



OSTAR® Engineering Evaluation Kit

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Agenda

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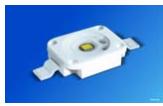
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Overview of SMT LED Packages

High-Power LED Packages

Dimensions: lengths x width x height

| | | | | | | |
|---|---|---|---|--|---|---|
| TOPLED® | Power TOPLED® | MultiLED® | Advanced Power TOPLED® | Golden / Platinum DRAGON® | Diamond DRAGON® | OSTAR® Lighting |
|  |  |  |  |  |  |  |
| 3.5 x 2.8 x 1.9 mm | 3.5 x 2.8 x 1.9 mm | 3.4 x 3.3 x 1.9 mm | 3.4 x 3.3 x 1.9 mm | 11.0 x 6.0 x 1.8 mm | 11.0 x 6.0 x 4.2 mm | OSTAR® Headlamp |
| PointLED® | Mini TOPLED® | Chipled | Micro SIDELED® 1.0 | SmartLED® | Micro SIDELED® 0.8 | |
|  |  |  |  |  |  | |
| 3.4 x 2.5 x 0.725 mm | 2.2 x 1.4 x 1.3 mm | 1.6 x 0.8 x 0.6 mm | 3.0 x 1.2 x 1.0 mm | 1.7 x 0.8 x 0.6 mm | 2.8 x 1.2 x 0.8 mm | |
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| Miniature LED Packages | | | | Opto Semiconductors | | |

FAQ

Questions Customers May Ask You

- **How are IR products measured?**
 - IR products are measured in radiant intensity (mW/sr)
- **How is brightness measured in LED products?**
 - Brightness is measured in lumens (lm) for visible LED products
- **When do we promote OSTAR® over DRAGON® solutions?**
 - The OSTAR® is a great solution in lumen dense applications where high-brightness is needed and space is limited
- **How does the OSTAR® family compare in price to discrete components, such as the DRAGON® family?**
 - The OSTAR® family of products fulfills different application requirements than discrete components, such as the DRAGON®, so a direct comparison of price is not applicable
- **Are there off-the-shelf lens solutions for OSTAR®?**
 - Yes. Our LED Light for You (LLFY) partners, such as LEDIL, offer off-the-shelf lens solutions for our high-power product families, including OSTAR® and DRAGON®. For more information on the LLFY program, please visit www.LEDLightforYou.com
- **How do I get more efficiency from the OSTAR®?**
 - Reducing the drive current of any LED will produce higher efficiency.

OSTAR® - Possible Applications



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OSTAR® - Possible Applications

- **General lighting**

- Retrofits, where space is limited
- Spot lights
- Recessed down lights
- Stage lighting
- Architectural illumination

- **Automotive exterior**

- Headlamps
- Active Night Vision
- Daytime running light

- **Industry**

- Machine Vision
- Emergency lights
- Warning lights i.e. light house, buoys
- Architainment,

- **Military / Security**

- Vehicle Mount NV (Humvee)
- Infrared Perimeter Security
- Tactical Flashlights
- Take Down Lights



OSTAR® - Customer Benefits

OSTAR® Lighting



- High luminous intensity and the hexagonal shape enables tight packing density.
- Small dimensions and a low height of less than 7 mm.
- Pure surface emitter, characterized by true Lambertian radiation characteristics, allowing for effective light coupling into optics.
- Available with four or six chips, with or without a lens.
- Very reliable due to long product lifetime (up to 50,000 hours) and low thermal resistance.

OSTAR® Observation



- High optical IR output, even in continuous operation.
- Compact size, with easy-to-mount standard connector.
- Certified for automotive applications at temperatures up to 125 °C.
- Exceptionally low thermal resistance for optimum thermal management.

OSTAR® Headlamp



- Pure surface emitter that provides a uniform illumination of the target area.
- Chip level conversion enables optimized coupling into optics and light guides.
- Compliant with the SAE- and ECE standard and certified according to automotive standards and to AEC-Q101.
- Long lifetime of 7,000-10,000 hours, comparable with the lifetime of a car.

OSTAR® - Features

OSTAR® Lighting



- Hexagonal shape with holes for precise adjustment of external optics
- Pure white is achieved by chip level conversion, simplifying the use of optics and lenses.
- Integrated primary lens with Lambertian beam shape increases light output by 40 %.
- The OSTAR-Lighting is characterized by low thermal resistance < 4 K/W and high max. forward current.
- The package comes with high ESD protection > 2 kV.
- Simple assembly with screws or springs using locating features

OSTAR® Observation (IR version)



- Wavelength suitable for CCD and CMOS cameras
- Package with standard connector - easy to mount
- Low thermal resistance
- Efficient Thinfilm technology offers continuous performance increases in the future
- Lambertian radiator - suitable for external optics

OSTAR® Headlamp



- Five white chips connected in line with a color temperature of 6000K
- Typical brightness of 550lm at 700mA, peak values of up to 650lm at 700mA
- Small dimensions: 33.0mm x 13.5mm x 4.55mm
- Excellent thermal management through metal core PCB
- High junction temperature of up to 150°

OSTAR® - Products

| OSTAR | Description | Type | Color | Typ. Brightness | Max. Brightness | |
|----------------|-----------------------------|-----------|----------------|------------------|-----------------|--|
| Headlamp | Silicone Encapsulation | LEWD1A | SAE-/ECE-White | 280 lm @ 700 mA | 420 lm @ 700 mA | |
| Headlamp | Glass Window Cover | LE UW D1W | SAE-/ECE-White | 550 lm @ 700 mA | 650 lm @ 700 mA | |
| Observation | 10 Chip Array (Black Frame) | SFH4730 | 850nm | 1W/SR, 1A/20ms | na | |
| Observation | 10 Chip Array (white frame) | SFH4740 | 850nm | 1.2W/SR, 1A/20ms | na | |
| Lighting-6chip | Silicone lens | LE UW E3B | 6500K | 850 lm @ 700 mA | na | |
| Lighting-6chip | Silicone lens | LE W E3B | 5700K | 750 lm @ 700 mA | na | |
| Lighting-6chip | Silicone lens | LE CW E3B | 3000K | 540 lm @ 700 mA | na | |
| Lighting-6chip | Silicone Encapsulation | LE W E3A | 5700K | 520 lm @ 700 mA | na | |
| Lighting-6chip | Silicone Encapsulation | LE CW E3A | 3000K | 380 lm @ 700 mA | na | |
| Lighting-4chip | Silicone lens | LE W E3B | 5700K | 500 lm @ 700 mA | na | |
| Lighting-4chip | Silicone lens | LE CW E3B | 3000K | 360 lm @ 700 mA | na | |
| Lighting-4chip | Silicone Encapsulation | LE W E3A | 5700K | 350 lm @ 700 mA | na | |
| Lighting-4chip | Silicone Encapsulation | LE CW E3A | 3000K | 240 lm @ 700 mA | na | |

Target Customers for the OSTAR® Engineering Evaluation Kit

Target customer resides in the engineering & product development of these industries:

- EVL / Transportation
- Security and Surveillance
- Military
- IR Illumination
- General Illumination

Kit and product meets customer's demands in these areas:

- Technology
- Performance
- Integration
- Flexibility / versatility
- Quality
- Availability
- Price

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Product Contents of the OSTAR® Engineering Evaluation Kit

Contents:

- (1) OSTAR® Lighting LED (LE W E3B), (1) OSTAR® Headlamp LED (LE W D1A) and (1) OSTAR® Observation IR (SFH 4730)
- (1) LEDIL narrow angle optic (LEDILSTAR)
- (1) Driver with integrated temperature display (OSRAM Intelligent Display SLR2016)
- (2) Heatsinks (Coolermaster ECB-00396-01-GP and Thermaflo E3034) with mounted Light Engines
- (1) 18V DC Power Supply
- (1) DVD including kit instructions, product datasheets, application notes, mechanical CAD files, optical ray trace files and electrical PSpice models



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Enable Customers with a Limited Time Offer OSTAR® Engineering Evaluation Kit

- Engineers can review and test the OSTAR® portfolio in their own environment
- Complete a light engine design in record time

| Kit Contents | Enables |
|---|---|
| Product Datasheets and Applications Notes | Product information and reference designs |
| Mechanical CAD files | Detailed dimensions and package specifications for mechanical and system design |
| Optical Ray Tracing files | Development of application specific optics |
| Electrical PSpice models | Circuit/ driver design |

\$200 Kit for a limited time only
Suggested Resale **\$89.99**

Glossary

- **What is Thermal resistance and why it is important?**

- Thermal resistance (K/W) is the measure of the heat transfer ability of an LED. The lower the thermal resistance, the greater the heat transfer out of the package.

- **What is Radiant Density? How is it measured?**

- Radiant density is the radiant energy passing through a unit of volume from all directions. The units are joules per cubic meter (J m³).

- **What is beam shaping and how does this affect designs?**

- Beam shaping optics are used in various optical fields to change the luminous intensity distribution. This affects designs by transforming the intensity profile of the light beam into a desired profile. Either primary or secondary optics can be used in beam shaping. Secondary, or external, optics can be used to focus, direct & manipulate light beams in desired directions.

- **Optical Ray Tracing files**

- Ray tracing, in general, is a method for calculating the path of particles or waves through a medium. Optical Ray Tracing files for a particular device enable the designer to simulate/ predict the behavior of the light beam in a complex system without having to build the system.

Call to Action

OSTAR® Engineering Evaluation Kit

Q3 Featured Product: OSTAR® and OSTAR® Engineering Evaluation Kit

- Identify target customers by market
- Identify required resources
- Schedule account visits

Q2 Featured Product: Diamond DRAGON® Follow-Up

- Share list of identified customers
- How many customers continued to have interest in this product after the discovery visit?
- What markets were you most successful in?
- Identify resources and timeline to close

Thank you for your attention.

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