

APPROVAL SHEET

产品型号 (Product Type) : 050FW-RH51-L058B

客户名称 (Customer) : _____

客户料号 (Part No) : _____

发布日期(Date Issued) : _____

Confirmed/确认	Approved/批准	Signature/签章

客户确认

Confirmed/确认	Approved/批准	Signature/签章

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1. GENERAL INFORMATION

1.1 Features

- 1) Pixel Arrangement: RGB Vertical Stripe
- 2) Interface Mode: 51PIN 3Line SPI+RGB 24bits
- 3) Driver IC: ILI9806E-2
- 4) Operation Temperature: -20~70°C
- 5) Storage Temperature: -30~80°C
- 6) Backlight Type: White LED
- 7) Display mode: Normally Black,
- 8) Pixel Density: 197 PPI
- 9) LED life time: 30,000 Hours

1.2 Mechanical Specification

Item 项目	Specification 规格	Unit 单位	Remark 备注
Pixel Driving element	A-Si TFT	-	-
Screen Size	4.95IPS	Inch	Diagonal
Resolution	480(W)*3(RGB)*854(H)	Dots	
Interface	3SPI_RGB 24bits	-	51PIN
Module Power Consumption	0.9	Watt	Typ.
Active Area	61.63(W)*109.65(H)	mm	-
Pixel pitch (W*H)	0.1284(W)*0.1284(H)	mm	-
Module Size (W*H*D)	66.56(W)*121.01(H)*2.0(D)	mm	-
Luminance	420	cd/m ²	Typ.
Viewing Direction	All	O'clock	-
Display Color	16.7M	Colors	24bits

2. ABSOLUTE MAXIMUM RATINGS

Item 项目	Symbol 符号	Min. 最小值	Max. 最大值	Unit 单位	Remark 备注
Power supply voltage	VCI	-0.5	3.6	V	Note1
Power supply voltage	IOVCC	-0.5	3.6	V	
LED forward current	I _F	-0.001	30	mA	For each led,Note1
LED Reverse Voltage	V _R	-	5	V	For each led,Note1
Operating temperature	T _{op}	-20	70	°C	Note1,2
Storage temperature	T _{st}	-30	80	°C	Note1,2
Humidity	H _{st}	10	90	%RH	Note1,3

(Ta=+25°C,GND=0V)

Note1:If the module exceeds the absolute maximum ratings, it may be damaged permanently. Also if the module operates with the absolute maximum ratings for a long time, the reliability may drop.

Note2: In case of temperature below 0°C,the response time of liquid crystal (LC) becomes slower and the color of panel darker than normal one.

Note3: Temp. ≤ 60°C , 90% RH MAX.

Temp. >60°C , Absolute humidity shall be less than 90% RH.

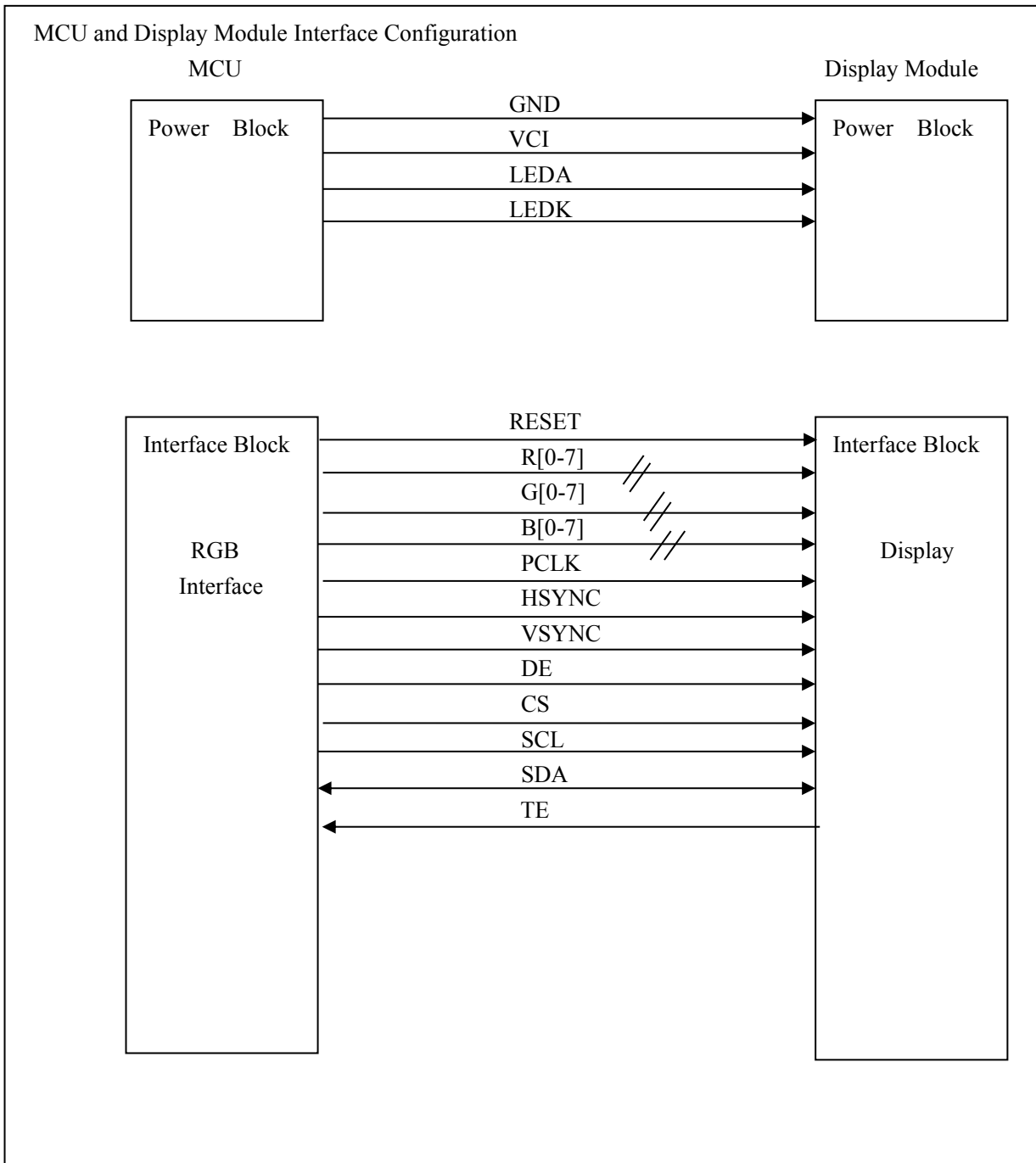
4. I/O CONNECTION & BLOCK DIAGRAM

4.1 I/O Connection

Pin No. 序号	Symbol 符号	I/O	Description 描述
1-2	GND	P	Power Ground
3	NC	-	NC
4	LEDA	P	Power supply for backlight anode
5	LEDK	P	Power supply for backlight cathode
6	NC	-	NC
7	VCI	P	Power supply to the internal logic power regulator(2.8V)
8	IOVCC	P	Power supply to the internal logic power regulator(1.8V)
9	NC	-	NC
10	GND	P	Power Ground
11	VSYNC	I	Vertical sync signal, Negative polarity
12	HSYNC	I	Horizontal sync signal, Negative polarity
13	PCLK	I	Pixel clock input pin, Negative polarity
14	DE	I	Data input enable. Display access is enabled when DE is “H”
15	GND	P	Power Ground
16-23	B0-B7	I	Blue data input.
24-31	G0-G7	I	Green data input.
32-39	R0-R7	I	Red data input.
40	GND	P	Power Ground
41	RESET	I	The signal will reset the LCM, Signal is active low.
42	CSX	I	Chip select input pin (“Low” enable), for initial RGB I/F。
43	CSL	I	serial interface clock, for initial RGB I/F。
44	SDI	I	Serial in signal, for initial RGB I/F。
45	SD0	O	Serial out signal, for initial RGB I/F。
46	TE	O	-Tearing effect output
47	GND	P	Power Ground
48	IM3	I	IM3
49	GND	P	Power Ground
50	NC	-	NC
51	GND	P	Power Ground

I: Input; O: Output; P: Power

4.2 Block Diagram



5. ELECTRICAL CHARACTERISTICS

5.1 TFT-LCD Panel Driving Section

Item 项目	Symbol 符号	Min. 最小值	Typ. 典型值	Max. 最大值	Unit 单位	Remark 备注
Power Supply Voltage	VCI	2.8	3.3	3.6	V	-
Power Supply Voltage	IOVCC	1.6	1.8	3.6		
Power Supply Current	I _{VDD}	-	30	-	mA	Note1
Logic Input High Voltage	V _{IH}	0.7VDD	-	VDD	V	-
Logic Input Low Voltage	V _{IL}	0	-	0.3VDD	V	-
Panel Power Consumption	P _{VDD}	-	0.099	-	Watt	Note1
Module Power Consumption	P _{LCM}	-	0.9	-	Watt	Note1,2

(Ta=+25°C,GND=0V)

Note1: Measurement Conditions (Video Mode): Full Screen Red Pattern, VDD=3.3V, 60Hz Refresh.

Note2: P_{LCM}= P_{VDD}+ P_{BL}, About P_{BL} information, inference to 5.2 Back Light Driving Section.

5.2 Back Light Driving Section

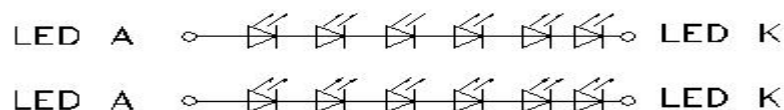
Item 项目	Symbol 符号	Min. 最小值	Typ. 典型值	Max. 最大值	Unit 单位	Remark 备注
Forward Voltage	V _F	-	19.2		V	Note1
Forward Current	I _F	-	40	-	mA	Note1
Backlight Power consumption	P _{BL}	-	0.768	-	Watt	Note1
LED life time	-	30000	-	-	Hrs	Note2
LED Quantity			12		PCS	

(Ta=+25°C,GND=0V)

Note1: The LED driving condition is defined for each LED module (6 LED Serial, 2 LED Parallel).

For each LED : I_F=20mA, V_F=3.2V(Typ.)/3.4V(Max.), Ta=25°C。

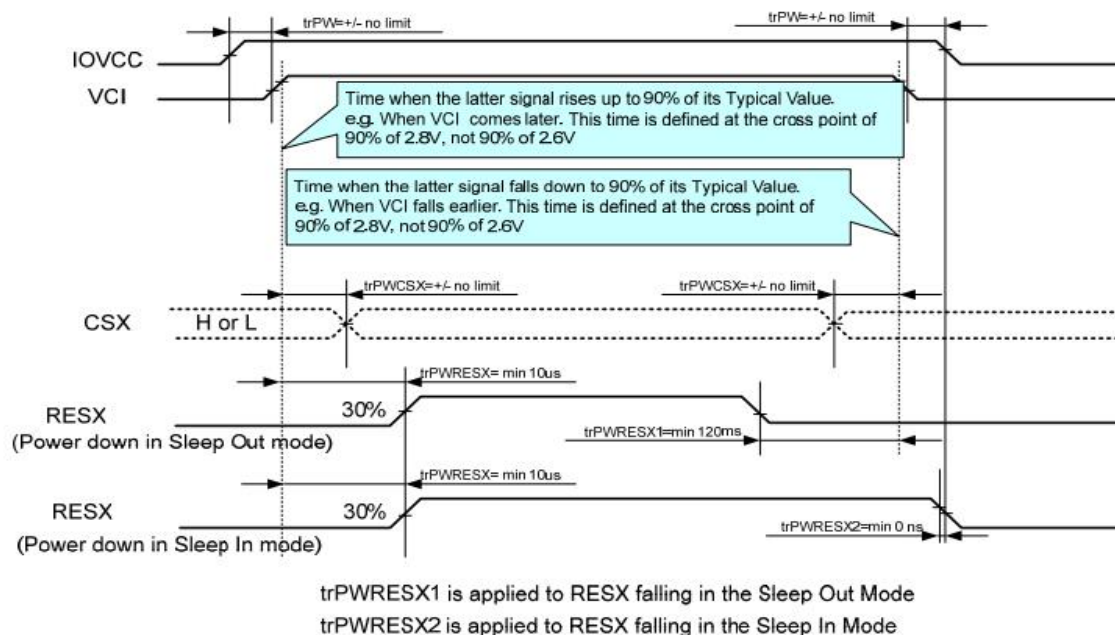
Note2: The “LED life time” is defined as the module brightness decrease to 50% of original brightness at I_{LED}=20mA(Per Led). The LED life time could be decreased if operating I_{LED} is larger than 20mA.



背光电路图
(CIRCUIT DIAGRAM)

VF: 17.4-19.2V IF: 40mA

5.3 Power On/Off Sequence

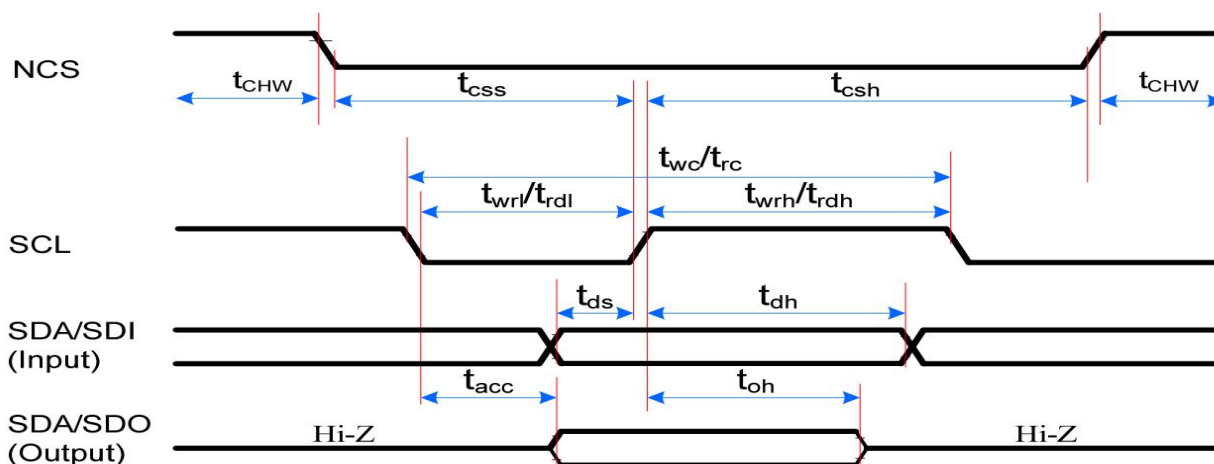


5.3.1 Power Off Sequence

The abnormal power off means a situation when e.g. there is removed a battery without the normal power off sequence. There will not be any damages for the display module or the display module will not cause any damages for the host or lines of the interface. At an abnormal power off event, ILI9806E will force the display to blank and will not be any abnormal visible effects with in 1 second on the display and remains blank until "Power On Sequence" powers it up.

5.4 Timing Characteristics

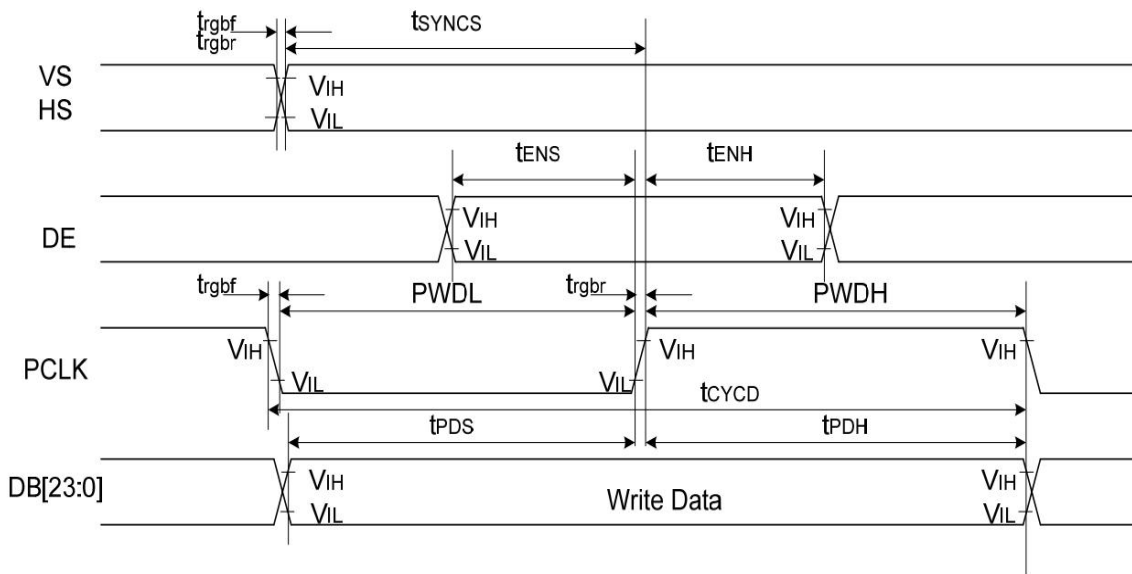
5.4.1 Timing for 3-Wire SPI Interface



($T_a = +25^\circ C, GND = 0V$)

Signal	Symbol	Parameter	min	max	Unit	Description
CSX	tcss	Chip select time (Write)	15	-	ns	
	tcsh	Chip select hold time (Read)	15	-	ns	
	tchW	CS "H" pulse width	40	-	ns	
SCL	twc	Serial clock cycle (Write)	30	-	ns	
	twrh	SCL "H" pulse width (Write)	10	-	ns	
	twrl	SCL "L" pulse width (Write)	10	-	ns	
	trc	Serial clock cycle (Read)	150	-	ns	
	trdh	SCL "H" pulse width (Read)	60	-	ns	
	trdl	SCL "L" pulse width (Read)	60	-	ns	
SDA/SDO (Output)	tacc	Access time (Read)	10	100	ns	For maximum CL=30pF
	toh	Output disable time (Read)	15	100	ns	For minimum CL=8pF
SDA/SDI (Input)	tds	Data setup time (Write)	10	-	ns	
	tdh	Data hold time (Write)	10	-	ns	

5.5 Timing Diagram



Signal	Symbol	Parameter	min	max	Unit	Description
VS/ HS	tSYNCS	VS/HS setup time	5	-	ns	24/18/16-bit bus RGB interface mode
	tSYNCH	VS/HS hold time	5	-	ns	
DE	tENS	DE setup time	5	-	ns	
	tENH	DE hold time	5	-	ns	
DB[23:0]	tPOS	Data setup time	5	-	ns	
	tPDH	Data hold time	5	-	ns	
PCLK	PWDH	PCLK high-level period	13	-	ns	
	PWDL	PCLK low-level period	13	-	ns	
	tCYCD	PCLK cycle time	28	-	ns	
	t _{rqbr} , t _{rgbf}	PCLK,HS,VS rise/fall time	-	15	ns	

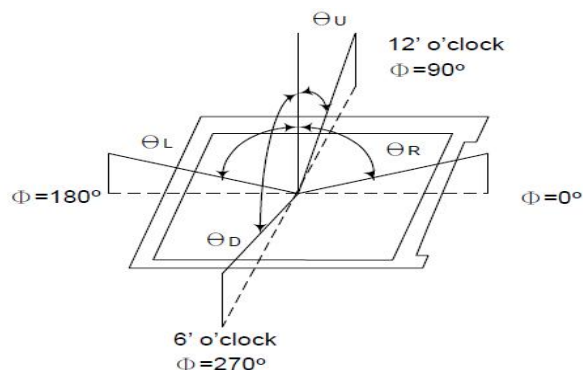
6. OPTICAL CHARACTERISTICS

Parameter 参数	Symbol 符号	Condition 条件	Min. 最小值	Typ. 典型值	Max. 最大值	Unit 单位	Remark 备注
Contrast Ratio	C/R	$\theta = 0^\circ$	640	800	-	-	Note(4)
NTSC Ratio	S	$\theta = 0^\circ$	-	70	-	%	Note(7)
Luminance	L	$\theta = 0^\circ$	-	420	-	cd/m ²	Note(5)
Luminance uniformity	U _w	$\theta = 0^\circ$	80	-	-	%	Note(3)
Response Time	T _R + T _F	25 °C	-	35	45	ms	Note(2)
Color Coordination	W _X	$\theta = 0^\circ$ (Center) Normal viewing angle B/L On	-0.03	0.290	+0.03	NTSC (x,y)	Note(6)
	W _Y			0.330			
	R _X			0.665			
	R _Y			0.327			
	G _X			0.276			
	G _Y			0.594			
	B _X			0.134			
	B _Y			0.118			
Viewing Angle	θ_L	C/R>10	-	80	-	Degree	Note(1)
	θ_R		-	80	-		
	θ_U		-	80	-		
	θ_D		-	80	-		

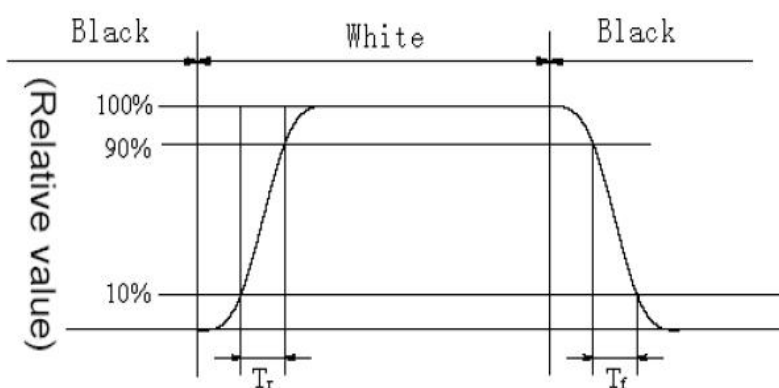
Test Conditions:

1. VDD=3.3V, I_F=80mA (Backlight current), the ambient temperature is +25°C.
2. The test systems refer to Note 8.

Note1: Definition of Viewing Angle: The viewing angle range that the CR>10

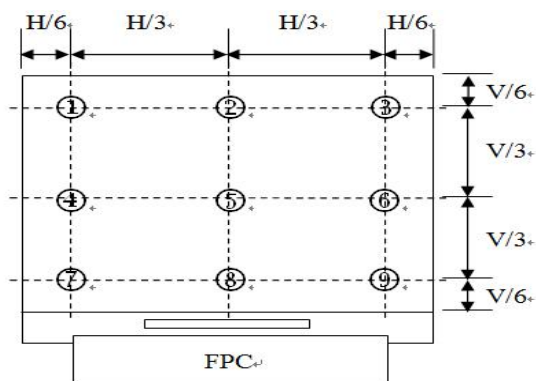


Note2: Definition of Response time: Sum of T_R and T_F



Note 3: Definition of Luminance Uniformity: Active area is divided into 9 measuring areas, every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity} = \frac{\text{Min Luminance of white among 9-points}}{\text{Max Luminance of white among 9-points}} \times 100\%$$



Note4: Definition of Contrast Ratio (CR): measured at the center point of panel

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

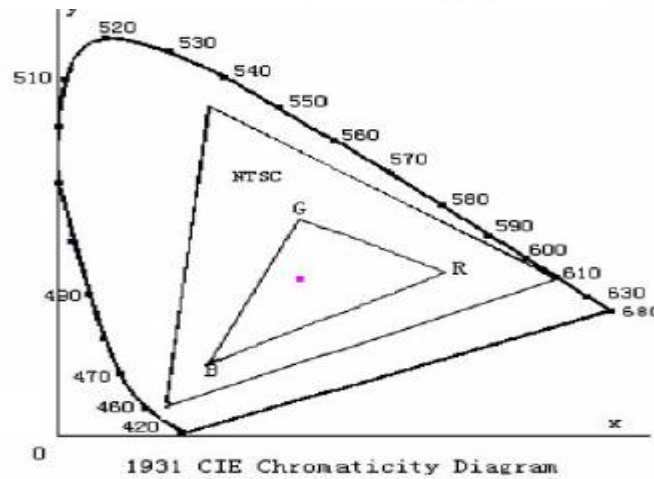
Note 5: Definition of Luminance: Center Luminance of white is defined as luminance values of 1point average across the LCD surface.

Note 6: Definition of Color Chromaticity (CIE 1931)

Color coordinates of white & red, green, blue measured at center point of LCD.

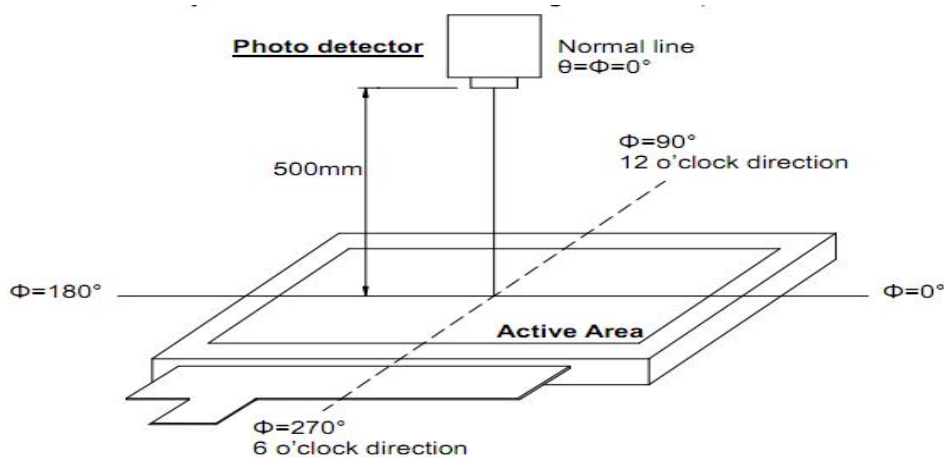
Note 7: Definition of NTSC ratio:

$$\text{NTSC ratio} = \frac{\text{Area of RGB triangle}}{\text{Area of NTSC triangle}}$$



Note 8: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 5 minutes operation, the optical properties are measured at the center point of the LCD screen. (Response time is measured by Photo detector TOPCON BM-7, Field of view: 1°/Height: 500mm.)



7. RELIABILITY

Item 项目	Test Condition 测试条件	Remark 备注
High Temperature Storage	Ta =+80°C / 96Hours	Note1,2,3
Low Temperature Storage	Ta =-30°C / 96Hours	Note1,2,3
High Temperature Operating	Ta =+70°C / 96Hours	Note1,2,3
Low Temperature Operating	Ta =-20°C / 96Hours	Note1,2,3
Temperature Cycle storage Test	-30°C/30min Δ+80°C /30min for 30cycles,Transfer time less than 5min	Note2,3
Thermal humidity storage Test	60°C x 90%RH / 96Hours	Note2,3
Package Vibration Test	Frequency: 10Hz~55Hz,Amplitude:1.5mm, 1 hrs for each direction of X, Y, Z	Note2

Inspection after Test:

Note1: Ta is the ambient temperature of samples.

Note 2: In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but doesn't guarantee all the cosmetic specification.

Note 3: Before cosmetic and function tests , the product must have enough recovery time, at least 2 hours at room temperature.

8. INSPECTION STANDARDS

8.1 AQL Sampling inspection standard

使用 GB/T 2828-2003 一般 II 水平, 采用正常检查一次抽样方式; 具体抽检方式参照《成品检验管理程序》、《抽样管理规范》

缺陷区分	AQL 允收水准
严重缺陷	0 收 1 退
重缺	0.4
轻缺	0.65

8.2 Inspect the condition

8.2.1 在 20—40W 日光灯的照明条件下, 样品离检查者眼睛约 30cm 处进行检查。检验方向以垂直线前后左右 45° (以时钟 3 点、6 点、9 点、12 点)

8.2.2 检验者视力需达到标准视力 1.0 以上。

8.2.3 检验者需戴静电手环、两手八个手指套。

8.2.4 外观检验者以目视检查或以菲林对比卡比对。

8.2.5 电性测试使用电测测架, 主板, 电源线及单片机。

8.2.6 若标准与规格书不符时, 以产品发行之规格书特殊检验规格、工程变更为准



8.2.7 辉色度检测请参照样品, 检测方法依照辉色度检验标准。

8.2.8 电测检验环境: 照度为 200LUX 以下, 外观检验环境: 照度为 600LUX-1000LUX, 检验时间: 1 秒-3 秒。

8.2.9 检验工具: 电测测架, 主板, 电源线及单片机, 菲林对比卡, 游标卡尺, 放大镜, 实体显微镜(必要时)等等。

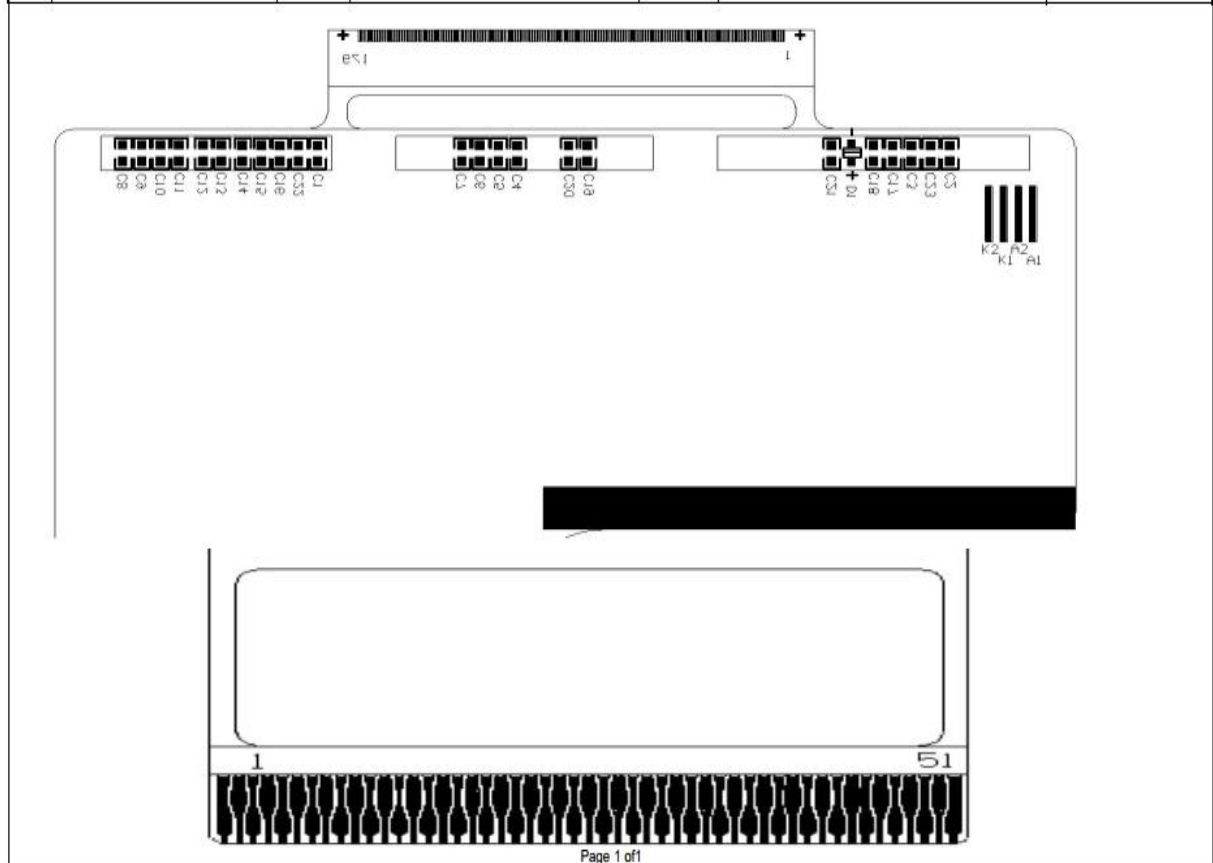
8.3 Judgment criterion

不良项目	判定标准		缺点类别	
点状缺陷	 <p>$D = (L+W) / 2$ 单位: mm 点不良间距需 $\geq 10\text{mm}$</p>	尺寸	允许个数	轻缺
		$D \leq 0.2$	忽略不计	
		$0.2 < D \leq 0.3$	3	
		$D > 0.3$	0	
亮点	1. 单一点: 单个 DOT 2. 连续点: 相连 2 个 DOT 3. 亮点及暗点总个数不可超过 5 个 4. 点不良间距需 $\geq 10\text{mm}$	单一点	2	轻缺
暗点		2 连续亮点	1	
		单一点	5	
		2 连续暗点	1	
POL 气泡、凹凸点	参照点状缺陷定义	$D \leq 0.2$	忽略不计	
		$0.2 < D \leq 0.4$	3	
		$D > 0.4$	0	

Mura	斑点、不均	ND 5% 不可见视为 OK		轻缺
电测 线状缺陷	 <p>L: 长度 W: 宽度 线不良间距需 $\geq 10.0\text{mm}$</p>	尺寸	允许个数	轻缺
		$W \leq 0.05$	忽略不计	
		$L \leq 5.0, 0.05 < W \leq 0.10$	3	
		$W > 0.10$	依点状缺陷判定	
外观 线状缺陷	 <p>L: 长度 W: 宽度 线不良间距需 $\geq 10.0\text{mm}$</p>	尺寸	允许个数	
		$W \leq 0.05$	忽略不计	
		$L \leq 10.0, 0.05 < W \leq 0.10$	3个	
		$W > 0.10$	依点状缺陷判定	

9. Bill of Main Material.

产品物料BOM清单									
LCM-UE050FW-RH51-L058B							REV. A		
级别	子件编码	子件名称	子件规格	单位	用量	损耗	放置位置	备注	
1	LCM-UE050FW-RH51-L058B	FPC类	FPC-UE050FW-RH51-L058-3	PCS	1			供应商: 盈通: 80pcs	
2	电容	CAP类	0402, 1uF, 10V, 10% 三星/松下/TDK	PCS	12		C2,C23,C4-C13		
3	电容	CAP类	0402, 1uF, 16V, 10% 三星/松下/TDK	PCS	2		C14,C16		
4	电容	CAP类	0402, 1uF, 25V, 10% 三星/松下/TDK	PCS	3		C15,C21,C22		
5	电容	CAP类	0402, 2.2uF, 10V, 10% 三星/松下/TDK	PCS	6		C1,C3,C17~C20		
6	二极管	DIODE类	RR521CS-30 (0402封装) 罗姆	PCS	1		D1		
7	LCD:64.46(H)X116.8(V)X0.8(T)	输影	HSD050B8W8-P	PCS	1				
8	Driver IC	奕力	ILI9806E-2	PCS	1				
9	BL		BL-050FW-RH51-L058B	PCS	1				
10	上偏光片	住友	上片, L*W*T:64.16*112.75*0.135mm, 竖屏/173度/IPS 油砂片/磨边	PCS	1				
11	下偏光片	住友	下片, L*W*T:64.16*112.75*0.135mm, 竖屏/97度/IPS光片/磨边	PCS	1			SMT贴片时请将BL焊盘上锡	
版本	修改内容	日期			签名	日期			
A	First release	2019/9/13			Prepared by				
B									



10. production flow

控制计划		□ 样件 ■ 试生产 □ 量产			文件编号		版 本		B0								
产品名称		LCM-060FW-RH51-L068B			产品料号		客户名称		华创信								
核心小组成员：		覃正峰、肖虎、蔡灿剑			联系人		肖虎		生效日期								
控制编号	制程名称	生产设备/治工具	控制方法				异常处置	检验项目	规格及公差	控制方法							
			设备参数	规格及公差	量测设备/方法	确认频率				记录表单	确认单位	量测设备/方法	抽样频率	抽样数	记录表单	确认单位	反应计划
1	LCDA清洁	自动清洗机	酒精更换/添加	/	添加/更换	每天一次	添加更换记录	机台操作员	更换/添加药水	外观	目视	首件确认每两小时送检一次	5PCS	前段首件检查表 水确角实验记录表	IPQC	手工替代自动设备	
2	IC ACP贴膜	自动COG邦定机	气压压力 时间 温度	0.1"0.25eps 0.5"2S 130±10℃	气压表 计时器 温控器	每天一次	设备日常保养记录表	机台操作员	调试机台	外观	目视	首件确认每两小时送检一次	5PCS	前段首件检查表 前段IPQC抽检记录表	IPQC	不合格控制程序	
3	IC绑定	自动COG邦定机	时间 温度	0.1"0.3S 70±10℃	计时器 温控器	每天一次	设备日常保养记录表	机台操作员	调试机台	外观	目视	首件确认每两小时送检一次	5PCS	前段首件检查表 前段IPQC抽检记录表	IPQC	不合格控制程序	
4	IC本压	自动COG邦定机	气压压力 时间 温度	0.05"0.25eps 6s或以上 170±10℃	气压表 计时器 温控器	每天一次	设备日常保养记录表	机台操作员	调试机台	外观	目视	首件确认每两小时送检一次	5PCS	前段首件检查表 前段IPQC抽检记录表	IPQC	不合格控制程序	
5	PPC ACP贴膜	全自动FOG邦定机	气压压力 时间 温度	0.1"0.25eps 0.5"2S 130±10℃	气压表 计时器 温控器	每天一次	设备日常保养记录表	机台操作员	调试机台	外观	目视	首件确认每两小时送检一次	5PCS	前段首件检查表 前段IPQC抽检记录表	IPQC	不合格控制程序	
6	PPC绑定	FOG邦定机	气压压力 时间 温度	0.05"0.25eps 12s或以上 170±10℃	气压表 计时器 温控器	每天一次	设备日常保养记录表	机台操作员	调试机台	外观	目视	首件确认每两小时送检一次	5PCS	前段首件检查表 前段IPQC抽检记录表	IPQC	自动替代手工	
7	镜检	拉力测试机	拉力	大于或等于0.8Nf/cm	显示表盘	每天一次	设备日常保养记录表	机台操作员	调试机台	拉力	拉力测试机	首件确认	5PCS	前段首件检查表	IPQC	不合格控制程序	
		显微镜	/	/	目视	每天一次	设备日常保养记录表	FOC	调试显微镜	外观	镜检分析指导	目视	首件确认每两小时送检20%	20%	前段首件检查表 前段IPQC抽检记录表	IPQC	不合格控制程序
8	点胶机	针筒	/	/	目视	/	/	作业员	更换胶/针筒	外观	目视	首件确认每两小时送检一次	5PCS	前段首件检查表 前段IPQC抽检记录表	IPQC	不合格控制程序	
9	点胶机	针筒	/	/	目视	/	/	作业员	更换胶/针筒	目视	目视	首件确认每两小时送检一次	5PCS	前段首件检查表 前段IPQC抽检记录表	IPQC	手工替代自动设备	
10	FOG电测	测试仪	电流	7±5mA	目视	每天一次	设备日常保养记录表	作业员	调试测试架	目视	目视	1.生产全检2.每小时送检一次	1.全检2.5PCS	品质检查记录表 前段IPQC抽检记录表	全检员 IPQC	不合格控制程序	
11	CTP测试	测试仪	/	/	目视	每天一次	设备日常保养记录表	作业员	调试测试架	目视	目视	1.生产全检2.每小时送检一次	1.全检2.5PCS	品质检查记录表 前段IPQC抽检记录表	全检员 IPQC	不合格控制程序	
12	OCA贴膜	OCA贴膜机	/	/	目视	每天一次	设备日常保养记录表	机台操作员	调试机台	外观	目视	首件确认每两小时送检一次	5PCS	前段首件检查表	IPQC	不合格控制程序	
13	OCA脱泡	消泡机	温度 时间 压力	40+/-2℃ 2min 0.3+/-0.05mpa	温控器 计时器 气压表	每天一次	设备日常保养记录表	机台操作员	调试机台	外观	消泡指引	目视	首件确认每两小时送检一次	5PCS	前段首件检查表	IPQC	不合格控制程序
		OCA+CTP外观	/	/	目视	/	/	/	/	外观	OCA+CTP外观指引	目视	首件确认每两小时送检一次	4PCS	前段首件检查表	IPQC	不合格控制程序
15	FOG+CTP贴合	贴合机	/	/	目视	每天一次	设备日常保养记录表	机台操作员	调试机台	外观	目视	首件确认每两小时送检一次	5PCS	前段首件检查表	IPQC	不合格控制程序	
16	FOG+CTP脱泡	消泡机	温度 时间 压力	40+/-2℃ 13+/-2min 0.3+/-0.05mpa	温控器 计时器 气压表	每天一次	设备日常保养记录表	机台操作员	调试机台	外观	消泡指引	目视	首件确认每两小时送检一次	5PCS	前段首件检查表 前段IPQC抽检记录表	IPQC	不合格控制程序
		FOG+CTP外观	/	/	目视	/	/	/	/	外观	FOG+CTP外观指引	目视	首件确认每两小时送检一次	4PCS	前段首件检查表	IPQC	不合格控制程序
18	IC组装	/	/	/	目视	/	/	/	/	外观	背光组装作业指引	目视	首件确认每两小时送检一次	5PCS	后段首件检查表	IPQC	不合格控制程序
19	IC焊接	烙铁	温度	300-330℃	温度测试仪	每2小时一次	温度记录表	IPQC	调试温度	目视	目视	首件确认每两小时送检一次	5PCS	后段首件检查表 温度测试记录表	IPQC	不合格控制程序	
20	焊盘清洁	酒精、无尘布	/	/	目视	/	/	/	/	外观	目视	首件确认每两小时送检一次	5PCS	后段首件检查表	IPQC	不合格控制程序	
21	LCM电测	测试仪	电流 亮度	/	目视	每天一次	设备日常保养记录表	作业员	调试测试架	目视	目视	首件确认每两小时送检一次	5PCS	后段首件检查表 后段IPQC抽检记录表	IPQC	不合格控制程序	
		CTP测试	测试仪	/	/	目视	每天一次	设备日常保养记录表	作业员	调试测试架	测试结果	目视	首件确认每两小时送检一次	5PCS	后段首件检查表	IPQC	不合格控制程序
23	贴高温胶	/	/	/	目视	/	/	/	/	外观	目视	首件确认每两小时送检一次	5PCS	后段首件检查表	IPQC	不合格控制程序	
24	外观检	/	/	/	目视	/	/	/	/	外观	目视	每批	全数	品质检查记录表	全检员	不合格控制程序	
25	QA检验	/	/	/	目视	/	/	/	/	外观	目视	每批	全数	QA检验记录表	QA	不合格控制程序	
26	包装入库	包装机	温度	/	温控器	每天一次	设备日常保养记录表	作业员	调试机台	数量、型号、料号、有效期	目视	每批	每批	包装作业指引、仓库物料先进先出管理办法、仓库管理期限规定表	入单员 仓管员	不合格控制程序	

说明：★A代表产品的功能特性 ★S代表产品的安全特性 ★B代表过程特性

核准：蔡灿剑

制定：肖虎

11. initial code

```
// VCI=2.8V
//***** Reset LCD Driver *****//
LCD_nRESET = 1;
delayms(1); // Delay 1ms
LCD_nRESET = 0;
delayms(10); // Delay 10ms // This delay time is necessary
LCD_nRESET = 1;
delayms(120); // Delay 120 ms
Hsync: 20
HBP:50HFP:55
Vsync: 8
VBP:6
VFP:6
PCLK:60Hz
HAdr480*VAdr854
//***** Start Initial Sequence *****//

LCD_ILI9806E_CMD(0xFF)//dcs_reg_w
LCD_ILI9806E_INDEX(0xFF)
LCD_ILI9806E_INDEX(0x98)
LCD_ILI9806E_INDEX(0x06)
LCD_ILI9806E_INDEX(0x04)
LCD_ILI9806E_INDEX(0x01)

LCD_ILI9806E_CMD(0x08)//generic_reg_w
LCD_ILI9806E_INDEX(0x10)

LCD_ILI9806E_CMD(0x21)
LCD_ILI9806E_INDEX(0x01)

LCD_ILI9806E_CMD(0x30)
LCD_ILI9806E_INDEX(0x01) //480x854

LCD_ILI9806E_CMD(0x31)
LCD_ILI9806E_INDEX(0x02)

LCD_ILI9806E_CMD(0x40)
LCD_ILI9806E_INDEX(0x14)//DDVDH/DDVDL

LCD_ILI9806E_CMD(0x41)
LCD_ILI9806E_INDEX(0x44)//DDVDH/DDVDL OK 0x00
```

LCD_ILI9806E_CMD (0x42)
LCD_ILI9806E_INDEX (0x03)

LCD_ILI9806E_CMD (0x43)
LCD_ILI9806E_INDEX (0x09)

LCD_ILI9806E_CMD (0x44)
LCD_ILI9806E_INDEX (0x09)

LCD_ILI9806E_CMD (0x50)
LCD_ILI9806E_INDEX (0x78)

LCD_ILI9806E_CMD (0x51)
LCD_ILI9806E_INDEX (0x78)

LCD_ILI9806E_CMD (0x52)
LCD_ILI9806E_INDEX (0x00)

LCD_ILI9806E_CMD (0x53)
LCD_ILI9806E_INDEX (0x3A) //vcom, 调闪

LCD_ILI9806E_CMD (0x57)
LCD_ILI9806E_INDEX (0x50)

LCD_ILI9806E_CMD (0x60)
LCD_ILI9806E_INDEX (0x07)

LCD_ILI9806E_CMD (0x61)
LCD_ILI9806E_INDEX (0x00)

LCD_ILI9806E_CMD (0x62)
LCD_ILI9806E_INDEX (0x08)

LCD_ILI9806E_CMD (0x63)
LCD_ILI9806E_INDEX (0x00)

//+++++ Gamma Setting +++++//
LCD_ILI9806E_CMD (0xA0)
LCD_ILI9806E_INDEX (0x00) // Gamma 0

LCD_ILI9806E_CMD (0xA1)
LCD_ILI9806E_INDEX (0x06) // Gamma 4

```

LCD_ILI9806E_CMD (0xA2)
LCD_ILI9806E_INDEX (0x10) // Gamma 8

LCD_ILI9806E_CMD (0xA3)
LCD_ILI9806E_INDEX (0x11) // Gamma 16

LCD_ILI9806E_CMD (0xA4)
LCD_ILI9806E_INDEX (0x0B) // Gamma 24

LCD_ILI9806E_CMD (0xA5)
LCD_ILI9806E_INDEX (0x1C) // Gamma 52

LCD_ILI9806E_CMD (0xA6)
LCD_ILI9806E_INDEX (0x0A) // Gamma 80

LCD_ILI9806E_CMD (0xA7)
LCD_ILI9806E_INDEX (0x0A) // Gamma 108

LCD_ILI9806E_CMD (0xA8)
LCD_ILI9806E_INDEX (0x00) // Gamma 147

LCD_ILI9806E_CMD (0xA9)
LCD_ILI9806E_INDEX (0x07) // Gamma 175

LCD_ILI9806E_CMD (0xAA)
LCD_ILI9806E_INDEX (0x04) // Gamma 203

LCD_ILI9806E_CMD (0xAB)
LCD_ILI9806E_INDEX (0x02) // Gamma 231

LCD_ILI9806E_CMD (0xAC)
LCD_ILI9806E_INDEX (0x0A) // Gamma 239

LCD_ILI9806E_CMD (0xAD)
LCD_ILI9806E_INDEX (0x35) // Gamma 247

LCD_ILI9806E_CMD (0xAE)
LCD_ILI9806E_INDEX (0x30) // Gamma 251

LCD_ILI9806E_CMD (0xAF)
LCD_ILI9806E_INDEX (0x00) // Gamma 255

///=====Nagitive
LCD_ILI9806E_CMD (0xC0)

```

LCD_ILI9806E_INDEX(0x00) // Gamma 0

LCD_ILI9806E_CMD(0xC1)
LCD_ILI9806E_INDEX(0x04) // Gamma 4

LCD_ILI9806E_CMD(0xC2)
LCD_ILI9806E_INDEX(0x10) // Gamma 8

LCD_ILI9806E_CMD(0xC3)
LCD_ILI9806E_INDEX(0x0F) // Gamma 16

LCD_ILI9806E_CMD(0xC4)
LCD_ILI9806E_INDEX(0x0A) // Gamma 24

LCD_ILI9806E_CMD(0xC5)
LCD_ILI9806E_INDEX(0x16) // Gamma 52

LCD_ILI9806E_CMD(0xC6)
LCD_ILI9806E_INDEX(0x0B) // Gamma 80

LCD_ILI9806E_CMD(0xC7)
LCD_ILI9806E_INDEX(0x09) // Gamma 108

LCD_ILI9806E_CMD(0xC8)
LCD_ILI9806E_INDEX(0x05) // Gamma 147

LCD_ILI9806E_CMD(0xC9)
LCD_ILI9806E_INDEX(0x08) // Gamma 175

LCD_ILI9806E_CMD(0xCA)
LCD_ILI9806E_INDEX(0x07) // Gamma 203

LCD_ILI9806E_CMD(0xCB)
LCD_ILI9806E_INDEX(0x05) // Gamma 231

LCD_ILI9806E_CMD(0xCC)
LCD_ILI9806E_INDEX(0x0C) // Gamma 239

LCD_ILI9806E_CMD(0xCD)
LCD_ILI9806E_INDEX(0x21) // Gamma 247

LCD_ILI9806E_CMD(0xCE)
LCD_ILI9806E_INDEX(0x1C) // Gamma 251

LCD_ILI9806E_CMD (0xCF)
LCD_ILI9806E_INDEX (0x00) // Gamma 255

//*****//
//***** Page 6 Command *****//
//*****//

LCD_ILI9806E_CMD (0xFF)
LCD_ILI9806E_INDEX (0xFF)
LCD_ILI9806E_INDEX (0x98)
LCD_ILI9806E_INDEX (0x06)
LCD_ILI9806E_INDEX (0x04)
LCD_ILI9806E_INDEX (0x06) // Change to Page 6

LCD_ILI9806E_CMD (0x00)
LCD_ILI9806E_INDEX (0x21)

LCD_ILI9806E_CMD (0x01)
LCD_ILI9806E_INDEX (0x09)

LCD_ILI9806E_CMD (0x02)
LCD_ILI9806E_INDEX (0x00)

LCD_ILI9806E_CMD (0x03)
LCD_ILI9806E_INDEX (0x00)

LCD_ILI9806E_CMD (0x04)
LCD_ILI9806E_INDEX (0x01)

LCD_ILI9806E_CMD (0x05)
LCD_ILI9806E_INDEX (0x01)

LCD_ILI9806E_CMD (0x06)
LCD_ILI9806E_INDEX (0x80)

LCD_ILI9806E_CMD (0x07)
LCD_ILI9806E_INDEX (0x05)

LCD_ILI9806E_CMD (0x08)
LCD_ILI9806E_INDEX (0x02)

LCD_ILI9806E_CMD (0x09)
LCD_ILI9806E_INDEX (0x80)

LCD_ILI9806E_CMD (0x0A)
LCD_ILI9806E_INDEX (0x00)

LCD_ILI9806E_CMD (0x0B)
LCD_ILI9806E_INDEX (0x00)

LCD_ILI9806E_CMD (0x0C)
LCD_ILI9806E_INDEX (0x0A)

LCD_ILI9806E_CMD (0x0D)
LCD_ILI9806E_INDEX (0x0A)

LCD_ILI9806E_CMD (0x0E)
LCD_ILI9806E_INDEX (0x00)

LCD_ILI9806E_CMD (0x0F)
LCD_ILI9806E_INDEX (0x00)

LCD_ILI9806E_CMD (0x10)
LCD_ILI9806E_INDEX (0xE0)

LCD_ILI9806E_CMD (0x11)
LCD_ILI9806E_INDEX (0xE4)

LCD_ILI9806E_CMD (0x12)
LCD_ILI9806E_INDEX (0x04)

LCD_ILI9806E_CMD (0x13)
LCD_ILI9806E_INDEX (0x00)

LCD_ILI9806E_CMD (0x14)
LCD_ILI9806E_INDEX (0x00)

LCD_ILI9806E_CMD (0x15)
LCD_ILI9806E_INDEX (0xC0)

LCD_ILI9806E_CMD (0x16)
LCD_ILI9806E_INDEX (0x08)

LCD_ILI9806E_CMD (0x17)
LCD_ILI9806E_INDEX (0x00)

LCD_ILI9806E_CMD (0x18)
LCD_ILI9806E_INDEX (0x00)

LCD_ILI9806E_CMD (0x19)
LCD_ILI9806E_INDEX (0x00)

LCD_ILI9806E_CMD (0x1A)
LCD_ILI9806E_INDEX (0x00)

LCD_ILI9806E_CMD (0x1B)
LCD_ILI9806E_INDEX (0x00)

LCD_ILI9806E_CMD (0x1C)
LCD_ILI9806E_INDEX (0x00)

LCD_ILI9806E_CMD (0x1D)
LCD_ILI9806E_INDEX (0x00)

LCD_ILI9806E_CMD (0x20)
LCD_ILI9806E_INDEX (0x01)

LCD_ILI9806E_CMD (0x21)
LCD_ILI9806E_INDEX (0x23)

LCD_ILI9806E_CMD (0x22)
LCD_ILI9806E_INDEX (0x45)

LCD_ILI9806E_CMD (0x23)
LCD_ILI9806E_INDEX (0x67)

LCD_ILI9806E_CMD (0x24)
LCD_ILI9806E_INDEX (0x01)

LCD_ILI9806E_CMD (0x25)
LCD_ILI9806E_INDEX (0x23)

LCD_ILI9806E_CMD (0x26)
LCD_ILI9806E_INDEX (0x45)

LCD_ILI9806E_CMD (0x27)
LCD_ILI9806E_INDEX (0x67)

LCD_ILI9806E_CMD (0x30)
LCD_ILI9806E_INDEX (0x01)

LCD_ILI9806E_CMD (0x31)
LCD_ILI9806E_INDEX (0x11)

LCD_ILI9806E_CMD (0x32)
LCD_ILI9806E_INDEX (0x00)

LCD_ILI9806E_CMD (0x33)
LCD_ILI9806E_INDEX (0xEE)

LCD_ILI9806E_CMD (0x34)
LCD_ILI9806E_INDEX (0xFF)

LCD_ILI9806E_CMD (0x35)
LCD_ILI9806E_INDEX (0xBB)

LCD_ILI9806E_CMD (0x36)
LCD_ILI9806E_INDEX (0xCA)

LCD_ILI9806E_CMD (0x37)
LCD_ILI9806E_INDEX (0xDD)

LCD_ILI9806E_CMD (0x38)
LCD_ILI9806E_INDEX (0xAC)

LCD_ILI9806E_CMD (0x39)
LCD_ILI9806E_INDEX (0x76)

LCD_ILI9806E_CMD (0x3A)
LCD_ILI9806E_INDEX (0x67)

LCD_ILI9806E_CMD (0x3B)
LCD_ILI9806E_INDEX (0x22)

LCD_ILI9806E_CMD (0x3C)
LCD_ILI9806E_INDEX (0x22)

LCD_ILI9806E_CMD (0x3D)
LCD_ILI9806E_INDEX (0x22)

LCD_ILI9806E_CMD (0x3E)
LCD_ILI9806E_INDEX (0x22)

LCD_ILI9806E_CMD (0x3F)

LCD_ILI9806E_INDEX (0x22)

LCD_ILI9806E_CMD (0x40)
LCD_ILI9806E_INDEX (0x22)

LCD_ILI9806E_CMD (0x52)
LCD_ILI9806E_INDEX (0x10)

LCD_ILI9806E_CMD (0x53)
LCD_ILI9806E_INDEX (0x10) //VGL

//*****
//***** Page 7 Command *****
//*****

LCD_ILI9806E_CMD (0xFF)
LCD_ILI9806E_INDEX (0xFF)
LCD_ILI9806E_INDEX (0x98)
LCD_ILI9806E_INDEX (0x06)
LCD_ILI9806E_INDEX (0x04)
LCD_ILI9806E_INDEX (0x07)

//LCD_ILI9806E_CMD (0x18)
//LCD_ILI9806E_INDEX (0x1D)

LCD_ILI9806E_CMD (0x17)
LCD_ILI9806E_INDEX (0x22)

LCD_ILI9806E_CMD (0x02)
LCD_ILI9806E_INDEX (0x77)

LCD_ILI9806E_CMD (0xE1)
LCD_ILI9806E_INDEX (0x79)

LCD_ILI9806E_CMD (0x06)
LCD_ILI9806E_INDEX (0x13)

LCD_ILI9806E_CMD (0x26)
LCD_ILI9806E_INDEX (0xB2)

//*****
LCD_ILI9806E_CMD (0xFF)

```
LCD_ILI9806E_INDEX(0xFF)
LCD_ILI9806E_INDEX(0x98)
LCD_ILI9806E_INDEX(0x06)
LCD_ILI9806E_INDEX(0x04)
LCD_ILI9806E_INDEX(0x00)
```

```
LCD_ILI9806E_CMD(0x11) // Sleep-Out
//LCD_ILI9806E_INDEX(0x00)
```

```
LCD_ILI9806E_CMD(0x29) // Display On
//LCD_ILI9806E_INDEX(0x00)
```

12. PACKAGE DRAWING

