

| Radiation | Type | Technology    | Case                     |
|-----------|------|---------------|--------------------------|
| Infrared  | 4 W  | AlGaAs/GaAlAs | Plastic lens, metal case |

|  |   |
|--|---|
|  | <b>Description</b><br>High-power infrared-LED in an aluminium case with thread socket, for easy handling and heat sink mounting |
|  | <b>Applications</b><br>Medical appliances, remote control and optical communications, light barriers, measurement systems       |

**Outline:**

H = 12.4 mm (± 0.5)

D = 16 mm (± 0.5)

Thread M10

Pin 1 – cathode

Pin 2 – anode

## Absolute Maximum Ratings

 at  $T_{amb} = 25^{\circ}\text{C}$ , on heat sink ( $S \geq 200 \text{ cm}^2$ ), unless otherwise specified

| Parameter                   | Test conditions                                     | Symbol    | Value       | Unit               |
|-----------------------------|---|-----------|-------------|--------------------|
| DC forward current          | on heat sink  | $I_F$     | 1.1         | A                  |
| Peak forward current        | $t_p \leq 10 \mu\text{s}$ , $f \leq 500 \text{ Hz}$ | $I_{FM}$  | 2.0         | A                  |
| Power dissipation           | on heat sink  | P         | 4           | W                  |
| Operating temperature range | on heat sink  | $T_{amb}$ | -25 to +100 | $^{\circ}\text{C}$ |
| Storage temperature range   | on heat sink  | $T_{stg}$ | -25 to +100 | $^{\circ}\text{C}$ |
| Junction temperature        | on heat sink  | $T_j$     | 100         | $^{\circ}\text{C}$ |

## Electrical Characteristics

 $T_{amb} = 25^{\circ}\text{C}$ , unless otherwise specified

| Parameter                        | Test conditions         | Symbol     | Min | Typ | Max | Unit |
|----------------------------------|-------------------------|------------|-----|-----|-----|------|
| Forward voltage                  | $I_F = 350 \text{ mA}$  | $V_F$      |     | 1.6 | 2.0 | V    |
| Forward voltage*                 | $I_F = 1000 \text{ mA}$ | $V_F$      |     | 2.0 | 2.6 | V    |
| Switching time                   | $I_F = 350 \text{ mA}$  | $t_r, t_f$ |     | 75  |     | ns   |
| Reverse voltage                  | $I_R = 100 \mu\text{A}$ | $V_R$      | 5   |     |     |      |
| Thermal resistance junction-case |                         | $R_{thJC}$ |     | 10  |     | K/W  |

\*only recommended on optimal heat sink

**Optical Characteristics**

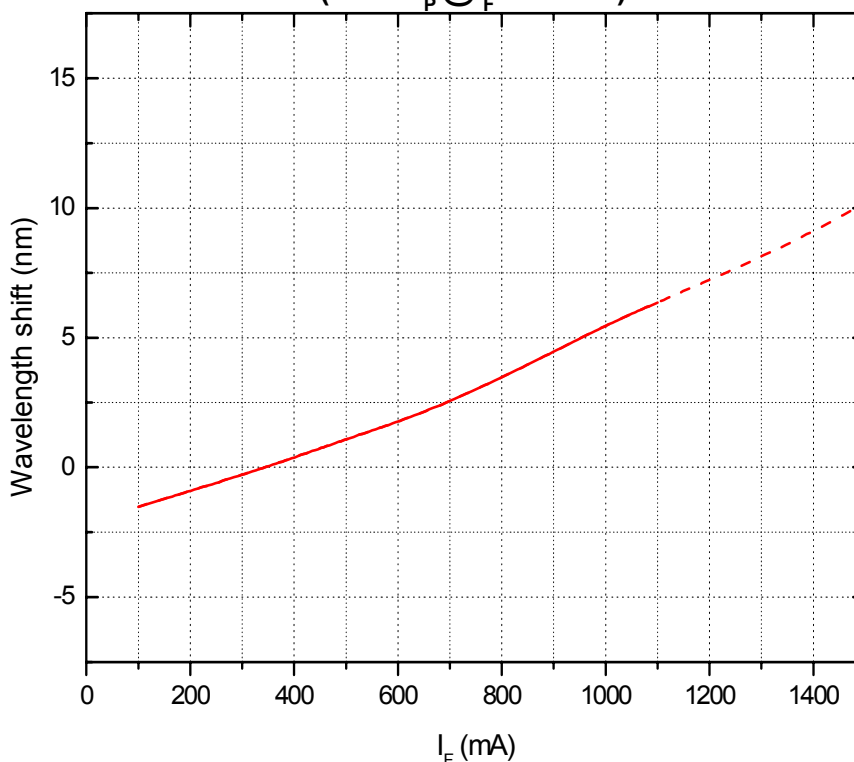
at  $T_{amb} = 25^{\circ}C$ , on heat sink ( $S \geq 200 \text{ cm}^2$ ), unless otherwise specified

| Parameter                 | Test conditions         | Symbol                | Min | Typ  | Max | Unit  |
|---------------------------|-------------------------|-----------------------|-----|------|-----|-------|
| Radiant power             | $I_F = 350 \text{ mA}$  | $\Phi_e$              | 40  | 50   |     | mW    |
| Radiant power*            | $I_F = 1000 \text{ mA}$ | $\Phi_e$              |     | 125  |     | mW    |
| Radiant intensity         | $I_F = 350 \text{ mA}$  | $I_e$                 | 300 | 600  |     | mW/sr |
| Radiant intensity*        | $I_F = 1000 \text{ mA}$ | $I_e$                 |     | 1650 |     | mW/sr |
| Peak wavelength           | $I_F = 350 \text{ mA}$  | $\lambda_p$           | 800 | 810  | 820 | nm    |
| Spectral bandwidth at 50% | $I_F = 350 \text{ mA}$  | $\Delta\lambda_{0,5}$ |     | 30   |     | nm    |
| Viewing angle             | $I_F = 350 \text{ mA}$  | $\varphi$             |     | 17   |     | deg   |

\*only recommended on optimal heat sink

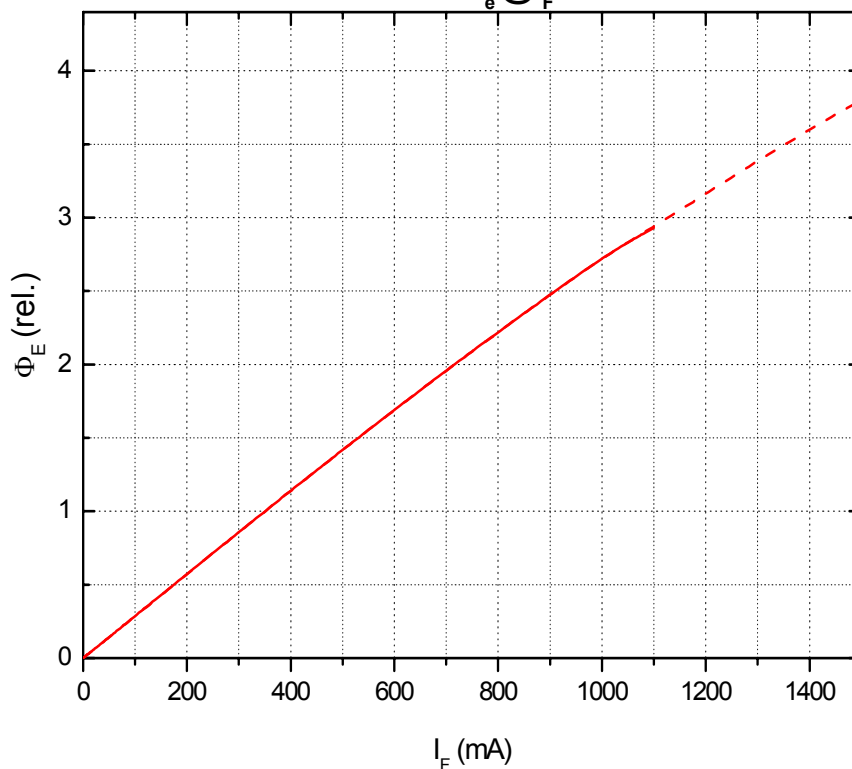
Note: All measurements carried out with *EPIGAP* equipment, on blank aluminium heat sink,  $S = 180 \text{ cm}^2$ , passive cooling. Measurement results and curve characteristics obtained with other heat sinks may differ.

**Typical wavelength shift vs. forward current**  
(rel. to  $\lambda_p @ I_F = 350 \text{ mA}$ )

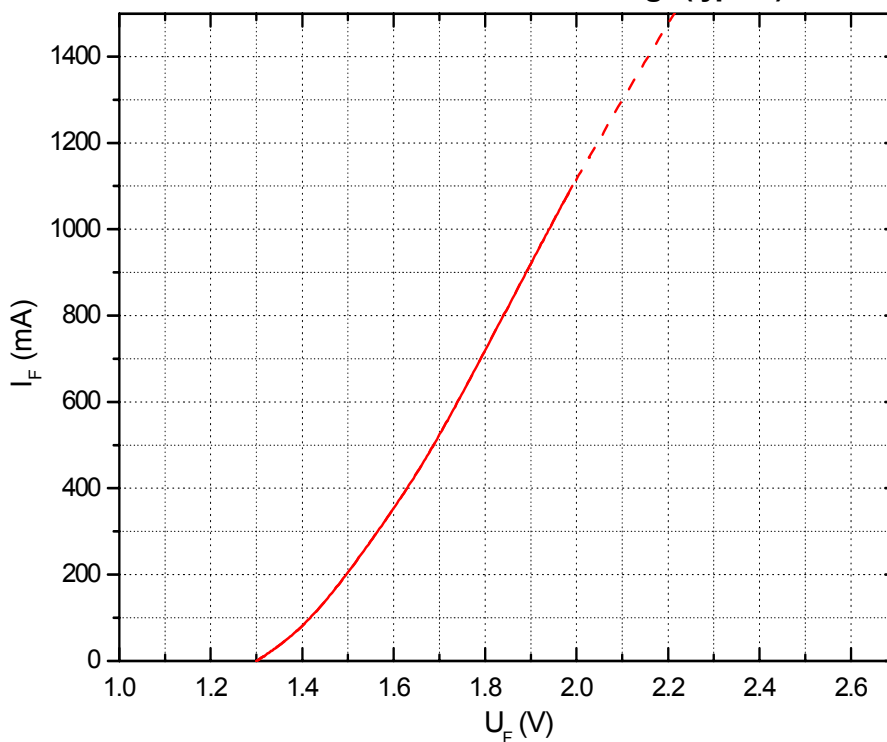


We reserve the right to make changes to improve technical design and may do so without further notice. Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer.

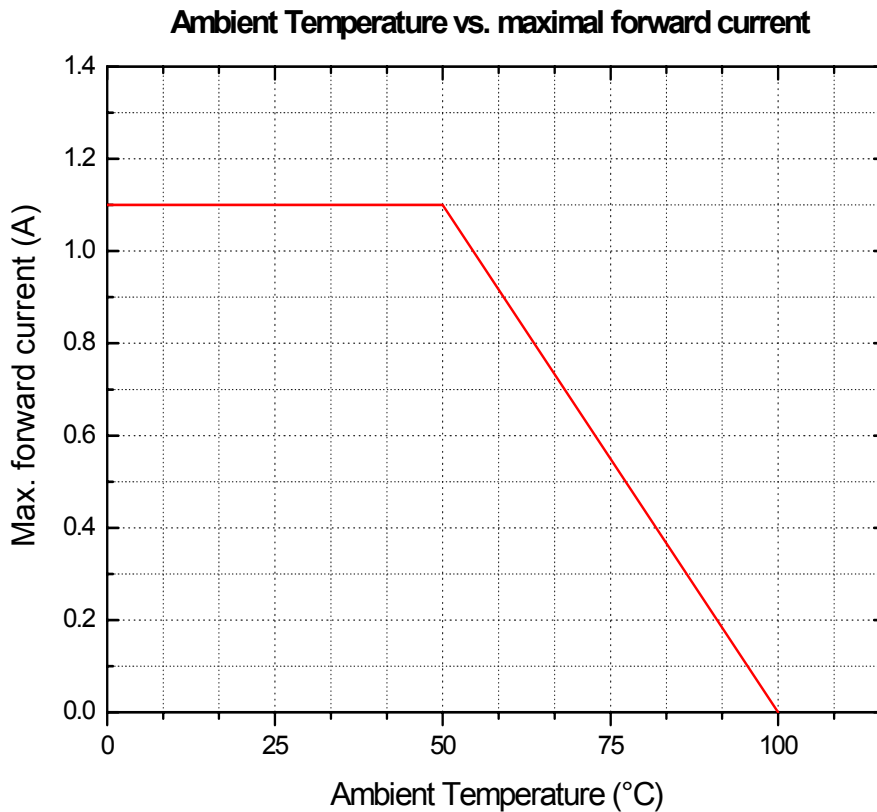
**Radiant power vs. forward current (typical)**  
 normalized to  $\Phi_e @ I_F = 350 \text{ mA}$



**Forward current vs. forward voltage (typical)**



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**Remarks concerning optical radiation safety\***

At low forward current (<100 mA), and continuous operation, this LED may be classified as LED product *Class 1*, according to standard IEC 60825-1:A2. *Class 1* products are safe to eyes and skin under reasonably predictable conditions. This implicates a direct observation of the light beam by means of optical instruments.

When driven with higher continuous forward current, (up to 800 mA), this product should be classified as LED product *Class 1M*, according to standard IEC 60825-1:A2. *Class 1M* products are safe to eyes and skin under normal conditions, including when users view the light beam directly. *Class 1M* products produce either a highly divergent beam or a large diameter beam. Therefore only a small part of the whole light beam can enter the eye. However, such optical products can be harmful to the retina if the beam is viewed using magnifying optical instruments. Therefore, users should not incorporate optics that could concentrate the output into the eyes.

If intended to operate at very high continuous current (>0.8 A), this product has to be (potentially) classified as *Class 3B* LED. *Class 3B* LEDs may have sufficient power to cause an eye injury, both from the direct beam and from reflections, so these products are therefore considered hazardous to the eye. However, the extent and severity of any eye injury arising from an exposure to the light beam of a *Class 3B* product will depend upon several factors including the radiant power entering the eye and the duration of the exposure. Nonetheless, adequate precautions should be taken to avoid direct or indirect viewing into the beam.

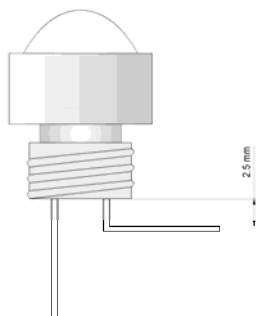
\*Note: Safety classification of an optical component mainly depends on the intended application and the way the component is being used. Furthermore, all statements made to classification are based on calculations and are only valid for this LED "as it is", and at continuous operation. Using pulsed current or altering the light beam with additional optics may lead to different safety classifications. Therefore these remarks should be taken as recommendation and guideline only.

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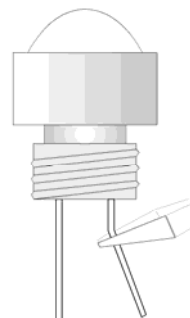
## Handling precautions

To prevent damage to the LED during soldering and assembly, following precautions have to be taken into account.

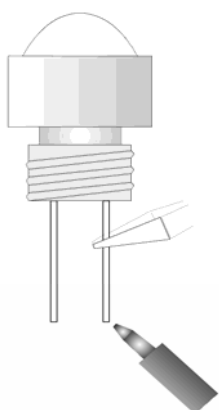
a) The bending point of the lead frame should be located at least 2.5 mm away from the body.



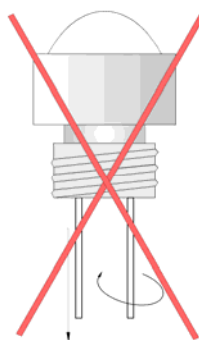
b) While bending, the base of the lead frame has to be fixed with radio pliers or similar.



c) To ensure an adequate strain relief, the lead frames have to be firmly fixed during soldering.



d) Avoid any torsion or tensile loading of the lead frames, especially when they have been heated after being soldered.



e) LEDs are static sensitive devices, so adequate handling precautions have to be taken, e.g. wearing grounding wrist straps.



**ESD**

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