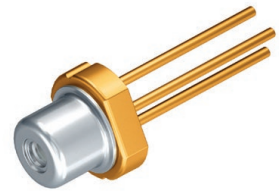


# PL 520

## Metal Can® TO38

Green Laser Diode in TO38 ICut Package



### Applications

- Health Monitoring (Heart Rate Monitoring, Pulse Oximetry)
- Projection Home LED & Laser
- Projection Professional LED & Laser

### Features:

- Optical output power (continuous wave): 30 / 50 mW ( $T_{case}=25^{\circ}C$ )
- Typical emission wavelength: 512 / 520 nm
- Efficient radiation source for cw and pulsed operation
- Single transverse mode semiconductor laser
- High modulation bandwidth
- Miniaturized TO38 ICut package
- Laser diode isolated against package

### Ordering Information

| Type        | Peak output power <sup>1)</sup><br>typ.<br>$P_{opt}$ | Ordering Code |
|-------------|--|---------------|
| PL 520_B1   | 50 mW  | Q65111A2445   |
| PL 520_B1_2 | 30 mW  | Q65111A3559   |

## Maximum Ratings

 $T_C = 25\text{ °C}$ 

| Parameter  | Symbol    |      | Values |
|--|-----------|------|--------|
| Operating temperature                            | $T_{op}$  | min. | -20 °C |
|  |           | max. | 60 °C  |
| Storage temperature                              | $T_{stg}$ | min. | -40 °C |
|  |           | max. | 85 °C  |
| Junction temperature                             | $T_j$     | max. | 120 °C |
| Forward current <sup>2)</sup>                    | $I_F$     | max. | 200 mA |
| Reverse voltage <sup>3)</sup>                    | $V_R$     | max. | 2 V    |
| Soldering temperature<br>$t_{max} = 10\text{ s}$ | $T_S$     | max. | 260 °C |

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

## Characteristics

$P_{\text{opt}} = 30 \text{ mW}$  (B2),  $P_{\text{opt}} = 50 \text{ mW}$  (B1);  $T_{\text{case}} = 25 \text{ °C}$

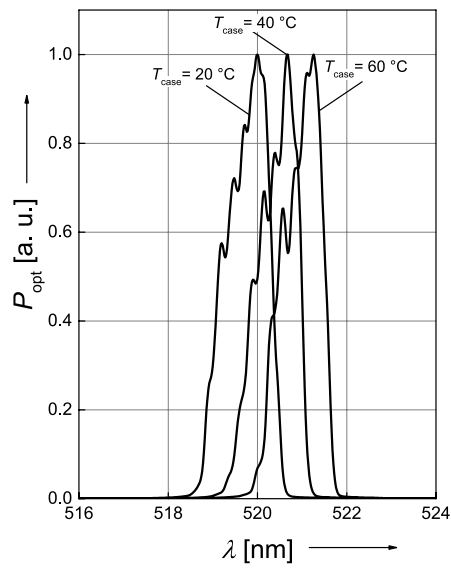
| Parameter   | Symbol               |                      | Values               |
|---|----------------------|----------------------|----------------------|
| Reverse current <sup>3)</sup>                       | $I_{\text{R}}$       | max.                 | 10 $\mu\text{A}$     |
| Forward current <sup>2)</sup><br>B1                 | $I_{\text{F}}$       | typ.<br>max.         | 125 mA<br>160 mA     |
| Forward current <sup>2)</sup><br>B2                 | $I_{\text{F}}$       | typ.<br>max.         | 100 mA<br>140 mA     |
| Spectral bandwidth at 50% $I_{\text{e,rel,max}}$    | $\Delta\lambda$      | typ.                 | 02 nm                |
| Beam divergence (FWHM) parallel to pn-junction      | $\Theta_{\parallel}$ | min.<br>typ.<br>max. | 5 °<br>7 °<br>9 °    |
| Beam divergence (FWHM) perpendicular to pn-junction | $\Theta_{\perp}$     | min.<br>typ.<br>max. | 19 °<br>22 °<br>25 ° |
| Threshold current<br>B1                             | $I_{\text{th}}$      | typ.<br>max.         | 45 mA<br>75 mA       |
| Threshold current<br>B2                             | $I_{\text{th}}$      | typ.<br>max.         | 50 mA<br>75 mA       |
| Forward voltage <sup>4)</sup><br>B1                 | $V_{\text{F}}$       | typ.<br>max.         | 6.9 V<br>8.0 V       |
| Forward voltage <sup>4)</sup><br>B2                 | $V_{\text{F}}$       | typ.<br>max.         | 6.5 V<br>8.0 V       |
| TE polarization                                     | $P_{\text{TE}}$      | typ.                 | 100:1                |
| Modulation frequency                                | f                    | min.                 | 100                  |
| Thermal resistance junction case real               | $R_{\text{thJC}}$    | typ.                 | 38 K / W             |

## Peak Wavelength

| Group | Peak wavelength <sup>5)</sup><br>min.<br>$\lambda_{\text{peak}}$ | Peak wavelength <sup>5)</sup><br>max.<br>$\lambda_{\text{peak}}$ |
|-------|--|--|
| B2    | 510 nm   | 530 nm   |
| B1    | 515 nm   | 530 nm   |

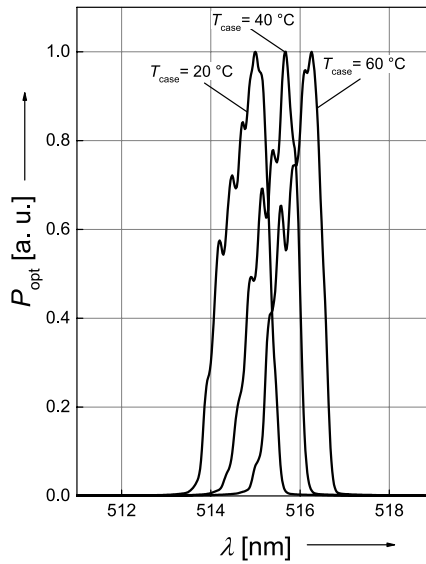
## Relative Spectral Emission <sup>6), 7)</sup>

B1:  $P_{\text{opt}} = f(\lambda)$ ;  $T_{\text{case}} = 25^\circ\text{C}$



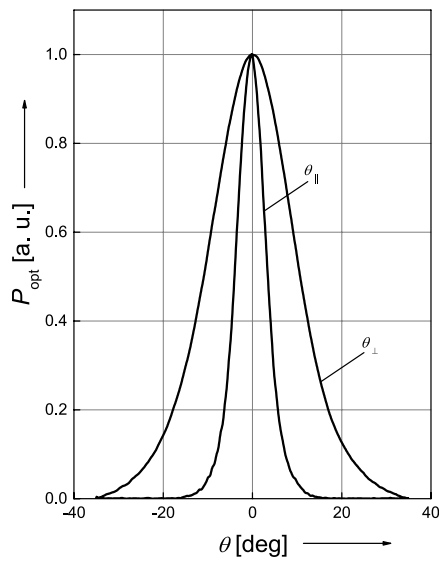
**Relative Spectral Emission** (6), 7)

$P_{opt} = f(\lambda); T_{case} = 25^{\circ}\text{C}$



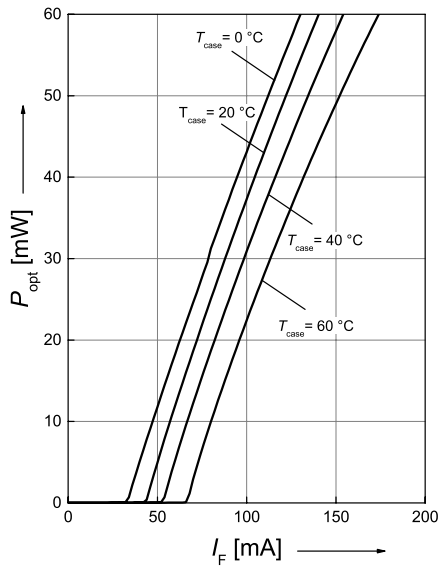
**Beam Divergence** (6), 7)

$P_{opt} = f(\Theta); T_{case} = 25^{\circ}\text{C}$



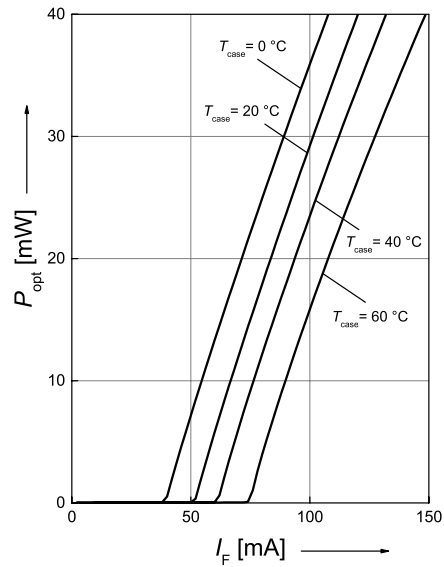
**Optical Output Power** 6), 7)

B1:  $P_{opt} = f(I_F)$ ;  $T_{case} = 25^\circ\text{C}$



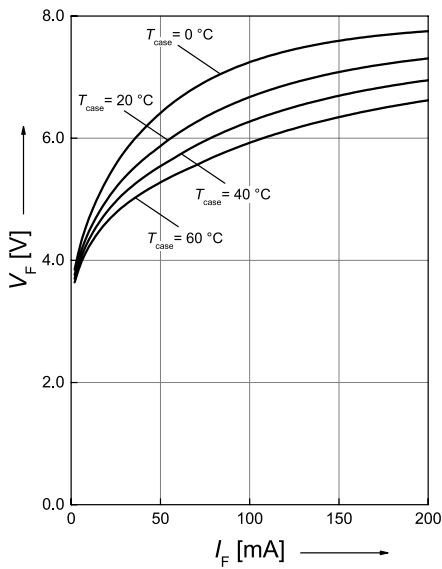
**Optical Output Power** 6), 7)

B2:  $P_{opt} = f(I_F)$ ;  $T_{case} = 25^\circ\text{C}$



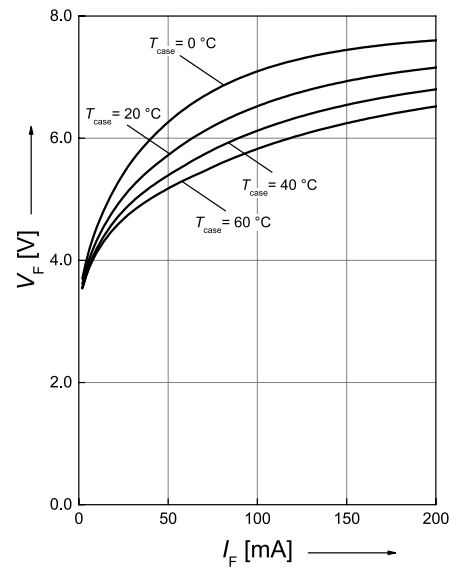
**Opt. Power / Forward Voltage** 6), 7)

B1:  $V_F = f(I_F)$ ;  $T_{case} = 25^\circ\text{C}$



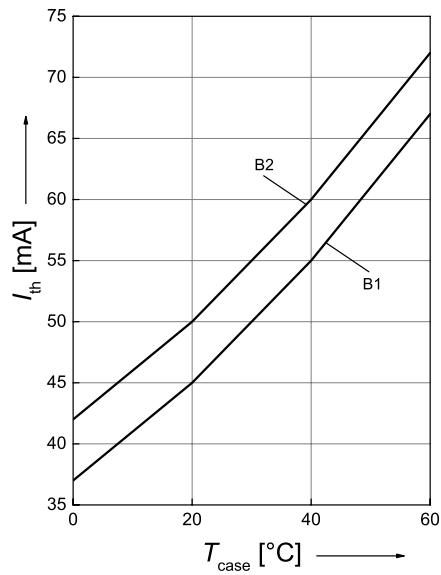
**Opt. Power / Forward Voltage** 6), 7)

B2:  $V_F = f(I_F)$ ;  $T_{case} = 25^\circ\text{C}$

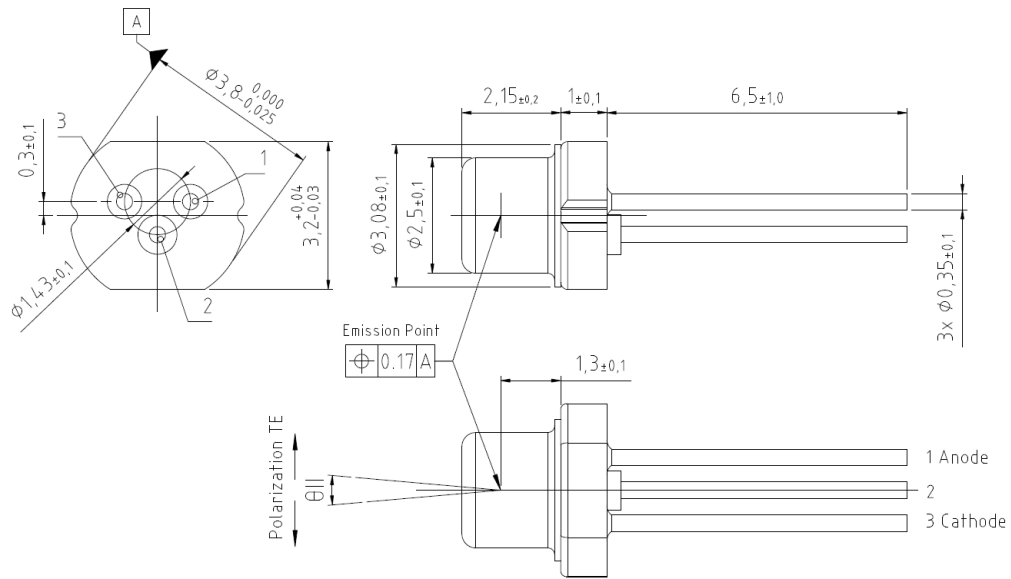


## Threshold Current

$$I_F = f(T)$$



**Dimensional Drawing** 8)



C63062-A4180-A1 -03

**Approximate Weight:** 0.0 g

**ESD advice:** ATTENTION – Observe Precautions For Handling – Electrostatic Sensitive Device.



---

## 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.

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

## 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 the OSRAM OS 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 safety devices/applications or medical devices/applications**

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

In case Buyer – or Customer supplied by Buyer– considers using OSRAM OS components in product safety devices/applications or medical devices/applications, Buyer and/or Customer has to inform the local sales partner of OSRAM OS immediately and OSRAM OS and Buyer and /or Customer will analyze and coordinate the customer-specific request between OSRAM OS and Buyer and/or Customer.

---

## Glossary

- 1) **Testcondition:** Tests are carried out at 25 °C.
- 2) **Operating/Forward current:** IF is measured with an internal reproducibility of  $\pm 7\%$  (acc. to GUM with a coverage factor of  $k = 3$ ).
- 3) **Reverse Operation:** Reverse Operation of 10 hours is permissible in total. Continuous reverse operation is not allowed.
- 4) **Operating/Forward voltage:** VF is measured with an internal reproducibility of  $\pm 0.05\text{ V}$  (acc. to GUM with a coverage factor of  $k = 3$ ).
- 5) **Wavelength:**  $\lambda_{\text{peak}}$  is measured with an internal reproducibility of  $\pm 0.3\text{ nm}$  (acc. to GUM with a coverage factor of  $k = 3$ ).
- 6) **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.
- 7) **Testing temperature:**  $T_A = 25^\circ\text{C}$
- 8) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with  $\pm 0.1$  and dimensions are specified in mm.

Published by OSRAM Opto Semiconductors GmbH EU RoHS and China RoHS compliant product  
Leibnizstraße 4, D-93055 Regensburg  
www.osram-os.com © All Rights Reserved.



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。