LCD MODULE

SPECIFICATION

Model:	UE035DV-RB40-L018E
Version:	V1.0
Date:	20190816

□ **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	2019.08.16	Preliminary release	

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1. GENERAL INFORMATION

1.1 Features

1) Pixel Arrangement：RGB_Stripe
2) Interface Mode： MIPI
3) Driver IC：R901
4) Operation Temperature：-20~60℃
5) Storage Temperature：-30~70℃
6) Backlight Type：White LED
7) Display mode：Normally Black,
8) Pixel Density：329 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	IPS TFT	-	
Screen Size	3.5	Inch	Diagonal
Resolution	640(W)*3(RGB)*960(H)	Dots	-
Interface	MIPI	-	4lane
Module Power Consumption	0.63	Watt	Typ.
Active Area	49.92(W)*74.88(H)	mm	-
Pixel pitch (W*H)	0.026(W)*0.026(H)	mm	-
Module Size (W*H*D)	54.80(W)*82.89(H)*1.69(D)	mm	-
Luminance	500	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	IOVDD	-0.3	3.6	V	Note1
Power supply2 voltage	VSP	-0.3	6.0	V	Note1
Power supply3 voltage	VSN	0	-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	℃	Note1,2
Storage temperature	T_{st}	-30	70	℃	Note1,2
Humidity	H_{st}	10	90	%RH	Note1,3

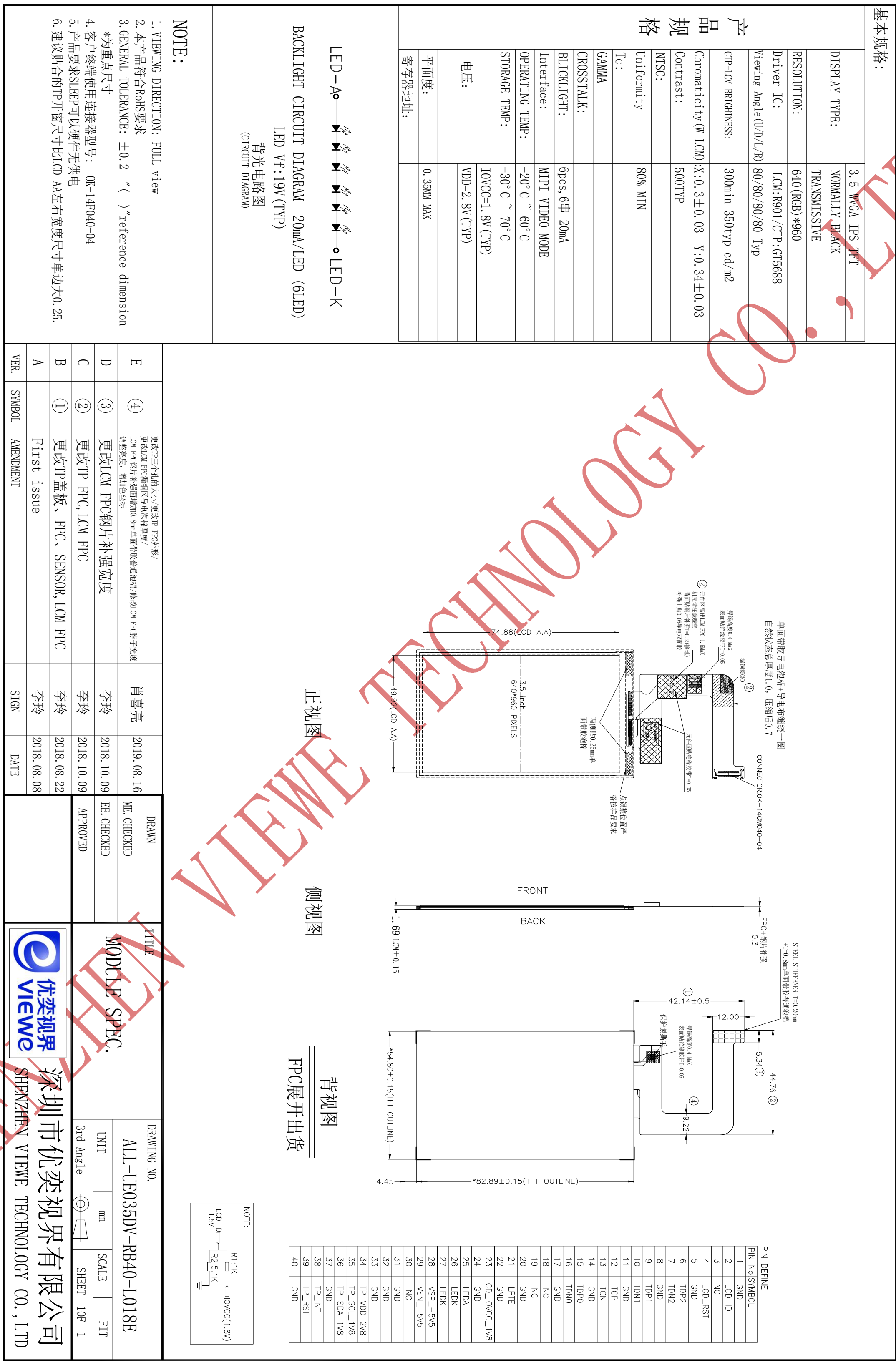
(Ta=+25°C,GND=0V)

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℃,the response time of liquid crystal (LC) becomes slower and the color of panel darker than normal one.

Note3: Temp. ≤ 60℃ , 90% RH MAX.
Temp. ＞60℃ , Absolute humidity shall be less than 90% RH .

3. MECHANICAL DRAWING



基本规格:		
产品规格	DISPLAY TYPE:	3.5 WVGA IPS TFT NORMALLY BLACK TRANSMISSIVE
	RESOLUTION:	640(RGB)*960
	Driver IC:	LCM:R901/CTP:GT5688
	Viewing Angle(U/D/L/R)	80/80/80/80 Typ
	CTP+LCM BRIGHTNESS:	300min 350typ cd/m2
	Chromaticity(W LCM)	X:0.3±0.03 Y:0.34±0.03
	Contrast:	500TYP
	NTSC:	
	Uniformity	80% MIN
	Tc:	
	GAMMA	
	CROSSTALK:	
	BLICKLIGHT:	6pcs,6串 20mA
	Interface:	MIPI VIDEO MODE
	OPERATING TEMP:	-20°C ~ 60°C
	STORAGE TEMP:	-30°C ~ 70°C
	电压:	IOVCC=1.8V(TYP) VDD=2.8V(TYP)
	平面度:	0.35MM MAX
	寄存器地址:	

NOTE:
1. VIEWING DIRECTION: FULL view
2. 本产品符合RoHS要求
3. GENERAL TOLERANCE: ±0.2 "( )"reference dimension
   *为重点尺寸
4. 客户终端使用连接器型号: OK-14F040-04
5. 产品要求SLEEP可以硬件无供电
6. 建议贴合的TP开窗尺寸比LCD AA左右宽度尺寸单边大0.25.

PIN No	SYMBOL
1	GND
2	LCD_ID
3	NC
4	LCD_RST
5	GND
6	TDP2
7	TDN2
8	GND
9	TDP1
10	TDN1
11	GND
12	TCP
13	TCN
14	GND
15	TDP0
16	TDN0
17	GND
18	NC
19	NC
20	GND
21	LPTE
22	GND
23	LCD_IOVCC_1V8
24	GND
25	LEDA
26	LEDK
27	LEDK
28	VSP_+5V5
29	VSN_-5V5
30	NC
31	GND
32	GND
33	GND
34	TP_VDD_2V8
35	TP_SCL_1V8
36	TP_SDA_1V8
37	GND
38	TP_INT
39	TP_RST
40	GND

VER.	SYMBOL	AMENDMENT	SIGN	DATE
E	④	更改TP三个孔的大小/更改TP FPC外形/更改LCM FPC漏铜区导电泡棉厚度/LCM FPC钢片补强面增加0.8mm单面带胶普通泡棉/修改LCM FPC脖子宽度调整亮度，增加色坐标	肖喜亮	2019.08.16
D	③	更改LCM FPC钢片补强宽度	李玲	2018.10.09
C	②	更改TP FPC,LCM FPC	李玲	2018.10.09
B	①	更改TP盖板、FPC、SENSOR,LCM FPC	李玲	2018.08.22
A		First issue	李玲	2018.08.08

DRAWN / ME. CHECKED / EE. CHECKED / APPROVED

TITLE: MODULE SPEC.

DRAWING NO. ALL-UE035DV-RB40-L018E

UNIT: mm | SCALE: FIT | 3rd Angle | SHEET 1OF 1

深圳市优奕视界有限公司
SHENZHEN VIEWE TECHNOLOGY CO.,LTD

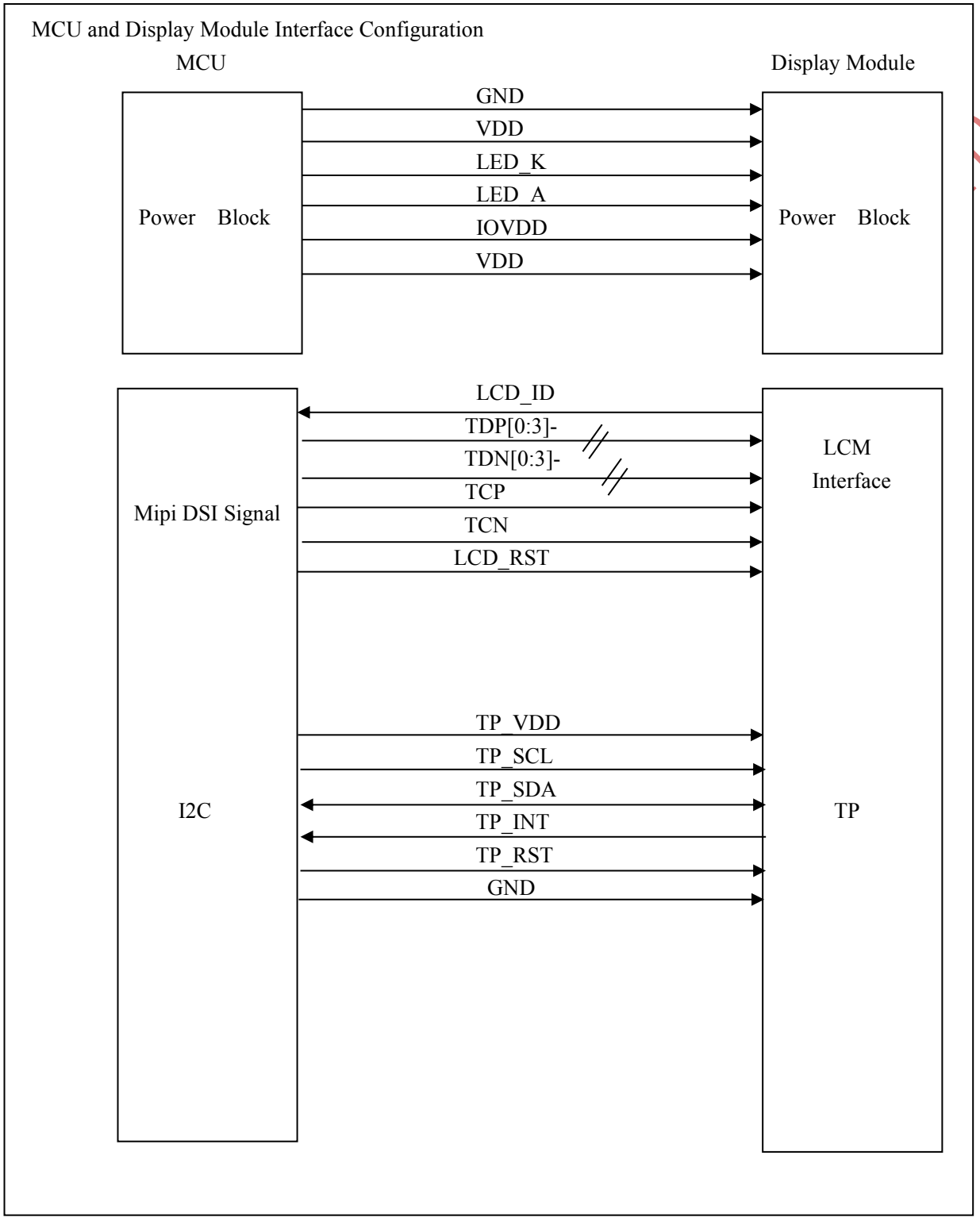
4. I/O CONNECTION & BLOCK DIAGRAM

4.1 I/O Connection

Pin No. 序号	Symbol 符号	I/O	Description 描述
1	GND	P	Power Ground
2	LCD_ID	P	ID Select
3	NC	-	NC
4	LCD_RST	I	Chip reset singal
5	GND	P	Power Ground
6	TDP2	I	DSI-D2+ differential data signals for MIPI interface
7	TDN2	I	DSI-D2- differential data signals for MIPI interface
8	GND	P	Power Ground
9	TDP1	I	DSI-D1+ differential data signals for MIPI interface
10	TDN1	I	DSI-D1- differential data signals for MIPI interface
11	GND	P	Power Ground
12	TCP	I	DSI-CLK+ differential clock signals for MIPI interface
13	TCN	I	DSI-CLK- differential clock signals for MIPI interface
14	GND	P	Power Ground
15	TDP0	I	DSI-D0+ differential data signals for MIPI interface
16	TDN0	I	DSI-D0- differential data signals for MIPI interface
17	GND	P	Power Ground
18	TDP3	I	DSI-D3+ differential data signals for MIPI interface
19	TDN3	I	DSI-D3- differential data signals for MIPI interface
20	GND	P	Power Ground
21	LPTE	I	Tearing effect output pin to synchronize MCU to frame writing
22	GND	P	Power Ground
23	LCD_IOVDD_1V8	P	Power supply for logic circuits and IO pads(1.8V)
24	GND	P	Power Ground
25	LED_A	P	Power supply for LED+
26	LED_K	P	Power supply for LED-
27	LED_K	P	Power supply for LED-
28	VSP	P	Input voltage from the set-up circuit. it is generated from VCIP
29	VSN	P	Input voltage from the set-up circuit. it is generated from AVEE.
30	NC	-	NC
31-33	GND	P	Power Ground
34	TP_VDD2.8V	P	.Analog Power Supply for TP
35	TP_SCL	I	I2C clock signals for TP
36	TP_SDA	I	I2C data signals for TP
37	GND	P	Power Ground
38	TP_INT	O	Interrupt signals for TP
39	TP_RST	I	The signal will reset the TP, Signal is active low
40	GND	P	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	IOVDD	1.7	1.8	3.6	V	-
Power Supply2 Voltage	VSP	2.8	5.5	6	V	
Power Supply3 Voltage	VSN	0	-5.5	-6	V	
Power Supply Current	I_{VDD}	-	28	-	mA	Note1
Logic Input High Voltage	V_{IH}	0.7IOVCC	-	IOVCC	V	-
Logic Input Low Voltage	V_{IL}	0	-	0.3IOVCC	V	-
Panel Power Consumption	P_{VDD}	-	0.0504	-	Watt	Note1
Module Power Consumption	P_{LCM}	-	0.63	-	Watt	Note1,2

(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	-	19	-	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			14		PCS	

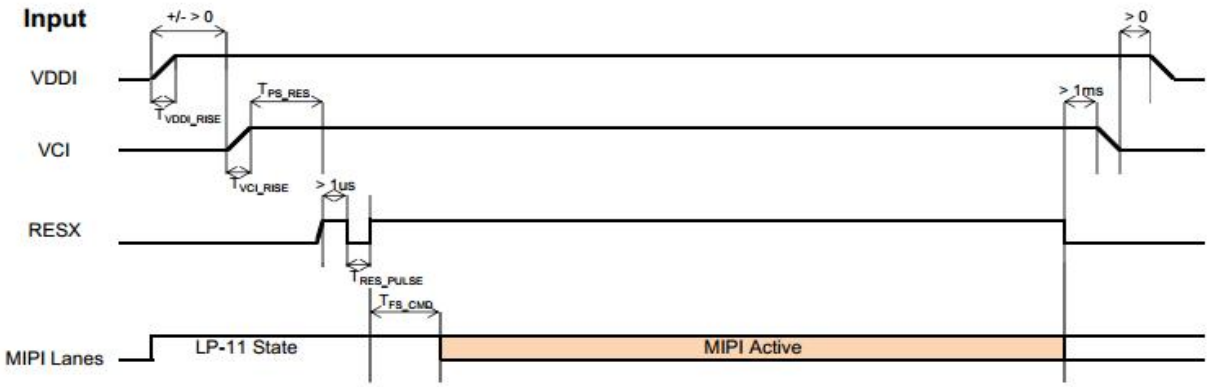
(Ta=+25°C,GND=0V)

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.),Ta=25℃。

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

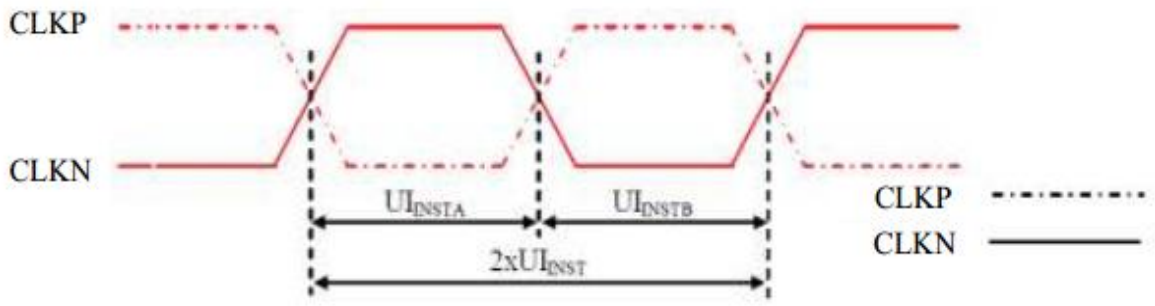
5.3.2 Power Off Sequence

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

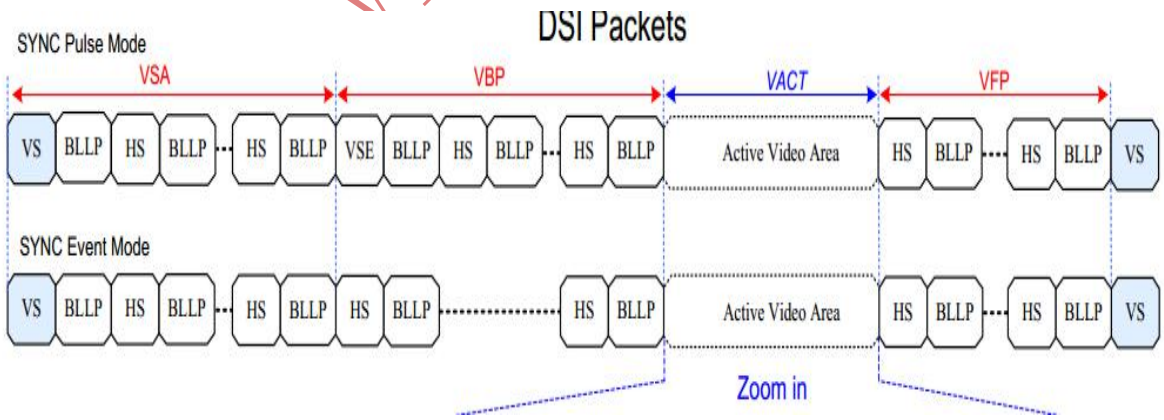
5.4.1 AC Characteristics

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

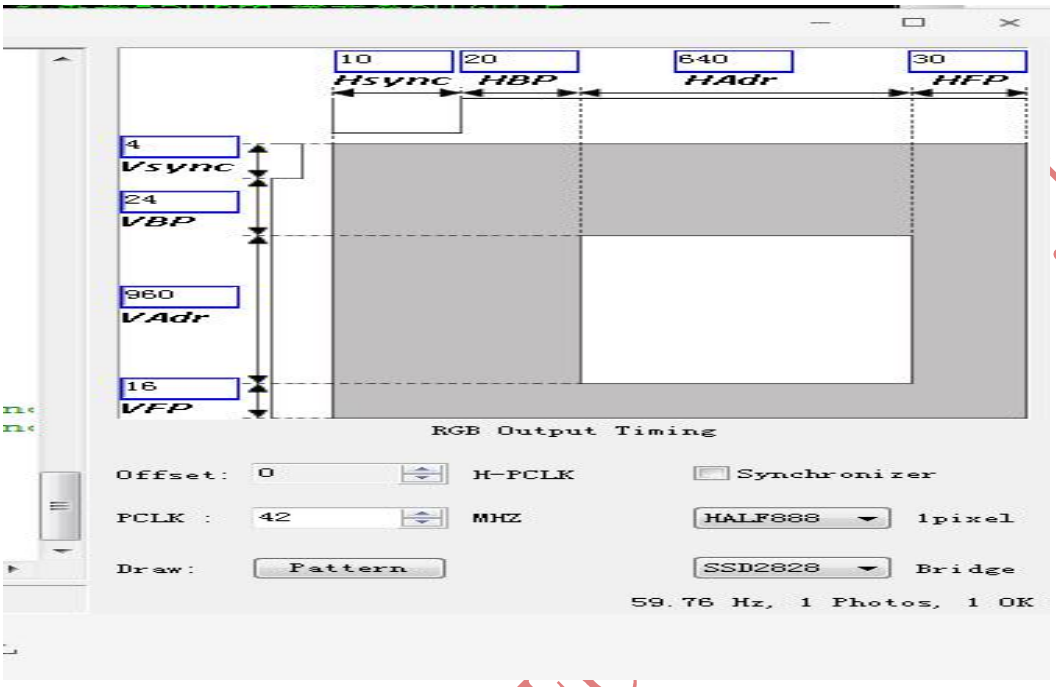


5.5 Timing Diagram

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	BR_{PHY}	80	-	1000	Mbps
Active pixel per line	HACT	-	640	-	Pixels
Horizontal back porch	t_{HBP}	-	20	-	DCLK
Horizontal sync active	t_{HSA}	-	10	-	DCLK
Horizontal front porch	t_{HFP}	-	30	-	DCLK
Active pixel per frame	VACT	-	960	-	H
Vertical back porch	t_{VBP}	-	24	-	H
Vertical sync active	t_{VSA}	-	4	-	H
Vertical front porch	t_{VFP}	-	16	-	H

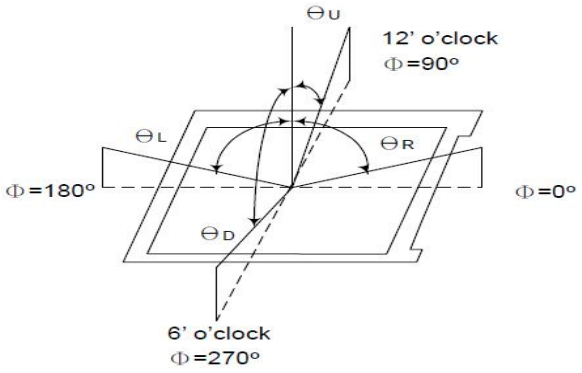
6. OPTICAL CHARACTERISTICS

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	θ = 0°	600	800	-	-	Note(4)
NTSC Ratio	S	θ =0°	-	55	-	%	Note(7)
Luminance	L	θ =0°	-	500	-	cd/m2	Note(5)
Luminance uniformity	U_W	θ =0°	70	80	-	%	Note(3)
Response Time	T_R+ T_F	25 °C	-	25	30	ms	Note(2)
Color Coordination	W_X	θ = 0° (Center) Normal viewing angle B/L On	-0.03	0.300	+0.03	NTSC (x,y)	Note(6)
	W_Y			0.340			
	R_X			0.605			
	R_Y			0.319			
	G_X			0.317			
	G_y			0.556			
	B_X			0.146			
	B_Y			0.146			
Viewing Angle	Θ_1	C/R>10	80	80	-	Degree	Note(1)
	θ_R		80	80	-		
	θ_U		80	80	-		
	θ_D		80	80	-		

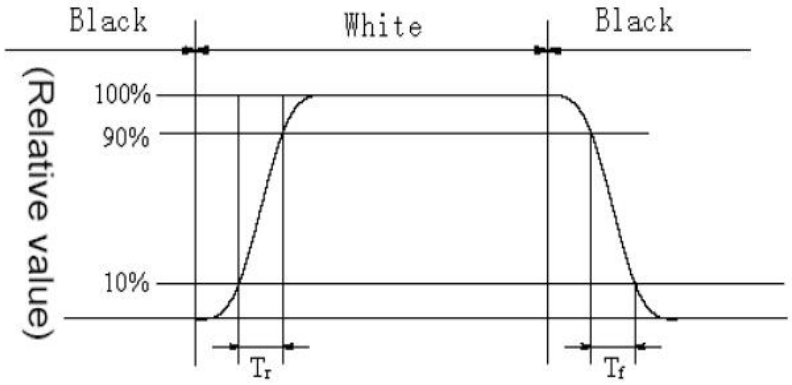
Test Conditions:

1. VDD=2.8V, 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

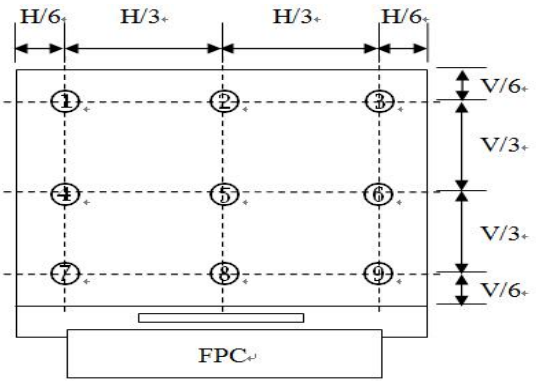


Note2: Definition of Response time: Sum of T_R and T_F



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

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

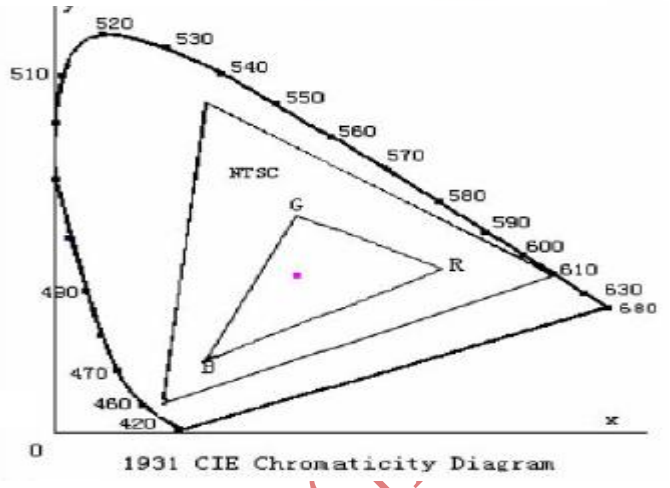
Note 5: Definition of Luminance: Center Luminance of white is defined as luminance values of 1point average across the LCD surface.

Note 6: Definition of Color Chromaticity (CIE 1931)

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

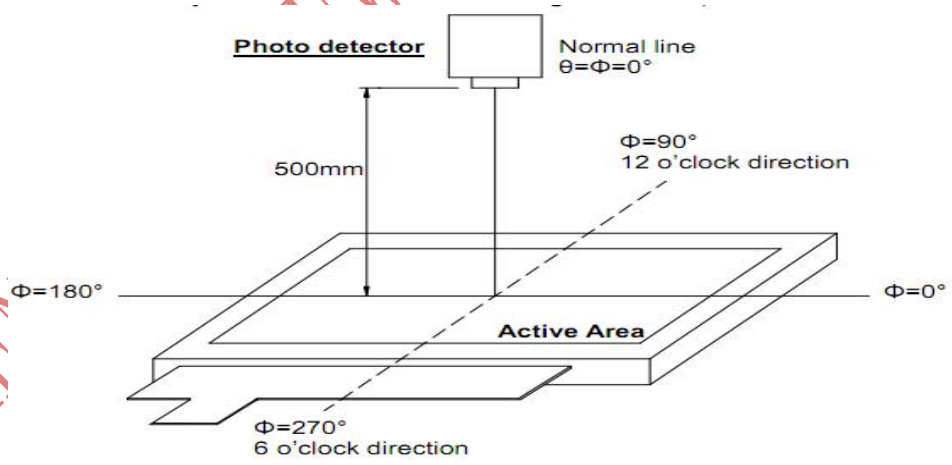
Note 7: Definition of NTSC ratio:

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



Note 8: Definition of optical measurement system.

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	-30°C/30min Δ+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

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