

# OSRAM PLPT5 447KA

## Datasheet

Published by **ams-OSRAM AG**

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Metal Can<sup>®</sup> TO56

# PLPT5 447KA

Blue Laser Diode in TO56 Package



## Applications

- Entertainment
- Projection
- Projection & Display

## Features

- Typical emission wavelength: 445 nm
- TO56 package
- High modulation bandwidth
- Multi-mode semiconductor laser
- Efficient radiation source for cw and pulsed operation
- Laser diode isolated against package
- ESD protection diode
- Optical power class: 2 W

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## Ordering Information

| Type        | Peak output power<br>typ.<br>$P_{opt}$ | Ordering Code |
|-------------|--|---------------|
| PLPT5 447KA | 2 W                                    | Q65113A0154   |

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## Maximum Ratings

$T_c = 25\text{ °C}$

| Parameter  | Symbol    |      | Values |
|--|-----------|------|--------|
| Operating temperature                              | $T_{op}$  | min. | -20 °C |
|  |           | max. | 85 °C  |
| Storage temperature                                | $T_{stg}$ | min. | -20 °C |
|  |           | max. | 100 °C |
| Junction temperature                               | $T_j$     | max. | 135 °C |
| Output power                                       | $P_{opt}$ | max. | 2.2 W  |
| Operating current <sup>1)</sup>                    | $I_{op}$  | max. | 1.5 A  |
| Soldering temperature<br>$t_{max} = 10\text{ sec}$ | $T_s$     | max. | 260 °C |

Operation outside these conditions may damage the device. Operation at maximum ratings may influence lifetime.

## Characteristics

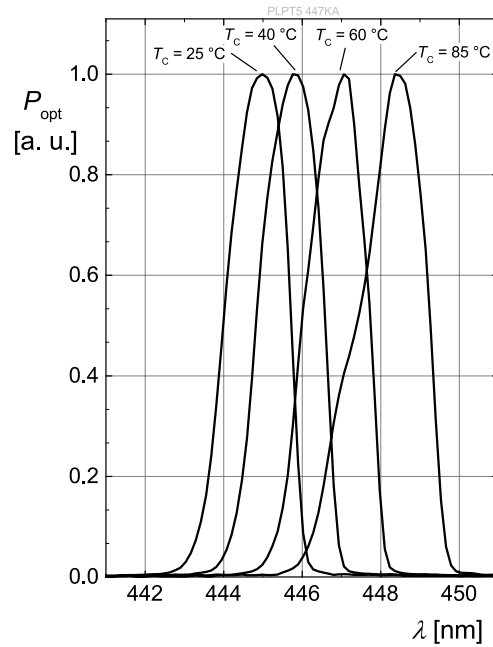
$P_{opt} = 2.0 \text{ W}; T_C = 25 \text{ °C}$

| Parameter  | Symbol               |      | Values   |
|--|----------------------|------|----------|
| Operating current <sup>1)</sup>                          | $I_{op}$             | typ. | 1.2 A    |
|  |                      | max. | 1.4 A    |
| Centroid wavelength <sup>2)</sup>                        | $\lambda_{centroid}$ | min. | 436 nm   |
|  |                      | typ. | 445 nm   |
|  |                      | max. | 456 nm   |
| Optical output power                                     | $P_{opt}$            | typ. | 2.0 W    |
| Beam divergence ( $1/e^2$ ) parallel to pn-junction      | $\Theta_{  }$        | min. | 6 °      |
|  |                      | typ. | 10 °     |
|  |                      | max. | 13 °     |
| Beam divergence ( $1/e^2$ ) perpendicular to pn-junction | $\Theta_{\perp}$     | min. | 40 °     |
|  |                      | typ. | 48 °     |
|  |                      | max. | 56 °     |
| Threshold current  | $I_{th}$             | typ. | 0.1 A    |
|  |                      | max. | 0.3 A    |
| Forward voltage <sup>3)4)</sup>                          | $V_F$                | typ. | 4.6 V    |
|  |                      | max. | 5.9 V    |
| Total power dissipation                                  | $P_{tot}$            | typ. | 3.5 W    |
| TE polarization  | $P_{TE}$             | typ. | 100:1    |
| Thermal resistance junction case real                    | $R_{thJC}$           | typ. | 13 K / W |

Info: according to AO-IN-2022-026-I

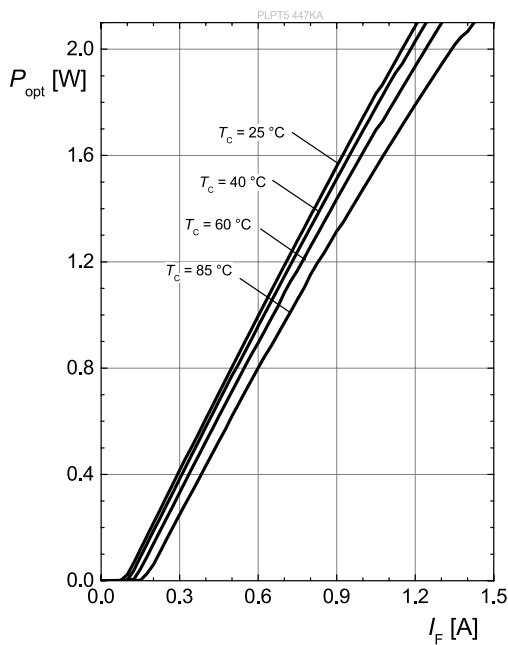
### Relative Spectral Emission 5), 6)

$$I_{e,rel} = f(\lambda); I_F = 1.2 \text{ A}; P_{opt} = 2.0 \text{ W}$$



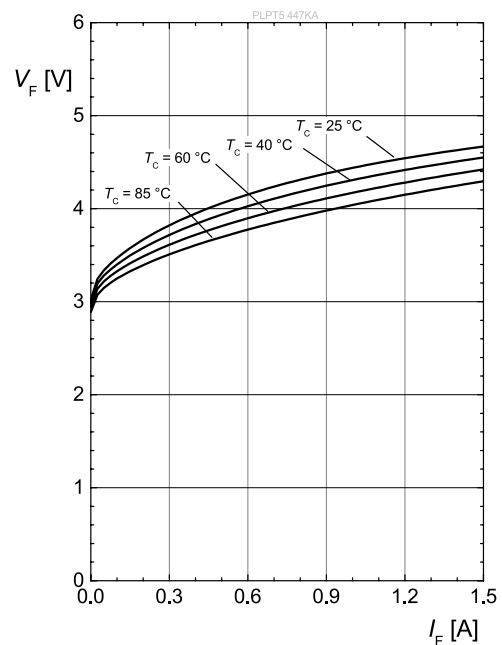
### Optical Output Power 5), 6)

$$P_{opt} = f(I_F)$$



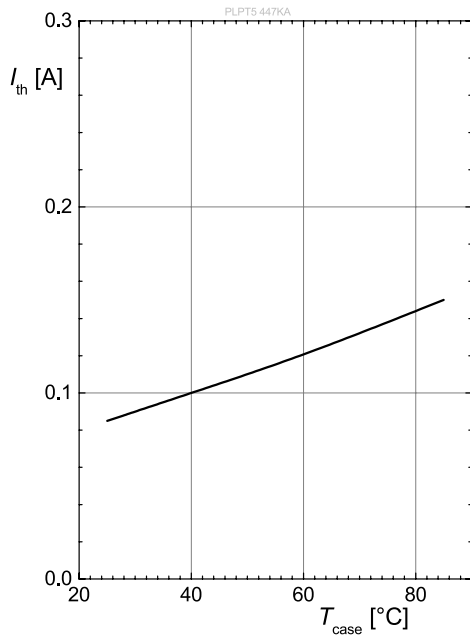
### Opt. Power / Forward Voltage 5), 6)

$$V_F = f(I_F)$$



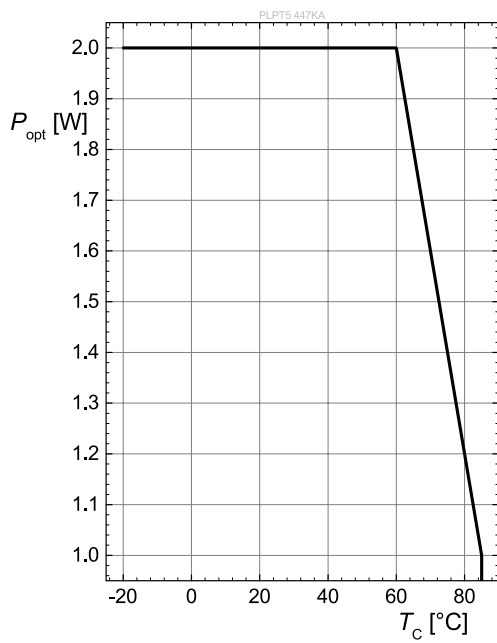
## Threshold Current

$$I_{th} = f(T_C)$$

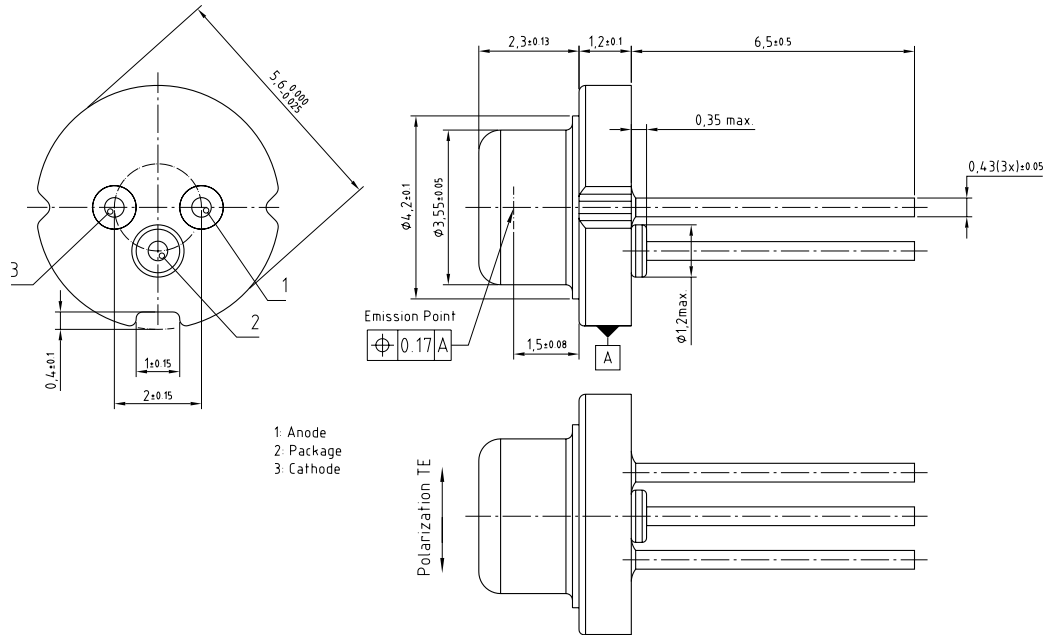


## Max. Permissible Opt. Output Power

$$P_{opt} = f(T_C)$$



Dimensional Drawing <sup>7)</sup>



C63062-A4171-A1-04

Further Information:

Approximate Weight: 310.0 mg





### Barcode-Product-Label (BPL)

**OSRAM Opto Semiconductors** LX XXXX    BIN1: XX-XX-X-XXX-X

RoHS Compliant

(6P) BATCH NO: 1234567890 ML Temp    ST  
X    XXX °C X

(1T) LOT NO: 1234567890 (9D) D/C: 1234

Pack: RXX  
DEMY    XXX  
X\_X123\_1234.1234 X

(X) PROD NO: 123456789(Q)QTY: 9999 (G) GROUP: XX-XX-X-X

OHA04563

### Dimensions of Transportation Box

| Width      | Length     | Height     |
|------------|------------|------------|
| 103 ± 5 mm | 128 ± 5 mm | 100 ± 5 mm |

### Notes

**CLASSNOTSPECIFIED**

Subcomponents of this device contain, in addition to other substances, metal filled materials including silver. Metal filled materials can be affected by environments that contain traces of aggressive substances. Therefore, we recommend that customers minimize device exposure to aggressive substances during storage, production, and use. Devices that showed visible discoloration when tested using the described tests above did show no performance deviations within failure limits during the stated test duration. Respective failure limits are described in the IEC60810.

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## Notes

### Handling:

Solvents, water, liquids, non-conductive plastics and glues are not allowed near the device, because solvents and other liquids could emerge and damage the product.

### Important notes of operation for laser diode

#### a) Electrical operation

OSRAMs laser diodes are designed for maximum performance and reliability. Operating the laser diode above the maximum rating even for very short periods of time can damage the laser diode or reduce its lifetime. The laser diode must be operated with a suitable power supply with minimized electrical noise. The laser diode is very sensitive to electrostatic discharge (ESD). Proper precautions must be taken.

#### b) Mounting instructions

In order to maintain the lifetime of the laser diode proper heat management is essential. Due to the design of the laser diode heat is dissipated only through the base plate of the diode's body. A proper heat conducting interconnection between the diodes base plate and the heat sink must be maintained.

For further application related information please visit [www.osram-os.com/appnotes](http://www.osram-os.com/appnotes)

**c) Qualifications:** Depending on the mode of operation, these devices emit highly concentrated visible light which can be hazardous to the human eye. Products which incorporate these devices have to follow the safety precautions found in IEC 60825 "Safety of laser products".

## Disclaimer

### 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 our website.

### 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.

### Product and functional safety devices/applications or medical devices/applications

Our components are not developed, constructed or tested for the application as safety relevant component or for the application in medical devices.

Our products are not qualified at module and system level for such application.

In case buyer – or customer supplied by buyer – considers using our components in product safety devices/ applications or medical devices/applications, buyer and/or customer has to inform our local sales partner immediately and we and buyer and /or customer will analyze and coordinate the customer-specific request between us and buyer and/or customer.

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## Glossary

- 1) **Operating/Forward current:** IF is measured with an internal reproducibility of  $\pm 7\%$  (acc. to GUM with a coverage factor of  $k = 3$ ).
- 2) **Wavelength:** The wavelengths are measured with a tolerance of  $\pm 1$  nm.
- 3) **Operating/Forward voltage:** VF is measured with an internal reproducibility of  $\pm 0.05$  V (acc. to GUM with a coverage factor of  $k = 3$ ).
- 4) **Forward Voltage:** The forward voltages are measured with a tolerance of  $\pm 0.1$  V.
- 5) **Typical Values:** Due to the special conditions of the manufacturing processes of semiconductor devices, 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.
- 6) **Testing temperature:** TA = 25°C (unless otherwise specified)
- 7) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with  $\pm 0.1$  and dimensions are specified in mm.

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## Revision History

| Version | Date       | Change          |
|---------|------------|-----------------|
| 1.0     | 2022-09-29 | Initial Version |

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EU RoHS and China RoHS compliant product

此产品符合欧盟 RoHS 指令的要求；  
按照中国的相关法规和标准，  
不含有毒有害物质或元素。

**Published by ams-OSRAM AG**

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