

# **PRODUCT SPECIFICATION**

Customer	
Project	
Part No.	Z686007-P31-I977-Y4
Remarks	□APPOVAL FOR SPECIFICATION ONLY ■APPOVAL FOR SPECIFICATION AND SAMPLE

	CUSTOME	R	Z	HUNYIKE.	II
Approved	Checked	Prepared	Approved	Checked	Prepared
By	By	By	By	By	By
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# **Revision Record**

Rev. No.	Date	Description
V1.0	2023-04-22	Preliminary Specification Release.

# Contents

1. General Specifications	3
2. Interface Definition Description	4
3. Mechanical Drawing	5
4. Electrical Specifications	6
5. Delivery Inspection	
6. Reliability Test	12
7. Precautions	13
8. Packing and Storage	15

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# 1. General Specifications

No.	Item	Specification	Unit
1	Display Size (Diagonal)	6.86	inch
2	Display Resolution	480(H) × RGB × 1280 (V)	pixels
3	Pixel Pitch	41.8(H) × 125.4 (V)	um
4	LCM Outline Dimension (Without FPC)	65.78 (W) ×171.75 (H) ×2.6 (T)	mm
5	LCD Outline Dimension	63.39 (W) × 169.01 (H) × 0.8 (T)	mm
6	LCD Active Area	60.19 (W) ×160.51 (H)	mm
7	View Direction (Gray Inversion)	FULL VIEW	-
8	Driver IC	ICNL9707	-
9	Pixel Arrangement	RGB-Stripe	-
10	Display Mode	Normal Black	-
11	Pixel driving Element	a-Si TFT	-
12	LCD Transmittance	Typ.: 4.4% Min:3.74%	-
13	LCD Contrast Ratio	Typ.: 1500 Min:1000	-
14	FPC Version	Z686007-P31 V5	-
15	Interface	MIPI	-
16	Operating Temperature	-20°C~ 70°C	-
17	Storage Temperature	-30°C~ 80°C	-
18	Backlight Arrangement	LED/4 Series 4 Parallel (16 lights in total)	-
19	Luminance	480	nit
20	Weight	0.119	kg

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# 2. Interface Definition Description

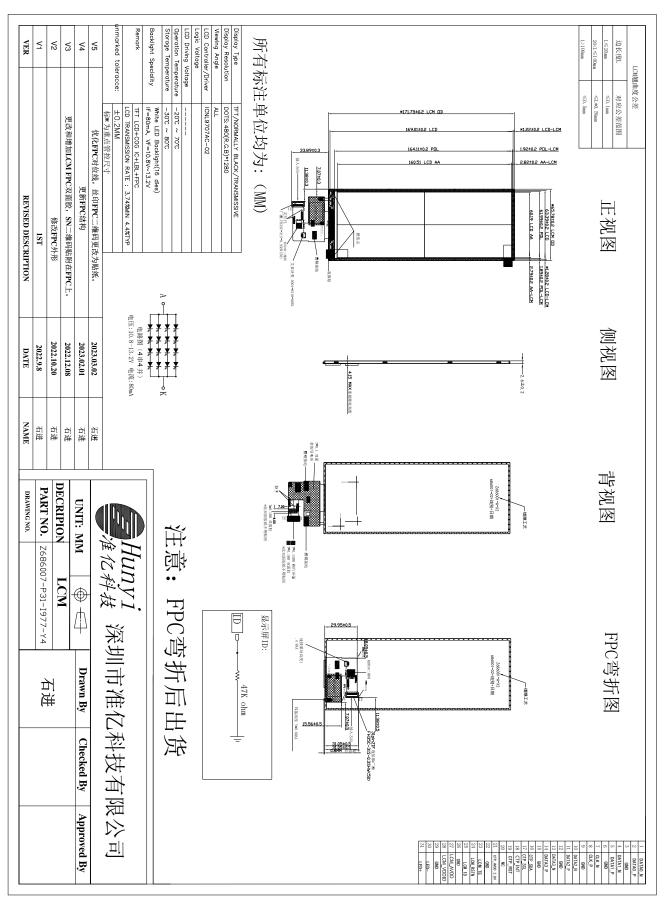
### 2.1 LCM PIN

IN NO.	PIN DEF.	FUNCTION DESC.
1	DATA0_N	Negative MIPI differential data input
2	DATA0_P	Positive MIPI differential data input
3	GND	Ground
4	DATA1_N	Negative MIPI differential data input
5	DATA1_P	Positive MIPI differential data input
6	GND	Ground
7	CLK_N	Negative MIPI differential CLOCK input
8	CLK_P	Positive MIPI differential CLOCK input
9	GND	Ground
10	DATA2_N	Negative MIPI differential data input
11	DATA2_P	Positive MIPI differential data input
12	GND	Ground
13	DATA3_N	Negative MIPI differential data input
14	DATA3_P	Positive MIPI differential data input
15	GND	Ground
16	CTP_SDA	TP I2C data (SDA) data input (MOSI)(1.8V)
17	CTP SCL	TP I2C clock (SCL) clock (SCLK)(1.8V)
18	CTP INT	TP Interrupt PIN(1.8V)
19	CTP RST	TP Reset PIN(1.8V)
20	NC	No Connection
21	CTP AVDD	TP POWER SUPPLY(2.8V)
22	GND	Ground
23	LCM TE	Tearing Effect PIN
24	LCM RSTN	LCM RESET PIN
25	LCM ID	LCM ID PIN
26	GND	Ground
27	LCM_AVDD	POWER SUPPLY(2.8V)
28	LCM_VDDIO	I/O POWER SUPPLY(1.8V)
29	GND	Ground
30	LEDK	POWER SUPPLY- FOR BACKLIGHT CATHODE
31	LEDA	POWER SUPPLY- FOR BACKLIGHT ANODE

when power on.



## 3. Mechanical Drawing



# 4. Electrical Specifications

# 4.1. LCD Optical Characteristics

Item		Symbol Conditions	Specification			Unit	Nata	
			Conditions	Min.	Тур.	Max.	Unit	Note
Transmittance (V	With PL)	T(%)	Viewing	3.74	4.4	-	%	-
Contrast Ra	ntio	CR	Viewing normal angle	1000	1500	-	-	-
Response T	ime	TR+TF	x = y =0	-	30	40	ms	-
	Hon	Θx+		75	85	-		
Viewing Angle	Hor. Ox-	Θx-	$CR \ge 10$	75	85	-	daa	
Viewing Angle	Var	Θу+	at 25°C	75	85	-	deg.	-
	Ver. Oy-		75	85	-			

### 4.2. Electrical Specifications

Item	Symbol	S	Unit		
nem	Symbol	Min.	Тур.	Max.	Umt
Power For Analog Circuit	AVDD	4.5	-	6.5	V
TFT Gate On Voltage	VGH	11	16	18	V
TFT Gate Off Voltage	VGL	-7.0	-14	-15	V
TFT Common Electrode Voltage	Vcom	-3.375	-	-0.3	V

# 4.3. Typical Operating Conditions

Item	Symbol	Min.	Тур.	Max.	Unit
Analog Supply Voltage	LCM_AVDD	2.6	2.8	3.6	V
I/O Supply Voltage	LCM_VDDIO	1.65	1.8	3.6	V
Input High Voltage	VIH	0.7×LCM_VDDIO	-	LCM_VDDIO	V
Input Low Voltage	VIL	GND	-	0.3×LCM_VDDIO	V

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Output High Voltage	VOH	0.8×LCM_VDDIO	-	LCM_VDDIO	V
Output Low Voltage	VOL	GND	-	0.2×LCM_VDDIO	V

# 4.4. Backlight Circuit Specifications

Item		Symbol	Min.	Тур.	Max.	Unit	Test Condition
Current		IB	-	80	-	mA	-
Voltage		V <sub>f</sub>	10.8	11	12.8	V	-
LCM Unifor	mity	-	80	-	-	%	10.00
Life Tim	e	-	30000	-	-	Hr.	If=80mA
Power Consur	nption	PBL	-	880	-	mW	
	<b>D</b> 1	Rx		0.623			
	Red	Ry		0.329			
		Gx		0.314	-		
СТР	Green	Gy	0.015	0.605			Average the brightness
Chromaticity	Blue	Bx	-0.015	0.144	+0.015		- EV at 9 points, Optical - Instrument BM-7
Coordinate		By		0.610			
		Wx		0.289			
	White	White Wy		0.321			

## 4.5. LCD Power Consumption

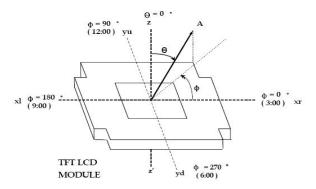
Mode	Symbol	Тур.	Max.	Unit				
Normal Mode	LCM_AVDD+LCM_VDDIO	-	-	mA				
Test Condition: LCM_AVDD=2	Test Condition: LCM_AVDD=2.8V.							
Interface Drive	Interface Drive Type: row flipping or column flipping.							
IPS Type LCD F	Panel => All Black Pattern.							
TN Type LCD P	Panel => All White Pattern.							
Temperature: 25°C.								
Mode	Symbol	Тур.	Max.	Unit				

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Sleep Mode	LCM_AVDD+LCM_VDDIO	-	-	μΑ	
Test Condition: LCM_AVDD=2.8V.					
DC/DC converter is enabled. Internal oscillator is started and panel scanning is started.					
Except for the IC internal crystal oscillator and panel scanning, other functions are suspended.					
Temperature: 25°C.					

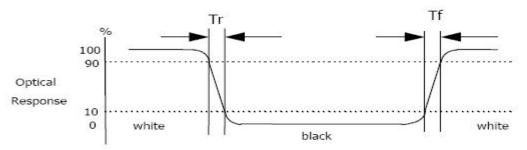
### 4.6. Measuring System

#### 4.6.1. LCM Viewing Angle



Viewing angle is the angle at which the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface.

#### 4.6.2. Response Time



Response time is the time required for the display to transition from white to black (Rising time, Tr) and from black to white (Falling time, Tf) for additional information.

#### 4.6.3. Contrast Ratio (CR)

Contrast Ratio (CR) is defined mathematically as:

 $Contrast Ratio = \frac{Surface Luminance with all white pixels}{Surface Luminance with all black pixels}$ 

Surface luminance is the center point across the LCD surface 500mm from the surface with all pixels displaying white.

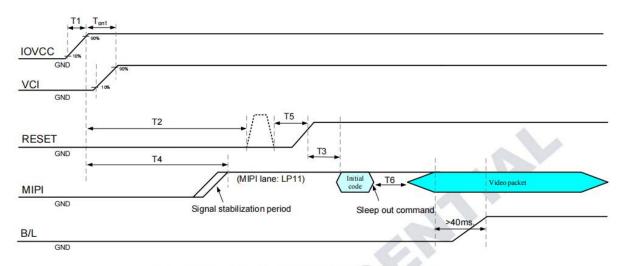
Page 8/17



### 4.7. Power On / Power Off

#### 4.7.1. Power On

Applied Power: IOVCC, VCI

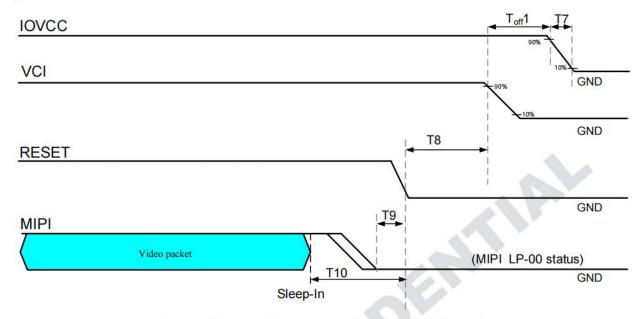


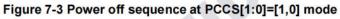
#### Figure 7-1 Power on sequence at PCCS[1:0]=[1,0] mode

Note1: Unless otherwise specified, timings herein show cross point at 50% of signal/power level.

#### 4.7.2. Power Off

#### Application Power: IOVCC, VCI,



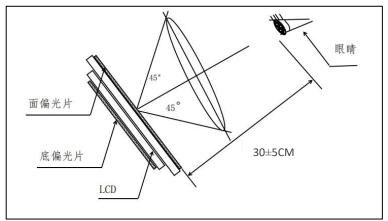


Note1: Unless otherwise specified, timings herein show cross point at 50% of signal/power level.

## 5. Delivery Inspection

### 5.1. Quality Inspection Environmental Conditions

- 5.1.1. Viewing distance: the normal viewing distance between the screen and the inspector is 30±5cm; Inspection Angle: 90°±45° (90° indicates that the inspector's perspective is perpendicular to the product to be inspected).
- 5.1.2. Visual inspection illumination: 1000±200LUX;Electrical inspection illumination: 200±100LUX;Ambient temperature 25±5°C, ambient humidity 55±15%RH.



### 5.2. Quality Inspection Standard

No.	Defect	Standard		Defect Grade	Result
	Spot Defect (including bright	< 7 inches	$\Phi \le 0.10$ mm	Ignore	OK
			$0.10$ mm $< \Phi \le 0.20$ mm $DS \ge 10$ mm	Minor Defect	OK
			Φ > 0.20mm	Serious Defect	NG
1	spot / color spot /	$\geq$ 7 inches	$\Phi \le 0.15 \text{mm}$	Ignore	OK
	bubble / dark spot, etc.)		$0.15$ mm $< \Phi \le 0.25$ mm DS $\ge 10$ mm	Minor Defect	OK
			Φ > 0.25mm	Serious Defect	NG
		Φ: defect diame	ter. DS: spacing.		
2	Linear Defect	< 7 inches	W≤0.02mm,	Ignore	OK
	(scratches,		L: unlimited		



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	filaments, etc.)		0.02mm < W L ≤ 5		Minor Defect	ОК
			W > 0.03mm		Serious Defect	NG
			W ≤ 0.0 L: unli		Ignore	ОК
		$\geq$ 7 inches	0.03mm < W L≤5		Minor Defect	OK
			W > 0.0	)5mm	Serious Defect	NG
		W: defect width	. L: defect length. D	S: spacing.		
		Display Area	Judge by Sp	pot Defect		
3	3 Polarizer Bubble	r Bubble Black Edge Area	The distance from the edge of the display area is greater than 0.5mm.		Minor defect	OK
			The distance from the edge of the display area is less than 0.5mm.		Judge by Spot Defect	
4	Polarizer Bump (Mark)	Display Area / Black Edge Area	Invisible when the cover plate is		Minor Defect	OK
		Item	Method	Instrument	Median	Tolerance Range
5	Color and Luminance	Color	x, y Color Coordinate	Optical Instrument BM-7	According to the actual test on the sample confirmed by the customer.	± 0.04
		Luminance	Average the brightness EV at 9 points	Optical Instrument BM-7	According to the actual test on the sample confirmed by the customer.	± 20%
6	Other Standards	Subject to the ne	Subject to the negotiation by both parties.			

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7	Warranty Period	One year after sale.		
8	Guarantee	ROHS, REACH		
9     Websites     https://www.zhunyikeji.com       https://www.zhunyidisplay.com       https://www.zhunyilcd.com		https://www.zhunyidisplay.com		

# 6. Reliability Test

Item	Condition	Result Determination
High-Temperature Storage	80°C 120H	
Low-Temperature Storage	-30°C 120H	After the test, leave the LCD
High-Temperature Operation	70°C 120H	samples indoors at normal
Low-Temperature Operation	-20°C 120H	temperature and humidity for 2H for function and
High-Temperature and High-Humidity	60°C 90%RH 120H	appearance inspection. The sample should meet the
Thermal Cycling Test	-30°C/0.5H ~ +80°C/0.5H 100 cycles in total	requirements on electrical performance, but be free from
Vibration Test	Frequency: 10Hz ~ 55Hz ~ 10Hz Amplitude: 0.75mm Cycle once a minute,30cycles in total (Packing Condition)	<ul><li>the following defects:</li><li>1. Air bubble in the module,</li><li>2. No display,</li><li>3. Glass crack.</li></ul>
ESD Test	±4kV Human Body Mode 150pF/330Ω ±8kV Air Mode 150pF/330Ω	

#### Note:

- 1) Each module under test can only be used for one of the test items.
- 2) The quantity of samples for each test item is 2.
- 3) Fault Judgment Criterion: Basic Specifications, Electrical Specifications, Mechanical Specifications, Optical Specifications.

### 7. Precautions

- 7.1. The display screen consists of glass and polarizer. Since the glass is fragile, the user must pay special attention to the edge area, and protect it from falling, vibration, or mechanical impact.
- 7.2. If the display screen is damaged and the liquid crystal material leaks, be sure not to get any in the mouth. If the liquid crystal material contacts the skin or clothes, flush off with soap and water.
- 7.3. Do not apply excessive force to the display screen or the joint part, or the color will change. Do not touch the display screen with bare hands, which will stain the display area and degraded insulation between terminals (some of the appearance is determined by the polarizer).
- 7.4. The polarizer covering the display panel of the LCD module is soft and easy to be scratched, be sure to handle carefully. Do not touch, impact, press, or rub the exposed polarizers with anything harder than an HB pencil lead (e.g.: glass, tweezers, etc.). Do not place or attach anything onto the display area to avoid leaving marks. The condensed material on the surface or terminals due to cold will damage or stain the polarizer. After the test in low temperature environment, the product must be warmed up in a container before put into the room temperature environment.
- 7.5. If the display panel is stained, blow warm air onto the surface and gently wipe it with a soft and dry cloth. If it is seriously contaminated, wipe it with a wet cloth dipped in one of the following solvents:
   glycerol

Do not scrub, and avoid damaging the display panel.

- 7.6. Solvents other than those mentioned above may damage the polarizer. In particular, never use any of the following solvents:
  - water
  - ketone
  - arene

Wipe off saliva or water drop immediately, the contact with water over a long period of time may cause deformation or color fading. Avoid contact with oil or grease.

- 7.7. Special note: minimize electrode corrosion. Because electrode corrosion can be accelerated by water droplets, condensation of humidity, or electrification in a high humidity environment.
- 7.8. Assemble the LCD Module by the mounting holes. Make sure the LCD module make sure there is no bending, distortion, or deformation. Do not forcibly pull or bend the transmission wire or the backlight wire.

<sup>-</sup> ethyl Alcohol

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- 7.9. Do not disassemble the LCD module.
- 7.10. NC terminal should be disconnected. Do not connect any device.
- 7.11. If the logic circuit power supply is off, do not send the input signal.
- 7.12. Since the LCD module is integrated with CMOS, pay special attention to the modules. To prevent electrostatic damage, be careful to maintain an suitable work environment.
  - Make sure the module has the same potential as the human body before take the LCD module out of the packing box for assembly. The reliable grounding is necessary during module processing.
  - The required tool, such as the electric soldering iron, must be reliably grounded. Make sure the it is connected to AC power supply, and no electric leakage. When fixing the module with electric screwdriver, it must be grounded, to reduce the electromagnetic wave generated by the electric commutator spark as much as possible.
  - Do not assemble or operate under dry condition to reduce the static electricity. To reduce static electricity, the workplace must not be too dry. The recommended relative humidity is 50 60%.
     Keep your work clothes and work table grounded as much as possible
  - The LCD module is coated with a film to protect the display surface. Be careful when peeling off the film to reduce the generated static electricity.
- 7.13. Since the LCD module has high precision assembly and regulation, try to avoid excessive impact on the module or making any changes:
  - Do not change the shape of the tab on the metal frame.
  - Do not drill any extra hole, modify the shape, or change the position of component on the printed circuit board.
  - Do not change or damage the pattern on the printed circuit board.
  - Never modify the zebra strip (conductive rubber) or heat seal connector.
  - Do not make any change with the electric soldering iron except for the joint.
  - Do not throw, bend or twist.



### 8. Packing and Storage

### 8.1. Packing Method

Step 1



Take 1pcs of the product, put it into a anti-static bag.



Take 2 bags of product to place into the carton, make sure they are surface to surface. Put a piece of EPE pad

between the carton and the separator to protect the

#### products.





Put the products into cartons one by one, each carton contains 60 pieces of products.

### 8.2. Storage Method

Store in an ambient temperature of 23±5°C, and in a relative humidity of 60±15%. The storage period should not exceed 12 months. Do not expose to the sun for a long period of time.

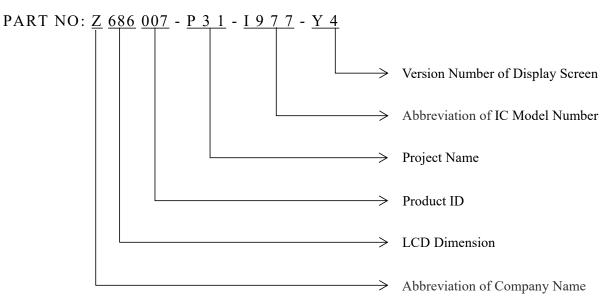
- 8.2.1. Store in clean environment, free from dust, active gas, or solvent.
- 8.2.2. Store in anti-static environment.



The cartons should be taped and shipped with labels.



### 8.3. Nomenclature



#### 8.4. Label

Shenzhen Zhunyi Technology Co., Ltd.			
Product:	Display Screer	LEVEL:3	
Spec.:			
P/N:			
Lot:			
D/C		间热器名间	
Qty.:		349 21 19	
Supplier Code:			
РО			
R/K			
Version: A	>	XXXXXX, YYYY-00000000000000000, KKKK, WWWW, AAAAA.	

<u>Shenzhen Zhunyi Technology Co., Ltd.</u>

# 8.5. Product appearance identification

Hunyi 淮化科技

Item	Description	Production QR Code Position Display
QR Code Content	二维码贴纸贴附在 FPC 上 213J1 年年年年月月日日六位序列号	Z68001-A-12 68001-02+线例-日期 wongenisation to 201-100000
Printing Code appearance and content	Z686007-P31-I977-Y4 www.zhunyikeji.com	
<ol> <li>Customer have requirements(R</li> <li>Control content</li> </ol>		