

Actively Cooled Diode Laser Stack, cw

SPL ENxx No Optics

SPL EYxx Fast-Axis Collimation



Preliminary Data

Features

- Uncollimated (EN-series) or fast-axis collimated radiation (EY-series)
- Modular stack of 1 cm bars actively cooled, for cw operation
- Highly reliable strained layer InGa(Al)As/GaAs material with MTTF > 10000 h
- Low thermal resistance using mini coolers
- Flexible stack design, integration of up to 60 bars
- Optional alternative bar-to-bar spacing values available
- Bar replacement capability for repair / upgrade
- Low smile (< 1 μm), and low mechanical tolerances
- Coolant inlet/outlet at bottom/side
- Extendable to two-dimensional stacks, TN, TY resp.

Applications

- Pumping of solid state lasers (Nd: YAG, Yb: YAG, ...)
- Direct industrial applications (soldering, surface treatment, marking, ...)
- Heating, illumination
- Medical and printing 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 ¹⁾	Ordering Code
SPL EN81	808 nm	on request
SPL EN94	940 nm	on request
SPL EN98	975 nm	on request
SPL EY81	808 nm	on request
SPL EY94	940 nm	on request
SPL EY98	975 nm	on request

¹⁾ 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.	max.	
Number of bars	n	2	60	–
Output power (continuous wave) per bar ¹⁾	P_{cw}	35	50	W
Operating temperature ²⁾	T_{op}	– 10	+ 60	°C
Storage temperature ²⁾	T_{stg}	– 40	+ 85	°C
Max. coolant pressure	P_{max}	–	5	bar

¹⁾ Optical power is measured by coupling into an integrating sphere.

²⁾ Condensation must be avoided.

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

Parameter	Symbol	Values			Unit	
		min.	typ.	max.		
Output power, cw per bar ¹⁾	P_{op}	35	40	50	W	
Emission wavelength ²⁾	λ_{peak}	–	808 940 975	–	nm	
Spectral width (FWHM) ²⁾	$\Delta\lambda$	–	4	–	nm	
Threshold current, cw-type						
808 nm	$I_{th, cw}$	–	18	20	A	
940 nm		–	10	12		
975 nm		–	8	10		
Differential efficiency ¹⁾						
808 nm	$\Delta P/\Delta I$	–	1.1	–	W/A	
940 nm		–	0.9	–		
975 nm		–	0.9	–		
Fast-axis collimation efficiency into beam divergence	EY-series	η_{col}	–	93	–	%
Operating current, cw-type ²⁾		$I_{op, cw}$	–	55	–	A
Operating voltage (per bar) ¹⁾²⁾		V_{op}	–	1.8	–	V
Overall efficiency	EN-Series	η	40	45	–	%
Beam divergence (half angle) ³⁾⁴⁾	EN-Series	$\theta_{\perp} \times \theta_{\parallel}$	–	30° × 5°	–	deg.
	EY-Series		–	0.5 × 5°	–	
Thermal resistance		R_{th}	–	0.5	–	K/W
Temperature coefficient of operating current ¹⁾		$\Delta I_{op}/I_{op}\Delta T$	–	0.5	–	%/K
Temperature coefficient of wavelength ¹⁾		$\Delta\lambda / \Delta T$	–	0.27	–	nm/K
Coolant flow rate (per bar)		dV/dT	0.35	0.5	–	l/min
Pressure drop ⁴⁾		ΔP	–	1.5	–	bar

1) Depending on emission wavelength.

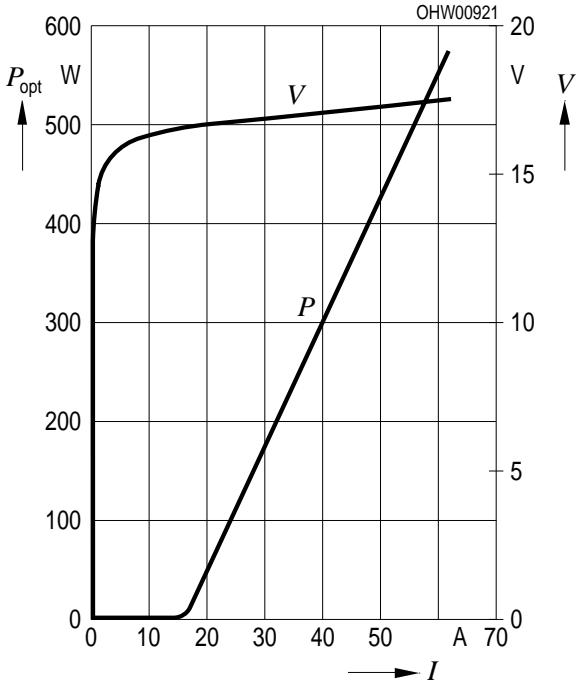
2) Standard operating conditions refer to 40 W cw optical output power at 20 °C. Optical power measurements refer to an integrating sphere.

3) Far field divergence refers to half angle at 1/e² relative intensity.

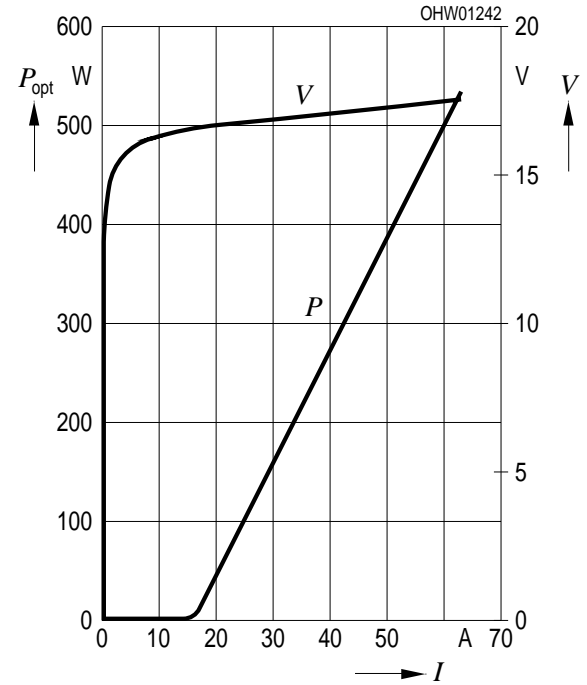
4) Depending on number of bars.

Optical Characteristics ($T_A = 20\text{ }^\circ\text{C}$ mount temperature)

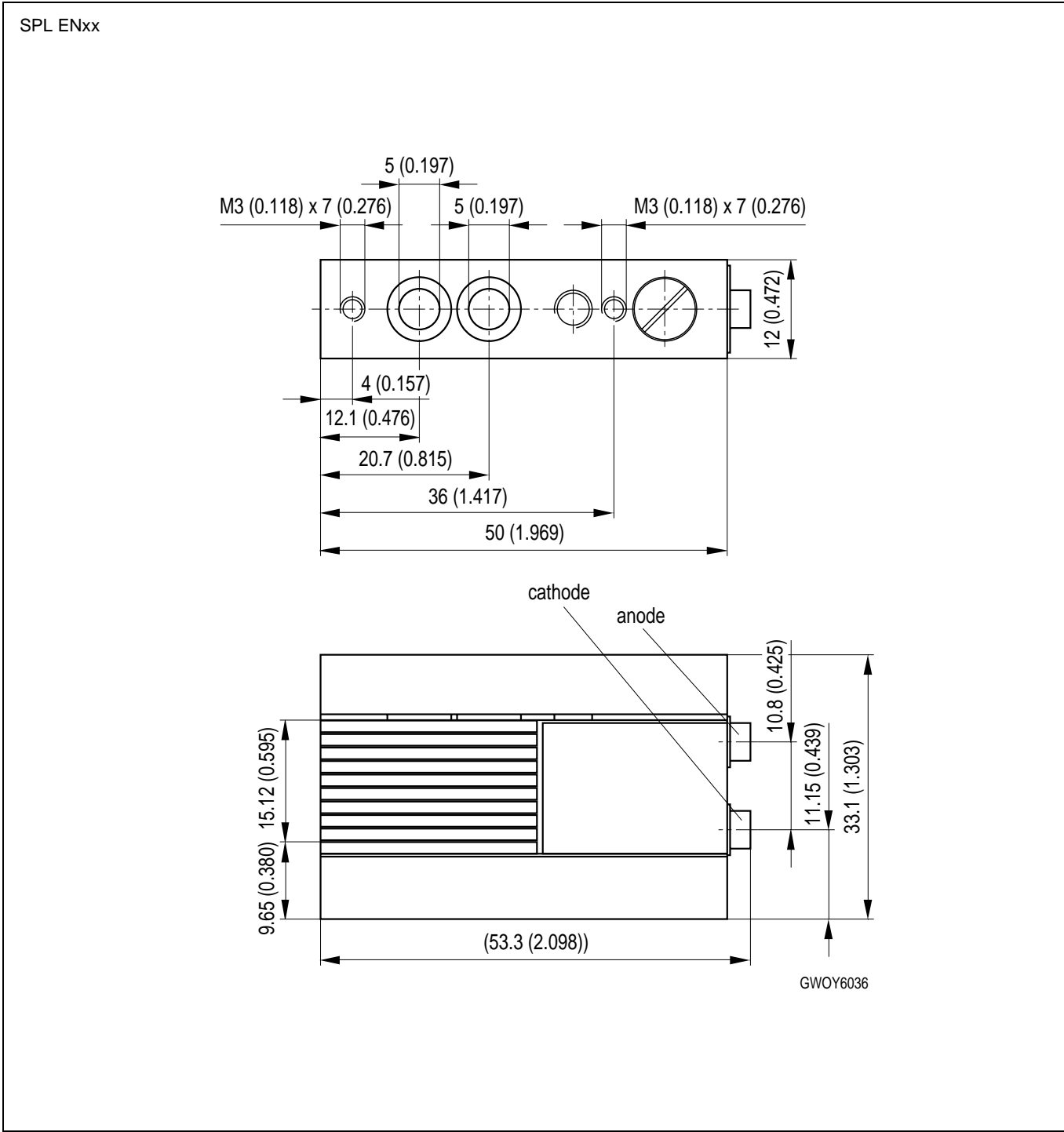
Optical Output Power P_{opt} vs.
Forward Current I_F
cw-device, 10 bars, SPL ENxx



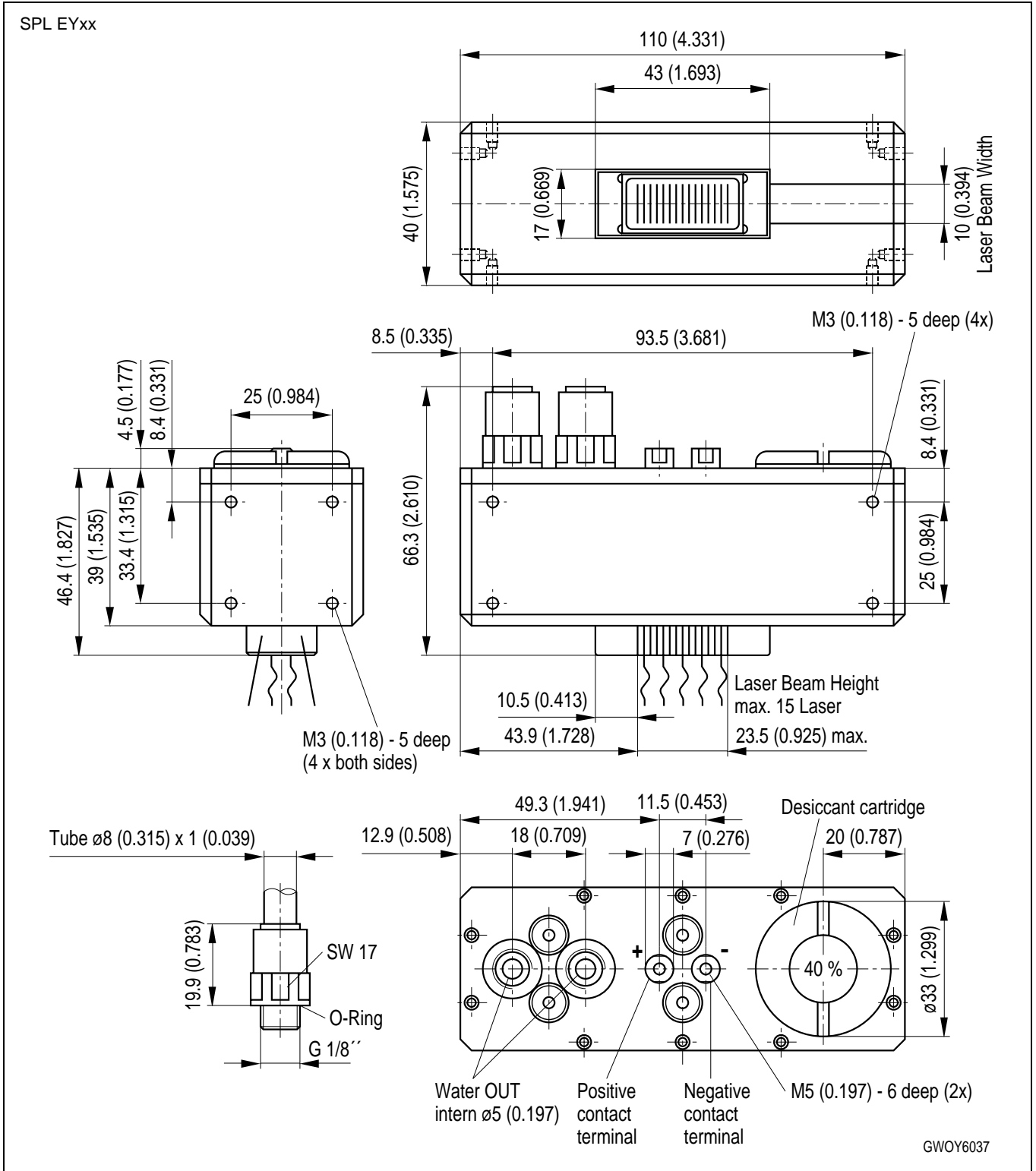
Optical Output Power P_{opt} vs.
Forward Current I_F
cw-device, 10 bars, SPL EYxx



Package Outlines



Dimensions are specified as follows: mm (inch).



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For safety, unpacking, handling, mounting and operating issues, please carefully read our “Notes For Operation II”.