

Hybride Impuls-Laserdiode mit integrierter Treiberstufe 25 W Spitzenleistung Hybrid Pulsed Laser Diode with Integrated Driver Stage 25 W Peak Power

SPL LL90



Besondere Merkmale

- Kleines kostengünstiges Plastik-Gehäuse
- Integriert sind ein FET und Kondensatoren zur Impulssteuerung
- 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 (< 20 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 μm x 2 μm
- High-speed operation (< 30 ns pulse width)
- Low supply voltage (< 20 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 LL90	25 W	905 nm	Q62702P5367

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}	–	30	W
Ladespannung ($V_G = 15\text{ V}$) Charge voltage ($V_G = 15\text{ V}$)	V_C		20	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 ¹⁾ Emission wavelength ¹⁾	λ	895	905	915	nm
Spektralbreite (Halbwertsbreite) ¹⁾ Spectral width (FWHM) ¹⁾	$\Delta\lambda$	–	7	9	nm
Spitzenausgangsleistung ¹⁾ Peak output power ¹⁾	P_{opt}	22	25	28	W
Ladespannung an der Laserschwelle Charge Voltage at laser threshold	$U_{\text{C, th}}$	1.2	1.5	2.0	V
Anstiegs- und Abfallzeit (10% ... 90%) ^{1), 2)} Rise and fall time (10% ... 90%) ^{1), 2)}	t_r , t_f	11 14	- -	– –	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⁾	θ_{\parallel}	12	15	18	Grad deg.
Strahldivergenz (Halbwertsbreite) senkrecht zum pn-Übergang ¹⁾ Beam divergence (FWHM) perpendicular to pn-junction ¹⁾	θ_{\perp}	27	30	33	Grad deg.
Temperaturkoeffizient der Wellenlänge Temperature coefficient of wavelength	$\partial\lambda / \partial T$	–	0.30	0.32	nm/K
Thermischer Widerstand Thermal resistance	R_{th}	–	200	–	K/W
Einschaltzeitpunkt der Gate-Spannung Switch on gate voltage	$V_{\text{G on}}$	–	4.0	–	V

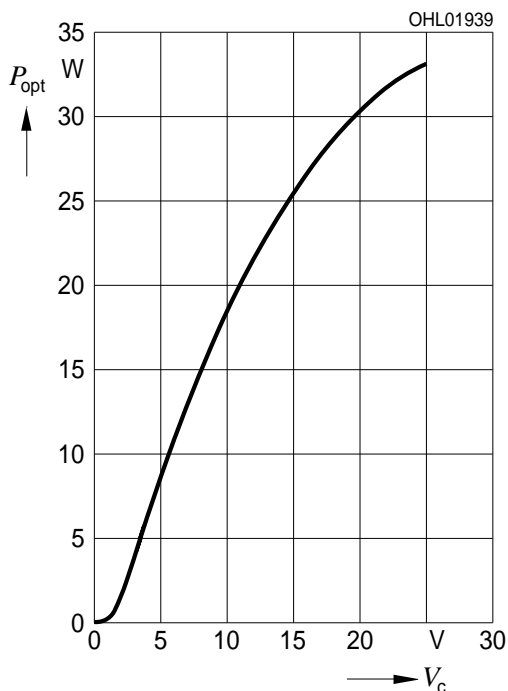
¹⁾ Werte beziehen sich auf folgende Standardbetriebsbedingung: 30 ns Pulsbreite, 1 kHz Pulswiederholrate, 16 V Ladespannung, 15 V Gate-Spannung und 25°C Umgebungstemperatur. Der Laser wird angesteuert mit dem MOSFET-Treiber Elantec EL7104C.

Values refer to the following standard operating conditions: 30 ns pulse width, 1 kHz pulse repetition rate, 16 V charge voltage, 15 V gate voltage and 25 °C ambient temperature. The laser is driven by the MOSFET driver Elantec EL7104C.

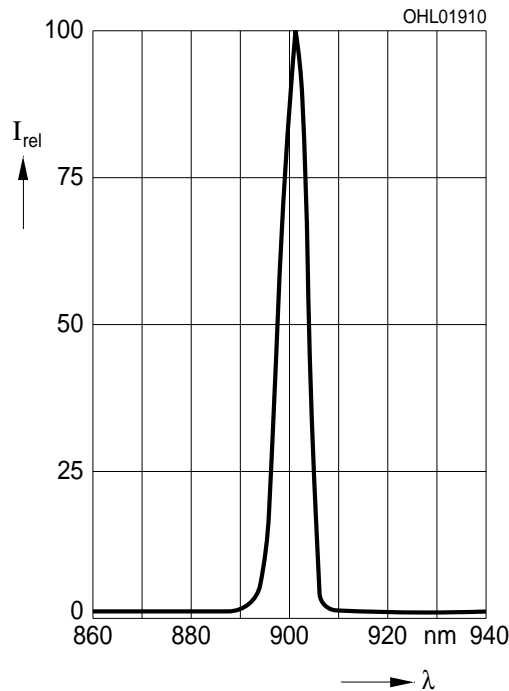
²⁾ Die Schaltgeschwindigkeit ist abhängig von Strom und Geschwindigkeit, mit der die Gate-Kapazität (typ. 300 pF) des internen Transistors geladen wird. Geringere Anstiegs- und Abfallzeiten erhält man bei reduzierter optischer Spitzenleistung (siehe Diagramme auf Seite 5)

Switching speed at gate depends on current and speed, charging the gate capacitance (typ. 300 pF) of the internal transistor. Reduced rise and fall times occur at reduced optical peak power (see diagrams on page 5)

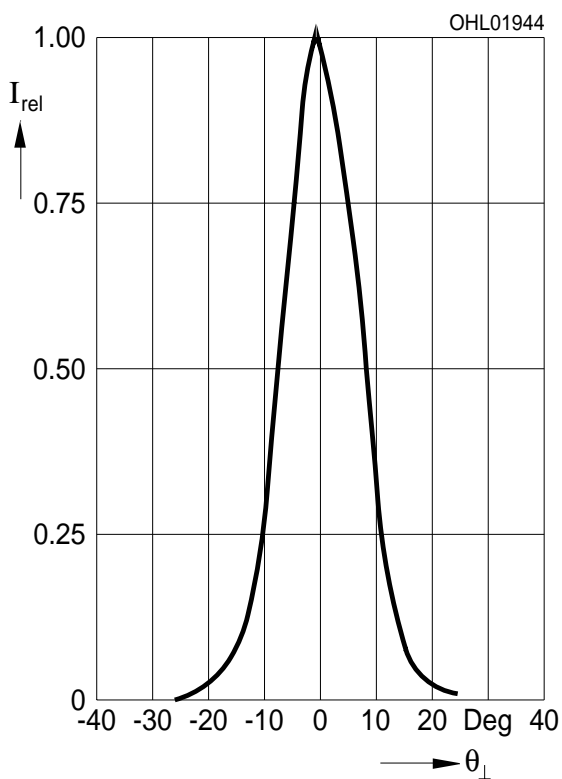
Optical output power P_{opt} vs charge voltage V_c
($t_p = 30$ ns)



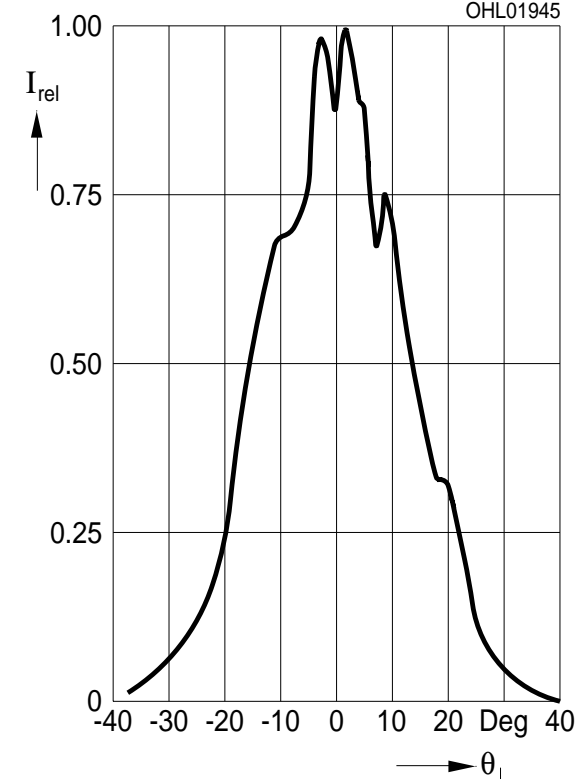
Optical spectrum, relative intensity I_{rel} vs. wavelength λ ($P_{opt} = 25$ W, $t_p = 30$ ns)



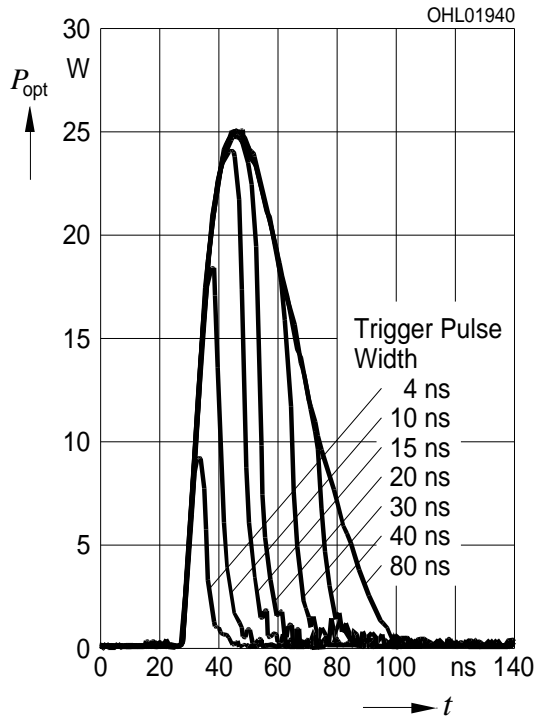
Far-field distribution parallel to junction
 I_{rel} vs. angle $\theta_{||}$



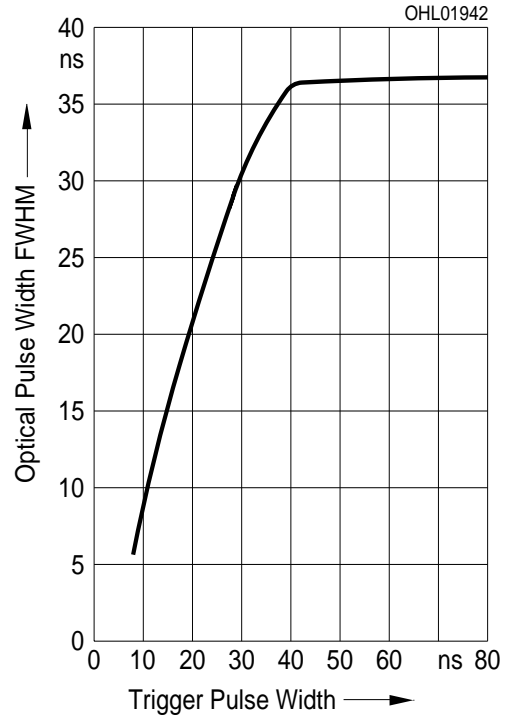
Far-field distribution perpendicular to junction
 I_{rel} vs. angle θ_{\perp}



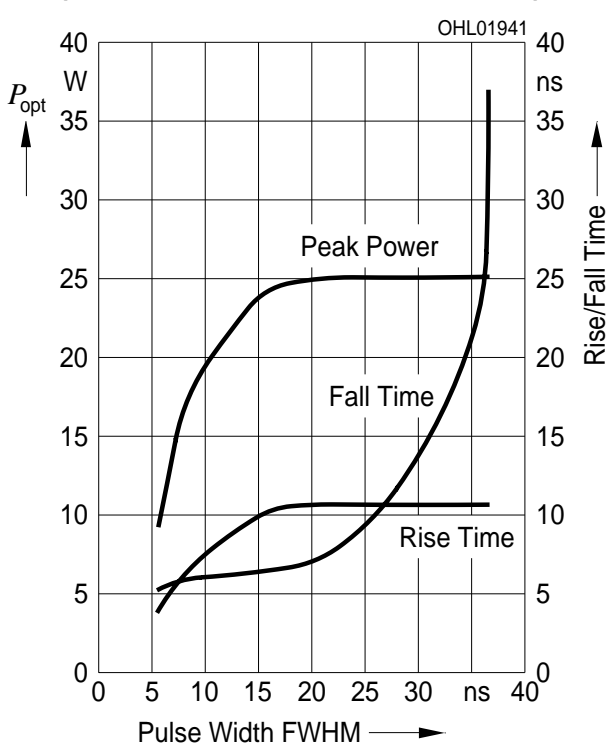
Optical pulse form for varying trigger pulse widths (MOSFET driver Elantec EL7104C)



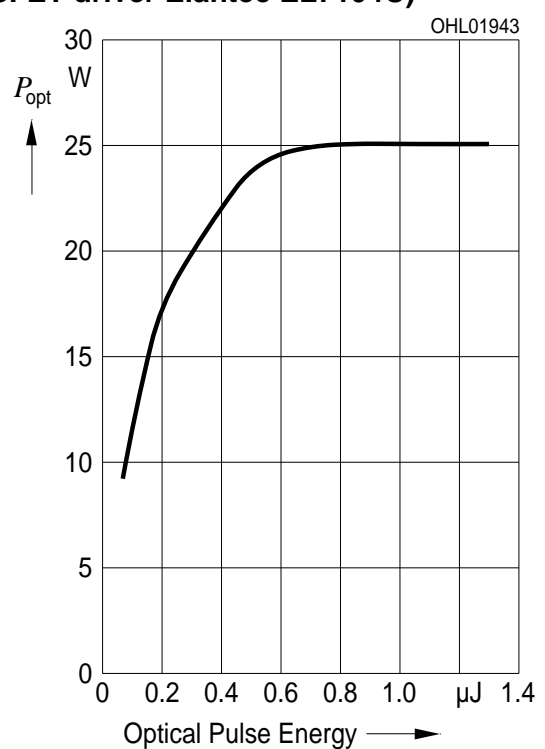
Optical pulse width vs. trigger pulse width (MOSFET driver Elantec EL7104C)



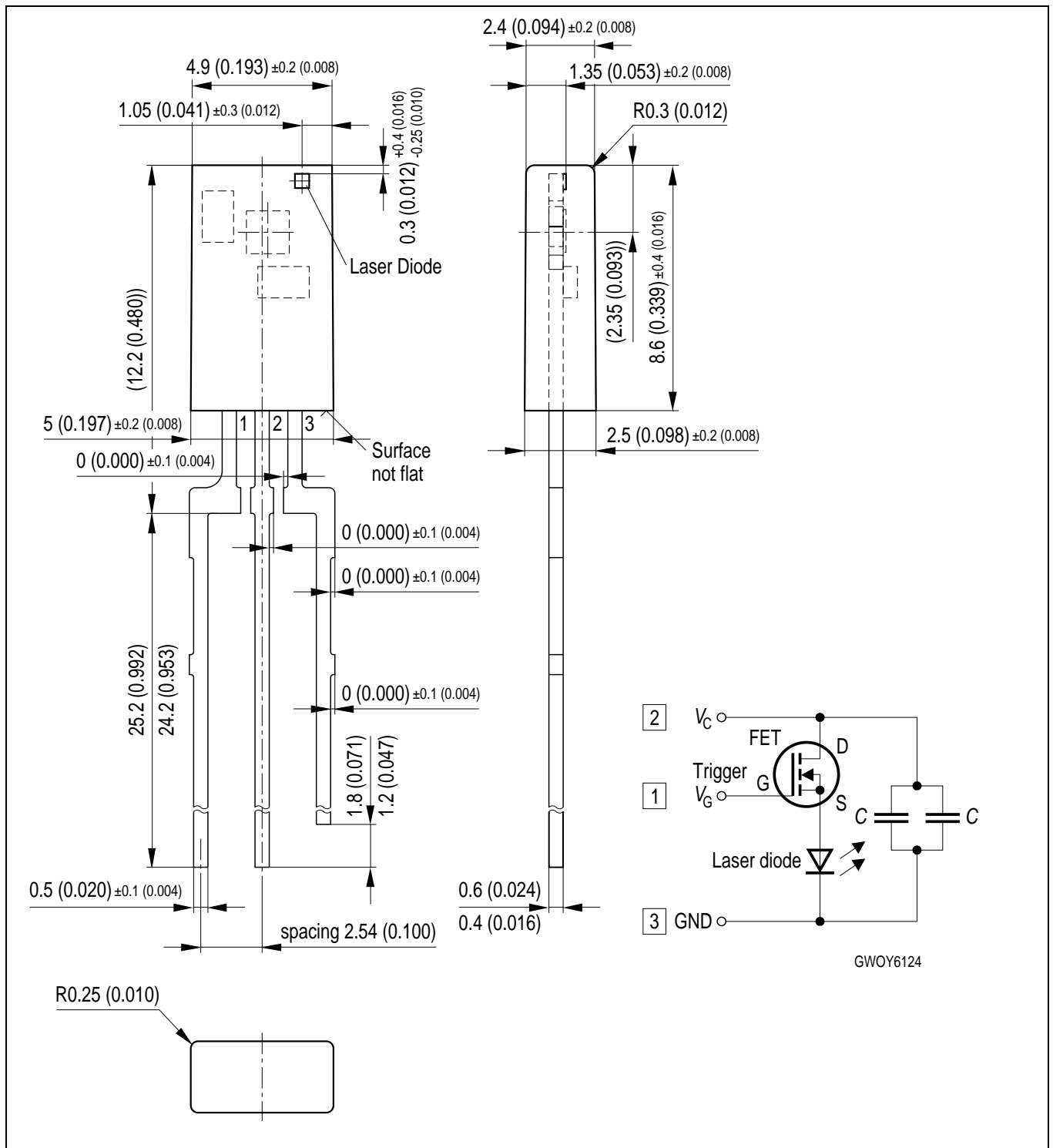
Optical peak power, fall and rise time vs. pulse width (MOSFET driver Elantec EL7104C)



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



Maßzeichnung
Package Outlines



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

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