

深圳市正晶浩电子有限公司

SHEN ZHEN ZHENG JING HAO ELECTRONICS CO.,LTD.

网址: www.zjhlcd.com 电话: 0755-29355801, 133-9284-8764

SPECIFICATION

LCD MODULE

P024H029-IPS

REVISION RECORD

DESIGN	CHECK	REVIEW
VERSION	DATE	CONTENTS
A	2016-03-18	First Release

CUSTOMER

Customer company:	Date:
Customer signature:	Date:

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GENERAL INFORMATION

Item	Contents	Unit
Driver element	a-Si 2.4 TFT active matrix	--
Viewing direction	IPS	O' Clock
LCM OUTLINE DIMENSIONS	42.72(W) x60.26(H) x 2.3(T)	mm
Active area (W×H)	36.72(H) × 48.96(V)MM	mm
Number of Dots	240RGB(H)×320(V)	Pixel
Driver IC	ST7789V	--
Colors	262K	--
Weight	TBD	g
Backlight Type	LED	--
Interface Type	3线/4线 SPI串口 MCU 8/9/16/ 18 BIT RGB 6/16/18BIT	--
Input voltage	2.8/3.3V	V

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit
Supply voltage for analog	V _{DD}	-0.3	3.3	V
Input voltage	V _{IN}	-0.3	V _{DD} +0.3	V
Operating temperature	T _{OP}	-20	70	°C
Storage temperature	T _{ST}	-30	80	°C
Humidity	RH		90% (Max60°C)	RH

ELECTRICAL CHARACTERISTICS

DC CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit
Supply voltage for analog	V _{DD}	2.3	2.8	3.3	V
Input Current	I _{dd}	--	--	--	mA
Supply voltage for I/O circuit	IOVCC	1.65	1.8	3.3	V
Input voltage 'H' level	V _{IH}	0.7 IOVCC	--	--	V
Input voltage 'L' level	V _{IL}	--	--	0.3 IOVCC	V
Output voltage 'H' level	V _{OH}	0.8 IOVCC	--	--	V
Output voltage 'L' level	V _{OL}	--	--	0.2 IOVCC	V

BACKLIGHT CHARACTERISTICS

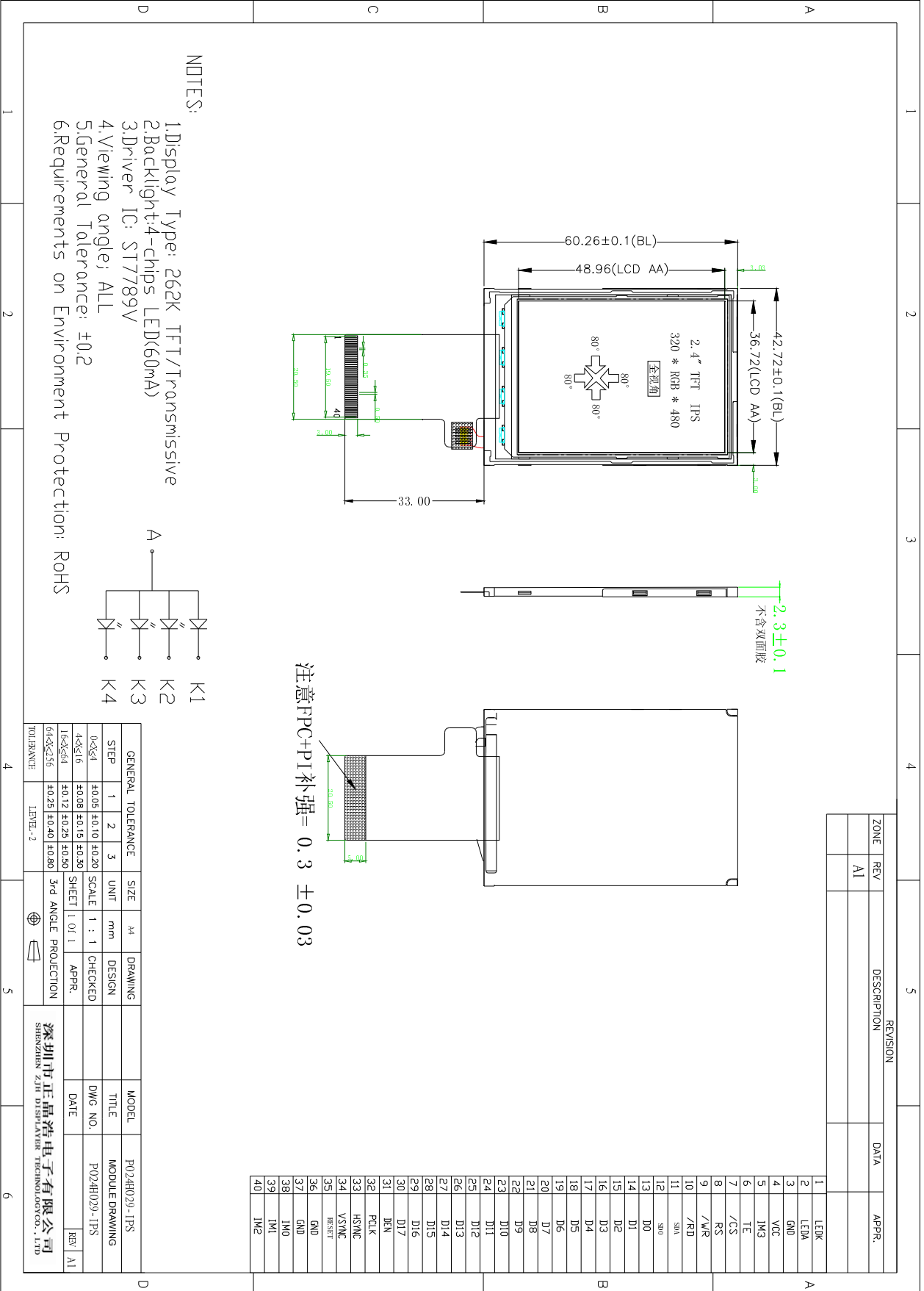
Item	Symbol	Min	Typ	Max	Unit	Condition
Forward voltage	V _f	2.8	3.2	3.3	V	If=60 mA
Luminance	L _v	5000		--	cd/m ²	
Number of LED	--	4			Piece	--
Connection mode	p	Parallel			--	--

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EXTERNAL DIMENSION



GENERAL TOLERANCE	1	2	3	SIZE	mm	UNIT	DRAWING
0.4<X<1.6	±0.05	±0.10	±0.20	SCALE	1 : 1	CHECKED	DESIGN
1.6<X<6.4	±0.12	±0.25	±0.50	SHEET	1 OF 1	APPR.	DATE
6.4<X<25.0	±0.25	±0.40	±0.80	3rd ANGLE PROJECTION			

MODEL	TITLE	MODULE DRAWING
P024H029-1PS	P024H029-1PS	

REV	DATE	APPR.
A1		

ZONE	REV	DESCRIPTION	DATA	APPR.
	A1			

1	LEDK
2	LEDA
3	GND
4	VCC
5	IM3
6	TE
7	/CS
8	RS
9	/WR
10	/RD
11	SVA
12	S00
13	D0
14	D1
15	D2
16	D3
17	D4
18	D5
19	D6
20	D7
21	D8
22	D9
23	D10
24	D11
25	D12
26	D13
27	D14
28	D15
29	D16
30	D17
31	DN
32	PLK
33	HSYNC
34	VSYNC
35	RES1
36	GND
37	GND
38	IM0
39	IM1
40	IM2

4 5 6

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Interface Signals

Pin No.	Symbol	Description
1	LEDK	LED Negative
2	LEDA	LED Positive
3	GND	Groud
4	VCC	Power supply (2.8/3.3V)
5	IM3	interface mode Select
6	FMARK	Tearing effect output pin
7	CS/SPI CS	Chip select input pin
8	RS/SPI SCL	Data/Command Write Select pin, serial interface clock in 3-wire 9-bit / 4-wire 8-bit serial datainterface.
9	WR/RS(4 线)	Write execution control pin, 4-line system (D/CX): Serves as command or parameter select.
10	RD	Read execution control pin
11	SPI SDI/SDA	Serial input signal.
12	SPI SDO	Serial output signal.
13-30	D0-D17	Data Bus
31	DE	Data enable signal for RGB interface operation.
32	PCLK	Dot clock signal for RGB interface operation.
33	HSYNC	Line synchronizing signal for RGB interface operation.
34	VSYNC	Frame synchronizing signal for RGB interface operation.
35	RESET	Reset pin
36	GND	Groud
37	GND	Groud
38	IM0	interface mode Select
39	IM1	interface mode Select
40	IM2	interface mode Select

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- Select the MCU interface mode

IM3	IM2	IM1	IM0	MCU-Interface Mode	DB Pin in use	
					Register/Content	GRAM
0	0	0	0	80 MCU 8-bit bus interface I	D[7:0]	D[7:0]
0	0	0	1	80 MCU 16-bit bus interface I	D[7:0]	D[15:0]
0	0	1	0	80 MCU 9-bit bus interface I	D[7:0]	D[8:0]
0	0	1	1	80 MCU 18-bit bus interface I	D[7:0]	D[17:0]
0	1	0	1	3-wire 9-bit data serial interface I	SDA: In/OUT	
0	1	1	0	4-wire 8-bit data serial interface I	SDA: In/OUT	
1	0	0	0	80 MCU 16-bit bus interface II	D[8:1]	D[17:10], D[8:1]
1	0	0	1	80 MCU 8-bit bus interface II	D[17:10]	D[17:10]
1	0	1	0	80 MCU 18-bit bus interface II	D[8:1]	D[17:0]
1	0	1	1	80 MCU 9-bit bus interface II	D[17:10]	D[17:9]
1	1	0	1	3-wire 9-bit data serial interface II	SDI: In SDO: Out	
1	1	1	0	4-wire 8-bit data serial interface II	SDI: In SDO: Out	

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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	δ WHITE		-	-	-	%	FIG 2.	3
Surface Luminance	Lv		300	-	-	cd/m ²	FIG 2.	2
Viewing angle range	CR>10	$\varnothing 3$	-	80	-	deg	FIG 3.	6
		$\varnothing 9$	-	80	-	deg	FIG 3.	
		$\varnothing 12$	-	80	-	deg	FIG 3.	
		$\varnothing 6$	-	80	-	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			

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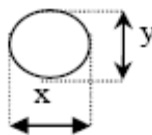
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4. Standards of inspection items

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	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																								
		<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>$\Phi \leq 0.15$</td> <td colspan="3">Ignore</td> </tr> <tr> <td>$0.15 < \Phi \leq 0.20$</td> <td colspan="3">2</td> </tr> <tr> <td>$0.20 < \Phi \leq 0.30$</td> <td colspan="3">1</td> </tr> <tr> <td>$\Phi > 0.30$</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		
		Zone Size(mm)			Acceptable Qty																					
				A	B	C																				
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Zone Size(mm)		Acceptable Qty																								
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2 Cosmetic Defect

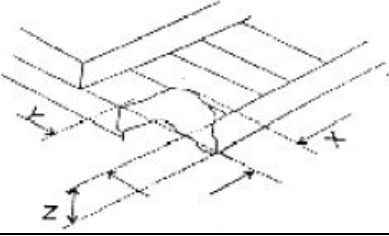
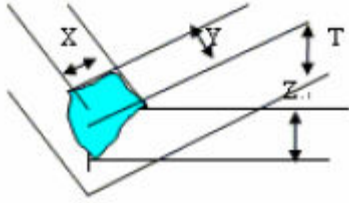
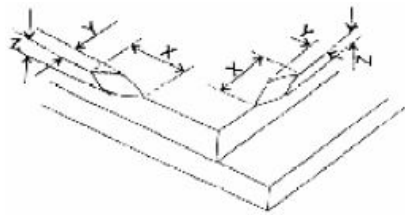
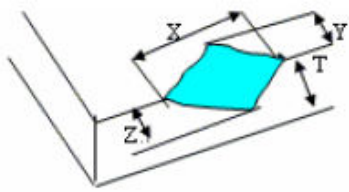
Item No	Items to be inspected	Inspection Standard				Classification of defects		
4.2.2	Line defect Black line, White line, Foreign material on polarizer	Size (mm)		Acceptable Qty			Minor	
		L (Length)	W (Width)	Zone				
				A	B	C		
		Ignore	$W \leq 0.01$	Ignore				Ignore
		$L \leq 3.0$	$0.01 < W \leq 0.03$	2				
		$L \leq 3.0$	$0.03 < W \leq 0.05$	1				
			$W > 0.05$	0				
4.2.2	Foreign material on TP film	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)	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	<p>(i) Chips on corner A:LCD Glass defect</p> 	Minor						
		<table border="1"> <tr> <th>X(mm)</th> <th>Y(mm)</th> <th>Z(mm)</th> </tr> <tr> <td>≤2.0</td> <td>≤S</td> <td>Disregard</td> </tr> </table>		X(mm)	Y(mm)	Z(mm)	≤2.0	≤S	Disregard
		X(mm)		Y(mm)	Z(mm)				
		≤2.0		≤S	Disregard				
		<p>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</p> 							
		<table border="1"> <tr> <th>X(mm)</th> <th>Y(mm)</th> <th>Z(mm)</th> </tr> <tr> <td>≤3.0</td> <td>≤3.0</td> <td>Disregard</td> </tr> </table>		X(mm)	Y(mm)	Z(mm)	≤3.0	≤3.0	Disregard
		X(mm)		Y(mm)	Z(mm)				
		≤3.0		≤3.0	Disregard				
		<p>(ii) Usual surface cracks A:LCD Glass defect</p> 							
		<table border="1"> <tr> <th>X(mm)</th> <th>Y(mm)</th> <th>Z(mm)</th> </tr> <tr> <td>≤3.0</td> <td><Inner border line of the seal</td> <td>Disregard</td> </tr> </table>		X(mm)	Y(mm)	Z(mm)	≤3.0	<Inner border line of the seal	Disregard
X(mm)	Y(mm)	Z(mm)							
≤3.0	<Inner border line of the seal	Disregard							
<p>B:TP Glass defect</p> 									
<table border="1"> <tr> <th>X(mm)</th> <th>Y(mm)</th> <th>Z(mm)</th> </tr> <tr> <td>≤6.0</td> <td><2.0</td> <td>Disregard</td> </tr> </table>	X(mm)	Y(mm)	Z(mm)	≤6.0	<2.0	Disregard			
X(mm)	Y(mm)	Z(mm)							
≤6.0	<2.0	Disregard							
<p>(iii) Crack Cracks tend to break are not allowed.</p> 