Display Elektronik GmbH

DATA SHEET

OLED-MODULE

DEP 256064F-W

2,08“ - OLED

Product Specification **Ver.: 0**

26.06.2018

1. Revision History

VERSION	DATE	REVISED PAGE NO.	Note
0	26.06.2018		First Release

Contents

1. General Specification

The Features is described as follow:

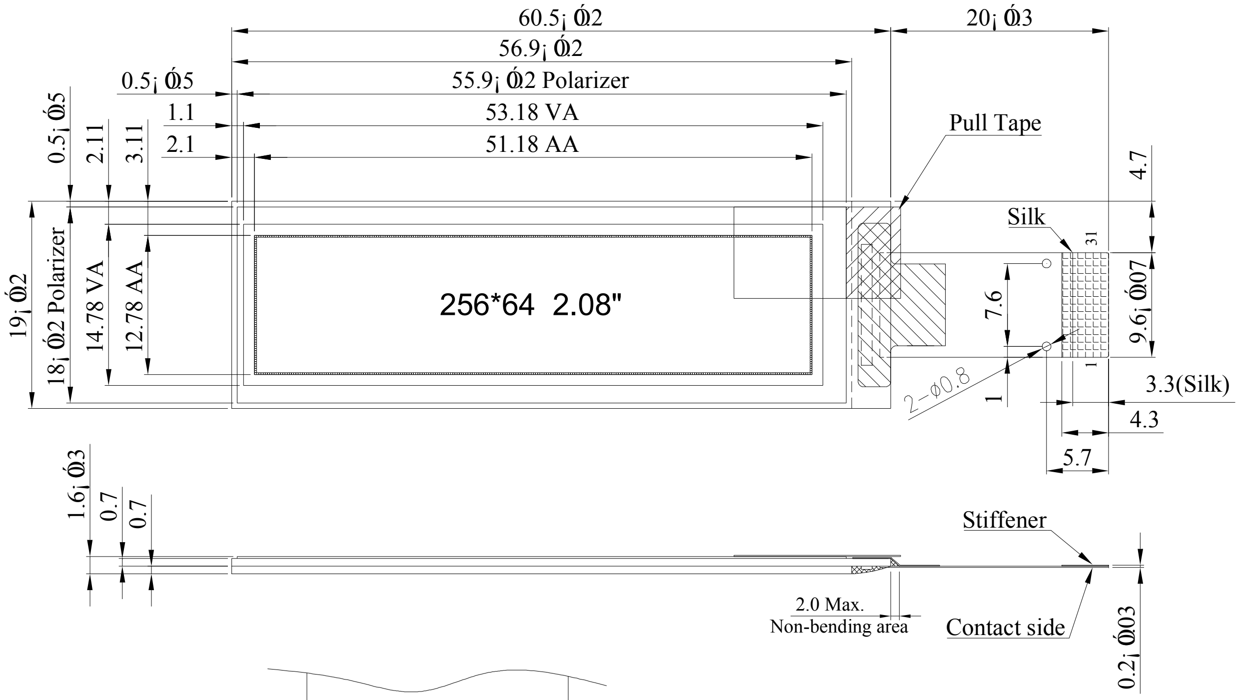
- Module Dimension: 60.50 x 19.00 x 1.60 mm
- Active Area: 51.18 x 12.78 mm
- Dot Matrix: 256 x 64 Dots
- Pixel Size: 0.18 x 0.18 mm
- Pixel Pitch: 0.20 x 0.20 mm
- Display Mode: Passive Matrix
- Duty: 1/64 Duty
- Gray Scale: 4 Bits
- Display Color: White
- IC: SSD1362Z
- Interface: 3-Wire and 4-Wire SPI, I2C, 6800, 8080 (Parallel Interface)
- Size: 2.08 Inch

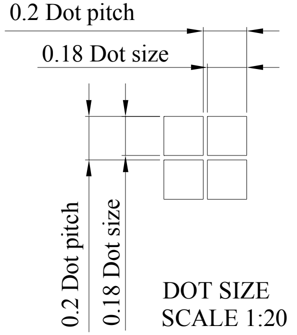
2. Interface Pin Function

<table>
<tr><th>No.</th><th>Symbol</th><th>Function</th></tr>
<tr><td>1</td><td>NC</td><td>These pins are reserved. Nothing should be connected to these pins, nor are they connected together.</td></tr>
<tr><td>2</td><td>VCC</td><td>Power supply for panel driving voltage. This is also the most positive power voltage supply pin. It is supplied by external high voltage source.</td></tr>
<tr><td>3</td><td>VP</td><td>This pin is the segment pre-charge voltage reference pin.
A capacitor should be connected between this pin and VSS.
No external power supply is allowed to connect to this pin.</td></tr>
<tr><td>4</td><td>VCOMH</td><td>COM signal deselected voltage level.
A capacitor should be connected between this pin and VSS.
No external power supply is allowed to connect to this pin.</td></tr>
<tr><td>5</td><td>VDD</td><td>Power supply for core logic operation.
VDD can be supplied externally (within the range of 1.65V to 2.6V) or regulated internally from VCI when VCI is >2.6V.
A capacitor should be connected between VDD and VSS under all circumstances.</td></tr>
<tr><td>6</td><td>VCC</td><td>Power supply for panel driving voltage. This is also the most positive power voltage supply pin. It is supplied by external high voltage source.</td></tr>
<tr><td>7</td><td>IREF</td><td>This pin is the segment output current reference pin.
When external IREF is used, a resistor should be connected between this pin and VSS to maintain current of around 18.75uA.
When internal IREF is used, this pin should be kept NC.</td></tr>
<tr><td>8</td><td>VCC</td><td>Power supply for panel driving voltage. This is also the most positive power voltage supply pin. It is supplied by external high voltage source.</td></tr>
<tr><td>9</td><td>NC</td><td>These pins are reserved. Nothing should be connected to these pins, nor are they connected together.</td></tr>
<tr><td>10</td><td>VSS</td><td>Ground pin. It must be connected to external ground.</td></tr>
<tr><td>11</td><td>VSS</td><td>Ground pin. It must be connected to external ground.</td></tr>
<tr><td>12</td><td>VCI</td><td>Low voltage power supply.
VCI must always be equal to or higher than VDD and VDDIO.</td></tr>
<tr><td>13</td><td>BS0</td><td rowspan="3">MCU bus interface selection pins. Select appropriate logic setting as described in the following table. BS2 and BS1, BS0 are pin select.
<table>
<tr><td>BS[2:0]</td><td>Interface</td></tr>
<tr><td>000</td><td>4 line SPI</td></tr>
<tr><td>001</td><td>3 line SPI</td></tr>
<tr><td>110</td><td>8-bit 8080 parallel</td></tr>
<tr><td>100</td><td>8-bit 6800 parallel</td></tr>
<tr><td>010</td><td>I^2C</td></tr>
</table>
Note (1) 0 is connected to VSS (2) 1 is connected to VCI</td></tr>
<tr><td>14</td><td>BS1</td></tr>
<tr><td>16</td><td>BS2</td></tr>
<tr><td>15</td><td>VCI</td><td>Low voltage power supply.
VCI must always be equal to or higher than VDD and VDDIO.</td></tr>
</table>

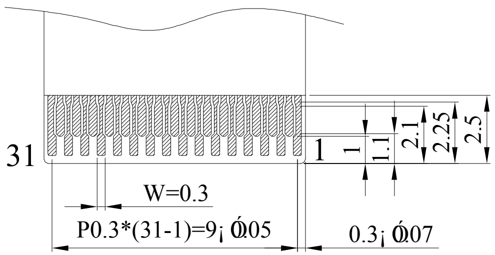
17	CS	This pin is the chip select input connecting to the MCU. The chip is enabled for MCU communication only when CS is pulled LOW (active LOW). In I2C mode, this pin must be connected to VSS.
18	RES	This pin is reset signal input. When the pin is pulled LOW, initialization of the chip is executed. Keep this pin pull HIGH during normal operation.
19	D/C	This pin is Data/Command control pin connecting to the MCU. When the pin is pulled HIGH, the data at D[7:0] will be interpreted as data. When the pin is pulled LOW, the data at D[7:0] will be transferred to a command register. In I2C mode, this pin acts as SA0 for slave address selection. When 3-wire serial interface is selected, this pin must be connected to VSS.
20	R/W	This pin is read / write control input pin connecting to the MCU interface. When 6800 interface mode is selected, this pin will be used as Read/Write (R/W) selection input. Read mode will be carried out when this pin is pulled HIGH and write mode when LOW. When 8080 interface mode is selected, this pin will be the Write (WR) input. Data write operation is initiated when this pin is pulled LOW and the chip is selected. When serial or I2C interface is selected, this pin must be connected to VSS.
21	RD	This pin is MCU interface input. When 6800 interface mode is selected, this pin will be used as the Enable signal. Read/write operation is initiated when this pin is pulled HIGH and the chip is selected. When 8080 interface mode is selected, this pin receives the Read (RD) signal. Read operation is initiated when this pin is pulled LOW and the chip is selected. When serial or I2C interface is selected, this pin must be connected to VSS.
22	D0	These pins are bi-directional data bus connecting to the MCU data bus. Unused pins are recommended to tie LOW. When serial interface mode is selected, D0 will be the serial clock input: SCLK; D1 will be the serial data input: SID. When I2C mode is selected, D2, D1 should be tied together and serve as SDA_{out}, SDA_{in} in application and D0 is the serial clock input, SCL.
23	D1	
24	D2	
25	D3	
26	D4	
26	D5	
28	D6	
29	D7	
30	NC	These pins are reserved. Nothing should be connected to these pins, nor are they connected together.
31	VCC	Power supply for panel driving voltage. This is also the most positive power voltage supply pin. It is supplied by external high voltage source.

3. Counter Drawing & Block Diagram

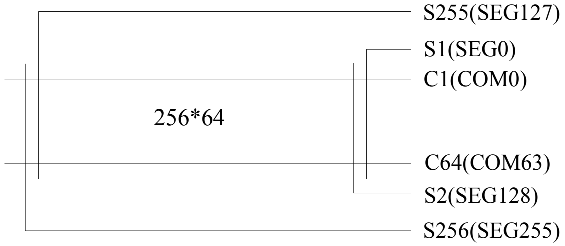




DOT SIZE
SCALE 1:20



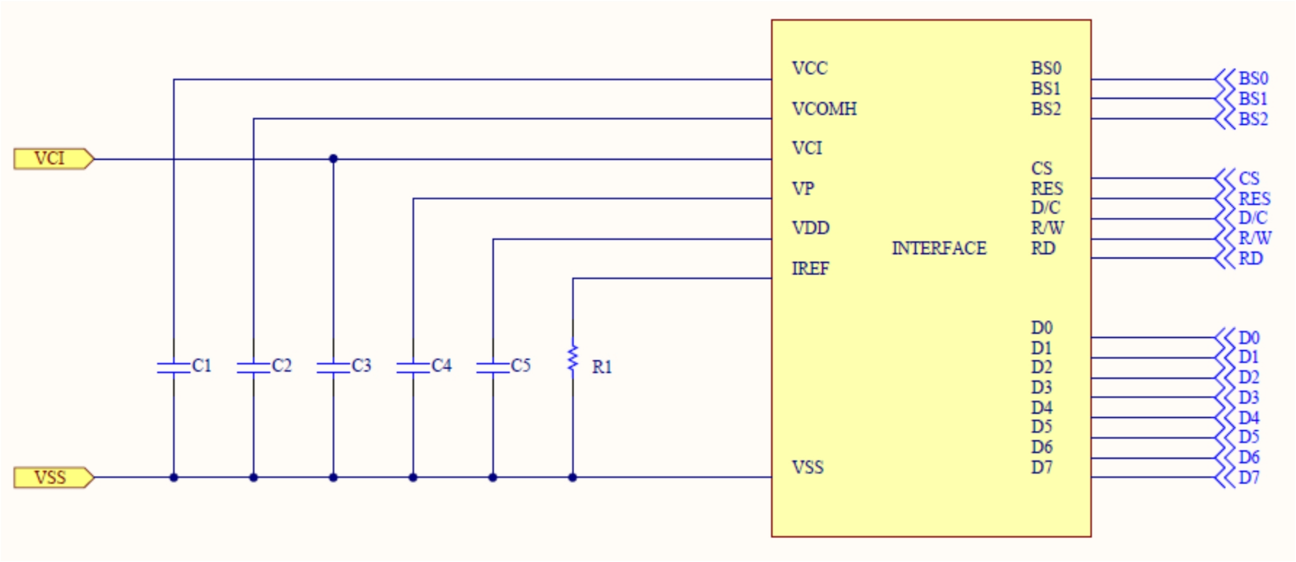
FPC Contact Side
SCALE 1:2.5



PIN	SYMBOL
1	NC
2	VCC
3	VP
4	VCOMH
5	VDD
6	VCC
7	IREF
8	VCC
9	NC
10	VSS
11	VSS
12	VCI
13	BS0
14	BS1
15	VCI
16	BS2
17	CS
18	RES
19	D/C
20	R/W
21	RD
22	D0
23	D1
24	D2
25	D3
26	D4
27	D5
28	D6
29	D7
30	NC
31	VCC

The non-specified tolerance of dimension is ¡ Ó0.3 mm .

3.1 Application Recommendations



Recommended Components：

C3, C4, C5：1.0uF

C1, C2：4.7uF

Bus Interface Selection: (Must be set the BS[2:0], refer to item 4)

8-Bits 6800 and 8080 Parallel, 3 and 4-Wire SPI, I2C

Voltage at IREF = VCC – 2.4V. For VCC = 12V, IREF = 18.75uA:

R1 = (Voltage at IREF - VSS) / IREF

= (12 – 2.4) / 18.75u ≅ 510kOhm

*For more information, please contact us

4. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Supply Voltage for Operation	VCI	-0.5	5.5	V	1, 2
Supply Voltage for Logic	VDD	-0.5	2.75	V	1, 2
Supply Voltage for Display	VCC	-0.5	21	V	1, 2
Operating Temperature	TOP	-40	+80	°C	-
Storage Temperature	TSTG	-40	+85	°C	-

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

Note 2: When this module is used beyond the above absolute maximum ratings, permanent breakage of the module may occur. Also, for normal operations, it is desirable to use this module under the conditions according to Section6 “Electrical Characteristics”. If this module is used beyond these conditions, malfunctioning of the module can occur and the reliability of the module may deteriorate.

5. Electrical Characteristics

5.1 DC Electrical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage for Logic	VCI	—	2.8	3.0	3.3	V
Supply Voltage for Display	VCC	—	11.5	12	12.5	V
Input High Voltage	VIH	—	0.8×VCI	—	VCI	V
Input Low Voltage	VIL	—	VSS	—	0.2×VCI	V
Output High Voltage	VOH	—	0.9×VCI	—	VCI	V
Output Low Voltage	VOL	—	VSS	—	0.1×VCI	V
50% Check Board operating Current	ICC	VCC=12V	—	15	30	mA

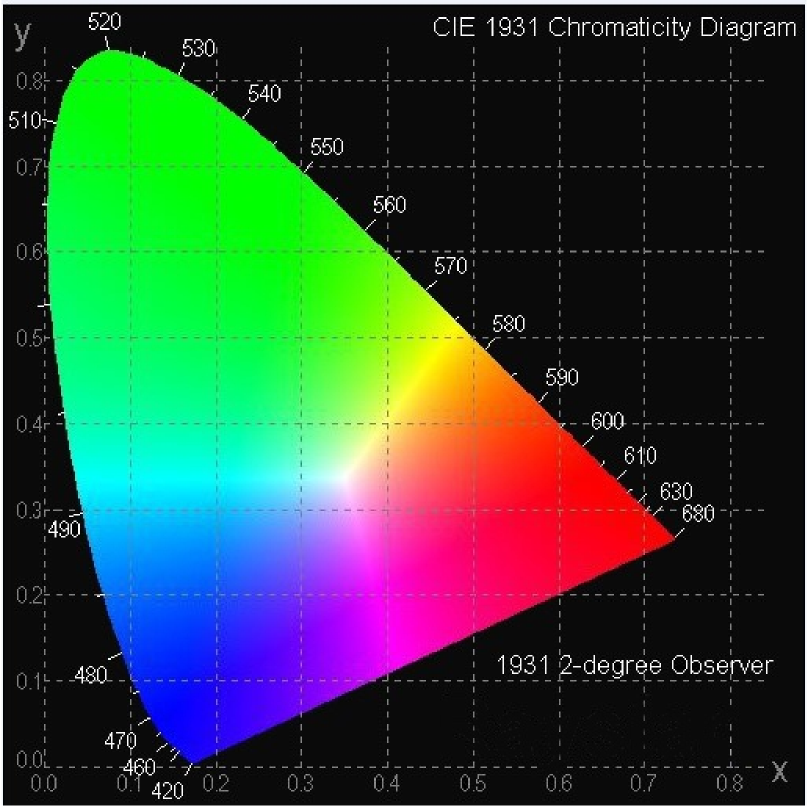
5.2 Initial Code Proposal

```
void Initial_SSD1362BZ(){

    Write_command(0XFD); //Set Command Lock
    Write_command(0X12); //(12H=Unlock,16H=Lock)

    Write_command(0XAE); //Display OFF(Sleep Mode)

    Write_command(0X15); //Set column Address
    Write_command(0X00); //Start column Address
    Write_command(0X7F); //End column Address

    Write_command(0X75); //Set Row Address
    Write_command(0X00); //Start Row Address
    Write_command(0X3F); //End Row Address

    Write_command(0X81); //Set contrast
    Write_command(0x2f);

    Write_command(0XA0); //Set Remap
    Write_command(0Xc3);

    Write_command(0XA1); //Set Display Start Line
    Write_command(0X00);

    Write_command(0XA2); //Set Display Offset
    Write_command(0X00);

    Write_command(0XA4); //Normal Display

    Write_command(0XA8); //Set Multiplex Ratio
    Write_command(0X3F);

    Write_command(0XAB); //Set VDD regulator
    Write_command(0X01); //Regulator Enable

    Write_command(0XAD); //External /Internal IREF Selection
    Write_command(0X8E);

    Write_command(0XB1); //Set Phase Length
    Write_command(0X22);

    Write_command(0XB3); //Display clock Divider
    Write_command(0XA0);

    Write_command(0XB6); //Set Second precharge Period
    Write_command(0X04);
```

```
    Write_command(0XB9); //Set Linear LUT

    Write_command(0XBc); //Set pre-charge voltage level
    Write_command(0X10); //0.5*Vcc

    Write_command(0XBD); //Pre-charge voltage capacitor Selection
    Write_command(0X01);

    Write_command(0XBE); //Set cOM deselect voltage level
    Write_command(0X07); //0.82*Vcc

    Write_command(0XAF); //Display ON

}
```

6. Optical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
View Angle	(V)θ	—	160	—	—	deg
	(H)φ	—	160	—	—	deg
Contrast Ratio	CR	Dark	2000:1	—	—	—
Response Time	T rise	—	—	10	—	μs
	T fall	—	—	10	—	μs
Display with 50% check Board Brightness			80	100	—	cd/m2
CIEx(White)		(CIE1931)	0.26	0.28	0.30	—
CIEy(White)		(CIE1931)	0.30	0.32	0.34	—



7. OLED Lifetime

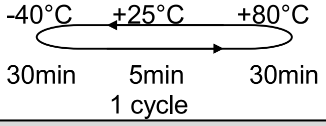
ITEM	Conditions	Min	Typ	Remark
Operating Lifetime	Ta=25°C / Initial 50% check board brightness Typical Value	20.000 Hrs	-	Note

Notes:

1. Life time is defined the amount of time when the luminance has decayed to <50% of the initial value.
2. This analysis method uses life data obtained under accelerated conditions to extrapolate an estimated probability density function (*pdf*) for the product under normal use conditions.
3. Screen saving mode will extend OLED lifetime.

8. Reliability

Content of Reliability Test

Environmental Test			
Test Item	**Content of Test**	**Test Condition**	**Applicable Standard**
High Temperature storage	Endurance test applying the high storage temperature for a long time.	+85°C 240hrs	——
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-40°C 240hrs	——
High Temperature Operation	Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.	+80°C 240hrs	——
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-40°C 240hrs	——
High Temperature/ Humidity Storage	Endurance test applying the high temperature and high humidity storage for a long time.	+60°C,90%RH 240hrs	——
High Temperature/ Humidity Operation	Endurance test applying the high temperature and high humidity Operation for a long time.	+60°C,90%RH 120hrs	——
Temperature Cycle	Endurance test applying the low and high temperature cycle. 	-40°C /+80°C 30 cycles	——
Mechanical Test			
Vibration test	Endurance test applying the vibration during transportation and using.	Frequency:10~55Hz amplitude:1.5mm Time:0.5hrs/axis Test axis:X,Y,Z	——
Others			
Static electricity test	Endurance test applying the electric stress to the terminal.	Air Discharge model ±4kv,10 times	——

*** Supply voltage for OLED system =Operating voltage at 25°C

Test and measurement conditions

1. All measurements shall not be started until the specimens attain to temperature stability. 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 23°C ± 5°C; 55%±15% RH.
2. All-pixels-on is used as operation test pattern.
3. The degradation of Polarizer are ignored for High Temperature storage, High Temperature/ Humidity Storage, Temperature Cycle

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.

APPENDIX:

RESIDUE IMAGE

Because the pixels are lighted in different time, the luminance of active pixels may reduce or differ from inactive pixels. Therefore, the residue image will occur. To avoid the residue image, every pixel needs to be lighted up uniformly.

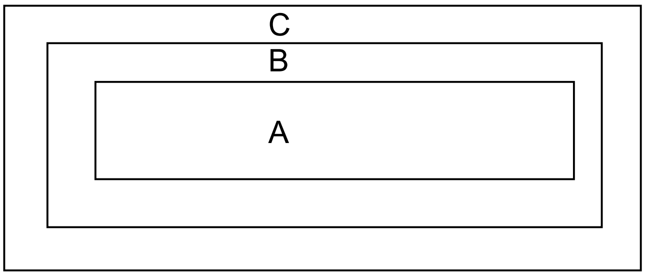
9. Inspection specification

Inspection Standard:

MIL-STD-105E table normal inspection single sample level II.

Definition

1 Major defect: The defect that greatly affect the usability of product.
2 Minor defect: The other defects, such as cosmetic defects, etc.
Definition of inspection zone:



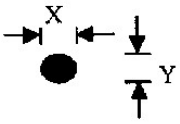
Zone A: Active Area
Zone B: Viewing Area except Zone A
Zone C: Outside Viewing Area
Note: As a general rule, visual defects in Zone C are permissible, when it is no trouble of quality and assembly to customer`s product.

Inspection Methods

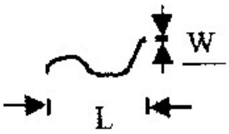
1 The general inspection: Under fluorescent light illumination: 750~1500 Lux, about 30cm viewing distance, within 45º viewing angle, under 25°C ± 5°C.
2 The luminance and color coordinate inspection: By SR-3 or BM-7 or the equal equipments in the dark room, under 25°C ± 5°C.

NO	Item	Criterion	AQL
01	Electrical Testing	1.1 Missing vertical, horizontal segment, segment contrast defect. 1.2 Missing character, dot or icon. 1.3 Display malfunction. 1.4 No function or no display. 1.5 Current consumption exceeds product specifications. 1.6 OLED viewing angle defect. 1.7 Mixed product types. 1.8 Contrast defect.	0.65
02	Black or white spots on OLED (display only)	2.1 White and black spots on display ≦0.25mm, no more than three white or black spots present. 2.2 Densely spaced: No more than two spots or lines within 3mm.	2.5

<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>AQL</th></tr>
<tr><td rowspan="2">03</td><td>OLED black spots, white spots, contamination (non-display)</td><td>3.1 Round type : As following drawing Φ=(x + y) / 2



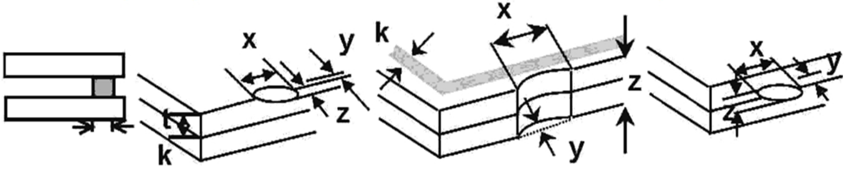
<table>
<tr><th>SIZE</th><th>Acceptable QTY</th><th>Zone</th></tr>
<tr><td>Φ≦0.10</td><td>Accept no dense</td><td>A+ B,</td></tr>
<tr><td>0.10＜Φ≦0.20</td><td>2</td><td>A+ B</td></tr>
<tr><td>0.20＜Φ≦0.25</td><td>1</td><td>A+ B</td></tr>
<tr><td>0.25＜Φ</td><td>0</td><td>A+ B</td></tr>
</table></td><td>2.5</td></tr>
<tr><td></td><td>3.2 Line type : (As following drawing)



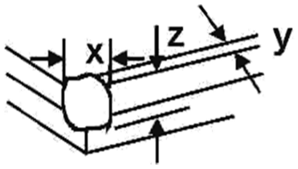
<table>
<tr><th>Length</th><th>Width</th><th>Acceptable Q TY</th><th>Zone</th></tr>
<tr><td>---</td><td>W≦0.02</td><td>Accept no dense</td><td>A+B</td></tr>
<tr><td>L≦3.0</td><td>0.02＜W≦0.03</td><td rowspan="2">2</td><td>A+B</td></tr>
<tr><td>L≦2.5</td><td>0.03＜W≦0.05</td><td>A+B</td></tr>
<tr><td>---</td><td>0.05＜W</td><td>As round type</td><td></td></tr>
</table></td><td>2.5</td></tr>
<tr><td>04</td><td>Polarizer bubbles</td><td>If bubbles are visible, judge using black spot specifications, not easy to find, must check in specify direction.

<table>
<tr><th>Size Φ</th><th>Acceptable Q TY</th><th>Zone</th></tr>
<tr><td>Φ≦0.20</td><td>Accept no dense</td><td>A+B</td></tr>
<tr><td>0.20＜Φ≦0.50</td><td>3</td><td>A+B</td></tr>
<tr><td>0.50＜Φ≦1.00</td><td>2</td><td>A+B</td></tr>
<tr><td>1.00＜Φ</td><td>0</td><td>A+B</td></tr>
<tr><td>Total Q TY</td><td>3</td><td></td></tr>
</table></td><td>2.5</td></tr>
<tr><td>05</td><td>Scratches</td><td>Follow NO.3 OLED black spots, white spots, contamination.</td><td></td></tr>
</table>

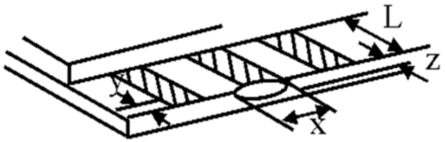
<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>AQL</th></tr>
<tr><td rowspan="3">06</td><td rowspan="2">Chipped glass</td><td>
Symbols Define:
x: Chip length y: Chip width z: Chip thickness
k: Seal width t: Glass thickness a: OLED side length
L: Electrode pad length:
6.1 General glass chip :
6.1.1 Chip on panel surface and crack between panels:



<table>
<tr><th>z: Chip thickness</th><th>y: Chip width</th><th>x: Chip length</th></tr>
<tr><td>Z≦1/2t</td><td>Not over viewing area</td><td>x≦1/8a</td></tr>
<tr><td>1/2t＜z≦2t</td><td>Not exceed 1/3k</td><td>x≦1/8a</td></tr>
</table>
⊙If there are 2 or more chips, x is total length of each chip.
</td><td>2.5</td></tr>
<tr><td>
6.1.2 Corner crack:

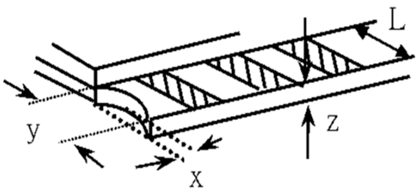


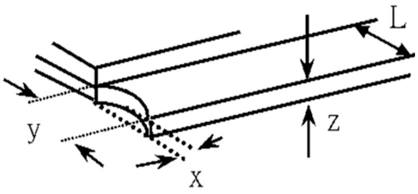
<table>
<tr><th>z: Chip thickness</th><th>y: Chip width</th><th>x: Chip length</th></tr>
<tr><td>Z≦1/2t</td><td>Not over viewing area</td><td>x≦1/8a</td></tr>
<tr><td>1/2t＜z≦2t</td><td>Not exceed 1/3k</td><td>x≦1/8a</td></tr>
</table>
⊙If there are 2 or more chips, x is the total length of each chip.
</td><td>2.5</td></tr>
<tr><td>Glass crack</td><td>
Symbols :
x: Chip length y: Chip width z: Chip thickness
k: Seal width t: Glass thickness a: OLED side length
L: Electrode pad length
6.2 Protrusion over terminal :
6.2.1 Chip on electrode pad :



<table>
<tr><th>y: Chip width</th><th>x: Chip length</th><th>z: Chip thickness</th></tr>
<tr><td>y≦0.5mm</td><td>x≦1/8a</td><td>0 ＜ z ≦ t</td></tr>
</table>
</td><td>2.5</td></tr>
</table>

<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>AQL</th></tr>
<tr><td>06</td><td>Glass crack</td><td>
6.2.2 Non-conductive portion:

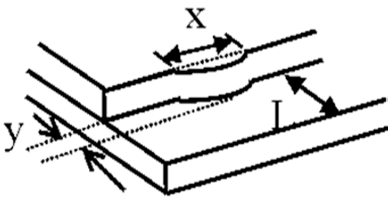




<table>
<tr><th>y: Chip width</th><th>x: Chip length</th><th>z: Chip thickness</th></tr>
<tr><td>y≦ L</td><td>x≦1/8a</td><td>0 ＜ z ≦ t</td></tr>
</table>

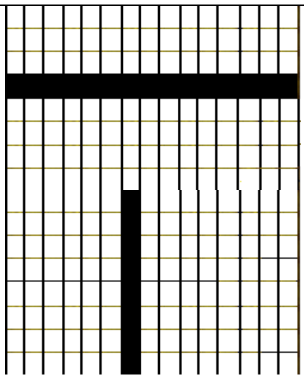
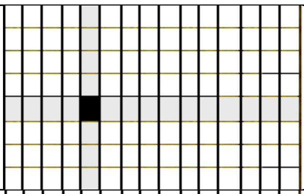
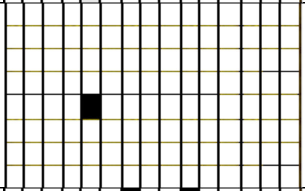
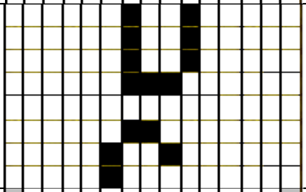
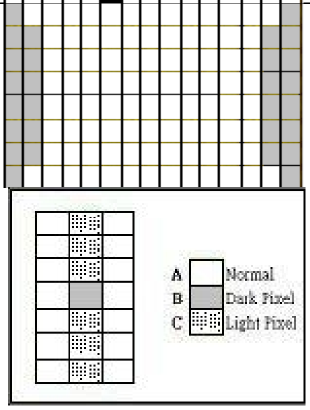
⊙If the chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications.
⊙If the product will be heat sealed by the customer, the alignment mark not be damaged.

6.2.3 Substrate protuberance and internal crack.



<table>
<tr><th>y: width</th><th>x: length</th></tr>
<tr><td>y≦1/3L</td><td>x ≦ a</td></tr>
</table>
</td><td>2.5</td></tr>
<tr><td>07</td><td>Cracked glass</td><td>The OLED with extensive crack is not acceptable.</td><td>2.5</td></tr>
<tr><td>08</td><td>Backlight elements</td><td>8.1 Illumination source flickers when lit.
8.2 Spots or scratched that appear when lit must be judged. Using OLED spot, lines and contamination standards.
8.3 Backlight doesn’t light or color wrong.</td><td>0.65
2.5
0.65</td></tr>
<tr><td>09</td><td>Bezel</td><td>9.1 Bezel may not have rust, be deformed or have fingerprints, stains or other contamination.
9.2 Bezel must comply with job specifications.</td><td>2.5
0.65</td></tr>
</table>

NO	Item	Criterion	AQL
10	PCB , COB	10.1 COB seal may not have pinholes larger than 0.2mm or contamination.	2.5
		10.2 COB seal surface may not have pinholes through to the IC.	2.5
		10.3 The height of the COB should not exceed the height indicated in the assembly diagram.	0.65
		10.4 There may not be more than 2mm of sealant outside the seal area on the PCB. And there should be no more than three places.	2.5
		10.5 No oxidation or contamination PCB terminals.	2.5
		10.6 Parts on PCB must be the same as on the production characteristic chart. There should be no wrong parts, missing parts or excess parts.	0.65
		10.7 The jumper on the PCB should conform to the product characteristic chart.	0.65
		10.8 If solder gets on bezel tab pads, OLED pad, zebra pad or screw hold pad, make sure it is smoothed down.	2.5
11	Soldering	11.1 No un-melted solder paste may be present on the PCB.	2.5
		11.2 No cold solder joints, missing solder connections, oxidation or icicle.	2.5
		11.3 No residue or solder balls on PCB.	2.5
		11.4 No short circuits in components on PCB.	0.65
12	General appearance	12.1 No oxidation, contamination, curves or, bends on interface Pin (OLB) of TCP.	2.5
		12.2 No cracks on interface pin (OLB) of TCP.	0.65
		12.3 No contamination, solder residue or solder balls on product.	2.5
		12.4 The IC on the TCP may not be damaged, circuits.	2.5
		12.5 The uppermost edge of the protective strip on the interface pin must be present or look as if it cause the interface pin to sever.	2.5
		12.6 The residual rosin or tin oil of soldering (component or chip component) is not burned into brown or black color.	2.5
		12.7 Sealant on top of the ITO circuit has not hardened.	2.5
		12.8 Pin type must match type in specification sheet.	0.65
		12.9 OLED pin loose or missing pins.	0.65
		12.10 Product packaging must the same as specified on packaging specification sheet.	0.65
		12.11 Product dimension and structure must conform to product specification sheet.	0.65

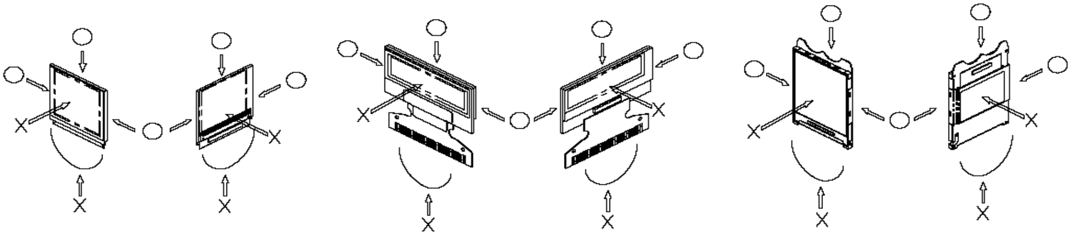
Check Item	Classification	Criteria
No Display	Major	
Missing Line	Major	
Pixel Short	Major	
Darker Short	Major	
Wrong Display	Major	
Un-uniform B/A x 100% < 70% A/C x 100% < 70%	Major	

10. Precautions in use of OLED Modules

(1) Avoid applying excessive shocks to module or making any alterations or modifications to it.
(2) Don’t make extra holes on the printed circuit board, modify its shape or change the components of OLED display module.
(3) Don’t disassemble the OLED display module.
(4) Don’t operate it above the absolute maximum rating.
(5) Don’t drop, bend or twist OLED display module.
(6) Soldering: only to the I/O terminals.
(7) Storage: please storage in anti-static electricity container and clean environment.
(8) It's pretty common to use "Screen Saver" to extend the lifetime and Don't use fix information for long time in real application.
(9) Don't use fixed information in OLED panel for long time that will extend "screen burn" effect time.
(10) DISPLAY has the right to change the passive components, including R2and R3 adjust resistors. (Resistors, capacitors and other passive components will have different appearance and color caused by the different supplier.)
(11) DISPLAY have the right to change the PCB Rev. (In order to satisfy the supplying stability, management optimization and the best product performance...etc, under the premise of not affecting the electrical characteristics and external dimensions, DISPLAY have the right to modify the version.)

10.1 Handling Precautions

(1) Since the display panel is being made of glass, do not apply mechanical impacts such us dropping from a high position.
(2) If the display panel is broken by some accident and the internal organic substance leaks out, be careful not to inhale nor lick the organic substance.
(3) If pressure is applied to the display surface or its neighborhood of the OLED display module, the cell structure may be damaged and be careful not to apply pressure to these sections.
(4) The polarizer covering the surface of the OLED display module is soft and easily scratched. Please be careful when handling the OLED display module.
(5) When the surface of the polarizer of the OLED display module has soil, clean the surface. It takes advantage of by using following adhesion tape.
 * Scotch Mending Tape No. 810 or an equivalent
 Never try to breathe upon the soiled surface nor wipe the surface using cloth containing solvent Also, pay attention that the following liquid and solvent may spoil the polarizer:
 * Water
 * Ketone
 * Aromatic Solvents
(6) Hold OLED display module very carefully when placing OLED display module into the System housing. Do not apply excessive stress or pressure to OLED display module. And, do not over bend the film with electrode pattern layouts. These stresses will influence the display performance. Also, secure sufficient rigidity for the outer cases.



(7) Do not apply stress to the LSI chips and the surrounding molded sections.

(8) Do not disassemble nor modify the OLED display module.

(9) Do not apply input signals while the logic power is off.

(10) Pay sufficient attention to the working environments when handing OLED display modules to prevent occurrence of element breakage accidents by static electricity.

* Be sure to make human body grounding when handling OLED display modules.

* Be sure to ground tools to use or assembly such as soldering irons.

* To suppress generation of static electricity, avoid carrying out assembly work under dry environments.

* Protective film is being applied to the surface of the display panel of the OLED display module. Be careful since static electricity may be generated when exfoliating the protective film.

(11) Protection film is being applied to the surface of the display panel and removes the protection film before assembling it. At this time, if the OLED display module has been stored surface of the display panel after removed of the film. In such case, remove the residue material by the method introduced in the above Section 5.

(12) If electric current is applied when the OLED display module is being dewed or when it is placed under high humidity environments, the electrodes may be corroded and be careful to avoid the above.

10.2 Storage Precautions

(1) When storing OLED display modules, put them in static electricity preventive bags avoiding exposure to direct sun light nor to lights of fluorescent lamps. And, also, avoiding high temperature and high humidity environment or low temperature (less than 0°C) environments.(We recommend you to store these modules in the packaged state when they were shipped from DISPLAY. At that time, be careful not to let water drops adhere to the packages or bags nor let dewing occur with them.

(2) If electric current is applied when water drops are adhering to the surface of the OLED display module, when the OLED display module is being dewed or when it is placed under high humidity environments, the electrodes may be corroded and be careful about the above.

10.3 Designing Precautions

(1) The absolute maximum ratings are the ratings which cannot be exceeded for OLED display module, and if these values are exceeded, panel damage may be happen.

(2) To prevent occurrence of malfunctioning by noise, pay attention to satisfy the VIL and VIH specifications and, at the same time, to make the signal line cable as short as possible.

(3) We recommend you to install excess current preventive unit (fuses, etc.) to the power circuit (VDD). (Recommend value: 0.5A)

(4) Pay sufficient attention to avoid occurrence of mutual noise interference with the neighboring devices.

(5) As for EMI, take necessary measures on the equipment side basically.

(6) When fastening the OLED display module, fasten the external plastic housing section.

(7) If power supply to the OLED display module is forcibly shut down by such errors as taking out the main battery while the OLED display panel is in operation, we cannot guarantee the quality of this OLED display module. Connection (contact) to any other potential than the above may lead to rupture of the IC.

(8) The limitation of FPC and Film bending.