

## Laser Diode on Submount 1.0 W cw (Class 4 Laser Product)

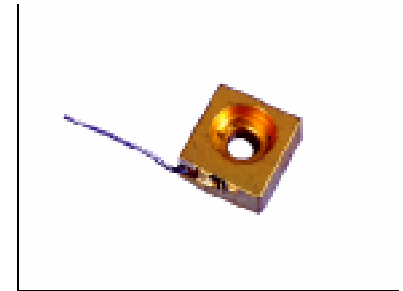
**SPL CGxx**  
(SFH 4804x2)

### Features

- Efficient radiation source for cw and pulsed operation
- Reliable InGa(Al)As strained quantum-well material
- Single emitting area  $200\ \mu\text{m} \times 1\ \mu\text{m}$
- Small C-type copper submount for OEM designs

### Applications

- Pumping solid state lasers (Nd: YAG, Yb: YAG, ...)
- Laser soldering, heating, illumination
- Printing, marking, surface processing
- Medical applications
- Testing and measurement applications



Type	Old Type (as of Oct. 1996)	Wavelength <sup>*)</sup>	Ordering Code
SPL CG81	SFH 480402	808 nm	Q62702-P358
SPL CG85	–	850 nm	on request
SPL CG94	SFH 480442	940 nm	Q62702-P1617
SPL CG98	–	980 nm	on request

\*) Other wavelengths in the range of 780 nm ... 980 nm are available on request.

### Maximum Ratings

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Output power (continuous wave) <sup>1)</sup>	$P_{\text{opt}}$	–	–	1.1	W
Output power (quasi-continuous wave) <sup>1)</sup> ( $t_p \leq 150\ \mu\text{s}$ , duty cycle $\leq 1\%$ )	$P_{\text{qcw}}$	–	–	1.5	W
Reverse voltage	$V_R$	–	–	3	V
Operating temperature <sup>2)</sup>	$T_{\text{op}}$	– 10	...	+ 60	$^\circ\text{C}$
Storage temperature <sup>2)</sup>	$T_{\text{stg}}$	– 40	...	+ 85	$^\circ\text{C}$
Soldering temperature, max. 10 s	$T_s$	–	–	140	$^\circ\text{C}$

1) Optical power measurements refer to a detector with  $\text{NA} = 0.6$

2) Bedewing is excluded

## Characteristics

( $T_A = 25\text{ °C}$ )

Parameter	Symbol	Values			Unit	
		min.	typ.	max.		
Emission wavelength <sup>1)</sup>	$\lambda_{\text{peak}}$	803 840 935	808 850 940	813 860 945	nm	
Spectral width (FWHM) <sup>1)</sup>	$\Delta\lambda$	2			nm	
Output power <sup>2)</sup>	$P_{\text{opt}}$	1.0			W	
Differential efficiency <sup>2)</sup>	$\eta$	808 nm 850 nm 940 nm	0.75 0.75 0.70	0.95 0.85 0.80	1.1 1.0 0.9	W/A
Threshold current	$I_{\text{th}}$	808 nm 850 nm 940 nm	0.40 0.30 0.30	0.45 0.40 0.35	0.55 0.50 0.40	A
Operating current <sup>1)</sup>	$I_{\text{op}}$	808 nm 850 nm 940 nm	1.3 1.3 1.4	1.5 1.5 1.6	1.8 1.8 1.8	A
Operating voltage <sup>1)</sup>	$V_{\text{op}}$	2.0			V	
Differential series resistance	$r_s$	–	0.2	0.4	$\Omega$	
Characteristic temperature (threshold) <sup>3)</sup>	$T_0$	150			K	
Temperature coefficient of operating current	$\partial I_{\text{op}} / \partial T$	0.5			%/K	
Temperature coefficient of wavelength <sup>4)</sup>	$\partial \lambda / \partial T$	0.25	0.27	0.30	nm/K	
Thermal resistance (junction → heat sink)	$R_{\text{th,JA}}$	10			K/W	

1) Standard operating conditions refer to 1 W cw measured with NA = 0.6

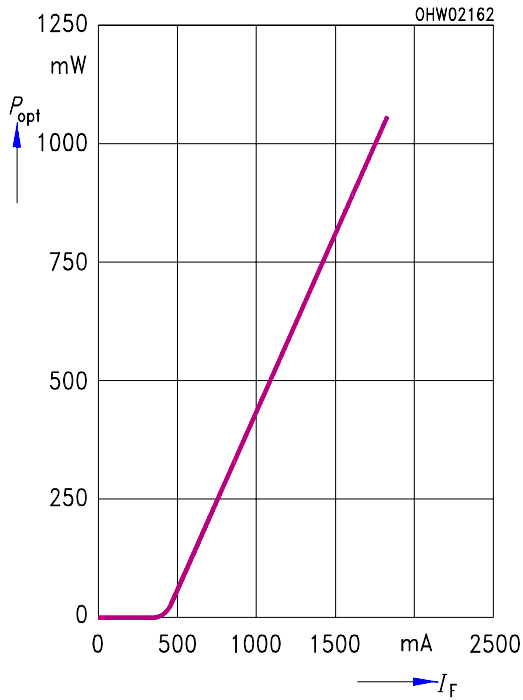
2) Optical power measurements refer to a detector with NA = 0.6

3) Model for the thermal behavior of threshold current:  $I_{\text{th}}(T_2) = I_{\text{th}}(T_1) \times \exp(T_2 - T_1)/T_0$

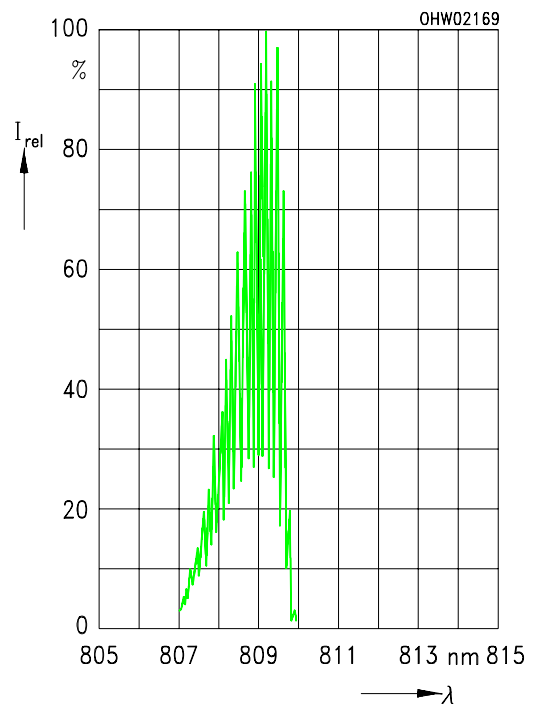
4) Depending on emission wavelength

## Optical Characteristics ( $T_A = 25\text{ °C}$ )

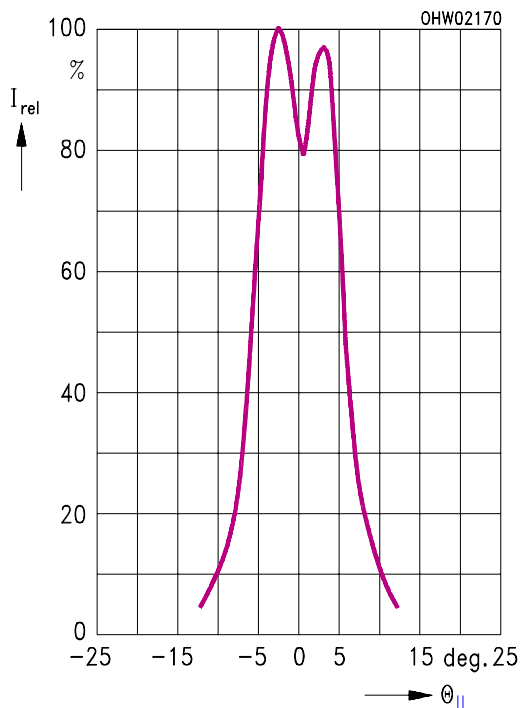
### Radiant Power $P_{opt}$ vs $I_F$



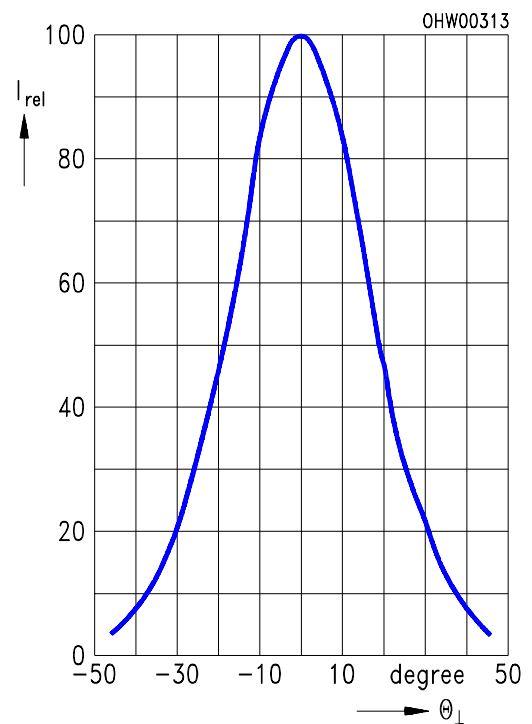
### Mode Spectrum $I_{rel}$ vs $\lambda$ ( $P_{opt} = 1.0\text{ W}$ )



### Farfield Distribution Parallel to Junction $I_{rel}$ vs $\theta_{||}$



### Farfield Distribution Perpendicular to Junction $I_{rel}$ vs $\theta_{\perp}$



## Notes for Operation

### 1. Eye Protection

This laser is a **Class 4 Laser** product.

Refer to the relevant safety regulations for protection during handling and operation.

### 2. Overload Protection

The specified values are valid as long as the diode has not been not overloaded. Voltage spikes from the power supply unit, even when applied for nanoseconds only, may cause irreversible damage to the laser diode. Such spikes may occur when the power supply is turned on or off, or they may reach the laser diode from the line via the coupling capacitance of electronically controlled devices.

The power supply should therefore be provided with appropriate protection circuits.

## Handling Notes

### 1. Package

To avoid electrostatic damages it is recommended to observe the same rules as for handling MOS-devices.

### 2. Mounting

When soldering, gluing or clamping, do not exceed the following limits:

- max. soldering temperature: 140 °C
- max. soldering time: 10 s
- max. curing temperature for adhesives: 100 °C

Any deformation of the heat sink by clamping must be avoided.

### 3. Electrical Connection

The cathode may be bonded by spot-welding, clamping or soldering.

In all these cases ESD-guidelines must be followed.

## Package Outlines

(Dimensions in mm, unless specified).

