

# Passiv gekühlter Diodenlaser-Barren, 50 W cw bei 915 nm Passively Cooled Diode Laser Bar, 50 W cw at 915 nm

**SPL MN91G2**



## Vorläufiges Datenblatt / Preliminary Data Sheet

### Besondere Merkmale

- Laserbarren auf passiv gekühlter Wärmesenke, kein Kühlwasser erforderlich
- Für Dauerstrich- (CW) und quasi-kontinuierlichen Betrieb (QCW)
- Zuverlässiges Halbleiter-Material mit Mindest-Lebensdauer von 10.000 h, typischerweise >50.000 h
- Geringer thermischer Widerstand
- Geringer smile ( $< 2,5 \mu\text{m}$ ), geringe mechanische Toleranzen

### Anwendungen

- Pumpen von Festkörperlasern
- Direkte industrielle Anwendungen (Löten, Oberflächenbehandlung,...)
- Medizinische Anwendungen
- Druckanwendungen

### Sicherheitshinweise

Je nach Betriebsart emittieren diese Bauteile hochkonzentrierte, nicht sichtbare Infrarot-Strahlung, die gefährlich für das menschliche Auge sein kann. Produkte, die diese Bauteile enthalten, müssen gemäß den Sicherheitsrichtlinien der IEC-Norm 60825-1 behandelt werden

### Features

- Laser bar mounted on passive mount, no water required
- For continuous wave (cw) and quasi continuous wave (qcw) operation
- Highly reliable semiconductor material with minimum life time of 10,000 h, typically >50,000 h
- Low thermal resistance
- Low smile ( $< 2.5 \mu\text{m}$ ) and low mechanical tolerances

### Applications

- Pumping of solid state lasers
- Direct industrial applications (soldering, surface treatment,...)
- Medical applications
- Printing applications

### Safety Advices

Depending on the mode of operation, these devices emit highly concentrated non visible infrared 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 "Safety of laser products".

| Type<br>Type | Anzahl Barren<br>Bar count | Wellenlänge<br>Wavelength | Bestellnummer<br>Ordering Code |
|--------------|----------------------------|---------------------------|--------------------------------|
| SPL MN91G2   | 1                          | 915 nm                    | Q65110A4159                    |

**Grenzwerte**  
**Maximum Ratings**

| Parameter<br>Parameter                                               | Symbol<br>Symbol | Werte<br>Values |      | Einheit<br>Unit |
|----------------------------------------------------------------------|------------------|-----------------|------|-----------------|
|                                                                      |                  | min.            | max. |                 |
| Ausgangsleistung<br>Optical output power                             | $P_{\max}$       | —               | 55   | W               |
| Tastverhältnis<br>Duty cycle                                         | $dc$             | —               | 100  | %               |
| Wärmesenktemperatur <sup>1)</sup><br>Mount temperature <sup>1)</sup> | $T_{\text{op}}$  | 5               | 40   | °C              |

<sup>1)</sup> Betauung des Moduls muss ausgeschlossen werden.  
Prevent moisture on the module.

**Dioden-Kennwerte** (25 °C Wärmesenktemperatur)**Diode Characteristics** (25 °C mount temperature)

| Parameter<br>Parameter                                                                                                    | Symbol<br>Symbol         | Werte<br>Values |          |      | Einheit<br>Unit |
|---------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------|----------|------|-----------------|
|                                                                                                                           |                          | min.            | typ.     | max. |                 |
| Optische Ausgangsleistung <sup>1)</sup><br>Optical output power <sup>1)</sup>                                             | $P_{\text{opt}}$         | –               | 50       | –    | W               |
| Emissionswellenlänge <sup>1) 2)</sup><br>Emission wavelength <sup>1) 2)</sup>                                             | $\lambda$                | 912             | 915      | 918  | nm              |
| Spektrale Breite (Halbwertsbreite) <sup>1)</sup><br>Spectral width (FWHM) <sup>1)</sup>                                   | $\Delta\lambda$          | –               | 3        | 5    | nm              |
| Schwellstrom<br>Threshold current                                                                                         | $I_{\text{th}}$          | –               | 12       | 14   | A               |
| Kennliniensteigung<br>Slope efficiency                                                                                    | $\Delta P/\Delta I$      | –               | 1.10     | –    | W/A             |
| Betriebsstrom <sup>1)</sup><br>Operating current <sup>1)</sup>                                                            | $I_{\text{op}}$          | –               | 57       | –    | A               |
| Betriebsspannung <sup>1) 3)</sup><br>Operating voltage <sup>1) 3)</sup>                                                   | $V_{\text{op}}$          | –               | 1.6      | –    | V               |
| Konversionseffizienz (elektrisch zu optisch) <sup>1)</sup><br>Conversion efficiency (electrical to optical) <sup>1)</sup> | $\eta_{\text{con}}$      | –               | 55       | –    | %               |
| Temperaturkoeffizient der Wellenlänge <sup>1) 2)</sup><br>Temperature coefficient of wavelength <sup>1) 2)</sup>          | $\Delta\lambda/\Delta T$ | –               | 0.28     | –    | nm/K            |
| Strahldivergenz senkrecht (Vollwinkel, 1/e <sup>2</sup> )<br>Beam divergence fast axis (full angle, 1/e <sup>2</sup> )    | $\theta_{\perp}$         | –               | 70       | –    | deg             |
| Strahldivergenz parallel (Vollwinkel, 1/e <sup>2</sup> )<br>Beam divergence slow axis (full angle, 1/e <sup>2</sup> )     | $\theta_{\parallel}$     | –               | 8        | –    | deg             |
| TE Polarisation<br>TE Polarization                                                                                        | $P_{\text{TE}}$          | 90              | –        | –    | %               |
| Thermischer Widerstand<br>(pn-Übergang - Wärmesenke)<br>Thermal resistance (junction to mount)                            | $R_{\text{th}}$          | –               | 0.5      | –    | K/W             |
| Strahlabmessungen am optischen Austritt<br>Beam dimensions at optical output                                              | $h \times w$             | –               | 0.001x10 | –    | mm <sup>2</sup> |

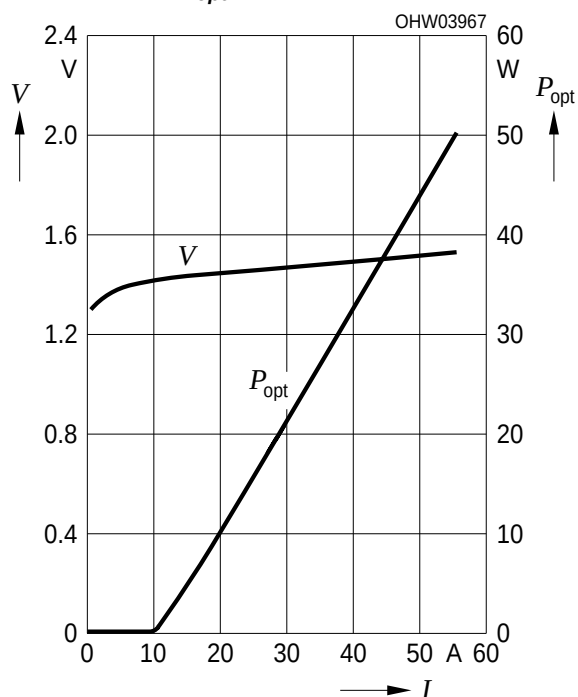
<sup>1)</sup> Werte beziehen sich auf die Standardbetriebsbedingung 50 W cw Ausgangsleistung, 25°C Wärmesenktemperatur.

Values refer to standard operating conditions of 50 W cw output power, 25°C mount temperature.

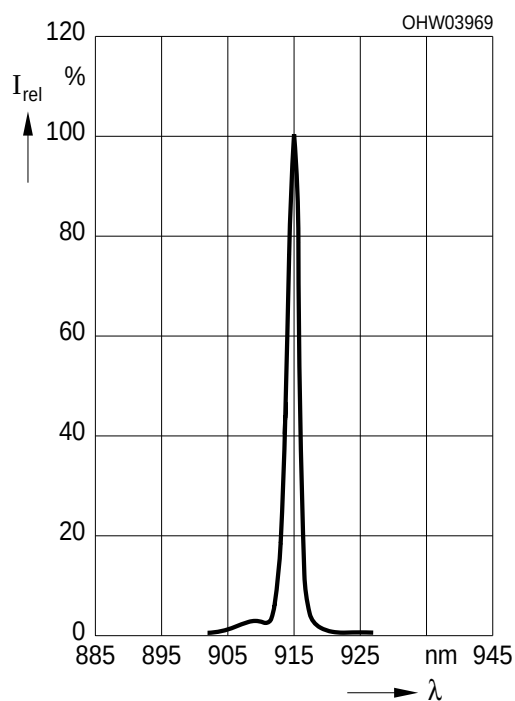
- <sup>2)</sup> Die zentrale Emissionswellenlänge muss beim spezifizierten Strom kontrolliert werden. Liegt die Wellenlänge höher als im Testprotokoll spezifiziert, so weist dies auf einen schlechten thermischen Kontakt und eine thermische Überlastung der Laserdiode hin. Bevor der Laserbetrieb weitergeführt wird, muss der thermische Kontakt verbessert werden. Die zentrale Emissionswellenlänge schiebt mit 0,28 nm/K.  
Check the emission wavelength at the specified current. A much longer wavelength than specified in the test protocol indicates inefficient or inadequate cooling and thermal overload of the diode laser. Then the cooling has to be improved before continuing laser operation. The emission wavelength shifts with 0.28 nm/K.
- <sup>3)</sup> Das Anlegen einer Spannung in Sperrrichtung der Laserdiode muss ausgeschlossen werden.  
Reverse voltage has to be excluded.

**Optische Kennwerte (cw, 25°C Wärmesenktemperatur)**  
**Optical Characteristics (cw, 25°C mount temperature)**

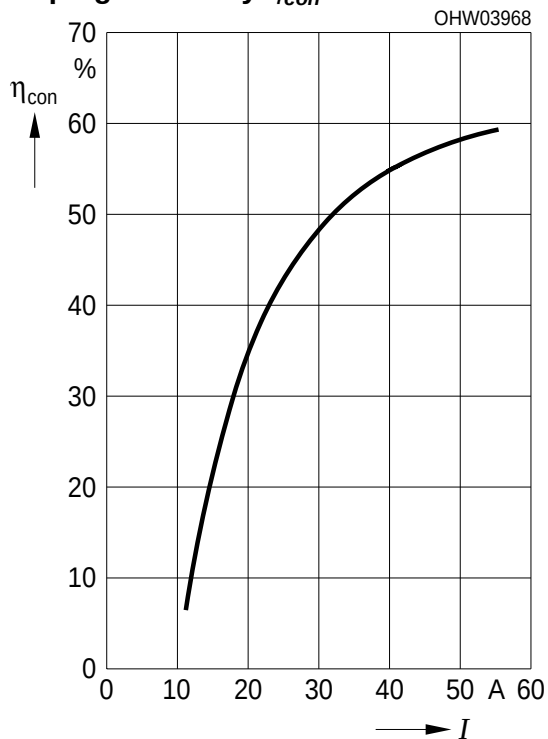
**Optical power  $P_{opt}$  and voltage  $V$  vs. current  $I$**



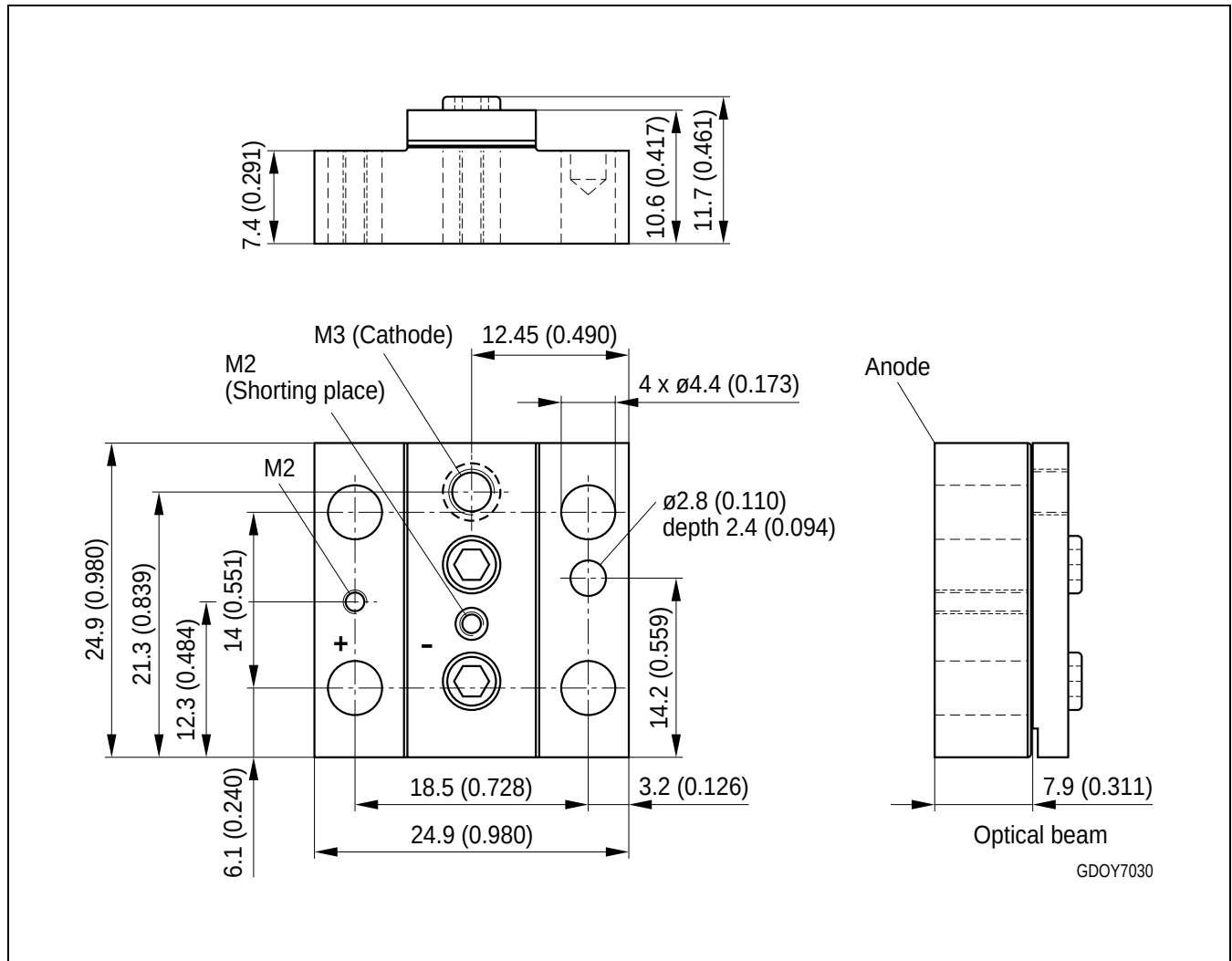
**Optical Spectrum @ 50 W**



**Wallplug efficiency  $\eta_{con}$  vs. current  $I$**



# Maßzeichnung Package Outlines



Maße in mm (Zoll) / Dimensions in mm (inch).

Allgemeintoleranz / General Tolerance:  $\pm 0.2$  mm (0.008 inch)

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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.

#### 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.

**Components used in life-support devices or systems must be expressly authorized for such purpose!** Critical components <sup>1</sup>, may only be used in life-support devices or systems <sup>2</sup> with the express written approval of OSRAM OS.

<sup>1</sup> 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 effectiveness of that device or system.

<sup>2</sup> 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 of the user may be endangered.



"This product contains lead (Pb) in the chip solder connection"  
按照中国的相关法规和标准，此产品的晶片焊锡连接含有铅。