

LCD MODULE
SPECIFICATION

Model:	UE050WV-RN40-L026
Version:	V1.0
Date:	20180509

☒ **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	2018.05.09	Preliminary release	

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1. GENERAL INFORMATION

1.1 Features

- 1) Pixel Arrangement: RGB Vertical Stripe
- 2) Interface Mode: RGB 24bits
- 3) Driver IC: Source/ILI6122, Gate/ILI5960
- 4) Operation Temperature: -20~70°C
- 5) Storage Temperature: -30~80°C
- 6) Backlight Type: White LED
- 7) Display mode: Normally White, Transmissive
- 8) Pixel Density: 187 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	5.0	Inch	Diagonal
Resolution	800(W)*3(RGB)*480(H)	Dots	
Interface	RGB 24bits	-	40PIN
Module Power Consumption	1.2	Watt	Typ.
Active Area	108(W)*64.8(H)	mm	
Pixel pitch (W*H)	0.135 (W)* 0.135 (H)	mm	
Module Size (W*H*D)	120.7(W)*75.8(H)*2.8(D)	mm	Tolerance: ±0.2
Luminance	400	cd/m ²	Typ.
Viewing Direction	6	O'clock	Gray inversion
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	-0.5	5	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	60	°C	Note1,2
Storage temperature	T _{st}	-20	70	°C	Note1,2
Humidity	H _{st}	10	80	%RH	Note1,3

(T_a=+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 , 80% RH MAX.

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

3. MECHANICAL DRAWING

[illegible]

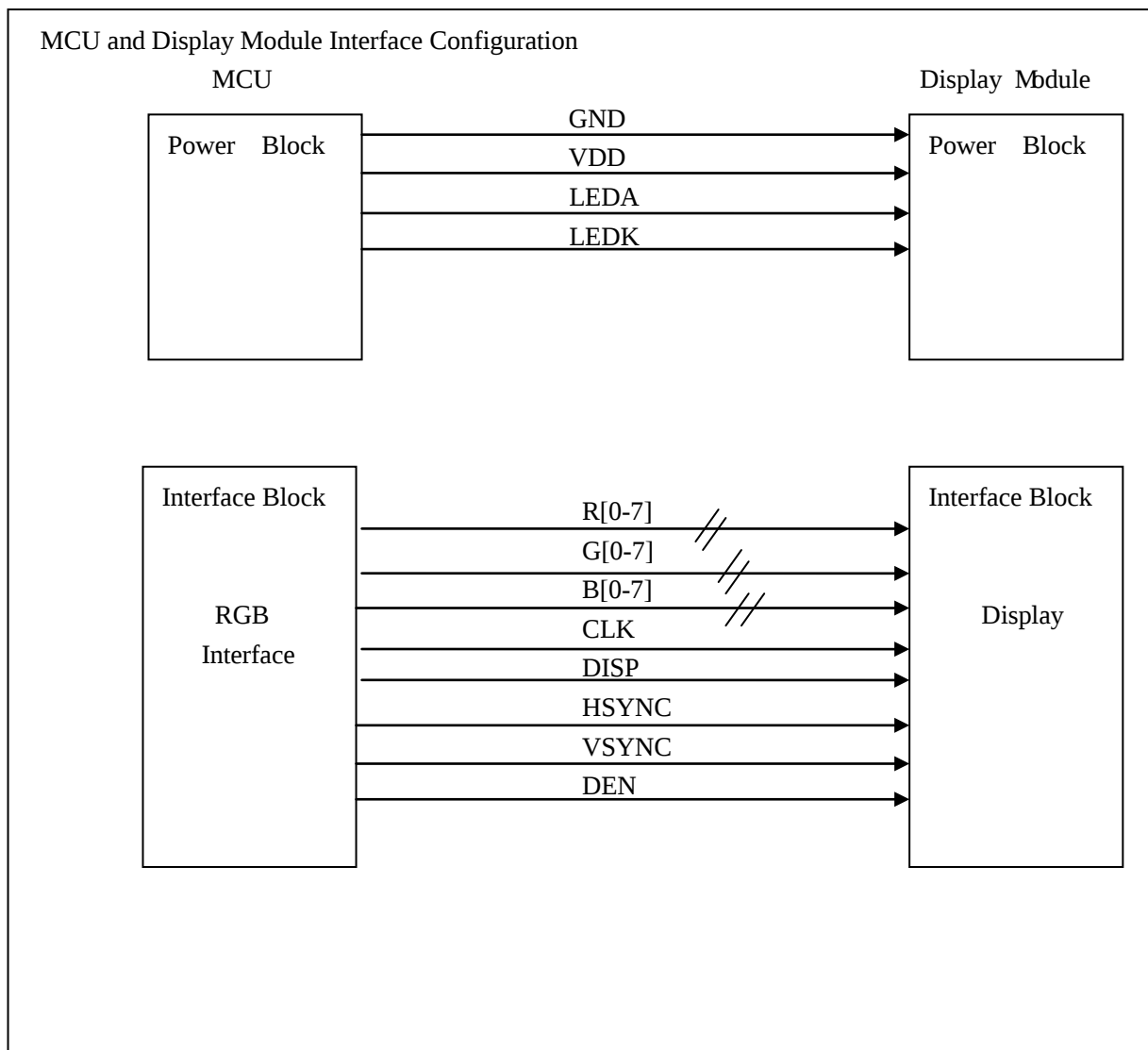
4. I/O CONNECTION & BLOCK DIAGRAM

4.1 I/O Connection

Pin No. 序号	Symbol 符号	I/O	Description 描述
1	LED-	P	Power for backlight cathode
2	LED+	P	Power for backlight anode
3	GND	P	Power Ground
4	VDD	P	Power for analog and digital block (3.3V)
5-12	R0-R7	I	Red data input.
13-20	G0-G7	I	Green data input.
21-28	B0-B7	I	Blue data input.
29	GND	P	Power Ground
30	PCLK	I	Clock for input data.
31	DISP	I	Standby mode. Normally pulled high.
32	HSYNC	I	Horizontal sync input in digital parallel RGB
33	VSNC	I	Vertical sync input in digital parallel RGB
34	DE	I	Input data enable control
35	NC	I	Dummy
36	GND	P	Power Ground
37	NC	-	Dummy
38	NC	-	Dummy
39	NC	-	Dummy
40	NC	-	Dummy

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	3.0	3.3	3.6	V	-
Power Supply Current	I _{VDD}	-	130	-	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}	-	0.429	-	Watt	Note1
Module Power Consumption	P _{LCM}	-	1.2	-	Watt	Note1,2

(Ta=+25°C,GND=0V)

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

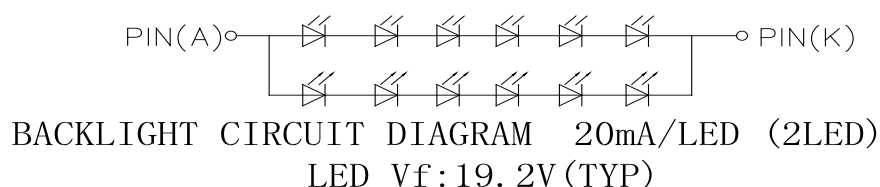
Item 项目	Symbol 符号	Min. 最小值	Typ. 典型值	Max. 最大值	Unit 单位	Remark 备注
Forward Voltage	V _F	-	19.2	-	V	Note1
Forward Current	I _F	-	40	-	mA	Note1
Backlight Power consumption	P _{BL}	-	0.768	-	Watt	Note1
LED life time	-	30000	-	-	Hrs	Note2
LED Quantity		12			PCS	

(Ta=+25°C,GND=0V)

Note1: The LED driving condition is defined for each LED module (6 LED Serial, 2 LED Parallel)。

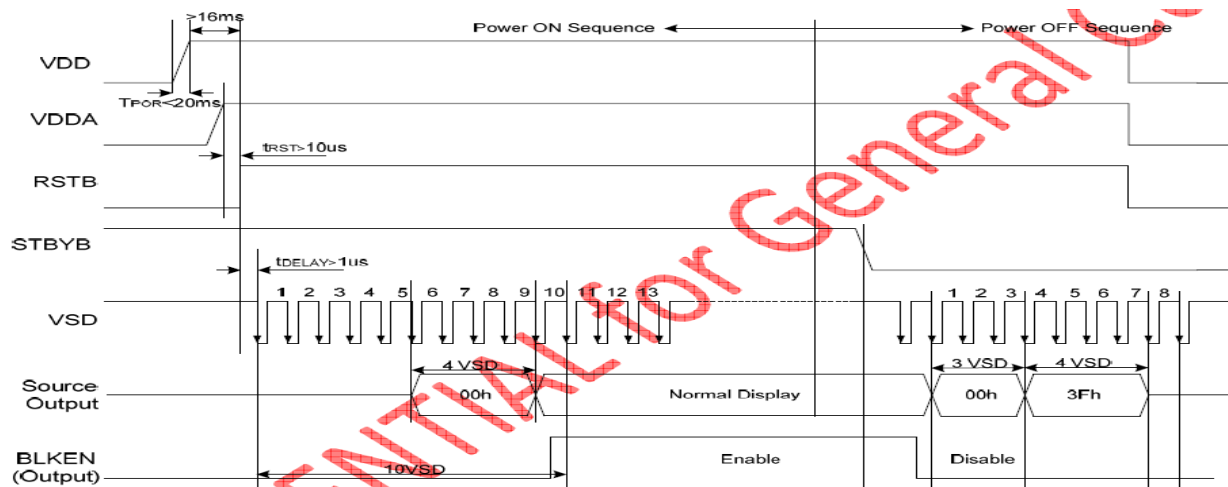
For each LED : I_F=20mA,V_F=3.2V(Typ.),Ta=25°C。

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.



背光电路图
(CIRCUIT DIAGRAM)

5.3 Power On/Off Sequence



Note: For prevent anormal operation, t_{RST} must be longer than 10us during Power ON sequence.

5.4 Timing Characteristics

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

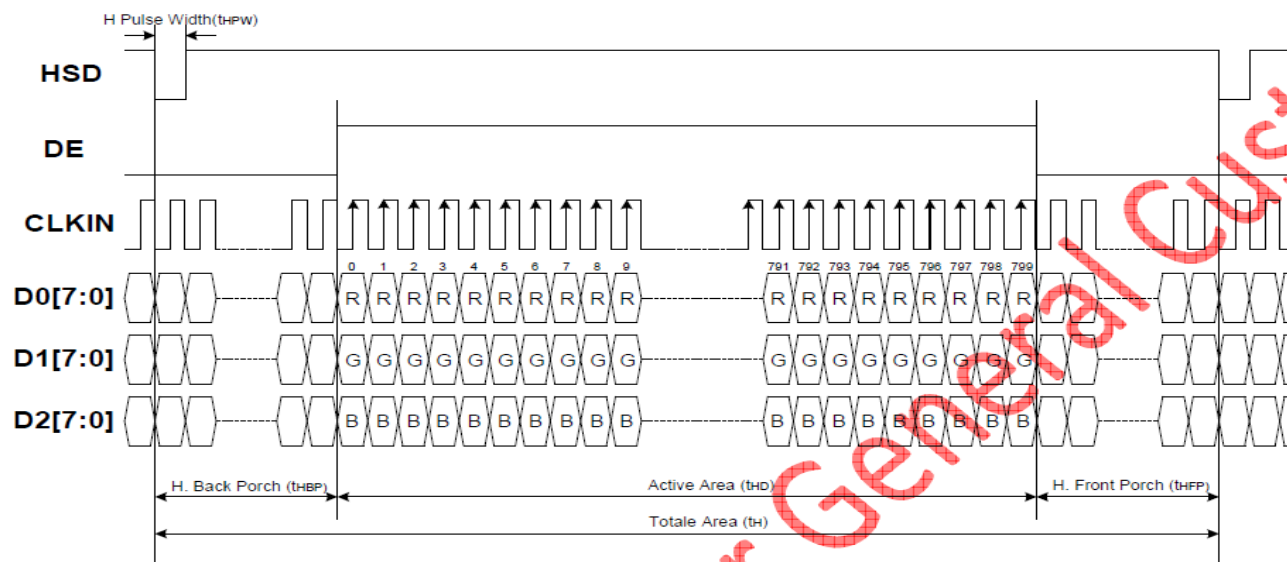
Vertical Input Timing					
Parameter	Symbol	Min.	Value Typ.	Max.	Unit
Vertical display area	t_{VD}	--	480	--	HSD
VSD period time	t_V	510	525	650	HSD
VSD pulse width	t_{VPW}	1	--	20	HSD
VSD back porch	t_{VBP}	23	23	23	HSD
VSD front porch	t_{VFP}	7	22	147	HSD

5.4.2 Horizontal Timing parameters

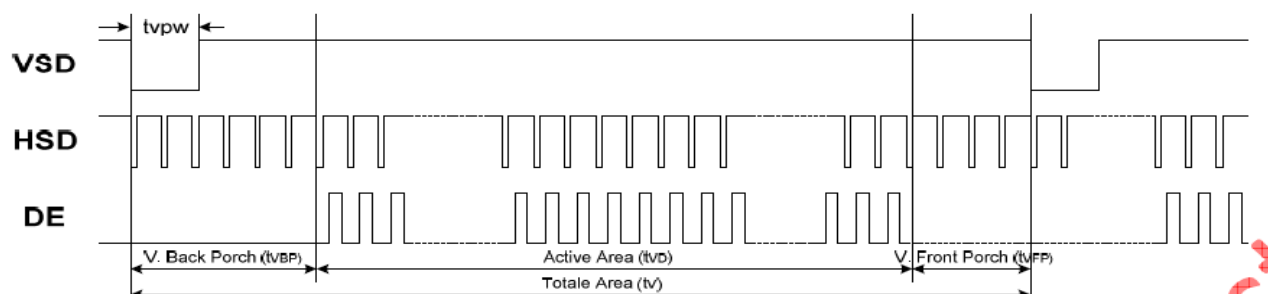
Horizontal Input Timing						
Parameter	Symbol	Min.	Value Typ.	Max.	Unit	
Horizontal display area	t_{HD}	--	800	--	CLKIN	
CLKIN frequency	f_{CLK}	--	33.3	50	MHz	
1 Horizontal line period	t_H	862	1056	1200	CLKIN	
HSD pulse width	Min.	--	1	--	CLKIN	
	Typ.	--	--	--	CLKIN	
	Max.	--	40	--	CLKIN	
HSD back porch	SYNC	t_{HBP}	46	46	CLKIN	
HSD front porch	SYNC	t_{HFP}	16	210	CLKIN	

5.5 Timing Diagram

5.5.1 Horizontal



5.5.2 Vertical



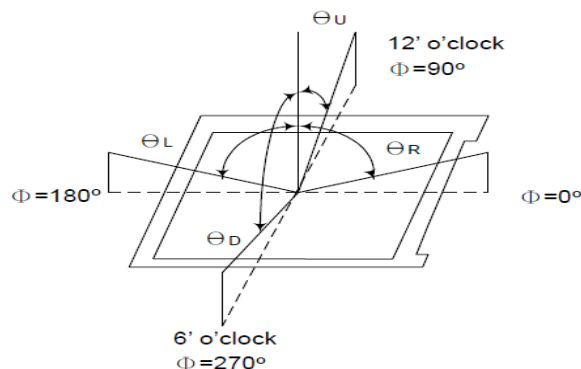
6. OPTICAL CHARACTERISTICS

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	$\theta = 0^\circ$	400	500	-	-	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	$\theta = 0^\circ$	75	-	-	%	Note(3)
Response Time	T _R + T _F	25 °C	-	25	50	ms	Note(2)
Color Coordination	W _X	$\theta = 0^\circ$ (Center) Normal viewing angle B/L On	-0.02	0.321	+0.02	NTSC (x,y)	Note(6)
	W _Y			0.346			
	R _X			0.579			
	R _Y			0.315			
	G _X			0.313			
	G _Y			0.556			
	B _X			0.135			
	B _Y			0.135			
Viewing Angle	θ_L	C/R>10	60	70	-	Degree	Note(1)
	θ_R		60	70	-		
	θ_U		40	50	-		
	θ_D		60	70	-		

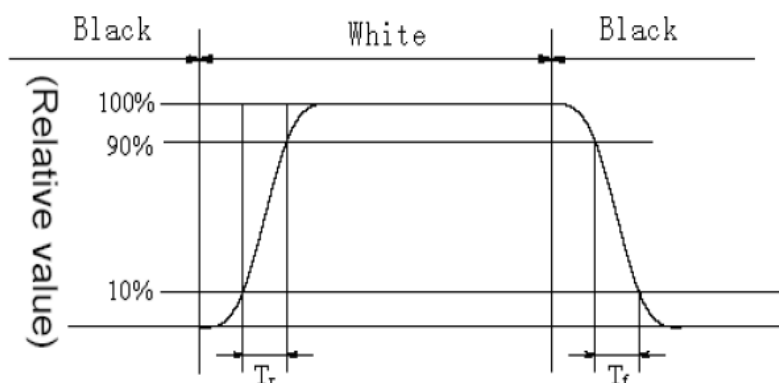
Test Conditions:

1. VDD=3.3V, 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

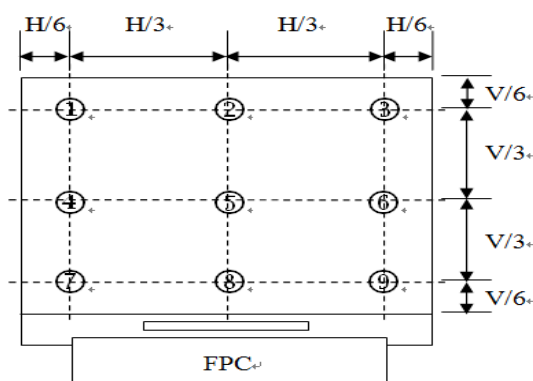


Note2: Definition of Response time: Sum of T_R and T_F



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

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

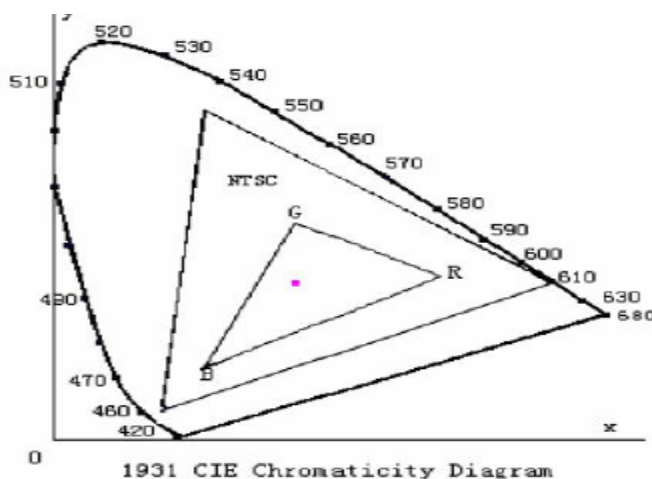
Note 5: Definition of Luminance: Center Luminance of white is defined as luminance values of 1point average across the LCD surface.

Note 6: Definition of Color Chromaticity (CIE 1931)

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

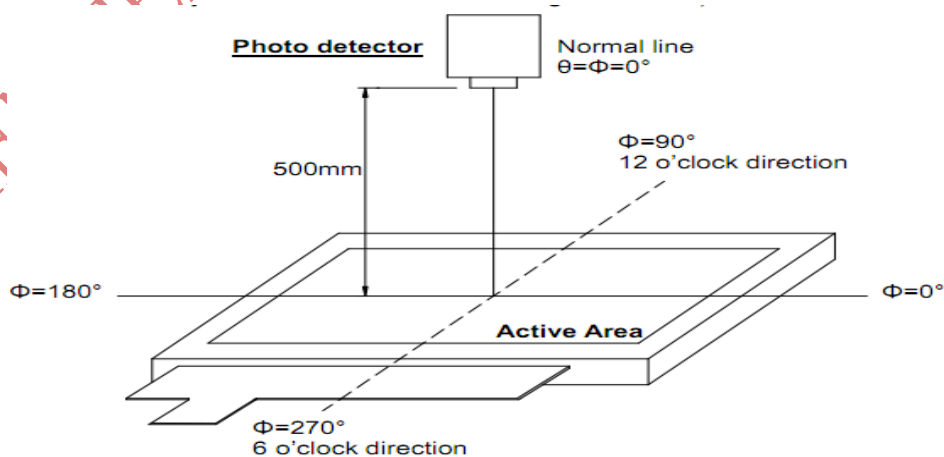
Note 7: Definition of NTSC ratio:

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



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 / 240Hours	Note1,2,3
Low Temperature Storage	Ta =-20°C / 240Hours	Note1,2,3
High Temperature Operating	Ta =+60°C / 240Hours	Note1,2,3
Low Temperature Operating	Ta =-10°C / 240Hours	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 / 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 1m height, 1 corner, 3 edges, 6 surfaces.	Note2
ESD(Whole Machine)	Contact: ±8KV, Air: ±12KV 150PF/330Ω, 5Points/panel, 5times	Note4

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.

Note 4: In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judged as a good part.

Note5: The final interpretation of the above reliability test standard is owned by VIEWE.

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:

