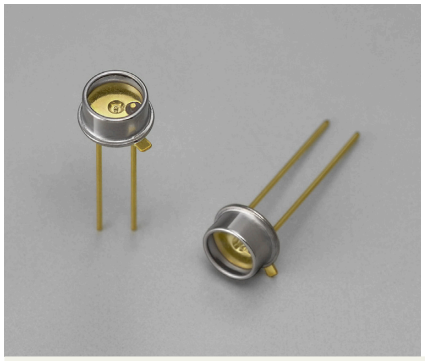
HAMAMATSU
PHOTON IS OUR BUSINESS

# Infrared LED

L8013



## Easy optical axis alignment LED for PCF200 fiber data links

L8013 is a high-speed LED developed for optical data links using PCF200 fibers. L8013 uses a non-confined structure chip that does not show the abrupt deterioration often encountered in some types of confined chips, thus providing high reliability over extended operation time. The optical output at the fiber end usually tends to vary due to non-uniform LED chip thickness. L8013 minimizes this problem by using a light condensing reflector with a slight matching offset from the chip. This widens the fiber input beam profile so fine adjustment of the optical axis is not required.

### Features

- **Easy optical axis alignment**
- **High-speed response: 50 MHz Typ.**
- **High optical output: 45 µW Typ. ($I_F$=30 mA, when used with PCF200 fiber)**
- **High reliability**

### Applications

- **Optical data link**

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

| Parameter | Symbol | Condition | Value | Unit |
|---|---|---|---|---|
| Reverse voltage | $V_R$ Max. | | 3 | V |
| Forward current | $I_F$ | | 80 | mA |
| Forward current decrease rate | - | Ta > 25 °C | 0.8 | mA/°C |
| Pulse forward current | $I_{FP}$ | Pulse width=10 µs<br>Duty ratio=1 % | 0.5 | A |
| Pulse forward current decrease rate | - | Ta > 25 °C | 5 | mA/°C |
| Power dissipation | P | | 150 | mW |
| Operating temperature | Topr | No dew condensation*1 | -30 to +85 | °C |
| Storage temperature | Tstg | No dew condensation*1 | -40 to +100 | °C |

*1: 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.

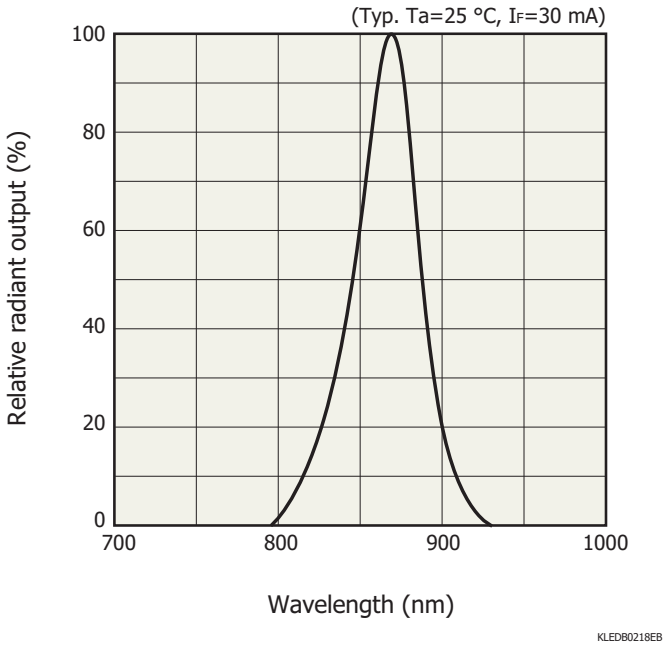
### Electrical and optical characteristics (Ta=25 °C)

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Peak emission wavelength | λp | $I_F$=30 mA | 840 | 870 | 900 | nm |
| Spectral half width | Δλ | $I_F$=30 mA | - | 45 | - | nm |
| Fiber end output*2 | Pf | $I_F$=30 mA | 30 | 45 | - | µW |
| Radiant flux | ϕe | $I_F$=30 mA | 4.5 | 6.5 | - | mW |
| Forward voltage | $V_F$ | $I_F$=30 mA | - | 1.45 | 1.6 | V |
| Reverse current | $I_R$ | $V_R$=3 V | - | - | 10 | µA |
| Cutoff frequency*3 | fc | $I_F$=30 mA ± 4 mAp-p | 30 | 50 | - | MHz |

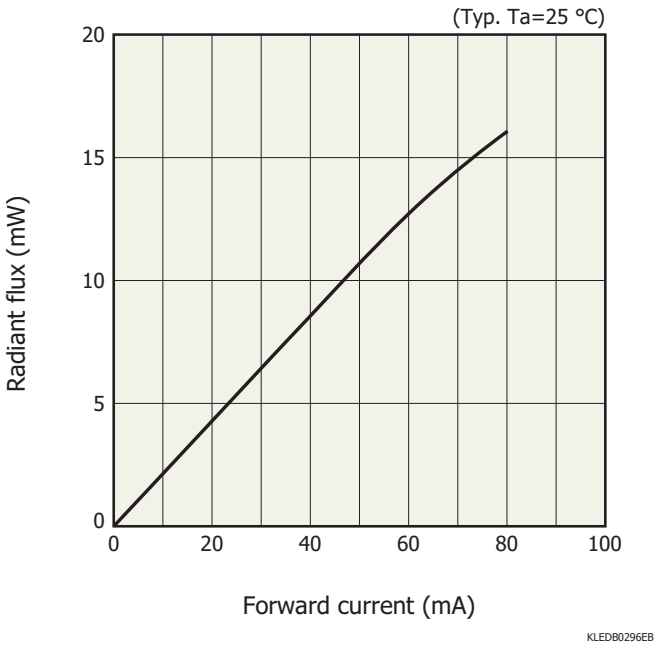
*2: PCF200 fiber; distance between fiber end and L8013 cap glass: 0.3 mm

*3: Frequency at which the optical output decreases by -3 dB versus a reference output level at 100 kHz.

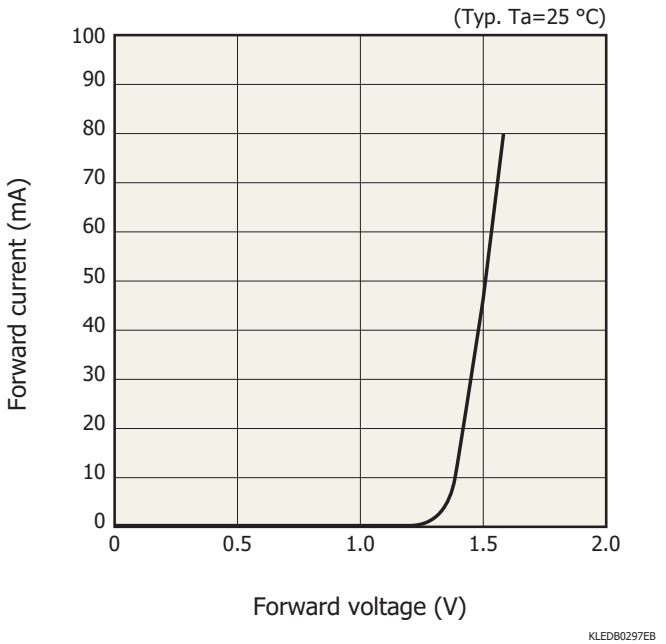
## Emission spectrum



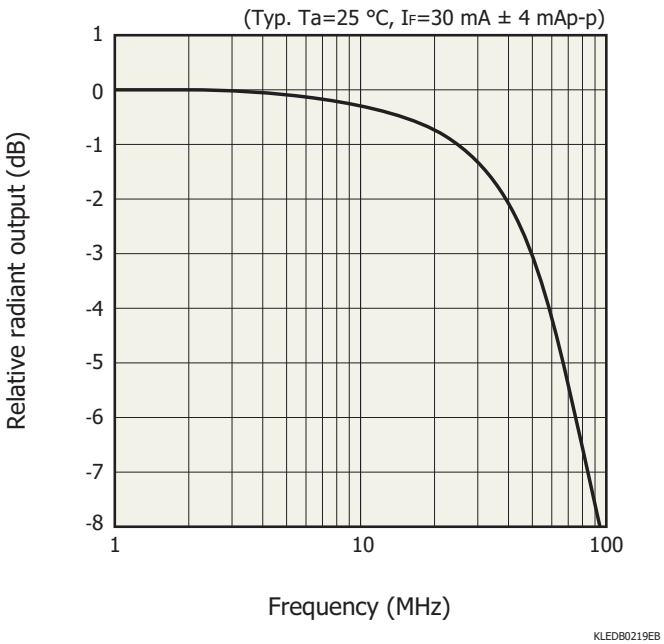

## Radiant flux vs. forward current




## Forward current vs. forward voltage

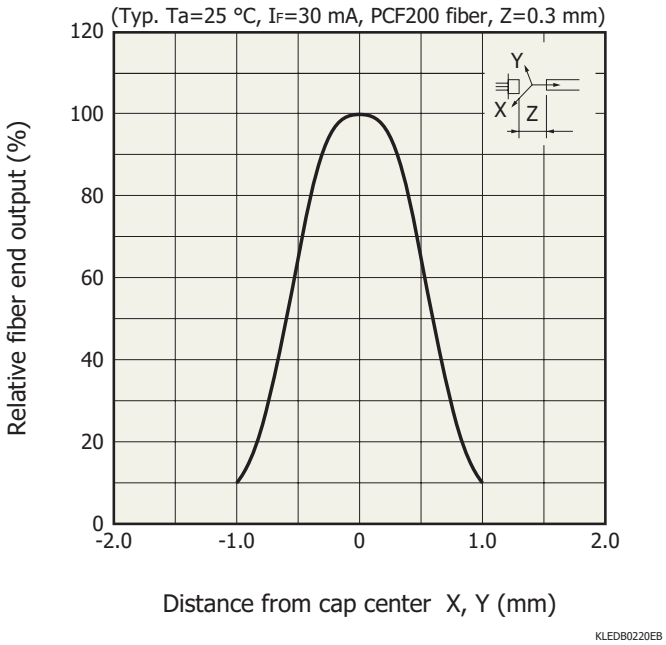



## Frequency response

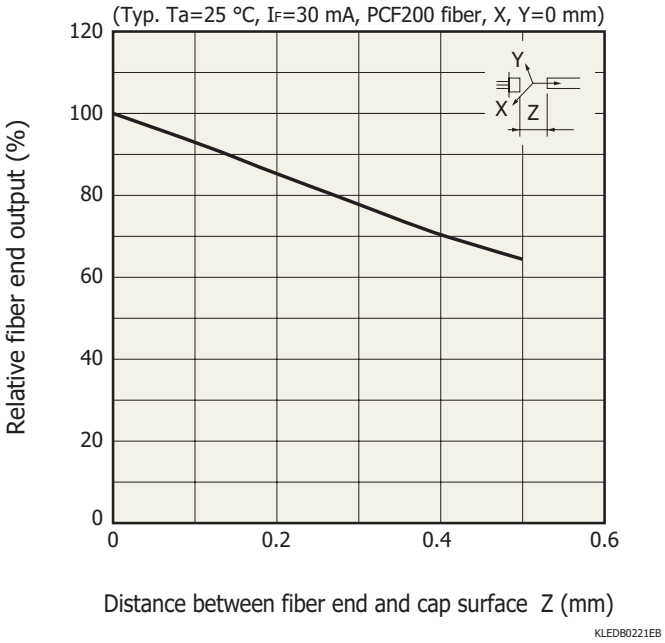


## Fiber coupling characteristics

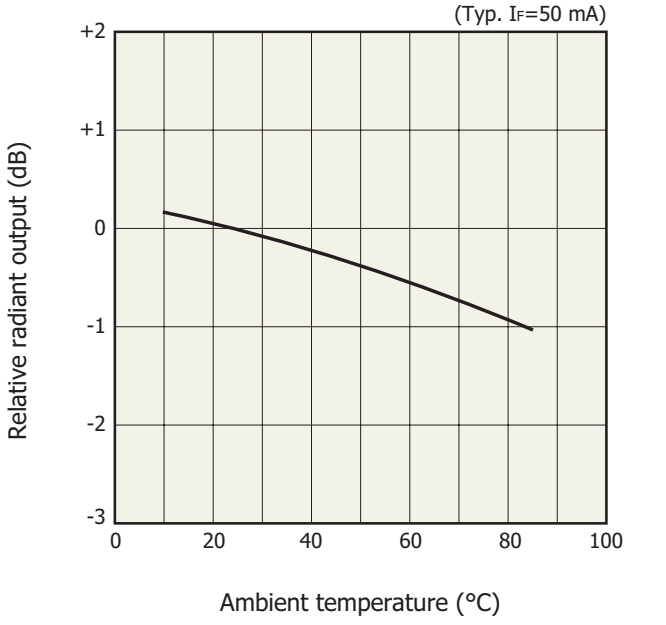
X, Y axes



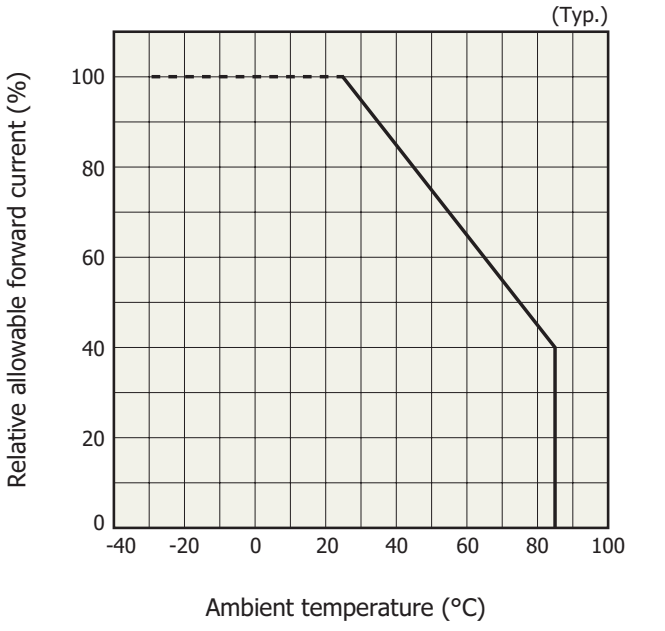

Z axis



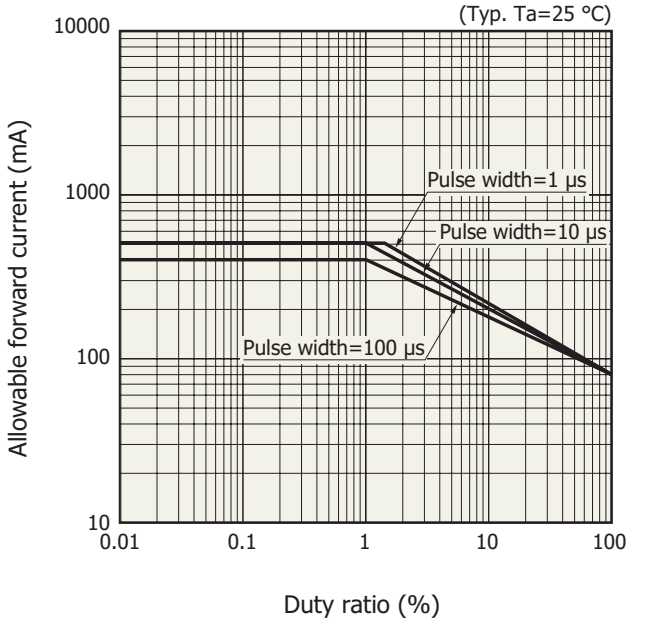

## Radiant output vs. ambient temperature




## Allowable forward current vs. ambient temperature

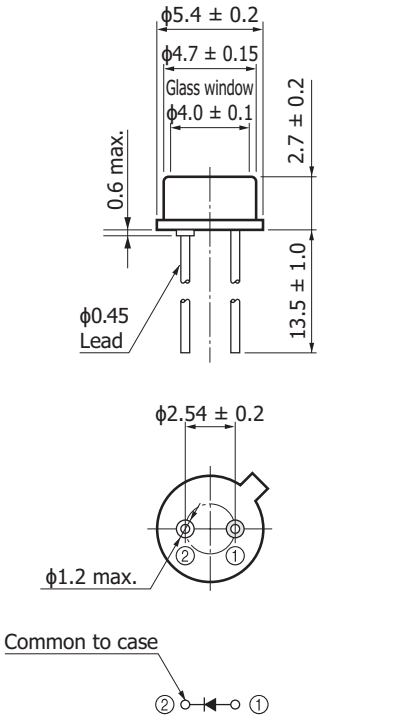


## Allowable forward current vs. duty ratio




KLEDB0289EB

## Dimensional outline (unit: mm)




KLEDA0102EB

## Related information

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

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

■ Technical information
· LED / Technical note



HAMAMATSU www.hamamatsu.com

HAMAMATSU PHOTONICS K.K., Solid State Division
1126-1 Ichino-cho, Higashi-ku, Hamamatsu City, 435-8558 Japan, Telephone: (81)53-434-3311, Fax: (81)53-434-5184
U.S.A.: HAMAMATSU CORPORATION: 360 Foothill Road, Bridgewater, NJ 08807, U.S.A., Telephone: (1)908-231-0960, Fax: (1)908-231-1218 E-mail: usa@hamamatsu.com
Germany: HAMAMATSU PHOTONICS DEUTSCHLAND GMBH.: Arzbergerstr. 10, 82211 Herrsching am Ammersee, Germany, Telephone: (49)8152-375-0, Fax: (49)8152-265-8 E-mail: info@hamamatsu.de
France: HAMAMATSU PHOTONICS FRANCE S.A.R.L.: 19, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: (33)1 69 53 71 00, Fax: (33)1 69 53 71 10 E-mail: infos@hamamatsu.fr
United Kingdom: HAMAMATSU PHOTONICS UK LIMITED: 2 Howard Court,10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, UK, Telephone: (44)1707-294888, Fax: (44)1707-325777 E-mail: info@hamamatsu.co.uk
North Europe: HAMAMATSU PHOTONICS NORDEN AB: Torshamnsgatan 35 16440 Kista, Sweden, Telephone: (46)8-509 031 00, Fax: (46)8-509 031 01 E-mail: info@hamamatsu.se
Italy: HAMAMATSU PHOTONICS ITALIA S.R.L.: Strada della Moia, 1 int. 6, 20044 Arese (Milano), Italy, Telephone: (39)02-93 58 17 33, Fax: (39)02-93 58 17 41 E-mail: info@hamamatsu.it
China: HAMAMATSU PHOTONICS (CHINA) CO., LTD.: 1201 Tower B, Jiaming Center, 27 Dongsanhuan Beilu, Chaoyang District, 100020 Beijing, P.R. China, Telephone: (86)10-6586-6006, Fax: (86)10-6586-2866 E-mail: hpc@hamamatsu.com.cn
Taiwan: HAMAMATSU PHOTONICS TAIWAN CO., LTD.: 8F-3, No.158, Section 2, Gongdao 5th Road, East District, Hsinchu, 300, Taiwan R.O.C. Telephone: (886)3-659-0080, Fax: (886)3-659-0081 E-mail: info@hamamatsu.com.tw

Cat. No. KLED1033E04 Apr. 2022 DN