



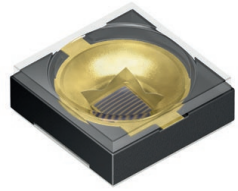
# THE DATASHEET OF SFH 4796S



# SFH 4796S

## OSLUX®

IR OSLUX (850nm) - 80°



## Applications

- Access Control (IRIS/Vein Scan, Face Recognition)

## Features:

- Corrosion Robustness Class: 3B
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)
- IR lightsource with high efficiency
- Double stack emitter
- Low thermal resistance (Max. 14 K/W)
- Centroid wavelength 850 nm
- Small package (LxWxH): 3.5mm x 3.5mm x 1.4mm

## Ordering Information

Type	Radiant intensity <sup>1)</sup> $I_F = 1 \text{ A}; t_p = 10 \text{ ms}$ $I_e$	Radiant intensity <sup>1)</sup> typ. $I_F = 1 \text{ A}; t_p = 10 \text{ ms}$ $I_e$	Ordering Code
SFH 4796S	450 ... 1100 mW/sr	650 mW/sr	Q65112A0372

## Maximum Ratings

$T_A = 25\text{ °C}$

Parameter	Symbol	Values
Operating temperature	$T_{op}$	min. -40 °C max. 85 °C
Storage temperature	$T_{stg}$	min. -40 °C max. 85 °C
Junction temperature	$T_j$	max. 145 °C
Forward current	$I_F$	max. 1000 mA
Surge current $t_p \leq 300\ \mu\text{s}; D = 0.005$	$I_{FSM}$	max. 3 A
Reverse current <sup>2)</sup>	$I_R$	max. 200 mA
Power consumption	$P_{tot}$	max. 3.5 W
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	$V_{ESD}$	max. 2 kV

For the forward current and power consumption please see “maximum permissible forward current” diagram

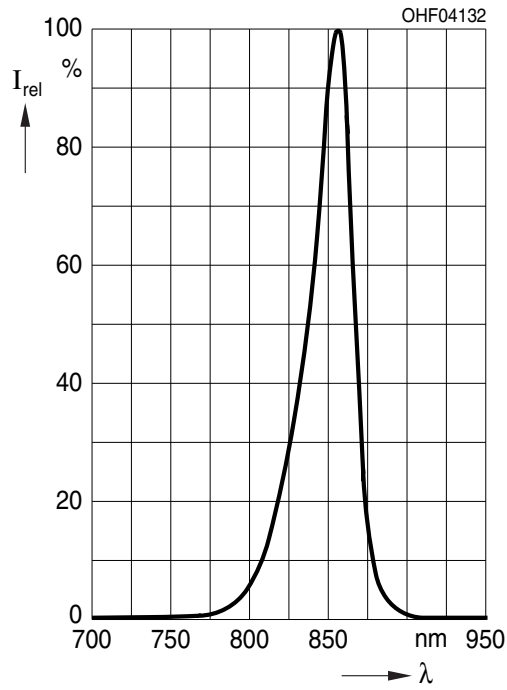
## Characteristics

$I_F = 1000 \text{ mA}$ ;  $t_p = 10 \text{ ms}$ ;  $T_A = 25 \text{ °C}$

Parameter	Symbol		Values
Peak wavelength	$\lambda_{\text{peak}}$	typ.	860 nm
Centroid wavelength	$\lambda_{\text{centroid}}$	typ.	850 nm
Spectral bandwidth at 50% $I_{\text{rel,max}}$ (FWHM)	$\Delta\lambda$	typ.	30 nm
Half angle	$\varphi$	typ.	40 °
Dimensions of active chip area	L x W	typ.	1 x 1 mm x mm
Rise time (10% / 90%) $I_F = 3 \text{ A}$ ; $R_L = 50 \text{ }\Omega$	$t_r$	typ.	12 ns
Fall time (10% / 90%) $I_F = 3 \text{ A}$ ; $R_L = 50 \text{ }\Omega$	$t_f$	typ.	15 ns
Forward voltage <sup>3)</sup>	$V_F$	typ. max.	3.15 V 3.5 V
Forward voltage <sup>3)</sup> $I_F = 3 \text{ A}$ ; $t_p = 100 \text{ }\mu\text{s}$	$V_F$	typ. max.	3.8 V 4.6 V
Reverse voltage <sup>2)</sup> $I_R = 20 \text{ mA}$	$V_R$	max.	1.2 V
Reverse voltage (ESD device) <sup>2)</sup>	$V_{\text{RESD}}$	min.	45 V
Total radiant flux <sup>4)</sup>	$\Phi_e$	typ.	960 mW
Total radiant flux <sup>4)</sup> $I_F = 1 \text{ A}$ ; $t_p = 100 \text{ }\mu\text{s}$	$\Phi_e$	typ.	1020 mW
Temperature coefficient of voltage	$TC_V$	typ.	-2 mV / K
Temperature coefficient of brightness	$TC_I$	typ.	-0.3 % / K
Temperature coefficient of wavelength	$TC_\lambda$	typ.	0.3 nm / K
Thermal resistance junction solder point real <sup>5)</sup>	$R_{\text{thJS real}}$	max.	14 K / W

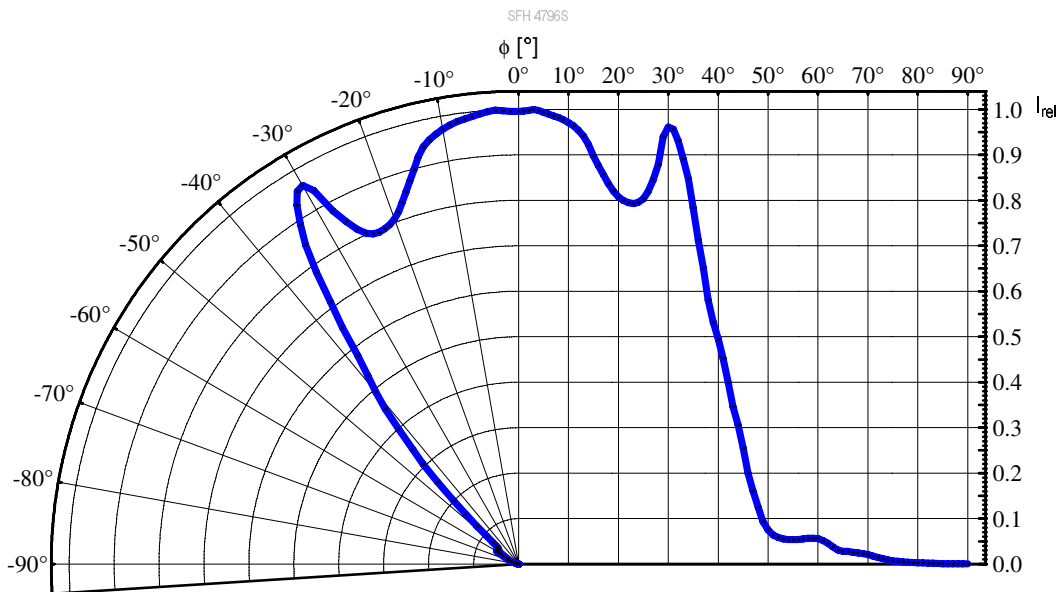
### Relative Spectral Emission 6), 7)

$I_{e,rel} = f(\lambda); I_F = 1000 \text{ mA}; t_p = 10 \text{ ms}$



### Radiation Characteristics 6), 7)

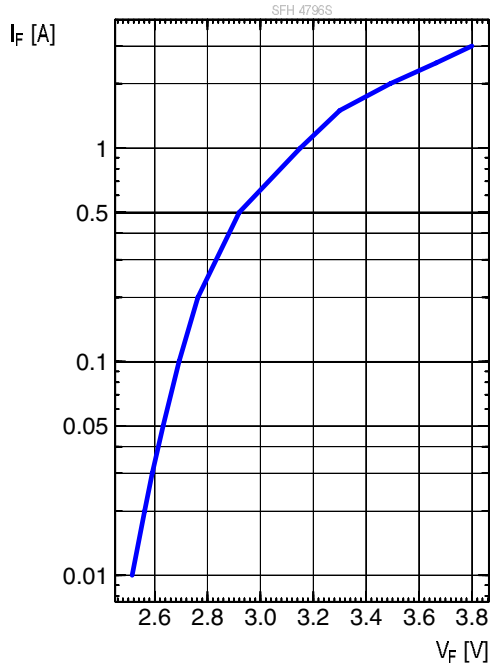
$I_{e,rel} = f(\varphi)$



Not for new design

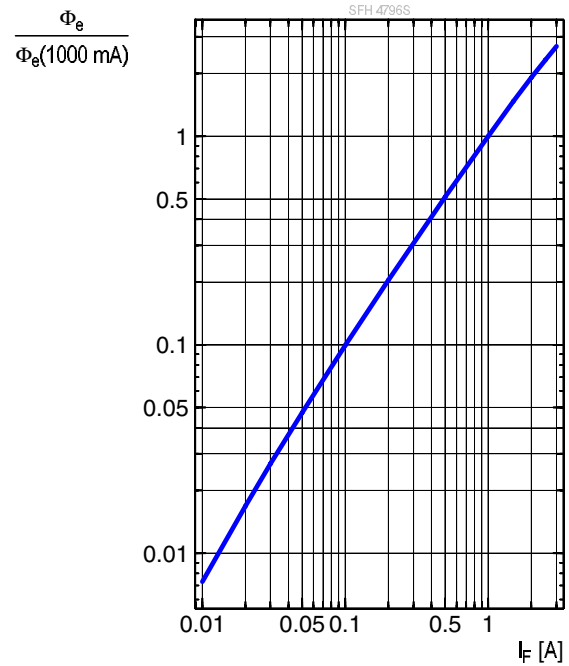
**Forward current** 6), 7)

$I_F = f(V_F)$ ; single pulse;  $t_p = 100 \mu s$



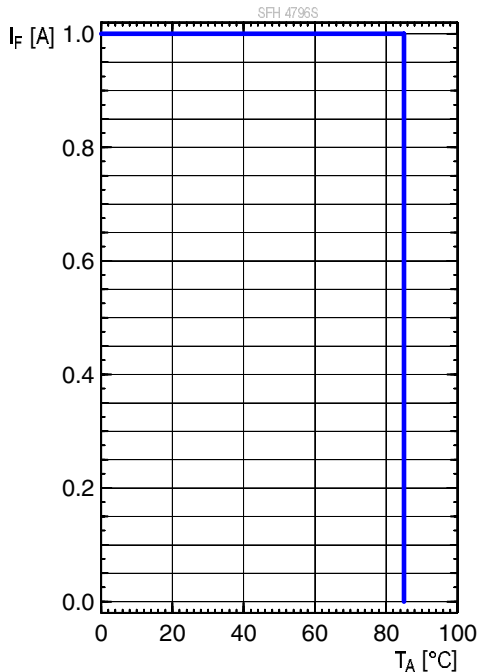
**Relative Total Radiant Flux** 6), 7)

$\Phi_e / \Phi_e(1000mA) = f(I_F)$ ; single pulse;  $t_p = 100 \mu s$



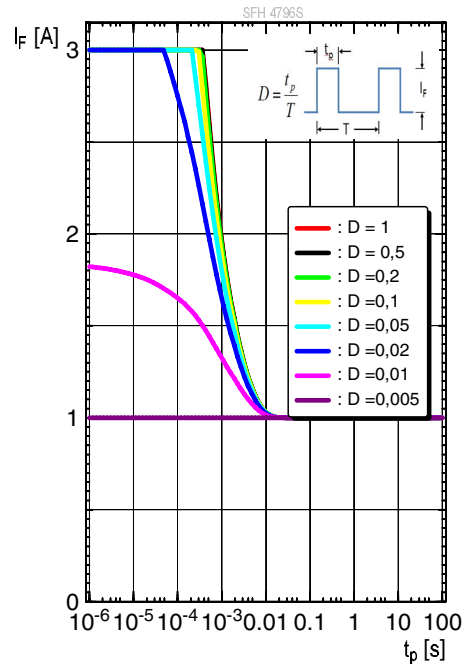
**Max. Permissible Forward Current**

$I_{F,max} = f(T_S)$ ;  $R_{th_{js}} = 14K / W$



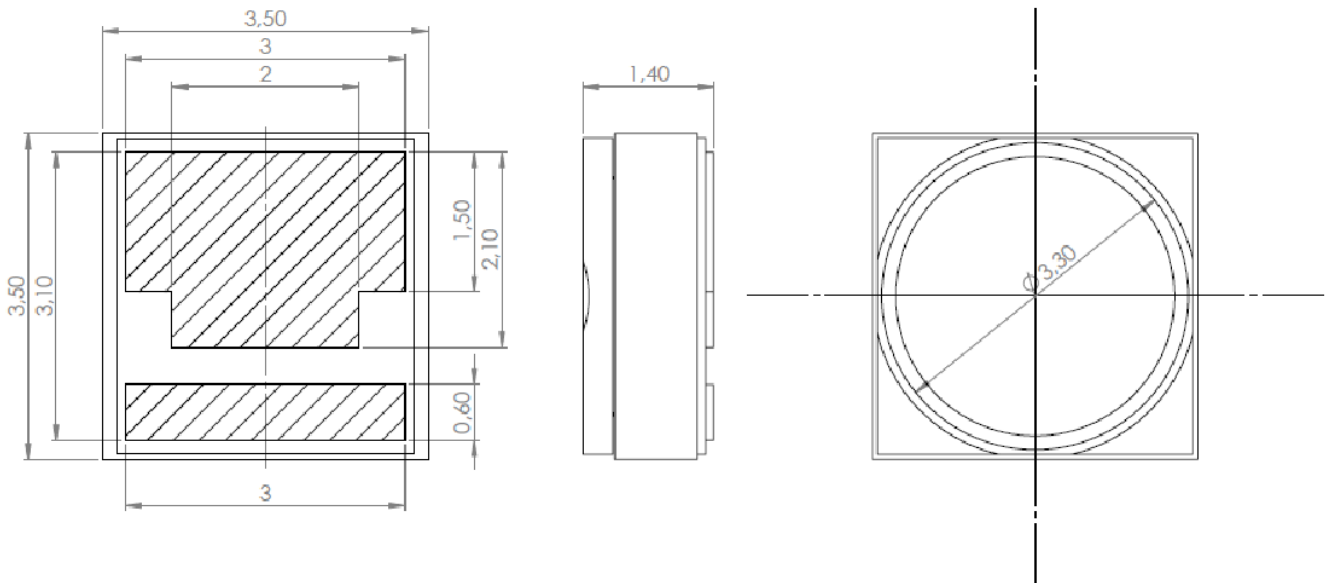
**Permissible Pulse Handling Capability**

$I_F = f(t_p)$ ; duty cycle  $D = \text{parameter}$ ;  $T_S = 85^\circ C$



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**Dimensional Drawing** <sup>8)</sup>



**Further Information:**

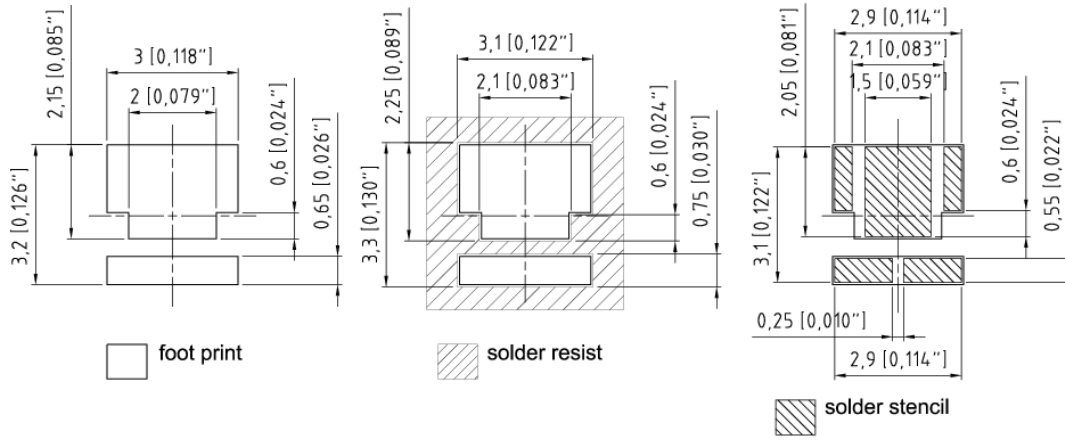
**Approximate Weight:** 270.0 mg

**Package marking:** Anode

**Corrosion test:** Class: 3B  
 Test condition: 40°C / 90 % RH / 15 ppm H<sub>2</sub>S / 14 days (stricter than IEC 60068-2-43)

**ESD advice:** The device is protected by ESD device which is connected in parallel to the Chip.

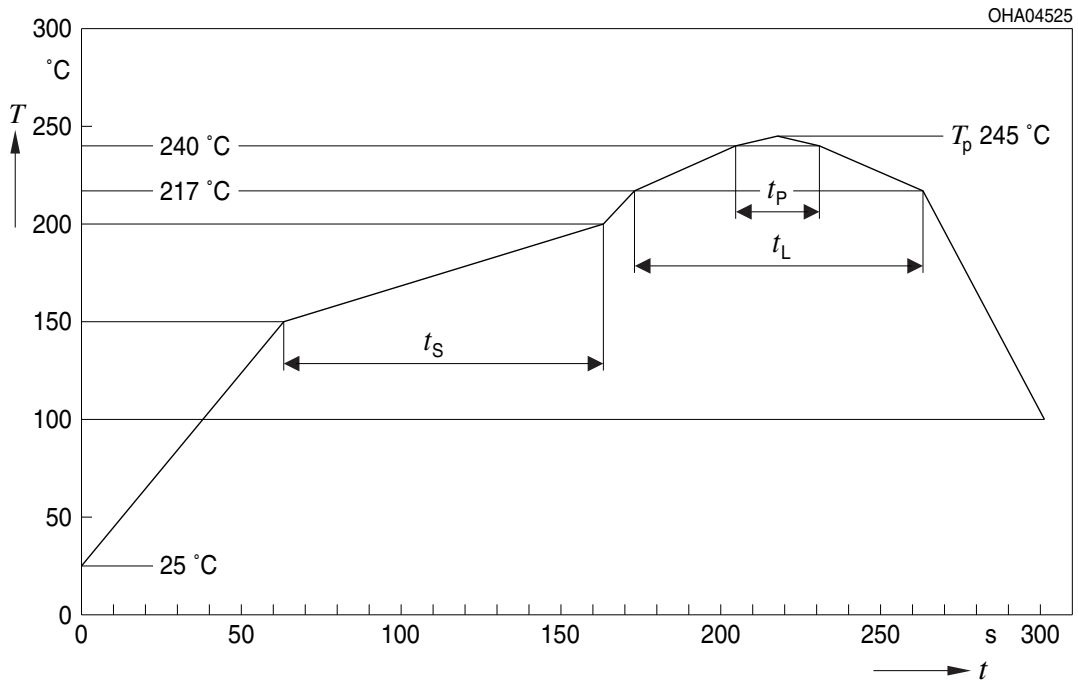
**Recommended Solder Pad** <sup>8)</sup>



For superior solder joint connectivity results we recommend soldering under standard nitrogen atmosphere. Package not suitable for ultra sonic cleaning.

## Reflow Soldering Profile

Product complies to MSL Level 3 acc. to JEDEC J-STD-020E

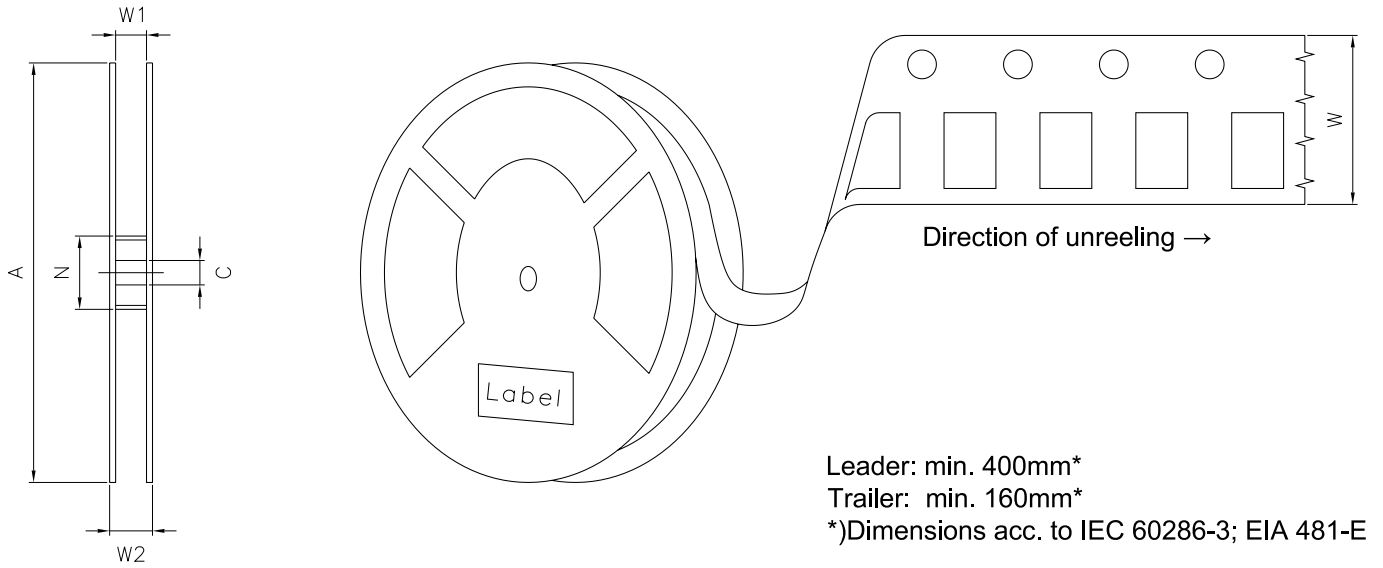


Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat <sup>*)</sup> 25 °C to 150 °C			2	3	K/s
Time $t_s$ $T_{Smin}$ to $T_{Smax}$	$t_s$	60	100	120	s
Ramp-up rate to peak <sup>*)</sup> $T_{Smax}$ to $T_p$			2	3	K/s
Liquidus temperature	$T_L$		217		°C
Time above liquidus temperature	$t_L$		80	100	s
Peak temperature	$T_p$		245	260	°C
Time within 5 °C of the specified peak temperature $T_p - 5$ K	$t_p$	10	20	30	s
Ramp-down rate* $T_p$ to 100 °C			3	6	K/s
Time 25 °C to $T_p$				480	s

All temperatures refer to the center of the package, measured on the top of the component  
 \*) slope calculation  $DT/Dt$ :  $Dt$  max. 5 s; fulfillment for the whole T-range

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**Tape and Reel** <sup>9)</sup>

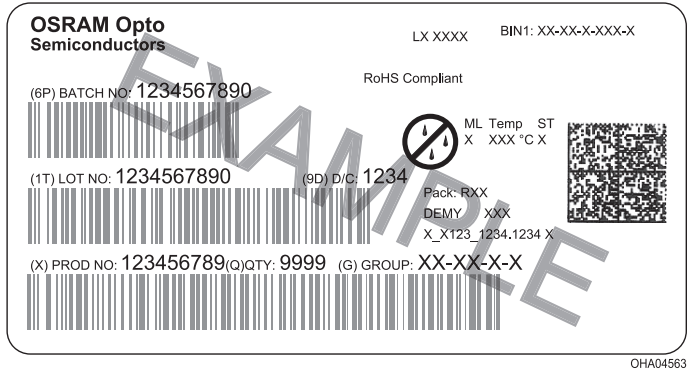


**Reel Dimensions**

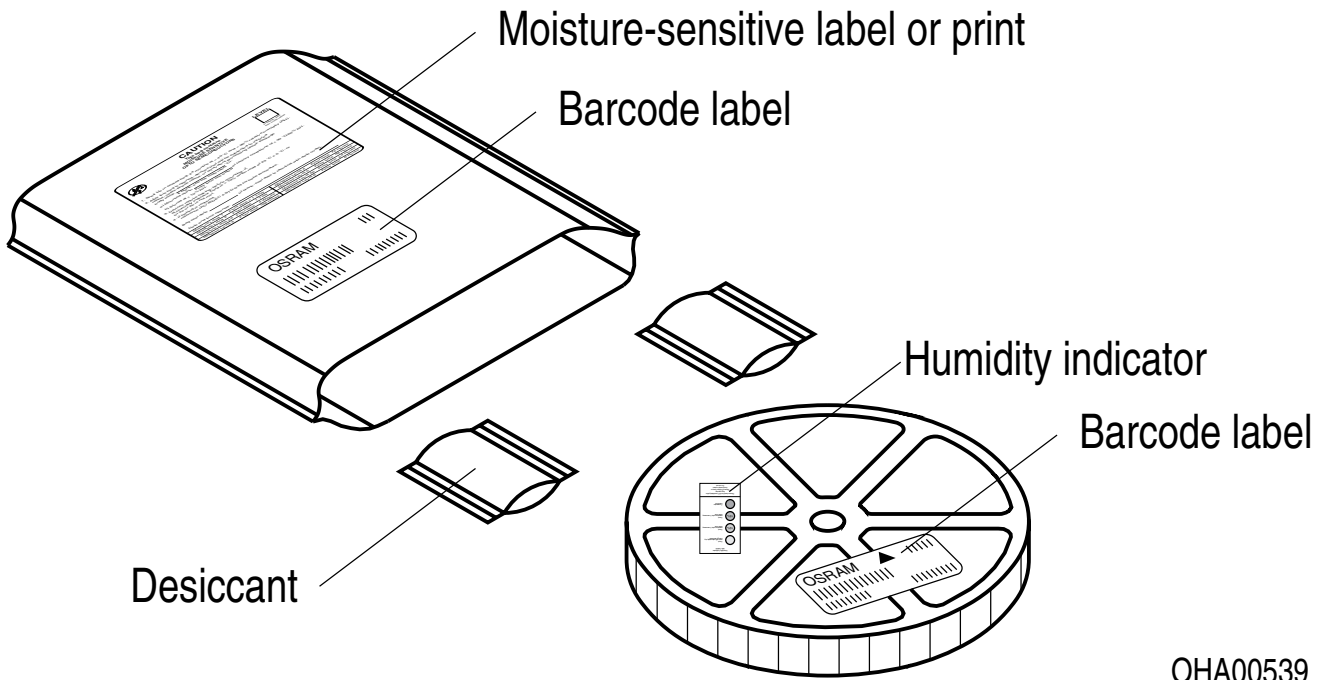
A	W	N <sub>min</sub>	W <sub>1</sub>	W <sub>2max</sub>	Pieces per PU
330 mm	12 + 0.3 / - 0.1 mm	60 mm	12.4 + 2 mm	18.4 mm	2500

Not for new design

## Barcode-Product-Label (BPL)



## Dry Packing Process and Materials <sup>8)</sup>



Moisture-sensitive product is packed in a dry bag containing desiccant and a humidity card according JEDEC-STD-033.

Not for new design

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## Notes

The evaluation of eye safety occurs according to the standard IEC 62471:2006 (photo biological safety of lamps and lamp systems). Within the risk grouping system of this IEC standard, the device specified in this data sheet fall into the class **exempt group (exposure time 10000 s)**. Under real circumstances (for exposure time, conditions of the eye pupils, observation distance), it is assumed that no endangerment to the eye exists from these devices. As a matter of principle, however, it should be mentioned that intense light sources have a high secondary exposure potential due to their blinding effect. When looking at bright light sources (e.g. headlights), temporary reduction in visual acuity and afterimages can occur, leading to irritation, annoyance, visual impairment, and even accidents, depending on the situation.

Subcomponents of this device contain, in addition to other substances, metal filled materials including silver. Metal filled materials can be affected by environments that contain traces of aggressive substances. Therefore, we recommend that customers minimize device exposure to aggressive substances during storage, production, and use. Devices that showed visible discoloration when tested using the described tests above did show no performance deviations within failure limits during the stated test duration. Respective failure limits are described in the IEC60810.

For further application related information please visit [www.osram-os.com/appnotes](http://www.osram-os.com/appnotes)

## Disclaimer

### Attention please!

The information describes the type of component and shall not be considered as assured characteristics. Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances.

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### Packing

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## Glossary

- 1) **Radiant intensity:** Measured at a solid angle of  $\Omega = 0.01$  sr
- 2) **Reverse Operation:** This product is intended to be operated applying a forward current within the specified range. Applying any continuous reverse bias or forward bias below the voltage range of light emission shall be avoided because it may cause migration which can change the electro-optical characteristics or damage the LED.
- 3) **Forward Voltage:** The forward voltages are measured with a tolerance of  $\pm 0.1$  V.
- 4) **Total radiant flux:** Measured with integrating sphere.
- 5) **Thermal resistance:** junction - soldering point, of the device only, mounted on an ideal heatsink (e.g. metal block)
- 6) **Typical Values:** Due to the special conditions of the manufacturing processes of semiconductor devices, the typical data or calculated correlations of technical parameters can only reflect statistical figures. These do not necessarily correspond to the actual parameters of each single product, which could differ from the typical data and calculated correlations or the typical characteristic line. If requested, e.g. because of technical improvements, these typ. data will be changed without any further notice.
- 7) **Testing temperature:**  $T_A = 25^\circ\text{C}$  (unless otherwise specified)
- 8) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with  $\pm 0.1$  and dimensions are specified in mm.
- 9) **Tape and Reel:** All dimensions and tolerances are specified acc. IEC 60286-3 and specified in mm.

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## Revision History

Version	Date	Change
1.0	2018-12-18	Additional Information
1.1	2019-03-22	Description Maximum Ratings Characteristics Electro - Optical Characteristics (Diagrams)
1.2	2020-08-26	Schematic Transportation Box Dimensions of Transportation Box
1.3	2021-07-26	Derating (Diagrams)
1.4	2021-08-04	Not for new design



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