

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

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

**Outline:**

 H = 12.4 mm ( $\pm 0.5$ )

 D = 16 mm ( $\pm 0.5$ )

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	$I_F$	1.2	A
Peak forward current	$t_p \leq 100 \mu\text{s}$ , $D = 0,05$	$I_{FM}$	2.0	A
Power dissipation	on heat sink	P	2.8	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	1.9	V
Forward voltage*	$I_F = 1000 \text{ mA}$	$V_F$		2.0	2.4	V
Switching time	$I_F = 350 \text{ mA}$	$t_r, t_f$		20		ns
Reverse voltage	$I_R = 10 \mu\text{A}$	$V_R$	5			
Thermal resistance junction-case		$R_{thJC}$		10		K/W

\*only recommended on optimal heat sink

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Parameters can vary in different applications. All operating parameters must be validated for each application by the customers themselves.

**Optical Characteristics**

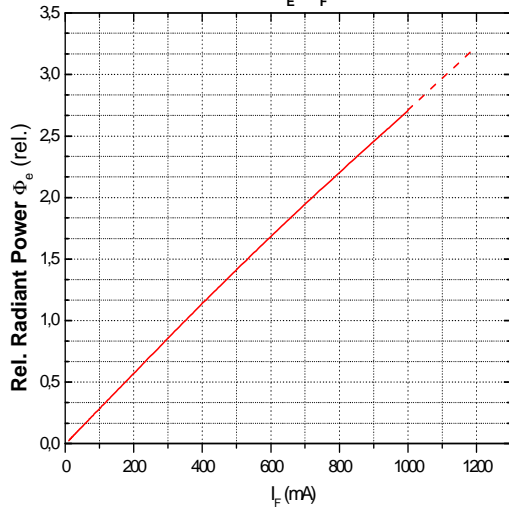
at  $T_{amb} = 25^{\circ}C$ , on heat sink ( $S \geq 200 \text{ cm}^2$ ), unless otherwise specified

Parameter	Test conditions	Symbol	Min	Typ	Max	Unit
Radiant power	$I_F = 350 \text{ mA}$	$\Phi_e$	80	100		mW
Radiant power*	$I_F = 1000 \text{ mA}$	$\Phi_e$		270		mW
Radiant intensity	$I_F = 350 \text{ mA}$	$I_e$	450	750		mW/sr
Radiant intensity*	$I_F = 1000 \text{ mA}$	$I_e$		2100		mW/sr
Peak wavelength	$I_F = 350 \text{ mA}$	$\lambda_p$	820	830	840	nm
Spectral bandwidth at 50%	$I_F = 350 \text{ mA}$	$\Delta\lambda_{0.5}$		35		nm
Full viewing angle	$I_F = 350 \text{ mA}$	$2\phi$		20		deg

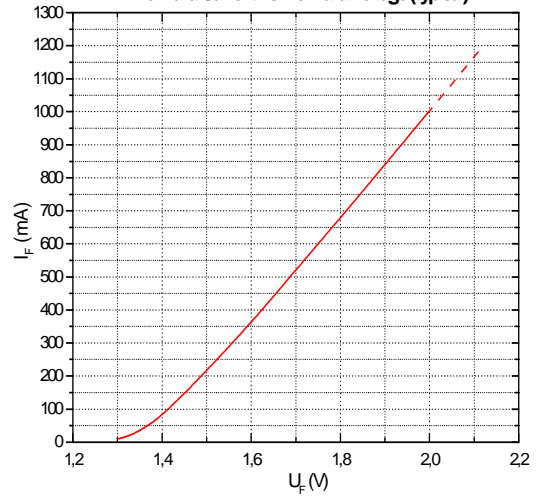
\*only recommended on optimal heat sink

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.

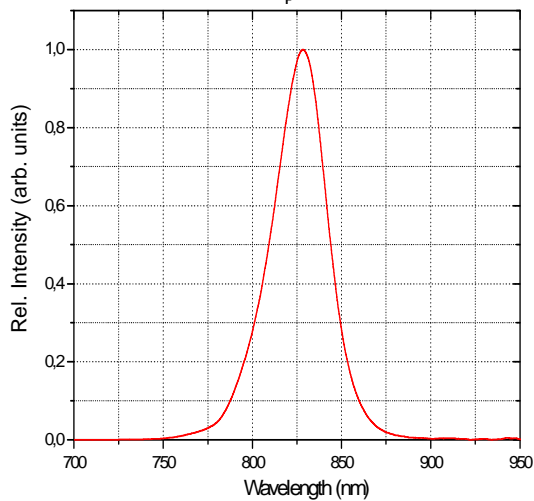
**Radiant Power vs. Forward Current (typical)**  
Normalized to  $\Phi_e$  @  $I_F = 350$  mA



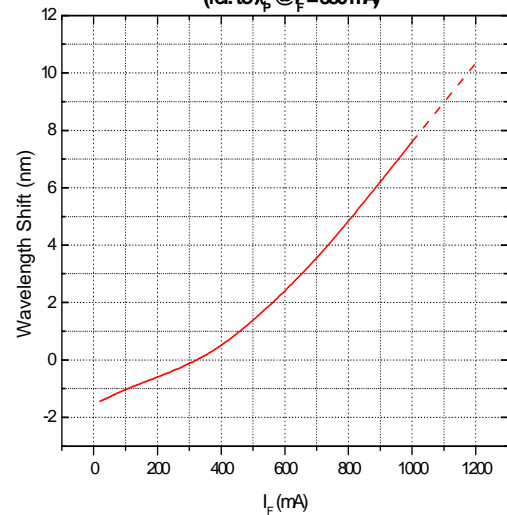
**Forward Current vs. Forward Voltage (typical)**



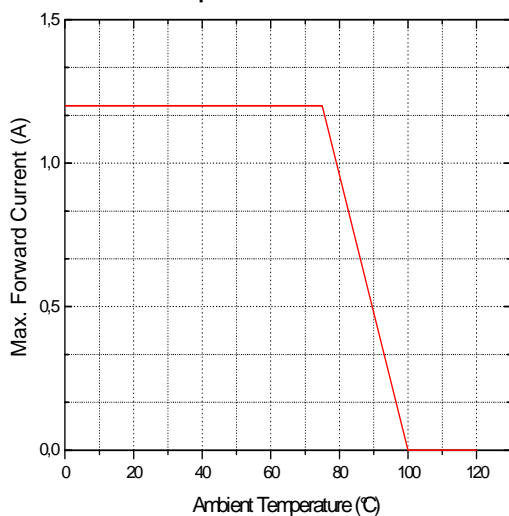
**Spectral Power Distribution (typical)**  
at  $I_F = 350$  mA



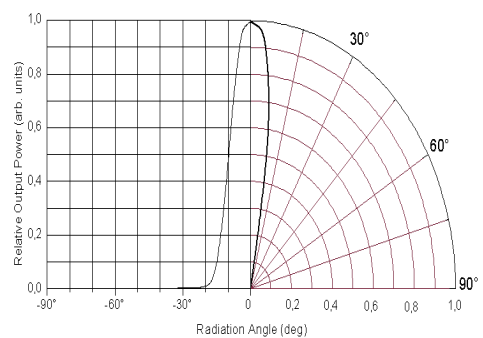
**Typical Wavelength Shift vs. Forward Current**  
(rel. to  $\lambda_p$  @  $I_F = 350$  mA)



**Ambient Temperature vs. Maximal Forward Current**



**Typical Radiant Pattern**



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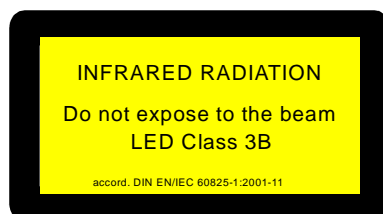
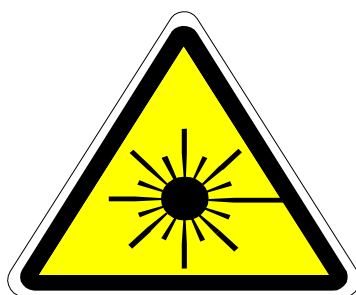
### Remarks concerning optical radiation safety\*

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

This product should be classified as LED product Class 1M according to standard IEC 60825-1:A2 if driven with higher continuous forward current (up to 700 mA). *Class 1M* products are safe to eyes and skin under normal conditions, even when users look into the light beam directly. *Class 1M* products produce either a highly divergent beam or a large diameter beam, so only a small part of the whole radiation beam can enter the eye. However, such optical products can be harmful to the retina using magnifying optical instruments. Therefore, users should not incorporate optics that could focus the output into the eyes.

If it is intended to operate the LED at very high continuous current (>1 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 by the direct beam and by reflections therefore these products are 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 looking into the beam.

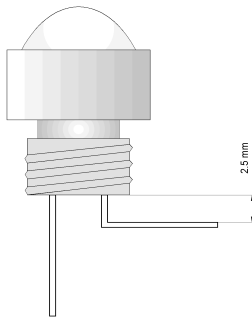
\*Note: Safety classification of an optical component mainly depends on the intended application and the way the component is being used. Furthermore, all statements made to classification are based on calculations and are only valid for this LED "as it is" and at continuous operation. Using pulsed current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



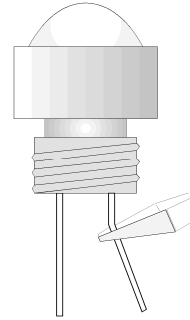
## Handling precautions

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

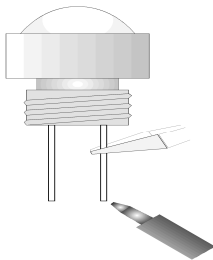
a) The bending point of the lead frame should be located at least 2.5 mm away from the body.



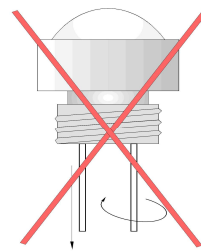
b) While bending, the base of the lead frame has to be fixed with radio pliers or similar.



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



d) To avoid any damage of the LED during soldering the lead frames should not be distorted especially when they have been heated



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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