SHENZHEN ATAR BILLIONS OF ELECTRONIC CO .,LTD

PRODUCT SPECIFICATIONS

For Customer: _____

Customer Model No._____

Module No.: XBY101MBI693-27

Date : 2020.09.18

Version :V0

■Preliminary Product SPEC

☐ Final Product SPEC

For Customer's Acceptance:

Approved By	Comment

Approved by DIV	Reviewed by QA	Reviewed by RD

. Revision Record

Date	Rev. No.	Page	Revision Items	Prepared
2020.09.18	**V0**		**The first release**	**Liang**

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1. General Specificati ns

XBY101MBI693-27 is a TFT-LCD module. It is composed of a TFT-LCD panel, driver IC, FPC, a back light unit. The 10.1′′ display area contains 800 x 1280 pixels and can display up to 16.7M colors. This product accords with RoHS .

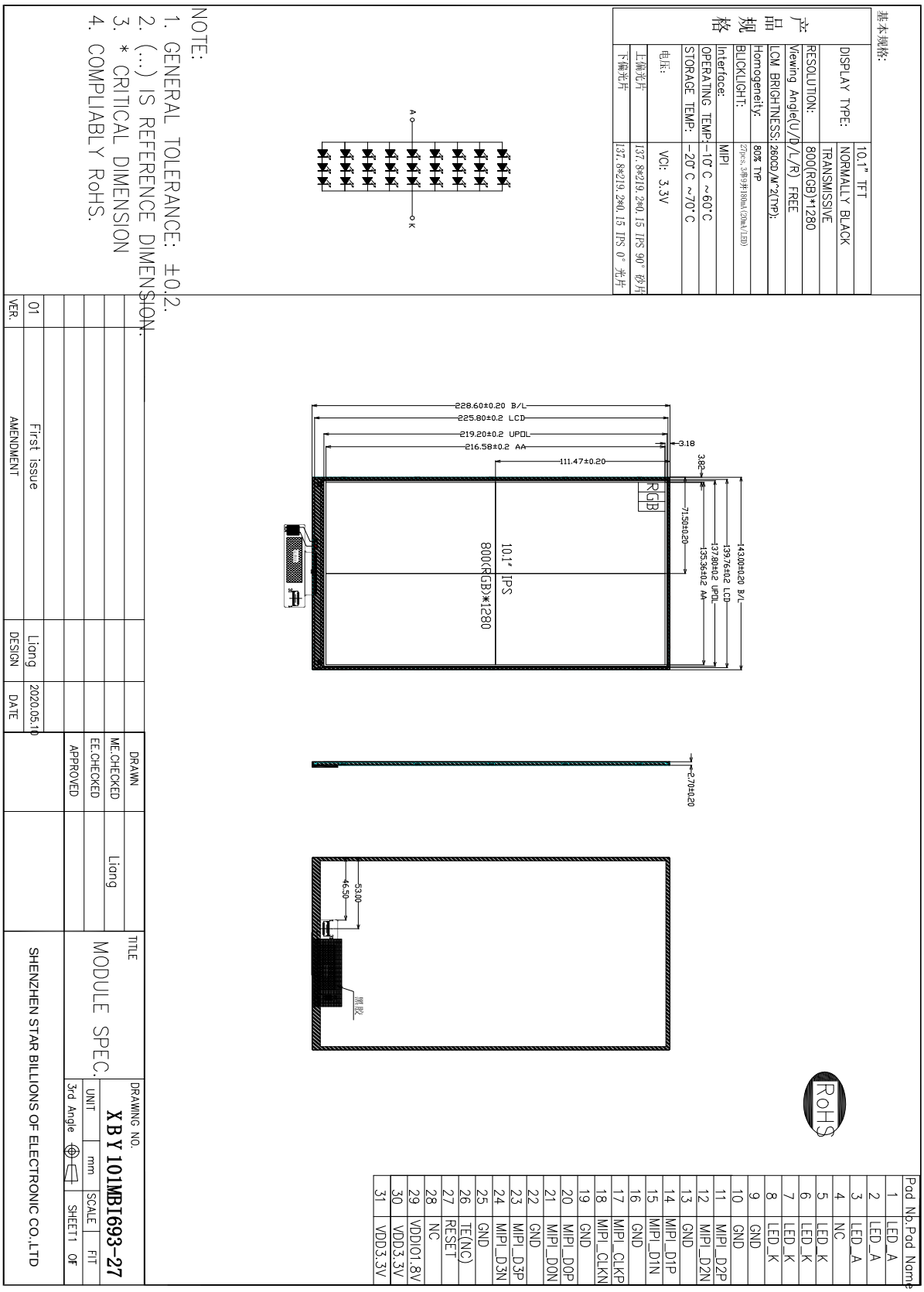
Item	Contents	Unit	Note
LCD Type	TFT	-	
Display color	16.7M		1
Viewing Direction	Free	O'Clock	
Operating temperature	-10~+60	℃	
Storage temperature	-20~+70	℃	
LCM size	142.94*228.54*2.7	mm	2
Active Area(W×H)	135.36x 216.58	mm	
Number of Dots	800（RGB）×1280	dots	
Power Supply Voltage	3.3	V	
Outline Dimensions	Refer to outline drawing	-	
Backlight	27	pcs	
Brightness(LCM)	260	CD/M^2	
Data Transfer	MIPI	-	

environmental criterion

Note 1: Color tune is slightly changed by temperature and driving voltage.

Note 2: Without FPC and Solder，but with eight bumps。

2.Outline.Drawing



3 Interface signals

Pin No.	Symbol	Function
1-3	LED+	LED Anode
4	NC	No Connection
5-8	LED-	LED Cathode
9-10	GND	Ground
11	D2P	+ MIPI differential data input
12	D2N	- MIPI differential data input
13	GND	Ground
14	D1P	+ MIPI differential data input
15	D1N	- MIPI differential data input
16	GND	Ground
17	CLKP	+MIPI differential clock input
18	CLKN	- MIPI differential clock input
19	GND	Ground
20	D0P	+ MIPI differential data input
21	D0N	- MIPI differential data input
22	GND	Ground
23	D3P	+ MIPI differential data input
24	D3N	- MIPI differential data input
25	GND	Ground
26	TE(NC)	No Connection
27	RESET	Global reset pin
28	NC	No Connection
29	IOVCC	Power supply(1.8V)
30-31	VDD	Power supply(3.3V)

4. Absolute Maximum Ratings(Ta=25℃)

4.1 Environmental Absolute Maximum Ratings.

Item	Storage		Operating		Note
	MIN.	MAX.	MIN.	MAX.	
Ambient Temperature	-20℃	70℃	-10℃	60℃	1,2
Humidity	-	-	-	-	3

1. The response time will become lower when operated at low temperature.
2. Background color changes slightly depending on ambient temperature.

   The phenomenon is reversible.
3. Ta<=40℃:85%RH MAX.

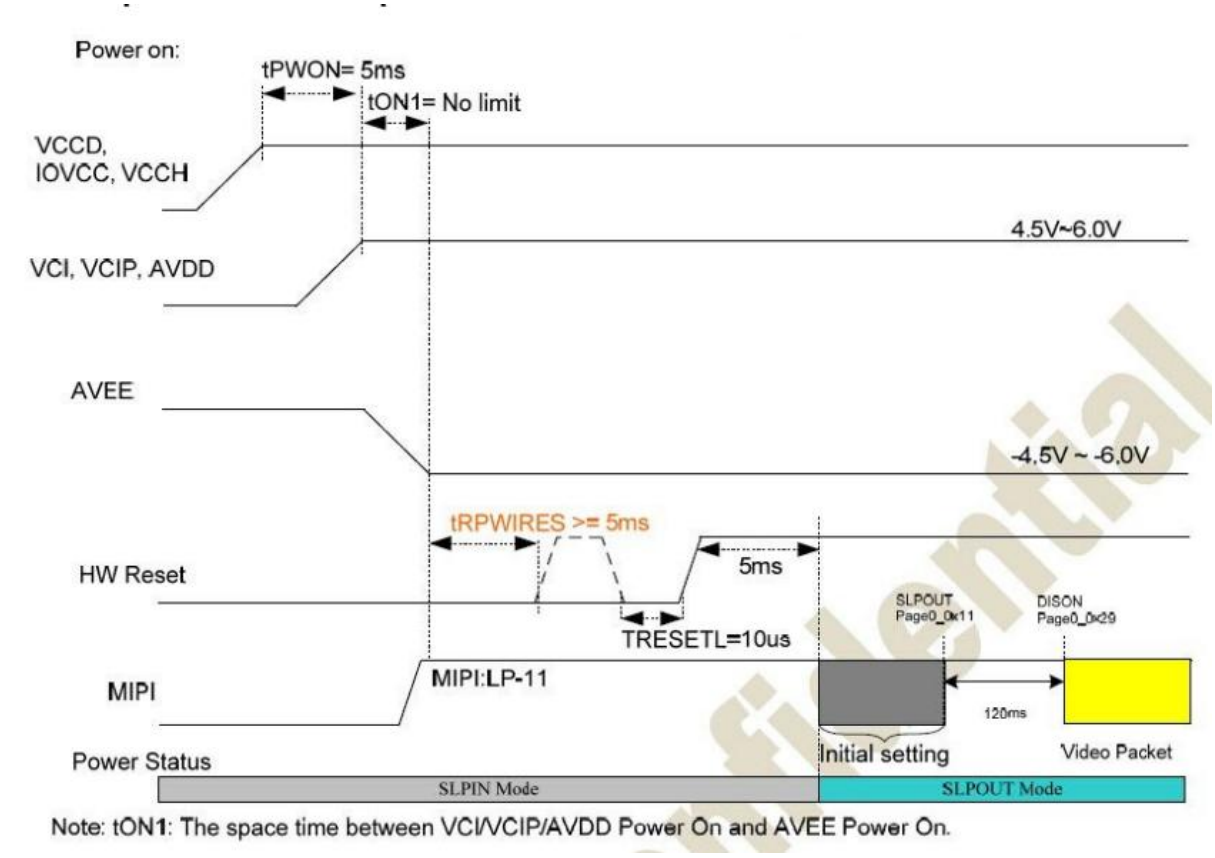
   Ta>=40℃:Absolute humidity must be lower than the humidity of 85%RH at 40℃.

5. Electrical Specifications and Instruction Code

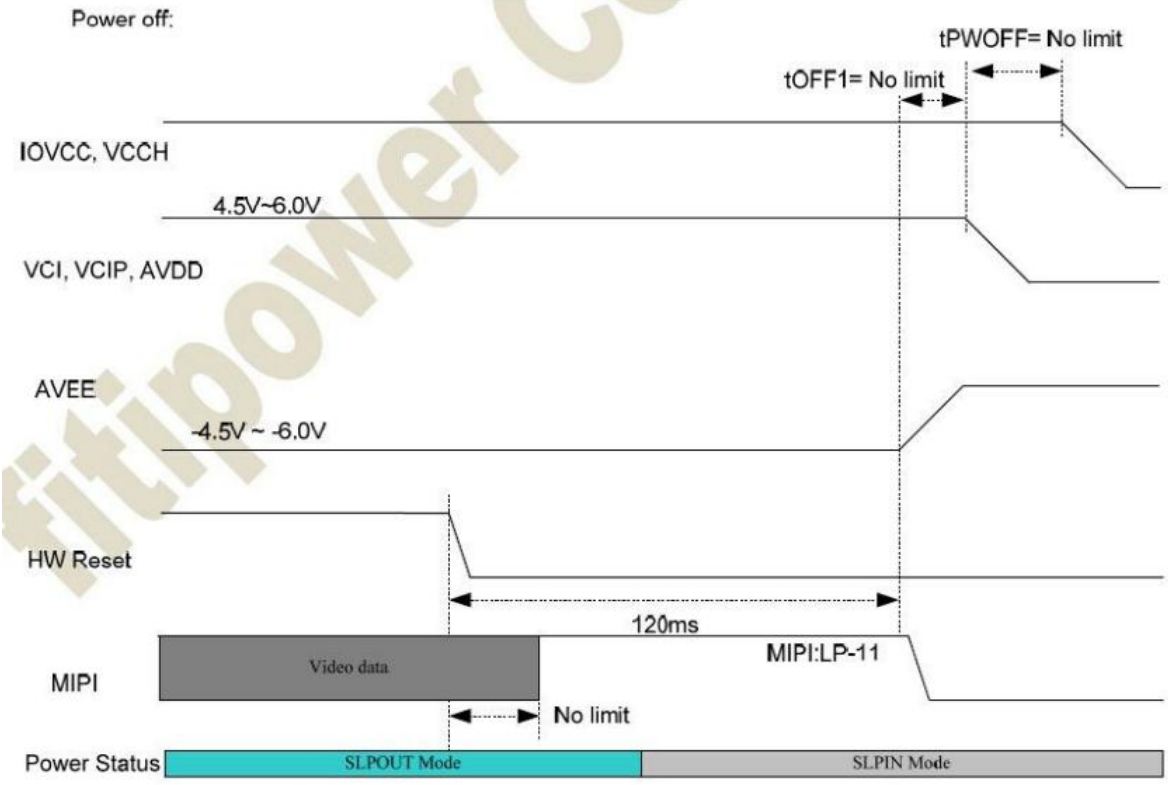
5.1 Electrical characteristics(Vss=0V ,Ta=25℃)

Parameter		Symbol	Condition	Min	Typ	Max	Unit	Note
Power supply		VCC	Ta=25℃	2.6	3.3	3.6	V	
		AVDD	Ta=25℃	5.2	5.5	5.8		
		AVEE	Ta=25℃	-5.8	-5.5	-5.2		
Input voltage	'H'	V_{IH}	V_{CC}=2.8V	0.8V_{CC}	-	V_{CC}	V	
	'L'	V_{IL}	V_{CC}=2.8V	0	-	0.2V_{CC}	V	

5.2 Power on/off sequence



Note: tON1: The space time between VCI/VCIP/AVDD Power On and AVEE Power On.



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5.3 Timing for MIPI Characteristics

Resolution=800x1280 (T_A=25°C, IOVCC=1.8V, VCIP=VCI=VCCH=2.8V)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
HS low pulse width	HS	-	6	18	78	DCK
Horizontal back porch	HBP	-	5	18	78	DCK
Horizontal front porch	HFP	-	5	18	78	DCK
Horizontal blanking period	HBLK	HS+HBP+HFP	16	54 (Note1)	88	DCK
Horizontal active area	HDISP	-	-	800	-	DCK
Pixel Clock	PCLK	-	63.06 (Note2)	67.33 (Note2)	81.51 (Note2)	MHz

Note 1: HS+HBP > 0.5us.
Note 2: Pixel Clock = (HBLK+HDISP) * (VBK+VDISP) * Frame rate, Frame rate=60Hz.

Resolution=800x1280(T_A=25°C, IOVCC=1.8V, VCIP=2.8V, VCI=2.8V)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Vertical low pulse width	VS	-	2	4	200 Note(1)	Line
Vertical front porch	VFP	-	4	20	200	Line
Vertical back porch	VBP	-	2	10	200 Note(1)	Line
Vertical blanking period	VBK	VS+VBP+VFP	8	34	250	Line
Vertical active area	-	VDISP	-	1280	-	Line
Vertical Refresh rate	VRR	-	-	60	-	Hz

Note: (1) The VS and VBP pulse width are related to GIP start pulse and GIP clock pulse timing. The GIP start pulse and GIP clock pulse must be set at corresponding position for LCD normal display.

5.4.1 Speed Data Transmission

Figure 7.29 shows the sequence of events during the transmission of a Data Burst. Transmission can be started and ended independently for any Lane by the protocol. However, for most applications the Lanes will start synchronously but may end at different times due to an unequal amount of transmitted bytes per Lane.

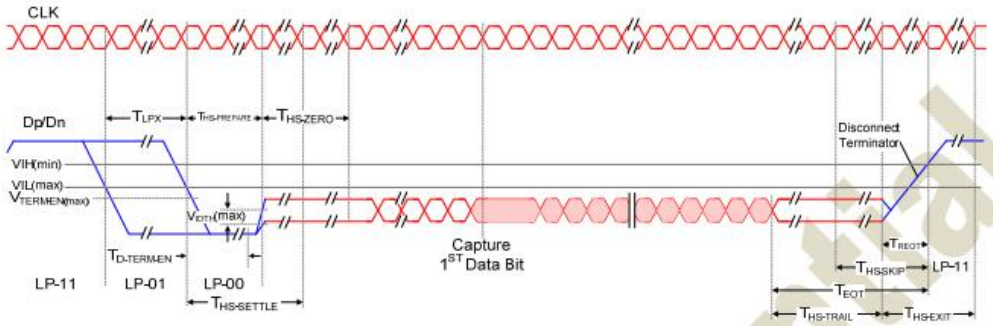


Figure 7.29: High-Speed Data Transmission in Bursts

5.4.2 Speed Data Transmission

In High-Speed mode the Clock Lane provides a low-swing, differential DDR (half-rate) clock signal from Master to Slave for High-Speed Data Transmission. The Clock signal shall have quadrature-phase with respect to a toggling bit sequence on a Data Lane in the Forward direction and a rising edge in the center of the first transmitted bit of a burst. The detail Clock Start and Stop procedures are shown in Figure 7.30.

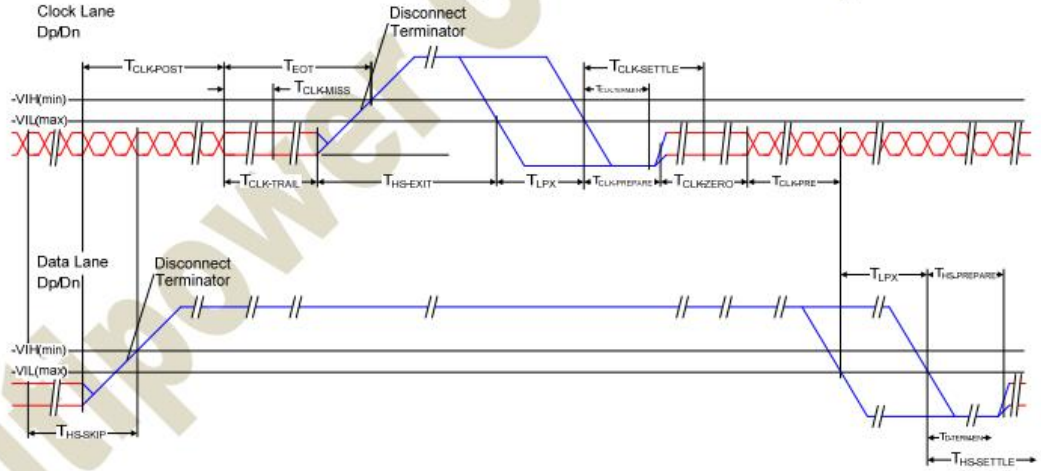


Figure 7.30: Switching the Clock Lane between Clock Transmission and Low-Power Mode

Note:

1:When an optimum contrast is obtained in transmissive mode.

6. Optical Characteristics

Item	Symbol		Condition	Min.	Typ.	Max.	Unit	Note
Brightness	Bp		θ=0° Φ=0°	-	260	-	CD/M^2	1
Uniformity	⊿Bp			-	80	-	%	1,2
Viewing Angle	3:00		Cr≥10	-	80	-	Deg	3
	6:00			-	80	-		
	9:00			-	80	-		
	12:00			-	80	-		
Contrast Ratio	Cr		θ=0° Φ=0°	800	1000	-	-	4
Response Time	T_r+T_f			-	30	-	ms	5
Color of CIE Coordinate	W	x	θ=0° Φ=0°	0.274	0.274	0.274	-	1,6
		y		0.29	0.29	0.29	-	
	R	x		0.588	0.588	0.588	-	
		y		0.338	0.338	0.338	-	
	G	x		0.295	0.295	0.295	-	
		y		0.573	0.573	0.573	-	
	B	x		0.128	0.128	0.128	-	
		y		0.066	0.066	0.066	-	
NTSC Ratio	S			-	60	-	%	

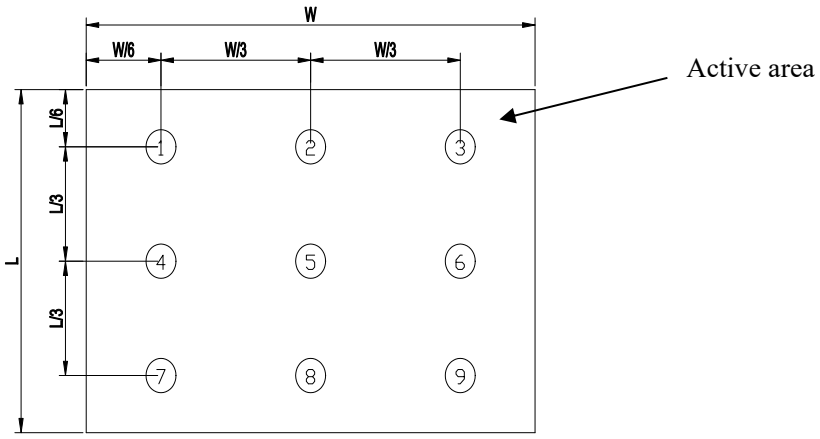
Note：The parameter is slightly changed by temperature, driving voltage and materiel

Note 1: The luminance uniformity is calculated by using following formula.

⊿Bp = Bp (Min.) / Bp (Max.)×100 (%)

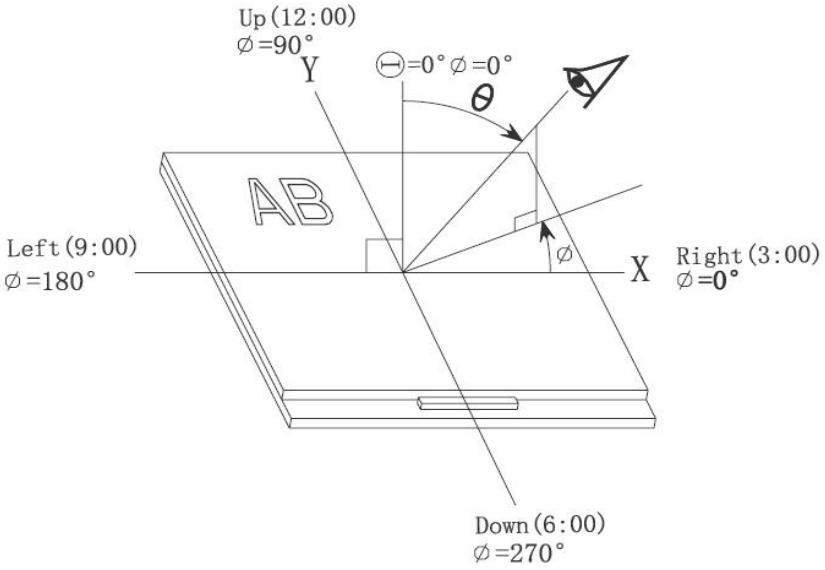
Bp (Max.) = Maximum brightness in 9 measured spots

Bp (Min.) = Minimum brightness in 9 measured spots.

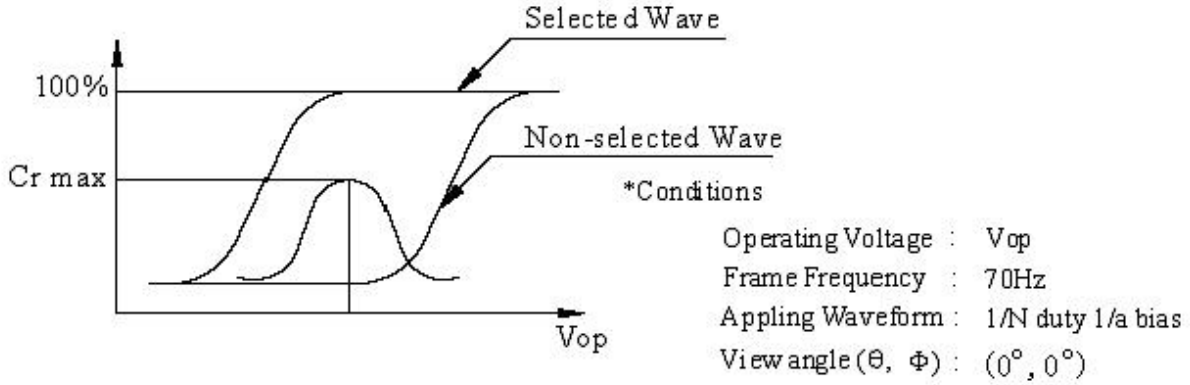


Note 3: The definition of viewing angle:

Refer to the graph below marked by *θ* and *Φ*



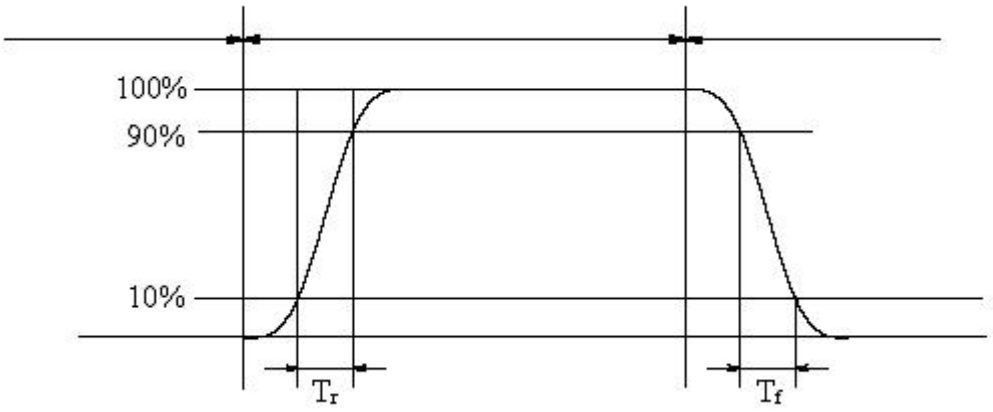
Note 4: Definition of contrast ratio.(Test LCD using DMS501)



$$Contrast\ ratio(Cr) = \frac{Brightness\ of\ selected\ dots}{Brightness\ of\ non-selected\ dots}$$

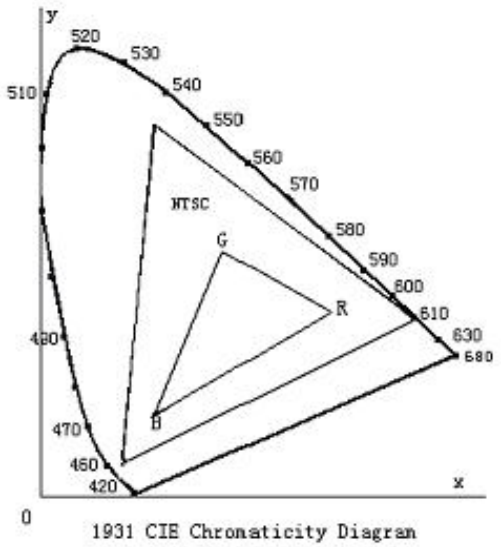
Note 5: Definition of Response time. (Test LCD using DMS501):

The output signals of photo detector are measured when the input signals are changed from “black” to “white”(falling time) and from “white” to “black”(rising time), respectively. The response time is defined as the time interval between the 10% and 90% of amplitudes.Refer to figure as below.



The definition of response time

Note 6: Definition of Color of CIE Coordinate and NTSC Ratio.

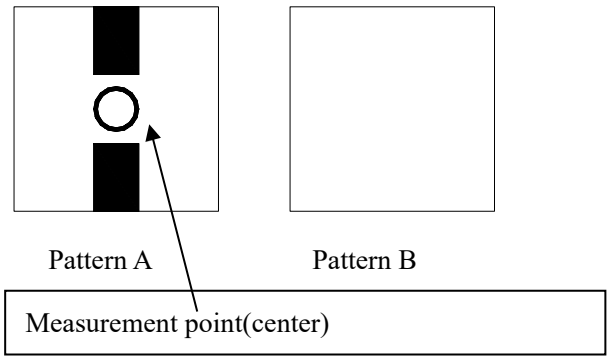


Color gamut:

$$\mathbf{S = \frac{area\ of\ RGB\ triangle}{area\ of\ NTSC\ triangle} \times 100\%}$$

Note 7: Definition of cross talk.

Cross talk ratio(%)=|pattern A Brightness-pattern B Brightness|/pattern A Brightness*100



Electric volume value=3F+/-3Hex

7. Reliability Test Items and Criteria

No	Test Item	Test condition	Criterion
1	High Temperature Storage	70℃±2℃ 96H Restore 2H at 25℃ Power off	1. After testing, cosmetic and electrical defects should not happen. 2. Total current consumption should not be more than twice of initial value.
2	Low Temperature Storage	-20℃±2℃ 96H Restore 2H at 25℃ Power off	
3	High Temperature Operation	60℃±2℃ 96H Restore 2H at 25℃ Power on	
4	Low Temperature Operation	-10℃±2℃ 96H Restore 4H at 25℃ Power on	
5	High Temperature/Humidity Operation	60℃±2℃ 90%RH 96H Power on	
6	Temperature Cycle	-20℃←————→70℃ 30min 5min 30min after 5 cycle, Restore 2H at 25℃ Power off	
7	Vibration Test	10Hz~150Hz, 100m/s^2, 120min	Not allowed cosmetic and electrical defects.
8	Shock Test	Half- sine wave,300m/s^2,11ms	
9	ESD Test	Air discharge:+/-8KV, Contact discharge:4KV	

Note: Operation: Supply 2.8V for logic system.

The inspection terms after reliability test, as below

ITEM	Inspection
Contrast	CR>50%
IDD	IDD<200%
Brightness	Brightness>60%
Color Tone	Color Tone+/-0,05

8 Quality level

As Quality department <<Product Cosmetic SPEC>>.

9. Precautions for Use of LCD Modules

9.1 Handling Precautions

9.1.1 The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.

9.1.2 If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.

9.1.3 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.

9.1.4 The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.

9.1.5 If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:

— Isopropyl alcohol

— Ethyl alcohol

Solvents other than those mentioned above may damage the polarizer. Especially, do not use the following:

— Water

— Ketone

— Aromatic solvents

9.1.6 Do not attempt to disassemble the LCD Module.

9.1.7 If the logic circuit power is off, do not apply the input signals.

9.1.8 To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

a. Be sure to ground the body when handling the LCD Modules.

b. Tools required for assembly, such as soldering irons, must be properly ground.

c. To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.

d. The LCD Module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.

9.2 Storage precautions

9.2.1 When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

9.2.2 The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a long time, the recommend condition is:

Temperature : 0℃ ～ 40℃

Relatively humidity: ≤80%

9.2.3 The LCD modules should be stored in the room without acid, alkali and harmful gas.

9.3 The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.