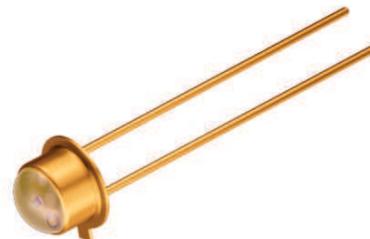


Infrared Emitter (940 nm)

Version 1.2

SFH 4841 E7800



Features:

- Wavelength 940nm
- Anode is electrically connected to the case
- Short switching times
- Spectral match with silicon photodetectors
- Measured with a 1.1mm aperture.
- DIN humidity category in acc. with DIN 40 040 GQG

Applications

- Photointerrupters
- Sensor technology
- Light curtains

Notes

Depending on the mode of operation, these devices emit highly concentrated non visible infrared light which can be hazardous to the human eye. Products which incorporate these devices have to follow the safety precautions given in IEC 60825-1 and IEC 62471.

Ordering Information

| Type: | Radiant Intensity I_e [mW/sr] $I_F= 100 \text{ mA}, t_p= 20 \text{ ms}$ | Ordering Code |
|----------------|---|---------------|
| SFH 4841 E7800 | 12 (≥ 6.3) | Q65111A6133 |

Note: Measured at a solid angle of $\Omega = 0.01 \text{ sr}$

Maximum Ratings ($T_A = 25\text{ °C}$)

| Parameter | Symbol | Values | Unit |
|---|-------------------|-------------|-------|
| Operation and storage temperature range | $T_{op}; T_{stg}$ | -40 ... 100 | °C |
| Reverse voltage | V_R | 5 | V |
| Forward current | I_F | 100 | mA |
| Surge current ($t_p \leq 250\ \mu\text{s}$, $D = 0$) | I_{FSM} | 1 | A |
| Power consumption | P_{tot} | 190 | mW |
| Thermal resistance junction - ambient | R_{thJA} | 500 | K / W |
| Thermal resistance junction - case | R_{thJC} | 350 | K / W |
| ESD withstand voltage (acc. to ANSI/ ESDA/ JEDEC JS-001 - HBM) | V_{ESD} | 2 | kV |

Characteristics ($T_A = 25\text{ °C}$)

| Parameter | | Symbol | Values | Unit |
|---|--------------|----------------------|------------------------------------|---------------|
| Peak wavelength ($I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$) | (typ) | λ_{peak} | 950 | nm |
| Centroid wavelength ($I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$) | (typ) | $\lambda_{centroid}$ | 940 | nm |
| Spectral bandwidth at 50% of I_{max} ($I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$) | (typ) | $\Delta\lambda$ | 42 | nm |
| Half angle | (typ) | φ | ± 32 | ° |
| Dimensions of active chip area | (typ) | L x W | 0.3 x 0.3 | mm x mm |
| Distance chip surface to lens top | (min .. max) | H | 0.3 ... 0.7 | mm |
| Rise and fall time of I_e (10% and 90% of $I_{e\ max}$) ($I_F = 100\text{ mA}$, $R_L = 50\ \Omega$) | (typ) | t_r, t_f | 12 | ns |
| Forward voltage ($I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$) | (typ (max)) | V_F | 1.6 (≤ 1.9) | V |
| Forward voltage ($I_F = 1\text{ A}$, $t_p = 100\ \mu\text{s}$) | (typ (max)) | V_F | 3.6 (≤ 4.6) | V |
| Reverse current ($V_R = 5\text{ V}$) | | I_R | not designed for reverse operation | μA |
| Total radiant flux ($I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$) | (typ) | Φ_e | 80 | mW |

| Parameter | | Symbol | Values | Unit |
|--|-------|--------------|--------|--------|
| Temperature coefficient of I_e or Φ_e ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) | (typ) | TC_I | -0.3 | % / K |
| Temperature coefficient of V_F ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) | (typ) | TC_V | -0.8 | mV / K |
| Temperature coefficient of wavelength ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) | (typ) | TC_λ | 0.3 | nm / K |

Grouping ($T_A = 25 \text{ }^\circ\text{C}$)

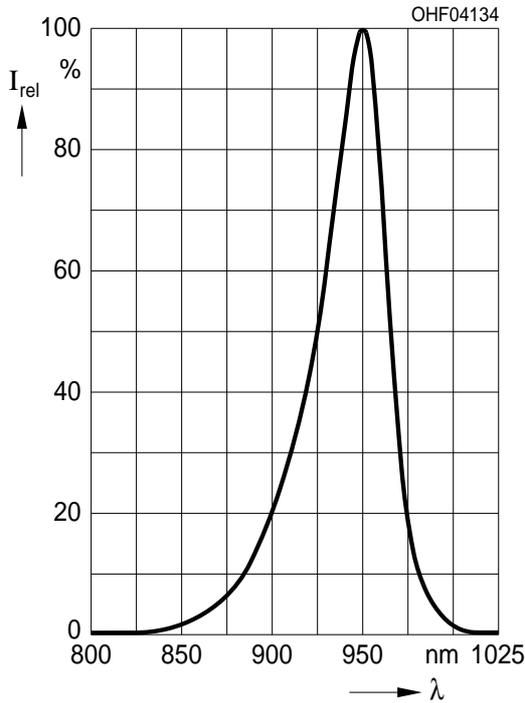
| Group | Min Radiant Intensity $I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$ $I_{e, \text{min}}$ [mW / sr] | Max Radiant Intensity $I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$ $I_{e, \text{max}}$ [mW / sr] | Typ Radiant Intensity $I_F = 1 \text{ A}$, $t_p = 100 \text{ } \mu\text{s}$ $I_{e, \text{typ}}$ [mW / sr] |
|------------------|--|--|--|
| SFH 4841 E7800-Q | 6.3 | 12.5 | 40 |
| SFH 4841 E7800-R | 10 | 20 | 60 |

Note: Only one group in one packing unit (variation lower 2:1).

E7800: An aperture is used in front of the component for measurement of the radiant intensity and the half angle (diameter of the aperture: 1.1 mm; distance of aperture to case back side: 4.0 mm). This ensures that solely the radiation in axial direction emitting directly from the chip surface will be evaluated during measurement of the radiant intensity. Radiation reflected by the bottom plate (stray radiation) will not be evaluated. These reflections impair the projection of the chip surface by additional optics (e.g. long-range light reflection switches). In respect of the application of the component, these reflections are generally suppressed by apertures as well. This measuring procedure corresponding with the application provides more useful values. This aperture measurement is denoted by "E 7800" added to the type designation.

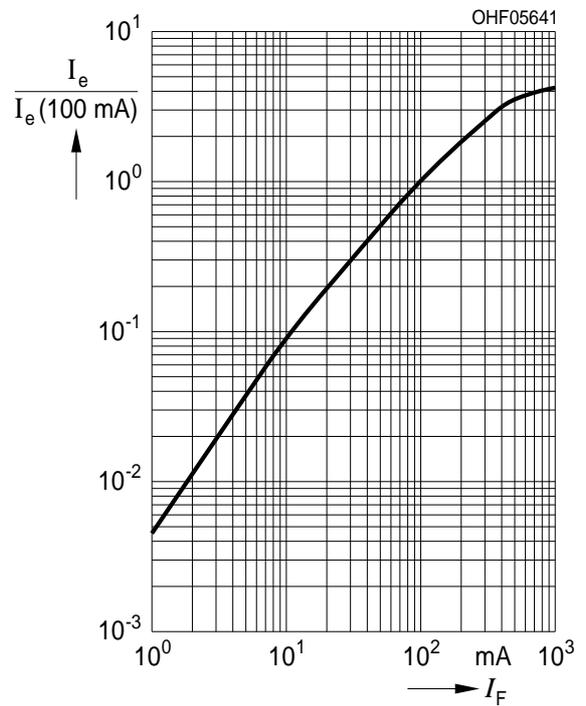
Relative Spectral Emission ^{1) page 9}

$I_{rel} = f(\lambda), T_A = 25^\circ\text{C}$



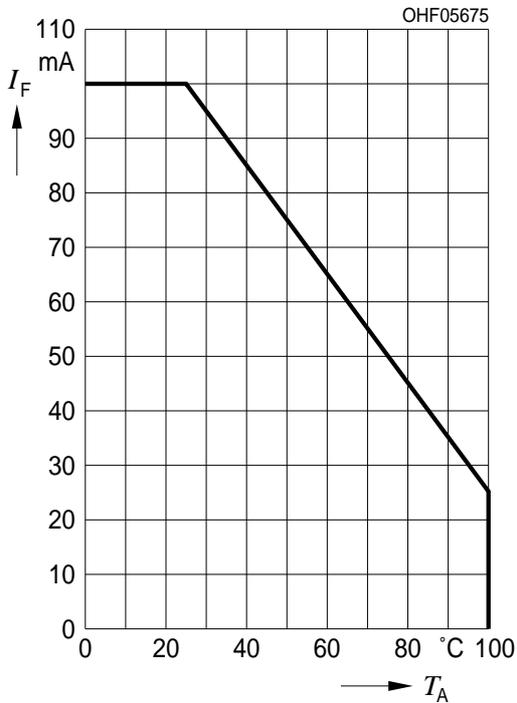
Radiant Intensity ^{1) page 9}

$I_e / I_e(100 \text{ mA}) = f(I_F), \text{ single pulse, } t_p = 100 \mu\text{s}, T_A = 25^\circ\text{C}$



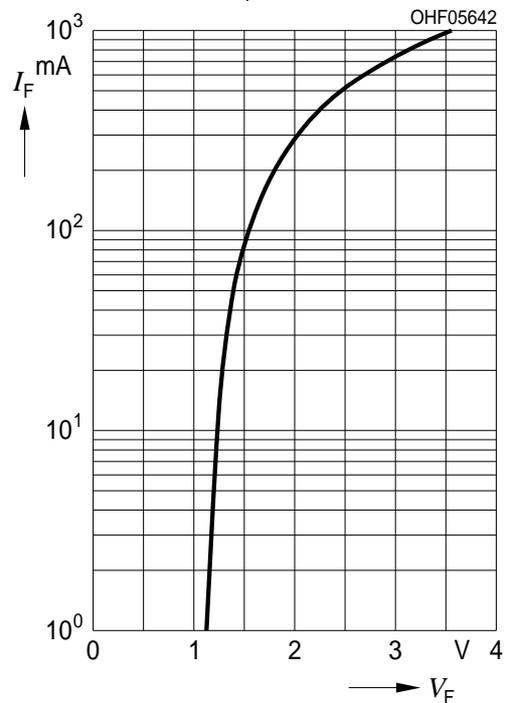
Max. Permissible Forward Current

$I_{F, max} = f(T_A), R_{thJA} = 500 \text{ K/W}$



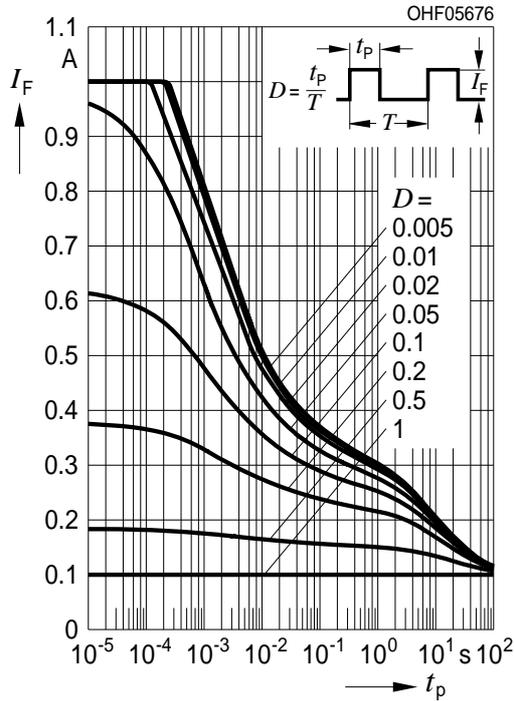
Forward Current ^{1) page 9}

$I_F = f(V_F), \text{ single pulse, } t_p = 100 \mu\text{s}, T_A = 25^\circ\text{C}$



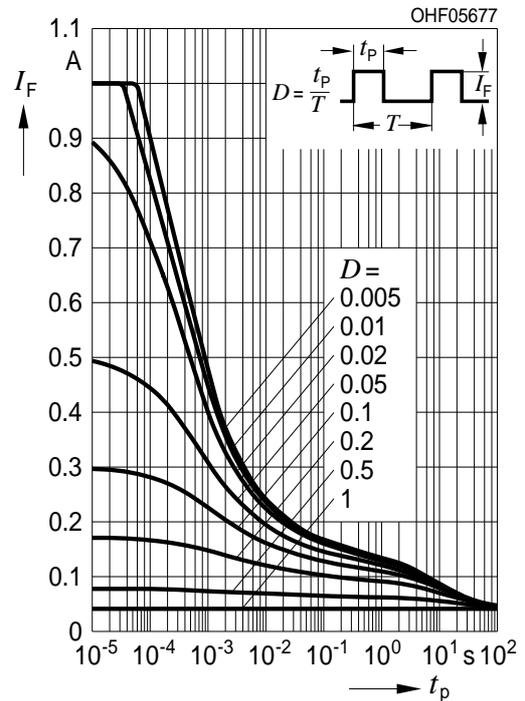
Permissible Pulse Handling Capability

$I_F = f(t_p)$, $T_A = 25\text{ °C}$, duty cycle $D = \text{parameter}$



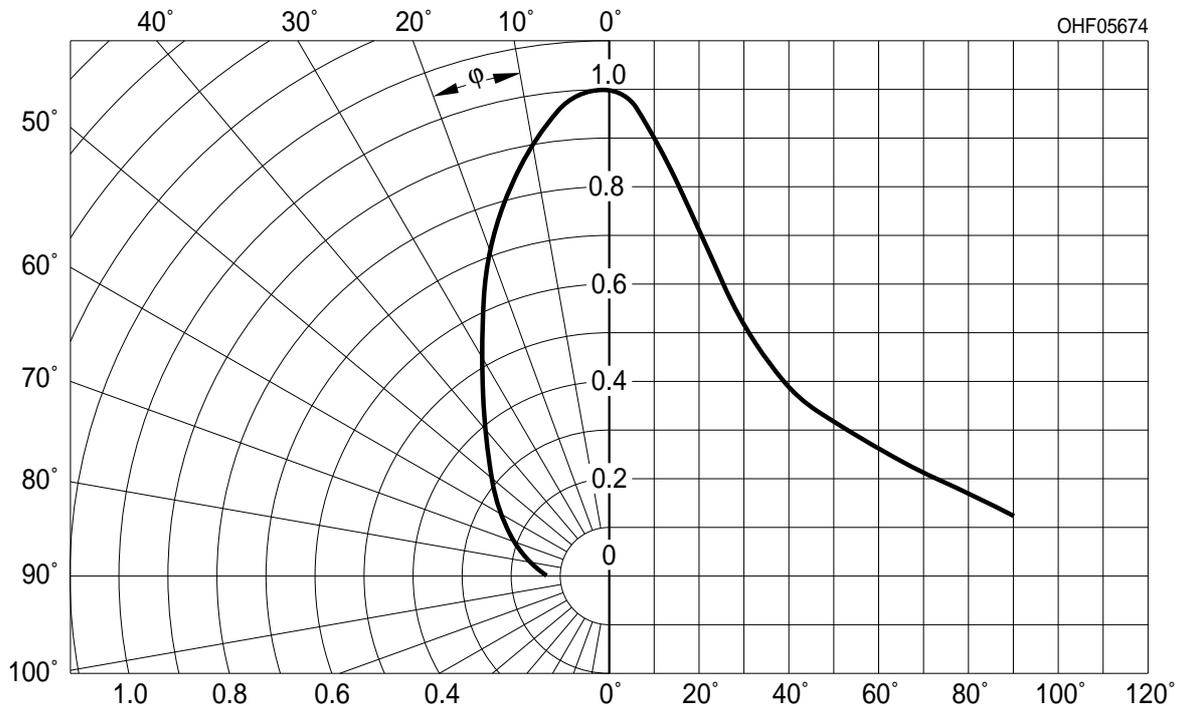
Permissible Pulse Handling Capability

$I_F = f(t_p)$, $T_A = 85\text{ °C}$, duty cycle $D = \text{parameter}$

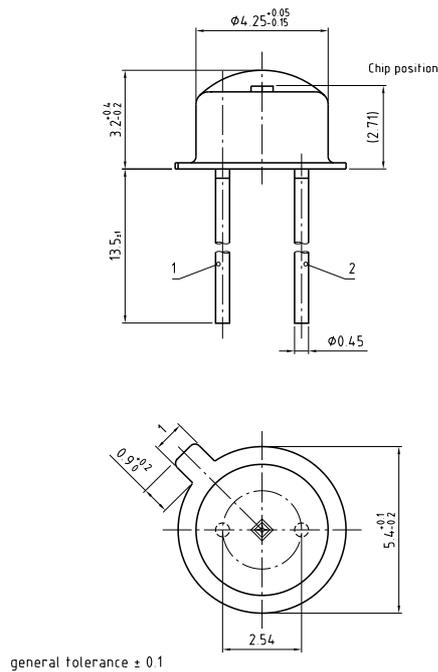


Radiation Characteristics ^{1) page 9}

$I_{rel} = f(\phi)$, $T_A = 25\text{ °C}$



Package Outline



C63062-A4263-A1 -03

Dimensions in mm.

Pinning

| Pin | Description |
|-----|-------------|
| 1 | Anode |
| 2 | Cathode |

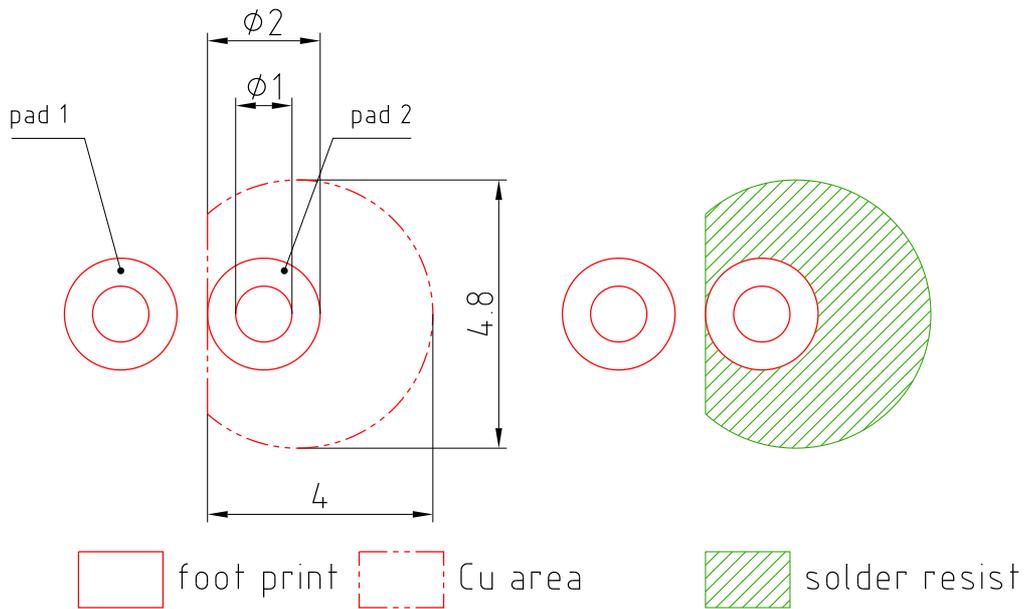
Package

Metal Can (TO-18)

Approximate Weight:

0.1 g

Recommended Solder Pad



E062.3010.188-01

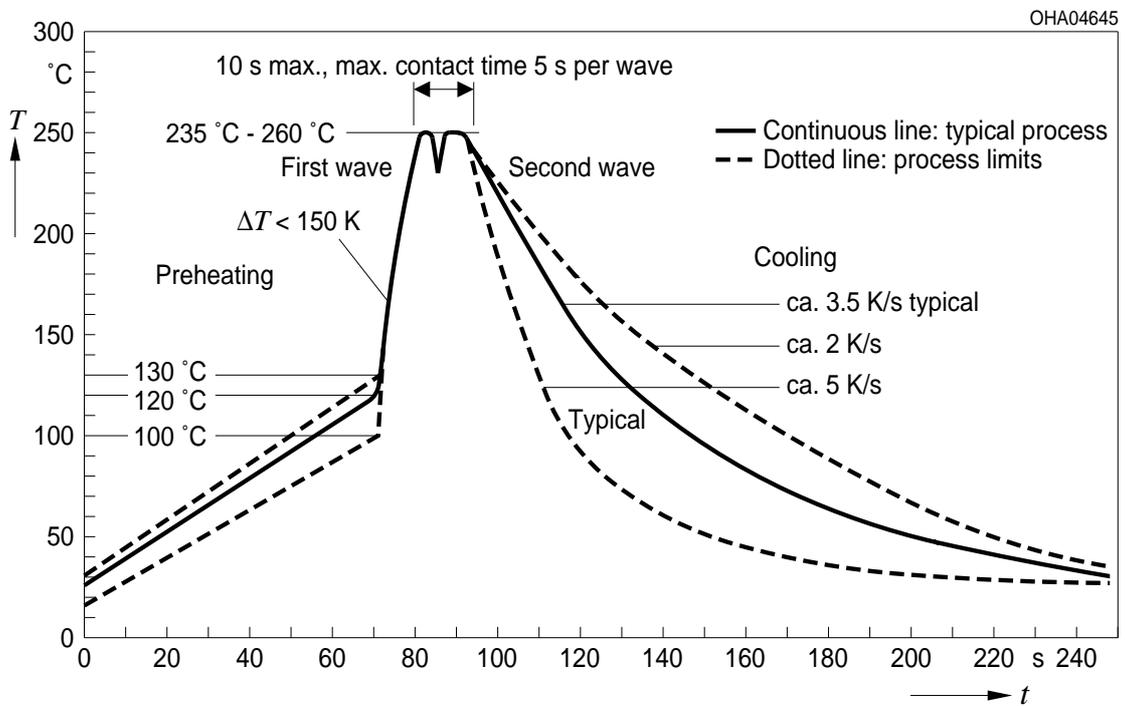
Dimensions in mm.

Note:

pad 1: cathode

TTW Soldering

IEC-61760-1 TTW



Disclaimer

Language english will prevail in case of any discrepancies or deviations between the two language wordings.

Attention please!

The information describes the type of component and shall not be considered as assured characteristics.

Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances.

For information on the types in question please contact our Sales Organization.

If printed or downloaded, please find the latest version in the Internet.

Packing

Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office.

By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

Components used in life-support devices or systems must be expressly authorized for such purpose!

Critical components* may only be used in life-support devices** or systems with the express written approval of OSRAM OS.

*) A critical component is a component used in a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or the effectiveness of that device or system.

**) Life support devices or systems are intended (a) to be implanted in the human body, or (b) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health and the life of the user may be endangered.

Glossary

- ¹⁾ **Typical Values:** Due to the special conditions of the manufacturing processes of LED, the typical data or calculated correlations of technical parameters can only reflect statistical figures. These do not necessarily correspond to the actual parameters of each single product, which could differ from the typical data and calculated correlations or the typical characteristic line. If requested, e.g. because of technical improvements, these typ. data will be changed without any further notice.

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