

TOUCH&DISPLAY MODULE

SPECIFICATIONS

MODULE NO: (模组型号) 90-07040-7134A

CUSTOMER NO: (客户型号) MFGF870014

CUSTOMER: (客户) 麒麟

CONFIDENTIALITY LEVEL: (保密等级) 秘密 (SECRET)

APPROVED BY CUSTOMER 客户签署栏:	
	
Approved by 审核:	Remak 备注:
Date:	

APPROVED BY DJN 帝晶签署栏			
Prepared by 制作	Checked by 检查		Approved by 审核
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邓子欢	邓子欢	叶才禄	余启腾

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REVISION RECORD

REV NO. 版本	CONTENTS 内容	REV DATE 修改日期	REMARKS 注释
A0	新制	2024/1/2	电子：邓子欢 结构：叶才禄 品质：何文龙
A1	更新光学视角规格 page 8	2024/1/11	
A2	更新 water ribble 和 flicker 规格 更新包装规范改为塑料栈板 page 21	2024/1/17	
A3	更新代码 page 23-28	2024/2/1	
A4	变更色坐标（更换 LED） page 5	2024/2/5	
A5	增加残影测试及判断标准-page 18 修改接口定义描述-page 6 修改极限参数-page 7 修改模块电气参数-page 8 修改光学特性-page 8 修改响应时间定义-page 10	2024/4/1	电子：王世伟 结构：叶才禄 品质：何文龙
A6	FPC 背面增加 PI 补强，元件区域位置移动，其它不变-page 5	2024/4/22	电子：王世伟 结构：叶才禄
A7	修改代码-page 24-29 包装标签型号升级版本-page 23	2024/6/3	电子：王世伟 结构：叶才禄
A8	更新 IC 型号-page 4 更新图纸-page 5	2024/7/23	电子：梁志忠 结构：叶才禄
A9	更新图纸-page 7 增加背光极限参数以及示意图 增加 porch 设定-page 14	2024/8/5	结构：叶才禄 电子：梁志忠
A10	增加原理图-page 8 增加 ESD 规格 page 22 增加 ESD 器件 list page 22	2024/9/5	电子：梁志忠

CONTENTS

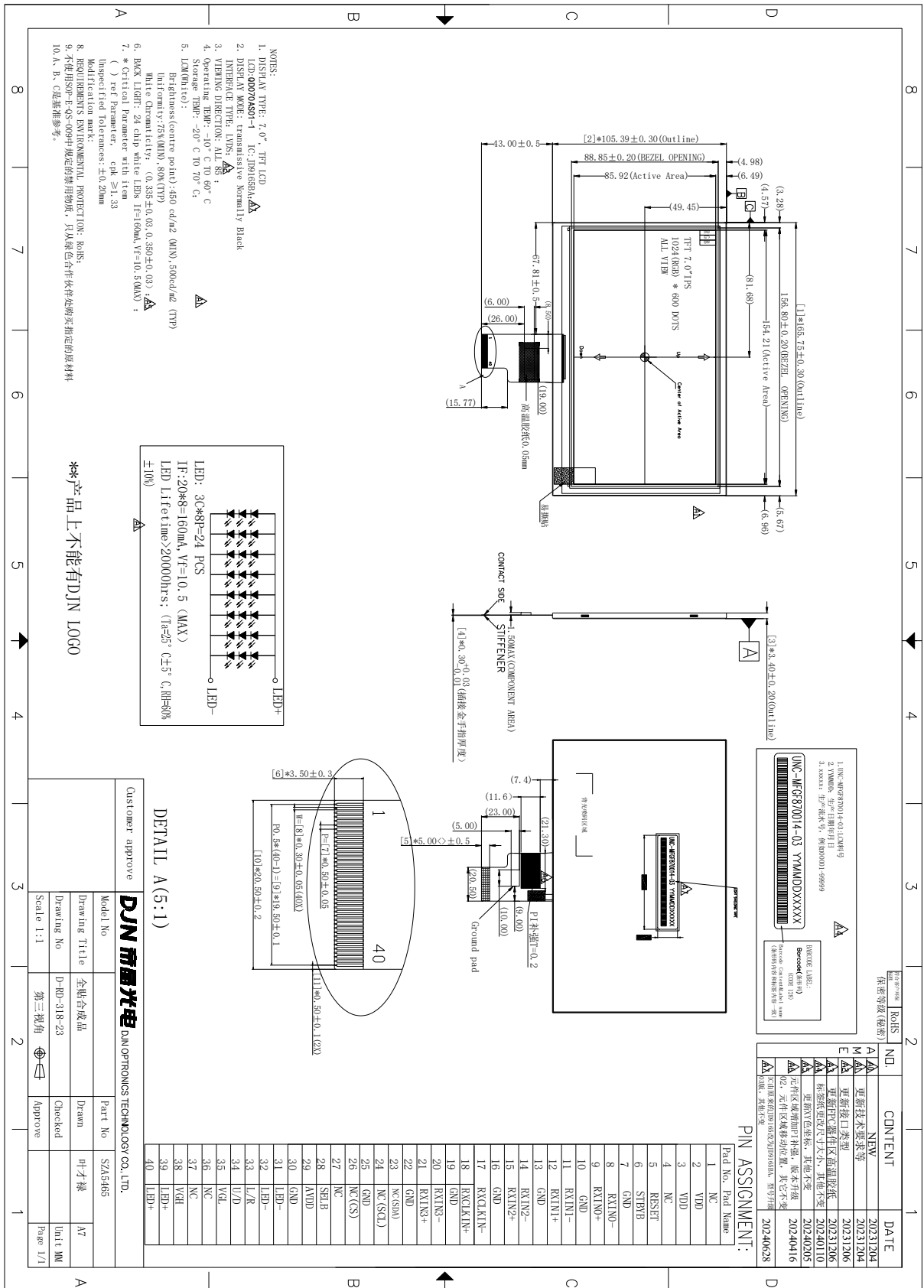
目录

1. GENERAL INFORMATION 基本描述	4
2. MODULE OUTLINE DRAWING 产品结构图.....	5
3. INTERFACE DESCRIPTION 接口定义	6
4. SCHEMATIC DIAGRAM 原理图.....	8
5. BACKLIGHT CHARACTERISTICS 背光电气特性	9
6. ABSOLUTE MAXIMUM RATINGS 极限参数	10
7. ELECTRICAL CHARACTERISTICS 模块电气特性	10
8. OPTICAL CHAYACTERISTICS 光学特性.....	10
9. TIMING SEQUENCE CHARACTERICS 时序特征.....	14
10. INSPECTION SPECIFICATIONS 品质检验标准.....	16
11. RELIABILITY TEST CONDITIONS 可靠性测试条件(参照客户标准).....	19
12. RoHS TEST REPORT RoHS 测试标准.....	22
13. PRECAUTIONS FOR USING LCD MODULES 模组使用注意事项	23
14. PACKING SPCIFICATION 包装规格	26
15. SPECIAL REMAKS 注意事项.....	28
16. APPEBDIX 附录	29

1. GENERAL INFORMATION 基本描述

Item 项目	Contents 内容	Unit 单位
LCD Type LCD 类型	a-Si TFT active matrix	-
Number of Dots 点阵	1024(H)*600(V)	Pixel
Outline dimensions 外形尺寸	165.75*105.39*3.4	mm
Active area 有效区域	154.2144 (H)*85.92(V)	mm ²
Pixel pitch 像素	150.6(H) x 143.2(V)	μ m
LCD Display Frame Rate LCD 显示刷新率	60Hz	-
Module size 模组尺寸	7.0	inch
Viewing direction 视角方向	ALL 85/85/85/85 (TYP)	O'clock
Backlight type 背光类型	24 (S3P8)	LED
LCD Driver IC LCD 驱动 IC	JD9165BA	-
Interface type 接口类型	LVDS	-
Display Operating Mode 显示工作模式	Normally Black	-
LCM Input voltage 模组输入电压	AVDD=11V, VDD=3.3V, VGH= 20V VGL=-7V	V
All material of MODULE and process measure up to ROHS、HF、REACH		

2. MODULE OUTLINE DRAWING 产品结构图



3. INTERFACE DESCRIPTION 接口定义

Pin No 接口序号	Symbol 符号	Description 描述
1	NC	No connection
2	VDD	Power Voltage for digital circuit
3	VDD	Power Voltage for digital circuit
4	NC	No connection
5	RESET	Global reset pin
6	STBYB	Standby mode, Normally pulled high STBYB = "1", normal operation STBYB = "0", timing controller, source driver will turn off, all output are High-Z
7	GND	Ground
8	RXIN0-	- LVDS differential data input
9	RXIN0+	+ LVDS differential data input
10	GND	Ground
11	RXIN1-	- LVDS differential data input
12	RXIN1+	+ LVDS differential data input
13	GND	Ground
14	RXIN2-	- LVDS differential data input
15	RXIN2+	+ LVDS differential data input
16	GND	Ground
17	RXCLKIN-	- LVDS differential clock input
18	RXCLKIN+	+ LVDS differential clock input
19	GND	Ground
20	RXIN3-	- LVDS differential data input
21	RXIN3+	+ LVDS differential data input
22	GND	Ground
23	NC(SDA)	Serial interface address and data input/output for SPI interface. This pin should be open for customer.

24	NC(SCL)	Serial interface clock input for SPI interface. This pin should be open for customer.
25	GND	Ground
26	NC(CS)	Serial Interface chip enable signal for SPI interface. SPI_CSB=0: Selected (Accessible). SPI_CSB=1: Not selected (Inaccessible). This pin should be open for customer.
27	NC	No connection
28	SELB	6bit/8bit mode selection SELB = "1", 8bit mode SELB = "0", 6bit mode
29	AVDD	Power for Analog Circuit
30	GND	Ground
31	LED-	LED Cathode
32	LED-	LED Cathode
33	L/R	Horizontal inversion
34	U/D	Vertical inversion
35	VGL	Gate off Voltage
36	NC	No connection
37	NC	No connection
38	VGH	Gate ON Voltage
39	VLED+	LED Anode
40	VLED+	LED Anode

4. SCHEMATIC DIAGRAM 原理图



5. BACKLIGHT CHARACTERISTICS 背光电气特性

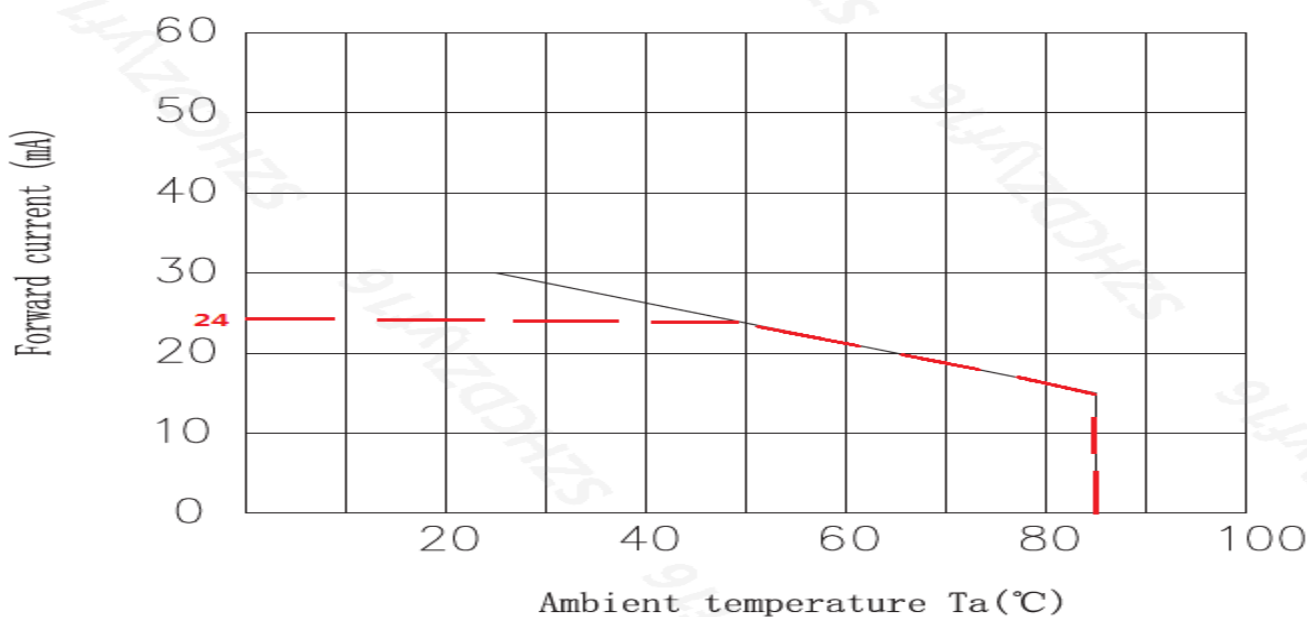
Item 项目	Symbol 符号	Min 最小值	Typ 中间值	Max 最大值	Unit 单位	Condition 条件
LED voltage	VLED	8.4	9.3	10.5	V	Single Serial
LED current	ILED		20*8		mA	Single Serial
Number of LED LED 灯数	-	24			Piece (颗)	-
Connection mode 连接类型	S/P	S3P8			-	-
Life time	Min. 20000Hrs (When the LED luminous intensity attenuation to 50% at the beginning of the luminous intensity of time)					1. Ta=25±5 °C, RH=60%±10%; If=20mA/LED 2.No other interference, Such as Current, Voltage suddenly rise, Electrostaticshock, etc

(Ta= 25°C, GND=0V)

5.1 LED Backlight Absolute Maximum Ratings(Ta=25°C)

Item	Symbol	Conditions	Min	Max	Unit
Absolute maximum forward current	Ifm	-	-	192	MA
Peak forward current	Ifp	1 msec plus, 1/10 duty cycle	-	384	MA
Reverse voltage	Vr	-	-	15	V
Power dissipation	Pa	-	-	1344	mW

Forward current derating curve
vs. ambient temperature



6. ABSOLUTE MAXIMUM RATINGS 极限参数

Parameter 参数	Symbol 符号	Min 最小值	Max 最大值	Unit 单位
Supply voltage for logic	VDD	-0.3	+3.96	V
AVDD voltage	AVDD	-0.3	+12	V
VGH voltage	VGH	-0.3	VGL+32V	V
VGL voltage	VGL	VGH-32V	0.3	V
Operating temperature	TOP	-10	+60	°C
Storage temperature	TST	-20	+70	°C

7. ELECTRICAL CHARACTERISTICS 模块电气特性

Parameter 参数	Symbol 符号	Min 最小值	Typ 中间值	Max 最大值	Unit 单位	Note 备注
Supply power voltage	VDD	2.8	3.3	3.6	V	
AVDD voltage	AVDD	9	11	12	V	
VGH voltage	VGH	19.5	20	20.5	V	
VGL voltage	VGL	-6.5	-7	-7.5	V	
Low level input voltage	VIL	GND	-	0.2xVDD	V	
High level input voltage	VIH	0.8xVDD	-	VDD	V	
Low level output voltage	VOL	GND	-	0.1xVDD	V	
High level output voltage	VOH	0.9xVDD	-	VDD	V	

8. OPTICAL CHAYACTERISTICS 光学特性

Item	Symbol	Condition	Min	Typ	Max	Unit	Remark	Note
Response time	Tr+Tf	$\Theta=0^\circ$ $\varnothing=0^\circ$ $T_a=25^\circ\text{C}$	-	30	40	ms	FIG1	1
Luminance (LCM)	WHITE	$\Theta=0^\circ$ $\varnothing=0^\circ$ $T_a=25^\circ\text{C}$	450	500	-	nits	FIG2	2
Contrast ratio	Cr	$\Theta=0^\circ$ $\varnothing=0^\circ$ $T_a=25^\circ\text{C}$	-	1000	-	-	FIG2	2
Color gamut CIE1931	S(%)	CIE1931	-	50	-	%	FIG2	2
CIE (X,Y) Chromaticity CIE1931	White(X)	$\Theta=0^\circ$ $\varnothing=0^\circ$ $T_a=25^\circ\text{C}$	0.305	0.335	0.365	-	FIG2	6
	White(Y)		0.320	0.350	0.380	-		
	Red(X)		0.576	0.606	0.636	-		
	Red(Y)		0.335	0.365	0.395	-		
	Green(X)		0.330	0.360	0.390	-		
	Green(Y)		0.555	0.585	0.615	-		

	Blue(X)		0.126	0.156	0.186	-		
	Blue(Y)		0.090	0.120	0.150	-		
Luminance uniformity	WHITE	$\Theta=0^\circ$ $\varnothing=0^\circ$ $T_a=25^\circ\text{C}$	75	80	-	%	FIG2	3
Viewing angle	Θ_{x+}	$CR \geq 10$ $T_a=25^\circ\text{C}$	80	85	-	deg	FIG3	4
	Θ_{x-}		80	85	-			
	Θ_{y+}		80	85	-			
	Θ_{y-}		80	85	-			
Flicker	flicker	60HZ 1+2dot pattern	-	-	-30	dB	-	-
Gamma	W	间隔 4gray, G16~G240	2	2.2	2.4	-	-	-
	W	间隔 4gray, G0~G16, G240~G255	1.9	2.2	2.5	-	-	-

Note1.Response time is the time required for the display to transition from White to black(Rise Time, T_r)and from black to white(Decay Time, T_f).For additional information see FIG1...

备注 1. 响应时间是 T_r (上升时间) 与 T_f (下降时间) 的和, T_r 指显示黑色画面转为显示白色画面需要时间, T_f 指显示白色画面转为显示黑色画面需要时间, 详见 FIG1.。

Note2.contrast Ratio(CR) is defined mathematically by the following formula ,For more information see FIG2.

Contrast Ratio(CR)=Average Surface Luminance with all white pixels/ Average Surface Luminance with all black pixels

备注 2. 对比度是由以下公式计算所得。详见 FIG2.

对比度=显示白色画面时平均表面亮度 ($P_1, P_2, \dots$)/显示黑色画面时平均表面亮度 ($P_1, P_2, \dots$)

Note3.The uniformity in surface luminance(WHITE) is determined by measuring luminance at each test position,and then dividing the maximum luminance of all white pixels by minimum luminance of all white pixels,For more information seeFIG2.

WHITE=Minimum Surface Luminance with all white pixels($P_1, P_2, \dots$)/Maximum Surface Luminance with all white pixels($P_1, P_2, \dots$)

备注 3. 均匀度是在显示白色画面时, 测试 P_1 到 P_{25} 的亮度, 然后再用 25 个点亮度的最小值除以最大值。详见 FIG2.。

均匀度=白色画面下表面亮度最小值 ($P_1, P_2, \dots$)/白色画面下表面亮度最大值 ($P_1, P_2, \dots$)

Note4.Viewing angle is the angel at which contrast ratio is greater than a specific value.For TET module,the specific value of contrast ratio is 10.For monochrome and color stn module,the specific value of contrast ratio is2.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 LCD surface.For more information see FIG3

备注 4. 视角指对比度大于等于一个特定值时的可视范围, 对 TFT 屏, 对比对特定值为 10, 对黑白屏 CSTN 屏, 对比度特定值为 2, 视角由横轴 (X 轴), 竖轴 (Y 轴) 同 Z 轴 (垂直与 LCD 表面) 之间的夹角来定义, 详见 FIG3.。

Note5. Surface luminance is the LCD surface luminance with all white pixels,For more information see FIG2.

LV=Average Surface Luminance with all white pixels(P1,P2,.....)

备注 5. 表面亮度是在显示白色画面时，测试的亮度值，详见 FIG2.

Lv=平均的表面亮度 (P1, P2,)

Note6.CIE(X,Y)chromaticity is the Center point value.For more information see FIG2.

备注 6. 选择中心点，分别测试 X, Y 值，详见 FIG2.。

Note7.For Viewing angle and response time testing,the testing date is base on Autronic-Melchers' s ConScope.Series instruments.For contrast ratio,Surface Luminance,Luminance uniformity and CIE,the testing date is base on CA310 photo detector.

备注 7. 视角和响应时间，测试数据基于 Autronil Melchers' s Conoscope 系列，而对比度，表面亮度，均匀度 CIE 坐标，测试数据基于 CA310 photo detector。

Note8.For TN type TFT transmissive module,Gray scale reverse occurs in the direction of panel viewing angle

备注 8. TN 型 TFT 全透产品，在视角方向会发生灰度反转。

FIG1. The response time is defined as the time interval

between the 10% and 90% amplitudes.

响应时间定义为时间间隔在 10%和 90%振幅之间。

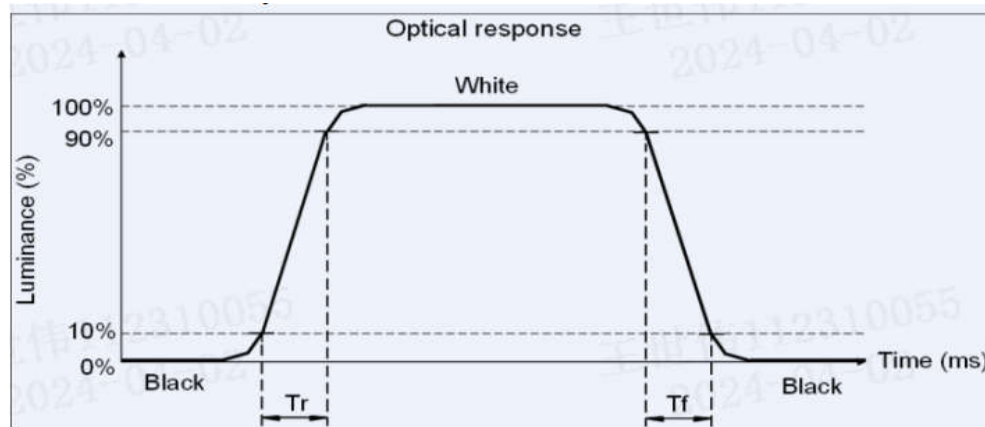
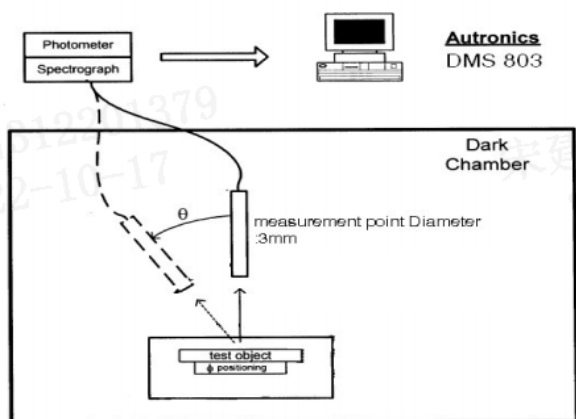


FIG1. Measuring method for Contrast ratio,surface luminance,Luminance uniformity,CIE(X,Y)chromaticity.

对比度，表面亮度，均匀度，CIE 坐标测试方法

Measurement Set-Up:

The LCD module should be stabilized at a given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



测试点位置图

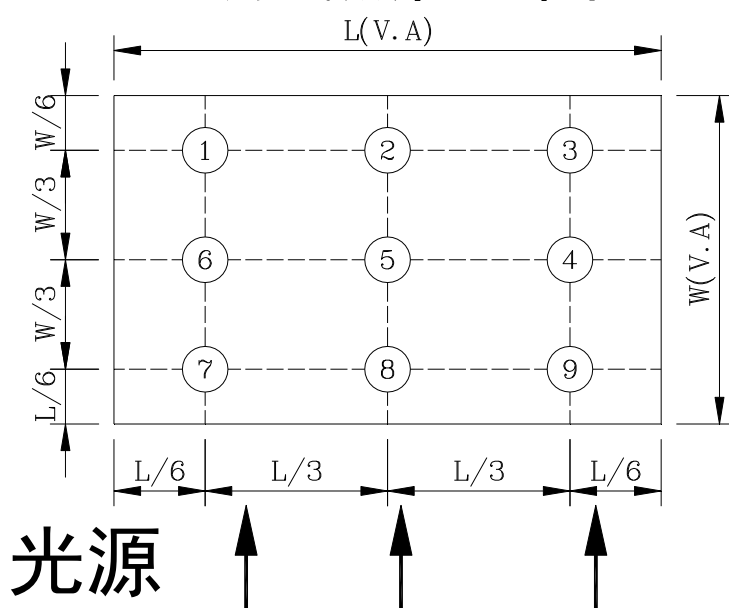
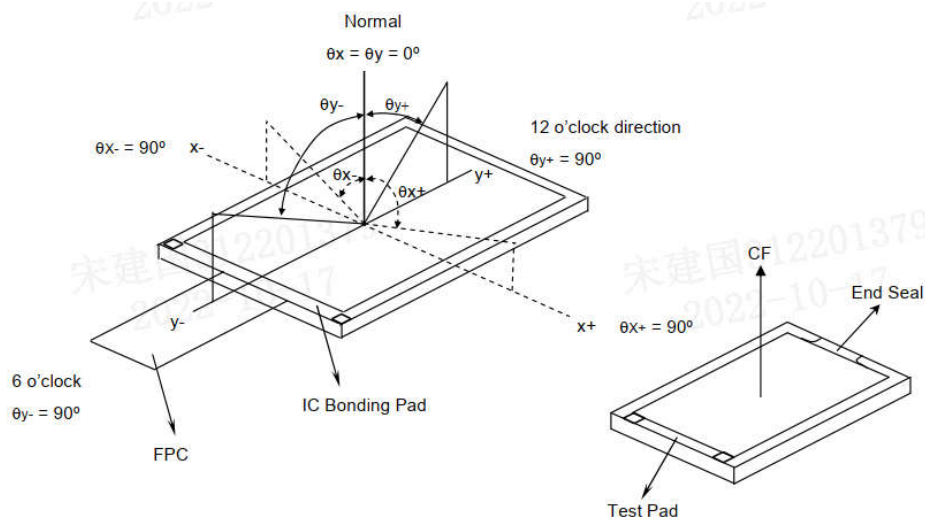


FIG 2 9点均匀性测试点位

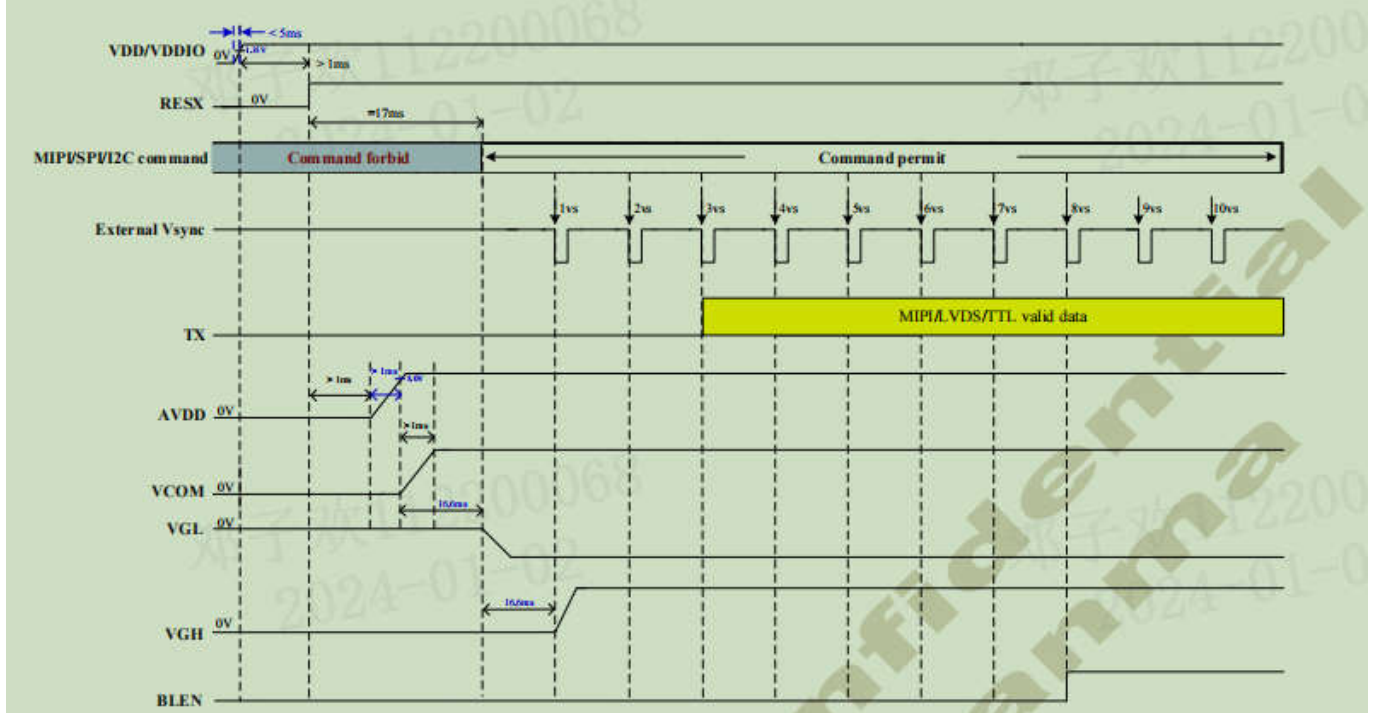
FIG3 The definition of viewing angle
视角定义



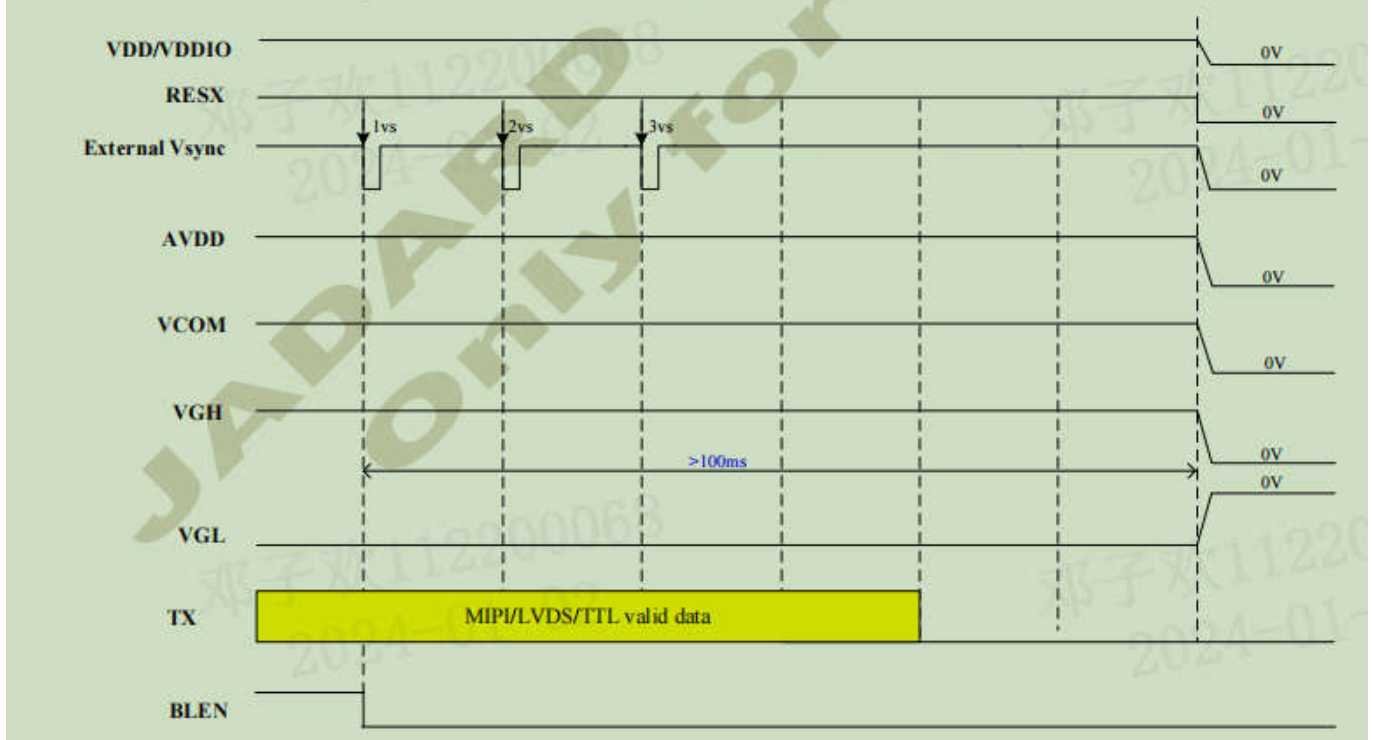
9. TIMING SEQUENCE CHARACTERICS 时序特征

9.1 Power On/Off Sequence (电源开/关时序)

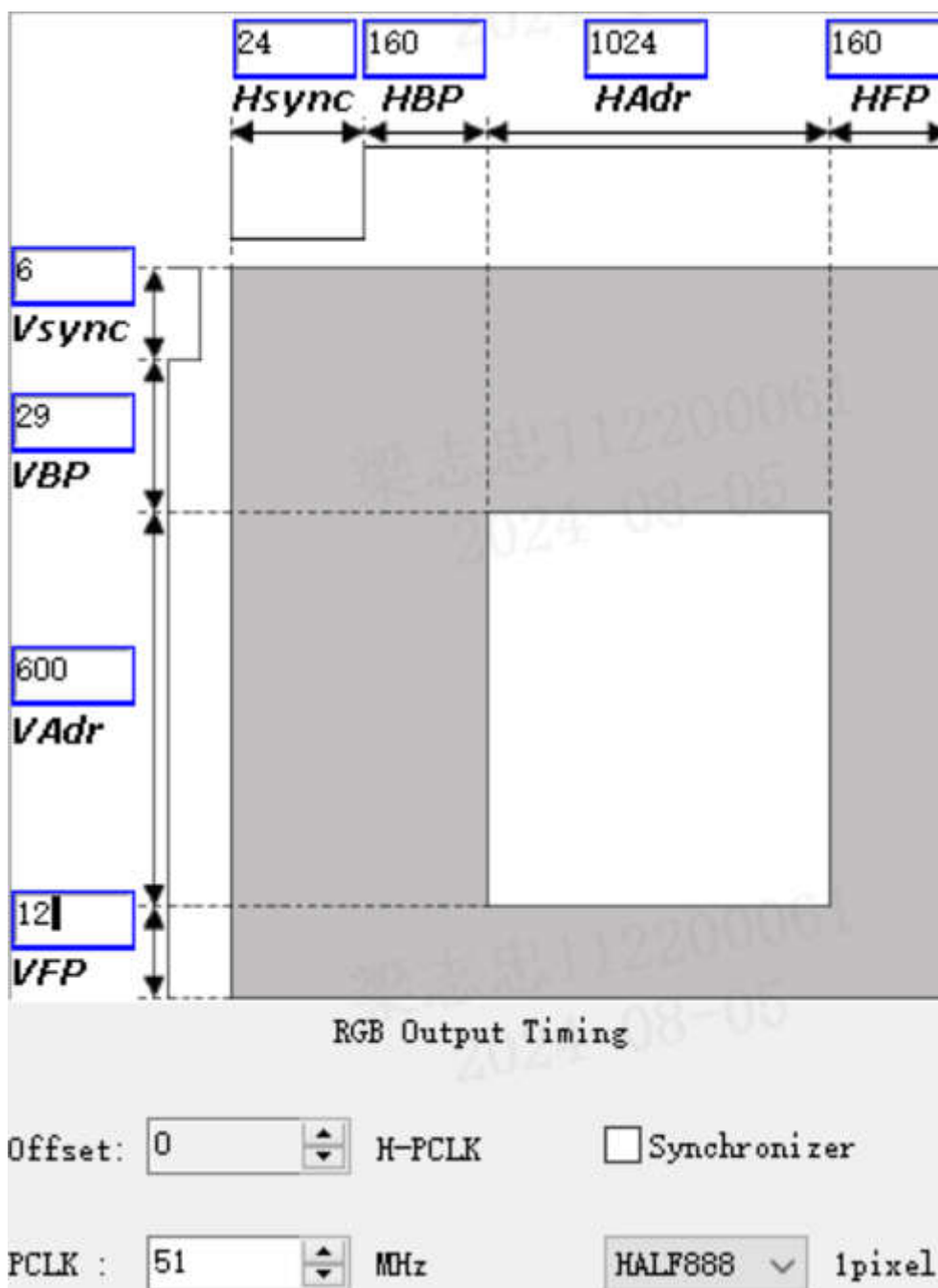
5.1 Power On Sequence



5.2 Power Off Sequence



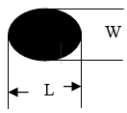
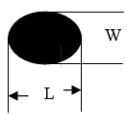
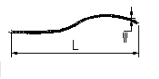
9.2 LVDS timing characteristic

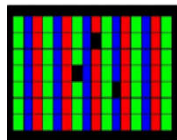
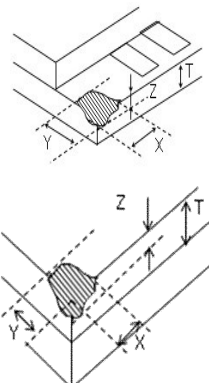
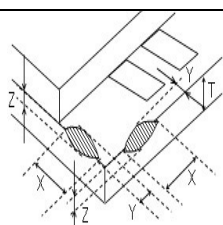
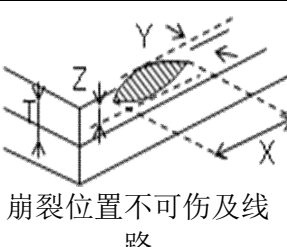


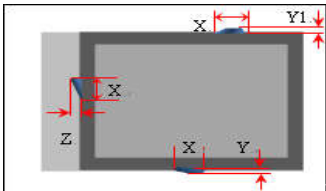
NOTE: This section is only for reference, Details please refer to the IC specification:JD9165BA.

备注：本节仅供参考, 详细信息请参阅 IC 规格书 JD9165BA

10. INSPECTION SPECIFICATIONS 品质检验标准

不良项目	判定标准		A 区			缺点类别
点状缺陷	 (黑白点)	$D \leq 0.2\text{mm}$	N&DS 不计，			轻缺
		$0.2\text{mm} < D \leq 0.5\text{mm}$	$N \leq 3$ 两点之间的距离 $\geq 10\text{mm}$			
		$D > 0.5\text{mm}$	0			
	 (凹凸点)	$D \leq 0.2\text{mm}$	N&DS 不计，			
		$0.2\text{mm} < D \leq 0.3\text{mm}$	$N \leq 3$ 两点之间的距离 $\geq 10\text{m}$			
		$0.2\text{mm} < D \leq 0.5\text{mm}$	$N \leq 1$			
		$D > 0.5\text{mm}$	0			
	不良项目	判定标准		A 区	B 区	
线状缺陷	 L: 长度 W: 宽度 不良间距需 $\geq 5\text{mm}$	$W \leq 0.05\text{mm}$, $L \leq 10\text{mm}$	2 条	3 条	不计	轻缺
		$0.05\text{mm} \leq W \leq 0.08\text{mm}$, $L \leq 10\text{mm}$	2 条	3 条	不计	轻缺
		$0.08\text{mm} \leq W \leq 0.1\text{mm}$, $L \leq 15\text{mm}$	2 条	2 条	不计	轻缺
		$0.1\text{mm} \leq W \leq 0.2\text{mm}$, $L > 15\text{mm}$	0	0	不计	轻缺
		硬划痕	不允许			重缺
	1、 $D = (L+W) / 2$ 单位: mm， 2、A 区: 显示区。B 区: 油墨区。C 区: 产品背面； 3. 点状: 点与点之间的间距 $\geq 5\text{mm}$ ，整个屏幕点缺陷数 ≤ 5 个。线与线之间距离在 5mm 以上，整个屏幕线条缺陷数 ≤ 4 条。 4. $W > 0.2\text{mm}$ 按点状缺陷标准；					
亮点		单一点		2	轻缺	
		2 连续亮点		0		

暗点		单一点		3		
		2 连续暗点		0		
备注： 1、 单一点：单个 Pixel 2、 连续点：相连 2 个 Pixel 3、 亮点总数不可超过 2 个，暗点总数不可超过 3 个 4、 点不良间距需≥5mm						
Mura	斑点、不均	ND5%遮盖				轻缺
LCD 角破损 (端子&非端子部)	 崩裂位置不可伤及线路	长度 X	宽度 Y	高度 Z	允许数	轻缺
		$X \leq 2.0$	$Y \leq 2.0$	$Z \leq T$	2	
		$2.0 < X \leq 3.0$	$2.0 < Y \leq 3.0$	$Z \leq T$	1	
		$X > 3$	$Y > 3$	$Z \leq T$	0	
LCD 边破损 (端子位)		1. 长度 $X \leq 5.0$ 宽度 $Y \leq 1.0$ 2. 崩裂位置不可伤及 ITO 线路、不可影响 bonding				轻缺
LCD 边破损 (非端子部)	 崩裂位置不可伤及线路	长度 X	宽度 Y	高度 Z	允许数	轻缺
		$X \leq 7.0$	$Y \leq 0.5$	$Z \leq T/2$	2	
		$X \leq 7.0$	$0.5 < Y \leq 0.8$	$Z \leq T$	1	
		$X > 7.0$	$Y > 0.8$		0	

玻璃凸缘		1、X 长度不计，Y、Y1、Z 凸出宽度按照图纸尺寸测量； 2、不得影响组装；	轻缺
LCD 裂纹		1: 内裂发生不可。 2: 外裂修正以玻璃破损规格判定, 但不能有可清除的玻璃屑附着。	重缺

不良项目		判定标准	缺点类别
FPC 类不良	FPC 折痕	死折不允许	轻缺
	FPC 破裂	NG	重缺
	FPC 开路及短路	NG	重缺
	FPC 元器件假焊	NG	重缺
	FPC 元器件偏移及短路	NG	重缺
	FPC 元器件少件或多件	NG	重缺
TP&CG 不良	白点、刮刺伤、异物	依点线规格判定	轻缺
BL 不良	BL 不亮	NG	重缺
	BL 死灯	NG	重缺
	BL 刮伤	按线状缺陷判定	轻缺
	BL 异物	按点状或线状缺陷判定	轻缺
LCD 不良	LCD 漏液	NG	重缺
功能不良	不显	NG	重缺
	乱显	NG	重缺
	大电流	NG	重缺
	横缺	NG	重缺
	竖缺	NG	重缺
	十字线缺	NG	重缺
包装不良	包装数量不符	NG	重缺
	包装不符	NG	轻缺

Note: 品质标准如有异议, 请以品质窗口信息为准。

11. RELIABILITY TEST CONDITIONS 可靠性测试条件(参照客户标准)

No.	实验项目	实验条件	判定基准
1	初期测定	使用厂家治具及 Limno 治具来确认来料产品的显示。	- 不可以有外观异常（根据规格书标准） - 不可有显示异常 - 亮度, 颜色要满足规格书的规格值。
2	高温动作	动作 60℃, 16Hr 保存后, 使用 LIMNO 的治具在槽内进行显示确认。	- 槽内确认及试验后确认(槽外确认)无显示异常 - 试验后无外观异常(根据规格书标准)
3	低温动作	动作-10℃, 16Hr 保存后, 使用 LIMNO 的治具在槽内进行显示确认。	- 槽内确认及试验后确认(槽外确认)无显示异常 - 试验后无外观异常(根据规格书标准)
4	高温保存	保存 70℃, 240Hr 保存。	- 试验后确认(槽外确认)无显示异常 - 试验后无外观异常(根据规格书标准)
5	低温保存	保存-20℃, 240Hr 保存。	- 试验后确认(槽外确认)无显示异常 - 试验后无外观异常(根据规格书标准)
6	恒温保存	保存温湿度 60℃, 90%RH, 240Hr 保存。	- 试验后确认(槽外确认)无显示异常 - 试验后无外观异常(根据规格书标准)
7	高温高湿保存	60℃, 90%RH, 240Hr 保存 TTF: 1000Hr 保存, 只做参考, 不做判定。	试验后确认无显示异常。 *试验后的外观异常不问
8	热冲击①	保存温度 70℃ 保存温度 -20℃, 各 30min。循环 100 次	- 试验后确认(槽外确认)无显示异常 - 试验后无外观异常(根据规格书标准)
9	热冲击②	70℃、40℃各 30min 100cycle . 各 30min,	试验后确认无显示异常。 *试验后的外观异常不问
10	高温持续通电	动作温度 60℃, 240Hr 持续通电。 使用产品实机治具, 并实施 test pattam 点亮。	- 试验后确认(槽外确认)无显示异常 - 试验后无外观异常(根据规格书标准) 24Hr, 120Hr, 240Hr 通电后, 实施槽内显示确认

11	低温持续通电	动作温度-10℃, 240Hr 持续通电。 使用产品实机治具, 并实施 test pattam 点亮。	• 试验后确认 (槽外确认) 无显示异常 • 试验后无外观异常 (根据规格书标准) 24Hr, 120Hr, 240Hr 通电后, 实施槽内显示确认
12	恒温连续通电	动作温度 60℃, 90%RH, 240Hr 持续通电。 使用产品实机治具, 并实施 test pattam 点亮。	• 试验后确认 (槽外确认) 无显示异常 • 试验后无外观异常 (根据规格书标准) 24Hr, 120Hr, 240Hr 通电后, 实施槽内显示确认
13	振动	振动频率 10-55Hz, 全振幅 1.5mm, 扫描速度 1oct/min X • Y • Z 方向各 2hr . *部品用治具固定试验	• 试验后确认 (槽外确认) 无显示异常 • 试验后无外观异常 (根据规格书标准)
14	跌落试验	冲击加速度 100G, 作用时间 6ms, $\pm X \therefore \pm Y \cdot \pm Z$ 各 3 回。 共计 18 回印加 . *部品用治具固定试验	• 试验后确认 (槽外确认) 无显示异常 • 试验后无外观异常 (根据规格书标准)
15	PCT	PANEL: 121℃、2 气压, 湿度不饱和 100%RH, 20hr 保存 COG FOG: 110℃~85%RH 8H	5Hr 试验后确认显示无 异常。 *试验后的外观异常不问。 *试验后 2Hr, 5Hr, 10Hr, 20Hr 确认显示 (5Hr 以后为实际确认)
16	残影	25° C, chessboard 7*5. change to L127 gray pattern. Check point: 30min (release 2s) ND 8% invisible 1hours (release 10s) ND 8%invisible 6hours (release 10min) ND8% invisible	30min change to L127 gray pattern(release 2s) ND 8% invisible is OK, otherwise that is NG 1hours change to L127 gray pattern(release 10s) ND 8% invisible is OK, otherwise that is NG 6hours change to L127 gray pattern(release 10min) ND 8% invisible invisible is OK, otherwise that is NG

17	ESD	测试条件 Conditions: 150PF/330Ω 接触放电 Contact: ±4KV 空气放电 Air : ±8KV 常规防静电级别说明: A 级: 试验前后及过程中, 试样一直保持 正常工作状态, 无任何功能异常。 B 级: 试样因受静电脉冲干扰, 可能会出 现屏闪、缺画、花屏、TP 失效(限 TP 产 品) 等异常, 能自动恢复。 C 级: 试样受静电脉冲干扰出现屏闪、缺 画、花屏、TP 失效(限 TP 产品) 等异 常, 需手动复位或者重启等操作才能恢复。 D 级: 试样出现功能异常, 并造成永久性 损坏, 无法通过用户操作恢复。	合格标准: C 级
----	-----	--	-----------

部件名称	型号规格	供应商	数量	单位	备注
TVS	LES8D8D12CT5G SOD882 0.5	LRC	2	pcs	T3 T4
	LES8D8D24CT5G SOD882 0.5		1	pcs	T5
	LES8D8D5.0CAT5G SOD882 0.5		2	pcs	T1 T2

Note: The rest of the test items are executed according to the customer's standard
 注: 其余测试项目按客户标准执行, 如有异议, 请参阅客户文件.

12. RoHS TEST REPORT RoHS 测试标准

Tested Item(s) 测试项目	Measured Equipment(s) 测量设备	Report Limit 限定值	Content 内容
Lead(Pb) 铅	XRF	Organic materials< 100PPM 有机材料<100PPM Inorganic materials< 700PPM 无机材料<700PPM	N.D.
Mercury(Hg) 汞	XRF	<700PPM	N.D.
Cadmium(Cd) 镉	XRF	<70PPM	N.D.
Hexavalent Chromium(Cr(VI)) 六价铬	XRF	<700PPM	N.D.
Polybrominated Biphenyls(PBBS) 多溴联苯	XRF	<700PPM	N.D.
Polybrominated Diphenyl Ethers(PBDES) 多溴二苯醚	XRF	<700PPM	N.D.

Note:-N.D.=Not Detected (<report limit)

-mg/kg=ppm=parts per million

13. PRECAUTIONS FOR USING LCD MODULES 模组使用注意事项

1. Handling precautions 使用注意事项

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

显示屏由玻璃和偏光片组成，由于玻璃是脆的，使用过程中要特别注意边缘区，请防止跌落或震动，不能机械碰撞。

1.2 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)

请勿施加过大的压力与显示屏或连接部位，否则会引起色调变化，不要用手接触显示屏，这将弄脏显示区和降低端子之间的绝缘能力，（一些外观是由偏光片决定的）

1.3 The polarizer covering the display surface of the LCD module 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 container before coming in to contact with room temperature air.

覆盖液晶显示模块显示平面的偏光片是软性且易被擦伤，请小心轻拿，请勿用任何硬度大于 HB 铅笔芯的物品（玻璃，镊子等）接触、撞压或摩擦裸露偏光片，不要放置或粘附物体在显示区域上以免留下痕迹，冷凝在表面和端子将会损坏或弄脏偏光片，产品在低温下测试之后，与室温空气接触之前必须在容器内升温。

1.4 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 LCM, 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.

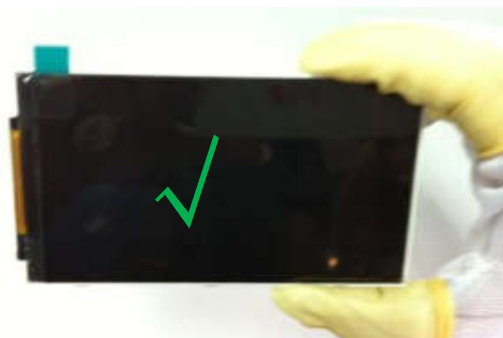
使用工具如电烙铁，要可靠接地，并确保烙铁使用交流电，不要漏电，用电批固定模块时，电批应接地，尽可能降低电动换向器火花产生的电磁波。

2. Handling precaution for LCM 模块操作规范

2.1 LCM is easy to be damaged. Please note below and be careful for handing.

液晶显示模块很容易被损坏，请注意以下并小心操作

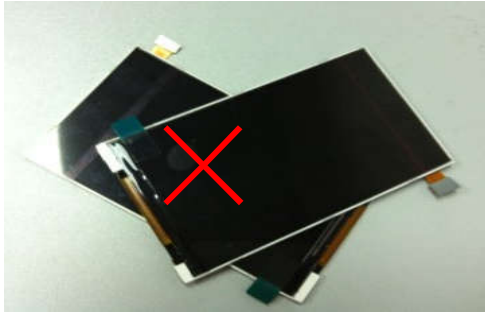
2.2 Correct handing; 正确操作



As above picture, Please handle with anti-static gloves around LCM edges.

像上面的图片，请戴防静电手套，并拿模块边缘。

2.3 Incorrect handing 错误操作



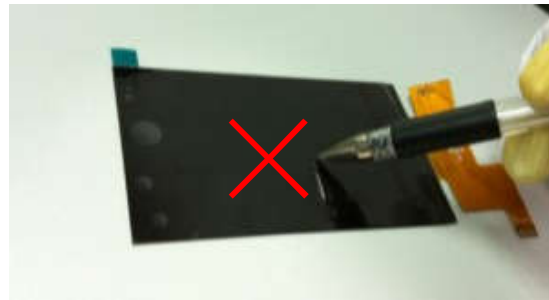
Please don't stack LCM
不要把模块叠在一起



Please don't hold the surface
请不要拿着面板的表面



don't hold the surface of IC
请不要拿着 IC 的表面



Please don't operate with sharp stick such as pens
请不要用尖锐的物体来操作，例如用笔尖

Please

2.4 Input logic voltage before apply analog high voltage such as LCD driving voltage when power on. Remove analog high voltage before logic when power off the module. Input each signal after the positive/negative voltage becomes stable.

开机时，先开逻辑电压，再接通模拟电压，如显示屏驱动电压。关机时，先断开模拟电压，再关逻辑电压，正负电源都稳定后再送控制信号。

2.5 If the LCD modules have been operating for a long time showing the same display patters,the display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. A normal operating status can be regained 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，也会出现轻微的对比度不均，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。

2.6 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. 模块在操作和存储规范范围内使用，高温高湿可能会引起偏振退化，气泡，偏光片脱落等问题。

3. Storage Precautions 储存注意事项

3.1 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：

3.2 Store them in sealed polyethylene bag. If properly sealed, there is no need for the desiccant 使用聚乙烯密袋封，如果密封得当，不需要干燥剂。

3.3 Store them in a dark place. Do not expose to sunlight or fluorescent light, keep the temperature between 0~35°C, and keep the relative humidity between 40% RH and 60% RH.

避光保存，避免直接暴晒在太阳光或黄光灯下，保持温度在 0~35℃之间，保持相对湿度在 40%RH 和 60% RH 之间。

3.4 The polarizer surface should not come in contact with any other objects(We advise you 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（建议存放在货运防静电包装中

4. Transportation Precautions 运输注意事项

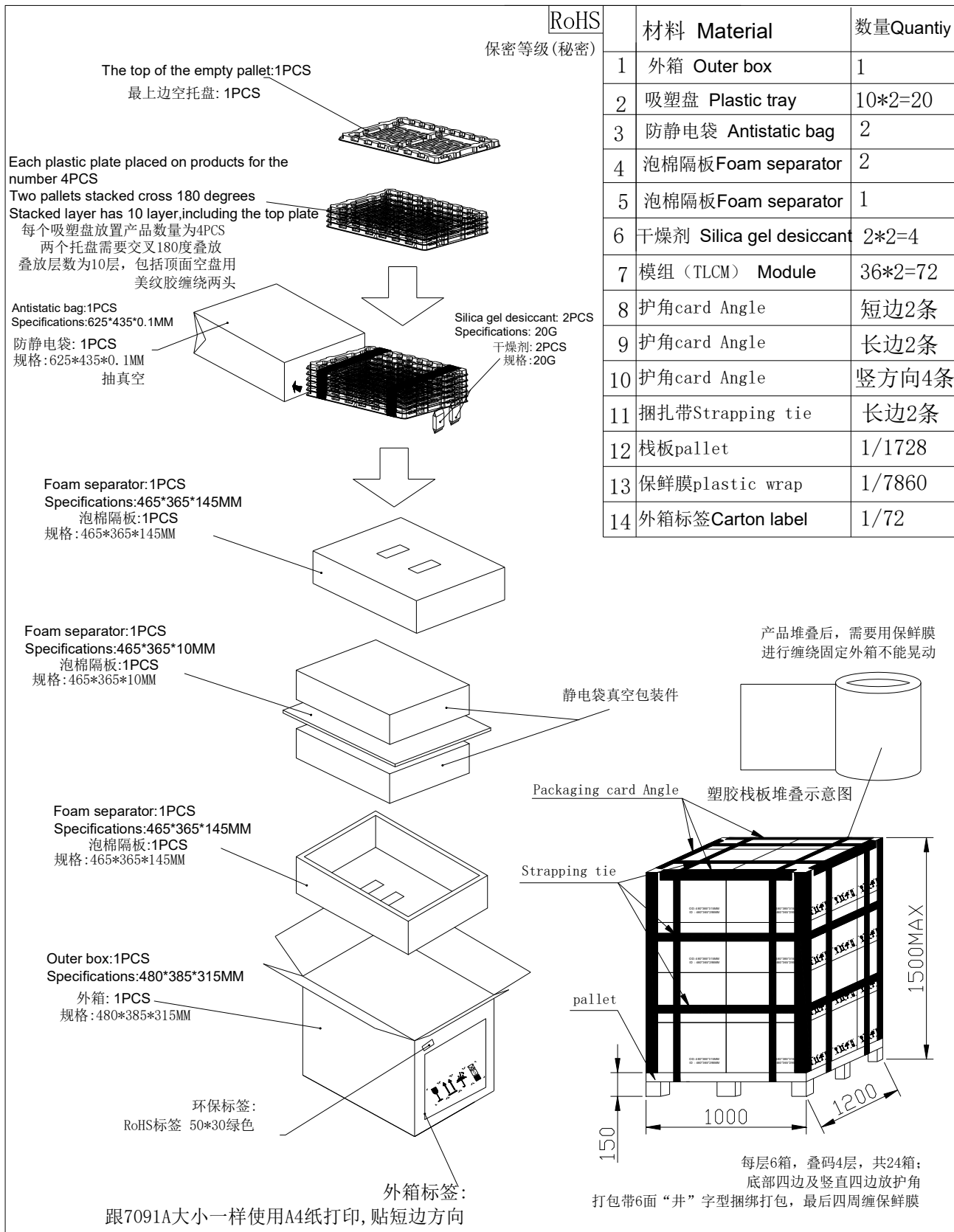
4.1 During shipment, please handle with care. The packaging bag can not be broken, step on trap. Packing Carton layer height can not be over two meters .

装运过程要轻拿轻放，不能出现包装袋破损，塌陷，卡通箱叠层高度不能超过两米。

4.2 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.

运输过程要注意有防水和防潮措施，产品不能淋水，产品乙烯密封袋不可拆封。

RoHS 吸(秘密) ant: 2PCS OG PCS OG		材料 Material	数量Quantity
	1	外箱 Outer box	1
	2	吸塑盘 Plastic tray	10*2=20
	3	防静电袋 Antistatic bag	2
	4	泡棉隔板Foam separator	2
	5	泡棉隔板Foam separator	1
	6	干燥剂 Silica gel desiccant	2*2=4
	7	模组（TLCM） Module	36*2=72
	8	护角card Angle	短边2条
	9	护角card Angle	长边2条
	10	护角card Angle	竖方向4条
	11	捆扎带Strapping tie	长边2条
	12	栈板pallet	1/1728
	13	保鲜膜plastic wrap	1/7860
14	外箱标签Carton label	1/72	



8

7

6

5

4

3

2

1

D

C

B

A

NO.

CONTENT

DATE

NEW

客户型号升级版本

客户型号升级版本

20231222

20240528

20240709

标签内容说明:

Part No.	UNC-MFGF870014-03	模组型号 固定
Qty.	72 PCS	产品数量: 例如 72PCS
P/O No.		空着 (订单编号)
Carton		空着 (箱号)
Gross Weight	XXXX KG	产品重量: 例如 9.25KG
Customer P/N	2RT4T42A03500	固定 (客户型号)

标签使用A4纸打印(不能手写), 粘贴(背面用双面胶)于外箱箱唛之上。

实物照片:

Customer approve

DJN 帝晶光电

DJN OPTRONICS TECHNOLOGY CO., LTD.

Model No

包装

Part No

90-07040-7134A

Drawing Title

外箱标签

Drawn

叶才禄

A2

Drawing No

D-RD-374-23

Checked

覃东浩

Unit MM

Scale 1:1

第三视角

Approve

金飞

Page 1/1

8

7

6

5

4

3

2

1

P/N: 90-07040-7134A

version:A10

R&D-RD-002-B

Page 27 of 34

15. SPECIAL REMAKS 注意事项

1. The above specifications are the binding criteria for DJN Technology's outgoing quality inspection.
以上规格描述为帝晶的品质出货标准
2. The customer is kindly requested to inform DJN Technology as soon as possible on any questions, remarks, and disagreements regarding these specifications.
对于规格中的任何问题或存在疑问，客户可随时向帝晶公司进行咨询。
3. DJN is not responsible for damage to its products due to neglect of the precautions as described in the previous chapter.
如果不按照规格书要求进行操作而损坏产品的，帝晶不承担责任。
4. About the limited warranty unless special agreement between DJN and customer DJN will replace or repair any of its products that are found to be functionally defective when inspected in accordance with DJN acceptance standards for a period of one year from data of shipments.
除帝晶跟客户签定协议外，对确认为属于产品本身功能性缺陷的，在帝晶可接受范围内可进行退换或维修，帝晶保质期为从出货日期起一年内有效

16. APPEBDIX 附录

初始化代码信息

Set_SPI(8,9);

```
//////////30H-1date//////////  
Write_LCD_REG(0x0000,0x0030);  
Write_LCD_REG(0x0000,0x0100);//00
```

```
//////////F7H-4date//////////  
Write_LCD_REG(0x0000,0x00F7);  
Write_LCD_REG(0x0000,0x0149);//49  
Write_LCD_REG(0x0000,0x0161);//61  
Write_LCD_REG(0x0000,0x0102);//02  
Write_LCD_REG(0x0000,0x0100);//00
```

```
//////////30H-1date//////////  
Write_LCD_REG(0x0000,0x0030);  
Write_LCD_REG(0x0000,0x0101);//01  
//////////04H-1date//////////  
Write_LCD_REG(0x0000,0x0004);  
Write_LCD_REG(0x0000,0x0100);//00
```

```
//////////05H-1date//////////  
Write_LCD_REG(0x0000,0x0005);  
Write_LCD_REG(0x0000,0x0180);//80
```

```
//////////BIST//////////  
//Write_LCD_REG(0x0000,0x0005);  
//Write_LCD_REG(0x0000,0x0101);  
//Write_LCD_REG(0x0000,0x0006);  
//Write_LCD_REG(0x0000,0x0140);
```

```
//////////06H-1date//////////  
Write_LCD_REG(0x0000,0x0006);  
Write_LCD_REG(0x0000,0x0100);//00
```

```
//////////08H-1date//////////  
Write_LCD_REG(0x0000,0x0008);  
Write_LCD_REG(0x0000,0x0180);//80
```

```
//////////0BH-1date//////////  
Write_LCD_REG(0x0000,0x000B);  
Write_LCD_REG(0x0000,0x0110);//10
```

```
//////////17H-1date//////////  
Write_LCD_REG(0x0000,0x0017);  
Write_LCD_REG(0x0000,0x0100);//00
```

```
//////////1FH-1date//////////  
Write_LCD_REG(0x0000,0x001F);  
Write_LCD_REG(0x0000,0x0105);//05
```

```
//////////23H-1date//////////  
Write_LCD_REG(0x0000,0x0023);  
Write_LCD_REG(0x0000,0x0100);//00
```

```

//////////25H-1date//////////
Write_LCD_REG(0x0000,0x0025);
Write_LCD_REG(0x0000,0x0119);//19

```

```

//////////28H-1date//////////
Write_LCD_REG(0x0000,0x0028);
Write_LCD_REG(0x0000,0x0118);//18

```

```

//////////29H-1date//////////
Write_LCD_REG(0x0000,0x0029);
Write_LCD_REG(0x0000,0x0104);//04

```

```

//////////2AH-1date//////////
Write_LCD_REG(0x0000,0x002A);
Write_LCD_REG(0x0000,0x0101);//01

```

```

//////////2BH-1date//////////
Write_LCD_REG(0x0000,0x002B);
Write_LCD_REG(0x0000,0x0104);//04

```

```

//////////2CH-1date//////////
Write_LCD_REG(0x0000,0x002C);
Write_LCD_REG(0x0000,0x0101);//01

```

```

//////////30H-1date//////////
Write_LCD_REG(0x0000,0x0030);
Write_LCD_REG(0x0000,0x0102);//02

```

```

//////////01H-1date//////////
Write_LCD_REG(0x0000,0x0001);
Write_LCD_REG(0x0000,0x0122);//22

```

```

//////////03H-1date//////////
Write_LCD_REG(0x0000,0x0003);
Write_LCD_REG(0x0000,0x0112);//12

```

```

//////////04H-1date//////////
Write_LCD_REG(0x0000,0x0004);
Write_LCD_REG(0x0000,0x0100);//00

```

```

//////////05H-1date//////////
Write_LCD_REG(0x0000,0x0005);
Write_LCD_REG(0x0000,0x0164);//64

```

```

//////////0AH-1date//////////
Write_LCD_REG(0x0000,0x000A);
Write_LCD_REG(0x0000,0x0108);//08

```

```

//////////0BH-11date//////////
Write_LCD_REG(0x0000,0x000B);
Write_LCD_REG(0x0000,0x010A);//0A
Write_LCD_REG(0x0000,0x011A);//1A
Write_LCD_REG(0x0000,0x010B);//0B
Write_LCD_REG(0x0000,0x010D);//0D
Write_LCD_REG(0x0000,0x010D);//0D

```

```
Write_LCD_REG(0x0000,0x0111); //11
Write_LCD_REG(0x0000,0x0110); //10
Write_LCD_REG(0x0000,0x0106); //06
Write_LCD_REG(0x0000,0x0108); //08
Write_LCD_REG(0x0000,0x011F); //1F
Write_LCD_REG(0x0000,0x011D); //1D
```

```
//////////0CH-11date//////////
Write_LCD_REG(0x0000,0x000C);
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
```

```
//////////0DH-11date//////////
Write_LCD_REG(0x0000,0x000D);
Write_LCD_REG(0x0000,0x0116); //16
Write_LCD_REG(0x0000,0x011B); //1B
Write_LCD_REG(0x0000,0x010B); //0B
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x0111); //11
Write_LCD_REG(0x0000,0x0110); //10
Write_LCD_REG(0x0000,0x0107); //07
Write_LCD_REG(0x0000,0x0109); //09
Write_LCD_REG(0x0000,0x011E); //1E
Write_LCD_REG(0x0000,0x011C); //1C
```

```
//////////0EH-11date//////////
Write_LCD_REG(0x0000,0x000E);
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
```

```
//////////0FH-11date//////////
Write_LCD_REG(0x0000,0x000F);
Write_LCD_REG(0x0000,0x0116); //16
Write_LCD_REG(0x0000,0x011B); //1B
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010B); //0B
Write_LCD_REG(0x0000,0x010D); //0D
```



```
Write_LCD_REG(0x0000,0x0111); //11
Write_LCD_REG(0x0000,0x0110); //10
Write_LCD_REG(0x0000,0x011C); //1C
Write_LCD_REG(0x0000,0x011E); //1E
Write_LCD_REG(0x0000,0x0109); //09
Write_LCD_REG(0x0000,0x0107); //07
```

```
//////////10H-11date//////////
Write_LCD_REG(0x0000,0x0010);
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
```

```
//////////11H-11date//////////
Write_LCD_REG(0x0000,0x0011);
Write_LCD_REG(0x0000,0x010A); //0A
Write_LCD_REG(0x0000,0x011A); //1A
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010B); //0B
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x0111); //11
Write_LCD_REG(0x0000,0x0110); //10
Write_LCD_REG(0x0000,0x011D); //1D
Write_LCD_REG(0x0000,0x011F); //1F
Write_LCD_REG(0x0000,0x0108); //08
Write_LCD_REG(0x0000,0x0106); //06
```

```
//////////12H-11date//////////
Write_LCD_REG(0x0000,0x0012);
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
Write_LCD_REG(0x0000,0x010D); //0D
```

```
//////////14H-4date//////////
Write_LCD_REG(0x0000,0x0014);
Write_LCD_REG(0x0000,0x0100); //00
Write_LCD_REG(0x0000,0x0100); //00
Write_LCD_REG(0x0000,0x0111); //00
Write_LCD_REG(0x0000,0x0111); //00
```

//////////18H-1date//////////

Write_LCD_REG(0x0000,0x0018);
Write_LCD_REG(0x0000,0x0199);//99

//////////30H-1date//////////

Write_LCD_REG(0x0000,0x0030);
Write_LCD_REG(0x0000,0x0106);//06

//////////12H-14date//////////

Write_LCD_REG(0x0000,0x0012);
Write_LCD_REG(0x0000,0x0136);//36
Write_LCD_REG(0x0000,0x012C);//2C
Write_LCD_REG(0x0000,0x012E);//2E
Write_LCD_REG(0x0000,0x013C);//3C
Write_LCD_REG(0x0000,0x0138);//38
Write_LCD_REG(0x0000,0x0135);//35
Write_LCD_REG(0x0000,0x0135);//35
Write_LCD_REG(0x0000,0x0132);//32
Write_LCD_REG(0x0000,0x012E);//2E
Write_LCD_REG(0x0000,0x011D);//1D
Write_LCD_REG(0x0000,0x012B);//2B
Write_LCD_REG(0x0000,0x0121);//21
Write_LCD_REG(0x0000,0x0116);//16
Write_LCD_REG(0x0000,0x0129);//29

//////////13H-14date//////////

Write_LCD_REG(0x0000,0x0013);
Write_LCD_REG(0x0000,0x0136);//36
Write_LCD_REG(0x0000,0x012C);//2C
Write_LCD_REG(0x0000,0x012E);//2E
Write_LCD_REG(0x0000,0x013C);//3C
Write_LCD_REG(0x0000,0x0138);//38
Write_LCD_REG(0x0000,0x0135);//35
Write_LCD_REG(0x0000,0x0135);//35
Write_LCD_REG(0x0000,0x0132);//32
Write_LCD_REG(0x0000,0x012E);//2E
Write_LCD_REG(0x0000,0x011D);//1D
Write_LCD_REG(0x0000,0x012B);//2B
Write_LCD_REG(0x0000,0x0121);//21
Write_LCD_REG(0x0000,0x0116);//16
Write_LCD_REG(0x0000,0x0129);//29

//////////30H-1date//////////

Write_LCD_REG(0x0000,0x0030);
Write_LCD_REG(0x0000,0x0108);//08

//////////05H-1date//////////

Write_LCD_REG(0x0000,0x0005);
Write_LCD_REG(0x0000,0x0101);//01

//////////0CH-1date//////////

Write_LCD_REG(0x0000,0x000C);
Write_LCD_REG(0x0000,0x011A);//1A

//////////0DH-1date//////////

Write_LCD_REG(0x0000,0x000D);

```
Write_LCD_REG(0x0000,0x010E); //0E
```

```
//////////30H-1date//////////  
Write_LCD_REG(0x0000,0x0030);  
Write_LCD_REG(0x0000,0x010A); //0A
```

```
//////////02H-1date//////////  
Write_LCD_REG(0x0000,0x0002);  
Write_LCD_REG(0x0000,0x014F); //4F
```

```
//////////0BH-1date//////////  
Write_LCD_REG(0x0000,0x000B);  
Write_LCD_REG(0x0000,0x0140); //40
```

```
//////////12H-1date//////////  
Write_LCD_REG(0x0000,0x0012);  
Write_LCD_REG(0x0000,0x013E); //3E
```

```
//////////13H-1date//////////  
Write_LCD_REG(0x0000,0x0013);  
Write_LCD_REG(0x0000,0x0178); //78
```

```
//////////30H-1date//////////  
Write_LCD_REG(0x0000,0x0030);  
Write_LCD_REG(0x0000,0x010D); //0D
```

```
//////////0DH-1date//////////  
Write_LCD_REG(0x0000,0x000D);  
Write_LCD_REG(0x0000,0x0104); //04
```

```
//////////10H-1date//////////  
Write_LCD_REG(0x0000,0x0010);  
Write_LCD_REG(0x0000,0x010C); //0C
```

```
//////////11H-1date//////////  
Write_LCD_REG(0x0000,0x0011);  
Write_LCD_REG(0x0000,0x010C); //0C
```

```
//////////12H-1date//////////  
Write_LCD_REG(0x0000,0x0012);  
Write_LCD_REG(0x0000,0x010C); //0C
```

```
//////////13H-1date//////////  
Write_LCD_REG(0x0000,0x0013);  
Write_LCD_REG(0x0000,0x010C); //0C
```

```
//Write_LCD_REG(0x0000,0x0030);  
//Write_LCD_REG(0x0000,0x0100);
```

```
Write_LCD_REG(0x0000,0x0011);  
Write_LCD_REG(0x0000,0x0100);  
Delay(120);
```

```
Write_LCD_REG(0x0000,0x0029);  
Write_LCD_REG(0x0000,0x0100);  
Delay(20);
```