

# Nanostack Impuls-Laserdioden-Array 75 W Spitzenleistung

## Nanostack Pulsed Laser Diode Array 75 W Peak Power

**Lead (Pb) Free Product - RoHS Compliant**

**SPL AH90\_3**



### Besondere Merkmale

- 12 getrennt ansteuerbare Impuls-Laser
- Monolithischer Laserchip mit 260 µm Kanalabstand
- Austrittsöffnung pro Laserkanal 200µm × 10µm
- Nanostack Lasertechnologie beinhaltet mehrere epitaktisch integrierte Emittier
- Optische Spitzenleistung bis zu 75 W pro Kanal
- Laserwellenlänge 905 nm
- Gehäuse mit AR-vergütetem Glasfenster
- Integrierte Heizung zur Wellenlängenstabilisierung
- Betriebstemperaturbereich -40 bis +105°C

### Anwendungen

- Entfernungsmessung, LIDAR
- 3D-Sensor
- Verkehrsüberwachung
- Industrie- und Automobil-Sensoren

### 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

- 12 individually addressable pulsed lasers
- Monolithic laser die with 260 µm channel pitch
- Aperture of each laser channel 200 µm × 10 µm
- Nanostack laser technology including multiple epitaxially stacked emitters
- Optical peak power up to 75 W per laser
- Laser wavelength 905 nm
- Top looker with AR-coated glass window
- Integrated heater for wavelength stabilization
- Operating temperature range -40 to +105°C

### Applications

- Range finding, LIDAR
- 3D-sensor
- Traffic surveillance
- Industrial and automotive sensors

### 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"

Typ	Anzahl der Kanäle	Opt. Spitzenausgangleistung	Wellenlänge	Bestellnummer
Type	Number of Channels	Opt. Peak Power	Wavelength	Ordering Code
SPL AH90_3	12	75 W	905 nm	Q65110A3900

**Grenzwerte (kurzzeitiger Betrieb) ( $T_A = 25\text{ °C}$ )**  
**Maximum Ratings (short time operation)**

Parameter Parameter	Symbol Symbol	Werte Values		Einheit Unit
		min.	max.	
Spitzenausgangsleistung Peak output power	$P_{\text{peak}}$	–	90	W
Spitzendurchlaßstrom Peak forward current	$I_F$	–	40	A
Pulsbreite (Halbwertsbreite) Pulse width (FWHM)	$t_p$	–	100	ns
Tastverhältnis Duty cycle	$d.c.$	–	0.1	%
Sperrspannung Reverse voltage	$V_R$	–	3	V
Betriebsspannung der Laserheizung Operating voltage of laser heating	$V_{\text{heat}}$	–	5	V
Betriebstemperatur Operating temperature	$T_{\text{op}}$	- 40	+ 105	°C
Lagertemperatur Storage temperature	$T_{\text{stg}}$	- 40	+ 105	°C
Kurzzeitlagertemperatur (2 h) Short time storage temperature (2 h)	$T_{\text{stg short}}$		+ 125	°C
Löttemperatur ( $t_{\text{max}} = 10\text{ s}$ , 2 mm von Gehäuseunterseite) Soldering temperature ( $t_{\text{max}} = 10\text{ s}$ , 2 mm from bottom edge of case)	$T_s$	–	+ 260	°C

Optische Kennwerte ( $T_A = 25\text{ °C}$ )

## Optical Characteristics

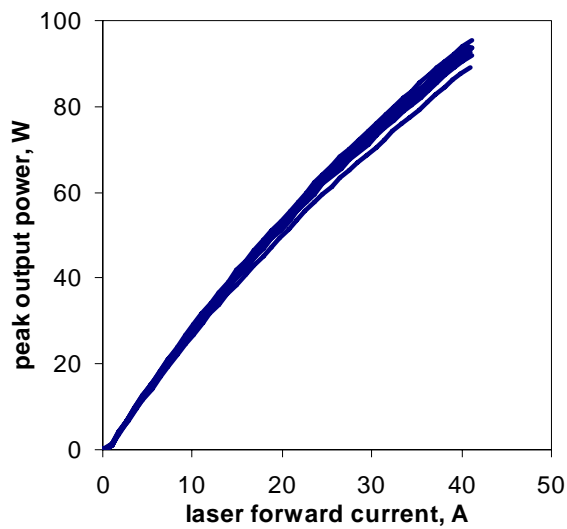
Parameter Parameter	Symbol Symbol	Werte Values			Einheit Unit
		min.	typ.	max.	
Zentrale Emissionswellenlänge <sup>1)</sup> Emission wavelength <sup>1)</sup>	$\lambda_{\text{peak}}$	895	905	915	nm
Spektralbreite (Halbwertsbreite) <sup>1)</sup> Spectral width (FWHM) <sup>1)</sup>	$\Delta\lambda$	–	7	9	nm
Spitzenausgangsleistung <sup>1)</sup> Peak output power <sup>1)</sup>	$P_{\text{op}}$	66	75	85	W
Kennliniensteigung im Bereich 25...35 A Slope of LI-curve in the range 25...35 A	$\Delta P/\Delta I$	1.6	2.0	2.4	W/A
Betriebsspannung <sup>1)</sup> Operating voltage <sup>1)</sup>	$V_{\text{op}}$	7	9	12	V
Anstiegs- und Abfallzeit (10%...90%) Rise and fall time (10% ... 90%) (electrical pulse: $I=30\text{A}$ , $t_r$ , $t_f = 0.8\text{ ns}$ )	$t_r$ , $t_f$	–	–	3	ns
Anzahl Kanäle Number of channels	N	–	12	–	–
Austrittsöffnung pro Kanal Aperture size for each channel	$w \times h$	–	$200 \times 10$	–	$\mu\text{m}$
Kanalabstand Gap between channels	$d$	–	60	–	$\mu\text{m}$
Strahldivergenz (Halbwertsbreite) parallel zum pn-Übergang Beam divergence (FWHM) parallel to pn-junction	$\theta_{\parallel}$	8	11	14	Grad deg.
Strahldivergenz (Halbwertsbreite) senkrecht zum pn-Übergang Beam divergence (FWHM) perpendicular to pn-junction	$\theta_{\perp}$	20	25	30	Grad deg.
Temperaturkoeffizient der Wellenlänge Temperature coefficient of wavelength	$\partial\lambda / \partial T$	–	0.28	0.31	nm/K
Temperaturkoeffizient der opt. Ausgangsleistung (25...105°C) Temperature coefficient of optical power (25...105°C)	$\Delta W/\Delta T$	–	-0.27	-0.32	W/K

**Optische Kennwerte ( $T_A = 25\text{ °C}$ )**  
**Optical Characteristics (cont'd)**

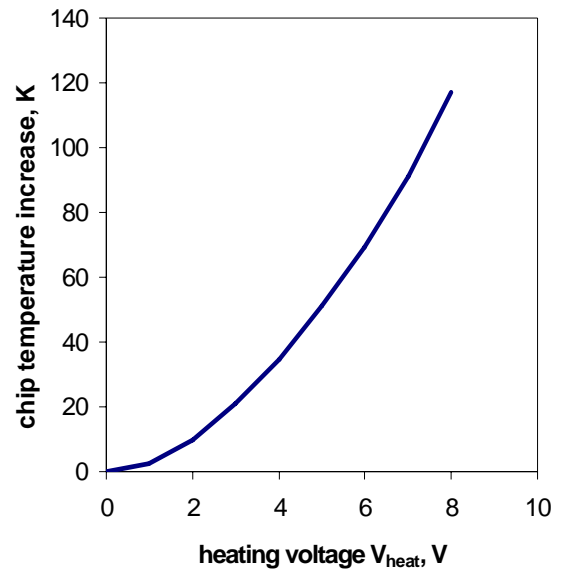
Parameter Parameter	Symbol Symbol	Werte Values			Einheit Unit
		min.	typ.	max.	
Elektrischer Widerstand der Laserheizung Electrical resistance of laser heating	$R_{\text{heat}}$	16	20	24	Ohm
Zentrale Emissionswellenlänge im Betriebstemperaturbereich -40...+30°C bei Lasermodule mit Heizung Emission wavelength in operating temperature range -40...+30°C for laser module with heating	$\lambda_{\text{peak, heat}}$	895	–	–	nm

- <sup>1)</sup> Standardbetriebsbedingungen beziehen sich auf eine Pulsbreite von 10-20 ns bei einer Frequenz von 1kHz und einem Betriebsstrom von 31 A bei  $T_A = 25\text{ °C}$ .  
Standard operating conditions refer to pulses of 10-20 ns pulse width at 1 kHz rate with 31 A operating current at  $T_A = 25\text{ °C}$ .

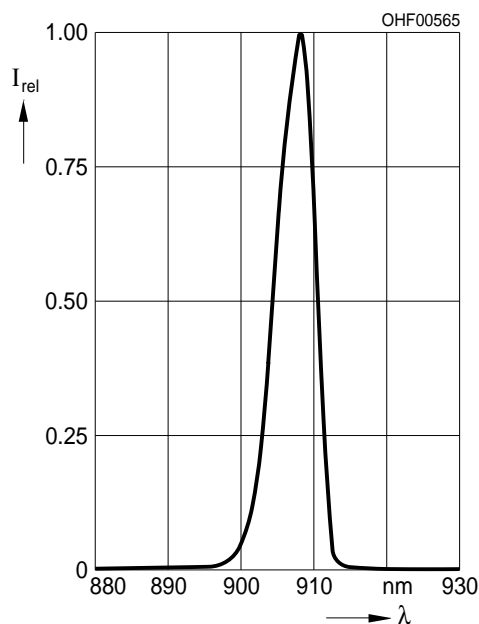
Optical output power  $P_{opt}$  vs. forward current  $I_F$  for all 12 channels ( $T_A = 25\text{ }^\circ\text{C}$ )



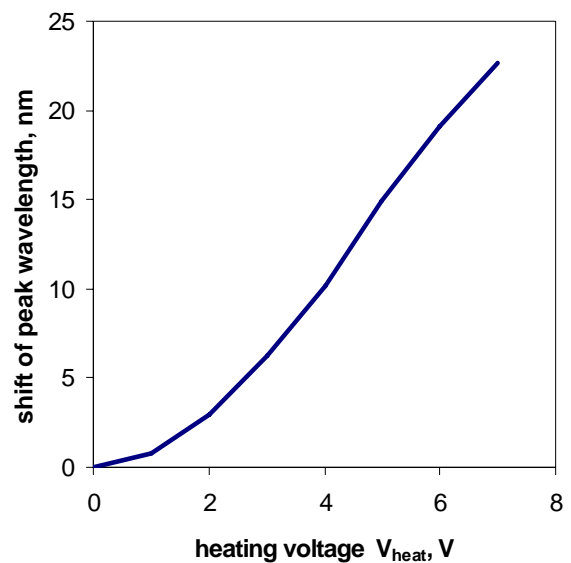
Chip temperature increase vs. heating voltage  $V_{heat}$



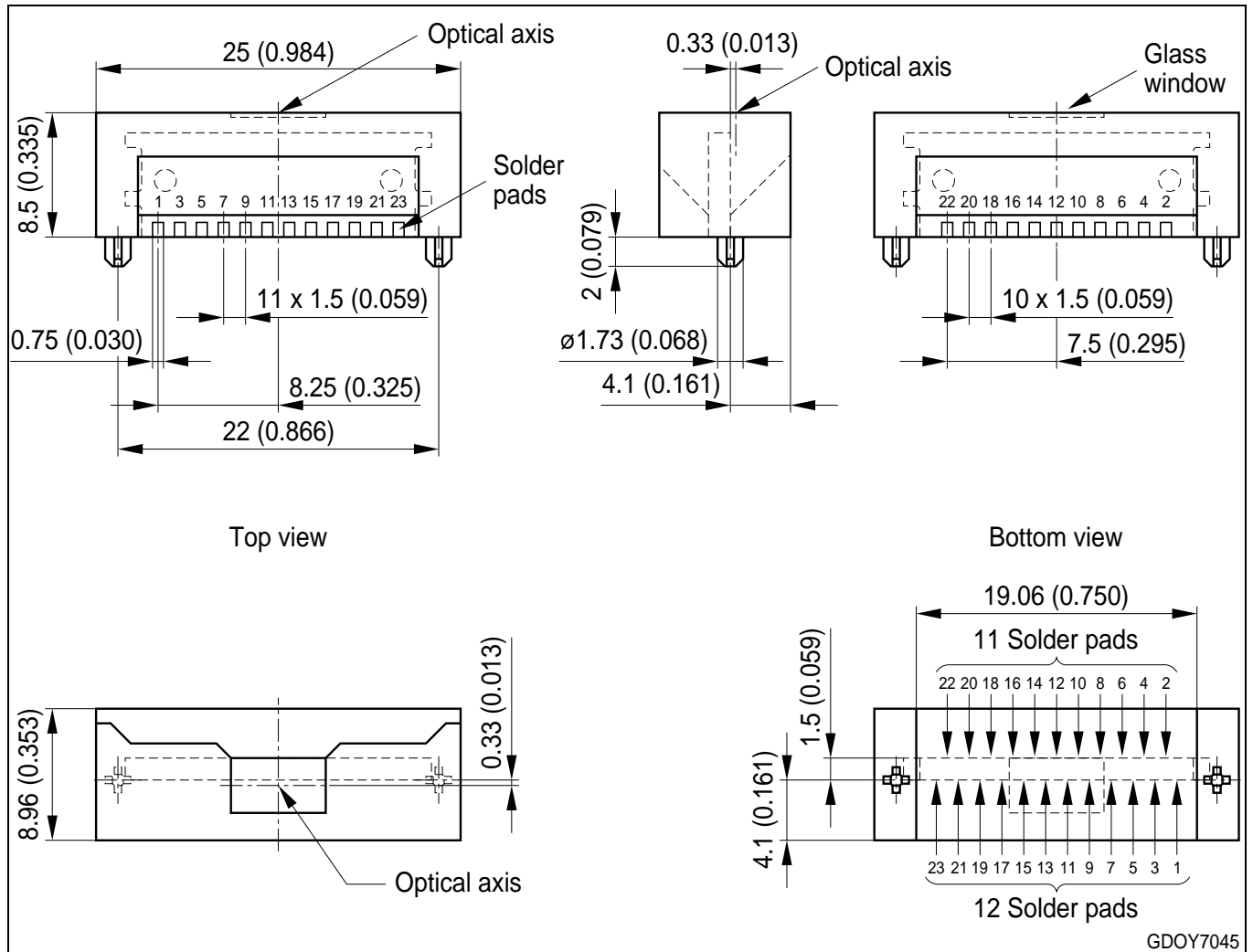
Optical spectrum, relative intensity  $I_{rel}$  vs. wavelength  $\lambda$  ( $T_A = 25\text{ }^\circ\text{C}$ ,  $P_{opt} = 75\text{ W}$ )



Shift of peak wavelength vs. heating voltage  $V_{heat}$



Maßzeichnung  
Package Outlines



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

**Belegung der Löt pads / Pinning of solder pads**

<b>Löt pad / Solder pad</b>	<b>Funktion / Function</b>
1	Heizung + / Heating +
2	NTC +
3	nicht verbunden / not connected
4	Anode Kanal 1 / Anode Channel 1
5	Masse / GND
6	Anode Kanal 2 / Anode Channel 2
7	nicht verbunden / not connected
8	Anode Kanal 3 / Anode Channel 3
9	Anode Kanal 4 / Anode Channel 4
10	Masse / GND
11	Anode Kanal 5 / Anode Channel 5
12	Anode Kanal 6 / Anode Channel 6
13	Anode Kanal 7 / Anode Channel 7
14	Anode Kanal 8 / Anode Channel 8
15	Masse / GND
16	Anode Kanal 9 / Anode Channel 9
17	Anode Kanal 10 / Anode Channel 10
18	nicht verbunden / not connected
19	Anode Kanal 11 / Anode Channel 11
20	Masse / GND
21	Anode Kanal 12 / Anode Channel 12
22	nicht verbunden / not connected
23	Heizung - , NTC - / Heating - , NTC -

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