OSRAM PLPT9 450MD_E

Datasheet

Published by ams-OSRAM AG
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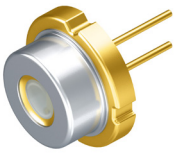
Metal Can

PLPT9 450MD_E

7 W Blue Laser Diode in TO90 Package



Applications

- Appliances & tools
- Digital diagnostic devices
- Entertainment
- Factory automation
- Material processing
- Outdoor & industrial lighting
- Projection & display
- Robotics

Features

- Emission wavelength: 434 - 470 nm
- Optical output power: 5 - 7 W (depending on wavelength)
- Efficient radiation source for cw and pulsed operation
- High optical efficiency
- TO90 package
- ESD protection diode
- Laser diode isolated against package

Ordering Information

Type with wavelength Group/ Bin information	Optical output power typ. P_{opt}	Wavelength range min. - max. $\lambda_{centroid}$	Ordering Code
PLPT9 450MD_E B53B60	7.0 W	434 - 450 nm	Q65115A2158
PLPT9 450MD_E B56B63	5.5 - 7.0 W	440 - 456 nm	Q65115A2161
PLPT9 450MD_E B59B66	5.5 - 7.0 W	446 - 462 nm	Q65115A2160
PLPT9 450MD_E B64B70	5.0 - 5.5 W	456 - 470 nm	Q65115A2159

Wavelength Groups and Output Power Range

T_C = 25 °C; wavelength measured at I_F = 3.5 A

Group/ Bin	Centroid wavelength min. $\lambda_{centroid}$	Centroid wavelength max. $\lambda_{centroid}$	Optical output power typ. P_{opt}
53	434 nm	436 nm	
54	436 nm	438 nm	
55	438 nm	440 nm	
56	440 nm	442 nm	
57	442 nm	444 nm	7.0 W typical at I_{op} = 3.7 A
58	444 nm	446 nm	
59	446 nm	448 nm	
60	448 nm	450 nm	
61	450 nm	452 nm	
62	452 nm	454 nm	
63	454 nm	456 nm	
64	456 nm	458 nm	5.5 W typical at I_{op} = 3.1 A
65	458 nm	460 nm	
66	460 nm	462 nm	
67	462 nm	464 nm	
68	464 nm	466 nm	
69	466 nm	468 nm	5.0 W typical at I_{op} = 3.5 A
70	468 nm	470 nm	

Maximum Ratings

Parameter	Symbol		Values
Operating temperature	T_{op}	min. max.	0 °C 60 °C
Storage temperature	T_{stg}	min. max.	-40 °C 85 °C
Junction temperature	T_j	max.	135 °C
Output power (Centroid wavelength 434 - 450 nm) (Centroid wavelength 450 - 462 nm; $P_{opt,max.}$ = 6.0 W) (Centroid wavelength 462 - 470 nm; $P_{opt,max.}$ = 5.5 W)	P_{opt}	max.	7.0 W
Forward current [1)]	I_F	max.	4.0 A
Reverse current	I_R	max.	20 mA
Soldering temperature	T_S	max.	260 °C

All listed parameters must be respected simultaneously.
Operation outside these conditions may lead to degradation or damage. Operation at maximum ratings may influence lifetime.

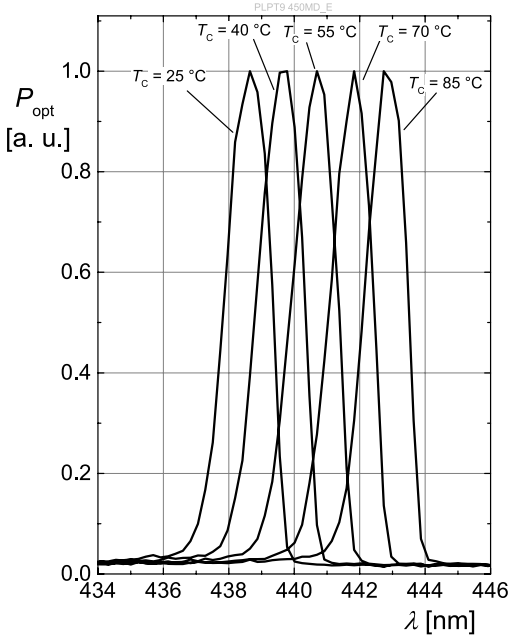
Characteristics

T_C = 25 °C

Parameter	Symbol		Values
Operating current [1] (P_{opt} = 7.0 W; 434 - 450 nm) (P_{opt} = 5.5 W; 450 - 462 nm: I_{op} = typ./max. 3.1 A/ 3.5 A) (P_{opt} = 5.0 W; 462 - 470 nm: I_{op} = typ./max. 3.5 A/ 4.0 A)	I_{op}	typ. max.	3.7 A 4.0 A
Operating voltage [2] (P_{opt} = 7.0 W; 434 - 450 nm) (P_{opt} = 5.5 W; 450 - 462 nm: V_{op} = typ./max. 4.0 V/ 4.8 V) (P_{opt} = 5.0 W; 462 - 470 nm: V_{op} = typ./max. 4.0 V/ 4.8 V)	V_{op}	typ. max.	4.1 V 4.8 V
Centroid wavelength [3] (I_F = 3.5 A)	$\lambda_{centroid}$	min. max.	434 nm 470 nm
Beam divergence (1/e²) parallel to pn-junction (I_F = 3.5 A)	$\Theta_{\parallel}$	min. typ. max.	6 ° 11 ° 13 °
Beam divergence (1/e²) perpendicular to pn-junction (I_F = 3.5 A; P_{opt} = 7.0 W; 434 - 450 nm) (P_{opt} = 5.5 W; 450 - 462 nm: $\Theta_{\perp}$ = min./typ./max. 41 °/ 49 °/ 57 °) (P_{opt} = 5.0 W; 462 - 470 nm: $\Theta_{\perp}$ = min./typ./max. 41 °/ 49 °/ 56 °)	$\Theta_{\perp}$	min. typ. max.	41 ° 54 ° 59 °
Threshold current (P_{opt} = 7.0 W; 434 - 450 nm) (P_{opt} = 5.5 W; 450 - 462 nm: I_{th} = typ./max. 0.30 A/ 0.45 A) (P_{opt} = 5.0 W; 462 - 470 nm: I_{th} = typ./max. 0.40 A/ 0.55 A)	I_{th}	typ. max.	0.30 A 0.45 A
TE polarization	P_{TE}	typ.	100:1
Thermal resistance junction case real	R_{thJC}	typ.	8 K / W

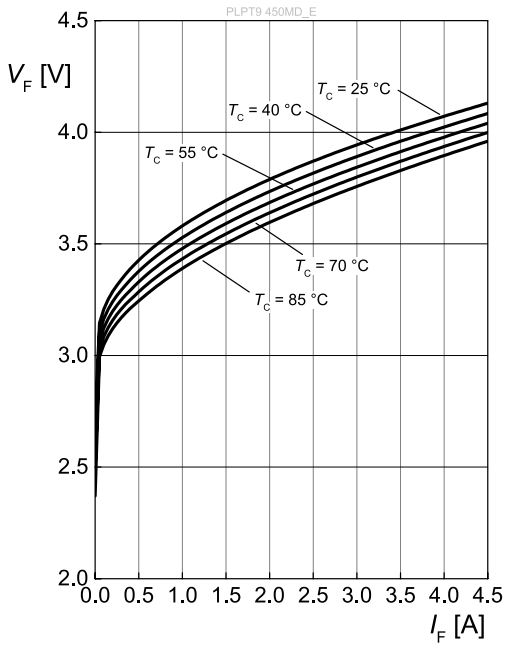
Relative Spectral Emission 4), 5)

$P_{opt} = f(\lambda)$; $I_F = 3.5$ A



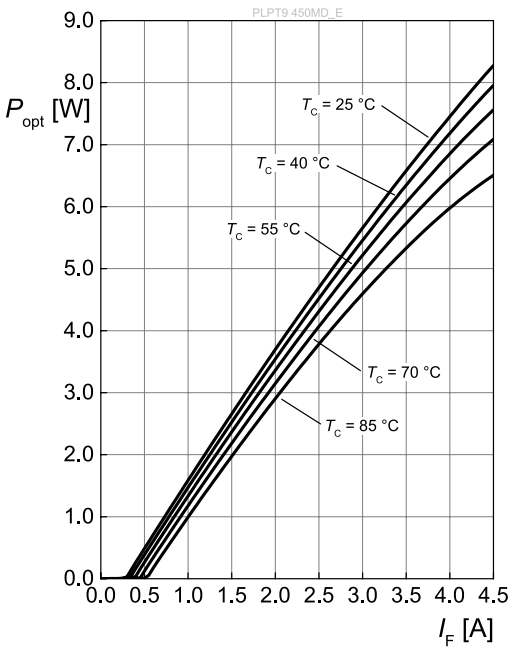
Forward Voltage 4), 5)

$V_F = f(I_F)$



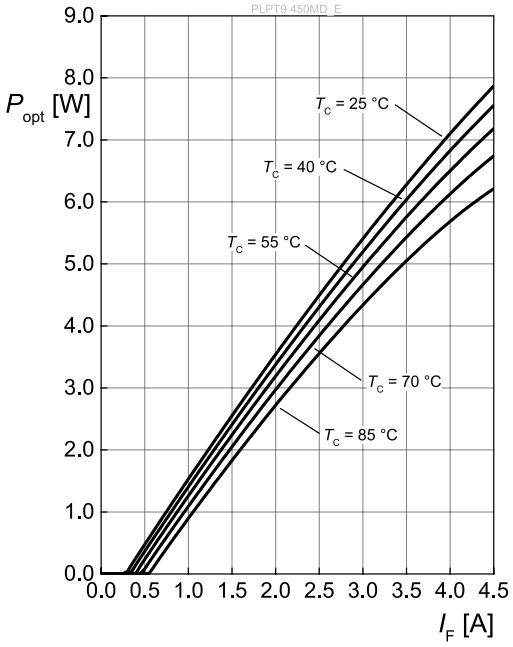
Optical Output Power 4), 5)

$P_{opt} = f(I_F)$; Centroid wavelength = 438 nm



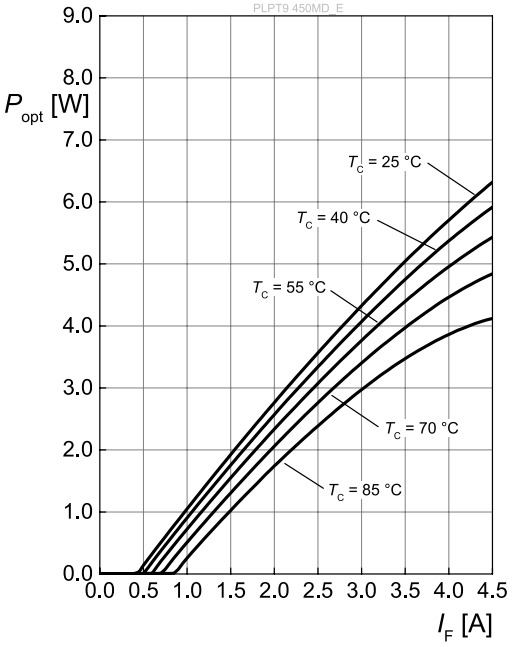
Optical Output Power [4], [5]

$P_{opt} = f(I_F)$; Centroid wavelength = 454 nm



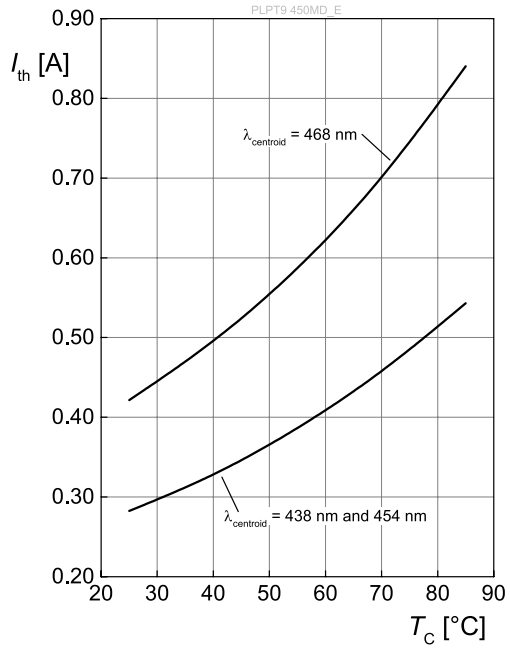
Optical Output Power [4], [5]

$P_{opt} = f(I_F)$; Centroid wavelength = 468 nm

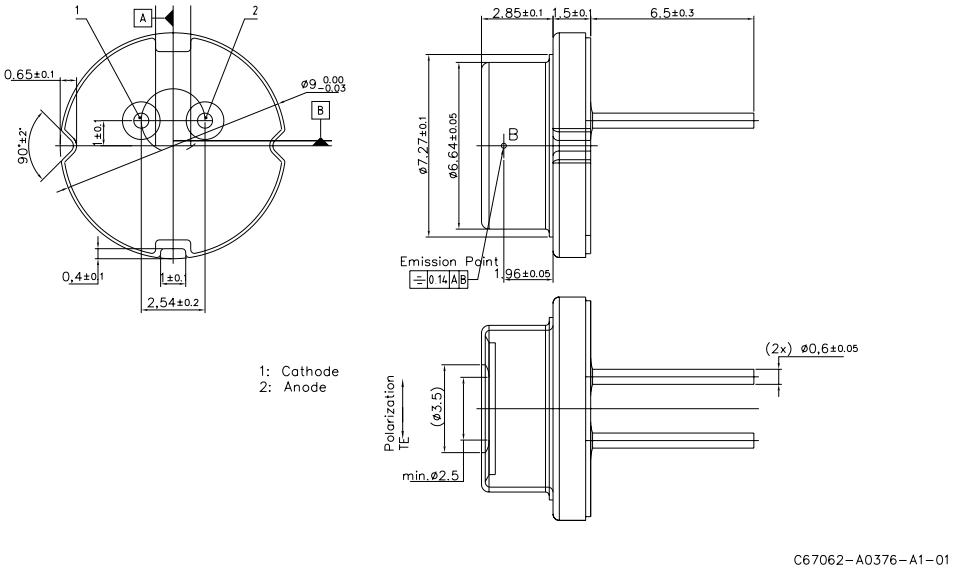


Threshold Current [4]

$I_{th} = f(T_C)$



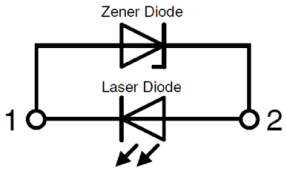
Dimensional Drawing [6)]



Further Information:

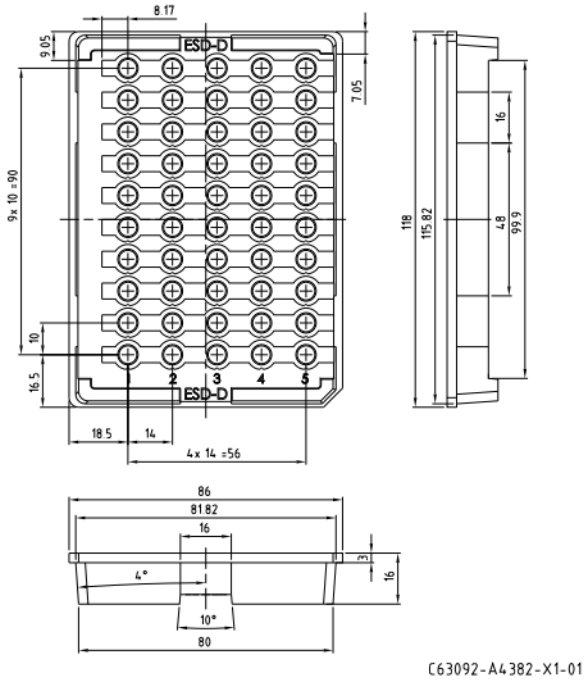
Approximate Weight: 1,180.0 mg

Electrical Internal Circuit

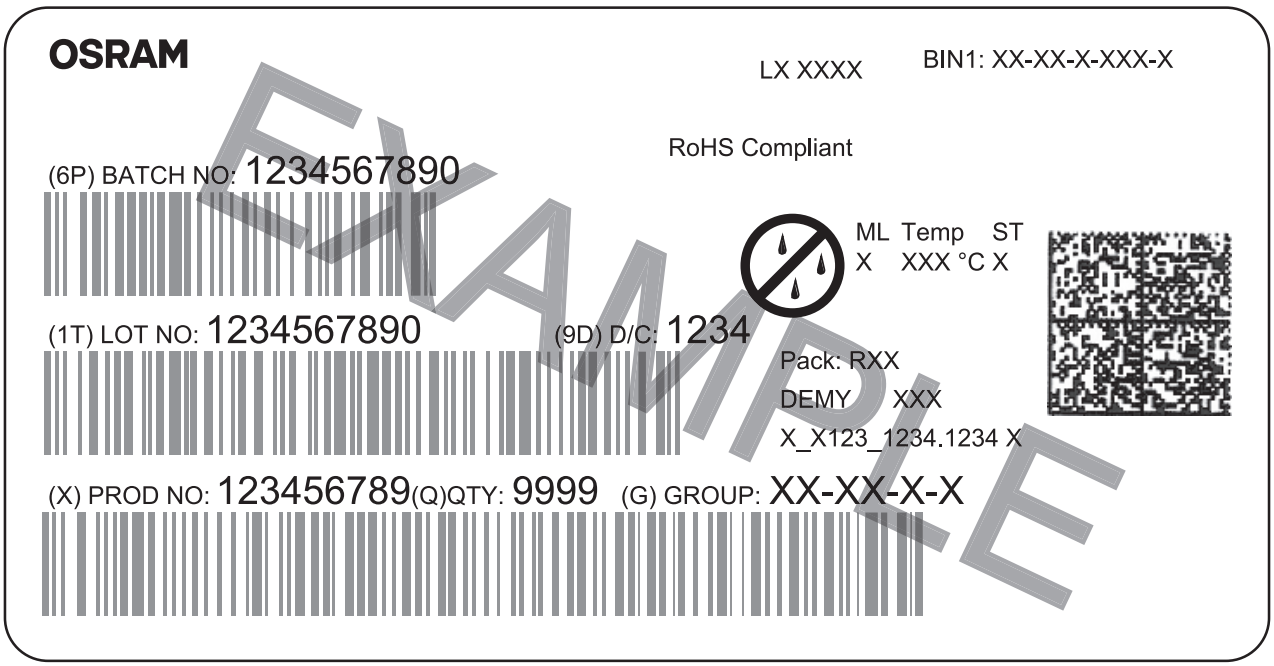


Pin	Description
PIN 1	LD Cathode
PIN 2	LD Anode

Taping [6)]



Barcode-Product-Label (BPL)



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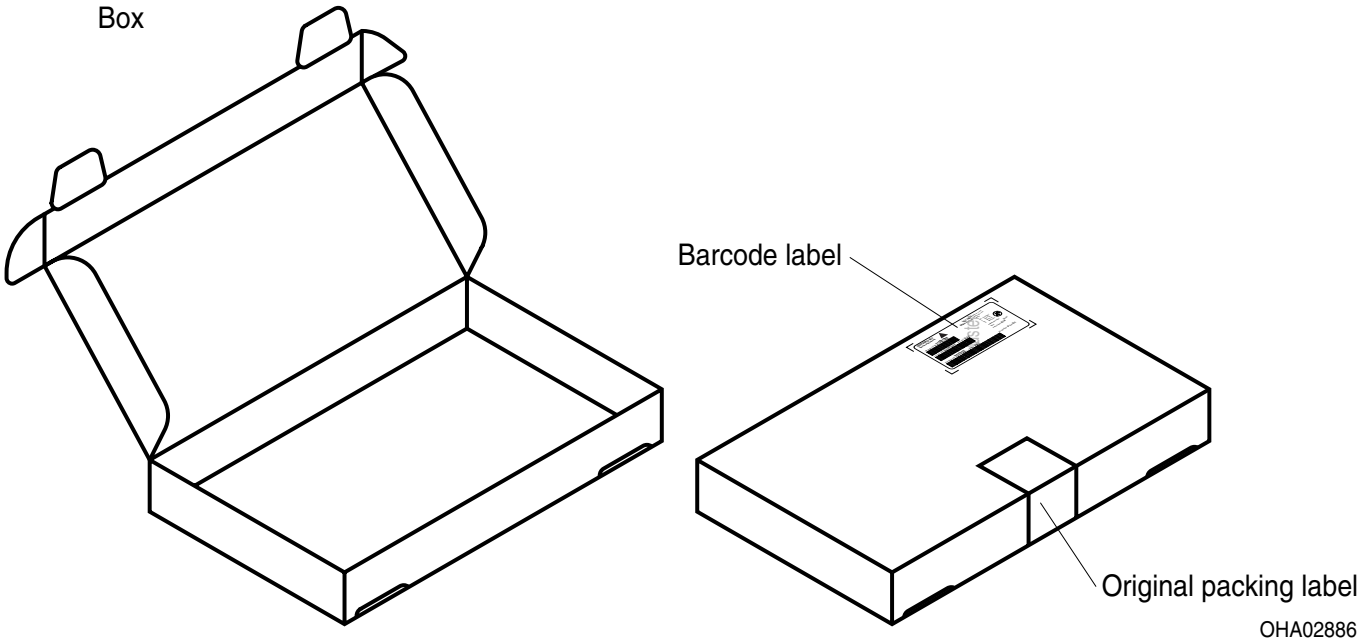
Schematic Transportation Box [6)]



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Dimensions of Transportation Box

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

Notes

Depending on the mode of operation, these devices emit highly concentrated visible and non visible light which can be hazardous to the human eye. Products which incorporate these devices have to follow the safety precautions given in IEC 60825-1.

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

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.

Revision History

Version	Date	Change
1.0	2026-02-11	Initial Version

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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