL(NC)	/	DUMMY
30	GND	P	Power Ground
31~32	LED-	P	Power supply for LED-
33~34	NC	/	DUMMY
35	AVEE	P	Negative Voltage for source driver
36~37	NC	/	DUMMY
38	AVDD	P	Positive Voltage for source driver
39~40	LED+	P	Power supply for LED+

Pin No.	Symbol	I/O	Description
1	VCC		Power supply.
2	RST		Global reset for TP, active is lo
3	INT		Interrupt output Pin.
4	SCL		I2C Serial Clock
5	SDA		I2C Serial Data Input or Output
6	GND		Power Ground.

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	1.65	1.8	3.6	V	-
Power Supply2 Voltage	AVDD	4.5	5	6.3	V	-
Power Supply3 Voltage	AVEE	-4.5	-5	-6.3	V	-
Power Supply4 Voltage	TP_VCC	2.8	3.3	3.6	V	-
Power Supply Current	IVDD	-	80	-	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}	-	0.054	-	Watt	Note1
Module Power Consumption	P _{LCM}	-	2.102	-	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

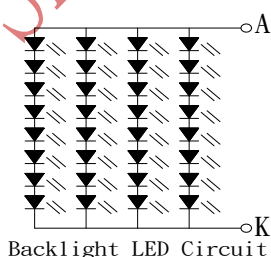
Item 项目	Symbol 符号	Min. 最小值	Typ. 典型值	Max. 最大值	Unit 单位	Remark 备注
Forward Voltage	V _F	-	25.6	-	V	Note1
Forward Current	I _F	-	80	-	mA	Note1
Backlight Power consumption	P _{BL}	-	2.048	-	Watt	Note1
LED life time	-	30000	-	-	Hours	Note2
LED Quantity		32			PCS	

(Ta=+25°C,GND=0V)

Note1: The LED driving condition is defined for each LED module (4LED Serial, 8 LED Parallel).

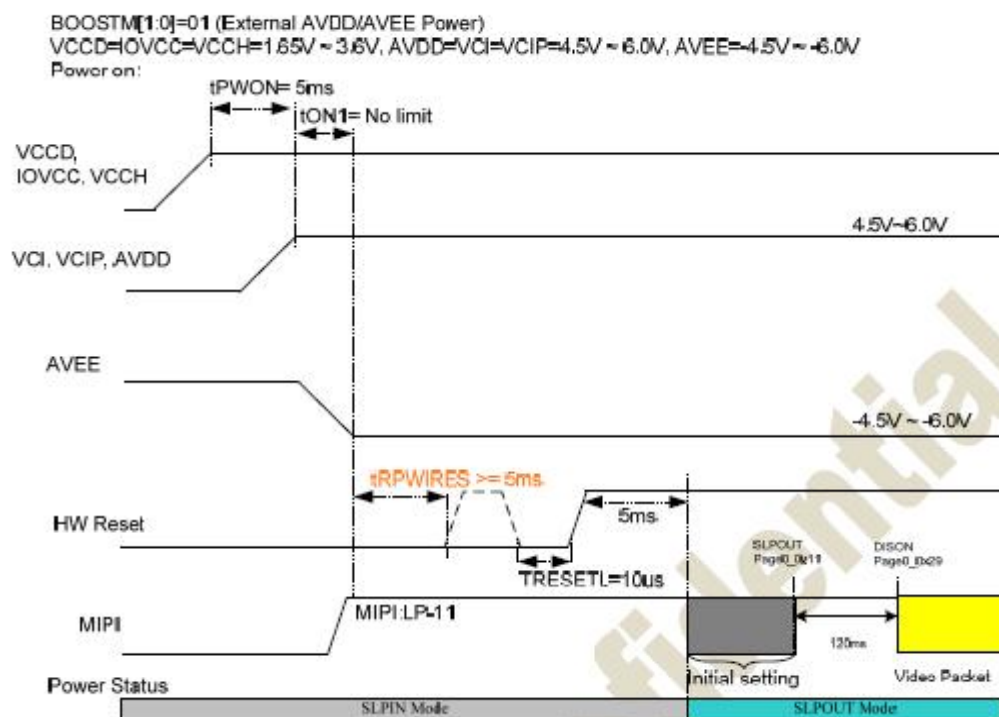
For each LED : $I_F=20mA$, $V_F=3.2V$ (Typ.), $T_a=25^\circ C$.

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.

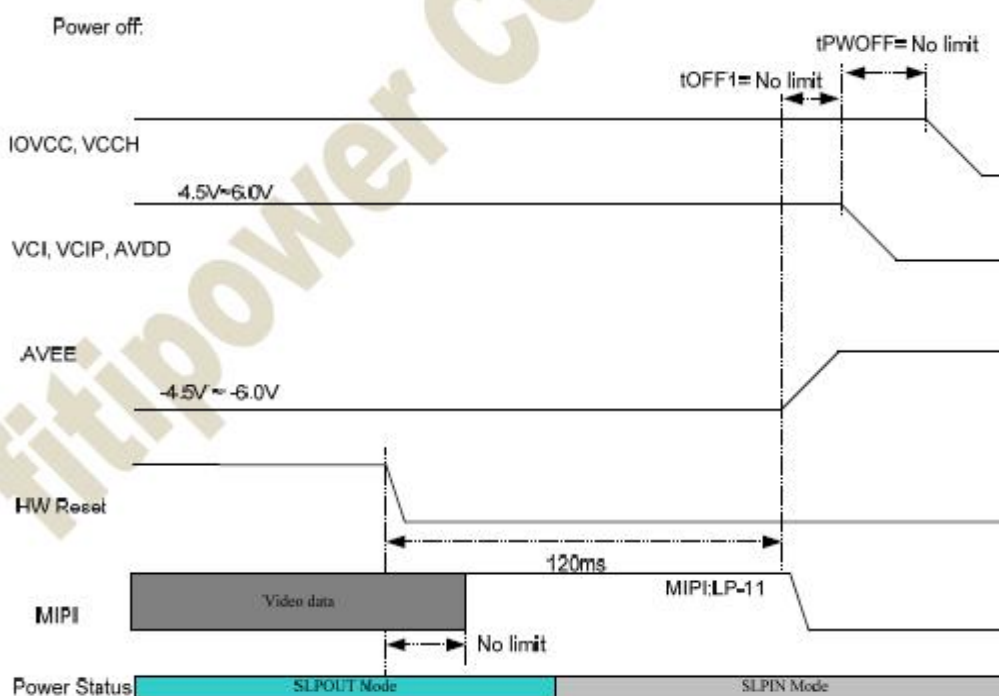


LED $V_f: 25.6V$ (TYP), $I_f: 80mA$
 背光电路图
 (CIRCUIT DIAGRAM)

5.3 Power On/Off Sequence

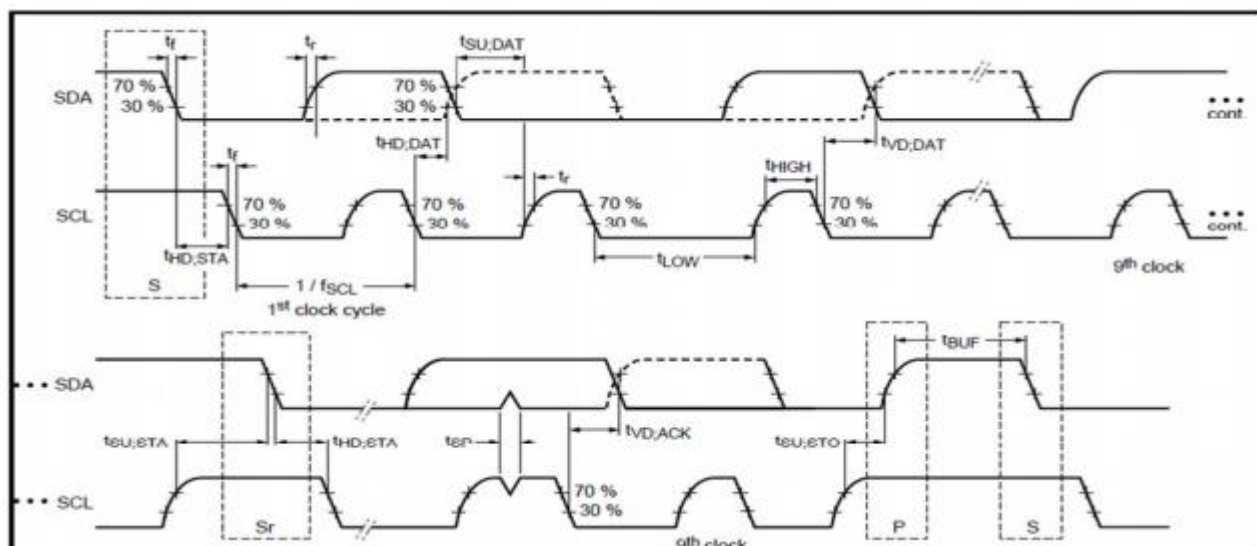


Note: t_{ON1} : The space time between VCI/VCIP/AVDD Power On and AVEE Power On.



5.4 Timing Characteristics

5.4.0 TPAC Characteristics

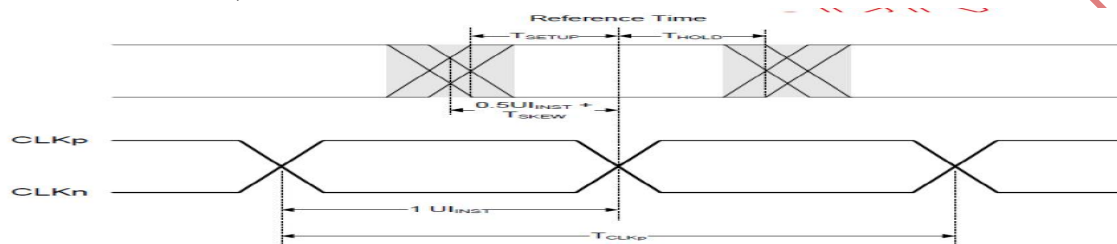


Parameter	Symbol	Standard-mode		Fast-mode		Unit
		Min	Max	Min	Max	
SCL clock frequency	f_{SCL}	0	100	0	400	kHz
Hold time START condition	$t_{HD,STA}$	4.0	-	0.6	-	us
LOW period of the SCL clock	t_{LOW}	4.7	-	1.3	-	us
HIGH period of the SCL clock	t_{HIGH}	4.0	-	0.6	-	us
Set-up time for a repeated START condition	$t_{SU,STA}$	4.7	-	0.6	-	us
Data hold time	$t_{HD,DAT}$	300	-	300	-	ns
Data set-up time	$t_{SU,DAT}$	250	-	100	-	ns
Rise time of both SDA and SCL signals (30% to 70%)	t_r	-	1000	20	300	ns
Fall time of both SDA and SCL signals (70% to 30%)	t_f	-	300	20	300	ns
Set-up time for STOP condition	$t_{SU,STO}$	4.0	-	0.6	-	us
Bus free time between a STOP and START condition	t_{BUF}	4.7	-	1.3	-	us
Capacitive load for each bus line	C_b	-	400	-	400	pF
Noise margin at the LOW level for each connected device	V_{nL}	$0.1V_{DD}$	-	$0.1V_{DD}$	-	V
Noise margin at the HIGH level for each connected device	V_{nH}	$0.2V_{DD}$	-	$0.2V_{DD}$	-	V

5.4.1 AC Characteristics

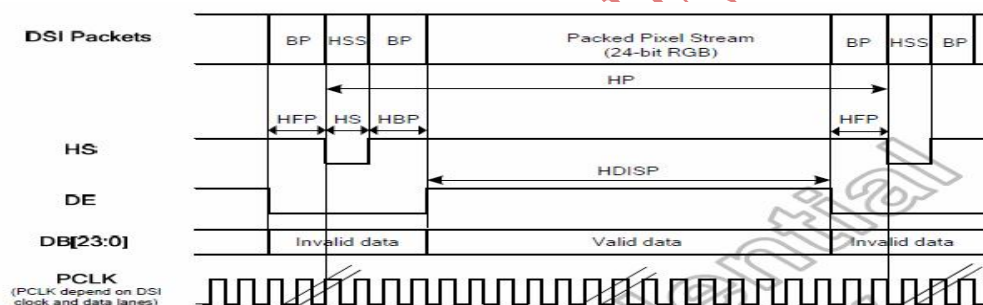
Parameter	Symbol	Min	Typ	Max	Units
UI instantaneous	U_{INST}	2	-	12.5	ns
Data to Clock Skew(measured at transmitter)	$T_{SKEW(TX)}$	-0.15	-	0.15	U_{INST}
Data to Clock Setup time(measured at receiver)	$T_{SETUP(RX)}$	0.15	-	-	U_{INST}
Data to Clock Hold time(measured at receiver)	$T_{HOLD(RX)}$	0.15	-	-	U_{INST}
20%~80% rise time and fall time	T_R, T_F	150	-	0.3	ps
		-	-	-	U_{INST}

($T_a=+25^{\circ}\text{C}$, $GND=0\text{V}$)

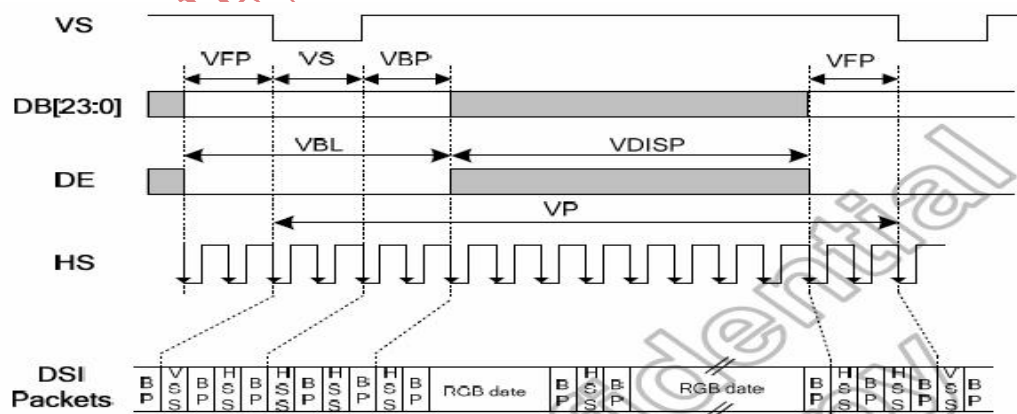


5.5 Timing Diagram

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	-	720	-	Pixels
Horizontal back porch	tHBP	5	-	-	DCLK
Horizontal sync active	tHSA	5	-	-	DCLK
Horizontal front porch	tHFP	5	-	-	DCLK
Active pixel per frame	VACT	-	1280	-	H
Vertical back porch	tVBP	2	-	-	H
Vertical sync active	tVSA	2	-	-	H
Vertical front porch	tVFP	2	-	-	H

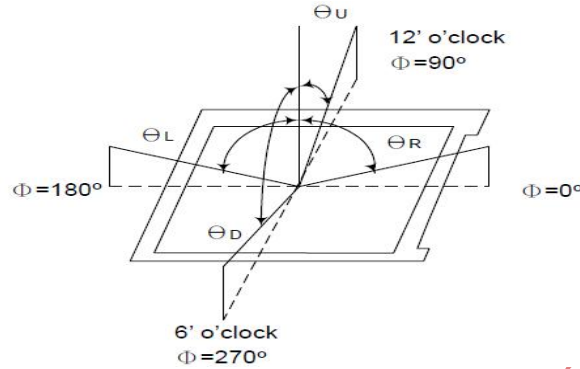
6. OPTICAL CHARACTERISTICS

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	$\theta = 0^\circ$	800	1000	-	-	Note(4)
NTSC Ratio	S	$\theta = 0^\circ$	50		-	%	Note(7)
Luminance	L	$\theta = 0^\circ$	-	300	-	cd/m ²	Note(5)
Luminance uniformity	U _w	$\theta = 0^\circ$	75	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	0.304	+0.03	NTSC (x,y)	Note(6)
	W _y			0.32			
	R _x			0.618			
	R _y			0.368			
	G _x			0.325			
	G _y			0.603			
	B _x			0.158			
	B _y			0.096			
Viewing Angle	θ_L	C/R>10	-	80	-	Degree	Note(1)
	θ_R		-	80	-		
	θ_U		-	80	-		
	θ_D		-	80	-		

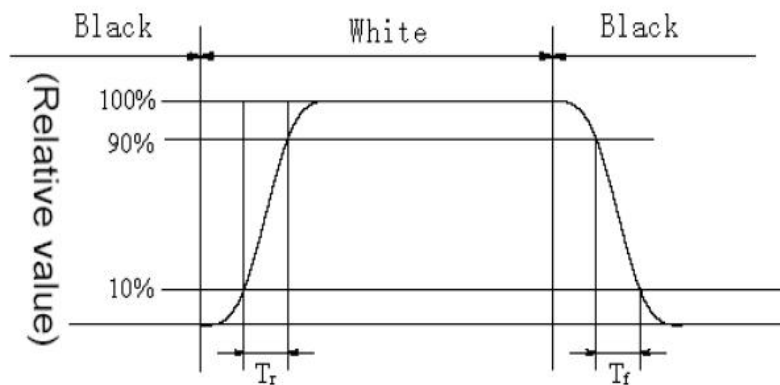
Test Conditions:

1. VDD=1.8V, I_F=40mA (Backlight current), the ambient temperature is +25℃.
2. The test systems refer to Note 8.

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

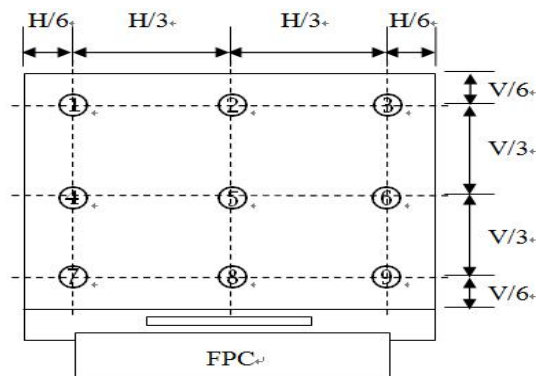


Note2: Definition of Response time: Sum of T_R and T_F



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

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

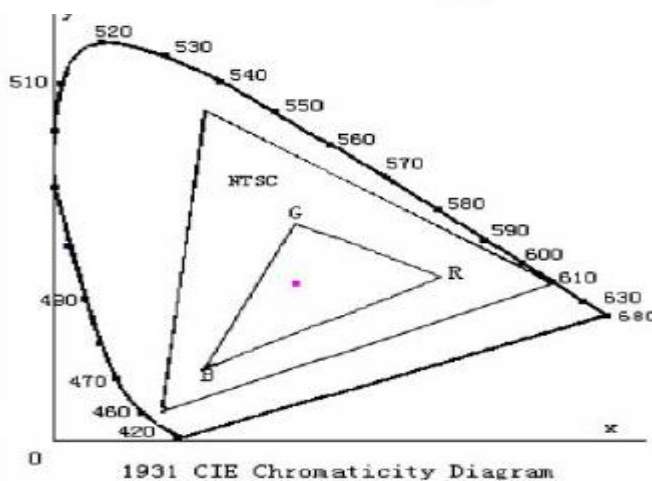
Note 5: Definition of Luminance: Center Luminance of white is defined as luminance values of 1point average across the LCD surface.

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:

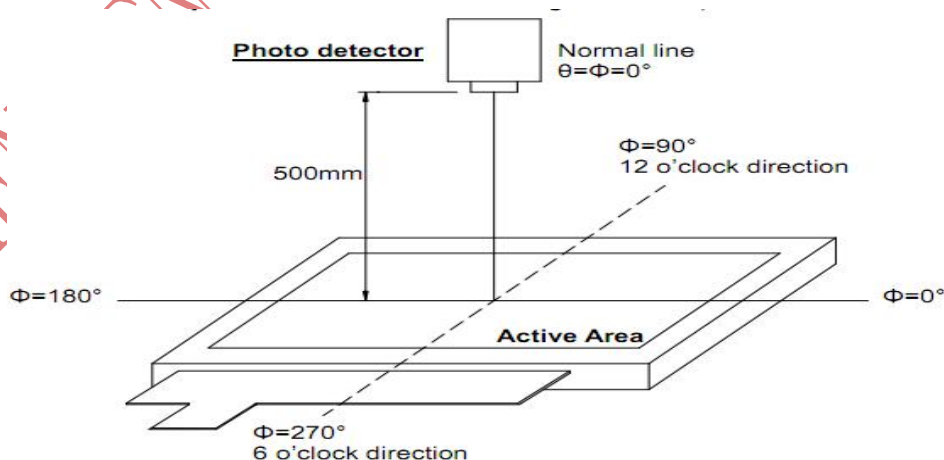
$$\text{NTSC ratio} = \frac{\text{Area of RGB triangle}}{\text{Area of NTSC triangle}}$$



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 / 240Hours	Note1,2,3
Low Temperature Storage	Ta =-30°C / 240Hours	Note1,2,3
High Temperature Operating	Ta =+60°C / 240Hours	Note1,2,3
Low Temperature Operating	Ta =-20°C / 240Hours	Note1,2,3
Temperature Cycle storage Test	-20°C/30min Δ +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

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:

