Opto Semiconductors

OSRAM

LASER COMPONENTS

Hybride Impuls-Laserdiode mit integrierter Treiberstufe 14 W Spitzenleistung
Hybrid Pulsed Laser Diode with Integrated Driver Stage 14 W Peak Power

Lead (Pb) Free Product - RoHS Compliant

SPL LL85

Besondere Merkmale

- Kleines kostengünstiges Plastik-Gehäuse
- Integriert sind ein FET und Kondensatoren zur Impulsansteuerung
- InAlGaAs/GaAs kompressiv verspannte Quantenfilmstruktur
- Hochleistungslaser mit „Large-Optical-Cavity“ (LOC) Struktur
- Laserapertur 200 µm x 2 µm
- Schneller Betrieb (< 30 ns Impulsbreite)
- Niedrige Versorgungsspannung (< 9 V)

Anwendungen

- Entfernungsmessung
- Sicherheit, Überwachung
- Beleuchtung, Zündung
- Test- und Messsysteme

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.

Features

- Low cost, small size plastic package
- Integrated FET and capacitors for pulse control
- Strained InAlGaAs/GaAs QW-structures
- High power large-optical-cavity laser structure
- Laser aperture 200 µm x 2 µm
- High-speed operation (< 30 ns pulse width)
- Low supply voltage (< 9 V)

Applications

- Range finding
- Security, surveillance
- Illumination, ignition
- Testing and measurement

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	Opt. Spitzenausgangsleistung Opt. Peak Power	Wellenlänge Wavelength	Bestellnummer Ordering Code
SPL LL85	14 W	850 nm	Q62702P3558

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Grenzwerte (kurzzeitiger Betrieb) (T_A = 25 °C)
Maximum Ratings (short time operation)

Parameter **Parameter**	**Symbol** **Symbol**	**Werte** **Values**		**Einheit** **Unit**
		min.	**max.**	
Spitzenausgangsleistung Peak output power	P_{opt}	–	18	W
Ladespannung (V_G = 15 V) Charge voltage (V_G = 15 V)	V_C		9	V
Gate-Spannung Gate voltage	V_G	– 20	+ 20	V
Tastverhältnis Duty cycle	$d.c.$	–	0.1	%
Betriebstemperatur Operating temperature	T_{op}	- 40	+ 85	°C
Lagertemperatur Storage temperature	T_{stg}	- 40	+ 100	°C
Löttemperatur (t_{max} = 10 s) Soldering temperature (t_{max} = 10 s)	T_s	–	+ 260	°C

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Optische Kennwerte (T_A = 25 °C)
Optical Characteristics

Parameter **Parameter**	**Symbol** **Symbol**	**Werte** **Values**			**Einheit** **Unit**
		min.	**typ.**	**max.**	
Zentrale Emissionswellenlänge[1)] Emission wavelength[1)]	λ	840	850	860	nm
Spektralbreite (Halbwertsbreite)[1)] Spectral width (FWHM)[1)]	$\Delta\lambda$	–	4	9	nm
Spitzenausgangsleistung[1)] Peak output power[1)]	P_{opt}	12	14	18	W
Ladespannung an der Laserschwelle Charge Voltage at laser threshold	$U_{C, th}$	1.2	1.5	2.0	V
Pulsbreite (Halbwertsbreite)[1), 2)] Pulse width (FWHM)[1), 2)]	t_p	25	28	31	ns
Anstiegs- und Abfallzeit (10% … 90%)[1), 2)] Rise and fall time (10% … 90%)[1), 2)]	t_r, t_f	7.0 26	9.5 29	12.0 32	ns ns
Austrittsöffnung Aperture size	$w \times h$	–	200 × 2	–	μm^2
Strahldivergenz (Halbwertsbreite) parallel zum pn-Übergang[1)] Beam divergence (FWHM) parallel to pn junction[1)]	$\theta_{\|\|}$	12	15	18	Grad deg.
Strahldivergenz (Halbwertsbreite) senkrecht zum pn-Übergang[1)] Beam divergence (FWHM) perpendicular to pn-junction[1)]	$\theta_{\perp}$	27	30	33	Grad deg.
Temperaturkoeffizient der Wellenlänge Temperature coefficient of wavelength	$\partial\lambda / \partial T$	–	0.25	0.32	nm/K
Thermischer Widerstand Thermal resistance	R_{th}	–	200	–	K/W
Einschaltpunkt der Gate-Spannung Switch on gate voltage	$V_{G\ on}$	–	4.5	–	V

[1)] Werte beziehen sich auf folgende Standardbetriebsbedingung: >40ns Trigger-Pulsbreite, 1kHz Pulswiederholrate, 6.7V Ladespannung, 15V Gate-Spannung und 25°C Umgebungstemperatur. Der Laser wird angesteuert mit dem MOSFET-Treiber Elantec EL7104C.
Values refer to the following standard operating conditions: >40ns trigger pulse width, 1kHz pulse repetition rate, 6.7V charge voltage, 15V gate voltage and 25 °C ambient temperature. The laser is driven by the MOSFET driver Elantec EL7104C.

[2)] Die Schaltgeschwindigkeit ist abhängig von Strom und Geschwindigkeit, mit der die Gate-Kapazität (typ. 300pF) des internen Transistors geladen wird. Kürzere Pulsbreiten, Anstiegs- und Abfallzeiten erhält man bei Trigger-Pulsbreiten <40ns. Dies bewirkt jedoch auch eine reduzierte optische Spitzenleistung (siehe Diagramme auf Seite 5).
Switching speed at gate depends on current and speed, charging the gate capacitance (typ. 300pF) of the internal transistor. Reduced pulse widths, rise and fall times occur at trigger pulse widths <40ns. This also reduces the optical peak power (see diagrams on page 5).

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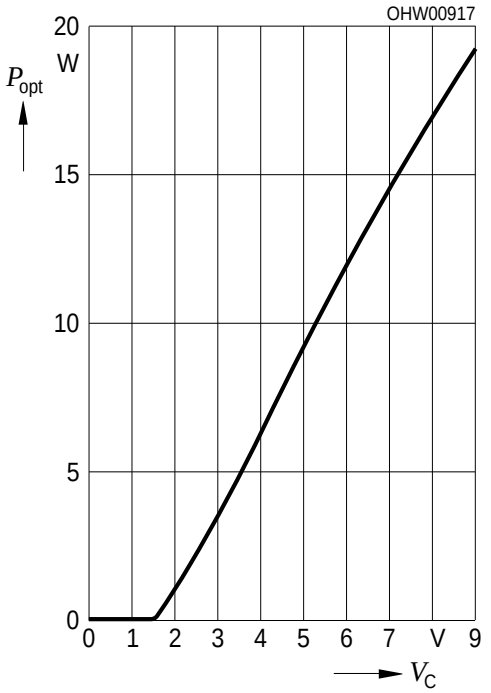
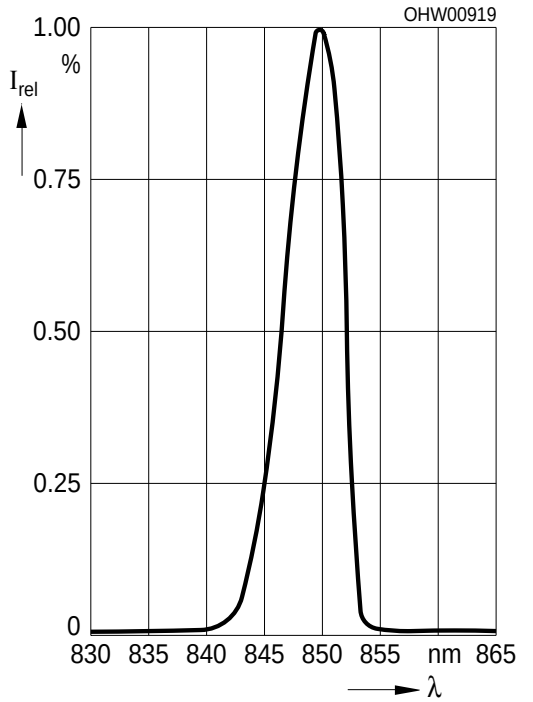
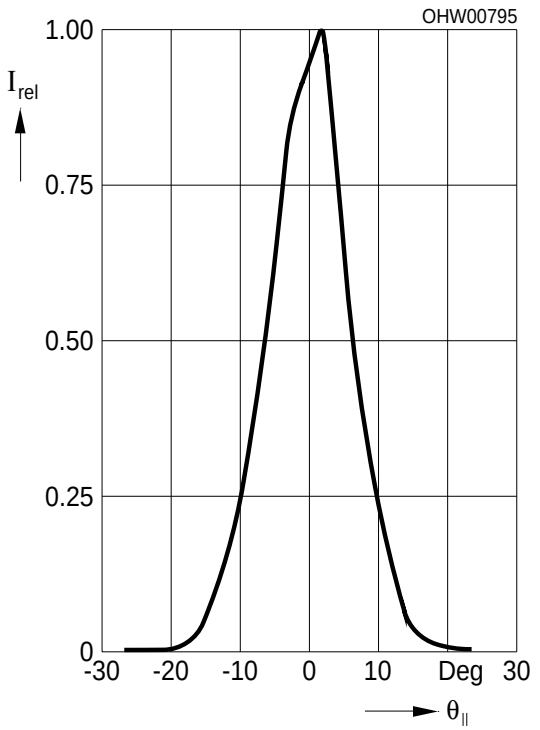
Optical output power P_{opt} vs charge voltage V_c (t_p = 30 ns, PRF = 1 kHz, V_G = 15 V)



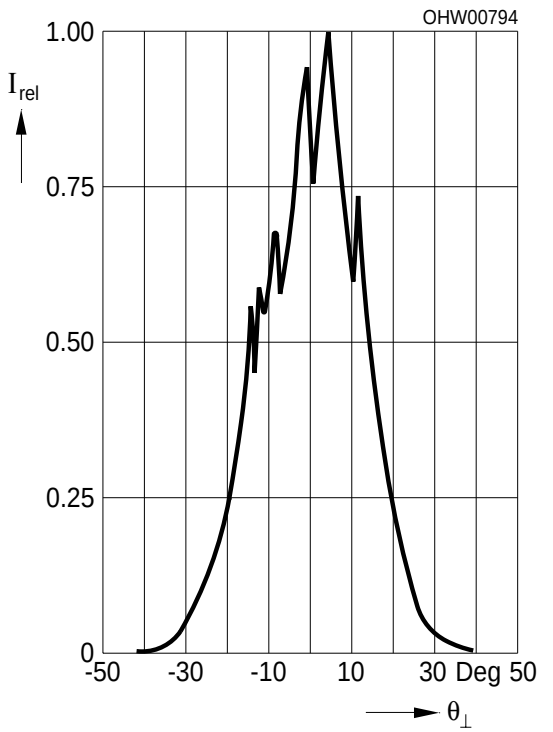
Optical spectrum, relative intensity I_{rel} vs. wavelength λ (P_{opt} = 14 W, t_p = 30 ns)



Far-field distribution parallel to junction I_{rel} vs. angle $\theta_{||}$



Far-field distribution perpendicular to junction I_{rel} vs. angle $\theta_{\perp}$



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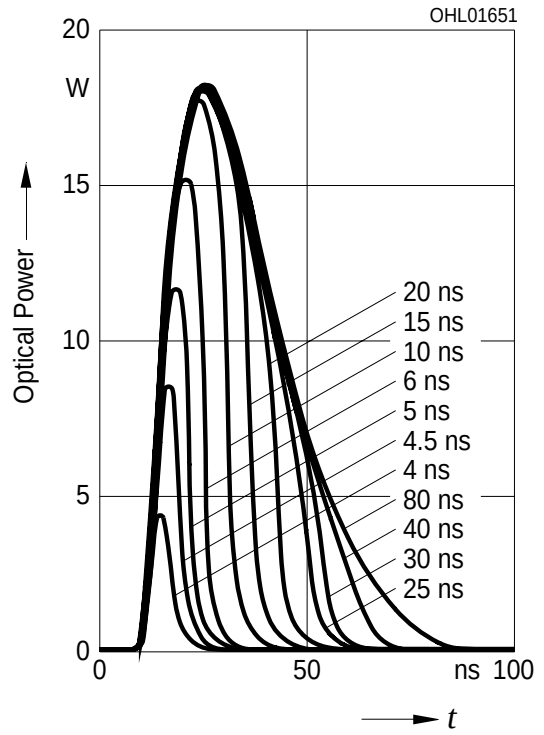
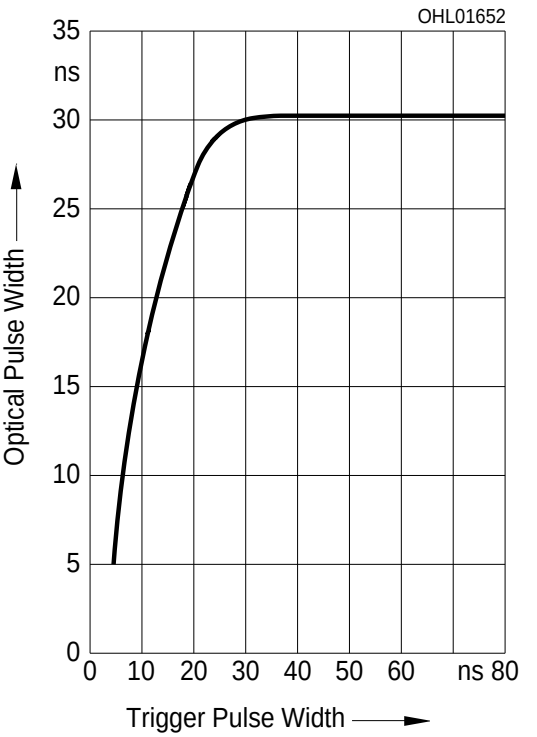
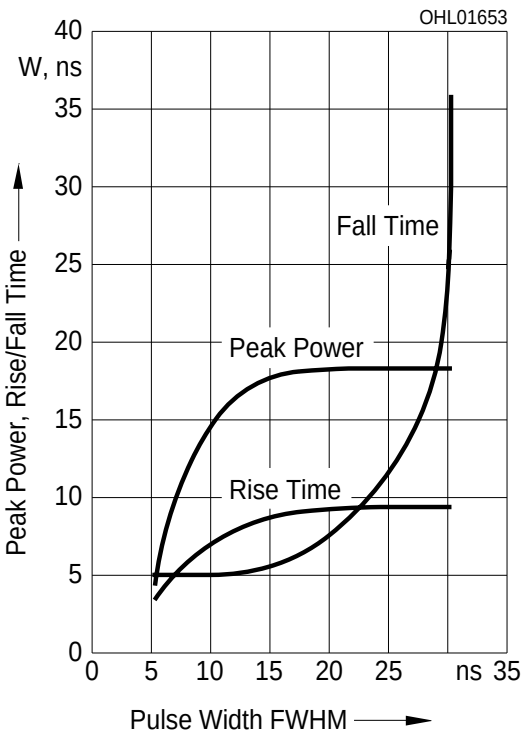
Optical pulse form for variing trigger pulse widths (MOSFET driver Elantec EL7104C)



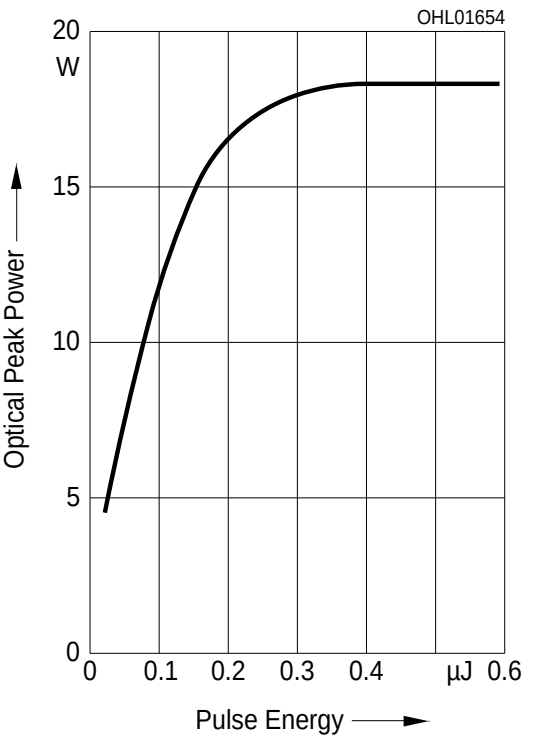
Optical pulse width vs. trigger pulse width (MOSFET driver Elantec EL7104C)



Optical peak power, fall and rise time vs. pulse width (MOSFET driver Elantec EL7104C)



Optical peak power vs. optical pulse energy (MOSFET driver Elantec EL7104C)



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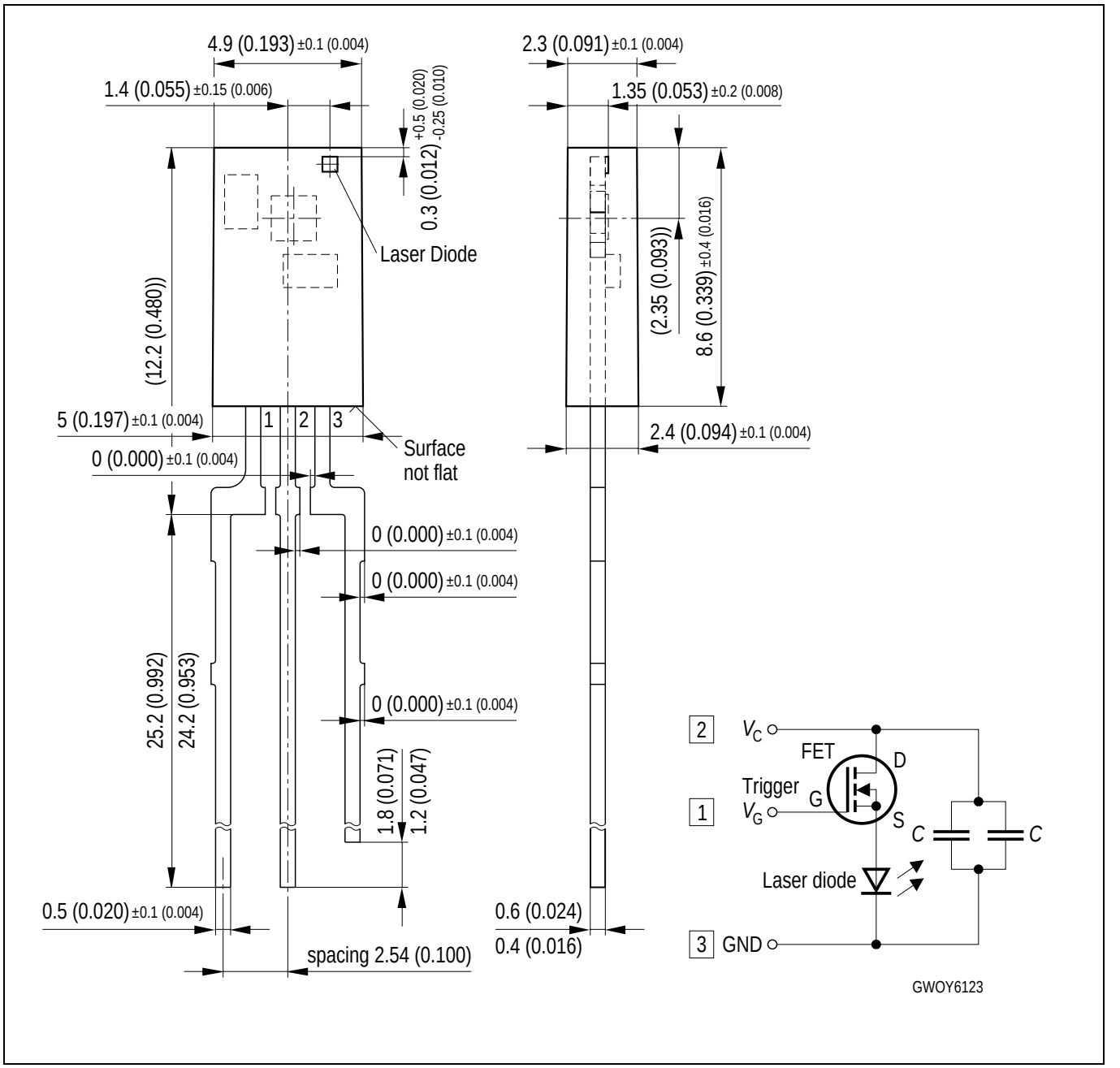
Maßzeichnung
Package Outlines



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

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Packing

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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.

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