

Blue Laser Diode in TO90 Package

Version a.2

PLPT9 450D_E A01



Features

- Typ. emission wavelength 447 nm
- Efficient radiation source for cw and pulsed operation
- TO90 package
- ESD protection diode
- Laser diode isolated against package

Applications

- Laser projection
- Laser shows
- Illumination
- Metrology

Safety Advice

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 60825-1 "Safety of laser products".



ATTENTION – Observe Precautions For Handling – Electrostatic Sensitive Device

Ordering Information

Type:	Optical Output Power P_{opt} ($T_{\text{case}} = 25\text{ °C}$)	Ordering Code
PLPT9 450D_E A01	3.5 W	–

Maximum Ratings

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

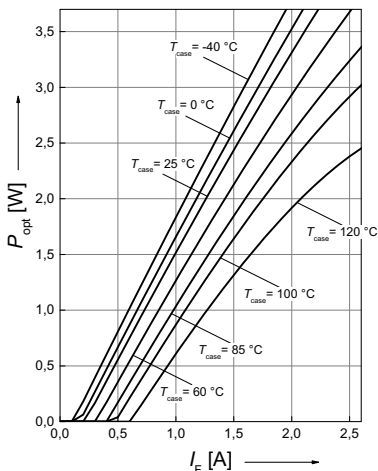
Parameter	Symbol	Values		Unit
		min.	max.	
Optical Output Power	$P_{\text{opt max}}$		3.7	W
Operating Current ^{1) page 6}	I_F		2.6	A
Operating Temperature ^{1) page 6}	T_{case}	-40	+120	°C
Storage Temperature	T_{stg}	-40	+135	°C
Reverse Current	I_R		20	mA
Soldering Temperature max. 10 sec.	T_{solder}		260	°C
Junction Temperature	T_j		160	°C

Laser Characteristics ($T_{\text{case}} = 25\text{ °C}$)

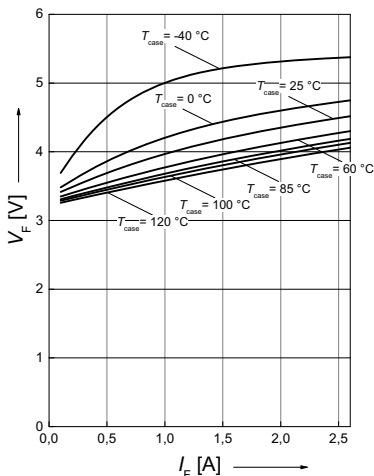
Parameter	Symbol	Values ^{2) page 6}			Unit	
		min.	typ.	max.		
Emission Wavelength ($P_{\text{opt}} = 3.5\text{ W}$) ^{3) page 6}	B1 B2 B3 B4 B5 B6 B7	λ_{peak}	440 442 444 446 448 450 452	– – – – – – –	442 444 446 448 450 452 455	nm nm nm nm nm nm nm
Threshold Current	I_{th}	–	0.25	0.40	A	
Optical Output Power ($I_F = 2.1\text{ A}$) ^{3) page 6}	P_{opt}	–	3.5	–	W	
Operating Current ($P_{\text{opt}} = 3.5\text{ W}$) ^{3) page 6}	I_F	–	2.1	2.5	A	
Forward Voltage ($P_{\text{opt}} = 3.5\text{ W}$) ^{3) page 6}	V_F	–	–	5.5	V	
Beam Divergence ($P_{\text{opt}} = 3.5\text{ W}$) Full angle at $1/e^2$ from peak intensity	θ_{\parallel} x θ_{\perp}	–	7 x 49	–	deg	
Polarization ($P_{\text{opt}} = 3.5\text{ W}$)	PR	–	100:1	–	TE:TM	
Thermal Resistance (junction to case)	R_{th}	–	10	–	K/W	
Total Power Dissipation	P_{tot}	–	6.75	–	W	

Optical Output Power ²⁾ page 6

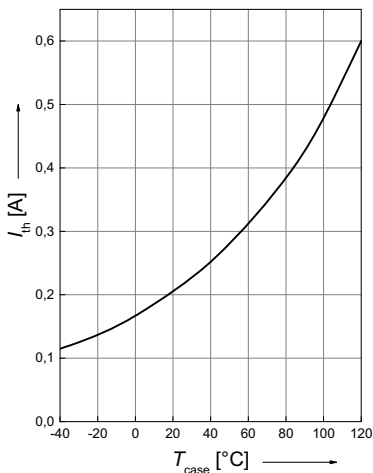
$$P_{\text{opt}} = f(I_F)$$

**Forward Voltage** ²⁾ page 6

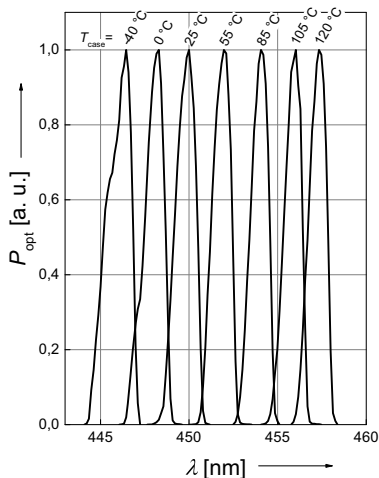
$$V_F = f(I_F)$$

**Threshold Current** ²⁾ page 6

$$I_{\text{th}} = f(T_{\text{case}})$$

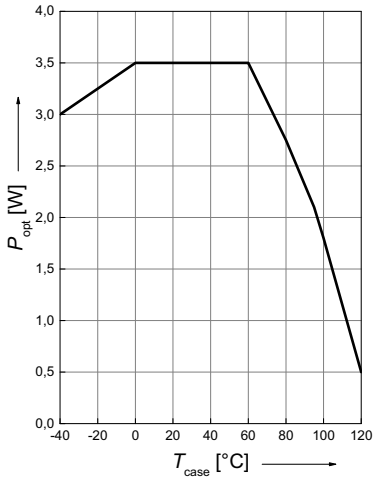
**Relative Spectral Emission** ²⁾ page 6

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

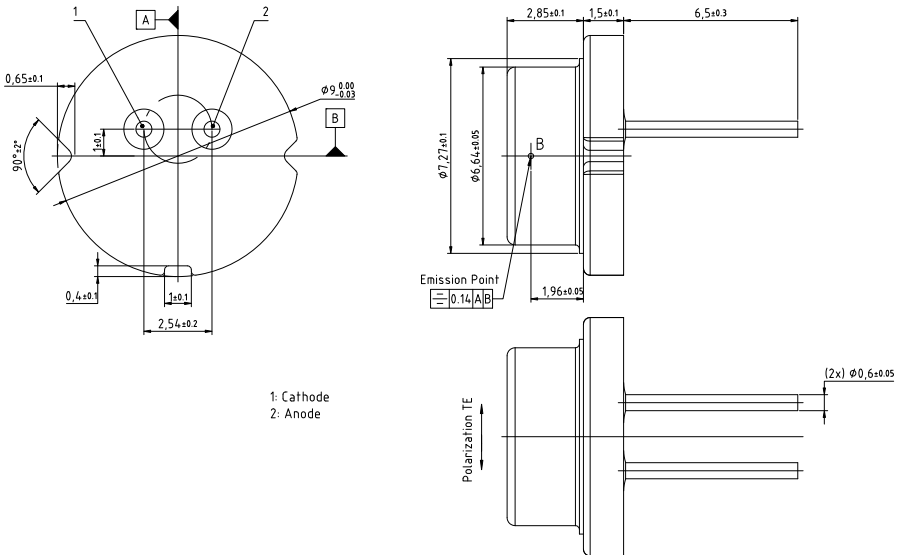


Max. Permissible Opt. Output Power ^{1) 2)} page 6

$$P_{\text{opt}} = f(T_{\text{case}})$$



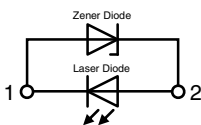
Package Outline



E062.5902.06-01

Dimensions in mm

Pin Connection



Pin 1: LD Cathode
Pin 2: LD Anode

Disclaimer

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Packing

Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office.

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Critical components* may only be used in life-support devices** or systems with the express written approval of OSRAM OS.

*) A critical component is a component used in a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or the effectiveness of that device or system.

**) Life support devices or systems are intended (a) to be implanted in the human body, or (b) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health and the life of the user may be endangered.

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.

Glossary

- 1) **Case temperatures:** At case temperature higher than 60°C we recommend a derating of the maximum operation current in order to not exceed the maximum junction temperature T_j .
- 2) **Typical values:** Due to the special conditions of the manufacturing processes of laser diodes, 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.
- 3) **Reproducibility:** P_{opt} , λ_{peak} , and V_F is measured with an internal reproducibility of $\pm 7\%$, ± 0.3 nm, and ± 0.05 V, respectively (acc. to GUM with a coverage factor of $k = 3$).

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