华 田 信 科 电 子 有 限 公 司

HTdisplay Electronic CO.,LTD

PRODUCT	**TFT LCD MODULE**
产品名称 ：	**TFT 液晶显示模块**
MODELNO	
模块型号 ：	**HT0700EI06A**
SUPPLIER	**HTdisplay**
供 应 商 ：	华田信科
DATE	
日　　期 ：	**2019-10-08**

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	Shan Wang	
CHECKED BY 审核	Haicheng yu	
Quality Department 品质	Shipin peng	
Approved by 批准	Ruxun wang	Approved By

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

Email:sales@htdisplay.com　　www.htdisplay.com

REVISION RECORD 修改记录

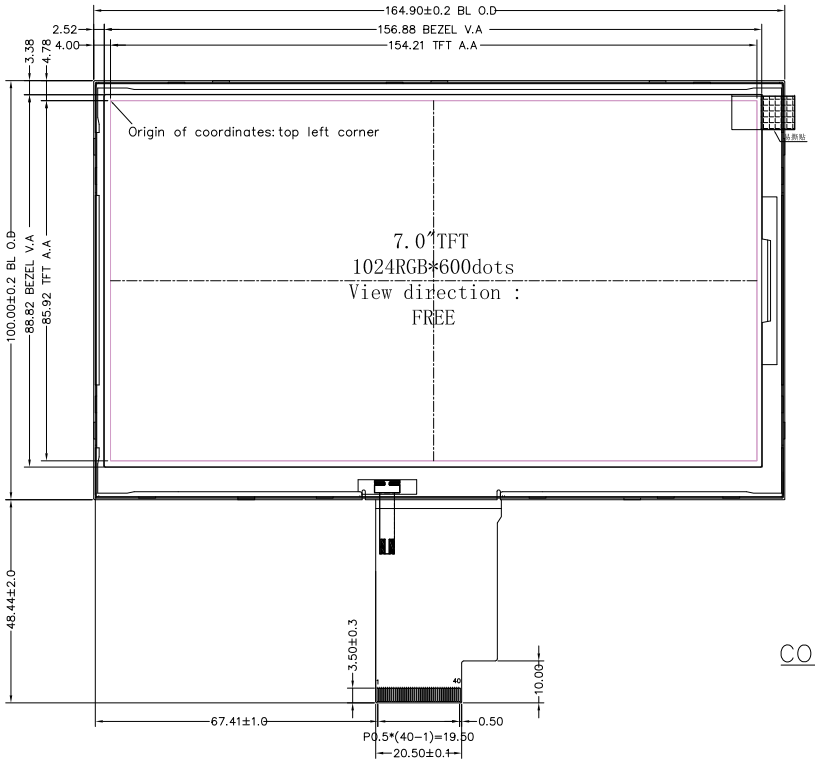
REV NO. 版本号	REV DATE 修改日期	CONTENTS 内容	REMARKS 注释
V0	2019-10-08	First release	Preliminary

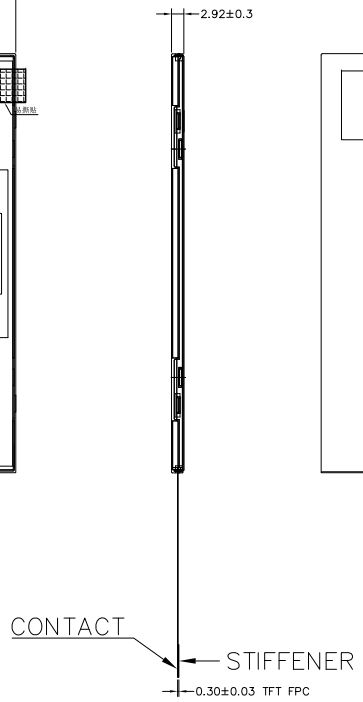
NO.	CONTENTS 内容	Page
1	General Information 主要特征描述	4
2	Outline Drawing 外形尺寸	5
3	Absolute Maximum Ratings 极限参数	6
4	Electrical Charateristics 模块电气特性	6
5	Backlight Charateristics 背光电气特性	6
6	Electro Optical Characteristics 光电参数	7
7	Read/Write Timing 读/写时序	8
8	Interface Description 接口定义描述	11
9	Reference Application Circuit 参考应用电路	12
10	Reliability Test Conditions 可靠性试验条件	12
11	Storage Precautions 储存注意事项	13
12	Inspection Criterion 检验标准	14
13	Precautions for Use of LCD Modules 使用注意事项	14
14	Packing 包装方式	16

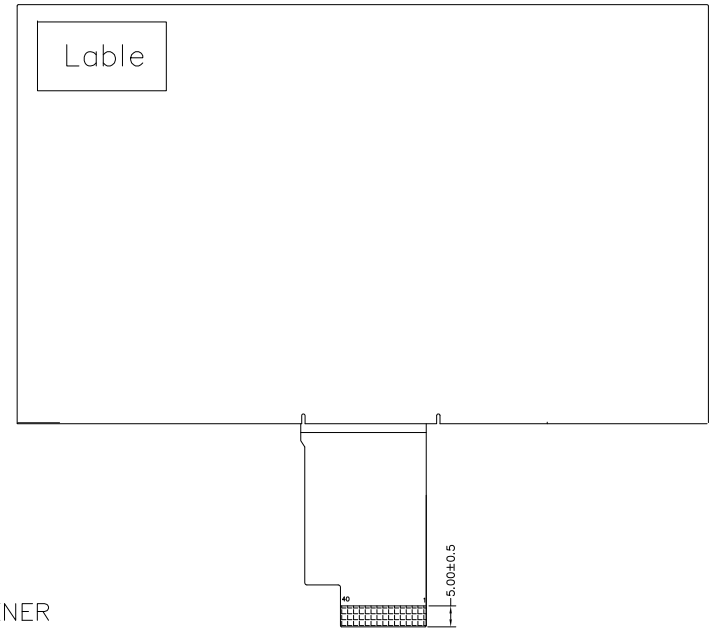
1. GENERAL INFORMATION 主要特征描述

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	FREE	O'Clock
Outline Dimensions (W × H×T) 外形尺寸（宽 x 高 x 厚）	164.9(W) × 100.0 (H) × 2.92(T)	mm
Viewing area 可视区域	156.88 x 88.82	mm
Active area 有效区域 (宽 × 高)	154.2144(W) x 85.92(H)	mm
Number of Dots 点阵	1024RGB x 600 Dots	---
Pixel pitch (W × H) 像素点尺寸	0.0502*0.1432	mm
Driver IC 驱动 IC	Source:EK79001HN + Gate:EK73215BCGA	---
Interface Type 接口类型	LVDS	---
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	---
With/Without TSP	Without TSP	---
Touch driver	------	---

REV.	CHANGE CONTENT	BY	DATE
A	FIRST ISSUE	Mr.Wang	19.10.8
B			



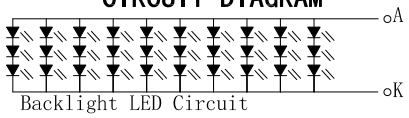




TFT

PIN	NAME
1	VCOM
2	VDD
3	VDD
4	NC
5	RESET
6	STBYB
7	GND
8	RXIN0-
9	RXIN0+
10	GND
11	RXIN1-
12	RXIN1+
13	GND
14	RXIN2-
15	RXIN2+
16	GND
17	RXCLKIN-
18	RXCLKIN+
19	GND
20	RXIN3-
21	RXIN3+
22	GND
23	NC
24	NC
25	GND
26	NC
27	DIMO
28	SELB(HSD)
29	AVDD
30	GND
31	LED-
32	LED-
33	L/R
34	U/D
35	VGL
36	NC
37	NC
38	VGH
39	LED+
40	LED+

CIRCUIT DIAGRAM



BACKLIGHT: 30 CHIP-WHITE LED
IF=200mA (VF≈16.8~19.2V)

NOTES:
1. Display Type: 7.0" TFT
2. Display Mode: Transmissive
3. Viewing Direction: FREE
4. Operation Temperature: -20°C to +70°C
   Storage Temperature: -30°C to +80°C
5. Contrast Ratio: 800:1
6. Luminance: 1000cd/m²(TYP)
7. TFT Driver IC: Source:EK79001HN+Gate:EK73215BCGA
8. TFT Interface: LVDS
   Unmarked Tolerance: ±0.3mm
   ROHS Compliant

HTDISPLAY Co., Ltd.			DRAWING No. : HT0700E106A	
			DRAWING TITLE: OUTLINE	
			FILE NO. : 1	
DESIGN	WS	2019.10.8	REV. : A	SCALE: 1:1
CHECKED	HY	2019.10.8	PROJECTION:	UNIT: mm
APPROVED	YHC	2019.10.8		SHEET: 1/1

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	3.6	V
Input voltage 输入电平	VIN	-0.3	VDD+ 0.3	V
Operating temperature 使用温度	TOP	-20	70	℃
Storage temperature 存储温度	TST	-30	80	℃
Humidity 湿度	RH		90%(Max60 °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	2.3	3.3	3.6	V
Input Current 输入电流	Idd		TBD	TBD	mA
Input voltage 'H' level 输入高电平	VIH	0.7VDD	–	VDD	V
Input voltage 'L' level 输入低电平	VIL	VSS		0.3VDD	V
Output voltage 'H' level 输出高电平	VOH	0.8VDD		VDD	V
Output voltage 'L' level 输出低电平	VOL	VSS		0.2VDD	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	Vf	16.8	-----	19.2	V	If=200mA
Number of LED LED数量			3(S)*10(P)		Piece	
Connection mode 连接类型	S+P		Series+Parallel			
Luminous Intensity 亮度参数			1000		Cd/m2	
Mean Time Between Failure	MTBF		40000		Hours	Ta=25℃

Parallel(P)(并联)； Series(S)(串联)。

Using condition: constant current driving method If=200mA(+/-10%).

使用条件：恒流的驱动方式是 If=200mA(+/-10%).

6. ELECTRO-OPTICAL CHARACTERISTICS 光电参数

6.1 Optical Specification

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing Angle range	Horizontal	Θ_3	CR > 10	-	85	-	Deg.	WV-Pol Note 1
		Θ_9		-	85	-	Deg.	
	Vertical	Θ_{12}		-	85	-	Deg.	
		Θ_6		-	85	-	Deg.	
Luminance Contrast ratio		CR	Θ = 0°	-	800	-		Note 2
Cell Transmittance		Tr		4.8	5.0	-	%	Base on C Light Note 3
White Chromaticity		x_w		TYP. - 0.03	0.308	TYP. + 0.03		Note 4 Base on C Light
		y_w			0.336			
Reproduction of color (C light)	Red	R_x			0.599			
		R_y			0.338			
	Green	G_x			0.299			
		G_y			0.550			
	Blue	B_x			0.139			
		B_y			0.131			
Color Gamut (C light)				-	50	-	%	
Response Time (Rising + Falling)		T_{RT}	Ta= 25° C Θ = 0°	-	30	40	ms	Note 5

Note :

1. Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or 3, 9 o'clock direction and the vertical or 6, 12 o'clock direction with respect to the optical axis which is normal to the LCD surface (see FIGURE 5).

2. Contrast measurements shall be made at viewing angle of Θ= 0 and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state . (see FIGURE 5) Luminance Contrast Ratio (CR) is defined mathematically.

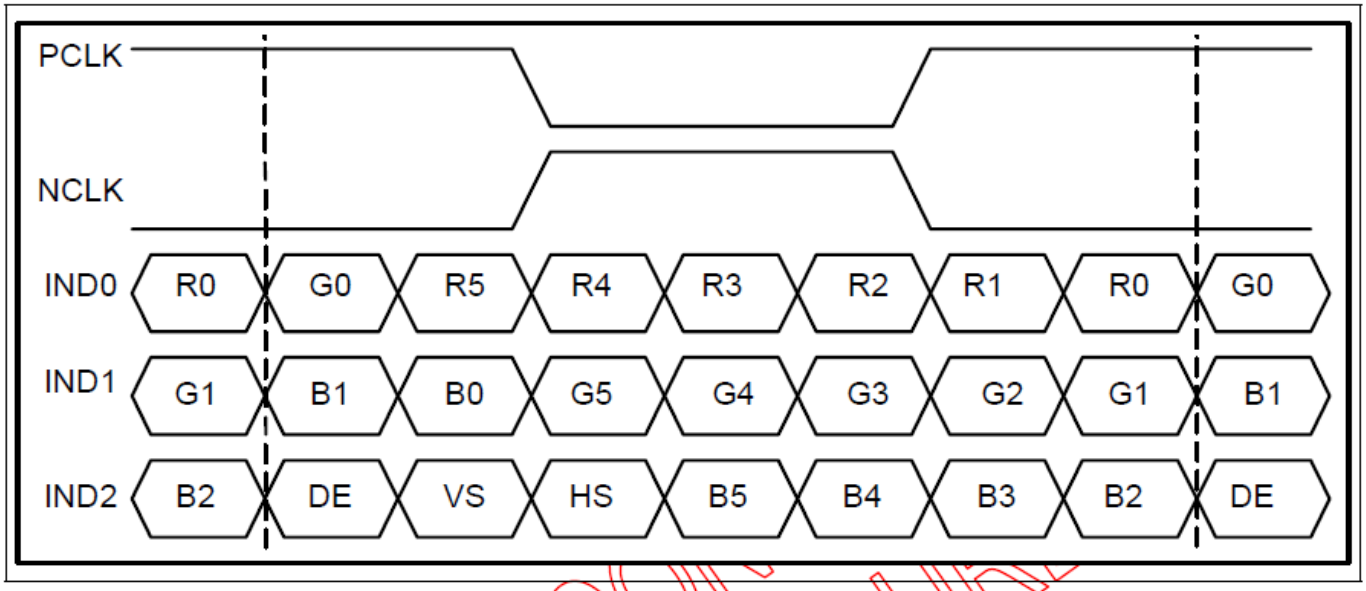
$$CR = \frac{\text{Luminance when displaying a white raster}}{\text{Luminance when displaying a black raster}}$$

3. Transmittance is the Value with Polarizer.

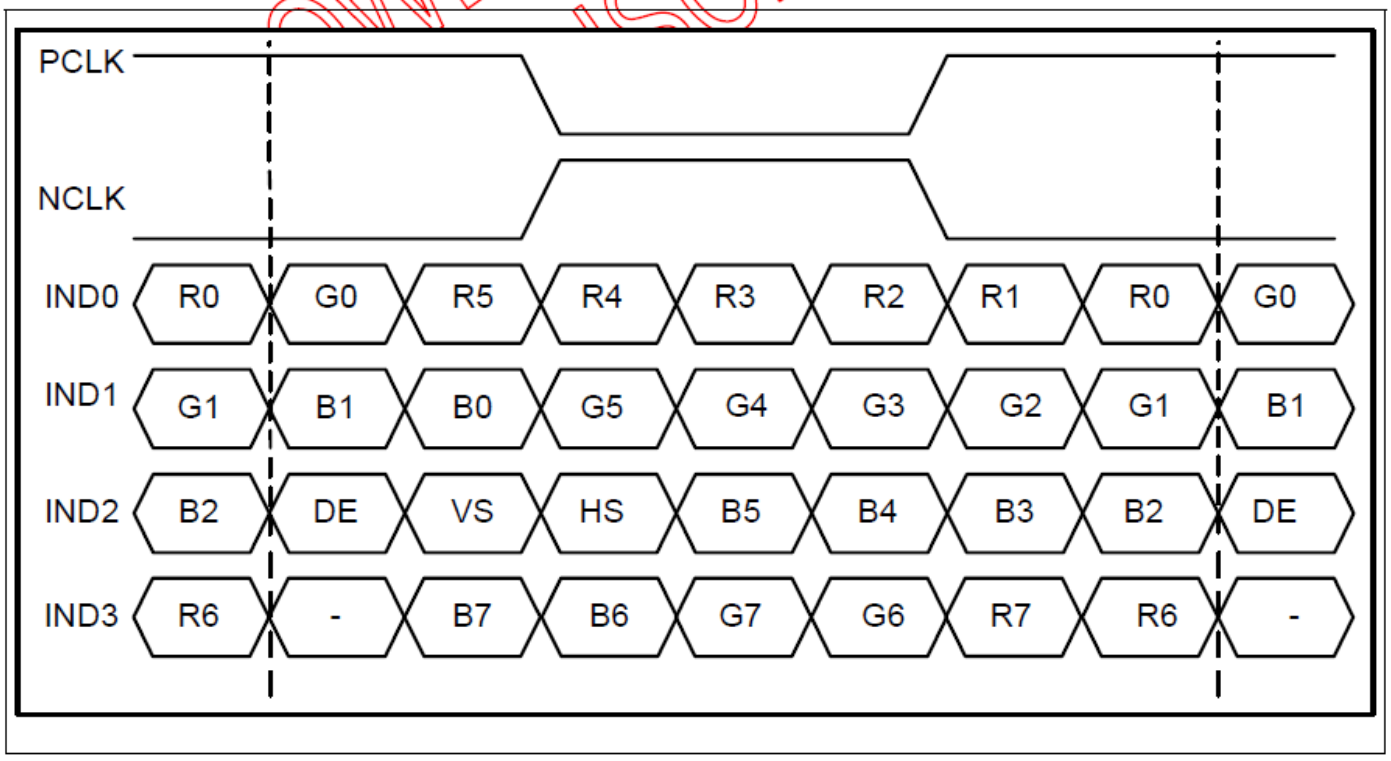
4. The color chromaticity coordinates specified in Table 6 shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.

5. The electro-optical response time measurements shall be made as FIGURE 6 by switching the "data" input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is Tr, and 90% to 10% is Td.

7. READ/WRITE TIMING 读/写时序



6-bit LVDS Input Timing chart

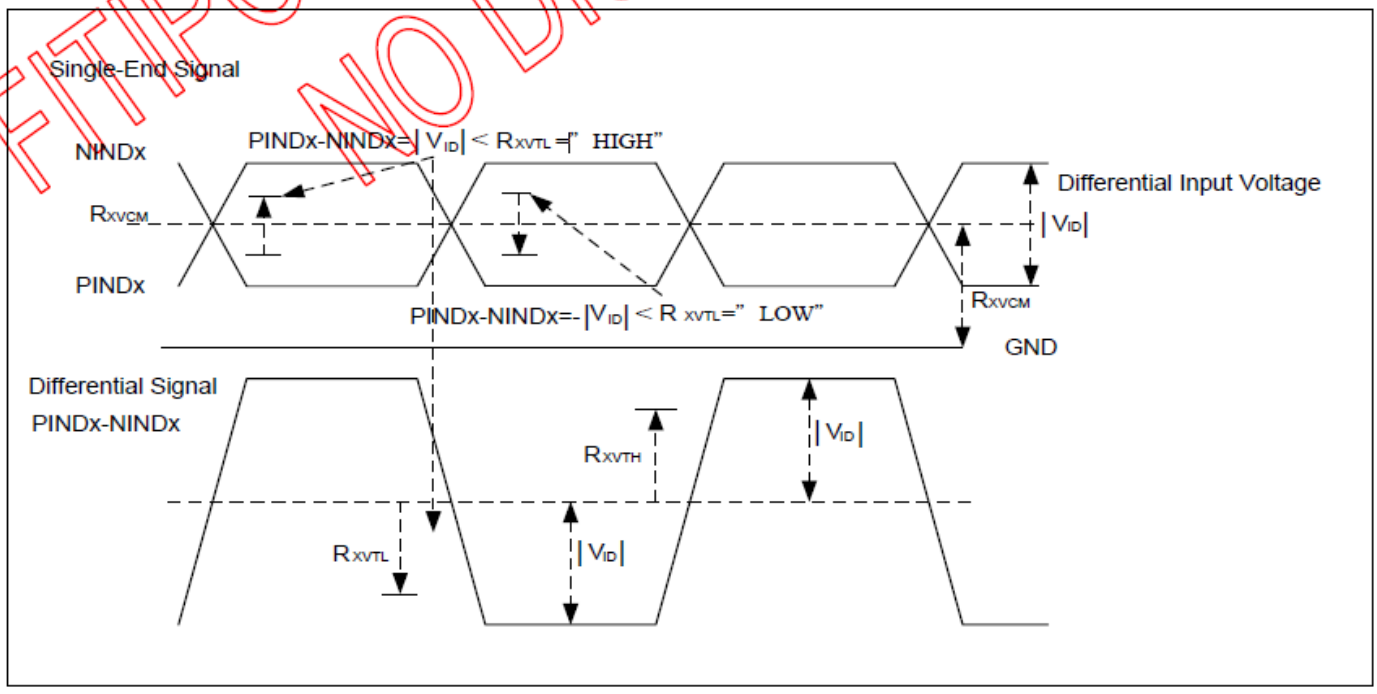


8-bit LVDS Input Timing chart

LVDS DC characteristic

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Differential input high threshold voltage	RxVTH			+0.1V	V	RxVCM=1.2V
Differential input low threshold voltage	RxVTL	-0.1			V	
Input voltage range(single-end)	RxVIN	0		2.4	V	
Differential input common mode voltage	RxVCM	$\|V_{ID}\|/2$		2.4 -$\|V_{ID}\|/2$	V	
Differential input voltage	$\|V_{ID}\|$	0.2		0.6	V	
Differential input leakage current	RxVTH	-10		+10	V	
LVDS Digital Operating Current	Iddlvsd	-	40(TBD)	50	mA	Fclk=65Mhz, VDD=3.3V
LVDS Digital Standby Current	Istlvds	-	10(TBD)	50	uA	Clock & all functions are stop

FTP CONFIDENTIAL
NO DISCLOSURE



Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Clock Frequency	R_{xFCLK}		20	-	71	MHz
Input data skew margin	T_{RSKM}	V_{IDL}=400mV R_{xVCM}=1.2V R_{xFCLK}=71MHz	500			ps
Clock High Time	T_{LVCH}			4/(7* R_{xFCLK})		ns ns
Clock Low Time	T_{LVCL}			3/(7* R_{xFCLK})		ns
PLL wake-up-time	T_{enPLL}				150	us

HV mode(1)

HV mode
Horizontal input timing

Parameter		Symbol	Value			Unit
Horizontal display area		thd	1024			DCLK
DCLK frequency@ Frame rate=60hz		fclk	Min.	Typ.	Max.	
			44.9	51.2	63	Mhz
1 Horizontal Line		th	1200	1344	1400	DCLK
HSYNC pulse width	Min.	thpw	1			
	Typ.		—			
	Max.		140			
HSYNC back porch		thbp	160	160	160	
HSYNC front porch		thfp	16	160	216	

HV mode(2)

Vertical input timing

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Vertical display area	tvd	600			H
VSYNC period time	tv	624	635	750	H
VSYNC pulse width	tvpw	1	—	20	H
VSYNC back porch	tvb	23	23	23	H
VSYNC front porch	tvfp	1	12	127	H

NOTE :This section is only for reference,Details please refer to the IC specification.

备注：本节内容仅供参考,详细参数信息请参阅 IC 规格书。

FITPOWER CONFIDENTIAL
NO DISCLOSURE

8. INTERFACE DESCRIPTION 接口定义描述

No.	SYMBOL	I/O	Description
TFT			
1	VCOM		A power supply for the TFT-LCD common electrode. （3.1V~3.3V，Power consumption：uA Level）
2-3	VDD		Analog supply voltage range VCI to AVSS （3.3V，Power consumption：20~30mA）
4	NC		--
5	RESET		This signal will reset the device and it must be applied to properly.
6	STBYB		Standby mode selection bit
7	GND		Ground for digital circuits.
8	RXIN0-		LVDS data input
9	RXIN0+		LVDS data input
10	GND		Ground for digital circuits.
11	RXIN1-		LVDS data input
12	RXIN1+		LVDS data input
13	GND		Ground for digital circuits.
14	RXIN2-		LVDS data input
15	RXIN2+		LVDS data input
16	GND		Ground for digital circuits.
17	RXCLKIN-		Clock Input pin for LVDS
18	RXCLKIN+		Clock Input pin for LVDS
19	GND		Ground for digital circuits.
20	RXIN3-		LVDS data input
21	RXIN3+		LVDS data input
22	GND		Ground for digital circuits.
23-24	NC		--
25	GND		Ground for digital circuits.
26	NC		--
27	DIMO		Ground for digital circuits.
28	SELB(HSD)		HSD=”L”:8 bit;HSD=”H”:6 bit
29	AVDD		Power pad for analog circuit. (+9.6V， Power consumption：10~20mA)
30	GND		Ground for digital circuits.
31-32	VLED-(K)		LED power cathode.
33	L/R		Source Right or Left sequence control. Normally pull high
34	U/D		Gate Up or Down scan control. Normally pull low.
35	VGL		A negative power input pin for gate driver. (-6V， Power consumption：uA Level)
36-37	NC		--
38	VGH		A positive power input pin for gate driver. (+18V， Power consumption：uA Level)
39-40	VLED+(A)		LED power anode.

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℃±2℃ 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℃±2℃ 240H	
3	High Temperature Operation 高温操作	70℃±3℃ 240H	
4	Low Temperature Operation 低温操作	-20℃±3℃ 240H	
5	High Temperature /Humidity Storage 高温高湿	40℃±3℃ 90%RH 240H	
6	Temperature Cycle 冷热循环	-30℃←→25℃←→80℃ 5min 30min ←→25℃， 5min after 10cycle, Restore 4H at 25℃	
7	Vibration Test (package state) 振荡试验	10Hz~150Hz, 100m/s2, 120min	

8	Dropping test 跌落试验	Drop to the ground from 0.5m height, one time, every side of carton. (Packing condition)	Not allowed cosmetic and electrical defects.
9	ESD test 静电试验	Voltage:±4KV R: 330Ω C: 150pF Air discharge, 10time	

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℃and 35 ℃, 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 patternsmay remain on the screen as ghost images and a slight contrast irregularity may also appear. A normal operating status can bere 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:

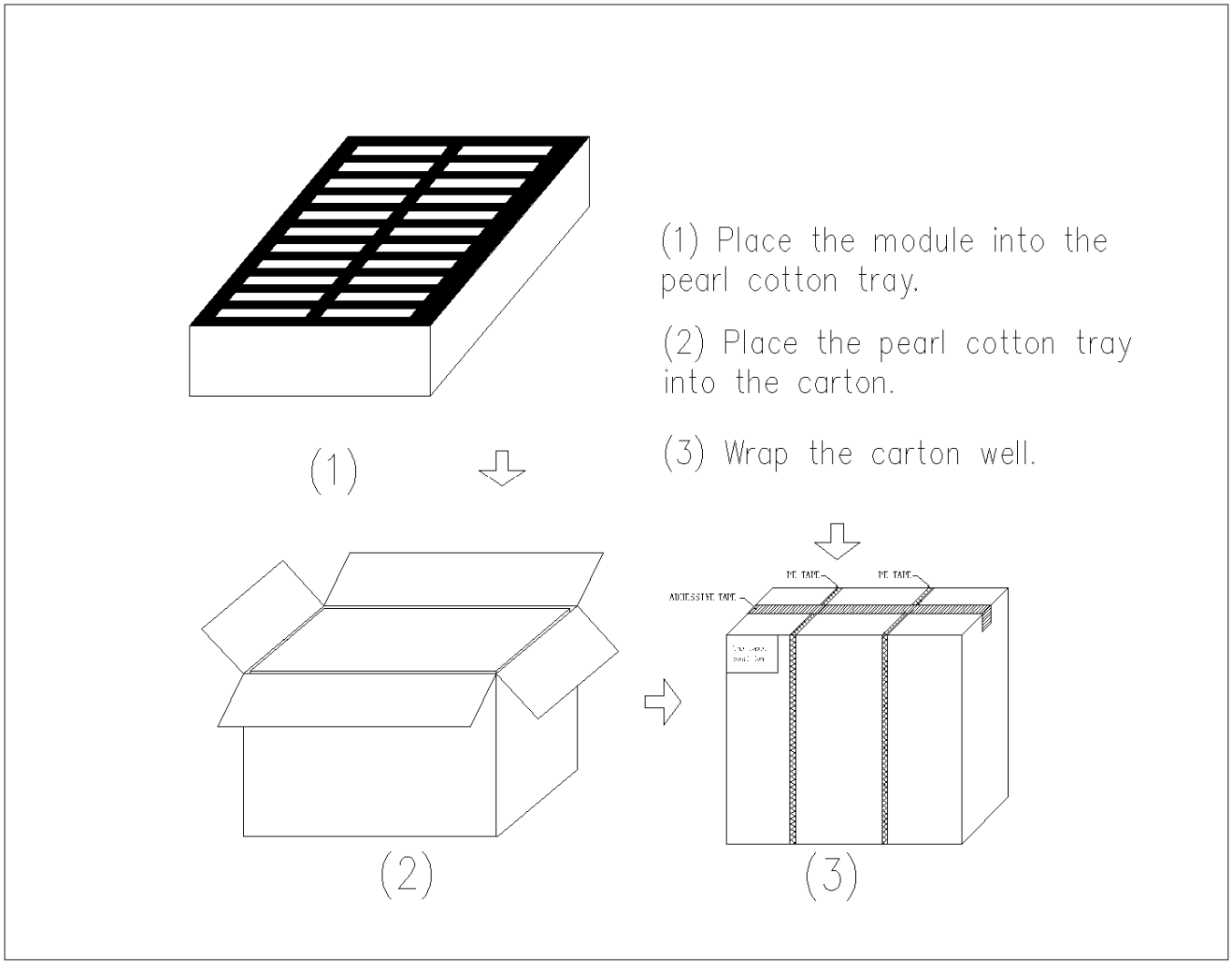
Temperature : 0℃ ～ 40℃

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



注意：包装方式图仅作参考，体产品出货时请以工厂实际出货时的包装方式为准。
Note: the packing mode diagram is for reference only. Please refer to the actual packing mode of the factory when the products are shipped.