



深圳市勋瑞光电科技有限公司
Xunrui photoelectric technology (shenzhen) CO.,LTD.



CERT. No. QAC0946535
(ISO9001)

CERT. No. HKG002005
(ISO14001)

Product Specification

() Preliminary Specification

() Final Specification

Customer	
Model Name	H101PWS40E1K01
Description	Standard LCD Module 1024(RGB)x600 Dots 10.1" TFT LCD
Date	2018/09/11
Revision	1.0

Engineering			
Check	Date	Prepared	Date



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1. Record of Revision

Rev	Issued Date	Description	Editor
1.0	2018/12/14	First Release.	Rich liang



2 General Specifications

Feature		Spec
Characteristics	Size	10.1 inch
	Resolution	1024(horizontal)*600(Vertical)
	Interface	RGB
	Connect type	Connector
	Color Depth	262K
	Technology type	a-Si
	Pixel pitch (mm)	0.2175*0.2088
	Pixel Configuration	R.G.B.-Stripe
	Display Mode	Normally White Transmissive
	Driver IC	TBD
	Surface Treatment	HC
	Viewing Direction	12 O'CLOCK
	Gray scale Direction	6 O'CLOCK
Mechanical	LCM (W x H x D) (mm)	235*143*4.9
	Active Area(mm)	222.72 x 125.28
	With /Without TSP	Without TSP
	Weight (g)	TBD
	LED Numbers	39 LEDs

Note 1: Viewing direction is follow the data which measured by optics equipment.

Note 2: Requirements on Environmental Protection: RoHS

Note 3: LCM weight tolerance: +/- 5%



3 Input/Output Terminals

No.	Symbol	Description
1, 2	NC	NO connection
3, 4	NC	NO connection
5	GND	Power Ground
6	VCOM	Common voltage
7	DVDD	Power for Digital Circuit
8	MODE	DE/SYNC mode select Note1
9	DE	Data Enable
10	VS	Vertical sync signal
11	HS	Horizontal sync Signal
12	B7	Blue data(MSB)
13	B6	Blue data
14	B5	Blue data
15	B4	Blue data
16	B3	Blue data
17	B2	Blue data
18	B1	Blue data Note2
19	B0	Blue data(LSB) Note2
20	G7	Green data(MSB)
21	G6	Green data
22	G5	Green data
23	G4	Green data
24	G3	Green data
25	G2	Green data
26	G1	Green data Note2
27	G0	Green data (LSB) Note2
28	R7	Red Data(MSB) Note2
29	R6	Red Data
30	R5	Red Data



31	R4	Red Data	
32	R3	Red Data	
33	R2	Red Data	
34	R1	Red Data	Note2
35	R0	Red Data(LSB)	Note2
36	GND	Power Ground	
37	DCLK	Pixel clock	Note3
38	GND	Power Ground	
39	L/R	Left/right selection	Note4/5
40	U/D	up/down selection	Note4/5
41	VGH	Gate ON Voltage	
42	VGL	Gate OFF Voltage	
43	AVDD	Power for Analog Circuit	
44	RESET	Global reset pin	Note6
45	NC	NO connection	
46	Vcom	Common Voltage	
47	DITHB	Dithering function	Note7
48	GND	Power Ground	
49	NC	NO connection	
50	NC	NO connection	

4 Absolute Maximum Ratings

Item	Symbol	MIN	MAX	Unit	Remark
Digital Supply Voltage	V _{DD}	-0.3	3.96	V	
TFT Gate on Voltage	VGH	-0.3	40	V	
TFT Gate off Voltage	VGL	-20	0.3	V	
Analog power Supply Voltage	AVDD	-0.5	14.85	V	
Operating Temperature	T _{OPR}	-20	70	°C	
Storage Temperature	T _{STG}	-30	80	°C	
Humidity	R _H	-	90%	RH	



5 Electrical Characteristics

5.1 Typical Operation Conditions

Item	Symbol	MIN	Typ	MAX	Unit	Remark
Digital Supply Voltage	DVDD	3	3.3	3.6	V	
TFT Gate on Voltage	VGH	17	21	23	V	
TFT Gate off Voltage	VGL	-9	-8	-5.4	V	
Analog power Supply Voltage	AVDD	8.5	8.9	9.8	V	
TFT Common electrode Voltage	VCOM	3.5	3.8	4.1	V	
Current Consumption of VDD	I _{DD}	-	40	50	mA	V _{DD} =3.3V
Current Consumption of AVDD	I _{AVDD}	-	35	1	mA	AV _{DD} =8.9V
Current Consumption of VGH Current Consumption of VGL	I _{VGH} I _{VGL}	-	0.5	1	mA	V _{GH} =21V V _{GL} =-8V

5.2Timing Characteristics

5 Timing characteristics

5.3Timing Characteristics



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DE MODE

Parameter		Value			Unit
		Min.	TYP.	MAX.	
DCLK Frequency		40	52	67	MHz
H Active	thd	1024			DCLK
H Total	th	1114	1344	1400	DCLK
HSYNC blanking		90	320	376	DCLK
V Active	tvd	600			H
V Total	tv	610	635	800	H
VSYNC blanking		10	35	200	H

HV MODE

H input timing

Parameter		Value			Unit
		Min.	TYP.	MAX.	
DCLK Frequency		45	52	63	MHz
H Active	thd	1024			DCLK
H Total	th	1200	1344	1400	DCLK
HSYNC blanking	thb	160	160	160	DCLK
HSYNC front porch	thfp	16	160	216	DCLK
HSYNC pulse width	thpw	1	-	140	DCLK

V input timing

Parameter		Value			Unit
		Min.	TYP.	MAX.	
V Active	tvd	600			DCLK
V Total	tvb	624	635	750	DCLK
VSYNC blanking	tvb	23	23	23	DCLK
VSYNC front porch	tvfp	1	12	127	DCLK
VSYNC pulse width	tpw	1	-	20	DCLK



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2.4 Timing

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max		
Clock frequency	fclk	40.8	51.2	67.2	MHz	Frame rate=60Hz
Horizontal display area	thd	1024			DCLK	
HS period time	th	1114	1344	1400	DCLK	
HS Blanking	thb	90	320	376	DCLK	
Vertical display area	tvd	600			H	
VS period time	tv	610	635	800	H	
VS Blanking	thb	10	35	200	H	

5.2.5 Reset Operation

Item	Symbol	Unit	Min.	Typ.	Max.
Reset low-level width	tRES	ms	1	-	-
Reset rise time	trRES	μs	-	-	10

5.4 Driving Backlight

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Forward Current	I _F	-	780		mA	
Forward Voltage	V _F	8.4	9.3	9.9	V	
Backlight Power consumption	W _{BL}	-	-	-	W	

Note 1: Each LED : I_F =60 mA, V_F =3.2V.

Note 2: Optical performance should be evaluated at Ta=25°C only.

Note 3: If LED is driven by high current, high ambient temperature & humidity condition. The life time of LED will be reduced. Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.



6 Optical Characteristics

Items		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing angles		θ_T	Center CR≥10	50	60	-	Degree.	Note2
		θ_B		65	75	-		
		θ_L		65	75	-		
		θ_R		65	75	-		
Contrast Ratio		CR	$\Theta =0$	500	600		-	Note1, Note3
Response Time		T _{ON}	25° C	-	25	50	ms	Note1, Note4
		T _{OFF}		-				
Chromaticity	White	X _W	Backlight is on	0.280	0.310	0.340	-	Note1, Note5
		Y _W		0.290	0.320	0.350	-	
	Red	X _R		0.550	0.590	0.630	-	
		Y _R		0.300	0.340	0.380	-	
	Green	X _G		0.301	0.341	0.381	-	
		Y _G		0.554	0.594	0.634	-	
	Blue	X _B		0.117	0.157	0.197	-	
		Y _B		0.075	0.115	0.155	-	
Uniformity		U		75	80	-	%	Note1, Note6
NTSC					50		%	Note5
Luminance		L			1000			Note1, Note7

Test Conditions:

1. IF= 20mA(one channel),the ambient temperature is 25° C
2. The test systems refer to Note 1 and Note 2.

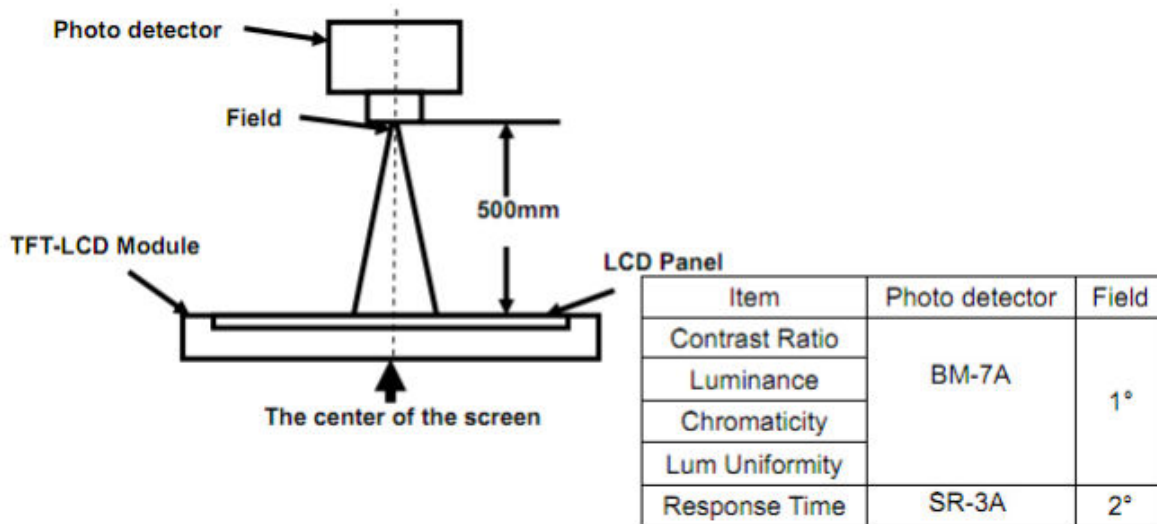
Note 1:Definition of optical measurement system.

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. All input terminals LCD panel must be ground when measuring the center area of the panel.



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Note 2: Definition of viewing angle range and measurement system.

viewing angle is measured at the center point of the LCD by CONOSCOPE(ergo-80).

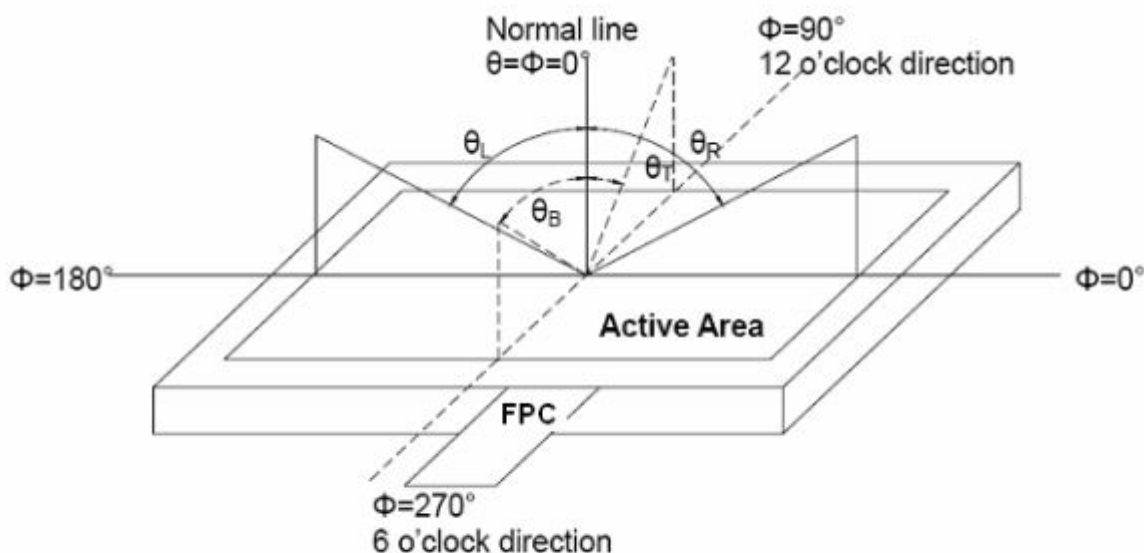


Fig. 1 Definition of viewing angle

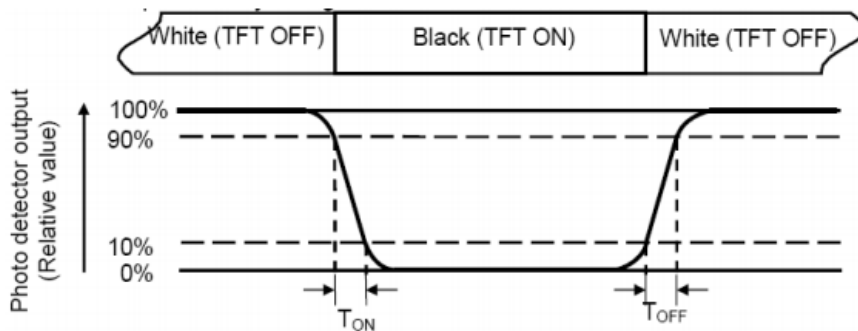
Note 3: Definition of contrast ratio

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



Note 4: Definition of Response time

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



Note 5: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

Note 6: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity}(U) = L_{\min} / L_{\max} \times 100\%$$

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

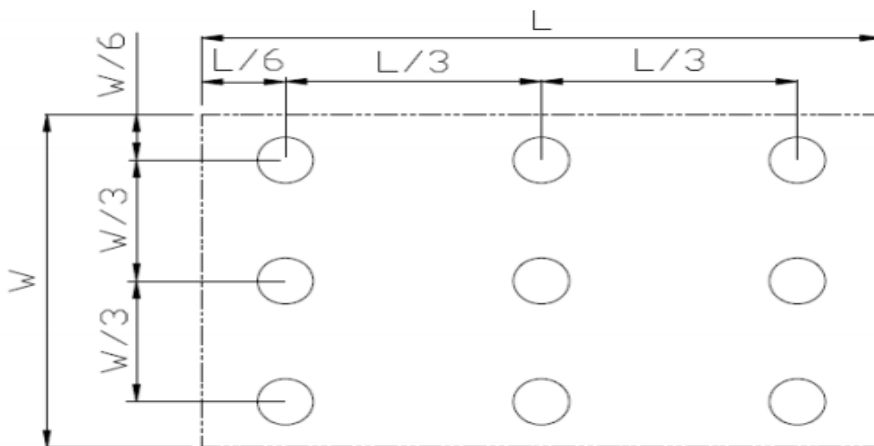


Fig. 2 Definition of uniformity

$L_{\max}$: The measured maximum luminance of all measurement position.

$L_{\min}$: The measured minimum luminance of all measurement position.

Note 7: Definition of Luminance :

Measure the luminance of white state at center point.



7 Environmental / Reliability Tests

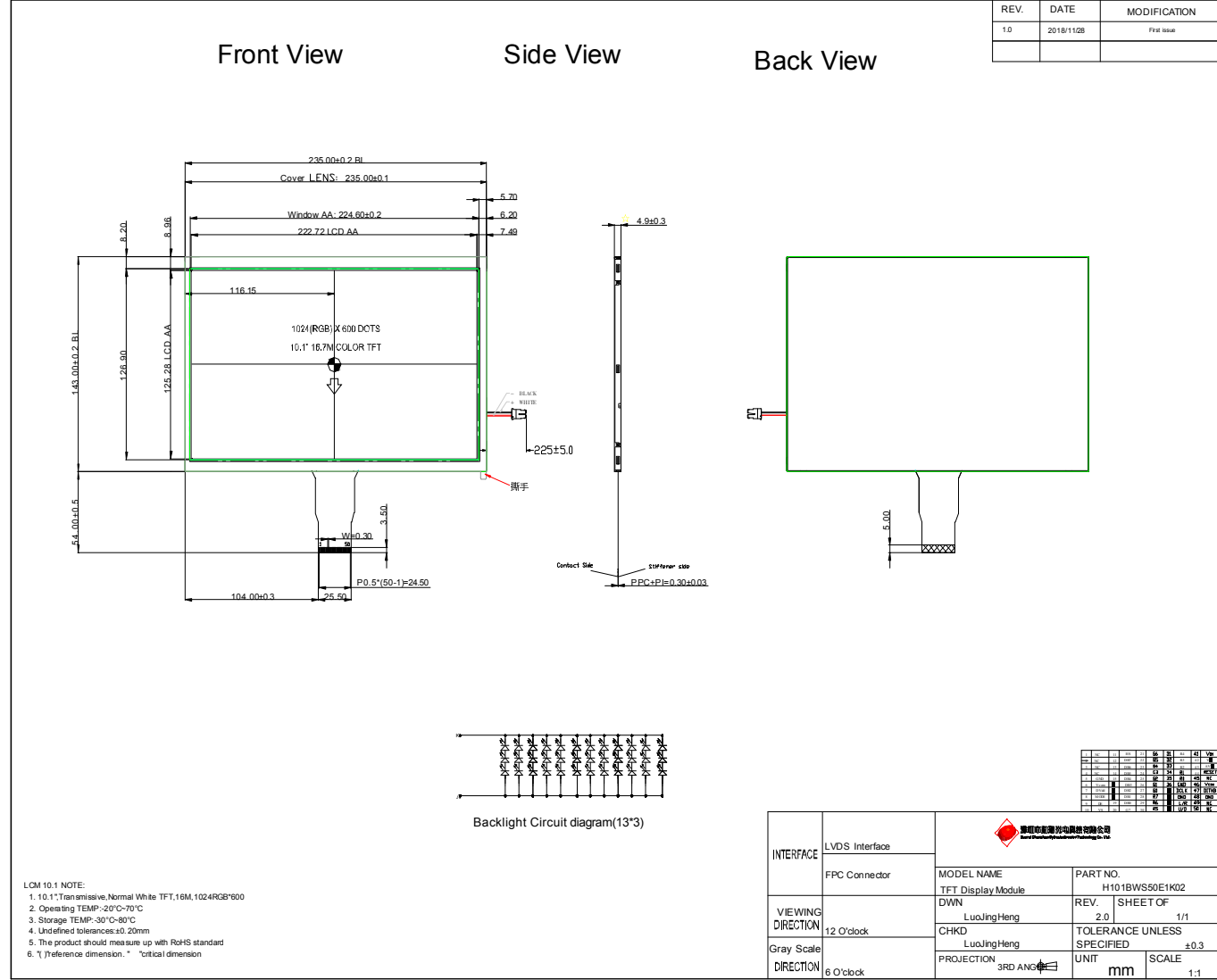
No	Test Item	Condition	Remarks
1	High Temperature Opeartion	$T_s = +70^{\circ}\text{C}$, 240hrs	Note 1 IEC60068-2-2, GB2423. 2-89
2	Low Temperature Opeartion	$T_a = -20^{\circ}\text{C}$, 240hrs	Note 2 IEC60068-2-1 GB2423.1-89
3	High Temperature Storage	$T_a = +80^{\circ}\text{C}$, 240hrs	IEC60068-2-2 GB2423. 2-89
4	Low Temperature Storage	$T_a = -30^{\circ}\text{C}$, 240hrs	IEC60068-2-1 GB/T2423.1-89
5	High Temperature & Humidity Storage	$T_a = +60^{\circ}\text{C}$, 90% RH max, 160 hours	IEC60068-2-3 GB/T2423.3-2006
6	Thermal Shock (Non-operation)	-30°C 30 min ~ $+80^{\circ}\text{C}$ 30 min Change time: 5min, 30 Cycle	Start with cold temperature,end with high temperature IEC60068-2-14, GB2423.22-87
7	Electro Static Discharge (Opeartion)	$C=150\text{pF}$, $R=330\ \Omega$, 5 points/panel Air: $\pm 8\text{KV}$, 5 times; Contact: $\pm 4\text{KV}$, 5 times; (Environment: $15^{\circ}\text{C} \sim 35^{\circ}\text{C}$, 30% ~ 60%, 86Kpa ~ 106Kpa)	IEC61000-4-2 GB/T17626.2-1998
8	Vibration (Non-operation)	Frequency range: 10~55Hz, Stroke: 1.mm Sweep: 10Hz~55Hz~10Hz 2 hours for each direction of X .Y. Z. (package condition)	IEC60068-2-6 GB/T2423.5-1995
9	Shock (Non-operation)	60G 6ms, $\pm X$, $\pm Y$, $\pm Z$ 3 times for each direction	IEC60068-2-27 GB/T2423.5-1995
10	Package Drop Test	Height: 80 cm, 1 corner, 3 edges, 6 surfaces	IEC60068-2-32 GB/T2423.8-1995

Note: 1. T_s is the temperature of panel's surface.

2. T_a is the ambient temperature of sample.



8 Mechanical Drawing

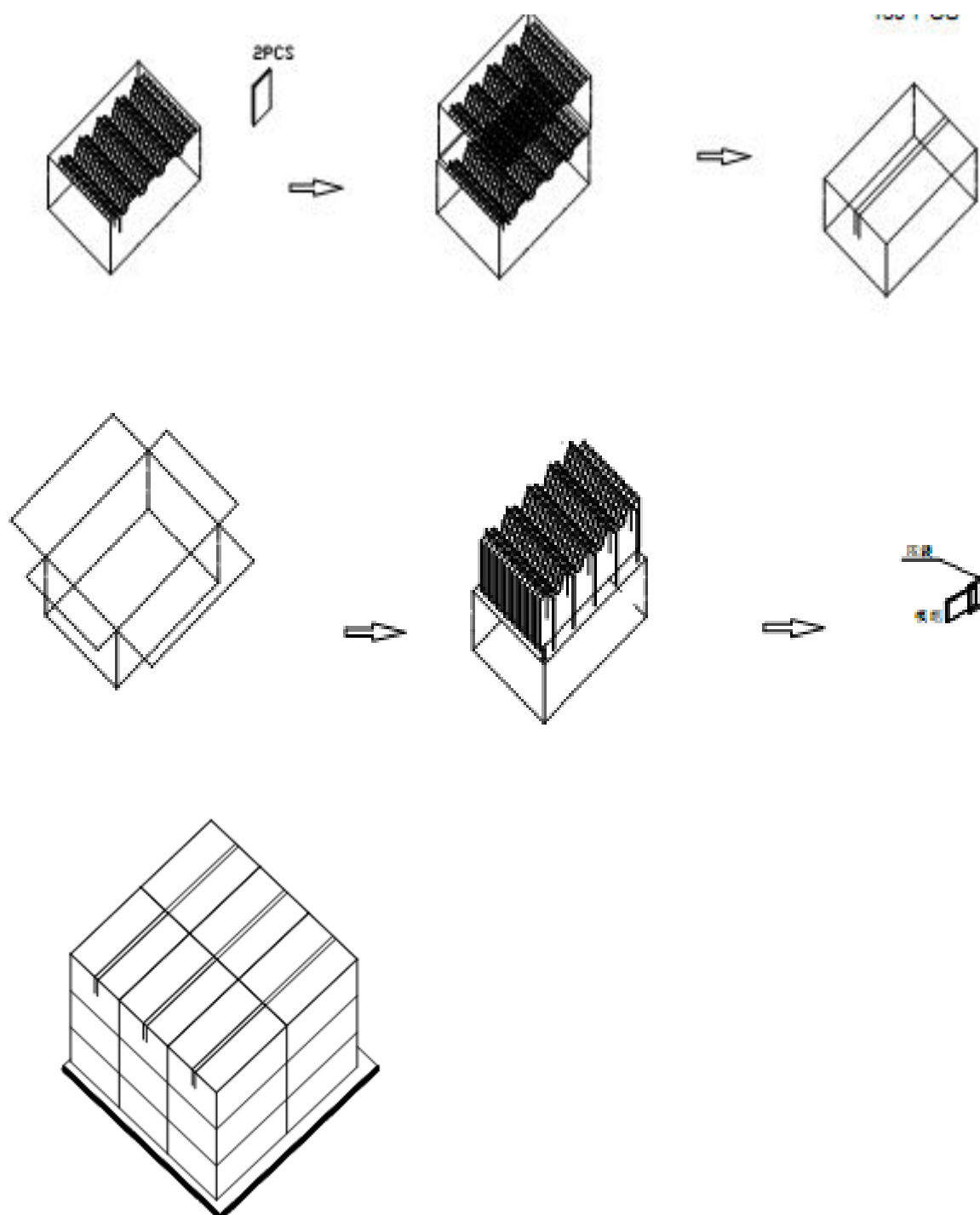




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9 Packing





10. Precautions For Use of LCD modules

10.1 Handling Precautions

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

10.1.2. 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.

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

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

10.1.5. 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

10.1.6. Do not attempt to disassemble the LCD Module.

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

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

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

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

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

10.1.8.4. 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.

10.2 Storage Precautions

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

10.2.2. 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%

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

10.3 Transportation Precautions

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