

Infrared LED

L8506

LED emitting collimated light

When an LED is used for optical encoders, it must emit a uniform, small spot light. L8506 is an infrared LED that emits such a light beam collimated by the combination of an aspheric lens. L8506 uses a non-confined structure chip that does not show an abrupt deterioration often encountered with some types of confined chips. The structure of L8506 is also designed to have high resistance to cyclic temperature changes so it copes with tough environmental conditions required for optical encoders used in factories.

Features

- Collimated light beam
- Uniform spot light
- Narrow directivity: $\pm 5^\circ$
- High-speed response: 40 MHz Typ.
- High reliability

Applications

- Optical encoder
- Optical switch

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

Parameter	Symbol	Condition	Value	Unit
Reverse voltage	VR		5	V
Forward current	IF		80	mA
Forward current reduction rate	-		0.67	mA/°C
Pulse forward current	IFP	Pulse width=10 μ s Duty ratio=1 %	0.5	A
Pulse forward current reduction rate	-		7	mA/°C
Power dissipation	P		150	mW
Operating temperature	Topr		-30 to +85	°C
Storage temperature	Tstg		-40 to +100	°C

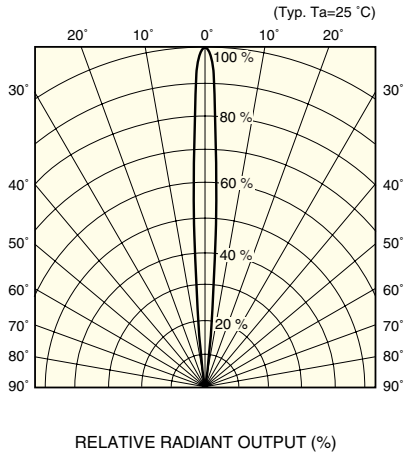
■ Electrical and optical characteristics (Ta=25 °C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak emission wavelength	λ_p	IF=50 mA	840	870	900	nm
Spectral half width	$\Delta\lambda$	IF=50 mA	-	45	-	nm
Radiant flux	ϕ_e	IF=50 mA	3.4	5.8	-	mW
Forward voltage	VF	IF=50 mA	-	1.6	1.75	V
Reverse current	IR	VR=5 V	-	-	5	μ A
Spot light size *1		IF=30 mA	-	4.3	-	mm
Cut-off frequency *2	fc	IF=30 mA \pm 4 mAp-p	25	40	-	MHz

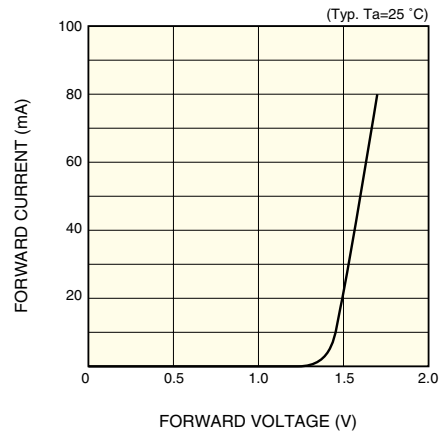
*1: Full width at half maximum, measurement distance (from the sensor to the bottom surface of L8506's base)=10 mm

*2: Frequency at which the light output drops by -3 dB from that at 100 kHz.

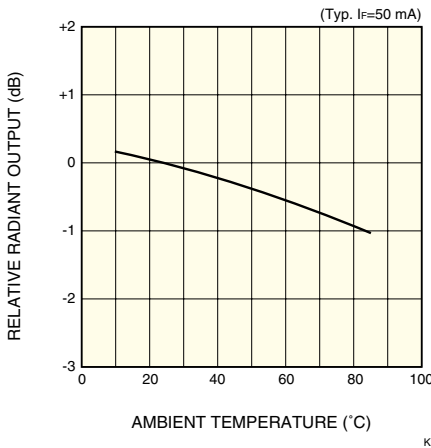
■ Directivity



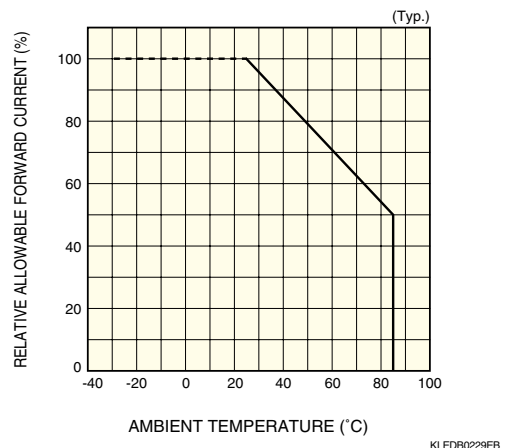
■ Forward current vs. forward voltage



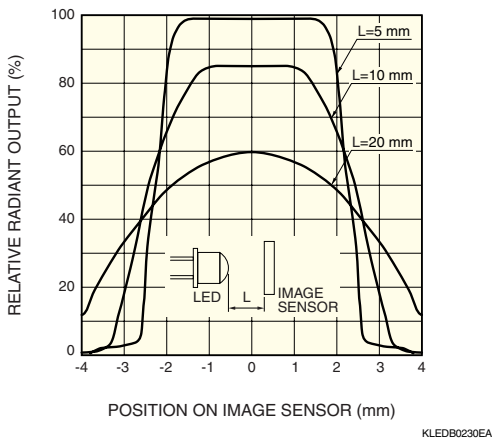
■ Radiant output vs. ambient temperature



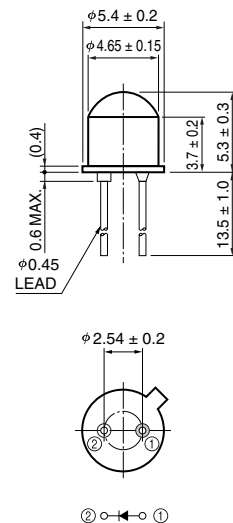
■ Allowable forward current vs. ambient temperature



■ Relative light intensity distribution



■ Dimensional outline (unit: mm)



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