

# OSRAM PLPT9 450LC\_E

## Datasheet

Preliminary datasheet version

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## Metal Can

# PLPT9 450LC\_E

Blue Laser Diode in TO90 Package



## Applications

- Outdoor & Industrial Lighting
- Projection & Display
- Static Signaling

## Features

- Typical emission wavelength: 455 nm
- Efficient radiation source for cw and pulsed operation
- TO90 package
- ESD protection diode
- Laser diode isolated against package

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## Ordering Information

Type	Peak output power typ. $P_{opt}$	Ordering Code
PLPT9 450LC_E	5.5 W	Q65113A7605

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## Maximum Ratings

$T_c = 25\text{ °C}$

Parameter	Symbol		Values
Operating temperature	$T_{op}$	min.	0 °C
		max.	70 °C
Storage temperature	$T_{stg}$	min.	-40 °C
		max.	85 °C
Junction temperature	$T_j$	max.	135 °C
Output power	$P_{opt}$	max.	6.0 W
Operating current <sup>1)</sup>	$I_{op}$	max.	3.8 A
Reverse current	$I_R$	max.	20 mA
Soldering temperature	$T_s$	max.	260 °C

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

## Characteristics

$P_{opt} = 5.5 \text{ W}; T_C = 25 \text{ }^\circ\text{C}$

Parameter	Symbol		Values
Operating current <sup>1)</sup>	$I_{op}$	typ.	3.3 A
		max.	3.5 A
Centroid wavelength <sup>2)</sup>	$\lambda_{centroid}$	min.	447 nm
		typ.	455 nm
		max.	463 nm
Optical output power	$P_{opt}$	typ.	5.5 W
Beam divergence ( $1/e^2$ ) parallel to pn-junction	$\Theta_{  }$	min.	6 °
		typ.	9 °
		max.	13 °
Beam divergence ( $1/e^2$ ) perpendicular to pn-junction	$\Theta_{\perp}$	min.	41 °
		typ.	49 °
		max.	57 °
Threshold current	$I_{th}$	typ.	0.32 A
		max.	0.45 A
Forward voltage <sup>3)4)</sup>	$V_F$	typ.	4.1 V
		max.	4.8 V
Total power dissipation	$P_{tot}$	typ.	8 W
TE polarization	$P_{TE}$	typ.	100:1
Thermal resistance junction case real	$R_{thJC}$	typ.	8 K / W

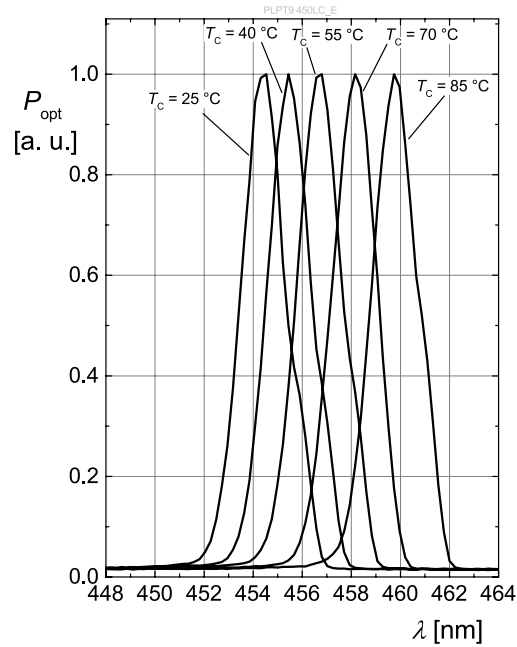
## Centroid Wavelength

$P_{opt} = 5.5 \text{ W}; T_C = 25 \text{ °C}$

Group	Centroid wavelength <sup>2)</sup>	
	min. $\lambda_{centroid}$	max. $\lambda_{centroid}$
2	447 nm	449 nm
3	449 nm	451 nm
4	451 nm	453 nm
5	453 nm	455 nm
6	455 nm	457 nm
7	457 nm	459 nm
8	459 nm	461 nm
9	461 nm	463 nm

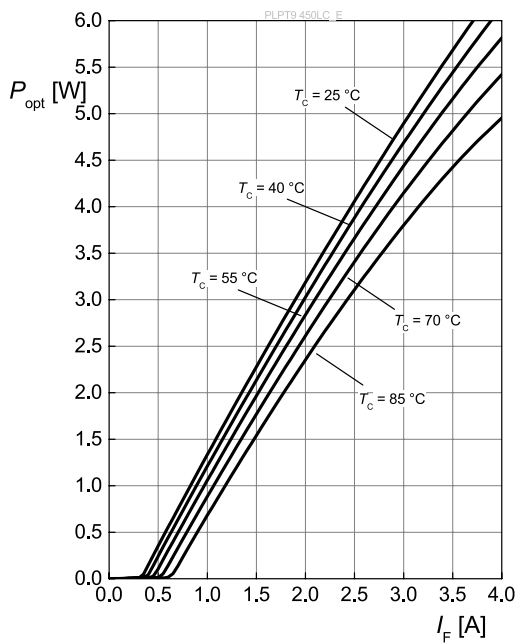
### Relative Spectral Emission 5), 6)

$$P_{\text{opt}} = f(\lambda); P_{\text{opt}} = 5.5 \text{ W}$$



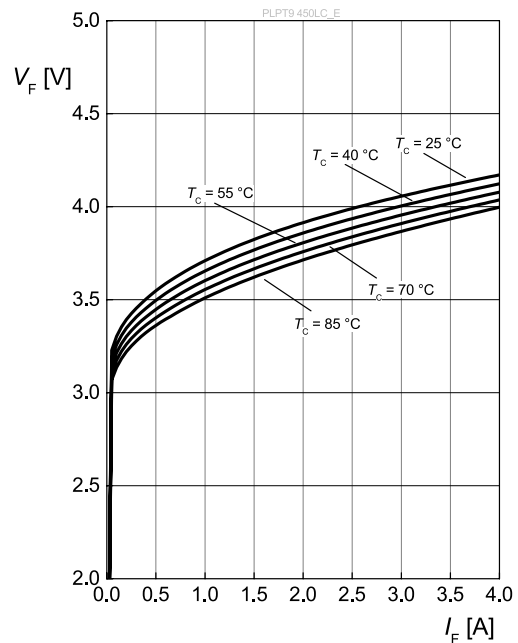
### Optical Output Power 5), 6)

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



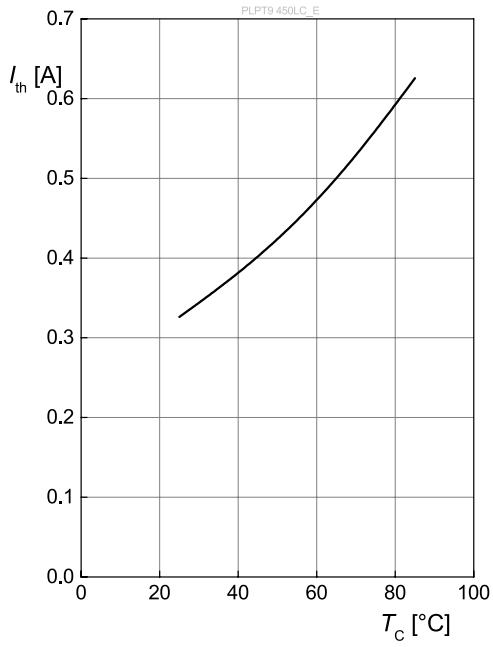
### Forward Voltage 5), 6)

$$V_F = f(I_F)$$



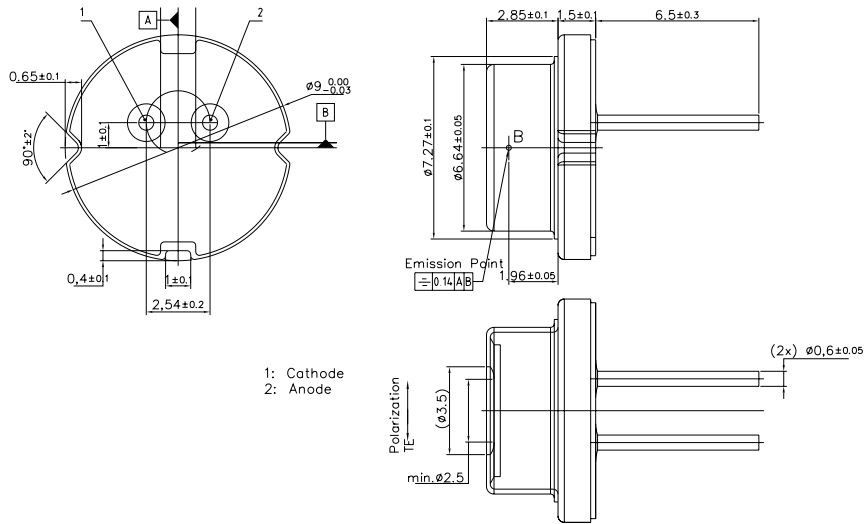
## Threshold Current <sup>5)</sup>

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





## Dimensional Drawing <sup>7)</sup>

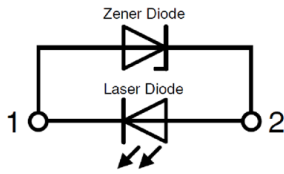


C67062-A0376-A1-01

## Further Information:

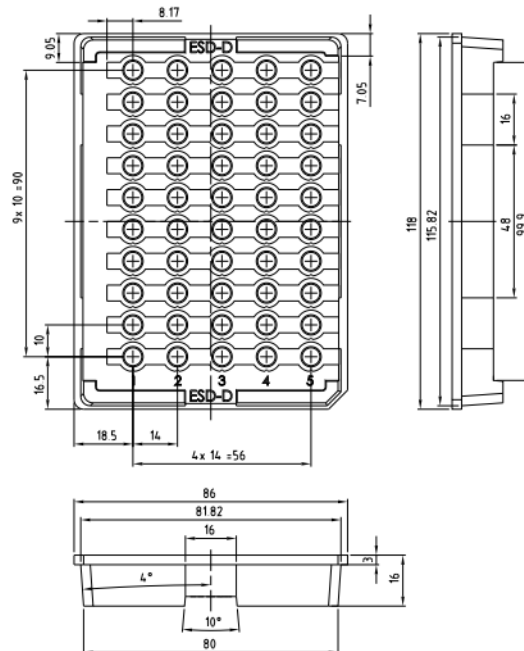
Approximate Weight: 1,000.0 mg

## Electrical Internal Circuit



Pin	Description
PIN 1	LD Cathode
PIN 2	LD Anode

## Taping <sup>7)</sup>



C63092-A4 382-X1-01

### Barcode-Product-Label (BPL)

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

RoHS Compliant

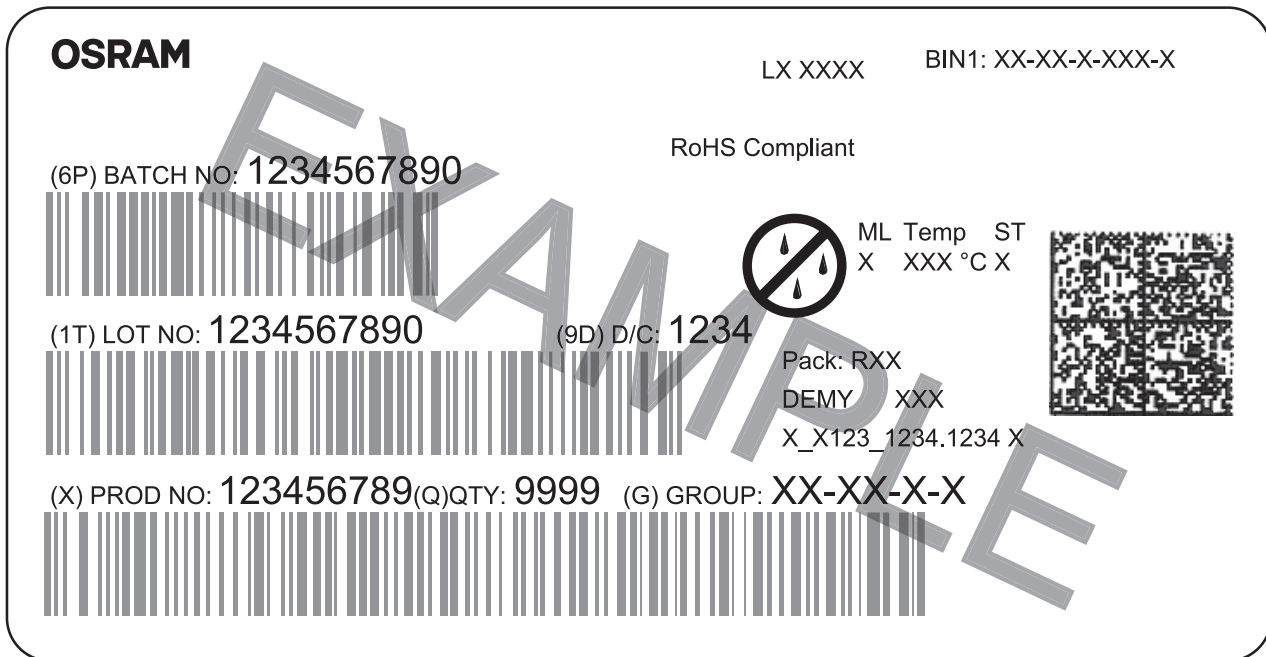
(6P) BATCH NO: 1234567890

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

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

ML Temp ST  
X XXX °C X

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

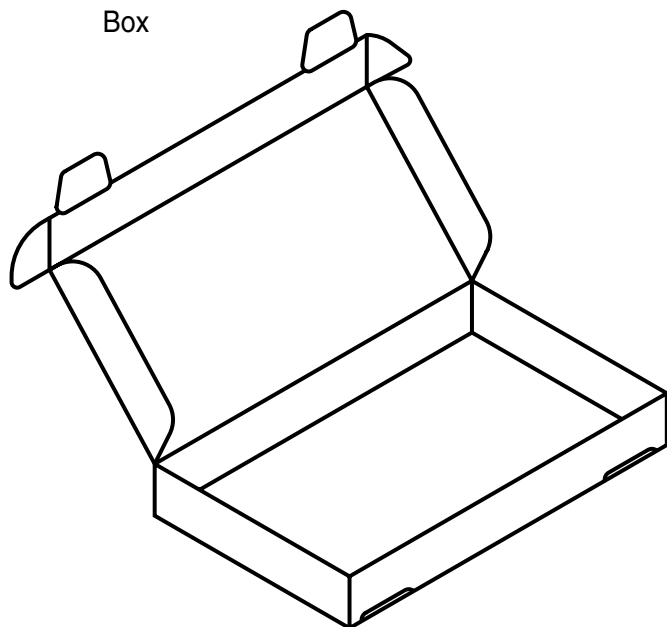


The diagram shows a rectangular label with rounded corners. It contains the OSRAM logo at the top left. To its right are the fields 'LX XXXX' and 'BIN1: XX-XX-X-XXX-X'. Below the logo is the text 'RoHS Compliant'. The label features three horizontal barcode sections. The first is labeled '(6P) BATCH NO: 1234567890'. The second is labeled '(1T) LOT NO: 1234567890' and '(9D) D/C: 1234'. The third is labeled '(X) PROD NO: 123456789 (Q) QTY: 9999 (G) GROUP: XX-XX-X-X'. To the right of the second barcode is a circular icon with a diagonal line and three raindrops, with the text 'ML Temp ST X XXX °C X' next to it. Below this icon is the text 'Pack: RXX', 'DEMY XXX', and 'X\_X123\_1234.1234 X'. A square QR code is located on the right side of the label.

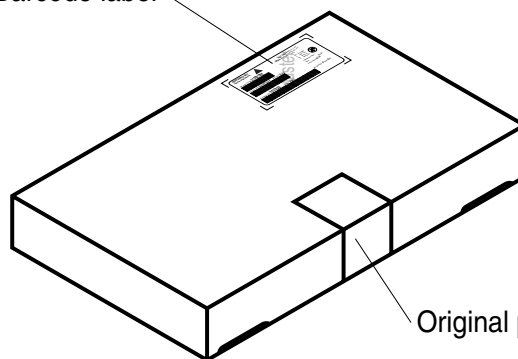
OHA04563

### Schematic Transportation Box <sup>7)</sup>

Box



Barcode label



Original packing label

OHA02886

## Dimensions of Transportation Box

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

### Notes

The evaluation of eye safety occurs according to the standard IEC 62471:2006 (photo biological safety of lamps and lamp systems). Within the risk grouping system of this IEC standard, the device specified in this data sheet fall into the class **exempt group (exposure time 10000 s)**. Under real circumstances (for exposure time, conditions of the 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. When looking at 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.

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.

### 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.

#### 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.

For further application related information please visit <https://ams-osram.com/support/application-notes>

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## Disclaimer

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For information on the types in question please contact our Sales Organization.

If printed or downloaded, please find the latest version on our website.

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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.

## Glossary

- 1) **Operating/Forward current:** IF is measured with an internal reproducibility of  $\pm 0.5$  mA (acc. to GUM with a coverage factor of  $k = 3$ ).
- 2) **Wavelength:**  $\lambda_{\text{peak}}$  is measured with an internal reproducibility of  $\pm 0.3$  nm (acc. to GUM with a coverage factor of  $k = 3$ ).
- 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
0.0	2024-03-13	Initial Version
0.1	2024-05-06	Maximum Ratings
0.2	2024-08-21	Characteristics
0.3	2024-10-14	Characteristics Wavelength Groups

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Preliminary datasheet 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。

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