

# Fully hermetic and autoclavable LED modules for challenging medical and dental applications

## Proven glass-to-metal sealing technology

SCHOTT has developed a new packaging solution for LEDs to meet the needs of the medical industry. The inorganic LED modules are fully hermetic and autoclavable. Based upon our established glass-to-metal sealing know-how, the newly developed glass-to-copper-sealing technology provides the added benefit of superior thermal conductivity and stability, leading to enhanced efficiency and lifetime of the LED.

The packages can be assembled together with customized optics for applications in the UV, VIS and IR spectral ranges. They are also available as panels and are SMD (surface mount device) -capable.

The LED packages from SCHOTT are ideal for:

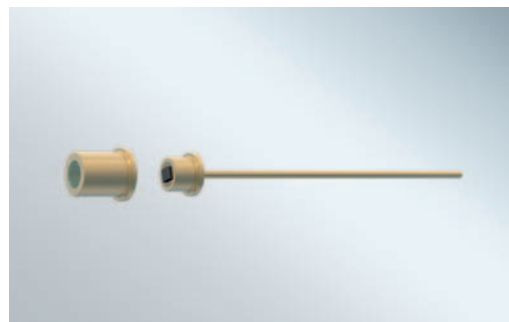
- Medical/Dental applications
- UV applications (e.g. UV curing, water and air purification, medical phototherapy)
- Harsh environments (applications such as instrumentation and sensing)

## Advantages

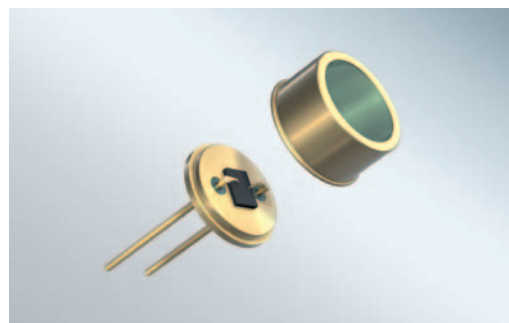
- **Hermetic and reliable autoclavable packages:** LED housings can withstand demanding operating conditions such as extreme temperature and pressure
- **Improved efficiency and lifetime of high power LEDs:** Superior thermal conductivity and resistance due to copper base
- **Inorganic LED packages resistant to aging:** Ideal for highly transmissive UV, VIS and IR applications
- **Customizable designs:** Design flexibility and autoclavability of SCHOTT LED packages enable entirely new and customized lighting design solutions



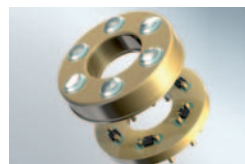
Hermetic LED packages are autoclavable



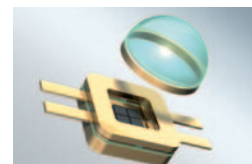
Mini LED



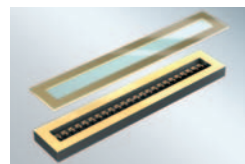
TO LED



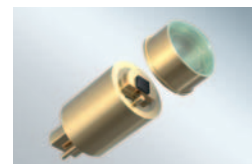
Ring LED with metal or ceramic base



SMD LED – single or multi chip



Array LED – single or multi



Bulb LED – single or multi chip array

# Improving the Efficiency and Lifetime of High Power LEDs with Glass-to-metal Sealed Packages

## Technical Information

**Autoclaving:** Proven functionality for

- Oils
- Disinfection with alkaline solutions (55 °C; 5 min)
- Thermal disinfection (95 °C; 10 min)
- Steam sterilization (2 bar; 134 °C for 3 min.)

**Temperature stability:** > 260 °C

**Gas-tight:**  $1 \times 10^{-8}$  mbar x l/s

**Electric insulation:** >10G $\Omega$

**Chemical resistance:** High

**Thermal shock stability:**  
- 65 °C to 150 °C for 15 cycles

## Preliminary Specifications

**Temperature conductivity:** 400 W · m<sup>-1</sup> · K<sup>-1</sup> (Copper)

**Package dimensions:**  $\geq 2.3$  mm

**Refractive Index of glass:** 1.48 – 1.85

## About SCHOTT Electronic Packaging

SCHOTT Electronic Packaging is a worldwide leading supplier of hermetic packaging solutions for the reliable, long-term protection of sensitive electronic devices. Since the 1930s, we have been developing, manufacturing and optimizing hermetic packaging solutions by using specialized glass, glass-to-metal and today also ceramic-to-metal sealing technology. More than 600 scientists and engineers are working for and with SCHOTT customers all over the world, while setting the pace by developing new, cutting edge technologies for the requirements of today and tomorrow.

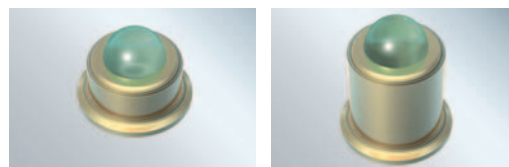
With 1,500 employees at five production locations and a number of competence centers in North America, Europe and Asia, SCHOTT Electronic Packaging is a strong and reliable partner for customers worldwide. More than 5,000 different articles have been developed and are distributed by SCHOTT. These are produced at company sites in Germany, the Czech Republic, Singapore, U.S.A. and Japan.

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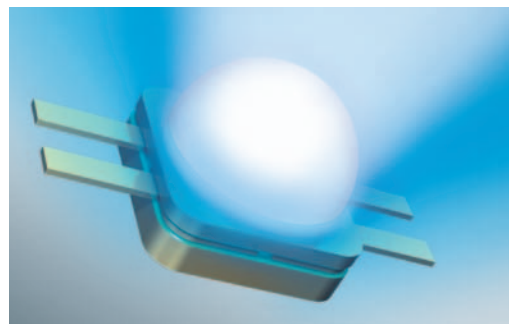
### Hermetic sealing with lens caps



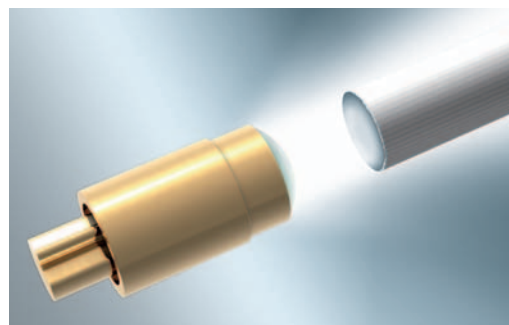
*Lens caps with high refractive index glass*



*Lens cap with low and high numerical aperture*



*UV transparent glasses available as windows or lenses*



*Optical simulation and fiber coupling*



*Thermal simulation of single chip package*

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**SCHOTT**  
 glass made of ideas