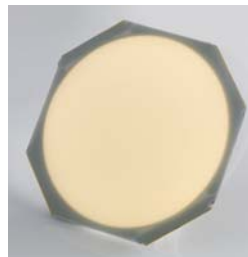


ORBEOS™ for OLED Lighting

Lead (Pb) Free Product - RoHS Compliant

CDW-031

Vorläufige Daten / Preliminary Data



Besondere Merkmale

- **Format:** Lichtkachel
- **Besonderheit des Bauteils:** blendfreie homogene Flächen-Lichtquelle, außergewöhnlich dünn (2.1 mm), schnelle Schaltzeiten, hohe Lichtqualität, sehr gute Farbwiedergabe, enthält kein Quecksilber
- **Farbe:** warm weiß
- **Emissionsfläche:** ø79.00 mm
- **Aussenabmessung:** siehe Maßzeichnung
- **Kontaktierung:** 4 Kontaktleisten

Anwendungen

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

Features

- **format:** lighting tile
- **feature of the device:** non glaring uniform area light source, exceptionally thin (2.1 mm), instant on/off, high quality of light, very good colour rendering, mercury-free
- **color:** warm white
- **light output area:** ø79.00 mm
- **glass size:** refer to product drawing
- **interconnect:** 4 contact ledges

Applications

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

Bestellinformation
Ordering Information

Typ	Gehäuse	Film	Bestellnummer
Type	Cap	Film	Ordering Code
OSP1G10WW2031C1000-3133-4Q9X	none	Diffusing Film	Q65110A9761
OSP1G10WW2031C1000-32-4Q9X	none	Diffusing Film	Q65110A9764

Grenzwerte**Maximum Ratings**

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Relative Luftfeuchtigkeit Relative Humidity	RH	40°/93%	%
Betriebstemperatur Operating temperature range	T_{op}	- 20 ... + 40	°C
Lagertemperatur Storage temperature range	T_{stg}	- 40 ... + 60	°C
Aussendruck Pressure Operating and Storage ($T_A=25^{\circ}\text{C}$)	(min.) P_{op}/P_{stg} (max.)	0.800 1.200	bar bar
Durchlassspannung ^{4) Seite 20)} Forward voltage ^{4) page 20} ($T_A=25^{\circ}\text{C}$)	(max.) V_F	4.5	V
Durchlassstrom Forward current ($T_A=25^{\circ}\text{C}$)	(max.) I_F I_F	400	mA
Sperrspannung Reverse voltage ($T_A=25^{\circ}\text{C}$)	V_R	not designed for reverse 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.

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

Elektrische und optische Kennwerte²⁾ Seite 20**Electrical / Optical Characteristics**²⁾ page 20 $(T_A = 25^\circ\text{C})$

Bezeichnung Parameter		Symbol Symbol	Wert Value	Einheit Unit
Durchlassspannung ⁴⁾ Seite 20	(min.)	V_F	3.15	V
Forward voltage ⁴⁾ page 20	(typ.)	V_F	3.4	V
$I_F = 186\text{ mA}$, $T_A = 25^\circ\text{C}$	(max.)	V_F	3.65	V
Leistungsaufnahme	(min.)	P	0.59	W
Power consumption	(typ.)	P	0.65	W
$I_F = 186\text{ mA}$, $T_A = 25^\circ\text{C}$	(max.)	P	0.71	W
Leuchtdichte* ¹⁾ Seite 20	(typ.)	$L(186\text{ mA})$	1000	cd/m^2
Luminance* ¹⁾ page 20	(typ.)	$L(93\text{ mA})$	500	cd/m^2
$T_A = 25^\circ\text{C}$	(typ.)	$L(46.5\text{ mA})$	250	cd/m^2
Lichtausbeute	(min)	η	20	lm/W
Luminous Efficacy	(typ.)	η	23	lm/W
$I_F = 186\text{ mA}$, $T_A = 25^\circ\text{C}$	(max)	η	-	lm/W
Farbkoordinate x/y nach CIE 1931 ³⁾ Seite 20				
Chromaticity coordinate x/y acc. to CIE 1931				
³⁾ page 20	(typ.)	x/y	0.46/0.42	—
$I_F = 186\text{ mA}$				
Farbtemperatur	(min.)	CCT	2580	K
Color temperature	(typ.)	CCT	2800	K
$I_F = 186\text{ mA}$, $T_A = 25^\circ\text{C}$	(max.)	CCT	3320	K
Farbwiedergabeindex				
Color Rendering Index	(typ.)	CRI	75	-
$I_F = 186\text{ mA}$, $T_A = 25^\circ\text{C}$				
Leuchtdichte Uniformität**	(min.)	U	75	%
Luminance Uniformity**		U		%
$I_F = 186\text{ mA}$, $T_A = 25^\circ\text{C}$, $\theta = \phi = 0^\circ$	(max.)	U	100	%
Abstrahlwinkel bei 50 % I_V (Vollwinkel)				
Viewing angle at 50 % I_V	(typ.)	2ϕ	120	deg.
Sperrstrom / Sperrspannung				
Reverse current / Reverse Voltage		I_R, V_R	not designed for reverse operation	

* Einzelgruppen siehe Seite 8
Individual groups on page 8

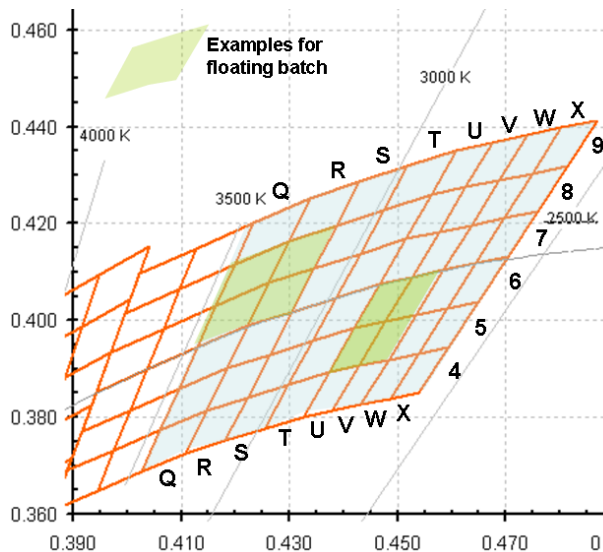
** Leuchtdichte Uniformität ist definiert als:

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

Luminance Uniformity is determined according to following formula:

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

Farbortgruppen³⁾ Seite 20
Chromaticity coordinate groups³⁾ page 20



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

Gruppe Group	Cx	Cy
9U	0.4562	0.4260
	0.4609	0.4352
	0.4674	0.4367
	0.4625	0.4275
8U	0.4515	0.4168
	0.4562	0.4260
	0.4625	0.4275
	0.4576	0.4182
7U	0.4467	0.4076
	0.4515	0.4168
	0.4576	0.4182
	0.4526	0.4090
6U	0.4420	0.3985
	0.4467	0.4076
	0.4526	0.4090
	0.4477	0.2998

Gruppe Group	Cx	Cy
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
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	0.3840
4R	0.4109	0.3726
	0.4147	0.3814
	0.4222	0.3840
	0.4181	0.3751
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
	0.4430	0.4138

Gruppe Group	Cx	Cy
5U	0.4373	0.3893
	0.4420	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
9V	0.4625	0.4275
	0.4674	0.4367
	0.4739	0.4382
	0.4688	0.4290
8V	0.4576	0.4182
	0.4625	0.4275
	0.4688	0.4290
	0.4636	0.4197
7V	0.4526	0.4090
	0.4576	0.4182
	0.4636	0.4197
	0.4585	0.4104
6V	0.4477	0.3998
	0.4526	0.4090
	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
9W	0.4688	0.4290
	0.4739	0.4382
	0.4803	0.4398
	0.4750	0.4304
8W	0.4636	0.4197
	0.4688	0.4290
	0.4750	0.4304
	0.4697	0.4211

Gruppe Group	Cx	Cy
7S	0.4304	0.4018
	0.4346	0.4108
	0.4430	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	0.3840
	0.4263	0.3929
	0.4342	0.3957
	0.4298	0.3867
4S	0.4181	0.3751
	0.4222	0.3840
	0.4298	0.3867
	0.4253	0.3776
9T	0.4474	0.4228
	0.4518	0.4319
	0.4609	0.4352
	0.4562	0.4260
8T	0.4430	0.4138
	0.4474	0.4228
	0.4562	0.4260
	0.4515	0.4168
7T	0.4386	0.4047
	0.4430	0.4138
	0.4515	0.4168
	0.4467	0.4076
6T	0.4342	0.3957
	0.4386	0.4047
	0.4467	0.4076
	0.4420	0.3985
5T	0.4298	0.3867
	0.4342	0.3957
	0.4420	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
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	0.4028
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
9X	0.4750	0.4304
	0.4803	0.4398
	0.4868	0.4413
	0.4813	0.4319
8X	0.4697	0.4211
	0.4750	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	0.3850

Helligkeits-Gruppierungsschema
Brightness Groups

Leuchtdichtegruppe Luminance group	Leuchtdichte bereich Luminance Range ¹⁾ Seite 20 page 20 cd/m ²	Anmerkung Comment
31	800... 920	-
32	920 ... 1060	-
33	1060 ... 1220	-

Exemplarische durchschnittliche Lebensdauer

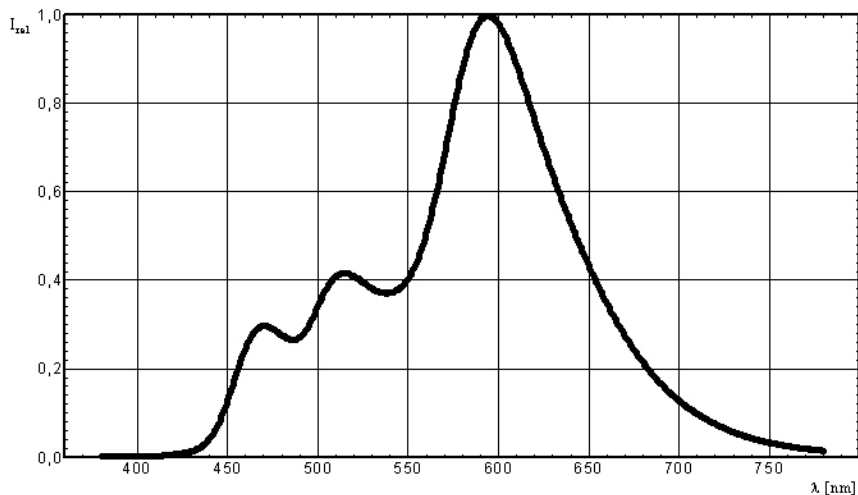
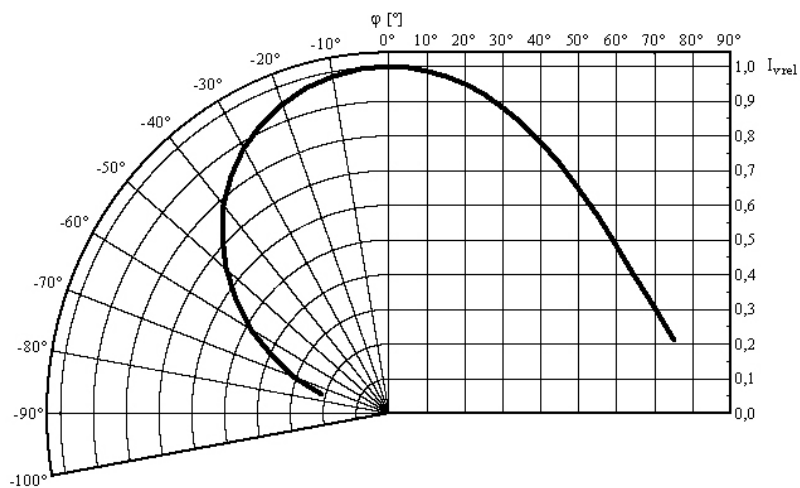
Exemplary median Lifetime

$T_A = 25^{\circ}\text{C}$

Bedingungen Conditions	mittlere Lebensdauer median Lifetime	Einheit Unit
$I_F = 186\text{ mA}$	5000	Betriebsstunden operating hours
$I_F = 93\text{ mA}$	10000	Betriebsstunden operating hours
$I_F = 46.5\text{ mA}$	15000	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.

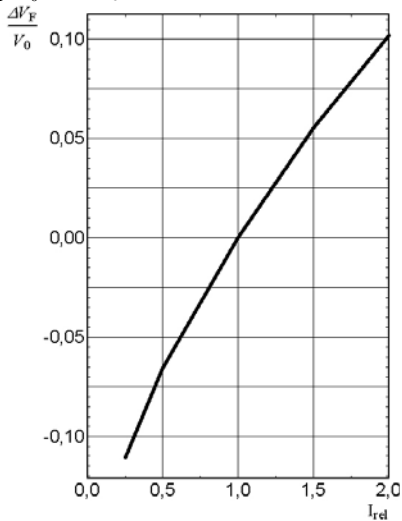
Note: Operating Lifetime is Time to Half Luminance; given as above table at 25°C at typical brightness level, until 50% of initial luminance is reached. The forward voltage may increase during lifetime up to 1 V.

Relative spektrale Emission²⁾ Seite 20Relative Spectral Emission²⁾ page 20 $\Phi_{\text{rel}} = f(\lambda); T_A = 25^\circ\text{C}; I_F = 186\text{ mA}$ Abstrahlcharakteristik²⁾ Seite 20Radiation Characteristic²⁾ page 20 $I_{\text{rel}} = f(\varphi); T_A = 25^\circ\text{C}$ 

Relative Durchlassspannung²⁾⁴⁾ Seite 20

Relative Forward Voltage²⁾⁴⁾ page 20

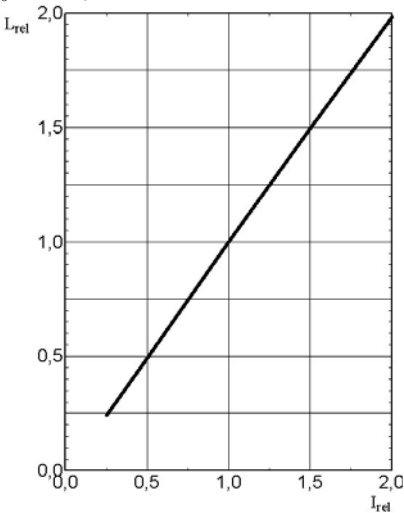
$\Delta V_F/V_0 = f(I_F/I_0); T_A = 25\text{ }^\circ\text{C}; I_0 = 186\text{ mA}$



Relative Leuchtdichte²⁾ Seite 20

Relative Luminance²⁾ page 20

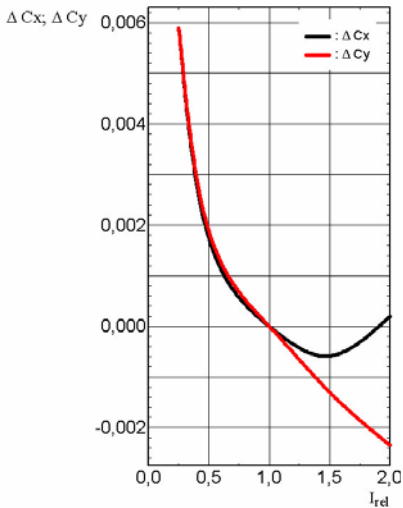
$L/L_0 = f(I_F/I_0); T_A = 25\text{ }^\circ\text{C}; I_0 = 186\text{ mA}$



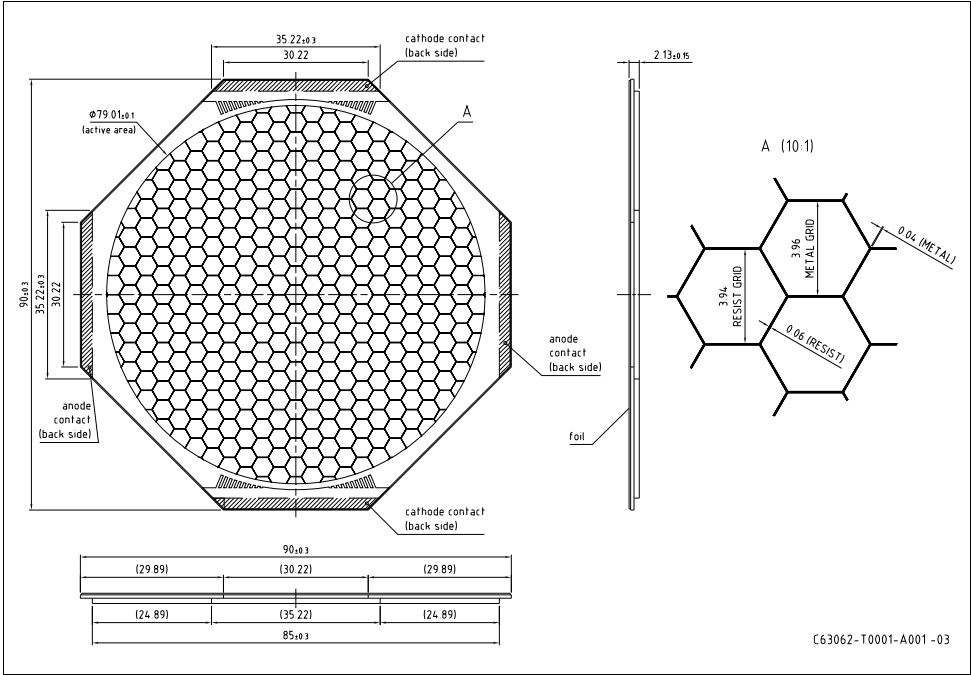
Farbortverschiebung²⁾ Seite 20

Chromaticity Coordinate Shift²⁾ page 20

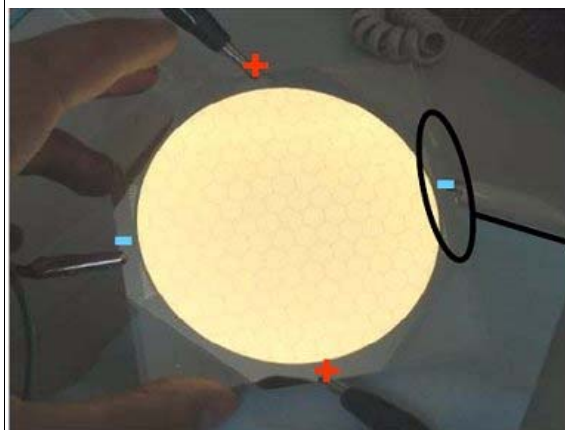
$\Delta Cx = f(I_F/I_0); \Delta Cy = f(I_F/I_0); T_A = 25\text{ }^\circ\text{C}; I_0 = 186\text{ mA}$



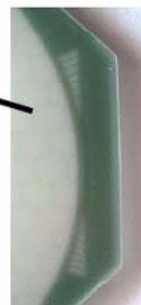
Maßzeichnung⁵⁾ Seite 20
Package Outlines⁵⁾ page 20



Polaritäten Polarity Information



**Contact ledges with
comb structures:
cathode contacts**



Anm.: Zwei Kontaktleisten zeigen auf der emissiven Seite Kamm-artige Strukturen. Damit sind die Kathodenkontakte definiert. Die beiden anderen Kontaktleisten sind Anodenkontakte. Um die beste Homogenität im Leuchtdichtebild zu erzeugen, sollten alle 4 Kontakte angebunden werden.

Note: Two contact ledges exhibit visible comb structures at the emissive side. These comb structures denote the cathode contacts. The other two contact ledges have anode polarity. To achieve best luminance uniformity connect all 4 contact ledges.

Interconnect Information

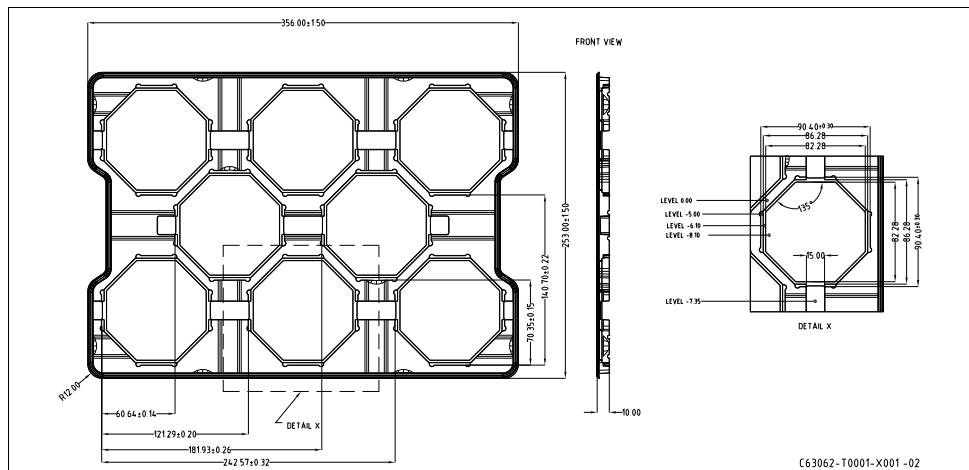
For interconnect, please use spring contact, zebra connectors or ACF flex bonding. Direct soldering onto the contact ledges is not possible. Soldering and interconnect technologies which apply heat to the light output area are not recommended and may cause OLED damage. For special modulation support please contact OSRAM Opto Semiconductors.

For further general handling and precaution notes please refer to page 17

Verpackung⁵⁾ Seite 20Method of Packing⁵⁾ page 20

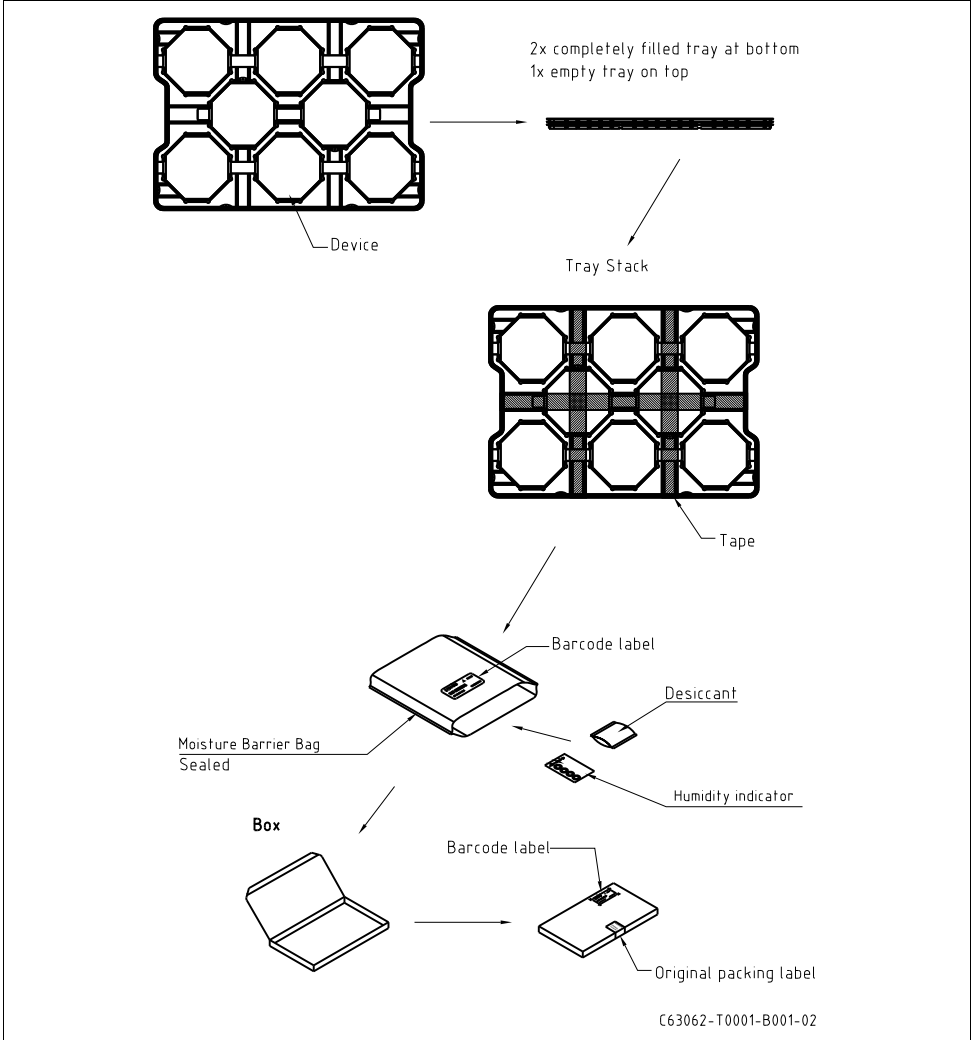
8 St. pro Box = Verpackungseinheit

8 pcs. per tray = packing unit

**Produktidentifikation****Product Marking****Legende****Legend**

OS011:	Production line chip info (fixed)
P1WW2:	Type abbreviation(fixed)
04	Device Number (01 to 20)
309	Internal factory number
00699B	Run number
04	Device Number (01 to 20)
OS011	Production line chip info (fixed)

Kartonverpackung und Materialien
Transportation Packing and Materials



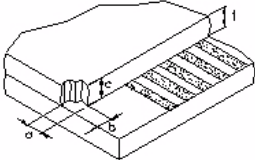
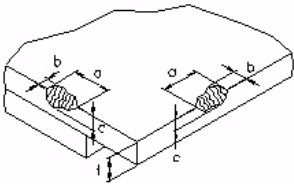
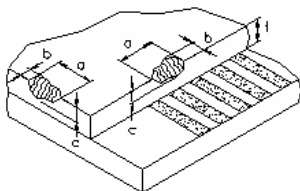
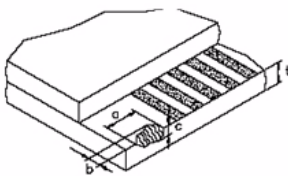
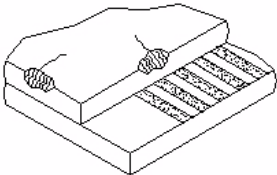
Dimensions of transportation box in mm (inch)

Breite / Width	Länge / length	Höhe / height
280 ±5 (11,02 ± 0,19685)	395 ±5 (15,55 ± 0,19685)	35 ±5 (1,38 ± 0,19685)

Cosmetic Criteria

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, delamination and 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 by pulling the metal contact traces.
- 1.7. Do not stack OLED tiles on top of each other to avoid scratches on film / 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 damage of film, while an active OLED tile with water condensation on its surface will cause corrosion of metal traces.
- 1.12. Handle the OLED surface (glass or film) 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. For interconnect, please use spring contact, zebra connectors of ACF flex bonding. 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 Opto Semiconductors.

2. Cleaning

Below are cleaning procedures to remove Particle/Foreign materials and Glue / Adhesive / Surface stains:

Particle / Foreign materials:

It 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 non-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 film.

3. Storage and Operating

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

Store OLED tiles as they have been contained in the inner container at the time of delivery from OSRAM Opto Semiconductors. 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: 2009-11-18

Previous Version:

Page	Subjects (major changes since last revision)	Date of change
all	Preliminary Data Sheet created	2009-11-18

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 in 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 20 may only be used in life-support devices or systems⁷⁾ page 20 with the express written approval of OSRAM OS.

Fußnoten:

- 1) Helligkeitswerte werden während eines Strompulses einer typischen Dauer von 25 ms, mit einer internen Reproduzierbarkeit von +/- 8 % und einer erweiterten Messunsicherheit von +/- 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 25 ms, mit einer internen Reproduzierbarkeit von +/- 0,005 und einer erweiterten Messunsicherheit von +/- 0,01 gemessen (gemäß GUM mit Erweiterungsfaktor $k = 3$).
- 4) Vorwärtsspannungen werden während eines Strompulses einer typischen Dauer von 8 ms, mit einer internen Reproduzierbarkeit von +/- 0,05 V und einer erweiterten Messunsicherheit von +/- 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 25 ms, with an internal reproducibility of +/- 8 % and an expanded uncertainty of +/- 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 typ. data will be changed without any further notice.
- 3) Chromaticity coordinates are measured during a current pulse of typical 25 ms, with an internal reproducibility of +/- 0,005 and an expanded uncertainty of +/- 0,01 (acc. to GUM with an expansion factor of $k = 3$).
- 4) The forward voltage is measured during a current pulse of typical 8 ms, with an internal reproducibility of +/- 0,05 V and an expanded uncertainty of +/- 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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