LCD MODULE

SPECIFICATION

Model:	UE080SX-RN40-L018A
Version:	V1.0
Date:	2018-03-15

□ **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	2018.03.15	Preliminary release	

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1. GENERAL INFORMATION

1.1 Features

1) Pixel Arrangement：RGB Vertical Stripe
2) Interface Mode： LVDS
3) Driver IC： -
4) Operation Temperature：-20℃~70℃
5) Storage Temperature：-30℃~80℃
6) Backlight Type：White LED
7) Display mode：Normally Black
8) Pixel Density：160 PPI
9) LED life time：30,000 Hours

1.2 Mechanical Specification

Item 项目	Specification 规格	Unit 单位	Remark 备注
LCD size	IPS 8.0 inch(Diagonal)	-	-
Screen Size	8.0	Inch	Diagonal
Resolution	1024(W)*3(RGB)*768(H)	Dots	40PIN
Interface	LVDS 8BIT	-	-
Module Power Consumption	TBD	Watt	Typ.
Surface treatment	Hard coating	-	-
Active Area	162.05(W)*121.54(H)	mm	-
Pixel pitch (W*H)	52.75(W)*158.25(H)	um	-
Module Size (W*H*D)	135.5(W)*174.3(H)*2.8(D)	mm	-
Luminance	450	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	5.0	V	Note1
Power supply2 voltage	AVDD	6.5	13.5	V	
Power supply3 voltage	VGH	-0.3	40	V	
Power supply4 voltage	VGL	-20	0.3	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	70	℃	Note1,2
Storage temperature	T_{st}	-30	80	℃	Note1,2
Humidity	H_{st}	10	90	%RH	Note1,3

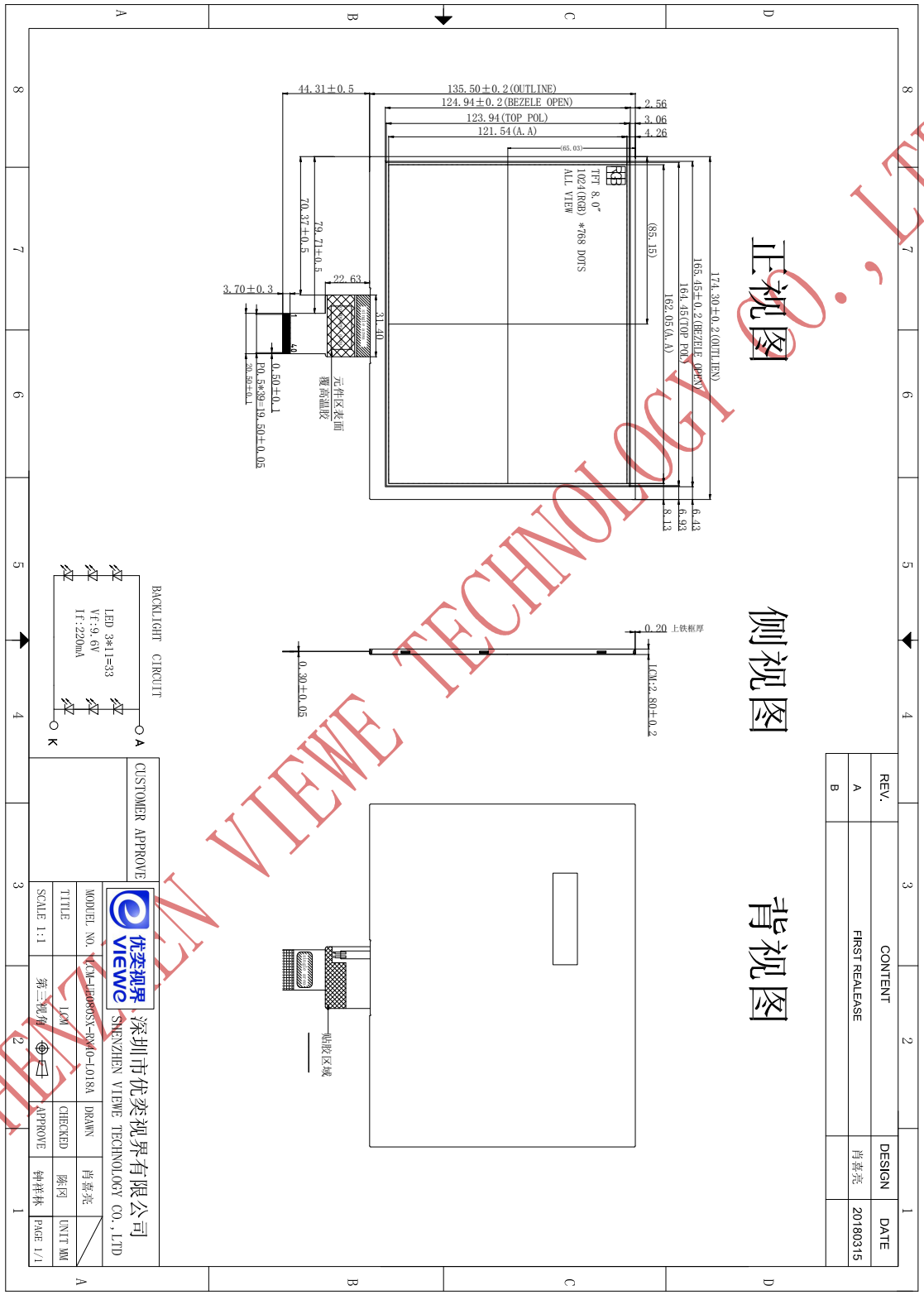
(Ta=+25°C,GND=0V)

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. ≤ 50℃ , 80% RH MAX.
Temp. ＞50℃ , Absolute humidity shall be less than 80% RH .

3. MECHANICAL DRAWING



4. I/O CONNECTION & BLOCK DIAGRAM

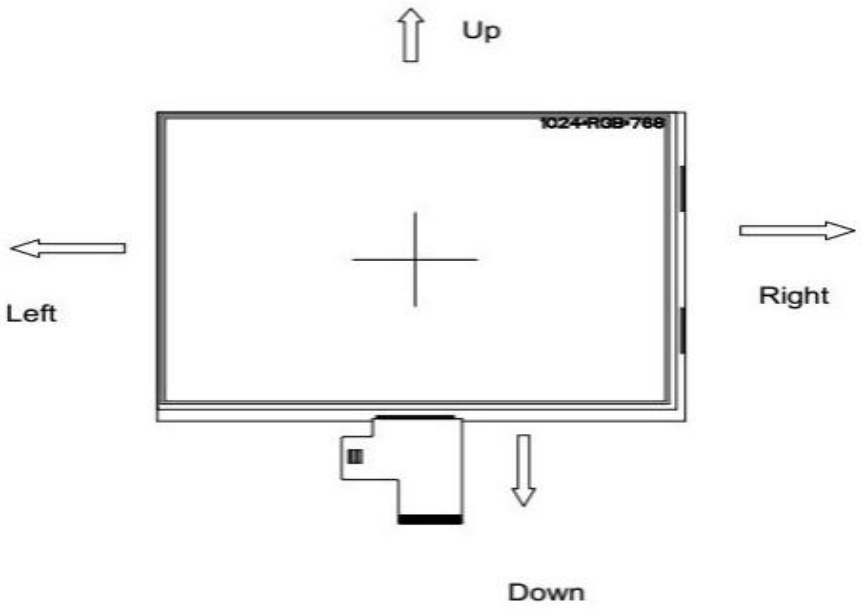
4.1 I/O Connection

Pin No. 序号	Symbol 符号	I/O	Description 描述
1	VCOM	P	Common Voltage
2-3	VDD	P	power supply for digital circuits
4	NC	-	Dummy
5	RESET	I	Chip reset signal, active is low
6	STBYB	I	Standby mode normally pulled high
7	GND	P	Power Ground
8	RXIN0-	I	LVDS differential data input
9	RXIN0+	I	LVDS differential data input
10	GND	P	Power Ground
11	RXIN1-	I	LVDS differential data input
12	RXIN1+	I	LVDS differential data input
13	GND	P	Power Ground
14	RXIN2-	I	LVDS differential data input
15	RXIN2+	I	LVDS differential data input
16	GND	P	Power Ground
17	RXCLKIN-	I	LVDS differential clock input
18	RXCLKIN+	I	LVDS differential clock input
19	GND	P	Power Ground
20	RXIN3-	I	LVDS differential data input
21	RXIN3+	I	LVDS differential data input
22	GND	P	Power Ground
23-24	NC	-	Dummy
25	GND	P	Power Ground
26	NC	-	Dummy
27	DIMO	I	Backlight CABC controller signal output
28	SELB	I	6bit/8bit mode select
29	AVDD	P	Power for Analog Circuits

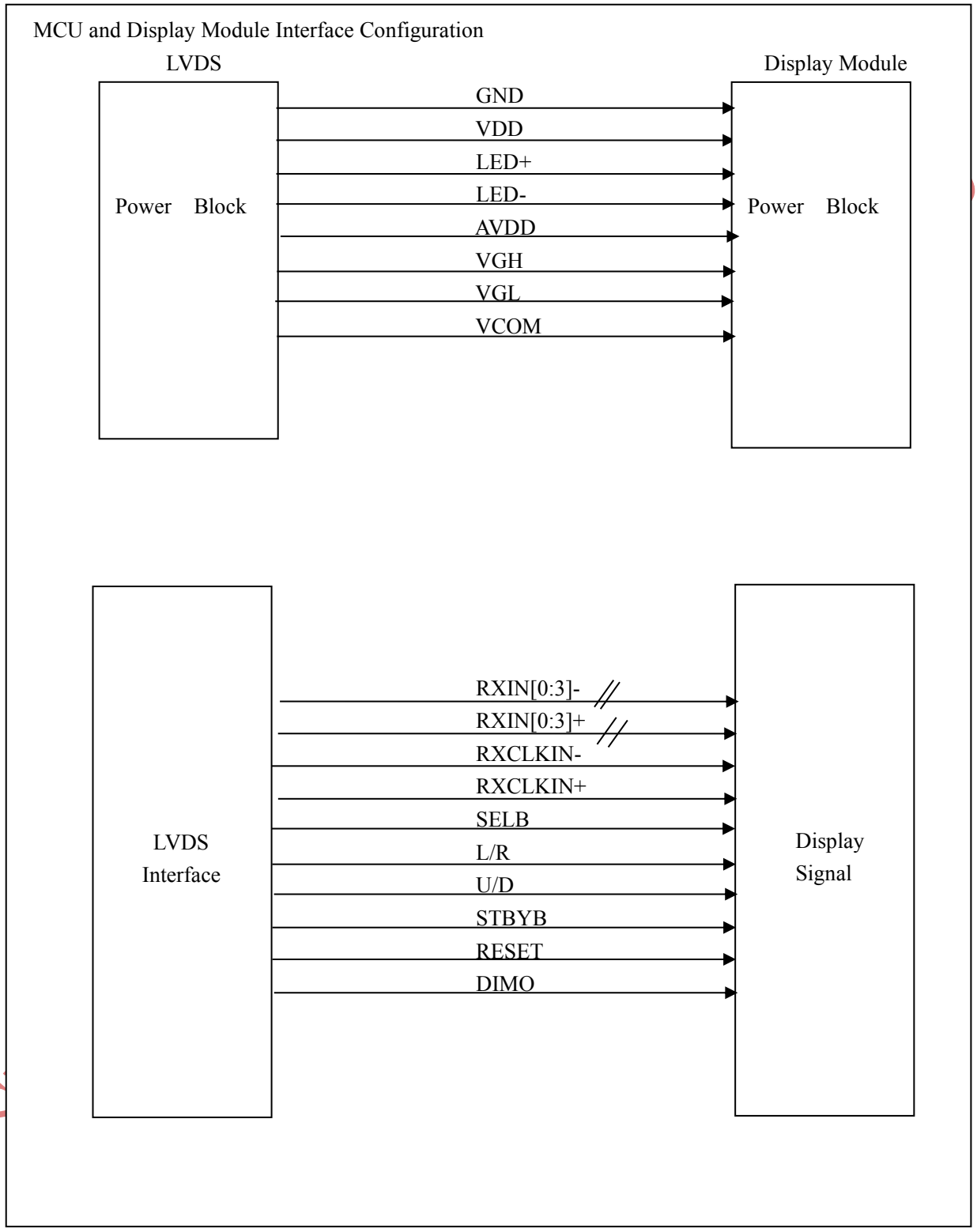
30	**GND**	P	Power Ground
31-32	**LED-**	P	Led cathode
33	**L/R**	I	Horizontal inversion,L:shift left,H:shift right
34	**U/D**	I	Vertical inversion, L:shift down,H:shift up
35	**VGL**	P	TFT Gate Off Voltage
36	**CABCEN1**	I	CABC H/W enable
37	**CABCEN0**	I	CABC H/W enable
38	**VGH**	P	TFT Gate On Voltage
39-40	**LED+**	P	Led anode

I：Input；O：Output；P：Power

Note1: If LVDS input data is 6 bits ,SELB must be set to High;
If LVDS input data is 8 bits ,SELB must be set to Low.
Note 2: When CABC_EN="00", CABC OFF.
When CABC_EN="01", user interface image.
When CABC_EN="10", still picture.
When CABC_EN="11", moving image.
When CABC off, don't connect DIMO, else connect it to backlight.
Note 3: When L/R="0", set right to left scan direction.
When L/R="1", set left to right scan direction.
When U/D="0", set top to bottom scan direction.
When U/D="1", set bottom to top scan direction.
Note 4: Definition of scanning direction.
Refer to the figure as below:



4.2 Block Diagram



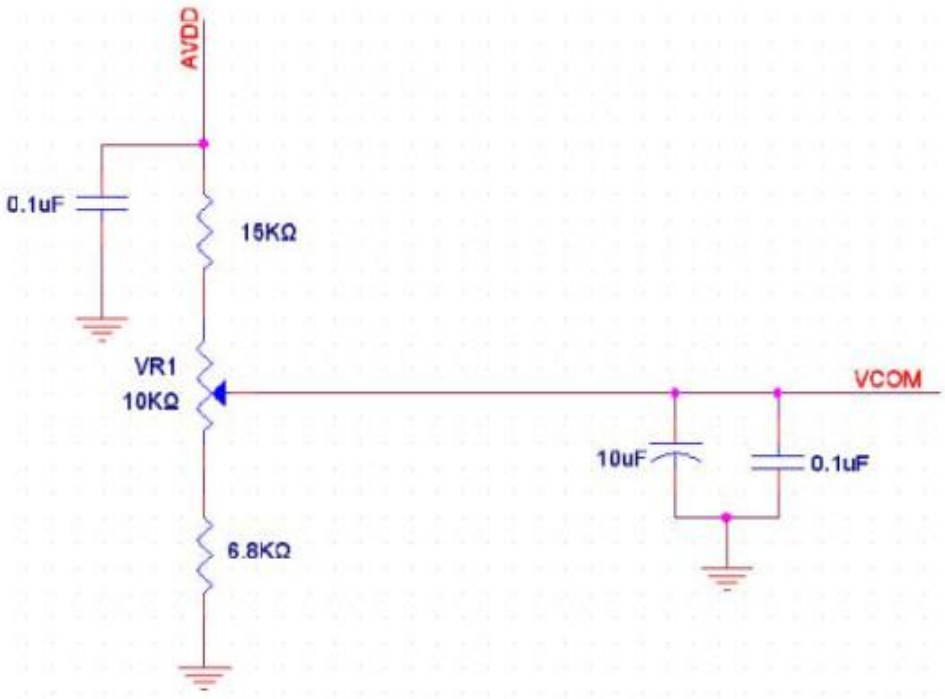
5. ELECTRICAL CHARACTERISTICS

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	3.0	3.3	3.6	V	-
Power Supply2 Voltage	AVDD	9.8	10	10.2	V	
Power Supply3 Voltage	VGH	18.6	18.9	19.2	V	
Power Supply4 Voltage	VGL	-8.1	-7.8	-7.5	V	
Power Supply5 Voltage	VCOM	2.6	3.6	4.6	V	
Power Supply Current	I_{VDD}	-	TBD	-	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}	-	TBD	-	Watt	Note1
Module Power Consumption	P_{LCM}	-	TBD	-	Watt	Note1,2

Note1:Measurement Conditions (Video Mode): Full Screen Red Pattern,VDD=3.3V,60Hz Refresh.

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



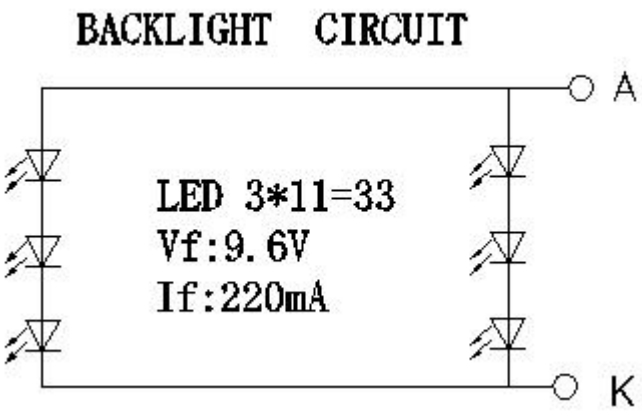
5.2 Back Light Driving Section

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	9.6	19.6	V	Note1
Forward Current	I_F	-	220	-	mA	Note1
Backlight Power consumption	P_{BL}	-	2.112	-	Watt	Note1
LED life time	-	30000	-	-	Hours	Note2
LED Quantity			33		PCS	

(Ta=+25°C,GND=0V)

Note1: The LED driving condition is defined for each LED module (3 LED Serial,11LED Parallel)。
For each LED ： I_F=20mA,V_F=3.2V(Typ.),Ta=25℃。

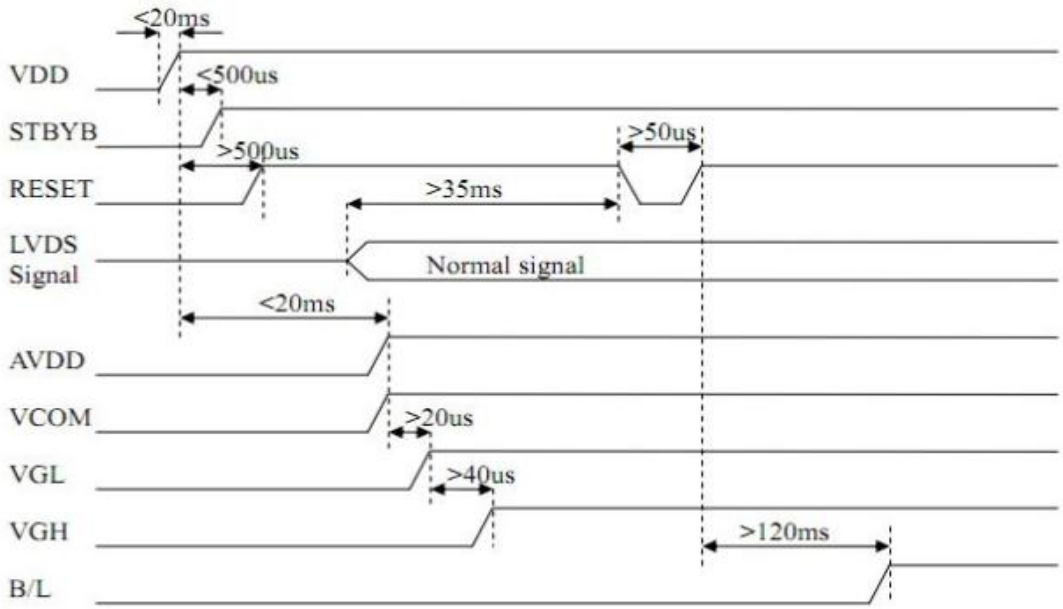
Note2:The "LED life time" is defined as the module brightness decrease to 50% of original brightness at I_{LED}=20mA(Per Led). The LED life time could be decreased if operating I_{LED} is larger than 20mA.



5.3 Power On/Off Sequence

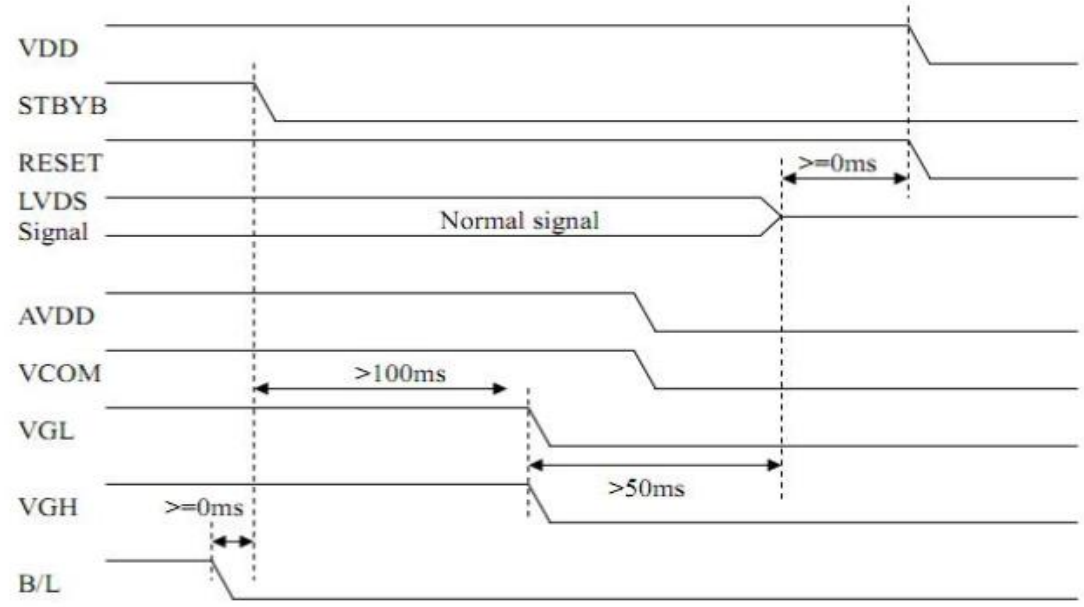
5.3.1 Power On Sequence

1) Power on:



5.3.2 Power Off Sequence

2) Power off:



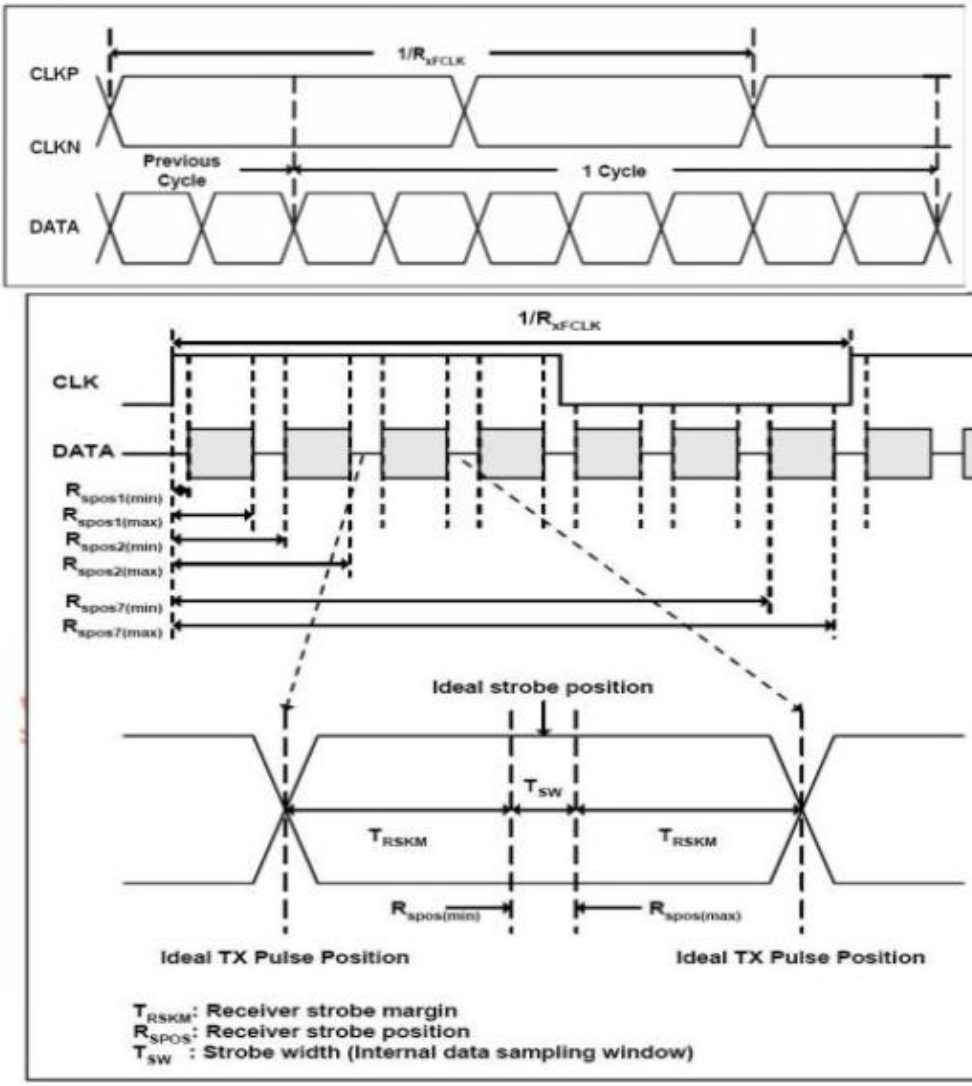
5.4 Timing Characteristics

5.4.1 LVDS DC Timing Characteristics

1) AC Electrical Characteristics

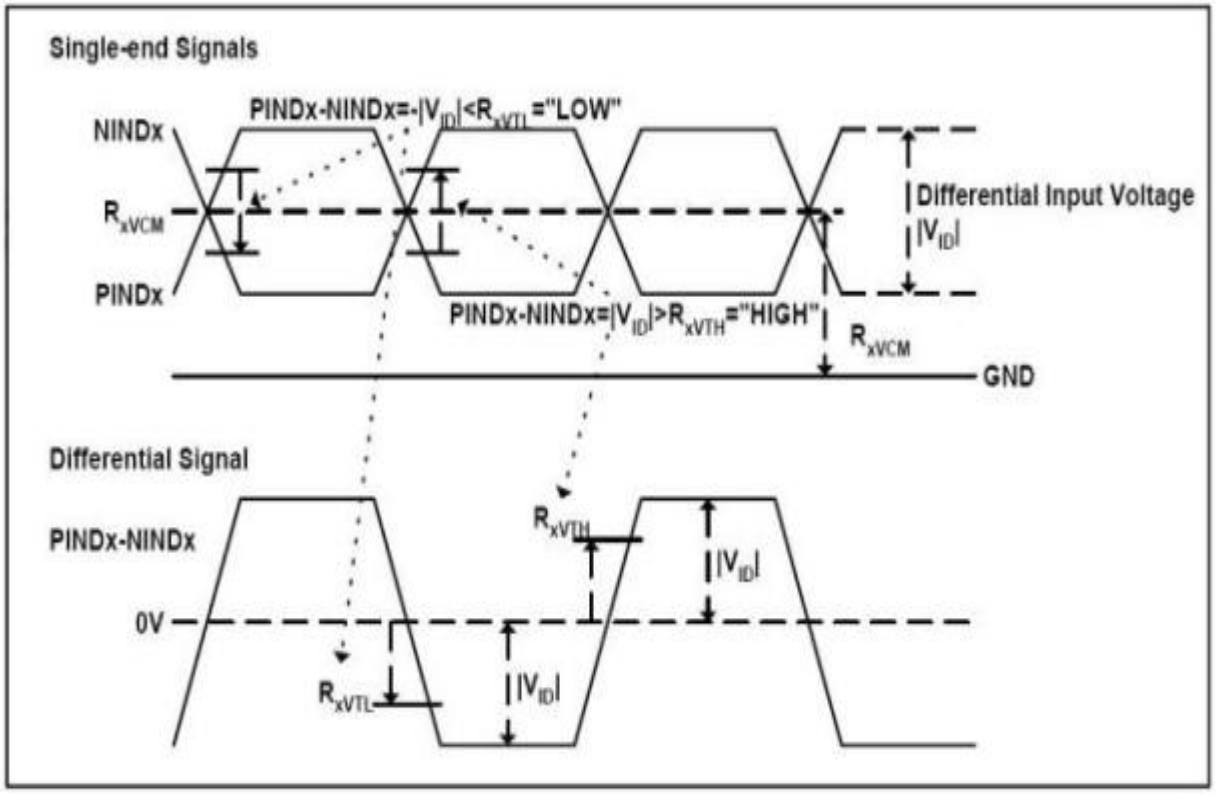
Parameter	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Clock frequency	R_{xFCLK}	20	-	71	MHz	
Input data skew margin	T_{RSKM}	500	-	-	ps	
Clock high time	T_{LVCH}	-	4/(7* R_{xFCLK})	-	ns	
Clock low time	T_{LVCL}	-	3/(7* R_{xFCLK})	-	ns	

2) Input Clock and Data Timing Diagram



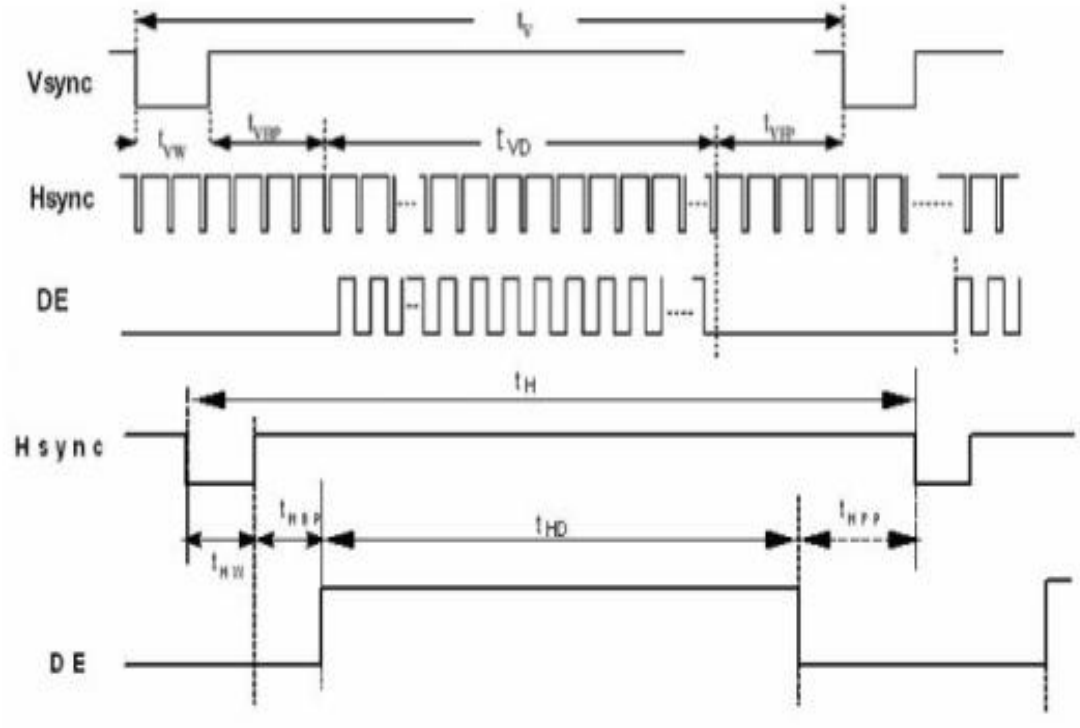
5.4.2 LVDS DC Timing Figure

Parameter	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Differential input high Threshold voltage	R_{xVTH}	-	-	+0.1	V	R_{XVCM}=1.2V
Differential input low Threshold voltage	R_{xVTH}	-0.1	-	-	V	
Input voltage range (singled-end)	R_{xVIN}	0	-	2.4	V	
Differential input common mode voltage	R_{xVCM}	$\|V_{ID}\|/2$	-	$2.4-\|V_{ID}\|/2$	V	
Differential voltage	$\|V_{ID}\|$	0.2	-	0.6	V	
Differential input leakage current	RV_{xliz}	-10	-	+10	uA	



5.4.3 Input Timing Parameters

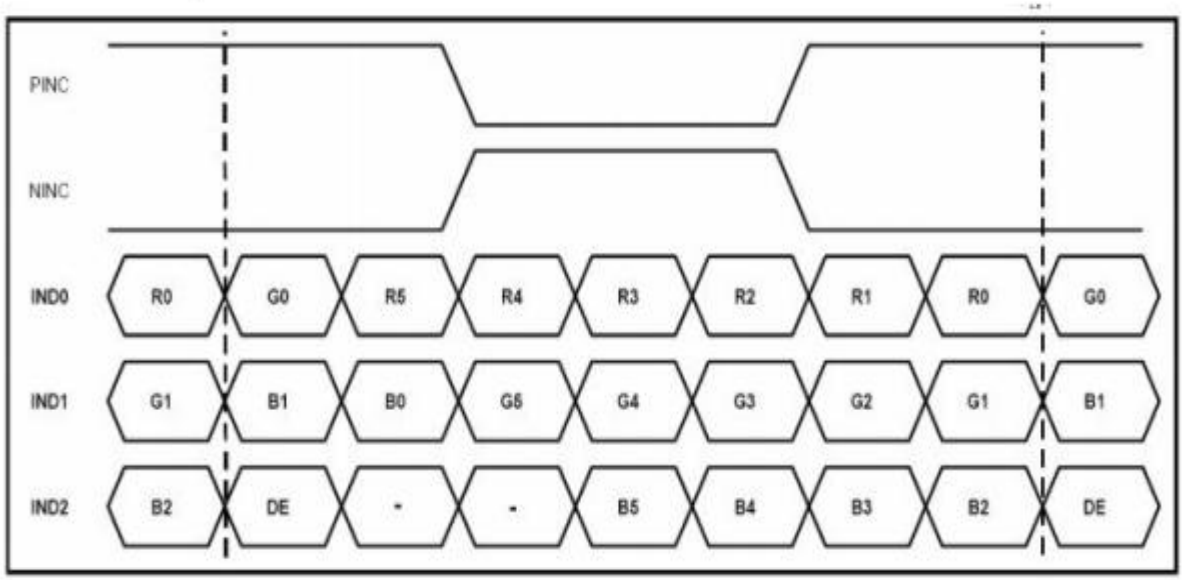
Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Clock Frequency	fclk	52	65	71	MHz	Frame rate
Horizontal display area	thd		1024		DCLK	
HS period time	th	1114	1344	1400	DCLK	
HS Blanking	thb	90	320	376	DCLK	
Vertical display area	tvd		768		H	
VS period time	tv	778	806	845	H	
VS Blanking	thb	10	38	77	H	



5.5 Timing Diagram

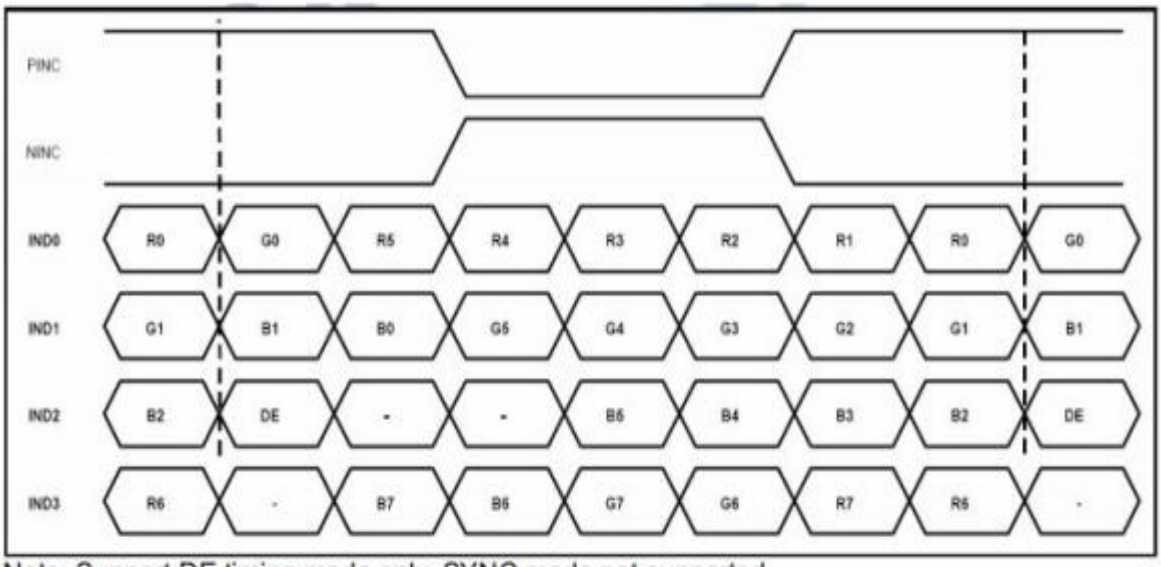
5.5.1 6-bit LVDS input data format

6bit LVDS input



5.5.2 8-bit LVDS input data format

8bit LVDS input



Note: Support DE timing mode only, SYNC mode not supported.

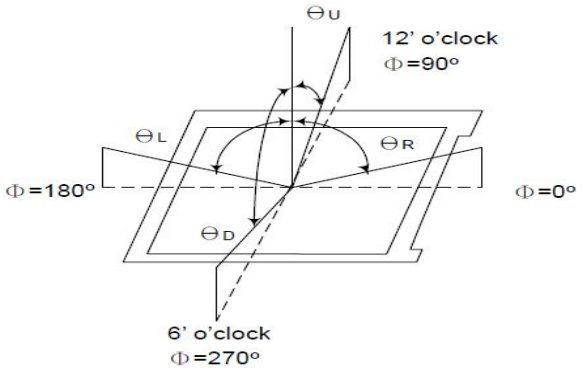
6. OPTICAL CHARACTERISTICS

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)
Luminance	L	θ =0°	-	450	-	cd/m2	Note(5)
Luminance uniformity	U_W	θ =0°	75	80	-	%	Note(3)
Response Time	T_R+ T_F	25 °C	-	25	50	ms	Note(2)
Color Coordination	W_X	θ = 0° (Center) Normal viewing angle B/L On	-0.03	TBD	+0.03	NTSC (x,y)	Note(6)
	W_Y			TBD			
	R_X			TBD			
	R_Y			TBD			
	G_X			TBD			
	G_y			TBD			
	B_X			TBD			
	B_Y			TBD			
Viewing Angle	θ_L	C/R>10	-	85	-	Degree	Note(1)
	θ_R		-	85	-		
	θ_U		-	85	-		
	θ_D		-	85	-		

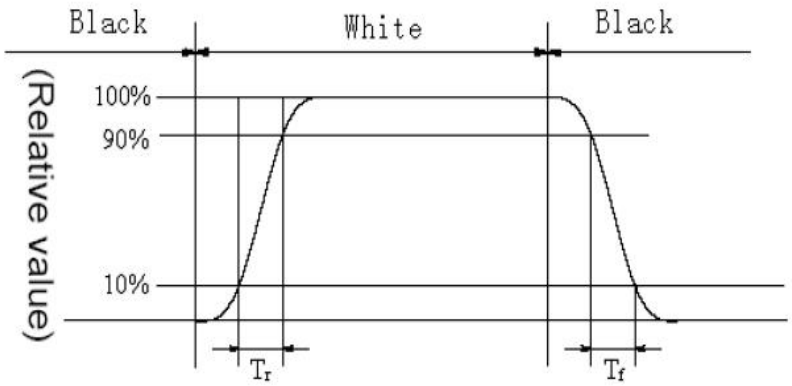
Test Conditions:

1. VDD=3.3V, I_F=70mA (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

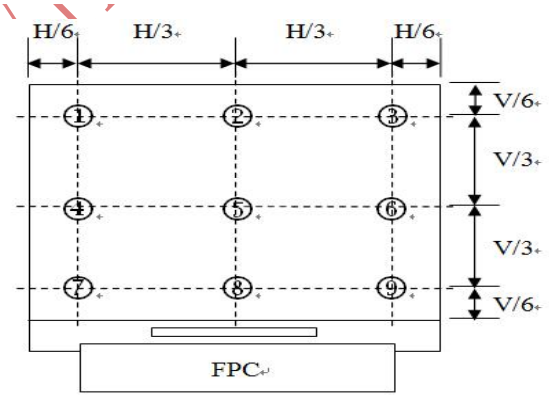


Note2: Definition of Response time: Sum of T_R and T_F



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.

$$\text{Luminance Uniformity} = \frac{\text{Min Luminance of white among 9-points}}{\text{Max Luminance of white among 9-points}} \text{ x100\%}$$



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

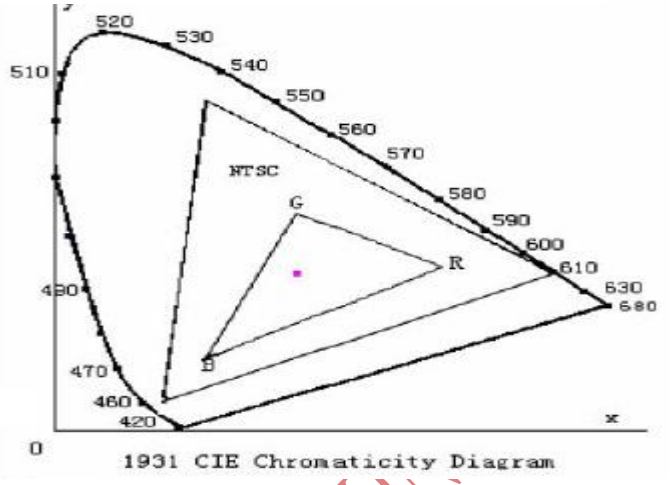
1point average across the LCD surface.

Note 6: Definition of Color Chromaticity (CIE 1931)

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

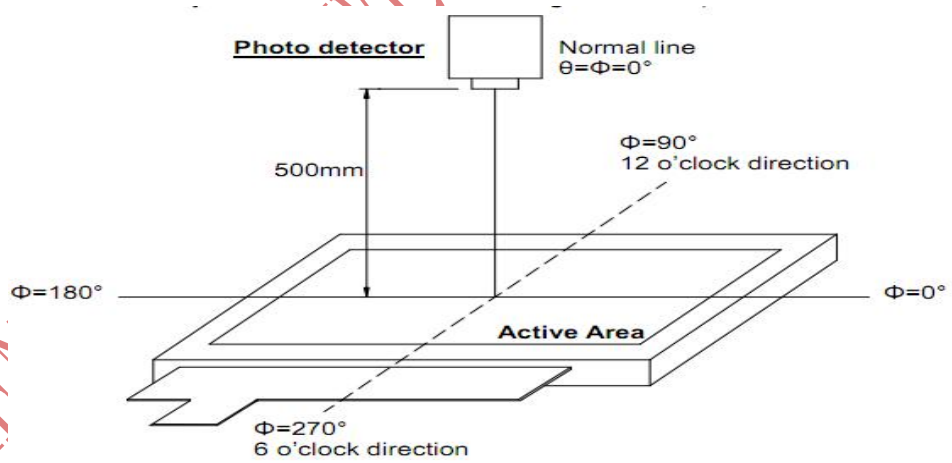
Note 7: Definition of NTSC ratio:

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



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 =+70°C / 96Hours	Note1,2,3
Low Temperature Operating	Ta =-20°C / 96Hours	Note1,2,3
Temperature Cycle storage Test	-30°C/30min Δ+80°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
Electrical Static Discharge	Air:±8KV 150pF/330Ω 5 times	Note2
	Contact:±4KV 150pF/330Ω 5 times	

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. INSPECTION STANDARDS

8.1 AQL Sampling inspection standard

使用 GB/T 2828-2003 一般 II 水平,采用正常检查一次抽样方式;具体抽检方式参照《成品检验管理程序》、《抽样管理规范》

缺陷区分	AQL 允收水准
严重缺陷	0 收 1 退
重缺	0.4
轻缺	0.65

8.2 Inspect the condition

8.2.1 在 20—40W 日光灯的照明条件下，样品离检查者眼睛约 30cm 处进行检查。检验方向以垂直线前后左右 45°（以时钟 3 点、6 点、9 点、12 点）

8.2.2 检验者视力需达到标准视力 1.0 以上。

8.2.3 检验者需戴静电手环、两手八个手指套。

8.2.4 外观检验者以目视检查或以菲林对比卡比对。

8.2.5 电性测试使用电测测架,主板,电源线及单片机。

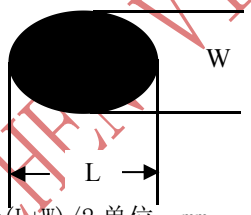
8.2.6 若标准与规格书不符时，以产品发行之规格书特殊检验规格、工程变更为准

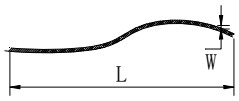
8.2.7 辉色度检测请参照样品,检测方法依照辉色度检验标准。

8.2.8 电测检验环境:照度为 200LUX 以下,外观检验环境: 照度为 600LUX-1000LUX，检验时间：1 秒-3 秒。

8.2.9 检验工具:电测测架,主板,电源线及单片机,菲林对比卡,游标卡尺,放大镜,实体显微镜(必要时)等等。

8.3 Judgment criterion

不良项目	判定标准			缺点类别
点状缺陷	 D=(L+W)/2 单位：mm 点不良间距需≥10mm	尺寸	允许个数	
		D≤0.2	忽略不计	轻缺
		0.2<D≤0.3	3	
		D>0.3	0	
亮点	1.单一点：单个 DOT 2.连续点：相连 2 个 DOT 3.亮点及暗点总个数不可超过 5 个 4.点不良间距需≥10mm	单一点	2	轻缺
		2 连续亮点	1	
暗点		单一点	5	
		2 连续暗点	1	
POL 气泡、凹凸点	参照点状缺陷定义	D≤0.2	忽略不计	
		0.2<D≤0.4	3	

<table>
<tr><td></td><td></td><td colspan="2">D＞0.4</td><td>0</td><td></td></tr>
<tr><td>Mura</td><td>斑点、不均</td><td colspan="2">ND 5% 不可见视为 OK</td><td></td><td>轻缺</td></tr>
<tr><td rowspan="5">电测
线状缺陷</td><td rowspan="9"> 

L：长度 W：宽度
线不良间距需≥10.0mm</td><td colspan="2">尺寸</td><td>允许个数</td><td rowspan="9">轻缺</td></tr>
<tr><td colspan="2">W≤0.05</td><td>忽略不计</td></tr>
<tr><td colspan="2">L≤5.0，0.05＜W≤0.10</td><td>3</td></tr>
<tr><td colspan="2">W＞0.10</td><td>依点状缺陷判定</td></tr>
<tr><td rowspan="4">外观
线状缺陷</td><td colspan="2">尺寸</td><td>允许个数</td></tr>
<tr><td colspan="2">W≤0.05</td><td>忽略不计</td></tr>
<tr><td colspan="2">L≤10.0，0.05＜W≤0.10</td><td>3个</td></tr>
<tr><td colspan="2">W＞0.10</td><td>依点状缺陷判定</td></tr>
</table>

9. PACKAGE DRAWING