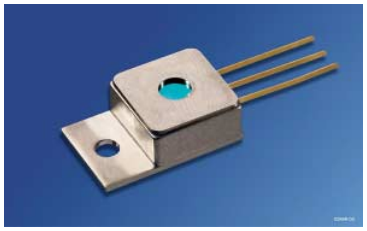
Laserdiode im TO-220 Gehäuse 2.0 W cw
Laser Diode in TO-220 Package 2.0 W cw

SPL 2Y81
SPL 2Y94



Besondere Merkmale

- Effiziente Strahlungsquelle für Dauerstrich- und gepulstem Betriebsmodus
- Zuverlässige InGa(Al)As kompressiv verspannte Quantenfilm-Struktur
- Kleines TO-220 Gehäuse mit effizienter thermischer Kopplung
- Integrierter Thermistor ermöglicht Wellenlängensteuerung über die Temperatur
- Austrittsöffnung 200 µm
- Zylinderlinse zur Korrektur der vertikalen Achse

Features

- Efficient radiation source for cw and pulsed operation
- Reliable InGa(Al)As strained layer quantum-well structure
- Small TO-220 package with efficient thermal coupling
- Included thermistor allows wavelength control by temperature
- Laser aperture 200 µm
- Cylindrical correction for a near circular far-field pattern

Anwendungen

- Pumpen von Festkörperlasern (Nd: YAG, Yb: YAG, …)
- Medizinische und zahnmedizinische Anwendungen
- Löten, Erwärmen, Beleuchten
- Freiraum-Datenübertragung
- Energieübertragung
- Test- und Messsysteme

Applications

- Pumping of solid state lasers (Nd: YAG, Yb: YAG, …)
- Medical and dental applications
- Soldering, heating, illumination
- Free space data transmission
- Energy transmission
- Testing and measuring applications

Sicherheitshinweise

Je nach Betriebsart emittieren diese Bauteile hochkonzentrierte, nicht sichtbare Infrarot-Strahlung, die gefährlich für das menschliche Auge sein kann. Produkte, die diese Bauteile enthalten, müssen gemäß den Sicherheits-richtlinien der IEC-Norm 60825-1 behandelt werden.

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”.

Typ Type	Wellenlänge Wavelength[1)]	Bestellnummer Ordering Code
SPL 2Y81	808 nm	Q62702P5376
SPL 2Y94	940 nm	Q62702P5462

1) Andere Wellenlängen im Bereich von 780 nm … 980 nm sind auf Anfrage erhältlich.
Other wavelengths in the range of 780 nm … 980 nm are available on request.

Grenzwerte (T_A = 25 °C)
Maximum Ratings

Bezeichnung Parameter	Symbol Symbol	Wert Values		Einheit Unit
		min.	max.	
Ausgangsleistung (Dauerstrichbetrieb)[1)] Output power (continuous wave)[1)]	P_{cw}	–	2.2	W
Ausgangsleistung (Quasi-Dauerstrichbetrieb)[1)] (t_p ≤150 µs, Tastverhältnis ≤30%) Output power (quasi-continuous wave)[1)] (t_p ≤150 µs, duty cycle ≤30%)	P_{qcw}	–	2.7	W
Sperrspannung Reverse voltage	V_R	–	3	V
Betriebstemperatur Operating temperature	T_{op}	– 10	+ 60	°C
Lagertemperatur Storage temperature	T_{stg}	– 40	+ 85	°C
Löttemperatur an den Anschlüssen, max. 10 s Soldering temperature at the pins, max. 10 s	T_s	–	260	°C

1) Zur Leistungsmessung wird die gesamte Lichtleistung in eine Ulbrichtkugel eingekoppelt.
Optical power is measured by coupling into an integrating sphere.

Diodenkennwerte (T_A = 25 °C)
Diode Characteristics

Bezeichnung **Parameter**		**Symbol** **Symbol**	**Wert** **Values**			**Einheit** **Unit**
			min.	**typ.**	**max.**	
Zentrale Emissionswellenlänge[1)] Emission wavelength[1)]	808 nm 940 nm	λ_{peak}	805 930	808 940	811 950	nm
Spektrale Breite (Halbwertsbreite)[1)] Spectral width (FWHM)[1)]		$\Delta\lambda$	–	3.0	–	nm
Opt. Ausgangsleistung im Betriebspunkt[2)] Output power[2)]		P_{op}	–	2.0	–	W
Differentielle Effizienz Differential efficiency	808 nm 940 nm	η	0.80 0.75	1.00 0.95	1.25 1.20	W/A
Schwellstrom Threshold current	808 nm 940 nm	I_{th}	0.55 0.35	0.65 0.45	0.80 0.60	A
Betriebsstrom[1)2)] Operating current[1)2)]	808 nm 940 nm	I_{op}	–	2.65 2.60	3.20 3.20	A
Betriebsspannung[1)2)] Operating voltage[1)2)]	808 nm 940 nm	V_{op}	–	2.05 2.00	2.35 2.30	V
Differentieller Serienwiderstand Differential series resistance		R_s	–	0.20	0.40	Ω
Strahldivergenz (Halbwertsbreite) Beam divergence (FWHM)		$\theta_{\parallel} \times \theta_{\perp}$	–	10° × 2°	–	Grad deg.
Charakteristische Temperatur (Schwelle)[3)] Characteristic temperature (threshold)[3)]	808 nm 940 nm	T_0	–	140 220	–	K
Temperaturkoeffizient des Betriebsstroms Temperature coefficient of operating current		$\partial I_{op}/I_{op}\partial T$	–	0.5	–	%/K
Temperaturkoeffizient der Wellenlänge Temperature coefficient of wavelength		$\partial\lambda/\partial T$	–	0.3	–	nm/K

Diodenkennwerte (T_A = 25 °C)
Diode Characteristics (cont'd)

Bezeichnung Parameter	Symbol Symbol	Wert Values			Einheit Unit
		min.	typ.	max.	
Thermischer Widerstand (pn-Übergang →Wärmesenke) Thermal resistance (junction →heat sink)	$R_{th\ JA}$	–	6.5	–	K/W

1) Standardbetriebsbedingungen beziehen sich auf 2 W cw optische Ausgangsleistung.
Standard operating conditions refer to 2 W cw optical output power.

2) Optische Leistungen werden mit einer Ulbrichtkugel gemessen.
Optical power measurements refer to an integrating sphere.

3) Modelle zur Bestimmung des thermischen Verhaltens bzgl. des Schwellstroms: $I_{th}(T_2) = I_{th}(T_1) \times \exp(T_2 - T_1)/T_0$
Model for the thermal behavior of threshold current: $I_{th}(T_2) = I_{th}(T_1) \times \exp(T_2 - T_1)/T_0$

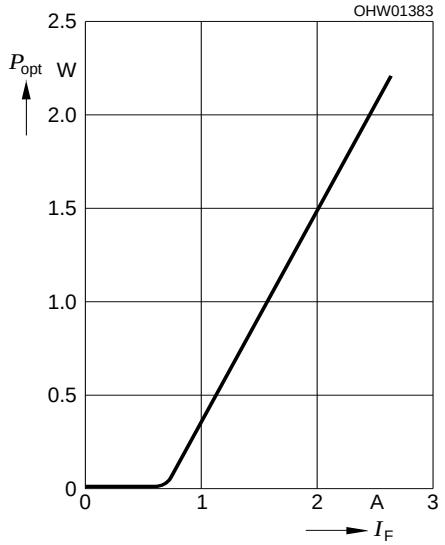
NTC Thermistor

$R_T = R_0 \times \exp(B \times (1/T - 1/T_0))$

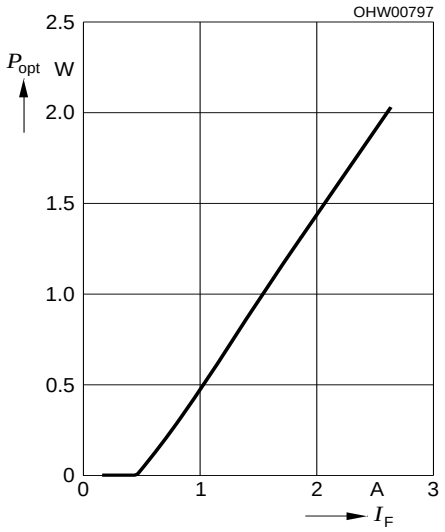
R_0 = 10 kΩ ± 3%, T_0 = 25 °C = 298 K, B = 3730 K

Optische Kennwerte

Optical Output Power P_{opt} vs. Forward Current I_F (T_A = 25 °C)
SPL 2Y81

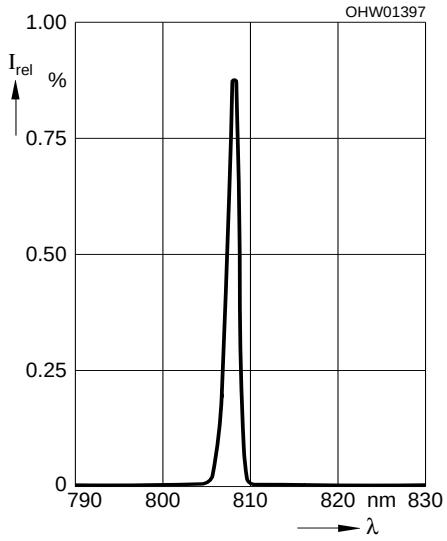


Optical Output Power P_{opt} vs. Forward Current I_F (T_A = 25 °C)
SPL 2Y94

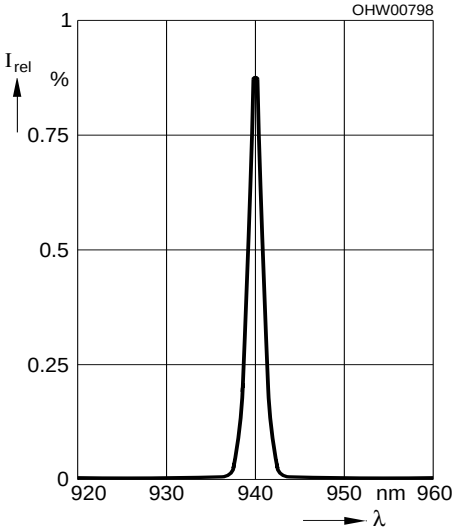


Optical Characteristics

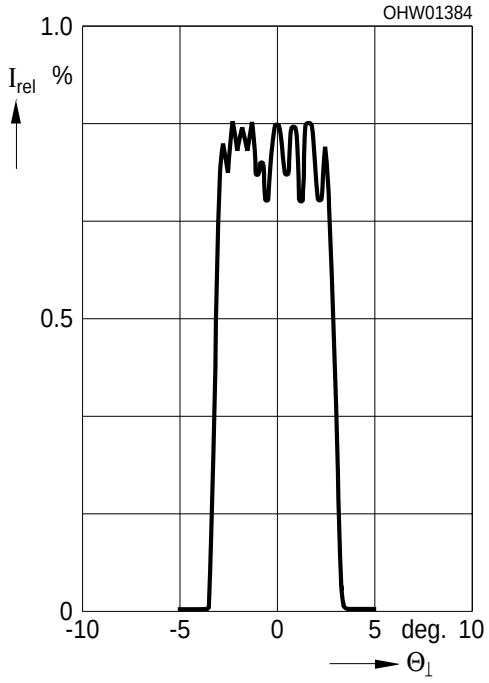
Optical Spectrum, Relative Intensity I_{rel} vs. Wavelength λ (T_A = 25 °C, P_{opt} = 1.5 W)
SPL 2Y81



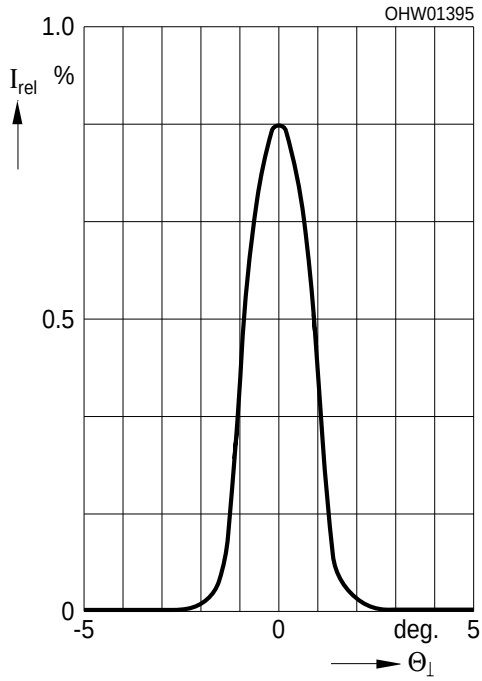
Optical Spectrum, Relative Intensity I_{rel} vs. Wavelength λ (T_A = 25 °C, P_{opt} = 1.5 W)
SPL 2Y94



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



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



Alle Laser werden vorgetestet und gemäß den gemessenen Kennwerten ausgeliefert.
Bezüglich Sicherheit, Verpackung, Behandlung, Montage und Betriebsbedingungen lesen Sie bitte sorgfältig unsere **„Notes for Operation I“**.

All devices are pretested and will be delivered including measured laser characteristics.
For safety, unpacking, handling, mounting, and operating issues, please read carefully our **“Notes for Operation I”**.

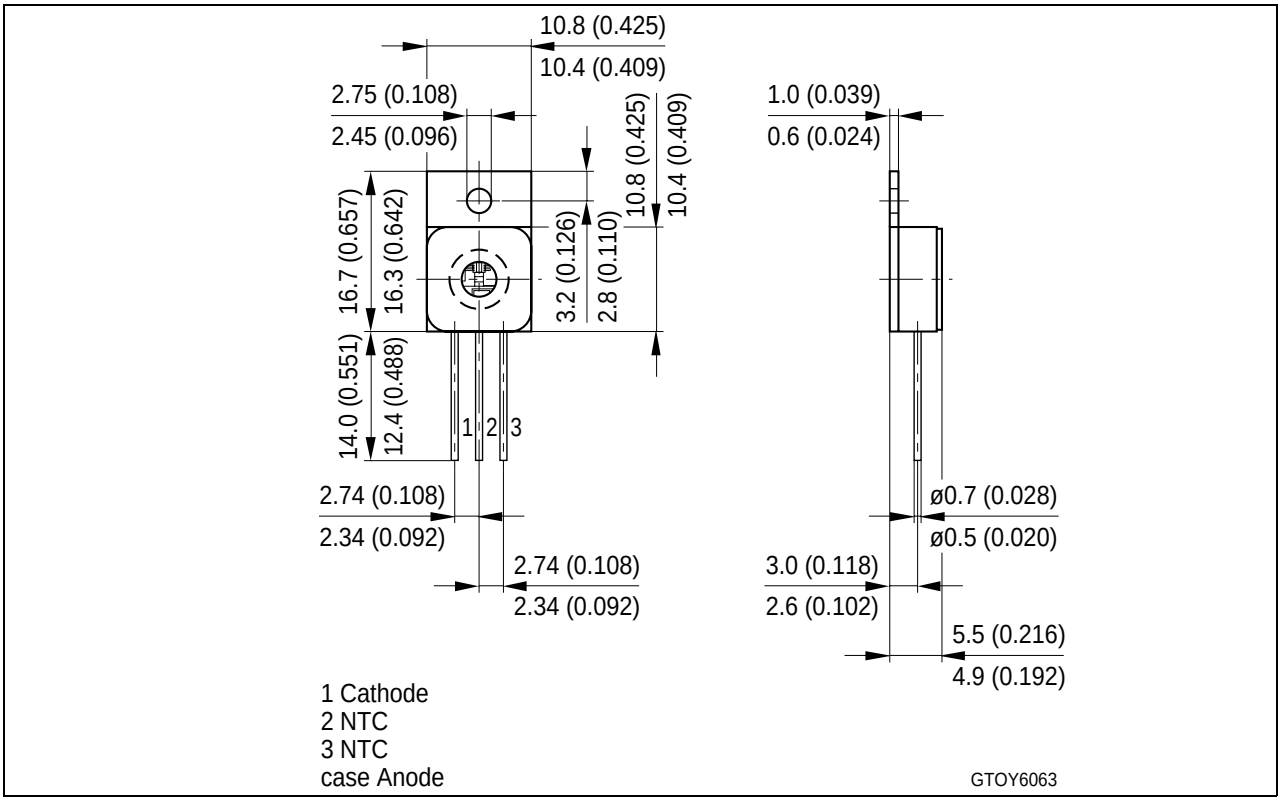
Mechanische Montage

Befestigungsloch (geeignet für M 2.5).
Durch die gute Wäremeleitfähigkeit der TO-220 Bodenplatte (Kupfer) wird die Wärme auch bei Befestigung an nur einer Seite gut abgeleitet.
Zur exakten Positionierung des Gehäuses und anderer Teile, z.B. Linsen, kann das TO-220-Gehäuse mit entsprechenden Klemmen oder Schrauben (max. M 2.5) befestigt werden.

Mechanical Attachment

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.
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).

Maßzeichnung
Package Outlines



Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

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The information describes the type of component and shall not be considered as assured characteristics.
Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances. For information on the types in question please contact our Sales Organization.

Packing

Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office. By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

Components used in life-support devices or systems must be expressly authorized for such purpose! Critical components [1] , may only be used in life-support devices or systems [2] with the express written approval of OSRAM OS.

[1] A critical component is a component usedin a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or effectiveness of that device or system.

[2] Life support devices or systems are intended (a) to be implanted in the human body, or (b) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health of the user may be endangered.