HAMAMATSU
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Pulsed laser diode (PLD)

L11854 series

High-power pulsed laser diode, Peak emission wavelength: 905 nm

L11854 series are pulse-driven multimode laser diodes that achieve high peak output. These are suitable for applications such LiDAR and 3D sensing.

Features

- **3-stack pulsed laser diode**
- **Peak emission wavelength: 905 nm typ.**
- **Emission area (design value): 70 µm × 10 µm**
- **Sharp and stable near filed pattern (NFP)**

Applications

- **LiDAR**
- **3D sensing**

Absolute maximum ratings (Tcase=25 °C, unless otherwise noted)

Parameter	Symbol	L11854-307-05, L11854-307-55	Unit
Pulse forward current	I_{FP}	10	A
Reverse voltage	V_R	6	V
Pulse width	tw	100	ns
Duty ratio	DR	0.1	%
Operating temperature (case)*1	Tcase	-40 to +85	°C
Storage temperature*1	Tstg	-40 to +100	°C

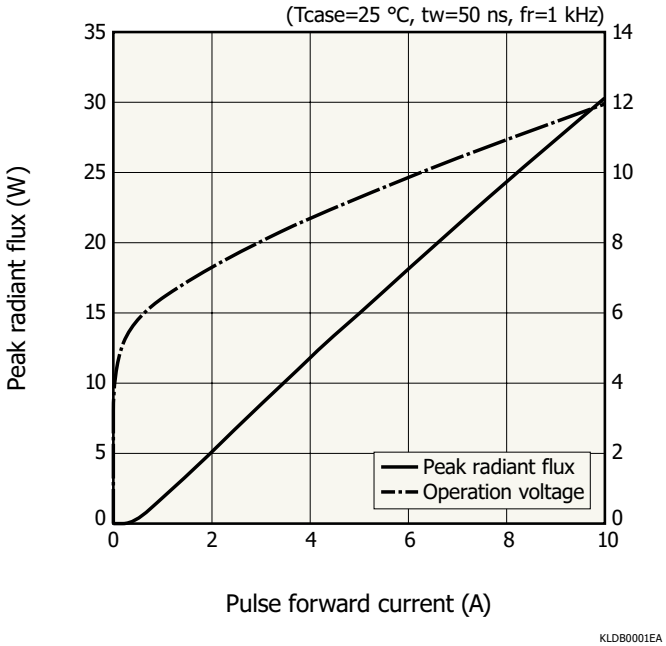
*1: No dew condensation
When there is a temperature difference between a product and the surrounding area in high humidity environments, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

Electrical and optical characteristics (Tcase=25 °C, tw=50 ns, Repetition frequency fr=1 kHz, unless otherwise noted)

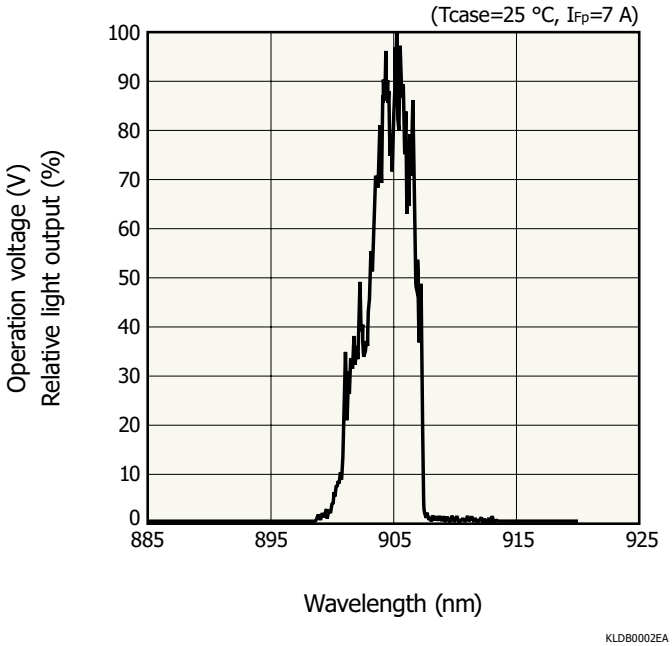
Parameter		Symbol	Condition	L11854-307-05, L11854-307-55			Unit
				Min.	Typ.	Max.	
Peak radiant flux		ϕep	I_{FP}=7 A	17	21	-	W
Peak emission wavelength		λp	I_{FP}=7 A	895	905	915	nm
Operating voltage		Vop	I_{FP}=7 A	-	11	14	V
Spectral half width		Δλ	I_{FP}=7 A	-	6	10	nm
Rise time		tr	I_{FP}=7 A	-	-	2	ns
Wavelength temperature coefficient		-	I_{FP}=7 A	-	0.28	0.32	nm/°C
Beam spread angle	Horizontal	θ//	FWHM, I_{FP}=7 A	7	11	15	°
	Vertical	θ⊥		18	23	28	
Threshold current		Ith		-	0.4	1	A
Optical axis tilt*2	Horizontal	Δθ//	FWHM, I_{FP}=7 A	-2	-	+2	°
	Vertical	Δθ⊥		-2	-	+2	
Emission area		-	Design value	-	70 × 10	-	µm
Position accuracy of emission point*3		-	ΔX, ΔY, ΔZ	-0.2	-	+0.2	mm

*2: Based on the bottom of the package base
*3: Position of emitter center with respect to package base center

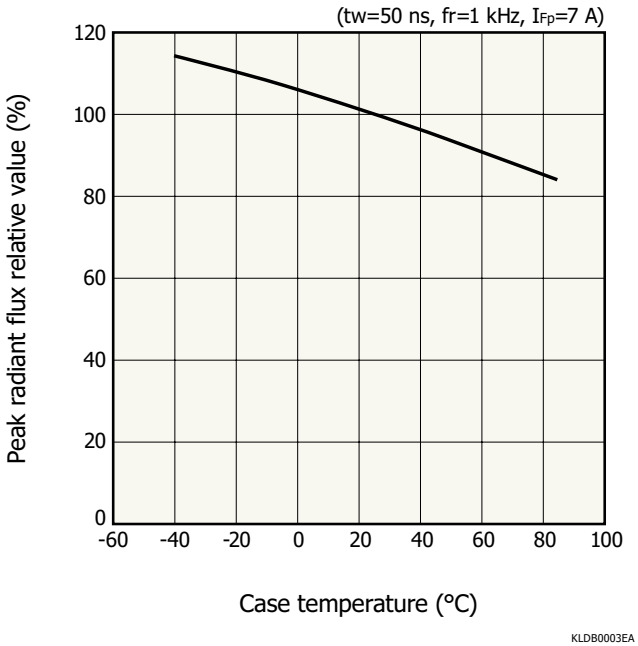
Peak radiant flux, operating voltage vs. pulse forward current (typical example)



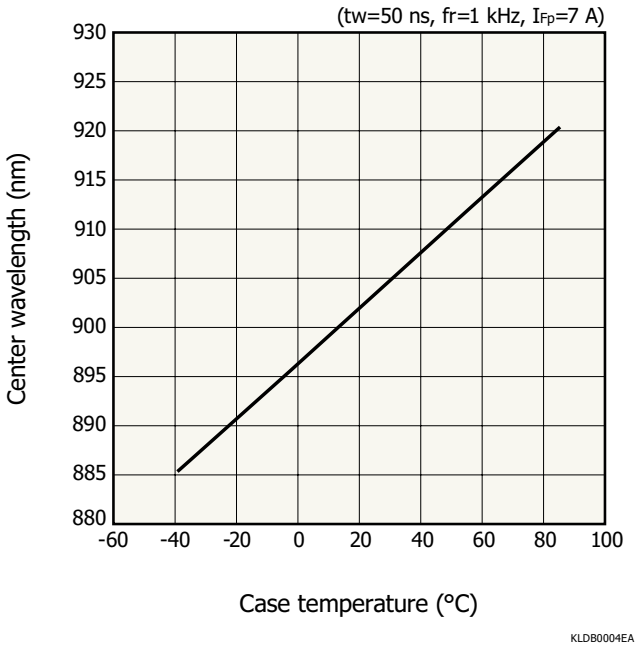
Emission spectrum (typical example)



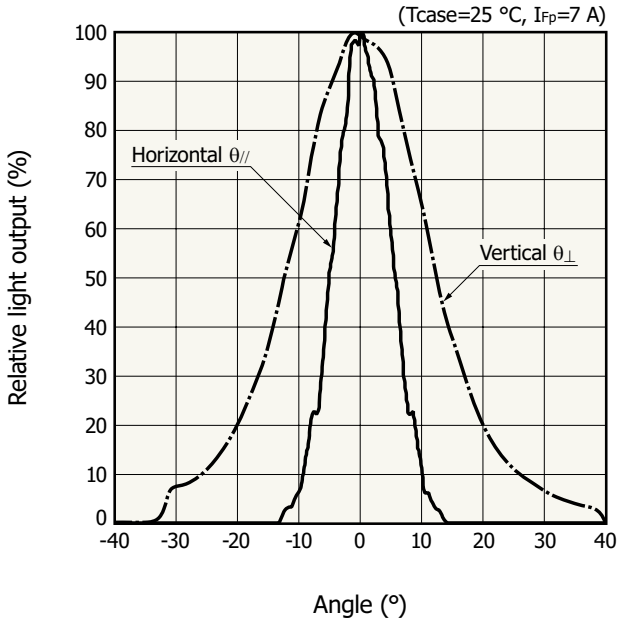
Peak radiant flux temperature characteristics (typical example)



Center wavelength temperature characteristics (typical example)



Directivity (typical example)



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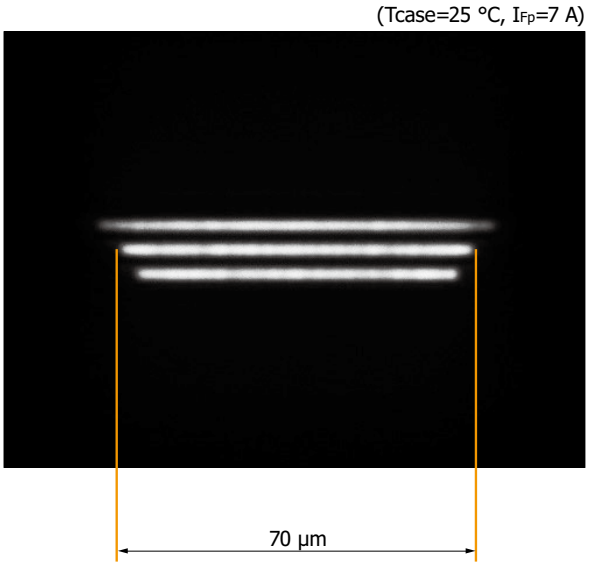
NFP emission pattern (typical example: L11854-307-05)



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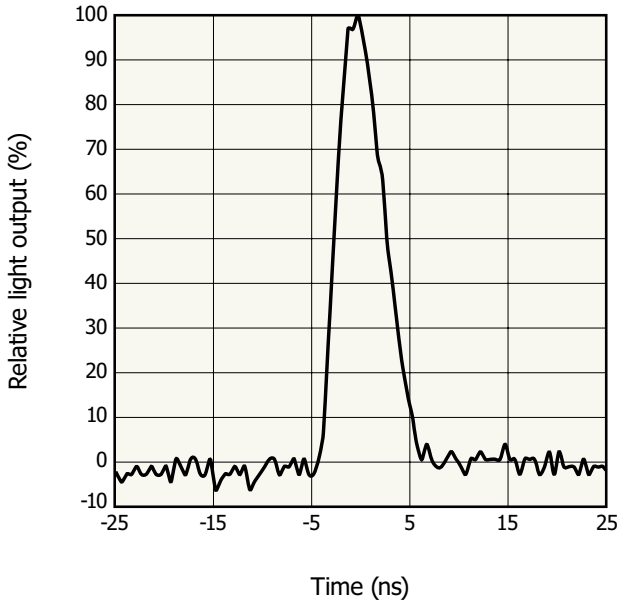
Short-pulse operation using laser driver board C14518 (example: L11854-307-05)



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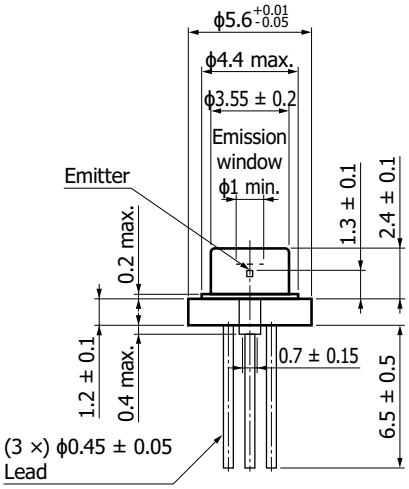
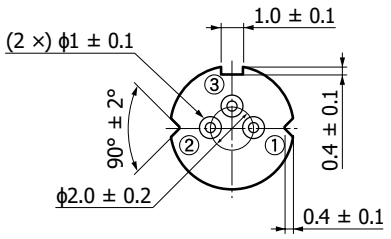
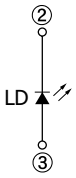
Dimensional outline (unit: mm)



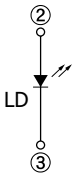


●L11854-307-05



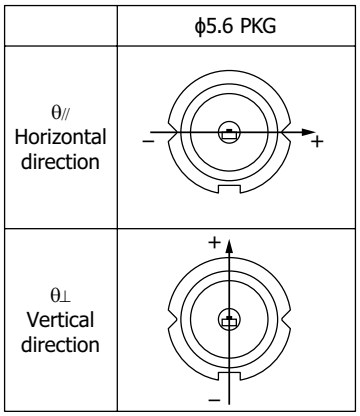
① NC
② LD cathode
③ LD anode (case)

●L11854-307-55



① NC
② LD anode
③ LD cathode (case)

FFP horizontal and vertical directions relative to the package (front view)



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Recommended soldering conditions

· Soldering temperature: 260 °C or less, within 5 seconds (1 second or less if the lead terminal length is 2 mm or less)
Note: When you set soldering conditions, check that problems do not occur in the product by testing out the conditions in advance.

Warning (Class 3B laser)
Invisible laser emission: Avoid exposure to the beam

This product falls under the "Class 3B laser" in the classification of laser products according to IEC 60825-01. The laser light emitted by this product is an invisible laser light that cannot be seen by the naked eye. Observing the laser light directly is dangerous, and you should also avoid direct exposure to the skin. In addition, some conditions may cause skin damage or flammable substances to ignite.
When using equipment incorporating this product, please classify it according to IEC 60825-01.

Note: For more detailed information, please see [IEC 60825-1:2014].

Warning label　Explanatory label
KLDC0003EA

Label for wearing protective goggles
KLDC0005EA

Precautions

(1) Electrostatic countermeasures
To prevent damage due to static electricity, take electrostatic countermeasures such as grounding of workers, work benches, and work tools. For details, please refer to the related information "Precautions / Compound opto-semiconductors (photosensors, light emitters)". Also protect this device from surge voltages which might be caused by peripheral equipment.

(2) Reflected light
The product will be destroyed if it is irradiated with laser light, such as by regular reflection. When using this product, use extra caution to avoid irradiation of reflected light.

Related information

www.hamamatsu.com/sp/ssd/doc_en.html

■ Precautions
· Disclaimer
· Safety consideration / Opto-semiconductor products
· Precautions / Compound opto-semiconductors (photosensors, light emitters)

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