

LCD MODULE
SPECIFICATION

Model:	UE070WV-RN50-L020
Version:	V2.0
Date:	20180308

☐ 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.

请贵司在收到规格书的两周内, 将签好字的规格书原件或者复印件寄回. 如果没有返回, 我司将会认为贵司已经默认接受产品规格书中的全部资料和规范.

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	2018.01.19	Preliminary release	
V2.0	2018.03.08	Change Spec format	All

TABLE of CONTENTS

1. GENERAL INFORMATION	4
1.1 Features	4
1.2 Mechanical Specification	4
2. ABSOLUTE MAXIMUM RATINGS	5
3. MECHANICAL DRAWING	6
4. I/O CONNECTION & BLOCK DIAGRAM	7
4.1 I/O Connection	7
4.2 Block Diagram	8
5. ELECTRICAL CHARACTERISTICS	9
5.1 TFT-LCD Panel Driving Section	9
5.2 Back Light Driving Section	9
5.3 Power On/Off Sequence	10
5.4 Timing Characteristics	11
5.5 Timing Diagram	11
6. OPTICAL CHARACTERISTICS	12
7. RELIABILITY	15
8. PACKAGE DRAWING	16

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: 133 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	7.0	Inch	Diagonal
Resolution	800(W)*3(RGB)*480(H)	Dots	
Interface	RGB 24bits	-	50PIN
Module Power Consumption	1.185	Watt	Typ.
Active Area	154.08(W)*85.92(H)	mm	
Pixel pitch (W*H)	0.1926 (W)* 0.179 (H)	mm	
Module Size (W*H*D)	165.2(W)*100.2(H)*5.7(D)	mm	Tolerance: ±0.2
Luminance	400	cd/m ²	Typ.
Viewing Direction	12	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	-0.5	5	V	Note1
Power supply2 voltage	AVDD	-0.5	13.5	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}	-20	70	°C	Note1,2
Storage temperature	T _{st}	-30	80	°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 .

3. MECHANICAL DRAWING

[illegible]

4. I/O CONNECTION & BLOCK DIAGRAM

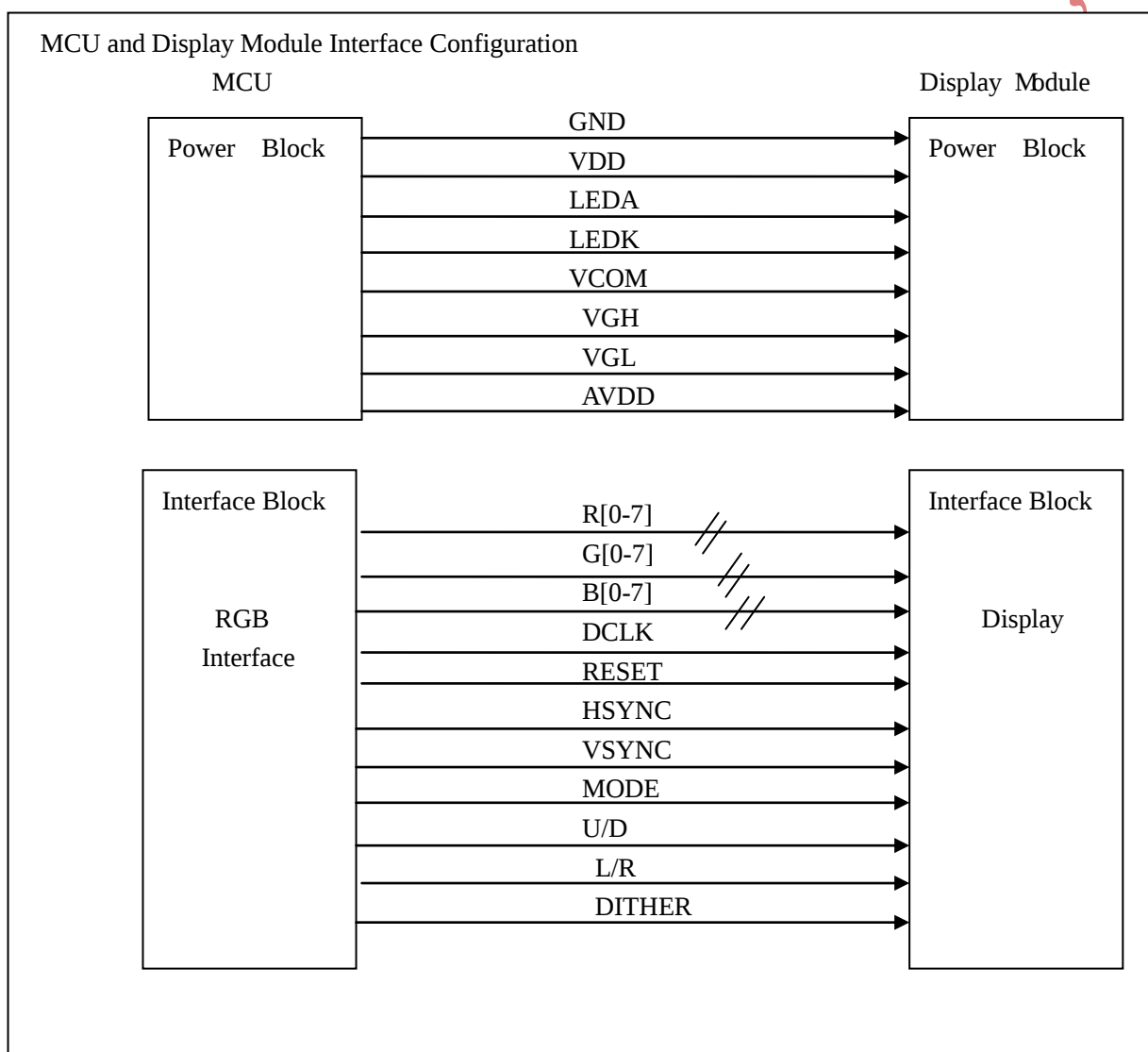
4.1 I/O Connection

Pin No. 序号	Symbol 符号	I/O	Description 描述
1-2	LEDA	P	Power for backlight anode
3-4	LEDK	P	Power for backlight cathode
5	GND	P	Power Ground
6	VCOM	P	LCD common voltage
7	VDD	P	Power for analog and digital block
8	MODE	I	DE/SYNC mode select(normally pull high)
9	DE	I	Input data enable control
10	VSNC	I	Vertical sync input in digital parallel RGB
11	HSNC	I	Horizontal sync input in digital parallel RGB
12-19	B7-B0	I	Blue data input.
20-27	G7-G0	I	Green data input
28-35	R7-R0	I	Red data input
36	GND	P	Power Ground
37	DCLK	I	Clock for input data.
38	GND	P	Power Ground
39	L/R	-	Shift direction control pin for Horizontal
40	U/D	-	Shift direction control pin for Vertical
41	VGH	-	Gate on voltage
42	VGL	-	Gate off voltage
43	AVDD		Power for analog block
44	RESET		Hardware global reset, Low active
45	NC		Dummy
46	VCOM		LCD common voltage

47	DITHER		Dithering function enable control (Normally pull high)
48	GND		Power Ground
49-50	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 Supply2 Voltage	AVDD	10.2	10.4	10.6		-
Power Supply3 Voltage	VGH	-	16	-		-
Power Supply4 Voltage	VGL	-	-7	-		-
Power Supply5 Voltage	VCOM	-	4.1	-		Note3
Power Supply Current	IVDD	-	10	-	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}	-	0.033	-	Watt	Note1
Module Power Consumption	P _{LCM}	-	1.185	-	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.

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

5.2 Back Light Driving Section

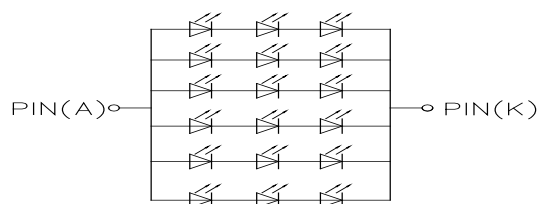
Item 项目	Symbol 符号	Min. 最小值	Typ. 典型值	Max. 最大值	Unit 单位	Remark 备注
Forward Voltage	V _F	-	9.6	-	V	Note1
Forward Current	I _F	-	120	-	mA	Note1
Backlight Power consumption	P _{BL}	-	1.152	-	Watt	Note1
LED life time	-	30000	-	-	Hrs	Note2
LED Quantity			18		PCS	

(Ta=+25°C,GND=0V)

Note1: The LED driving condition is defined for each LED module (3 LED Serial, 6 LED Parallel)。

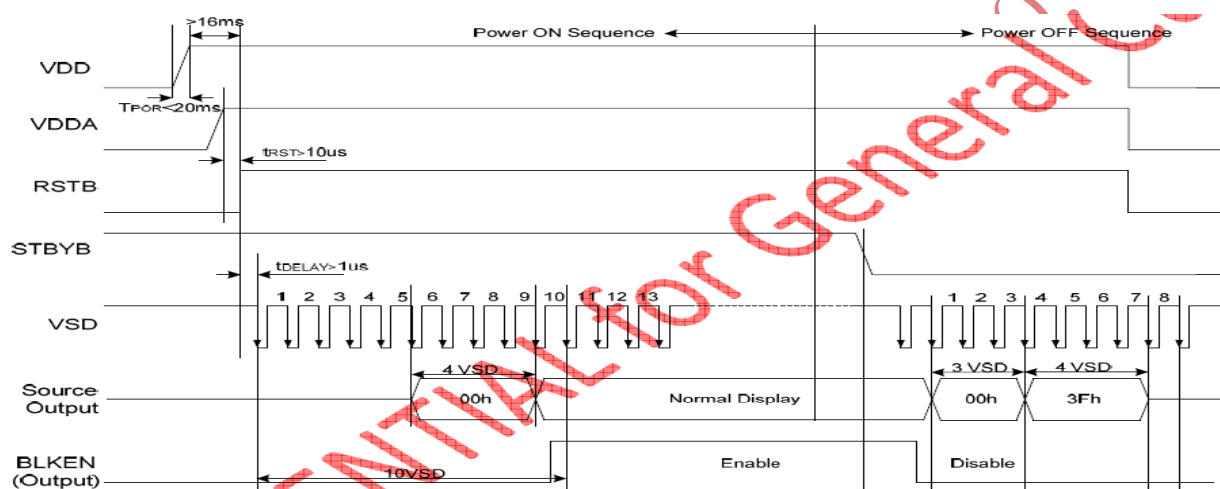
For each LED : I_F=20mA,V_F=3.2V(Typ.),Ta=25°C。

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.



BACKLIGHT CIRCUIT DIAGRAM 20mA/LED (18LED)
LED Vf: 9.6V (TYP)
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 ($T_a = +25^\circ C, GND = 0V$)

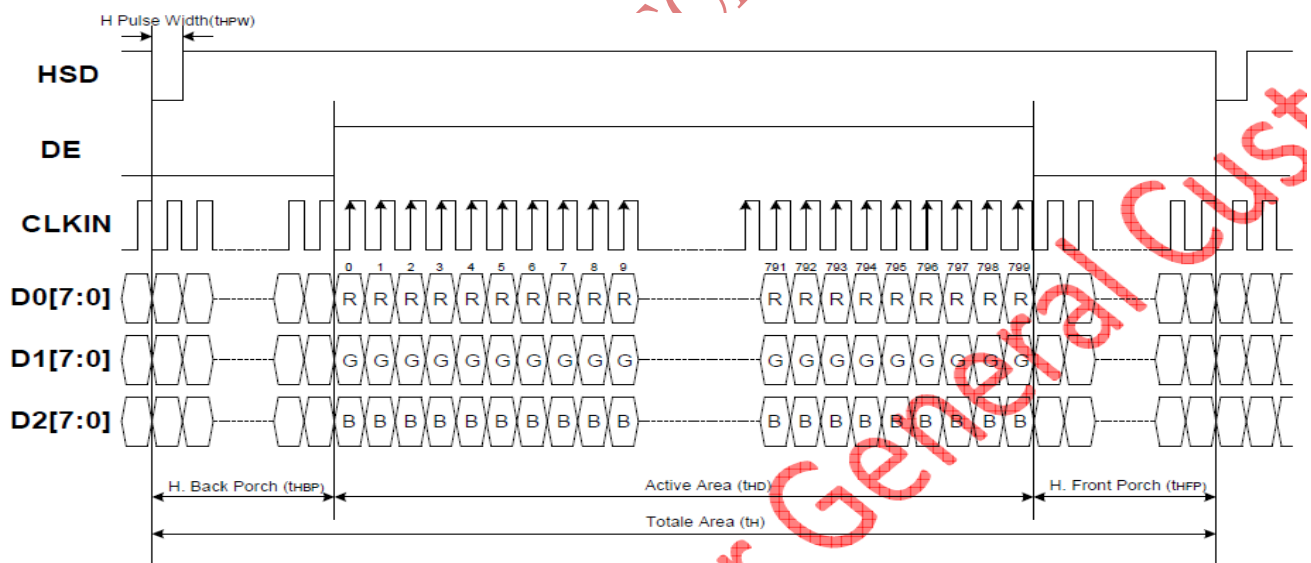
Vertical Input Timing					
Parameter	Symbol	Min.	Value Typ.	Max.	Unit
Vertical display area	t_{VD}	--	480	--	HSD
VSD period time	t_V	510	525	650	HSD
VSD pulse width	t_{VPW}	1	--	20	HSD
VSD back porch	t_{VBP}	23	23	23	HSD
VSD front porch	t_{VFP}	7	22	147	HSD

5.4.2 Horizontal Timing parameters

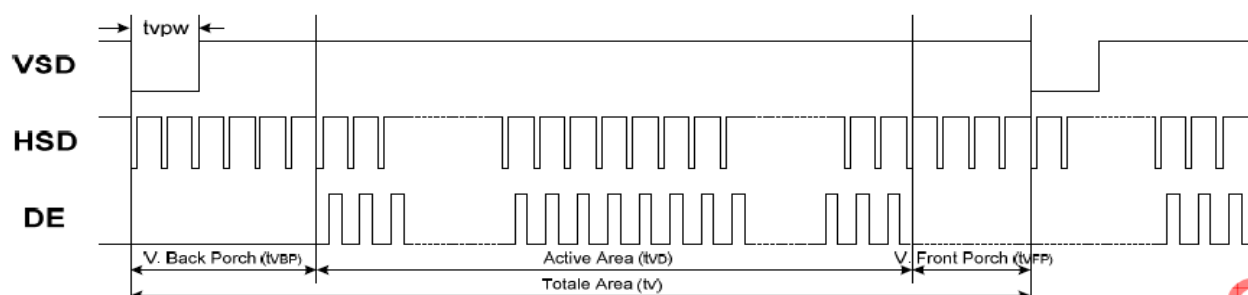
Horizontal Input Timing						
Parameter	Symbol	Min.	Value Typ.	Max.	Unit	
Horizontal display area	t_{HD}	--	800	--	CLKIN	
CLKIN frequency	f_{CLK}	--	33.3	50	MHz	
1 Horizontal line period	t_H	862	1056	1200	CLKIN	
HSD pulse width	Min.	--	1	--	CLKIN	
	Typ.	--	--	--	CLKIN	
	Max.	--	40	--	CLKIN	
HSD back porch	SYNC	t_{HBP}	46	46	CLKIN	
HSD front porch	SYNC	t_{HFP}	16	210	354	CLKIN

5.5 Timing Diagram

5.5.1 Horizontal



5.5.2 Vertical



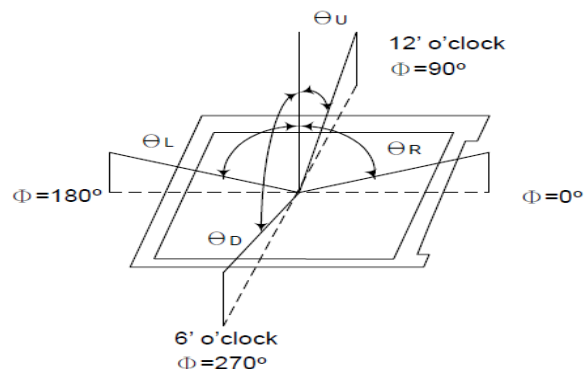
6. OPTICAL CHARACTERISTICS

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	$\theta = 0^\circ$	500	800	-	-	Note(4)
NTSC Ratio	S	$\theta = 0^\circ$	-	51	-	%	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	0.310	+0.02	NTSC (x,y)	Note(6)
	W _Y			0.330			
	R _X			0.581			
	R _Y			0.311			
	G _X			0.311			
	G _Y			0.555			
	B _X			0.136			
	B _Y			0.119			
Viewing Angle	θ_L	C/R>10	60	70	-	Degree	Note(1)
	θ_R		60	70	-		
	θ_U		50	60	-		
	θ_D		60	70	-		

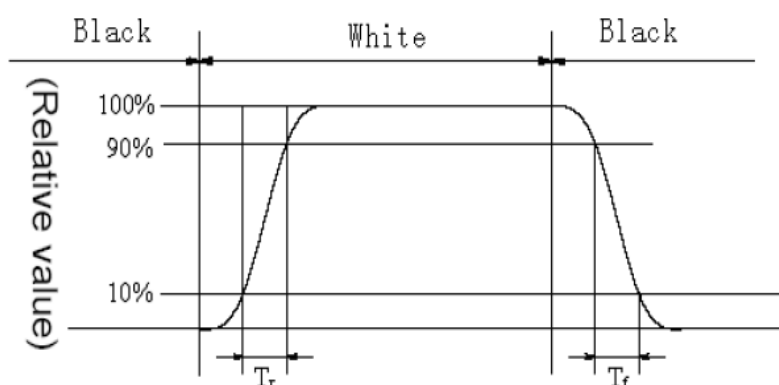
Test Conditions:

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

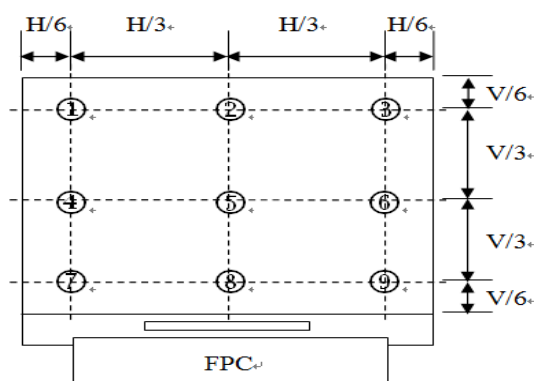


Note2: Definition of Response time: Sum of T_R and T_F



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

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

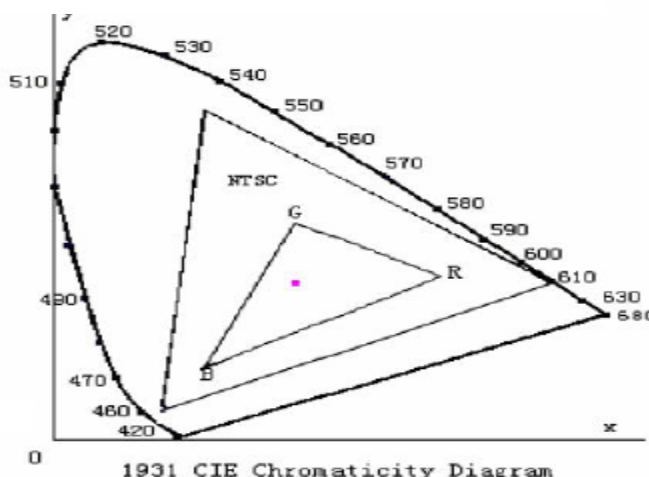
Note 5: Definition of Luminance: Center Luminance of white is defined as luminance values of 1point average across the LCD surface.

Note 6: Definition of Color Chromaticity (CIE 1931)

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

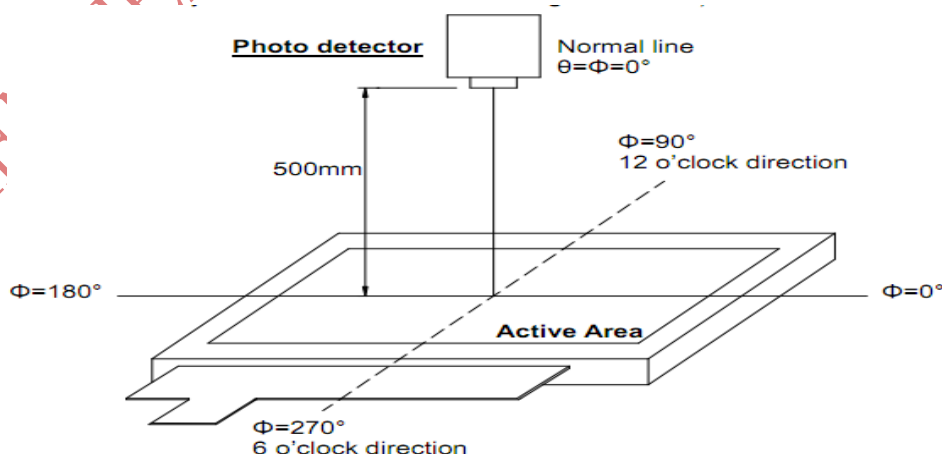
Note 7: Definition of NTSC ratio:

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



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 =+80°C / 240Hours	Note1,2,3
Low Temperature Storage	Ta =-30°C / 240Hours	Note1,2,3
High Temperature Operating	Ta =+70°C / 240Hours	Note1,2,3
Low Temperature Operating	Ta =-20°C / 240Hours	Note1,2,3
Temperature Cycle storage Test	-30°C/30min ↔ +80°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:

