P&O™ 深圳市浦洋通讯设备有限公司

SPECIFICATION

LCD MODULE

P032H005

REVISION RECORD

DESIGN	CHECK	REVIEW
VERSION	DATE	CONTENTS
A	2016-09-18	First Release

CUSTOMER

Customer company: Date:
Customer signature: Date:

FAX: 0755-27585596 TEL：13600197172

CONTENTS

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GENERAL INFORMATION

Item	Contents	Unit
Driver element	a-Si 3.2 TFT active matrix	--
Viewing direction	Wide	O’ Clock
LCM OUTLINE DIMEMSIONS	55.04(W) x 77.5(H) x 3.7(T)	mm
Active area (W×H)	48.6(H) × 64.8(V)MM	mm
Number of Dots	240RGB(H)×320(V)	Pixel
Driver IC	ILI9341V	--
Colors	262K	--
Weight	TBD	g
Backlight Type	LED	--
Interface Type	8 /16bits parallel interface	--
Input voltage	2.8	V

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit
Supply voltage for analog	VDD	-0.3	3.3	V
Input voltage	VIN	-0.3	VDD+0.3	V
Operating temperature	TOP	-20	70	℃
Storage temperature	TST	-30	80	℃
Humidity	RH		90%(Max60℃)	RH

ELECTRICAL CHARACTERISTICS

DC CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit
Supply voltage for analog	VDD	2.3	2.8	3.3	V
Input Current	Idd	—	-	-	mA
Supply voltage for I/O circuit	IOVCC	1.65	1.8	3.3	V
Input voltage ′ H′ level	VIH	0.7 IOVCC	—	—	V
Input voltage ′ L′ level	VIL	—	—	0.3 IOVCC	V
Output voltage ′ H′ level	VOH	0.8 IOVCC	—	—	V
Output voltage ′ L′ level	VOL	—	—	0.2 IOVCC	V

BACKLIGHT CHARACTERISTICS

Item	Symbol	Min	Typ	Max	Unit	Condition
Forward voltage	Vf	2.8	3.2	3.3	V	If=90 mA
Luminance	LV	6800		--	cd/m²	
Number of LED	-	6			Piece	-
Connection mode	p	Parallel			-	-

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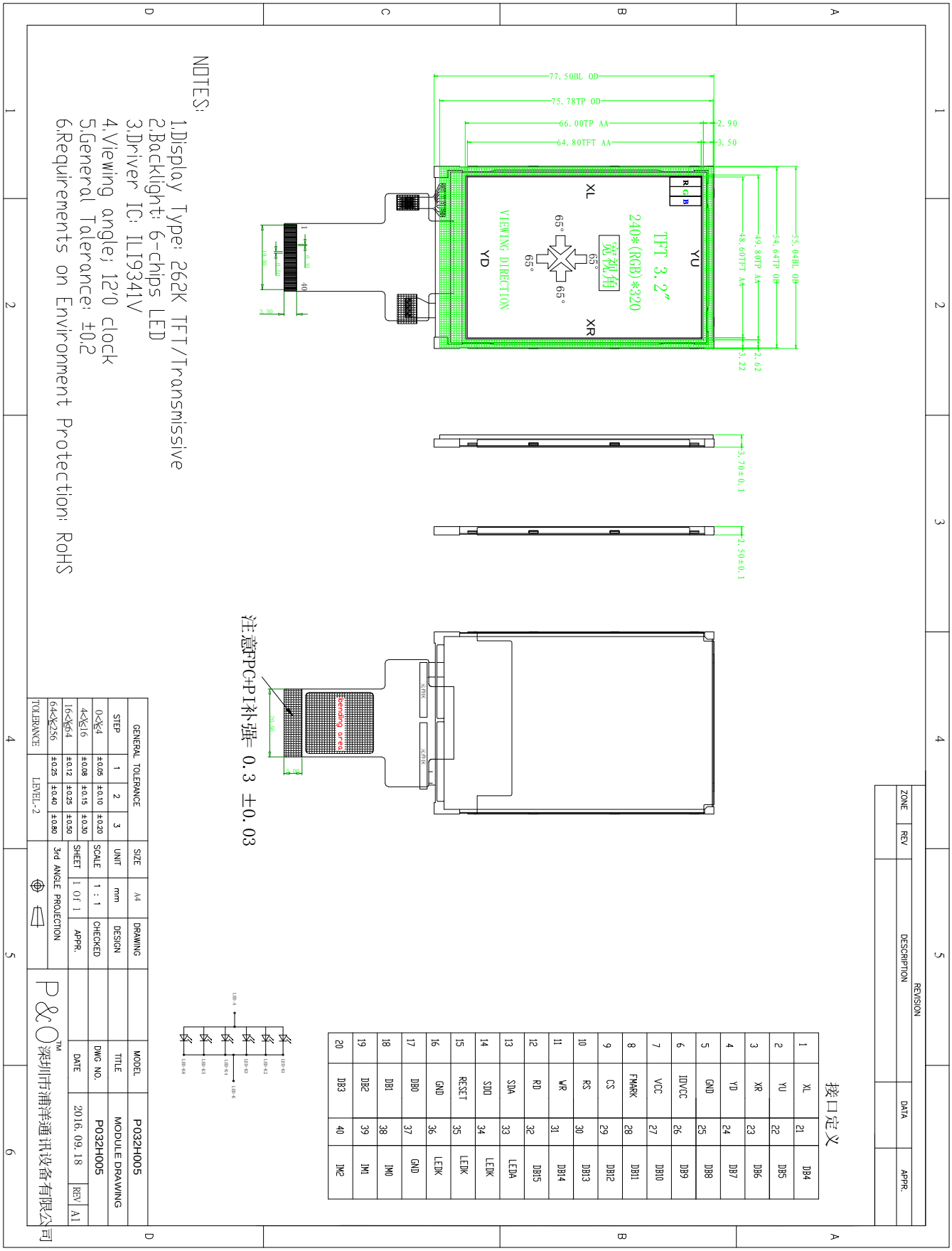
EXTERNAL DIMENSION



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PIN No.	Symbol	Description
1	X(L)	Touch panel control pin (触摸屏控制脚)
2	Y(U)	Touch panel control pin (触摸屏控制脚)
3	X(R)	Touch panel control pin (触摸屏控制脚)
4	Y(D)	Touch panel control pin (触摸屏控制脚)
5	GND	Ground （接地脚）
6	IOVCC	Power supply for LCM (2.8V-3.3V) （屏供电脚）
7	VCI	Power supply for LCM (2.8V-3.3V) （屏供电脚）
8	FMARK	Tearing effect output pin to synchronize MPU to frame writing, activated by S/W command. When this pin is not activated, this pin is low. If not used, open this pin. (帧同信号,不用时悬空)
9	CS/SPI CS	Chip select pin ("Low" enable) （屏驱动芯片片选脚，低电平有效）
10	RS/SPI SCL/SCK	This pin is used to select "Data or Command" in the parallel interface or serial data interface. (用于并口或者串口) Parallel(并口): When RS= '1', data is selected.(选择数据) When RS= '0', command is selected.(选择寄存器) Serial(串口): This pin is used serial interface clock in 3-wire 9-bit / 4-wire 8-bit serial data interface. (3线串口或者4线串口的时钟信号)

		If not used, this pin should be connected to IOVCC or GND. (不用时接 IOVCC 或者接地)
11	WR/A0(4 线)	Serves as a write signal and writes data at the rising edge. - 4-line system (D/CX): Serves as command or parameter select. *Fix to* IOVCC *level when not in use.* （并口的写控制脚或者 4 线串口的寄存器/数据选择，不用时接 IOVCC）
12	RD	Serves as a read signal and MCU read data at the rising edge. *Fix to* IOVCC *level when not in use.* （并口的读控制脚，不用时接 IOVCC）
13	SPI SDI/SDA	Serial input signal. The data is applied on the rising edge of the SCL signal. If not used, fix this pin at IOVCC or GND (串口数据输入信号，不用时接 IOVCC 或者接地)
14	SPI SDO	Serial output signal. The data is outputted on the falling edge of the SCL signal. If not used, open this pin (串口数据输出信号，不用时悬空)
15	RESET	LCM Reset pin Signal is active low. （屏复位脚，低电平复位）
16	GND	Ground （接地脚）
17-24	DB0-DB7	Data bus *Fix to* GND *level when not in use* (低 8 位数据线，不用时接地)
25-32	DB8-DB15	Data bus *Fix to* GND *level when not in use* (高 8 位数据线，不用时接地)
33	A	Anode of Backlight (3.0V-3.4V Typical:3.2V) （背光正极供电脚，电压范围:3.0-3.4V，典型值:3.2V）
34-36	K	Cathode of Backlight （背光负极供电脚）
37	GND	Ground （接地脚）

<table>
<tr><td></td><td></td><td></td></tr>
<tr><td>38</td><td>IM0</td><td rowspan="3">Select the MCU interface mode
(接口选择)
IM2 IM1 IM0
<table><tr><td>0</td><td>0</td><td>0</td><td>80 MCU 16-bit bus interface Ⅱ</td><td>D[8:1]</td><td>D[17:10], D[8:1]</td></tr><tr><td>0</td><td>0</td><td>1</td><td>80 MCU 8-bit bus interface Ⅱ</td><td>D[17:10]</td><td>D[17:10]</td></tr><tr><td>0</td><td>1</td><td>0</td><td>80 MCU 18-bit bus interface Ⅱ</td><td>D[8:1]</td><td>D[17:0]</td></tr><tr><td>0</td><td>1</td><td>1</td><td>80 MCU 9-bit bus interface Ⅱ</td><td>D[17:10]</td><td>D[17:9]</td></tr><tr><td>1</td><td>0</td><td>1</td><td>3-wire 9-bit data serial interface Ⅱ</td><td colspan="2">SDI: In
SDO: Out</td></tr><tr><td>1</td><td>1</td><td>0</td><td>4-wire 8-bit data serial interface Ⅱ</td><td colspan="2">SDI: In
SDO: Out</td></tr></table>
NOTE:
D[8:1]即低 8 位数据线 DB7-DB0D
D[17:10]即高 8 位数据线 DB15-DB8</td></tr>
<tr><td>39</td><td>IM1</td></tr>
<tr><td>40</td><td>IM2</td></tr>
</table>

关于供电说明：

IOVCC 和 VCC 连一起，用 2.8V-3.3V 供电；背光 LED 可以单独供电（3.0-3.4 V），也可以和 VCC 共用一组电压（A 为正接 VCC，K 连一起作为负接地）.

APPLICATION CIRCUIT

Please consult our technical department for detail information.

INITIAL CODE

Please consult our technical department for detail information.

ELECTRO-OPTICAL CHARACTERISTICS

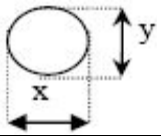
Item		Symbol	Condition	Min	Typ	Max	Unit	Remark	Note
Response time		Tr+Tf	θ =0° E=0° Ta=25℃	-	20	30	ms	FIG 1.	4
Contrast ratio		Cr		-	400	500	-	FIG 2.	1
Luminance uniformity		δ WHITE		-	-	-	%	FIG 2.	3
Surface Luminance		Lv		300	-	-	cd/m²	FIG 2.	2
Viewing angle range		CR>10	E 3	60	65	-	deg	FIG 3.	6
			E 9	60	65	-	deg	FIG 3.	
			E 12	60	65	-	deg	FIG 3.	
			E 6	50	65	-	deg	FIG 3.	
CIE(x,y) chromaticity	Red	x	θ =0° E=0° Ta=25℃	0.586	0.636	0.686		FIG 2.	5
		y		0.273	0.323	0.373			
	Green	x		0.252	0.277	0.297			
		y		0.529	0.549	0.569			
	Blue	x		0.122	0.142	0.162			
		y		0.102	0.122	0.142			
	White	x		0.283	0.303	0.323			
		y		0.305	0.325	0.345			

4.Standards of inspection items

4.1Major Defect

Item No	Items to be inspected	Inspection Standard	Classification of defects
4.1.1	All functional defects	1.No display 2.Display abnormally 3.Missing vertical, horizontal segment 4.Short circuit 5. Back-light no lighting, flickering and abnormal lighting.	Major
4.1.2	Missing	Missing component	
4.1.3	Outline dimension	Overall outline dimension beyond the drawing is not allowed.	
4.1.4	linearity	No more than 1.5%	

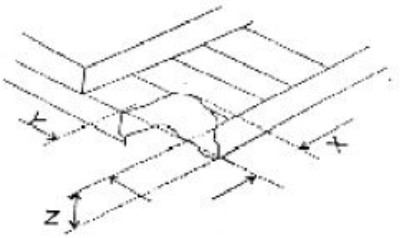
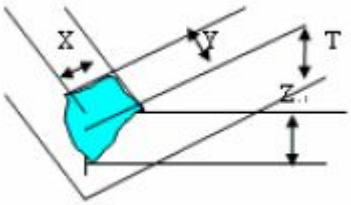
4.2 Cosmetic Defect

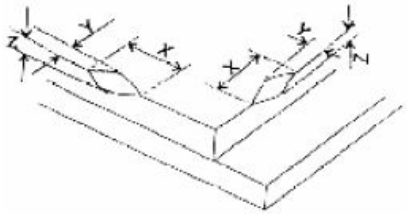
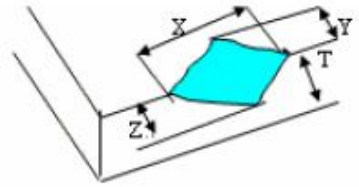
Item No	Items to be inspected	Inspection Standard				Classification of defects
4.21	**Clear Spots** Black and white Spot defect Pinhole, Foreign Particle, polarizer Dirt	For dark/white spot, size Φ is defined as $\Phi=\frac{(x+y)}{2}$ 				Minor
		1				
		Zone / Size(mm)	Acceptable Qty			
			A	B	C	
		Φ≤0.15	Ignore		Ignore	
		0.15＜Φ≤0.20	2			
		0.20＜Φ≤0.30	1			
		Φ＞0.30	0			
	Clear Spots TP Dirt	2				Minor
		Zone / Size(mm)	Acceptable Qty			
			A	B	C	
		Φ≤0.15	Ignore		Ignore	
		0.15＜Φ≤0.20	2			
		0.20＜Φ≤0.30	1			
		Φ＞0.30	0			
	Dim Spots Circle shaped and dim edged defects	3				Minor
		Zone / Size(mm)	Acceptable Qty			
			A	B	C	
		Φ≤0.2	Ignore		Ignore	
		0.20＜Φ≤0.40	2			
		0.40＜Φ≤0.60	1			
		Φ＞0.60	0			

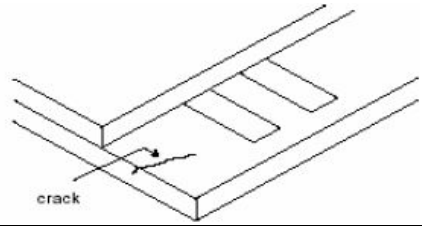
2 Cosmetic Defect

<table>
<tr><th>Item No</th><th>Items to be inspected</th><th colspan="5">Inspection Standard</th><th>Classification of defects</th></tr>
<tr><td rowspan="6">4.2.2</td><td rowspan="6">Line defect
Black line, White line, Foreign material on polarizer</td><td colspan="2">Size(mm)</td><td colspan="3">Acceptable Qty</td><td rowspan="6">Minor</td></tr>
<tr><td rowspan="2">L(Length)</td><td rowspan="2">W(Width)</td><td colspan="3">Zone</td></tr>
<tr><td>A</td><td>B</td><td>C</td></tr>
<tr><td>Ignore</td><td>W≤0.01</td><td colspan="2">Ignore</td><td rowspan="4">Ignore</td></tr>
<tr><td>L≤3.0</td><td>0.01＜W≤0.03</td><td colspan="2">2</td></tr>
<tr><td>L≤3.0</td><td>0.03＜W≤0.05</td><td colspan="2">1</td></tr>
<tr><td></td><td>W＞0.05</td><td colspan="2">0</td></tr>
<tr><td rowspan="6">4.2.3</td><td rowspan="6">Dim line defect
Polarizer scratch
TP film scratch</td><td colspan="6">The line can be seen after mobile phone in the operating condition:</td><td rowspan="6">Minor</td></tr>
<tr><td colspan="2">Size(mm)</td><td colspan="3">Acceptable Qty</td></tr>
<tr><td rowspan="2">L(Length)</td><td rowspan="2">W(Width)</td><td colspan="3">Zone</td></tr>
<tr><td>A</td><td>B</td><td>C</td></tr>
<tr><td>Ignore</td><td>W≤0.03</td><td colspan="2">Ignore</td><td rowspan="3">Ignore</td></tr>
<tr><td>L≤5.0</td><td>0.03＜W≤0.05</td><td colspan="2">3</td></tr>
<tr><td></td><td>W＞0.05</td><td colspan="2">0</td></tr>
<tr><td rowspan="6">4.2.4</td><td rowspan="6">Polarize Air bubble</td><td colspan="6">If the scratch can be seen after mobile phone cover assembling or in the operating condition, judge by the line defect of 4.2.2.
If the scratch can be seen only in non-operating condition or some special angle, judge by the following.</td><td rowspan="6">Minor</td></tr>
<tr><td colspan="2">Size(mm)</td><td colspan="3">Acceptable Qty</td></tr>
<tr><td rowspan="2">L(Length)</td><td rowspan="2">W(Width)</td><td colspan="3">Zone</td></tr>
<tr><td>A</td><td>B</td><td>C</td></tr>
<tr><td>Ignore</td><td>W≤0.03</td><td colspan="2">Ignore</td><td rowspan="3">Ignore</td></tr>
<tr><td>5.0＜L≤10.0</td><td>0.03＜W≤0.05</td><td colspan="2">2</td></tr>
<tr><td>L≤5.0</td><td>0.05＜W≤0.08</td><td colspan="2">1</td></tr>
<tr><td></td><td>W＞0.08</td><td colspan="2">0</td></tr>
<tr><td rowspan="5">4.2.4</td><td rowspan="5">Polarize Air bubble</td><td colspan="6">Air bubbles between glass & polarizer</td><td rowspan="5">Minor</td></tr>
<tr><td colspan="2" rowspan="2">Zone
Size(mm)</td><td colspan="3">Acceptable Qty</td></tr>
<tr><td>A</td><td>B</td><td>C</td></tr>
<tr><td colspan="2">Φ≤0.25</td><td colspan="2">Ignore</td><td rowspan="3">Ignore</td></tr>
<tr><td colspan="2">0.25＜Φ≤0.5</td><td colspan="2">2</td></tr>
<tr><td colspan="2">Φ＞0.50</td><td colspan="2">0</td></tr>
</table>

Item No	Items to be inspected	Inspection Standard	Classification of defects

<table>
<tr>
<td>4.35</td>
<td>Glass defect</td>
<td>
(i) Chips on corner
A:LCD Glass defect

<table>
<tr><td>X(mm)</td><td>Y(mm)</td><td>Z(mm)</td></tr>
<tr><td>≤2.0</td><td>≤S</td><td>Disregard</td></tr>
</table>
Notes: S=contact pad length
Chips on the corner of terminal shall not be allowed to extend into the ITO pad or expose perimeter seal.
B:TP Glass defect


<table>
<tr><td>X(mm)</td><td>Y(mm)</td><td>Z(mm)</td></tr>
<tr><td>≤3.0</td><td>≤3.0</td><td>Disregard</td></tr>
</table>
(ii)Usual surface cracks
A:LCD Glass defect

<table>
<tr><td>X(mm)</td><td>Y(mm)</td><td>Z(mm)</td></tr>
<tr><td>≤3.0</td><td><Inner border line of the seal</td><td>Disregard</td></tr>
</table>
B:TP Glass defect


<table>
<tr><td>X(mm)</td><td>Y(mm)</td><td>Z(mm)</td></tr>
<tr><td>≤6.0</td><td><2.0</td><td>Disregard</td></tr>
</table>
(iii) Crack
Cracks tend to break are not allowed.


</td>
<td>Minor</td>
</tr>
</table>