

深圳市高信技术有限公司

PRODUCT SPECIFICATION

7" 1024RGB×600 TFT

Customer :

	PREPARED BY	CHECKED BY	APPROVED BY
SIGNATURE			
DATE			

CUSTOMER APPROVAL	SIGNATURE	DATE

The information contained in this document is proprietary to create wealth technology display and shall not be reproduced or used in part or whole without written permission of Create wealth technology display.

This Specification is subject to change without prior notice. Please contact Create wealth technology to confirm the latest revision.

深圳市高信技术有限公司

Revision History

Revision	Date	Originator	Detail	Remarks
1	2014-08-25		First Release	

深圳市高信技术有限公司

Contents

No.	Contents	Page
1	General specifications	4
2	Absolute maximum ratings	5
3	Electrical characteristics	5
4	Dimensional drawing	6
5	Interface pin connections	7
6	Timing characteristics	8-11
7	Electro-optical characteristics	12-14
8	Inspection criteria	14-15
9	Reliability	16
10	Packing form	17
11	Precautions for using LCD module	18-19

深圳市高信技术有限公司

1.0 General Specifications

GX070-1024600-30MIPI-CPT is a color active matrix LCD module incorporating amorphous silicon TFT (Thin Film Transistor). It is composed of a color TFT-LCD panel, driver IC, FPC and a back light unit. The module display area contains 1024x 600 pixels. This product accords with RoHS environmental criterion.

Item	Contents	Unit
LCD Type	TFT TRANSMISSIVE	/
Viewing direction	6:00	O'Clock
Module outline (W x HxD)	163.8*97*2.6	mm
Active area (WxH)	154.21x85.92	mm
Number of Dots	1024(RGB) x600	/
Backlight Type	8*3chips white LED	/
Interface Type	Parallel 24bit RGB	/
Input voltage	1.8	V

2.0 ABSOLUTE MAXIMUM RATINGS

AGND= GND=0V, Ta = 25

ITEM	Symbol	Min	Max	Unit	Note
Digital Supply Voltage	VDD	1.8		V	TYP
Analog Supply Voltage	AVDD	-0.5	13.5	V	
Gate On Voltage	VDDG	-0.3	+42	V	
Gate Off Voltage	VEEG	-20	+0.3	V	
Gate On - Gate Off Voltage	VDDG-VEEG	12	40	V	
Operation Temperature	Top	-20	70	°C	
Storage Temperature	Tstg	-30	80	°C	

Note1:If users use the product out off the environmental operation rangetemperature and humidity, it will have visual quality concerns.

深圳市高信技术有限公司

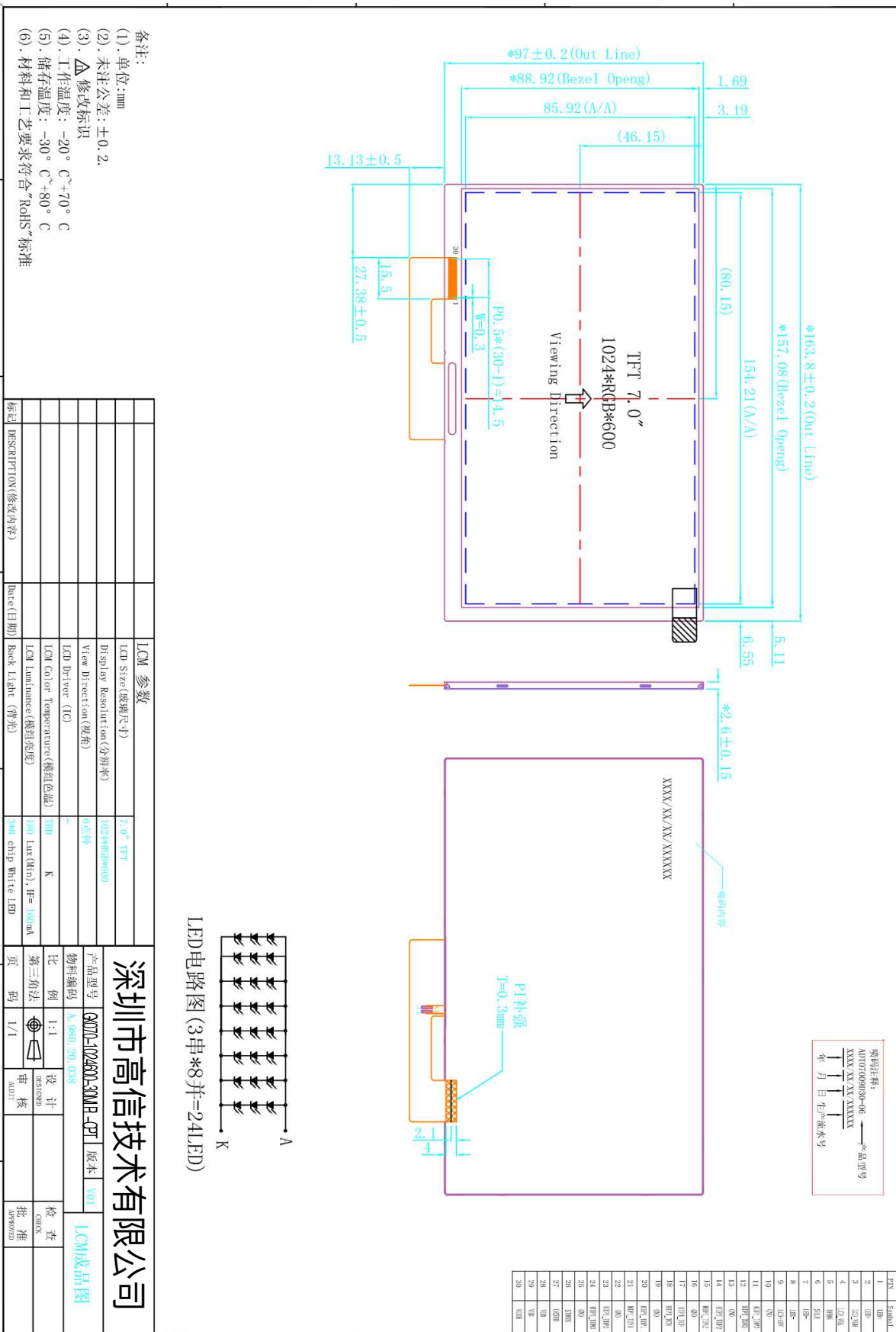
3.0 ELECTRICAL CHARACTERISTICS

ITEM	Symbol	Value			Unit	Note
		Min	typ	Max		
Digital Supply Voltage	VCC		1.8		V	
Analog Supply Voltage	AVDD	9.4	9.6	9.8	V	
Gate On Voltage	VDDG	16.5	18	19	V	
Gate Off Voltage	VEEG	-6.6	-6	-5.4	V	
Common Voltage	VCOM	-	3.9	-	V	Note1
Current of power supply (VCC=1.8V;AVDD=9.6V;VGH=18V;VGL=-6V)	IVDD	-	20	40	MA	
	I _{AVDD}	-	35	40	MA	
	I _{VGH}	-	0.5	2	MA	
	I _{VGL}	-	0.5	2	MA	
Logic Input Voltage	V _{IH}	0.7VDD	--	VDD	V	
	V _{IL}	GND	--	0.3VDD	V	
LCM Luminance	L _v	180	200	-	V	LUX
Color Temperature(LCM)		4500	5500	6500	K	

Note1:Please adjust VCOM to make the flicker level be minimum.

深圳市高信技术有限公司

4.0 DIMENSIONAL DRAWING



深圳市高信技术有限公司

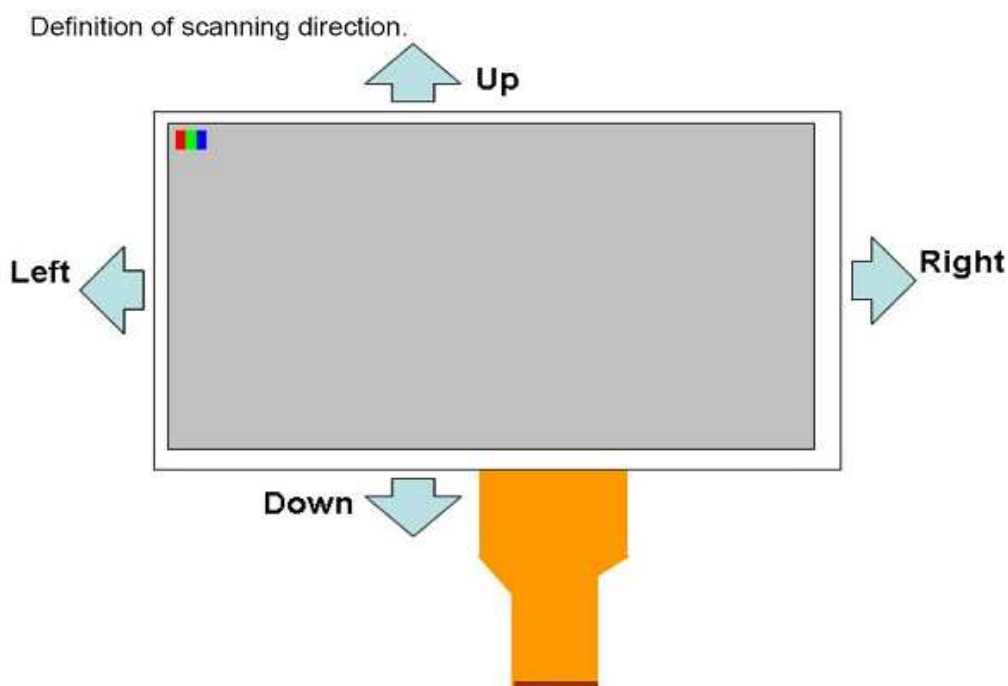
5.0 INTERFACE PIN CONNECTIONS

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	LCD+10V	A power supply for the analog power.
10	GND	Ground
11	MIPI_TDP3	MIPI-DSI Data differential signal input pins. (Data lane 3+)
12	MIPI_TDN3	MIPI-DSI Data differential signal input pins. (Data lane 3-)
13	GND	Ground
14	MIPI_TDP2	MIPI-DSI Data differential signal input pins. (Data lane 2+)
15	MIPI_TDN2	MIPI-DSI Data differential signal 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 differential signal input pins. (Data lane 1+)
21	MIPI_TDN1	MIPI-DSI Data differential signal input pins. (Data lane 1-)
22	GND	Ground
23	MIPI_TDP0	MIPI-DSI Data differential signal input pins. (Data lane 0+)
24	MIPI_TDN0	MIPI-DSI Data differential signal input
25	GND	Ground
26	STBYB	
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 _Ω , C=1 μF)
28	VDD	A power supply for the analog power. (VDD=1.8V.)
29	VDD	A power supply for the analog power. (VDD=1.8V.)
30	VCOM	The power supply of common voltage in DC com driving.

深圳市高信技术有限公司

【Note1】 SHLR : left or right setting
UPDN : up or down setting

SHLR	UPDN	Data shifting
DVDD	GND	Left→Right · Up→Down(default)
GND	GND	Right→Left · Up→Down
DVDD	DVDD	Left→Right · Down→Up
GND	DVDD	Right→Left · Down→Up



6.1 Timing characteristics

6.1.1 Parallel RGB input timing table

- Horizontal timing

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Horizontal Display Area	thd		800		DCLK
DCLK frequency	fcik	-	30	50	MHz
One Horizontal Line	th	889	928	1143	DCLK
HS pulse width	thpw	1	48	255	DCLK
HS Back Porch (Blanking)	thb		88		DCLK
HS Front Porch	thfp	1	40	255	DCLK
DE mode Blanking	th-thd	85	128	512	DCLK

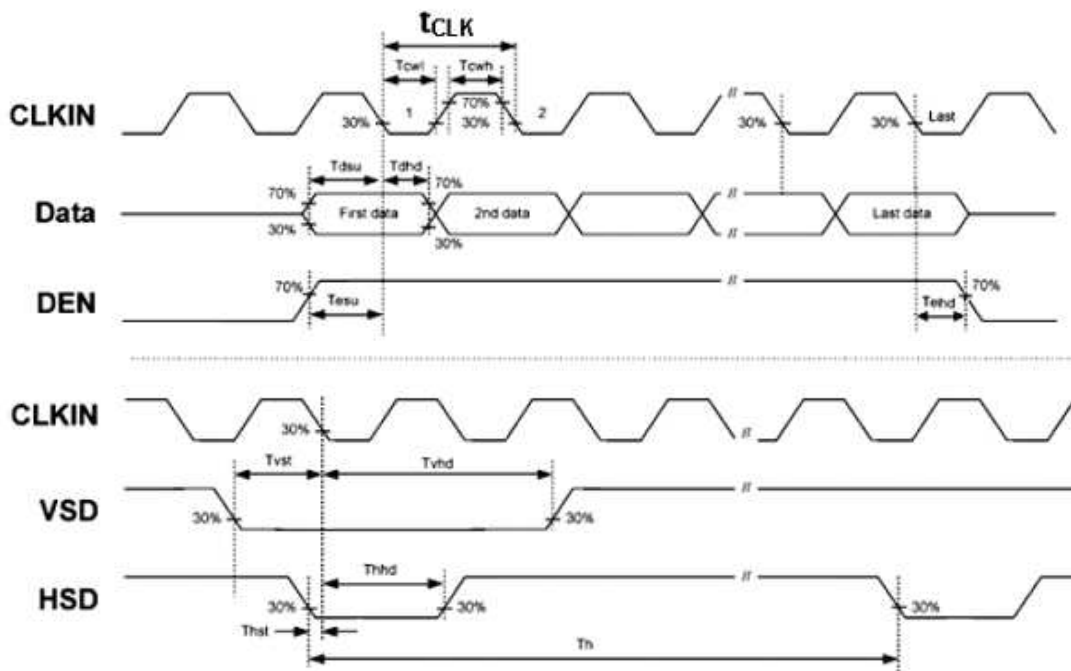
深圳市高信技术有限公司

- Vertical timing

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Vertical Display Area	tvd		480		T _H
VS period time	tv	513	525	787	T _H
VS pulse width	tpw	3	3	255	T _H
VS Back Porch (Blanking)	tvb		32		T _H
VS Front Porch	tvfp	1	13	255	T _H
DE mode Blanking	tv-tvd	4	45	255	T _H

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
CLKIN Frequency	Fclk	-	40	50	MHz	VDD=3.0V~3.6V
CLKIN Cycle Time	Tclk	20	25	-	ns	-
CLKIN Pulse Duty	Tcwh	40	50	60	%	Tclk
Time from HSD to Source Output	Thso		64		CLKIN	-
Time from HSD to LD	Thld		64		CLKIN	-
Time from HSD to STV	Thstv		2		CLKIN	-
Time from HSD to CKV	Thckv		20		CLKIN	-
Time from HSD to OEV	Thoev		4		CLKIN	-
LD Pulse Width	Twid		10		CLKIN	-
CKV Pulse Width	Twckv		66		CLKIN	-
OEV Pulse Width	Twoev		74		CLKIN	-

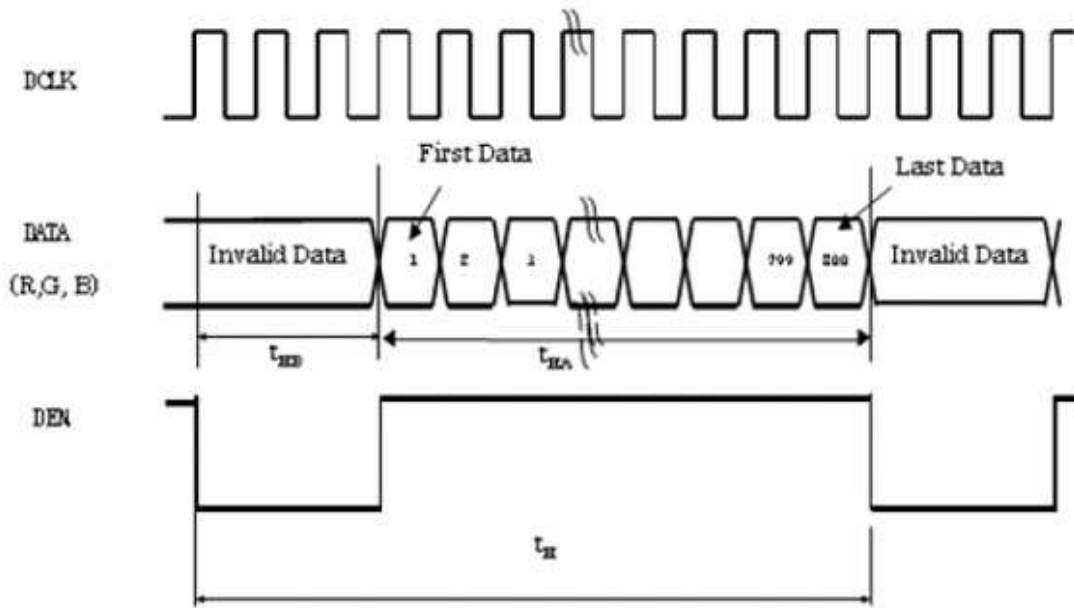
Table 10. 1 Parallel 24-bit RGB mode



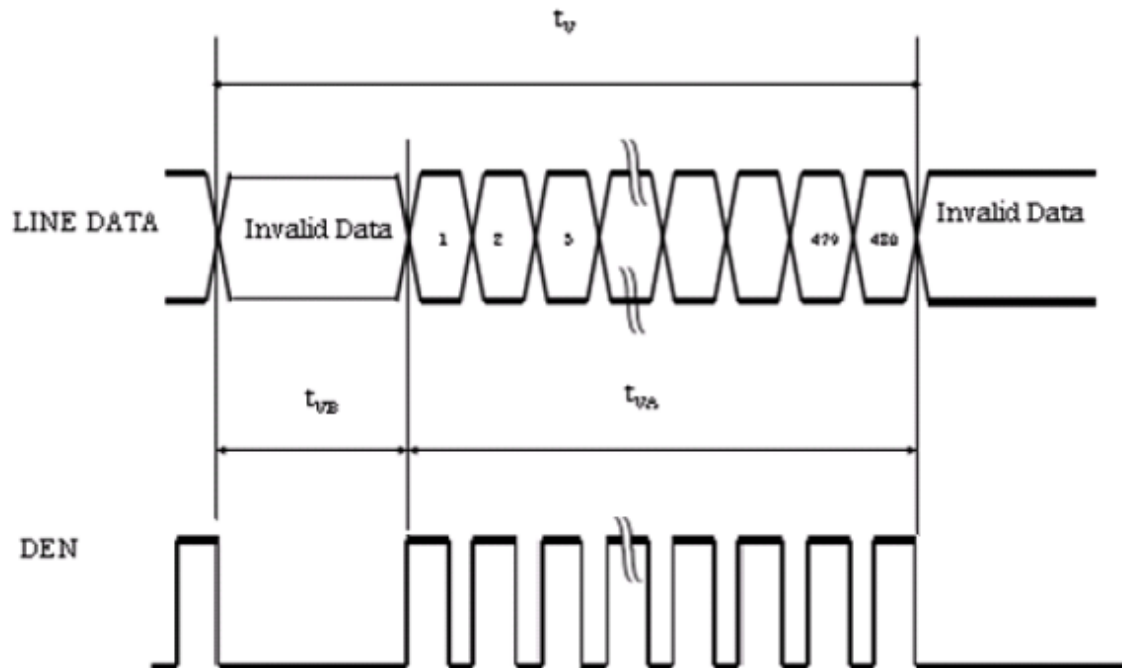
深圳市高信技术有限公司

DE mode

Horizontal timing :



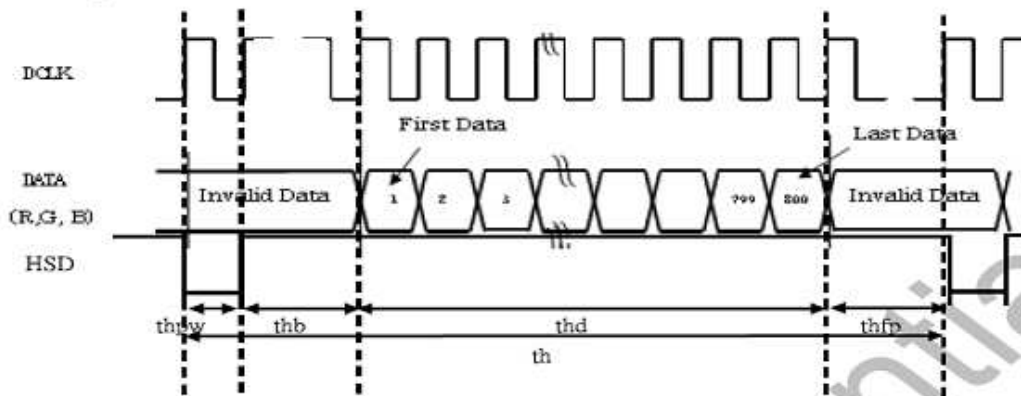
Vertical timing :



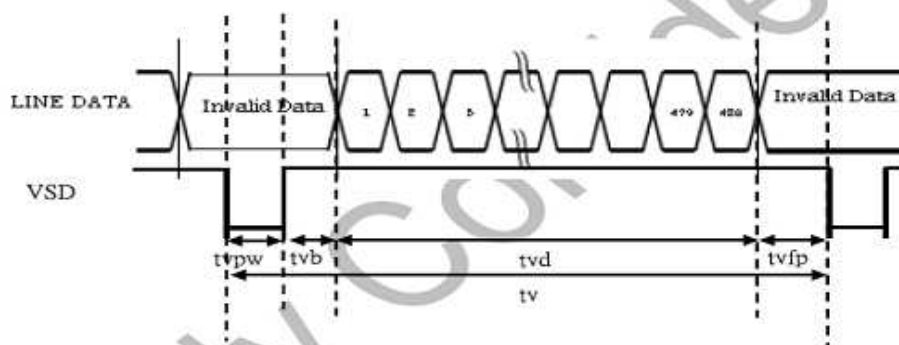
深圳市高信技术有限公司

SYNC mode

Horizontal timing :

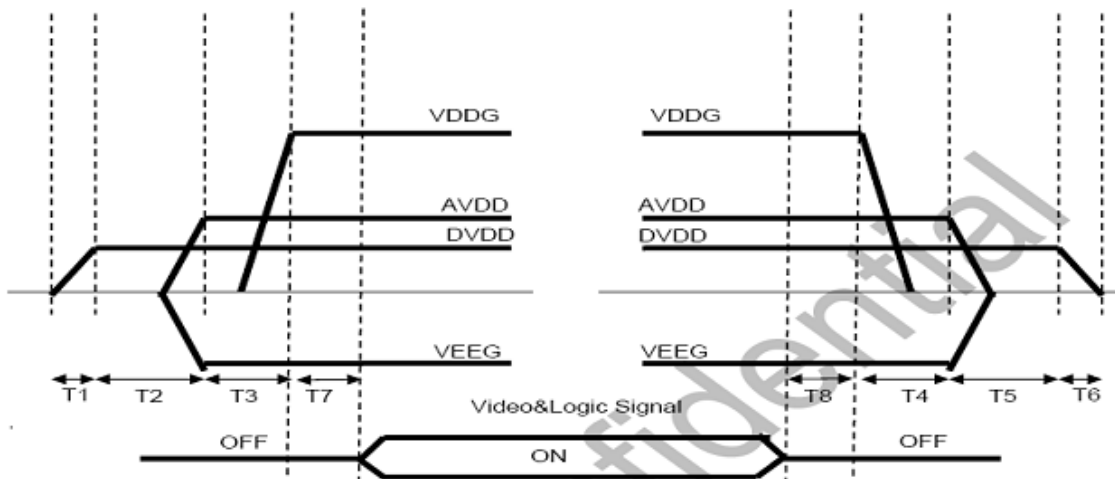


Vertical timing :



6.1.2 Power & Signal sequence

Power On : DVDD—AVDD/VEEG—VDDG—Video & Logic Signal
 Power Off : Video & Logic Signal—VDDG—AVDD/VEEG—DVDD



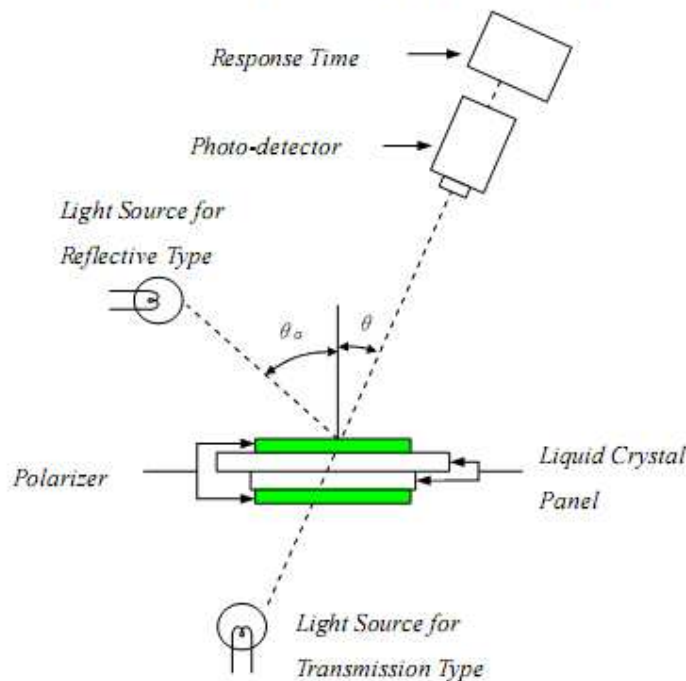
$0 < T1 \leq 10\text{ms}$ $T5 > 0\text{ms}$
 $T2 > 20\text{ms}$ $T6 > 0\text{ms}$
 $T3 > 10\text{ms}$ $0 < T7 \leq 10\text{ms}$
 $T4 > 0\text{ms}$ $0 < T8 \leq 10\text{ms}$

深圳市高信技术有限公司

7. ELECTRO-OPTICAL CHARACTERISTICS

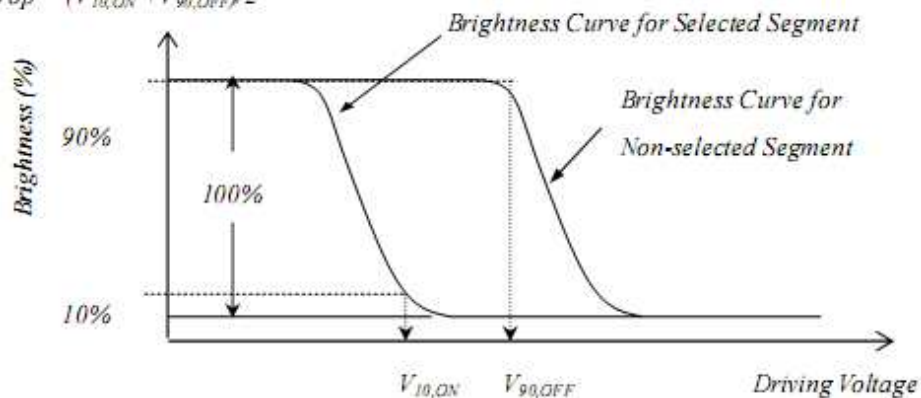
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
Panel Transmittance	T	~	3.9	4.2	--	%	
Contrast Ratio	CR	Point-5)	600	800	--	--	2
Response Time	Tr + Tf	Point-5	--	25	40	ms	3
NTSC			45%	50%	--		
Viewing Angle	Left	ϕ	Point-5 CR \geq 10	70	80		4
	Right	ϕ		70	80		4
	Upper	θ		50	60		4
	Lower	θ		70	70		4
Color Filter Chromaticity	White	x	$\theta = \phi = 0^\circ$	0.273	0.313	0.353	
		y		0.289	0.329	0.369	
	Red	x	$\theta = \phi = 0^\circ$	TBD	TBD	TBD	
		y		TBD	TBD	TBD	
	Green	x	$\theta = \phi = 0^\circ$	TBD	TBD	TBD	
		y		TBD	TBD	TBD	
	Blue	x	$\theta = \phi = 0^\circ$	TBD	TBD	TBD	
		y		TBD	TBD	TBD	

7.1 ELECTRO-OPTICAL CHARACTERISTICS TEST METHOD



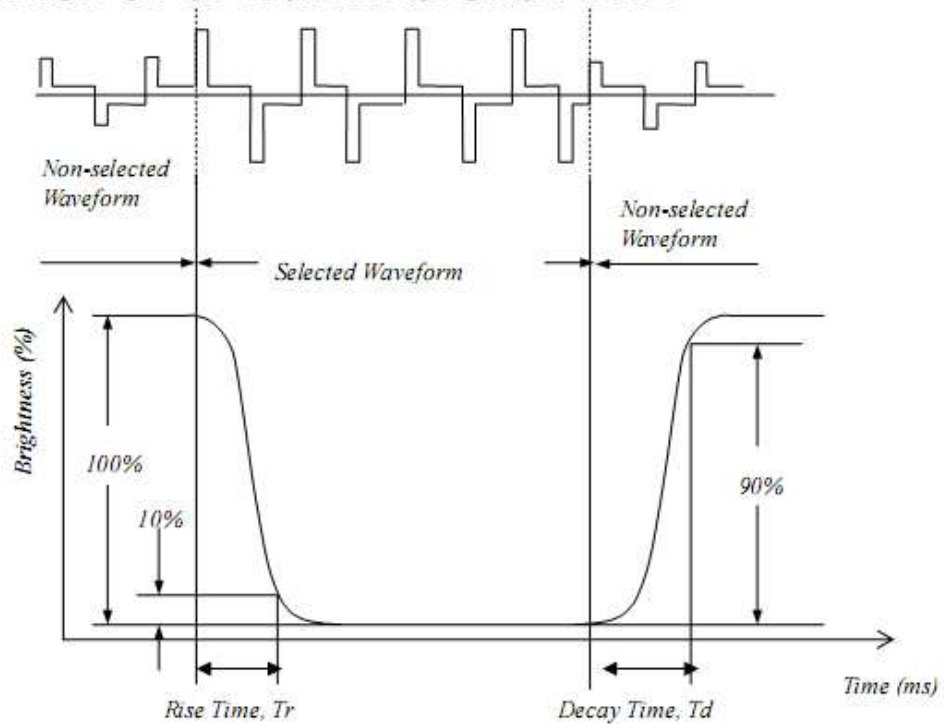
7.2 DEFINITION OF OPERATING VOLTAGE, VOP

$$V_{op} = (V_{10,ON} + V_{90,OFF})/2$$

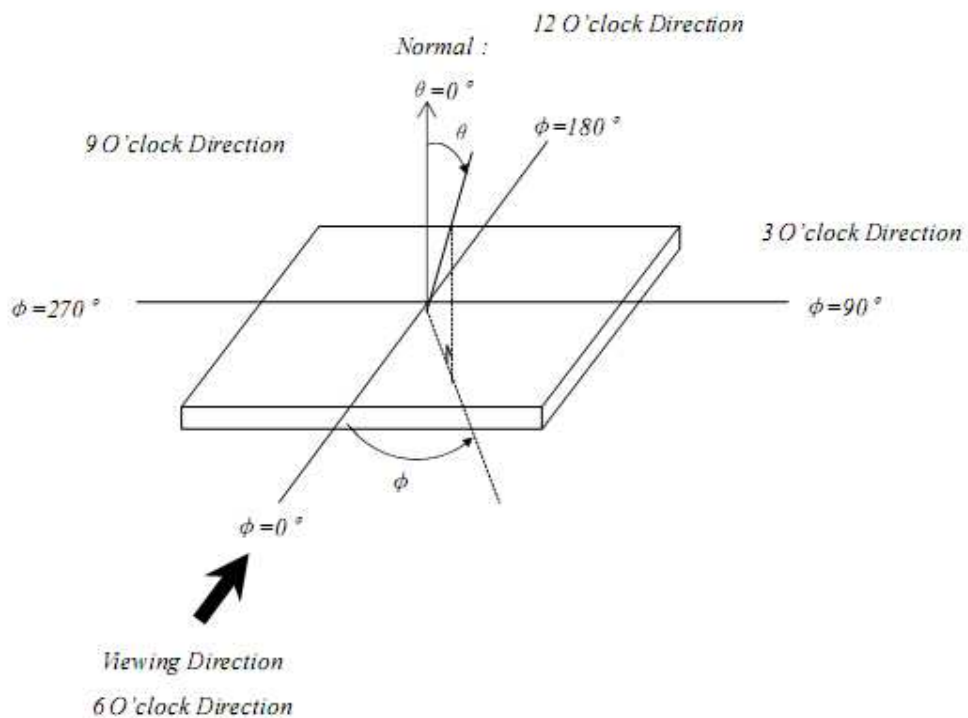


深圳市高信技术有限公司

7.3 DEFINITION OF OPTICAL RESPONSE TIME



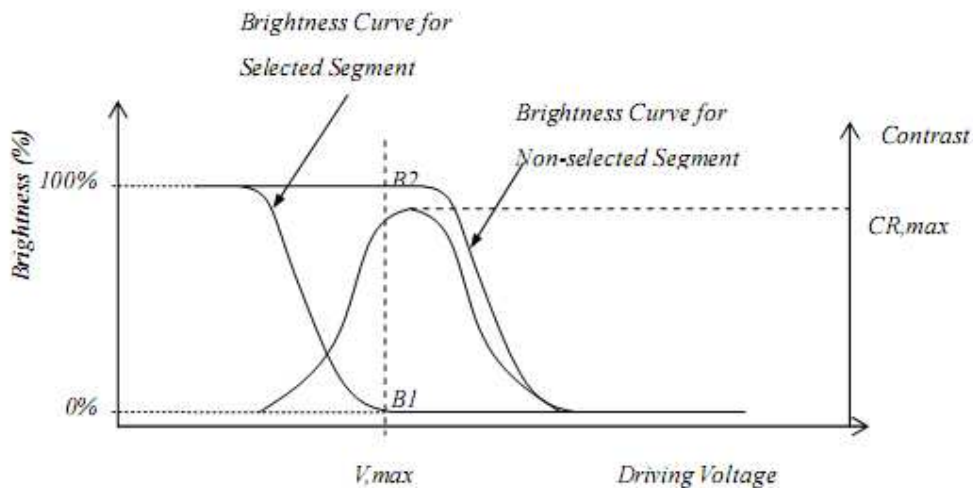
7.4 DEFINITION OF VIEWING ANGLE θ AND ϕ



深圳市高信技术有限公司

7.5 DEFINITION OF CONTRAST RATIO, CR

$$CR = \frac{\text{Brightness of Non-selected Segment (B2)}}{\text{Brightness of Selected Segment (B1)}}$$



8. INSPECTION CRITERIA

8.1 Inspection Conditions

8.1.1 Environmental conditions

The environmental conditions for inspection shall be as follows

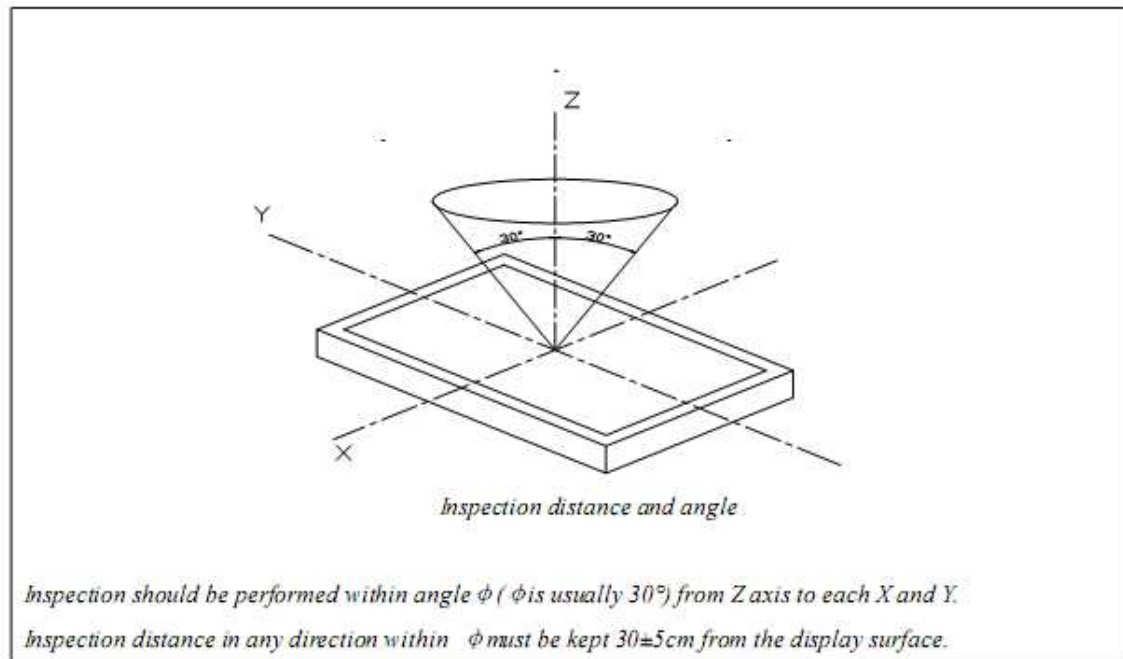
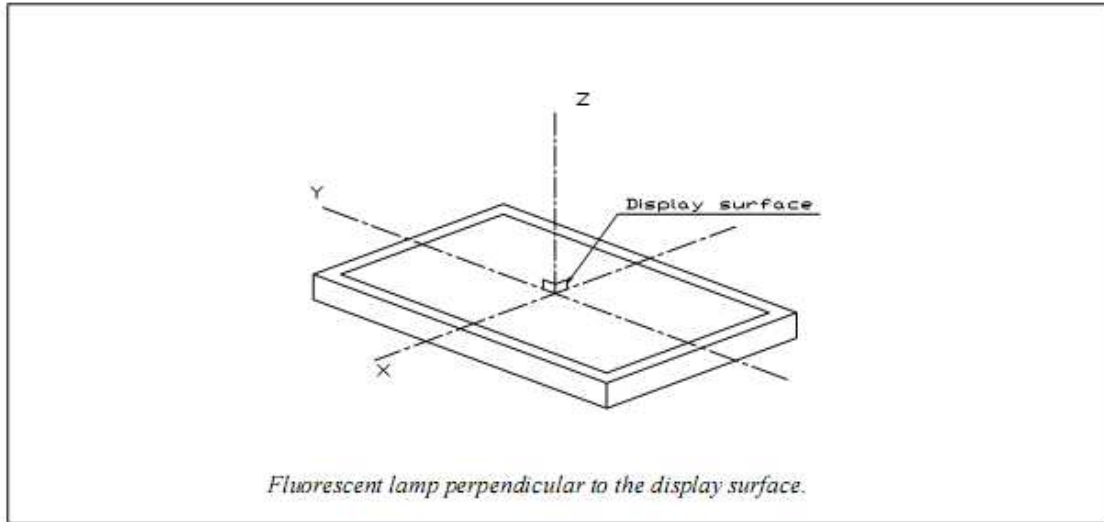
Room temperature: $20 \pm 3^{\circ}\text{C}$

Humidity: $65 \pm 20\%RH$

8.1.2 The external visual inspection

With a single 20-watt fluorescent lamp as the light source, the inspection was in the distance of 30cm or more from the LCD to the inspector's eyes.

8.2 LIGHT METHOD



8.3 Classification of defects

8.3.1 Major defect

A major defect refers to a defect that may substantially degrade usability for product applications.

8.3.2 Minor defect

A minor defect refers to a defect which is not considered to be able substantially degrade the product application or a defect that deviates from existing standards almost unrelated to the effective use of the product or its operation.

深圳市高信技术有限公司

9. RELIABILITY

9.1 MTBF

The LCD module shall be designed to meet a minimum MTBF value of 50000 hours with normal. (25°C in the room without sunlight)

9.2 TESTS

NO	Item	Conditions	Remark
1	High Temperature Storage	Ta=+70°C, 240hrs	
2	Low Temperature Storage	Ta=-20°C, 240hrs	
3	High Temperature Operation	Ta=+60°C, 240hrs	
4	Low Temperature Operation	Ta=-10°C, 240hrs	
5	High Temperature and High Humidity (operation)	Ta=+60°C, 90%RH, 240hrs	
6	Thermal Cycling Test (non operation)	-20°C (0.5hr) → +70°C (0.5hr), 200cycles	
7	Vibration	1. Random: 1.04G, 10~500HZ, X, Y, Z direction 30min/each direction 2. Sweep sine: 1.5G, 5~500Hz, X/Y/Z, 30min/each direction	
8	Shock	100G, 6ms, ±X, ±Y, ±Z 3 time for each direction	JIS C7021, A-10 (Condition A)
9	Vibration (with carton)	Random: 1.04Grms, 10~500Hz, X/Y/Z 45min/each direction Fixed: 5Hz, 1.5Grms, X/Y/Z 45min/each direction	
10	Drop (with carton)	Height: 60cm 1 corner, 3 edges, 6 surfaces	JIS Z0202
11	Electrostatic Discharge	±200V, 200PF, 0Ω 1 time/each terminal	
12	ESD Test (End Product)	150 pF Ω 330, ±(4kV/n, tCionet sa) cote 1 150 pF Ω 330, ±(8kV/n, tAirres) Note 2	

Note: All tests above are practiced at module type.

There is no display function NG issue occurred, All the cosmetic specification is judged before the reliability stress.

Note 1: defect is allowed after testing

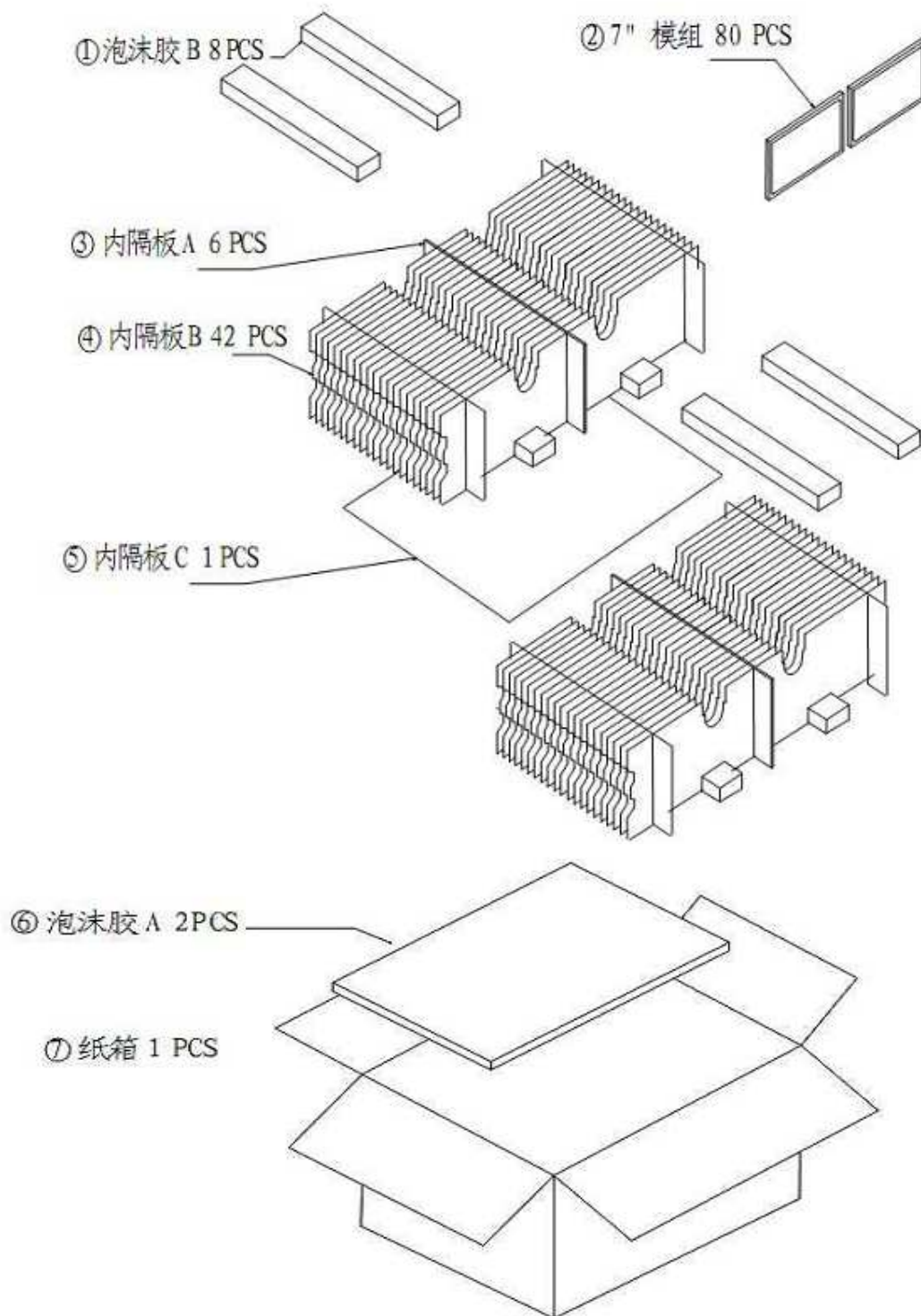
The End Product ESD value is only indicative and depends on customer ESD protection design for the whole system

Note 2: ESD should be applied to LCD glass panel, not other
IDD should be within twice initial value.

In case of malfunction defect caused by ESD damage

深圳市高信技术有限公司

10.0 Packing form



深圳市高信技术有限公司

11. PRECAUTIONS FOR USING LCD MODULE

11.1 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.**

11.2 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.

11.3 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.*