

深圳市勤正达电子有限公司

PRODUCT SPECIFICATION FOR LCD MODULE

MODULE NO: (模组型号) FXD024Q08-A

CUSTOMER: (客户) _____

APPROVED BY CUSTOMER 客户签署栏	
Approved by 审核	Remark 备注

APPROVED BY HX 勤正达签署栏		
Electronics engineer 电子	Structural engineer 结 构	Approved by 审核

REVISION RECORD

修改记录

REV NO. 版本	CONTENTS 内容	REV DATE 修改日期	REMARKS 注释
Preliminary	First release	2018-12-29	
A			
B			
C			
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1. GENERAL INFORMATION 基本描述

Item	Contents	Unit
LCD Size	2.4	inch
Driver element	a-Si TFT active matrix	--
Viewing direction	6:00	O'clock
Module Size	42.72(W)*60.26(H)*2.3(T)	mm
Touch Panel View Area	--	mm
Touch Panel Active Area	--	mm
Panel Active Area	36.72(W)*48.96(H)	mm
Number of Dots	240(R.G.B)*320	Pixel
Driver IC	ST7789V	--
Colors	262K	--
Weight	TBD	--
Backlight Type	LED	--
Operating Temperature	-10℃--60℃	℃
Storage Temperature	-20℃--70℃	℃
LCM: All of LCM of material and process measure up to ROHS Europe		

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Typ	Max	Unit
Supply voltage for logic	VDD-VSS	2.6	2.8	3.3	V
Supply voltage for analog	Vcc	2.6	2.8	3.3	V
Supply voltage for interface I/O	IOVcc	1.65	--	3.3	V
I/O leakage current	Idd	--	--	TBD	mA
Input voltage ' H ' level	VIH	0.8*IOVcc	--	IOVcc	V
Input voltage ' L ' level	VIL	-0.3	--	0.2*IOVcc	V
Output voltage ' H ' level	VOH	0.8*IOVcc	--	--	V
Output voltage ' L ' level	VOL	--	--	0.2*IOVcc	V

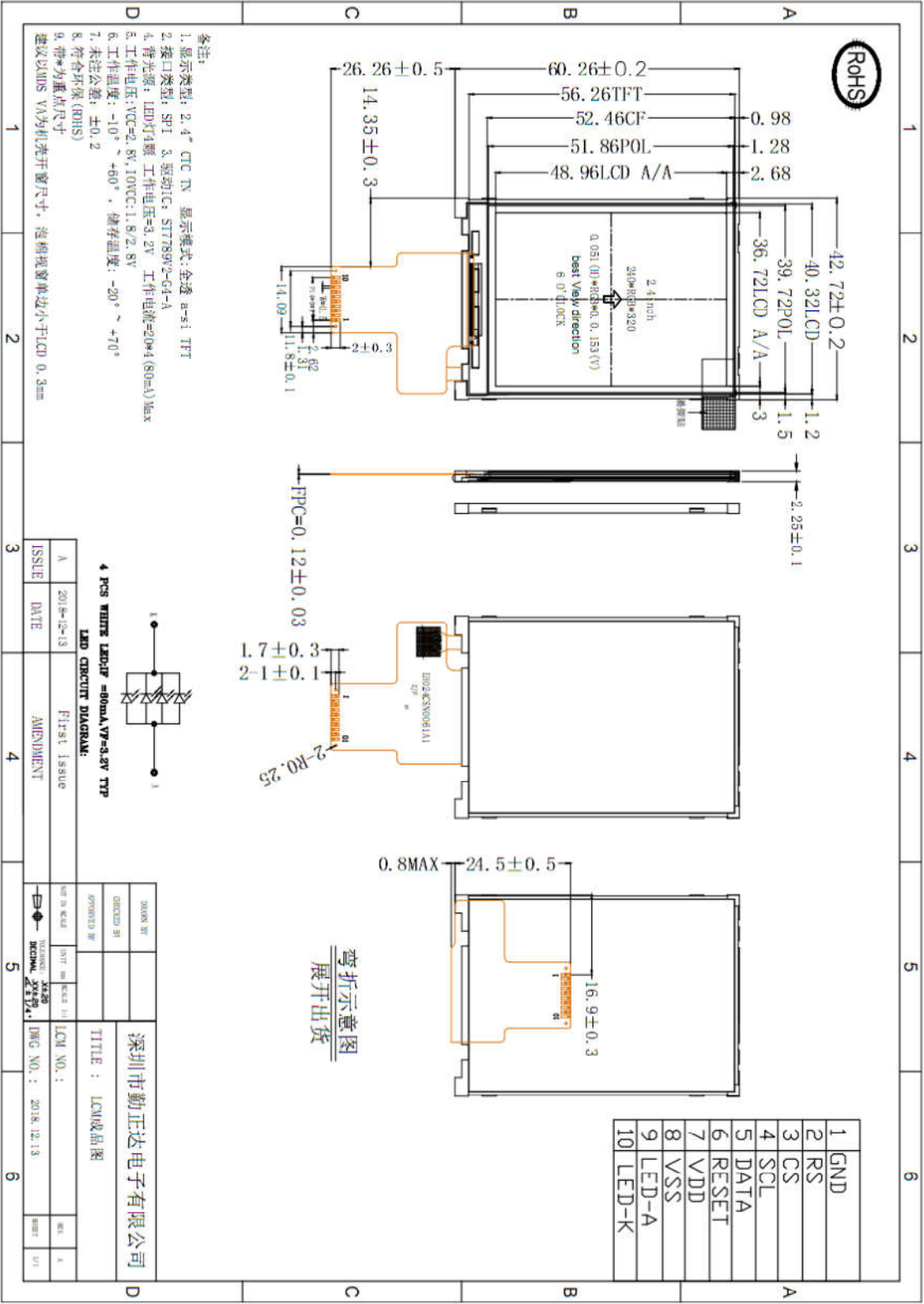
ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min	Max	Unit
Supply voltage for logic	VDD	-0.6	4.5	V
Input voltage	VIN	-0.3	VCC+0.3	V
Operating temperature	TOP	-20	70	°C
Storage temperature	TST	-30	80	°C
Humidity	RH	--	90%(Max60°C)	RH

BACKLIGHT CHARACTERISTICS

Item	Symbol	Min	Typ	Max	Unit	Condition
Forward voltage	Vf	2.8	3.0	3.2	V	If=60 mA
Luminance	LV	3000			cd/m²	
Number of LED	--	4			Piece	
Connection mode	p	4 parallel				

2. MODULE OUTLINE DRAWING 产品外形图



3. INTERFACE DESCRIPTION 接口定义

Pin No 接口序号	Symbol 符号	Description 描述
1	GND	Ground
2	RS	Data/Command control Pin
3	/CS	Chip select pin
4	SCL	Serial clock signal
5	DATA	Serial in signal
6	/RESET	Reset signal input
7	VDD	Power supply(2.8V)
8	VSS	Ground
9	LED-A	Backlight anode
10	LED-K	Backlight cathode

4. IC READ/WRITE TIMING IC 读/写时序

(IC 的详细信息请参阅 IC 规格书)

5. SPECIFICATION OF QUALITY ASSURANCE

5-1. Purpose

This standard for Quality Assurance should affirm the quality of LCD module products to supply to purchaser by QZDA

5-2. Standard for Quality Test

a. Inspection:

Before delivering, the supplier should take the following tests, and affirm the quality of product.

b. Electro-Optical Characteristics:

According to the individual specification to test the product.

c. Test of Appearance Characteristics:

According to the individual specification to test the product.

d. Test of Reliability Characteristics:

According to the definition of reliability on the specification for testing products.

e. Delivery Test:

Before delivering, the supplier should take the delivery test.

(i) Test method: According to MIL-STD105E.General Inspection Level II take a single time.

(ii) The defects classify of AQL as following:

Major defect: AQL = 0.65

Minor defect: AQL = 2.5

Total defects: AQL = 2.5

5-3. Non- conforming Analysis & Deal With Manners

a. Non- conforming Analysis:

(i) Purchaser should supply the detail data of non- conforming sample and the non-conforming.

(ii) After accepting the detail data from purchaser, the analysis of non- conforming should be finished in two weeks.

(iii) If supplier can not finish analysis on time, must announce purchaser before 3 days.

b. Disposition of non- conforming:

(i) If find any product defect of supplier during assembly time, supplier must change the good product for every defect after recognition.

(ii) Both supplier and customer should analyze the reason and discuss the disposition of non-conforming when the reason of nonconforming is not sure.

5-4. Agreement items

Both sides should discuss together when the following problems happen.

a. There is any problem of standard of quality assurance, and both sides should think that must be modified.

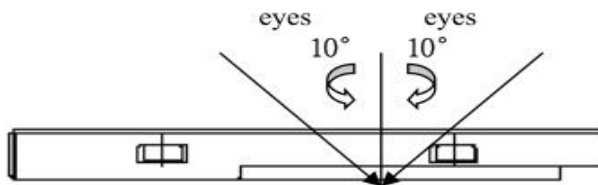
b. There is any argument item which does not record in the standard of quality assurance.

c. Any other special problem.

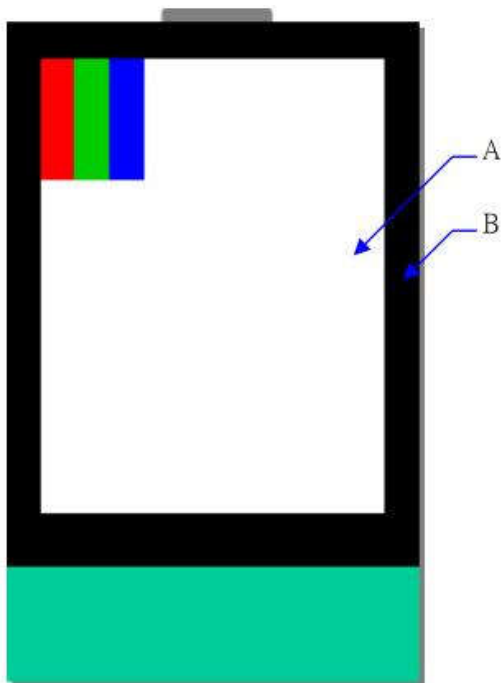
5-5. Standard of The Product Appearance Test

a. Manner of appearance test:

- (i) The test must be under $20W \times 2$ or $40W$ fluorescent light, and the distance of view must be at $30 \pm 5cm$.
- (ii) When test the model of transmissive product must add the reflective plate.
- (iii) The test direction is base on around 10° of vertical line.
- (iii) Temperature: $25 \pm 5^\circ C$ Humidity: $60 \pm 10\%RH$



(iv) Definition of area:



A. Area: Viewing area.

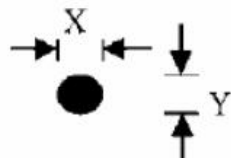
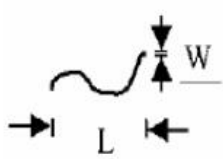
B. Area: Out of viewing area.

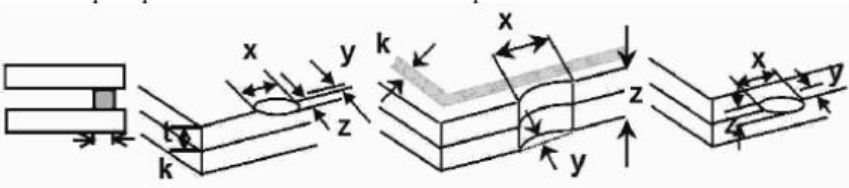
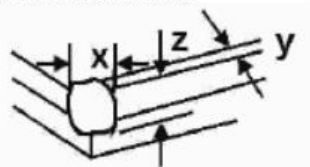
(Outside viewing area)

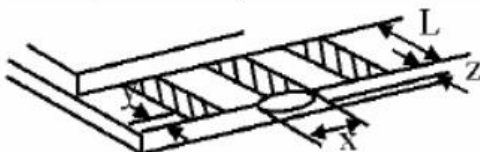
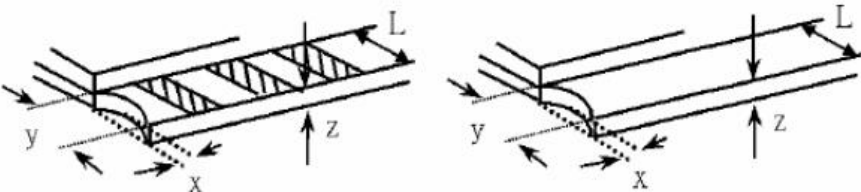
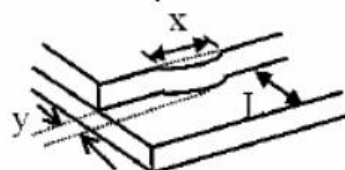
b. Basic principle:

- (i) It will accord to the AQL when the standard can not be described.
- (ii) The sample of the lowest acceptable quality level must be discussed by both supplier and customer when any dispute happened.
- (iii) Must add new item on time when it is necessary.

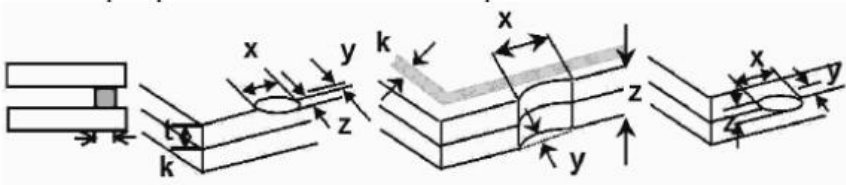
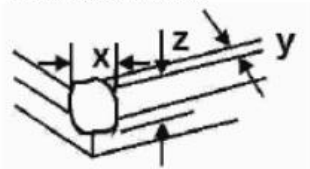
c. Standard of inspection: (Unit: mm)

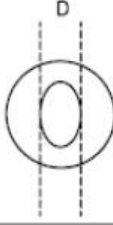
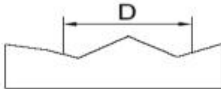
NO	Item	Criterion	AQL																										
01	Electrical Testing	1.1 Missing vertical, horizontal segment, segment contrast defect. 1.2 Missing character, dot or icon. 1.3 Display malfunction. 1.4 No function or no display. 1.5 Current consumption exceeds product specifications. 1.6 LCD viewing angle defect. 1.7 Mixed product types. 1.8 Flicker	0.65																										
02	Black or White spots or Bright spots or Color spots on LCD (Display only)	2.1 White and black or color spots on display ≤ 0.25mm, no more than Five spots. 2.2 Densely spaced: No more than three spots within 3mm.	2.5																										
03	LCD and Touch Panel black spots, white spots, contamination (non – display)	<div>3.1 Round type: As following drawing $\Phi = (X+Y) / 2$<div></div><table><tr><th>Size(mm)</th><th>Acceptable Q'ty</th></tr><tr><td>$\Phi \leq 0.10$</td><td>Accept no dense</td></tr><tr><td>$0.10 < \Phi \leq 0.20$</td><td>2</td></tr><tr><td>$0.20 < \Phi \leq 0.25$</td><td>2</td></tr><tr><td>$0.25 < \Phi \leq 0.30$</td><td>1</td></tr><tr><td>$0.30 < \Phi$</td><td>0</td></tr></table><p>* Densely spaced: No more than two spots within 3mm.</p></div> <div>3.2 Line type: (As following drawing)<div></div><table><tr><th>Length(m m)</th><th>Width(mm)</th><th>Acceptable Q'ty</th></tr><tr><td>---</td><td>$W \leq 0.02$</td><td>Accept no dense</td></tr><tr><td>$L \leq 3.0$</td><td>$0.02 < W \leq 0.05$</td><td rowspan="2">2</td></tr><tr><td>$L \leq 2.5$</td><td>$0.03 < W \leq 0.08$</td></tr><tr><td>---</td><td>$0.08 < W$</td><td>Rejection</td></tr></table><p>* Densely spaced: No more than two lines within 3mm.</p></div>	Size(mm)	Acceptable Q'ty	$\Phi \leq 0.10$	Accept no dense	$0.10 < \Phi \leq 0.20$	2	$0.20 < \Phi \leq 0.25$	2	$0.25 < \Phi \leq 0.30$	1	$0.30 < \Phi$	0	Length(m m)	Width(mm)	Acceptable Q'ty	---	$W \leq 0.02$	Accept no dense	$L \leq 3.0$	$0.02 < W \leq 0.05$	2	$L \leq 2.5$	$0.03 < W \leq 0.08$	---	$0.08 < W$	Rejection	2.5
Size(mm)	Acceptable Q'ty																												
$\Phi \leq 0.10$	Accept no dense																												
$0.10 < \Phi \leq 0.20$	2																												
$0.20 < \Phi \leq 0.25$	2																												
$0.25 < \Phi \leq 0.30$	1																												
$0.30 < \Phi$	0																												
Length(m m)	Width(mm)	Acceptable Q'ty																											
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$L \leq 2.5$	$0.03 < W \leq 0.08$																												
---	$0.08 < W$	Rejection																											

NO	Item	Criterion	AQL																		
04	Polarizer bubbles	<div><div>If bubbles are visible, judge using black spot specifications, not easy to find, must check in specify direction</div><table><tr><th>Size Φ(mm)</th><th>Acceptable Q'ty</th></tr><tr><td>$\Phi \leq 0.20$</td><td>Accept no dense</td></tr><tr><td>$0.20 < \Phi \leq 0.50$</td><td>3</td></tr><tr><td>$0.50 < \Phi \leq 1.00$</td><td>2</td></tr><tr><td>$1.00 < \Phi$</td><td>0</td></tr><tr><td>Total Q'ty</td><td>3</td></tr></table></div>	Size Φ (mm)	Acceptable Q'ty	$\Phi \leq 0.20$	Accept no dense	$0.20 < \Phi \leq 0.50$	3	$0.50 < \Phi \leq 1.00$	2	$1.00 < \Phi$	0	Total Q'ty	3	2.5						
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$\Phi \leq 0.20$	Accept no dense																				
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$0.50 < \Phi \leq 1.00$	2																				
$1.00 < \Phi$	0																				
Total Q'ty	3																				
05	Scratches	Follow NO.3 -2 Line Type.																			
06	Chipped glass	<div><div>Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Glass thickness a: LCD side length L: Electrode pad length 6.1 General glass chip: 6.1.1 Chip on panel surface and crack between panels:</div><div></div><table><tr><td>z: Chip thickness</td><td>y: Chip width</td><td>x: Chip length</td></tr><tr><td>$Z \leq 1/2t$</td><td>Not over viewing area</td><td>$x \leq 1/8a$</td></tr><tr><td>$1/2t < z \leq 2t$</td><td>Not exceed $1/3k$</td><td>$x \leq 1/8a$</td></tr></table><div><div>⊙ Unit: mm</div><div>⊙ If there are 2 or more chips, x is the total length of each chip</div><div>6.1.2 Corner crack:</div><div></div><table><tr><td>z: Chip thickness</td><td>y: Chip width</td><td>x: Chip length</td></tr><tr><td>$Z \leq 1/2t$</td><td>Not over viewing area</td><td>$x \leq 1/8a$</td></tr><tr><td>$1/2t < z \leq 2t$</td><td>Not exceed $1/3k$</td><td>$x \leq 1/8a$</td></tr></table><div><div>⊙ Unit: mm</div><div>⊙ If there are 2 or more chips, x is the total length of each chip</div></div></div></div>	z: Chip thickness	y: Chip width	x: Chip length	$Z \leq 1/2t$	Not over viewing area	$x \leq 1/8a$	$1/2t < z \leq 2t$	Not exceed $1/3k$	$x \leq 1/8a$	z: Chip thickness	y: Chip width	x: Chip length	$Z \leq 1/2t$	Not over viewing area	$x \leq 1/8a$	$1/2t < z \leq 2t$	Not exceed $1/3k$	$x \leq 1/8a$	2.5
z: Chip thickness	y: Chip width	x: Chip length																			
$Z \leq 1/2t$	Not over viewing area	$x \leq 1/8a$																			
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NO	Item	Criterion	AQL																
07	Glass crack	<p>Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Glass thickness a: LCD side length L: Electrode pad length</p> <p>7.2 Protrusion over terminal: 7.2.1 Chip on electrode pad:</p>  <table><tr><td>y: Chip width</td><td>x: Chip length</td><td>z: Chip thickness</td></tr><tr><td>$y \leq 0.5\text{mm}$</td><td>$x \leq 1/8a$</td><td>$0 < z \leq t$</td></tr></table> <p>7.2.2 Non-conductive portion:</p>  <table><tr><td>y: Chip width</td><td>x: Chip length</td><td>z: Chip thickness</td></tr><tr><td>$y \leq L$</td><td>$x \leq 1/8a$</td><td>$0 < z \leq t$</td></tr></table> <p>⊙ If there chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications. ⊙ If the product will be heat sealed by the customer, the alignment mark must not be damaged.</p> <p>7.2.3 Substrate protuberance and internal crack</p>  <table><tr><td>y: width</td><td>x: length</td></tr><tr><td>$y \leq 1/3L$</td><td>$X \leq a$</td></tr></table>	y: Chip width	x: Chip length	z: Chip thickness	$y \leq 0.5\text{mm}$	$x \leq 1/8a$	$0 < z \leq t$	y: Chip width	x: Chip length	z: Chip thickness	$y \leq L$	$x \leq 1/8a$	$0 < z \leq t$	y: width	x: length	$y \leq 1/3L$	$X \leq a$	2.5
y: Chip width	x: Chip length	z: Chip thickness																	
$y \leq 0.5\text{mm}$	$x \leq 1/8a$	$0 < z \leq t$																	
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$y \leq L$	$x \leq 1/8a$	$0 < z \leq t$																	
y: width	x: length																		
$y \leq 1/3L$	$X \leq a$																		

NO	Item	Criterion	AQL
08	Cracked glass	The LCD with extensive crack is not acceptable.	2.5
09	Backlight elements	9.1 Illumination source flickers when lit. 9.2 Spots or scratches that appear when lit must be judged. Using LCD spot, lines and contamination standards. 9.3 Backlight doesn't light or color is wrong.	2.5 2.5 0.65
10	Bezel	Bezel must comply with product specifications.	2.5
11	PCB、COB	11.1 COB seal may not have pinholes larger than 0.2mm or contamination. 11.2 COB seal surface may not have pinholes through to the IC. 11.3 The height of the COB should not exceed the height indicated in the assembly diagram. 11.4 There may not be more than 2mm of sealant outside the seal area on PCB. And there should be no more than three places. 11.5 Parts on PCB must be the same as on the production characteristic chart, There should be no wrong parts, missing parts or excess parts. 11.6 The jumper on the PCB should conform to the product characteristic chart.	2.5 2.5 2.5 2.5 0.65 0.65
12	FPC	12.1 FPC terminal damage \leq 1/2 FPC terminal width and can not affect the function , we judge accept. 12.2 FPC alignment hole damage \leq 1/2 alignment area and can not affect the function , we judge accept.	2.5 2.5
13	Soldering	13.1 No cold solder joints, missing solder connections, oxidation or icicle. 13.2 No short circuits in components on PCB or FPC.	2.5 0.65

NO	Item	Criterion	AQL												
14	Touch Panel Chipped glass	<p>Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Touch Panel Total thickness a: LCD side length L: Electrode pad length</p> <p>14.1 General glass chip: 14.1.1 Chip on panel surface and crack between panels:</p>  <table><tr><td>z: Chip thickness</td><td>y: Chip width</td><td>x: Chip length</td></tr><tr><td>$Z \leq t$</td><td>$\leq 1/2 k$ and not over viewing area</td><td>$x \leq 1/8a$</td></tr></table> <p>⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip</p> <p>14.1.2 Corner crack:</p>  <table><tr><td>z: Chip thickness</td><td>y: Chip width</td><td>x: Chip length</td></tr><tr><td>$z \leq t$</td><td>$\leq 1/2 k$ and not over viewing area</td><td>$x \leq 1/8a$</td></tr></table> <p>⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip</p>	z: Chip thickness	y: Chip width	x: Chip length	$Z \leq t$	$\leq 1/2 k$ and not over viewing area	$x \leq 1/8a$	z: Chip thickness	y: Chip width	x: Chip length	$z \leq t$	$\leq 1/2 k$ and not over viewing area	$x \leq 1/8a$	2.5
z: Chip thickness	y: Chip width	x: Chip length													
$Z \leq t$	$\leq 1/2 k$ and not over viewing area	$x \leq 1/8a$													
z: Chip thickness	y: Chip width	x: Chip length													
$z \leq t$	$\leq 1/2 k$ and not over viewing area	$x \leq 1/8a$													

NO	Item	Criterion	AQL										
15	Touch Panel(Fish eye、dent and bubble on film)	<table><tr><th>SIZE(mm)</th><th>Acceptable Q'ty</th></tr><tr><td>$\Phi \leq 0.2$</td><td>Accept no dense</td></tr><tr><td>$0.2 < D \leq 0.4$</td><td>5</td></tr><tr><td>$0.4 < D \leq 0.5$</td><td>2</td></tr><tr><td>$0.5 < D$</td><td>0</td></tr></table> <div></div>	SIZE(mm)	Acceptable Q'ty	$\Phi \leq 0.2$	Accept no dense	$0.2 < D \leq 0.4$	5	$0.4 < D \leq 0.5$	2	$0.5 < D$	0	2.5
SIZE(mm)	Acceptable Q'ty												
$\Phi \leq 0.2$	Accept no dense												
$0.2 < D \leq 0.4$	5												
$0.4 < D \leq 0.5$	2												
$0.5 < D$	0												
16	Touch Panel Newton ring	Newton ring dimension $\leq 1/2$ touch panel area and not affect font and line distortion($\leq 2.5\%$) , it is acceptable.	2.5										
17	Touch Panel Linearity	Less than 2.5% is acceptable.	2.5										
18	LCD Ripple	Touch the touch panel , can not see the LCD ripple. Pen: R 1.0mm silicon rubber. Operation Force: 80g	2.5										
19	General appearance	19.1 Pin type must match type in specification sheet. 19.2 LCD pin loose or missing pins. 19.3 Product packaging must the same as specified on packaging specification sheet. 19.4 Product dimension and structure must conform to product specification sheet.	0.65 0.65 0.65 0.65										

6. RELIABILITY TEST CONDITIONS

可靠性测试条件

NO.	Test Item	Test Condition	Inspection after test
1	High Temperature Storage 高温存储测试	80°C±2°C/72 hours	Inspection after 2~4 hours storage at room temperature ,the sample shall be free from defects: 实验结束后, 已测试的 LCD 样品必须在室内正常温湿度环境下放置, 2~4 小时以上才能进行功能和外观检查, 样品不允许有以下缺陷: 1.Air bubble in the LCD; 模块中有气泡 2.Sealleak;封口松脱 3.Non-display;不显示 4.missing segments;漏笔 5.Glass crack;玻璃破碎 6.Current IDD is twice higher than initial value. 电流 IDD 大于初始值的两倍。
2	Low Temperature Storage 低温存储测试	-30°C±2°C/72 hours	
3	High Temperature Operating 高温操作测试	70°C±2°C/72 hours	
4	Low Temperature Operating 低温操作测试	-20°C±2°C/72 hours	
5	Temperature Cycle 冷热循环存储	-20°C±2°C~25°C~60°C±2°C*5cycles (30min.) (5min.) (30min.)	
6	Damp Proof Test 防潮测试	60°C±5°C*90%RH/120 hours	
7	Vibration Test 震荡测试	Frequency:10Hz-55Hz-10Hz Amplitude:1.5mm x,y,z direction for total 3hours(packing condition)	
8	Drooping Test 跌落测试	Drop to the ground from 1m heigh , one time ,ever side of carton..(packing condition)	
9	ESD Test 静电测试	Voltage: ±4KV R:330Ω C:150pF Air discharge ,10time	

7. ROHS TEST REPORT

ROHS 测试标准

Tested Item(s) 测试项目	Measured Equipment(s) 测量设备	Report Limit 限定值	Content 内容
Lead(Pb)铅	ICP-OES	2 mg/kg	N.D.
Mercury(Hg)汞	ICP-OES	2 mg/kg	N.D.
Cadmium(Cd)铬	ICP-OES	2 mg/kg	N.D.
Hexavalent Chromium(Cr(VI))六价铬	UV-VIS	2 mg/kg	N.D.
Bromine(Br)溴	IC	10 mg/kg	N.D.
Polybrominated Biphenyls(PBBS)多溴联苯	GS-MS	5 mg/kg	N.D.
Polybrominated Diphenyl Ethers(PBDES) 多溴二苯醚	GC-MS	5mg/kg	N.D.

Note:-N.D.=Not Detected (<report limit) -mg/kg=ppm=parts per millio

8. PRECAUTIONS FOR USING LCD MODULES 模组使用注意事项

1. Handling precautions 使用注意事项

1.1 The display panel is made of glass and polarizer. As glass is fragile. It tends to become or chipped during handling especially on the edges. Please avoid dropping or jarring. Do not subject it to a mechanical shock by dropping it or impact.

显示屏由玻璃和偏光片组成，由于玻璃是脆的，使用过程中要特别注意边缘区，请防止跌落或震动，不能机械碰撞。

1.2 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary. Do not touch the display with bare hands, This will stain the display area and degraded insulation between terminals (some cosmetics are determined to the polarizer)

请勿施加过大的压力与显示屏或连接部位，否则会引起色调变化，不要用手接触显示屏，这将弄脏显示区和降低端子之间的绝缘能力，（一些外观是由偏光片决定的）

1.3 The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully. Do not touch, push or rub the exposed polarizers with anything harder than an HB pencil lead (glass, tweezers, etc). Do not put or attach anything on The display area to avoid leaving marks on it. Condensation on the surface and contact with terminals due to cold will damage, stain or dirty the polarizer. After products are tested at low temperature they must be warmed up in container before coming in to contact with room temperature air.

覆盖液晶显示模块显示平面的偏光片是软性且易被擦伤，请小心轻拿，请勿用任何硬度大于 HB 铅笔芯的物品（玻璃，镊子等）接触、撞压或摩擦裸露偏光片，不要放置或粘附物体在显示区域上以免留下痕迹，冷凝在表面和端子将会损坏或弄脏偏光片，产品在低温下测试之后，与室温空气接触之前必须在容器内升温。

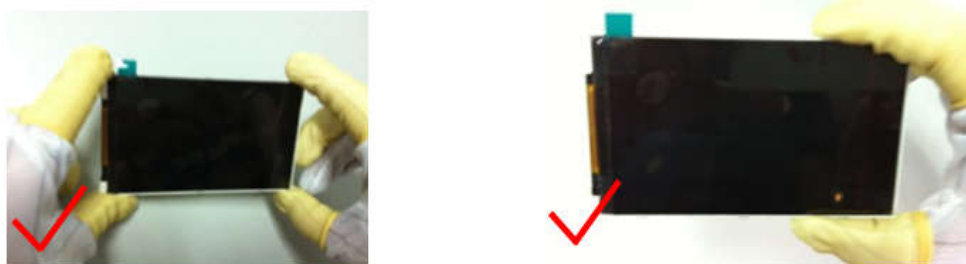
1.4 Tools required for assembling, such as soldering irons, must be properly grounded. Make certain the AC power source for the soldering iron does not leak. When using an electric screwdriver to attach LCM, the screwdriver should be of ground potentiality to minimize as much as possible any transmission of electromagnetic waves produced sparks coming from the commutator of the motor.

使用工具如电烙铁，要可靠接地，并确保烙铁使用交流电，不要漏电，用电批固定模块时，电批应接地，尽可能降低电动换向器火花产生的电磁波。

2. Handling precaution for LCM 模块操作规范

2.1 LCM is easy to be damaged. Please note below and be careful for handling.

液晶显示模块很容易被损坏，请注意以下并小心操作

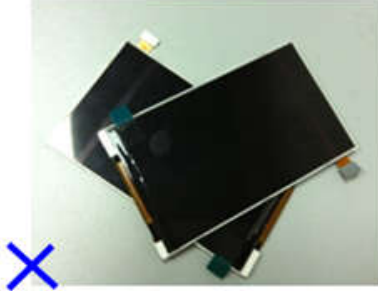


2.2 Correct handling; 正确操作

As above picture, Please handle with anti-static gloves around LCM edges.

像上面的图片，请戴防静电手套，并拿模块边缘。

2.3 Incorrect handing 错误操作



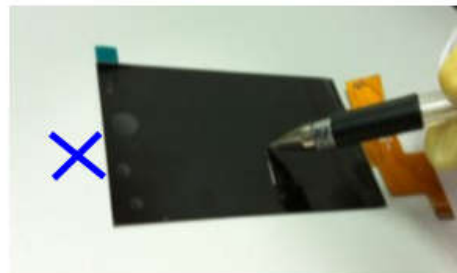
Please don't stack LCM
不要把模块叠在一起



Please don't hold the surface of panel
请不要拿着面板的表面



Please don't hold the surface of IC
请不要拿着 IC 的表面



Please don't operate with sharp stick such as pens
请不要用尖锐的物体来操作，例如用笔尖

2.4 Input logic voltage before apply analog high voltage such as LCD driving voltage when power on. Remove analog high voltage before logic when power off the module. Input each signal after the positive/negative voltage becomes stable.

开机时，先开逻辑电压，再接通模拟电压，如显示屏驱动电压。关机时，先断开模拟电压，再关逻辑电压，正负电源都稳定后再送控制信号。

2.5 If the LCD modules have been operating for a long time showing the same display patters,the display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear.A normal operating status can be regained by suspending use for some time.It should be noted that this phenomenon does not adversely affect performance reliability.

如果液晶显示模块长时间工作于同一个显示图案，换屏时会出现鬼影，也会出现轻微的对比度不均，停止使用一段时间后可恢复到正常状态，此现象不会严重影响性能可靠性。

2.6 Please keep the temperature within the specified range for use and storage.Polarization degradation,bubble generation or polarizer peel-off may occur with high temperature and high humidity.

模块在操作和存储规范范围内使用，高温高湿可能会引起偏振退化，气泡，偏光片脱落等问题。

3. Storage Precautions 存储注意事项

3.1 When storing the LCD modules,the following precaution are necessary.

液晶显示模块的存储依照以下几点：

3.2 Store them in sealed polyethylene bag.If properly sealed,there is no need for the desiccant
使用聚乙烯密袋封，如果密封得当，不需要干燥剂。

3.3 Store them in a dark place. Do not expose to sunlight or fluorescent light, keep the temperature between 0~35°C, and keep the relative humidity between 40% RH and 60% RH.

避光保存，避免直接暴晒在太阳光或黄光灯下，保持温度在 0~35°C 之间，保持相对湿度在 40% RH 和 60% RH 之间。

3.4 The polarizer surface should not come in contact with any other objects (We advise you store them in the anti-static electricity container in which they were shipped)

偏光片表面避免接触其他物质（建议存放在货运防静电包装中）

4 Transportation Precautions 运输注意事项

4.1 During shipment, please handle with care. The packaging bag can not be broken, step on trap. Packing Carton layer height can not be over two meters.

装运过程要轻拿轻放，不能出现包装袋破损，塌陷，卡通箱叠层高度不能超过两米。

4.2 The transportation process should pay attention to the waterproof and moisture-proof measures. Product can not be watering. Ethylene sealed bags can not be unsealed.

运输过程要注意有防水和防潮措施，产品不能淋水，产品乙烯密封袋不可拆封

9. SPECIAL REMARKS

注意事项

1. The above specifications are the binding criteria for QZD Technology's outgoing quality inspection.

以上规格描述为勤正达的品质出货标准

2. The customer is kindly requested to inform QZD Technology as soon as possible on any questions, remarks, and disagreements regarding these specifications.

对于规格中的任何问题或存在疑问，客户可随时向勤正达公司进行咨询。

3. QZD is not responsible for damage to its products due to neglect of the precautions as described in the previous chapter.

如果不按照规格书要求进行操作而损坏产品的，勤正达不承担责任。

4. About the limited warranty unless special agreement between HX and customer QZD will replace or repair any of its products that are found to be functionally defective when inspected in accordance with HX acceptance standards for a period of one year from date of shipments.

除勤正达跟客户签定协议外，对确认为属于产品本身功能性缺陷的，在勤正达可接受范围内可进行退换或维修，勤正达保质期为从出货日期起一年内有效。