

# SCHOTT Solidur® TO LED

Custom designable, sterilizable and robust HB LED for Medical Devices

## Product Information

The Solidur® TO LED is enclosed in a hermetic, glass-to-metal sealed housing. This makes the TO LED a fully autoclavable High Brightness (HB) LED.

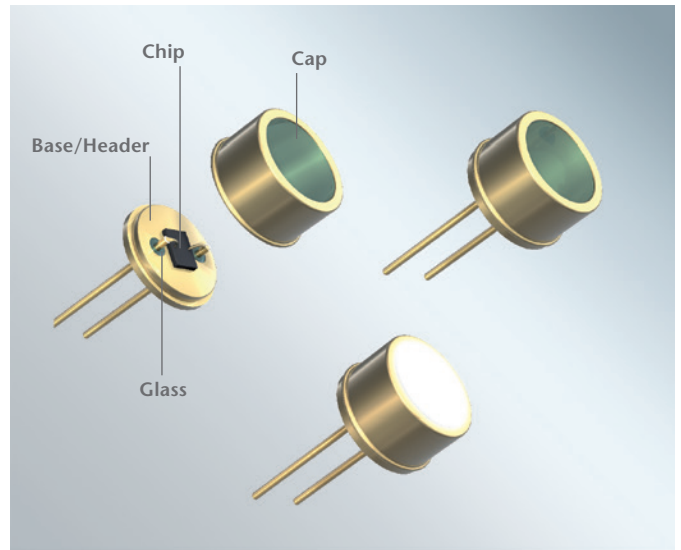
The shape and design is based on typical TO (Transistor Outline) footprints. These footprints are industrial standards that have governed the design and size of current-conducting microelectronic packaging and housings over the past few decades.

### Gas-tight and robust

Owing to its fully gas-tight housing based on inorganic, non-aging materials, the TO LED is extremely robust, resistant to chemicals, corrosion and pressure – even at varying temperatures.

### Sterilizable

This makes the Solidur® TO LED a highly reliable light source, performing efficiently over a long period time and over many autoclaving cycles (over 3500 cycles at 134°C).



### Easy to integrate

The TO LED can easily be incorporated into any medical device as it is available as a connectorized format as well as in SMD (surface mount) design.

## Applications

The TO LED is suitable for applications in medical lighting, especially for medical devices that need autoclaving. Typical applications include UV curing devices, endoscopes, laparoscopes, laryngoscopes, intraoral cameras, otoscopes, surgical equipment and many more.

### Medical



Surgical



Otoscopes



Endoscopes, Laparoscopes



Ophthalmoscopes

### Dental



UV Curing



Cameras



Mirrors



Hand tools

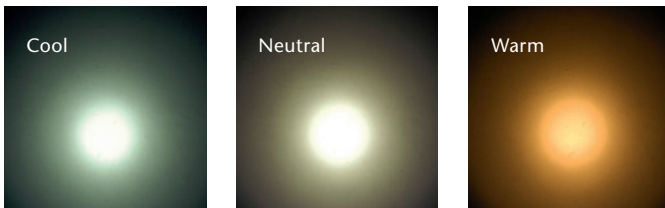
... and more applications.

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## Features

- Color temperature  $C_T$ : 3000-6000K (warm, neutral to cold white)
- Color rendering index  $R_a$ : 65-92
- Individual wavelength according to customer request
- Forward current  $I_F$ : typ. <700 mA
- ESD protection and resistors integrable
- Luminous flux  $\phi_v$ : typ. 10-300 lm at 20-700 mA (design depending)
- Colored LEDs on request
- Forward voltage  $V_F$ : typ. 3.4 V at  $I_F = 350$  mA
- Viewing angle: Full Width Half Maximum (FWHM)  $\Theta_v$ : typ. 20–130°
- Layout for multi chips possible
- Size:  $\varnothing \geq 2$  mm
- Height: > 2 mm
- Lens material: refractive index  $1.5 < n < 1.84$



Customized white light and color temperature

## Technical concept

- Typically metal header and cap
- Inorganic, non-aging materials
- Single and Multi-chip package
- High corrosion robustness
- Low thermal resistance
- Available as white light LED or coloured LED

## Advantages

- The TO LED can be adapted to your application and requirements:
  - Choose your light color
  - Define your colour temperature and CRI
  - Define your radiation pattern
  - Customize your optical properties like luminous flux, radiation pattern and lens
  - Different colors and wavelength can be combined within one LED module
- Fully autoclavable, highly reliable light source
- Good thermal management
- Non-aging glass lens

Window caps

Molded/solder caps

Ball lens cap

## Material options for lens and window optics

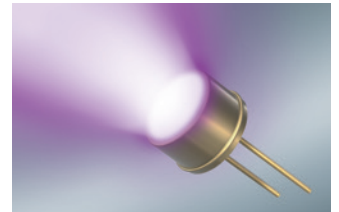
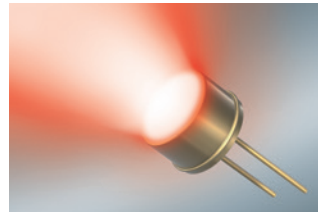
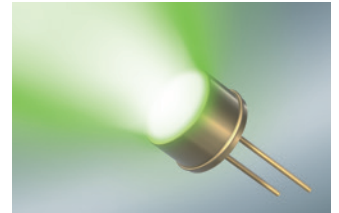
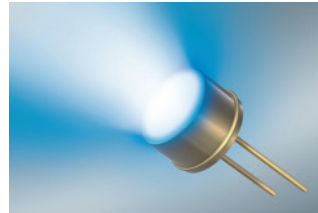
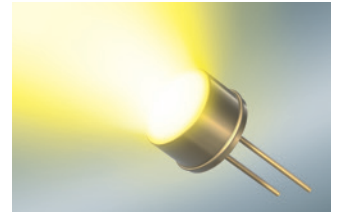
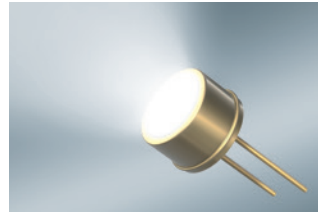
Glass type	Lens shape	Metal cap	Physical data			Transmission			
			$n_d$	$\alpha$	$\lambda$	DUV	UVB/UVA	VIS	IR
				$10^{-6} K^{-1}$	W/mK	240-280 nm	280-380 nm	380-780 nm	780-1 $\mu m$
Standard	Lens Flat window	Kovar (29Ni-18Fe-Co)	1.487	5.0	1.2			✓	✓
Autoclavable	Lens Flat window	Kovar (29Ni-18Fe-Co)	1.490	5.5	1			✓	✓
UV	Lens Flat window	Kovar (28Ni-18Fe-Co)	1.476	4.1	1.0	✓	✓	✓	✓
Sapphire	Flat window	Kovar (29Ni-18Fe-Co)	1.767	5.4-6.2	4.0		✓	✓	✓
Ultraflat window Glass; Type B/D	Flat window	NiFe alloys	1.523	7.4/9.4	1			✓	✓
NBK 7	Ball Lens windows	NiFe alloys	1.517	8.3	1.1			✓	✓
Fused Silica	Ball Lens	NiFeCo/NiFe	1.458	0,57	1.3	✓	✓	✓	✓
Coating options			AR coating Filter coating						

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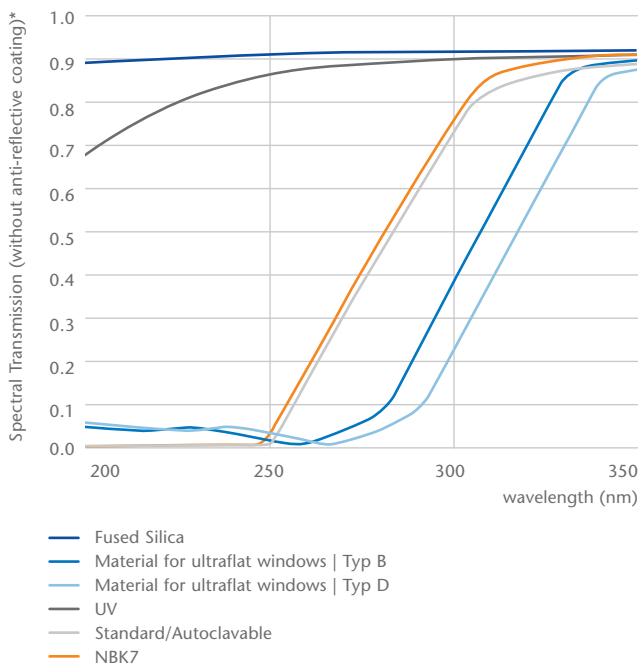
Customized caps and lenses for UV applications



SMD LED module



TO LEDs with different wavelengths



\*Typical values, not intended for specification purpose

- Specially adapted UV transparent glasses available as windows or lenses
- High transmission at low wavelength
- Fully hermetic

## About SCHOTT Electronic Packaging

SCHOTT is an international technology group with more than 130 years of experience in the areas of specialty glasses and materials.

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.

The SCHOTT Group with a workforce of about 15,400 employees maintains close proximity to its customers with manufacturing and sales units in 35 different countries.

[schott.com](http://schott.com)

SCHOTT North America, Inc.  
Phone: +1 508 764-9374, [epackaging@us.schott.com](mailto:epackaging@us.schott.com)

**SCHOTT**  
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