

SPL DP90_3

IR LASER Diode

Nanostack Pulsed Laser Diode



Applications

- CCTV Surveillance
- Industrial Automation (Machine Controls, Light Barriers, Vision Controls)
- LIDAR, Pre-Crash, ACC
- Pedestrian Protection / Lane Departure Warning

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)
- Reliable strained InGaAs/GaAs material
- High efficiency
- Narrow emission width and chip size
- 3 vertically nanostacked emitters

Ordering Information

Type	Peak output power ¹⁾ typ. $I_F = 20 \text{ A}; t_p = 100 \text{ ns}; D = 0.1 \text{ \%};$ measured in TO56 P_{opt}	Ordering Code
SPL DP90_3	65 W	Q65113A0420

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Maximum Ratings

$T_A = 25\text{ °C}$

Parameter	Symbol	Values
Operating temperature	T_{op}	min. -40 °C max. 105 °C
Storage temperature	T_{stg}	min. -40 °C max. 105 °C
Junction temperature	T_j	max. 125 °C
Forward current	I_F	max. 20 A
Pulse width (FWHM)	t_p	max. 100 ns
Duty cycle	dc	max. 0.1 %
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	V_{ESD}	max. 2 kV

The duty cycle must never exceed 0.1%.
This also applies within burst modes.
P-Side up die gluing is recommended.

Characteristics

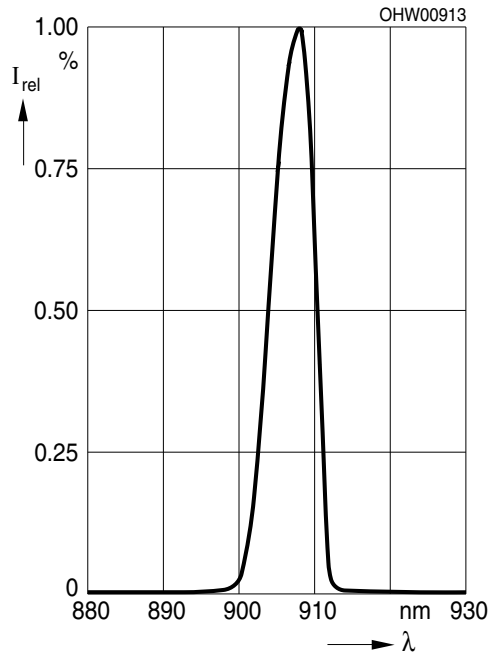
$I_F = 20 \text{ A}$; $t_p = 100 \text{ ns}$; $D = 0.1 \%$; $T_A = 25 \text{ °C}$

Parameter	Symbol		Values
Number of emitters (stacked emitters)	n		3
Standard pulse center wavelength ²⁾ $I_F = 5.2 \text{ A}$	λ_{pulse}	min. typ. max.	894 nm 904 nm 914 nm
Peak output power ¹⁾ (measured in TO56)	P_{opt}	typ.	65 W
Beam divergence (FWHM) parallel to pn-junction	Θ_{\parallel}	typ.	10 °
Beam divergence (FWHM) perpendicular to pn-junction	Θ_{\perp}	typ.	25 °
Differential efficiency ¹⁾ $I_F = 1 - 4 \text{ A}$	η	typ.	3.5 W / A
Threshold current	I_{th}	typ.	0.3 A
Aperture size	w x h	typ.	110 X 10 μm^2
TE polarization (TE/(TE+TM); parameter depends strongly on chip mounting quality)	P_{TE}	typ.	98 %

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

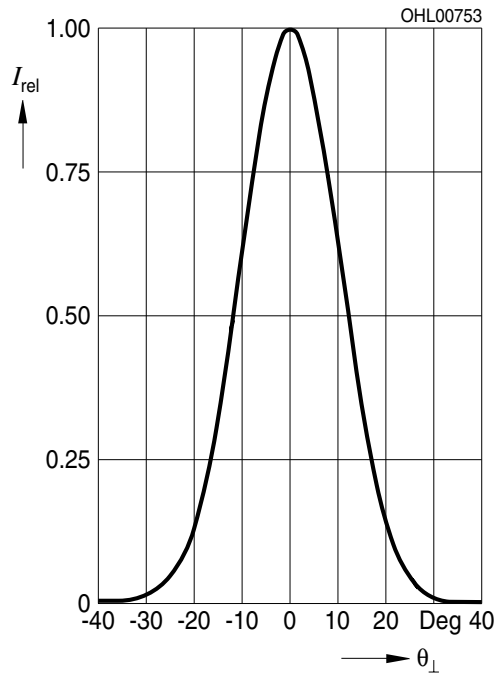
Relative Spectral Emission 3), 4)

$I_{e,rel} = f(\lambda); P_{opt} = 65 \text{ W}$



Far-Field Distribution Perpendicular to pn-Junction 3), 4)

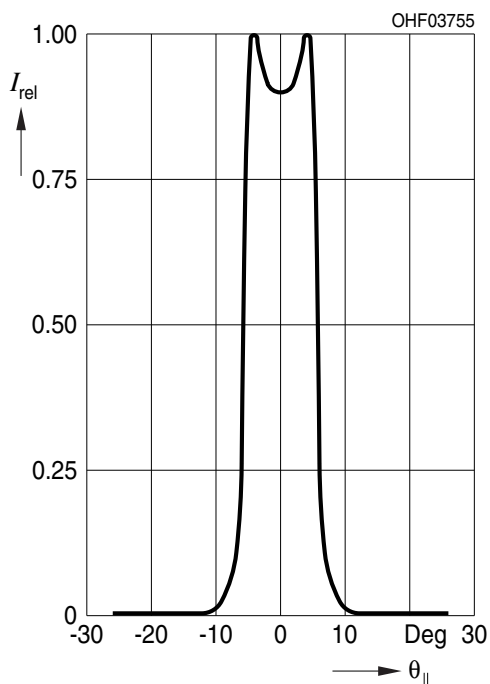
$I_{e,rel} = f(\Theta_{\perp}); P_{opt} = 65 \text{ W}$



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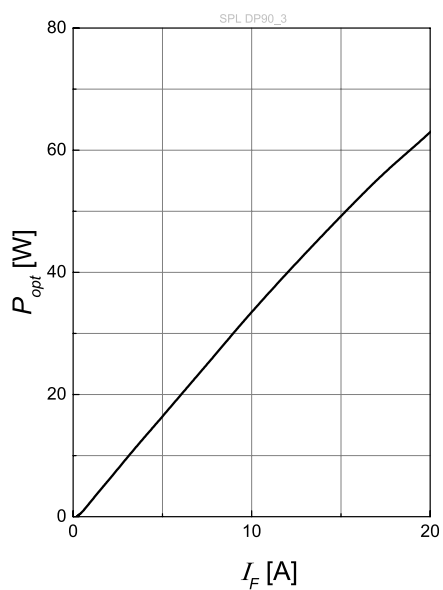
Far-Field Distribution Parallel to pn-Junction ^{3), 4)}

$$I_{e,rel} = f(\Theta_{||}); P_{opt} = 65 \text{ W}$$



Optical Output Power ^{3), 4)}

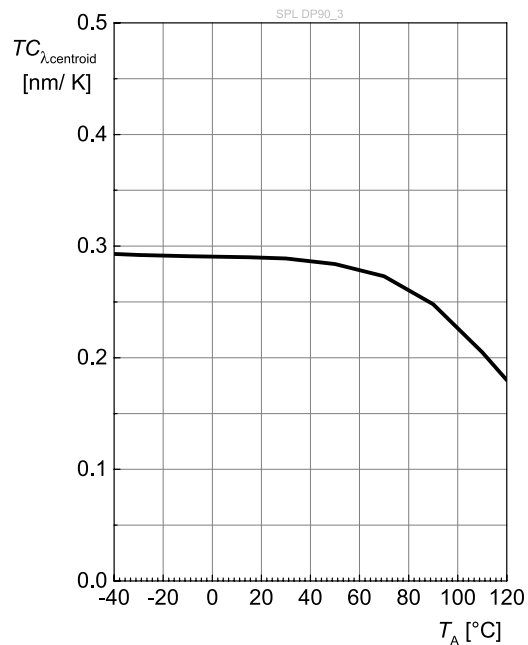
$$P_{opt} = f(I_F)$$



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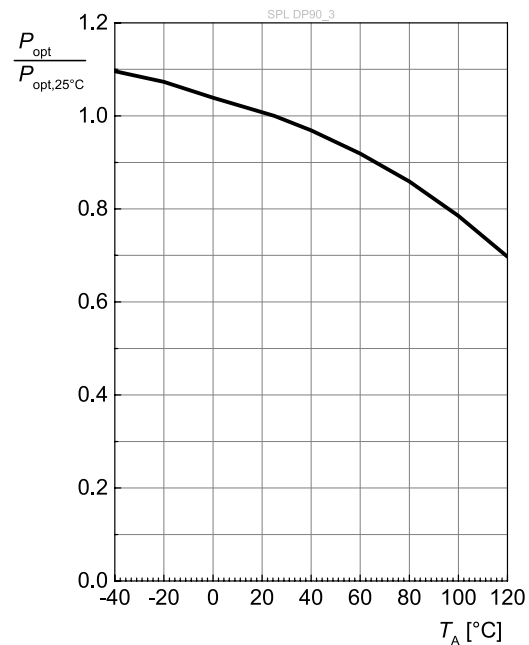
Centroid Wavelength ³⁾

$\lambda_{\text{centroid}} = f(T_A)$; $I_F = 20\text{A}$; $t_p = 100\text{ns}$; $f = 1\text{kHz}$; (on TO56)



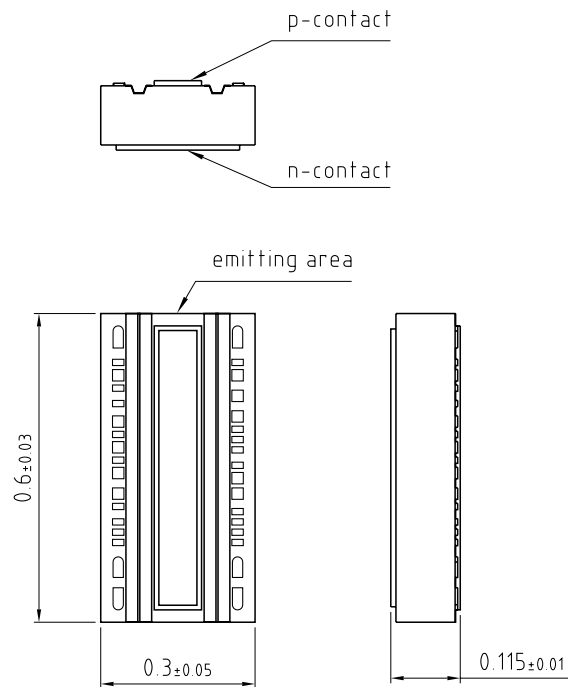
Peak Output Power

$P_{\text{opt}} = f(T_A)$; $I_F = 20\text{A}$; $t_p = 100\text{ns}$; $f = 1\text{kHz}$; (on TO56)



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Dimensional Drawing ⁵⁾



Further Information:

Approximate Weight: 0.1 mg

Notes: The passive Chip ID structure beside the emitter is intended for chip identification only.

Notes

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 www.osram-os.com/appnotes

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 and IEC 62471.

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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
α.1	2019-07-26	Product Image Dimensional Drawing
α.2	2019-12-17	Dimensional Drawing Notes
α.3	2020-01-27	Ordering Information Notes Electro - Optical Characteristics (Diagrams)
α.4	2020-02-03	Applications Features
α.5	2020-03-06	Characteristics

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