SPL LL90_3

Radial Smart Laser

Hybrid Pulsed Laser Diode with Integrated Driver Stage 905 nm, 70 W Peak Power

Applications

- Electronic Equipment
- Equipment Illumination (e.g. Curing, Endoscope)
- Highbay Industrial
- Industrial Automation (Machine Controls, Light Barriers, Vision Controls)
- LIDAR, Pre-Crash, ACC
- Safety and Security, CCTV

Features:

- Qualifications: The product qualification test plan is based on the guidelines of AEC-Q101-REV-C, Stress Test Qualification for Automotive Grade Discrete Semiconductors.
- Laser wavelength 905 nm
- Low cost, small size plastic package
- Integrated FET and capacitors for pulse control
- Strained InAlGaAs/GaAs QW-structures
- High power large-optical-cavity laser structure
- Nanostack laser technology including multiple epitaxially stacked emitters
- High-speed operation (< 30 ns pulse width)
- Low supply voltage (< 20 V)

Ordering Information

Type	Peak output power typ. $t_p \geq 50$ ns; f = 1 kHz; V_C = 18.5 V; V_G = 15 V P_{opt}	Ordering Code
SPL LL90_3	70 W	Q65110A1009

Maximum Ratings

short time operation, T_A = 25°C

Parameter	Symbol		Values
Operating Temperature	T_{op}	min. max.	-40 °C 100 °C
Storage Temperature	T_{stg}	min. max.	-40 °C 100 °C
Junction temperature [1)]	T_j	max.	105 °C
Peak output power	P_{opt}	max.	80 W
Duty cycle	dc	max.	0.1 %
Gate voltage	V_G	min. max.	-20 V 20 V
Charge voltage V_G = 15 V	V_C	max.	20 V
Reverse voltage [2)]	V_R	max.	12 V
Soldering temperature t_{max} = 10 s	T_S	max.	260 °C

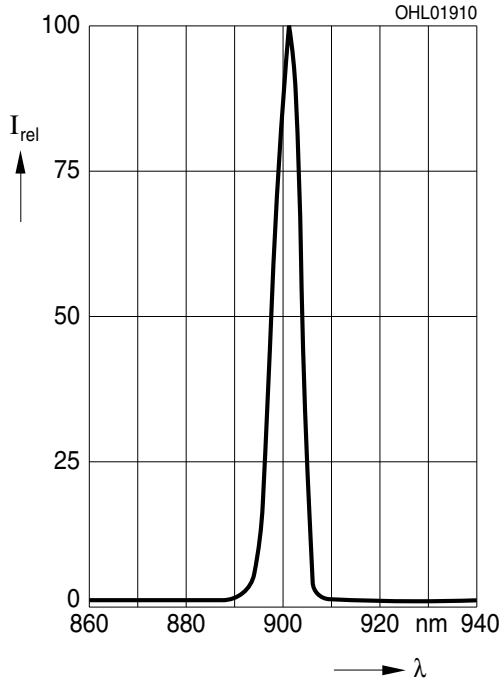
Characteristics

$t_p \geq 50$ ns; f = 1 kHz; V_C = 18.5 V; V_G = 15 V

Parameter	Symbol		Values
Peak wavelength [3]	λ_{peak}	typ.	905 nm 915 nm 895 nm
Reverse current [2]	I_R	max.	10 µA
Number of emitters	n	typ.	3
Spectral bandwidth at 50% $I_{rel,max}$ [3]	$\Delta\lambda$	typ.	7 nm
Peak output power [3]	P_{opt}	min. typ. max.	60 W 70 W 80 W
Beam divergence (FWHM) parallel to pn-junction [3]	$\Theta_{\parallel}$	min. typ. max.	12 ° 15 ° 18 °
Beam divergence (FWHM) perpendicular to pn-junction [3]	$\Theta_{\perp}$	min. typ. max.	27 ° 30 ° 33 °
Pulse width (FWHM) [3][4]	t_P	min. typ. max.	37 ns 40 ns 43 ns
Charge voltage at laser threshold	$U_{C, th}$	min. typ. max.	4 V 4.5 V 5 V
Switch on gate voltage	$V_{G\ on}$	typ.	5 V
Rise time [3][4]	t_r	min. typ. max.	7 ns 10 ns 13 ns
Fall time [3][4]	t_f	min. typ. max.	40 ns 45 ns 50 ns
Jitter (regarding trigger signal and optical pulse)	t_j	typ. max.	170 ps 500 ps
Aperture size	w x h	typ.	200 X 10 µm²
Temperature coefficient of wavelength	TC_λ	typ. max.	0.30 nm / K 0.33 nm / K
Thermal resistance junction ambient real	R_{thJA}	typ.	200 K / W

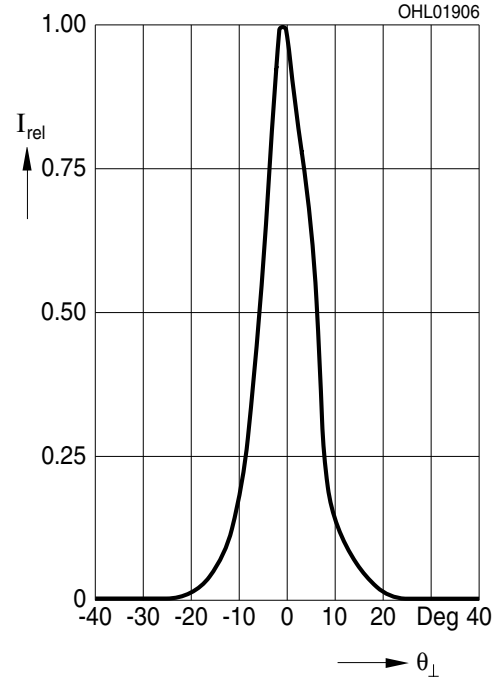
Relative Spectral Emission [5), 6)]

$I_{e,rel} = f(\lambda)$; I_F = 999 mA; P_{opt} = 70 W; t_p = 30 ns



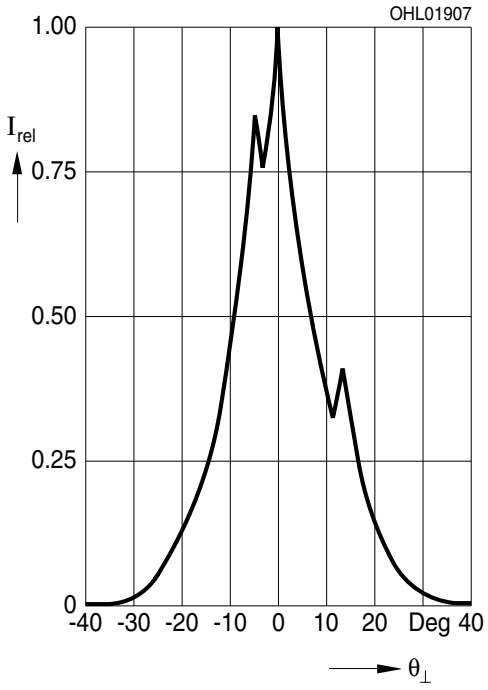
Far-Field Distribution Parallel to pn-Junction [5), 6)]

$I_{e,rel} = f(\Theta_{II})$; P_{opt} = 70 W; t_p = 30 ns



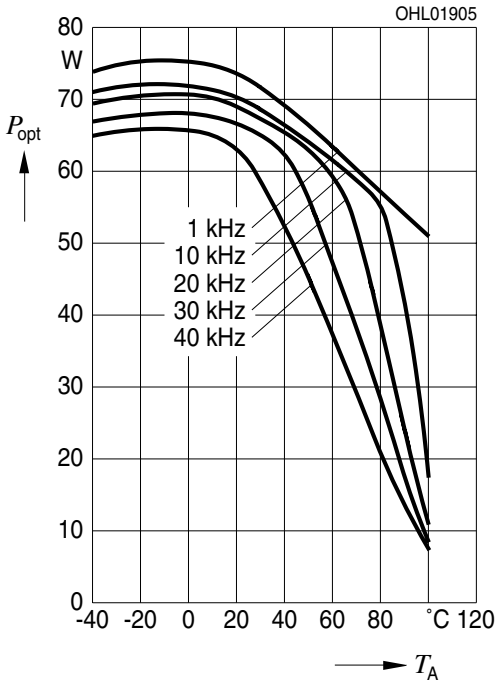
Far-Field Distribution Perpendicular to pn-Junction [5), 6)]

$I_{e,rel} = f(\Theta_{\perp})$; P_{opt} = 70 W; t_p = 30 ns



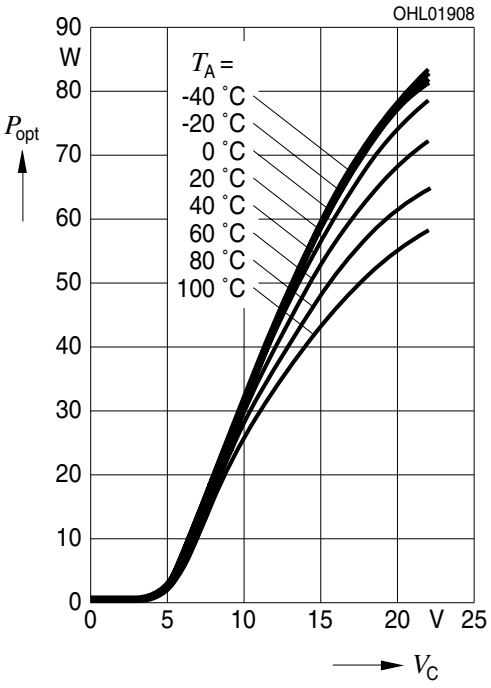
Peak Output Power [5)]

$P_{opt} = f(T_A)$; t_p = 30 ns



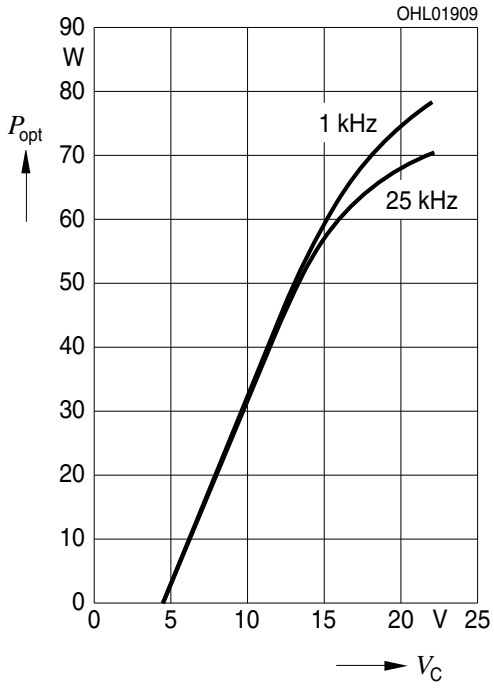
Optical Output Power [5), 6)]

$P_{opt} = f(V_C)$; t_p = 30 ns; PRF = 1 kHz



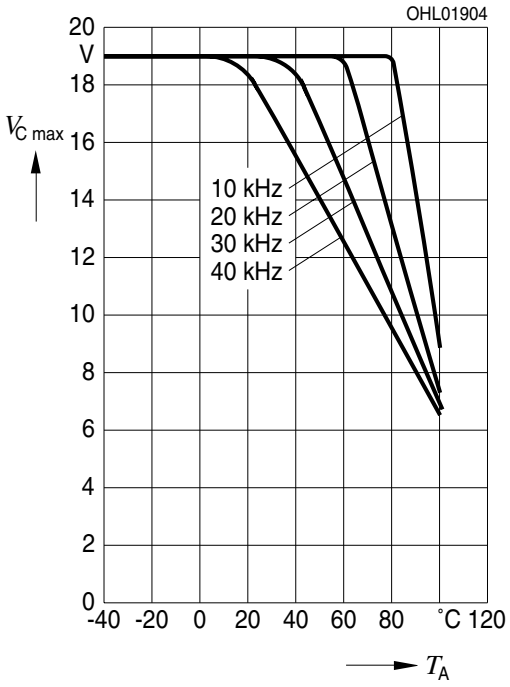
Optical Output Power [5), 6)]

$P_{opt} = f(V_C)$; t_p = 30 ns; PRF = 1 kHz

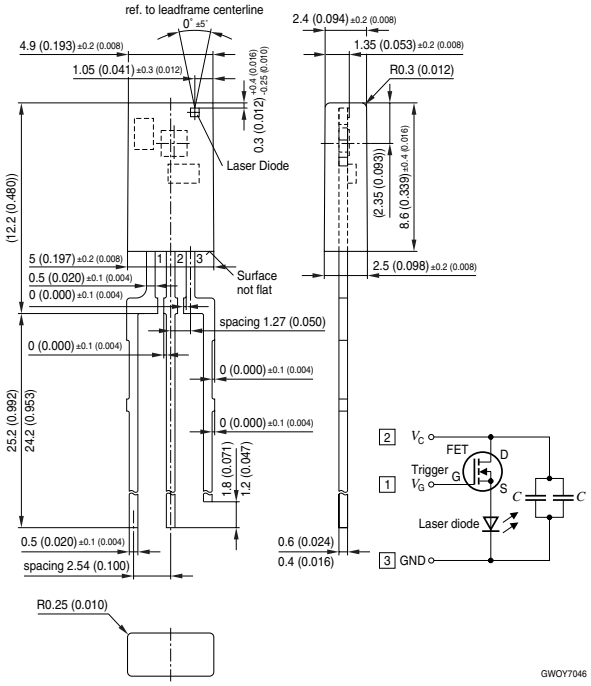


Max. Charge Voltage [5)]

$V_{C,max} = f(T_A)$; t_p = 30 ns; $V_C \leq 19$ V; $T_{chip} \leq 105$ °C



Dimensional Drawing [7)]



Approximate Weight: 430.0 mg

Notes

Depending on the mode of operation, these devices emit highly concentrated visible and non visible light 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.

For further application related informations please visit 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 webside.

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) **Junction temperature:** Limited due to plastic package, not due to laser chip.

2) **Reverse Operation:** Reverse Operation of 10 hours is permissible in total. Continuous reverse operation is not allowed.

3) **Driver information:** The laser is driven by the MOSFET driver Elantec EL7104C.

4) **Switching speed:** Switching speed at gate depends on current and speed, charging the gate capacitance (typ. 300 pF) of the internal transistor. Reduced pulse widths, rise and fall times occur at trigger pulse widths < 50 ns. This also reduces the optical peak power.

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

7) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with ±0.1 and dimensions are specified in mm.

Revision History

Version	Date	Change
1.2	2018-12-13	Additional Information

Published by OSRAM Opto Semiconductors GmbH
Leibnizstraße 4, D-93055 Regensburg

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。