PRODUCT SPECIFICATION

Customer	
Project	
Part No.	**Z35017-P40-总成 3**
Remarks	□APPOVAL FOR SPECIFICATION ONLY ■APPOVAL FOR SPECIFICATION AND SAMPLE

CUSTOMER			ZHUNYIKEJI		
Approved By	Checked By	Prepared By	Approved By	Checked By	Prepared By
				Shi Jin	Yang Zifeng

Revision Record

Rev. No.	Date	Description
V1.0	2023-04-06	Preliminary Specification Release.

Contents

1. General Specifications

No.	Item	Specification	Unit
1	Display Size (Diagonal)	3.5	inch
2	Display Resolution	320(H）× RGB × 480（V）	pixels
3	Pixel Pitch	153(H）× 153（V）	um
4	LCM Outline Dimension (Without FPC）	53.76 (W) ×82.39 (H) ×2.23 (T)	mm
5	CTP Outline Dimension (Without FPC）	55.46 (W) ×83.94 (H) ×4.25 (T)	mm
6	LCD Outline Dimension	51.96 (W) × 80.22 (H) × 0.8 (T)	mm
7	LCD Active Area	48.96（W）×73.44（H）	mm
8	View Direction (Gray Inversion)	FULL VIEW	-
9	Driver IC	ILI9488	-
10	Pixel Arrangement	RGB-Stripe	-
11	Display Mode	Normal Black	-
12	Pixel driving Element	a-Si TFT	-
13	LCD Transmittance	Typ.: 4.05% Min:3.45%	-
14	LCD Contrast Ratio	Typ.: 1000 Min:800	-
15	FPC Version	Z35017-P40 V3	-
16	Interface	MCU18BIT/SPI+ 18BIT RGB	-
17	Operating Temperature	-20°C~ 70°C	-
18	Storage Temperature	-30°C~ 80°C	-
19	Backlight Arrangement	LED/3 Series 2 Parallel (6 lights in total)	-
20	Luminance	220	nit
21	Weight	0.035	kg

2. Interface Definition Description

2.1 LCM PIN

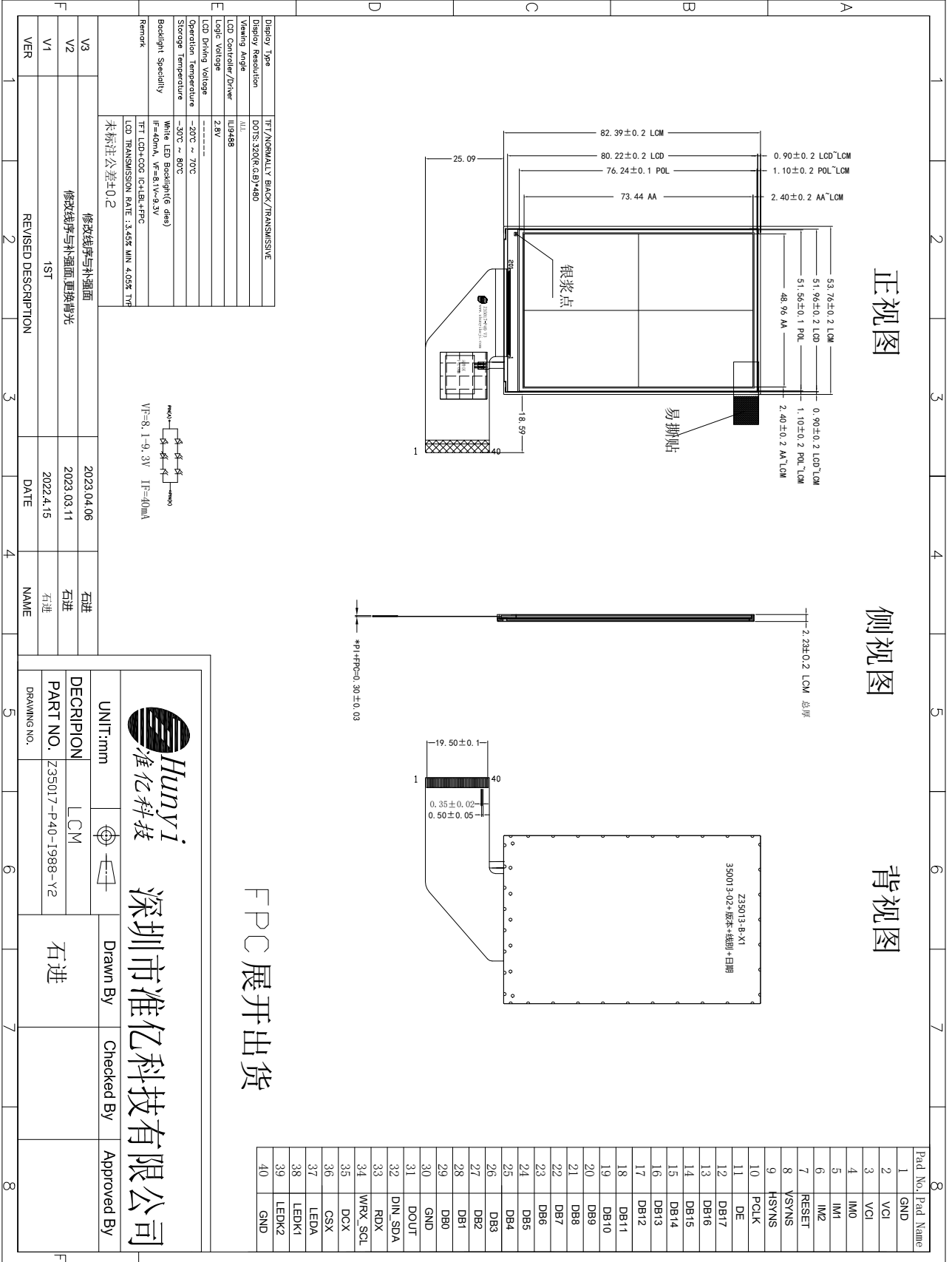| PIN NO.	PIN DEF.	FUNCTION DESC.
1	GND	Ground
2-3	VCI	Power supply for analog circuit
4	IM0	Interface mode select PIN
5	IM1	Interface mode select PIN
6	IM2	Interface mode select PIN
7	RESET	Reset pin
8	VSYNC	Vertical synchronizing input signal for RGB interface
9	HSYNC	Horizontal synchronizing input signal for RGB interface
10	PCLK	Dot clock signal for RGB interface operation
11	DE	Data enable signal for RGB interface operation
12-29	DB17-DB0	DATA BUS
30	GND	Ground
31	DOUT	SPI interface output pin
32	DIN_SDA	SPI interface input pin
33	RDX	Read enable in 8080 MCU parallel interface
34	WRX _SCL	Write enable in MCU parallel interface In SPI mode, this pin is used as SCL
35	DCX	Display data/command selection (RS) pin in MCU interface
36	CSX	Chip selection pin
37	LEDA	LED Anode
38	LEDK1	LED Cathode
39	LEDK2	LED Cathode
40	GND	Ground

RESET voltage should be consistent with VDDI voltage, or there probably is black screen fault when power on.

2.1 TP PIN

PIN NO.	PIN DEF.	FUNCTION DESC.
1	TP-VDD(3.3V)	TP POWER SUPPLY(3.3V)
3	TP-GND	Ground
4	TP-SCL(3.3V)	TP I2C clock (SCL) clock (SCLK)(3.3V)
4	TP-SDA(3.3V)	TP I2C data (SDA) data input (MOSI)(3.3V)
5	TP-INT(3.3V)	TP Interrupt PIN(3.3V)
6	TP-RESET(3.3V)	TP Reset PIN(3.3V)

3. Mechanical Drawing

3.1 LCM

正视图

侧视图

背视图

82.39±0.2 LCM
80.22±0.2 LCD
76.24±0.1 POL
73.44 AA
25.09
0.90±0.2 LCD~LCM
1.10±0.2 POL~LCM
2.40±0.2 AA~LCM

53.76±0.2 LCM
51.96±0.2 LCD
51.56±0.1 POL
48.96 AA
0.90±0.2 LCD~LCM
1.10±0.2 POL~LCM
2.40±0.2 AA~LCM

银浆点
易撕贴

18.59

1 40

2.23±0.2 LCM 总厚

*PI+FPC=0.30±0.03

19.50±0.1
1 40
0.35±0.02
0.50±0.05

Z35013-B-X1
350013-02+版本+线图+日期

FPC 展开出货

Pad No.	Pad Name
1	GND
2	VCI
3	VCI
4	IM0
5	IM1
6	IM2
7	RESET
8	VSYNS
9	HSYNS
10	PCLK
11	DE
12	DB17
13	DB16
14	DB15
15	DB14
16	DB13
17	DB12
18	DB11
19	DB10
20	DB9
21	DB8
22	DB7
23	DB6
24	DB5
25	DB4
26	DB3
27	DB2
28	DB1
29	DB0
30	GND
31	DOUT
32	DIN_SDA
33	RDX
34	WRX_SCL
35	DCX
36	CSX
37	LEDA
38	LEDK1
39	LEDK2
40	GND

Display Type	TFT/NORMALLY BlACK/TRANSMISSIVE	
Display Resolution	DOTS:320(R.G.B)*480	
Viewing Angle	ALL	
LCD Controller/Driver	ILI9488	
Logic Voltage	2.8V	
LCD Driving Voltage	—	
Operation Temperature	-20℃ ~ 70℃	
Storage Temperature	-30℃ ~ 80℃	
Backlight Speciality	White LED Backlight(6 dies) IF=40mA, VF=8.1V~9.3V	
Remark	TFT LCD+COG IC+LBL+FPC LCD TRANSMISSION RATE：3.45% MIN 4.05% TYP	

未标注公差±0.2

修改线序与补强面
修改线序与补强面,更换背光

VF=8.1~9.3V IF=40mA

V3	修改线序与补强面	2023.04.06	石进
V2	修改线序与补强面,更换背光	2023.03.11	石进
V1	1ST	2022.4.15	石进
VER	REVISED DESCRIPTION	DATE	NAME

Hunyi 准亿科技
深圳市准亿科技有限公司

UNIT:mm
DECRIPION LCM
PART NO. Z35017-P40-T988-Y2
DRAWING NO.

Drawn By	Checked By	Approved By
石进		

3.2 CTP

正面图

侧面图

背面图

堆叠图

GLASS 圆偏子 T=1.1
TOP OCA T=0.125
TOP FILM T=0.125
BOT OCA T=0.06
BOT FILM T=0.125

技术参数 Spec.:

	容球规格 Spec.	110g 40cm，中心点3次无破碎
1	产品结构类型 Structure	
2	COVER LENS钢化类型 Strengthening	Glass+Film+Film
3	COVER LENS表面硬度 Surface Hardness	化学钢化
4	无油墨处透光率 Transmission	旭硝子1.1MM ≥6H
5	工作温度 Operation temperature	≥83%
6	储存温度 Storage temperature	-20℃~70℃
7	是否有防指纹效果?	-30℃~80℃≤90%RH
8	防指纹油是否影响透光率?	是 □ 否 □
9	是否进行功能按键字消音?	是 □ 否 ☑
10	功能键与FPC是否在同类基材上点胶?	是 □ 否 □
11	表面处理要求?	是 □ 否 ☑

接口类型 Interface: ☑IC □GT911 ☑2Z2 □一体黑设计? 是 □ 否 ☑

触控IC型号 Touch IC	
供电电压 Vdd	☑3.3V □5V
Resistance on SDA, SCL	通道数 Channels
SDA, SCL主板上是否有上拉电阻	通道电压 IIc Voltage □3.3V □1.8V

□IC □USB □UART

TX □ RX □

CTP厚度T=1.525±0.10
LCM=2.23±0.15
LCM+CTM模组贴合后总厚度 4.25±0.20

VF=8.1-9.3V IF=40mA

CTP Pin description	
1	TP-VDD(3.3V)
2	TP-GND
3	TP-SCL
4	TP-SDA
5	TP-INT
6	TP-RESET

Pad No., Pad Name	
1	GND
2	VCI
3	VCI
4	IM0
5	IM1
6	IM2
7	RESET
8	VSYNS
9	HSYNS
10	PCLK
11	DE
12	DB17
13	DB16
14	DB15
15	DB14
16	DB13
17	DB12
18	DB11
19	DB10
20	DB9
21	DB8
22	DB7
23	DB6
24	DB5
25	DB4
26	DB3
27	DB2
28	DB1
29	DB0
30	GND
31	DOUT
32	DIN_SDA
33	RDX
34	WRX_SCL
35	CSX
36	DCX
37	LEDA
38	LEDK1
39	LEDK2
40	GND

Display Type TFT/NORMALLY BLACK/TRANSMISSIVE
Display Resolution DOTS:320(R.G.B)*480
Viewing Angle ALL
LCD Controler/Driver ILI9488
Logic Voltage 2.8V
LCD Driving Voltage
Operation Temperature -20℃~70℃
Storage Temperature -30℃~80℃
Backlight Speciality White LED Backlight(6 dies) IF=40mA VF=8.1V~9.3V
Remark TFT LCD+COG IC+LBL+FPC
LCD TRANSMISSION RATE: 3.45% MIN 4.05% TH
未标注公差±0.2

VER		REVISED DESCRIPTION	DATE	NAME
V1	1ST		2022.09.24	石进
V2	修改线序与补强面		2023.03.11	石进
V3	修改线序与补强面，更换背光		2023.04.06	石进

UNIT: mm

4. Electrical Specifications

4.1. LCD Optical Charcteristics

Item		Symbol	Conditions	Specification			Unit	Note
				Min.	Typ.	Max.		
Transmittance (With PL)		T(%)	Viewing normal angle x = Y =0	3.45	4.05	-	%	-
Contrast Ratio		CR		800	1000	-	-	-
Response Time		TR+TF		-	25	35	ms	-
Viewing Angle	Hor.	Θx+	CR≧10 at 25℃	80	85	-	deg.	-
		Θx-		80	85	-		
	Ver.	Θy+		80	85	-		
		Θy-		80	85	-		

4.2. Electrical Specifications

Item	Symbol	Specification			Unit
		Min.	Typ.	Max.	
Power For Analog Circuit	AVDD	-	-	-	V
TFT Gate On Voltage	VGH	10	12	14	V
TFT Gate Off Voltage	VGL	-14	-12	-10	V
TFT Common Electrode Voltage	Vcom	-2	-	0	V

4.3. Typical Operating Conditions

Item	Symbol	Min.	Typ.	Max.	Unit
Analog Supply Voltage	VCI	2.5	2.8	3.3	V
I/O Supply Voltage	1.8V	1.65	1.8	3.3	V
Input High Voltage	VIH	$0.7 \times VCI$	-	VCI	V
Input Low Voltage	VIL	-0.3	-	$0.3 \times VCI$	V

Output High Voltage	VOH	0.8 × VCI	-	VCI	V
Output Low Voltage	VOL	0	-	0.2 × VCI	V

4.4. Backlight Circuit Specifications

Item		Symbol	Min.	Typ.	Max.	Unit	Test Condition
Current		I_B	-	40	-	mA	-
Voltage		V_f	8.1	9	9.3	V	-
LCM Uniformity		-	80	-	-	%	If=40mA
Life Time		-	30000	-	-	Hr.	
Power Consumption		PBL	-	360	-	mW	
LCM Chromaticity Coordinate	Red	Rx	0.611	0.626	0.641		Average the brightness EV at 9 points，Optical Instrument BM-7
		Ry	0.325	0.340	0.355		
	Green	Gx	0.294	0.309	0.324		
		Gy	0.589	0.604	0.619		
	Blue	Bx	0.127	0.142	0.157		
		By	0.035	0.050	0.065		
	White	Wx	0.272	0.287	0.302		
		Wy	0.304	0.319	0.334		

4.5. LCD Power Consumption

Mode	Symbol	Typ.	Max.	Unit
Normal Mode	VCI+1.8V	-	-	mA
Test Condition: VCI=3.3V.				
Interface Drive Type: row flipping or column flipping.				
IPS Type LCD Panel => All Black Pattern.				
TN Type LCD Panel => All White Pattern.				
Temperature: 25°C.				
Mode	**Symbol**	**Typ.**	**Max.**	**Unit**

Sleep Mode	VCI+1.8V	-	-	μA

Test Condition: VCI=3.3V.
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
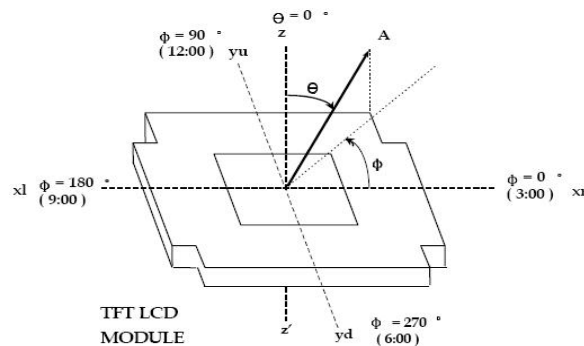
Viewing angle is the angle at which the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface.

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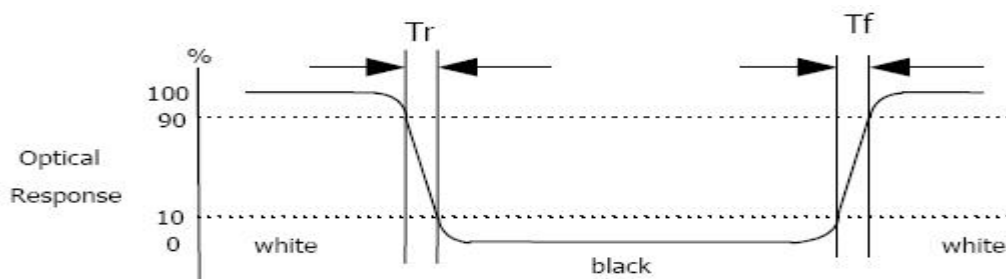
Response time is the time required for the display to transition from white to black (Rising time, Tr) and from black to white (Falling time, Tf) for additional information.

4.6.3.   Contrast Ratio (CR)

Contrast Ratio (CR) is defined mathematically as:

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

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

4.7. Power On / Power Off

4.7.1. Power On/Off

Case 1 – RESX Line is Held High or Unstable by Host at Power ON

If the RESX line is held High or unstable by the host during Power On, then Hardware Reset must be applied after both VCI and IOVCC have been applied. Otherwise, the correct functionality is not guaranteed. There is no timing restriction upon this hardware reset.

trPWRESX1 is applied to RESX falling in the Sleep Out Mode
trPWRESX2 is applied to RESX falling in the Sleep In Mode
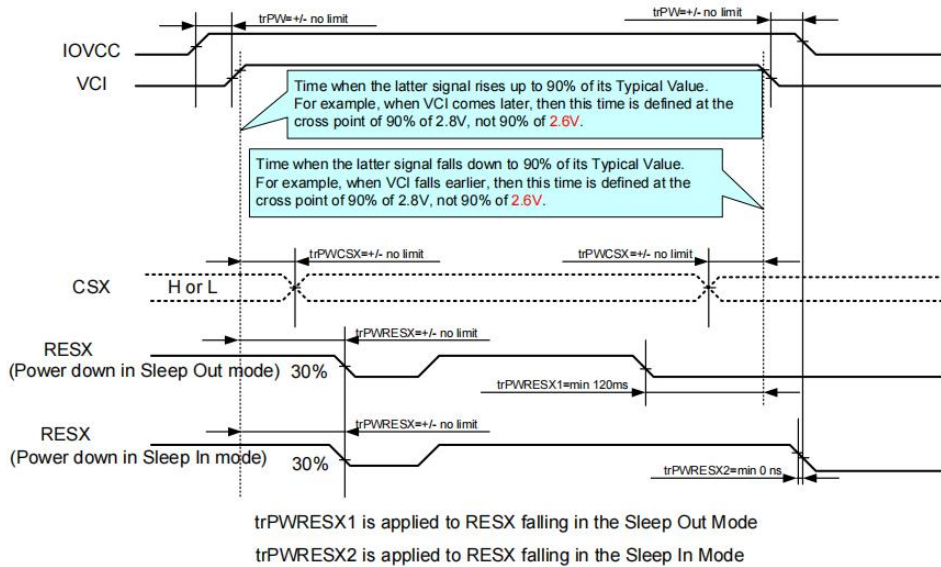
Note: Unless otherwise specified, timings herein show the cross point at 50% of the signal power level.

Case 2 – RESX Line is Held Low by Host at Power ON

If the RESX line is held Low (and stable) by the host during Power On, then the RESX must be held low for a minimum of 10µsec after both VCI and IOVCC have been applied.

trPWRESX1 is applied to RESX falling in the Sleep Out Mode
trPWRESX2 is applied to RESX falling in the Sleep In Mode
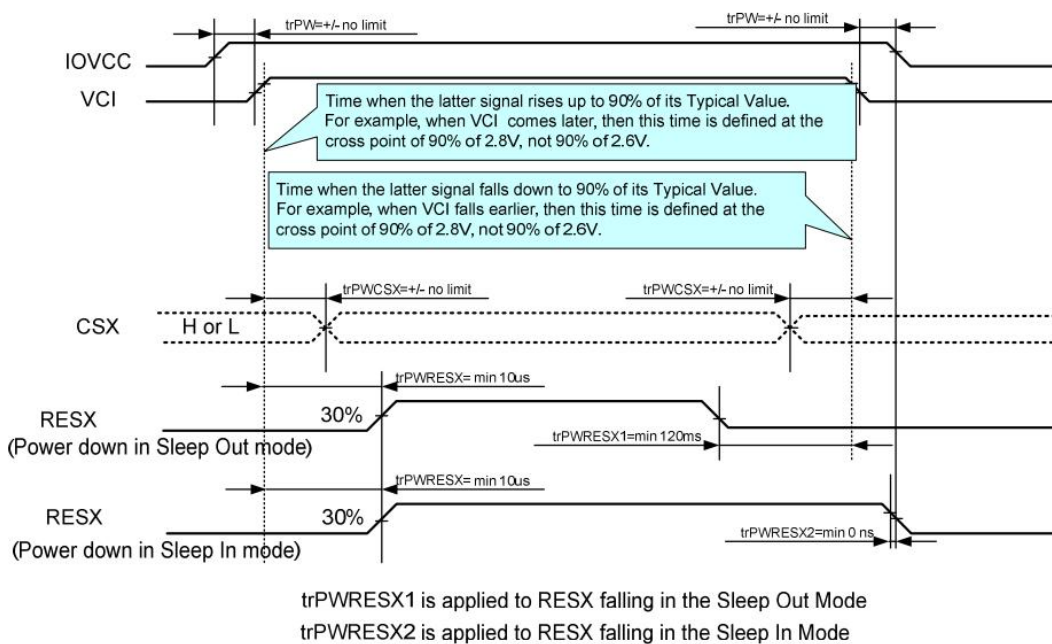
5. Delivery Inspection

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℃, ambient humidity 55±15%RH.
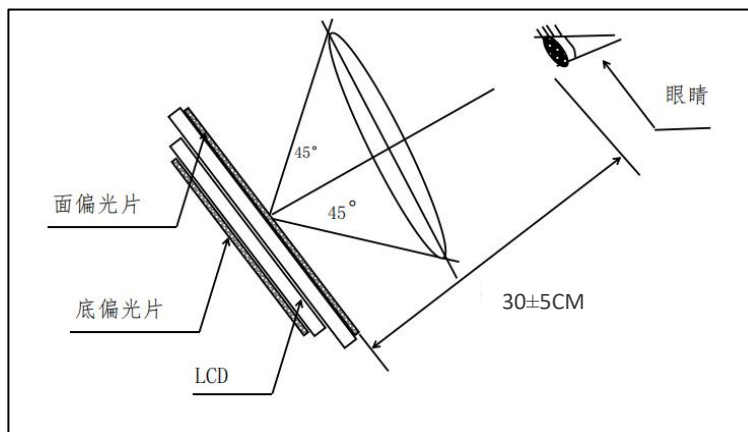
5.2. Quality Inspection Standard

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

filaments, etc.)		0.02mm < W ≤ 0.03mm L ≤ 5mm		Minor Defect	OK
		W > 0.03mm		Serious Defect	NG
	≧ 7 inches	W ≤ 0.03mm L: unlimited		Ignore	OK
		0.03mm < W ≤ 0.05mm L ≤ 5mm		Minor Defect	OK
		W > 0.05mm		Serious Defect	NG
	W: defect width. L: defect length. DS: spacing.				

3	Polarizer Bubble	Display Area	Judge by Spot Defect		
		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 touch screen or cover plate is assembled.	Minor Defect	OK

5	Color and Luminance	Item	Method	Instrument	Median	Tolerance Range
		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 negotiation by both parties.			

7	Warranty Period	One year after sale.
8	Guarantee	ROHS、REACH
9	Websites	Official: https://en.zhunyikeji.com/ Globle Resources: https://zhunyi.manufacturer.globalsources.com/ Alibaba: https://zhunyikeji.en.alibaba.com/ 1688: https://shop9641057ru80o3.1688.com/

6. Reliability Test

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

- ethyl Alcohol

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.

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.
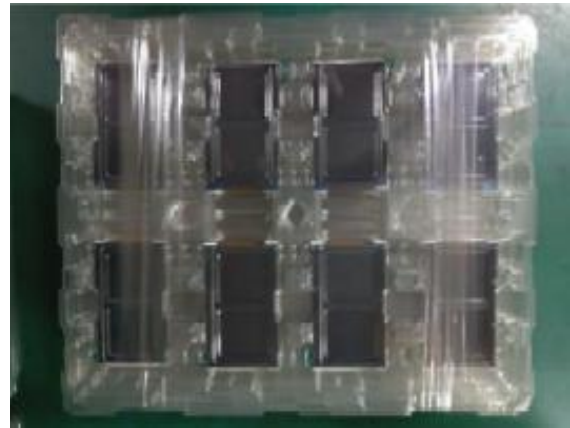
- Do not throw, bend or twist.

8. Packing and Storage

8.1. Packing Method

Step 1

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

Step 2

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.

Step 3

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

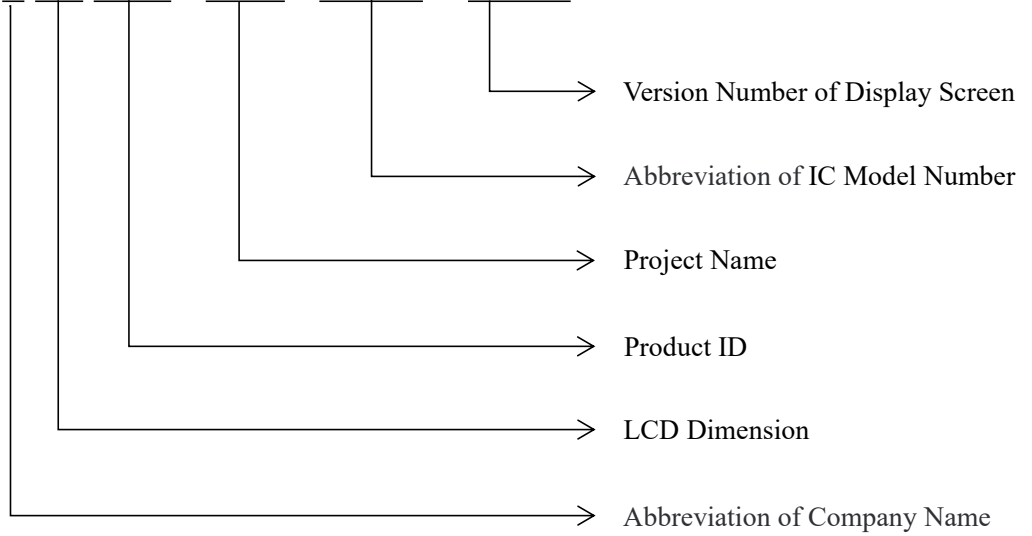**Step 4**

The cartons should be taped and shipped with labels.

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.
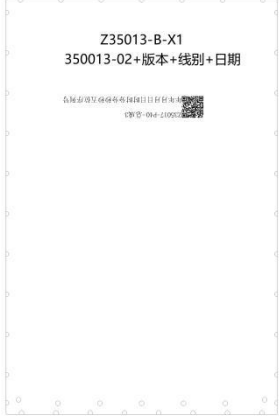
8.2.2. Store in anti-static environment.

8.3. Nomenclature

PART NO: Z 3 5 0 1 7 - P 4 0 - XXXX - 总成 3

→ Version Number of Display Screen

→ Abbreviation of IC Model Number

→ Project Name

→ Product ID

→ LCD Dimension

→ Abbreviation of Company Name

8.4. Label

Shenzhen Zhunyi Technology Co., Ltd.	
Product: Display Screen	LEVEL:3
Spec.:	
P/N:	
Lot:	
D/C	
Qty.:	
Supplier Code:	
PO	
R/K	
Version: A	XXXXXXX, YYYY-00000000000000000, KKKK, WWWW, AAAAA.

8.5. Product appearance identification

Item	Description	Production QR Code Position Display
 QR Code Content	www.zhunyikeji.com 13823705290	Z35013-B-X1 350013-02+版本+线别+日期
Printing Code appearance and content	Z35017-P40-总成 3 **YYMMDD+Time+5 digits serial number**	
1. **Customer have detail position and direction requirements(Refer to right picture for details）.** 2. **Control content,format,position of the QR Code strictly.**		