

LL178RS1-64P1-OY1

Technical data sheet

Supplier : LG Display, Ltd.

Issued date : Jan. 04, 2016

Product : OLED panel

	Development Team	Production Team	QA Team
Approval			
	2016.01.04		

Rigid Square Type OLED Panel (LL178RS1-64P1-OY1)

1. Ordering Information

Model	Description	Efficacy	CCT
LL178RS1-64P1-OY1	Panel with flexible PCB	55lm/W	4000K

2. General Conditions

Parameter	Temperature	Humidity	Remark
Storage condition	0°C~40°C	< 70% RH	
Transport condition	-20°C~60°C	< 85% RH	Not over 170hrs
Operating condition	0°C~40°C	< 70% RH	

3. Maximum Ratings

Parameter	Sym	Unit	Max.	Condition
DC Forward Voltage	V_F	V	7.0	$T_A=25^\circ\text{C}$
DC Forward Current	I_F	mA	4200	$T_A=25^\circ\text{C}$

Disclaimer: Device reliability may be affected if product is operated beyond the given conditions for an extended period of time

4. Electrical & Optical Characteristics

Operation @800lm

Parameter		unit	Min.	Typ.	Max.
Electrical data	Forward voltage*	V	5.7	6.0	6.3
	DC forward current (Current density)	mA (mA/cm ²)		2500 (2.78mA/cm ²)	
	Power consumption	W	14.25	15.00	15.75
Optical data	CCT (integrated)	K	3750	4000	4250
	CRI	Ra	85	90	
	Duv		-0.005		0.005
	Spatial uniformity**	%	80		
	Efficacy	lm/W	48	55	62
	Flux	lm	700	800	900
Lifetime***	LT70, @2.78mA/cm ²	Hrs.		30000	

*Voltage is measured after stabilization. Panel under test is regarded as stable if the voltage do not change during 1min interval measurement or total turn on time is over 5min.

** Luminous uniformity calculation formula: $U = [1 - (L_{max} - L_{min}) / (L_{max} + L_{min})] \times 100\%$

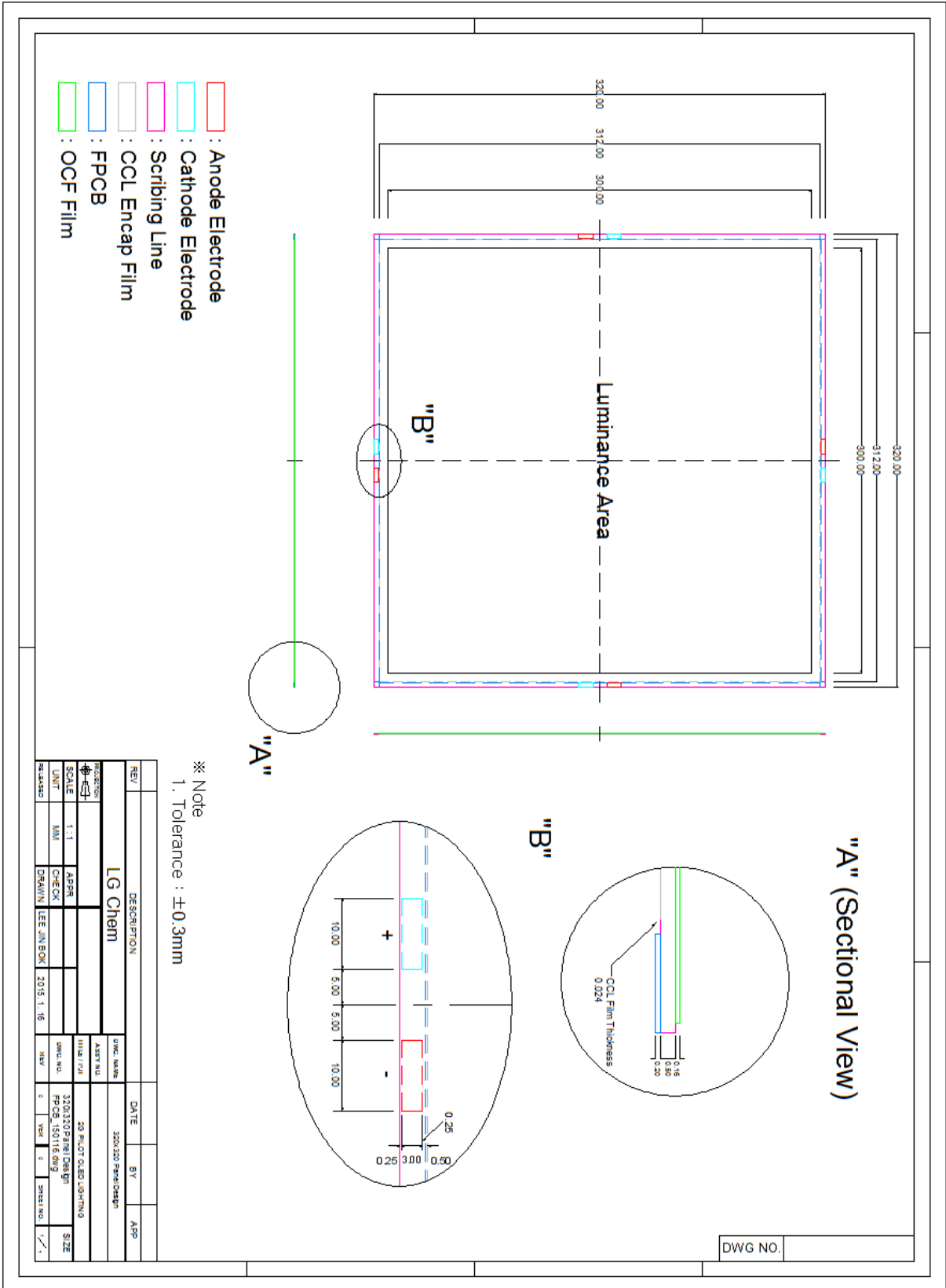
*** Operating Lifetime is from the beginning of operation until brightness reaches 70% of the initial luminance.
(Assumed Operating Condition: 25 °C at typical brightness level)

5. Mechanical Dimensions

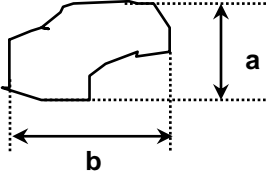
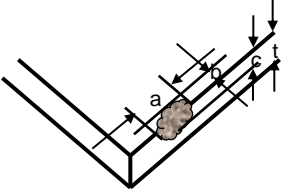
	Parameter	Sym	Unit	Bare panel
Outer	Length	L	mm	320.0±0.3
	Width	W	mm	320.0±0.3
	Thickness*	T	mm	0.88±0.1
	Shape			Square
	Weight		g	<200
Inner	Encapsulation area		mm ²	312.0x312.0
	Luminance area		mm ²	300.0x300.0

* Thickness with out-coupling film

6. Drawings



7. Appearance Criteria

Items	Criteria								
Dark spot	Defects are judged by the size of each item in the active area and based on the criteria below								
Particle	<table border="1" data-bbox="489 411 1158 604"> <thead> <tr> <th>Size(mm)</th> <th>Acceptable number</th> </tr> </thead> <tbody> <tr> <td>$D \leq 0.5$</td> <td>Not counted</td> </tr> <tr> <td>$0.5 < D \leq 0.8$</td> <td>Not over 5</td> </tr> <tr> <td>$0.8 < D$</td> <td>Not allowed</td> </tr> </tbody> </table>	Size(mm)	Acceptable number	$D \leq 0.5$	Not counted	$0.5 < D \leq 0.8$	Not over 5	$0.8 < D$	Not allowed
Size(mm)	Acceptable number								
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$0.5 < D \leq 0.8$	Not over 5								
$0.8 < D$	Not allowed								
Pinhole									
Dent on surface	<p data-bbox="476 625 672 653">Note : $D = (a+b)/2$</p> 								
Bubble									
Scratch or line on emitting surface	<p data-bbox="461 915 1153 971">Defects are judged by the size of each item in the active area and based on the criteria below</p> <table border="1" data-bbox="489 1000 1158 1174"> <thead> <tr> <th>Size(mm)</th> <th>Acceptable number</th> </tr> </thead> <tbody> <tr> <td>Width ≤ 0.3</td> <td>Not counted</td> </tr> <tr> <td>$0.3 < \text{Width or } 10 < \text{Length}$</td> <td>Not allowed in active area</td> </tr> </tbody> </table>	Size(mm)	Acceptable number	Width ≤ 0.3	Not counted	$0.3 < \text{Width or } 10 < \text{Length}$	Not allowed in active area		
Size(mm)	Acceptable number								
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$0.3 < \text{Width or } 10 < \text{Length}$	Not allowed in active area								
Chip	<p data-bbox="461 1267 953 1294">Defects are judged based on the criteria below</p> <ul data-bbox="494 1319 1093 1373" style="list-style-type: none"> * Corner chip : Not allowed if $a > 2\text{mm}$ or $b > 2\text{mm}$ * Edge chip : Not allowed if $a > 10\text{mm}$ or $b > 2\text{mm}$ or $c \geq t$  <p data-bbox="461 1601 1062 1628">Note : $t =$ Thickness of glass (Substrate or Encapsulation)</p>								

8. Reliability

- Evaluation criteria : Luminance change within +/- 10% of initial value

Items	Condition
High temperature/humidity operation	60°C, 90% RH / IF=Typ.mA,96Hrs
Thermal shock	-45°C,15min ↔ 85°C,15min 1cycle ,200cycles
High temperature /humidity storage	+85°C, 85% / 500Hrs
Life time	Room Temp. / IF=Typ.mA, 2,000Hrs

9. Guideline to OLED Handling

A. Handling and Safety

1. Unpack packing box with care. Remove packing trays gently and carefully from packing box.
2. During unloading and handling, gloves are required to prevent finger cuts or possible shocks. Gloves are also required to avoid fingerprints being left on the glass, and to keep moisture from causing corrosion to the metal traces.
3. Handle panels with caution. Mechanical stress such as shocks and pressures on the panel surface (active area, encapsulation glass cavity area) must be avoided to prevent cracking of the glass, delamination, scratching of the film, and internal structure damage. Do not press or drop the panel.
4. During unloading and handling, panels should always be held from the side. Avoid direct contact with metal contact pads or connector traces.
5. Protect the panel surface from scratches. Avoid direct contact on panel surface and do not stack panels on top of each other.
6. Protect the corners and edges during handling, assembly or installation to prevent chipping or breakage of glass.
7. Avoid contact with chemicals such as solvents.
8. Contact with water must be avoided to prevent damage of films and corrosion of metal traces. Water drops must be wiped immediately.
9. To remove particle/foreign materials and surface stains, gently wipe the surface of the panel with non-abrasive cloth.
10. In case of breakage, avoid direct contact with bare hands. Do not swallow particles, chips, or materials.
11. For interconnections, spring contacts are recommended. Soldering and other interconnecting technologies which apply heat to the panel may cause damage, and are therefore not recommended.
12. Do not hold the panel on the surface. Hold the panel from the edge.
13. In case of connecting multiple panels, series connection is highly recommended. Panel to panel uniformity problem can occur by parallel connection.

B. Storage and Operation

1. Store and operate OLED panels within the ranges specified in the product specifications on page 1. Recommended temperature is at 25°C; Recommended relative humidity is below 60% (RH). (High temperature and humidity can cause film degradation, bubble generation, and film delamination)
2. Store panels as delivered from LG Chem.

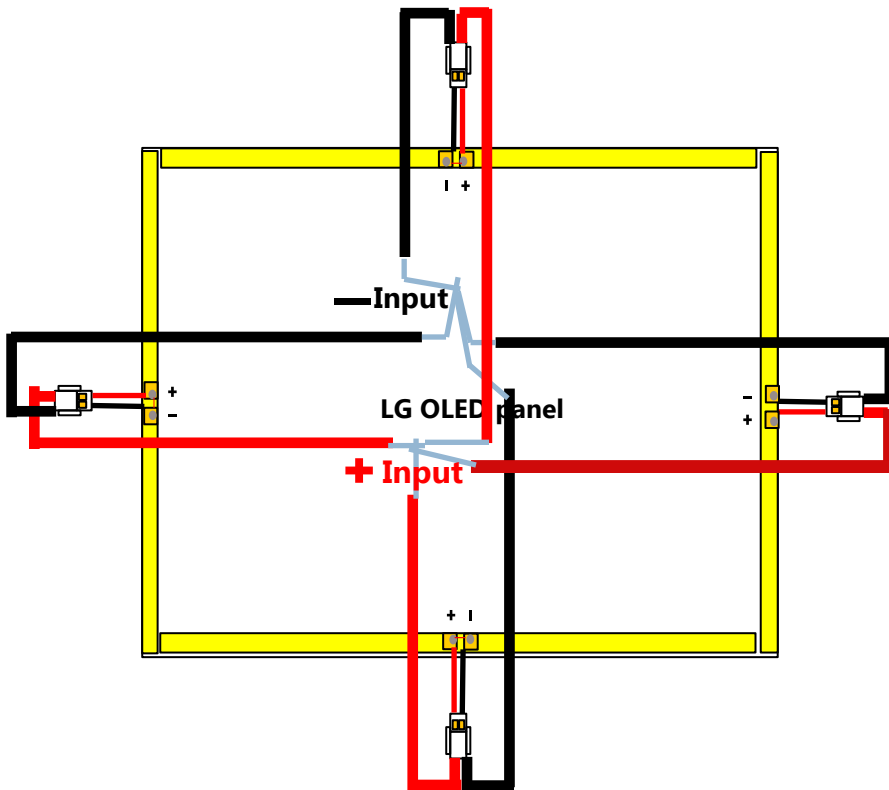
C. Disposition

Dispose OLED materials/panels/modules in accordance with each region's environmental laws and regulations. If necessary, consult qualified agencies on industrial waste treatment.

Appendix

A. Wiring connection guide

1. Each (+),(-) electrode of 4side ends of panel should be connected together to get appropriate uniformity.



B. Soldering guide

1. Please, follow the recommendation as below.
 - Max temp : 400°C
 - Duration time : up to 2 sec