深圳市勋瑞光电科技有限公司

Xunrui photoelectric technology （shenzhen） CO,.LTD.

Product Specifications

Customer: _____

Model Name: _____H070BWS30I3542_____

Date: _____2023-10-10_____

Version: _____V0_____

■ **Preliminary Specification**

□ **Final Specification**

For Customer's Acceptance

Approved by	Comment

Approved by	Reviewed by	Prepared by

Contents

1. Record of Revision

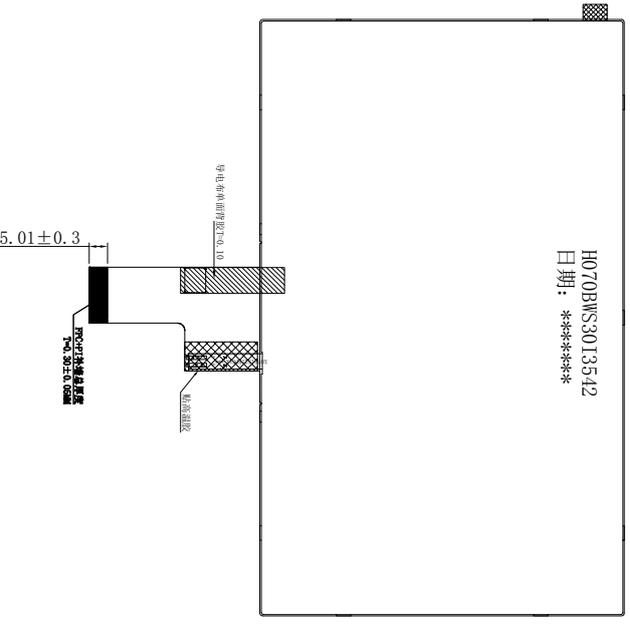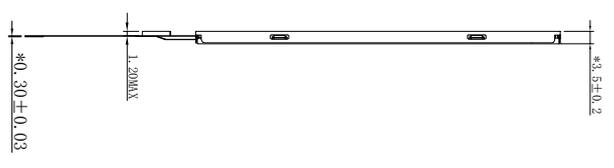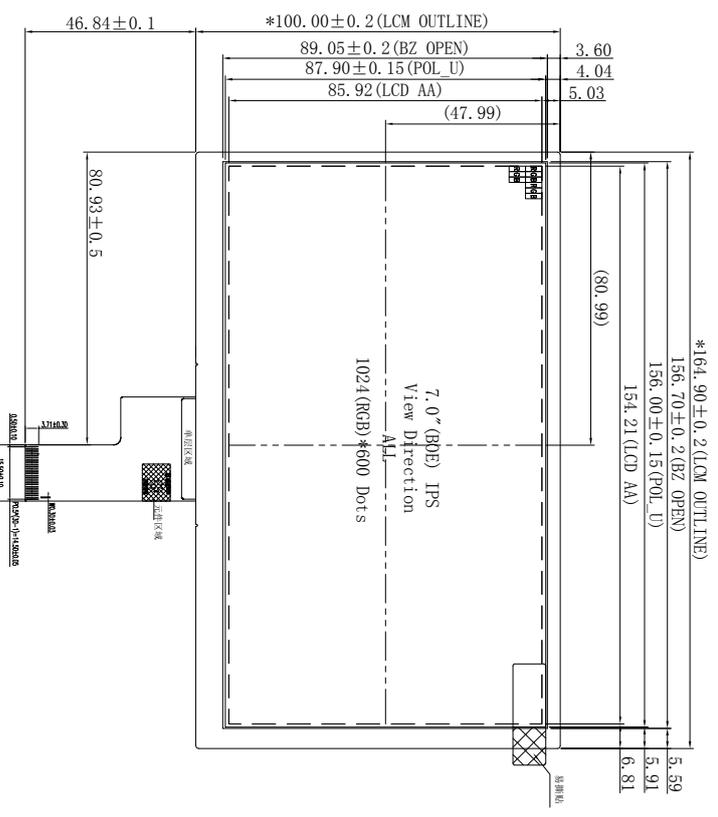| Rev	Issued Date	Description	Editor
V0	2023/10/10	First Release.	

2 . General Specifications

H070BWS30I3542 is a color active matrix thin film transistor(TFT) liquid crystal display (LCD) that use's amorphous silicon TFT as a switching device. This module is composed of a TFT LCD panel, driver ICs, FPC and a backlight unit.

No.	Item	Specification	Unit
1	Panel Size	7"	inch
2	Number of Pixels	1024 (H) × 3(RGB) ×600 (V)	pixels
3	Active Area	154.2144(H)×85.92(V)	mm
4	Pixel Pitch	0.0502 (H)×0.1432 (V)	mm
5	OutlineDimension	164. 9(H) x 100(V) x 3.5(T)	mm
6	Pixel arrangement	RGB vertical stripe	-
7	Display Mode	Normally Black	-
8	Viewing Direction	ALL	-
9	Display Color	16.7M	-
10	Luminance(cd/m2)	350(TYP.)	nit
11	Contrast Ratio	800(TYP.)	-
12	Surface Treatment	Anti-Glare	-
13	Interface	MIPI	-
14	Backlight	White LED	-
15	OperationTemperature	-10~60	℃
16	StorageTemperature	-20~70	℃

3. MECHANICAL SPECIFICATION

LCM NOTES:

1. DISPLAY TYPE: 7.0 INCH TFT /BLACK
2. BACKLIGHT: 27 CHIP WHITE LED, IN PARALLEL
3. OPERATING TEMP: -10°C~+60°C
4. STORAGE TEMP: -20°C~+70°C
5. RESOLUTION: 1024RGBx600
6. LCD IC: TBD
7. Luminous instensity(9 AVG):Module:300cd/m2(MIN.),350cd/m2(TYP.)
8. Uniformity:75%(Min)
9. "( )"reference dimension. " * "critical dimension
10. RoHS Compliant

BACKLIGHT CIRCUIT DIAGRAM:

27顆灯 3串9并
(If=180mA, VF=8.4V~10.2V)

*100.00±0.2(LCM OUTLINE)
89.05±0.2(BZ OPEN)
87.90±0.15(POL_U)
85.92(LCD AA)
(47.99)
46.84±0.1
3.60
4.04
5.03

*164.90±0.2(LCM OUTLINE)
156.70±0.2(BZ OPEN)
156.00±0.15(POL_U)
154.21(LCD AA)
80.93±0.5
(80.99)

7.0"(BOE) IPS
View Direction
ALL
1024(RGB)*600 Dots

5.59
5.91
6.81

*0.30±0.03
1.20MAX
*3.5±0.2

5.01±0.3
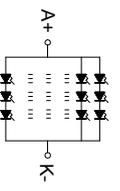
H070BWS30I3542
日期: ***********

INTERFACE		RGB Interface
		FPC Connector
VIEWING DIRECTION		ALL
Gray Scale DIRECTION		FREE

MODEL NAME	TFT Display Module
DWN	
CHKD	
PART NO.	H070BWS30I3542
REV. A0	SHEET OF 1/1
TOLERANCE UNLESS SPECIFIED	
UNIT mm	SCALE 1:1

深圳市勋炜光电科技有限公司
Xunwei photoelectric technology (shenzhen) Co.,LTD.

A0   2023.10.10   First issue

ASSIGNMEN

PIN	SYMBLE
1	VLED+
2	VLED+
3	VGH
4	VGL
5	U/D
6	L/R
7	VLED-
8	VLED-
9	AVDD
10	AVDD
11	MIPI-T1
12	MIPI-T1
13	GND
14	MIPI-T1
15	MIPI-T1
16	GND
17	MIPI-T1
18	MIPI-T1
19	GND
20	MIPI-T1
21	MIPI-T1
22	GND
23	MIPI-T1
24	MIPI-T1
25	GND
26	STBYB
27	RSTB
28	VDD(1.8)
29	VDD(1.8)
30	VCOM

4. PIN DESCRIPTION

PIN NO	Symbol	Description
1	VLED+	LED backlight (Anode)
2	VLED+	LED backlight (Anode)
3	VGH	Gate ON Voltage
4	VGL	Gate OFF Voltage
5	U/D	UP / down select
6	L/R	Left/right select
7	VLED-	LED backlight (Cathode)
8	VLED-	LED backlight (Cathode)
9	AVDD	A power supply for the analog power.
10	GND	Ground
11	MIPI_TDP3	MIPI-DSI Data differentialsignal input pins. (Data lane 3+)
12	MIPI_TDN3	MIPI-DSI Data differentialsignal input pins. (Data lane 3-)
13	GND	Ground
14	MIPI_TDP2	MIPI-DSI Data differentialsignal input pins. (Data lane 2+)
15	MIPI_TDN2	MIPI-DSI Data differentialsignal input pins. (Data lane 2-)
16	GND	Ground
17	MIPI_TCP	MIPI-DSI CLOCK differential signal input pins.
18	MIPI_TCN	MIPI-DSI CLOCK differential signal input pins.
19	GND	Ground
20	MIPI_TDP1	MIPI-DSI Data differentialsignal inputpins. (Data lane 1+)
21	MIPI_TDN1	MIPI-DSI Data differentialsignal input pins. (Data lane 1-)
22	GND	Ground
23	MIPI_TDP0	MIPI-DSI Data differentialsignal input pins. (Data lane 0+)
24	MIPI_TDN0	MIPI-DSI Data differentialsignal input
25	GND	Ground
26	STBYB	待机模式，正常拉高 STBYB=1， 正常操作 STBYB=0，定时控制器，电源驱动将关闭
27	LRSTB	Global reset pin. Active low to enter reset state.Suggest to connecting with an RC reset circuit for stability.Normally pull high. (R=10K_，C=1μF)
28	VDD	A power supply for the analog power. VDD= 1.8V
29	VDD	A power supply for the analog power. VDD3= 1 8V
30	VCOM	The power supply of common voltage in DC com driving.

I：input，O：output，P：Power

【Note】　*1)：When SHLR ="0"，set right to left scan dirction

When SHLR ="1"，set left to right scan dirction

When UPDN ="0"，set top to bottom scan dirction

5. ELECTRICAL CHARACTERISTICS

5.1 ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Values Min.	Values Max.	Unit	Remark
Digital Supply Voltage	VDD	- 0.3	2.0	V	
Analog Supply Voltage	AVDD	-0.5	15	V	
Gate On Voltage	VGH	-0.3	40	V	
Gate Off Voltage	VGL	-20	0.3	V	
Gate On-Gate Off Voltage	VGH-VGL	12	40	V	

5.2 TFT LCD MODULE

5.2.1 Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Digital Supply Voltage	VDD	1.71	1.8	1.89	V	
TFT Gate on voltage	VGH	16	18	20	V	
TFT Gate off voltage	VGL	-7	-6	-5	V	
TFT Common electrode voltage	VCOM	3.0	3.2	3.3	V	
Analog power supply voltage	AVDD	8.0	9.6	13.5	V	

5.2.2 Current Consumption

Item	Symbol	Condition	Values Min.	Values Typ.	Values Max.	Unit	Remark
Gate on power Current	IVGH	VGH =18 V	-	0.5	1	mA	Note2
Gate off power current	IVGL	VGL= -6V	-	1	2	mA	Note2
Digital power current	IVDD	VDD = 1.8V	-	30	45	mA	Note2
Analog power current	IAVDD	AVDD =9.6V	-	35	45	mA	Note2

5.3 POWER ON/OFF SEQUENCE

In order to prevent IC from power on reset fail, the rising time (TPOR) of the digital power supply VDD should be maintained within the given specifications. Refer to "AC Characteristics" for more detail on timing.

5.3.1 POWER-ON/OFF TIMING SEQUENCE

Enter and Exit Standby Mode timing chart

5.4 BACK LIGHT UNIT

Ta=25℃

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
LED current	ILED	-	180	-	mA	27LEDS
Forward voltage	VF	8.4	9.0	10.2	V	IF=180mA 27LEDS
Reverse current	IR	-	-	50	μA	VR=5V,1LED
Power dissipation	Pd		1620		mW	27LEDS
Peak forward current	IFP		25		mA	1LED
Reverse Voltage	VR		5		V	1LED

5.4.1 Internal Circuit Diagram

BACKLIGHT CIRCUIT DIAGRAM:

27颗灯 3串9并
(If=180mA, VF=8.4V~10.2V)

6. INPUT SIGNAL TIMING AND INITION CODE

6.1 DE MODE FOR 1024RGB*600

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK Frequency	fclk	40.8	51.2	67.2	MHz
Horizontal Display Area	thd		1024		DCLK
HSD Period	th	1114	1344	1400	DCLK
HSD Blanking	thb+ thfp	90	320	376	DCLK
Vertical Display Area	tvd		600		T_H
VSD Period	tv	610	635	800	T_H
VSD Blanking	tvbp+ tvfp	10	35	200	T_H

6.2 Inition code for LCM

5.2.1 MIPI-4LINE command:

MIPI CLK Speed:340Mbps(170MHZ)
H blank porch:160
H front porch:160
H pulse width:10
V blank porch:23
V front porch:12
V pulse width:1

MIPI command:
regw(0x01);//Reset
Delay 30ms
regw(0x80,0xAC);
regw(0x81,0xBB);
regw(0x82,0x09);
regw(0x83,0x78);
regw(0x84,0x7F);
regw(0x85,0xBB);
regw(0x86,0x70);

7.OPTICAL CHARACTERISTICS

Ta = 25 ± 2℃

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Response time		Tr	θ=φ= 0°	-	30	40	ms	Note3
		Tf						
Contrast ratio		CR	θ=φ= 0°	600	800	-	-	Note4
Color Chromaticity	White	x	Θ=0 Normal viewing angle	0.278	0.308	0.338		Note2 Note5
		y		0.306	0.336	0.366		
	Red	x		0.569	0.599	0.629		
		y		0.305	0.335	0.365		
	Green	x		0.267	0.297	0.327		
		y		0.522	0.552	0.582		
	Blue	x		0.110	0.140	0.170		
		y		0.101	0.131	0.161		
Luminance		L		300	350	-	cd/m2	Note2 Note6
Luminance uniformity		YU		70	75	-	%	
Viewing Angle	Ver.	θU	CR≧10	-	85	-		Note1
		θD		-	85	-		
	Hor.	φL		-	85	-		
		φR		-	85	-		
NTSC				45	50	-	%	

Note1:Definition of viewing angle range
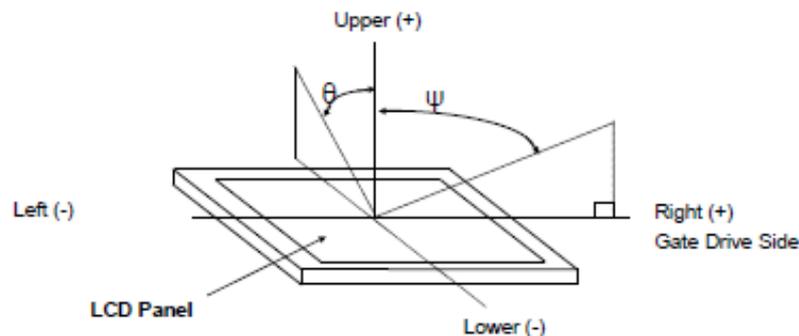
Fig. 6-1 Definition of viewing angle

Note 2: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 30 minutes operation, the optical properties are measured at the center point of the LCD screen. (Viewing angle is measured by ELDIM-EZ contrast/Height :1.2mm , other items are measured by Photo detector TOPCON BM-7 Field of view: 1°/Height: 500mm.)
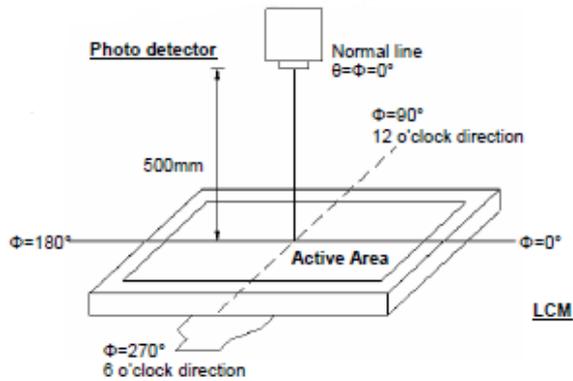
Fig. 6-2 Optical measurement system setup

Note3: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 10% to 90%. And fall time (TOFF) is the time
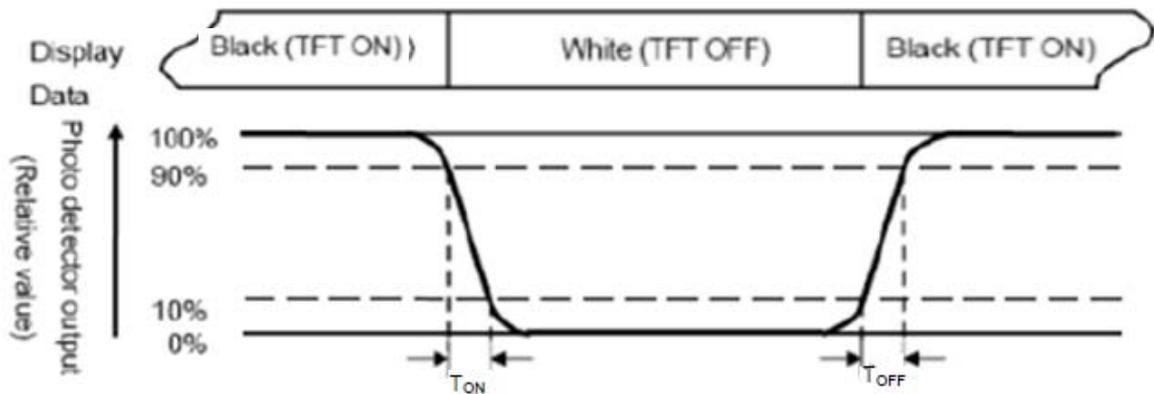between photo detector output intensity changed from 90% to 10%.

Fig. 6-3 Definition of response time

Note4:Definition of contrast ratio:

Note5: Definition of color chromaticity
       Color coordinates measured at center point of LCD.

Note6: All input terminals LCD panel must be ground while measuring the center area of

       the panel. The LED driving condition is IL=140mA.

8 . Environmental / Reliability Tests

8.1 TEMPERATURE AND HUMIDITY

Test Item	Test Condition	Remark
HighTemperatureStorage	Ta=70℃;	72hrs
Low Temperature Storage	Ta=-20℃;	72hrs
High Temperature Operation	Ta=60℃;	72hrs
Low Temperature Operation	Ta=-10℃;	72hrs
High Temperature High Humidity Operation	Ta=60℃，90%RH，	72Hrs(no condensation)
Thermal Shock	-20℃(0.5h) ~ 70℃(0.5h) / 10cycles	Start with cold temperature，End with high temperature.

8.2 VIBRATION SHOCK

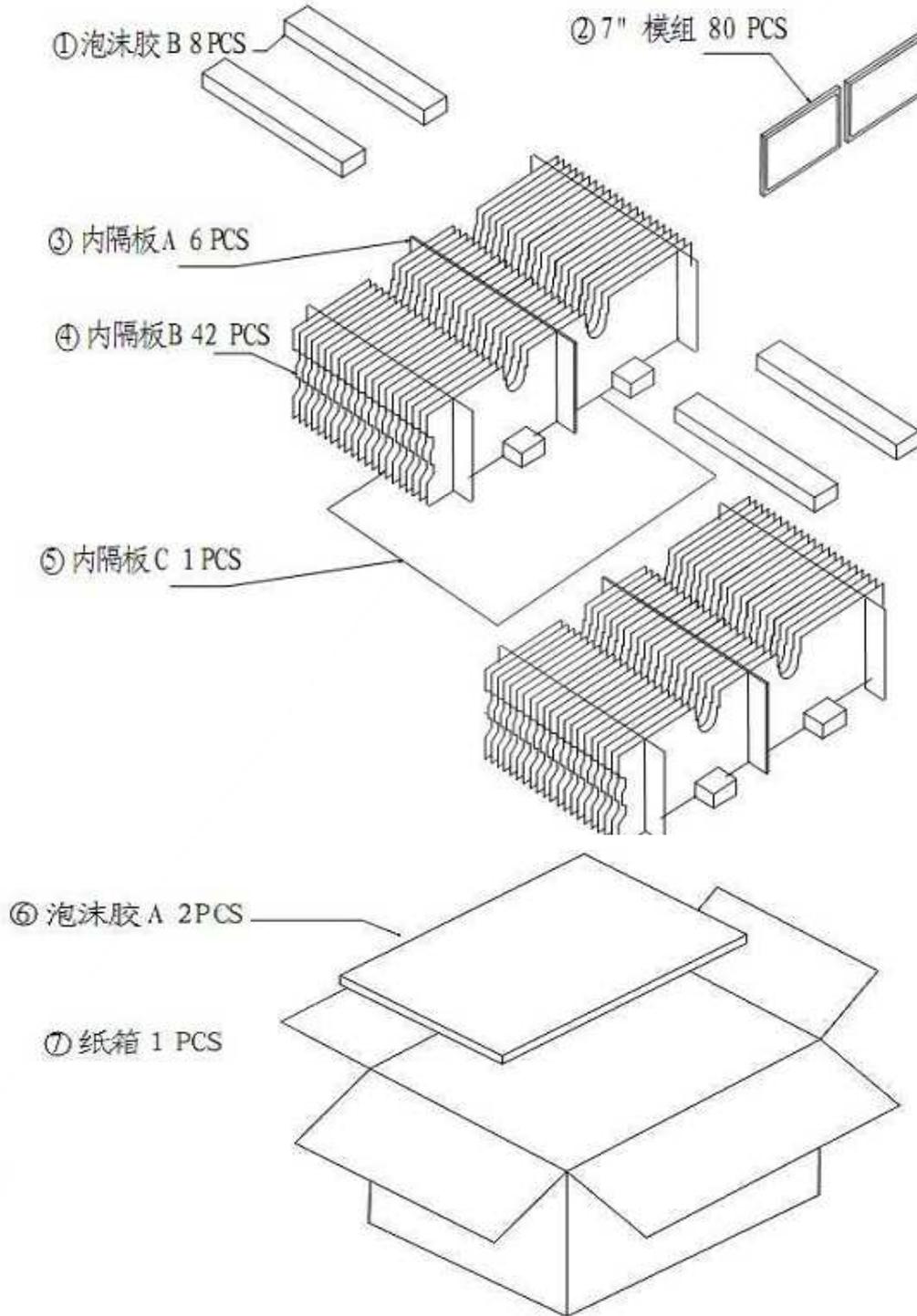| Test item	Conditions	Remark
Packing Shock (non-operation)	980m/s2,6ms, ±x,y,z 3times for direction	IEC60068-2-27：1987 GB/T2423.5-1995
Packing Vibration (non-operation)	Frequency range:10 HZ~50HZ Stroke:1.0mm,sweep:10 HZ ~50HZ x,y,z 2 hours for each direction	IEC60068-2-32：1990 GB/T2423.8-1995

8.3ESD

Test item	Conditions		Remark
Electro Static Discharge Test (non-operation)	150pF，330Ω，Contact:±4KV,Air:±8KV	1	IEC61000-4-2：2001 GB/T17626.2-2006
	200pF，0Ω，±200V contact test	2	

Note: Measure point :

1. LCD glass and metal bezel

2. IF connector pins

9.Packing

① 泡沫胶 B 8 PCS

② 7" 模组 80 PCS

③ 内隔板 A 6 PCS

④ 内隔板 B 42 PCS

⑤ 内隔板 C 1 PCS

⑥ 泡沫胶 A 2 PCS

⑦ 纸箱 1 PCS

10. Precautions for Use of LCD modules

10.1 *HANDING PRECAUTIONS*

(1) *The display panel is made of glass. Do not subject it to a mechanical shock or impact by dropping it.*

(2) *If the display panel is damaged and the liquid crystal substance leaks out, be sure not to get any in your mouth. If the substance contacts your skin or clothes, wash it off using soap and water.*

(3) *Do not apply excessive force to the display surface or the adjoining areas 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 this polarizer carefully.*

(5) *If the display surface becomes contaminated,breathe on the surface and gently wipe it with a soft dry cloth. If it is heavily contaminated, moisten a cloth with one of the following solvents:*

> *- Isopropyl alcohol*
>
> *- Ethyl alcohol*

(6) *Solvents other than those above mentioned may damage the polarizer.*

> *Especially, do not use the following:*
>
> > *- Water*
> >
> > *- Ketone*
> >
> > *- Aromatic solvents*

(7) *Extra care to minimize corrosion of the electrode. Water droplets, moisture condensation or a current flow in a high-humidity environment accelerates corrosion of the electrode.*

(8) *Install the LCD Module by using the mounting holes. When mounting the LCD Module, make sure it is free of twisting, warping and distortion. In particular, do not forcibly pull or bend the I/O cable or the backlight cable.*

(9) *Do not attempt to disassemble or process the LCD Module.*

(10) *NC terminal should be open. Do not connect anything.*

(11) *If the logic circuit power is off, do not apply the input signals.*

(12) *To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.*

> *- Be sure to ground the body when handling he LCD Module.*
>
> *-To reduce the amount of static electricity generated, do not conduct assembling and other*
>
> *-The LCD Module is coated with a film to protect the display surface. Exercise care when peeling off this protective film since static electricity may be generated.*

10.2 *STORAGE PRECAUTIONS*

When storing The LCD Module, avoid exposure to direct sunlight of fluorescent lamps. Keep the modules in bags (avoid high temperature/ high humidity and low temperatures below 0 ℃). Whenever possible, the LCD Module should be stored in the same conditions in which they were shipped from our company.

10.3 *OTHERS*

Liquid crystals solidify under low temperature (below the storage temperature range) leading to defective orientation or the generation of air bubbles (black or white). Air bubbles may also be generated if the module is subject to a low temperature.

If the LCD Module have been operating for a long time showing the same display patterns the display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. A normal operating status can be recovered by suspending use for some time. It should be noted that this phenomenon does not adversely affect performance reliability.

To minimize the performance degradation of the LCD Module resulting from destruction caused by static electricity etc. exercise care to avoid holding the following sections when handling the modules.

- Exposed area of the printed circuit board.
- Terminal electrode sections.