

样品规格承认书

Specification

客户名称(CUSTOMER) : _____

型号名称(LCM CODE (Ver.)) : **ST018A0P-S11 (Ver: 0)**

描述(Description) : **1.8" a-Si TFT 液晶显示屏**

客户确认:
**CUSTOMER
APPROVED:**

APPROVED BY	CHECK BY	PREPARED BY

LCM SPECIFICATION

RECORDS OF REVISION

Date	Rev.	Description	Note	Page
2011/05/26	0	New sample		

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1. SPECIFICATIONS

1.1 Features

Item	Standard Value
Display Type	128(RGB)*160 Dots
LCD Type	a-Si TFT, Positive, Transmissive
Viewing Direction	12 O'clock
Backlight	2-LED White Color
Interface	Serial interface
Controller/driver IC	ILI9163C

1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	46.70 (L) x36.70(W) x 2.80(T)	mm
Viewing Area	36.04(L)X29.03(W)	mm
Active Area	35.04 (L) x28.03(W)	mm
Pixel pitch	0.219 (H) x 0.219 (V)	mm

Note : For detailed information please refer to LCM drawing

1.3 Absolute Maximum Ratings

Item	Symbol	Condition	Min.	Max.	Unit
Power Supply Voltage	V _{DD}	-	-0.3	4.6	V
LCD Driver Supply Voltage	V _{GH-VSS}	-	-0.3	18.5	V
Input voltage	V _{in}		-0.3	4.6	V
Operating Temperature	T _{OP}	-	-20	+70	°C
Storage Temperature.	T _{ST}	-	-30	+80	°C
Storage Humidity	H _D	T _a < 40 °C	-	90	%RH

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1.4 DC Electrical Characteristics

$V_{DD} = 2.4\sim 3.3V, V_{SS} = 0V, T_a = 25^\circ C$

Item	Symbol	Condition	Min.	Type	Max.	Unit
Logic Supply Voltage	V_{DD}	-	2.4	2.8	3.3	V
“H” Input Voltage	V_{IH}	-	$0.8 V_{DD}$	-	V_{DD}	V
“L” Input Voltage	V_{IL}	-	V_{SS}	-	$0.2 V_{DD}$	V
“H” Output Voltage	V_{OH}	-	$0.8V_{DD}$	-	V_{DD}	V
“L” Output Voltage	V_{OL}	-	V_{SS}	-	$0.2 V_{DD}$	V
Supply Current	I_{DD}	$V_{DD} = 2.8V$	-	4	6	mA

1.5 Optical Characteristics

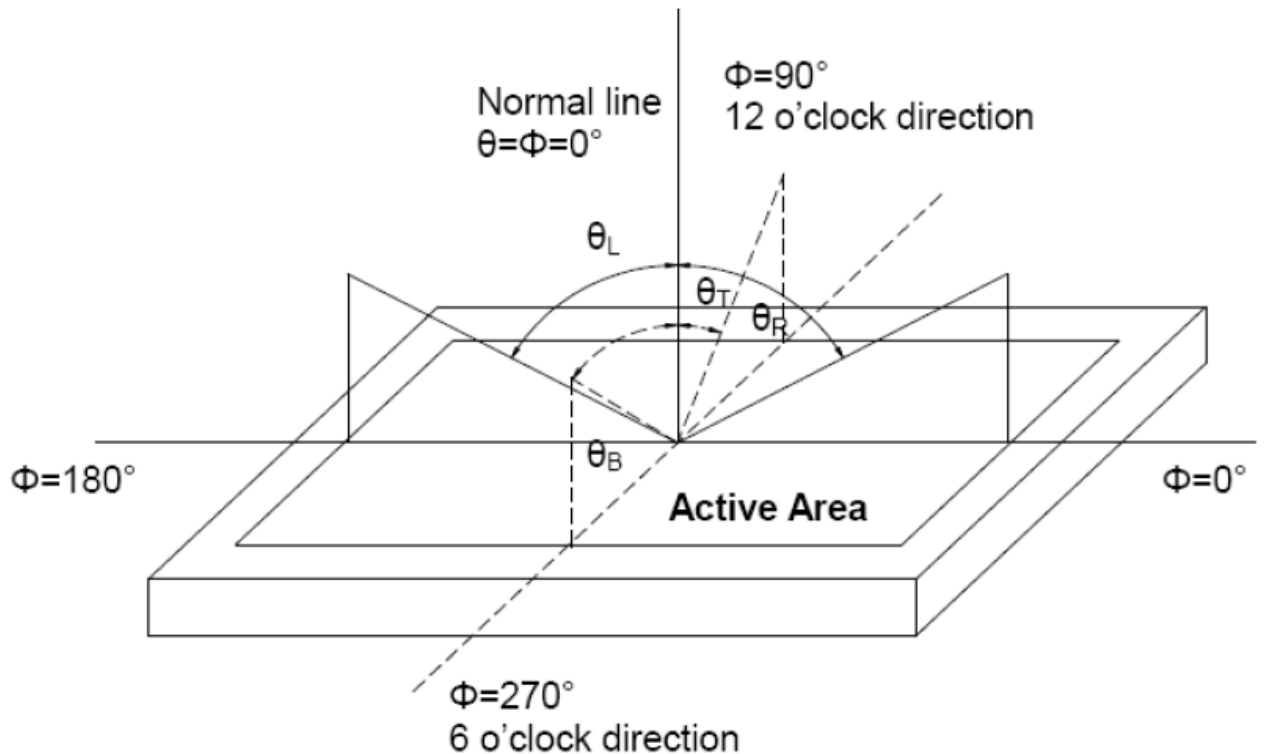
$T_a = 25^\circ C$

Item	Symbol	Conditions	Min.	Typ.	Max.	Reference
View Angle	θT	$C \geq 10, \phi = 0^\circ$	--	45	--	Note 2
	θB		--	45	--	Note 2
	θL		--	45	--	Note 2
	θR		--	20		Note 2
Contrast Ratio	C	$\theta = 0^\circ, \phi = 0^\circ$	--	250	--	--
Response Time	Ton	25°C	--	30ms	--	Note 4
	Toff					
Luminance	B	$\theta = 0^\circ, \phi = 0^\circ$	-	180	-	cd/m ²

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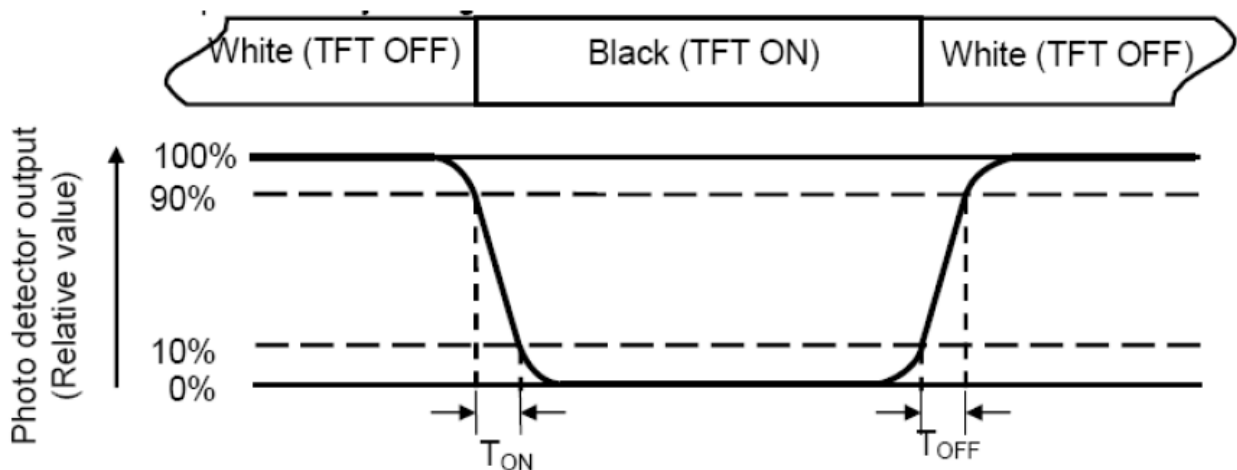
Note 2: Definition of viewing angle range and measurement system.

viewing angle is measured at the center point of the LCD by CONOSCOPE(ergo-80).



Note 4: Definition of Response time

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time (T_{ON}) is the time between photo detector output intensity changed from 90% to 10%. And fall time (T_{OFF}) is the time between photo detector output intensity changed from 10% to 90%.



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1.6 Backlight & LED Characteristics

Maximum Ratings

Item	Symbol	Conditions	Min.	Max.	Unit
Forward Current	IF	Ta =25℃	-	20 (1 LED)	mA
Reverse Voltage	VR	Ta =25℃	-	5	V
Power Dissipation	PO	Ta =25℃	-	320	mW
Operating Temperature	T _{OP}	-	-20	70	℃
Storage Temperature	T _{ST}	-	-30	80	℃
Solder Temp. for 3 Seconds	-	-	-	260	℃

Electrical / Optical Characteristics

VSS = 0V, Ta =25℃

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF	IF= 15mA*2	2.9	3.1	3.3	V
Reverse Current	IR	VR= 5V	-	-	50	uA
Average Brightness (without LCD)	IV	IF= 15mA*2	-	3000	-	cd/m ²
CIE Color Coordinate (without LCD)	X	IF= 15mA*2	0.283	-	0.330	—
	Y		0.276	-	0.328	
Color	WHITE					

*1 This value will be changed while mass production.

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2. MODULE STRUCTURE

2.1 Interface Pin Description

NO	SYMBOL	FUNCTION
1	GND	GROUND
2	GND	GROUND
3	ID	OPEN
4	VSS	GROUND
5	VDDIO	POWER SUPPLY FOR INTERFACE PINS(1.8/2.8V)
6	RESET	Chip reset signal ("L" →Active)
7	RS	Data / Command select signal("L"→ register index; "H"→data)
8	SCL	Serial data clock
9	SDI	Serial input/output pin
10	CS	Chip select signal ("L" →Active)
11	GND	GROUND
12	VDD	POWER SUPPLY CIRCUIT(2.8V)
13	LEDA	BACK LIGHTA
14	LEDK1	BACK LIGHTK1
15	LEDK2	BACK LIGHTK2
16	GND	GROUND

2.2 Timing Characteristics

Please refer to ILI9163C DATASHEET.

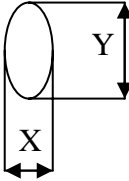
2.3 Display Command

Please refer to ILI9163C DATASHEET.

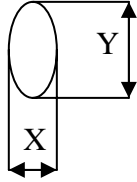
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3. INSPECTION SPECIFICATION

NO.	项目 Item	经验标准 Inspection Standard	判断 Result	备注 Note
1	整体功能 All functional defects	1) 不显示 No display 2) 显示异常 Display abnormally 3) 缺划 (横或竖, 横&竖) Missing vertical, horizontal segment 4) 短路 Short circuit 5) 背光不亮或闪烁 Backlight no lighting, flickering and abnormal lighting.	不允许 Reject	
2	缺失 Missing	少成分 Missing component	不允许 Reject	
3	外观尺寸 Outline dimension	同 CD 图 Overall outline dimension beyond the drawing is not allowed		

NO.	项目 Item	检验标准 Inspection Standard	备注 Note																			
4	清楚的黑白点 Clear Spots	$\phi = (X+Y) / 2$  <p>A: AA 区 (显示区) B: VA 区 (可视区) C: 可视区以外(Out of VA)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">区域 Zone 尺寸 Size</th> <th colspan="3">接受个数 Acceptable Quantity</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>$\phi \leq 0.1\text{mm}$</td> <td colspan="3">Ignore</td> </tr> <tr> <td>$0.1\text{mm} < \phi \leq 0.2\text{mm}$</td> <td>3</td> <td colspan="2" rowspan="3">Ignore</td> </tr> <tr> <td>$0.2\text{mm} < \phi \leq 0.25\text{mm}$</td> <td>2</td> </tr> <tr> <td>$\phi > 0.25\text{mm}$</td> <td>0</td> </tr> </tbody> </table>	区域 Zone 尺寸 Size	接受个数 Acceptable Quantity			A	B	C	$\phi \leq 0.1\text{mm}$	Ignore			$0.1\text{mm} < \phi \leq 0.2\text{mm}$	3	Ignore		$0.2\text{mm} < \phi \leq 0.25\text{mm}$	2	$\phi > 0.25\text{mm}$	0	
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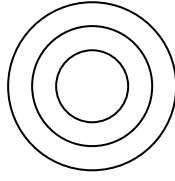
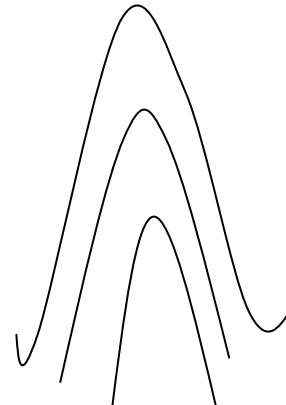
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NO.	项目 Item	检验标准 Inspection Standard	备注 Note																														
5	不明显的黑白点 Dim Spots	$\phi = (X+Y) / 2$ A: AA 区 (显示区) B: VA 区 (可视区) C: 可视区以外(Out of V.A.)																															
																																	
		<table border="1" style="margin: auto;"> <tr> <th rowspan="2" style="width: 30%;">区域 Zone 尺寸 Size</th> <th colspan="3">接受个数 Acceptable Quantit</th> </tr> <tr> <th style="width: 10%;">A</th> <th style="width: 10%;">B</th> <th style="width: 10%;">C</th> </tr> <tr> <td>$\phi \leq 0.3\text{mm}$</td> <td colspan="3">Ignore</td> </tr> <tr> <td>$0.3\text{mm} < \phi \leq 0.6\text{mm}$</td> <td colspan="3">2</td> </tr> <tr> <td>$\phi > 0.6\text{mm}$</td> <td colspan="3">0</td> </tr> </table>		区域 Zone 尺寸 Size	接受个数 Acceptable Quantit			A	B	C	$\phi \leq 0.3\text{mm}$	Ignore			$0.3\text{mm} < \phi \leq 0.6\text{mm}$	2			$\phi > 0.6\text{mm}$	0													
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6	线不良 Line defect	<table border="1" style="margin: auto;"> <tr> <th colspan="2">尺寸 Size (mm)</th> <th colspan="3">接受个数 Acceptable Quantity</th> </tr> <tr> <th style="width: 20%;">L (Length)</th> <th style="width: 20%;">W (width)</th> <th style="width: 10%;">A</th> <th style="width: 10%;">B</th> <th style="width: 10%;">C</th> </tr> <tr> <td>Ignore</td> <td>$W \leq 0.03$</td> <td colspan="3">Ignore</td> </tr> <tr> <td>$L < 5.0$</td> <td>$0.03 < W \leq 0.05$</td> <td colspan="3">2</td> </tr> <tr> <td></td> <td>$0.05 < W$</td> <td colspan="3">以脏污论 Define as spot defect</td> </tr> </table>	尺寸 Size (mm)		接受个数 Acceptable Quantity			L (Length)	W (width)	A	B	C	Ignore	$W \leq 0.03$	Ignore			$L < 5.0$	$0.03 < W \leq 0.05$	2				$0.05 < W$	以脏污论 Define as spot defect								
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7	偏光片刮伤 Polarizer Scratch	<table border="1" style="margin: auto;"> <tr> <th colspan="2">尺寸 Size (mm)</th> <th colspan="3">Acceptable Quantity</th> </tr> <tr> <th style="width: 20%;">L (Length)</th> <th style="width: 20%;">W (width)</th> <th style="width: 10%;">A</th> <th style="width: 10%;">B</th> <th style="width: 10%;">C</th> </tr> <tr> <td>Ignore</td> <td>$W \leq 0.03$</td> <td colspan="3">Ignore</td> </tr> <tr> <td>$L \leq 10$</td> <td>$0.03 < W \leq 0.05$</td> <td colspan="3">2</td> </tr> <tr> <td>$L < 5.0$</td> <td>$0.05 < W \leq 0.08$</td> <td colspan="3">1</td> </tr> <tr> <td></td> <td>$0.08 < W$</td> <td colspan="3">0</td> </tr> </table>	尺寸 Size (mm)		Acceptable Quantity			L (Length)	W (width)	A	B	C	Ignore	$W \leq 0.03$	Ignore			$L \leq 10$	$0.03 < W \leq 0.05$	2			$L < 5.0$	$0.05 < W \leq 0.08$	1				$0.08 < W$	0			
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8	偏光片与玻璃间气泡 Polarize Air bubble	区域 Zone			接受个数 Acceptable Quantity			
		尺寸 Size			A	B	C	
		$\phi \leq 0.2\text{mm}$			Ignore			Ignore
		$0.2\text{mm} < \phi \leq 0.3\text{mm}$			2			
		$0.3\text{mm} < \phi \leq 0.5\text{mm}$			1			
$\phi > 0.5\text{mm}$			0					

牛顿环/干涉纹 Newton Ring

NO.	项目 Item	检验标准 Inspection Standard	备注 Note
9	规则 Inerratic	<p>1. 在整个触摸屏检查区域内（可视区）超过 1/3 范围，不可；When Newton ring dimension is more than 1/3 of sample dimension, it is regarded as a defect.</p> <p>2. 直径$\leq 5\text{mm}$，且在整个触摸屏检查区（可视区）域小于 1/3 范围，不影响透过率及失真；不计 When Newton ring dimension is less than 1/3 of sample dimension is not affect font effect and line distortion under a ceiling fluorescent light, it is acceptable.</p>	
10	不规则 Atactic	<p>1. 在照明环境下牛顿环有影响清晰度和透过率，失真；不可。As long as Newton ring affects font effect and line distortion under a ceiling fluorescent light, it is regarded as a defect.</p> <p>在整个触摸屏检查区域（可视区）内，超过 1/2，不可。$\phi \leq 10\text{mm}$；不计。When $\phi \leq 10\text{mm}$, it is acceptable</p>	

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4. PRECAUTION RELATING PRODUCT HANDLING

4.1 SAFETY

- 4.1.1 If the LCD panel breaks , be careful not to get the liquid crystal to touch your skin.
- 4.1.2 If the liquid crystal touches your skin or clothes , please wash it off immediately by using soap and water.

4.2 HANDLING

- 4.2.1 Avoid any strong mechanical shock which can break the glass.
- 4.2.2 Avoid static electricity which can damage the CMOS LSI—When working with the module, be sure to ground your body and any electrical equipment you may be using.
- 4.2.3 Do not remove the panel or frame from the module.
- 4.2.4 The polarizing plate of the display is very fragile. So , please handle it very carefully, Do not touch, push or rub the exposed polarizing with anything harder than an HB pencil lead (glass , tweezers , etc.)
- 4.2.5 Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the Surface of plate.
- 4.2.6 Do not touch the display area with bare hands , this will stain the display area.
- 4.2.7 Do not use ketonic solvent & aromatic solvent. Use with a soft cloth soaked with A cleaning naphtha solvent.
- 4.2.8 To control temperature and time of soldering is $280 \pm 10^{\circ}\text{C}$ and 3-5 sec.
- 4.2.9 To avoid liquid (include organic solvent) stained on LCM.

4.3 STORAGE

- 4.3.1 Store the panel or module in a dark place where the temperature is $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and the humidity is below 65% RH.
- 4.3.2 Do not place the module near organics solvents or corrosive gases.
- 4.3.3 Do not crush, shake , or jolt the module.

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5. MODULE STRUCTURE

5.1 Counter Drawing

