

样品规格承认书

Specification

客户名称(CUSTOMER) :

型号名称(LCM CODE (Ver.)) : **ST020B6C-T01 (Ver: 0)**

描述(Description) : **2.0" a-Si TFT 液晶显示屏**

客户确认:
**CUSTOMER
APPROVED:**

APPROVED BY	CHECK BY	PREPARED BY

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RECORDS OF REVISION

Date	Rev.	Description	Note	Page
2009/12/01	0	New sample		

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1. SPECIFICATIONS

1.1 Features

Item	Standard Value
Display Type	176(R+G+B) * 220 Dots
LCD Type	a-Si TFT, Positive, Transmissive
Viewing Direction	6 O'clock
Backlight	3 LED White Color
Interface	8080 MPU interface (8 bit bus)
Controller/driver IC	HX8340B

1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	51.4(L) x 38.4(W) x 2.35 (T)	mm
Viewing Area	40.6(L) x 32.68 (W)	mm
Active Area	39.6 (L) x 31.68(W)	mm
Pixel pitch	0.18 (L) x 0.18 (W)	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

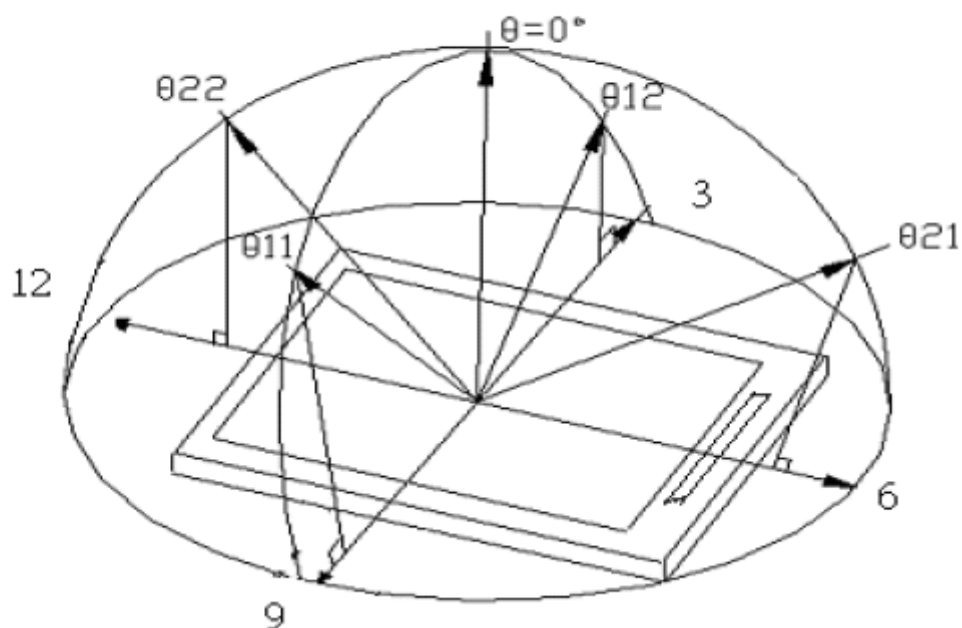
1.5 Optical Characteristics

$T_a = 25^\circ C$

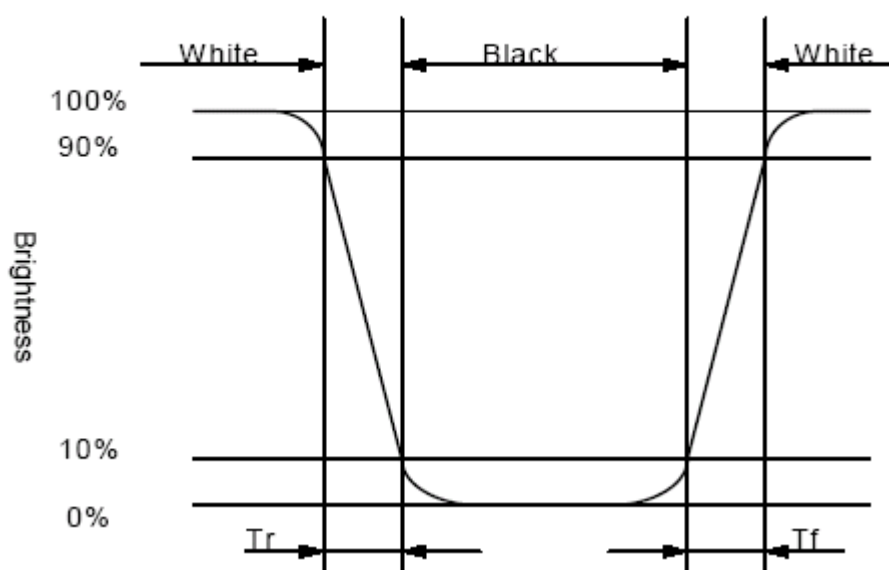
Item	Symbol	Conditions	Min.	Typ.	Max.	Reference
View Angle	θ_{11}, θ_{12}	$C \geq 10, \varnothing = 0^\circ$	--	45	--	Note6-1
	θ_{21}		--	35	--	Note6-1
	θ_{22}		--	15	--	Note6-1
Contrast Ratio	C	$\theta = 0^\circ, \varnothing = 0^\circ$	150	250	-	--
Response Time(rise)	tr	$\theta = 0^\circ, \varnothing = 0^\circ$	-	10ms	20ms	Note6-3
Response Time(fall)	tf	$\theta = 0^\circ, \varnothing = 0^\circ$	-	20ms	30ms	Note6-3
Luminance	B	$\theta = 0^\circ \text{ \& } \varnothing = 0^\circ$	-	180	-	cd/m ²

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Note 6-1 : The definitions of viewing angles



Note 6-3 : The definition of response time :



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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℃	-	198	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℃

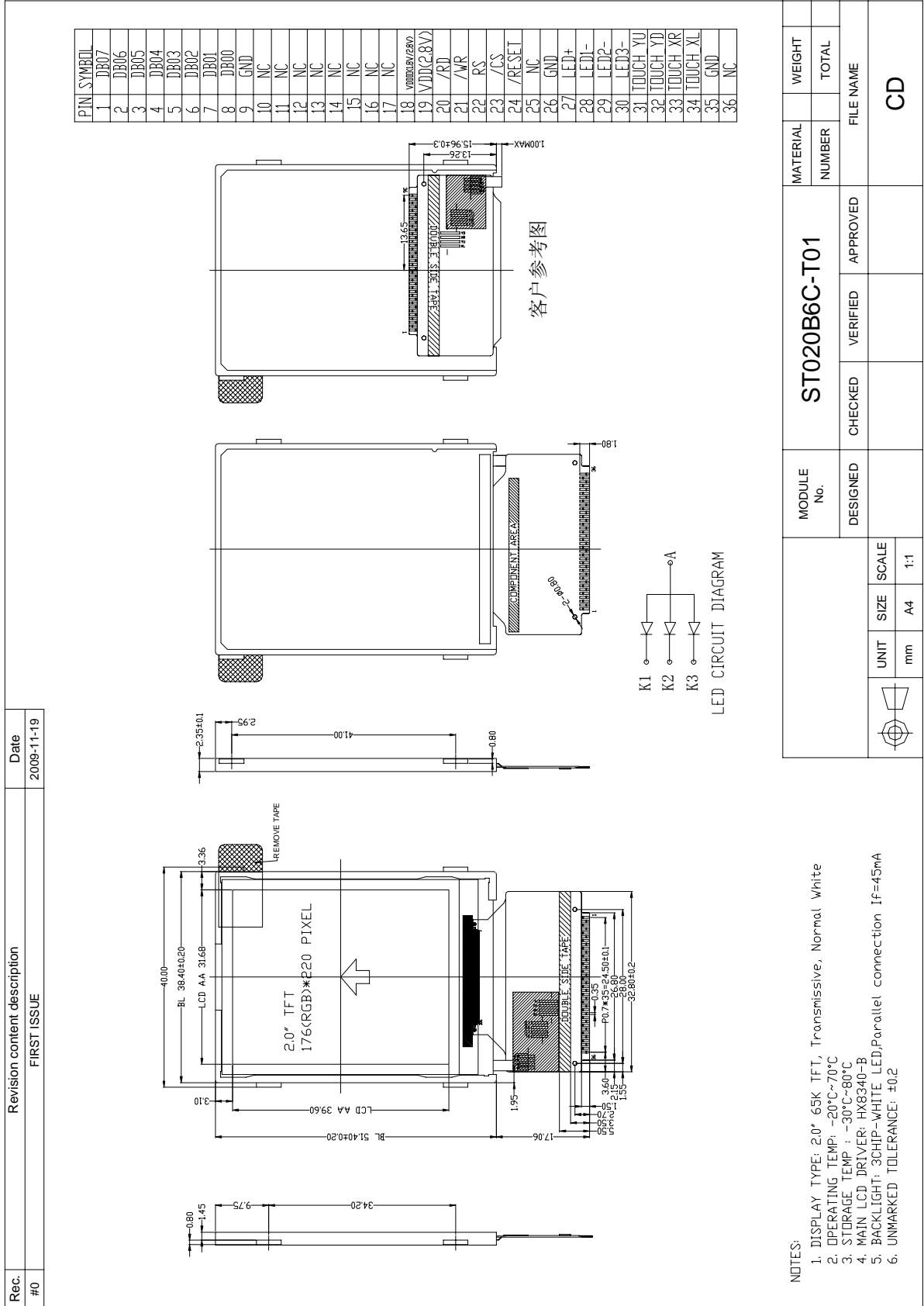
Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF	IF= 15mA*3	2.8	3.3	3.5	V
Reverse Current	IR	VR= 5V	-	-	50	uA
Average Brightness (without LCD)	IV	IF= 15mA*3	3000	-	-	cd/m ²
CIE Color Coordinate (without LCD)	X	IF= 15mA*3	0.260	-	0.310	—
	Y		0.260	-	0.310	
Color	WHITE					

*1 This value will be changed while mass production.

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2. MODULE STRUCTURE

2.1 Counter Drawing



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2.2 Interface Pin Description

NO	SYMBOL	FUNCTION
1~8	DB7~DB0	DATA BUS
9	GND	GROUND
10~17	NC	OPEN
18	VDDIO	POWER SUPPLY FOR INTERFACE PINS
19	VDD	POWER SUPPLY
20	/RD	Read signal ("L" →Active)
21	/WR	Write signal ("L" →Active)
22	RS	Data / Command select signal("L"→ register index; "H"→data)
23	/CS	Chip select signal ("L" →Active)
24	/RESET	Chip reset signal ("L" →Active)
25	NC	OPEN
26	GND	GROUND
27	LED_A	BACK LIGHT +
28	LED_K1	BACK LIGHT -
29	LED_K2	BACK LIGHT -
30	LED_K3	BACK LIGHT -
31	YU	TOUCH PANEL PIN
32	YD	TOUCH PANEL PIN
33	XR	TOUCH PANEL PIN
34	XL	TOUCH PANEL PIN
35	GND	GROUND
36	NC	OPEN

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2.3 Timing Characteristics

Please refer to HX8340B DATASHEET.

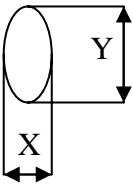
2.4 Display Command

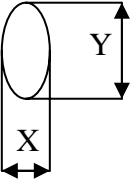
Please refer to HX8340B DATASHEET.

3. INSPECTION SPECIFICATIONN

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		

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NO.	项目 Item	检验标准 Inspection Standard	备注 Note																			
4	清楚的黑白点 Clear Spots	$\phi = (X+Y) / 2$  A: AA 区 (显示区) B: VA 区 (可视区) C: 可视区以外(Out of VA)																				
		<table border="1"> <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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$\phi > 0.25\text{mm}$	0																					

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.)																		
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$\phi > 0.6\text{mm}$	0																			

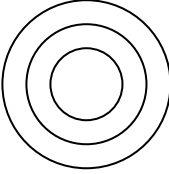
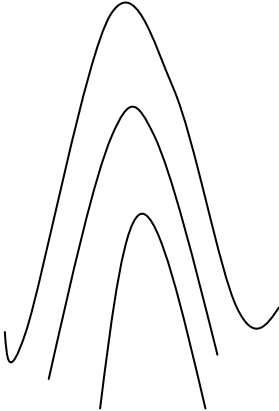
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6	线不良 Line defect	尺寸 Size (mm)		接受个数 Acceptable Quantity		
		L (Length)	W (width)	A	B	C
		Ignore	$W \leq 0.03$	Ignore		
		$L < 5.0$	$0.03 < W \leq 0.05$	2		Ignore
			$0.05 < W$	以脏污论 Define as spot defect		
7	偏光片刮伤 Polarizer Scratch	尺寸 Size (mm)		Acceptable Quantity		
		L (Length)	W (width)	A	B	C
		Ignore	$W \leq 0.03$	Ignore		
		$L \leq 10$	$0.03 < W \leq 0.05$	2		Ignore
		$L < 5.0$	$0.05 < W \leq 0.08$	1		
			$0.08 < W$	0		
8	偏光片与玻璃间气泡 Polarize Air bubble	区域 Zone 尺寸 Size		接受个数 Acceptable Quantity		
				A	B	C
		$\phi \leq 0.2\text{mm}$		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
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9	<p>规则 Inerratic</p>	<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	<p>不规则 Atactic</p>	<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.