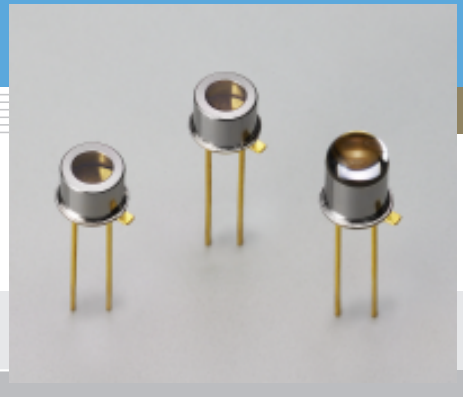


# Red LED

## L7868 series

Small emission spot, red LED using current confined chip



L7868/-02 are red LEDs with a microball lens bonded to the current-confined structure chip surface. L7868-01 uses the same structure LED chip with no microball lens and provides a smaller emission spot of  $\phi 150 \mu\text{m}$ . L7868-02 uses a glass lens window for even narrower directivity (beam spread).

### Features

- Small emission spot  
L7868:  $\phi 400 \mu\text{m}$   
L7868-01:  $\phi 150 \mu\text{m}$
- Uniform emission pattern
- Narrow directivity: L7868-02

### Applications

- Optical switches
- Automatic control system

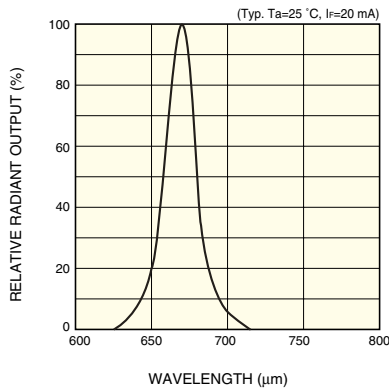
#### ■ Absolute maximum ratings ( $T_a = 25^\circ\text{C}$ , unless otherwise noted)

| Parameter                           | Symbol    | Condition                                      | Value       | Unit                 |
|-------------------------------------|-----------|------------------------------------------------|-------------|----------------------|
| Reverse voltage                     | $V_R$     |                                                | 3           | V                    |
| Forward current                     | $I_F$     |                                                | 60          | mA                   |
| Forward current derating rate       | -         | $T_a > 25^\circ\text{C}$                       | 0.8         | mA/ $^\circ\text{C}$ |
| Pulse forward current               | $I_{FP}$  | Pulse width=10 $\mu\text{s}$<br>Duty ratio=1 % | 0.5         | A                    |
| Pulse forward current derating rate | -         | $T_a > 25^\circ\text{C}$                       | 7           | mA/ $^\circ\text{C}$ |
| Power dissipation                   | P         |                                                | 180         | mW                   |
| Operating temperature               | $T_{opr}$ |                                                | -30 to +85  | $^\circ\text{C}$     |
| Storage temperature                 | $T_{stg}$ |                                                | -40 to +100 | $^\circ\text{C}$     |

#### ■ Electrical and optical characteristics ( $T_a = 25^\circ\text{C}$ )

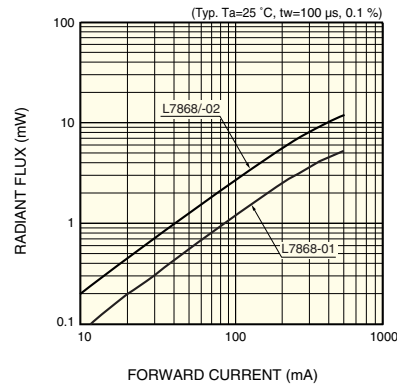
| Parameter                  | Symbol          | Condition                               | L7868 |      |      | L7868-01 |      |      | L7868-02 |      |      | Unit               |
|----------------------------|-----------------|-----------------------------------------|-------|------|------|----------|------|------|----------|------|------|--------------------|
|                            |                 |                                         | Min.  | Typ. | Max. | Min.     | Typ. | Max. | Min.     | Typ. | Max. |                    |
| Peak emission wavelength   | $\lambda_p$     | $I_F = 20 \text{ mA}$                   | 650   | 670  | 700  | 650      | 670  | 700  | 650      | 670  | 700  | nm                 |
| Spectral half width (FWHM) | $\Delta\lambda$ | $I_F = 20 \text{ mA}$                   | -     | 20   | -    | -        | 20   | -    | -        | 20   | -    | nm                 |
| Radiant flux               | $\phi_e$        | $I_F = 20 \text{ mA}$                   | 0.35  | 0.45 | -    | 0.15     | 0.2  | -    | 0.35     | 0.45 | -    | mW                 |
| Radiant illuminance        | $P_E$           | $I_F = 20 \text{ mA}$                   | -     | 0.1  | -    | -        | -    | -    | -        | 0.4  | -    | mW/cm <sup>2</sup> |
| Forward voltage            | $V_F$           | $I_F = 20 \text{ mA}$                   | -     | 1.9  | 2.2  | -        | 1.9  | 2.2  | -        | 1.9  | 2.2  | V                  |
| Pulse forward voltage      | $V_{FP}$        | $I_F = 0.5 \text{ A}$                   | -     | 4.3  | 5.5  | -        | 4.3  | 5.5  | -        | 4.3  | 5.5  | V                  |
| Reverse current            | $I_R$           | $V_R = 3 \text{ V}$                     | -     | -    | 10   | -        | -    | 10   | -        | -    | 10   | $\mu\text{A}$      |
| Rise time                  | $t_r$           | $I_F = 20 \text{ mA}$ ,<br>10 % to 90 % | -     | 0.06 | 0.1  | -        | 0.06 | 0.1  | -        | 0.06 | 0.1  | $\mu\text{s}$      |
| Fall time                  | $t_f$           | $I_F = 20 \text{ mA}$ ,<br>90 % to 10 % | -     | 0.06 | 0.1  | -        | 0.06 | 0.1  | -        | 0.06 | 0.1  | $\mu\text{s}$      |

## ■ Emission spectrum



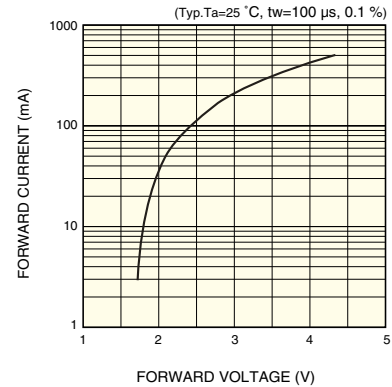
KLEDB0238EA

## ■ Radiant flux vs. forward current



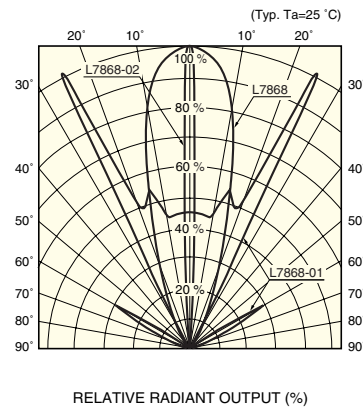
KLEDB0242EA

## ■ Forward current vs. forward voltage



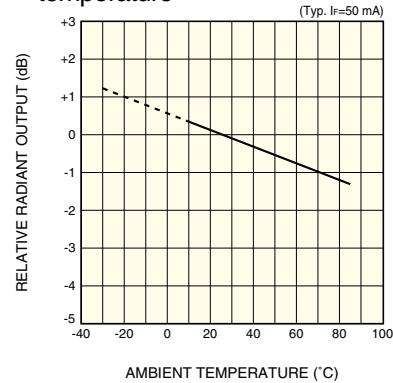
KLEDB0243EA

## ■ Directivity



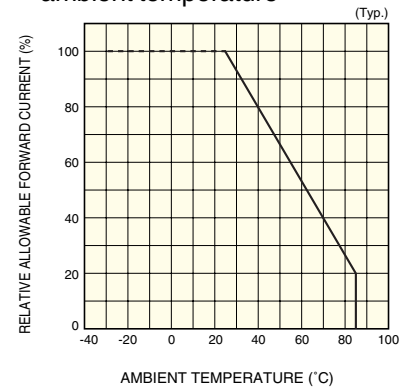
KLEDB0244EA

## ■ Radiant output vs. ambient temperature



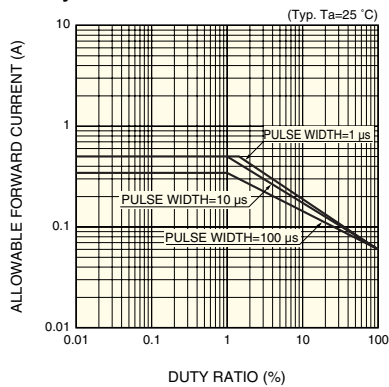
KLEDB0245EA

## ■ Allowable forward current vs. ambient temperature



KLEDB0247EA

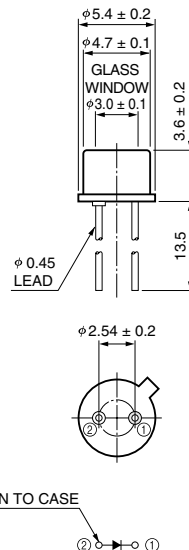
## ■ Allowable forward current vs. duty ratio



KLEDB0246EA

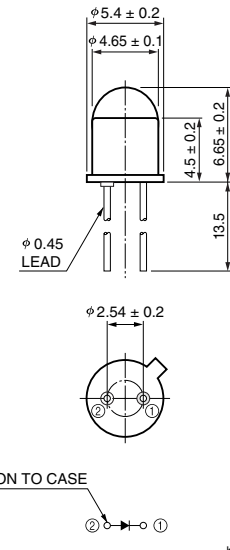
## ■ Dimensional outlines (unit: mm)

### L7868-01



KLEDA0075EA

### L7868-02



KLEDA0076EA

# HAMAMATSU

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HAMAMATSU PHOTONICS K.K., Solid State Division

1126-1 Ichino-cho, Hamamatsu City, 435-8558 Japan, Telephone: (81) 053-434-3311, Fax: (81) 053-434-5184, <http://www.hamamatsu.com>

U.S.A.: Hamamatsu Corporation, 360 Foothill Road, P.O. Box 6910, Bridgewater, N.J. 08807-0910, U.S.A., Telephone: (1) 908-231-0960, Fax: (1) 908-231-1218

Germany: Hamamatsu Photonics Deutschland GmbH, Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49) 08152-3750, Fax: (49) 08152-2658

France: Hamamatsu Photonics France S.A.R.L., 8, 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

United Kingdom: Hamamatsu Photonics UK Limited, 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, United Kingdom, Telephone: (44) 1707-294888, Fax: (44) 1707-325777

North Europe: Hamamatsu Photonics Norden AB, Smidesvägen 12, SE-171 41 Solna, Sweden, Telephone: (46) 8-509-031-00, Fax: (46) 8-509-031-01

Italy: Hamamatsu Photonics Italia S.R.L., Strada della Moia, 1/E, 20020 Arese, (Milano), Italy, Telephone: (39) 02-935-81-733, Fax: (39) 02-935-81-741

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