

# 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  $\mu\text{m}$  x 2  $\mu\text{m}$
- 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 Sicherheitsrichtlinien 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  $\mu\text{m}$  x 2  $\mu\text{m}$
- 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

**Grenzwerte (kurzzeitiger Betrieb) ( $T_A = 25\text{ °C}$ )**  
**Maximum Ratings (short time operation)**

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

**Optische Kennwerte ( $T_A = 25\text{ °C}$ )**  
**Optical Characteristics**

Parameter Parameter	Symbol Symbol	Werte Values			Einheit Unit
		min.	typ.	max.	
Zentrale Emissionswellenlänge <sup>1)</sup> Emission wavelength <sup>1)</sup>	$\lambda$	840	850	860	nm
Spektラルbreite (Halbwertsbreite) <sup>1)</sup> Spectral width (FWHM) <sup>1)</sup>	$\Delta\lambda$	–	4	9	nm
Spitzenausgangsleistung <sup>1)</sup> Peak output power <sup>1)</sup>	$P_{\text{opt}}$	12	14	18	W
Ladespannung an der Laserschwelle Charge Voltage at laser threshold	$U_{\text{C, th}}$	1.2	1.5	2.0	V
Pulsbreite (Halbwertsbreite) <sup>1), 2)</sup> Pulse width (FWHM) <sup>1), 2)</sup>	$t_p$	25	28	31	ns
Anstiegs- und Abfallzeit (10% ... 90%) <sup>1), 2)</sup> Rise and fall time (10% ... 90%) <sup>1), 2)</sup>	$t_r$ , $t_f$	7.0 26	9.5 29	12.0 32	ns ns
Austrittsöffnung Aperture size	$w \times h$	–	200 × 2	–	$\mu\text{m}^2$
Strahldivergenz (Halbwertsbreite) parallel zum pn-Übergang <sup>1)</sup> Beam divergence (FWHM) parallel to pn junction <sup>1)</sup>	$\theta_{\parallel}$	12	15	18	Grad deg.
Strahldivergenz (Halbwertsbreite) senkrecht zum pn-Übergang <sup>1)</sup> Beam divergence (FWHM) perpendicular to pn-junction <sup>1)</sup>	$\theta_{\perp}$	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	$R_{\text{th}}$	–	200	–	K/W
Einschaltpunkt der Gate-Spannung Switch on gate voltage	$V_{\text{G on}}$	–	4.5	–	V

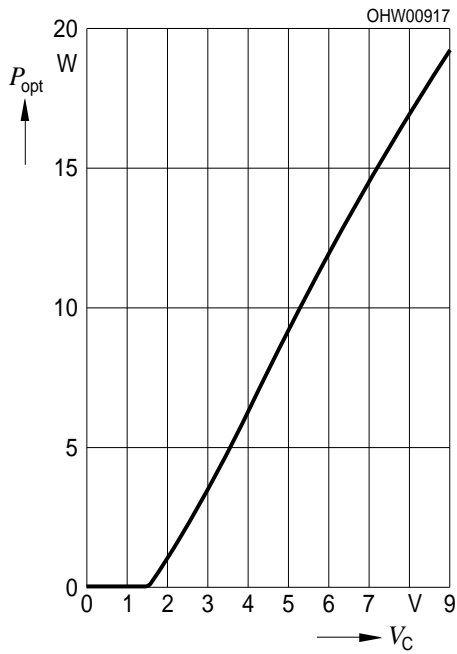
<sup>1)</sup> Werte beziehen sich auf folgende Standardbetriebsbedingung: >40ns Trigger-Pulsbreite, 1kHz Pulswiederholrate, 6.7V Ladespannung, 15V Gate-Spannung und 25°C Umgebungstemperatur. Der Laser wird angesteuert mit dem MOSFET-Treiber Elantec EL7104C.

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.

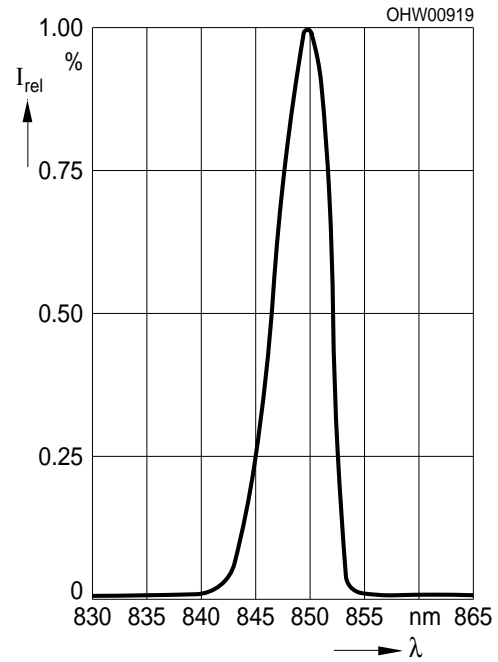
<sup>2)</sup> Die Schaltgeschwindigkeit ist abhängig von Strom und Geschwindigkeit, mit der die Gate-Kapazität (typ. 300pF) des internen Transistors geladen wird. Kürzere Pulsbreiten, Anstiegs- und Abfallzeiten erhält man bei Trigger-Pulsbreiten <40ns. Dies bewirkt jedoch auch eine reduzierte optische 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).

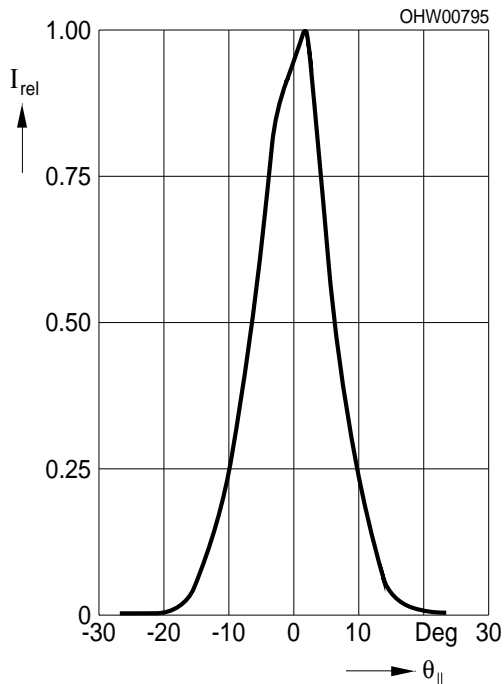
Optical output power  $P_{opt}$  vs charge voltage  $V_C$   
 ( $t_p = 30$  ns, PRF = 1 kHz,  $V_G = 15$  V)



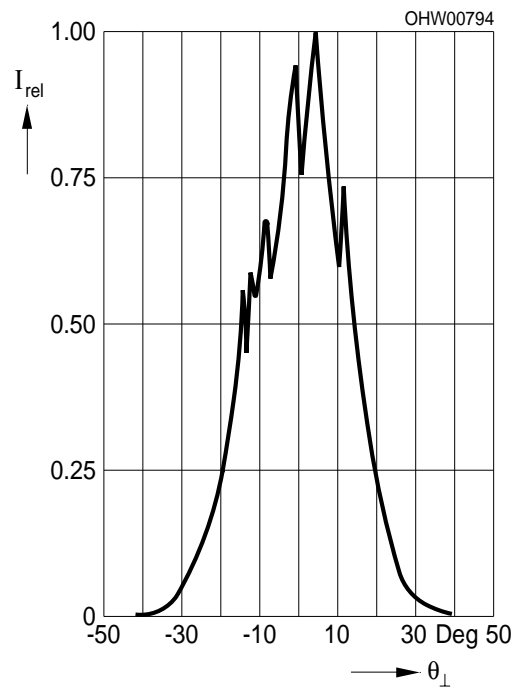
Optical spectrum, relative intensity  $I_{rel}$  vs. wavelength  $\lambda$  ( $P_{opt} = 14$  W,  $t_p = 30$  ns)



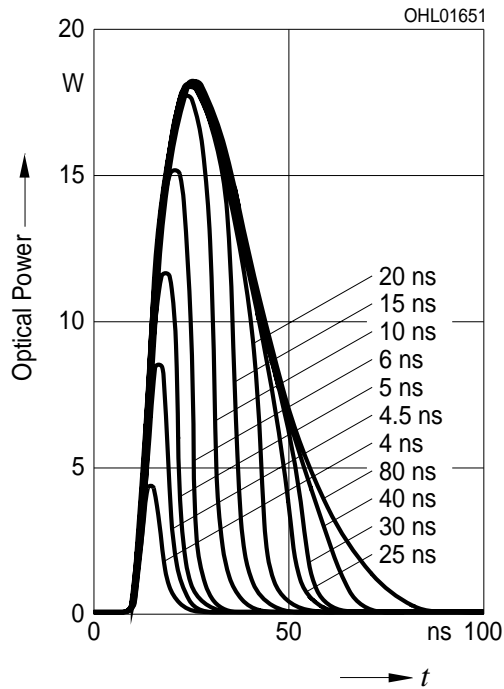
Far-field distribution parallel to junction  
 $I_{rel}$  vs. angle  $\theta_{||}$



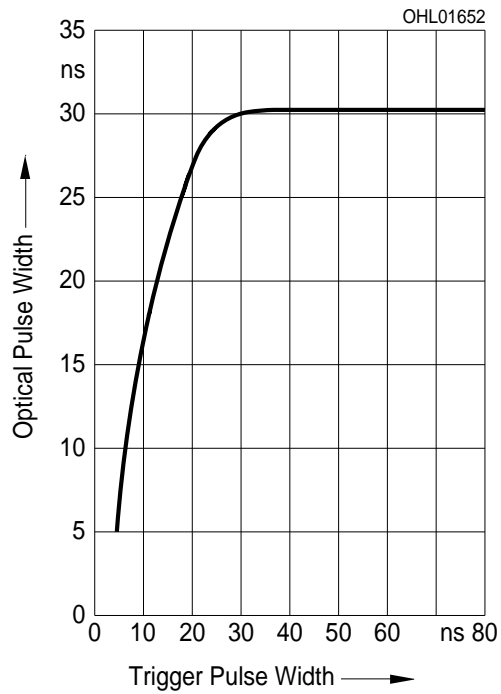
Far-field distribution perpendicular to junction  
 $I_{rel}$  vs. angle  $\theta_{\perp}$



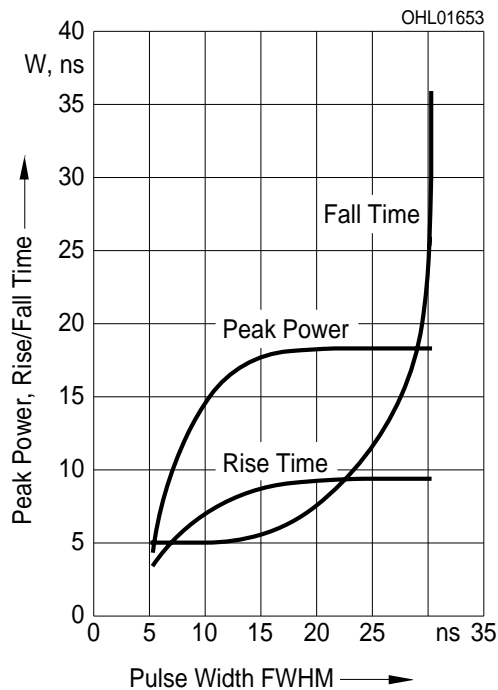
**Optical pulse form for varying trigger pulse widths (MOSFET driver Elantec EL7104C)**



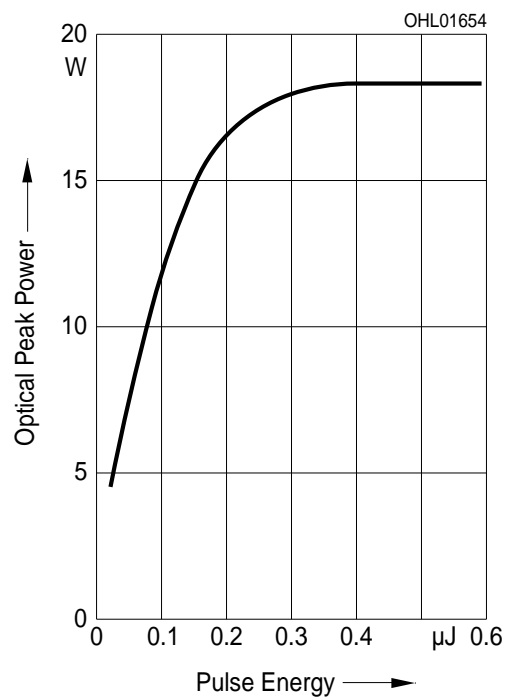
**Optical pulse width vs. trigger pulse width (MOSFET driver Elantec EL7104C)**



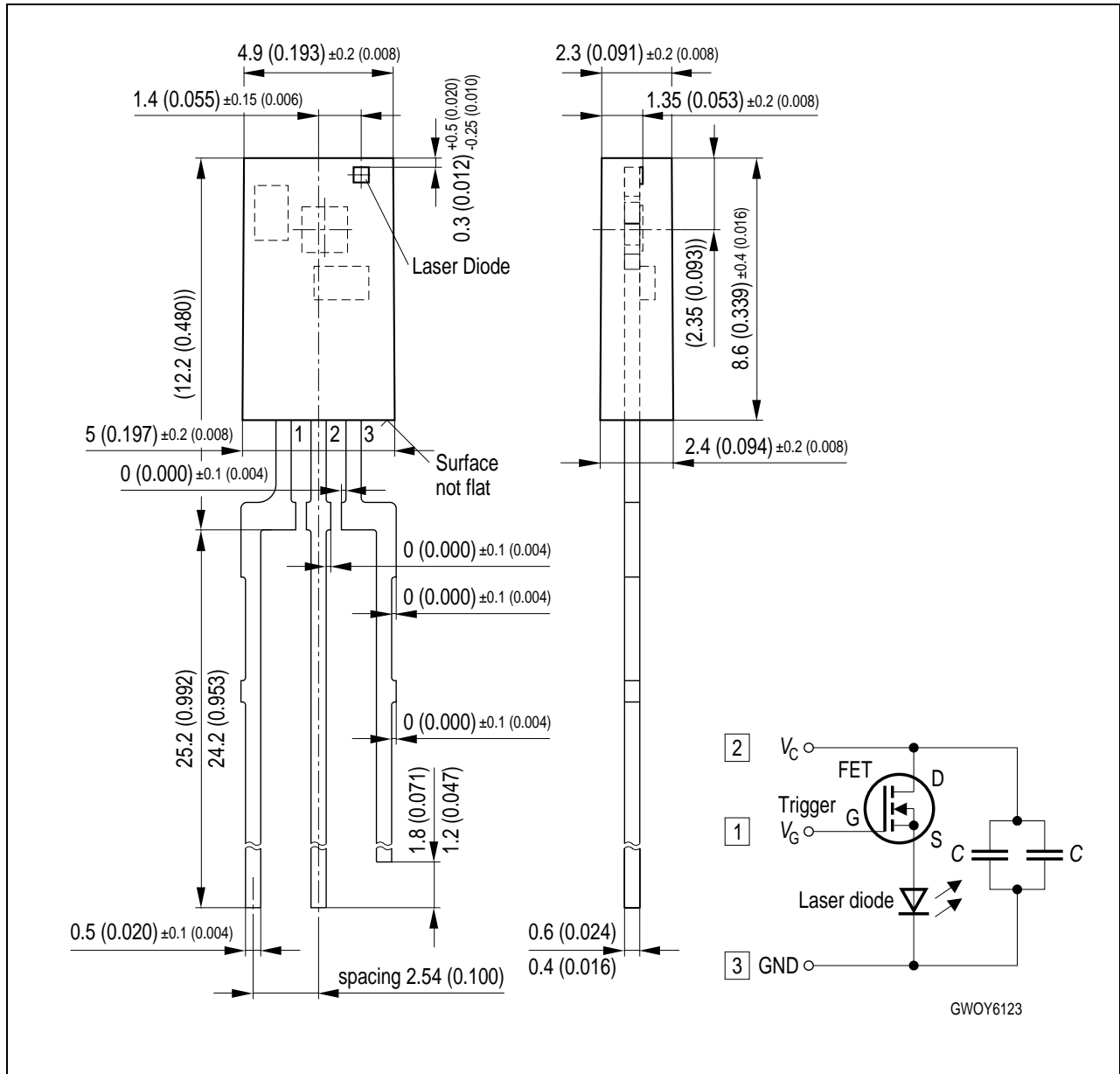
**Optical peak power, fall and rise time vs. pulse width (MOSFET driver Elantec EL7104C)**



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



Maßzeichnung  
Package Outlines



Maße in mm (inch) / Dimensions in mm (inch).

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