



深圳市鑫航盛科技有限公司

SHENZHEN XINHANGSHENG TECHNOLOGY CO., LTD.,

产品规格书

Product Type: 7" TFT LCD Module

LCD Nunmber: WD070PHT50AE-A9

MODULE NO. : _____

CUSTOMER APPROVED	PREPARE BY	CHECK BY	APPROVED BY
SUPPLIER APPROVED	PREPARE BY	CHECK BY	APPROVED BY

☒ Preliminary Specification

☐ Final Specification

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1.0 GENERAL DESCRIPTION

1.1 Introduction

HannStar Display model WD070PHT50AE-A9 is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This model is composed of a TFT LCD panel and a driving circuit. This TFT LCD has a 7.0 (16:9) inch diagonally measured active display area with WVGA (800 horizontal by 480 vertical pixel) resolution.

1.2 Features

- 7 (16:9 diagonal) inch configuration
- 6 bits + FRC driver with 1channel TTL interface
- Up/Down, Left/Right reversion selection
- RoHS Compliance

1.3 General information

Item	Specification	Unit
Outline Dimension	164.9*100*5.6 (Typ.)	mm
Display area	153.6 (H) x 86.64 (V)	mm
Number of Pixel	800 RGB(H) x 480(V)	pixels
Pixel pitch	0.192(H) x 0.1805(V)	mm
Pixel arrangement	RGB Vertical stripe	
Display mode	Normally white	

2.0 ABSOLUTE MAXIMUM RATINGS

2.1 Electrical Absolute Rating

2.1.1 TFT LCD Module

Item	Symbol	Min.	Max.	Unit	Note
Power supply voltage	V _{CC}	-0.3	6.0	V	GND=0
	V _{GH}	0.3	15	V	GND=0
	V _{GL}	-20	-7	V	GND=0
	A _V _{DD}	0.5	14.8	V	AGND=0
	V _{COM}	0	3.72	V	
Logic Signal Input Level	V _I	-0.3	V _{CC} +0.3	V	

Note

- (1) Permanent damage may occur to the LCD module if beyond this specification.
Functional operation should be restricted to the conditions described under normal operating conditions.
- (2) T_a =25±2℃

2.2 Environment Absolute Rating

Item	Symbol	Min.	Max.	Unit	Note
Operating Temperature	T _{opa}	-10	60	℃	
Storage Temperature	T _{stg}	-20	70	℃	

3.0 OPTICAL CHARACTERISTICS

3.1 Optical specification

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Transmittance (With Polarizer)		T		—	6.27	—	%	
Contrast Ratio		CR	Θ=0 Normal viewing angle	400	500	—		(1)(2)
Response time	Rising	T _R		—	5	7	msec	(1)(3)
	Falling	T _F		—	20	28		
Color gamut		S		—	50	—	%	C light
Color chromaticity (CIE1931)	White	W _x		0.237	0.287	0.337		(1)(4) CF Glass C light
		W _y	0.265	0.315	0.365			
Viewing angle	Hor.	Θ _L	CR>10	60	70	—		
		Θ _R		60	70	—		
	Ver.	Θ _U		40	50	—		
		Θ _D		50	60	—		
Optima View Direction		6 O'clock						(5)

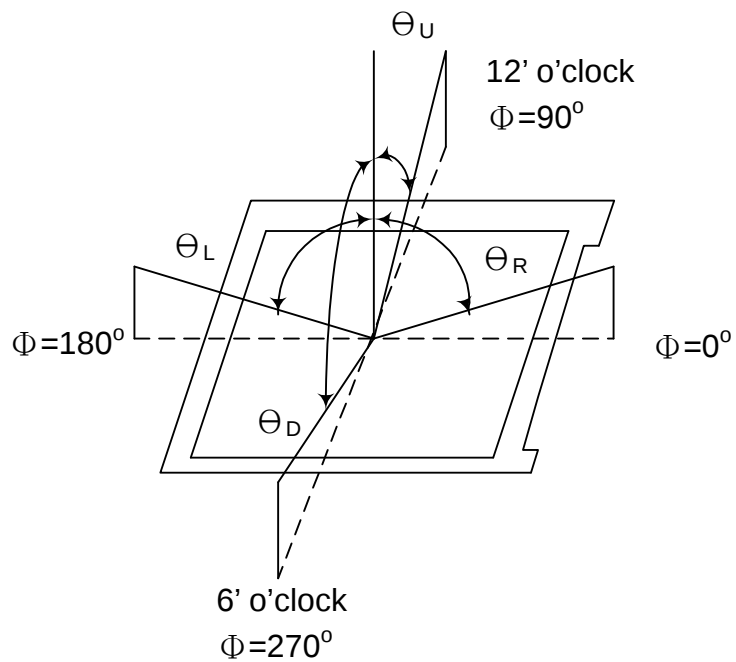
3.2 Measuring Condition

- Measuring surrounding: dark room
- Ambient temperature: 25±2°C

3.3 Measuring Equipment

- FPM520 of Westar Display technologies, INC., which utilized SR-3 for Chromaticity and BM-5A for other optical characteristics.
- Measuring spot size: 20 ~ 21 mm

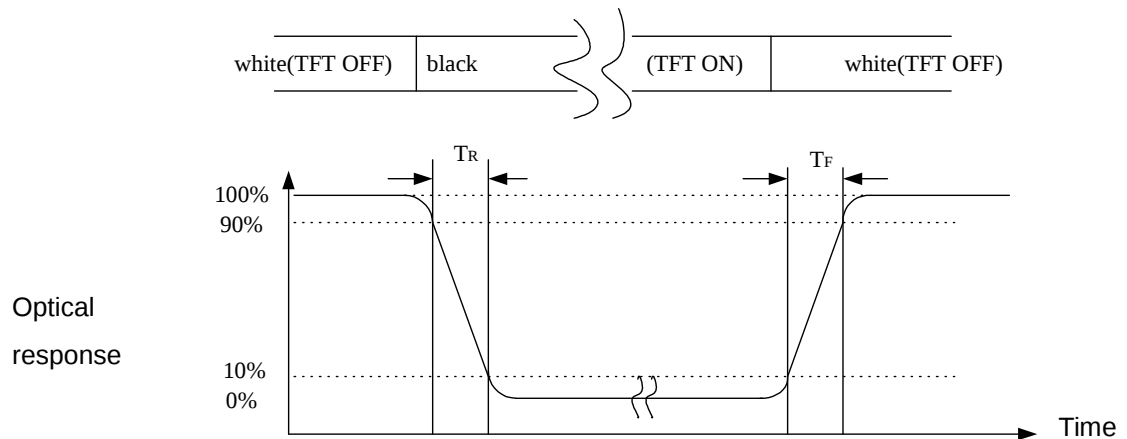
Note (1) Definition of Viewing Angle :



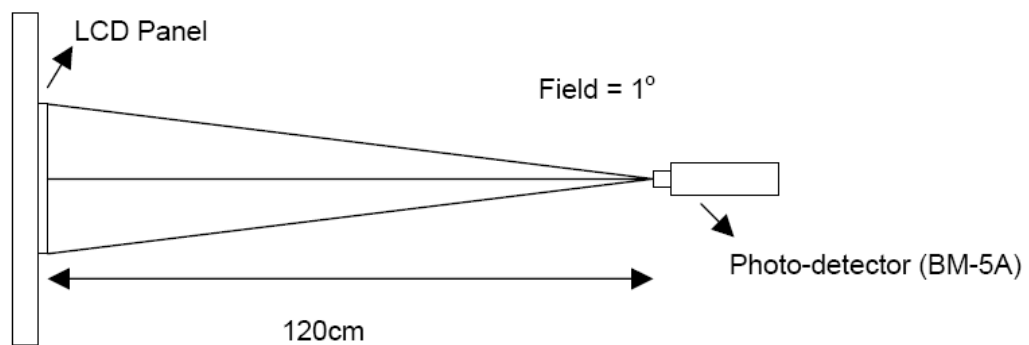
Note (2) Definition of Contrast Ratio (CR):
Measured at the center point of panel

$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

Note (3) Definition of Response Time: Sum of T_R and T_F



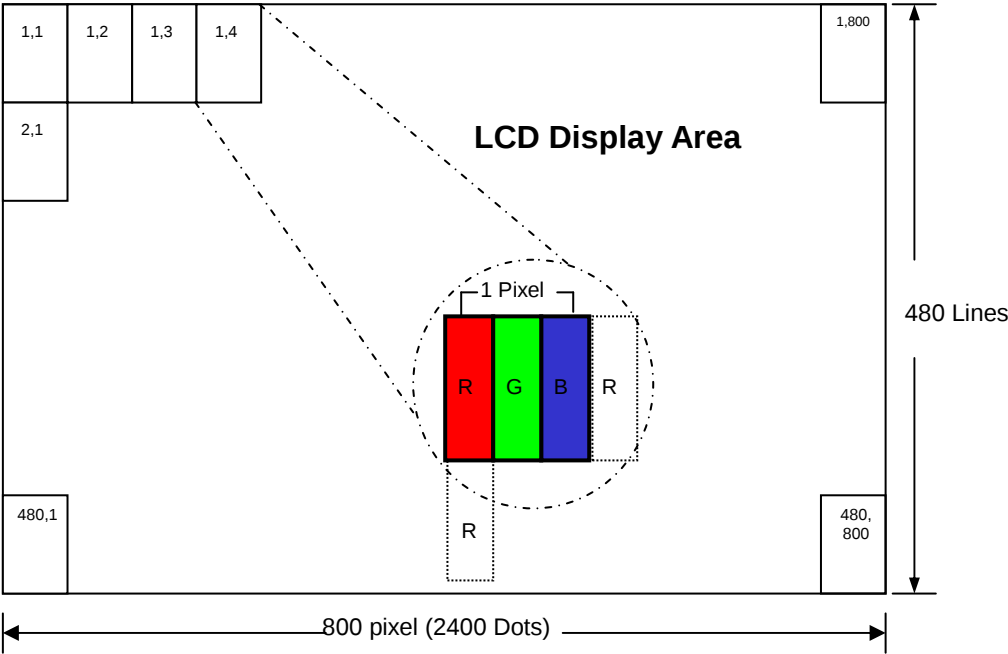
Note (4) Definition of optical measurement setup



Note (5) Rubbing Direction (The different Rubbing Direction will cause the different optimal view direction.)

4.0 BLOCK DIAGRAM

4.1 Pixel Format



2. Pin Assignment

1	VLED+	Power for LED backlight(Anode)
2	VLED+	Power for LED backlight(Anode)
3	VLED-	Power for LED backlight(Cathode)
4	VLED-	Power for LED backlight(Cathode)
5	GND	Power ground
6	VCOM	Common voltage
7	DVDD	Power for Digital Circuit
8	MODE	DE/SYNC mode select
9	DE	Data input enable
10	VS	Vertical sync input
11	HS	Horizontal sync input
12	B7	Blue data
13	B6	Blue data
14	B5	Blue data
15	B4	Blue data
16	B3	Blue data
17	B2	Blue data
18	B1	Blue data
19	B0	Blue data
20	G7	Green data
21	G6	Green data
22	G5	Green data
23	G4	Green data
24	G3	Green data
25	G2	Green data
26	G1	Green data
27	G0	Green data
28	R7	Red data
29	R6	Red data
30	R5	Red data

31	R4	Red data
32	R3	Red data
33	R2	Red data
34	R1	Red data
35	R0	Red data
36	GND	Power Ground
37	DCLK	Clock Signal Input
38	GND	Power Ground
39	L/R	Left/right select
40	U/D	UP/down select
41	VGH	Gate on voltage
42	VGL	Gate off voltage
43	AVDD	Power for Analog circuit
44	RESET	Global reset pin
45	NC	No connection
46	VCOM	Common voltage
47	DITHB	Dithering function
48	GND	Power Ground
49	NC	No connection
50	NC	No connection

I: input, O: output, P: Power

Note 1: DE/SYNC mode select. Normally pull high.

When select DE mode, MODE="1", VS and HS must pull high.

When select SYNC mode, MODE="0", DE must be grounded.

Note 2: When input 18 bits RGB data, the two low bits of R,G and B data must be grounded.

Note 3: Data shall be latched at the falling edge of DCLK.

6.0 ELECTRICAL CHARACTERISTICS

6.1 TFT LCD Module

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage	Vcc	3.0	3.3	3.6	V	
	VGH	14.5	15.0	15.5	V	
	VGL	-7.5	-7.0	-6.5	V	
	AVDD	9.85	10	10.15	V	
VCOM	VCOMin	-	3.72	-	V	
Input signal voltage	ViH	0.7 Vcc	-	Vcc	V	Note (1)
	ViL	0	-	0.3 Vcc	V	
Current of power supply	IDD	-	2.95	-	mA	Vcc =3.3V
	IADD	-	11.92	-	mA	AVDD=10 V(Black)
	IGH	-	0.153	-	mA	VGH=15V
	IGL	-	0.313	-	mA	VGL= 7V

Note (1): HSYNC, VSYNC, DE, Digital Data

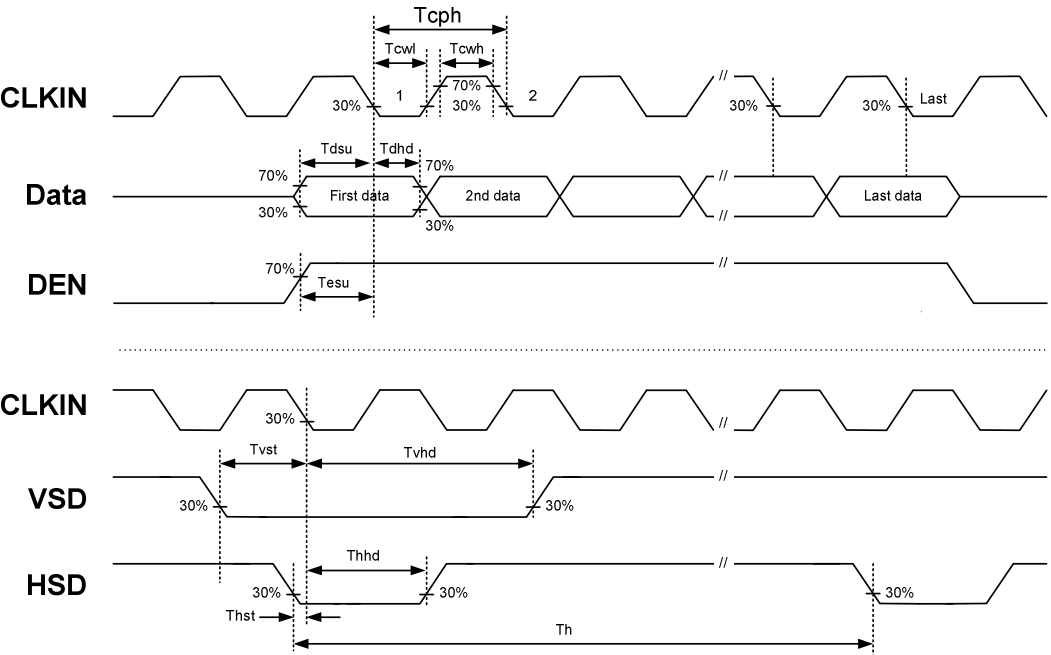
Note (2): Be sure to apply the power voltage as the power sequence spec.

Note (3): DGND=AGND=0V,)

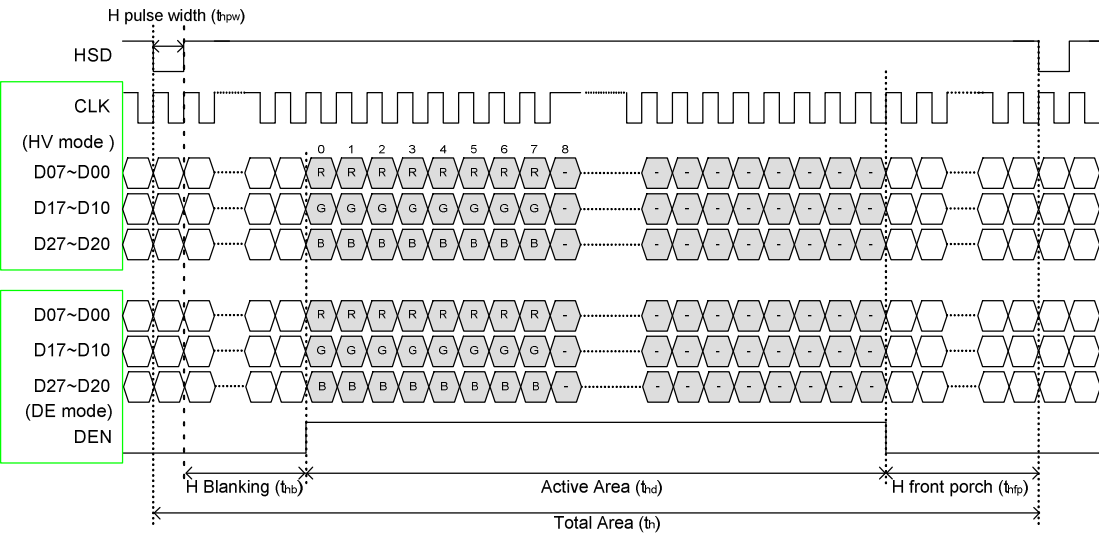
6.2 AC Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Note
DCLK cycle time	Tcph	25			ns	
DCLK frequency	fclk		30	40	MHz	
DCLK pulse duty	Tcwh	40	50	60	%	
VSD setup time	Tvst	8			ns	
VSD hold time	Tvhd	8			ns	
HSD setup time	Thst	8			ns	
HSD hold time	Thhd	8			ns	
Data setup time	Tdsu	8			ns	
Data hold time	Tdhd	8			ns	
DE setup time	Tesu	8			ns	
DE hold time	Tehd	8			ns	
Horizontal display area	thd		800		Tcph	
HSD period time	th		928		Tcph	
HSD pulse width	thpw	32	48	122	Tcph	
HSD back porch	thb	24	40	84	Tcph	
for sync mode thpw + thb is fixed		88				
HSD front porch	thfp	32	40	122	Tcph	
for DE mode H-Blanking	th-thd	120	128	210		
Vertical display area	tvd		480		th	
VSD period time	tv		525		th	
VSD pulse width	tpw	1	3	31	th	
VSD back porch	tvb	1	29	31	th	
for sync mode tpw + tvb is fixed		32				
VSD front porch	tvfp	3	13	122	th	
for DE mode V-Blanking	tv-tvd	35	45	154		

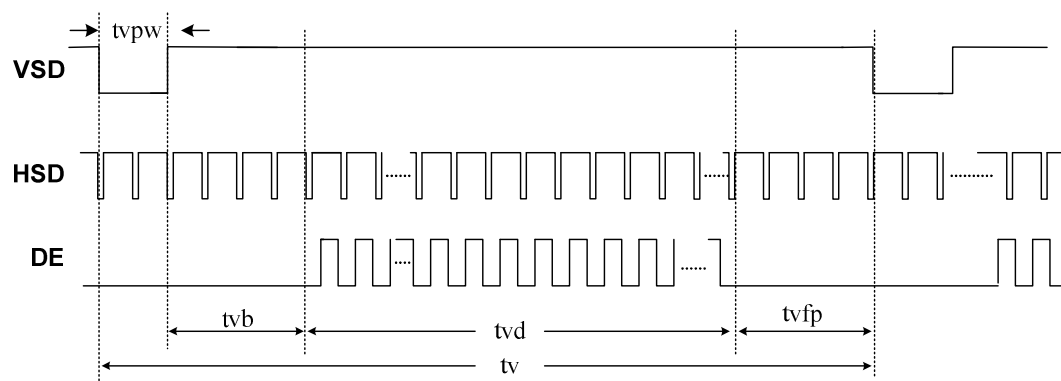
6.3 Timing Diagram of Interface Signal



Sampling clock timing

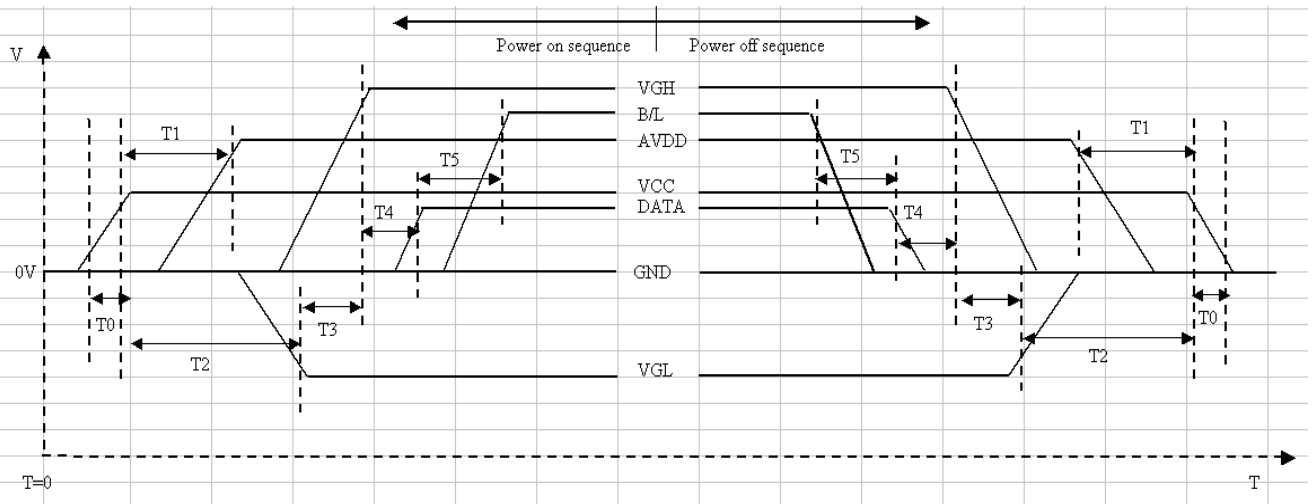


Horizontal display timing range

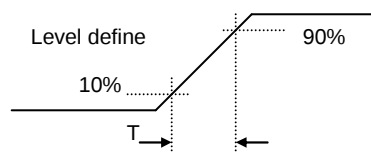


Vertical timing

6.4 Power Sequence



Item	Min.	Typ.	Max.	Unit
T0	0.5	--	20	msec
T1	16	--	--	msec
T2	20	--	--	msec
T3	10	--	--	msec
T4	10	--	50	msec
T5	50	--	--	msec



Power On Sequence: VCC-> AVDD -> VGL -> VGH -> Data -> B/L

Power Off Sequence: B/L-> Data -> VGH -> VGL -> AVDD -> VCC

Notes: Data include R0~R7, G0~G7, B0~B7, HSD, VSD, DCLK, SHLR, UPDN, DE
MODE, RSTB, STBYB, SHLR, UPDN, DITH

6.5 VGH & VGL Power On / Off Inrush Current

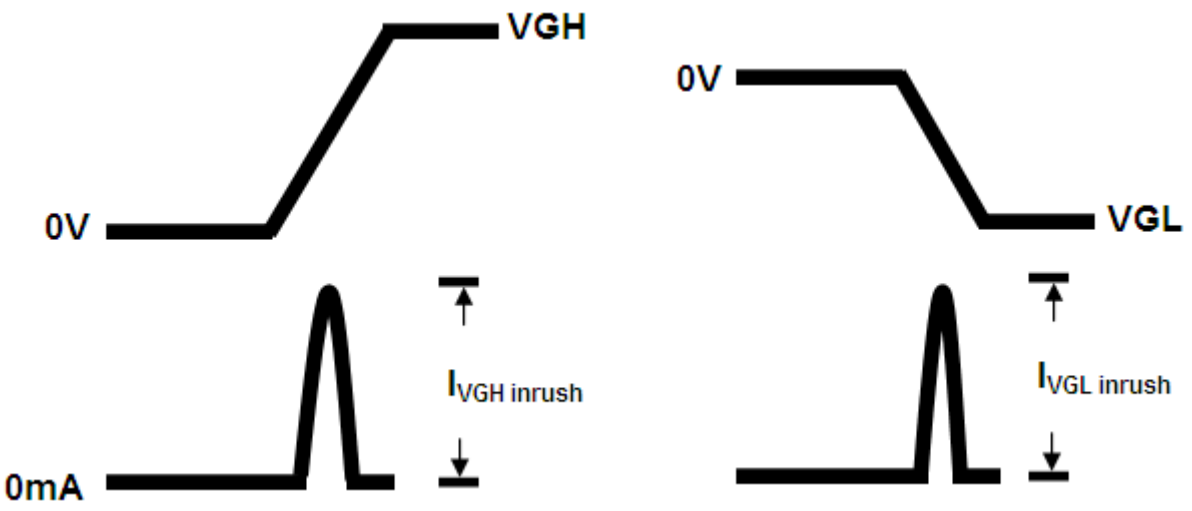


Fig 1. VGH & VGL Power on Inrush current

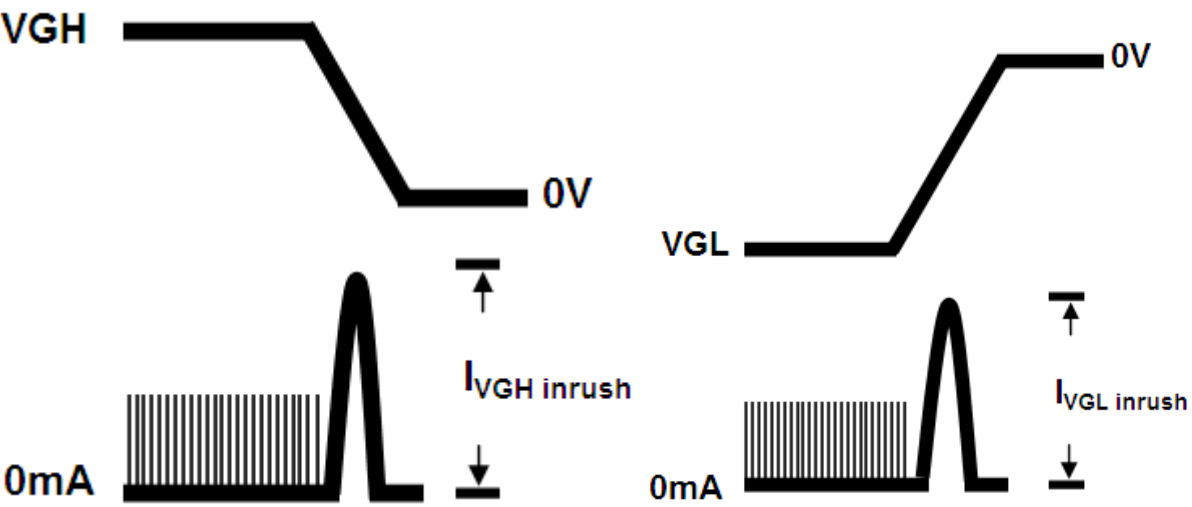


Fig 2. VGH & VGL Power off Inrush current

Item	Min.	Typ.	Max.	Unit	Remark
$I_{VGH \text{ inrush}}$	--	--	100	mA	VGH Power on/off inrush current
$I_{VGL \text{ inrush}}$	--	--	100	mA	VGL Power on/off inrush current

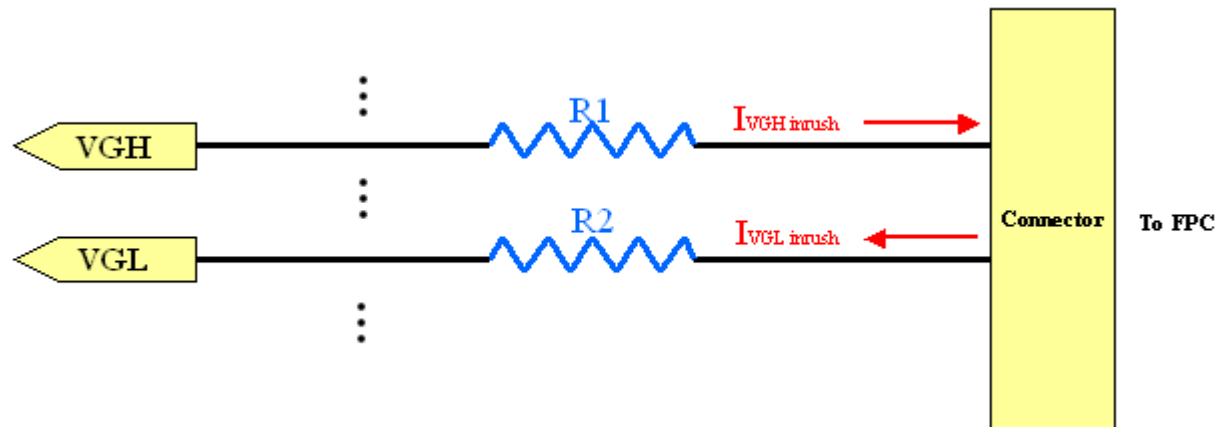


Fig 3. Reference circuit for inrush current limit resistor of VGH/VGL

Note: R1 = VGH inrush current limit resistor. Tune R1 resistor to make VGH inrush current less than 100mA.
 R2 = VGL inrush current limit resistor. Tune R2 resistor to make VGL inrush current less than 100mA.

7.0 RELIABILITY TEST ITEMS

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(30min)→+70°C(30min), 200cycles	
7	Electrostatic Discharge	±200V,200pF(0Ω) 1 time/each terminal	
8	Vibration (with carton)	Random: 0.015G ² /Hz, 5~200Hz -6dB/Octave, 200~400Hz XYZ each direction: 2hr	
9	Drop (with carton)	Height: 80cm 1 corner, 3 edges, 6 surfaces	

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

11.0 GENERAL PRECAUTION

11.1 Use Restriction

This product is not authorized for use in life supporting systems, aircraft navigation control systems, military systems and any other application where performance failure could be life-threatening or otherwise catastrophic.

11.2 ASSEMBLY PRECAUTION

- 11.2.1 Please use the mounting hole on the module side in installing and do not bending or wrenching LCD in assembling. And please do not drop, bend or twist LCD module in handling.
- 11.2.2 Please design display housing in accordance with the following guide lines.
 - 11.2.2.1 Housing case must be destined carefully so as not to put stresses on LCD all sides and not to wrench module. The stresses may cause non-uniformity even if there is no non-uniformity statically.
 - 11.2.2.2 Keep sufficient clearance between LCD module back surface and housing when the LCD module is mounted. The clearance in the design is recommended taking into account the tolerance of LCD module thickness and mounting structure height on the housing.
- 11.2.3 Please do not push or scratch LCD panel surface with any-thing hard. And do not soil LCD panel surface by touching with bare hands. (Polarizer film, surface of LCD panel is easy to be flawed.)
- 11.2.4 Please do not press any parts on the rear side such as source IC, gate IC, and FPC during handling LCD module. If pressing rear part is unavoidable, handle the LCD module with care not to damage them.
- 11.2.5 Please wipe out LCD panel surface with absorbent cotton or soft cloth in case of it being soiled.
- 11.2.6 Please wipe out drops of adhesives like saliva and water on LCD panel surface immediately. They might damage to cause panel surface variation and color change.
- 11.2.7 Please do not take a LCD module to pieces and reconstruct it. Resolving and reconstructing modules may cause them not to work well.

11.3 Disassembling or Modification

Do not disassemble or modify the module. It may damage sensitive parts inside LCD module, and may cause scratches or dust on the display. HannStar does not warrant the module, if customers disassemble or modify the module.

11.4 Breakage of LCD Panel

- 11.4.1 If LCD panel is broken and liquid crystal spills out, do not ingest or inhale liquid crystal, and do not contact liquid crystal with skin.
- 11.4.2 If liquid crystal contacts mouth or eyes, rinse out with water immediately.
- 11.4.3 If liquid crystal contacts skin or cloths, wash it off immediately with alcohol and rinse thoroughly with water.
- 11.4.4 Handle carefully with chips of glass that may cause injury, when the glass is broken.

11.5 Absolute Maximum Ratings and Power Protection Circuit

- 11.5.1 Do not exceed the absolute maximum rating values, such as the supply voltage variation, input voltage variation, variation in parts' parameters, environmental temperature, etc., otherwise LCD module may be damaged.
- 11.5.2 Please do not leave LCD module in the environment of high humidity and high temperature for a long time.
- 11.5.3 It's recommended employing protection circuit for power supply.

11.6 Operation

- 11.6.1 Do not touch, push or rub the polarizer with anything harder than HB pencil lead. Use fingerstalls or soft gloves in order to keep clean display quality, when persons handle the LCD module for incoming inspection or assembly.
- 11.6.2 When the surface is dusty, please wipe gently with absorbent cotton or other soft material.
- 11.6.3 Wipe off saliva or water drops as soon as possible. If saliva or water drops contact with polarizer for a long time, they may cause deformation or color fading.
- 11.6.4 When cleaning the adhesives, please use absorbent cotton wetted with a little petroleum benzene or other adequate solvent.

11.7 Static Electricity

- 11.7.1 Protection film must be removed very slowly from the surface of LCD module to prevent from electrostatic occurrence.
- 11.7.2 Because LCD module uses CMOS-IC on TFT-LCD panel, it is very weak to electrostatic discharge. Please be careful with electrostatic discharge.
- 11.7.3 Persons who handle the module should be grounded through adequate methods.

11.8 Disposal

When disposing LCD module, obey the local environmental regulations.

11.9 Others

- 11.9.1 A strong incident light into LCD panel might cause display characteristics' changing inferior because of Polarizer film, color filter, and other materials becoming inferior. Please do not expose LCD module to direct sunlight and strong UV rays.
- 11.9.2 Please pay attention to a panel side of LCD module not to contact with other materials in preserving it alone.
- 11.9.3 For the packaging box, please pay attention to the followings:
 - 11.9.3.1 Packaging box and inner case for LCD are designed to protect the LCDs from the damage or scratching during transportation. Please do not open except picking LCDs up from the box.
 - 11.9.3.2 Please do not pile them up more than 6 boxes. (They are not designed so.) And please do not turn over.
 - 11.9.3.3 Please handle packaging box with care not to give them sudden shock and vibrations. And also please do not throw them up.

11.9.3.4 Packing box and inner case for LCDs are made of cardboard. So please pay attention not to get them wet. (Such like keeping them in high humidity or wet place can occur getting them wet.)

DIMENSION RANGE		尺寸范围	
TOLERANCE	GRADE (±)	0	5
		0.05	0.10
		0.15	0.20
		0.25	0.30
		0.35	0.40
		0.45	0.50
		0.55	0.60
		0.65	0.70
		0.75	0.80
		0.85	0.90
		0.95	1.00
		1.05	1.10
		1.15	1.20
		1.25	1.30
		1.35	1.40
		1.45	1.50
		1.55	1.60
		1.65	1.70
		1.75	1.80
		1.85	1.90
		1.95	2.00
		2.05	2.10
		2.15	2.20
		2.25	2.30
		2.35	2.40
		2.45	2.50
		2.55	2.60
		2.65	2.70
		2.75	2.80
		2.85	2.90
		2.95	3.00
		3.05	3.10
		3.15	3.20
		3.25	3.30
		3.35	3.40
		3.45	3.50
		3.55	3.60
		3.65	3.70
		3.75	3.80
		3.85	3.90
		3.95	4.00
		4.05	4.10
		4.15	4.20
		4.25	4.30
		4.35	4.40
		4.45	4.50
		4.55	4.60
		4.65	4.70
		4.75	4.80
		4.85	4.90
		4.95	5.00
		5.05	5.10
		5.15	5.20
		5.25	5.30
		5.35	5.40
		5.45	5.50
		5.55	5.60
		5.65	5.70
		5.75	5.80
		5.85	5.90
		5.95	6.00
		6.05	6.10
		6.15	6.20
		6.25	6.30
		6.35	6.40
		6.45	6.50
		6.55	6.60
		6.65	6.70
		6.75	6.80
		6.85	6.90
		6.95	7.00
		7.05	7.10
		7.15	7.20
		7.25	7.30
		7.35	7.40
		7.45	7.50
		7.55	7.60
		7.65	7.70
		7.75	7.80
		7.85	7.90
		7.95	8.00
		8.05	8.10
		8.15	8.20
		8.25	8.30
		8.35	8.40
		8.45	8.50
		8.55	8.60
		8.65	8.70
		8.75	8.80
		8.85	8.90
		8.95	9.00
		9.05	9.10
		9.15	9.20
		9.25	9.30
		9.35	9.40
		9.45	9.50
		9.55	9.60
		9.65	9.70
		9.75	9.80
		9.85	9.90
		9.95	10.00
		10.05	10.10
		10.15	10.20
		10.25	10.30
		10.35	10.40
		10.45	10.50
		10.55	10.60
		10.65	10.70
		10.75	10.80
		10.85	10.90
		10.95	11.00
		11.05	11.10
		11.15	11.20
		11.25	11.30
		11.35	11.40
		11.45	11.50
		11.55	11.60
		11.65	11.70
		11.75	11.80
		11.85	11.90
		11.95	12.00
		12.05	12.10
		12.15	12.20
		12.25	12.30
		12.35	12.40
		12.45	12.50
		12.55	12.60
		12.65	12.70
		12.75	12.80
		12.85	12.90
		12.95	13.00
		13.05	13.10
		13.15	13.20
		13.25	13.30
		13.35	13.40
		13.45	13.50
		13.55	13.60
		13.65	13.70
		13.75	13.80
		13.85	13.90
		13.95	14.00
		14.05	14.10
		14.15	14.20
		14.25	14.30
		14.35	14.40
		14.45	14.50
		14.55	14.60
		14.65	14.70
		14.75	14.80
		14.85	14.90
		14.95	15.00
		15.05	15.10
		15.15	15.20
		15.25	15.30
		15.35	15.40
		15.45	15.50
		15.55	15.60
		15.65	15.70
		15.75	15.80
		15.85	15.90
		15.95	16.00
		16.05	16.10
		16.15	16.20
		16.25	16.30
		16.35	16.40
		16.45	16.50
		16.55	16.60
		16.65	16.70
		16.75	16.80
		16.85	16.90
		16.95	17.00
		17.05	17.10
		17.15	17.20
		17.25	17.30
		17.35	17.40
		17.45	17.50
		17.55	17.60
		17.65	17.70
		17.75	17.80
		17.85	17.90
		17.95	18.00
		18.05	18.10
		18.15	18.20
		18.25	18.30
		18.35	18.40
		18.45	18.50
		18.55	18.60
		18.65	18.70
		18.75	18.80
		18.85	18.90
		18.95	19.00
		19.05	19.10
		19.15	19.20
		19.25	19.30
		19.35	19.40
		19.45	19.50
		19.55	19.60
		19.65	19.70
		19.75	19.80
		19.85	19.90
		19.95	20.00
		20.05	20.10
		20.15	20.20
		20.25	20.30
		20.35	20.40
		20.45	20.50
		20.55	20.60
		20.65	20.70
		20.75	20.80
		20.85	20.90
		20.95	21.00
		21.05	21.10
		21.15	21.20
		21.25	21.30
		21.35	21.40
		21.45	21.50
		21.55	21.60
		21.65	21.70
		21.75	21.80
		21.85	21.90
		21.95	22.00
		22.05	22.10
		22.15	22.20
		22.25	22.30
		22.35	22.40
		22.45	22.50
		22.55	22.60
		22.65	22.70
		22.75	22.80
		22.85	22.90
		22.95	23.00
		23.05	23.10
		23.15	23.20
		23.25	23.30
		23.35	23.40
		23.45	23.50
		23.55	23.60
		23.65	23.70
		23.75	23.80
		23.85	23.90
		23.95	24.00
		24.05	24.10
		24.15	24.20
		24.25	24.30
		24.35	24.40
		24.45	24.50
		24.55	24.60
		24.65	24.70
		24.75	24.80
		24.85	24.90
		24.95	25.00
		25.05	25.10
		25.15	25.20
		25.25	25.30
		25.35	25.40
		25.45	25.50
		25.55	25.60
		25.65	25.70
		25.75	25.80
		25.85	25.90
		25.95	26.00
		26.05	26.10
		26.15	26.20
		26.25	26.30
		26.35	26.40
		26.45	26.50
		26.55	26.60
		26.65	26.70
		26.75	26.80
		26.85	26.90
		26.95	27.00
		27.05	27.10
		27.15	27.20
		27.25	27.30
		27.35	27.40
		27.45	27.50
		27.55	27.60
		27.65	27.70
		27.75	27.80
		27.85	27.90
		27.95	28.00
		28.05	28.10
		28.15	28.20
		28.25	28.30
		28.35	28.40
		28.45	28.50
		28.55	28.60
		28.65	28.70
		28.75	28.80
		28.85	28.90
		28.95	29.00
		29.05	29.10
		29.15	29.20
		29.25	29.30
		29.35	29.40
		29.45	29.50
		29.55	29.60
		29.65	29.70
		29.75	29.80
		29.85	29.90
		29.95	30.00
		30.05	30.10
		30.15	30.20
		30.25	30.30
		30.35	30.40
		30.45	30.50
		30.55	30.60
		30.65	30.70
		30.75	30.80
		30.85	30.90
		30.95	31.00
		31.05	31.10
		31.15	31.20
		31.25	31.30
		31.35	31.40
		31.45	31.50
		31.55	31.60
		31.65	31.70
		31.75	31.80
		31.85	31.90
		31.95	32.00
		32.05	32.10
		32.15	32.20
		32.25	32.30
		32.35	32.40
		32.45	32.50
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		32.75	32.80
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		33.85	33.90
		33.95	34.00
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		34.25	34.30
		34.35	34.40
		34.45	34.50
		34.55	34.60
		34.65	34.70
		34.75	34.80
		34.85	34.90
		34.95	35.00
		35.05	35.10
		35.15	35.20
		35.25	35.30
		35.35	35.40
		35.45	35.50
		35.55	35.60
		35.65	35.70
		35.75	35.80
		35.85	35.90
		35.95	36.00
		36.05	36.10
		36.15	36.20
		36.25	36.30
		36.35	36.40
		36.45	36.50
		36.55	36.60
		36.65	36.70
		36.75	36.80
		36.85	36.90
		36.95	37.00
		37.05	37.10
		37.15	37.20
		37.25	37.30
		37.35	37.40
		37.45	37.50
		37.55	37.60
		37.65	37.70
		37.75	37.80
		37.85	37.90
		37.95	38.00
		38.05	38.10
		38.15	38.20
		38.25	38.30
		38.35	38.40
		38.45	38.50
		38.55	38.60
		38.65	38.70
		38.75	38.80
		38.85	38.90
		38.95	

6、产品寿命

周围温度 $+25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ，湿度 $60 \pm 20\% \text{RH}$ ，以每灯 20mA 工作电流之推荐使用条件，

背光源寿命为：

辉度减半平均寿命： 30,000 小时以上 辉度减半保证寿命： 20,000 小时以上

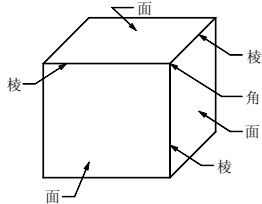
注：辉度减半平均寿命指背光源平均辉度衰减到初期平均辉度的 50%所需时间。

7、信赖性试验

7.1 寿命试验

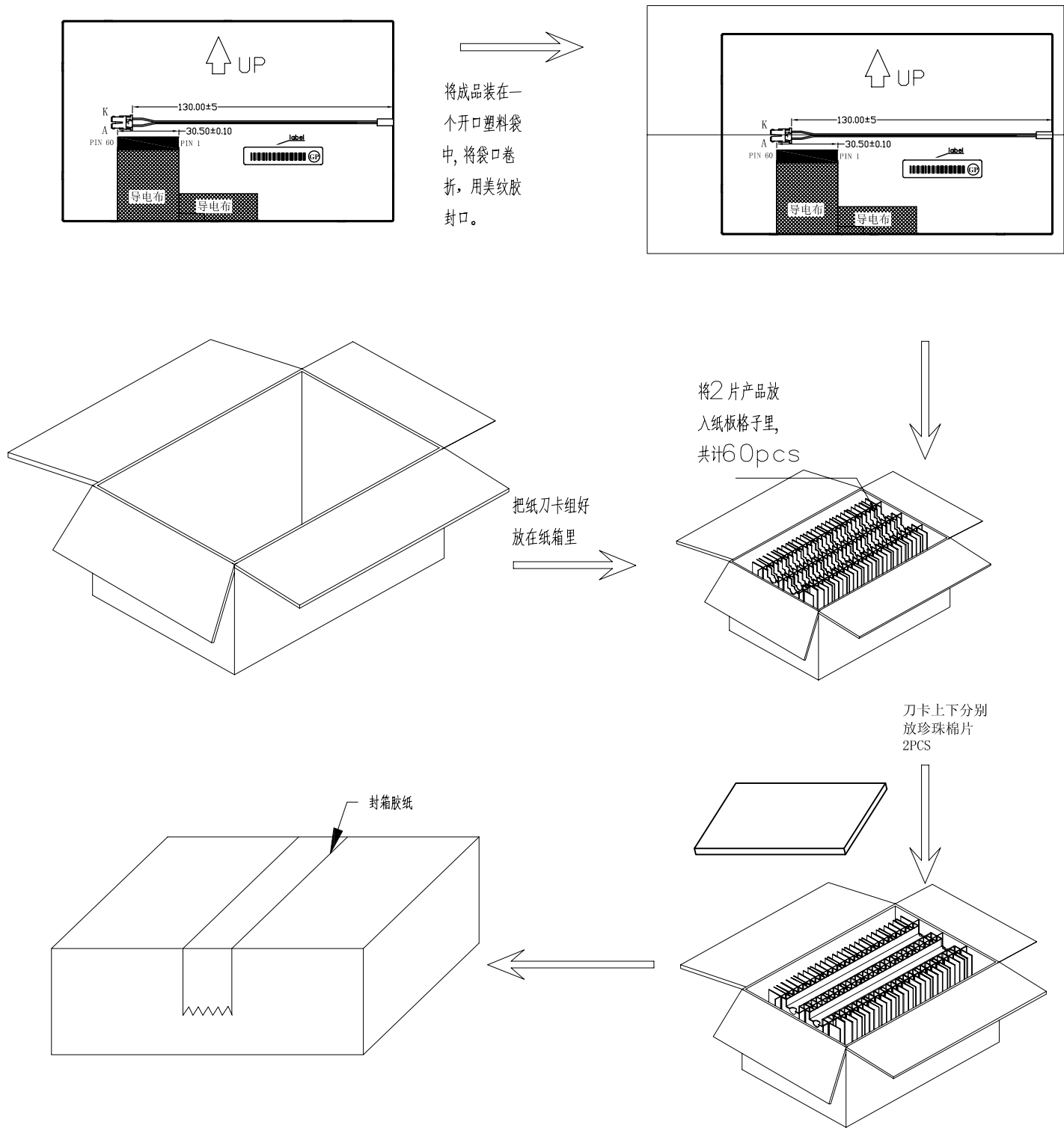
试验项目	检验方法	判定
1. 高温高湿放置试验	温度 $+60^{\circ}\text{C}$ ，湿度 90%RH 240Hrs	试验后，须常温放置 2 小时，在 24 小时后测定。 1. 亮度衰减在 20%以内，电压 $\leq \pm 5\%$ 。2. 外形尺寸变化仍在规格以内。 注：马口铁，镀铝锌板铁框在高湿、吸潮的情况下易生绣，生绣不列入判定项目。
2. 低湿放置试验	温度 -30°C ，常湿 240Hrs	
3. 高温放置试验	温度 $+70^{\circ}\text{C}$ ，常湿 240Hrs	
4. 高温高湿操作试验	温度 $+60^{\circ}\text{C}$ ，湿度 90%RH 240Hrs	
5. 低温操作试验	温度 -20°C ，常湿 240Hrs	
6. 高温操作试验	温度 $+60^{\circ}\text{C}$ ，常湿 240Hrs	
7. 冷热冲击试验	$-20^{\circ}\text{C} \rightarrow +25^{\circ}\text{C} \rightarrow +70^{\circ}\text{C}$ $(30\text{min}) \rightarrow (5\text{min}) \rightarrow (30\text{min})$ 200Cycles	

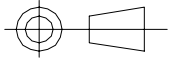
7.2 机械环境测试

试验项目	检验方法	时间	判定
跌落试验	H=60cm 自由落下： 从七个方向：相邻的三个面、三条棱、一个角 	首次量产及包装方式、材料变更时。	1. 试验后-----外观及机能判定： a. 异物混入（产品表面可接受）、刮伤、位置偏移、零件脱落、凹凸伤痕、折痕，不可有。 b. 不点灯或点灯异常（闪烁变色半亮）之非正常点灯现象不可有。 c. 机械性及物理性之损害（部材破损、外观变形、嵌合不良）不可有。 d. 落下试验后，包外箱不可有破裂之现象。 2. 判定基准 a. 点灯无问题。 b. 外观无异常变化。 c. 外观无损坏、破裂伤痕等情形。
振荡试验	幅度 1.5mm 频率 10~55Hz，相邻三个面每面各 15 分钟		外观：产品无缺损，脱落等外观不良。 发光：不可有不发光及点亮闪烁。
引线拉伸强度	于管轴方向可抵抗 11.76N (1.2kgf/sec) 静负荷		
端子拉伸强度	于管轴方向可抵抗 11.76N (1.2kgf/sec) 静负荷		
底盖螺栓孔承受扭力	1.5kgf • cm		

深圳市鑫航盛科技有限公司

包装方式:



UNIT 单位	mm	REVISION 版本	A0	MODEL NO. 物料编码	APPROVED BY 核准	CHECKED BY 审核	DRAWN BY 编制
 THIRD ANGLE PROJECT 第三视角		SCALE 比例	1:1				
		DATE 日期	2015-01-31				
		PAGE 页码	1/1				