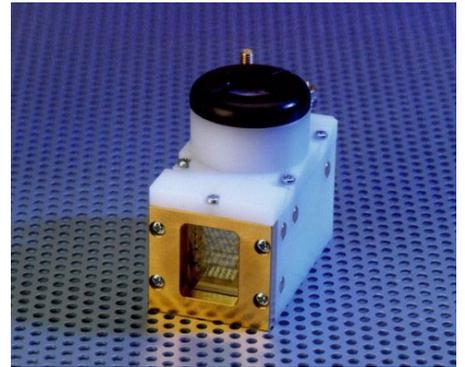


# Actively Cooled Diode Laser Stack 25 ... 100 W cw, Both Axes Collimated

## SPL EBxx



### Preliminary Data

#### Features

- Both axes collimated linear stack, actively cooled, for cw operation
- Highly reliable strained layer InGa(Al)As/GaAs material with MTTF life time > 10000 h
- Low thermal resistance using mini coolers
- Sealed housing with desiccating cell
- Modular stack design, integration of up to 4 bars
- Bar replacement capability for repair / upgrading

#### Applications

- End pumping of rods and fibers
- Direct material processing, soldering
- Marking, surface processing
- Medical applications

#### 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".

Type	Wavelength <sup>1)</sup>	Bar Count (n)	Power	Ordering Code
SPL EB81-E	808 nm	1	25 W	on request
SPL EB81-H		2	50 W	
SPL EB81-J		3	75 W	
SPL EB81-K		4	100 W	
SPL EB94-E,	940 nm	1	25 W	on request
SPL EB94-H		2	50 W	
SPL EB94-J		3	75 W	
SPL EB94-K		4	100 W	
SPL EB98-E,	975 nm	1	25 W	on request
SPL EB98-H,		2	50 W	
SPL EB98-J,		3	75 W	
SPL EB98-K		4	100 W	

<sup>1)</sup> Other wavelengths in the range of 780 nm ... 980 nm are available on request.

**Maximum Ratings** ( $T_A = 20\text{ °C}$  mount temperature)

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Number of bars	$n$	1	...	4	–
Output power (continuous wave) per bar <sup>1)</sup>	$P_{cw}$	–	25	35	W
Operating coolant temperature <sup>2)</sup>	$T_{op}$	+ 10	–	+ 40	°C
Storage temperature <sup>2)</sup>	$T_{stg}$	- 20	–	+ 70	°C
Maximum coolant pressure	$P_{max}$	–	–	5	bar

1) Standard operating conditions refer to 25 W at 808 nm and 30 W at 940 nm cw collimated optical output power per bar at 20 °C using pure water as coolant (resistivity > 0.2 MΩ cm, using particle filter of 30 μm, and 0.5 l/min flow rate).

2) Condensation must be avoided (> 10K above dew point).

**Diode Characteristics** ( $T_A = 20\text{ °C}$  mount temperature)

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Emission wavelengths	$\lambda$	–	808 940 975	–	nm
Spectral width (FWHM) <sup>1)</sup>	$\Delta\lambda$	–	4	–	nm
Threshold current at 808 nm at 940 nm, and 975 nm	$I_{th}$	–	18 11	20 13	A
Differential efficiency (per bar) <sup>1)</sup>	$\eta_d$	–	0.65	0.75	W/A
Operating current <sup>1)</sup>	$I_{op}$	–	55	60	A
Operating voltage (per bar) <sup>1)</sup>	$V_{op}$	–	1.8	–	V
Operating voltage <sup>1)</sup>	$V_{op}$	–	1.8	–	V
Overall efficiency <sup>1)</sup>	$\eta$	28	32	35	%
Emitting aperture	$H$ $W$	–	n × 4 12	–	mm mm
Beam divergence <sup>1) 2)</sup>	$\theta_{\perp} \times \theta_{\parallel}$	–	15 × 20	20 × 25	mrad
Temperature coefficient of wavelength	$\Delta\lambda / \Delta T$	–	0.27	–	nm/K
Temperature coefficient of operating current	$\Delta I_{op} / I_{op} \Delta T$	–	0.5	–	%/K
Coolant flow rate (per bar) <sup>1)</sup>	$dV/dt$	0.35	0.5	–	l/min
Pressure drop <sup>1)</sup>	$\Delta p$	–	1.5	3.0	bar

1) Standard operating conditions refer to 25 W at 808 nm and 30 W at 940 nm cw collimated optical output power per bar with water coolant at 20 °C.

2) Far field divergence refers to half angle at  $1/e^2$  relative intensity.

**Optical Characteristics**

( $T_A = 25\text{ }^\circ\text{C}$  mount temperature)

**Optical Output Power  $P_{opt}$  vs.  
Forward Current  $I_F$   
cw-device, 3 bars**

