





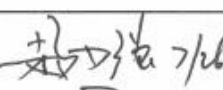

Product Specification

(Common Application)

Product Name: VGM128128A8W01

Product Code: MR0090

Customer
Approved by Customer
Approved Date:

Designed By	Checked By	Approved By	
		R&D	QA
 2018.7.24	 2018.7.24	 2018.7.26  2018.7.26	 7/26  7/26

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REVISION RECORD

REV.	REVISION DESCRIPTION	REV. DATE	REMARK
Y01	Initial Release	2015-01-12	
Y02	Update the Mechanical Data Update the Mechanical Drawing Update DC Electrical Characteristics Update Electro-optical Characteristics Update Application Circuit Add the Software Initialization Add the Package Specification Update Precautions for operation and Storage	2016-12-1	Page 4 Page 5 Page 8 Page 8 Page 13,14 Page 16 Page 17 Page 24
A01	Update the Mechanical Drawing Update the Electrical Characteristics Update the Recommended Software Initialization Update the Lifetime Update the Warranty period	2018-07-22	Page 5 Page 8~9 Page 17 Page 19 Page 25

1 Application Filed

Common Application

2 Overview

VGM128128A8W01 is a monochrome OLED display module with 128×128 dot matrix. The characteristics of this display module are high brightness, self-emission, high contrast ratio, slim/thin outline, wide viewing angle, wide temperature range, and low power consumption.

3 Features

- Display Color: White
- Dot Matrix: 128×128
- Driver IC: SH1107G
- Interface: 4-Wire SPI、I²C。
- Wide range of operating temperature: -40°C to 70°C
- Wide range of Storage temperature: -40°C to 85°C

4 Mechanical Data

NO.	ITEM	SPECIFICATION	UNIT
1	Dot Matrix	128(W)×128(H)	-
2	Dot Size	0.234(W)×0.234(H)	mm ²
3	Dot Pitch	0.259(W)×0.259(H)	mm ²
4	Aperture Rate	82	%
5	Active Area	33.169(W)×33.169(H)	mm ²
6	Panel Size	36.37(W) ×39.96(H) ×1.2(T)	mm ³
7	Module Size	36.37(W) ×60.02(H) ×1.43(T)	mm ³
8	Diagonal A/A Size	1.3	inch
9	Module Weight	3.07±10%	gram

5 Mechanical Drawing

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分发自

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Dimensions:
 (60.02)
 20.06±0.5
 39.96±0.2 Panel
 35.37±0.2 Polarizer
 36.72±0.2 Cap
 34.169 V.A
 33.169 A.A
 0.5±0.5
 (1.1)
 1.6
 36.37±0.2 Panel
 35.37±0.2 Polarizer
 34.169 V.A
 33.169 A.A
 0.5±0.5
 (1.1)
 1.6
 0.5
 1.43±0.1
 0.7
 Without Protective film of Polarizer
 3.5±0.3 (Stiffener)
 0.2±0.03
 Conductor
 1.46±0.3
 0.3±0.07
 P0.3*(11-1)=3±0.03
 W=0.3±0.03
 P1N1
 P1N10
 P1N11
 P1N2
 P1N3
 (5.09)
 19.56±0.2 Panel
 2.6±0.2
 (4.132)
 Pull Tape
 (2.001)

Dot.s:128*128
1.3"

Detail A (20:1)

COMSEG LAYOUT

Pin Assignment

NO.	SYMBOL
1	GND
2	VPP
3	D1
4	D0
5	A0
6	RESB
7	CSB
8	TREF
9	MT1
10	VDD
11	VCOMH

Specification:
 1. Display: OLED(White)
 2. Format: 128*128
 3. Driver IC: SH1107G
 4. General Tolerance: ±0.3
 5. Operate Temp: -40° C~70° C
 Storage Temp: -40° C~85° C
 6. DUTY: 1/128
 7. RoHS Compliant

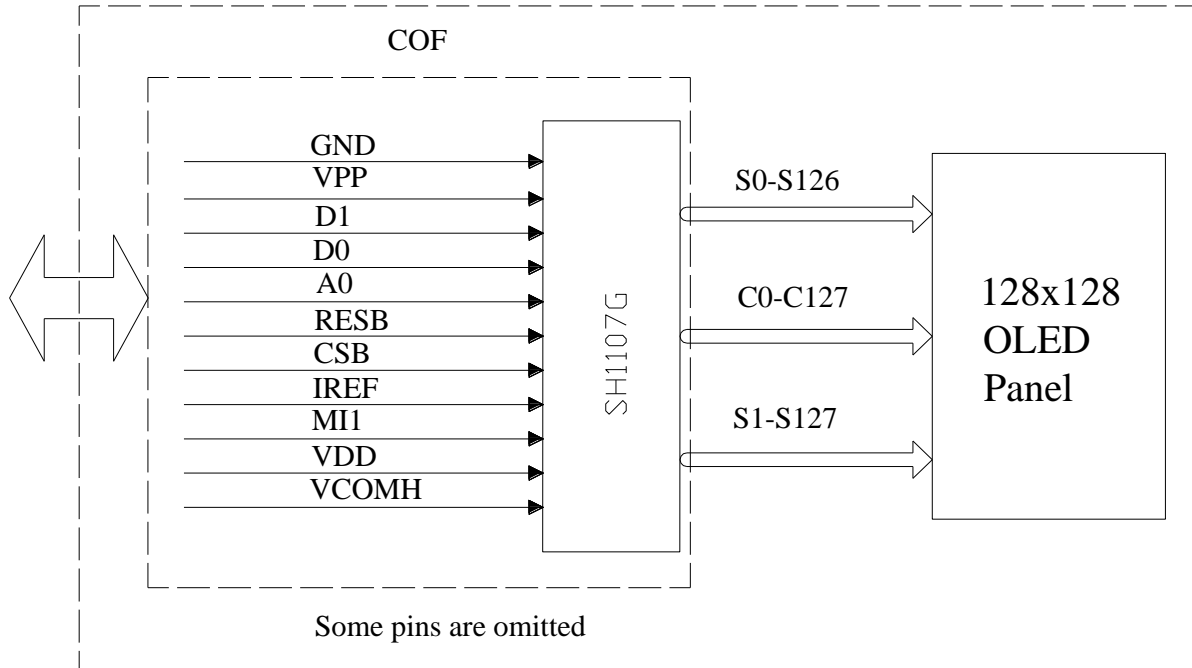
Customer Approval	Signature
Part Name	Module Ass'y
Project Code	R0090
Part No.	R0090-MA1-C
Date	2018.07.23
DES'D BY	彭丽娟
CHK'D BY	王玲玲
Unit	mm
Rev.	04
CHK'D BY	李煥
Sheet	1/1
APPROVED	刘宏俊

Rev.	Date	Note
△1	2014.12.02	Primary
△3	2017.08.23	Modify the POL size
△4	2018.07.23	Modify the Logo

6 Module Interface

PIN NO.	PIN NAME	DESCRIPTION
1	GND	Ground.
2	VPP	This is the most positive voltage supply pad of the chip. It should be supplied externally.
3	D1	When the serial interface is selected, then D0 serves as the serial clock input pad (SCL) and D1 serves as the serial data input pad (SI). When the I ² C interface is selected, then D0 serves as the serial clock input pad (SCL) and D1 serves as the serial data input pad (SDA).
4	D0	
5	A0	This is the Data/Command control pad that determines whether the data bits are data or a command. In I ² C interface, this pad serves as SA0 to distinguish the different address of OLED driver.
6	RESB	This is a reset signal input pad. When RES is set to “L”, the settings are initialized. The reset operation is performed by the RES signal level.
7	CSB	This pad is the chip select input. When CS = “L”, then the chip select becomes active, and data/command I/O is enabled.
8	IREF	This is a segment current reference pad. A resistor should be connected between this pad and VSS.
9	MI1	This is the MPU interface mode select pad. When MI1 = “L”, it is the 4-wire SPI interface mode. When MI1 = “H”, it is the I ² C interface mode.
10	VDD	Power supply for logic and input.
11	VCOMH	This is a pad for the voltage output high level for common signals. A capacitor should be connected between this pad and VSS.

7 Function Block Diagram



8 Absolute Maximum Ratings

ITEM	SYMBOL	MIN	MAX	UNIT	REMARK
Supply voltage	VDD	-0.3	3.6	V	IC maximum rating
	VPP	-0.3	17	V	IC maximum rating
Operating Temp.	Top	-40	70	°C	-
Storage Temp	Tstg	-40	85	°C	-

Note (1): All of the voltages are on the basis of “VSS = 0V”.

Note (2): Permanent breakage of module may occur if the module is used beyond the maximum rating. The module can be normal operated under the conditions according to Section 9 “Electrical Characteristics”. Malfunctioning of the module may occur and the reliability of the module may deteriorate if the module is used beyond the conditions.

9 Electrical Characteristics

9.1 DC Electrical Characteristics

ITEM	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Operating Voltage	VPP	-	10.5	11	11.5	V
Logic Supply Voltage	VDD	-	1.65	3.0	3.5	V
High-level Output voltage	V _{OHC}	I _{oH} =-0.5mA(D0-D1)	0.8×VDD	-	VDD	V
Low-level Output voltage	V _{OLC}	I _{oL} =0.5mA(D0-D1)	0	-	0.2×VDD	V
High Logic Input voltage	V _{IHC}	A0, D0 – D1, CS , IM1 and RES .	0.8×VDD	-	VDD	V
Low Logic Input voltage	V _{ILC}		VSS	-	0.2×VDD	V

Note : The VPP input must be kept in a stable value; ripple and noise are not allowed.

9.2 Electro-optical Characteristics

ITEM	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Normal Mode Brightness	L _{br}	All pixels ON(1)	65	80	-	cd/m ²
VDD Sleep mode Current	ISP_VDD	During sleep, TA = +25°C, VDD = 3V	-	0.02	10	uA
VPP Sleep mode Current	ISP_VPP	During sleep, TA = +25°C, VPP = 15V (External)	-	0.02	10	uA
Normal Mode Power Consumption	Pt	All pixels ON(1)	-	264	352	mW
C.I.E(White)	(x)	x,y(CIE1931)	0.26	0.30	0.34	-
	(y)		0.29	0.33	0.37	-
Dark Room Contrast	CR	-	≥2000:1	-	-	-
Response Time	-	-	-	10	-	μ s
View Angle	-	-	≥160	-	-	Degree

Note(1): Normal Mode test conditions are as follows:

- Driving voltage: 11V
- Contrast setting: 0xFF
- Frame rate: 100Hz
- Duty setting: 1/128

9.3 AC Electrical Characteristics

(1) System buses Write characteristics (For 4 wire SPI)

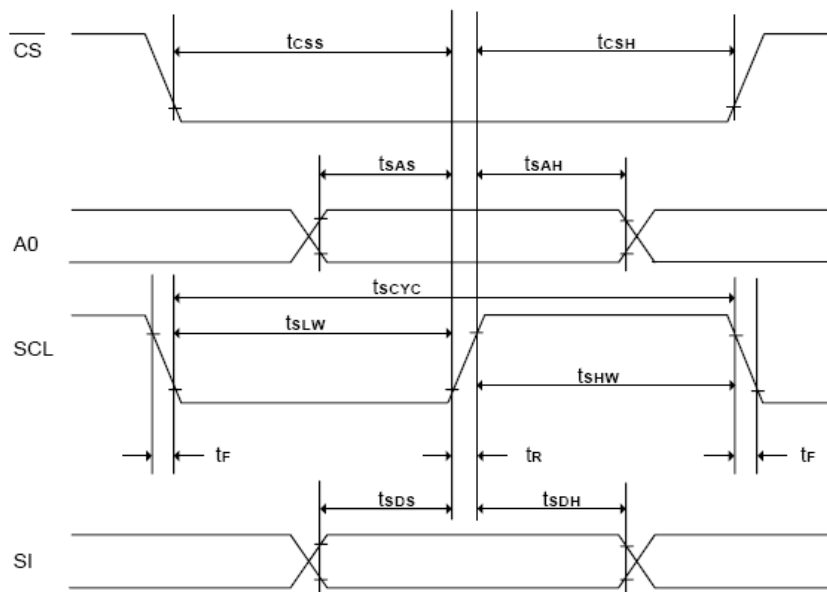
(VDD = 1.65 – 2.4V, TA = +25°C)

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	

(VDD = 2.4 - 3.5V, TA = +25°C)

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	

Serial Interface characteristics (4-wire SPI)

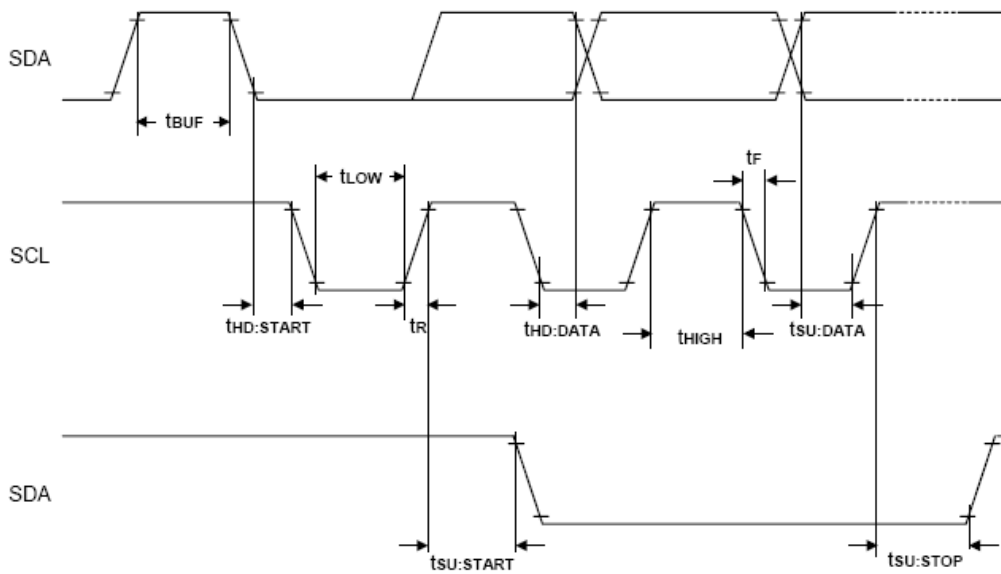


(2) System buses Write characteristics (For I²C)

(V_{DD} = 1.65 - 3.5V, TA = +25°C)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition
f _{SCL}	SCL clock frequency	DC	-	400	kHz	
T _{LOW}	SCL clock Low pulse width	1.3	-	-	μs	
T _{HIGH}	SCL clock H pulse width	0.6	-	-	μs	
T _{SU:DATA}	data setup time	100	-	-	ns	
T _{HD:DATA}	data hold time	0	-	0.9	μs	
T _R	SCL, SDA rise time	20+0.1Cb	-	300	ns	
T _F	SCL, SDA fall time	20+0.1Cb	-	300	ns	
C _b	Capacity load on each bus line	-	-	400	pF	
T _{SU:START}	Setup time for re-START	0.6	-	-	μs	
T _{HD:START}	START Hold time	0.6	-	-	μs	
T _{SU:STOP}	Setup time for STOP	0.6	-	-	μs	
T _{BUF}	Bus free times between STOP and START condition	1.3	-	-	μs	

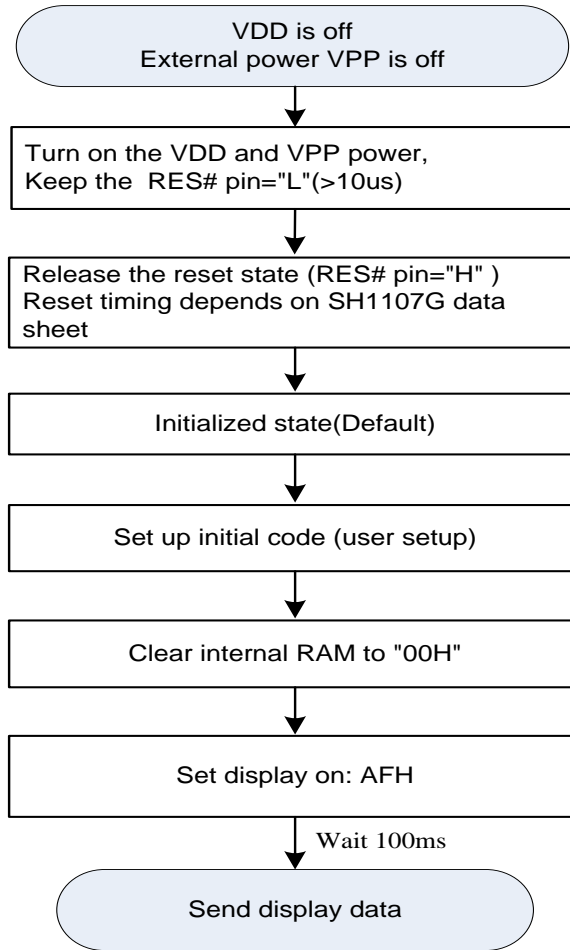
I²C Interface Timing characteristics



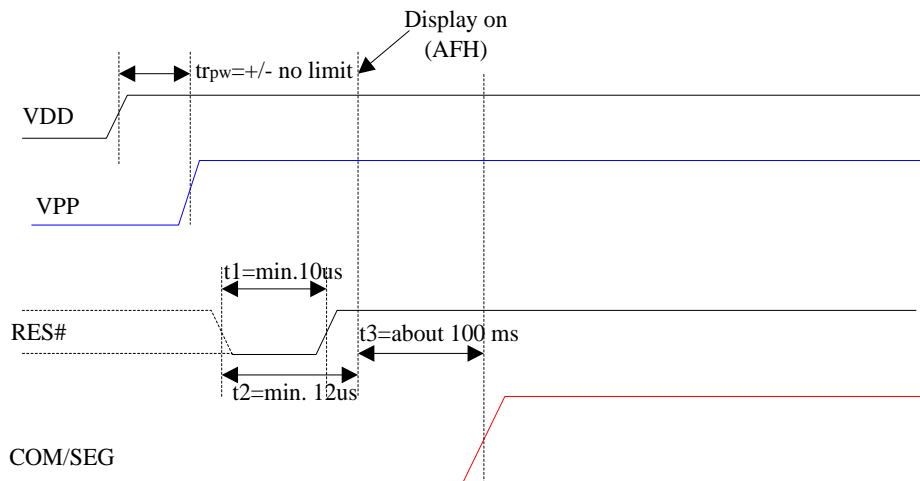
10 Functional Specification and Application Circuit

10.1 Power ON and Power OFF Sequence

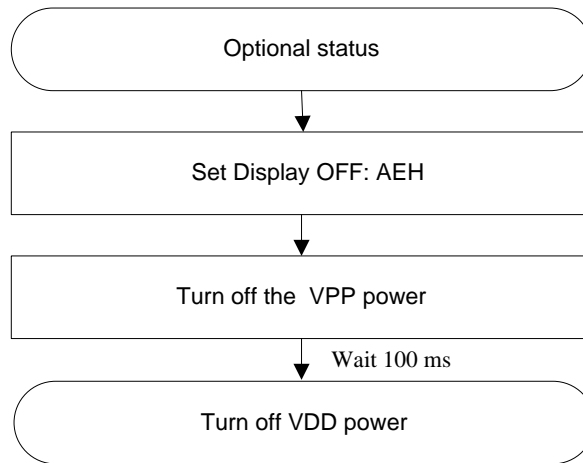
10.1.1 External power is being used immediately after turning on the power:



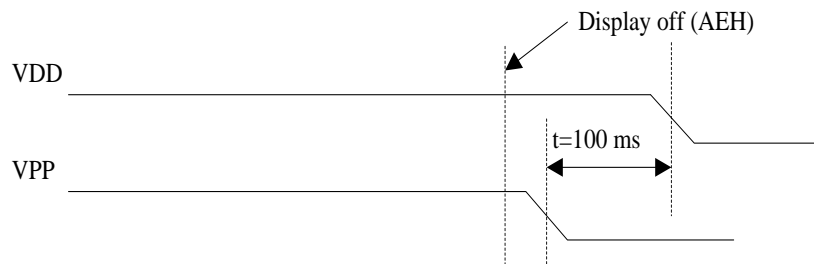
Power ON Sequence:



10.1.2 Power OFF



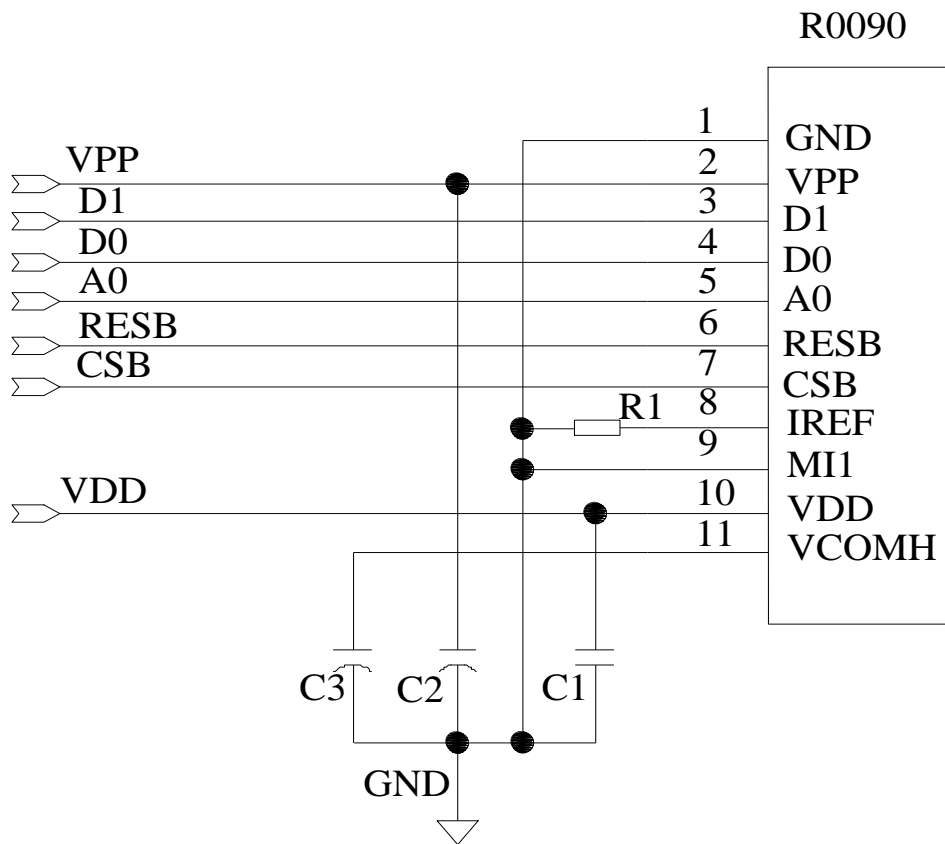
Power OFF Sequence:



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

10.2 Application Circuit

(1).The configuration for 4-wire SPI interface mode, external VPP is shown in the following diagram:



Pin connected to MCU interface: D1, D0,A0, RESB, CSB

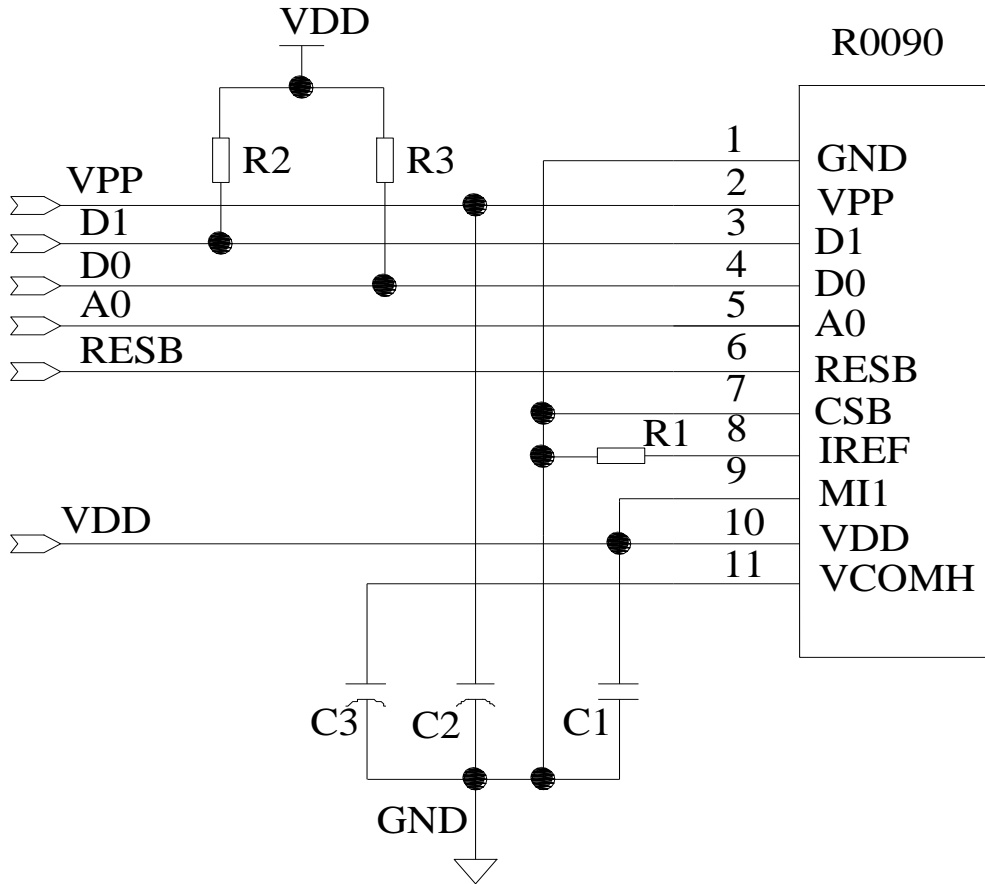
Recommended components

C1: 0.1uF-0603-X7R±10%.RoHS

C2, C3: 4.7μF/25V.RoHS (Tantalum Capacitors)

R1: 0603 1/10W +/-5% 750Kohm.RoHS

2). The configuration for I²C interface mode, external VPP is shown in the following diagram:



Pin connected to MCU interface: D1, D0, A0, RESB

SA0	I ² C Address
0	0x78
1	0x7A

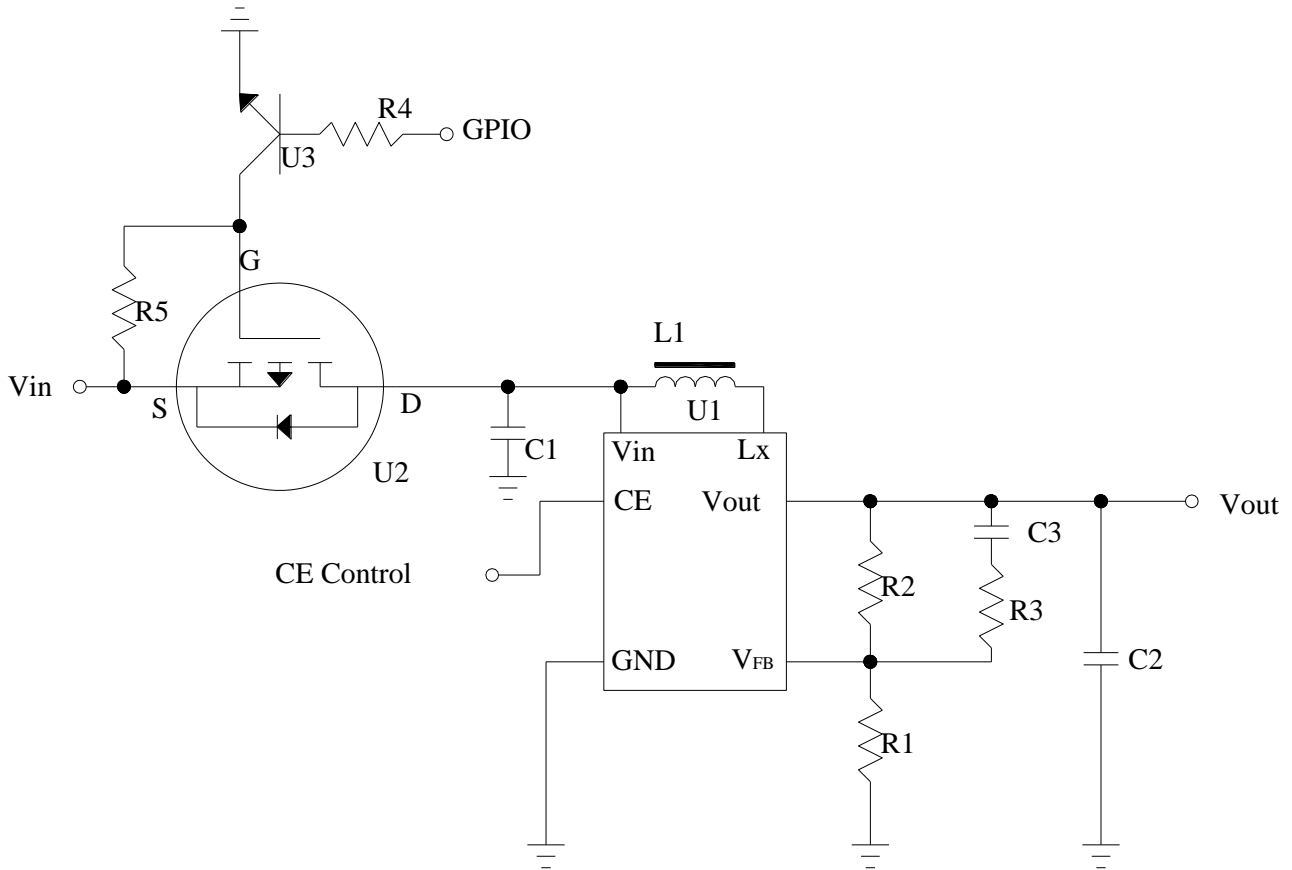
Recommended components

- C1: 0.1uF-0603-X7R ±10%.RoHS
- C2, C3: 4.7µF/25V.RoHS (Tantalum Capacitors)
- R1: 0603 1/10W +/-5% 750Kohm.RoHS
- R2, R3: 0603 1/10W +/-5% 10Kohm.RoHS

9.2

9.2.1

10.3 External DC-DC application circuit



Recommend component

- The C1 : 1 uF-0603-X7R ±10%.RoHS
- The C2 : 1 uF-0603-X7R ±10%.RoHS
- The C3 : 220pF-0603-X7R ±10%.RoHS
- The R1 : 0603 1/10W +/-5% 10Kohm.RoHS
- The R2 : 0603 1/10W +/-1% 100Kohm.RoHS
- The R3 : 0603 1/10W +/-5% 2Kohm.RoHS
- The R4 : 0603 1/10W +/-5% 1Kohm.RoHS
- The R5 : 0603 1/10W +/-5% 10Kohm.RoHS
- The L1 : 22uH
- The U1 : R1200
- The U2 : FDN338P
- The U3 : 8050

10.4 Display Control Instruction

Refer to SH1107G IC Specification.

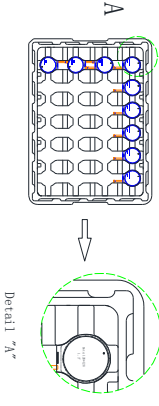
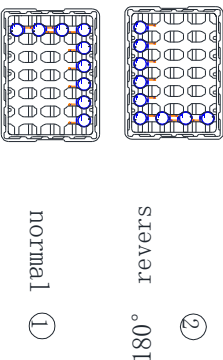
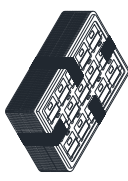

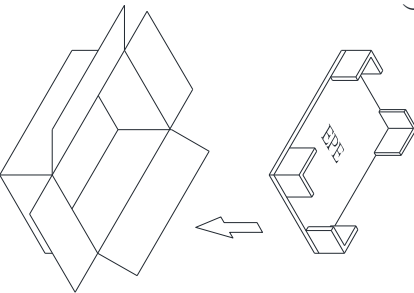
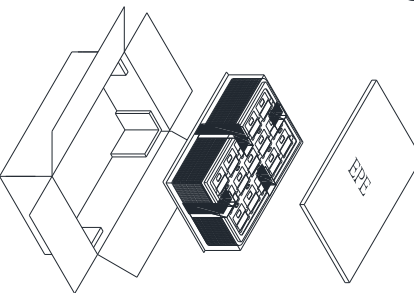
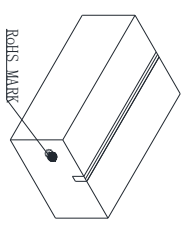
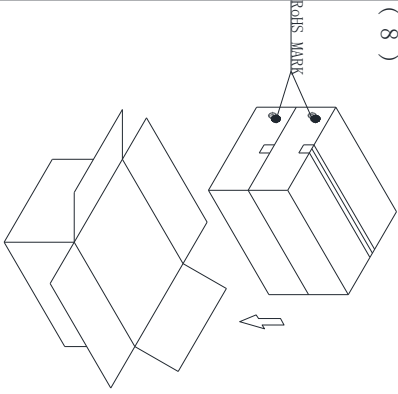
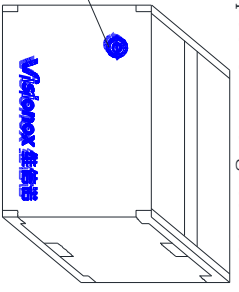

10.5 Recommended Software Initialization

In order to ensure the reliability and stability of the module, the module must initialize use the following code, Malfunctioning of the module may occur and the reliability of the module may deteriorate if the module is used beyond the initialize code.

```
void Init_IC()
{
    Write_Command(0xAE);    //Display OFF
    Write_Command(0xD5);    // Set Dclk
    Write_Command(0x50);    //100Hz
    Write_Command(0x20);    // Set row address
    Write_Command(0x81);    // Set contrast control
    Write_Command(0xFF);
    Write_Command(0xA0);    // Segment remap
    Write_Command(0xA4);    // Set Entire Display ON
    Write_Command(0xA6);    // Normal display
    Write_Command(0xAD);    // Set external VPP
    Write_Command(0x80);
    Write_Command(0xC0);    // Set Common scan direction
    Write_Command(0xD9);    // Set phase length
    Write_Command(0x25);
    Write_Command(0xDB);    // Set Vcomh voltage
    Write_Command(0x28);    // 0.687*VPP
    Clear_Screen();
    Write_Command(0xAF);    //Set Display On
}
```

11 Package Specification

Packing Process (1) ~ (9)

<p>(1) Tray Type:R0090-MT1-A</p>  <p>Detail 7A</p>	<p>(2)</p>  <p>normal ① seaver ②</p>	<p>(3) order ① ② ① ② fix trays with tape, 384 pcs of 1 small carton, 1 tray contain 24 pcs, 16 contained trays, 1 empty tray</p>  <p>small carton package</p>	<p>(4) Use vacuum bag to package the tray and add 5 bags of desiccant into the vacuum bag *5</p> 
<p>(5)</p> 	<p>(6)</p> 	<p>(7)</p>  <p>RoHS MARK</p>	<p>(8)</p>  <p>RoHS MARK</p> <p>2 small cartons in 1 big carton</p>
<p>(9) 32 contained trays, 2 empty trays, Package quantity products: 768 pcs of 1 big carton</p>  <p>RoHS标识 Package finished L450*W350*L352mm</p>	<p>NOTE:1、The inner carton and master carton must be sealed with adhesive tape. 2、Fill up the gap with tray. 3、If the customer has special needs with the RoHS making, the inner carton and master carton need adhesive new RoHS marking at . 4、Packaging materials are not recommended for recycling</p>		

12 Reliability

12.1 Reliability Test

NO.	ITEM	CONDITION	QUANTITY
1	High Temperature (Non-operation)	85°C,240hrs	4
2	Low Temperature (Non-operation)	-40°C,240hrs	4
3	High Temperature (Operation)	70°C,240hrs	4
4	Low Temperature (Operation)	-40°C,240hrs	4
5	High Temperature / High Humidity (Operation)	60°C,90%RH,240hrs	4
6	Thermal shock (Non-operation)	-40°C~85°C(-40°C/30min;transit/3min;85°C/30min;transit/3min) 1cycle: 66min,30cycles	4
7	ESD Air discharge (Non-operation)	± 8kV, Test 9 point; Each point discharge 10 times. Time interval is less than 1 second.	4

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 $\pm 3^{\circ}\text{C}$, and the tolerance of relative humidity is $\pm 5\%$.

Evaluation criteria

1. The function test is OK.
2. No observable defects.
3. Luminance: $\geq 50\%$ of initial value.
4. Current consumption: within $\pm 50\%$ of initial value.

12.2 Lifetime

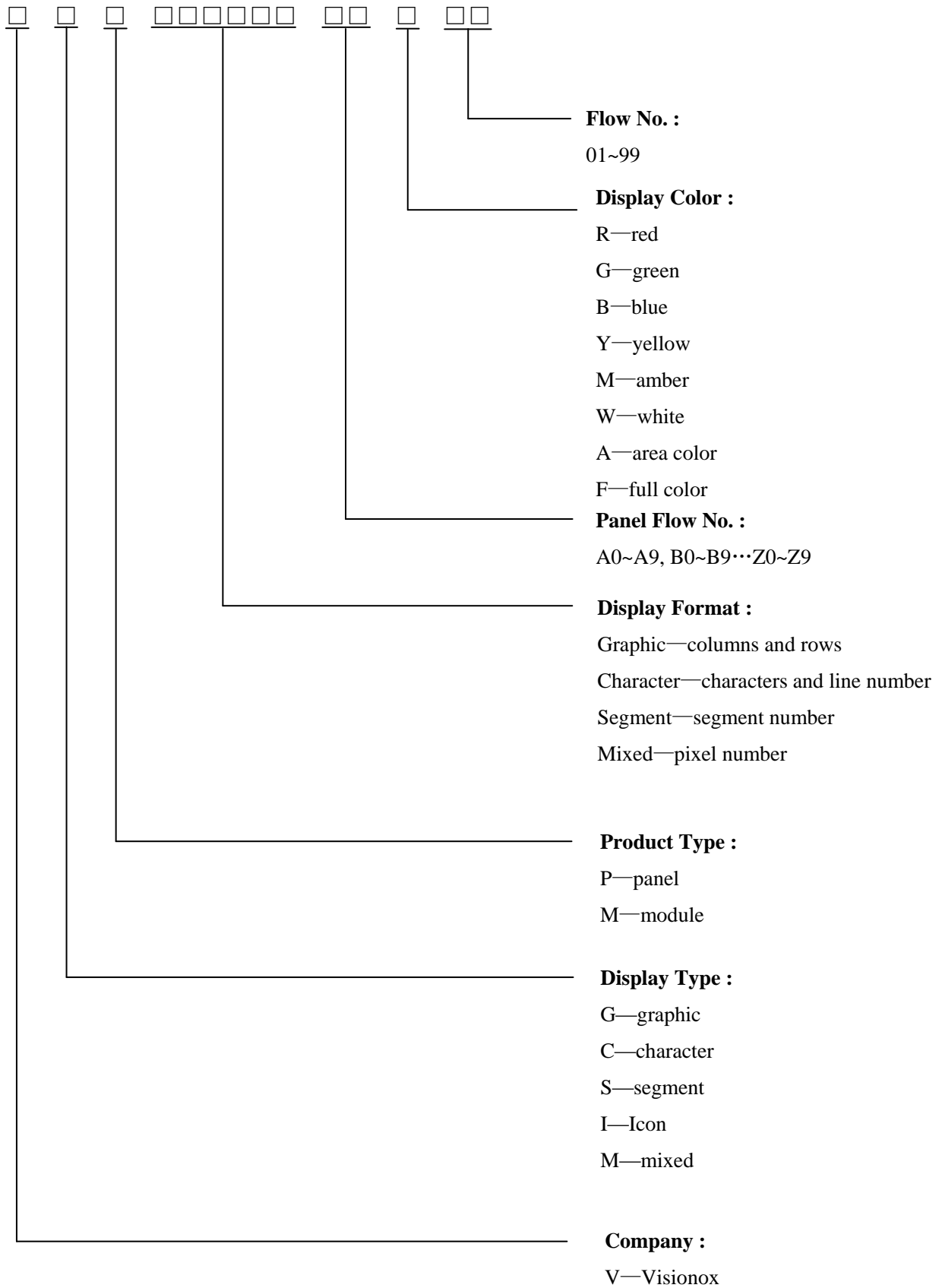
End of lifetime is specified as 50% of initial brightness and the test pattern at operating condition is 50% alternating checkerboard.

ITEM	MIN	MAX	UNIT	CONDITION
Operation Life Time	10,000	-	hrs	80 cd/m ² , 50% alternating checkerboard, 22±3 °C, 55±15% RH

12.3 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.

13 Illustration of OLED Product Name



14 Outgoing Quality Control Specifications

14.1 Sampling Method

- (1) GB/T 2828.1/ISO2859-1, inspection level II , normal inspection, single sample inspection
- (2) AQL: Major 0.65; Minor 1.0

14.2 Inspection Conditions

The environmental conditions for test and measurement are performed as follows.

Temperature: $22 \pm 3^{\circ}\text{C}$

Humidity: $55 \pm 15\% \text{R.H}$

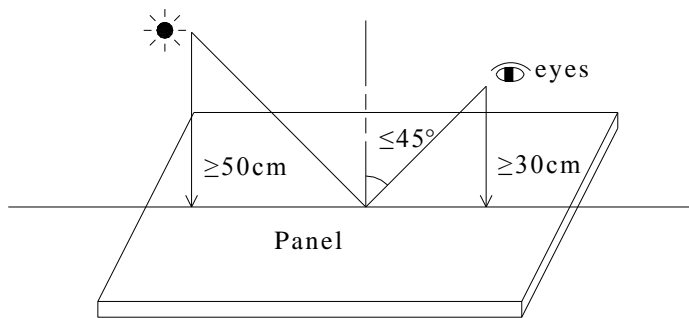
Fluorescent Lamp: 30W

Distance between the Panel & Lamp: $\geq 50\text{cm}$

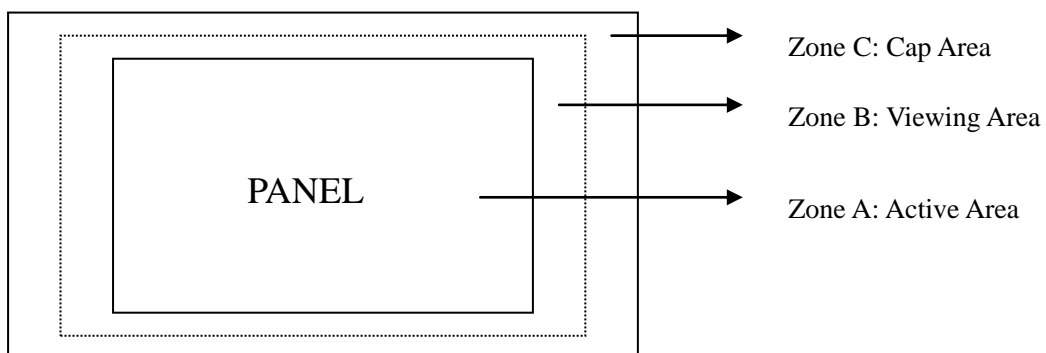
Distance between the Panel & Eyes: $\geq 30\text{cm}$

Viewing angle from the vertical in each direction: $\leq 45^{\circ}$

(See the sketch below)

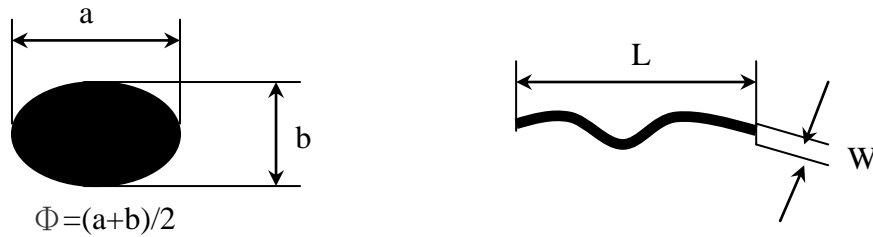


14.3 Quality Assurance Zones



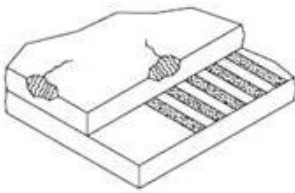
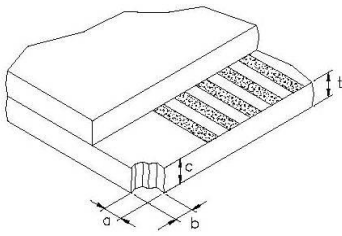
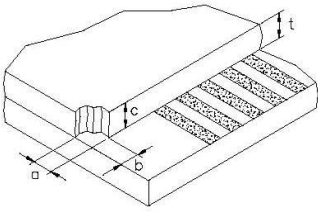
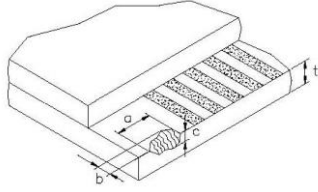
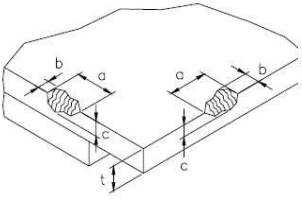
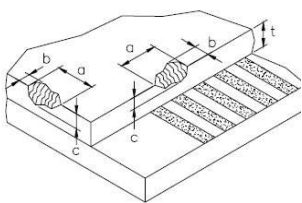
14.4 Inspection Standard

Definition of Φ &L&W (Unit: mm)



I . Appearance Defects

NO.	ITEM	CRITERIA	CLASSIFICATION																
1	Polarizer Black or White spot, Dirty spot, Foreign matter, Dent on the polarizer	<table border="1"> <thead> <tr> <th rowspan="2">Average Diameter (mm)</th> <th colspan="2">Acceptable Number</th> </tr> <tr> <th>Zone A,B</th> <th>Zone C</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.15$</td> <td>Ignore</td> <td rowspan="3">Ignore</td> </tr> <tr> <td>$0.15 < \Phi \leq 0.30$</td> <td>3</td> </tr> <tr> <td>$\Phi > 0.30$</td> <td>0</td> </tr> </tbody> </table>	Average Diameter (mm)	Acceptable Number		Zone A,B	Zone C	$\Phi \leq 0.15$	Ignore	Ignore	$0.15 < \Phi \leq 0.30$	3	$\Phi > 0.30$	0	Minor				
Average Diameter (mm)	Acceptable Number																		
	Zone A,B	Zone C																	
$\Phi \leq 0.15$	Ignore	Ignore																	
$0.15 < \Phi \leq 0.30$	3																		
$\Phi > 0.30$	0																		
2	Scratch/line on the glass/Polarizer	<table border="1"> <thead> <tr> <th rowspan="2">Width (mm)</th> <th rowspan="2">Length (mm)</th> <th colspan="2">Acceptable Number</th> </tr> <tr> <th>Zone A,B</th> <th>Zone C</th> </tr> </thead> <tbody> <tr> <td>$W < 0.05$</td> <td>---</td> <td>Ignore</td> <td rowspan="3">Ignore</td> </tr> <tr> <td>$0.05 < W \leq 0.1$</td> <td>$L \leq 5.0$</td> <td>3</td> </tr> <tr> <td>$W > 0.1$</td> <td>---</td> <td>0</td> </tr> </tbody> </table>	Width (mm)	Length (mm)	Acceptable Number		Zone A,B	Zone C	$W < 0.05$	---	Ignore	Ignore	$0.05 < W \leq 0.1$	$L \leq 5.0$	3	$W > 0.1$	---	0	Minor
Width (mm)	Length (mm)	Acceptable Number																	
		Zone A,B	Zone C																
$W < 0.05$	---	Ignore	Ignore																
$0.05 < W \leq 0.1$	$L \leq 5.0$	3																	
$W > 0.1$	---	0																	
3	Polarizer Bubble	<table border="1"> <thead> <tr> <th rowspan="2">Average Diameter (mm)</th> <th colspan="2">Acceptable Number</th> </tr> <tr> <th>Zone A,B</th> <th>Zone C</th> </tr> </thead> <tbody> <tr> <td>$\Phi > 0.2$</td> <td>0</td> <td rowspan="3">Ignore</td> </tr> <tr> <td>$0.2 < \Phi \leq 0.5$</td> <td></td> </tr> <tr> <td>$\Phi \leq 0.5$</td> <td>Ignore</td> </tr> </tbody> </table>	Average Diameter (mm)	Acceptable Number		Zone A,B	Zone C	$\Phi > 0.2$	0	Ignore	$0.2 < \Phi \leq 0.5$		$\Phi \leq 0.5$	Ignore	Minor				
Average Diameter (mm)	Acceptable Number																		
	Zone A,B	Zone C																	
$\Phi > 0.2$	0	Ignore																	
$0.2 < \Phi \leq 0.5$																			
$\Phi \leq 0.5$	Ignore																		
4	Any Dirt & Scratch on Polarizer's Protective Film	Ignore for not affect the polarizer.	Minor																
5	Any Dirt on Cap Glass	Inside the Cap, Ignore the dirt without moving.	Minor																

6	Glass Crack	 <p>Propagation crack is not acceptable.</p>	Major
7	Corner Chip	 <p>t= Glass thickness Accept $a \leq 2.0\text{mm}$ or $b \leq 2.0\text{mm}$, $c \leq t$</p>	Minor
8	Corner Chip on Cap Glass	 <p>t= Glass thickness Accept $a \leq 1.5\text{mm}$ or $b \leq 1.5\text{mm}$, $c \leq t$</p>	Minor
9	Chip on Contact Pad	 <p>t= Glass thickness Accept $a \leq 3.0\text{mm}$ or $b \leq 0.8\text{mm}$, $c \leq t$ (on the contact pin) $a \leq 3.0\text{mm}$ or $b \leq 2.0\text{mm}$, $c \leq t$ (outside of the contact pin)</p>	Minor
10	Chip on Face of Display	 <p>t= Glass thickness Accept $a \leq 1.5\text{mm}$ or $b \leq 1.5\text{mm}$, $c \leq t$</p>	Minor
11	Chip on Cap Glass	 <p>t= Glass thickness Accept $a \leq 3.0\text{mm}$ or $b \leq 3.0\text{mm}$, $c \leq t/2$ $a \leq 1.5\text{mm}$ or $b \leq 1.5\text{mm}$, $t/2 \leq c \leq t$</p>	Minor
12	Stain on Surface	Stain removable by soft cloth or air blow is acceptable.	Minor
13	TCP/FPC Damage	<p>(1) Crack, deep scratch, deep hole and deep pressure mark on the TCP/FPC are not acceptable.</p> <p>(2) Terminal lead twisted or broken is not allowable.</p> <p>(3) Copper exposed is not allowed by naked eye inspection.</p>	Minor
14	Dimension Unconformity	Checking by mechanical drawing.	Major

II. Displaying Defects

NO.	ITEM	CRITERIA	CLASSIFICATION															
1	Black/White spot Dirty spot Foreign matter	<table border="1"> <thead> <tr> <th data-bbox="517 322 794 383">Average Diameter (mm)</th> <th colspan="2" data-bbox="794 322 1155 360">Pieces Permitted</th> </tr> <tr> <td data-bbox="517 360 794 383">$\Phi \leq 0.10$</td> <td data-bbox="794 360 979 383">Zone A,B</td> <td data-bbox="979 360 1155 383">Zone C</td> </tr> <tr> <td data-bbox="517 383 794 421">$0.10 < \Phi \leq 0.20$</td> <td colspan="2" data-bbox="794 383 1155 421">Ignore</td> </tr> <tr> <td data-bbox="517 421 794 495">$\Phi > 0.20$</td> <td data-bbox="794 421 979 495">3</td> <td data-bbox="979 421 1155 495">Ignore</td> </tr> <tr> <td data-bbox="517 495 794 524"></td> <td data-bbox="794 495 979 524">0</td> <td data-bbox="979 495 1155 524"></td> </tr> </thead> </table>	Average Diameter (mm)	Pieces Permitted		$\Phi \leq 0.10$	Zone A,B	Zone C	$0.10 < \Phi \leq 0.20$	Ignore		$\Phi > 0.20$	3	Ignore		0		Minor
Average Diameter (mm)	Pieces Permitted																	
$\Phi \leq 0.10$	Zone A,B	Zone C																
$0.10 < \Phi \leq 0.20$	Ignore																	
$\Phi > 0.20$	3	Ignore																
	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	Refer to the SPEC.	Major															
8	Luminance NG	Refer to the SPEC.	Major															
9	Over Current	Refer to the SPEC.	Major															

15 Precautions for operation and Storage

15.1 Precautions for Operation

- (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.

15.2 Soldering

- (1) Soldering should be performed only on the I/O terminals.
- (2) Use soldering irons with proper grounding and no leakage.
- (3) Iron: The temperature setting of electric iron is 350°C, but we suggest that during soldering, the temperature of iron tip should be no higher than 330°C and soldering be finished within 3~4 seconds.

15.3 Precautions for Storage

- (1) Please store OLED module in a dark place. Avoid exposure to sunlight, the light of fluorescent lamp or any ultraviolet ray.
- (2) Keep the environment temperature between 10°C and 35°C and the relative humidity less than 70%. Avoid high temperature and high humidity.
- (3) Keep the OLED modules stored in the container when shipped from supplier before using them is recommended.
- (4) Do not leave any article on the OLED module surface for an extended period of time.

15.4 Warranty period

Visionox warrants for a period of 12 months from the shipping date when stored or used under normal condition. In addition to the failure and quality problems caused by man-made damage and force majeure, we promise to provide maintenance and replacement free of charge during the warranty period. If the warranty period has been exceeded, we need to collect the staff's travel expenses, materials and other related costs.