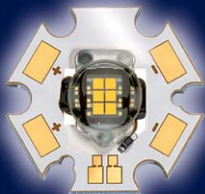




VISIBLE

# OSTAR<sup>®</sup>-Lighting Engineering Kit

Instruction Manual



Opto Semiconductors

**OSRAM**

## OSTAR®-Lighting Engineering Kit

The banner features a blurred background image of a modern interior with a circular pendant light fixture. At the top left, the website [www.osram-os.com](http://www.osram-os.com) is displayed. The main title "OSTAR®-Lighting Engineering Kit" is centered in white text on a dark blue background. Below the title is the OSRAM logo and the text "Opto Semiconductors". In the bottom left corner, the "LED Light for you" logo is shown, with "powered by OSRAM" underneath. In the top right corner of the dark blue area, the word "VISIBLE" is written in white.

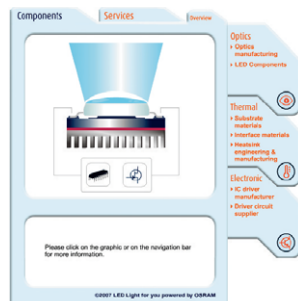
Further and more detailed information (e.g. datasheets, application notes) are available for download at [www.ledlightforyou.com](http://www.ledlightforyou.com) under "Tools & Downloads".

### Sales and technical support

Sales and technical support for the OSTAR®-Lighting and the power supplies is given by our Hotline +49 941 850 1700.

### OSRAM Opto Semiconductors GmbH

Leibnizstrasse 4  
D – 93055 Regensburg  
Phone: + 49-941-850 1700  
Fax: + 49-941-850-444 1700  
e-mail: [support@osram-os.com](mailto:support@osram-os.com)



Sales and technical support for the other components used in the OSTAR®-Lighting Engineering Kit is given directly by the LED Light for you certified partners. The Bill of material (BOM) indicates the products used of each company.

The contact information of each company is available on [www.ledlightforyou.com](http://www.ledlightforyou.com).

## Safety information

- The OSTAR®-Lighting itself and all its components must not be mechanically stressed.
- Assembly must not damage or destroy conducting paths on the circuit board.
- To avoid mechanical damage to the connecting cables, the module should be attached securely to the intended substrate. Heavy vibration should be avoided and the cables should be also fixed.
- Exceeding maximum ratings may damage the OSTAR®-Lighting and cause potential safety hazards.
- Elevated operating temperatures can be expected to negatively impact the service life in terms of lumen output.
- Incorrect wiring (i.e. reverse polarity) with constant current power supplies may damage the OSTAR®-Lighting.
- Not intended for use with constant voltage power supplies or AC power supply.

The OSTAR®-Lighting incorporates no protection against short circuits, overload or overheating. Therefore it is absolutely necessary to operate the OSTAR®-Lighting with an electronically stabilised power supply offering protection to avoid the above mentioned safety risks.

For dimming applications attention should be paid to specific references in "OPTOTRONIC® Technical Guide".

**OSRAM OPTOTRONIC® power supplies are specifically designed with protection features for safe operation.**

When using other power supplies than OPTOTRONIC® the following basic safety features are required, in addition to any other application specific concerns and local safety codes:

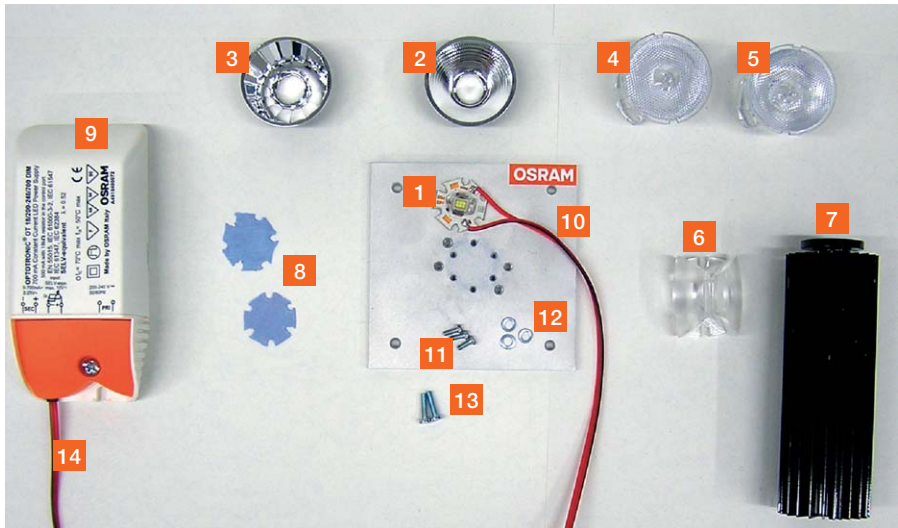
- Short circuit protection
- Overload protection
- Overheat protection
- Correct output voltage/current, including consideration for ripple and spikes.
- Installation of the OSTAR®-Lighting (with power supplies) and all other components needs to be made with regard to all applicable electrical and safety standards. Only qualified personnel should be allowed to perform installations.
- Observe correct electrical polarity! Wrong polarity will lead to no light emission. Attention, the OSTAR®-Lighting can be destroyed! Correct polarity immediately!
- Parallel connection is recommended as safe electrical operation mode (Luminaire Class III). Electrical parallel connection may lead to unbalanced voltage distribution which results in damage and potentially hazardous overload of some LEDs.

Serial connection is possible but safety regulations for the higher forward voltage have to be considered (Luminaire Class I or II).

For a better (optical) performance (luminous flux, colour stability, temperature shift, lifetime etc.) of the LED setup (equal forward current for each LED, the forward voltage can vary) a serial connection is recommend.

- **Warning: Only qualified personnel should perform installation. To avoid electrical shock or component damage, disconnect power before attempting installation of the power supplies and/or modules.**
- Failure to install the power supplies and/or LED modules in accordance with the National Electric Code (NEC), all applicable Federal, State and local electric codes as well as the specific Underwriter's Laboratories (UL) safety standards for the installation, location and application may cause serious personal injury, death, property damage and/or product malfunction. These instructions are guidelines for installation of OSRAMs OSTAR®-Lighting, power supplies and additional components from third parties. Installation requirements may vary depending on the application. Licensed electricians should provide all installation services for connection of both primary and secondary (input/output) of the power supplies.
- Pay attention to standard ESD precautions when installing the module.
- Please ensure that the power supply is of adequate power to operate the total load.
- Electrical contact is achieved with the contact cables. One OSTAR®-Lighting can be operated on one power supply.
- OSTAR®-Lighting, as manufactured, has no conformal coating and therefore offers no inherent protection against corrosion. Damage by corrosion will not be honoured as a materials defect claim. It is the user's responsibility to provide suitable protection against corrosive agents such as moisture and condensation and other harmful elements.
- If the IP rating of the fixture should be higher than IP20, the design of the housing should be according to the IP standards in the application.
- Do not operate the OSTAR®-Lighting without a heat sink or attached to an additional metal surface for an appropriate heat spreading and dissipation. The LED will be damaged and parts may be too hot to touch; act with caution.
- In case of thermal overload in the application, improve heat dissipation by extending the size of the heat sink or reduce the ambient temperature.  
The cooling surface should be in general of an area larger than 300 cm<sup>2</sup> or with an appropriate Heatsink with a thermal conductivity below 6.5 K/W.
- The evaluation of eye safety occurs according to the standard CIE S009/E:2002 ("photobiological safety of lamps and lamp systems"). Within the risk grouping system of this CIE standard, the LEDs specified sheet fall into the "low risk" group (relating to devices in the visible spectrum with an exposure time of 100 s). Under real circumstances (for exposure time, eye pupils, observation distance), it is assumed that no endangerment to the eye exists from these devices. As a matter of principle, however, it should be mentioned that intense light sources have a high secondary exposure potential due to their blinding effect. As is also true when viewing other bright light sources (e.g. headlights), temporary reduction in visual acuity and afterimages can occur, leading to irritation, annoyance, visual impairment, and even accidents, depending on the situation. These effects can occur on a higher scale, by attaching the additional secondary optics/reflectors.

## Pictures for assembly steps: (Components of OSTAR-Lighting Engineering Kit)



Look for description in "Bill of Material" at the end of this document

### Assembly information

Please consider for correct assembly the Application Note "Mounting Guideline for High Power Light Sources of the OSTAR® LED Product Family".

- Solder connections should only be performed on designated solder pads at the locations of the OSTAR®-Lighting marked "+" and "-".
- The mounting of the module is facilitated with the Thermal Interface Material (TIM) between the module and the mounting surface. Care must be taken to provide a clean and

dry mounting surface, free of oils or silicone coatings as well as dirt particles. The mounting substrate must have sufficient structural integrity. Once the OSTAR®-Lighting is appropriately positioned, a contact pressure on the module with about 0.35 MPa is appropriate.

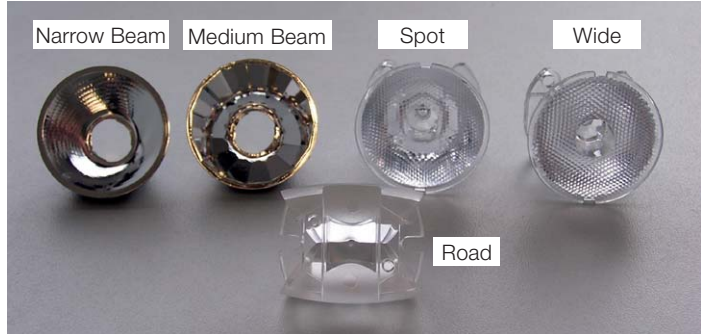
- The OSTAR®-Lighting should be installed onto flat surfaces to facilitate intimate thermal contact between the circuit board and the substrate material. The OSTAR®-Lighting should not be installed onto curved surfaces.

**Not included but necessary**

**Step 1 – Choose Application: (Decide which lens to use)**

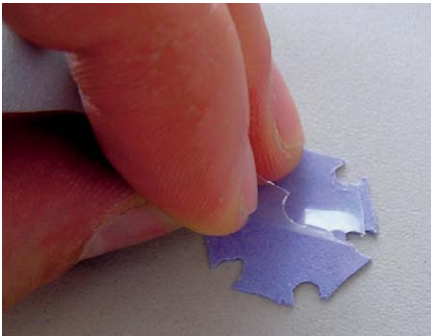


Power cable and screwdriver

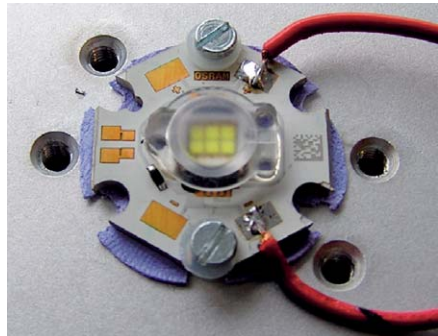


Left two lenses ▶ Use Cooler Master cylindrical cooler unit for mounting (Step 2B)  
Right two and front lens ▶ Use Aluminium plate for mounting (Step 2A)

**Step 2 – Mounting: (A. Aluminium Plate)**



Remove protection film on both sides and place it with help of the OSTAR (for right position and rotation) on the Aluminium plate.



Mount the OSTAR module with two M2 screws and the appropriate insulating washers like shown in the picture. Take care on right orientation of the OSTAR before screwing for proper secondary lens assembly later.

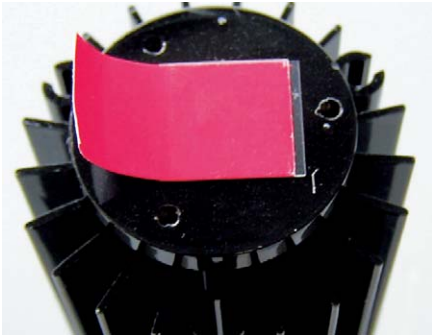


Now you can try out the different LEDIL lenses and the FRAEN reflectors by just plugging it on the OSTAR or by fixing the lenses with two M3 screws (only for LEDIL possible).

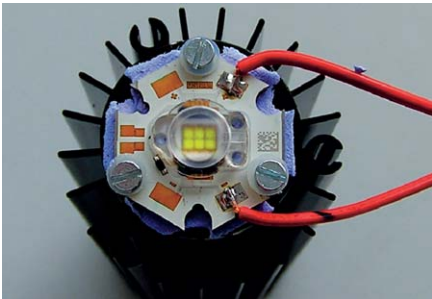


To light up the OSTAR you have to connect the current power supply (► Step 3)

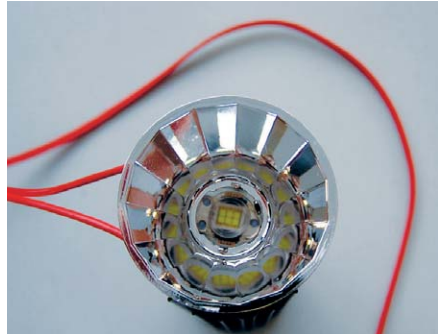
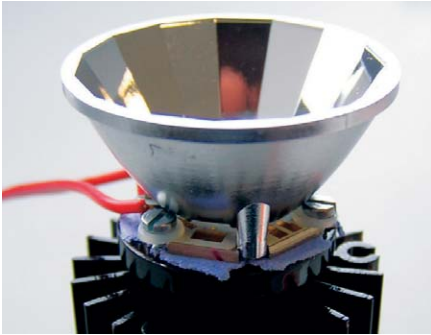
**(B. COOLERMASTER Heatsink “Sunflower”)**



*Remove red protection film and place thermal interface material on it (remove protection film on both sides). Take care on right orientation in terms of unseal the tapped holes.*



*Mount the OSTAR module with three M2 screws and the appropriate insulating washers like shown in the picture. Take care on right orientation of the primary lens for proper secondary lens assembly later.*

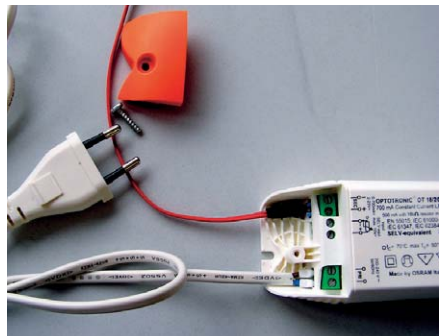
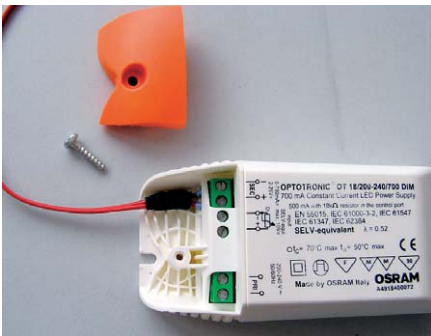


Now you can try out the two different FRAEN reflectors by plugging it on the OSTAR. Fixing with screws in this application is not possible. For final fixing gluing would be appropriate.



To light up the OSTAR you have to connect the power supply (current source) ▶ Step 3)

### Step 3 – Power Connection



Connect the power cable to the power supply (current source). Therefore you have to open the lid with the screwdriver and connect your power cable to the AC clamps as shown in the picture. Close the lid properly before power will be connected!

## LED Details:

- **OSTAR Lighting Product Promotion and Overview**

([http://www.osram-os.com/osram\\_os/EN/Products/Product\\_Promotions/OSTAR\\_Family/OSTAR-Lighting/index.html](http://www.osram-os.com/osram_os/EN/Products/Product_Promotions/OSTAR_Family/OSTAR-Lighting/index.html))

- **OSTAR Lighting Showroom**

(<http://www.osram-os.com/appsos/showroom/index.php>)

- **Technical overview including Datasheets and Application Notes**

(<http://catalog.osram-os.com/catalogue/catalogue.do?favOid=00000010001fefb00550023&act=showBookmark>)

The table chart is a survey of the different OSTAR Lighting versions. The LE UW E3B with 6500 K is the version attached to the Kit. Please check the OSRAM web for further details with datasheets, application notes, availability, updates etc.

Type	Color	Description	Typ. Brightness	Typ. Power
<b>LE UW E3B</b>	<b>6500 K daylight white</b>	<b>6 LED dies, 130° lens</b>	<b>730 lm @ 700 mA</b>	<b>15 W</b>
LE W E2A	4500–7000 K daylight white	4 LED dies, without lens	280 lm @ 700 mA	10 W
LE W E2B	4500–7000 K daylight white	4 LED dies, 130° lens	410 lm @ 700 mA	10 W
LE W E3A	4500–7000 K daylight white	6 LED dies, without lens	430 lm @ 700 mA	15 W
LE W E3B	4500–7000 K daylight white	6 LED dies, 130° lens	600 lm @ 700 mA	15 W
LE CW E2A	2800–4200 K warm white	4 LED dies, without lens	210 lm @ 700 mA	10 W
LE CW E2B	2800–4200 K warm white	4 LED dies, 130° lens	310 lm @ 700 mA	10 W
LE CW E3A	2800–4200 K warm white	6 LED dies, without lens	330 lm @ 700 mA	15 W
LE CW E3B	2800–4200 K warm white	6 LED dies, 130° lens	450 lm @ 700 mA	15 W

- **General useful application notes**

(<http://catalog.osram-os.com/catalogue/catalogue.do?catGroupOid=000000000001fab4000100b7&favOid=000000000001fab4000100b7&act=showProductGroups>)

The Application Notes of OSRAM Opto Semiconductors offers an in-depth know-how about the different aspects of the LED application. Please have a look at the attached files and the product catalogue under Application Support.

- **Rayfiles for Optical Simulation**

*(<http://catalog.osram-os.com/applications/applications.do?folderId=443&favOid=0000000200034c80025d0023&act=showBookmark>)*

The ray files / distribution files are available in the product catalogue under Application Support.

- **Light planning program files (Elumdat & IES files)**

*(<http://catalog.osram-os.com/applications/applications.do?folderId=443&favOid=0000000200034c80025d0023&act=showBookmark>)*

The IES files (.ies) and the Elumdat files (.ldt) for standard light planning programs e.g. DIALux (<http://www.dial.de>) or RELUX (<http://www.relux.biz>) (Programs available as a free download) are attached available for download. The .ies and .ldt files of the OSTAR®-Lighting with Fraen reflector are also attached and available at LED Light for you <http://www.ledlightforyou.com/Services/tools-downloads.php?lan=eng&id=19>.

- **Light Planning with LEDs – Step by step guide**

*(<http://www.ledlightforyou.com/Services/tools-downloads.php?lan=eng&id=19>)*

A step by step guide, how to include LEDs into DiaLux and make a first basic light planning is available at LED Light for you.

- **PSpice and ORCAD Electrical Simulation Models / Layout**

*(<http://catalog.osram-os.com/applications/applications.do?folderId=35&favOid=000000030003a11f01ca0023&act=showBookmark>)*

The PSpice electrical simulation models / layouts are available in the product catalogue under Application Support. Please use the Golden Dragon chip four times for the OSTAR with 4-chips (E2x) or 6 times for the 6-chip version (E3x).

- **Package CAD Data**

*(<http://catalog.osram-os.com/applications/applications.do?folderId=149&favOid=000000010003381902230023&act=showBookmark>)*

The 3D-Models in IGS or STEP format are available in the product catalogue under Application Support.

- **Fraen – Reflector (narrow – wide beam)**

*([http://www.fraensrl.com/prodinfo.html#OSRAM\\_OSTAR](http://www.fraensrl.com/prodinfo.html#OSRAM_OSTAR))*

For detail information on the narrow and medium beam reflector from Fraen, please check the attached datasheet and the “Technical Presentation OSTAR – Lighting”.

- **LEDIL – lens (medium – spot – CAT)**

*([http://www.ledil.com/index.php?page=ostar\\_lighting](http://www.ledil.com/index.php?page=ostar_lighting))*

For detail information on the spot / wide and oval beam lens from LEDIL, please check the attached datasheet and the “Technical Presentation OSTAR – Lighting”.

- **LLFY Optical Partners**

*(<http://www.ledlightforyou.com/Suche/index.php?lan=eng&id=31&sol=o&regi=&spec=>)*

For further help concerning optical products, solutions and services please have a look to the certified LLFY Partners.

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## **Thermal Solution**

- **Coolermaster – Heat sink “Sunflower”**

*([http://ecd.coolermaster.com/english/products/products.php?\\_ledlist](http://ecd.coolermaster.com/english/products/products.php?_ledlist))*

- **Laird – Thermal Interface Material – TIM T-flex 620 - Datasheet**

*(<http://lairdtech.thomasnet.com/item/gap-filler-materials/t-flex-8482-600-series/pn-3969?&seo=110&plover=10>)*

- **Laird – LED Thermal Info**

*(<http://www.lairdtech.com/downloads/LEDApplicationNoteforweb1-10-08.pdf>)*

- **LLFY Thermal Partners**

*(<http://www.ledlightforyou.com/Suche/index.php?lan=eng&id=31&sol=t&regi=&spec=>)*

For further help concerning thermal products, solutions and services please have a look at the certified LLFY Partners.

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## **Electronical Solution**

### **OSRAM converter OT 18/200-240/700 DIM\*\***

*([http://www.osram.com/osram\\_com/Professionals/ECG\\_%26\\_LMS/ECGs\\_for\\_LED\\_modules/OT\\_static/index.html#700m](http://www.osram.com/osram_com/Professionals/ECG_%26_LMS/ECGs_for_LED_modules/OT_static/index.html#700m))*

#### **(200-240 V Version for EU&APAC)**

#### **Technical Features:**

**Constant current mode. Output: P = 17 W,  
I = 700 mA (dimnable), U<sub>out</sub> = 2–25 VDC**

For details please see attached datasheet.

### **OSRAM Sylvania converter (for NAFTA market input voltage 90–265 VAC)**

#### **Technical Features:**

**Constant current mode. Output: P = 25 W,  
I = 700 mA, U<sub>out</sub> = 18–36 VDC**

For details please see attached datasheet.

For further standard driver and control solutions please have a look at the OSRAM webpage for “Electronic power supplies for LED modules OPTOTRONIC” ([http://www.osram.com/osram\\_com/Professionals/ECG\\_%26\\_LMS/ECGs\\_for\\_LED\\_modules/index.html](http://www.osram.com/osram_com/Professionals/ECG_%26_LMS/ECGs_for_LED_modules/index.html)).

• **LLFY Electrical Partners**

(<http://www.ledlightforyou.com/Suche/index.php?weiter=1&lan=eng&id=31&sol=e&regi=>)

For customized driver solutions, electrical engineering and EMS services please have a look at the certified LLFY Partners. For first IC driver recommendations and details about electrical application know how, please have a look at the attached “Technical Presentation OSTAR – Lighting”.

**Bill of material (BOM)**

Item #	Qty.	Description	Manufacturer	Manufacturer (Part Number)
1	1	OSTAR Lighting Ultra-White LE UW E3B	OSRAM	Q65110A7213
2	1	Fraen OSTAR reflector narrow beam	Fraen	FRC-N1-0E2B-0
3	1	Fraen OSTAR reflector medium beam	Fraen	FRC-M1-0E2B-0
4	1	LEDILSTAR lighting – SPOT	LEDIL	LEDILSTAR-L-S
5	1	LEDILSTAR lighting – WIDE	LEDIL	LEDILSTAR-L-W
6	1	CAT lens for Road Lighting	LEDIL	CAT
7	1	Heatsink Sunflower	Coolermaster	ECB-00396-01-GP
8	2	TIM T-flex 620 20.2 mm x 22.9 mm IR T = 0.5 mm	Laird	T-flex 620 OSRAM
9a	1	Optotronic EU & Asian market OT 18/200-240/700 DIM	OSRAM	EAN 400832113920
9b	1	Optotronic NAFTA market (90–264 VAC)	OSRAM	LP1025-36C0700
<b>Miscellaneous</b>				
10	1	Aluminium plate 12 x 12 cm		
11	3	M2 screws		
12	3	M2 plastic insulting washer		
13	2	M3 screws		
14	1	Cable		
15	1	User guide	OSRAM	
16	1	Box	OSRAM	

**Published by**

OSRAM Opto Semiconductors GmbH  
Leibnizstrasse 4, D-93055 Regensburg  
**www.osram-os.com**  
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• **About OSRAM Opto Semiconductors**

OSRAM is part of the Industry sector of Siemens and one of the two leading lighting manufacturers in the world. Its subsidiary, OSRAM Opto Semiconductors GmbH in Regensburg (Germany), offers its customers solutions based on semiconductor technology for lighting, sensor and visualization applications. OSRAM Opto Semiconductors has production sites in Regensburg (Germany) and Penang (Malaysia). Its headquarters for North America is in Santa Clara (USA), and for Asia in Hong Kong. OSRAM Opto Semiconductors also has sales offices throughout the world. In the 2007 fiscal year (to the end of September) OSRAM Opto Semiconductors employed more than 4000 people and achieved sales totaling 520 million euros. For more information go to **www.osram-os.com**.

All information contained in this document has been checked with the greatest care. OSRAM Opto Semiconductors GmbH can however, not be made liable for any damage that occurs in connection with the use of these contents.

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EU RoHS and China RoHS compliant product



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