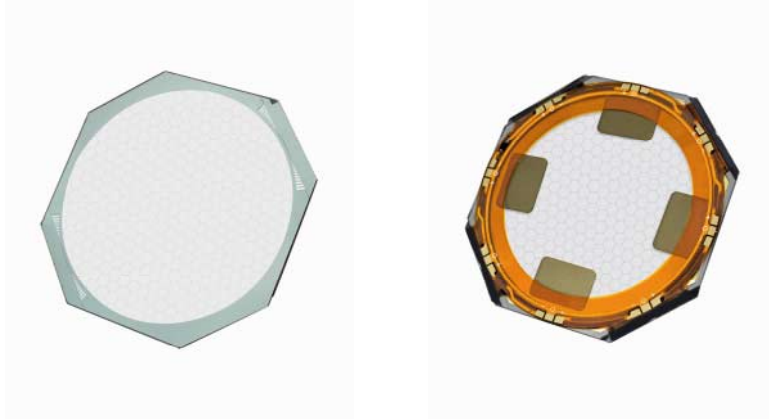


ORBEOS™ for OLED Lighting Lead (Pb) Free Product - RoHS Compliant

CMW-031

OSP1F00WW3031C1000

Vorläufige Daten / Preliminary Data



Besondere Merkmale

- **Format:** Lichtkachel
- **Besonderheit des Bauteils:** blendfreie homogene Flächen-Lichtquelle, außergewöhnlich dünn (1.8 mm), schnelle Einschaltzeiten, hohe Lichtqualität, sehr gute Farbwiedergabe, enthält kein Quecksilber, spiegelnd im ausgeschalteten Zustand
- **Farbe:** warm weiß
- **Emissionsfläche:** ø79.00 mm
- **Außenabmessung:** siehe Maßzeichnung
- **Kontaktierung:** Lötkontakte auf flexibler Leiterplatte

Anwendungen

- Designer Leuchten
- Dekorative Beleuchtung, Stimmungslicht
- Funktionelle Beleuchtung
- Allgemeinbeleuchtung innen

Features

- **format:** lighting tile
- **feature of the device:** non glaring uniform area light source, exceptionally thin (1.8 mm), instant on/off, high quality of light, very good color rendering, mercury-free, mirror-like off-state appearance
- **color:** warm white
- **light output area:** ø79.00 mm
- **glass size:** refer to product drawing
- **interconnect:** wiring via soldering pads on flex-PCB

Applications

- designer luminaires
- decorative lighting, mood lighting
- functional lighting
- general lighting indoor

Bestellinformation
Ordering Information

Typ	Gehäuse	Film	Bestellnummer	VE-Nummer
Type	Cap	Film	Ordering Code	VE-number
OSP1F00WW3031C1000	none	none	Q65111A0840	103379020000

Grenzwerte Maximum Ratings

Bezeichnung Parameter		Wert Value	Symbol Symbol
Relative Luftfeuchtigkeit Relative Humidity	RH	40°C/93%	%
Betriebstemperatur Operating temperature range	T_{op}	– 20 ... + 40	°C
Lagertemperatur Storage temperature range	T_{stg}	– 40... + 60	°C
Aussendruck Pressure Operating and Storage ($T_A=25^\circ\text{C}$)	P_{op}/P_{stg}	0.800 (min) 1.200 (max)	bar bar
Durchlassspannung Forward voltage ^{4) Seite 18} ($T_A=25^\circ\text{C}$)	V_F	4.5 (max)	V
Durchlassstrom Forward current($T_A=25^\circ\text{C}$)	I_F	540 (max)	mA
Sperrspannung Reverse voltage($T_A=25^\circ\text{C}$)	V_R	not designed for re- verse operation	V

Anm.: Betriebsstress unter strengeren Bedingungen als in den unter „Grenzwerte“ angegebenen kann zu permanenten Schädigungen des Bauteils führen und die Zuverlässigkeit beeinträchtigen. Längerer Betrieb unter Grenzwertbedingungen kann zu permanenten Schädigungen des Bauteils führen und die Zuverlässigkeit beeinträchtigen. Die Lagerfähigkeit bei 60°C wurde 500h überprüft. Die ESD-Ausfallsicherheit wurde bei 2kV gemäß HBM überprüft. Das Bauteil ist für Innenanwendungen ausgelegt (direkte Sonnenbestrahlung beeinträchtigt die Lebenszeit).

Note: Stresses above those listed under „Maximum Ratings“ may cause permanent damage to the device. Exposure to maximum rating conditions for extended periods may affect device reliability. Shelf life at 60°C is ensured for over 500h. ESD robustness has been tested at 2kV according to HBM. The device is designed for indoor applications (exposure to sun light affects lifetime).

Elektrische und optische Kennwerte^{2) Seite 19}**Electrical / Optical Characteristics**^{2) page 19}(T_A = 25 °C)

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Typische Durchlassspannung ^{4) Seite 18} Typical forward voltage ^{4) page 18} I _F = 270 mA , T _A =25°C	V _F (min.) V _F (typ.) V _F (max.)	3.37 3.62 3.87	V V V
Typische Leistungsaufnahme Typical power consumption I _F = 270 mA , T _A =25°C	P (min.) P (typ.) P (max.)	0.91 0.97 1.04	W W W
Typ. Leuchtdichte* Typ. Luminance* T _A =25°C	L (270 mA) L (135 mA) L (67.5 mA)	910 455 278	cd/m ² cd/m ² cd/m ²
Typ. Lichtausbeute Typ. Luminous Efficacy I _F = 270 mA , T _A =25°C	H	14	lm/W
Typ. Farbkoordinate x/y nach CIE 1931 ^{3) Seite 18} Typ. chromaticity coordinate x/y acc. to CIE 1931 ^{3) page 18} I _F = 270 mA	x/y	0.458/0.427	–
Typ. Farbtemperatur Typ. color temperature I _F = 270 mA , T _A =25°C	CCT (min.) CCT (typ.) CCT (max.)	2580 2800 3320	K K K
Farbwiedergabeindex Color Rendering Index (typ.) I _F = 270 mA , T _A =25°C	CRI	86	-
Typische Leuchtdichte Uniformität** Luminance Uniformity** I _F = 270 mA , T _A =25°C , φ = 0°	U (min.) U (typ.) U (max.)	75 81 100	% % %
Abstrahlwinkel bei 50 % IV (Vollwinkel) Viewing angle at 50 % IV(typ.)	2φ	120	deg.
Sperrstrom / Sperrspannung Reverse current / Reverse voltage	I _R , V _R	not designed for reverse operation	

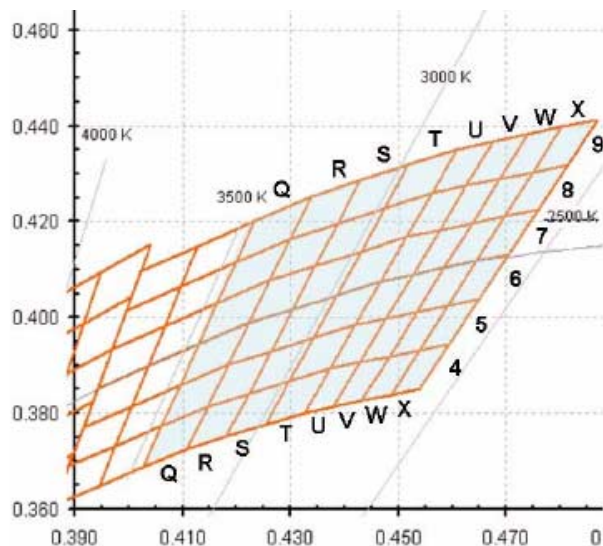
* Einzelgruppen siehe Seite 8, For individual groups please refer to page 8

** Leuchtdichte Uniformität ist definiert als:

$$U = 1 - (L_{\max} - L_{\min}) / (L_{\max} + L_{\min}) * 100\%$$

Luminance Uniformity is determined according to following formula:

$$U = 1 - (L_{\max} - L_{\min}) / (L_{\max} + L_{\min}) * 100\%$$



Gruppe / group	Cx	Cy
9Q	0.4198	0.4115
	0.4232	0.4201
	0.4337	0.4253
	0.4299	0.4165
8Q	0.4164	0.4029
	0.4198	0.4115
	0.4299	0.4165
	0.4261	0.4077
7Q	0.4129	0.3944
	0.4164	0.4029
	0.4261	0.4077
	0.4223	0.3989
6Q	0.4095	0.3858
	0.4129	0.3944
	0.4223	0.3989
	0.4185	0.3902
5Q	0.4061	0.3773
	0.4095	0.3858
	0.4185	0.3902
	0.4147	0.3814
4Q	0.4027	0.3687
	0.4061	0.3773
	0.4147	0.3814
	0.4109	0.3726

Gruppe / group	Cx	Cy
9R	0.4299	0.4165
	0.4337	0.4253
	0.4428	0.4286
	0.4387	0.4197
8R	0.4261	0.4077
	0.4299	0.4165
	0.4387	0.4197
	0.4346	0.4108
7R	0.4223	0.3989
	0.4261	0.4077
	0.4346	0.4108
	0.4304	0.4018
6R	0.4185	0.3902
	0.4223	0.3989
	0.4304	0.4018
	0.4263	0.3929
5R	0.4147	0.3814
	0.4185	0.3902
	0.4263	0.3929
	0.4222	0.384
4R	0.4109	0.3726
	0.4147	0.3814
	0.4222	0.384
	0.4181	0.3751

Gruppe / group	Cx	Cy
9S	0.4387	0.4197
	0.4428	0.4286
	0.4518	0.4319
	0.4474	0.4228
8S	0.4346	0.4108
	0.4387	0.4197
	0.4474	0.4228
	0.443	0.4138
7S	0.4304	0.4018
	0.4346	0.4108
	0.443	0.4138
	0.4386	0.4047
6S	0.4263	0.3929
	0.4304	0.4018
	0.4386	0.4047
	0.4342	0.3957
5S	0.4222	0.384
	0.4263	0.3929
	0.4342	0.3957
	0.4298	0.3867
4S	0.4181	0.3751
	0.4222	0.384
	0.4298	0.3867
	0.4253	0.3776

Gruppe / group	Cx	Cy
9T	0.4474	0.4228
	0.4518	0.4319
	0.4609	0.4352
	0.4562	0.426
8T	0.443	0.4138
	0.4474	0.4228
	0.4562	0.426
	0.4515	0.4168
7T	0.4386	0.4047
	0.443	0.4138
	0.4515	0.4168
	0.4467	0.4076
6T	0.4342	0.3957
	0.4386	0.4047
	0.4467	0.4076
	0.442	0.3985
5T	0.4298	0.3867
	0.4342	0.3957
	0.442	0.3985
	0.4373	0.3893
4T	0.4253	0.3776
	0.4298	0.3867
	0.4373	0.3893
	0.4326	0.3801

Gruppe / group	Cx	Cy
9U	0.4562	0.426
	0.4609	0.4352
	0.4674	0.4367
	0.4625	0.4275
8U	0.4515	0.4168
	0.4562	0.426
	0.4625	0.4275
	0.4576	0.4182
7U	0.4467	0.4076
	0.4515	0.4168
	0.4576	0.4182
	0.4526	0.409
6U	0.442	0.3985
	0.4467	0.4076
	0.4526	0.409
	0.4477	0.3998
5U	0.4373	0.3893
	0.442	0.3985
	0.4477	0.3998
	0.4428	0.3906
4U	0.4326	0.3801
	0.4373	0.3893
	0.4428	0.3906
	0.4379	0.3813

Gruppe / group	Cx	Cy
9V	0.4625	0.4275
	0.4674	0.4367
	0.4739	0.4382
	0.4688	0.429
8V	0.4576	0.4182
	0.4625	0.4275
	0.4688	0.429
	0.4636	0.4197
7V	0.4526	0.409
	0.4576	0.4182
	0.4636	0.4197
	0.4585	0.4104
6V	0.4477	0.3998
	0.4526	0.409
	0.4585	0.4104
	0.4534	0.4011
5V	0.4428	0.3906
	0.4477	0.3998
	0.4534	0.4011
	0.4483	0.3918
4V	0.4379	0.3813
	0.4428	0.3906
	0.4483	0.3918
	0.4432	0.3826

Gruppe / group	Cx	Cy
9W	0.4688	0.429
	0.4739	0.4382
	0.4803	0.4398
	0.475	0.4304
8W	0.4636	0.4197
	0.4688	0.429
	0.475	0.4304
	0.4697	0.4211
7W	0.4585	0.4104
	0.4636	0.4197
	0.4697	0.4211
	0.4644	0.4118
6W	0.4534	0.4011
	0.4585	0.4104
	0.4644	0.4118
	0.4591	0.4024
5W	0.4483	0.3918
	0.4534	0.4011
	0.4591	0.4024
	0.4538	0.3931
4W	0.4432	0.3826
	0.4483	0.3918
	0.4538	0.3931
	0.4485	0.3838

Gruppe / group	Cx	Cy
9X	0.475	0.4304
	0.4803	0.4398
	0.4868	0.4413
	0.4813	0.4319
8X	0.4697	0.4211
	0.475	0.4304
	0.4813	0.4319
	0.4758	0.4225
7X	0.4644	0.4118
	0.4697	0.4211
	0.4758	0.4225
	0.4703	0.4132
6X	0.4591	0.4024
	0.4644	0.4118
	0.4703	0.4132
	0.4648	0.4038
5X	0.4538	0.3931
	0.4591	0.4024
	0.4648	0.4038
	0.4593	0.3944
4X	0.4485	0.3838
	0.4538	0.3931
	0.4593	0.3944
	0.4538	0.385

Helligkeits-Gruppierungsschema Brightness Groups

Leuchtdichtegruppe Luminance group	Leuchtdichtebereich Luminance Range cd/m ²	Anmerkung Comment
24	610...700	-
25	700...800	-
31	800...920	-
32	920...1060	-

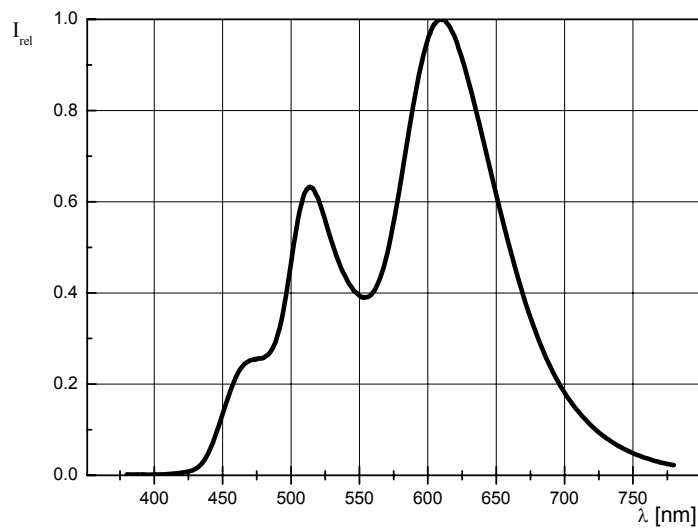
Exemplarische durchschnittliche Lebenszeit Exemplary median Lifetime ($T_A = 25^\circ\text{C}$)

Bedingungen Conditions	mittlere Lebensdauer median Lifetime	Einheit Unit
$I_F = 270\text{mA}$	5000	Betriebsstunden operating hours

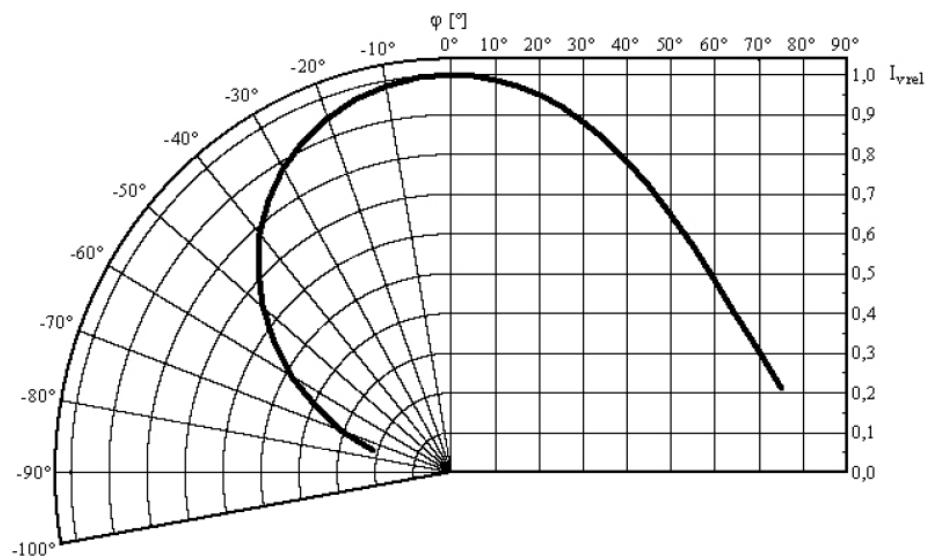
Anm.: Die mittlere Lebensdauer ist die Zeit, in der das Bauteil unter den angegebenen Bedingungen 50% der Anfangshelligkeit erreicht. In dieser Zeit kann die Spannung um bis zu 1 V ansteigen.

Note: Operating Lifetime is time to Half Luminance, given as in table above at 25°C at typical brightness level, until 50% of initial luminance is reached. The forward voltage may increase during lifetime up to 1 V.

Relative spektrale Emission ^{2) Seite 19}
Relative Spectral Emission ^{2) page 19}
 $\Phi_{\text{rel}} = f(\lambda); T_A = 25^\circ\text{C}; I_F = 270\text{ mA}$



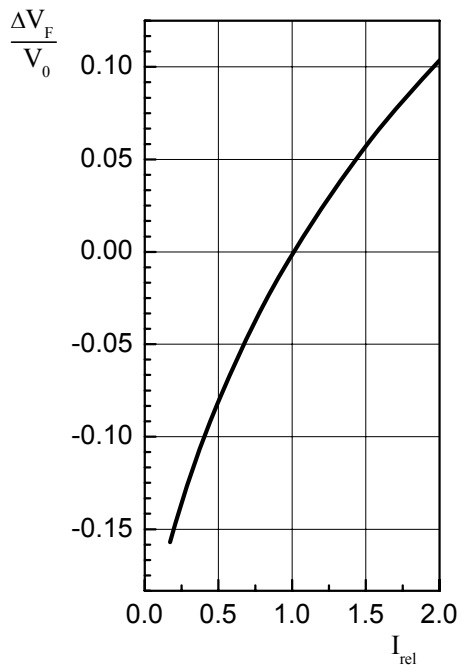
Abstrahlcharakteristik ^{2) Seite 19}
Radiation Characteristic ^{2) page 19}
 $I_{\text{rel}} = f(\varphi); T_A = 25^\circ\text{C}$



Relative Durchlassspannungg ^{2) 4) Seite 19}

Relative Forward Voltage ^{2) 4) page 19}

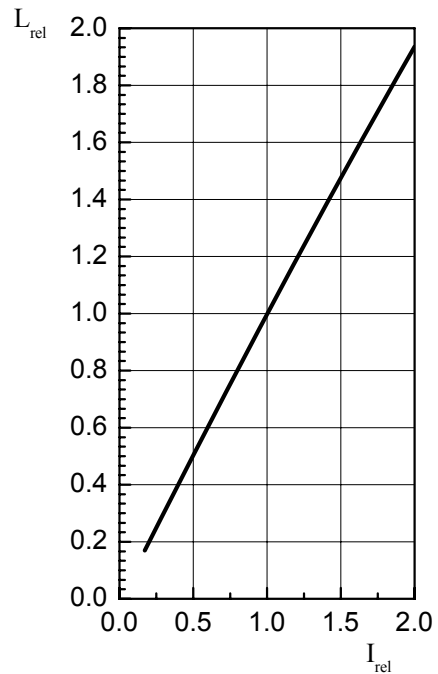
$\Delta V_F/V_0 = f(I_F/I_0)$; $T_A = 25\text{ °C}$; $I_F = 270\text{ mA}$



Relative Leuchtdichte ^{2) Seite 19}

Relative Luminance ^{2) page 19}

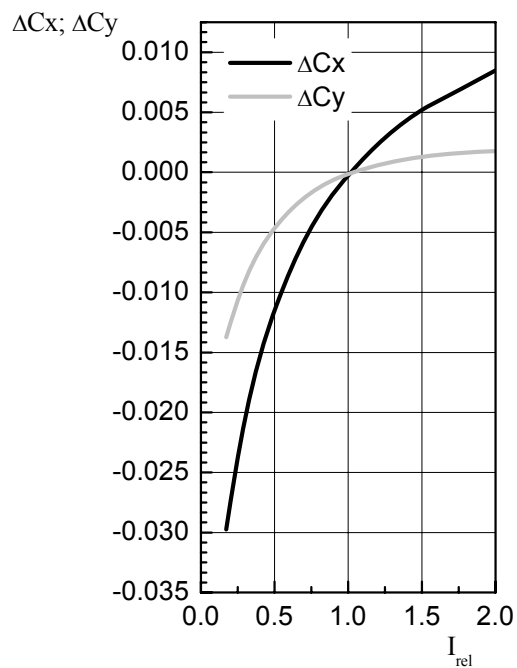
$L/L_0 = f(I_F/I_0)$; $T_A = 25\text{ °C}$; $I_F = 270\text{ mA}$

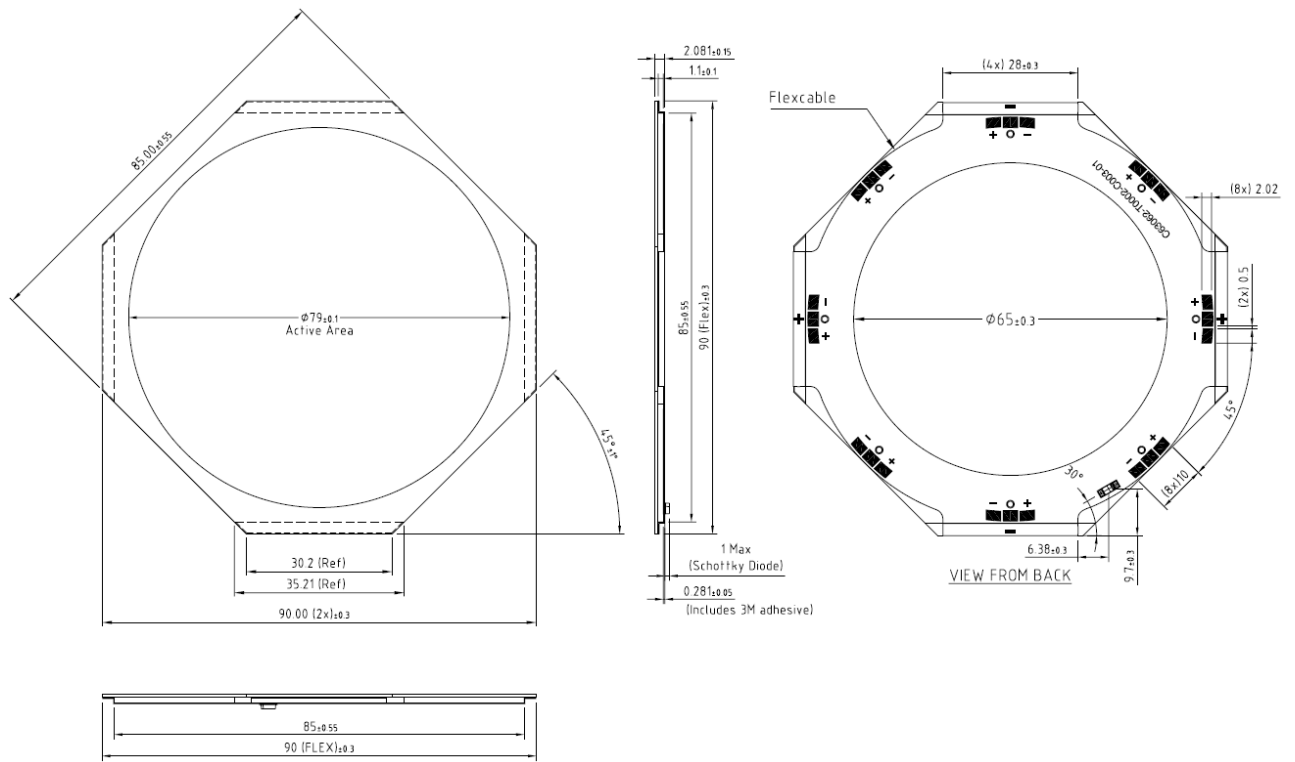


Farbortverschiebung ^{2) Seite 19}

Chromaticity Coordinate Shift ^{2) page 19}

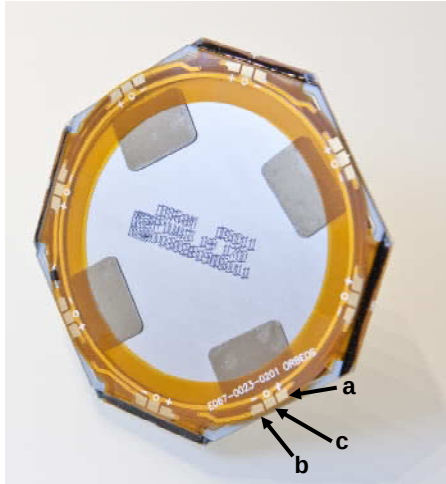
$\Delta Cx = f(I_F/I_0)$; $\Delta Cy = f(I_F/I_0)$; $T_A = 25\text{ °C}$;
 $I_F = 270\text{ mA}$





Polaritäten

Polarity Information



Kontaktierung

Die Verdrahtung wird über die Lötkontakte realisiert (plus (a), minus (b), Durchgangsschleife (c)). Nur ein Lötkontakt je Polarität muss verdrahtet werden. Die Verdrahtung sollte nur durch Selektivlöten erfolgen. Eine Verdrahtung durch Aufschmelzlötung führt zur Beschädigung des Bauteils.

Interconnect Information

Please use solder pads for wiring (plus (a), minus (b), feed through (c)). Only wiring to one pad per polarity is needed. Wiring should only be realized by tip soldering. Reflow soldering process leads to device damage.

Produktidentifikation Product Marking

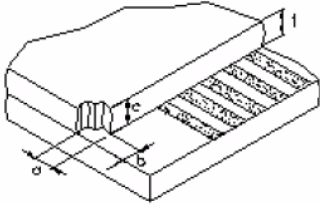
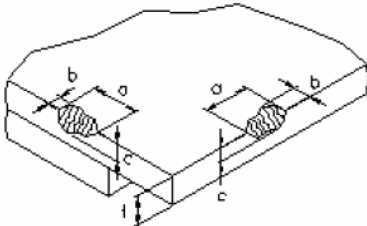
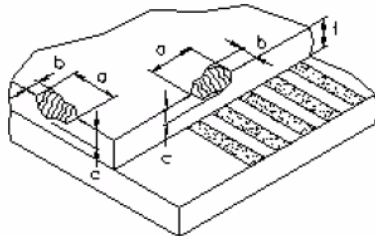
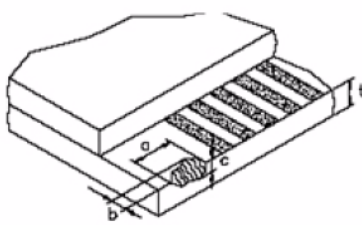
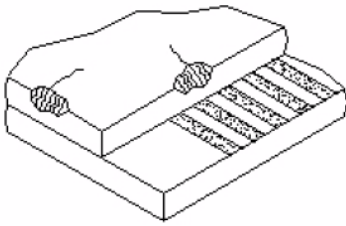


Legende Legend

OS011	Production line chip info (fixed)
P1WW3	Type abbreviation(fixed)
19	Device Number (01 to 20)
170	Internal factory number
01802B	Run number

Cosmetic Criteria

Items	Criterion for Defects	Defect Type																
Black spot, particle, pin-hole, dent on surface	Within Active Area (determined in ON-State): <table><tr><th>Size Φ (mm)</th><th>Acceptable number</th></tr><tr><td>$\Phi \leq 0.15$</td><td>Not counted</td></tr><tr><td>$0.15 \leq \Phi \leq 0.3$</td><td>5</td></tr><tr><td>$\Phi > 0.3$</td><td>0</td></tr></table> No cumulation allowed, i.e. minimum distance of spot centers > 5 mm. Outside active area: Not applicable. Note 1: $\Phi = (\text{Long diameter} + \text{Short diameter})/2$	Size Φ (mm)	Acceptable number	$\Phi \leq 0.15$	Not counted	$0.15 \leq \Phi \leq 0.3$	5	$\Phi > 0.3$	0	Medium								
Size Φ (mm)	Acceptable number																	
$\Phi \leq 0.15$	Not counted																	
$0.15 \leq \Phi \leq 0.3$	5																	
$\Phi > 0.3$	0																	
Bright spot	A bright spot is defined as a relatively small area which is minimum 10% brighter than its surrounding. Within Active Area (determined in ON-State): <table><tr><th>Size Φ (mm)</th><th>Acceptable number</th></tr><tr><td>$\Phi \leq 0.1$</td><td>Not counted</td></tr><tr><td>$\Phi > 0.1$</td><td>5</td></tr></table> No cumulation allowed, i.e. minimum distance of spot centers > 5 mm. Outside active area: Not applicable. Note 1: $\Phi = (\text{Long diameter} + \text{Short diameter})/2$ Note 2: This is a cosmetic criterion. If the nature of the spot can be the root cause of a potential device failure, than no spots are allowed.	Size Φ (mm)	Acceptable number	$\Phi \leq 0.1$	Not counted	$\Phi > 0.1$	5	Major										
Size Φ (mm)	Acceptable number																	
$\Phi \leq 0.1$	Not counted																	
$\Phi > 0.1$	5																	
Scratches / lines on emissive surface	Within Active Area : <table><tr><th>Size (mm)</th><th>Acceptable number</th></tr><tr><td>Width ≤ 0.1</td><td>Not counted</td></tr><tr><td>Length ≤ 2, $0.1 < \text{Width} \leq 0.2$</td><td>3</td></tr><tr><td>Width > 0.2 or Length > 2</td><td>0</td></tr></table> Outside active area: <table><tr><th>Size (mm)</th><th>Acceptable number</th></tr><tr><td>Width ≤ 0.1</td><td>Not counted</td></tr><tr><td>Length ≤ 2, $0.1 < \text{Width} \leq 0.2$</td><td>Not counted</td></tr><tr><td>Width > 0.2 or Length > 2</td><td>3</td></tr></table> Minimum distance between two scratches is 5 mm.	Size (mm)	Acceptable number	Width ≤ 0.1	Not counted	Length ≤ 2 , $0.1 < \text{Width} \leq 0.2$	3	Width > 0.2 or Length > 2	0	Size (mm)	Acceptable number	Width ≤ 0.1	Not counted	Length ≤ 2 , $0.1 < \text{Width} \leq 0.2$	Not counted	Width > 0.2 or Length > 2	3	Medium
Size (mm)	Acceptable number																	
Width ≤ 0.1	Not counted																	
Length ≤ 2 , $0.1 < \text{Width} \leq 0.2$	3																	
Width > 0.2 or Length > 2	0																	
Size (mm)	Acceptable number																	
Width ≤ 0.1	Not counted																	
Length ≤ 2 , $0.1 < \text{Width} \leq 0.2$	Not counted																	
Width > 0.2 or Length > 2	3																	
Bubble (in case of external film)	Within Active Area Reject if bubble is observed with naked eyes at 30 cm distance. Outside Active – IGNORE	Minor																

Corner Chip	Accept if a or $b \leq 1.0 \text{ mm}$ $c \leq t$ 	Minor
Chip on Face of Tile	Accept if a or $b \leq 2 \text{ mm}$ $c \leq 0.33t$ 	Minor
Chip on Back of Tile	Accept if a or $b \leq 2.0 \text{ mm}$ $c \leq 0.33t$ 	Minor
Chip on Contact Pad	Accept if $a \leq 2.0 \text{ mm}$ $b \leq 0.8 \text{ mm}$ $c \leq 0.33t \text{ mm}$ 	Medium
Chip with crack	No crack allowed 	Major

General OLED Handling and Care

1. Mechanical Handling

- 1.1. As OLED is made of glass, do avoid mechanical stress such as shock and pressure onto glass during handling, especially at the center of the active area and also at the back of the cap glass cavity (to avoid glass crack or damage on internal structure).
- 1.2. For OLED tile designed without a frame to protect the edges and corners of tile, do exercise caution to avoid glass chipping and breakage.
- 1.3. Finger cots and gloves are recommended to be worn all the time when handling OLED to avoid direct contact of glass or contacts with bare fingers that may leave finger print on glass.
- 1.4. Hold the OLED tile on side of tiles. Avoid direct contact on metal contacting traces or connector's traces.
- 1.5. Unpack the packing box with care and remove OLED tile packing trays gently and carefully from packing box.
- 1.6. Picking up OLED tile by holding to side of tiles. Do not unload tile from luminaire fixture by pulling the flex-PCB.
- 1.7. Do not stack OLED tiles on top of each other to avoid scratches on glass surface.
- 1.8. In case of module (flex connector or other type of connector), do not pull, press, or peel on the connector to glass contact area. This will cause module malfunctions with lift-up, peel-off contacts.
- 1.9. Avoid corner contact to tile during assembly or installation to end products as glass can be easily chipped or cracked from rough handling. Avoid pressing or dropping of glass.
- 1.10. Do not submerge the module into any kind of solvent or any other chemicals like acids, bases and salts.
- 1.11. Wipe off water drops immediately. Contact with water over a long period of time may cause device damage.
- 1.12. Handle the OLED surface with care as it is easily scratched. Avoid hard or sharp objects in contact with the tile surface. Do not rub hard on OLED surface.
- 1.13. Avoid touching exposed contact pads with bare fingers. This will leave moisture on metal traces and cause corrosion.
- 1.14. Soldering and interconnect technologies which apply heat to the light output area are not recommended and may cause OLED damage. For special modulisation support please contact OSRAM.
- 1.15. Installation Bending: The flex is generally designed to facilitate mounting to a PCB or connector. It is not a dynamic flex. Therefore, bending should be limited to less than 10 times.

2. Cleaning

Below are cleaning procedures to remove particle/foreign materials and glue/adhesive/surface stains:

Particle / foreign materials:

It is recommended to use non-abrasive cloth (recommended Smartat Cleanroom Wipes WIP-1009 D Series) to gently wipe over the surface of the tile.

Glue / adhesive stains:

Method 1:

Do not use abrasive cloth (recommended Smartat Cleanroom Wipes WIP-1009 D Series) and applicator (dipped in iso-propanol or ethanol if necessary, no acetone) to gently wipe over the surface of the tile.

Method 2:

Do use the finger cot to clean the stain on flex-PCB.

3. Storage and Operating

Store and operate OLED tile within specified ratings as per product specifications.

Keep the temperature within specified range for use and storage. Recommended storage and operating temperature is at 25°C. Dry environmental condition with low humidity is preferred. Relative humidity is recommended to be kept below 60% (RH) for operating and storage. Film degradation, bubble generation, film peel-off may occur with high temperature and high humidity.

4. Safety

When handled with bare fingers, pay special attention to sharp glass edges to avoid potential injury. In case of OLED breakage, please avoid direct contact. Do not swallow chips and materials.

5. Disposition

Consult qualified agencies on industrial waste treatment to dispose OLED modules in accordance to region's environmental laws and regulations.

Revision History

Page	Subjects (major changes since last revision)	Date of change
<i>all</i>	<i>Preliminary Data Sheet created</i>	<i>12-17-2010</i>

Attention please!

The information describes the type of component and shall not be considered as assured characteristics. Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances. For information on the types in question please contact our Sales Organization. If printed or downloaded, please find the latest version on the Internet.

Packing

Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office. By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

Components used in life-support devices or systems must be expressly authorized for such purpose! Critical components⁶⁾ page 18 may only be used in life-support devices or systems⁷⁾ with the express written approval of OSRAM OS.

Fußnoten:

1. Helligkeitswerte werden während eines Strompulses einer typischen Dauer von 500 ms, mit einer internen Reproduzierbarkeit von $\pm 8\%$ und einer erweiterten Messunsicherheit von $\pm 11\%$ gemessen (gemäß GUM mit Erweiterungsfaktor $k = 3$).
2. Wegen der besonderen Prozessbedingungen bei der Herstellung von OLED können typische oder abgeleitete technische Parameter nur aufgrund statistischer Werte wiedergegeben werden. Diese stimmen nicht notwendigerweise mit den Werten jedes einzelnen Produktes überein, dessen Werte sich von typischen und abgeleiteten Werten oder typischen Kennlinien unterscheiden können. Falls erforderlich, z.B. aufgrund technischer Verbesserungen, werden diese typischen Werte ohne weitere Ankündigung geändert.
3. Farbkoordinaten werden während eines Strompulses einer typischen Dauer von 500 ms, mit einer internen Reproduzierbarkeit von $\pm 0,005$ und einer erweiterten Messunsicherheit von $\pm 0,01$ gemessen (gemäß GUM mit Erweiterungsfaktor $k = 3$).
4. Vorwärtsspannungen werden während eines Strompulses einer typischen Dauer von 500 ms, mit einer internen Reproduzierbarkeit von $\pm 0,05$ V und einer erweiterten Messunsicherheit von $\pm 0,1$ V gemessen (gemäß GUM mit Erweiterungsfaktor $k = 3$).
5. Maße werden wie folgt angegeben: mm
6. Ein kritisches Bauteil ist ein Bauteil, das in lebenserhaltenden Apparaten oder Systemen eingesetzt wird und dessen Defekt voraussichtlich zu einer Fehlfunktion dieses lebenserhaltenden Apparates oder Systems führen wird oder die Sicherheit oder Effektivität dieses Apparates oder Systems beeinträchtigt.
7. Lebenserhaltende Apparate oder Systeme sind für (a) die Implantierung in den menschlichen Körper oder (b) für die Lebenserhaltung bestimmt. Falls sie versagen, kann davon ausgegangen werden, dass die Gesundheit und das Leben des Patienten in Gefahr ist.

Remarks:

1. Brightness values are measured during a current pulse of typical 500 ms, with an internal reproducibility of $\pm 8\%$ and an expanded uncertainty of $\pm 11\%$ (acc. to GUM with an expansion factor of $k = 3$).
2. Due to the special conditions of the manufacturing processes of OLED, the typical data or calculated correlations of technical parameters can only reflect statistical figures. These do not necessarily correspond to the actual parameters of each single product, which could differ from the typical data and calculated correlations or the typical characteristic line. If requested, e.g. because of technical improvements, these typical data will be changed without any further notice.
3. Chromaticity coordinates are measured during a current pulse of typical 500 ms, with an internal reproducibility of $\pm 0,005$ and an expanded uncertainty of $\pm 0,01$ (acc. to GUM with an expansion factor of $k = 3$).
4. The forward voltage is measured during a current pulse of typical 500 ms, with an internal reproducibility of $\pm 0,05$ V and an expanded uncertainty of $\pm 0,1$ V (acc. to GUM with an expansion factor of $k = 3$).
5. Dimensions are specified as follows: mm
6. A critical component is a component used in a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or the effectiveness of that device or system.
7. Life support devices or systems are intended (a) to be implanted in the human body, or (b) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health and the life of the user may be endangered.

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