SURENOO GRAPHIC OLED SERIES DISPLAY
Product Specification

Part Name: OEL Display Panel
Model No.: SOG128128A_P112

Please click the following image to buy the sample

Surenoo 1.12" 128*128 Transparent OLED Panel

Surenoo Display

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Shenzhen Surenoo Technology Co.,Ltd.
www.surenoo.com
E-mail: info@surenoo.com
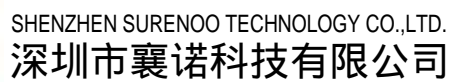**Skype: Surenoo365**

Graphic OLED Display Selection Guide

Graphic OLED Module | **Graphic OLED Panel**

SH1107 | Test Code

2. TABLE OF CONTENTS

3. RECORD OF REVISION

REV	COMMENT	PAGE	DATE
A	Initial Release	1-25	2022-11-28

4. GENERAL SPECIFICATION

ITEM	CONTENTS	UNIT
Module Size	23.10 (L) × 54.10（W）× 1.27(H)	mm
Panel Size	23.10 (L) × 27.46（W）× 1.27(H)	mm
Active Area	20.14（L)× 20.14(W)	mm
View Area	21.10（L)× 21.10(W)	mm
Dot Matrix	128（L)X 128（W)	mm
Diagonal A/A Size	1.12	inch
Driver IC	SH1107G	---
Display Color	Monochrome (white)	---
Weight	TBD±10%	gram

SHENZHEN SURENOO TECHNOLOGY CO.,LTD.

5.Mechanical Drawing

VER.	SYMBOL	AMENDMENT	SIGN	DATE
01	△0	First issue	SUNHAIYA	20221024
02	△1	改外形尺寸	SUNHAIYA	20221122

PIN	SYMBOL
1	VSS
2	SI
3	SCL
4	A0
5	RES
6	CS
7	IREF
8	VDD
9	VSS
10	VCOMH
11	VPP
12	VSS

128(c)×128(s)
1.12"

NOTES:
1. OPERATING TEMP: −40°C TO 70°C
2. STORAGE TEMP: −40°C TO 85°C
3. VIEWING DIRECTION: ALL
4. OLED DRIVE IC: SH1107G
5. DISPLAY COLOR: Blue / Yellow / Green
6. UNSPECIFIED TOLERANCES: ±0.2mm.
7. ( ) MEANS: DIMENSION FOR REFERENCE
8. THE PROTECTIVE FILM ON FRONT SIDE
OF OLED MUST BE REMOVED BEFORE
ASSEMBLY BY CUSTOMER.(客户在装机时自己必
须撕掉保护膜)

RW112C004 ← 产品型号
XXXXXX-XXX
年月日 流水号

RW112C004
XXXXXX-XXX

	SHENZHEN SURENOO TECHNOLOGY CO.,LTD.		
DESIGNED BY: *Sun Haiya*	SOG128128A_T112	VERSION:	2.0
CHECKED BY: *Cao Feng*		NO. 1 OF 2	
APPROVED BY: *Xing Mingying*		TOL: ±0.2mm if not specify	
		UNIT: MM	
		DATE: 2022−11−22	

SILICON
STIFFENER   CONTACT SIDE
TOP GLASS   BOTTOM GLASS

Model No.: SOG128128A_P112

SHENZHEN SURENOO TECHNOLOGY CO.,LTD.

Surenoo® Display

VER.	AMENDMENT	DATE
01	First issue	20221024
02	改外形尺寸	20221118

23.10±0.10
MIN V.A 21.10
A.A 20.14
1.00
1.48

0.50±0.05
0.55±0.05
1.27±0.10

0.30±0.30
0.30±0.30

TOP GLASS
BOTTOM GLASS

27.46±0.10
23.14±0.10
MIN V.A 21.10
A.A 20.14

128(c)×128(s)
1.12"

4.32
1.50
1.50

0.08 0.08
1.00

7.43±0.2 ─ PITCH 0.15*55=8.25

RW112C004 ◄────── 产品型号

XXXXXX-XXX
年月日 流水号

RW112C004
XXXXXX-XXX

NOTES:
1. OPERATING TEMP:-40°C TO 70°C
2. STORAGE TEMP: -40°CTO 85°C
3. VIEWING DIRECTION:ALL
4. OLED DRIVE IC:SH1107G
5. DISPLAY COLOR: WHITE
6. UNSPECIFIED TOLERANCES:±0.2mm.
7. ( ) MEANS: DIMENSION FOR REFERENCE
8. THE PROTECTIVE FILM ON FRONT SIDE
OF OLED MUST BE REMOVED BEFORE
ASSEMBLY BY CUSTOMER.(客户在装机时自己必
须撕掉保护膜)

0.1375
0.1575
0.1375
0.1575

DESIGNED BY: CSA	RW112C004	VERSION: 2.0
CHECKED BY: XG		NO. 1 OF 2
		TOL: ±0.2mm if not specify
APPROVED BY:		UNIT: MM
		DATE: 2022-11-18

排版数：19*13=247

6. INTERFACE PIN ASSIGNMENT

| PIN NO.	PIN NAME	DESCRIPTION	Setting at each interface		
			8080 parallel	SPI	IIC
1	VSS	Ground pin.			
2	SI	When the serial interface is selected, then D0 serves as the serial clock input pin (SCL) and D1 serves as the serial data input pin (SI).	NA	SI	NA
3	SCL		NA	SCL	NA
4	A0	This is the Data/Command control pin that determines whether the data bits are data or a command. In I^2C interface, this pin serves as SA0 to distinguish the different address of OLED driver.	NA	A0	NA
5	RES	This is a reset signal input pin. When RES is set to "L", the settings are initialized.	NA	RES#	NA
6	CS	This pin is the chip select input. When CS = "L", then the chip select becomes active, and data/command I/O is enabled.	NA	CS#	NA
7	IREF	This is a segment current reference pin. A resistor should be connected between this pin and VSS.			
8	VDD	Power supply for logic and input/output.			
9	VSS	Ground pin.			
10	VCOMH	This is voltage output high level for common signals. A capacitor should be connected between this pin and VSS.			
11	VPP	Power supply for panel driving voltage.			
12	VSS	Ground pin.			

Note

(1) Low is connected to VSS

(2) High is connected to VDD

7. Function Block Diagram

7.1 Function Block Diagram
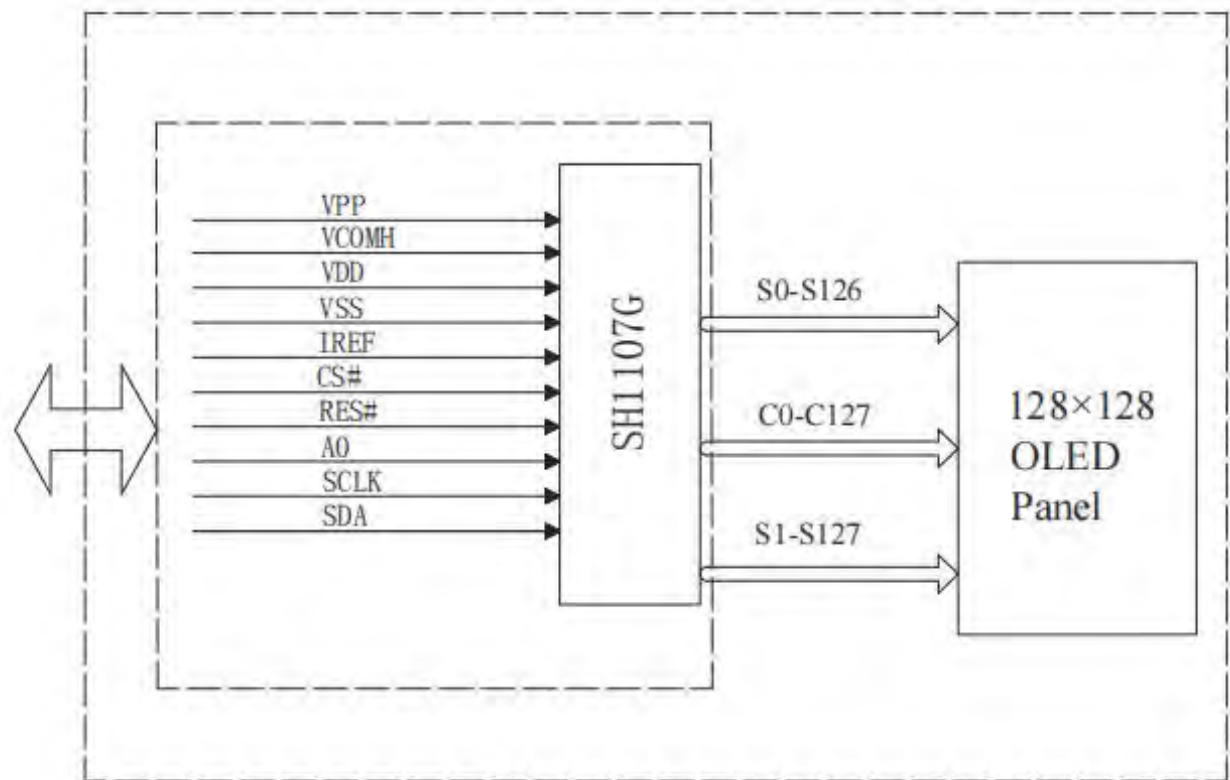
7.2 Panel Layout Diagram
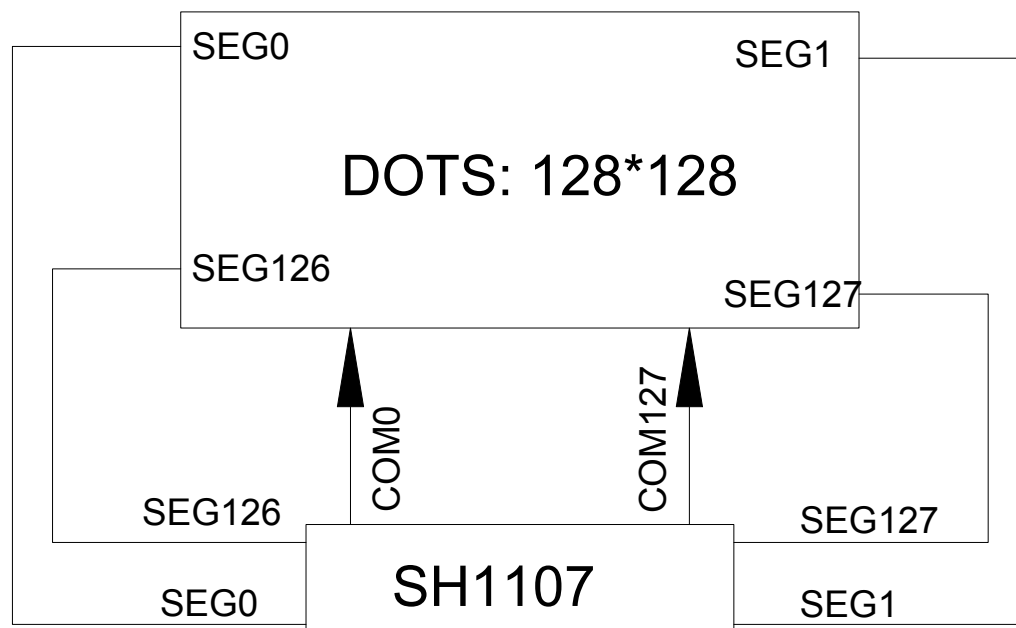
Com & Seg layout

8.Absolute Maximum Ratings

ITEM	MIN	MAX	UNIT	Condition	Remark
Supply Voltage (V_{DD})	-0.3	+3.6	V	Ta = 25 ℃	IC maximum rating
Supply Voltage (V_{PP})	7	17	V	Ta = 25 ℃	IC maximum rating
Operating Temp.	-40	70	℃	-	-
Storage Temp	-40	85	℃	-	Note (2)

Note:

(1) Maximum ratings are those values beyond which damages to the OLED module may occur. The OLED functional operation should be restricted to the limits in the section 6. Electrical Characteristics tables.

(2) The defined temperature ranges do not include the polarizer. The maximum withstood temperature of the polarizer should be 80°C.

9.Electrical Characteristics

PANEL ELECTRICAL SPECIFICATIONS

PARAMETER	MIN	TYP.	MAX	UNITS	COMMENTS
Normal mode current (IPP)	-	41.5	44.5	mA	All pixels on (1)
	-	9.5	10.5	mA	20% pixels on (1)
Standby mode current (IPP)	-	3	4	mA	Standby mode 10% pixels on (2)
Normal mode power consumption	-	560.25	600.75	mW	All pixels on (1)
	-	128.25	141.75	mW	20% pixels on (1)
Standby mode power consumption	-	40.5	54	mW	Standby mode 10% pixels on (2)
IDD sleep mode current	-	-	5	uA	Sleep mode Current (3)
IPP sleep mode current	-	-	5	uA	Sleep mode Current (3)
Normal mode Luminance	170	210		cd/m^2	Display Average
Standby Luminance		70	-	cd/m2	Display Average
CIEx (White)	0.26	0.30	0.34		x, y (CIE 1931)
CIEy (White)	0.29	0.33	0.37		
Dark Room Contrast	2000:1				
Viewing Angle	160			degree	
Response Time		10		µs	

(1) Normal mode condition :

- Driving Voltage : 13.5V

- Contrast setting : 0xa2

- Frame rate : 105 Hz

- Duty setting : 1/128

(2) Standby mode condition :

- Driving Voltage : 13.5v

- Contrast setting : 0x00

- Frame rate : 105 Hz

- Duty setting : 1/128

(3) Sleep mode condition :

When send 0xae command OLED display off and memory data will be maintained.

(4) Wake up condition :

When send 0xaf command OLED will be turned on.

DC Characteristics (VSS = 0V, VDD = 1.65 - 3.5V AVDD=2.4-3.5V, TA =+25 C, unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition
V$_{DD}$	Operating voltage	1.65	-	3.5	V	
AV$_{DD}$	DC-DC voltage	2.4	3.0	3.5	V	
V$_{PP}$	OLED Operating voltage	7	15	16.5	V	
V$_{BREF}$	Internal voltage reference	1.15	1.20	1.25	V	
I$_{DD1}$	Dynamic current consumption 1(in V$_{DD}$)	-	110	160	µA	V$_{DD}$ = 3V, AV$_{DD}$=3V, I$_{REF}$ = -15.625µA, Contrast α = 256, Bulid-in DC-DC OFF, Display ON, display data = All ON, No panel attached.
I$_{DD2}$	Dynamic current consumption 2 (in AVDD)	-	190	285	µA	V$_{DD}$=3V, AV$_{DD}$=3V, I$_{REF}$ = -15.625µA, Contrast α = 256, Bulid-in DC-DC ON, VPP=15V, Display ON, display data = All ON, No panel attached.
I$_{PP}$	OLED dynamic current consumption	-	1	1.27	mA	V$_{DD}$ = 3V, AV$_{DD}$ =3V ,V$_{PP}$ = 15V, I$_{REF}$ = -15.625µA, Contrast α = 256, Display ON, Display data = All ON, No panel attached
I$_{SP}$	Sleep mode current consumption in V$_{DD}$ & AVDD	-	0.01	5	µA	During sleep, T$_A$ = +25°C, V$_{DD}$ = 3V ,AV$_{DD}$=3V
	Sleep mode current consumption in V$_{PP}$	-	0.01	5	µA	During sleep, T$_A$ = +25°C, V$_{PP}$ = 15V (External)
I$_{SEG}$	Segment output current	-	-500	-	µA	V$_{DD}$ = 3V, V$_{PP}$ = 15V, I$_{REF}$ = -15.625µA, R$_{LOAD}$ = 20kΩ, Display ON. Contrast α = 256.
		-	-343.75	-	µA	V$_{DD}$ = 3V, V$_{PP}$ = 15V, I$_{REF}$ = -15.625µA, R$_{LOAD}$ = 20kΩ, Display ON. Contrast α = 176.
		-	-187.5	-	µA	V$_{DD}$ = 3V, V$_{PP}$ = 15V, I$_{REF}$ = -15.625µA, R$_{LOAD}$ = 20kΩ, Display ON. Contrast α = 96.
		-	-31.25	-	µA	V$_{DD}$ = 3V, V$_{PP}$ = 15V, I$_{REF}$ = -15.625µA, R$_{LOAD}$ = 20kΩ, Display ON. Contrast α = 16
ΔI$_{SEG1}$	Segment output current uniformity	-	-	±3	%	ΔI$_{SEG1}$ = (I$_{SEG}$ - I$_{MID}$)/I$_{MID}$ X 100% I$_{MID}$ = (I$_{MAX}$ + I$_{MIN}$)/2 I$_{SEG}$ [0:131] at contrast α = 256.
ΔI$_{SEG2}$	Adjacent segment output current uniformity	-	-	±2	%	ΔI$_{SEG2}$ = (I$_{SEG}$[N] - I$_{SEG}$ [N+1])/(I$_{SEG}$[N] + I$_{SEG}$[N+1]) X 100% I$_{SEG}$ [0:131] at contrast α = 256.

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition	
V$_{IHC}$	High-level input voltage	0.8 X V$_{DD}$	-	V$_{DD}$	V	A0, D0 - D7, $\overline{RD}$ (E), $\overline{WR}$ (R/$\overline{W}$), $\overline{CS}$, CLS, CL, IM0~2 and $\overline{RES}$.	
V$_{ILC}$	Low-level input voltage	Vss	-	0.2 X V$_{DD}$	V		
V$_{OHC}$	High-level output voltage	0.8 X V$_{DD}$	-	V$_{DD}$	V	I$_{OH}$ = -0.5mA (D0 - D7, and CL).	
V$_{OLC}$	Low -level output voltage	Vss	-	0.2 X V$_{DD}$	V	I$_{OL}$ = 0.5mA (D0 , D2 - D7, and CL)	
V$_{OLCS}$	SDA low -level output voltage	Vss	-	0.2 X V$_{DD}$	V	VDD<2V	I$_{OL}$=2mA (SDA)
				0.4		VDD>2V	I$_{OL}$=3mA (SDA)
I$_{LI}$	Input leakage current	-1.0	-	1.0	µA	V$_{IN}$ = V$_{DD}$ or Vss (A0, $\overline{RD}$ (E), $\overline{WR}$ (R/$\overline{W}$), $\overline{CS}$, CLS, IM0~2 and $\overline{RES}$).	
I$_{Hz}$	Hz leakage current	-1.0	-	1.0	µA	When the D0 - D7, and CL are in high impedance.	
fosc	Oscillation frequency	-	720	-	kHz	T$_A$ = +25°C.VDD=3V	
f$_{FRM}$	Frame frequency for 128 Commons	-	104	-	Hz	When fosc = 720kHz, Divide ratio = 1, common width = 54 DCLKs.	
R$_{ON1}$	Common switch resistance	-	15	-	Ω	V$_{PP}$=15V,Vcom=Vss+0.4V	
R$_{ON2}$	Common switch resistance	-	500	-	Ω	V$_{PP}$=15V,VCOM=0.770×V$_{PP}$-0.4V	

10.AC CHARACTERISTICS

10.1 System buses Write characteristics(For 4 wire SPI)
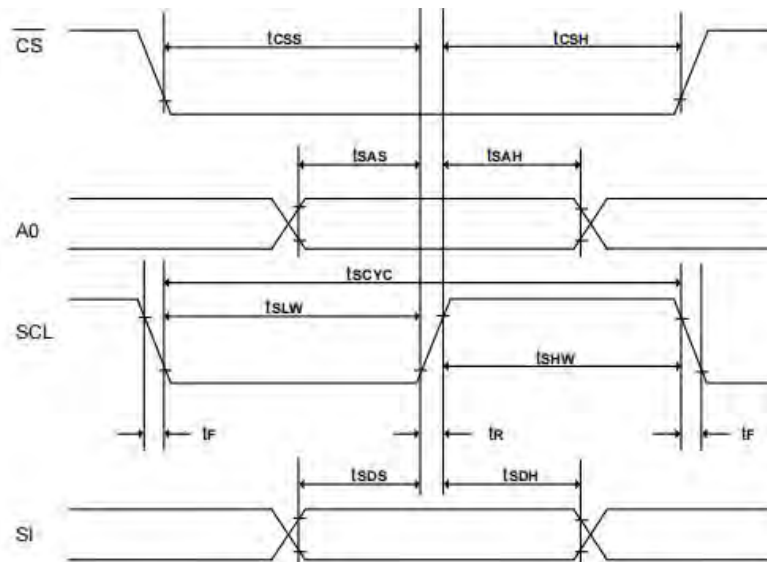
(VDD1 = 1.65 – 2.4V, TA = +25 ℃)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition
tscYC	Serial clock cycle	500	-	-	ns	
tsAS	Address setup time	300	-	-	ns	
tsAH	Address hold time	300	-	-	ns	
tsDS	Data setup time	200	-	-	ns	
tsDH	Data hold time	200	-	-	ns	
tcss	$\overline{CS}$ setup time	240	-	-	ns	
tcsH	$\overline{CS}$ hold time time	120	-	-	ns	
tsHW	Serial clock H pulse width	200	-	-	ns	
tsLW	Serial clock L pulse width	200	-	-	ns	
tR	Rise time	-	-	30	ns	
tF	Fall time	-	-	30	ns	

(VDD1 = 2.4 - 3.5V, TA = +25 ℃)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition
tscYC	Serial clock cycle	250	-	-	ns	
tsAS	Address setup time	150	-	-	ns	
tsAH	Address hold time	150	-	-	ns	
tsDS	Data setup time	100	-	-	ns	
tsDH	Data hold time	100	-	-	ns	
tcss	$\overline{CS}$ setup time	120	-	-	ns	
tcsH	$\overline{CS}$ hold time time	60	-	-	ns	
tsHW	Serial clock H pulse width	100	-	-	ns	
tsLW	Serial clock L pulse width	100	-	-	ns	
tR	Rise time	-	-	15	ns	
tF	Fall time	-	-	15	ns	

10.2 Reset Timing
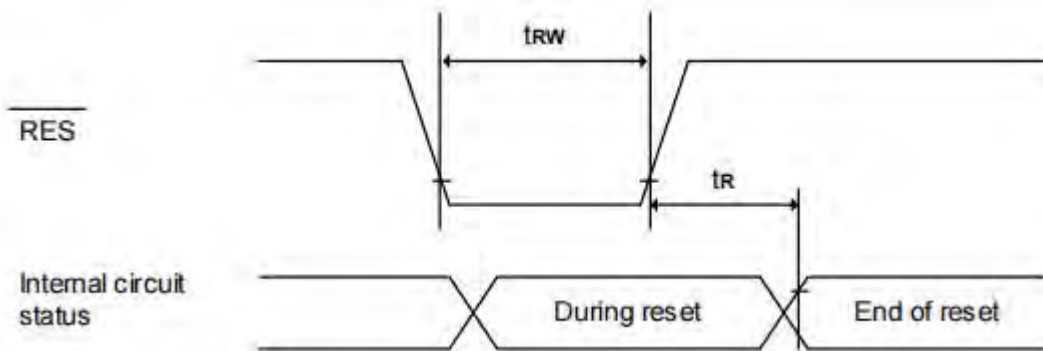
(VDD = 1.65 - 3.5V, TA = +25 ℃)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition
tR	Reset time	-	-	2.0	μs	
tRW	Reset low pulse width	10.0	-	-	μs	

11. POWER ON / OFF SEQUENCE

**External power is being used immediately after turning on the power:**

```
          ┌────────────────────────────────┐
          │   VDD is off                   │
          │   External power VPP is off    │
          └────────────────────────────────┘
                          │
          ┌────────────────────────────────┐
          │ Turn on the VDD1 and VPP power,│
          │ keep the  RES pin="L"(>10us)   │
          └────────────────────────────────┘
                          │
          ┌────────────────────────────────┐
          │ Release the reset state (RES pin="H" )│
          │ Reset timing depends on SH1107 data sheet│
          └────────────────────────────────┘
                          │
          ┌────────────────────────────────┐
          │   Initialized state(Default)   │
          └────────────────────────────────┘
                          │
          ┌────────────────────────────────┐
          │   Set up initial code (user setup)│
          └────────────────────────────────┘
                          │
          ┌────────────────────────────────┐
          │   Clear internal RAM to "00H"  │
          └────────────────────────────────┘
                          │
          ┌────────────────────────────────┐
          │   Set display on: AFH          │
          └────────────────────────────────┘
                          │  Wait 100ms
          ┌────────────────────────────────┐
          │   Send display data            │
          └────────────────────────────────┘
```
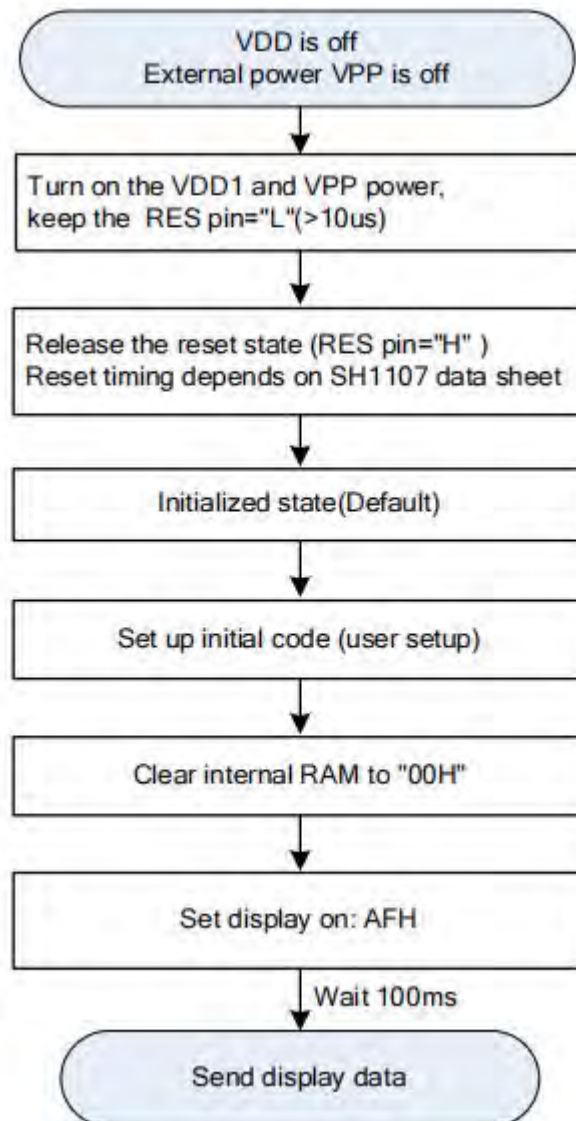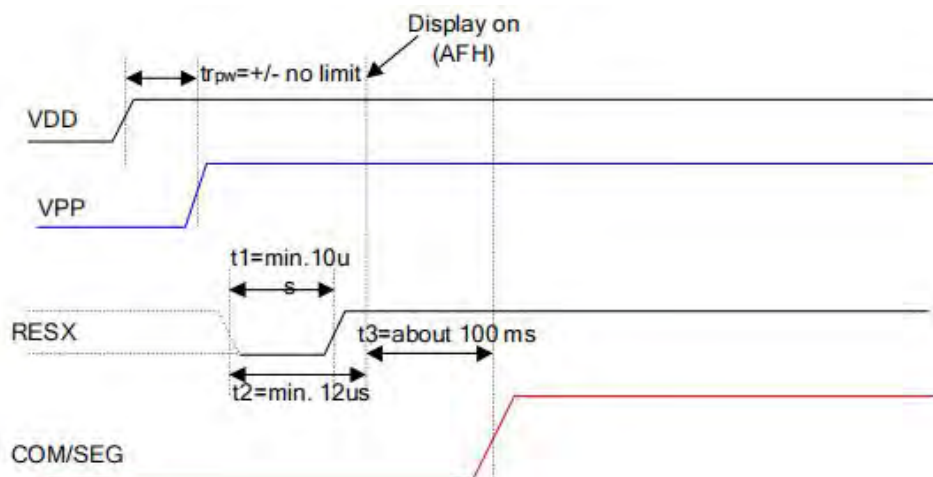
Power on sequence：

Power Off:
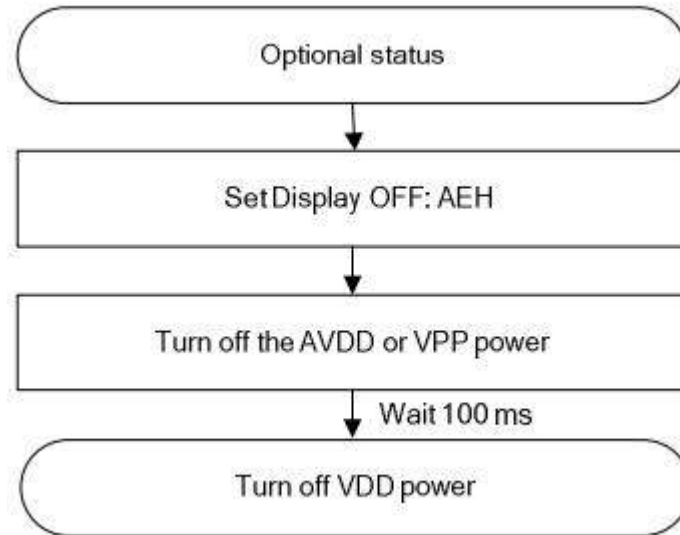
Power off sequence：
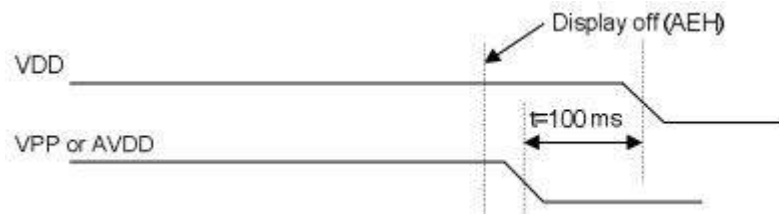
Note：There will be no damages to the display module if the power sequences are not met.

12. APPLICATION CIRCUIT

12.1 Application circuit
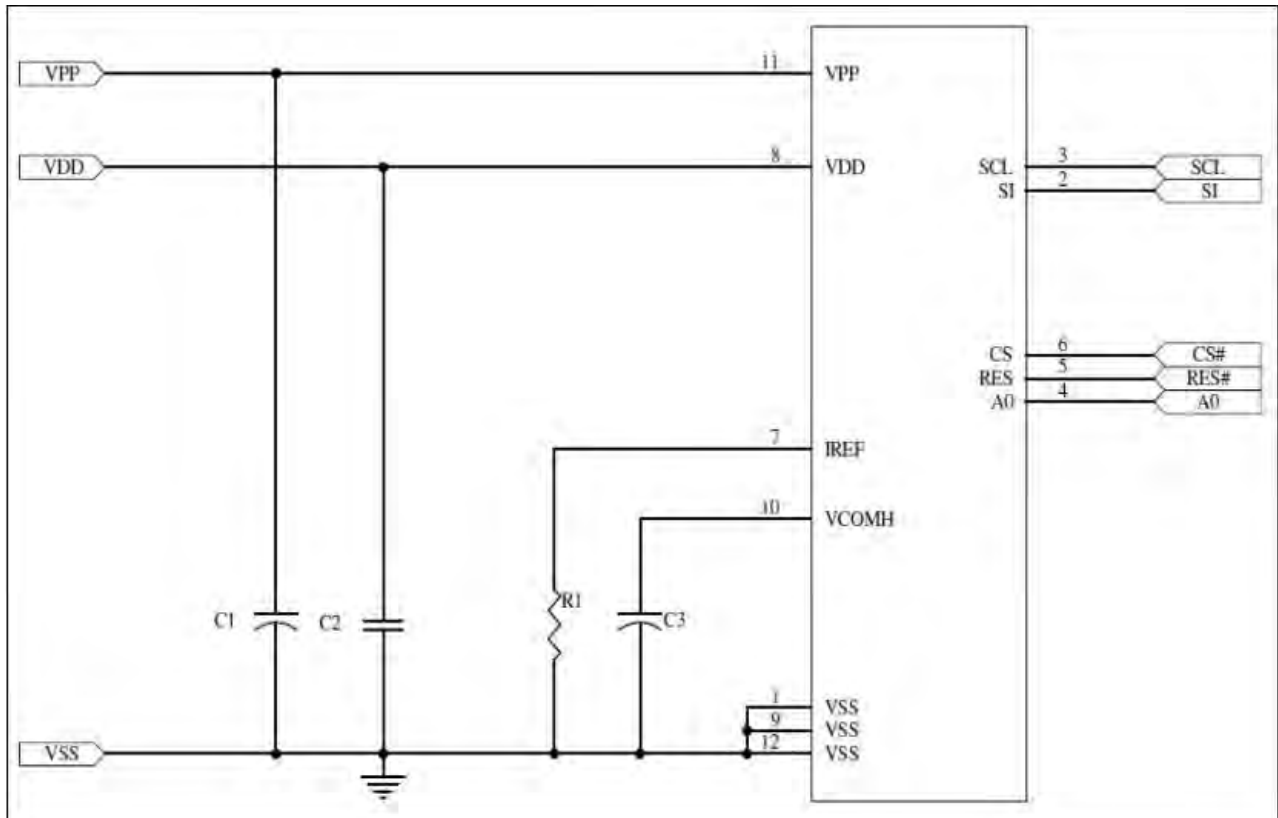
Recommended components：

C1：4.7uF/16V(0805)

C2：1uF/6.3V(0603)

C3：4.7uF/25V(Tantalum type) or VISHAY (572D475X0025A2T)

R1：1M ohm 1%(0603)

This circuit is for 4-wire SPI interface.

12.2 COMMAND TABLE

Command	Code											Function
	A0	RD	WR	D7	D6	D5	D4	D3	D2	D1	D0	
1. Set Column Address 4 lower bits	0	1	0	0	0	0	0	Lower column address				Sets 4 lower bits of column address of display RAM in register. (POR = 00H)
2. Set Column Address 4 higher bits	0	1	0	0	0	0	1	0	Higher column address			Sets 4 higher bits of column address of display RAM in register. (POR = 10H)
3. Set memory addressing mode	0	1	0	0	0	1	0	0	0	0	D	D = 1, Vertical Addressing Mode D = 0, Page Addressing Mode (POR=20H)
4. The Contrast Control Mode Set	0	1	0	1	0	0	0	0	0	0	1	This command is to set Contrast Setting of the display.
Contrast Data Register Set	0	1	0	Contrast Data								The chip has 256 contrast steps from 00 to FF. (POR = 80H)
5. Set Segment Re-map (ADC)	0	1	0	1	0	1	0	0	0	0	ADC	The down (0) or up (1) rotation. (POR = A0H)
6. Set Multiplex Ration	0	1	0	1	0	1	0	1	0	0	0	This command switches multiplex mode to any multiplex ratio from 1 to 128. (POR = 7FH)
	0	1	0	-	Multiplex Ratio							
7. Set Entire Display OFF/ON	0	1	0	1	0	1	0	0	1	0	D	Selects normal display (0) or Entire Display ON (1). (POR = A4H)
8. Set Normal/ Reverse Display	0	1	0	1	0	1	0	0	1	1	D	Normal indication (0) when low, but reverse indication (1) when high. (POR = A6H)
9. Set display offset	0	1	0	1	1	0	1	0	0	1	1	This is a double byte command that specifies the mapping of display start line to one of COM0 -127 . (POR = 00H)
	0	1	0	-	COMx							
10. DC-DC Control Mode Set	0	1	0	1	0	1	0	1	1	0	1	This command is to control the DC-DC voltage DC-DC will be turned on when display on converter (1) or DC-DC OFF (0). (POR = 81H)
DC-DC Setting Mode Set	0	1	0	1	0	0	0	F2	F1	F0	D	

Command	Code											Function
	A0	$\overline{RD}$	$\overline{WR}$	D7	D6	D5	D4	D3	D2	D1	D0	
11. Display OFF/ON	0	1	0	1	0	1	0	1	1	1	D	Turns on OLED panel (1) or turns off (0). (POR = AEH)
12. Set Page Address	0	1	0	1	0	1	1	Page Address				Specifies page address to load display RAM data to page address register. (POR = B0H)
13 Set Common Output Scan Direction	0	1	0	1	1	0	0	D	*	*	*	Scan from COM0 to COM [N - 1] (0) or Scan from COM [N -1] to COM0 (1). (POR = C0H)
14. Set Display Divide Ratio/Oscillator Frequency Mode Set	0	1	0	1	1	0	1	0	1	0	1	This command is used to set the frequency of the internal display clocks. (POR = 50H)
Divide Ratio/Oscillator Frequency Data Set	0	1	0	Oscillator Frequency				Divide Ratio				
15. Dis-charge / Pre-charge Period Mode Set	0	1	0	1	1	0	1	1	0	0	1	This command is used to set the duration of the dis-charge and pre-charge period. (POR = 22H)
Dis-charge /Pre-charge Period Data Set	0	1	0	Dis-charge Period				Pre-charge Period				
16. VCOM Deselect Level Mode Set	0	1	0	1	1	0	1	1	0	1	1	This command is to set the common pad output voltage level at deselect stage. (POR = 35H)
VCOM Deselect Level Data Set	0	1	0	VCOM = (β_1 X V_{REF})								
17. Set Display Start Line	0	1	0	1	1	0	1	1	1	0	0	Specify RAM display line for COM0.
	0	1	0	-	Start line							
18. Read-Modify-Write	0	1	0	1	1	1	0	0	0	0	0	Read-Modify-Write start.
19. End	0	1	0	1	1	1	0	1	1	1	0	Read-Modify-Write end.
20. NOP	0	1	0	1	1	1	0	0	0	1	1	Non-Operation Command
21 Write Display Data	1	1	0	Write RAM data								
22 Read ID	0	0	1	BUSY	ON/ OFF	ID						
23. Read Display Data	1	0	1	Read RAM data								

Note: Do not use any other command, or the system malfunction may result.

13. RELIABILITY

ITEM	Conditions	QUANTITY
High Temperature Operation	70℃, 240 hrs	4
Low Temperature Operation	-40℃, 240 hrs	4
High Temperature Storage	85℃, 240 hrs	4
Low Temperature Storage	-40℃, 240 hrs	4
High Temperature/Humidity Operation	60℃, 90% RH, 120 hrs	4
Thermal Shock	-40℃~80℃(-40℃/30min;transit/3min;80℃/30min;transit/3min) 1cycle: 66min,30cycles	4
Vibration	Frequency: 5~50Hz,0.5G Scan rate: 1 oct/min	1 Carton
Drop	Height: 100 cm Sequence: 1 angle, 3 edges and 6 faces	1 Carton

Test and measurement conditions

1. All measurements shall not be started until the specimens attain to temperature stability, the stable time is at least 15 minutes.

2. The degradation of polarizer is ignored for item 5.

3.The tolerance of temperature is ±3℃, and the tolerance of relative humidity is ±5%.

Evaluation criteria

1. The function test is OK.

2. No observable defects.

3. Luminance:≥50% of initial value.

4. Current consumption: within ± 50% of initial value.

13.2 Lifetime

End of lifetime is specified as 50% of initial brightness and the test pattern at operating condition is 50% alternating checkerboard.

ITEM	MIN	MAX	UNIT	REMARK
Life Time	10000	-	hour	40cd/m2 , 50% alternating checkerboard, 22±3° C, 55±15% RH

Failure Check Standard

After the completion of the described reliability test, the samples were left at room temperature for 2 hrs prior to conducting the failure test at 22±3°C; 55±15% RH.

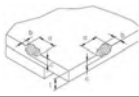# 14.INSPECTION CRITERIA

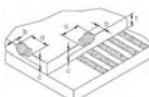## Definition of Φ&L&W (Unit: mm)
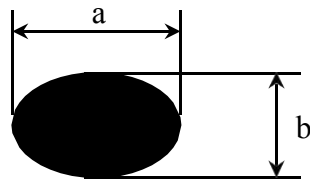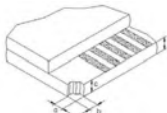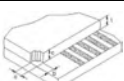
$$\Phi=(a+b)/2$$
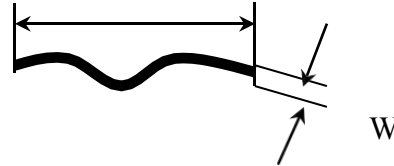
Note: Zone A: Active Area   Zone B: Viewing Area   Zone C: Cap Area
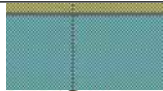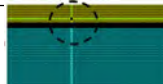
NO	ITEM	CRITERIA				CLASSIFICATION
1	Polarizer Black or White spot, Dirty spot, Foreign matter, Dent on the polarizer	Average Diameter (mm)	Acceptable Number			minor
			Zone A,B	Zone C		
		Φ≤0.15	Ignore	Ignore		
		0.15<Φ≤0.30	3			
		Φ>0.30	0			
2	Scratch/line on the glass/Polarizer	Width (mm)	Length (mm)	Acceptable Number		minor
				Zone A,B	Zone C	
		W≤0.03	---	Ignore	Ignore	
		0.03<W≤0.08	L≤5.0	3		
		W>0.08	---	0		
3	Polarizer Bubble	Average Diameter (mm)	Acceptable Number			minor
			Zone A,B	Zone C		
		Φ>0.5	Ignore	Ignore		
		0.2<Φ≤0.5	3			
		Φ≤0.2	0			
4	Any Dirt & Scratch on Polarizer's Protective Film	Ignore for not affect the polarizer				Acceptable
5	Any Dirt on Cap Glass	Average Diameter (mm)	Acceptable Number			Minor
		Φ≤0.5	Ignore			
		0.5<Φ≤1.0	3			
		Φ>1.0	0			
6	Glass Crack	saceptable.				Major
7	Corner Chip	t= Glass thicknGlassthickness Accepta≤2.0mm or b≤2.0mm, c≤t				Minor
8	Corner Chip on Cap Glass	t= Glass thickness Accept a≤1.5mm or b≤1.5mm, c≤t				Minor

9	Chip on Contact Pad		t= Glass thickness Accept a≤3.0mm or b≤0.8mm, c≤t (on the contact pin) a≤3.0mm or b≤1.5mm, c≤t (outside of the contact pin)	Minor
10	Chip on Face of Display		t= Glass thickness Accept a≤1.5mm or b≤1.5mm, c≤t	Minor
11	Chip on Cap Glass		t= Glass thickness Accept a≤3.0mm or b≤3.0mm, c≤t/2 a≤1.5mm or b≤1.5mm, t/2≤c≤t	Minor
12	Stain on Surface	Stain removable by soft cloth or air blow is acceptable.		Minor
13	TCP/FPC Damage	(1) Crack, deep scratch, deep hole and deep pressure mark on the TCP/FPC are not acceptable. (2) Terminal lead twisted or broken is not allowable. (3) Copper exposed is not allowed by naked eye inspection.		Minor
14	Dimension Unconformity	Checking by mechanical drawing.		Major

Displaying Defects

NO	ITEM	CRITERIA			CLASSIFICATION
1	Black/White spot Dirty spot Foreign matter	Average Diameter (mm)	Acce□table Number Zone A,B	Zone C	Minor
		Φ≤0.10	Ignore	Ignore	
		0.10<Φ≤0.20	3		
		Φ>0.20	0		
2	No Display	Not allowable.			Major
3	Irregular Display	Not allowable.			Major
4	Missing Line (row or column)	Not allowable.			Major
5	Short	Not allowable.			Major
6	Flicker	Not allowable.			Major
7	Abnormal Color	Not allowable.			Major
8	Luminance NG	Not allowable.			Major
9	Over Current	Not allowable.			Major

15.Precautions for operation and Storage

(1) Since OLED panel is made of glass, do not apply any mechanical shock or impact or excessive   force to it when installing the OLED module. Any strong mechanical impact due to falling dropping etc. may cause damage (breakage or cracking).

(2) The polarizer on the OLED surface is made of soft material and is easily scratched. Please take most care when handing. When the surface of the polarizer of OLED Module is contaminated, please wipe it off gently by using moisten soft cloth with isopropyl alcohol, do not use water, ketone or aromatics. If there is saliva or water on the OLED surface, please wipe it off immediately.

(3) When handling OLED module, please be sure that the body and the tools are properly grounded. And do not touch I/O pins with bare hands or contaminate I/O pins, it will cause disconnection or defective insulation of terminals.

(4) Do not attempt to disassemble or process the OLED module.

(5) OLED module should be used under recommended operating conditions shown in the specification. Since the higher voltage leads to the shorter lifetime, be sure to use the specified operating voltage.

(6) Foggy dew, moisture condensation or water droplets deposited on surface and contact terminals will cause polarizer stain or damage, the deteriorated display quality and electrochemical reaction then leads to shorter life time and permanent damage to the module probably. Please pay attention to the environmental temperature and humidity.

(7) An afterimage is created by the difference in brightness between unused dot and the fixed dot, according to the decrease of brightness of the emitting time. Therefore, to avoid having an afterimage, the full set should be thoroughly used instead of using a fixed dot. When the fixed dot emits, an afterimage can be created.

(8) Flicker could be come out at full on display. And it disappears when frame frequency increase, but brightness decreases too.

(9) Soldering should be performed only on the I/O terminals.

(10)Use soldering irons with proper grounding and no leakage..

(11)Please store OLED module in a dark place. Avoid exposure to sunlight, the light of fluorescent lamp or any ultraviolet ray.

(12)Keep the environment temperature between 10℃ and 35℃ and the relative humidity less than 60%. Avoid high temperature and high humidity.

(13)Keep the OLED modules stored in the container when shipped from supplier before using them is recommended.

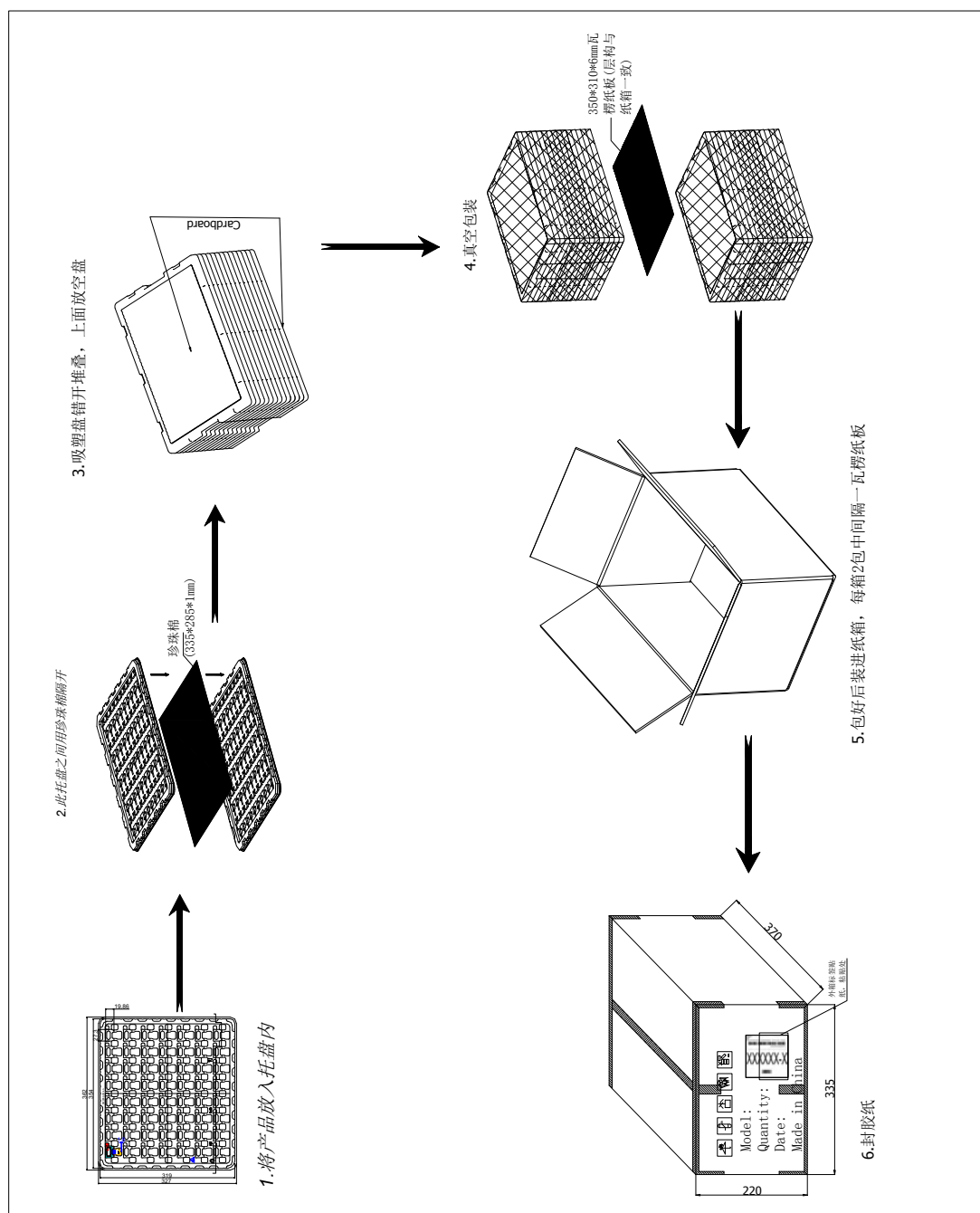(14)Do not leave any article on the OLED module surface for an extended period of time.

Warranty period:

Runan warrants for a period of 12 months from the shipping date when stored or used under normal condition.

16. PACKAING INFORMATION

16.1 Package diagram

16.2 Packing inspection

Definition: to prevent external vibration, impact and pressure of protective packaging for inspection, with the naked eye to check for the principle, commissioned by vibration when necessary, drop, such as reliability test.

Check tools: with the smallest unit of measurement for the 1 mm 30 cm ruler or 2 m tape.

Inspection standard: 1, packaging materials shall have no foreign body or dirt on logo is not clear, torsion deformation, as well as the wet.

2, labels shall not alter or error.

SHENZHEN SURENOO TECHNOLOGY CO.,LTD.

17.Illustration of OLED Product Name