华夏彩光电（深圳）有限公司

Huaxia RGB Display（Shen Zhen）Co.,Ltd

规格书

Product Specification

客户名称 Customer	
客户项目号 Part NO	
产品型号 Part NO	H0183S008T008　V1
产品内容 Product type	Mode:Transmissive type .Normally black. TFTLCD Module LCD Module: 1.83” 240RGB*280 Dot 4SPI
客户确认签章 Signature by Customer:	

PREPARED BY	CHECKED BY	APPROVED BY

Records of Revision 修改记录

Rev 版本号	Date 修改日期	Description 内容	Page 页	Remarks 注释
V1	2024-8-19	首 次	18	

Table of Contents 目录

1 General Description 规格简介

This display module is a transmissive type color active matrix TFT(Thin Film Transistor) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This module is composed of a TFT LCD module, a driver circuit, and a back-light unit.The resolution of a 1.83" contains 240RGB x 280 dots and can display up to 262K colors.

该显示模块是一种采用非晶硅 TFT 作为开关器件的透射型彩色有源矩阵 TFT(薄膜晶体管)液晶显示器。该模块由 TFT 液晶显示模块、驱动电路和背光单元组成。1.83 英寸的分辨率包含 240RGB x 280 点，可显示高达 262K 的颜色。

2 Module Parameter 模组参数

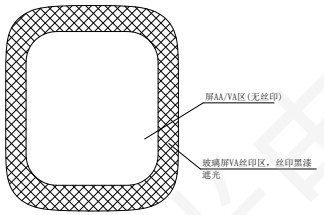
Features	Details	Unit
Display Size(Diagonal) 显示尺寸(对角线)	1.83	inch
LCD type 液晶显示屏类型	α-Si TFT	-
Display Mode 显示模式	IPS / Transmissive / Normally Black	-
Resolution 分辨率	240RGB x 280	-
Active Area 显示区	30.24(H) ×35.28(V)	mm
Module Outline 模组外形	32.34(H) ×39.43(V)×1.9(T)	mm
Display Colors 显示颜色	262K	-
Interface 接口	4SPI	-
Driver IC 驱动 IC	ST7789	-
TP Viewing Area TP 视窗	30.74(H) ×35.78(V)	mm
TP Outline(assembly) TP 外形	40.21(H) ×47.85(V)×0.95(T)	mm
Luminance on surface 亮度	400	cd/m²
View Direction 视角方向	All	Best image
Contrast ratio 对比度	1200:1	
Color gamut 色域	72%	
PPI 图像点密集度	201	-
Window effect 视窗效果	无一体黑	-
Cover plate surface effect 盖板表面效果	无 AF/AG	-
Operating Temperature 工作温度	-20～70	℃
Storage Temperature 储存温度	-30～80	℃
Weight 重量	TBD	g

Note 1: Excluding hooks, posts , FPC/FPC tail etc.

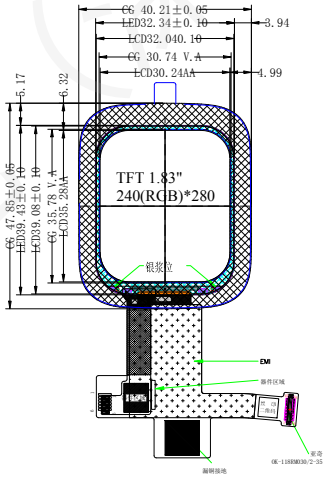
3 Mechanical Drawings 结构图

REV.	DESCRIPTION	DATA	NAME
1	更改胶纸背光，更改FPC	240123	

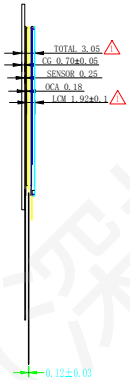
丝印效果图



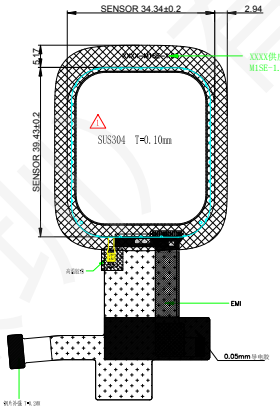
正视图



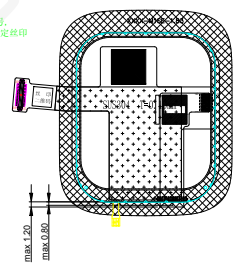
侧视图



背视图



弯折示意图
FPC弯折出货



LCM PIN定义

SPI接口屏PIN序说明

PIN序号	网络名	TFT屏	
1	GND		
2	SPI_SDA	三线制接地	显示屏SPI接口
3	NC	三线制接地	
4	GND		
5	SPI_CLK		
6	LCD_RS		
7	GND		
8	CTP_RST		TP信号线 支持3.3V电压
9	CTP_INT		
10	CTP_SDA		
11	CTP_SCL		
12	GND		TP 3.3V供电
13	CTP_VDD3.3V		
14	GND		屏ID1
15	LCM_ID1		
16	TPFUNC1		NC
17	LCM_ID2		屏ID2
18	LCM_FMARK/TE		屏控制信号线
19	LCM_RSTN		
20	GND		
21	VDD3.3V		TFT屏AVDD(3.3V)
22	VDD3.3V		屏ID电压 TP IO电压
23	GND		
24	SPI_CS		显示屏SPI接口
25	GND		
26	LED_K		TFT屏背光负极
27	LED_K		
28	LED_A		
29	LED_A		TFT屏背光正极
30	GND		
31	GND		
32	GND		
33	GND		固定脚
34	GND		
35	GND		
36	GND		

连接器：0K-1188M030/2-35（公座）

TP PIN定义

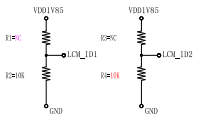
TP PIN DESCRIPTION	
NO	PIN NAME
1	CTP_RST
2	CTP_INT
3	CTP_SDA
4	CTP_SCL
5	GND
6	CTP_VDD2V8

有问题请扫图中二维码

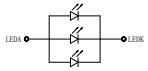
LCD型号/类型/分辨率	1.83″,IPS/240*280
视角方向	FREE
偏光片	见BOM
驱动IC	ST7789
接口类型	4SPI
LED颗数/连接方式/电流	3-LED/3并/60MA
亮度	TBD（MIN）
色坐标	TBD
连接器型号	亚奇0K-1188M030/2-35

1	结构	G+F
2	IC	CST816D
3	VA区透光率：	≥87%;摄像头孔透光率≥90%;
4	CG材质&表面硬度	玻璃子 0.7mm & ≥7H（莫氏）
5	工作/存储温度	工作温度：-20°～+70°；存储温度：-30°～+80°
6	墨油度&油墨厚度	≤0.2%;BLACK INK图层为黑色印刷；
7	钢珠冲击能量	50g钢珠，30cm高度自由落体冲击不损坏；
8	强化条件	强化深度DOL≥8um，表面应力CS≥450Mpa。
9	ESD要求	接触±6KV，空气±10KV
10	达因值	CG背面达因能≥32dyn
11		所有的材料符合ROHS 2.0，HF，REACH标准
12		保护膜不浅胶，不印水，易贴附无气泡，防静电值介于10-11；
13		带“*”为CPK重点管控尺寸 CPK≥1.33，未注公差±0.20mm；
14		

ID识别图：请客户确认并把控好。



LED CIRCUIT DIAGRAM:



If=60mA Vf=2.9~3.4V

华夏彩光电（深圳）有限公司 Huaxia RGB Display(shenzhen)Co., Ltd					
DRAWN BY: 绘 图		PRODUCT NO: 产品编号	H0183S008T008	SCALE: 比 例	1:1
CHECKED BY: 审 核		CLIENT NO: 客户编号		UNITS: 单 位	MM
DATA: 日 期		VERSION NUMBER: 版本号	V1	VIEW: 投影方式	

4 Module Interface 模组接口定义

NO	SYMBOL	FUNCTION
1	GND	Power ground
2	SPI_SDA	Serial data input pin for SPI Interface.
3	NC	OPEN
4	GND	Power ground
5	SPI_CLK	the serial input/output clock in serial interface mode
6	LCD_RS	Display data/command selection pin in 4-line serial interface
7	GND	Power ground
8	CTP_RST	Touch panel rese.If not used, please open it.
9	CTP_INT	Touch panel interrupt output.If not used, please open it.
10	CTP_SDA	Touch panel I2C data.If not used, please open it.
11	CTP_SCL	Touch panel I2C clock..If not used, please open it.
12	GND	Power ground
13	CTP_VDD3.3V	Touch panel Power Supply for Analog.If not used, please open it.
14	GND	Power ground
15	LCM_ID1	High speed interface data differential signal input/output pins.
16	VPP(NC)	NC
17	LCM_ID2	High speed interface data differential signal input/output pins.
18	LCM_FMARK/TE	Tearing effect signal is used to synchronize MCU to frame memory writing. -If not used, please let this pin open
19	LCM_RSTN	-This signal will reset the device and it must be applied to properly initialize the chip. -Signal is active low
20	GND	Power ground
21	VDD3.3V	Power Supply for I/O system. VDDIO=1.65V~3.3V
22	VDD3.3V	Power Supply for I/O system. VDDIO=1.65V~3.3V
23	GND	Power ground
24	SPI_CS	Chip selection pin ， Low enable，High disable
25	GND	Power ground
26	LEDK	LED Cathode
27	LEDK	LED Cathode
28	LED_A	LED Anode
29	LED_A	LED Anode
30	GND	Power ground
31	GND	Power ground
32	GND	Power ground
33	GND	Power ground

34	GND	Power ground
35	GND	Power ground
36	GND	Power ground

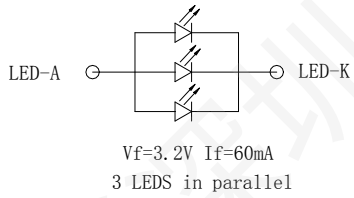
5 Application Circuit 应用电路

5.1 Backlight recommended circuit 背光电路参考

Motherboard driver backlight is need constant current circuit, if the rated voltage screen after light brightness difference.Current and power consumption of the machine are inconsistent, so recommend a backlight driving circuit is best rated current.It is recommended to use IC (AW9364). The reference circuit is as follows：

5.2Backlight recommended circuit 背光电路参数推荐

Motherboard driver backlight is need constant current circuit:



3LED 灯

Note: constant current circuit for every LED,and though LED lamp current is less than 20mA.Recommand between 15mA and 20 mA for every LED.

5.3 Application Circuit 应用电路（）

6 Absolute Maximum Ratings 绝对最大额定值

VSS=0V, Ta=25ºC

Item 项目		Symbol	Min.最小	Max.最大	Unit 单位
Supply Voltage 电源电压	Power supply 电力供应	VDD	-0.3	+4.6	V
	Analog 模拟	-	-	-	V
	IO	IOVDD	-0.3	+4.6	V
Input Voltage 输入电压		Vi	-0.3	IOVDD+0.3	V
Storage temperature 储存温度		T_{stg}	-30	+70	ºC
Operating temperature 工作温度		T_{op}	-20	+60	ºC
Storage humidity 存储湿度		H_{stg}	10	Note 1	%RH

Operating humidity 操作湿度	H_{op}	10	Note 1	%RH

Note 1: 90%RH max, If Ta is below 50ºC; 60%RH max, If Ta is over 60ºC.

7 Electrical Specification 电性规格

DC Characteristics 直流特性

Item 项目		Symbol	Min.最小	Typ.中间	Max.最大	Unit 单位
Supply Voltage 电源电压	Powersupply 电力供应	VDD	2.4	2.8	3.3	V
	Analog	VCI	2.4	2.8	3.3	V
	IO	IOVDD	1.65	1.8/2.8	3.3	V
Logic Low input voltage 输入电压低		V_{IL}	-0.3IOVDD	-	0.3IOVDD	V
Logic High input voltage 输入电压高		V_{IH}	0.7IOVDD	-	IOVDD	V
Logic Low output voltage 输出电压低		V_{OL}	-	-	0.2IOVDD	V
Logic High output voltage 输出电压高		V_{OH}	0.8IOVDD	-	-	V
Current Consumption 电流消耗	Normal display 正常的显示	Ivdd	-	30	-	mA
	Standby mode 待机模式	Ivdd	-	60	-	uA
Frame Frequency 帧频		f_{FR}	-	60	-	Hz

8 Initialization Code 初始化代码

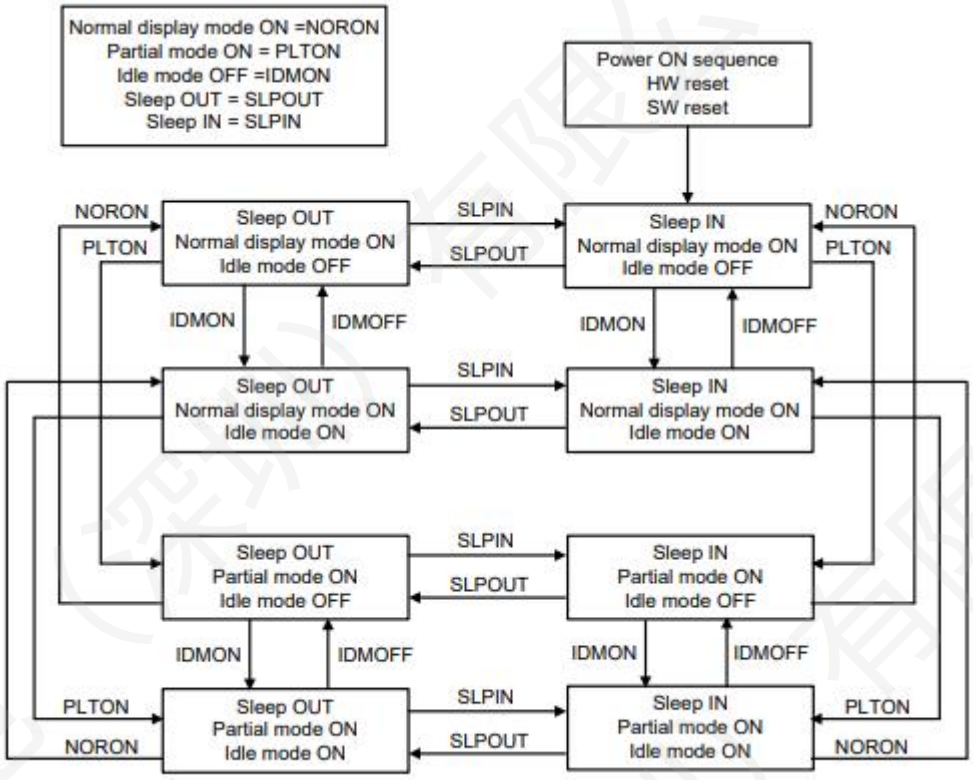
9 Optical Specifications 光学规格

9.1 Optical Specifications 光学规格

Ta=25ºC, VDD=2.8V, TN LC+ Polarizer

	Item 项目		Symbol 标志	Condition 条件	Specification 规范			Unit 单位
					Min. 最小	Typ. 中间	Max. 最大	
Backlight On (Transmissive Mode)	Luminance on surface(I_f =20mA) 表面亮度		*Lv*	Normally viewing angle $\theta_X=\theta_Y$ =0º		400	-	cd/m²
	Contrast ratio 对比度		*CR*		1000	1200	-	-
	Response time 响应时间		*TR*		-	10	15	ms
			TF	-	-	20	20	
	Chromaticity Transmissive 色度	Red 红	*XR*	-	-	0.670	-	-
			YR		-	0.321	-	-
		Green 绿	*XG*		-	0.273	-	-
			YG		-	0.583	-	-
		Blue 蓝	*XB*		-	0.136	-	-
			YB		-	0.110	-	-
		White 白	*XW*		-	0.292	-	-
			YW		-	0.330	-	-
	Viewing Angle 视角	Horizontal	θX+	Center CR≥10	80	85	-	Deg.
			θX-		80	85	-	
		Vertical	θY+		80	85	-	
			θY-		80	85	-	
	NTSC Ratio(Gamut)		-	-	67	72	-	%

9.2 The power on/off sequence is illustrated below 电源启动/关闭顺序



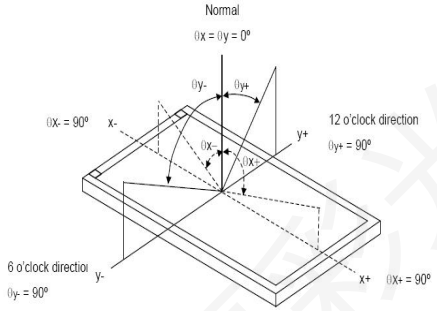
9.3 Definition of Contrast Ratio 对比度的定义

Contrast is measured perpendicular to display surface in reflective and transmissive mode. The measurement condition is:

Measuring Equipment 测量设备	**BM-7 or EQUI**
Measuring Point Diameter 测点直径	3mm//1mm
Measuring Point Location 测点位置	Active Area centre point
Test pattern 测试模式	A: All Pixels white
	B: All Pixel black
Contrast setting	Maximum

Definitions: CR (Contrast) = Luminance of White Pixel / Luminance of Black Pixel

9.4 Definition of Viewing Angles 视角的定义



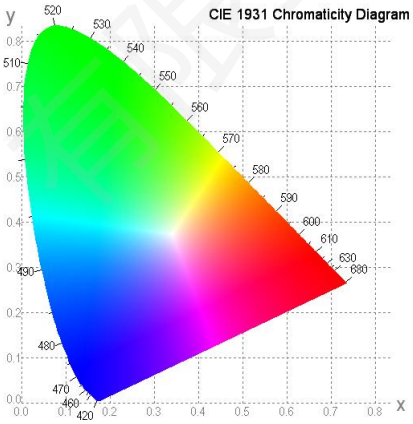
Measuring machine: LCD-5100 or EQUI

9.5 Definition of Color Appearance 色域的定义

R,G,B and W are defined by (x, y) on the IE chromaticity diagram

NTSC=area of RGB triangle/area of NTSC triangleX100%

Measuring picture: Red, Green, Blue and White (Measuring machine: BM-7)



9.6 Definition of Surface Luminance, Uniformity and Transmittance

表面亮度、均匀性和透光率的定义

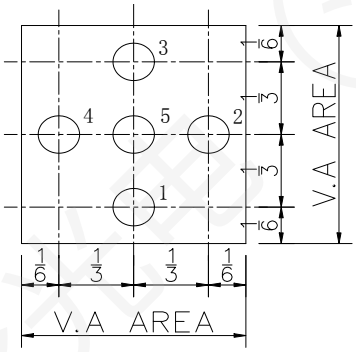
Using the transmissive mode measurement approach, measure the white screen luminance of the display panel and backlight.

9.6.1 Surface Luminance: LV = average (LP1:LP5)

9.6.2 Uniformity = Minimal (LP1:LP5) / Maximal (LP1:LP5) * 100%

9.6.3 Transmittance = LV on LCD / LV on Backlight * 100%

Note :Measuring machine:BM-7



10 Quality Assurance 质量标准

10.1 Purpose 目的

This standard for Quality Assurance assures the quality of LCD module products supplied to customer by HuaXia RGB Display..

10.2 Agreement Items 协议项目

HuaXia RGB Display and customer shall negotiate if the following situation occurs:

10.2.1 Discrepancies between HuaXia RGB Display's QA standards and customer's QA standards.

10.2.2 Additional requirement to be added in product specification.

10.2.3 Any other special problem.

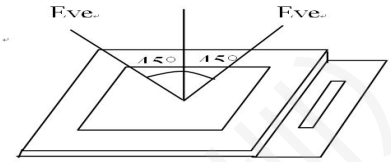
10.3 Standard of the Product Visual Inspection 产品外观检验标准

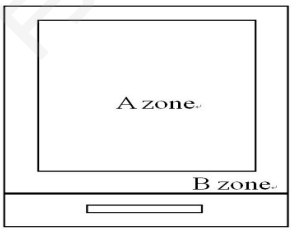
10.3.1 Appearance inspection:

10.3.1.1 The inspection must be under illumination about 1000 – 1500 lx, and the distance of view must be at 30cm ± 2cm.

10.3.1.2 The viewing angle should be 45° from the vertical line without reflection light or follows customer's viewing angle specifications.

10.3.1.3 Definition of area: A Zone: Active Area, B Zone: Viewing Area.





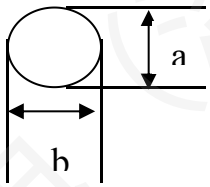
10.3.2 Basic principle:A set of sample to indicate the limit of acceptable quality level must be discussed by both HuaXia RGB Display and customer when there is any dispute happened.

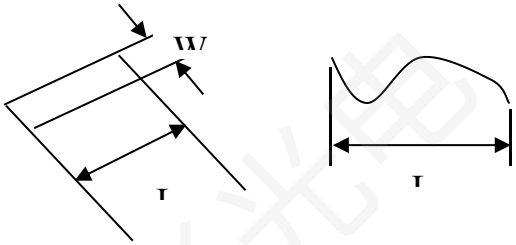
10.4 Inspection Specification 检验标准

Sampling plan according to GB/T2828.1-2012/ISO 2859-1：1999 and ANSI/ASQC Z1.4-1993,normal level 2 and based on:

Major defect: AQL 0.4

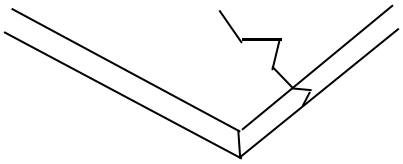
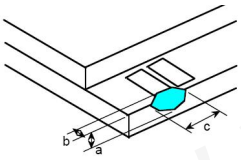
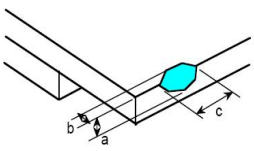
Minor defect: AQL 1.0

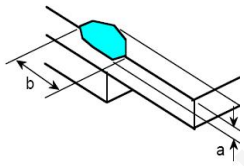
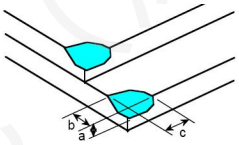
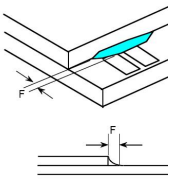
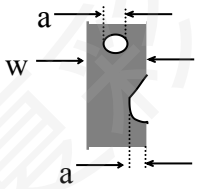
<table>
<tr><th>No.</th><th>Item 项目</th><th>Criteria (Unit: mm) 标准</th></tr>
<tr><td>01</td><td>Black / White spot
Foreign material
(Round type)
Pinholes Stain
Particles inside cell.
(Minor defect) 黑/白斑/异物
(圆类型)细胞内的针孔染色颗粒。(小瑕疵)</td><td> 

<table>
<tr><th>Size \ Area</th><th>Acc. Qty</th></tr>
<tr><td>φ≤0.10</td><td>Ignore</td></tr>
<tr><td>0.10<φ≤0.2</td><td>2</td></tr>
<tr><td>0.2<φ</td><td>0</td></tr>
<tr><td>Total</td><td>N≦3
NO include
φ≤ 0.10</td></tr>
</table>
φ= (a + b) /2
Distance between 2 defects should more than10mm apart.</td></tr>
<tr><td>02</td><td>Black and White line
Scratch
Foreign material
(Line type)
(Minor defect) 黑白线刮伤异物(类型)行(小瑕疵)</td><td> 

<table>
<tr><th>Length</th><th>Width</th><th>Acc. Qty</th></tr>
<tr><td>/</td><td>W ≦ 0.03</td><td>Ignore</td></tr>
<tr><td>L ≦ 3</td><td>0.05 ＜ W ≦ 0.08</td><td>2</td></tr>
<tr><td>/</td><td>0.08 ＜ W</td><td>0</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>No.</th><th>Item 项目</th><th>Criteria (Unit: mm) 标准</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Total</td><td>N≦2</td></tr>
</table>

Distance between 2 defects should more than 10mm apart.
Scratches not viewable through the back of the display are acceptable.
</td></tr>
<tr><td>03</td><td>Glass Crack
(Minor defect) 玻璃裂纹(小瑕疵)</td><td> 
LCD with extensible crack line is unacceptable(When press the cracked LCD area, the line will expand, we define it is extensible crack line)</td></tr>
<tr><td>04</td><td>Glass Chipping Pad Area: (Minor defect) 玻璃碎片面积:(轻微缺陷)
  </td><td>
<table>
<tr><td>Length and Width</td><td>Acc. Qty</td></tr>
<tr><td>c ＜ 5.0, b< 0.4</td><td>Ignore</td></tr>
</table>
</td></tr>
<tr><td>05</td><td>Glass Chipping Rear of PadArea:(Minordefect) 玻璃切屑垫区后方:(小瑕疵)
  </td><td>
<table>
<tr><td>Length and Width</td><td>Acc. Qty</td></tr>
<tr><td>c > 3.0, b< 1.0</td><td>1</td></tr>
<tr><td>c< 3.0, b< 1.0</td><td>2</td></tr>
<tr><td>c< 3.0, b< 0.5</td><td>4</td></tr>
<tr><td colspan="2">a<Glass Thickness</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Item 项目</th><th>Criteria (Unit: mm) 标准</th></tr>
<tr><td>06</td><td>Glass Chipping Except Pad Area: (Minor defect) 除垫区外的玻璃切屑:(小瑕疵)
  </td><td><table><tr><td>Length and Width</td><td>Acc. Qty</td></tr><tr><td>c ≤0.6, b< 5.0</td><td>Ignore</td></tr><tr><td colspan="2">aGlass Thickness</td></tr></table></td></tr>
<tr><td>07</td><td>Glass Corner Chipping: (Minor defect) 玻璃切角:(小瑕疵)
  </td><td><table><tr><td>Length and Width</td><td>Acc. Qty</td></tr><tr><td>c < 2.0, b< 1.5</td><td>Ignore</td></tr><tr><td>c < 1.5, b< 2</td><td>Ignore</td></tr><tr><td colspan="2">a<Glass Thickness</td></tr></table></td></tr>
<tr><td>08</td><td>Glass Burr: (Minor defect) 玻璃磨:(小瑕疵)
  </td><td>Glass burr don’t affect assemble and module dimension.
<table><tr><td>Length</td><td>Acc. Qty</td></tr><tr><td>F < 0.5</td><td>Ignore</td></tr></table></td></tr>
<tr><td>09</td><td>FPC Defect: (Minor defect) FPC 缺陷:(小瑕疵)
  </td><td>9.1 Dent, pinhole width a<w/3.
(w: circuitry width.)
9.2 Open circuit is unacceptable.
9.3 No oxidation, contamination and distortion.</td></tr>
<tr><td>10</td><td>Screen deformation 屏幕上的变形
  </td><td>Test for insertion of plug gauge at highest warping point：
(3.1-6.0inches)
H≦0.3MM
The client has special requirements,according to drawing</td></tr>
</table>

<table>
<tr><th>No.</th><th>Item 项目</th><th>Criteria (Unit: mm) 标准</th></tr>
<tr><td>11</td><td>Bubble on Polarizer (Minor defect) 偏光片上的气泡(小瑕疵)</td><td><table><tr><td>Diameter</td><td>Acc. Qty</td></tr><tr><td>φ≤0.15</td><td>Ignore</td></tr><tr><td>0.15 <φ≤0.25</td><td>2</td></tr><tr><td>0.25 <φ≤0.3</td><td>1</td></tr><tr><td>0.3 < φ</td><td>0</td></tr></table></td></tr>
<tr><td>12</td><td>Dent on Polarizer (Minor defect) 偏光片上的凹痕(小瑕疵)</td><td><table><tr><td>Diameter</td><td>Acc. Qty</td></tr><tr><td>φ≤0.15</td><td>Ignore</td></tr><tr><td>0.15 <φ≤0.25</td><td>2</td></tr><tr><td>0.2 5<φ≤0.30</td><td>1</td></tr><tr><td>0.3< φ</td><td>0</td></tr></table></td></tr>
<tr><td>13</td><td>Bezel 边框</td><td>13.1 No rust, distortion on the Bezel.</td></tr>
<tr><td>14</td><td>Touch Panel 触控面板</td><td>D: Diameter W: width L: length
14.1 Spot: D≤0.20 is acceptable
0.20<D≤0.3, acceptable QTY, 3
D>0.3 is unacceptable
14.2 Dent（dot):
D≤0.20 is acceptable
0.20<D≤0.3, acceptable QTY, 3
D>0.30 is unacceptable
2dots are acceptable and the distance between defects should more than 10 mm.
Dent（line） According to the limit sample
14.3 Scratch: W≤0.03, L≤10 is acceptable,
0.03<W≤0.10, L≤10 ,acceptable QTY, 3
W>0.10 is unacceptable.
Distance between 2 defects should more than 10 mm.</td></tr>
<tr><td>15</td><td>PCB</td><td>15.1 No distortion or contamination on PCB terminals.
15.2 All components on PCB must same as documented on the BOM/component layout.
15.3 Follow IPC-A-600F.</td></tr>
<tr><td>16</td><td>Soldering 焊接</td><td>Follow IPC-A-610C standard</td></tr>
</table>

No.	Item 项目	Criteria (Unit: mm) 标准
17	Electrical Defect (Major defect) 电气缺陷(主要缺陷)	The below defects must be rejected. 17.1 Missing vertical / horizontal segment, 17.2 Abnormal Display. 17.3 No function or no display. 17.4 Current exceeds product specifications. 17.5 LCD viewing angle defect. 17.6 No Backlight. 17.7 Dark Backlight. 17.8 Touch Panel no function. 17.9 Dark Dot –one Allowed. 17.10 Bright Dot – one Allowed. Remark: 1. A pixel defect is acceptable if one color is none functional and causes a bright dot. The display may have one case where one color is out and cause a dark dot. 2. Bright dot caused by scratch and foreign object accords to item1.
18	Light leak 漏光	Yellow light OK; White light,According to the limit sample

Remark: Visual and cosmetic defects are rejectable only if these fall within the LCD viewing area.

10.5 Classification of Defects 缺陷的分类

Visual defects (Except no / wrong label) are treated as minor defect and electrical defect is major.

10.6 Identification/marking criteria 识别/评分标准

Any unit with illegible / wrong /double or no marking/ label shall be rejected.

10.7 Packing 包装

10.7.1 There should be no damage of the outside carton box, each packaging box should has label in the correct location per packing drawing requirement.

10.7.2 All direct package materials shall offer ESD protection.

11 Reliability Specification 可靠性规范

Item 项目	Condition 条件	Cycle Time 周期时间	Quantity 数量	Remark 备注
Constant Temp. and Constant Humidity Operation Test 恒温恒湿运行试验	+40 ± 3ºC,90 ± 3%RH	96hrs	--	*1
High Temp. Operation Test 高温操作试验	+70 ± 3ºC	96hrs	--	
Low Temp. Operation Test 低温操作试验	-20 ± 3ºC	96hrs	--	
Thermal Shock Test 热冲击试验	-20 ± 3ºC (30min)	10cycles	--	

	+70 ± 3℃ (30min)			
ESD Test(end product) ESD 测试(最终产品)	150pF, 330Ω, ±2KV,Contact 150pF, 330Ω, ±6KV, Air	10times	--	*2, *3
Vibration Test(for packaging) 振动测试(包装)	Frequency: 10Hz to 55Hz to10Hz,Swing:1.5mm,time：X,Y,Z each 2H.	6hrs	One inner carton	*4

Note 1. For humidity test, DI water should be used.

Inspection Standard: Inspect after 1-2hrs storage at room temperature, the sample shall be free from the following defects:

- Air bubble in the LCD
- Seal Leakage
- Non-display
- Missing Segment
- Glass Crack
- IDD is greater than twice initial value.
- Others as per QA Inspection Criteria

Note 2. No 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 3. ESD should be applied to LCD glass panel, not other areas (such as on IC and so on) IDD should be within twice initial value.

In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judged as a good part.

Note 4. Only upon request.

12 Precautions and Warranty 注意事项和保证

12.1 Safety 安全

12.1.1 The liquid crystal in the LCD is poisonous. Do not put it in your mouth. If the liquid crystal touches your skin or clothes, wash it off immediately using soap and water.

12.1.2 Since the liquid crystal cells are made of glass, do not apply strong impact on them. Handle with care.

12.2 Handling 处理

12.2.1 Reverse and use within ratings in order to keep performance and prevent damage.

12.2.2 Do not wipe the polarizer with dry cloth, as it might cause scratch. If the surface of the LCD needs to be cleaned, wipe it swiftly with cotton or other soft cloth soaked with petroleum IPA, do not use other chemicals.

12.3 Operation 操作

12.3.1 Do not drive LCD with DC voltage

12.3.2 Response time will increase below lower temperature

12.3.3 Display may change color with different temperature

12.3.4 Mechanical disturbance during operation, such as pressing on the display area, may

cause the segments to appear “fractured”.

12.4 Static Electricity 静电

12.4.1 CMOS LSIs are equipped in this unit, so care must be taken to avoid the electro-static charge, by ground human body, etc.

12.4.2 The normal static prevention measures should be observed for work clothes and benches.

12.4.3 The module should be kept into anti-static bags or other containers resistant to static for storage.

12.5 Limited Warranty 有限质量保证

12.5.1 Unless otherwise agreed between HuaXia RGB Display and customer, HuaXia RGB Display will replace or repair any of its LCD and LCM which HuaXia RGB Display found to be defective electrically and visually when inspected in accordance with HuaXia RGB Display Quality Standards, for a period of one year from date of shipment.

12.5.2 The warranty liability of HuaXia RGB Display is limited to repair and/or replacement. HuaXia RGB Display will not be responsible for any consequential loss.

12.5.3 If possible, we suggest you use up all modules in six months. If the module storage time over twelve months, we suggest that recheck it before the module be used.

13 Packaging 包装

TBD

14 Prior Consult Matter 免责声明

1. For HuaXia RGB standard products, we keep the right to change material, process for improving the product property without prior notice to our customer.

2. For OEM products, if any changes are needed which may affect the product property, we will consult with our customer in advance.

3. If you have special requirement about reliability condition, please let us know before you start the test on our samples.

Reference 参考

Item 项目	Description 描述	Revision 修订
ST7789	IC Data sheet	V0
Panel 1.83 寸 240X280	LCM assembly drawing	V0