Add: 2nd Floor, Building C, Jia Huang Yuan Technical Park, Tiegang, Xixiang, Bao'an District, Shenzhen city, Guangdong province, P.R.China 518126.
E-mail: Helen@kingtechgroup.cn TEL: 86-755- 23037763 Mobile: +86-139-2528-0716 Web: www.kingtechgroup.cn

``PRODUCT		
产品名称	**：**	AMOLED MODULE
MODEL NO.		
模块型号	**：**	PV017802T45C
SUPPLIER		
供应商	**：**	Kingtech Group Co.,Ltd.
DATE 日期	**：**	2021-06-17

SPECIFICATION
产品说明书

Revision: 1.0
版本：1.0

PV017802T45C
This module uses ROHS material
模块用环保材料

Quality Assurance Department:_____ 质量保证部门 Approved by: _____ 核准 Technical Department:_____ 技术部门	Approved by: _____ 核准:

Add: 2nd Floor, Building C, Jia Huang Yuan Technical Park, Tiegang, Xixiang, Bao'an District, Shenzhen city, Guangdong province, P.R.China 518126.
E-mail: Helen@kingtechgroup.cn TEL: 86-755- 23037763 Mobile: +86-139-2528-0716 Web: www.kingtechgroup.cn

REVISION RECORD
修改记录

REV NO. 版本号	REV DATE 修改日期	CONTENTS 内容	REMARKS 注释
1.0	2021-06-17	First release	Primary

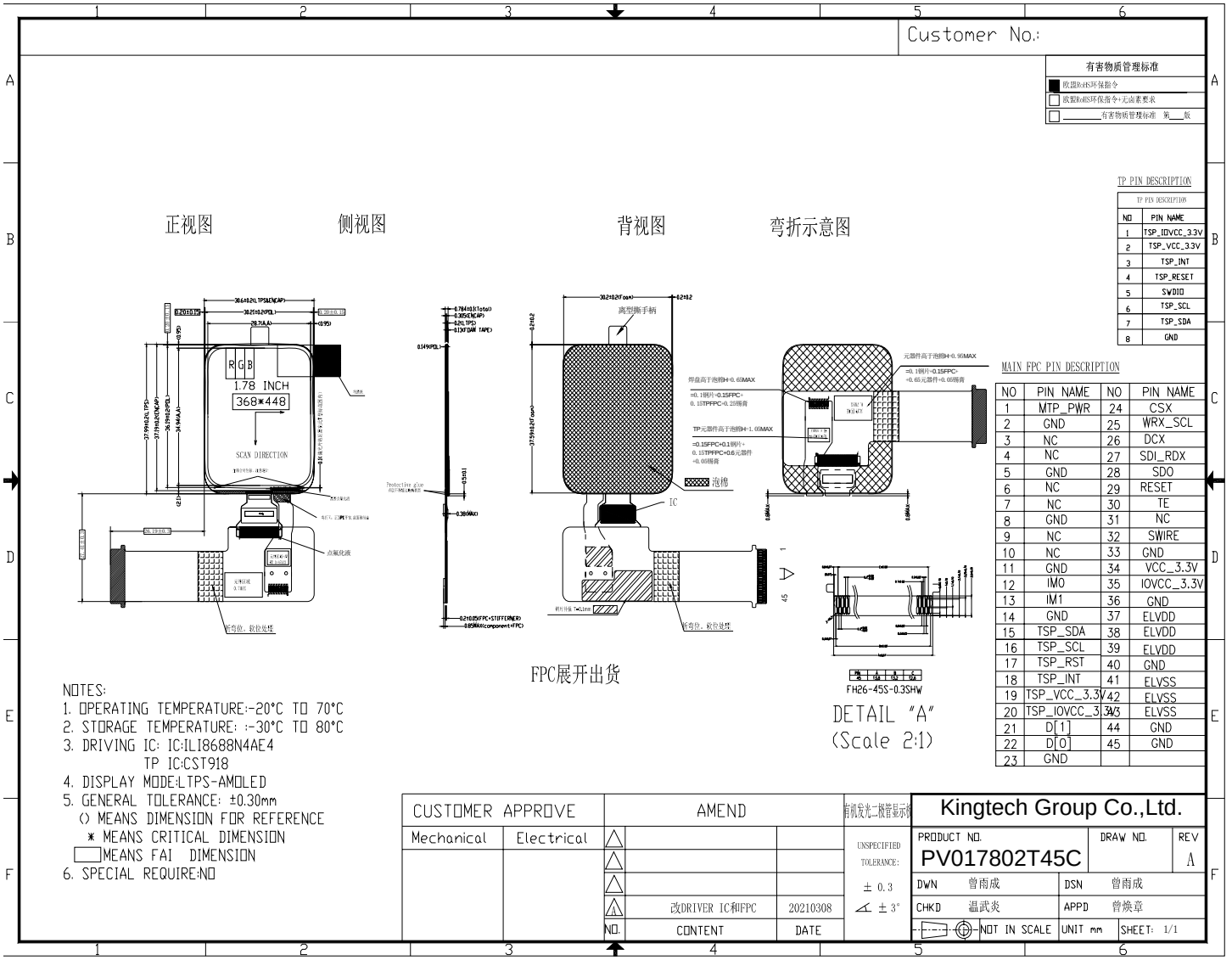
CONTENTS 内容

WRITTEN BY 制作	CHECKED BY 检查	APPROVED BY 核准
XUKAIXUAN	DAI ZHENMING	DAI ZHENMING

■ GENERAL INFORMATION
主要特征描述

Item	Contents	Unit
Display Mode	AMOLED	/
LTPS Glass Outline (W×H)	30.60×37.99	mm
Module Outline	30.60×37.19	mm
Active area	34.90×28.7	mm
Number of Dots	368(RGB)×448	/
Diagonal Inch	1.78	inch
Pixel pitch (W×H)	0.078×0.078	mm
Module Thickness	0.784	mm

■ EXTERNAL DIMENSIONS
外形尺寸



■ ABSOLUTE MAXIMUM RATINGS
极限参数

Parameter	Symbol	Min	Max	Unit
Supply voltage (Display)	VCC	-0.3	5.5	V
	IOVCC	-0.3	5.5	V
	ELVDD	0.0	6.5	V
	ELVSS	-6.5	0.0	V
Supply voltage (TP)	TSP_VCC	-0.5	6	V
	TSP_IOVCC	-0.5	6	V
Operating temperature	TOP	-20	70	℃
Storage temperature	TST	-30	80	℃
Humidity	RH	-	90	%RH

Note: Absolute maximum ratings means the product can withstand short-term, NOT more than 120 hours. If the product is a long time to withstand these conditions, the life time would be shorter.

■ ELECTRICAL CHARACTERISTICS
模块电气特性

DC CHARACTERISTICS
直流特性

Parameter		Symbol	Condition	Min	Typ	Max	Unit
Supply voltage (Display)		VCC		3.2	3.3	3.4	V
		IOVCC		3.2	3.3	3.4	V
		ELVDD		4.55	4.6	4.65	V
		ELVSS		-2.25	-2.2	-2.15	V
Supply voltage (TP)		TSP_VCC		3.2	3.3	3.4	V
		TSP_IOVCC		3.2	3.3	3.4	V
Input voltage	'L' level	VIL	IOVCC=1.65V~3.3V	GND	-	0.2*IOVCC	V
	'H' level	VIH		0.8*IOVCC	-	IOVCC	V
Output voltage	'L' level	VOL	I(OH)=-1 mA I(OL)=+1 mA	GND	-	0.2*IOVCC	V
	'H' level	VOH		0.8*IOVCC	-	IOVCC	V
Current (Display)	Sleep out mode	IVCC	Full white display	-	1	2	mA
		IIOVCC			1.2	2.4	mA
		Ielvdd		-	30.1	46	mA
		Ielvss			30.1	46	mA
	Sleep in mode	IVCC			0.59	1.2	uA
		IIOVCC			74	150	uA
	Deep Standby Mode	IVAVDD		-	-	1	uA
		IIOVCC		-	-	1	uA
Frame Frequency		fFRM		-	30	-	Hz

■ ELECTRO-OPTICAL CHARACTERISTICS
光电参数

Item	Symbol	Condition	Min	Type	Max	Unit	Note
Surface Luminance	Lv	θ=0° ∅=0° Ta=25℃	500	550	-	cd/m2	Note1
Luminance uniformity	δ WHITE		80	-	-	%	Note2
Contrast Ratio	Cr		60000	-	-	-	Note3
Viewing Angle	θ	Up/Down/Right/Left Cr≥200	70	80	-	deg	Note4
Color Coordinate of CIE1931	Red x	θ=0° ∅=0° Ta=25℃.	0.6431	0.6831	0.7231	-	Note 5
	Red y		0.2765	0.3165	0.3565	-	
	Green x		0.1825	0.2225	0.2825	-	
	Green y		0.6928	0.7328	0.7728	-	
	Blue x		0.1071	0.1371	0.1671	-	
	Blue y		0.0244	0.0544	0.0844	-	
	White x		0.28	0.30	0.32	-	
	White y		0.29	0.31	0.33	-	
NTSC ratio	-	-	90	100	-	%	CIE1931
Gamma	-	θ=0° ∅=0° Ta=25℃ V(Gray)=44,68,100, 132,164,196,228,252 ,255	2.0	2.2	2.4	-	
Lifetime	T95	25℃	240			h	

Note1. Surface Luminance

- Measurement equipment: CS2000 or similar equipment.
- Measuring surroundings: Dark room.
- Measuring temperature: Ta=25℃.
- The data are measured after OLEDs are lighted on for more than 5 minutes and all pixels are fully white.
- The Surface Luminance is the average value of 5 measured spots (Fig-1):
  Lv = Average Luminance with all white pixels (P1, P2, P3, P4, P5)

Note2. Luminance Uniformity

- Measurement equipment: CS2000 or similar equipment.
- Measuring surroundings: Dark room.
- Measuring temperature: Ta=25℃.
- The data are measured after OLEDs are lighted on for more than 5 minutes and all pixels are fully white.
- The Luminance Uniformity is calculated by using following formula:
  δ WHITE = Lp (Min.) / Lp (Max.)×100 (%)

  Lp (Min.) = Minimum Luminance with all white pixels (P1, P2, P3, P4, P5)
  Lp (Max.) = Maximum Luminance with all white pixels (P1, P2, P3, P4, P5)

Note3. Contrast Ratio

• Measurement equipment: CS2000 or similar equipment.
• Measuring surroundings: Dark room.
• Measuring temperature: Ta=25℃.
• The data are measured after OLEDs are lighted on for more than 5 minutes.
• The Contrast Ratio is calculated by using following formula:

Contrast Ratio(Cr) = Lw / Lb

Lw = Average Luminance with all white pixels (P1, P2, P3, P4, P5)

Lb = Average Luminance with all black pixels (P1, P2, P3, P4, P5)

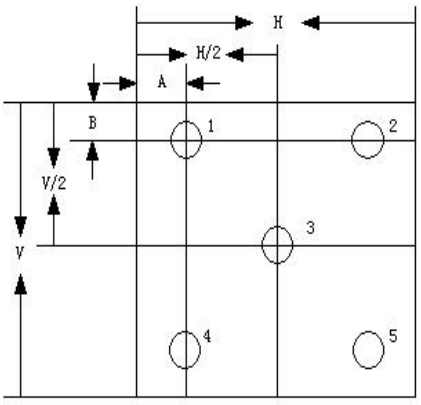


Fig-1

Note4. Viewing Angle

• Measurement equipment: DMS803 or similar equipment.
• Measuring surroundings: Dark room.
• Measuring temperature: Ta=25℃.
• The Viewing Angle is the angle at which the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the display surface.

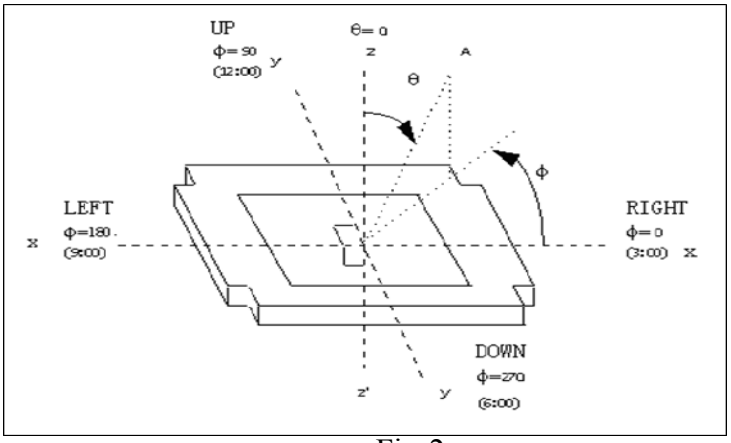


Fig-2

Note5. Color Coordinate of CIE1931

• Measurement equipment: CS2000 or similar equipment.
• Measuring surroundings: Dark room.
• Measuring temperature: Ta=25℃.
• The x, y value of Color Coordinate is determined by measuring at center position of the display panel.

■ INTERFACE DESCRIPTION

接口定义描述

Interface NO.	Symbol	I/O or Connected to	Description	When not in use
1	MTP_PWR	Power	MTP programming power supply pin.	Left open or connected to GND
2	GND	Connected to GND	Ground.	/
3	NC	-	-	/
4	NC	-	-	/
5	GND	Connected to GND	Ground.	/
6	NC	-	-	/
7	NC	-	-	/
8	GND	Connected to GND	Ground.	
9	NC	-	-	/
10	NC	-	-	/
11	GND	Connected to GND	Ground.	
12	IM0	I	Interface type selection pin.	/
13	IM1			
14	GND	Connected to GND	Ground.	/
15	TSP_SDA	I/O	Touch I2C data	/
16	TSP_SCL	I	Touch I2C clock	
17	TSP_RESET	I	TSP Reset signal. Active low.	/
18	TSP_INT	I	Touch State change interrupt	
19	TSP_VCC	Power	TP Power Supply	/
20	TSP_IOVCC	Power	TP Power Supply	
21	D[1]	I/O	4-bit data bus for Q-SPI .	OPEN
22	D[0]			
23	GND	Connected to GND	Ground.	/
24	CSX	I	Chip select input pin (“Low” enable) in SPI I/F.	Connecte To IOVCC
25	WRX_SCL	I	SCL: A synchronous clock signal in SPI I/F.	Connecte TO GND
26	DCX	I	Display data / command selection in 4-wire SPII/F. DCX = ”0” : Command DCX = ”1” : Display data or Parameter	Connecte TO GND
27	SDI_RDX	I/O	SDI: Serial inputs signal in SPI I/F. The data is input on the rising edge of the SCL signal.	OPEN

28	SDO	O	Serial outputs signal in SPI I/F. The data is output on the rising/falling edge of the SCL signal. If the host places the SDI line into high-impedance state during the read interval, the SDI and SDO can be tied together.	OPEN
29	RESET	I	This signal will reset the device and must be applied to properly initialize the chip. Signal is active low.	/
30	TE	O	Tearing effect output pin to synchronize MCU to frame writing, activated by S/W command. When this pin is not activated, this pin is output low. If not used, please open this pin.	OPEN
31	NC	-	-	/
32	SWIRE	O	Swire protocol setting pin (Note: "H" = VDDI level, "L" = VSSI level.)	/
33	GND	Connected to GND	Ground.	/
34	VCC	Power	Input Voltage for analog power supply	/
35	IOVCC	Power	Input voltage for logic/interface power supply	/
36	GND	Connected to GND	Ground.	/
37	ELVDD	Power	Power supply for pixel circuit.	/
38	ELVDD			/
39	ELVDD			/
40	GND	Connected to GND	Ground.	/
41	ELVSS	Power	Power supply for pixel circuit.	/
42	ELVSS			/
43	ELVSS			/
44	GND	Connected to GND	Ground.	/
45	GND	Connected to GND	Ground.	/

■ REFERENCE APPLICATION CIRCUIT
参考应用电路

Please consult our technical department for detail information.
详细信息请联系我们的技术部

■ RELIABILITY TEST CONDITIONS
可靠性试验条件

No.	Test Item	Test Condition	Qty	Inspection after test
1	High Temperature Storage	80℃±2℃/240 hours	5	Inspection after 2 hours storage at room temperature, the sample shall be free from defects: 1. Remarkable deterioration of No clearly visible defects or display quality. However, any polarizer's deteriorations by the high temperature/ High humidity Storage test and the High temperature/ High humidity Operation test are permitted. 2. No function-related abnormalities. 3. Optical criteria : .White △u'v' ≤0.02 4. No visible defects .(optical / mechanical) . 5. No function-related abnormalities
2	Low Temperature Storage	-30℃±2℃/240 hours	5	
3	High Temperature Operating	70℃±2℃/120 hours	5	
4	Low Temperature Operating	-20℃±2℃/120 hours	5	
5	Temperature Cycle storage	-30℃±2℃~80℃±2℃×100cycles (30min.) (5min.) (30min.)	5	
6	ESD test	Voltage:±4KV R: 330Ω C: 150pF Air discharge, 10time	5	
7	Vibration Test	Frequency：10Hz~55Hz~10Hz Amplitude：1.5mm, X，Y，Z direction for total 3hours (Packing condition)	5	
8	Dropping test	Drop to the ground from 1m height, one time,every side of carton. (Packing condition)	5	

Remark:
1.The test samples should be applied to only one test item.
2.For Damp Proof Test, Pure water(Resistance＞10MΩ) should be used.
3.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.
4.Failure Judgment Criterion: Basic Specification, Electrical Characteristic, Mechanical Characteristic, Optical Characteristic.

■ INSPECTION CRITERION
检查标准

1.0 抽样计划

按照抽样方案 GB/T2828.1-2003/ISO 2859-1：1999 和 ANSI/ASQC Z1.4-1993 Level Ⅱ划分样品可以接受或拒绝的等级如下:

重缺陷：AQL 0.65

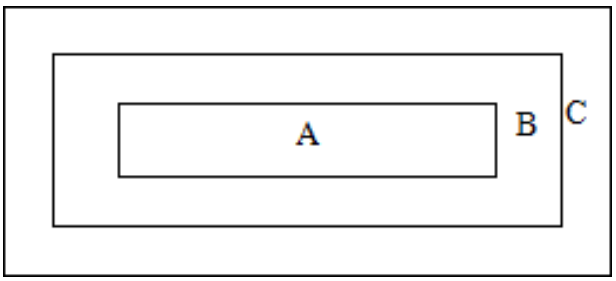
轻缺陷：AQL 1.5

2.0 检查条件

检查样品时，外观检查的观察距离距检查者眼睛 30cm ，在 20～40W 日光灯的光照环境下（外观检查亮度 1000±200 LUX;功能检查亮度 100-300 LUX; ），保持检查样品应在垂直方向 45 度以内. （正常温度和湿度分别为 20~25℃，60±15%RH ）

3.0 检查区域定义：

屏幕显示区域定义：



区域 A: 符号或数字显示区域

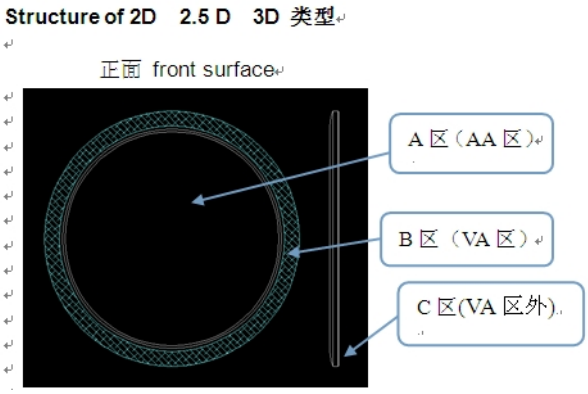
区域 B: 视区（除 A 区）（A 区+B 区=最小视区，相对于模块确认的 VA 区范围）

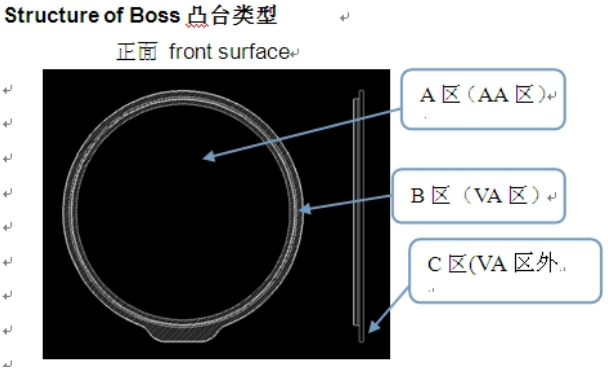
区域 C: 视区外围（模块确认图的 VA 区外，客户机装机后看不到此区域）

如上图：LCD 的检查区域定义

注意：在区域 C 中看得见的缺陷，但不影响产品质量以及客户组装，允许出货。

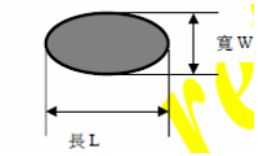
4.0 贴合模组区域定义



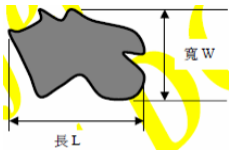


5.0 点线缺陷定义

5.0.1 点状缺陷：



直径Φ=1/2(L+W)



直径Φ=1/2(L+W)

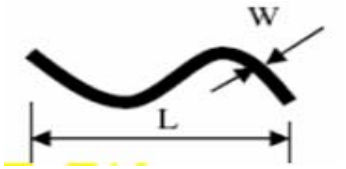
5.0.2 亮点：一个像素由 3 个 DOT 点（R,G,B）构成，任一 DOT 点面积的 1/2 称之为 1/2DOT；在黑色界面下，有红或绿或蓝任意一个像素被点亮，统称为 DOT 亮点，面积超过 1/2DOT 点即为不良（小于 1/2 的 DOT 点不计入亮点数）

5.0.3 暗点：在白色画面下，有红或绿或蓝任意一个像素未点亮，统称为 DOT 暗点，面积超过 1/2DOT 点即为不良（小于 1/2 的 DOT 点不计入暗点数）

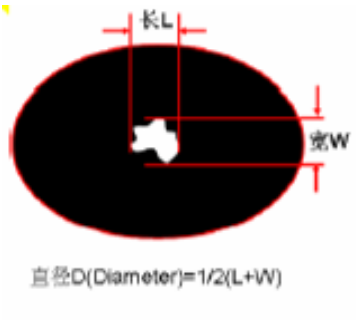
5.0.4 异物亮点：在黑色画面的由偏光片贴附或盒内异物导致发光的点；

碎亮点：在黑色画面的由偏光片贴附或盒内异物导致发光的点；直径＜0.1mm

5.0.5 线状缺陷：



5.0.6 针孔（透光）/锯齿



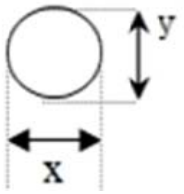
6.0 检查标准

6.0.1 重缺陷

项目	检查项目	检查标准	缺陷分类
重缺陷	功能缺陷	1）不显示 2）显示异常 3）缺划 4）短路 5）背光不亮，闪烁或亮度异常 6）串漏笔	重

		7）玻璃裂缝 以上缺陷不允许	
	残缺	缺少元器件（不允许）	
	外观尺寸	不允许外观尺寸超出图纸规格	

6.0.2 外观缺陷

<table>
<tr><th>项目</th><th>检查项目</th><th colspan="4">项目标准</th><th>缺陷分类</th></tr>
<tr><td rowspan="8">显示屏</td><td rowspan="5">黑/白点/污点/异物点等清晰点</td><td colspan="4">对黑白点，Φ定义如下：
$\Phi = \frac{(x+y)}{2}$  </td><td rowspan="5">轻</td></tr>
<tr><td rowspan="4"></td><td>区域
尺寸</td><td colspan="2">可接收数目</td><td></td></tr>
<tr><td>A</td><td>B</td><td>C</td></tr>
<tr><td>Φ≤0.1</td><td colspan="2">不计,不串点</td><td rowspan="3">忽略</td></tr>
<tr><td>0.1＜Φ≤0.15</td><td colspan="2">2，DS≥5mm</td></tr>
<tr><td>0.15＜Φ≤0.2</td><td colspan="2">1，DS≥5mm</td></tr>
<tr><td>碎亮点</td><td colspan="4">Φ＜0.1mm；个数不计，用 6%的 ND Filter 遮盖看不见 OK</td></tr>
<tr><td>异物亮点</td><td colspan="4">Φ≤0.1，不计，DS≥2mm；0.1＜Φ≤0.2mm，N≤2，DS≥5mm；Φ＞0.2mm，不允许</td></tr>
<tr><td>亮点</td><td colspan="4">不允许</td></tr>
<tr><td>暗点</td><td colspan="4">允许 2 个；DS≥5mm</td></tr>
</table>

<table>
<tr><th>项目</th><th>检查项目</th><th colspan="5">检查标准</th><th>缺陷分类</th></tr>
<tr><td rowspan="6">显示屏</td><td rowspan="6">线缺陷 黑线、白线、偏光片下面的异物</td><td colspan="2">尺寸(mm)</td><td colspan="3">可接收数目</td><td rowspan="6">轻</td></tr>
<tr><td rowspan="2">L(长度)</td><td rowspan="2">W(宽度)</td><td colspan="3">区域</td></tr>
<tr><td>A</td><td>B</td><td>C</td></tr>
<tr><td>不限</td><td>W≤0.03</td><td colspan="2">忽略</td><td rowspan="3">忽略</td></tr>
<tr><td>L≤10.0</td><td>0.03＜W≤0.05</td><td colspan="2">2</td></tr>
<tr><td>L≤3.0</td><td>0.05＜W≤0.06</td><td colspan="2">1</td></tr>
<tr><td>/</td><td>0.06＜W</td><td colspan="2">按点缺陷处理</td></tr>
<tr><td></td><td colspan="7"></td></tr>
</table>

<table>
<tr><td></td><td>偏光片划痕</td><td colspan="5">如果偏光片划痕在组装后或点亮运行条件下能够看见，则按照9.2线缺陷进行判定.
如果偏光片划痕在不点亮条件下或者特殊角度才能看见，则按如下标准进行判定：</td><td>轻</td></tr>
<tr><td></td><td></td><td colspan="2">尺寸(mm)</td><td colspan="3">可接收数目</td><td></td></tr>
<tr><td></td><td></td><td rowspan="2">L(长度)</td><td rowspan="2">W(宽度)</td><td colspan="3">区域</td><td></td></tr>
<tr><td></td><td></td><td>A</td><td>B</td><td>C</td><td></td></tr>
<tr><td></td><td></td><td>不限</td><td>W≤0.03</td><td colspan="2">忽略</td><td rowspan="3">忽略</td><td></td></tr>
<tr><td></td><td></td><td>L≤10.0</td><td>0.03＜W≤0.05</td><td colspan="2">2</td><td></td></tr>
<tr><td></td><td></td><td>/</td><td>0.05＜W</td><td colspan="2">0</td><td></td></tr>
<tr><td colspan="8"></td></tr>
<tr><td></td><td>偏光片气泡</td><td colspan="2" rowspan="2">区域
尺寸(mm)</td><td colspan="3">可接收数目
区域</td><td rowspan="4">轻</td></tr>
<tr><td></td><td></td><td>A</td><td>B</td><td>C</td><td></td></tr>
<tr><td></td><td></td><td colspan="2">Φ≤0.1</td><td colspan="2">忽略</td><td rowspan="3">忽略</td><td></td></tr>
<tr><td></td><td></td><td colspan="2">0.1＜Φ≤0.2</td><td colspan="2">2 DS≥5mm</td><td></td></tr>
<tr><td></td><td></td><td colspan="2">0.2＜Φ</td><td colspan="2">0</td><td></td></tr>
</table>

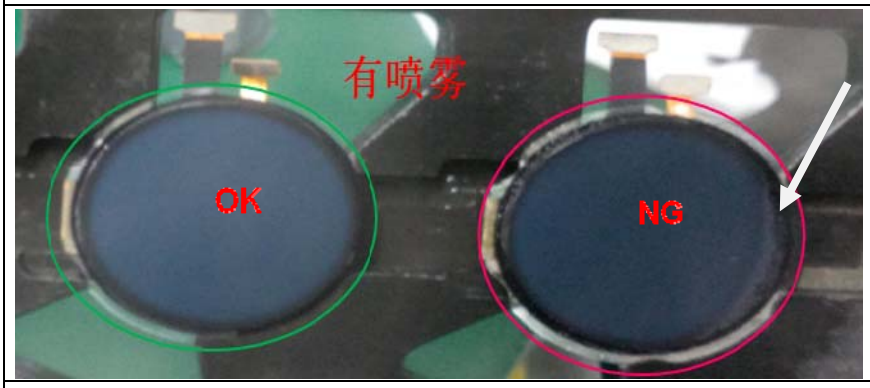
<table>
<tr><td>项目</td><td>检查项目</td><td colspan="3">检查标准</td><td>缺陷分类</td></tr>
<tr><td rowspan="11">TP
盖板</td><td rowspan="5">黑/白点/污点/异物点/锯齿/针孔</td><td colspan="2" rowspan="2">区域(zone)
尺寸(mm)</td><td>A面</td><td rowspan="5">轻</td></tr>
<tr><td>可接收</td></tr>
<tr><td colspan="2">Φ≤0.10</td><td>不计，DS≥2mm</td></tr>
<tr><td colspan="2">0.10＜Φ≤0.15</td><td>N≤2，DS≥5mm</td></tr>
<tr><td colspan="2">0.15＜Φ≤0.2</td><td>N≤1</td></tr>
<tr><td colspan="2">Φ＞0.2</td><td>N≤1</td></tr>
<tr><td colspan="5"></td></tr>
<tr><td rowspan="6">线缺陷</td><td colspan="2">尺寸(mm)</td><td>A面</td><td rowspan="6">轻</td></tr>
<tr><td>L(长度)</td><td>W(宽度)</td><td>可接收</td></tr>
<tr><td>/</td><td>W≤0.03</td><td>不计，但不能聚集</td></tr>
<tr><td>L≤10</td><td>0.03＜W≤0.05</td><td>N≤2，DS≥5mm</td></tr>
<tr><td>L≤3.0</td><td>0.05＜W≤0.06</td><td>N≤1</td></tr>
<tr><td>/</td><td>0.06＜W</td><td>定义为点缺陷</td></tr>
<tr><td colspan="5"></td></tr>
<tr><td>刮伤</td><td colspan="3">如果划痕在组装后能够看见，则按照9.2线缺陷进行判定；
如果划痕仅在特殊角度才能看见，则按如下标准进行判定</td><td>轻</td></tr>
</table>

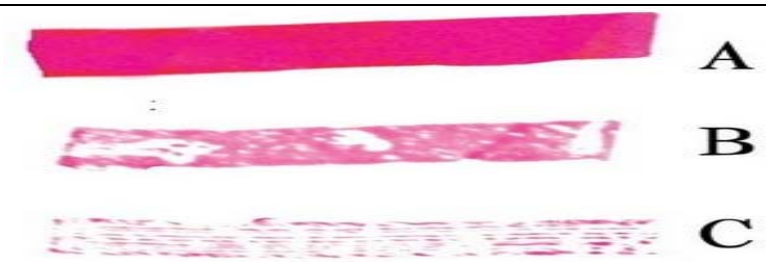
		尺寸(mm)		A 面	
		L(长度)	W(宽度)	可接收	
		/	W≤0.03	不计但不能聚集	
		5.0＜L≤10	0.03＜W≤0.05	N≤2，DS≥5mm	
		L≤5	0.05＜W≤0.06	N≤1，	
		/	W＞0.06	0	
	气泡	区域(zone) / 尺寸(mm)		A 面	轻
				可接收	
		Φ≤0.15		不计，DS≥2mm	
		0.15＜Φ≤0.25		N≤2，DS≥5mm	
		Φ＞0.25		0	

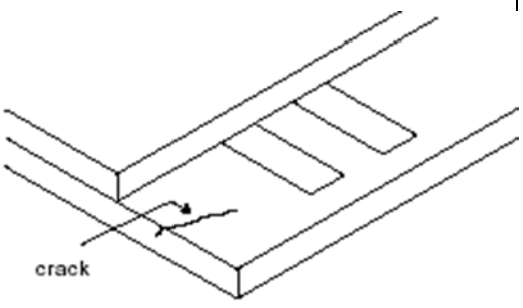
TP 盖板	凹凸点/鱼眼	区域(zone) / 尺寸(mm)	A 面	轻
			可接收	
		Φ≤0.10	不计，DS≥2mm	
		0.10＜Φ≤0.15	N≤2，DS≥5mm	
		0.15＜Φ≤0.2	N≤1	
		Φ＞0.2	不允许	
	崩角/崩边	区域(zone) / 尺寸(mm)	A 面	轻
			可接收	
		Φ≤0.10	不计	
		0.10＜Φ≤0.40	N≤2，DS≥5mm	
		Φ＞0.40	0	

6.0.3 外观缺陷

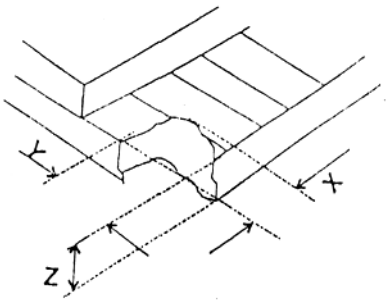
项目	检查项目	检查标准	缺陷分类
其他外观	MURA	使用 3%的 ND Filter，能够看见为 NG。	轻
	残影	在点亮 8*8 黑白棋盘格画面 2 个小时后,然后切换到 127 灰画面检查，判断标准： 15 分种消失。	
	混色	3% ND Filter 在 255 灰阶下观察不可视 OK，特殊要求参考客户签样	
	AF	1)初期水滴角 115° ±5° ，样本测试 5 点	
		2)测试行程内 3 点,摩擦后水滴角>100°	

		3)用热喷雾检查外观上无出现 Coating 脱落现象判 OK（如图 1），有脱落现象判断 NG（如图 2）  图 1 图 2	轻

项目	检查项目	检查标准	缺陷分类
其他外观	达因值	酒精擦拭后，油墨面用 32 达因笔测试（菲林面用 30 达因笔测试），施加 0.5kgf 在 2 秒内画一条 2-3cm 长的直线，画完整条线 5 秒后观察笔迹收缩情况，完全不收缩为 A，收缩达到原来面积的 80%为 B，收缩面积小于原来面积的 80%为 C；（达因笔要求：品牌为 Arcotest，保质期为半年，超过保质期之后需要更换新达因笔进行测试） 判定依据：画线 5 秒后成 A 、B 状为合格； C 状均为不合格； 	轻

项目	检查项目	检查标准	缺陷分类
显示屏	玻璃缺陷	**裂缝：裂缝不允许** 	重

角崩

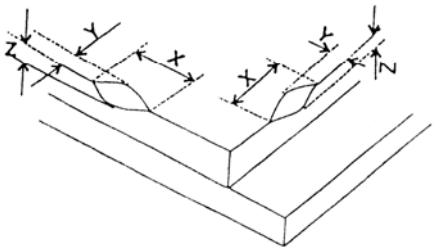


X	Y	Z	接收
≤2.0	≤2.0	不能超过玻璃的厚度	N≤2

角崩不允许延伸到 ITO 引线或者触及环氧胶，使环氧胶暴露

轻

边崩



X	Y	Z	接收
≤2	≤0.5	不能超过玻璃的厚度	N≤2

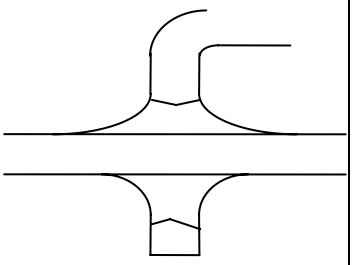
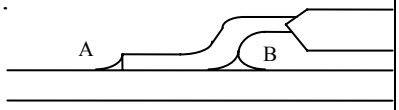
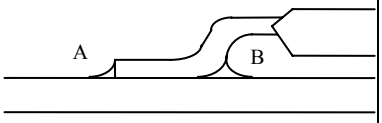
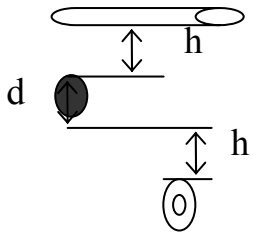
轻

项目	检查项目	检查标准	缺陷分类
A 面包括正面视窗区、印刷区和背面视窗区	LOGO 图案	点：按照点标准  粗细不均:用标准图文字宽与印刷图文字宽差值的绝对值相对于标准图文字宽的百分比来表示 $\frac{\lvert \text{标准图文字宽} - \text{丝印图文字宽} \rvert}{\text{标准图文字宽}} \times 100\% \leqslant 30\%$ 图文倾斜： 印刷图文长度≤10mm，允许倾斜角度≤3°； 10mm＜印刷图文长度≤20mm，允许倾斜角度≤1.5°  图文锯齿：H≤0.05mm	轻

		图文漏印、错误、重印、断线：不允许 图文断线：宽度≤0.10mm。 字体和图案色差、色薄： 参照限度样板	
项目	**检查项目**	**检查标准**	**缺陷分类**
A 面包括正面视窗区、印刷区和背面视窗区	透光	按照点缺陷，最大-参照透光的限度样品	轻
	溢墨	30cm 可见不允许	
	异色	明显可见的印刷区颜色差异不允许	
	Icon 背面印刷区刮伤	Icon 背面印刷图案区不允许有穿透性刮伤	
	IR hole, light sensor hole LED hole	 1. A.B.C 孔，需符合穿透率标准 2. A.B.C 孔不允许透光，A.B 孔参照限度样本 A/B，C（LED）孔不需在灯座下检查，在黑色背景下检查无明显缺陷为 OK 3. 装有光感 IC 的 IR 孔：以实际测试光感值的标准为准，光感 IC 偏位不做管控	
	脏污	1.不可擦拭的点状脏污按点状不良判定； 2.可擦拭的脏污判定为 OK； 3.保护膜的质量保证期为三个月，在质量保证期内因保护膜问题造成的脏污判定为不良。	
B 面正面台阶以外和背面印刷区	毛屑 异物 脏污/污迹 刮伤，PC 板气泡 棱边毛边等	允许正面可视区看不到的缺陷	

7.0 模块外观标准

项目	检查项目	检查标准	缺陷分类
1	与规格书不符.	不允许	重
2	图案脱落	不允许底层图案脱落或者不固定	重
3	焊接不合格	不能出现虚焊，漏焊；	重
		不能出现焊接短路；	重
		不能出现冷焊。	轻
4	PCB 板瑕疵	底板图案上有可见的铜箔（∅≤0.5mm）	轻
5	FPC 金手指	不允许出现污染、折断及氧化发黑现象	重
6	背光胶框	不能有变形、裂痕、折断，定位柱断及明显划痕	轻
7	印字唛效果	不允许字码模糊、残缺、变形造成无法确认	轻
8	各类 IC 外观	IC 边崩在不影响性能和伤及线路的情况下可以接受 允许表面脏污及划伤	
9	过多金属杂质	没有过多金属杂质（∅≤0.2mm）	轻

10	金属底板褪色	金属底板没有褪色、生锈	轻
11	焊接数量 1.引脚部件	a. PCB 焊接面在引脚周围焊接形成片状，在引脚上不能焊接太多。 b. 元件面（避免“穿过 PCB 板的孔”）焊接需接触到 PCB 元件面。. C．SMT 焊接元器件的标准参考 IPC 610D 。 	轻
	2.引脚封装	趾部 A 到根部 B 要求有润焊. 焊接后须能看出引脚. SMT 焊接元器件的标准参考 IPC 610D 	轻
	3.芯片焊接	(3/2) H ≥ h ≥ (1/2) H 	轻
	4.焊锡球/泼溅	a. 固定的焊锡球距焊盘或导线距离 h ≥0.13mm，直径 d≤0.15mm。 b. 在 600 平方毫米不允许超过 5 个焊锡球/泼溅 	轻
		c. 焊锡球/泼溅不允许违反最小电气间隙。（重缺陷）	重
		d. 焊锡球/泼溅必须被包封或附着于金属表面。 备注：固定的/附着的或类似的表达，指在通常使用环境下不会导致松动。	轻

■ PRECAUTIONS FOR USING LCM MODULES

使用注意事项

Handing Precautions

1 The display panel is made of glass and polarizer. As glass is fragile. It tends to become or chipped during handling especially on the edges. Please avoid dropping or jarring. Do not subject it to a mechanical shock by dropping it or impact.

2 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary. Do not touch the display with bare hands. This will stain the display area and degraded insulation between terminals (some cosmetics are determined to the polarizer).

3 The polarizer covering the display surface is soft and easily scratched. Handle this polarizer carefully. Do not touch, push or rub the exposed polarizers with anything harder than an HB pencil lead (glass, tweezers, etc.). Do not put or attach anything on the display area to avoid leaving marks on it. Condensation on the surface and contact with terminals due to cold will damage, stain or dirty the polarizer. After products are tested at low temperature they must be warmed up in a container before coming in to contact with room temperature air.

4 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 cloth with one of the following solvents
- Isopropyl alcohol
- Ethyl alcohol

Do not scrub hard to avoid damaging the display surface.

5 Solvents other than those above-mentioned may damage the polarizer. Especially, do not use the following.
- Water
- Ketone
- Aromatic solvents

Wipe off saliva or water drops immediately, contact with water over a long period of time may cause deformation or color fading. Avoid contact with oil and fats.

6 Exercise care to minimize corrosion of the electrode. Corrosion of the electrodes is accelerated by water droplets, moisture condensation or a current flow in a high-humidity environment.

7 Do not attempt to disassemble or process the AMOLED module.

8 NC terminal should be open. Do not connect anything.

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

10 Electro-Static Discharge Control， Since this module uses a CMOS LSI, the same careful attention should be paid to electrostatic discharge as for an ordinary CMOS IC. To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

- Before removing AMOLED from its packing case or incorporating it into a set, be sure the module and your body have the same electric potential. Be sure to ground the body when handling the AMOLED modules.

- Tools required for assembling, such as soldering irons, must be properly grounded. Make certain the AC power source for the soldering iron does not leak. When using an electric screwdriver to attach AMOLED modules, the screwdriver should be of ground potentiality to minimize as much as possible any transmission of electromagnetic waves produced sparks coming from the commutator of the motor.

- To reduce the amount of static electricity generated, do not conduct assembling and other work under dry conditions. To reduce the generation of static electricity be careful that the air in the work is not too dry. A relative humidity of 50%-60% is recommended. As far as possible make the electric potential of your work clothes and that of the work bench the ground potential.

- The AMOLED 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 Since AMOLED has been assembled and adjusted with a high degree of precision, avoid applying excessive shocks to the module or making any alterations or modifications to it.

- Do not alter, modify or change the shape of the tab on the metal frame.

- Do not make extra holes on the printed circuit board, modify its shape or change the positions of components to be attached.

- Do not damage or modify the pattern writing on the printed circuit board.

- Absolutely do not modify the zebra rubber strip (conductive rubber) or heat seal connector.

- Except for soldering the interface, do not make any alterations or modifications with a soldering iron.

- Do not drop, bend or twist the AMOLED.

Handling precaution for AMOLED

1 AMOLED is easy to be damaged. Please note below and be careful for handling.

2 Correct handling:

3 Incorrect handling:

Storage Precautions

1 When storing the AMOLED modules, the following precaution are necessary.
- 1) Store them in a sealed polyethylene bag. If properly sealed, there is no need for the desiccant.
- 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.
- 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).

2 Transportation Precautions
- 1) During shipment, please handle with care. The packaging bag can not be broken, step on trap. Packaging Carton layer height can not be over two meters.
- 2) The transportation process should pay attention to the waterproof and moisture-proof measures. Product can not be watering. Ethylene sealed bags can not be unsealed.

3 Others
- 1) To minimize the performance degradation of the AMOLED modules resulting from destruction caused by static electricity etc., exercise care to avoid holding the following sections when handling the modules.
  - a) - Exposed area of the printed circuit board.
  - b) -Terminal electrode sections.

USING AMOLED MODULES

1 Installing AMOLED Modules

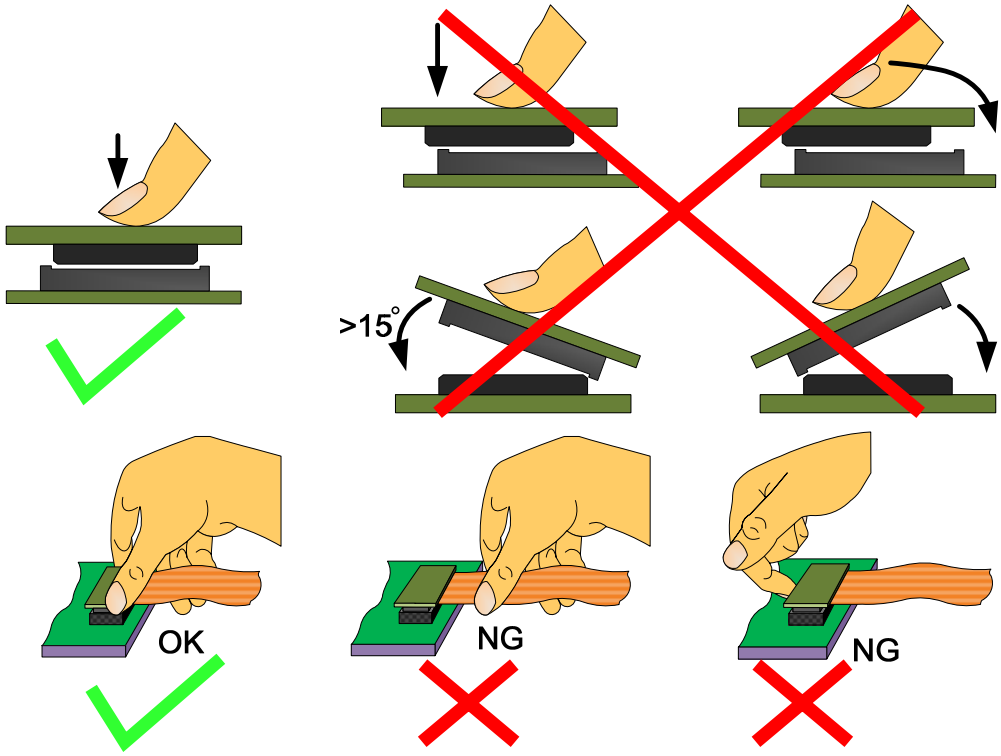
The hole in the printed circuit board is used to fix AMOLED as shown in the picture below. Attend to the following items when installing the AMOLED.

1) Cover the surface with a transparent protective plate to protect the polarizer.

2) When assembling the AMOLED into other equipment, the spacer to the bit between the AMOLED and the fitting plate should have enough height to avoid causing stress to the module surface, refer to the individual specifications for measurements. The measurement tolerance should be ±0.1mm.

2 Precaution for assemble the module with BTB connector:

Please note the position of the male and female connector position, don't assemble or assemble like the method which the following picture shows



3 Precaution for soldering the AMOLED

	Manual soldering	Machine drag soldering	Machine press soldering
No RoHS Product	290°C ~350°C. Time : 3-5S.	330°C ~350°C. Speed : 4-8 mm/s.	300°C ~330°C. Time : 3-6S. Press: 0.8~1.2Mpa
RoHS Product	340°C ~370°C. Time : 3-5S.	350°C ~370°C. Time : 4-8 mm/s.	330°C ~360°C. Time : 3-6S. Press: 0.8~1.2Mpa

1) If soldering flux is used, be sure to remove any remaining flux after finishing to soldering operation (This does not apply in the case of a non-halogen type of flux). It is recommended that you protect the AMOLED surface with a cover during soldering to prevent any damage due to flux spatters.

2) When soldering the PC board, the board should not be detached more than three times. This maximum number is determined by the temperature and time conditions mentioned above, though there may be some variance depending on the temperature of the soldering iron.

4 Precautions for Operation

1) If the display area is pushed hard during operation, the display will become abnormal. However, it will return to normal if it is turned off and then back on.

2) A slight dew depositing on terminals is a cause for electro-chemicalreaction resulting in terminal open circuit.Usage under the maximum operating temperature,50%RH or less is required.

3) Input logic voltage before apply analog high voltage such as AMOLED driving voltage when power on. Removeanalog high voltage before logic voltage when power off the module. Input each signal after the positive/negative voltage becomes stable.
4) Please keep the temperature within the specified range for use and storage. Polarization degradation, bubble generation or polarizer peel-off may occur with high temperature and high humidity.

5 Safety

1) It is recommended to crush damaged or unnecessary AMOLEDs into pieces and wash them off with solvents such as acetone and ethanol, which should later be burned.

6 Limited Warranty

Unless agreed between Kingtech and the customer, Kingtech will replace or repair any of its AMOLED modules which are found to be functionally defective when inspected in accordance with Kingtech AMOLED acceptance standards (copies available upon request) for a period of one year from date of production. Cosmetic/visual defects must be returned to Kingtech within 90 days of shipment. Confirmation of such date shall be based on data code on product. The warranty liability of Kingtech limited to repair and/or replace on the terms set forth above. Kingtech will not be responsible for any subsequent or consequential events.

7 Return AMOLED under warranty

1) No warranty can be granted if the precautions stated above have been disregarded. The typical examples of violations are :
   a) - Broken AMOLED glass.
   b) - PCB eyelet is damaged or modified.
   c) -PCB conductors damaged.
   d) - Circuit modified in any way, including addition of components.
   e) - PCB tampered with by grinding, engraving or painting varnish.
   f) - Soldering to or modifying the bezel in any manner.
2) Module repairs will be invoiced to the customer upon mutual agreement. Modules must be returned with sufficient description of the failures or defects. Any connectors or cable installed by the customer must be removed completely without damaging the PCB eyelet, conductors and terminals.

■ PACKING SPECIFICATION
包装规格书

Please consult our technical department for detail information.
详细信息请联系我们的技术部

■ PRIOR CONSULT MATTER
提前商议事项

1 For Kingtech standard products, we keep the right to change material, process ... for improving the product property without prior notice to our customer.
对于Kingtech的标准产品，我们保留在不通知客户的情况下，为提高产品性能而改变原材料及加工方法等的权利。

2 For OEM products, if any changes are needed which may affect the product property, we will consult with our customer in advance.
对于 OEM 产品，如果需要做任何会影响到产品性能的改变，我们会提前和客户商议。

3 If you have special requirement about reliability condition, please let us know before you start the test on our samples.
如对可靠性条件有特殊要求，请在模块测试前通知我们。