

# **SPECIFICATION**

## **LCD MODULE**

### **P023T009-V2**

#### **REVISION RECORD**

DESIGN	CHECK	REVIEW
VERSION	DATE	CONTENTS
A	2017-02-24	First Release

#### **CUSTOMER**

Customer company:

Date:

Customer signature:

Date:

## CONTENTS

- ✦ GENERAL INFORMATION
- ✦ ABSOLUTE MAXIMUM RATINGS
- ✦ ELECTRICAL CHARACTERISTICS
- ✦ TIMING OF POWER SUPPLY
- ✦ BACKLIGHT CHARACTERISTICS
- ✦ EXTERNAL DIMENSIONS
- ✦ INTERFACE SIGNALS
- ✦ ELECTRO-OPTICAL CHARACTERISTICS
- ✦ QUALITY LEVEL
- ✦ PACKAGING DRAWING
- ✦ PRECAUTIONS FOR USE OF LCD MODULES

# P&O<sup>TM</sup> 深圳市浦洋通讯设备有限公司

## GENERAL INFORMATION

Item	Contents	Unit
Driver element	a-Si 2.31 TFT active matrix	--
Viewing direction	6 O' CLOCK	O' Clock
LCM OUTLINE DIMENSIONS	51(W) x45.8(H) x 2.3(T)	mm
Active area (W×H)	46.75(H) × 35.06(V)MM	mm
Number of Dots	320RGB(H)×240(V)	Pixel
Driver IC	ILI9342C	--
Colors	262K	--
Weight	TBD	g
Backlight Type	4 White LEDs in Parallel	--
Interface Type	MCU8/16 BIT	--
Input voltage	2.8V ~ 3.3V	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	°C
Storage temperature	TST	-30	80	°C
Humidity	RH		90% (Max60°C)	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	I <sub>dd</sub>	—	—	—	mA
Supply voltage for I/O circuit	IOVCC	1.65	1.8	3.3	V
Input voltage ' H ' level	V <sub>IH</sub>	0.7 IOVCC	—	—	V
Input voltage ' L ' level	V <sub>IL</sub>	—	—	0.3 IOVCC	V
Output voltage ' H ' level	V <sub>OH</sub>	0.8 IOVCC	—	—	V
Output voltage ' L ' level	V <sub>OL</sub>	—	—	0.2 IOVCC	V

## TIMING OF POWER SUPPLY

PLEASE REFER TO THE DRIVER IC SPECIFICATION.

## BACKLIGHT CHARACTERISTICS

Item	Symbol	Min	Typ	Max	Unit	Condition
Forward voltage	V <sub>f</sub>	2.9	3.2	3.3	V	I <sub>f</sub> =80 mA
Luminance	L <sub>v</sub>	3000	--	--	cd/m <sup>2</sup>	
Number of LED	—	4			Piece	—
Connection mode	p	Parallel			—	—

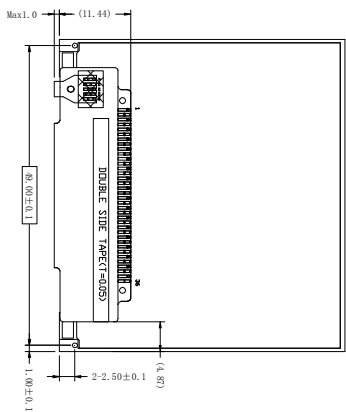
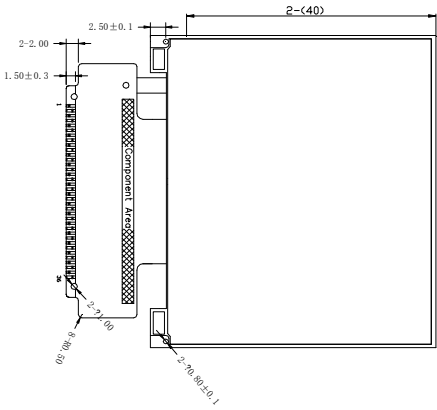
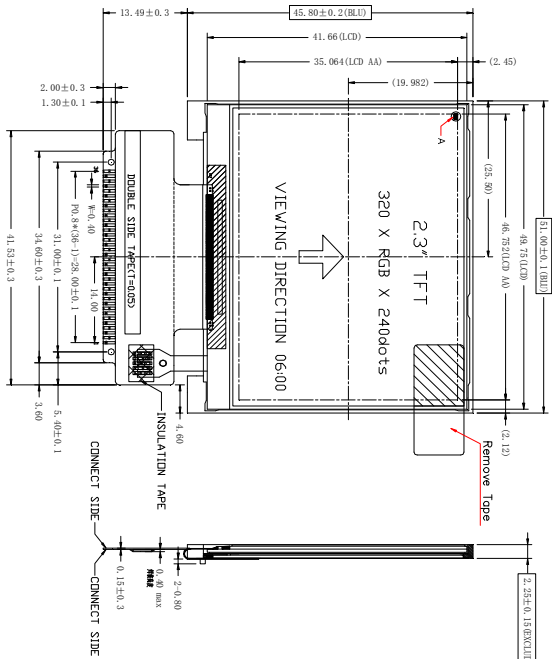
FAX : 0755-27585596

TEL : 13600197172

产品编码

Customer's Approval

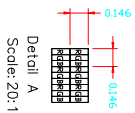
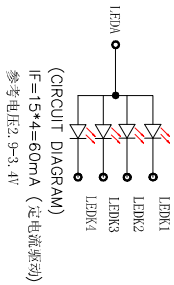
Customer  
Date



客户零件参考图

Pin	Pin Name
1	LEDA
2	LEDK1
3	LEDK2
4	LEDK3
5	LEDK4
6	GND
7	RESET
8	DB15
9	DB14
10	DB13
11	DB12
12	DB11
13	DB10
14	DB9
15	DB8
16	DB7
17	DB6
18	DB5
19	DB4
20	DB3
21	DB2
22	DB1
23	DB0
24	V16 8X
25	RD
26	WR
27	RS
28	CS
29	IDVCC
30	VCC
31	NC
32	GND
33	NC
34	NC
35	NC
36	NC

## 8/16BIT



- NOTES:
- 1.DISPLAY TYPE: TFT
  - 2.VIEWING DIRECTION: 12:00
  - 3.LCD DRIVE IC: ILI9342C
  - 4.POLARIZER MODE: TRANSMISSIVE/POSITIVE
  - 6.VDD2 2.8V(TYP)
  - 7.OPERATING TEMP: -20°C -- 70°C
  - 8.STORAGE TEMP: -30°C -- 80°C
  - 9.UNMARKED TOLERANCE: ±0.20
  - 10.REQUIREMENTS ON ENVIRONMENTAL PROTECTION: ROHS

REVISED RECORD			
A	NOV23/2007 8:43:38 AM	2013/11/10	
B			
C			
D			
E			

PRODUCT NO.	P023T009-V2
SCALE	1:1
PAGE	1/1
DRAWN BY	YUN
CHECKED BY	
APPROVED BY	
ORG DATE	

NO.	NAME	QTY	PART No.	REMARK
5	硬膜	1	TFT023-1U/GBX-820A(10PCS)	
4	偏光片	2	普通规格(规格: 37.45*49.15*0.17mm)	上下各1
3	PCB	1	023T009-V2 PCB	
2	主板	1	TM023T009 T=0.5mm	TM & ILI9342C
1	背光	1	P023T009-V2	
N.D.	NAME			VERSION & DATE

## APPLICATION CIRCUIT

Please consult our technical department for detail information.

## INITIAL CODE

Please consult our technical department for detail information.

## ELECTRO-OPTICAL CHARACTERISTICS

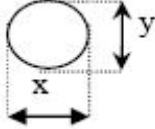
Item	Symbol	Condition	Min	Typ	Max	Unit	Remark	Note
Response time	Tr+Tf	$\theta = 0^\circ$ $\varnothing = 0^\circ$ Ta=25°C	-	20	30	ms	FIG 1.	4
Contrast ratio	Cr		-	400	500	-	FIG 2.	1
Luminance uniformity	$\delta$ WHITE		-	-	-	%	FIG 2.	3
Surface Luminance	Lv		300	-	-	cd/m <sup>2</sup>	FIG 2.	2
Viewing angle range	CR>10	$\varnothing 3$	60	70	-	deg	FIG 3.	6
		$\varnothing 9$	60	70	-	deg	FIG 3.	
		$\varnothing 12$	60	70	-	deg	FIG 3.	
		$\varnothing 6$	50	65	-	deg	FIG 3.	
CIE(x, y) chromaticity	Red	x	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

##### 4.1 Major 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%	

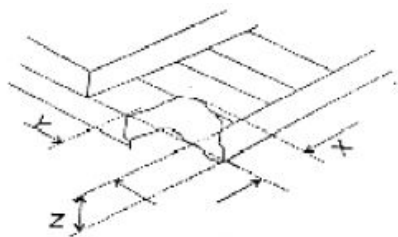
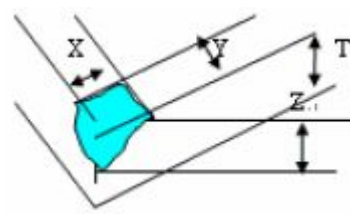
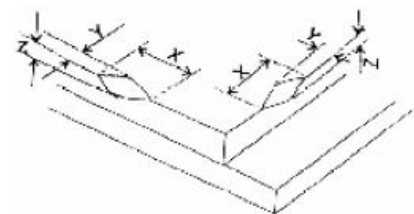
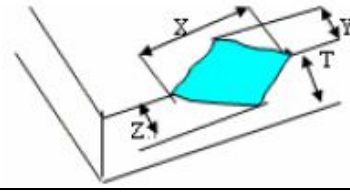
##### 4.2 Cosmetic Defect

Item No	Items to be inspected	Inspection Standard	Classification of defects																								
4.21	<b>Clear Spots</b> Black and white Spot defect Pinhole, Foreign Particle, polarizer Dirt	For dark/white spot, size $\Phi$ is defined as $\Phi = \frac{(x + y)}{2}$ 	Minor																								
		1																									
		<table border="1"> <thead> <tr> <th rowspan="2">Zone Size(mm)</th> <th colspan="3">Acceptable Qty</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td><math>\Phi \leq 0.15</math></td> <td colspan="3">Ignore</td> </tr> <tr> <td><math>0.15 &lt; \Phi \leq 0.20</math></td> <td colspan="3">2</td> </tr> <tr> <td><math>0.20 &lt; \Phi \leq 0.30</math></td> <td colspan="3">1</td> </tr> <tr> <td><math>\Phi &gt; 0.30</math></td> <td colspan="3">0</td> </tr> </tbody> </table>		Zone Size(mm)	Acceptable Qty			A	B	C	$\Phi \leq 0.15$	Ignore			$0.15 < \Phi \leq 0.20$	2			$0.20 < \Phi \leq 0.30$	1			$\Phi > 0.30$	0			Ignore
		Zone Size(mm)			Acceptable Qty																						
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<b>Dim Spots</b> Circle shaped and dim edged defects	3																										
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	Zone Size(mm)		Acceptable Qty																								
		A	B	C																							
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$\Phi > 0.60$	0																										

2 Cosmetic Defect

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

Item No	Items to be inspected	Inspection Standard	Classification of defects
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4.35	Glass defect	(i) Chips on corner A:LCD Glass defect		<table border="1"> <tr> <td style="width: 30%;">X(mm)</td> <td style="width: 40%;">Y(mm)</td> <td style="width: 30%;">Z(mm)</td> </tr> <tr> <td style="text-align: center;"><math>\leq 2.0</math></td> <td style="text-align: center;"><math>\leq S</math></td> <td style="text-align: center;">Disregard</td> </tr> </table>	X(mm)	Y(mm)	Z(mm)	$\leq 2.0$	$\leq S$	Disregard	Minor	
		X(mm)	Y(mm)	Z(mm)								
		$\leq 2.0$	$\leq S$	Disregard								
		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 border="1"> <tr> <td style="width: 30%;">X(mm)</td> <td style="width: 40%;">Y(mm)</td> <td style="width: 30%;">Z(mm)</td> </tr> <tr> <td style="text-align: center;"><math>\leq 3.0</math></td> <td style="text-align: center;"><math>\leq 3.0</math></td> <td style="text-align: center;">Disregard</td> </tr> </table>	X(mm)	Y(mm)	Z(mm)	$\leq 3.0$	$\leq 3.0$		Disregard
		X(mm)	Y(mm)	Z(mm)								
		$\leq 3.0$	$\leq 3.0$	Disregard								
		(ii) Usual surface cracks A:LCD Glass defect		<table border="1"> <tr> <td style="width: 30%;">X(mm)</td> <td style="width: 40%;">Y(mm)</td> <td style="width: 30%;">Z(mm)</td> </tr> <tr> <td style="text-align: center;"><math>\leq 3.0</math></td> <td style="text-align: center;">&lt; Inner border line of the seal</td> <td style="text-align: center;">Disregard</td> </tr> </table>	X(mm)	Y(mm)	Z(mm)	$\leq 3.0$	< Inner border line of the seal	Disregard		
		X(mm)	Y(mm)	Z(mm)								
		$\leq 3.0$	< Inner border line of the seal	Disregard								
		B:TP Glass defect			<table border="1"> <tr> <td style="width: 30%;">X(mm)</td> <td style="width: 40%;">Y(mm)</td> <td style="width: 30%;">Z(mm)</td> </tr> <tr> <td style="text-align: center;"><math>\leq 6.0</math></td> <td style="text-align: center;">&lt; 2.0</td> <td style="text-align: center;">Disregard</td> </tr> </table>	X(mm)	Y(mm)	Z(mm)	$\leq 6.0$	< 2.0		Disregard
X(mm)	Y(mm)	Z(mm)										
$\leq 6.0$	< 2.0	Disregard										
(iii) Crack Cracks tend to break are not allowed.	