

SPECIFICATION

[☒] Preliminary Specification
[] Final Specification

Description 8.0” 1024xRGBx768 TFT-LCD Module
Part Number P0800XGF2MB00

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* This cover page is for your Comments and Signatures back to TIANMA.

REVISION HISTORY

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1. Summary

1.1 General Description

This is a 8.0 inch a-Si TFT-LCD module with Normal- Black technology. It is composed of a TFT-LCD panel, a driver circuit, FPC, and a LED backlight unit.

1.2 Features

- Ultra-wide viewing angle
- Interface: LVDS
- This product will comply with UL62368-1/CSA C22.2 No.62368-1-03
- This product will comply with the European RoHS Directive (2011/65/EU) and Delegated Directive (2015/863/EU, Amending Annex II of 2011/65/EU)

2. General Specifications

Feature		Spec	Unit
Display Spec	Size	8 inch	
	Resolution	1024(RGB)x768	
	Pixel Pitch	0.158x0.158	mm
	TFT Active Area	162.05x121.54	mm
	Technology Type	a-Si	
	Pixel Configuration	R.G.B Vertical Stripe	
	Display Mode	SFT, Normally Black	
	Viewing Direction	All	
Mechanical Characteristics	LCM (W x H x D)	182.73x137.65x3.85	mm
	Weight	160	g
Optical Characteristics	Luminance	450	cd/m ²
	Contrast Ratio	1800:1	
	NTSC	72	%
	Viewing Angle	88/88/88/88	degree
Electrical Characteristics	Interface	LVDS	
	Color Depth	16.7 Million	color
	Power Consumption	LCD: 256; Backlight: (1512)	mW

Table 2.1 General TFT Specifications

3. Input / Output Terminals

3.1 CN1 Pin assignment (LCD Interface)

Connector Information	
LCD Module connector	NA
Matching connector	FH12A-40S-0.5SH(55) or equivalent

Table 3.1.1 Connector information

No	Symbol	I/O	Description	Comment
1	NC	N	No connection	
2	VDD	P	Power Voltage for digital circuit	
3	VDD	P	Power Voltage for digital circuit	
4	NC	N	No connection	
5	RESET	I	Global reset pin, active low. (Default pull High)	
6	STBYB	I	Standby mode selection.(Default pull High) STBYB=H, Normal mode. STBYB=L, Standby mode. If not used, please fix this pin at VDD level.	
7	GND	P	Ground	
8	RXIN0-	I	- LVDS differential data input	
9	RXIN0+	I	+ LVDS differential data input	R[0]~G[0]
10	GND	P	Ground	
11	RXIN1-	I	- LVDS differential data input	
12	RXIN1+	I	+ LVDS differential data input	G[1]~B[1]
13	GND	P	Ground	
14	RXIN2-	I	- LVDS differential data input	
15	RXIN2+	I	+ LVDS differential data input	DE/-/ B[2]~B[5]
16	GND	P	Ground	
17	RXCLKIN-	I	- LVDS differential clock input	
18	RXCLKIN+	I	+ LVDS differential clock input	
19	GND	P	Ground	
20	RXIN3-	I	- LVDS differential data input	
21	RXIN3+	I	+ LVDS differential data input	R[6]/R[7]/G[6]/G[7]/B[6]/B[7]
22	GND	P	Ground	
23	NC (CSB)	N	No connection, Please Open.	
24	NC (SCL)	N	No connection, Please Open.	
25	GND	P	Ground	
26	NC (SDI)	N	No connection, Please Open.	
27	NC	N	No connection	
28	SELB	I	6-bit / 8-bit input select for LVDS mode. (Default pull High)	

			"1": 8-bit (Default pull High) "0": 6-bit	
29	AVDD	P	Power for Analog Circuit	
30	GND	P	Ground	
31	LED-	P	LED Cathode	
32	LED-	P	LED Cathode	
33	L/R	I	Horizontal scan direction. (Default pull Low) 1: right to left 0: left to right	
34	U/D	I	Vertical scan direction. (Default pull Low) 1: Bottom → Top 0: Top → Bottom	
35	VGL	P	Gate OFF Voltage	
36	NC	N	No connection	
37	NC	N	No connection	
38	VGH	P	Gate ON Voltage	
39	LED+	P	LED Anode	
40	LED+	P	LED Anode	

Table 3.1.2 Pin Assignment for LCD Interface

Note1: I/O definition: I---Input, O---Output, P---Power/Ground, N---No connection

Note2: All of the GND pins should be connected to the system ground.

Note3: This LCD module supports DE mode, the pin setting is different from each other. Please refer to the descriptions.

4. Absolute Maximum Ratings

Item	Symbol	MIN	MAX	Unit	Remark
Power Voltage	VDD	-0.3	3.96	V	
Power Supply Voltage 2	AVDD	-0.3	12	V	
Power Supply Voltage 3	VGH	-0.3	VGL+32V	V	
Power Supply Voltage 4	VGL	VGH-32V	0.3	V	
Power Supply Voltage 5	VIN	-0.3	3.96	V	Note1
Power Supply Voltage 6	LVDS	-0.3	2.5	V	Note2
Backlight Forward current	IF	--	80	mA	Per one circuit
Operating Temperature	Top	-20	70	°C	
Storage Temperature	Tst	-30	80	°C	
Relative Humidity Note2	RH	--	≤95	%	Ta≤40°C
		--	≤85	%	40°C<Ta≤50°C
		--	≤55	%	50°C<Ta≤60°C
		--	≤36	%	60°C<Ta≤70°C
		--	≤24	%	70°C<Ta≤80°C
Absolute Humidity	AH	--	≤70	g/m³	Ta>70°C

Table 4.1 Absolute Maximum Ratings

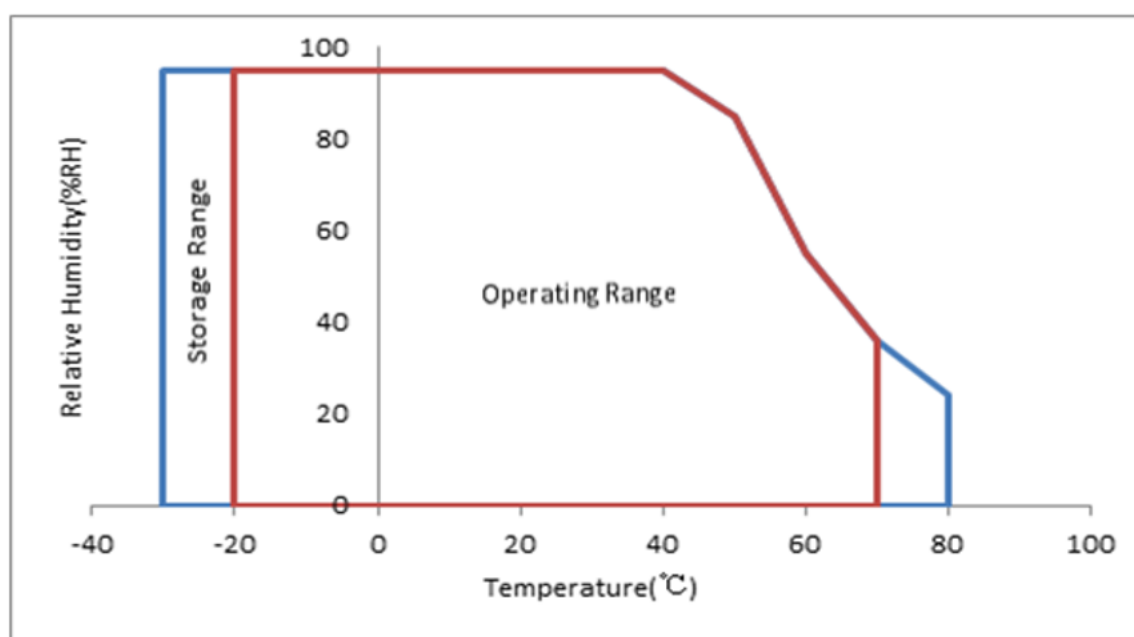


Table 4.2 Absolute Maximum Ratings chart

Note1: Input voltage include RESET、STBYB、SELB、L/R、U/D.

Note2: Input voltage include RXIN0+/-、RXIN1+/-、RXIN2+/-、RXIN3+/-、RXCLKIN+/-.

Note3: Ta means the ambient temperature. It is necessary to limit the relative humidity to the specified temperature range. Condensation on the module is not allowed.

Note4: The absolute maximum rating values of this product are not allowed to be exceeded at any times. A module should be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme condition, the module may be permanently destroyed

5. Electrical Characteristics

5.1 DC Characteristics for Panel Driving

AGND=GND=0V, Ta = 25°C

Item	Symbol	Min	Typ.	Max	Unit	Remark
Digital Supply Voltage	VDD	3.2	3.3	3.4	V	-
Analog Supply Voltage	AVDD	(11.4)	(11.6)	(11.8)	V	
Gate On Voltage	VGH	(18)	(19)	(20)	V	-
Gate Off Voltage	VGL	(-9.5)	(-9)	(-8.5)	V	
Low level input voltage	VIL	VSS	-	0.2*VDD	V	Note1
High level input voltage	VIH	0.8*VDD	-	VDD	V	Note1

Table 5.1.1 Operating Voltages

Note1: Input voltage include RESET、STBYB、SELB、L/R、U/D.

AGND=GND=0V, Ta = 25°C

Item	Symbol	Condition	Min	Typ.	Max	Unit	Remark
Digital Supply Current	I _{VCC}	VDD=3.3V	-	21	-	mA	Note1
Analog Supply Current	I _{AVDD}	AVDD=11.6V	-	4	-	mA	Note1
Gate On Current	I _{VGH}	VGH=19V	-	5	-	mA	Note1
Gate Off Current	I _{VGL}	VGL=-9V	-	5	-	mA	Note1
Power Consumption	P		-	256		mW	Note1

Table 5.1.2 Power Consumption

Note1: Test condition: white pattern. Actual power consumption is based on actual measurement.

5.2 DC Characteristics for Backlight Driving

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Forward Current	I _F	--	(15)	--	mA	(36) LEDs (9 LED Serial,4 LED Parallel)
Forward Current Voltage	V _F	--	(25.2)	(27)	V	
Backlight Power Consumption	W _{BL}	--	(1512)	--	mW	
LED life time	--	--	50000	--	Hrs	

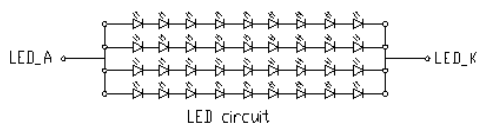
Table 5.2.1 LED Backlight Characteristics

Note1: I_F is defined for each channel.

Note2: Optical performance should be evaluated at Ta=25°C only.

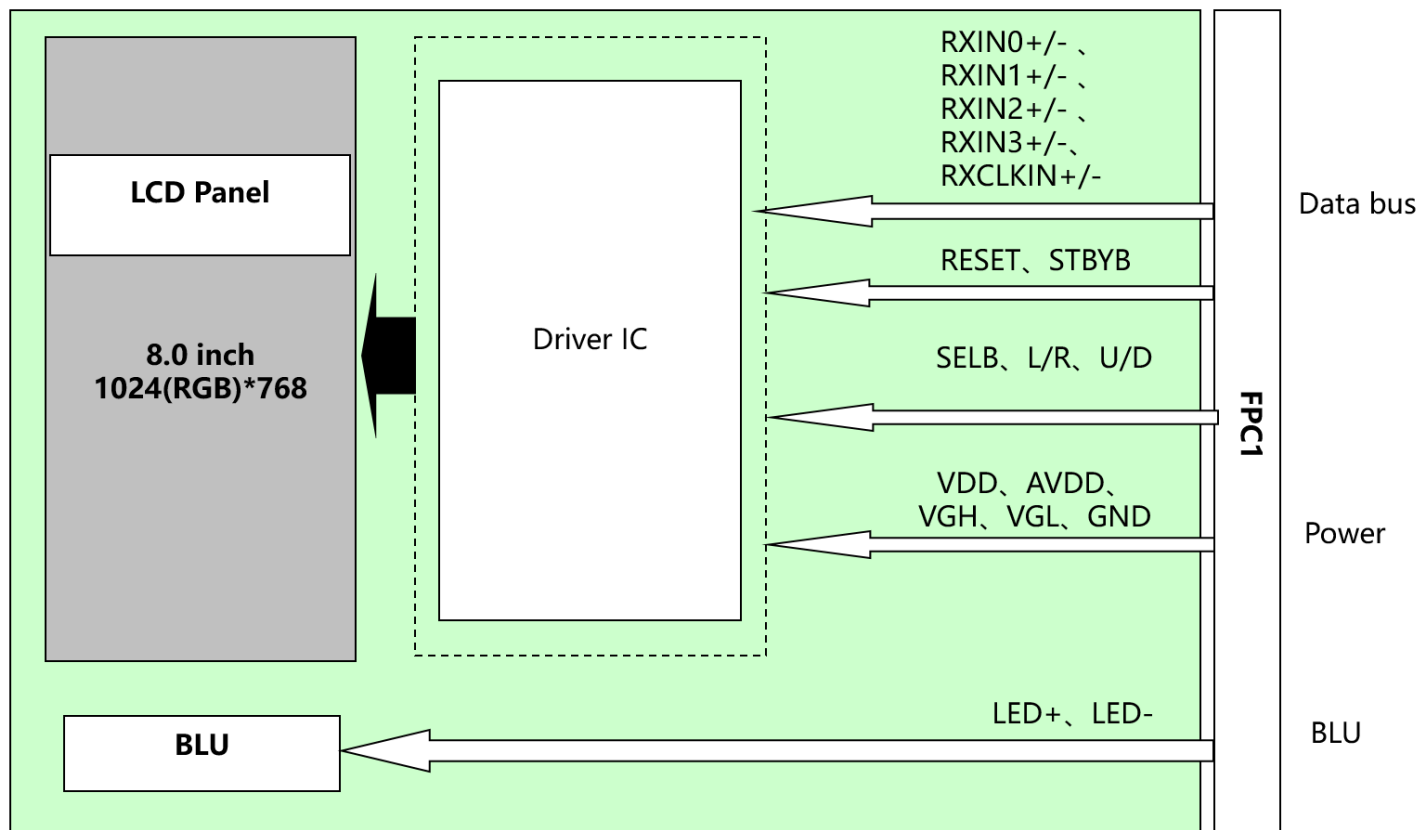
Note3: If LED is driven by high current, high ambient temperature & humidity condition, The life time of LED will be reduced.

Note4: Operating life means brightness goes down to 50% of initial brightness. Typical operating life time is estimated data.



Backlight Circuit Diagram
9S-4P; 1f=15mA/LED

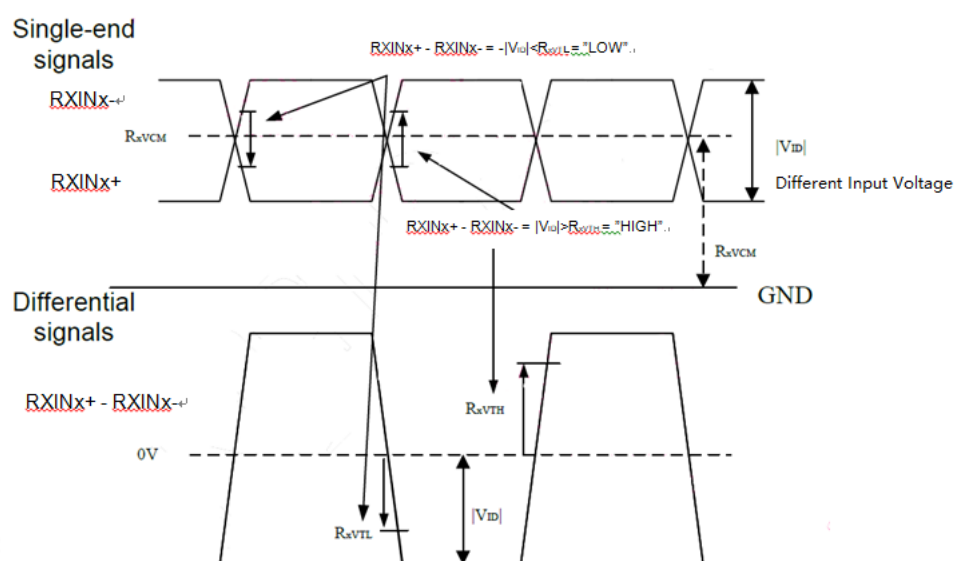
5.3 LCD Module Block Diagram



6. Interface Timing Characteristics

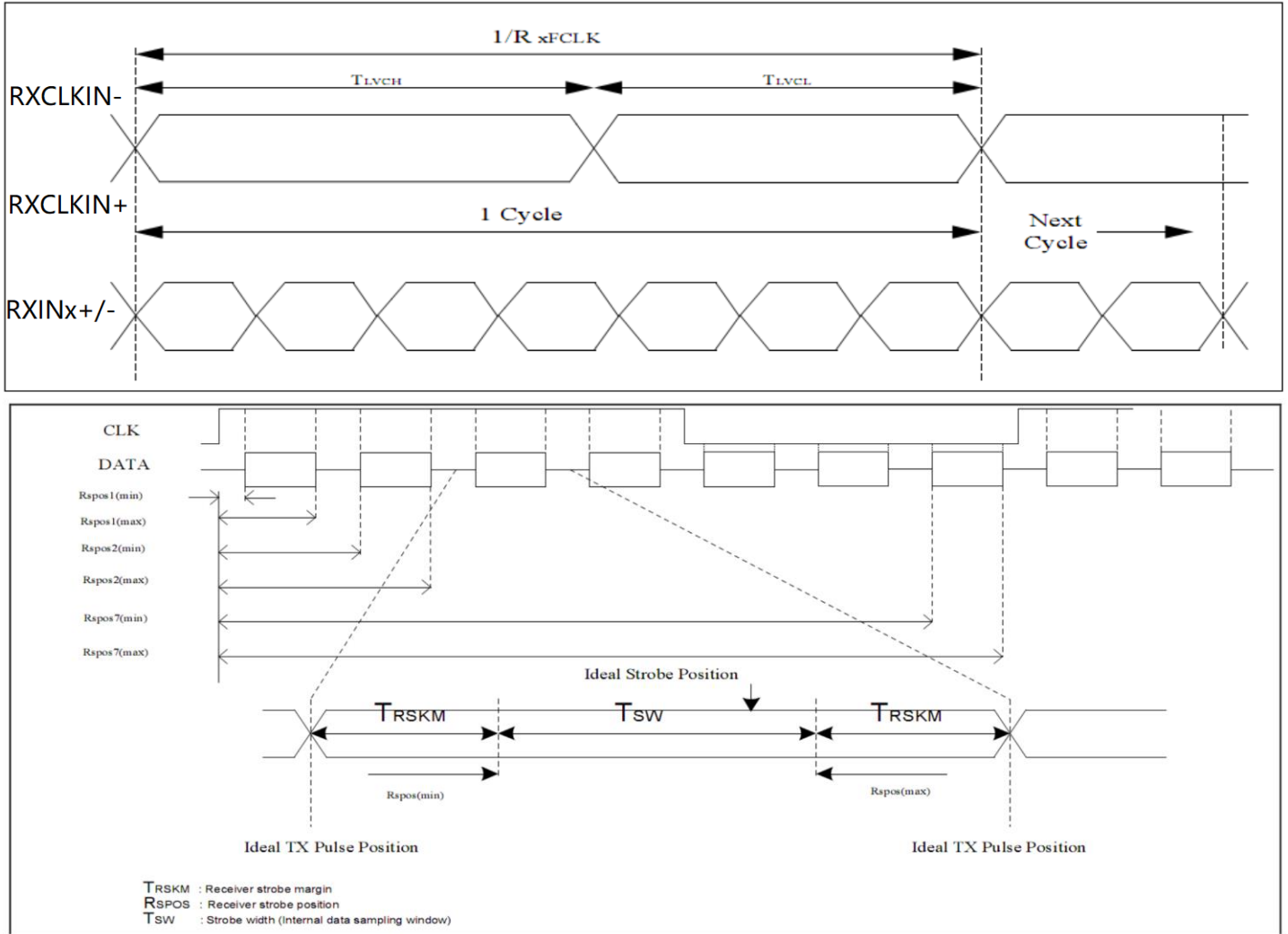
6.1 LVDS mode DC electrical characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Input voltage range (singled-end)	R_{XVIN}	400	-	1650	mV	1. $R_{XVCM} + 1/2 V_{ID} \leq 1650\text{mV}$. 2. $R_{XVCM} - 1/2 V_{ID} \geq 400\text{mV}$.
Differential input common mode voltage	R_{XVCM}	600	1200	1375	mV	
Differential input voltage	$ V_{ID} $	200	-	400	mV	
Differential input impedance	Z_{ID}	80	100	120	ohm	
Differential input leakage current	I_{LCLVDS}	-10	-	+10	uA	



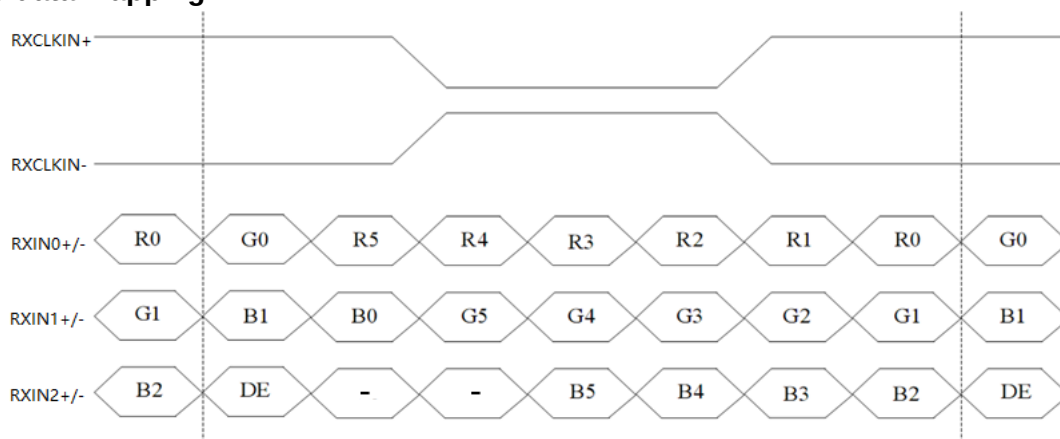
6.2 LVDS mode AC electrical characteristics

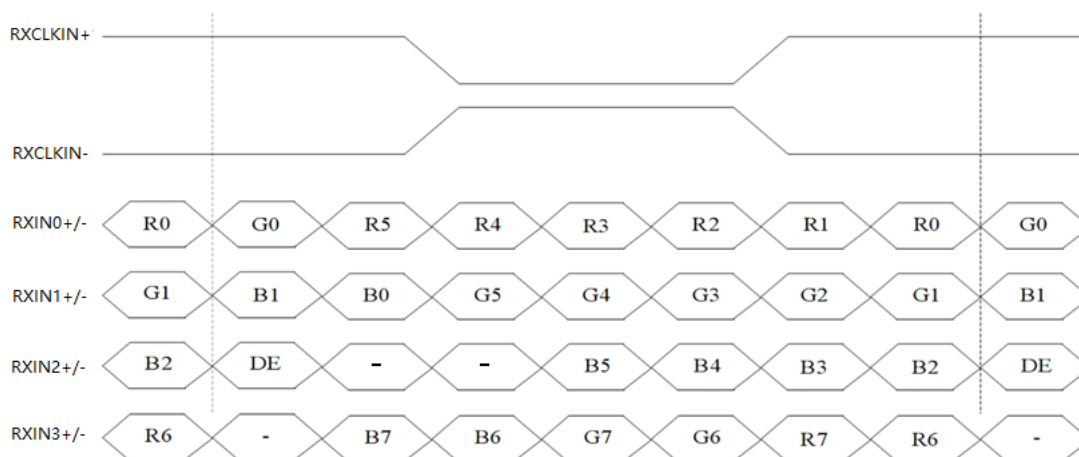
Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Input data skew margin	T_{RSKM}	-0.2	-	0.2	UI
Clock high time	T_{LVCH}	-	$4/(7 * R_{XFCLK})$	-	ns
Clock low time	T_{LVCL}	-	$3/(7 * R_{XFCLK})$	-	ns



6.3 Data input format

6.3.1 LVDS data mapping

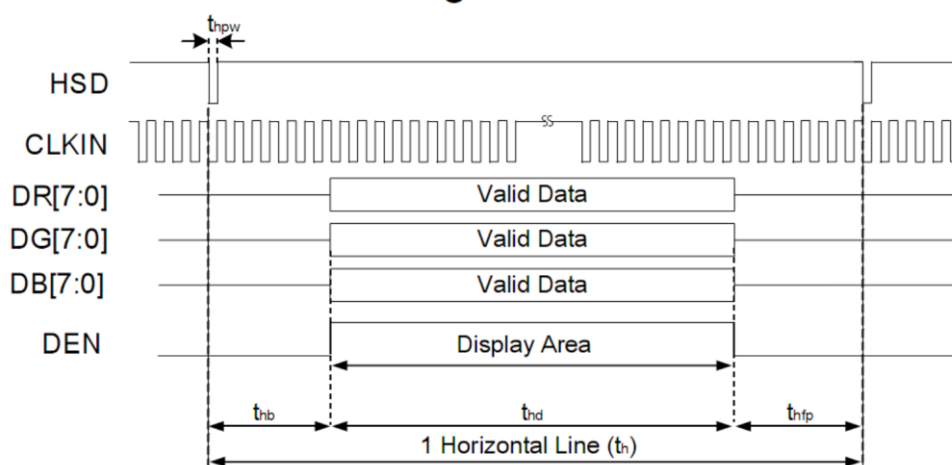




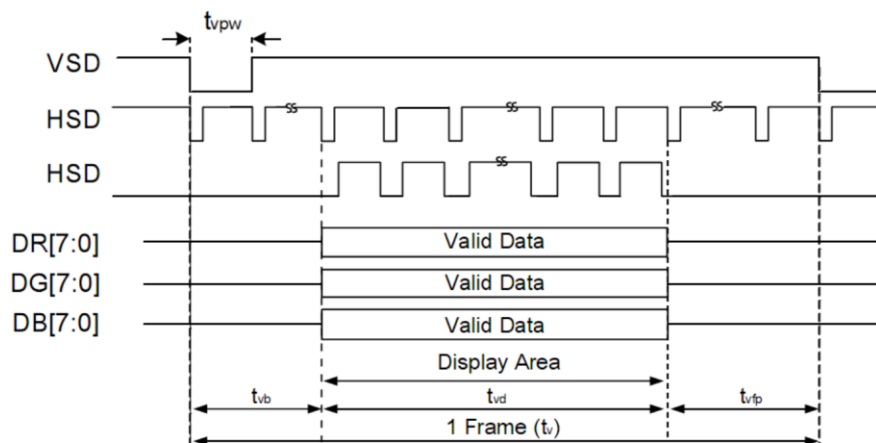
6.3.2 Parallel RGB input timing table

LVDS Input Timing Parameter	Symbol	MIN	Typ	MAX	Unit	Remark
DCLK frequency	tclk	58.8	65	67.9	MHz	
Horizontal display area	thd	1024			tclk	
Horizontal Blanking time	thbt	205	320	348	tclk	Thbt=thb+thfp
HSYNC period	th	1229	1344	1372	tclk	
Vertical display area	tvd	768			th	
Vertical Blanking time	tvbt	29	38	57	th	Tvbt=tvb+tvfp
VSD period	tv	797	806	825	th	
Frame rate	FR	60	60	60	Hz	

●Horizontal timing

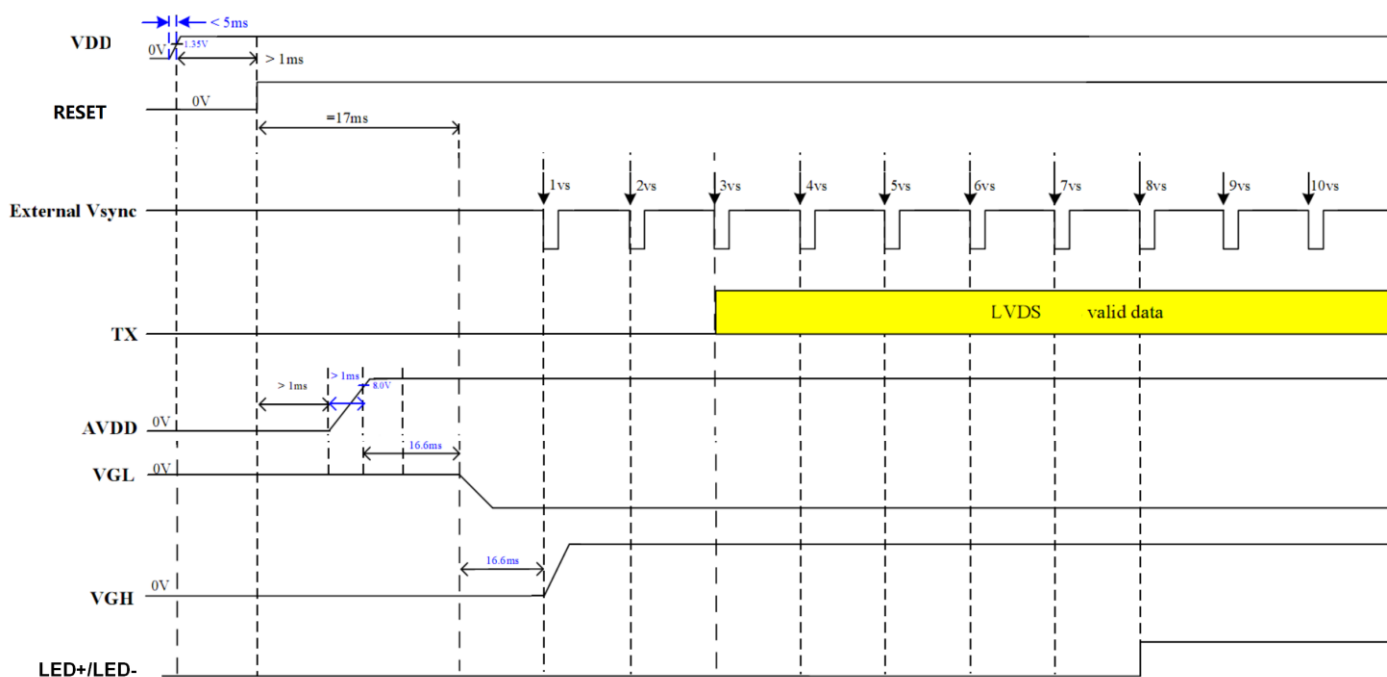


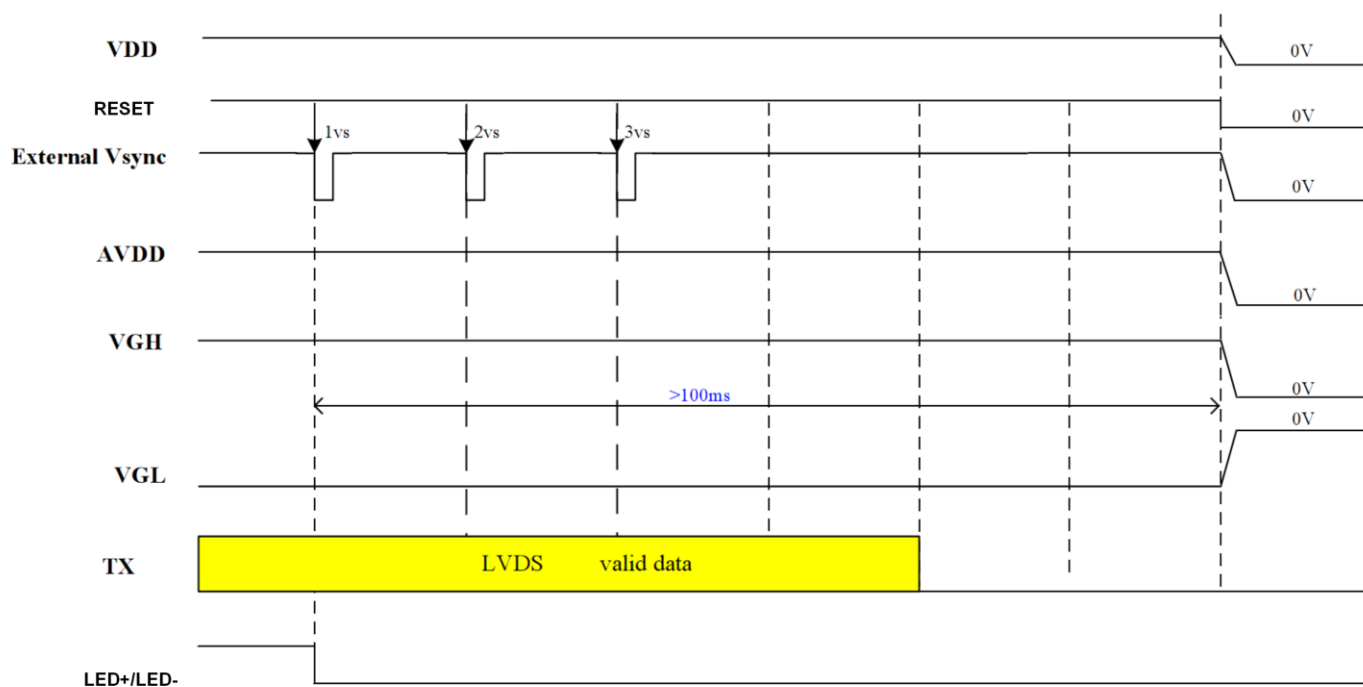
● Vertical timing



Note1: Module is DE MODE, HSD and VSD are not used.

6.4 Power ON/OFF Sequence





Note1: VDD power on slew time

Be sure that VDD input can't result automatically in power on sequence.

Parameter	Symbol	Conditions	Spec.			Unit
			Min.	Typ.	Max	
VDD power on skew time	T_{POR}	From 0V to 1.35V	0.1	-	5	ms

Note2: Timing requirements for RESET

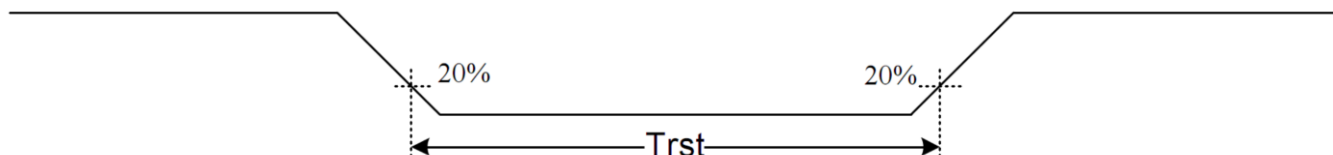
When RESET of the reset pin equals to Low, it will be in the condition of reset.

When it is in the condition of reset, it will make the device recover the initial set.

However, in order to avoid the reset noise cause reset, there is a mechanism to judge about whether the reset is needed or not.

The closed interval of Low can be shown as the following.

Parameter	Symbol	Conditions	Spec.			Unit
			Min.	Typ.	Max	
Reset low pulse width	T_{rst}		6	-	-	μs



7. Optical Characteristics

Item		Symbol	Condition	Min	Typ	Max	Unit	Remark
View Angles		θT	CR≧10	80	88	-	degree	Note2,3
		θB		80	88	-		
		θL		80	88	-		
		θR		80	88	-		
Contrast Ratio		CR	θ=0°	1200	1800	-		Note 3
Response Time		T _{ON}	25℃	--	35	45	ms	Note 4
		T _{OFF}						
Chromaticity	White	x	Backlight is on	(0.247)	(0.297)	(0.347)		Note 1,5
		y		(0.281)	(0.331)	(0.381)		
	Red	x		(0.594)	(0.644)	(0.694)		Note 1,5
		y		(0.288)	(0.338)	(0.388)		
	Green	x		(0.274)	(0.324)	(0.374)		Note 1,5
		y		(0.559)	(0.609)	(0.659)		
	Blue	x		(0.100)	(0.150)	(0.200)		Note 1,5
		y		(0.002)	(0.052)	(0.102)		
Uniformity		U		80	85	-	%	Note 6
NTSC		-		67	72	-	%	Note 5
Luminance		L		360	450	-	cd/m ²	Note 7

Table 7.1 Optical Parameters

Test Conditions:

1. $I_F = (15)$ mA, and the ambient temperature is 25°C.
2. The test systems refer to Note1 and Note2.

Note1: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 5 Minutes operation, the optical characteristics are measured at the center point of the LCD screen.

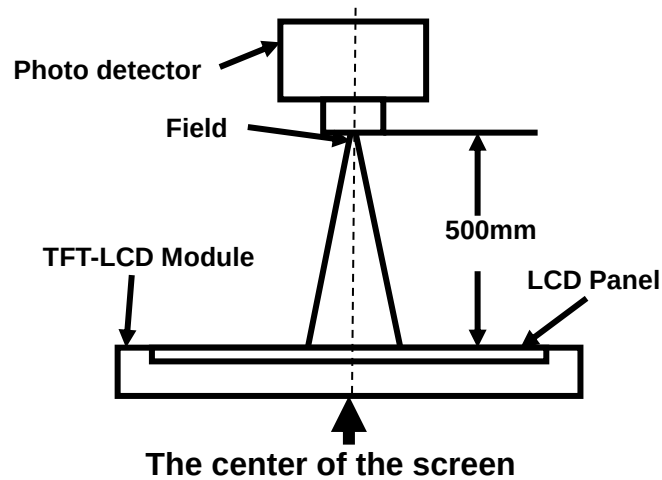


Fig1.Measurement Set Up

Note2: Definition of viewing angle range and measurement system. Viewing angle is measured at the center point of the LCD .

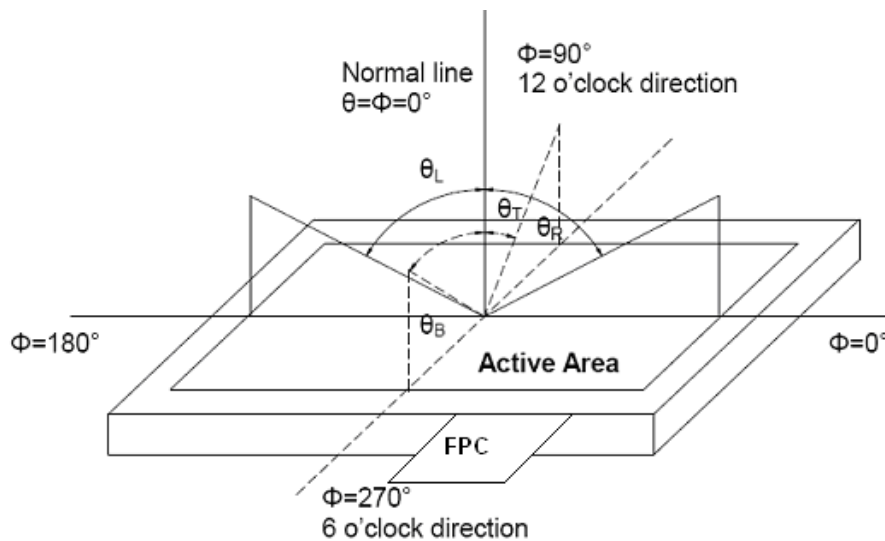


Fig2. Measurement viewing angle

Note3: Definition of contrast ratio

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

Note4: 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%.

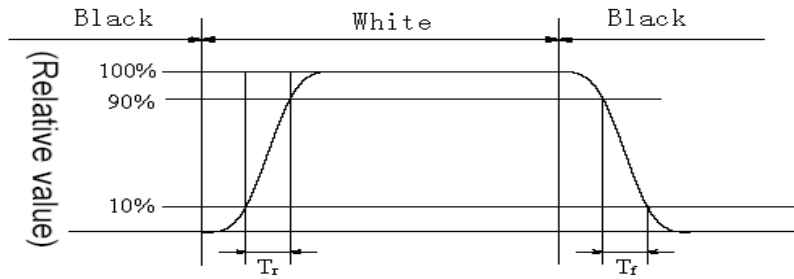


Fig3. Response Time Testing

Note5: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

Note6: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (Refer Fig.5). Every measuring point is placed at the center of each measuring area.

Luminance Uniformity (U) = L_{min} / L_{max}

L_{max} : The measured Maximum luminance of all measurement position.

L_{min} : The measured Minimum luminance of all measurement position.

L-----Active area length; W----- Active area width

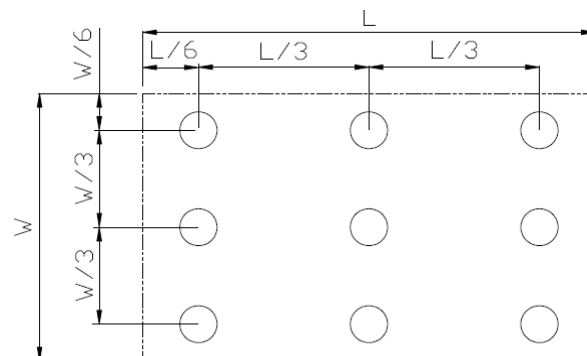


Fig4. Luminance Uniformity Measurement Locations(9 points)

Note7: Definition of Luminance:

Measure the luminance of white state at center point.

8. Reliability Test

No	Test Item	Condition	Remarks
1	High Temperature Operation	+70℃ , 240H	IEC60068-2-1:2007 GB2423.2-2008
2	Low Temperature Operation	-20℃ , 240H	IEC60068-2-1:2007 GB2423.1-2008
3	High Temperature Storage	+80℃ , 240H	IEC60068-2-1:2007 GB2423.2-2008
4	Low Temperature Storage	-30℃ , 240H	IEC60068-2-1:2007 GB2423.1-2008
5	Storage at High Temperature and Humidity(non-operation)	+60℃ , 90%RH , 240H	IEC60068-2-78 :2001 GB/T2423.3—2006
6	Thermal Shock (non-operation)	-30℃ , 30min~80℃ , 30min , change time : 5min , 100cycle	Start with cold temperature, End with high temperature, IEC60068-2-14:1984,GB2423.22-2002
7	ESD	C=150pF , R=330Ω , 5point/panel Air : ±8kv , 5times ; Contact : ±4kv , 5times ; (Environment : 15℃~35℃ , 30%~60% , 86Kpa~106Kpa)	IEC61000-4-2:2001 GB/T17626.2-2006
8	Vibration Test	5Hz~20Hz~200Hz , 0.01g2/Hz~0.01g2/Hz~0.001g2/Hz , X/Y/Z 30min	GB/T 4857.23-2012
9	Package Drop Test	Height: X cm,1 corner, 3edges, 6 surfaces Note : X > 10Kg:60cm ; ≤10Kg:80cm	IEC60068-2-32:1990 GB/T2423.8—1995

Table 8.1 RA test condition

Note1: Temperature is the ambient temperature of sample

Note2: Before cosmetic and function test, the product must have enough recovery time, at least 24 hours at room temperature.

Note3: In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product's function only be guaranted, but not for all of the cosmetic specification.

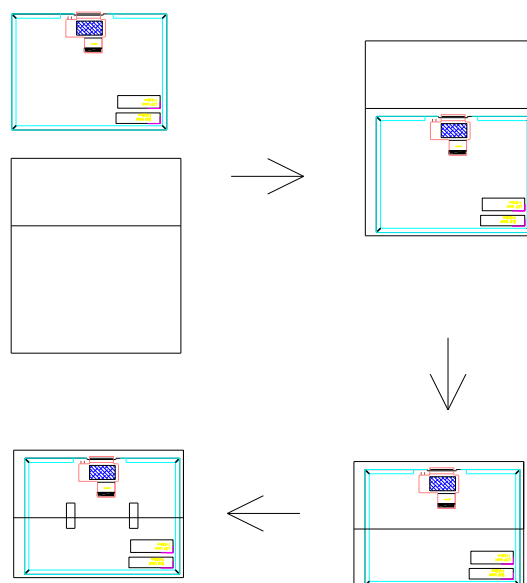


10. Packing Instruction

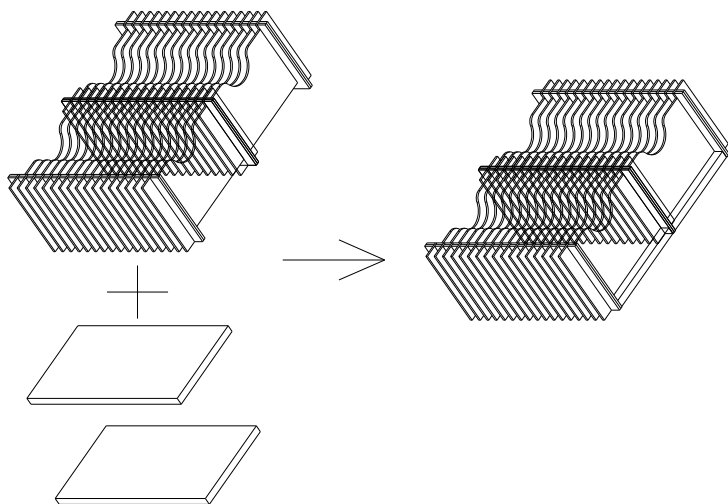
No	Item	Model (Material)	Dimensions(mm)	Unit Weight(Kg)	Quantity	Remark
1	LCM module	P0800XGF2MB00	182.73x137.65x3.85	0.16	26	
2	Partition	Corrugated paper	527X348X220	1.20	1	
3	Anti-static bubble Bag	PE	231X200X6	0.020	26	
4	Dust-Proof Bag	PE	700X545	0.050	1	
5	Paper holder	Corrugated Paper	348×194×39	0.055	2	
6	Carton	Corrugated paper	544X365X250	1.01	1	
7	EPE	EPE	346×193×25	0.033	2	
8	Lable	Lable	100×52	0.001	1	
9	Beauty-grain	Tape	30×10	0.001	52	
10	Total weight	7.169 Kg±10%				

Packing flow chart

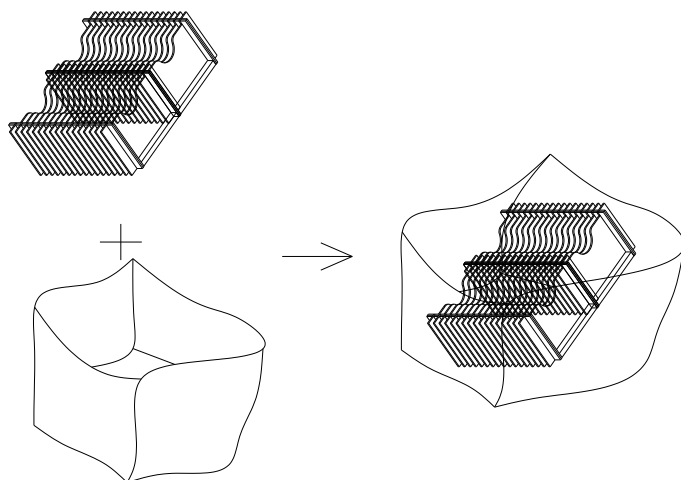
1. Load the module into an electrostatic bubble bag as shown in the figure below, fold the bubble bag, and fix it with masking tape



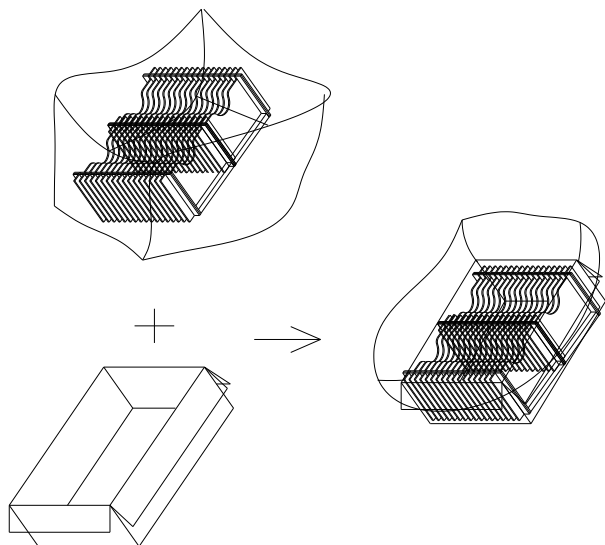
2. Load the EPE under the paper card (the surface of the paper card without a semi-circular arc), as shown in the following figure:



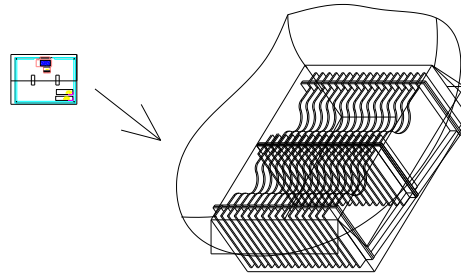
3. Put the combination of step 2 into a dust bag



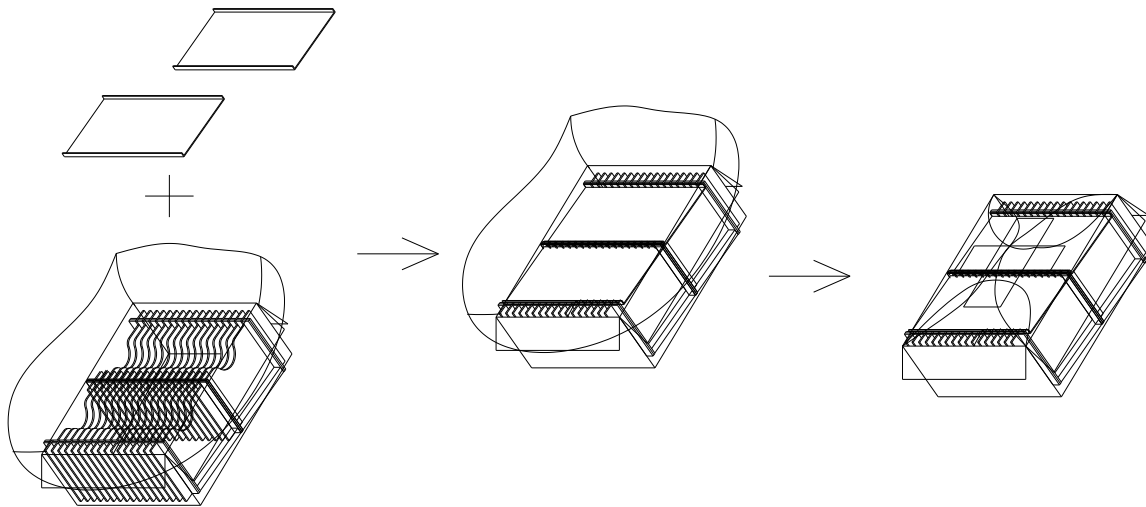
4. Put the assembled parts of STEP 3 into the carton



5. Put the modules into the carton in turn (the edges of the modules with missing corners are facing downward, and the modules can be facing the same direction in the paper card of the carton) The carton is loaded with 26 modules



6. Put the paper holder on top of the paper card, fold the excess part of the dust bag in half, and seal the dust bag with tape:



7. Seal the carton and attach the label



11. Precautions for Use of LCD Modules

11.1 Handling Precautions

- (1) The display panel is made of glass. Do not subject it to mechanical shock by dropping it, etc.
- (2) If the display panel is damaged and the liquid crystal fluid inside it leaks out be sure not to get any in your mouth. If the fluid comes into contact with your skin or clothes promptly wash it off using soap and water.
- (3) Do not apply excessive force to the display surface or the bezel since this may cause the color tone to vary.
- (4) The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle the polarizer carefully.
- (5) If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If it is still not completely clear use a moist cloth with one of the following solvents:
 - Isopropyl alcohol
 - Ethyl alcohol
 Solvents other than those mentioned above may damage the polarizer. Specifically, do not use the following:
 - Water
 - Ketone
 - Aromatic solvents
- (6) Do not disassemble the LCD Module.
- (7) If powered off, do not apply the input signals.
- (8) To prevent destruction of the module by static electricity, be careful to maintain an optimum work environment.
- (9) Be sure to ground your body when handling the LCD Modules.
- (10) Tools used for assembly, must be properly grounded.
- (11) To reduce the amount of static electricity generated, do not conduct assembly or other work under very low humidity conditions.
- (12) The LCD Module is covered with a film to protect the display surface, remove film slowly under the ionizer.

11.2 Storage precautions

- (1) When storing the LCD modules avoid exposure to direct sunlight or to the light of fluorescent lamps.
- (2) The LCD modules should be stored within the rated storage temperature range. The recommend condition is: Temperature: 0 ~ 35 °C at normal humidity.
- (3) The LCD modules should be stored in a room without acid, alkali or other harmful gas.

11.3 Transportation Precautions

The LCD modules should not be dropped or subject to violent mechanical shock during transportation. Also they should avoid excessive pressure, water, high humidity and direct sunlight.

11.4 Screen saver Precautions

Not display the fixed pattern for a long time. Use a screen saver, if the fixed pattern is displayed on the screen

11.5 Safety Precautions

- (1) When you waste damaged or unnecessary LCDs, it is recommended to crush LCDs into pieces and wash them off with solvents such as acetone and ethanol, which should later be burned
- (2) Be sure to turn off the power supply when inserting or disconnecting the LED backlight cable.
- (3) LED driver should be designed carefully to limit or stop its function when over current is detected on the LED.