OSRAM SPL DP91A_5

Datasheet

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IR LASER Diode

SPL DP91A_5

Nanostack Pulsed Laser Diode

Applications

- 3D Sensing
- Exterior sensing for ADAS
- Robotics

Features

- Qualifications: The product qualification test plan is based on the guidelines of AEC-Q102, failure mechanism based Stress Test Qualification for Discrete Optoelectronic Semiconductors in Automotive applications.
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)
- High efficiency
- Narrow emission width and chip size
- 5 vertically nanostacked emitters
- Wavelength stabilisation over temperature

Ordering Information

Type	Peak output power [1] typ. P_{opt}	Ordering Code
SPL DP91A_5	155 W	Q65113A9685

Maximum Ratings

T_A = 25 °C

Parameter	Symbol		Values
Operating temperature	T_{op}	min. max.	-40 °C 105 °C
Storage temperature	T_{stg}	min. max.	-40 °C 105 °C
Junction temperature	T_j	max.	125 °C
Forward current	I_F	max.	30 A
Pulse width (FWHM)	t_P	max.	15 ns
Duty cycle	D	max.	0.3 %
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	V_{ESD}	max.	2 kV

The duty cycle must never exceed 0.3 %.
This also applies within burst modes.
P-Side up die gluing is recommended.

Characteristics

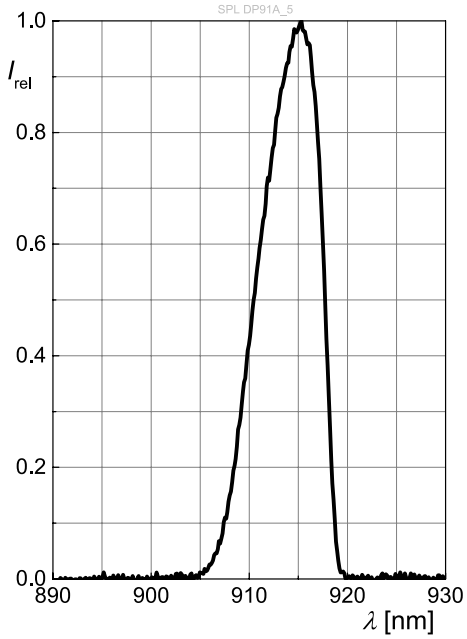
I_F = 30 A; t_p = 50 ns; D = 0.01 %; T_A = 25 °C

Parameter	Symbol		Values
Number of emitters	n		5
Standard pulse center wavelength [2] I_F = 3.5 A; t_p = 1 µs; D = 0.1 %; T_A = 25 °C	λ_{pulse}	min. typ. max.	908 nm 912 nm 916 nm
Spectral bandwidth (FWHM)	$\Delta\lambda$	typ.	8 nm
Peak output power [1]	P_{opt}	typ.	155 W
Beam divergence (FWHM) parallel to pn-junction	$\Theta_{\parallel}$	typ.	11 °
Beam divergence (FWHM) perpendicular to pn-junction	$\Theta_{\perp}$	typ.	25 °
Threshold current	I_{th}	typ.	0.6 A
Aperture size (1/e²)	w x h	typ.	132 X 20 µm²
TE polarization TE/(TE+TM), (depends strongly on chip mounting quality)	P_{TE}	typ.	96 %

For safety-related applications, 100% final testing needed after assembly at operation conditions.

Relative Spectral Emission [3], [4]

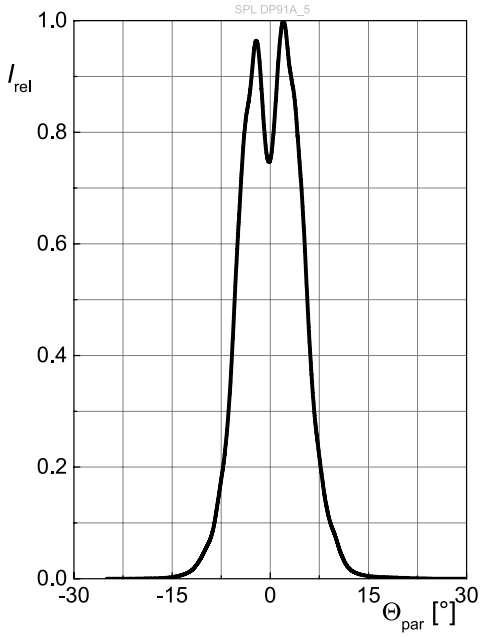
$I_{e,rel} = f(\lambda)$; P_{opt} = 155 W; t_p = 50 ns



Far-Field Distribution Parallel to pn-Junction [3], [4]

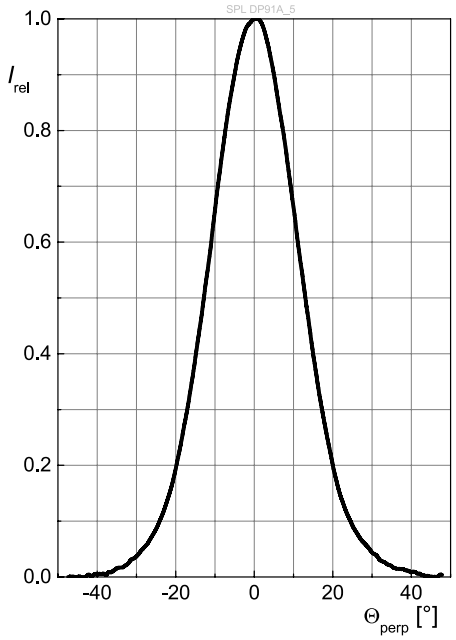
$I_{e,rel} = f(\Theta_{II})$; P_{opt} = 155 W; t_p = 50 ns

TBD



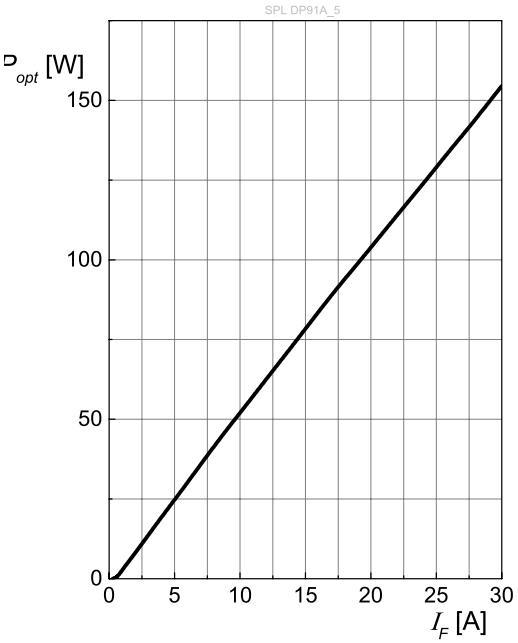
Far-Field Distribution Perpendicular to pn-Junction [3], [4]

$I_{e,rel} = f(\Theta_{\perp})$; P_{opt} = 155 W; t_p = 50 ns



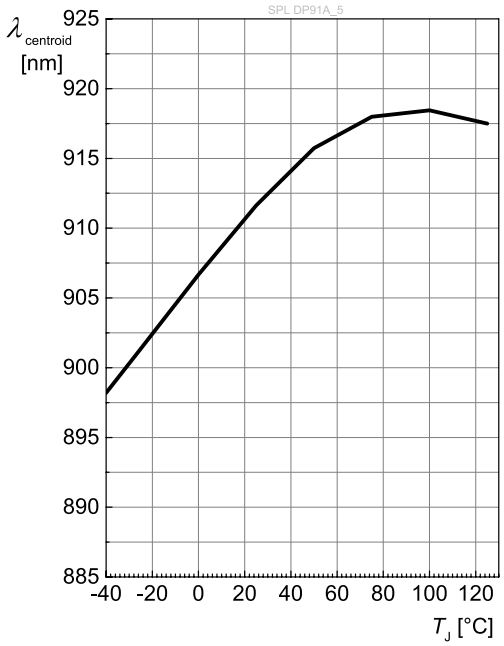
Optical Output Power [3], [4]

$P_{opt} = f(I_F)$



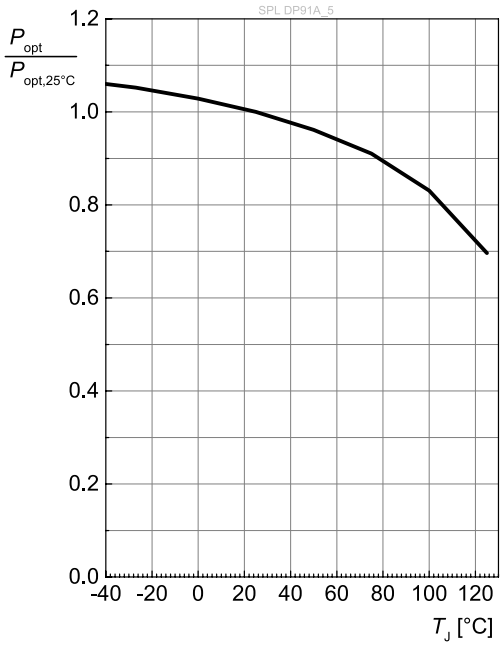
Centroid Wavelength [3)]

$\lambda_{centroid} = f(T_A); I_F = 30A; t_p = 50ns$

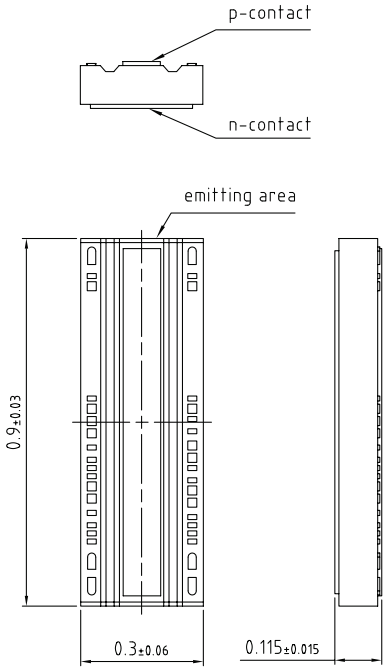


Peak Output Power

$P_{opt} = f(T_A); I_F = 30A; t_p = 50ns$



Dimensional Drawing [5)]



Further Information:

Approximate Weight: 0.2 mg

Notes: Chip thickness will be safeguarded via statistical process control.
The passive Chip ID structure beside the emitter is intended for chip identification only.

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.

Inked dies

The carrier frame can contain a small amount of defective parts, marked by an ink dot in the center of the defective unit.
The defective parts in each ring are not counted for total delivery quantity and shall not be used by the customer.

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.

Glossary

1) **Optical power:** Optical power measurements refer to an integrating sphere.

2) **Wavelength:** The wavelengths are measured with a tolerance of ±1 nm.

3) **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.

4) **Testing temperature:** TA = 25°C (unless otherwise specified)

5) **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
1.0	2025-11-02	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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