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# ELJ-870-629

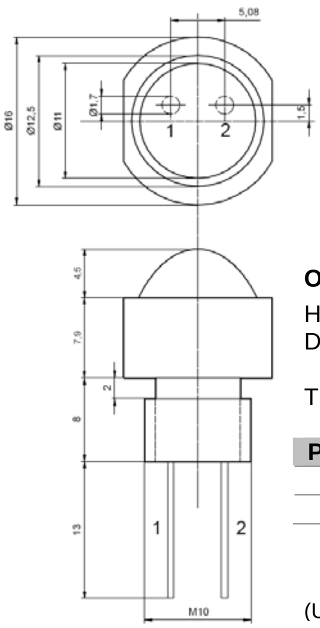
## TECHNICAL DATA

## High Power LED, Jumbo Package AlGaAs

ELJ-870-629 is high power LED in an black anodised aluminium case, with thread socket for easy handling and heat sink mounting.
It is designed for medical appliances, remote control and optical communications, light barriers, measurement systems, etc.

### *Specifications*

- Technology: AlGaAs/GaAlAs, 1 power LED chip
- Peak Wavelength: typ. 870 nm
- Optical Ouput Power: typ. 90 mW
- Package: Jumbo, metal case with plastic lens




**Outline:**
H = 12.4 mm (± 0.5)
D = 16 mm (± 0.5)

Thread M10

| PIN | Function |
|---|---|
| 1 | LED Cathode |
| 2 | LED Anode |

(Unit: mm)

### *Absolute Maximum Ratings ($T_C$=25°C)*

| Item | Symbol | Value | Unit |
|---|---|---|---|
| Power Dissipation | $P_D$ | 4 | W |
| Forward Current | $I_F$ | 1.5 | A |
| Pulse Forward Current * | $I_{FP}$ | 2.0 | A |
| Operating Temperature | $T_{opr}$ | -25 … +100 | °C |
| Storage Temperature | $T_{stg}$ | -25 … +100 | °C |
| Junction Temperature | $T_j$ | 100 | °C |

on heat sink (S ≥ 200 cm²)
* pulse width ≤ 10µs, f ≤ 500 Hz

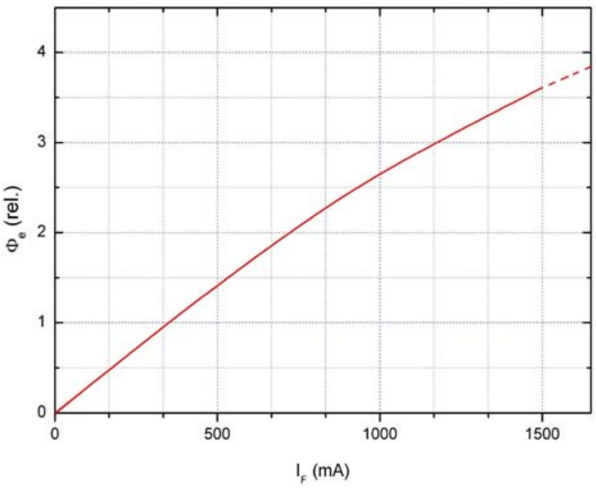
### *Specifications ($T_C$=20°C)*

| Item | Test Condition | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Optical Specifications** | | | | | | |
| Radiant Power | $I_F$ = 350 mA | $\Phi_e$ | 70 | 90 | - | mW |
| Radiant Power * | $I_F$ = 1000 mA | $\Phi_e$ | - | 250 | - | mW |
| Radiant Intensity | $I_F$ = 350 mA | $I_e$ | 350 | 650 | - | mW/sr |
| Radiant Intensity * | $I_F$ = 1000 mA | $I_e$ | - | 1900 | - | mW/sr |
| Peak Wavelength | $I_F$ = 350 mA | $\lambda_p$ | 860 | 870 | 880 | nm |
| Spectral Bandwidth at 50% | $I_F$ = 350 mA | $\Delta\lambda_{0.5}$ | - | 42 | - | nm |
| Viewing Angle | $I_F$ = 350 mA | $\varphi$ | - | 17 | - | deg |
| **Electrical Specifications** | | | | | | |
| Forward Voltage | $I_F$ = 350 mA | $U_F$ | - | 1.5 | 1.8 | V |
| Forward Voltage * | $I_F$ = 1000 mA | $U_F$ | - | 1.8 | 2.3 | V |
| Switching Time | $I_F$ = 350 mA | $t_r$, $t_f$ | - | 10/20 | - | ns |
| Reverse Voltage | $I_R$ = 100 µA | $U_R$ | 5 | - | - | |
| Thermal Resistance Junction-Case | | $R_{thJC}$ | - | 10 | - | K/W |

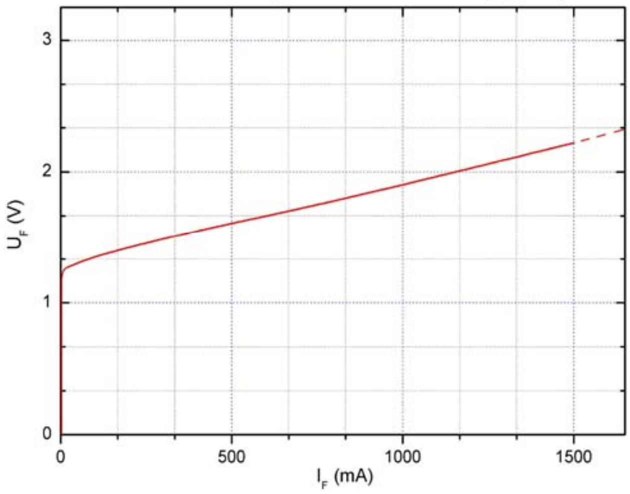
* only recommended on optimal heat sink

## *Typical Performance Curves*

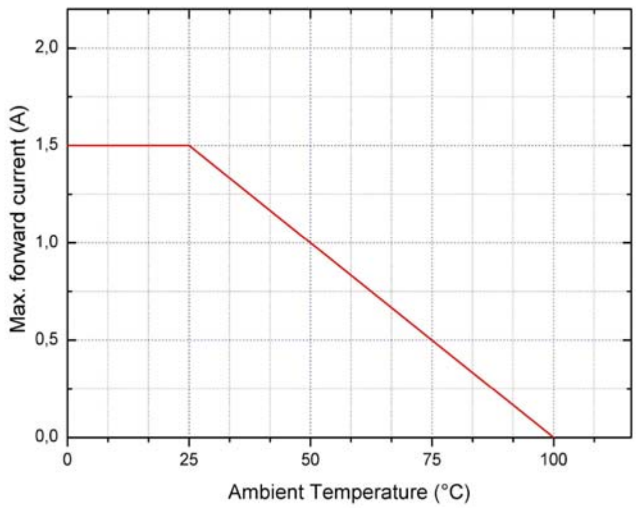
Radiant power vs. forward current (typical)
normalized to $\Phi_E$ @ $I_F$ = 350 mA



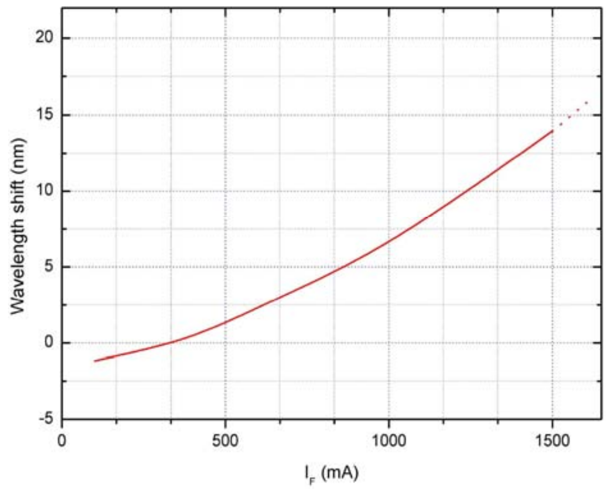

Forward voltage vs. forward current (typical)




Ambient Temperature vs. maximal forward current




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



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### *Remarks concerning optical radiation safety**

At low forward current (≤150 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 1 A), 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 (>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 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. Nontheless, 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.

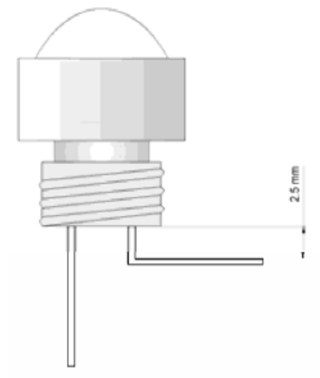
### *Notes*

- The mentioned specifications are for reference purpose only and subjected to change without prior notice.
- All measurements carried out on blank aluminium heat sink, S = 180 cm², passive cooling. Measurement results and curve characteristics obtained with other heat sinks may differ.
- Do not view directly into the emitting area of the LED during operation!
- This high power LED must be cooled!

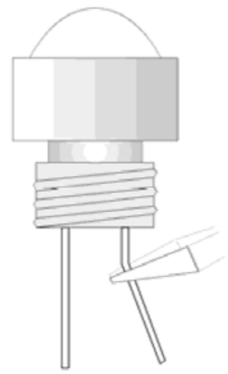
### *Handling precautions*

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

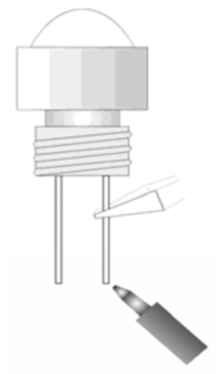
a) The bending point of the lead frame should be located at least 2.5 mm away from the body.



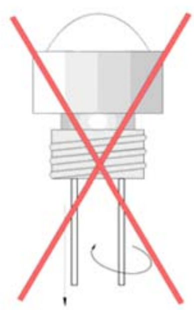

b) While bending, the base of the lead frame has to be fixed with radio pliers or similar.



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.