



Light is performance  
Opto components for  
projection

Light is OSRAM

**OSRAM**  
Opto Semiconductors



OSRAM Opto Semiconductors LED and laser projection light sources are designed to fit perfectly into your applications.

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## Your first choice for all projection applications

Imagine a portfolio of LED and laser components that makes the most challenging projection installations possible. That's precisely what you get from OSRAM Opto Semiconductors.

High power solutions for professional applications? Power solutions for business applications? Compact solutions for home and gaming applications? Or miniature solutions for mobile devices? OSRAM Opto Semiconductors has the right LED and laser diodes for you. In every performance class and for every application. Mixable and matchable in endless combinations. Enabling you to realize totally new and innovative solutions.

Profit from our 40 years of expertise in the semiconductor industry. Perfectly enhanced by 100 years of experience in lighting technology from OSRAM.

**Compact solutions**

Looking for high power in a small form factor? Looking to stay mobile and small, but with a big screen and good picture quality from your companion projector? Then our products, whether LEDs or lasers, are perfect for you.



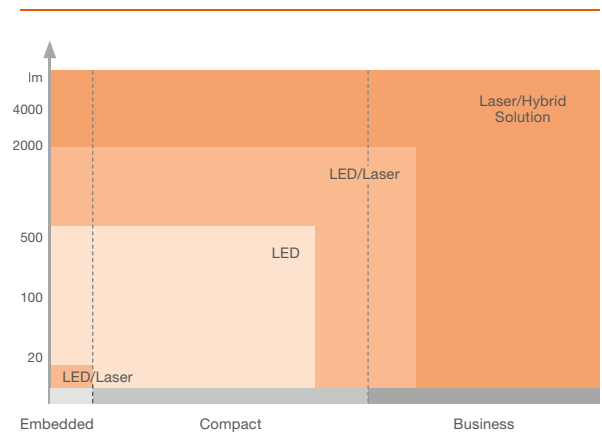
**Embedded solutions**

Thinking of mobile phones, still and video cameras? Looking for low power consumption, small footprints and high efficiency? With our LEDs and lasers for embedded projection applications we offer you the perfect products.



**Business solutions**

Developing business solutions, from control room to professional cinema applications? Want to impress with high power, long lifetime, high efficiency and wide color gamut? Our laser and LED products will manage all your tasks perfectly.



The diagram shows which product types and performance classes are specifically suitable and recommended for embedded, compact or business projection solutions/ applications at present.

# Stay mobile: brilliant embedded solutions

## OSRAM OSTAR® Projection Compact and Cube

For a pico projector embedded in a mobile device the available electrical power is limited to a fixed value. To ensure that the expected battery operation time is met, the figure of merit is the projector efficacy (lm/W). I. e. the white screen lumens per electrical LED power.

The goal for embedded pico projection is to get at least 20 screen lumens at 1 W LED power. For this the LED source is optimized in respect to the chip and package efficiency and to the etendue match for the projector optical system. These requirements are met by the OSRAM OSTAR® Projection Compact and Cube series LED.

In addition to single chip devices this package platform also allows multiple chips and colors to be combined within one package. This enables projection engine makers to design 2- and 1-channel engines with only two LEDs (G+RB) or even a single (RGB) LED component.

### Features:

- SMD package
- ThinFilm, ThinGaN® and UX:3 chip technology
- Small form factor
- High luminance
- Etendue matched to pico projection systems

### Applications:

- Embedded solutions
- Camera (still/video)
- Smartphones
- Tablets

## OSRAM OSTAR® Projection Compact



	LE BA Q6WM	LE ATB N7WM	LE x Q9WM	LE x Q9WN
Chip size	2 × 750 μm	3 × 750 μm	750 μm	1 mm <sup>2</sup>
Top emitting area in mm	1.40 × 0.65	2.15 × 0.65	0.65 × 0.65	0.9 × 0.9
LED package size in mm	3.9 × 3.7 × 1.2	5.3 × 2.7 × 1.2	3.9 × 3.7 × 1.2	3.9 × 3.7 × 1.2
Typ. thermal resistance R <sub>th,JS</sub>	18 K/W per chip	18 K/W per chip	20 K/W	15 K/W
Typ. dominant wavelength @25 °C	A: 617 nm B: 460 nm @350 mA per chip	A: 617 nm T: 525 nm B: 460 nm @350 mA per chip	A: 617 nm T: 525 nm B: 460 nm @350 mA	A: 617 nm T: 525 nm B: 460 nm @700 mA
	A: 2.2V B: 3.4V @350 mA per chip	A: 2.2V T: 3.5V B: 3.4V @350 mA per chip	A: 2.2V T: 3.5V B: 3.4V @350 mA	A: 2.5V T: 3.6V B: 3.5V @700 mA
	A: 42 lm B: 350 mW @350 mA per chip	A: 42 lm T: 71 lm B: 350 mW @350 mA per chip	A: 42 lm T: 71 lm B: 71 lm @350 mA	A: 85 lm T: 130 lm B: 740 mW @700 mA
Typ. brightness @25 °C	A: 42 lm B: 350 mW @350 mA per chip	A: 42 lm T: 71 lm B: 350 mW @350 mA per chip	A: 42 lm T: 71 lm B: 71 lm @350 mA	A: 85 lm T: 130 lm B: 740 mW @700 mA



**OSRAM OSTAR®**  
Projection Cube



	<b>LCG H9RN</b>	<b>LCG H9RM</b>
Chip size	1 mm <sup>2</sup>	750 μm
Top emitting area in mm	0.98 × 0.98	0.72 × 0.72
LED package size in mm	3.8 × 3.8 × 0.5	3.8 × 3.8 × 0.5
Typ. thermal resistance R <sub>th,JS</sub>	8.5 K/W	20 K/W
Typ. color coordinate C <sub>x</sub> /C <sub>y</sub> within 500...600 nm @25 °C	0.32/0.64	0.32/0.64
Typ. forward voltage per chip @25 °C	3.3V @700 mA	3.3V @350 mA
Typ. brightness @25 °C	280 lm @700 mA	140 lm @350 mA



Single-mode laser



@25 °C	PL 450B	PL 520
Output power	80 mW	50 mW
Emission wavelength typ.	450 nm	520 nm
Threshold current typ.	30 mA	45 mA
Operating current typ.	100 mA	150 mA
Wall plug efficiency	14 %	5–6 %
Package type	TO38 icut	TO38 icut



# Low space, high efficiency: intelligent embedded solutions

## Single-mode laser PL 450B & PL 520

The blue and green single-mode laser diodes from OSRAM Opto Semiconductors are designed to meet the needs of laser projection applications and are perfectly suitable for systems which use a MEMS scanner as the imager. The laser diodes combine an unbeatable form factor with an excellent beam quality and high efficiencies while fulfilling all essential requirements to turn the vision of mobile projection into reality.

### Features:

- Single transverse mode laser
- Perfect beam quality
- Miniaturized TO38 ICut package
- High modulation capability

### Applications:

- Embedded solutions
- Camera (still/video)
- Smartphones
- Tablets
- Head-up displays



# Economy size: powerful compact solutions

## OSRAM OSTAR® Projection Compact

These LEDs use the 2 mm<sup>2</sup> chip suited for high power operation. The OSRAM OSTAR® Compact LE × Q8WP contains one chip. The LE × Q7WP solution has two chips side by side. These LEDs can be operated up to 6A in pulsed mode and provide the basis for compact and bright projectors ranging from 100 lm up to 700 lm.



### Features:

- SMD package
- ThinFilm and UX:3 chip technology
- Small form factor
- High luminance due to “chip on air”

### Applications:

- Compact solutions
- Home cinema
- Gaming
- Notebook accessory
- Head-up display

## OSRAM OSTAR® Projection Compact



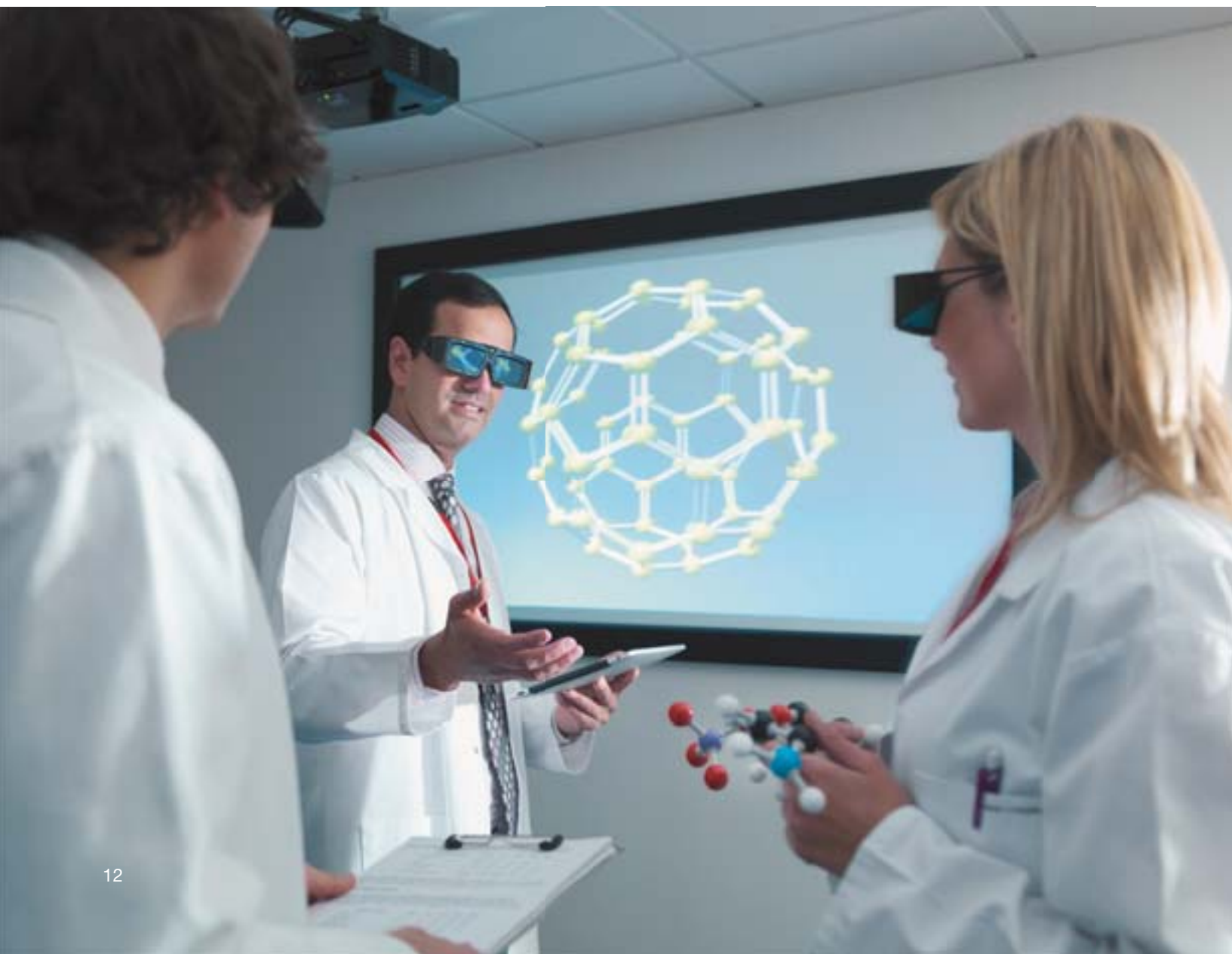
	LE × Q8WP	LE × Q7WP
Chip size	2 mm <sup>2</sup>	2 × 2 mm <sup>2</sup>
Top emitting area in mm	1.5 × 1.2	2.6 × 1.5
LED package size in mm	3.9 × 3.7 × 1.2	5.8 × 4.7 × 1.2
Thermal resistance R <sub>th,JS</sub>	A: 3.0 K/W CG: 2.6 K/W B: 2.6 K/W	A: 1.6 K/W CG: 1.4 K/W B: 1.4 K/W
Typ. dominant wavelength @25 °C, 1.4 A	A: 617 nm CG: 0.32/0.64 B: 459 nm	A: 617 nm CG: 0.32/0.64 B: 459 nm
Typ. brightness @25 °C, 1.4 A	A: 160 lm CG: 525 lm B: 1.5 W	A: 320 lm CG: 1050 lm B: 3 W
Typ. brightness @25 °C, max. pulse current	A: 470 lm @4.5 A CG: 1700 lm @6 A B: 4.5 W @6 A	A: 930 lm total @4.5 A per chip CG: 3400 lm total @6 A per chip B: 9 W total @6 A per chip



# Bigger and brighter: impressive business solutions

## **OSRAM OSTAR® Projection Power**

OSRAM OSTAR® Projection Power is among the greats in terms of its performance and its dimensions. The range starts with a 2 chip version at max 12A up to a 6 chip version running at max 36A. All family members offer lowest thermal resistance in class. The 6 chip version is suitable for all types for cooling, including water cooling.





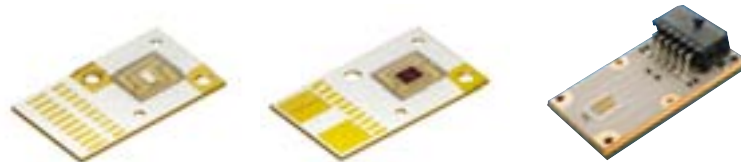
**Features:**

- Copper metal board
- Connector on board (LE x P3W)
- ThinFilm, ThinGaN® and UX:3 chip technology
- Low thermal resistance
- Capable for direct water cooling (LE x P3W)
- Improved 50,000h lifetime (L50B50, LE x P3W)

**Applications:**

- Business solutions
- Office
- Education
- Professional (simulation, control rooms)
- High end personal projection
- Home cinema
- Rear projection applications

**OSRAM OSTAR®  
Projection Power**



	<b>LE x P1W</b>	<b>LE x P2W</b>	<b>LE x P3W</b>
Chip size	2 x 2 mm <sup>2</sup>	4 x 2 mm <sup>2</sup>	6 x 2 mm <sup>2</sup>
Top emitting area in mm	2.6 x 1.5	3.2 x 2.6	4.8 x 2.6
LED package size in mm	27 x 15 x 2.1	27 x 15 x 2.1	46 x 29 x 12
Typ. thermal resistance R <sub>thB</sub>	1.0 K/W	0.7 K/W	0.5 K/W
Typ. dominant wavelenght @25 °C	A: 617 nm B: 453 nm CG: 0.32/0.64 @12 A (6 A per chip)	A: 617 nm B: 453 nm CG: 0.32/0.64 @24 A (6 A per chip)	A: 617 nm B: 459 nm CG: 0.32/0.64 @36 A (6 A per chip)
	A: 3.3V B: 3.6V CG: 3.6V @12 A (6 A per chip)	A: 3.3V B: 3.6V CG: 3.6V @24 A (6 A per chip)	A: 3.3V B: 4.4V CG: 4.4V @36 A (6 A per chip)
Typ. brightness @25 °C	A: 1250 lm B: 9.25W CG: 3350 lm @12 A (6 A per chip)	A: 2500 lm B: 18.5W CG: 6700 lm @24 A (6 A per chip)	A: 3400 lm B: 25W CG: 7500 lm @36 A (6 A per chip)



**Multi-mode laser**



@25 °C	<b>PL TB450B</b>	<b>PLP 520</b>
Output power	1.6W	120 mW
Emission wavelength typ.	450 nm	520 nm
Threshold current typ.	0.2A	140 mA
Operating current typ.	1.2A	340 mA
Efficiency typ.	30 %	6 %
Package type	TO56 improved	TO56 improved

# Professional power: successful business solutions

## Multi-mode laser PL TB450B and PLP 520

Professional projectors are the main area of application for laser diode PL TB450B. With its wavelength of 450 nanometer (nm) and output power above the 1 W range, this laser diode produces the exact blue desired and the high optical output required for most projection application. The long lifetime of the laser diode allows for maintenance free operation of projectors and low energy consumption. The small package with improved thermal resistance also enables projectors with small form factors to be produced.

Additional, OSRAM Opto Semiconductors offers a green multi-mode laser with an output power of 120 mW which is suitable for pure-laser projectors.



### Features:

- High optical output power in the blue and green spectral range
- Multi transverse mode laser
- High beam quality
- Compact T056 package with improved thermal resistance
- High efficiency

### Applications:

- Home cinema
- Notebook accessory
- Business solutions
- Office
- Education
- Professional cinema

# Multi-Die Laser Package for projectors

## **The new PLPM4 450 offers 50W blue laser light out of a single package**

Unique 50 W optical output power: the new laser module PLPM4 450 from OSRAM Opto Semiconductors greatly simplifies the construction of professional laser projectors. For the first time up to 20 blue laser chips have been packaged into a compact housing. In addition, the optical power of the individual chips has been doubled, thus achieving a total power of 50 watts and enabling projectors over 2,000 lumens of brightness with only one housing.







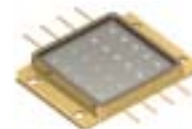
**Features**

- Butterfly package with 50 W optical output power at Tcase 50 °C
- Up to 5 multimode laser chips in series connection bonded on 4 bars
- Each bar can be operated individually
- Wavelength: 450 nm +/-10nm
- Typ. wall plug efficiency of 30 %
- ESD protection diode for each laser chip
- Polarization ratio TE/TM mode: 100:1
- Operation temperature: 10 °C up to 70 °C

**Applications:**

- Office
- Education
- Professional

**Multi-Die Laser Package**



	<b>PLPM4 450</b>
Chip size	25.5 mm × 35 mm
Emitting surface	16 mm × 16.5 mm
Optical output power	50 W (at 50 °C case temperature )
Wavelength	440 nm to 460 nm
Lifetime (L50)	Up to 20,000 hours (depending on ambient conditions)

# Choose perfection – easily

✓ recommendation

	OSRAM OSTAR® Projection Cube	OSRAM OSTAR® Projection Compact	OSRAM OSTAR® Projection Power	Single-mode laser	Multi-mode laser	Multi-Die Laser Package
<b>Embedded solutions</b>						
 Camera (still/video)	✓	✓		✓		
 Smartphones	✓	✓		✓		
 Tablets	✓	✓		✓		
<b>Compact solutions</b>						
 Home cinema		✓	✓		✓	
Gaming		✓		✓	✓	
Notebook accessory		✓		✓	✓	
Control room		✓	✓		✓	
Head-up display		✓		✓		
<b>Business solutions</b>						
 Office			✓		✓	✓
Education			✓		✓	✓
Professional			✓		✓	✓
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# Be informed – completely

Looking for more information and data on our products for LEDs in general lighting or LEDs in general? All you need to know about our state-of-the-art products, modern LED technology and the latest LED trends can be found on our website along with other related links.

## [catalog.osram-os.com](http://catalog.osram-os.com)

Our complete product catalog with all available products

## [www.osram-os.com/solid-state-lighting](http://www.osram-os.com/solid-state-lighting)

Products and solutions for general lighting/solid state lighting

## [ledlight.osram-os.com](http://ledlight.osram-os.com)

The leading source of LED information, resources, tools, technology & LED lighting solutions for the solid state lighting and general illumination sectors

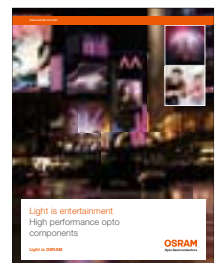
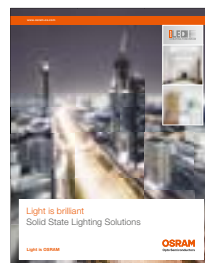
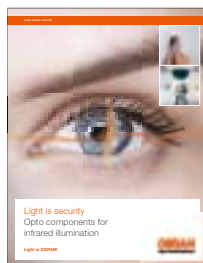
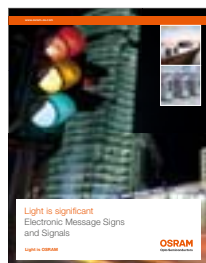
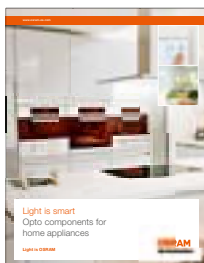
## [www.ledlightforyou.com](http://www.ledlightforyou.com)

The network for LED lighting technology – powered by OSRAM



## Application brochures available from OSRAM Opto Semiconductors

Our innovative products open up a wide variety of applications. Just contact us for assistance with your specific design (for contact information see last page) or order our application brochures: [www.osram-os.com/downloads](http://www.osram-os.com/downloads).



## Bringing your visions to life

OSRAM Opto Semiconductors is one of the world's leading manufacturers of optoelectronic semiconductors and is considered an authority on innovative light technologies. With numerous patented technologies, a deep understanding of customer needs, close customer relations and highly committed employees, we take an active part in shaping the future of light.

### **Leader in technology**

Because for decades we have been investing in technology and quality, steadily expanding our competencies, OSRAM Opto Semiconductors today sets the highest international standards in the fields of illumination, visualization and sensor technology. Our products range from high-performance light-emitting diodes (LEDs) and infrared diodes (IREDs) to detectors.



**Your partner of choice**

OSRAM Opto Semiconductors' close cooperation with our customers and partners generates new ideas for products and light solutions. Not least, these joint efforts have also resulted in an application-specific portfolio for a variety of applications: our semiconductors are used, for instance, in light solutions for automotive, white goods, entertainment and infotainment, projection and general lighting as well as numerous infrared and laser solutions.



**Driver for innovation**

Continuous commitment to research and development have established a solid foundation at OSRAM Opto Semiconductors for product development and manufacturing at a consistently high level. We have, for example, turned out pioneering technologies for almost 40 years and hold thousands of patents. Milestones reached in setting numerous standards in LED light technologies include the development of the first surface-mountable LED (TOPLED®), the first LED with white light and the OSRAM OSTAR® product platform with its versatile package design.



**Competent light solutions around the globe**

By engineering and manufacturing highly complex semiconductor chips and consistently developing new products for new applications, OSRAM Opto Semiconductors is able to satisfy the needs and requirements of customers around the world. With our headquarters in Regensburg (Germany), Sunnyvale (USA) for North America and Hong Kong for Asia, production sites in Regensburg, Penang (Malaysia) and soon in Wuxi (China), some of the most modern LED chip manufacturing facilities in the world, and a global network of sales and marketing centers, we and you are in an excellent position to meet the challenges of today and tomorrow.



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