PHOENIX DISPLAY INTERNATIONAL, INC.

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SPECIFICATION FOR LCD MODULE

CUSTOMER	
PART NUMBER	PDI035FP-01
DESCRIPTION	3.5" TFT 320 X 480
VERSION	0
ISSUE DATE	03-20-2012

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RECORDS OF REVISION

Date	Rev.	Description	Note	Page
2012/03/20	**0**	**First issue.**		

Contents

1. SPECIFICATIONS

1.1 Features

Item	Standard Value
Display Type	320(R+G+B) * 480 Dots
LCD Type	a-Si TFT, Positive, Transmissive
Viewing Direction	6 O'clock
Backlight	6LED White Color
Interface	8080 MPU interface (16 bit bus)
Controller/driver IC	HX8357C

1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	82.94 (L) ×54.66 (W) ×2.2MAX(T)	mm
Active Area	73.44(L) ×48.96 (W)	mm
Pixel pitch	0.153 (L) × 0.153 (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_{cc}	-	-0.3	4.6	V
LCD Driver Supply Voltage	VGH-VSS	-	-0.3	18.5	V
Input voltage	Vin		-0.3	V_{cc} +0.3	V
Operating Temperature	T_{OP}	-	-20	+70	°C
Storage Temperature.	T_{ST}	-	-30	+80	°C
Storage Humidity	H_D	Ta < 40 °C	-	90	%RH

1.4 DC Electrical Characteristics

VCC = 2.4~3.3V, IOVCC=1.65~3.3V V_{SS} = 0V, Ta = 25°C

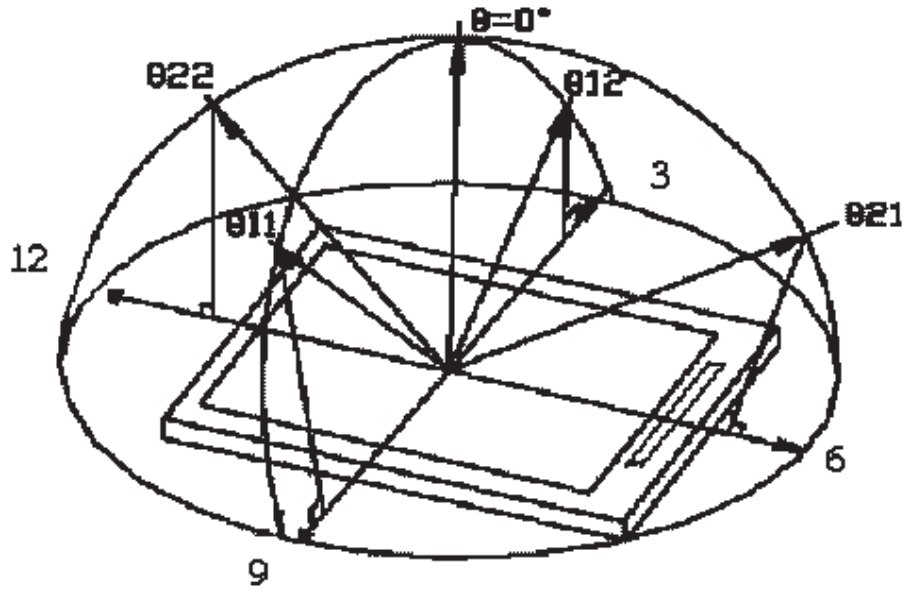
Item	Symbol	Condition	Min.	Type	Max.	Unit
Logic Supply Voltage	IOVCC	-	1.65	2.8	3.3	V
"H" Input Voltage	V_{IH}	-	0.7 IOVCC	-	IOVCC	V
"L" Input Voltage	V_{IL}	-	-0.3	-	0.3IOVCC	V
"H" Output Voltage	V_{OH}	-	0.8 IOVCC	-	-	V
"L" Output Voltage	V_{OL}	-	-	-	0.2IOVCC	V
Supply Current	I	VCC= 2.8V	-	4	6	mA

1.5 Optical Characteristics

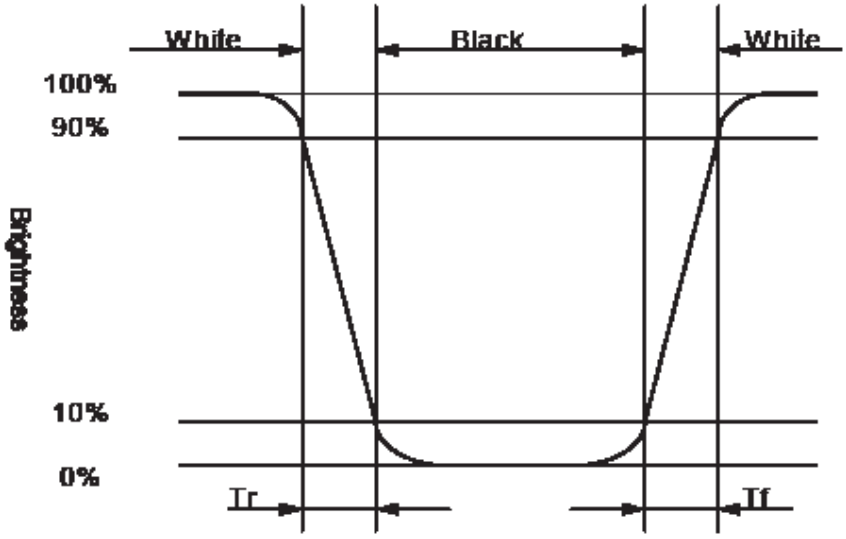
Ta = 25°C

Item	Symbol	Conditions	Min.	Typ.	Max.	Reference
View Angle	θ11, θ12	C≥10,∅=0°	45°	50	--	Note6-1
	θ21		35	35	--	Note6-1
	θ22		10	15	--	Note6-1
Contrast Ratio	C	θ=0°, ∅=0°	-	160	-	--
Response Time(rise)	tr	θ=0°, ∅=0°	-	10ms	20ms	Note6-3
Response Time(fall)	tf	θ=0°, ∅=0°	-	20ms	30ms	Note6-3
Luminance	B	θ =0° § =0°	-	170	-	cd/m²

Note 6-1 : The definitions of viewing angles



Note 6-3 : The definition of response time :



1.6 Backlight & LED Characteristics

Maximum Ratings

Item	Symbol	Conditions	Min.	Max.	Unit
Forward Current	IF	Ta =25℃	-	25(1LED)	mA
Reverse Voltage	VR	Ta =25℃	-	5	V
Power Dissipation	PO	Ta =25℃	-	340	mW
Operating Temperature	T_{OP}	-	-20	70	℃
Storage Temperature	T_{ST}	-	-30	80	℃
Solder Temp. for 3 Seconds	-	-	-	260	℃

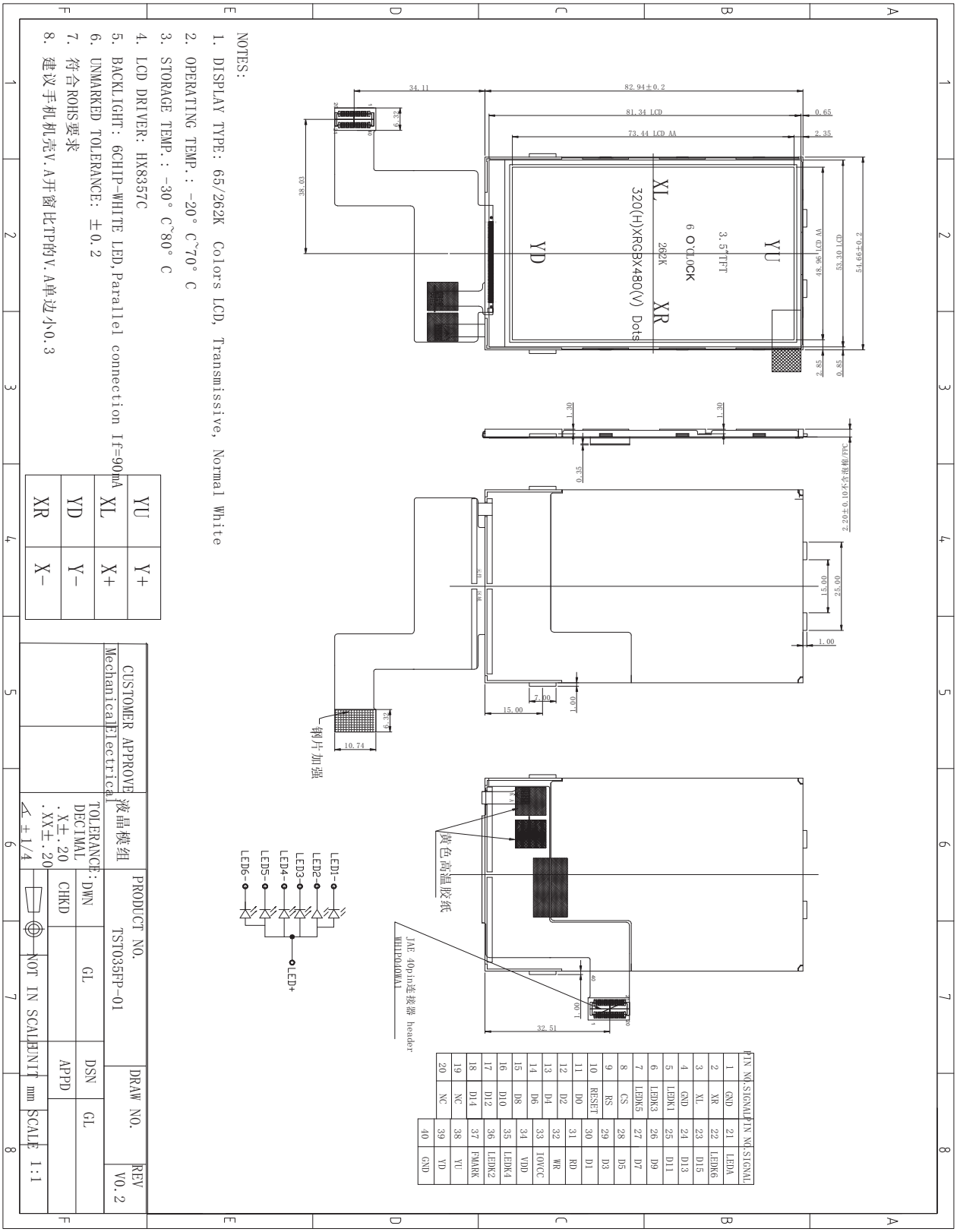
Electrical / Optical Characteristics **VSS = 0V, Ta =25℃**

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF	IF= 15Ma*6	30.	3.2	3.4	V
Reverse Current	IR	VR= 10V	-	-	10	uA
Average Brightness (without LCD)	IV	IF= 15mA*6	2800	3000	-	cd/m^2
CIE Color Coordinate (without LCD)	X	IF= 15mA*6	0.260	-	0.300	—
	Y		0.260	-	0.300	
Color	WHITE					

*1 This value will be changed while mass production.

2. MODULE STRUCTURE

2.1 Counter Drawing



2.2 Interface Pin Description

NO	SYMBOL	FUNCTION

1	**GND**	**GROUND**
2	**XR**	**Touch Panel Pin**
3	**XL**	**Touch Panel Pin**
4	**GND**	**GROUND**
5	**LED-K1**	**LED-K1**
6	**LED-K3**	**LED-K3**
7	**LED-K5**	**LED-K5**
8	**CS**	**Chip select signal (“L” →Active) Chip reset signal (“L” →Active)**
9	**RS**	**Data / Command select signal**
10	RESET	**Chip reset signal (“L” →Active)**
11	**DB0**	**DATA BUS**
12	**DB2**	**DATA BUS**
13	**DB4**	**DATA BUS**
14	**DB6**	**DATA BUS**
15	**DB8**	**DATA BUS**
16	**DB10**	**DATA BUS**
17	**DB12**	**DATA BUS**
18	**DB14**	**DATA BUS**
19	**DB17**	**NC**
20	**DB16**	**NC**
21	**LED-A-**	**LED-A**
22	**LED-K6**	**LED-K6**
23	**DB15**	**LED-A**
24	**DB13**	**DATA BUS**
25	**DB11**	**DATA BUS**
26	**DB9**	**DATA BUS**
27	**DB** 7	**DATA BUS**
28	**DB5**	**DATA BUS**
29	**DB3**	**DATA BUS**
30	**DB1**	**DATA BUS**
31	**RD**	**Read signal (“L” →Active)**
32	**WR**	**Write signal (“L” →Active)**
33	**IOVCC**	**POWER SUPPLY CIRCUIT**

34	**VDD**	**Reset pin.**
35	**LED-K4**	**LED-K4**
36	**LED-K2**	**LED-K2**
37	FMARK	**Tearing effect output**
38	**YU**	**Touch Panel Pin**
39	**YD**	**Touch Panel Pin**
40	**GND**	**GROUND**

2.3 Timing Characteristics

Please refer to HX8357C DATASHEET.

2.4 Display Command

Please refer to HX8357C DATASHEET.

3. INSPECTION SPECIFICATIONN

3.1. 产品的检验要求

3.1.1 检查距离：250±50mm

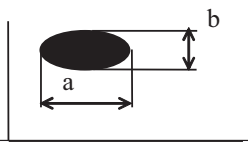
3.1.2 检验环境：万级洁净度，温度：（23±2）℃，湿度：（65±5）%RH

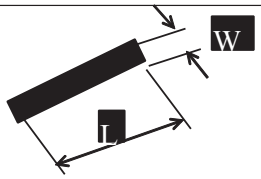
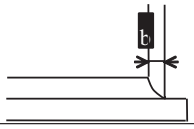
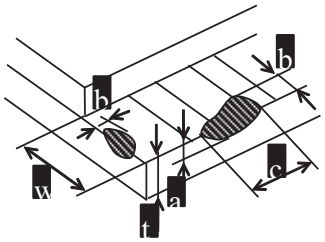
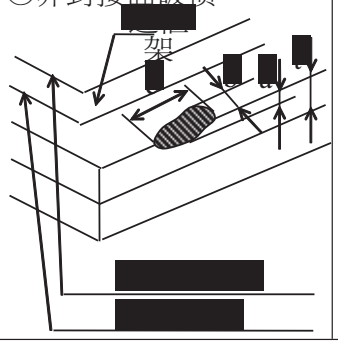
3.2. 不良说明

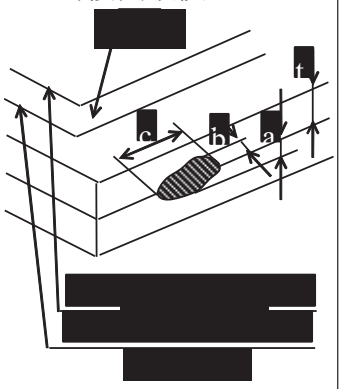
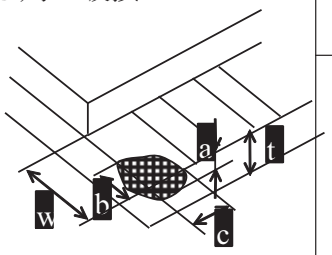
3.2.1 点缺陷说明

名称	特征说明	点不良定义
亮点	目视在黑画面时可见发亮的点且大小不变的点	点不良大小≥单个Pixel的50%判为一个亮暗点
暗点	目视在 RGB 画面时可见暗色的点且大小不变的点	
连接点不良	相邻 2 个子像素同时出现显示不良（定义为 2Dot 不良）	

3.3・外观检查标准

项目	说明或图示	判断标准	可接受数量	
			可视区	非可视区
黑点 白点		Φ≦0.10	不计	不计
		0.10<Φ≦0.15	2,两点间距离不小于5mm	
		0.15<Φ≦0.20	1	

	Φ=(a+b)/2	0.2<Φ≦0.25	1	
		0.25<Φ	0	
亮点暗点	亮点	1/2 Dot<Φ≦1 Dot	1	不计
	暗点	1/2 Dot<Φ≦1 Dot	2	不计
	连接暗点		1	
黑线白线		W≦0.03	不计	不计
		0.03<W≦0.05,L≦2.0	2	
		0.05<W	按黑白点判定	
项目	说明或图示	判定标准		
玻璃毛刺		b≦1.0 且不影响外形尺寸及装配（切裂不良）		
		不影响外形尺寸及装配		
进胶尺寸	封口胶外部尺寸和渗入尺寸	渗入深度大于等于 0.2mm，但不进入显示区。凸出高度小于等于 0.8mm, 外部长度：（注入口宽度）+（2~6mm）		
玻璃缺陷划伤、缺损	①台阶破损 	分类（以下 3 个条件需同时符合）		
		（1）	若 a ≦ t 且 b ≦1.0, c 方向不限制（非电极区）	
		（2）	电极区的破损,b 不得超过邦定电极长度(该长度应不小于 1.2㎜)的 1/4,a、c 方向不限制	
		（3）	台阶两侧的缺损不得损伤对位标识	
	②非封接面破损 	b 方向破损不得到达边框内沿		

<table>
<tr><td></td><td>③ 封接面破损
 
</td><td colspan="2">b 方向破损不得到达边框外沿或走线</td></tr>
<tr><td rowspan="2"></td><td rowspan="2">④角上破损
 
</td><td>（1）</td><td>a ≦ t， b ≦ 3.0， c ≦ 3.0（触及到电极时结合台阶面电极区判定标准进行判定）</td></tr>
<tr><td colspan="2">玻璃破损不允许损伤电极图形和/或对位标识</td></tr>
</table>

项目	位置	线路区	非线路区	对位 Mark
表面清洁	台阶表面	浮灰等易于清除的杂质不计，玻璃碎不可有		
裂痕	全区	不可有		
注：a:表示崩角厚度；b:表示崩角深度；c:表示崩角长度；t;表示单片玻璃厚度；单位：mm				

偏光片刮伤
Polarizer Scratch

尺寸 Size（mm）		Acceptable Quantity		
L（Length）	W（width）	A	B	C
Ignore	W≤0.03	Ignore		Ignore
L≤10	0.03〈W≤0.05	2		
L〈5.0	0.05〈W≤0.08	1		
	0.08〈W	0		

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 ± 10°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°C ± 5°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.