Microtips Technology

SPECIFICATION

REX012864GWPP3N00000

CUSTOMER:

APPROVED BY	
PCB VERSION	
DATE	

FOR CUSTOMER USE ONLY

SALES BY	APPROVED BY	CHECKED BY	PREPARED BY

RAYSTAR
OLED Display Provider

曜凌光電股份有限公司
Raystar Optronics, Inc.
OLED Display Provider

24 June, 2015

To Whom It May Concern,

In continuing to develop and promote the strategic partnership between Microtips Technology USA (MTUSA) and Raystar Optronics, Inc (Raystar), Raystar is pleased to announce that we have entered into a business agreement with MTUSA . Raystar shall provide MTUSA datasheets, prices, samples and orders status. MTUSA shall promote the products of Raystar. In order to avoid the customer conflicts in USA market, MTUSA shall disclose the project and end customer name to Raystar.

Raystar is confident that this arrangement between our two companies will ultimately benefit the end customer.

Raystar Optronics, Inc.,
2015/07/20.
Signature
Zoe Chen
Printing Name

Microtips Technology USA

Signature
REED ARFIN
Printing Name

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1. Revision History

DATE	VERSION	REVISED PAGE NO.	Note
2013/09/23	1		First issue

2. General Specification

The Features is described as follow:

- Module dimension: 60.74 × 37.86 × 2.15 (max.) mm
- Active area: 53.74 × 26.86 mm
- Number of dots: 128 x 64
- Pixel Size: 0.42 × 0.42mm
- Pixel Pitch：0.4 × 0.4 mm
- Display Mode: Passive Matrix
- Duty: 1/64
- Display Color: White
- Controller IC：SSD1309Z

3. Module Coding System

1	2	3	4	5	6	7	8	9	10	11	12	13
R	E	X	012864	G	W	P	P	3	N	0	0	000

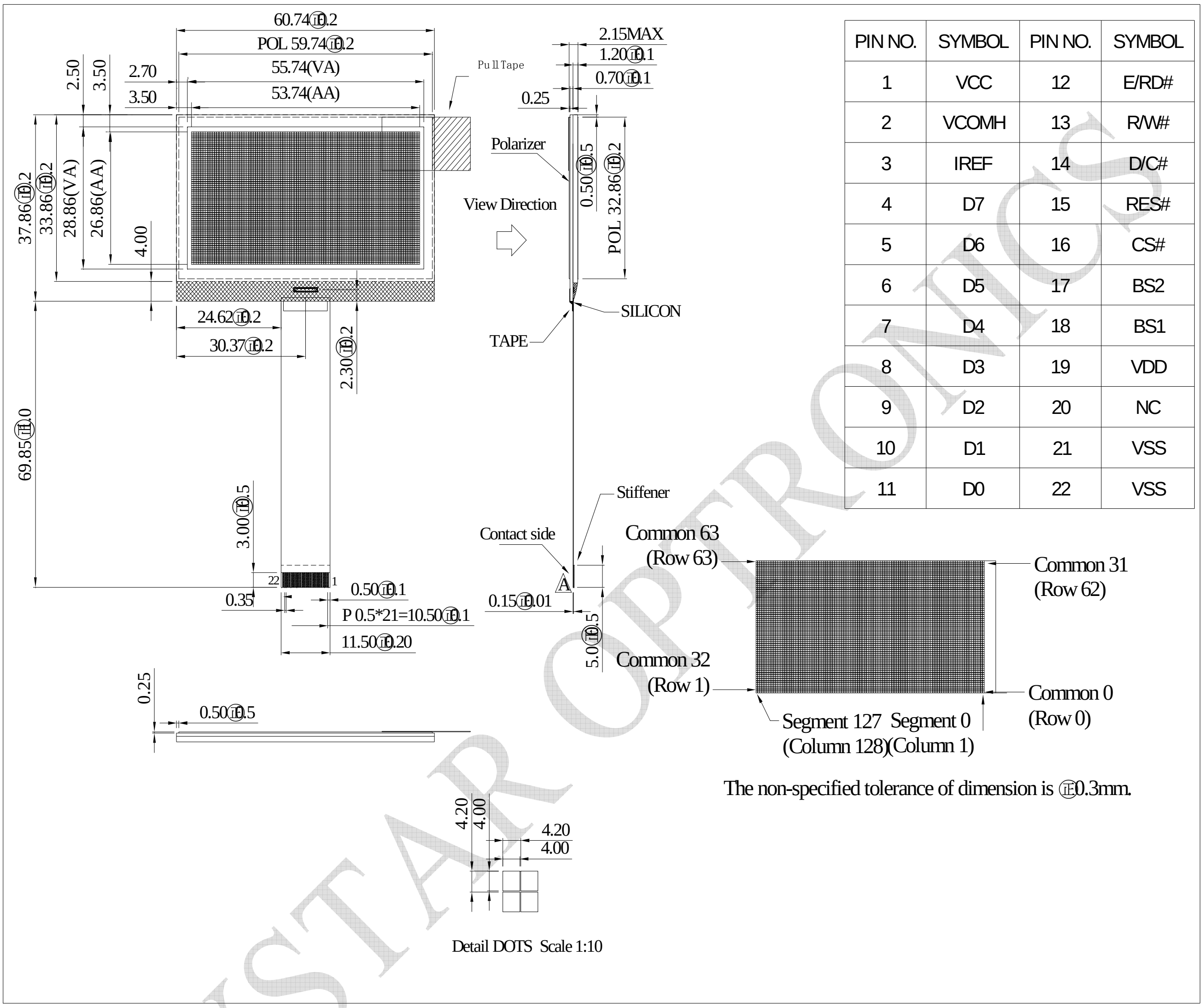
Item	**Description**		
1	R：Raystar Optronics Inc.		
2	E：OLED		
3	Display Type: C→Character Type, G→Graphic Type, **X→COG Type**		
4	Number of dots：**128 Dots x 64 Dots**		
5	Serials code		
6	Emitting Color	A：Amber	R：RED
		B：Blue	Y：Yellow
		G：Green	**W：White**
7	Polarizer	**P：With Polarizer;** N: Without Polarizer	
8	Display Mode	**P：Passive Matrix ;** A: Active Matrix	
9	Driver Voltage	**3: 3.0 V;** 5: 5.0V	
10	Touch Panel	**N：Without touch panel;** T: With touch panel	
11	Species	**0:Normal**, 1:Sunlight readable, 2:Transparent, 3:Flexible, 4:Lighting	
12	Grade code		
13	Serial No.	000: Sales code	

4. Interface Pin Function

Pin No.	Symbol	Function
1	VCC	Power supply for panel driving voltage. This is also the most positive power voltage supply pin.
2	VCOMH	COM signal deselected voltage level. A capacitor should be connected between this pin and VSS.
3	IREF	This pin is the segment output current reference pin. IREF is supplied externally. A resistor should be connected between this pin and VSS to maintain the current around 10uA. Please refer to Figure 8-15 for the details of resistor value
4~11	D7~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: SDIN and D2 should be kept NC. When I2C mode is selected, D2, D1 should be tied together and serve as SDAout, SDAin in application and D0 is the serial clock input, SCL.
12	E/RD#	This pin is MCU interface input. When 6800 interface mode is selected, this pin will be used as the Enable (E) 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.
13	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.
14	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. For detail relationship to MCU interface signals, refer to Timing Characteristics

<table>
<tr><td>15</td><td>RES#</td><td>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.</td></tr>
<tr><td>16</td><td>CS#</td><td>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).</td></tr>
<tr><td>17</td><td>BS2</td><td rowspan="2">MCU bus interface selection pins. Select appropriate logic setting as described in the following table. BS2, BS1 and BS0 are pin select.
Bus Interface selection
<table><tr><th>BS[2:0]</th><th>Interface</th></tr><tr><td>000</td><td>4 line SPI</td></tr><tr><td>001</td><td>3 line SPI</td></tr><tr><td>010</td><td>I²C</td></tr><tr><td>110</td><td>8-bit 8080 parallel</td></tr><tr><td>100</td><td>8-bit 6800 parallel</td></tr></table>Note
(1) 0 is connected to VSS
(2) 1 is connected to VDD</td></tr>
<tr><td>18</td><td>BS1</td></tr>
<tr><td>19</td><td>VDD</td><td>Power supply pin for core logic operation.</td></tr>
<tr><td>20</td><td>NC</td><td>No connection</td></tr>
<tr><td>21</td><td>VSS</td><td rowspan="2">Ground.</td></tr>
<tr><td>22</td><td>VSS</td></tr>
</table>

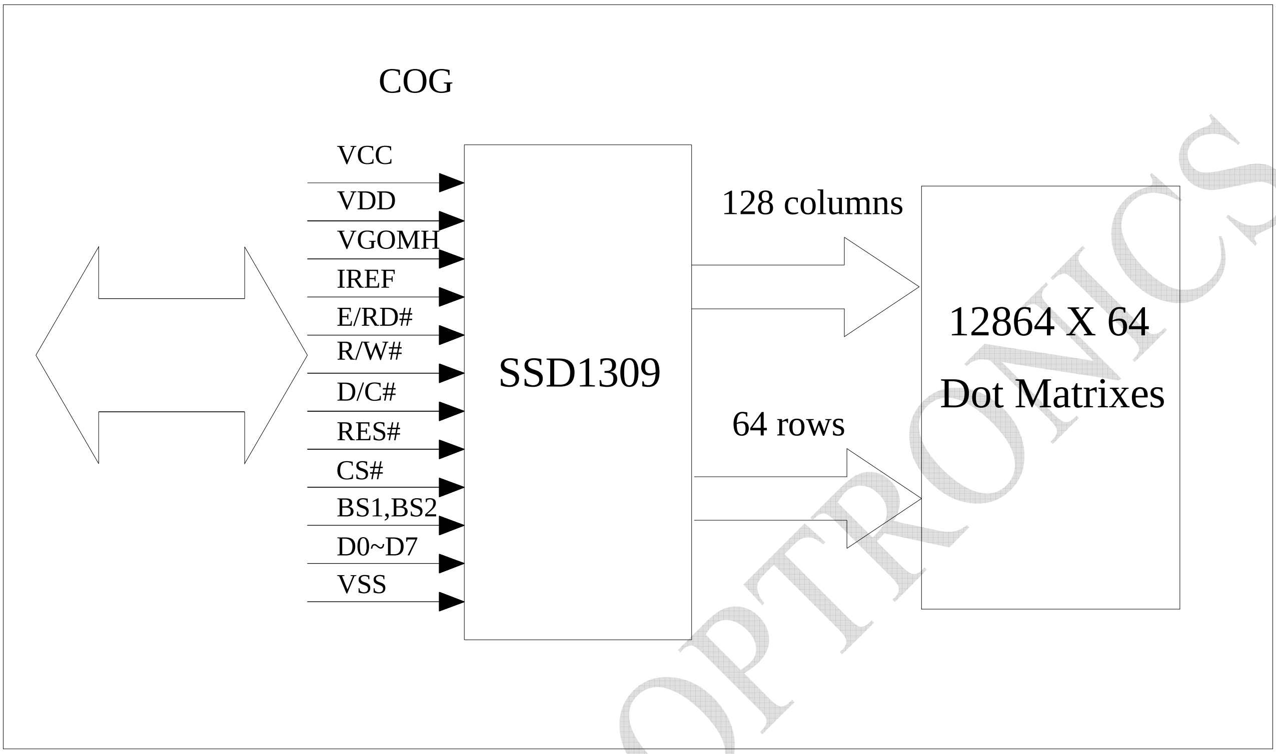
5. Outline Dimension



PIN NO.	SYMBOL	PIN NO.	SYMBOL
1	VCC	12	E/RD#
2	VCOMH	13	R/W#
3	IREF	14	D/C#
4	D7	15	RES#
5	D6	16	CS#
6	D5	17	BS2
7	D4	18	BS1
8	D3	19	VDD
9	D2	20	NC
10	D1	21	VSS
11	D0	22	VSS

The non-specified tolerance of dimension is ±0.3mm.

6.Block Diagram



7.Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Supply Voltage for Logic	VDD	-0.3	4	V	
Supply Voltage for Display	VCC	0	17	V	
Operating Temperature	TOP	-30	+70	℃	-
Storage Temperature	TSTG	-40	+80	℃	-

Maximum ratings are those values beyond which damages to the device may occur. Functional operation should be restricted to the limits in the Electrical Characteristics tables or Pin Description section.

This device may be light sensitive. Caution should be taken to avoid exposure of this device to any light source during normal operation. This device is not radiation protected.

8.Electrical Characteristics

Characteristics	Symbol	Conditions	Min	Typ	Max	Unit
Supply Voltage for Logic	V_{DD}	—	2.7	3.0	3.3	V
Supply Voltage for Display	V_{CC}	Note 3	11	12	13	V
High Level Input	V_{IH}	—	0.8×V_{DD}	—	—	V
Low Level Input	V_{IL}	—	—	—	0.2×V_{DD}	V
High Level Output	V_{OH}	—	0.9×V_{DD}	—	—	V
Low Level Output	V_{OL}	—	—	—	0.1×V_{DD}	V
Operating Current for V_{DD}	I_{DD}	Note 4 Note 5	—	180 180	300 300	μA μA
Operating Current for V_{CC}	I_{CC}	Note 4 Note 5	—	20 25	25 35	mA mA
Sleep Mode Current for V_{DD}	$I_{DD, SLEEP}$	—	—	1	5	μA
Sleep Mode Current for V_{CC}	$I_{CC, SLEEP}$	—	—	1	5	μA

Optical measurement taken at VDD = 3.0V, VCC = 12.0V.

Software configuration follows Section 4.4 Initialization.

Note 3: Brightness (Lbr) and Supply Voltage for Display (VCC) are subject to the change of the panel characteristics and the customer's request.

Note 4: VDD = 3.0V, VCC = 12.0V, 50% Display Area Turn on.

Note 5: VDD = 3.0V, VCC = 12.0V, 100% Display Area Turn on.

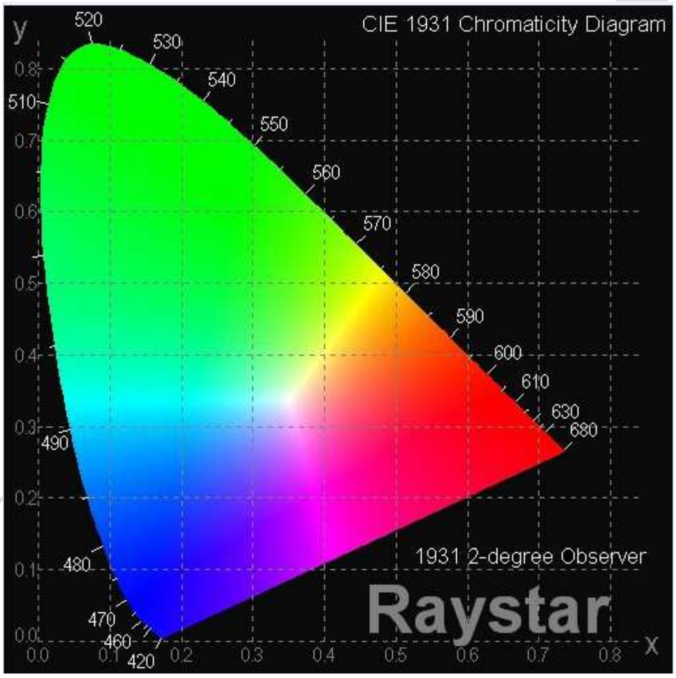
* Software configuration follows Section 4.4 Initialization.

9.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
CIEx(White)		x,y(CIE1931)	0.26	0.28	0.32	
CIEy(White)		x,y(CIE1931)	0.28	0.32	0.34	
Supply Voltage For Logic 3.3V 50% Check Board Brightness		With polarizer	40	50		nits Note1

Notes: 1.When random texts pattern is running , averagely , at any instance , about 1/2 of pixels will be on.

2. You can to use the display off mode to make long life.



10.OLED Lifetime

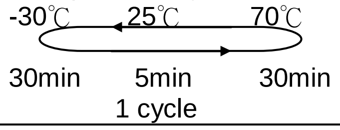
ITEM	Conditions	Typ	Remark
Operating Life Time	Ta=25℃ /Initial 50% check board brightness 50nits	50,000 Hrs	Note

Notes:

1. Simulation pattern for operation test: interchanging with 50% checkboard
   The brightness decay does not exceed 50%.
2. You can use the display off mode to make long life.
3. The average operating lifetime at room temperature is estimated by the accelerated operation at high temperature conditions.

11.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.	80℃ 240hrs	——
High Temperature Operation	Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.	70℃ 240hrs	——
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-30℃ 240hrs	——
High Temperature/ Humidity Storage	Endurance test applying the high temperature and high humidity storage for a long time.	60℃,90%RH 240hrs	——
Temperature Cycle	Endurance test applying the low and high temperature cycle. 	-30℃/70℃ 100 cycles	——
Mechanical Test			
Vibration test	Endurance test applying the vibration during transportation and using.	10~22Hz→1.5mmp-p 22~500Hz→1.5G Total 0.5hrs	——
Shock test	Constructional and mechanical endurance test applying the shock during transportation.	50G Half sign wave 11 msedc 3 times of each direction	——
Atmospheric pressure test	Endurance test applying the atmospheric pressure during transportation by air.	115mbar 40hrs	——
Others			
Static electricity test	Endurance test applying the electric stress to the terminal.	VS=800V,RS=1.5kΩ CS=100pF 1 time	——

***Supply voltage for logic system=5V. Supply voltage for LCD system =Operating voltage at 25℃

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±5℃; 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

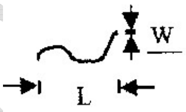
1. The function test is OK.
2. No observable defects.
3. Luminance: > 50% of initial value.
4. Current consumption: within ± 50% of initial value.

APPENDIX:

RESIDUE IMAGE

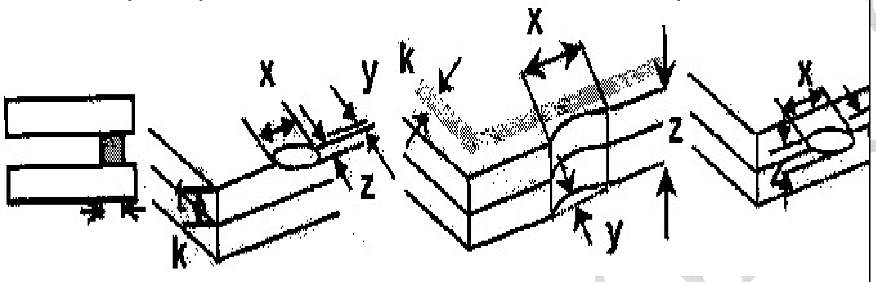
Because the pixels are lighted in different time, the luminance of active pixels may reduce or differ from inactive pixels. Therefore, the residue image will occur. To avoid the residue image, every pixel needs to be lighted up uniformly.

12. Inspection specification

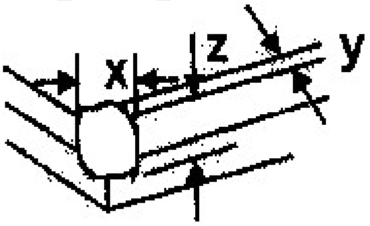
<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>AQL</th></tr>
<tr><td>01</td><td>Electrical Testing</td><td>1.1 Missing vertical, horizontal segment, segment contrast defect.
1.2 Missing character , dot or icon.
1.3 Display malfunction.
1.4 No function or no display.
1.5 Current consumption exceeds product specifications.
1.6 Viewing angle defect.
1.7 Mixed product types.
1.8 Contrast defect.</td><td>0.65</td></tr>
<tr><td>02</td><td>Black or white spots (display only)</td><td>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</td><td>2.5</td></tr>
<tr><td rowspan="2">03</td><td rowspan="2">Black spots, white spots, contamination (non-display)</td><td>3.1 Round type : As following drawing
Φ=(x + y) / 2</td><td>2.5</td></tr>
<tr><td>3.2 Line type : (As following drawing)


<table>
<tr><th>Length</th><th>Width</th><th>Acceptable Q TY</th></tr>
<tr><td>---</td><td>W≦0.02</td><td>Accept no dense</td></tr>
<tr><td>L≦3.0</td><td>0.02＜W≦0.03</td><td rowspan="2">2</td></tr>
<tr><td>L≦2.5</td><td>0.03＜W≦0.05</td></tr>
<tr><td>---</td><td>0.05＜W</td><td>As round type</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></tr>
<tr><td>Φ≦0.20</td><td>Accept no dense</td></tr>
<tr><td>0.20＜Φ≦0.50</td><td>3</td></tr>
<tr><td>0.50＜Φ≦1.00</td><td>2</td></tr>
<tr><td>1.00＜Φ</td><td>0</td></tr>
<tr><td>Total Q TY</td><td>3</td></tr>
</table></td><td>2.5</td></tr>
</table>

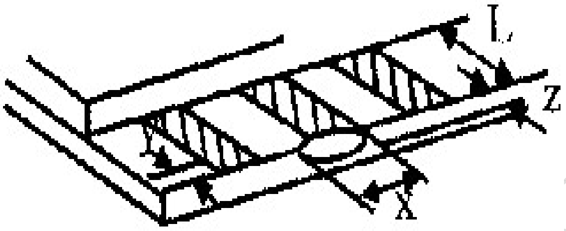
<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>AQL</th></tr>
<tr><td>05</td><td>Scratches</td><td>Follow NO.3 Black spots, white spots, contamination</td><td></td></tr>
<tr><td>06</td><td>Chipped glass</td><td>
Symbols Define:
x: Chip length y: Chip width z: Chip thickness
k: Seal width t: Glass thickness a: Side length
L: Electrode pad length:

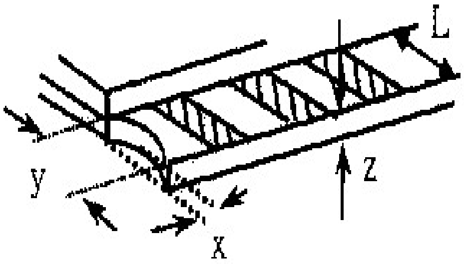
6.1 General glass chip :
6.1.1 Chip on panel surface and crack between panels:


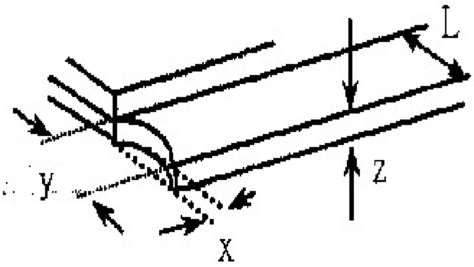
<table>
<tr><th>z: Chip thickness</th><th>y: Chip width</th><th>x: Chip length</th></tr>
<tr><td>Z≦1/2t</td><td>Not over viewing area</td><td>x≦1/8a</td></tr>
<tr><td>1/2t＜z≦2t</td><td>Not exceed 1/3k</td><td>x≦1/8a</td></tr>
</table>
⊙If there are 2 or more chips, x is total length of each chip.

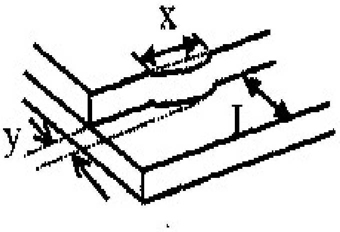
6.1.2 Corner crack:


<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>
</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>
Symbols :
x: Chip length y: Chip width z: Chip thickness
k: Seal width t: Glass thickness a: 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>
6.2.2 Non-conductive portion:


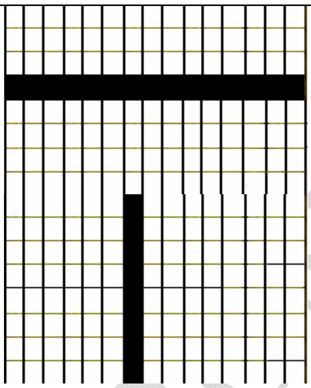
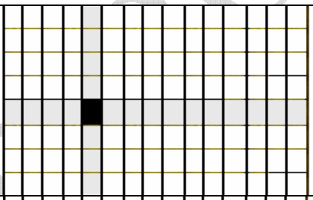
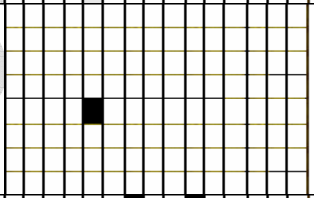
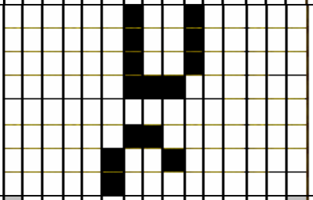
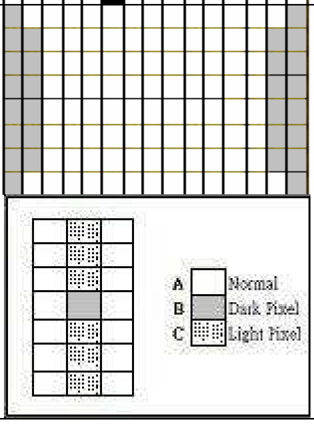


<table>
<tr><th>y: Chip width</th><th>x: Chip length</th><th>z: Chip thickness</th></tr>
<tr><td>y≦ L</td><td>x≦1/8a</td><td>0 ＜ z ≦ t</td></tr>
</table>
⊙If the chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications.
⊙If 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>
</table>

NO	Item	Criterion	AQL
07	Cracked glass	With extensive crack is not acceptable.	2.5
08	Backlight elements	8.1 Illumination source flickers when lit. 8.2 Spots or scratched that appear when lit must be judged. Using Spot, lines and contamination standards. 8.3 Backlight doesn’t light or color wrong.	0.65 2.5 0.65
09	Bezel	9.1 Bezel may not have rust, be deformed or have fingerprints, stains or other contamination. 9.2 Bezel must comply with job specifications.	2.5 0.65
10	PCB、COB	10.1 COB seal may not have pinholes larger than 0.2mm or contamination. 10.2 COB seal surface may not have pinholes through to the IC. 10.3 The height of the COB should not exceed the height indicated in the assembly diagram. 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. 10.5 No oxidation or contamination PCB terminals. 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. 10.7 The jumper on the PCB should conform to the product characteristic chart. 10.8 If solder gets on bezel tab pads, LED pad, zebra pad or screw hold pad, make sure it is smoothed down.	2.5 2.5 0.65 2.5 2.5 0.65 0.65 2.5
11	Soldering	11.1 No un-melted solder paste may be present on the PCB. 11.2 No cold solder joints, missing solder connections, oxidation or icicle. 11.3 No residue or solder balls on PCB. 11.4 No short circuits in components on PCB.	2.5 2.5 2.5 0.65

NO	Item	Criterion	AQL
12	General appearance	12.1 No oxidation, contamination, curves or, bends on interface Pin (OLB) of TCP. 12.2 No cracks on interface pin (OLB) of TCP. 12.3 No contamination, solder residue or solder balls on product. 12.4 The IC on the TCP may not be damaged, circuits. 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. 12.6 The residual rosin or tin oil of soldering (component or chip component) is not burned into brown or black color. 12.7 Sealant on top of the ITO circuit has not hardened. 12.8 Pin type must match type in specification sheet. 12.9 Pin loose or missing pins. 12.10 Product packaging must the same as specified on packaging specification sheet. 12.11 Product dimension and structure must conform to product specification sheet.	2.5 0.65 2.5 2.5 2.5 2.5 2.5 0.65 0.65 0.65 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	

13.Precautions in use of OLED Modules

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 module.

(3)Don’t disassemble the OLEDM.

(4)Don’t operate it above the absolute maximum rating.

(5)Don’t drop, bend or twist OLEDM.

(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

13.1 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

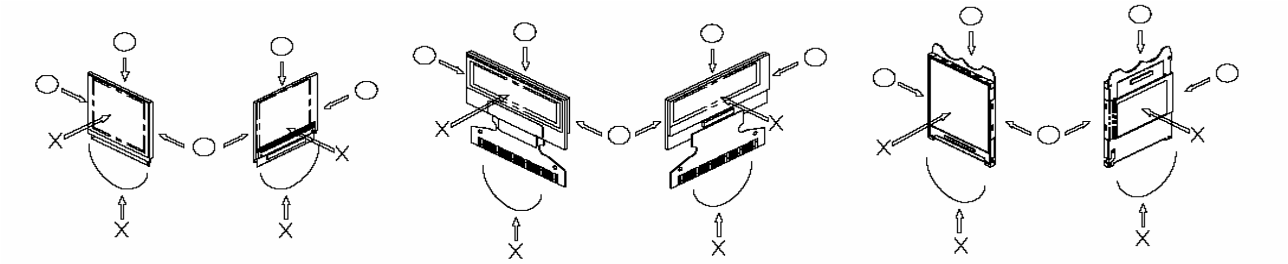
Never try to breathe upon the soiled surface nor wipe the surface using cloth containing solvent such as ethyl alcohol, since the surface of the polarizer will become cloudy.

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 for a long period of time, residue adhesive material of the protection film may remain on the 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.

13.2 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℃) environments.

(We recommend you to store these modules in the packaged state when they were shipped from RAYSTAR Technology Inc.

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.

13.3 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.

13.4 Precautions when disposing of the OLED display modules

1) Request the qualified companies to handle industrial wastes when disposing of the OLED display modules. Or, when burning them, be sure to observe the environmental and hygienic laws and regulations.

13.5 Other Precautions

(1) When an OLED display module is operated for a long of time with fixed pattern may remain as an after image or slight contrast deviation may occur.

Nonetheless, if the operation is interrupted and left unused for a while, normal state can be restored. Also, there will be no problem in the reliability of the module.

(2) To protect OLED display modules from performance drops by static electricity rapture, etc., do not touch the following sections whenever possible while handling the OLED display modules.

* Pins and electrodes

* Pattern layouts such as the TCP & FPC

(3) With this OLED display module, the OLED driver is being exposed. Generally speaking, semiconductor elements change their characteristics when light is radiated according to the principle of the solar battery. Consequently, if this OLED driver is exposed to light, malfunctioning may occur.

* Design the product and installation method so that the OLED driver may be shielded from light in actual usage.

* Design the product and installation method so that the OLED driver may be shielded from light during the inspection processes.

(4) Although this OLED display module stores the operation state data by the commands and the indication data, when excessive external noise, etc. enters into the module, the internal status may be changed. It therefore is necessary to take appropriate measures to suppress noise generation or to protect from influences of noise on the system design.

(5) We recommend you to construct its software to make periodical refreshment of the operation statuses (re-setting of the commands and re-transference of the display data) to cope with catastrophic noise.

(6)Resistors,capacitors and other passive components will have different appearance and color caused by the different supplier.

(7)Our company will has the right to upgrade and modify the product function.

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Module Sample Estimate Feedback Sheet		
Module Number：____________________		
1、Panel Specification：		
1. Panel Type：	☐ Pass	☐NG ,____________________________
2. Numbers of Pixel：	☐ Pass	☐NG ,____________________________
3. View Area：	☐ Pass	☐NG ,____________________________
4. Active Area：	☐ Pass	☐NG ,____________________________
5.Emitting Color：	☐ Pass	☐NG ,____________________________
6.Uniformity：	☐Pass	☐NG ,____________________________
7.Operating Temperature：	☐ Pass	☐NG ,___________________________
8.Storage Temperature：	☐ Pass	☐NG ,__________________________
9.Others：____		
2、Mechanical Specification：		
1. PCB Size：	☐Pass	☐NG ,____________________________
2.Frame Size：	☐Pass	☐NG ,____________________________
3.Materal of Frame：	☐Pass	☐NG ,____________________________
4.Connector Position：	☐Pass	☐NG ,____________________________
5.Fix Hole Position：	☐Pass	☐NG ,____________________________
6. Thickness of PCB：	☐Pass	☐NG ,_________________________
7. Height of Frame to PCB：	☐Pass	☐NG ,________________________
8.Height of Module：	☐Pass	☐NG ,____________________________
9.Others：	☐Pass	☐NG ,____________________________
3、Relative Hole Size：		
1.Pitch of Connector：	☐Pass	☐NG ,____________________________
2.Hole size of Connector：	☐Pass	☐NG ,____________________________
3.Mounting Hole size：	☐Pass	☐NG ,____________________________
4.Mounting Hole Type：	☐Pass	☐NG ,____________________________
5.Others：	☐Pass	☐NG ,____________________________

＞＞ **Go to page 2** ＜＜

Module Number： ____________________		
4、Electronic Characteristics of Module：		
1.Input Voltage：	□Pass	□NG ,__________________________
2.Supply Current：	□Pass	□NG ,__________________________
3.Driving Voltage for OLED：	□Pass	□NG ,___________________________
4.Contrast for OLED：	□Pass	□NG ,___________________________
5.Negative Voltage Output：	□Pass	□NG ,_________________________
6.Interface Function：	□Pass	□NG ,__________________________
7.ESD test：	□Pass	□NG ,__________________________
8.Others：	□Pass	□NG ,_________________________
5、Summary：		

Sales signature： _________________

Customer Signature： _____________ **Date：   /   /**

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