



PRODUCT TFT LCD MODULE

产品名称：TFT 液晶显示模块

MODELNO

模块型号：HT0500CI02A

SUPPLIER HTdisplay

供应商：华田信科

DATE

日期：2019-03-11

SPECIFICATIONS

产品规格书

Version 版本号：V0

This module uses ROHS material

模块用环保材料

HTdisplay(华田信科)		Customer (客户)
PREPARED BY 制定	贺园	Approved by:
CHECKED BY 审核	李延峰	
Quality Department 品质	王波	
Approved by 批准	胡佳利	

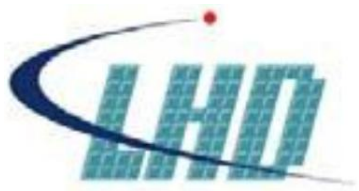
北京华田信科电子有限公司

Beijing HTdisplay Electronic co.,Ltd

Address: 北京经济技术开发区荣昌东街7号隆盛工业园5号楼5楼西侧

Tel: (86) 10 67806456 Fax: (86) 10 67805529

www.htdisplay.com



华田信科电子有限公司

HTdisplay Electronic CO., LTD

NO.	CONTENTS 内容	Page
1	General Information 主要特征描述	4
2	Outline Drawing 外形尺寸	5
3	Absolute Maximum Ratings 极限参数	6
4	Electrical Charateristics 模块电气特性	6
5	Backlight Charateristics 背光电气特性	6
6	Electro Optical Characteristics 光电参数	7
7	Read/Write Timing 读/写时序	8
8	Interface Description 接口定义描述	9
9	Reference Application Circuit 参考应用电路	10
10	Reliability Test Conditions 可靠性试验条件	10
11	Storage Precautions 储存注意事项	11
12	Inspection Criterion 检验标准	12
13	Precautions for Use of LCD Modules 使用注意事项	12
14	Packing 包装方式	14

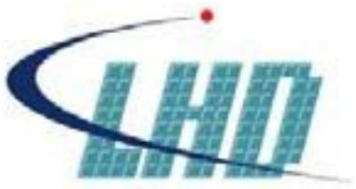


华田信科电子有限公司

HTdisplay Electronic CO., LTD

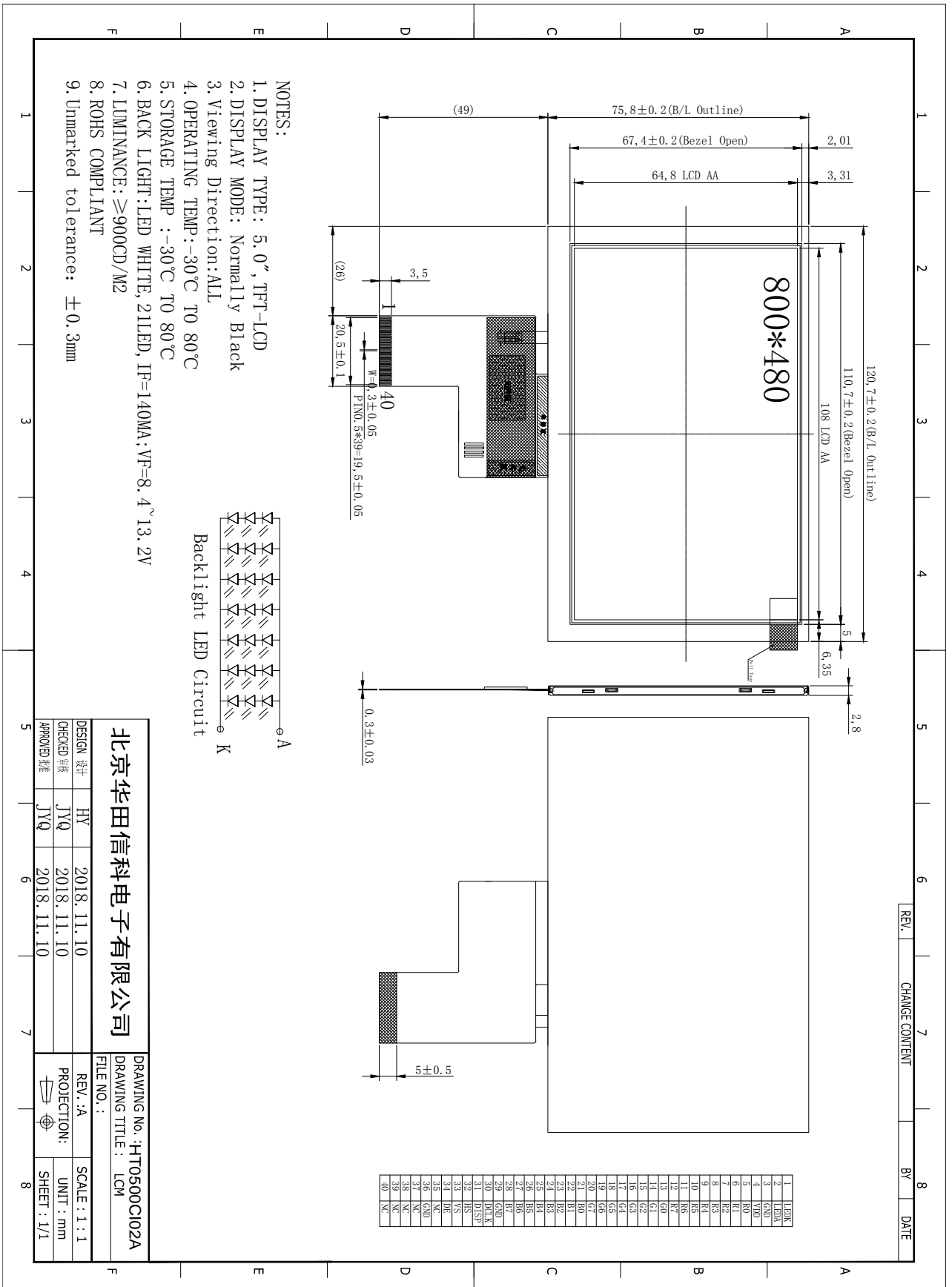
1. GENERAL INFORMATION 主要特征描述

Item 项目	Contents 内容	Unit 单位
LCD Type 液晶显示类型	TFT/TRANSMISSIVE	---
Viewing Direction 视角方向	ALL	o'clock
Outline Dimensions (W × H×T) 外形尺寸 (宽 × 高 × 厚)	120.7(W) × 75.8 (H) × 2.8(T)	mm
Viewing area 可视区域	110.7 x 67.4	mm
Active area 有效区域 (宽 × 高)	108(W) x 64.8(H)	mm
Number of Dots 点阵	800RGB x 480 Dots	---
Pixel pitch (W × H) 像素点尺寸	0.135*0.135	mm
Driver IC 驱动 IC	ST7262	---
Interface Type 接口类型	RGB 24bit	---
Input voltage 输入电压	3.3	V
Module Power consumption 模块功耗	TBD	MW
Colors 色彩	16.7	M
Backlight Type 背光类型	LED	---



华田信科电子有限公司 HTdisplay Electronic CO., LTD

2. OUTLINE DRAWING 外形尺寸





华田信科电子有限公司

HTdisplay Electronic CO., LTD

3. ABSOLUTE MAXIMUM RATINGS 极限参数

Item 项目	Symbol 符号	Min 最小值	Max 最大值	Unit 单位
Supply voltage for logic 逻辑电压	VDD	-0.3	4.0	V
Input voltage 输入电平	VIN	-0.3	VDD+ 0.3	V
Operating temperature 使用温度	TOP	-30	80	°C
Storage temperature 存储温度	TST	-30	80	°C
Humidity 湿度	RH		80%(Max90 °C)	RH

4. ELECTRICAL CHARACTERISTICS 模块电气特性

Item 项目	Symbol 符号	Min 最小值	Typ 典型值	Max 最大值	Unit 单位
Supply voltage for logic 逻辑电压	VDD	3.0	3.3	3.6	V
Input Current 输入电流	I _{dd}		TBD	TBD	mA
Input voltage 'H' level 输入高电平	V _{IH}	0.7VDD	-	VDD	V
Input voltage 'L' level 输入低电平	V _{IL}	VSS		0.3VDD	V
Output voltage 'H' level 输出高电平	V _{OH}	VDD-0.4		VDD	V
Output voltage 'L' level 输出低电平	V _{OL}	VSS		GND+0.4	V

5. BACKLIGHT CHARACTERISTICS 背光电气特性

Item 项目	Symbol 符号	Min 最小值	Typ 典型值	Max 最大值	Unit 单位	Condition 条件
Forward voltage 正向电压	V _f	8.4V	9.6V	13.2V	V	I _f =140mA
Number of LED LED数量			21		Piece	
Connection mode 连接类型	S		3series*7para llel			
Luminous Intensity 亮度参数	L _v	900	1000	-	Cd/m ²	
LED life time 背光寿命	H _r	50000	-	-	Hour	Note

Note: Using condition: constant current driving method I_f=140mA.

使用条件: 恒流的驱动方式是 I_f=140mA.

Brightness to be decreased to 50% of the initial value at ambient temperature T_A=25°C.



6. ELECTRO-OPTICAL CHARACTERISTICS 光电参数

Items 项目	Symbol 符号	Condition 条件	Min 最小值	Typ 典型值	Max 最大值	Unit 单位	Note 备注
Transmittance 透过率	T%			(4.8)		%	Measuring with normal polarizer
Contrast Ratio 对比度	CR	观察角度 $\theta=0$	(800)	(1000)		-	(1) (2)
Response Time 响应时间	Ton+Toff	Normal viewing angle		30	40	ms	(1) (3)
Chromaticity 色度	Red 红	Normal viewing angle		(0.629)		-	(1) (4) CF glass C-light
			Y _R		(0.326)	-	
	Green 绿		X _G		(0.337)	-	
			Y _G		(0.546)	-	
	Blue 蓝		X _B		(0.136)	-	
			Y _B		(0.143)	-	
	White 白		X _w		(0.320)	-	
	Y _w		(0.345)	-			
Viewing Angle	Hor.	θ_L	CR>10	70	80	-	(1)(4) Measuring with normal polarizer, Reference Only
		θ_R		70	80		
	Ver.	θ_U		70	80		
		θ_D		70	80		

Measuring Condition

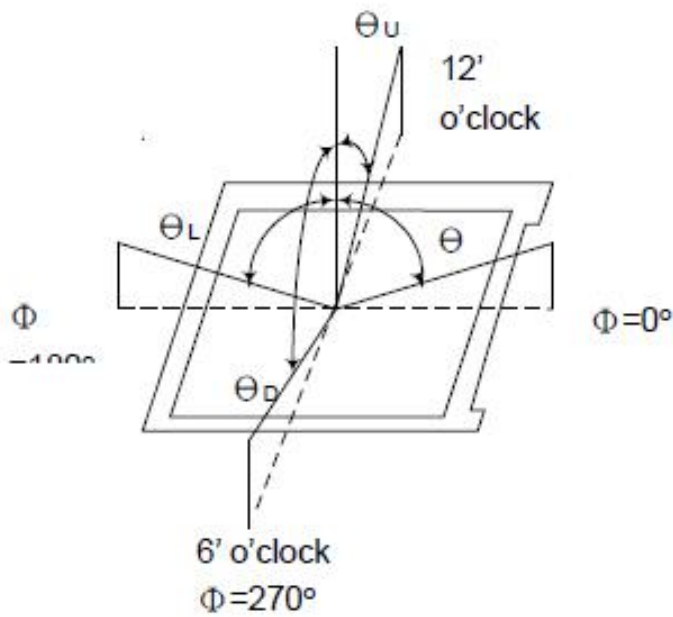
- Measuring surrounding : dark room
- Ambient temperature : 25±2°C
- 15min. warm-up time.



Measuring Equipment

- FPM520 of Westar Display technologies, INC., which utilized SR-3 for Chromaticity and BM-5A for other optical characteristics.

Note (1) Definition of Viewing Angle:



Note (2) Definition of Contrast Ratio (CR) :

measured at the center point of panel

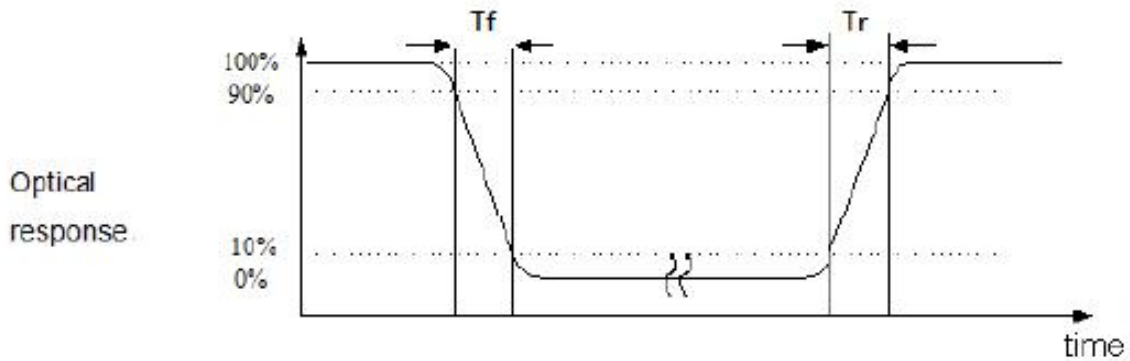
$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$



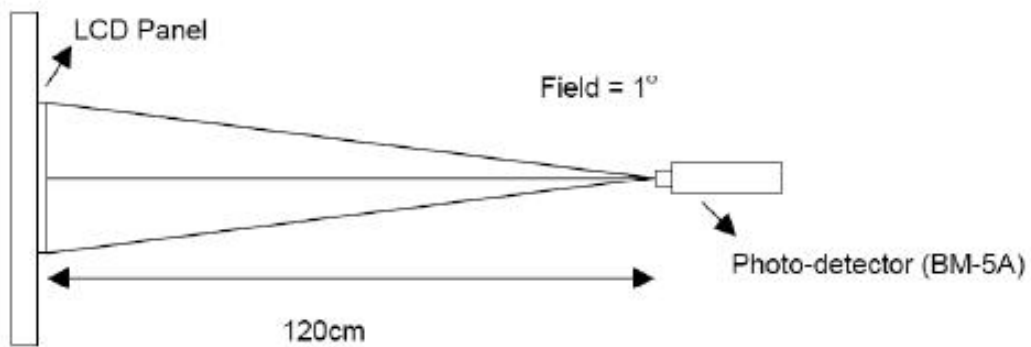
华田信科电子有限公司

HTdisplay Electronic CO., LTD

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



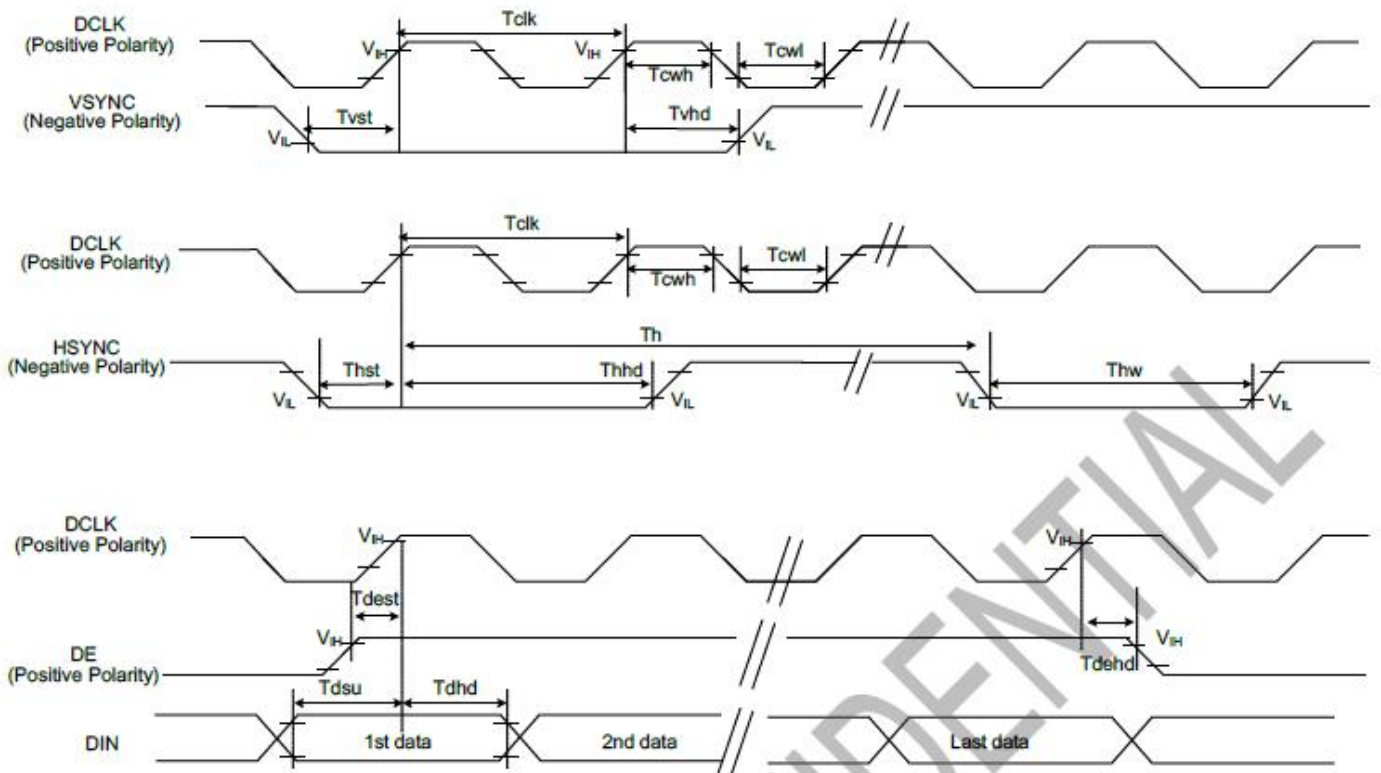
Note (4) Definition of optical measurement setup





7. READ/WRITE TIMING 读/写时序

Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
CLK Pulse Duty	Tcw	40	50	60	%	
HSYNC Width	Thw	2	-	-	DCLK	
HSYNC Period	Th	55	60	65	us	
VSYNC Setup Time	Tvst	12	-	-	ns	
VSYNC Hold Time	Tvhd	12	-	-	ns	
HSYNC Setup Time	Thst	12	-	-	ns	
HSYNC Hold Time	Thhd	12	-	-	ns	
Data Setup Time	Tdsu	12	-	-	ns	
Data Hold Time	Tdhd	12	-	-	ns	
DE Setup Time	Tdest	12	-	-	ns	
DE Hold Time	Tdehd	12	-	-	ns	





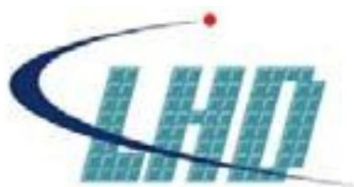
华田信科电子有限公司

HTdisplay Electronic CO., LTD

Parallel 24-bit RGB Input Timing Table

Parallel 24-bit RGB Input Timing (PVDD=PVDD1=VDD=VDDI= 3.3V, AGND= 0V, TA=25°C)

Parallel 24-bit RGB Interface Timing Table							
Item	Symbol	Min.	Typ.	Max.	Unit	Remark	
DCLK Frequency		Fclk	23	25	27	MHz	
HSYNC	Period Time	Th	808	816	896	DCLK	
	Display Period	Thdisp	800			DCLK	
	Back Porch	Thbp	4	8	48	DCLK	
	Front Porch	Thfp	4	8	48	DCLK	
	Pulse Width	Thw	2	4	8	DCLK	
VSYNC	Period Time	Tv	488	496	504	HSYNC	
	Display Period	Tvdisp	480			HSYNC	
	Back Porch	Tvbp	4	8	12	HSYNC	
	Front Porch	Tvfp	4	8	12	HSYNC	
	Pulse Width	Tvw	2	4	8	HSYNC	



8. INTERFACE DESCRIPTION 接口定义描述

No. 序号	SYMBOL 符号	I/O	Description 描述
1	LED-(K)		LED power cathode
2	LED+(A)		LED power anode
3	GND		Ground for digital circuits.
4	VDD		Analog supply voltage range VDD to AVSS: 3.3V
5-12	R0-R7		Parallel 8-bit digital Red data input.
13-20	G0-G7		Parallel 8-bit digital Green data input.
21-28	B0-B7		Parallel 8-bit digital Blue data input.
29	GND		Ground for digital circuits.
30	DCLK		Clock signal. Latching data at the rising edge.
31	DISP		Standby setting for testing, it should be connected to VDDIO in normal Operation mode. If connected to GND, the IC is in standby mode.
32	HS		Horizontal Sync input. Negative polarity.
33	VS		Vertical Sync input. Negative polarity.
34	DE		Data input Enable. Active High to enable the data input Bus under "DE Mode".
35	NC		-
36	GND		Ground for digital circuits.
37	NC(XR)		Touch Panel
38	NC(YD)		Touch Panel
39	NC(XL)		Touch Panel
40	NC(YU)		Touch Panel



9. REFERENCE APPLICATION CIRCUIT 参考应用电路

Please consult our technical department for detail information.

详细资料请联系我们的技术部门。

10. RELIABILITY TEST CONDITIONS 可靠性试验条件

No. 序号	Test Item 试验项目	Test condition 试验条件	Inspection after test 判断标准
1	High Temperature Storage 高温存放	80°C±2°C 240H	Inspection after 2~4hours storage at room temperature, the sample shall be free from defects: 试验结束后, 已测试的 LCD 样品必须在室内正常温湿度环境下放置 2~4 个小时以上才能进行功能和外观检查, 样品不允许有以下缺陷: 1. Air bubble in the LCD; 模块中有气泡; 2. Sealleak; 封口松脱; 3. Non-display; 不显示; 4. missing segments; 漏笔 5. Glass crack; 玻璃破碎; 6. Current Idd is twice higher than initial value. 电流 Idd 大于初时值的2倍.
2	Low Temperature Storage 低温存放	-30°C±2°C 240H	
3	High Temperature Operation 高温操作	80°C±3°C 240H	
4	Low Temperature Operation 低温操作	-30°C±3°C 240H	
5	High Temperature /Humidity Storage 高温高湿	80°C±3°C 90%RH 240H, under no-load condition, then taking it out and drying it at normal	
6	Temperature Cycle 冷热循环	10 cycles : -30°C for 30 minutes → normal temperature for 5 minutes → +60°C for 30 minutes → normal temperature for 5 minutes, as one cycle.	
7	Vibration Test 振荡试验	Frequency range : 10Hz ~ 55Hz Amplitude of vibration : 1.5mm Sweep time: 12 min X,Y,Z 2 hours for each direction.	
8	Dropping test 跌落试验	Drop to the ground from 0.5m height, one time, every side of carton. (Packing condition)	
9	ESD test 静电试验	Air: ±8KV 150pF/330Ω 5 times Contact: ±4KV 150pF/330Ω 5 time	



华田信科电子有限公司

HTdisplay Electronic CO., LTD

After completing the reliability test, leave the samples under the room temperature and for the following inspection items:
可靠性测试完成后，在室温存放 4 小时，再按以下步骤检测。

1. No clearly visible defects or deterioration of display quality allowed.
无明显的质量及外观上的不合格。
2. No function-related abnormalities.
应无任何功能异常。
3. Connected parts still connecting tightly.
外观的接合部分依然紧密连接
4. Display characteristics fulfill initial value, contrast ratio should be an least 30% of initial value.
显示特性满足初期的规格，对比度不低于最初对比度的 30%。

11. Storage Precautions 储存注意事项

11.1 When storing the LCD modules, the following precaution are necessary:
液晶显示模块的存储依照以下几点：

- 1、 Store them in a sealed polyethylene bag. If properly sealed, there is no need for the desiccant.
使用聚乙烯袋密封，如果密封得当，不需要干燥剂。
- 2、 Store them in a dark place. Do not expose to sunlight or fluorescent light, keep the temperature between 0°C and 35 °C, and keep the relative humidity between 40%RH and 60%RH.
避光保存，避免直接暴露在太阳光或荧光灯下，保持温度在 0~35 摄氏度之间，保持相对湿度在 40%RH 和 60%RH 之间。
- 3、 The polarizer surface should not come in contact with any other objects (We advise you to store them in the anti-static electricity container in which they were shipped).
偏光片表面避免接触其他物质（建议在货运时存放防静电包装中）。
- 4、 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.
液晶在低温会凝固（低于储存温度范围以下）会导致缺陷或产生气泡（黑或白）如果模块处于低温下，也会产生气泡。
- 5、 If the LCD modules 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 gained by suspending use for some time. It should be noted that this phenomenon does not adversely affect performance reliability.
如果液晶显示模块长时间工作于同一个显示图案，换屏时会出现鬼影和轻微的对比度不均。停止使用一段时间后可恢复到正常状态。此现象不会严重影响性能可靠性。



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

为最小限度地降低由静电等对液晶显示模块性能的破坏，使用模块时避免接触下列区域：

1 - Exposed area of the printed circuit board.

- 印制电路板裸露区域。

2 - Terminal electrode sections.

- 印制电路板引出端子区域。

12. INSPECTION CRITERION 检查标准

Please consult our Quality Department for detail information.

详细信息请联系我们的品质部门。

13. PRECAUTIONS FOR USE OF LCD MODULES 使用注意事项

13.1 Handling Precautions

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

13.1.2 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.

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

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

13.1.5 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

13.1.6 Do not attempt to disassemble the LCD Module.

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

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

- a. Be sure to ground the body when handling the LCD Modules.
- b. Tools required for assembly, such as soldering irons, must be properly ground.
- c. To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.
- d. 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.

13.2 Storage precautions

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

13.2.2 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°C ~ 40°C

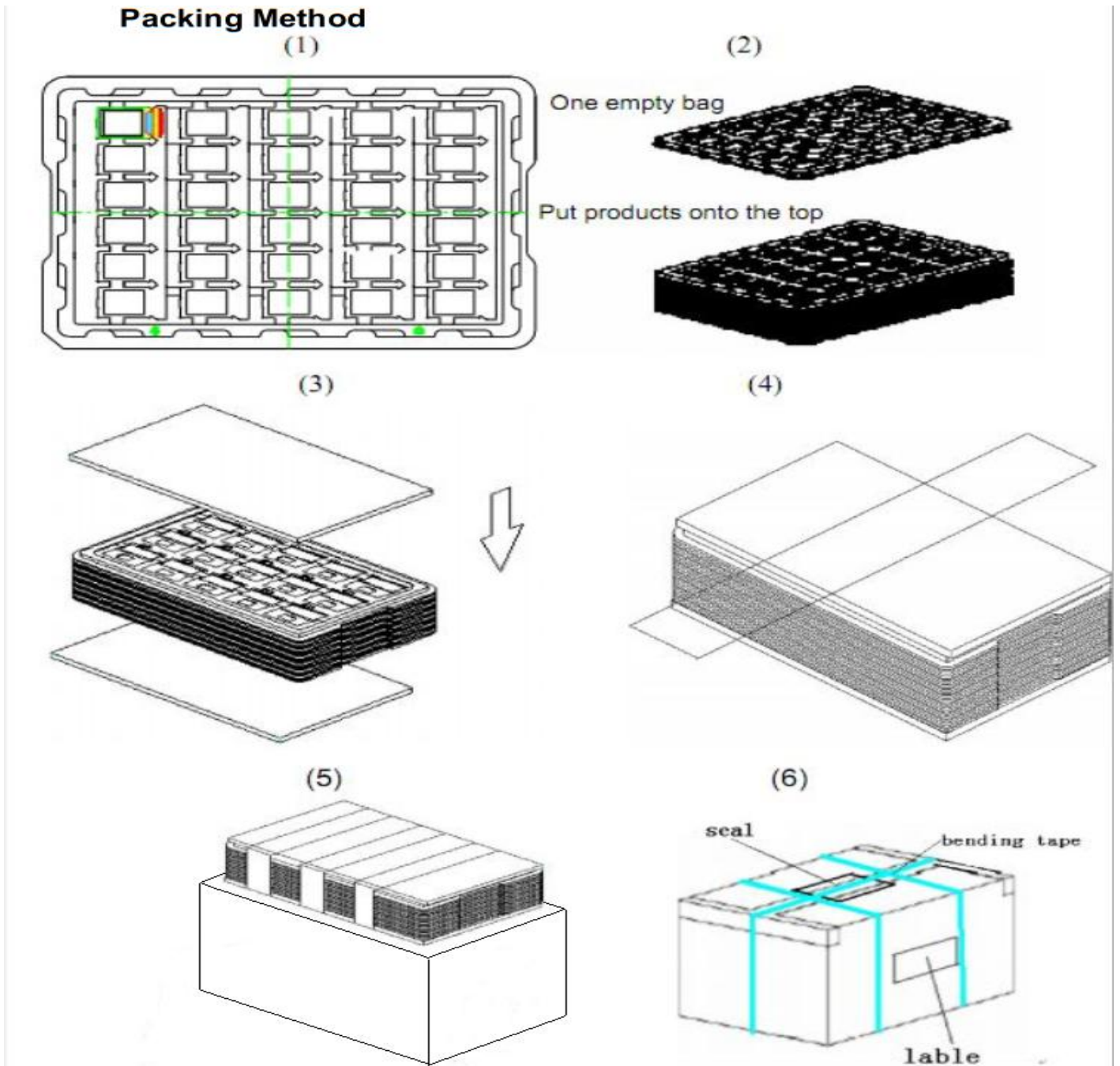
Relatively humidity: ≤80%

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

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



14. Packing 包装方式



1. Put module into tray cavity:
2. Tray stacking
3. Put 1 cardboard under the tray stack and 1 cardboard above:
4. Fix the cardboard to the tray stack with adhesive tape:
5. Put the tray stack into carton.
6. Carton sealing with adhesive tape.

注意：包装方式图仅作参考，因实际出货可能存在同一款屏有不同的客户都在使用，不同客户可能会出现不同的包装要求，因此具体产品出货时请以工厂实际出货时的包装方式为准。