



承认书

产品型号: DW1560B6Y1 (Color gamut: 69%)

产品规格: 1920RGB*1080TFTLCM(1000cd/m2)

送承方:

制订	审查	核准	公司印章
 2021.09.25	 2021.09.25		

承认方:

研发部	工程部	品质部	核准	公司印章

临时规格书

正式规格书



Document Revision History

Version	Date	Page	Description	Changed By
V00	2021-09-25	-	First issue	王加林



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1. LCM Specification

1.1 Description

DW1560B6Y1 is a transmissive type color active matrix liquid crystal display(LCD) which uses amorphous thin film transistor(TFT) as switching devices. This product is composed of a TFT LCD panel, 4 drives IC, 2 PCBAs and a LED-backlight unit. The active display area is 15.6 inches diagonally measured and the native resolution is 1920*RGB*1080.Features of this product are listed in the following table.

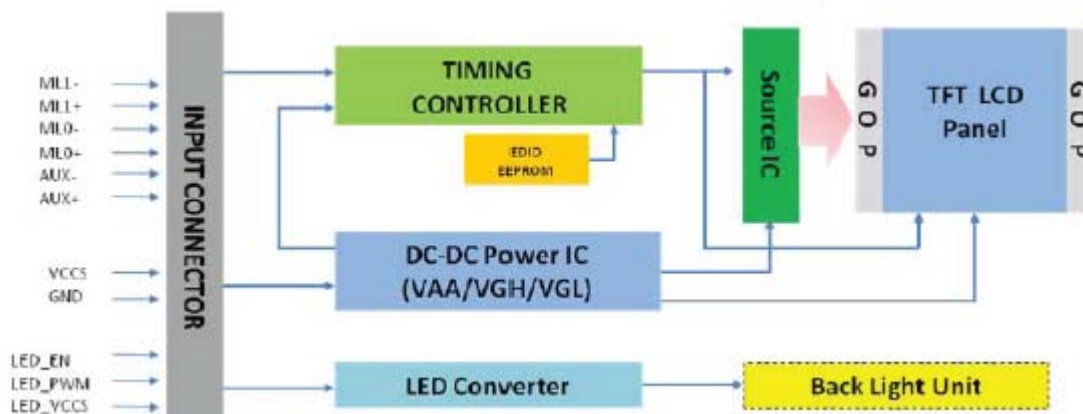
1.2 Functions & Features

Table 1.1 Module Functions & Features

Parameter	Value	Unit
LCD Mode	TFT/Transmissive	-
Color Depth	16.7M	-
Display Resolution	1920RGB*1080	pixels
Module Size	222.0(H)*360.0(W)*5.70(T)(Exclude PCBA)	mm
Active Area (A.A)	193.59(H)*344.16(W)	mm
Pixel Arrangement	RGB-stripe	-
Viewing Direction	ALL	
Display Mode	Normally Black	
LCD Controller/Driver	ILI6145A	-
IC Package Type	COG	-
Interface	8Bit LVDS	-
Power Supply Voltage	3.0~3.6 (Cell 0.9W max)	V
LCM Brightness	1000 (Type.)	cd/m ²
Back-light	White LED*100	PCS

Note : The specified power consumption (with converter efficiency) is under the conditions at VCCS = 3.3 V, fv = 60 Hz, and Ta = 25 ± 2 °, whereas **Mosaic** pattern is displayed.

1.3 Function Block Diagram





2. Mechanical Specification

Dimensions: 360±0.3 (OUTLINE), 212.3±0.3 (OUTLINE), 4.28±0.5, 96.74, 66.46, 120.89±0.5, 155.39, 5.74±0.3, 360±0.3 (OUTLINE), 348.25 (BEZ Opening), 346.76 (UP PDL), 344.16 (A.A), 178.79, 50.56, 258.4, 5.41, 6.71, 9.33, 7.77, 106.13, 193.59 (K.A), 196.7 (UP PDL), 197.61 (BEZ Opening), 212.3±0.3 (OUTLINE), 221.95±0.5.

Labels: PCB 厚度 0.8mm, 元件高度最大 1.3mm, 导电布, 导电胶, 导电膏, 导电漆, 导电布, 导电胶, 导电膏, 导电漆.

U20	PIN NO.	SYMBOL
	1	GND
	2	RXEINO-
	3	RXEINO+
	4	GND
	5	RXEINI-
	6	RXEINI+
	7	GND
	8	REXIN2-
	9	REXIN2+
	10	GND
	11	RXECLK-
	12	RXECLK+
	13	GND
	14	RXEIN3-
	15	RXEIN3+
	16	GND
	17	RXOINO-
	18	RXOINO+
	19	GND
	20	RXOINI-
	21	RXOINI+
	22	GND
	23	RXOIN2-
	24	RXOIN2+
	25	GND
	26	RXDCLK-
	27	RXDCLK+
	28	GND
	29	RXOIN3-
	30	RXOIN3+
	31	GND
	32	GND
	33	GND
	34	BL_EN (DN:3.3V)
	35	BL_PWM (20KHZ)
	36	BL_PWR (11-15V)
	37	BL_PWR (11-15V)
	38	VDD (3.3V)
	39	VDD (3.3V)
	40	GND

LED 电路图

LCM Brightness	850cd/m ² (MIN) 1000 cd/m ² (TYP)
Display Type	TFT/NormallyBlack/TRANSMISSIVE
Display Resolution	DOTS:1920RGB*1080
Viewing Angle	ALL
LCD Controller/Driver	IL16145A
Logic Voltage	3.3V
Operation Temperature	-20°C ~ 70°C
Storage Temperature	-30°C ~ 80°C
Backlight Spec.	White LED (10 dies in series 10 parallel I=450mA V=29V)

Kingtech Group Co., Ltd.	
TITLE:	DW1560B6Y1
DOC. NO.	
PART NO.	
REV. 1.0	SHEET 1 OF 1
SCALE	1:1
UNITS:	mm

DRAWN:	蒋雨吉
CHECK:	
DATE	20210926
DESCRIPTION	新制订
APPROVE:	王加林



3. Pin Descriptions

3.1 Input CONN Pin Assignment

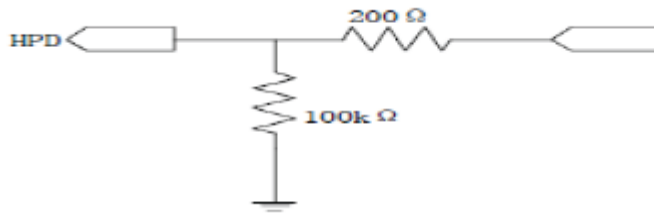
Input Connector (I-pex 20455-040E-12) is used for the module electronics interface

Pin No.	Symbol	I/O	Functional	Remark
1	GND	P	System ground.	
2	RXEIN0-	I	- LVDS differential data input	
3	RXEIN0+	I	+ LVDS differential data input	
4	GND	P	System ground.	
5	RXEIN1-	I	- LVDS differential data input	
6	RXEIN1+	I	+ LVDS differential data input	
7	GND	P	System ground.	
8	RXEIN2-	I	- LVDS differential data input	
9	RXEIN2+	I	+ LVDS differential data input	
10	GND	P	System ground.	
11	RXECLKIN-	I	- LVDS differential clock input	
12	RXECLKIN+	I	+ LVDS differential clock input	
13	GND	P	System ground.	
14	RXEIN3-	I	- LVDS differential data input	
15	RXEIN3+	I	+ LVDS differential data input	
16	GND	P	System ground.	
17	RXOIN0-	I	- LVDS differential data input	
18	RXOIN0+	I	+ LVDS differential data input	
19	GND	P	System ground.	
20	RXOIN1-	I	- LVDS differential data input	
21	RXOIN1+	I	+ LVDS differential data input	
22	GND	P	System ground.	
23	RXOIN2-	I	- LVDS differential data input	
24	RXOIN2+	I	+ LVDS differential data input	
25	GND	P	System ground.	
26	RXOCLKIN-	I	- LVDS differential clock input	
27	RXOCLKIN+	I	+ LVDS differential clock input	
28	GND	P	System ground.	
29	RXOIN3-	I	- LVDS differential data input	
30	RXOIN3+	I	+ LVDS differential data input	
31-33	GND	P	System ground.	
34	BL_ENABLE	P	Off: 0V ; ON: 3.3V	
35	BL_PWM_DM	P	BL Brightness Control, Typ.: 20K Hz	
36-37	BL_PWR	P	BL Power Input 11-15V, Typ:12V	
38-39	VDD	P	Power for Analog Circuit , 3.3V	
40	GND	P	System ground.	

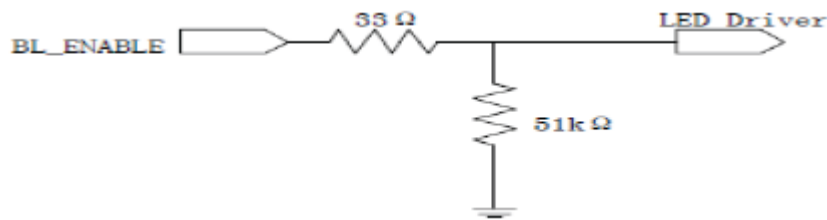
I: Input, O: Output, P: Power



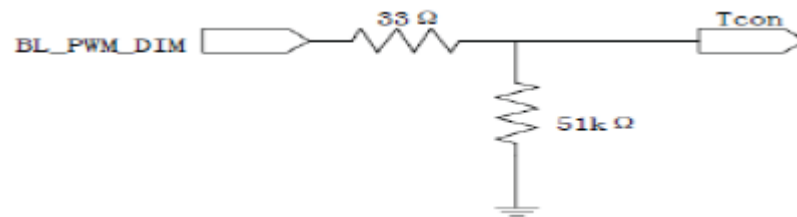
Note 3.1.1 Output circuit is as below:



Note 3.1.2 Input circuit is as below:

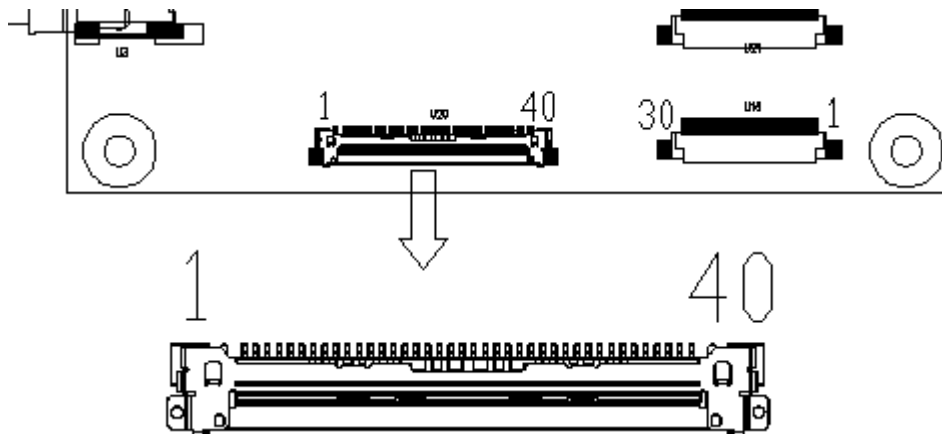


Note 3.1.3 Input circuit is as below:



3.2 CONN PIN1 Location

Input CONNis on bottom side of PCBA, pin 1 location shows as following figure.





4. Electrical Units

4.1 Absolute Maximum Ratings

The absolute maximum ratings are list on Table 4.1. When used out of the absolute maximum ratings, the LCM may be permanently damaged. Using the LCM within the following electrical characteristics limit is strongly recommended for normal operation. If these electrical characteristic conditions are exceeded during normal operation, the LCM will malfunction and cause poor reliability.

Table 4.1 Module Absolute Maximum Ratings

Item	Symbol	Unit	Value	Note
Power Supply Voltage (1)	Vdd	V	-0.3 to +4.0	
Power Supply Voltage (2)	VGH ~ VSS	V	*	
Power Supply Voltage (3)	VSS ~ VGL	V	*	
Operating Temperature	Top	°C	-20 to +70	
Storage Temperature	Tst	°C	-30 to +80	
Operating Humidity	Hop	%(RH)	10~85	

(VSS=0V)

4.2 LCD Electrical characteristics (Ta=25°C)

Item	Symbol	Min.	Type	Max.	Unit.	Note
Power supply voltage	VDD	3.0	3.3	3.6	V	GND=0
	Vrp		50	150	mV	Vcc=+3.3V
	Irush	0		1.5	A	GND=0
	IDD	-	212	364	mA	AGND=0
	Irush			1.0	A	
Operation Temperature	Top	-20		70	°C	
Storage Temperature	Tst	-30		80	°C	



4.3 Back-light Specification

Table 4.3 Back-light Characteristics

Item	Symbol	Conditions	Min.	Type.	Max.	Unit
Supply Voltage	VF	Only Backlight	-	29	33	V
Supply Current	IF		450			mA
Average Brightness	IV	Backlight Current IF=450mA	19300	22700	-	Cd/ m ²
CIE Color Coordinate (Without LCD)	X	Backlight Current IF=450mA	0.29	0.32	0.35	-
	Y		0.33	0.36	0.39	
Uniformity	B	Backlight Current IF=450mA	--	70%	-	%
Color	White					

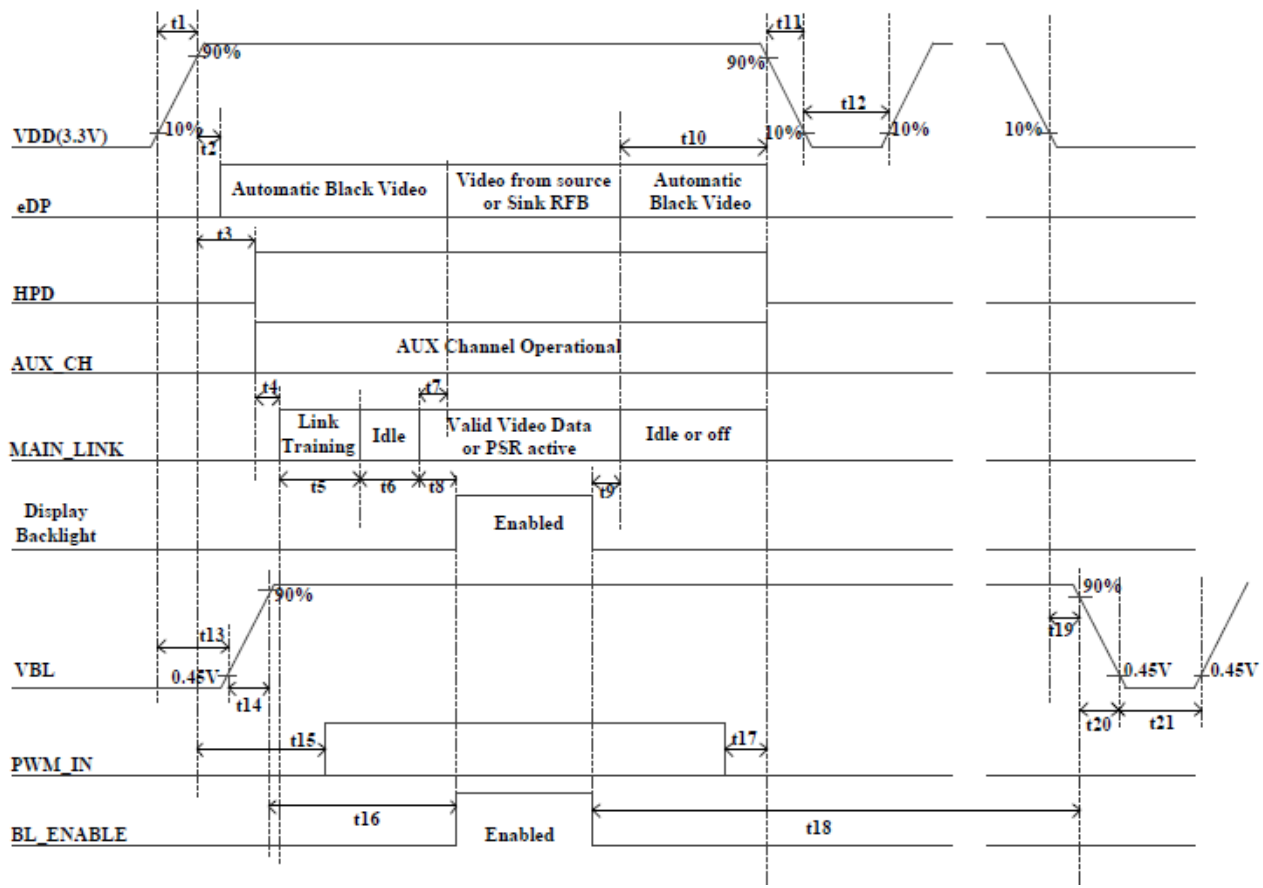
Note: 10 LEDs in series 10 parallel connection.

LCM Brightness: 1000cd/m² (Type.)



5. AC Characteristics

5.1 By after LVDS invert to Edp





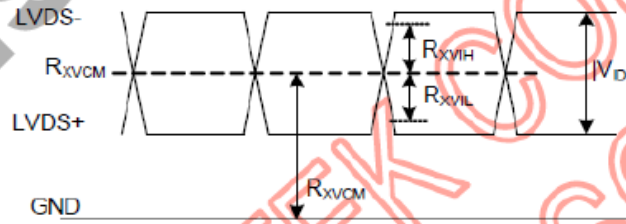
[Note] Do not keep the interface signal high-impedance or unusual signal when power is on.

Symbol	Min	Max	Unit	Note
t1	0.5	10	ms	
t2	0	100	ms	
t3	0	100	ms	
t4	-	-	ms	
t5	-	-	ms	
t6	-	-	ms	
t7	0	50	ms	
t8			ms	
t9			ms	
t10	0	500	ms	
t11	1	50	ms	[Note1]
t12	500	-	ms	
t13	-	-	ms	
t14	0.5	10	ms	
t15	100		ms	
t16	-	-	ms	
t17	0	-	ms	
t18	-	-	ms	
t19	-	-	ms	
t20	0.1	-	ms	
t21	100		ms	

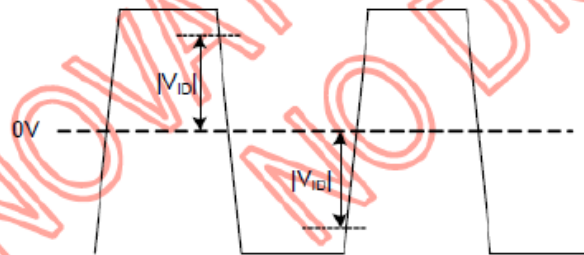
5.2 Switching characteristics for LVDS Receiver

Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
Differential Input High Threshold	R_{xVTH}	+100		+300	mV	
Differential Input Low Threshold	R_{xVTL}	-300		-100	mV	
Differential input common mode voltage	R_{xVCM}	1.0	1.2	1.7- $I_{VID}/2$	V	
Input leakage Current	I_{IN}	-10		10	uA	RX+/-, RXC+/-
Differential input Voltage	I_{VID}	200		600	mV	

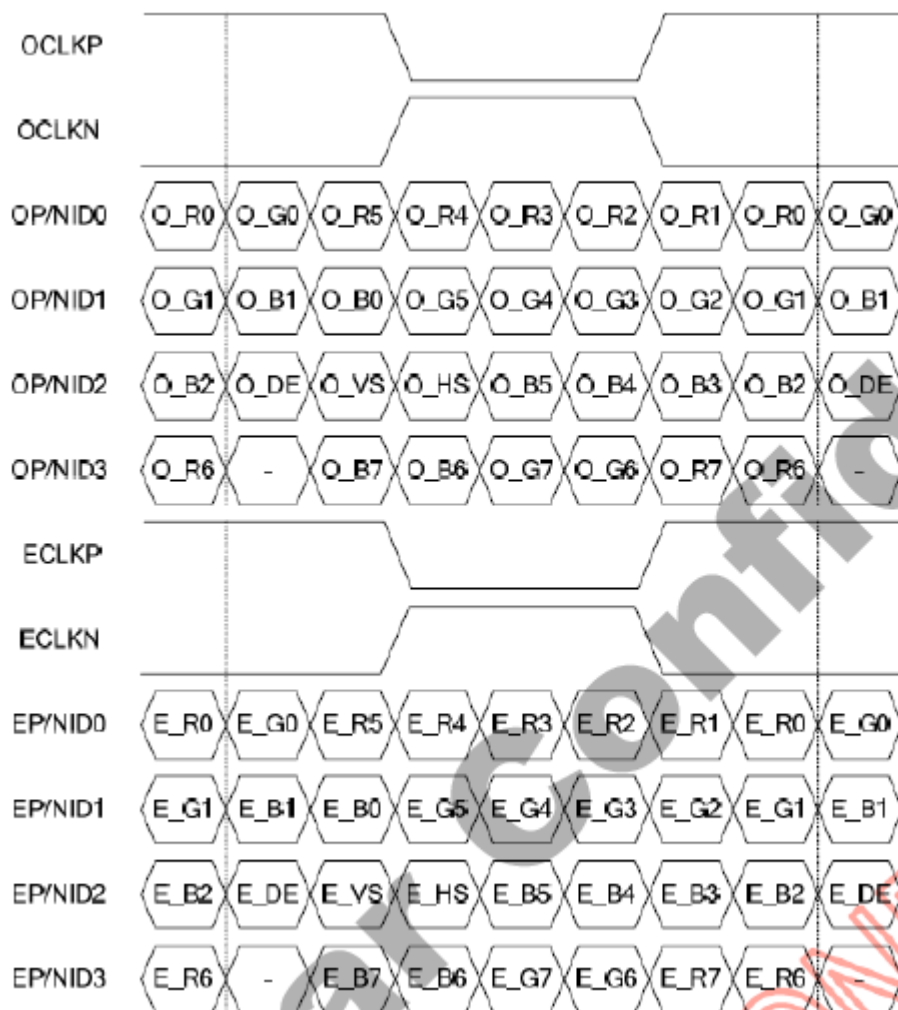
Single-end Signal



Differential Signal



5.3 8Bits LVDS input





5.4 Interface timing (DE mode)

The input signal timing specifications are shown as the following table and timing diagram.

Refresh rate 60Hz

Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
DCLK	Frequency	1/Tc	151.6	152.84	154.04	MHz	-
DE	Vertical Total Time	TV	1128	1132	1136	TH	-
	Vertical Active Display Period	TVD	1080	1080	1080	TH	-
	Vertical Active Blanking Period	TVB	TV-TVD	52	TV-TVD	TH	-
	Horizontal Total Time	TH	2240	2250	2260	Tc	-
	Horizontal Active Display Period	THD	1920	1920	1920	Tc	-
	Horizontal Active Blanking Period	THB	TH-THD	330	TH-THD	Tc	-

Refresh rate 50Hz (Power Saving Mode)

Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
DCLK	Frequency	1/Tc	126.35	127.35	128.35	MHz	-
DE	Vertical Total Time	TV	1128	1132	1136	TH	-
	Vertical Active Display Period	TVD	1080	1080	1080	TH	-
	Vertical Active Blanking Period	TVB	TV-TVD	52	TV-TVD	TH	-
	Horizontal Total Time	TH	2240	2250	2260	Tc	-
	Horizontal Active Display Period	THD	1920	1920	1920	Tc	-
	Horizontal Active Blanking Period	THB	TH-THD	330	TH-THD	Tc	-

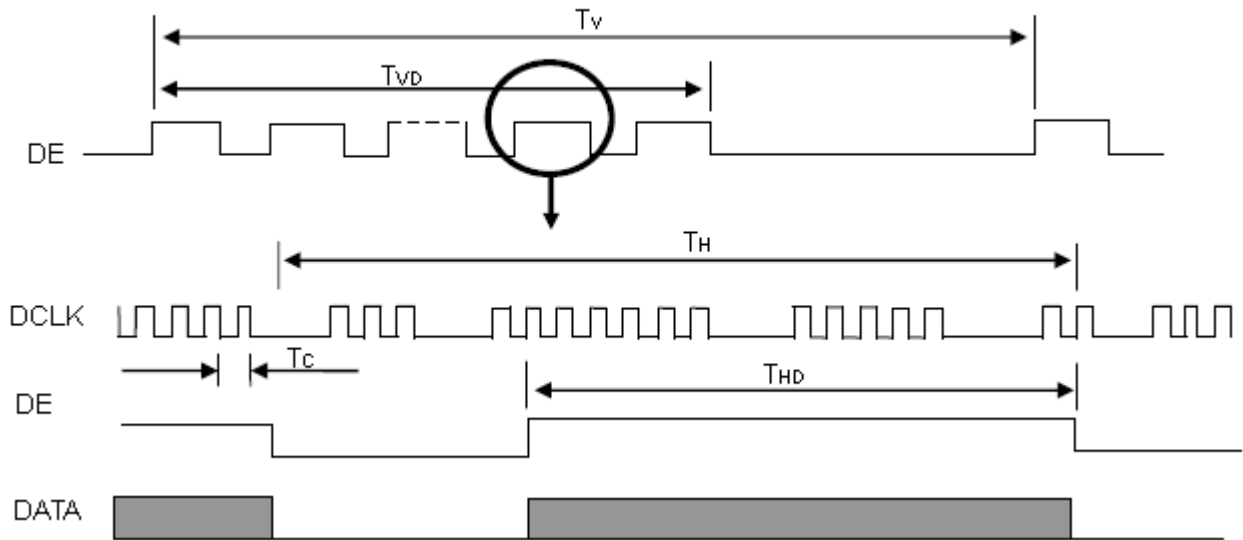
Refresh rate 50Hz (Power Saving Mode)

Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
DCLK	Frequency	1/Tc	121.3	122.26	123.22	MHz	-
DE	Vertical Total Time	TV	1128	1132	1136	TH	-
	Vertical Active Display Period	TVD	1080	1080	1080	TH	-
	Vertical Active Blanking Period	TVB	TV-TVD	52	TV-TVD	TH	-
	Horizontal Total Time	TH	2240	2250	2260	Tc	-
	Horizontal Active Display Period	THD	1920	1920	1920	Tc	-
	Horizontal Active Blanking Period	THB	TH-THD	330	TH-THD	Tc	-

Note (1) The panel can operate at 60Hz normal mode and power saving mode, respectively. All reliability tests are based on specific timing of 60Hz refresh rate. We can only assure the panel's electrical function at power saving mode.



INPUT SIGNAL TIMING DIAGRAM



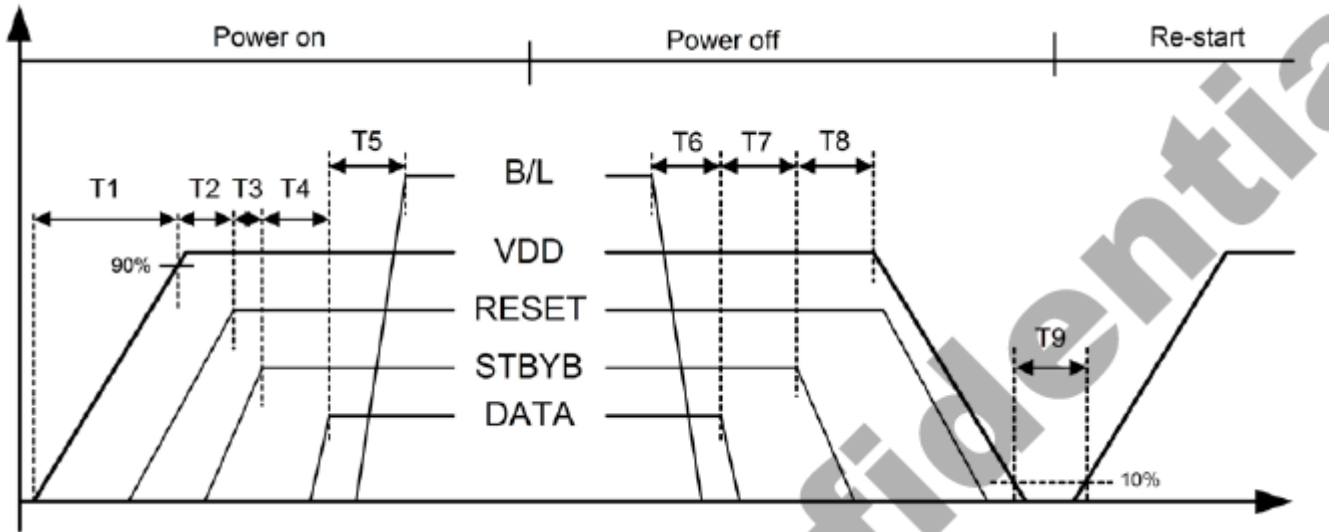
5.5 Input signal, basic display colors and gray scale of each color

Color	Data Signal																							
	Red								Green								Blue							
	R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gray Scale	Red(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(1)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(2)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	...	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Of	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Red	Red(253)	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Red(254)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Red(255)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gray Scale	Green(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	Green(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
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	Of	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Green	Green(253)	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0
		Green(254)	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
		Green(255)	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
Gray Scale	Blue(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Blue(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	...	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Of	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Blue	Blue(253)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	1
		Blue(254)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0
		Blue(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1

Note (1) 0: Low Level Voltage, 1: High Level Voltage



6. Power On/Off Sequence



Item	Min.	Typ.	Max.	Unit
T1	0.5	--	20	ms
T2	1	--	--	ms
T3	1	--	--	ms
T4	200	--	--	ms
T5	50	--	--	ms
T6	50	--	--	ms
T7	16	--	--	ms
T8	16	--	--	ms
T9	1000	--	--	ms

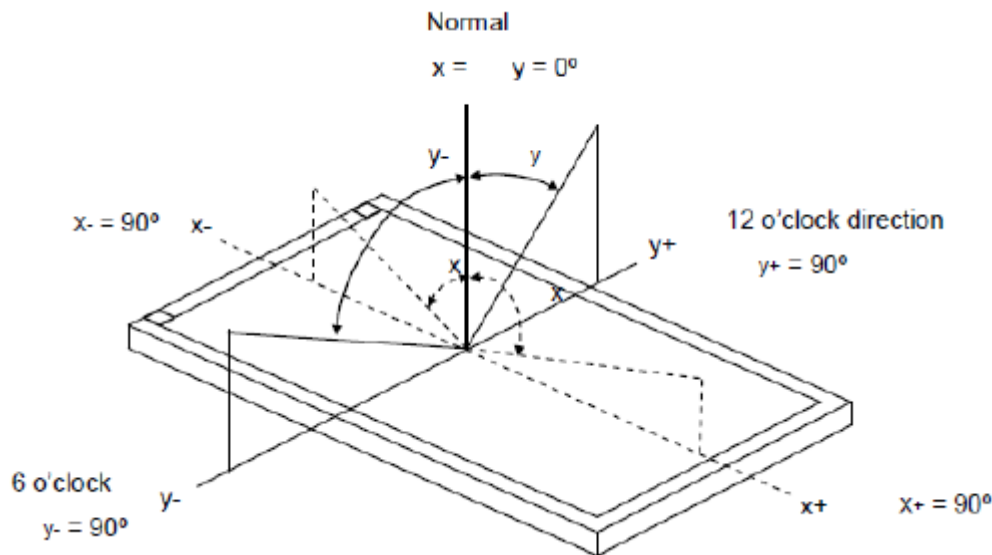


7. Optical Specifications

The relative measurement methods of optical characteristics are shown

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note						
Color Chromaticity (CIE 1931) FOG Only with C-light	Red	Rx	$\theta_x=0^\circ, \theta_y=0^\circ$ R=G=B=255 Gray scale	Typ - 0.03	0.658	Typ + 0.03	-	C Light Source (1),(5) (6),(7),(8)					
		Ry			0.328								
	Green	Gx			0.275								
		Gy			0.574								
	Blue	Bx			0.143								
		By			0.092								
	White	Wx			0.314								
		Wy			0.361								
	Color gamut	C.G							64	69	-	%	
	Center Transmittance	T%							3.83	4.39	-	%	INX BLU (1),(4),(6)
Contrast Ratio	CR		800	1000	-	-	(2)						
Response Time	T_R+T_F	$\theta_x=0^\circ, \theta_y=0^\circ$	-	25	30	ms	(3),(6)						
Viewing Angle	Horizontal	x +	CR>10	80	-	-	Deg.	(1),(5),(6)					
		x -		80	-	-							
	Vertical	y +		80	-	-							
		y -		80	-	-							

Note (1) Definition of Viewing Angle ($_x, _y$):



Note (2) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

$$\text{Contrast Ratio (CR)} = L_{255} / L_0$$

L255: Luminance of gray level 255

L 0: Luminance of gray level 0

$$CR = CR (5)$$

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note (6).

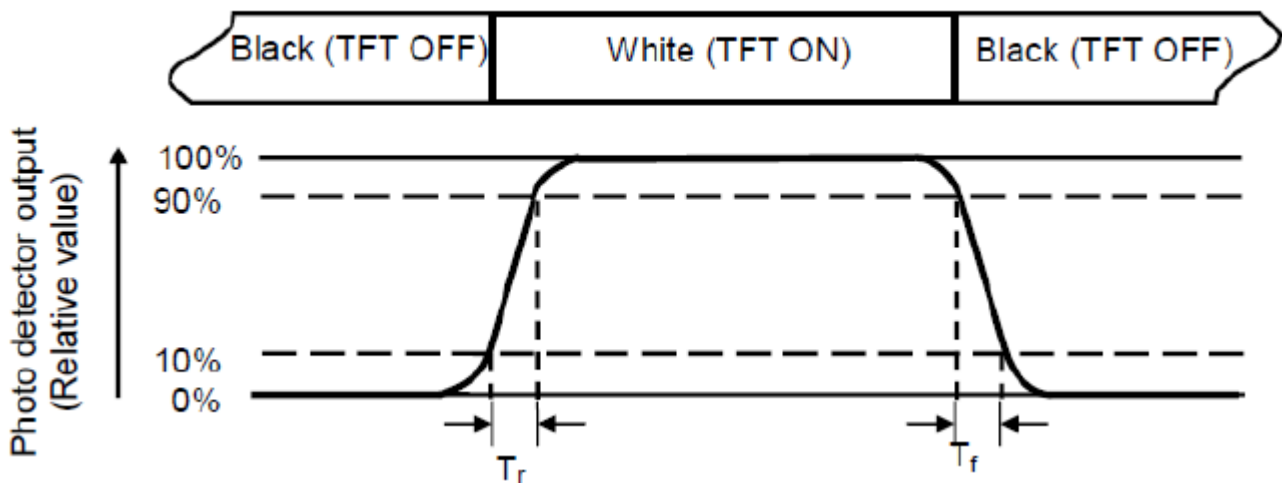


Note (3) Definition of Response Time :

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time (T_r) is the time between photo detector output intensity changed from 10% to 90%. And fall time (T_f) is the time between photo detector output intensity changed from 90% to 10%.

RT = RT (5)

RT (X) is corresponding to the Response Time of the point X at Figure in Note (6).



Note (4) Definition of Luminance of White (L_c):

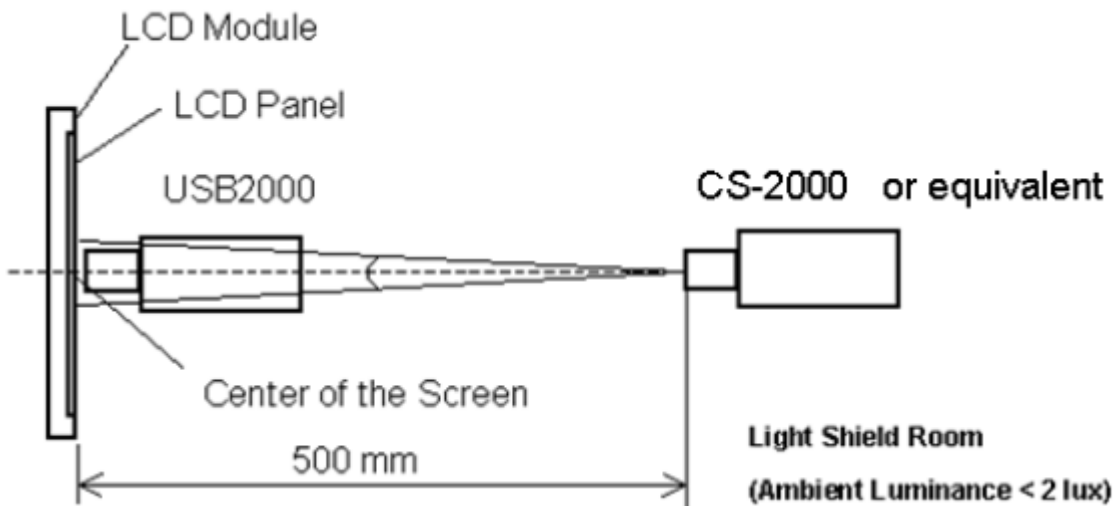
Measure the luminance of gray level 255 at center point

$LC = L$ (5)

$L(x)$ is corresponding to the luminance of the point X at Figure in Note (6).

Note (5) Measurement Setup:

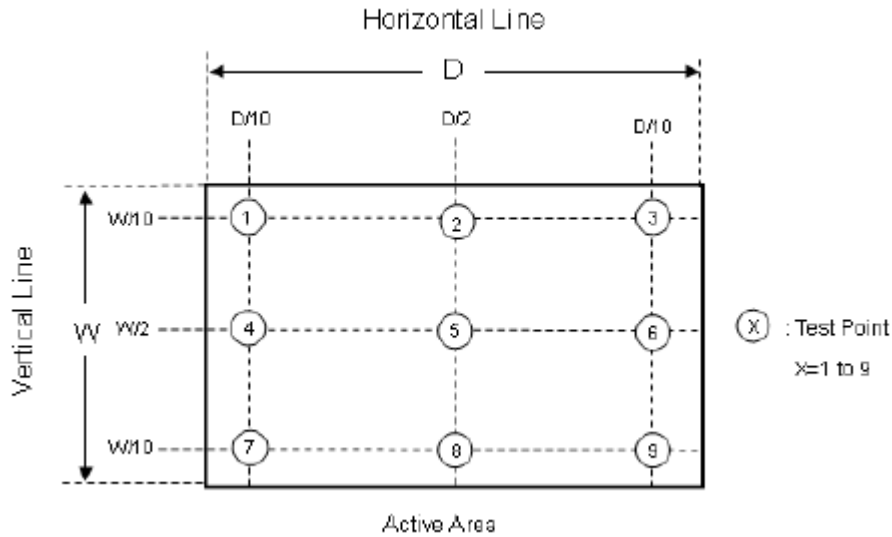
The LCD module should be stabilized at given temperature for 40 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 40 minutes in a windless room.





Note (6) Definition of White Variation ($_W$):

Measure the luminance of gray level 255 at 9 points



Note (7) The listed optical specifications refer to the initial value of manufacture, but the condition of the specifications after long-term operation will not be warranted.

Note (8) Definition of color gamut (C.G%):

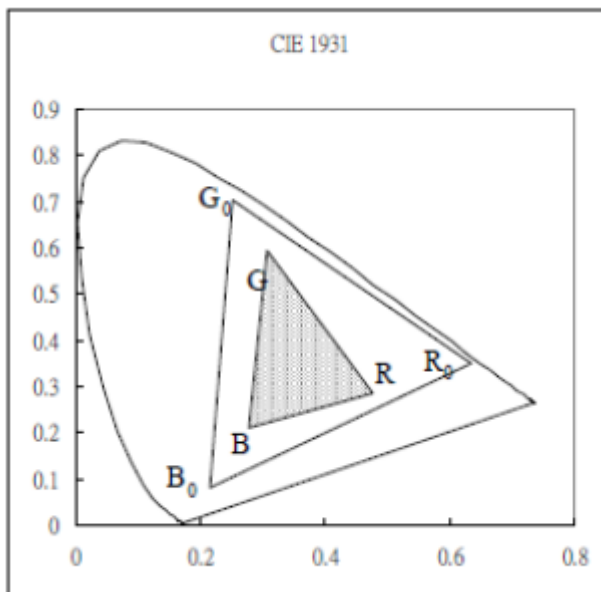
$$C.G\% = \frac{R G B}{R_0 G_0 B_0} \cdot 100\%$$

R_0, G_0, B_0 : color coordinates of red, green, and blue defined by NTSC, respectively.

R, G, B : color coordinates of module on 255 gray levels of red, green, and blue, respectively.

$R_0 G_0 B_0$: area of triangle defined by R_0, G_0, B_0

$R G B$: area of triangle defined by R, G, B





8. Reliability Test Items

No.	Test Item	Test Condition	Check Time
1	High temp storage	T=80°C	96Hrs
2	Low temp storage	T=-30°C	96Hrs
3	High temp operation	T=70°C	96Hrs
4	Low temp operation	T=-20°C	96Hrs
5	High temp & high humidity	T=50°C H=90%	96Hrs

Note 1: The test samples have recovery time for 2 hours at room temperature before the function check. In the standard conditions, there is no display function NG issue occurred.

Note 2: After the reliability test, the product only guarantees operation, but don't guarantee all of the cosmetic specification.

Note 3: Under no condensation of dew.



9. Handling Precautions

9.1 Safety

The liquid crystal in the LCD is poisonous. Keep away from your mouth and eyes. If the liquid crystal contacts with your skin, mouse or clothes, use soap to wash it off immediately.

9.2 Handling

- i. The LCD panel is made of very thin glass. Mechanical impact or extrusion to the surface should be prevented.
- ii. The polarizer attached on the display is very easy to be damaged, handle it with special attention.
- iii. To avoid contamination on the display surface, do not touch the display surface with bare hands.
- iv. The transparent electrodes may be disconnected if you use the LCD panel under dew-condensing environment.
- v. The characteristics of the semiconductor devices may be affected when they are exposed to light, possibly resulting in malfunctioning of the ICs. To prevent such malfunctioning of the ICs, make sure the application and the mounting of the panel are designed so that the IC is not exposed to light.

9.3 Static Electricity

Ground soldering iron tips, tools and testers when you operate. Also ground your body when handling the products and store the products in an anti-electrostatic container.

9.4 Storage

Store the products in a dark place where the temperature is within the range of $25\pm 10^{\circ}\text{C}$ and with low humidity (60%RH or less). Do not store the LCD product in an atmosphere containing organic solvents or corrosive gases.

9.5 Cleaning

Do not wipe the polarizer with dry cloth, as it might cause scratching. Wipe the polarizer with a soft cloth soaked with petroleum IPA. Other chemical might damage the panel.



10. QC

10.1 目的

制定 15.6 寸模组产品出货检验标准，明确检验内容和规范；

10.2 范围

使用原装模组、FOG或自购LCD所生产的模组、FOG出货；

10.3 定义

黑白点：显示的点是黑色或者白色，当对比变化时，这些缺陷在大小或强度上没有变化；

亮点：显示中的点（子像素），在显示区域显示为明亮，大小大于 1/2dot，通过 5%的 ND 卡在黑色画面下可见；

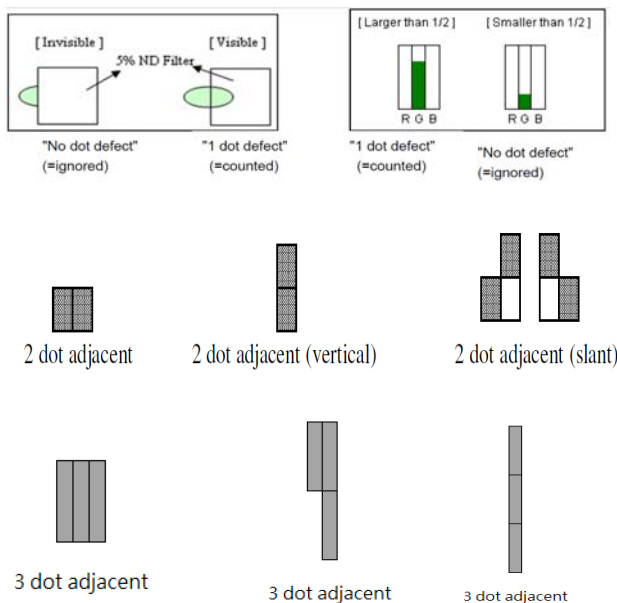
碎亮点：在黑画面下看到的发亮的，大小小于 1/2dot 的点；

暗点：显示中的点（子像素），大小大于 1/2dot，在红绿蓝画面的显示区域显示为黑色；

Mura：相对于显示区域的部分背景亮度，部分区域更暗或者更亮的现象（显示画面不均匀）；

二连点：两个相邻的 dot 点；

三连点：三个相邻的 dot 点；



10.4 检验条件

10.4.1 环境要求：温度：25±5℃、湿度：30%–70%RH；

10.4.2 外观检验灯光：20w 荧光灯或等效照度；

10.4.3 检验距离：30cm；

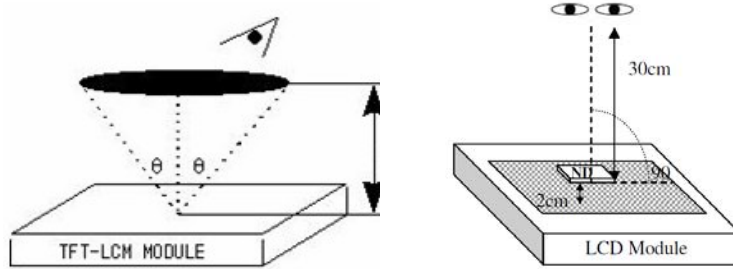


10.4.4 电性检验照度要求：100-200Lux；

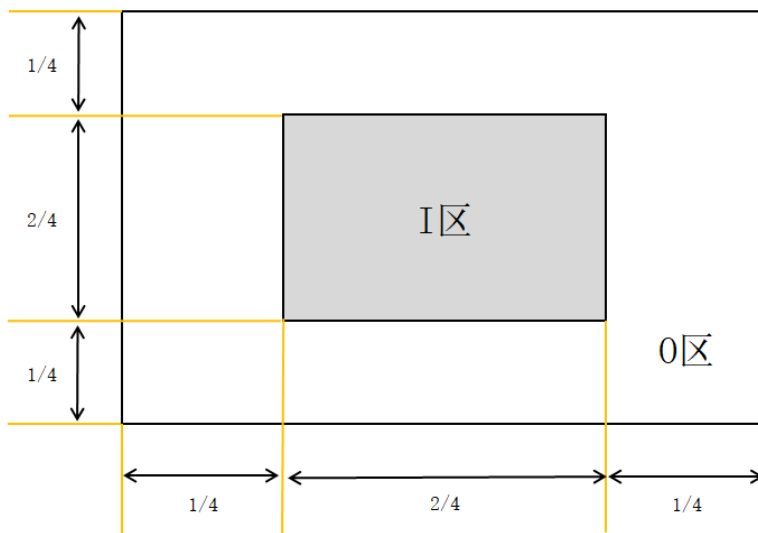
10.4.5 外观检验照度要求：500-700Lux；

10.4.6 ND 卡检验要求：ND 放于距 cell 表面 2cm 处，从 30cm 距离检验；

10.4.7 检验角度：做垂直方向 $\pm 45^\circ$ ，水平方向 $\pm 45^\circ$ 夹角检验；



10.4.8 显示区域划分：将显示区长度和宽度方向均匀分为 4 等分，中间 2/4 区域为 I 区，四周为 0 区，见下图：





10.5 电性检测

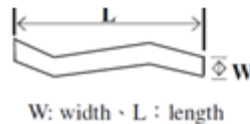
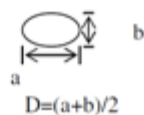
检验项目	检验标准																							
	A0 规			A1 规			A2 规			A3 规			A4 规			B 规								
	I 区	O 区	总数	I 区	O 区	总数	I 区	O 区	总数	I 区	O 区	总数	I 区	O 区	总数	I 区	O 区	总数						
亮点	N≤0			N≤2			N≤4			N≤5			N≤8			N≤10			不计					
二线亮点	N≤0			N≤0			N≤1			DS W			N≤5			N≤10			不计					
三线亮点	N≤0			N≤0			N≤0			5mm			N≤5			N≤10			不计					
暗点	N≤1	N≤5, DS W 10mm	N≤5, DS W 10mm	N≤5, DS W≥10mm		N≤5, DS W	N≤7		N≤7, DS W	N≤10			N≤20			不计								
二线暗点	N≤0			N≤1			10mm			N≤2, DS W≥5mm			5mm			N≤7			N≤20			不计		
三线暗点	N≤0			N≤0			N≤1			N≤1			N≤7			N≤20			不计					
亮点+暗点	N≤5, DS W≥10mm			N≤5, DS W≥10mm			N≤7, DS W≥5mm			/			/			/			/					
脏污点	10xND 逆指不可见, 无视			5xND 逆指不可见, 无视			不计 (测量量不可)			不计 (测量量不可)			不计 (测量量不可)			不计 (测量量不可)			不计					
点状异物 黑点	D≤0.15mm, 数量 N 不计; 0.15mm<D≤0.3mm, N≤3, 间隔≥10mm; 0.3mm<D≤0.4mm, N≤1			D≤0.3mm, 数量 N 不计; 0.3mm<D≤0.8mm, N≤3, 间隔≥10mm;			D≤0.5mm, 数量 N 不计; 0.5mm<D≤0.8mm, N≤3, 间隔≥10mm; 0.8mm<D≤1.2mm, N≤1;			不计			不计			不计								
线状异物	W≤0.1mm, L≤0.3mm, 不计; W≤0.1mm, L≤2mm, N≤2, DS W≥10mm;			W≤0.1mm, 不计; 0.1mm<W≤0.2mm, 0.8mm<L≤4mm, N≤3;			W≤0.1mm, 不计; 0.1mm<W≤0.3mm, 0.8mm<L≤5mm, N≤3;			W≤0.1mm, 不计; 0.1mm<W≤0.5mm, 0.8mm<L≤4mm, N≤5;			不计			不计								
POL 气泡	D≤0.2mm, 不计; 0.2mm<D≤0.8mm, N≤2, DS W≥10mm 线状按线状异物判定			线状及点状不良参照异物标准; 边缘气泡不进入 DM 区 1/2 为 OK			线状及点状不良参照异物标准; 边缘气泡不进入显示区为 OK			不计			5xND 逆指不可见			不计								
Mura	1. 全视角判定, 距离 30mm-50mm 不可见为 OK 2. 轻微 mura 按 10xND 逆指不可见为 OK			MCS 和灰阶范围不可见, 漏背景可见, 不计			5xND 逆指不可见			5xND 逆指不可见			不影响电性 OK			不计								
功能缺陷	显示异常、断线(横线、竖线等)、无品、等影响功能的不良不可有																							



10.6 外观检验

检验项目	图示	检验标准					
		A0 级	A1 级	A2 级	A3 级	A4 级	B 级
FAD 区角落破损		I≤1.5mm, Y≤1.5mm, Z≤T, N≤2 不伤及线路, 显示正常			不伤及线路, 显示正常		
FAD 区边缘破损		Y≤0.5, X≤2.0, Z≤T, N≤2 不伤及线路, 显示正常			不伤及线路, 显示正常		
非 FAD 区角落破损		I≤1.5mm, Y≤1.5mm, Z≤T, N≤2, 不伤及线路, 显示正常			不伤及线路, 显示正常		
非 FAD 区边缘破损		I≤1.5mm, Y≤0.5mm, Z≤T, N 不计, 不伤及线路, 显示正常			不伤及线路, 显示正常		
表面点	无图	D≤0.3mm, 数量 N 不计; 0.3mm<D≤0.8mm, N≤3, 间距≥10mm;			不计		
表面划伤	无图	W≤0.1mm, 不计; 0.1mm<W≤0.2mm, 0.8mm<L≤4mm, N≤3;			不计		
FPC/PCB	无图	1. 定位孔破损不可有 2. FPC 死折不可有 3. 元件脱落不可有 4. 元件虚焊、溢锡等焊接不良不可有 5. 金手指断、脱不可有 6. 元件卡不到位不可有 7. FPC 锡球对位偏移不可有 8. FPC 上双面胶脱落或异常不可有 9. 插座不能松动, 不影响插拔			1. 元件脱落, 不可有 2. 元件虚焊、溢锡等焊接不良, 不可有		
保护膜	无图	1. 划伤不可有, 其他划伤、印记等无视 2. 易擦除贴膜痕附			有保护膜		
裂纹		不可有					

- 1. W : Width
- 2. L : Length
- 3. D : Average Diameter
- 4. N : Count



10.7 质保期限

10.7.1 保修 12 个月（如有合同，以合同为准）。