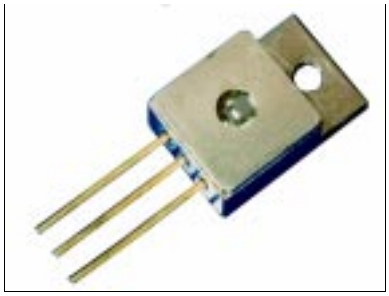
SIEMENS

Laser Diode in TO-220 Package
1.0 W cw (Class 4 Laser Product)

SPL 2Yxx
(SFH 4874x1)



Features

- Efficient radiation source for pulsed and cw-operation
- Reliable InGa(Al)As strained layer quantum-well material
- Small TO-220 package with efficient thermal coupling
- Includes thermistor to control temperature/wavelength
- Single emitting area 200 µm × 1 µm
- Cylindrical correction for a near circular farfield pattern

Applications

- Pumping solid state lasers (Nd: YAG, Yb: YAG, …)
- Medical applications
- Laser soldering
- Energy transmission
- Testing and measuring applications

Type	Old Type (as of Oct. 1996)	Wavelength *)	Ordering Code
SPL 2Y81	SFH 487401	808 nm	Q62702-P367
SPL 2Y85	SFH 487421	850 nm	Q62702-P1677
SPL 2Y94	SFH 487441	940 nm	Q62702-P1630
SPL 2Y98	–	980 nm	on request

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

Maximum Ratings

(T_A = 25 °C)

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Output power (continuous wave) 1)	P_{opt}	–	–	1.1	W
Output power (quasi-continuous wave) 1) ($t_p \leq 150$ µs, duty cycle ≤ 1%)	P_{qcw}	–	–	1.5	W
Reverse voltage	V_R	–	–	3	V
Operating temperature	T_{op}	– 10	…	+ 60	°C
Storage temperature	T_{stg}	– 40	…	+ 85	°C
Maximum soldering temperature, max. 5 s	T_s	–	–	250	°C

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

Diode Characteristics

(T_A = 25 °C)

Parameter		Symbol	Values			Unit
			min.	typ.	max.	
Emission wavelength [1]		λ_{peak}	803 840 935	808 850 940	813 860 945	nm
Spectral width (FWHM) [1]		$\Delta\lambda$		2		nm
Output power [2]		P_{opt}		1.0		W
Differential efficiency [2]	808 nm 850 nm 940 nm	η	0.75 0.75 0.70	0.95 0.85 0.80	1.1 1.0 0.9	W/A
Threshold current	808 nm 850 nm 940 nm	I_{th}	0.40 0.30 0.30	0.45 0.40 0.35	0.55 0.50 0.40	A
Operating current [1]	808 nm 850 nm 940 nm	I_{op}	1.3 1.3 1.4	1.5 1.5 1.6	1.8 1.8 1.8	A
Operating voltage [1]		V_{op}		2.0		V
Differential series resistance		r_s	–	0.2	0.4	Ω
Characteristic temperature (threshold) [3]		T_0		150		K
Temperature coefficient of operating current		$\partial I_{op}/\partial T$		0.5		%/K
Temperature coefficient of wavelength [4]		$\partial\lambda/\partial T$	0.25	0.27	0.30	nm/K
Thermal resistance (junction → heat sink)		$R_{th\ JA}$		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: $I_{th}(T_2) = I_{th}(T_1) \times \exp(T_2 - T_1)/T_0$

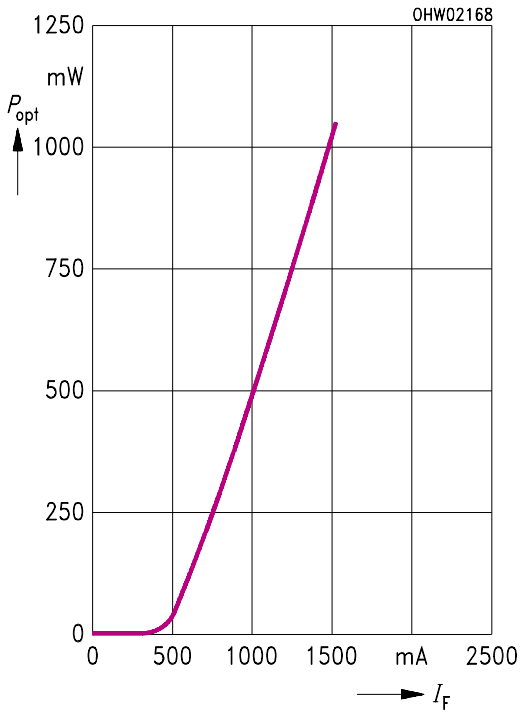
4) Depending on emission wavelength

NTC Thermistor

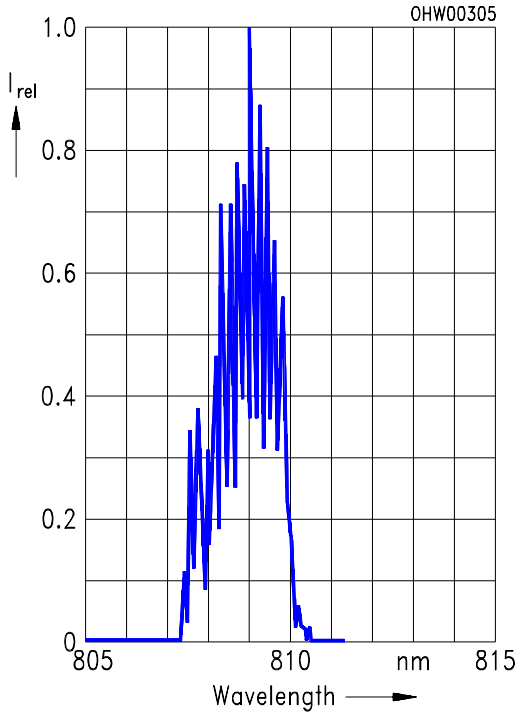
Parameter	Symbol	Typ. Values	Unit
Resistance at room temperature (25 °C)	R_{NTC}	10	kΩ

Optical Characteristics (T_A = 25 °C)

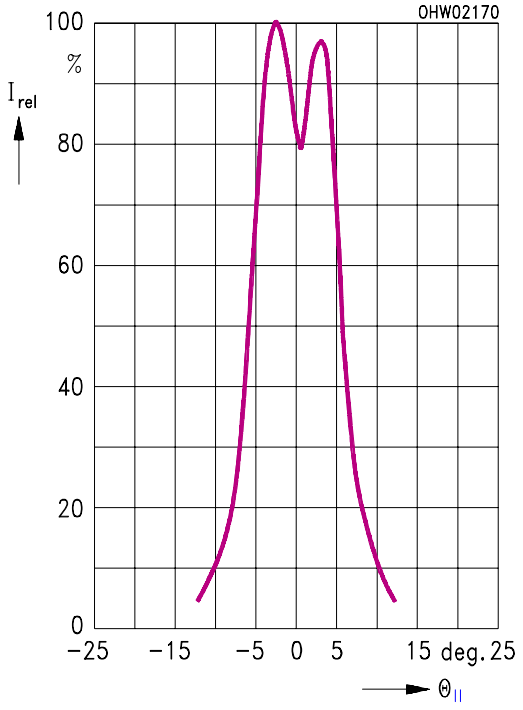
Radiant Power P_{opt} vs I_F



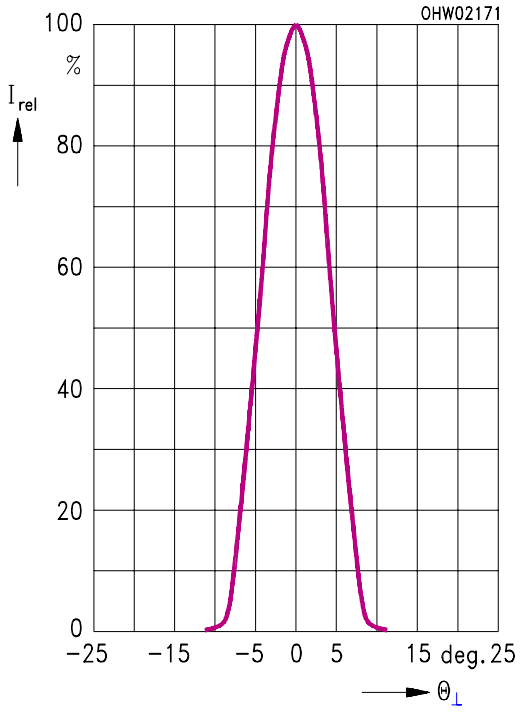
Mode Spectrum I_{rel} vs λ (P_{opt} = 1.0 W)



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



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 damage it is recommended to observe the same rules as for handling MOS-devices.

2. Mechanical Attachment

2.1 Mounting hole (suitable for M 2.5)
Because of the good thermal conductivity of the TO 220 base plate (copper) the heat loss is properly dissipated even if the component is attached on one side only. Some mounting techniques are shown below (**Fig. 1 – 3**).

2.2 For exact positioning of the TO component and other parts, e.g. lenses, the TO 220 package can be attached with appropriate clamping devices or screws (max. M 2.5).

3. Soldering

When soldering the TO base to a heat sink, do not exceed the following limits:

- max. soldering temperature: 125 °C
- max. soldering time: 1 min.

Mounting Techniques

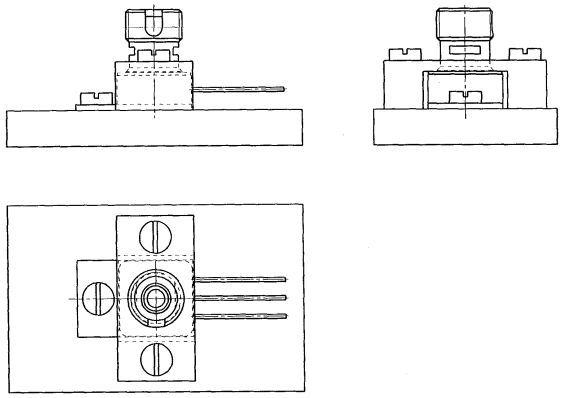


Figure 1

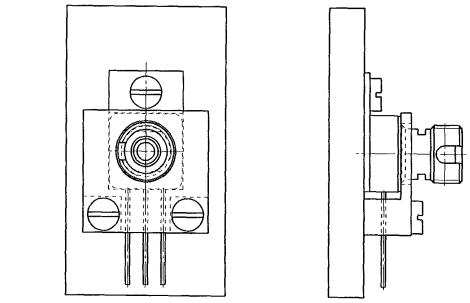


Figure 2

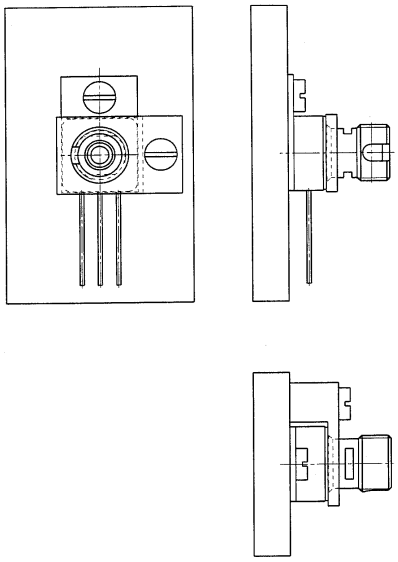
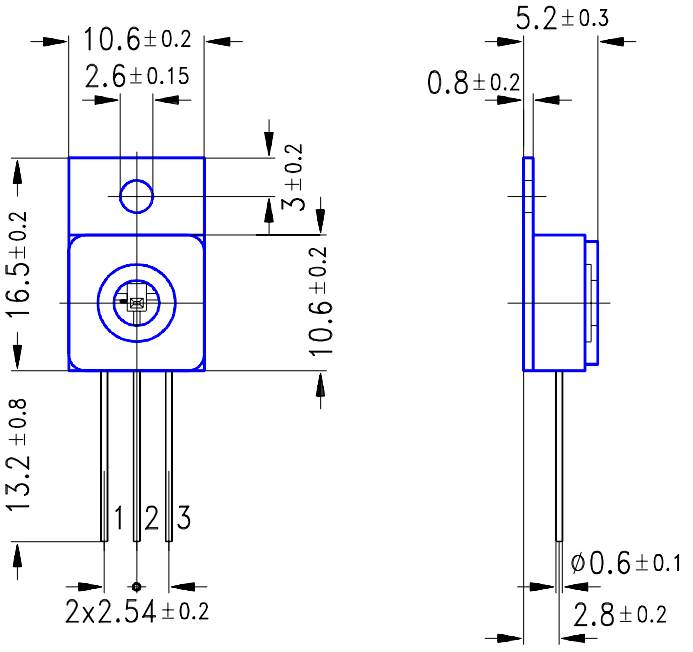


Figure 3

Package Outlines
(Dimensions in mm, unless specified).



1 Laserdiode Cathode
2 NTC
3 NTC
case Anode