

SPECIFICATION

LCD MODULE

P028H026-TP

REVISION RECORD

DESIGN	CHECK	REVIEW
VERSION	DATE	CONTENTS
A	2017-02-15	First Release

CUSTOMER












Customer company:

Date:

Customer signature:

Date:

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P&OTM 深圳市浦洋通讯设备有限公司

GENERAL INFORMATION

Item	Contents	Unit
Driver element	a-Si 2.8 TFT active matrix	--
Viewing direction	12	O' Clock
LCM OUTLINE DIMENSIONS	50(W) x 69.2(H) x 2.3(T)	mm
Active area (W×H)	43.2(H) × 57.6(V)MM	mm
Number of Dots	240RGB(H)×320(V)	Pixel
Driver IC	ILI9341V	--
Colors	262K	--
Weight	TBD	g
Backlight Type	LED	--
Interface Type	MCU 16 Bit/8BIT/SPI4/SPI3	--
Input voltage	2.8	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}	2.5	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

TIMING OF POWER SUPPLY

PLEASE REFER TO THE DRIVER IC SPECIFICATION.

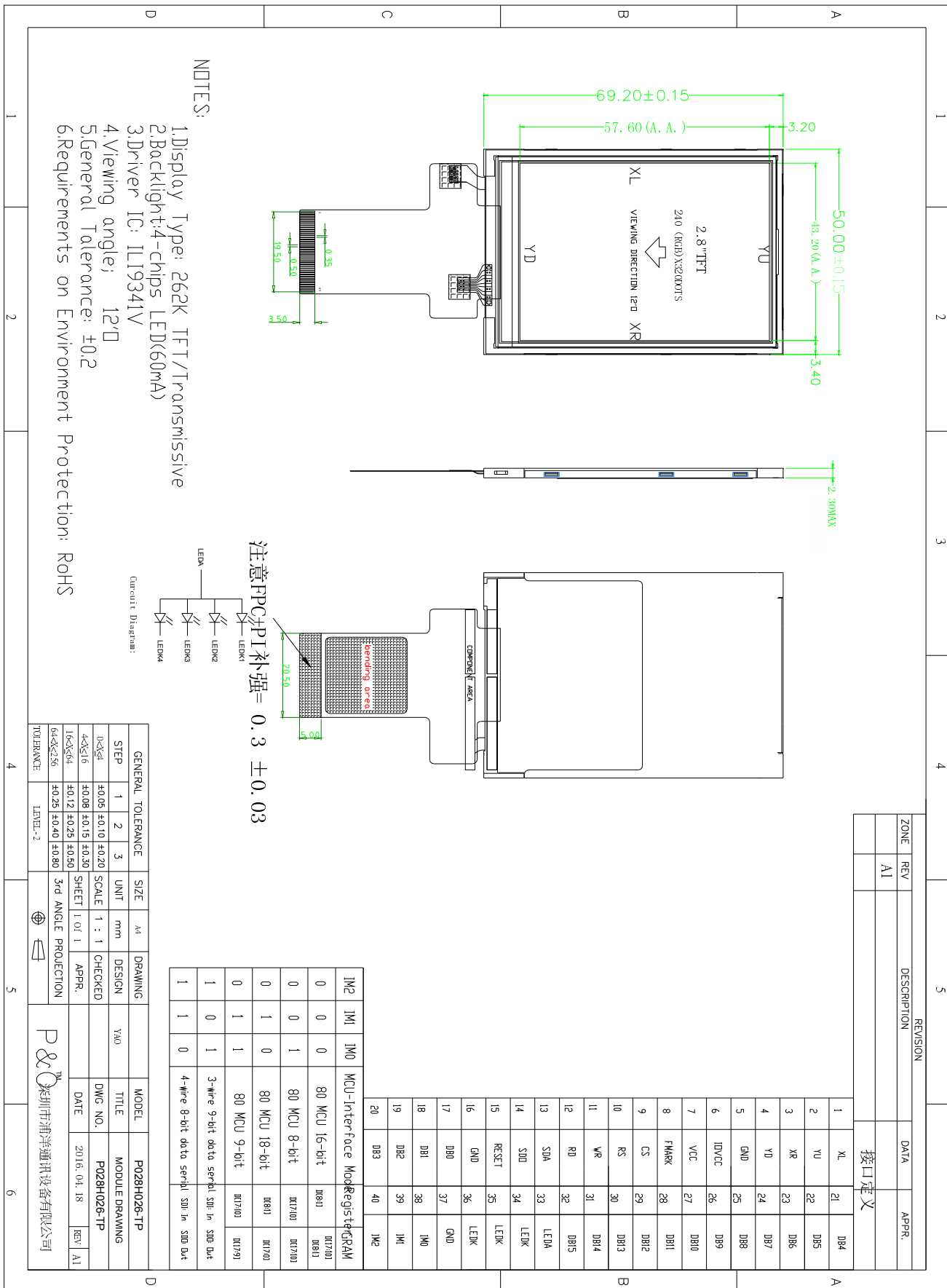
BACKLIGHT CHARACTERISTICS

Item	Symbol	Min	Typ	Max	Unit	Condition
Forward voltage	V _f	5.6	6.4	6.6	V	If=80 mA
Luminance	L _v	5000		--	cd/m ²	
Number of LED	—	4			Piece	—
Connection mode	p	Parallel			—	—

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EXTERNAL DIMENSION



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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

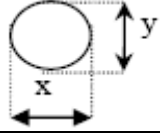
Item		Symbol	Condition	Min	Typ	Max	Unit	Remark	Note
Response time		Tr+Tf	$\theta = 0^\circ$ $\varnothing = 0^\circ$ Ta=25°C	—	20	30	ms	FIG 1.	4
Contrast ratio		Cr		—	400	500	—	FIG 2.	1
Luminance uniformity		δ WHITE		—	—	—	%	FIG 2.	3
Surface Luminance		Lv		300	—	—	cd/m ²	FIG 2.	2
Viewing angle range	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

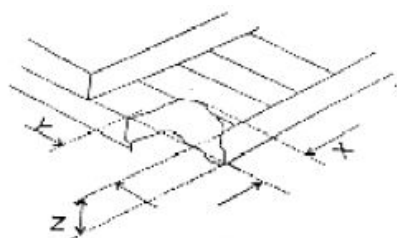
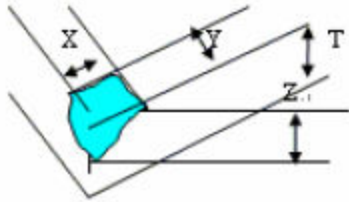
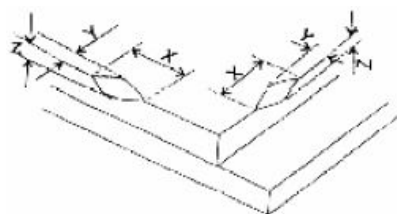
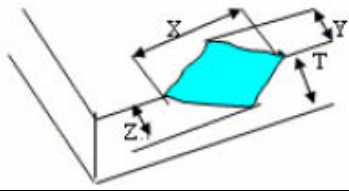
4.2 Cosmetic Defect

Item No	Items to be inspected	Inspection Standard				Classification of defects	
4.21	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					
		<div>Zone Size(mm)</div>	Acceptable Qty				Ignore
			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				
	Clear Spots TP Dirt	2				Minor	
		<div>Zone Size(mm)</div>	Acceptable Qty				Ignore
			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				
		Dim Spots Circle shaped and dim edged defects	3				Minor
	<div>Zone Size(mm)</div>		Acceptable Qty			Ignore	
			A	B	C		
	$\Phi \leq 0.2$		Ignore				
	$0.20 < \Phi \leq 0.40$		2				
	$0.40 < \Phi \leq 0.60$		1				
	$\Phi > 0.60$		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			
	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. If the scratch can be seen only in non-operating condition or some special angle, judge by the following.					Minor
		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
		Zone 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	(i) Chips on corner A:LCD Glass defect		Minor					
		<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>	X(mm)		Y (mm)	Z (mm)	≤2.0	≤S	Disregard
		X(mm)	Y (mm)		Z (mm)				
		≤2.0	≤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><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>	X(mm)		Y (mm)	Z (mm)	≤3.0	≤3.0	Disregard
		X(mm)	Y (mm)		Z (mm)				
		≤3.0	≤3.0		Disregard				
		(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>	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							
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>	X(mm)	Y (mm)	Z (mm)	≤6.0	<2.0	Disregard			
X(mm)	Y (mm)	Z (mm)							
≤6.0	<2.0	Disregard							
(iii) Crack Cracks tend to break are not allowed.	