

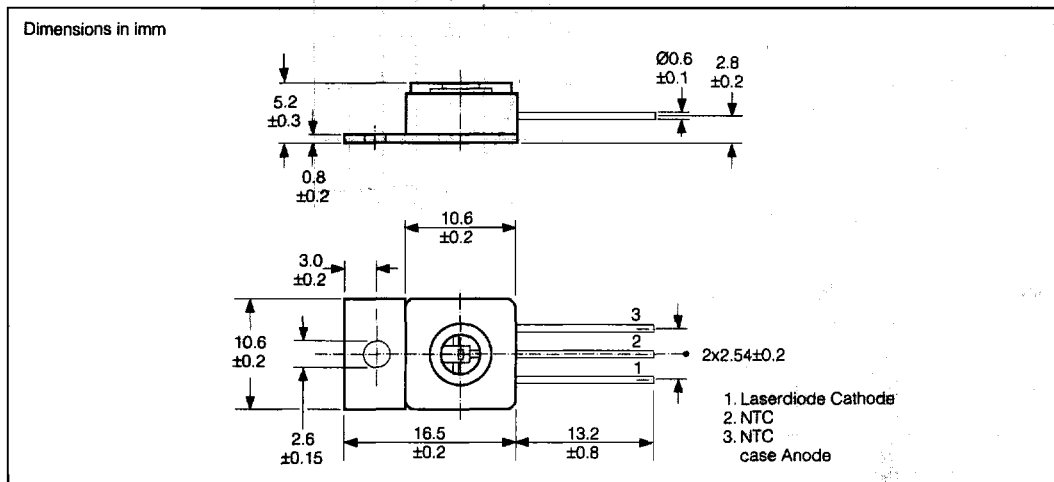
SIEMENS

808 nm **SPL 2Y81***

850 nm **SPL 2Y85***

940 nm **SPL 2Y94***

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



FEATURES

- Efficient radiation source for pulsed and CW-operation
- Reliable InGa(AI)As strained layer quantum-well material
- Small TO-220 package with efficient thermal coupling
- Includes thermistor to control temperature/wavelength
- Single emitting area $200 \mu\text{m} \times 1 \mu\text{m}$
- Cylindrical correction for a near circular Farfield pattern

Note

Other wavelengths in the range of 780 nm to 980 nm are available upon request.

*Formerly SFH 487401, SFH 487421, and SFH487441 respectively.

APPLICATIONS

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

NOTES FOR OPERATION

Eye Protection

This laser is a Class 4 Laser product. Refer to the relevant safety regulations for protection during handling and operation.

Overload Protection

The specified values are valid as long as the diode has not been 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 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 by screws (max. M2.5).

Figure 1.

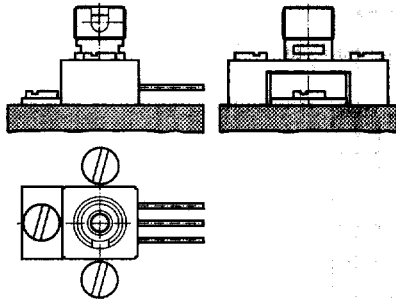


Figure 2.

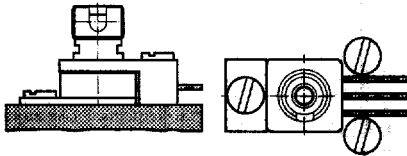
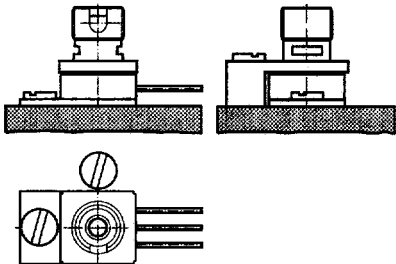


Figure 3.



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

Maximum Ratings $T_A=25^\circ\text{C}$

Output Power (continuous wave) (P_{OPT})	1.1 W
Output Power (quasi-continuous wave) (P_{QCW})	1.5 W
$t_p \leq 150 \mu\text{s}$, Duty Cycle $\leq 1\%$	
Reverse Voltage (V_R)	3 V
Operating Temperature (T_{OP})	-10 to +60°C
Storage Temperature (T_{STG})	-40 to +85°C
Maximum Soldering Temperature (T_S), max. 5 s	250°C

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

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

Parameter	Symbol	Value			Unit	
		Min.	Typ.	Max.		
Emission Wavelength ⁽¹⁾	λ_{peak}	803	808	813	nm	
		840	850	860		
		935	940	945		
Spectral Width (FWHM) ⁽¹⁾	$\Delta\lambda$	2			nm	
Output Power ⁽²⁾	P_{opt}	1.0			W	
Differential Efficiency ⁽²⁾	SPL 2Y81, 808 nm SPL 2Y85, 850 nm SPL 2Y94, 940 nm	η	0.75	0.95	1.1	W/A
			0.75	0.85	1.0	
			0.70	0.80	0.9	
Threshold Current	SPL 2Y81, 808 nm SPL 2Y85, 850 nm SPL 2Y94, 940 nm	I_{th}	0.40	0.45	0.55	A
			0.30	0.40	0.50	
			0.30	0.35	0.40	
Operating Current ⁽¹⁾	SPL 2Y81, 808 nm SPL 2Y85, 850 nm SPL 2Y94, 940 nm	I_{op}	1.3	1.5	1.8	A
			1.3	1.5	1.8	
			1.4	1.6	1.8	
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 Current	$\partial I_{\text{op}}/\partial T$	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_{thJA}	10			K/W	
NTC Thermistor					Typical Values	
Resistance at room temperature (25°C)	R_{NTC}	10			k Ω	

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

Figure 4. Radiant power P_{opt} versus (I_F)

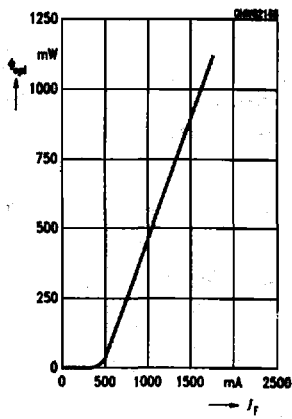


Figure 5. Mode spectrum I_{REL} versus λ ($P_{opt}=1.0\text{ W}$)

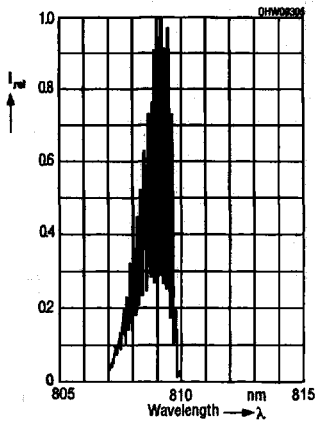


Figure 6. Farfield distribution parallel to junction I_{REL} versus $\theta_{||}$

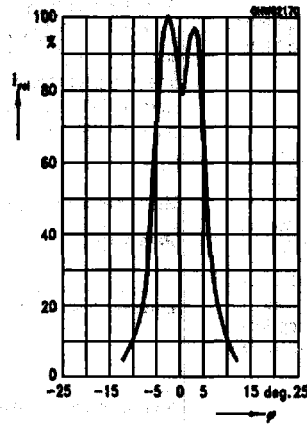


Figure 7. Farfield distribution parallel to junction I_{REL} versus θ_{\perp}

