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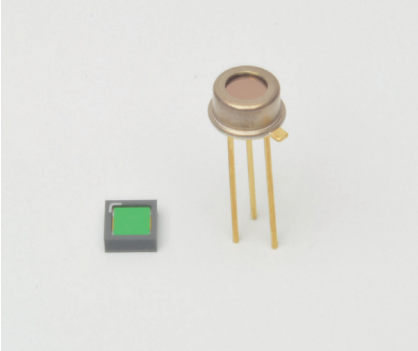
Mid infrared LED



L13454 series

Peak emission wavelength: 3.9 µm

The L13454 series is a high-output mid-infrared LED with a 3.9 µm peak emission wavelength. It is a product that has been achieved using Hamamatsu unique crystal growth technology and process technology. It is a suitable reference light source for gas measurement.

Features

- **High output**
- **High-speed response**
- **High reliability**
- **Surface mount type ceramic package (L13454-0390C)**

Applications

- **Reference light source for gas measurement**

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

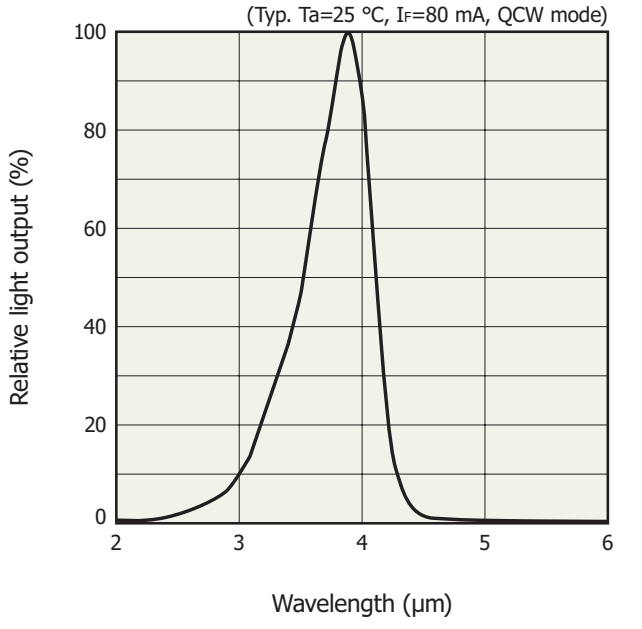
Parameter	Symbol	Condition	L13454-0390C	L13454-0390M	Unit
Reverse voltage	V_R		1		V
Forward current (QCW mode)*1	I_{FQCW}	Pulse width=100 µs Duty ratio=50%	100		mA
Pulse forward current	I_{FP}	Pulse width=10 µs Duty ratio=1%	0.5		A
Power dissipation	P		110		mW
Operating temperature	Topr	No dew condensation*2	-30 to +85		°C
Storage temperature	Tstg	No dew condensation*2	-40 to +100		°C
Reflow soldering condition	-		Peak temperature: 260 °C, 2 times*3	-	-

*1: Quasi continuous wave mode
*2: When there is a temperature difference between a product and the surrounding area in high humidity environment, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.
*3: JEDEC level 3
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.

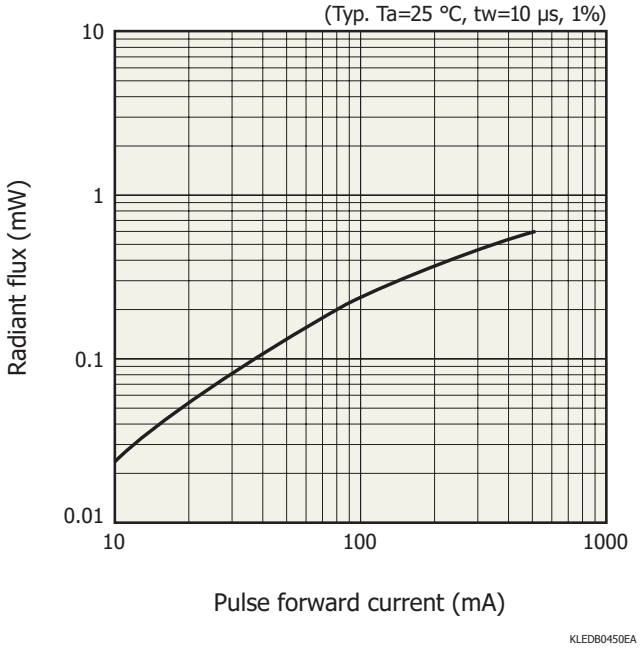
Electrical and optical characteristics (Ta=25 °C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak emission wavelength	λp	I_F=80 mA, QCW mode	3.8	3.9	4.1	µm
Spectral half width	Δλ	I_F=80 mA, QCW mode	-	0.5	0.8	µm
Radiant flux	ϕe	I_F=80 mA, QCW mode	0.1	0.2	-	mW
Forward voltage	V_F	I_F=80 mA, QCW mode	-	1.7	2.1	V
Reverse current	I_R	V_R=100 mV	-	-	1000	µA
Rise time	tr	10 to 90%	-	-	1	µs

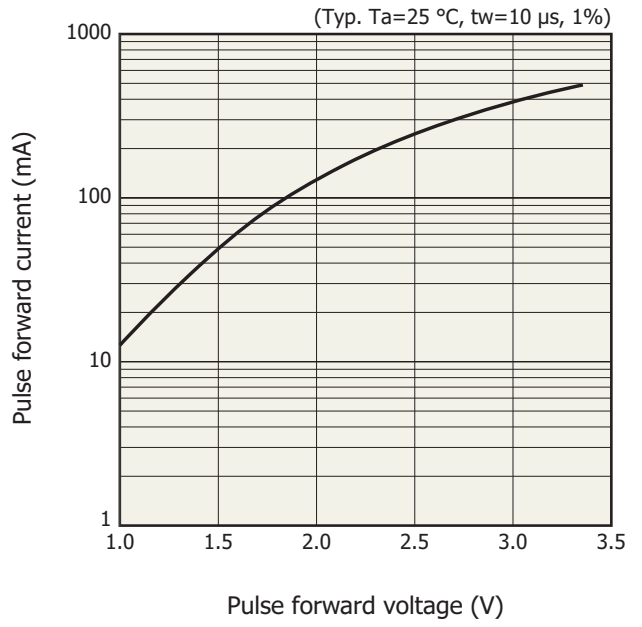
Emission spectrum



Radiant flux vs. pulse forward current

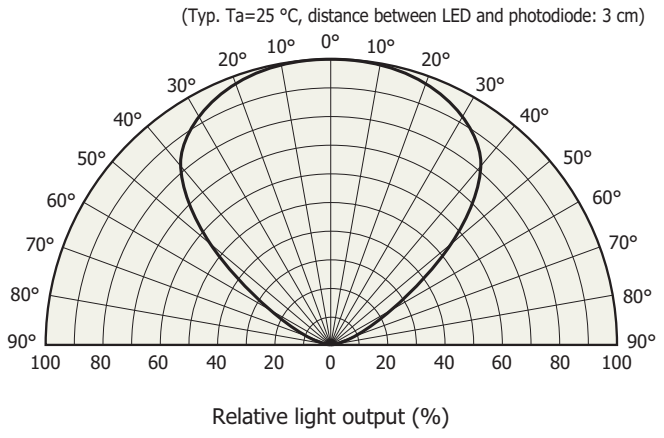


Pulse forward current vs. pulse forward voltage



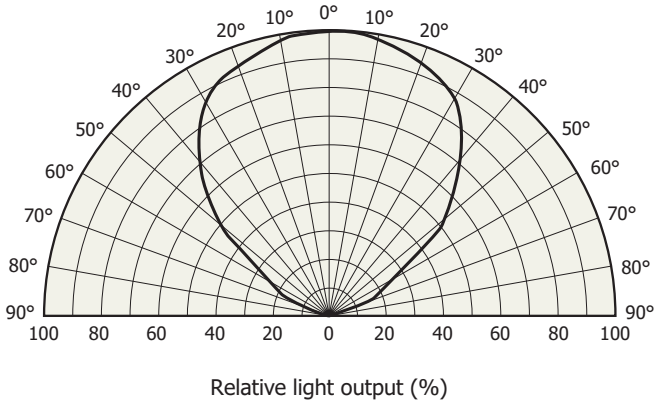
Directivity

L13454-0390C



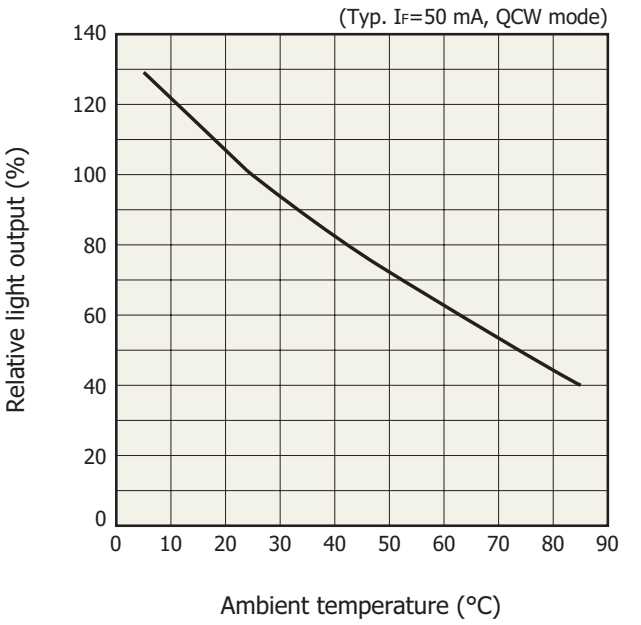
L13454-0390M

(Typ. Ta=25 °C, distance between LED and photodiode: 5 cm)



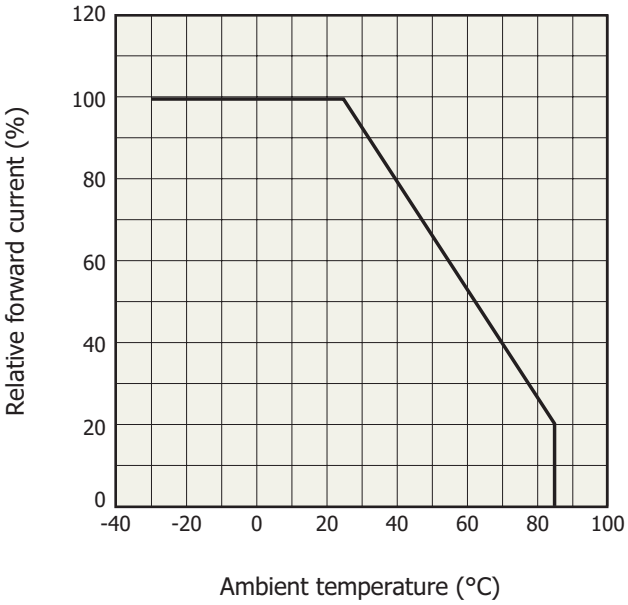
KLEDB0452EA

Light output vs. ambient temperature



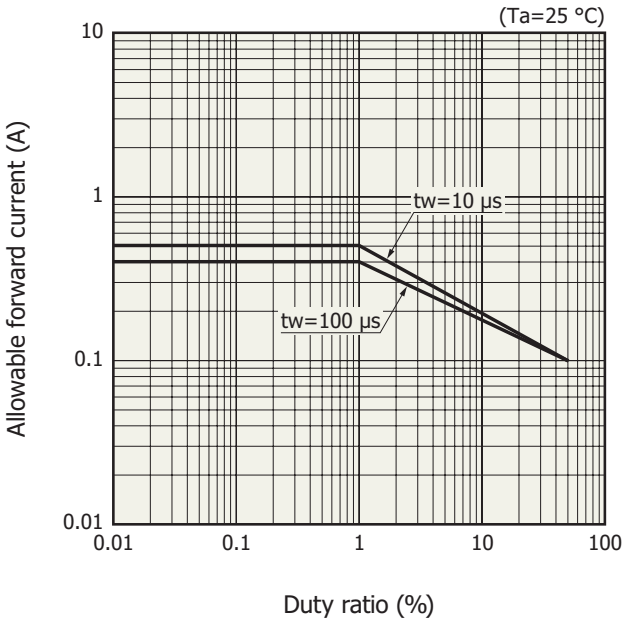
KLEDB0453EA

Allowable forward current vs. ambient temperature



KLEDB0448EA

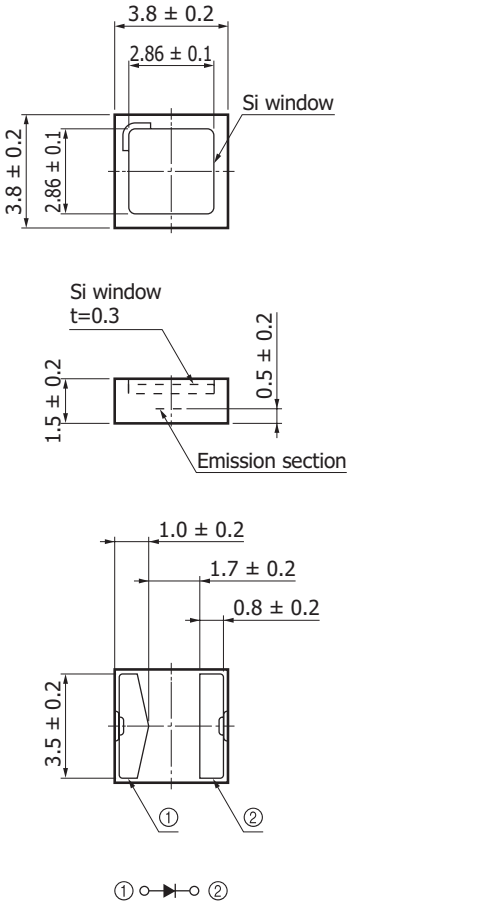
Allowable forward current vs. duty ratio



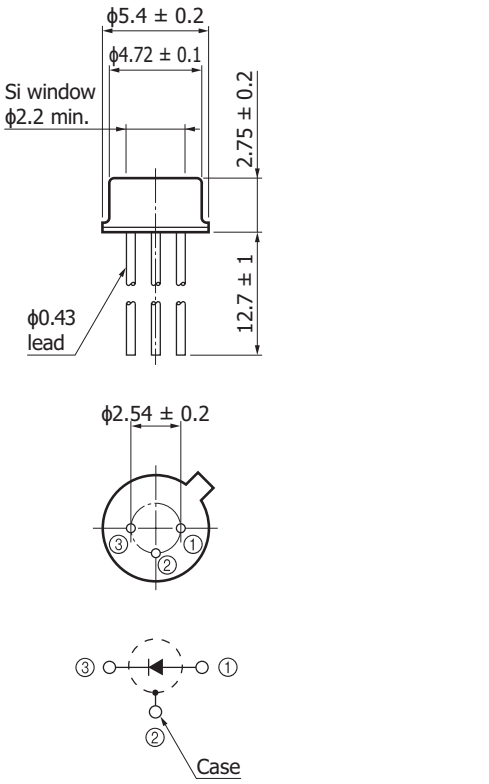
KLEDB0418EA

Dimensional outlines (unit: mm)

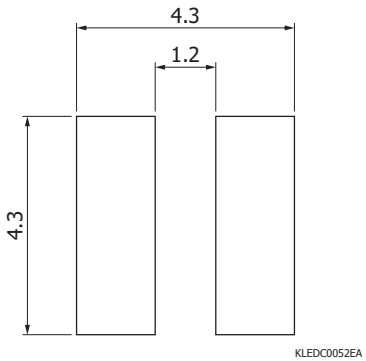
L13454-0390C



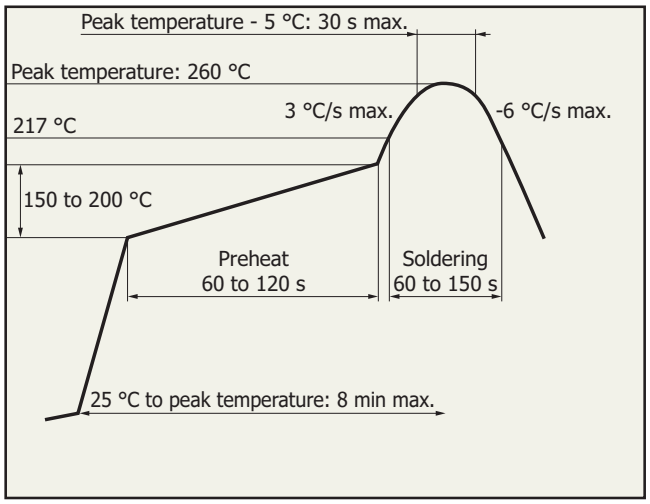
L13454-0390M



Recommended land pattern (unit: mm)



Recommended solder reflow conditions



- After unpacking, store the device in an environment at a temperature range of 5 to 30 °C and a humidity of 60% or less, and perform reflow soldering within 168 hours.
- The effect that the product receives during reflow soldering varies depending on the circuit board and reflow oven that are used. Before actual reflow soldering, check for any problems by testing out the reflow soldering methods in advance.

KLEDB0465EA

Related information

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

■ Precautions
- Disclaimer
- Metal, ceramic, plastic packages

■ Technical information
- LED

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