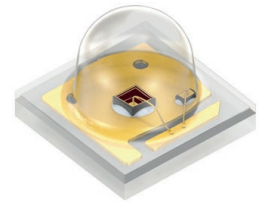


# LY CN5M

## OSLON® SX

The OSLON® SX combine a compact size (small footprint: 3x3mm) with a high efficiency and a electrically insulated thermal pad.



## Applications

- Cluster, Button Backlighting
- Custom Tuning
- Electronic Equipment
- Flash & Autofocus
- Head-Up Display LED & Laser
- Industrial Automation (Machine Controls, Light Barriers, Vision Controls)
- Interior Illumination (e.g. Ambient Map)
- Transportation, Plane, Ship

## Features:

- Package: SMD ceramic package with silicone lens
- Chip technology: Thinfilm
- Typ. Radiation: 60°
- Color:  $\lambda_{\text{dom}} = 590 \text{ nm}$  (● yellow)
- Optical efficacy: 44 lm/W
- Corrosion Robustness Class: 3A
- Qualifications: The product qualification test plan is based on the guidelines of AEC-Q101-REV-C, Stress Test Qualification for Automotive Grade Discrete Semiconductors.
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)

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## Ordering Information

Type	Luminous Flux <sup>1)</sup> $I_F = 140 \text{ mA}$ $\Phi_V$	Ordering Code
LY CN5M-FAGB-36-3B5A	11.2 ... 28.0 lm	Q65112A1586

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## Maximum Ratings

Parameter	Symbol		Values
Operating Temperature	$T_{op}$	min.	-40 °C
		max.	125 °C
Storage Temperature	$T_{stg}$	min.	-40 °C
		max.	125 °C
Forward current $T_s = 25\text{ °C}$	$I_F$	min.	30 mA
		max.	200 mA
Surge Current $t \leq 10\text{ }\mu\text{s}$ ; $D = 0.005$ ; $T_s = 25\text{ °C}$	$I_{FS}$	max.	1000 mA
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	$V_{ESD}$		2 kV
Reverse current <sup>2)</sup>	$I_R$	max.	200 mA

## Characteristics

$I_F = 140 \text{ mA}$ ;  $T_s = 25 \text{ °C}$

Parameter	Symbol		Values
Peak Wavelength	$\lambda_{\text{peak}}$	typ.	594 nm
Dominant Wavelength <sup>3)</sup>	$\lambda_{\text{dom}}$	min.	583 nm
$I_F = 140 \text{ mA}$		typ.	590 nm
		max.	595 nm
Spectral Bandwidth at 50% $I_{\text{rel,max}}$	$\Delta\lambda$	typ.	18 nm
Viewing angle at 50 % $I_v$	$2\phi$	typ.	60 °
Forward Voltage <sup>4)</sup>	$V_F$	min.	2.05 V
$I_F = 140 \text{ mA}$		typ.	2.25 V
		max.	2.65 V
Reverse voltage (ESD device)	$V_{\text{R ESD}}$	min.	45 V
Reverse voltage <sup>2)</sup>	$V_R$	max.	1.2 V
$I_R = 20 \text{ mA}$			
Real thermal resistance junction/solderpoint <sup>5)</sup>	$R_{\text{thJS real}}$	typ.	30 K / W

## Brightness Groups

Group	Luminous Flux <sup>1)</sup> $I_F = 140 \text{ mA}$ min. $\Phi_V$	Luminous Flux <sup>1)</sup> $I_F = 140 \text{ mA}$ max. $\Phi_V$	Luminous Intensity <sup>6)</sup> $I_F = 140 \text{ mA}$ typ. $I_v$
FA	11.2 lm	14.0 lm	8.8 cd
FB	14.0 lm	18.0 lm	11.2 cd
GA	18.0 lm	22.4 lm	14.1 cd
GB	22.4 lm	28.0 lm	17.6 cd

## Forward Voltage Groups

Group	Forward Voltage <sup>4)</sup> $I_F = 140 \text{ mA}$ min. $V_F$	Forward Voltage <sup>4)</sup> $I_F = 140 \text{ mA}$ max. $V_F$
3B	2.05 V	2.20 V
4A	2.20 V	2.35 V
4B	2.35 V	2.50 V
5A	2.50 V	2.65 V

## Wavelength Groups

Group	Dominant Wavelength <sup>3)</sup> $I_F = 140 \text{ mA}$ min. $\lambda_{\text{dom}}$	Dominant Wavelength <sup>3)</sup> $I_F = 140 \text{ mA}$ max. $\lambda_{\text{dom}}$
3	583 nm	586 nm
4	586 nm	589 nm
5	589 nm	592 nm
6	592 nm	595 nm

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## Group Name on Label

**Example: FA-3-3B**

Brightness

Wavelength

Forward Voltage

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FA

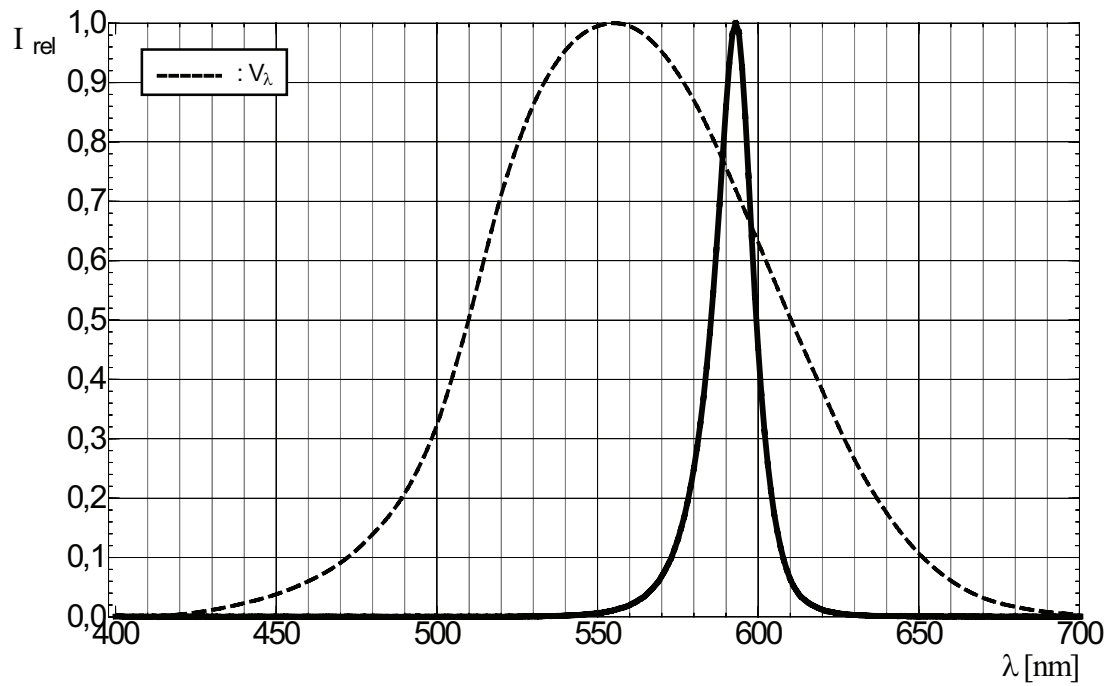
3

3B

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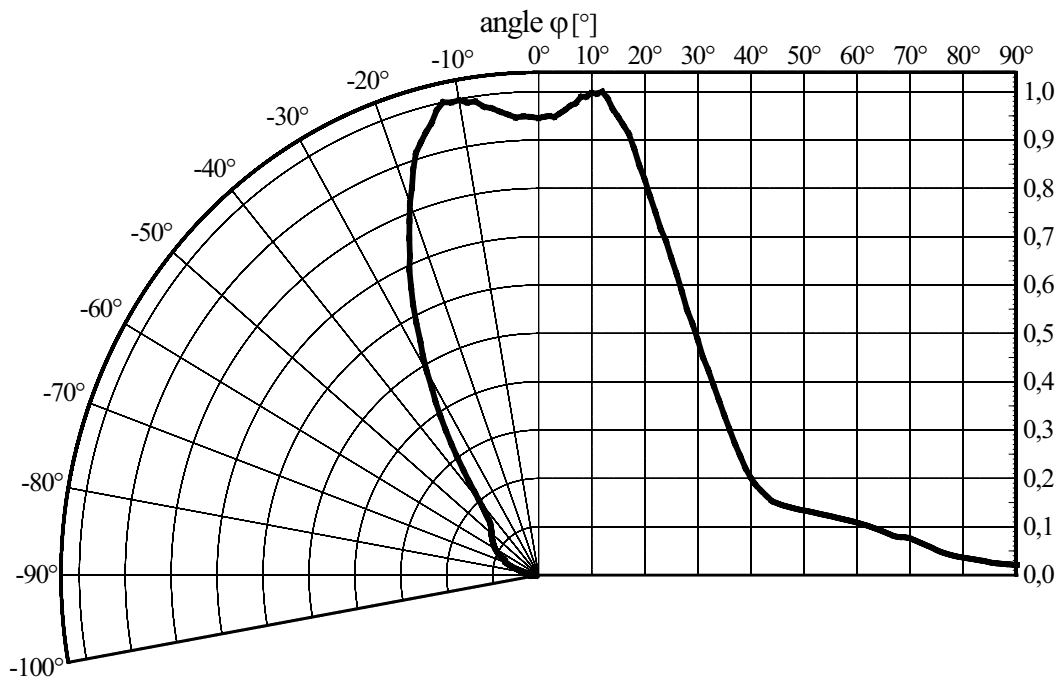
## Relative Spectral Emission <sup>6)</sup>

$$\Phi_{\text{rel}} = f(\lambda); I_F = 140 \text{ mA}; T_S = 25^\circ \text{C}$$



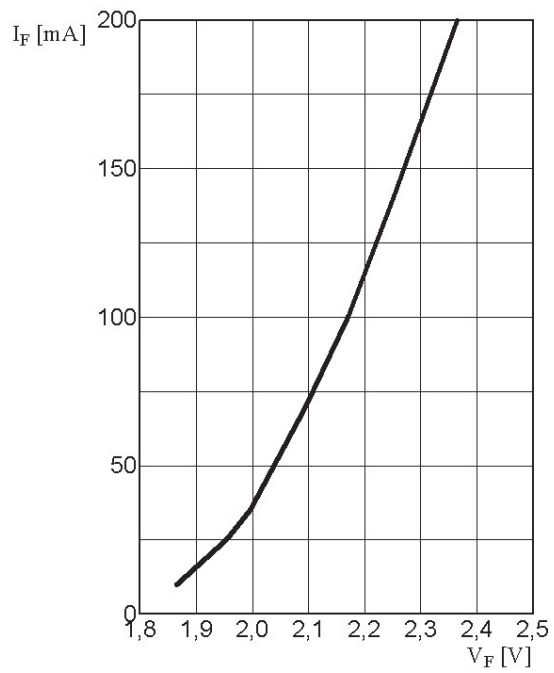
## Radiation Characteristics <sup>6)</sup>

$$I_{\text{rel}} = f(\phi); T_S = 25^\circ \text{C}$$

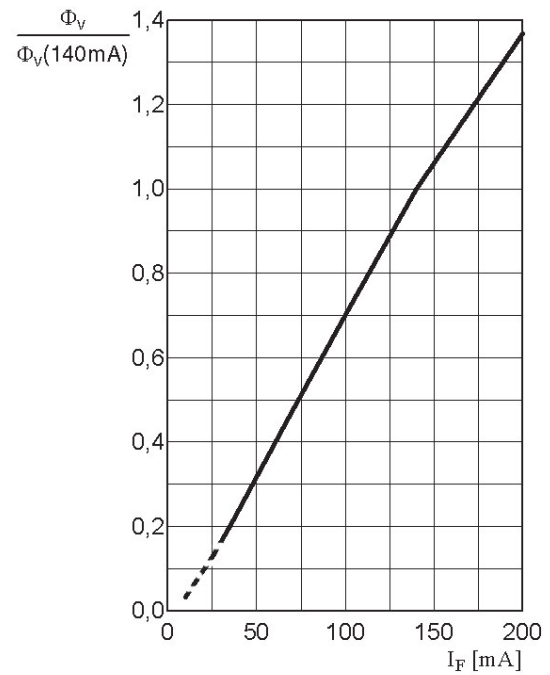


**Forward current** <sup>6), 7)</sup>

$$I_F = f(V_F); T_S = 25\text{ °C}$$

**Relative Luminous Flux** <sup>6), 7)</sup>

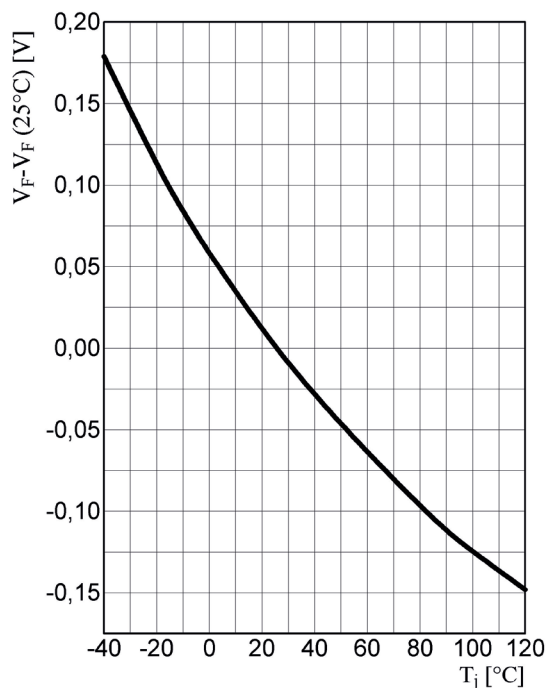
$$\Phi_V / \Phi_V(140\text{ mA}) = f(I_F); T_S = 25\text{ °C}$$



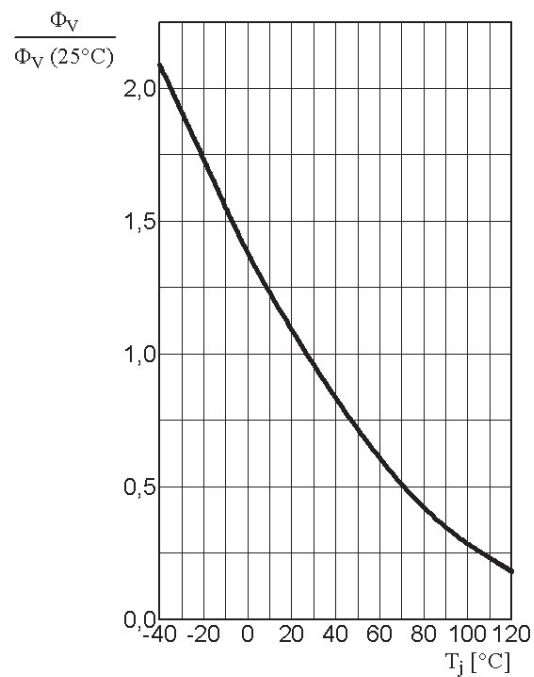


**Forward Voltage** <sup>6)</sup>

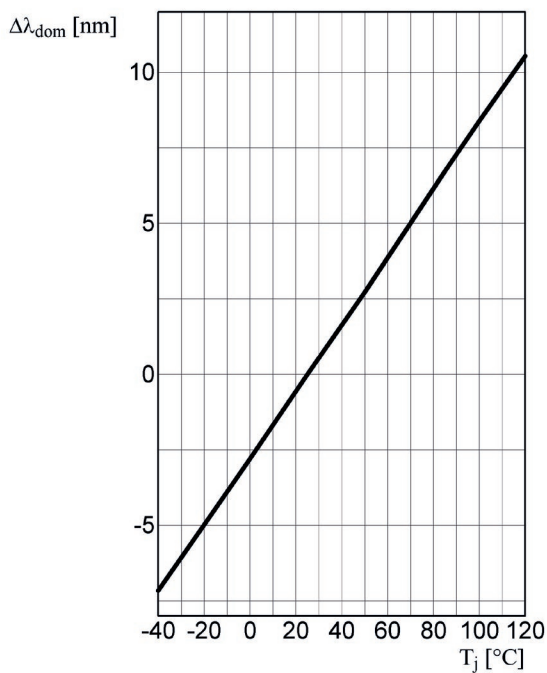
$$\Delta V_F = V_F - V_F(25^\circ\text{C}) = f(T_j); I_F = 140\text{ mA}$$

**Relative Luminous Flux** <sup>6)</sup>

$$\Phi_V/\Phi_V(25^\circ\text{C}) = f(T_j); I_F = 140\text{ mA}$$

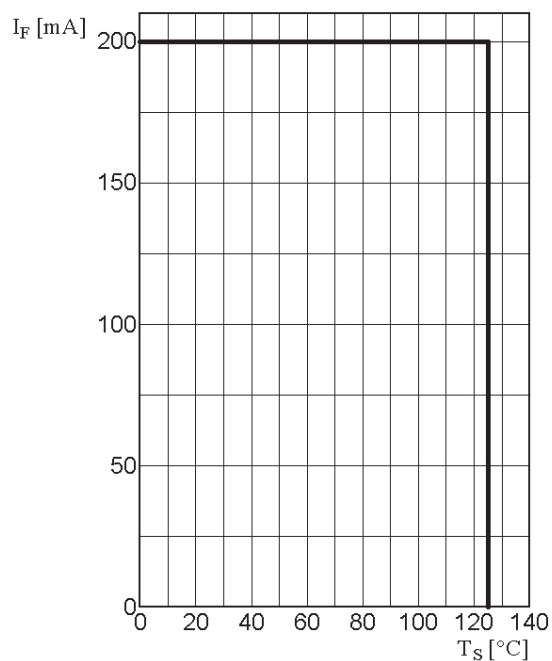
**Dominant Wavelength** <sup>6)</sup>

$$\lambda_{\text{dom}} = f(T_j); I_F = 140\text{ mA}$$



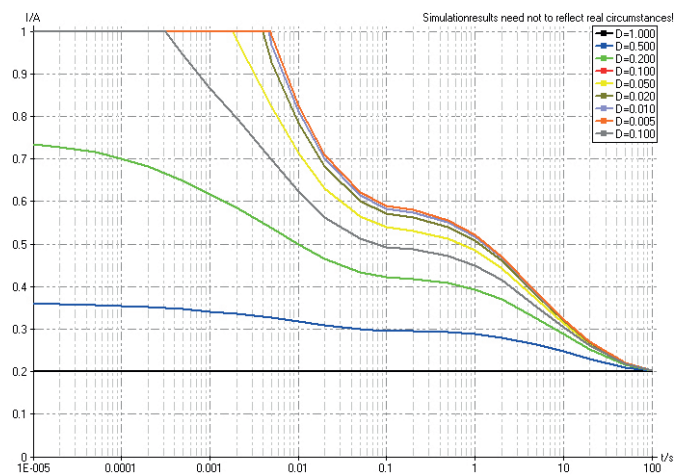
## Max. Permissible Forward Current

$$I_F = f(T)$$



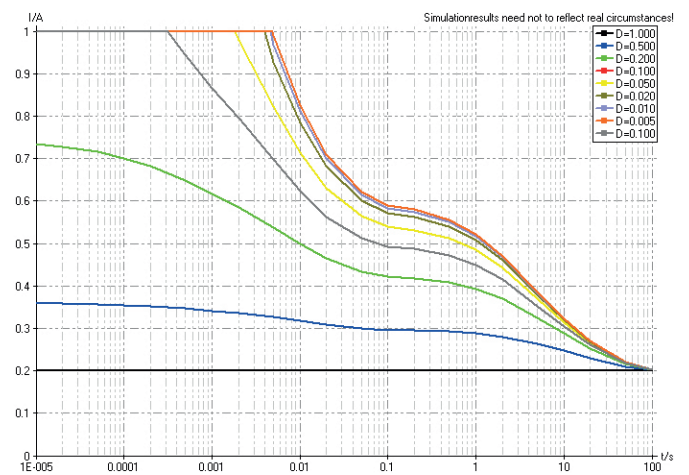
## Permissible Pulse Handling Capability

$$I_F = f(t_p); D: \text{Duty cycle}; T_s = 25^\circ\text{C}$$

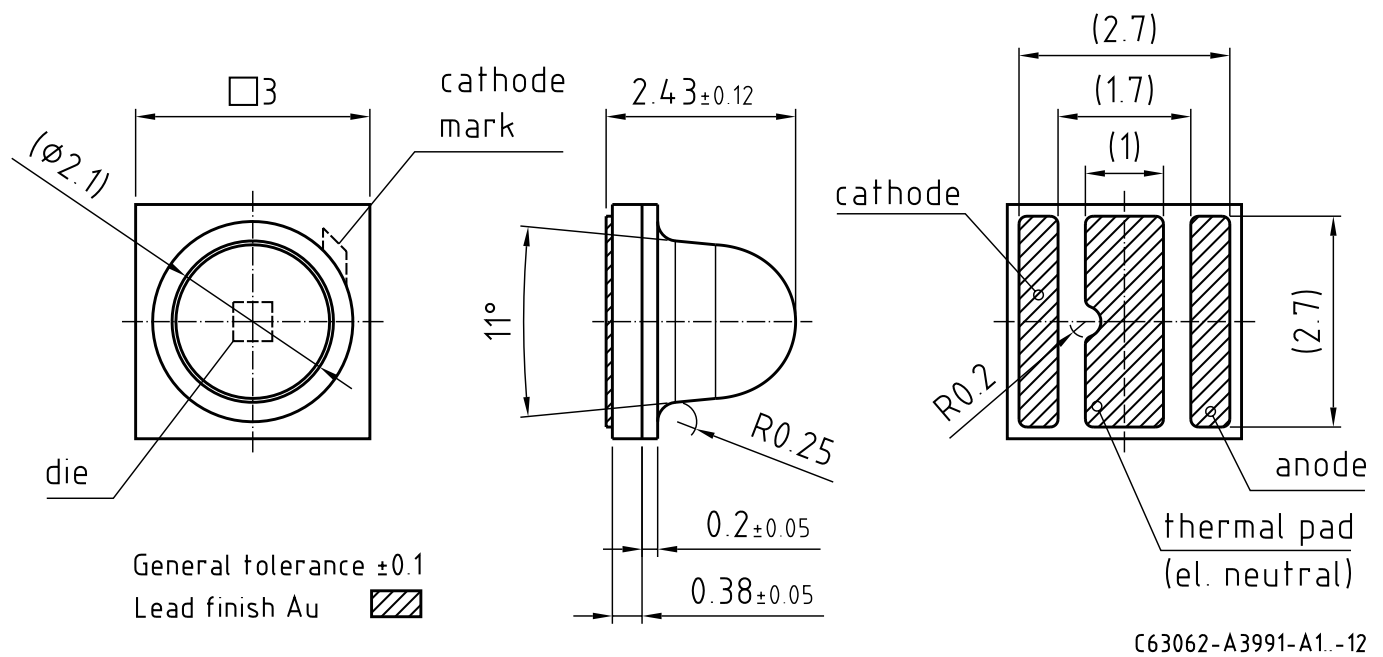


## Permissible Pulse Handling Capability

$$I_F = f(t_p); D: \text{Duty cycle}; T_s = 85^\circ\text{C}$$



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



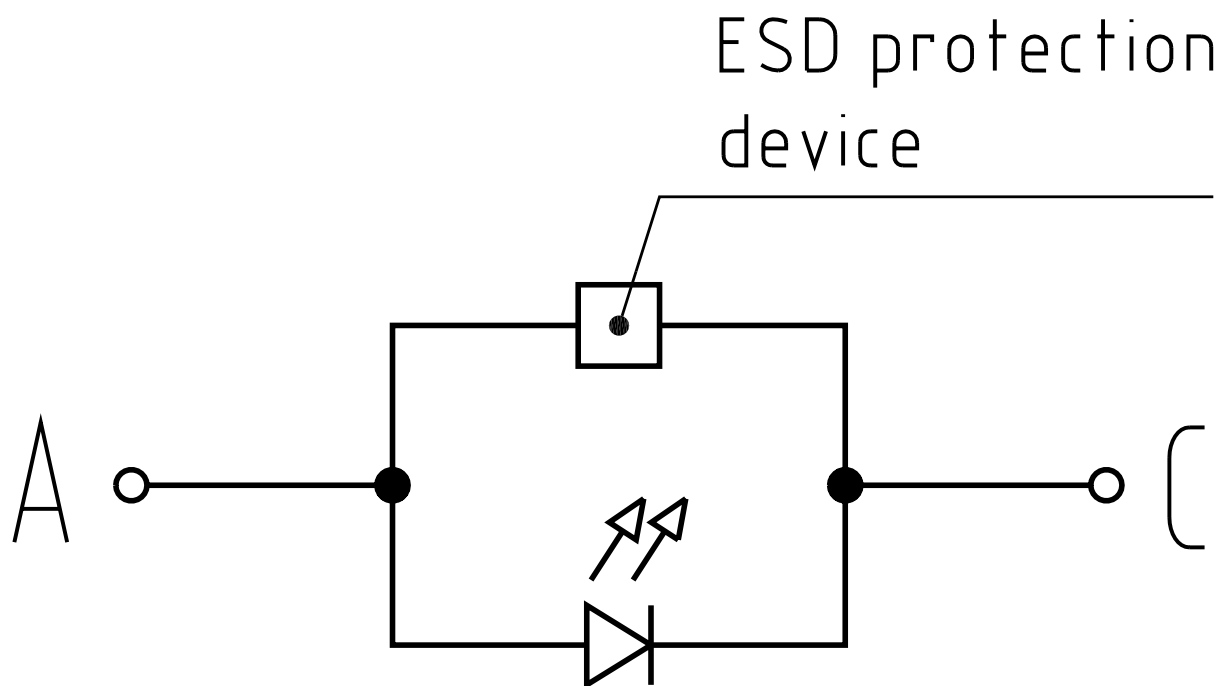
**Approximate Weight:** 26.0 mg

**Package marking:** Cathode

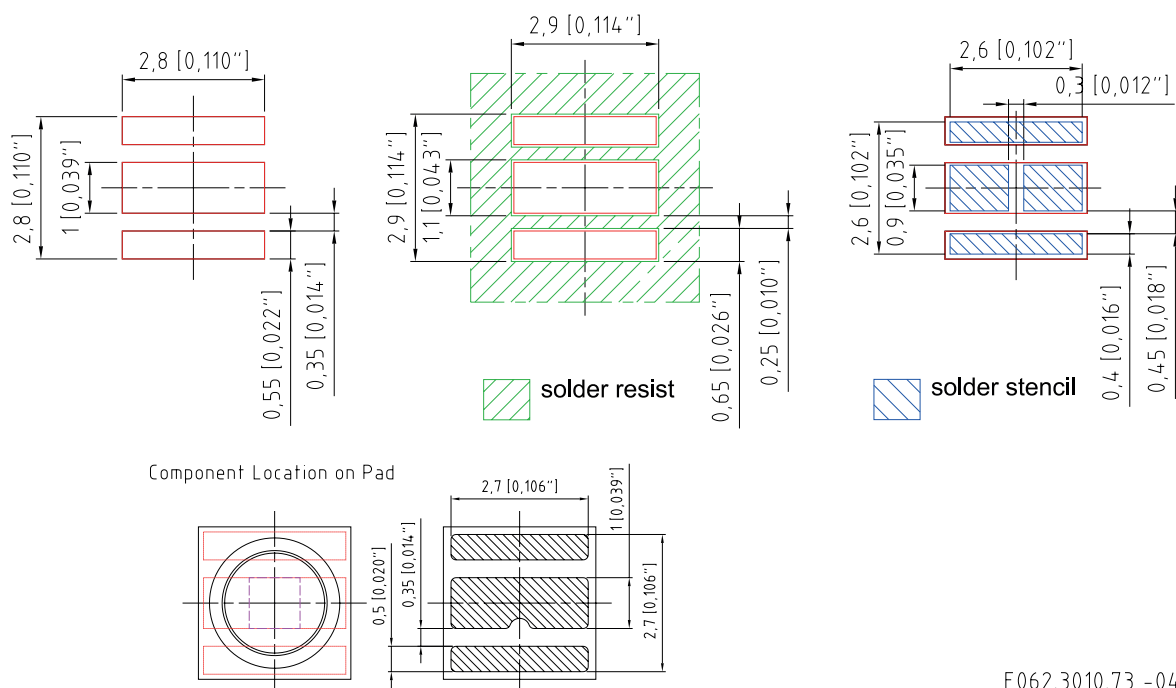
**Corrosion test:** Class: 3A  
Test condition: 40°C / 90 % RH / 15 ppm H<sub>2</sub>S / 14 days (stricter than IEC 60068-2-43)

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

## Electrical internal circuit



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

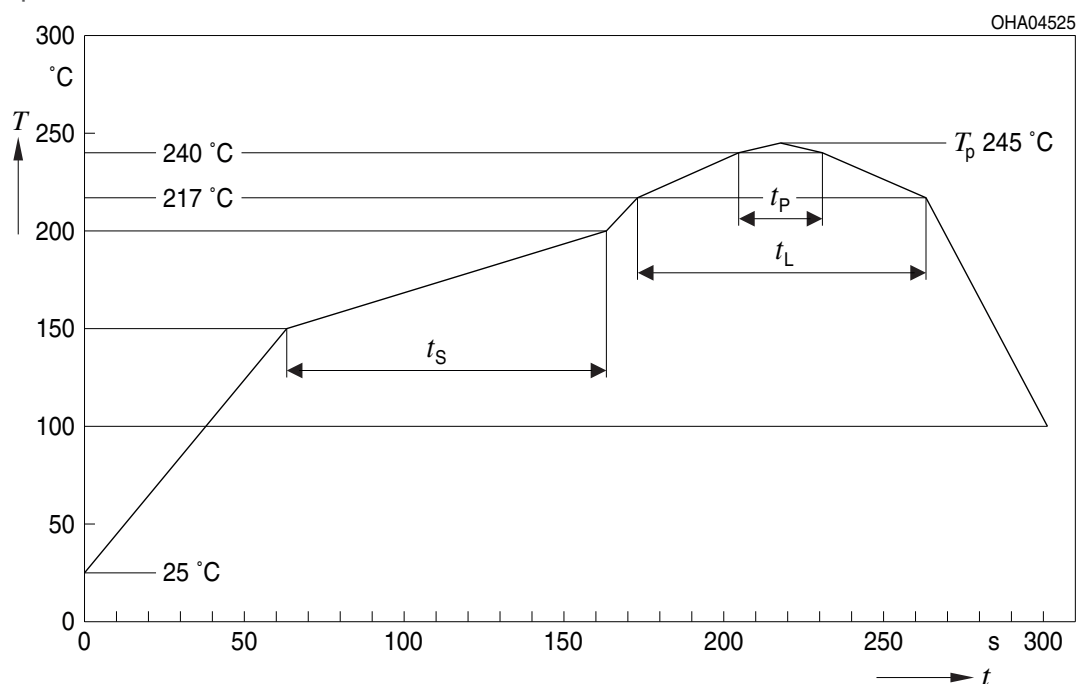


E062.3010.73 -04

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

## Reflow Soldering Profile

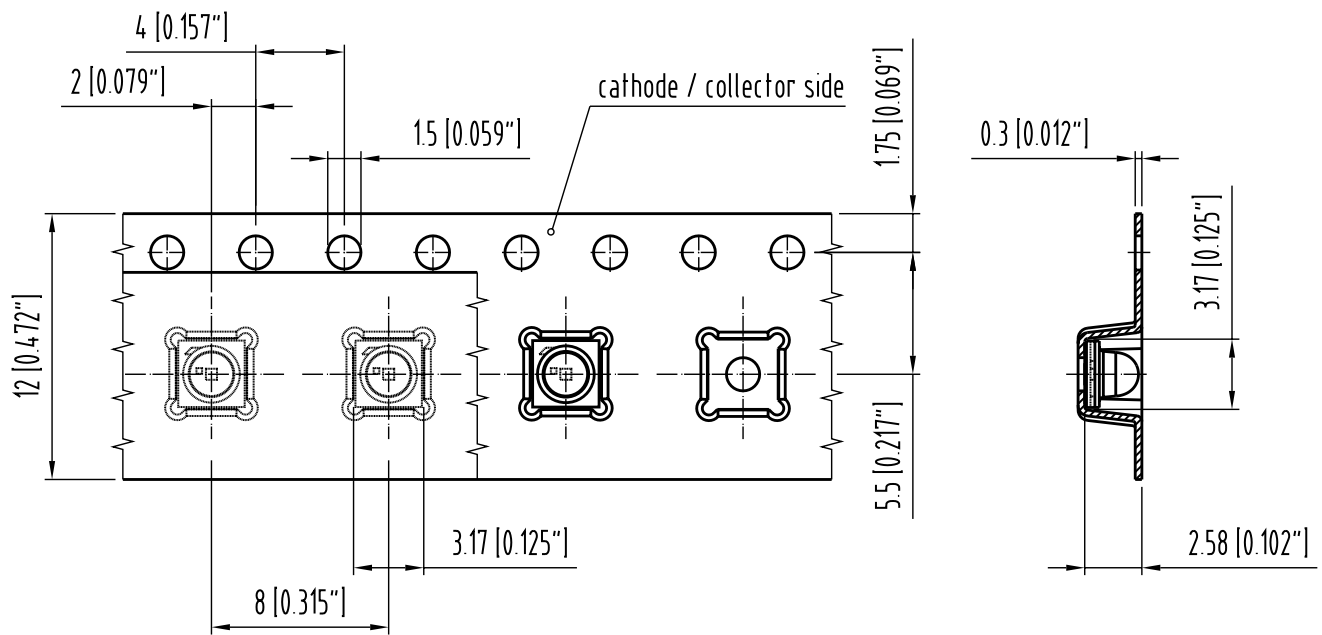
Product complies to MSL Level 2 acc. to JEDEC J-STD-020E



Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat*) 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*) $T_{Smax}$ 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

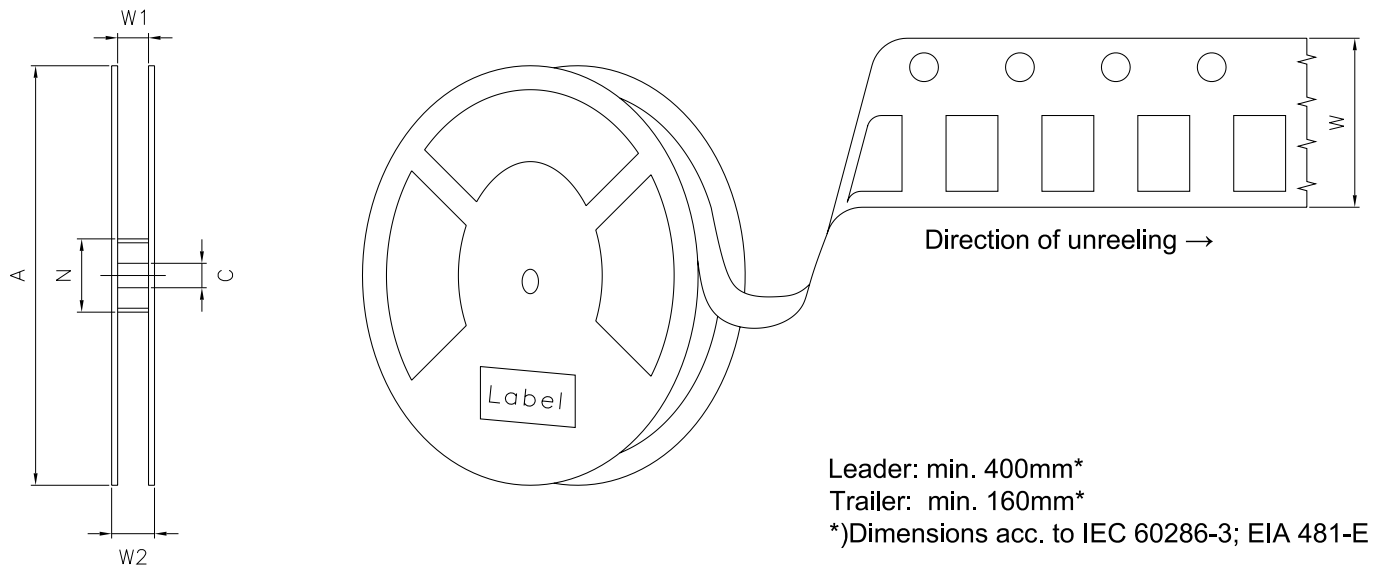
All temperatures refer to the center of the package, measured on the top of the component

\* slope calculation  $DT/Dt$ :  $Dt$  max. 5 s; fulfillment for the whole T-range

**Taping** <sup>8)</sup>

C63062-A3991-B9-07

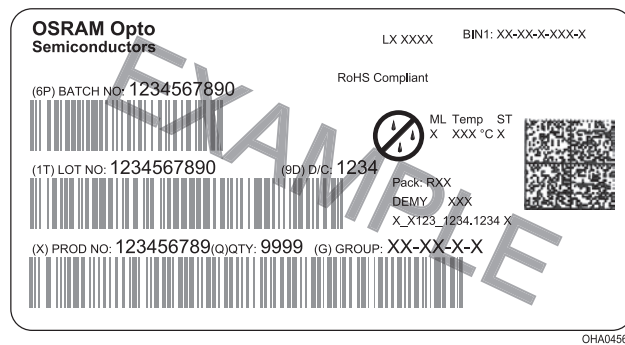
## Tape and Reel <sup>9)</sup>



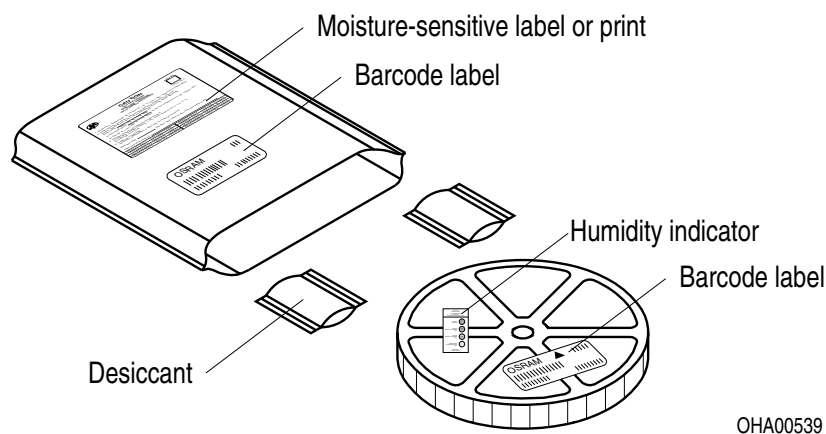
## Reel dimensions [mm]

A	W	N <sub>min</sub>	W <sub>1</sub>	W <sub>2 max</sub>	Pieces per PU
180 mm	12 + 0.3 / - 0.1	60	12.4 + 2	18.4	600

## Barcode-Product-Label (BPL)



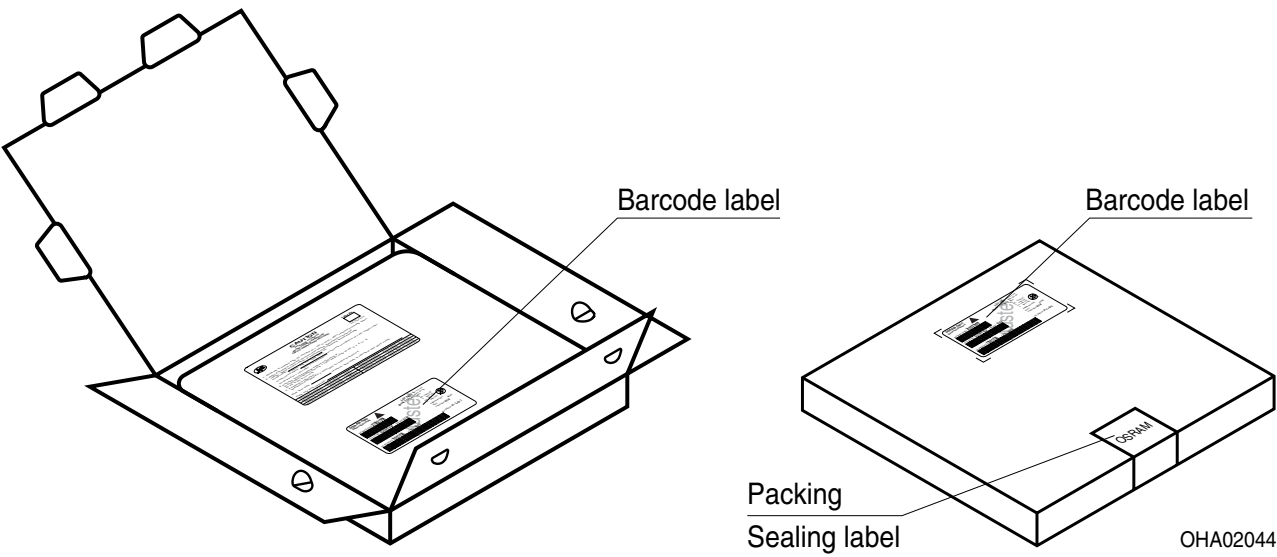
## Dry Packing Process and Materials <sup>8)</sup>



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



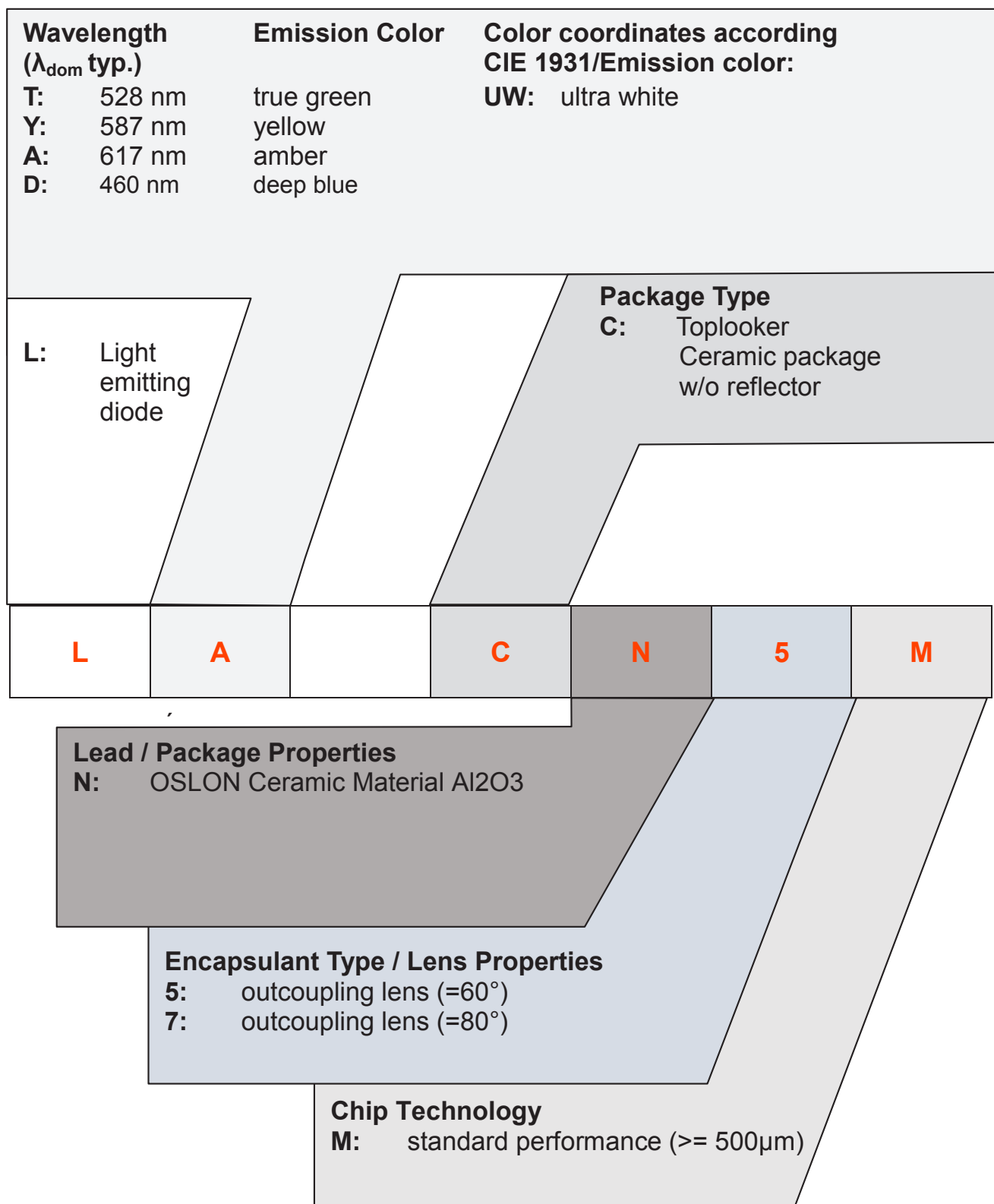
Transportation Packing and Materials <sup>8)</sup>



Dimensions of transportation box in mm

Width	Length	Height
195 ± 5 mm	195 ± 5 mm	30 ± 5 mm

## Type Designation System



## 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 falls 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 LED contain, in addition to other substances, metal filled materials. Metal filled materials can be affected by environments that contain traces of aggressive substances. Therefore, we recommend that customers minimize LED exposure to aggressive substances during storage, production, and use.

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

## Disclaimer

### Disclaimer

Language english will prevail in case of any discrepancies or deviations between the two language wordings.

### 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.

For information on the types in question please contact our Sales Organization.

If printed or downloaded, please find the latest version on the OSRAM OS website.

### Packing

Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office.

By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

### Product safety devices/applications or medical devices/applications

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## Glossary

- 1) **Brightness:** Brightness values are measured during a current pulse of typically 25 ms, with an internal reproducibility of  $\pm 8\%$  and an expanded uncertainty of  $\pm 11\%$  (acc. to GUM with a coverage factor of  $k = 3$ ).
- 2) **Reverse Operation:** Reverse Operation of 10 hours is permissible in total. Continuous reverse operation is not allowed.
- 3) **Wavelength:** The wavelength is measured at a current pulse of typically 25 ms, with an internal reproducibility of  $\pm 0.5\text{ nm}$  and an expanded uncertainty of  $\pm 1\text{ nm}$  (acc. to GUM with a coverage factor of  $k = 3$ ).
- 4) **Forward Voltage:** The forward voltage is measured during a current pulse of typically 8 ms, with an internal reproducibility of  $\pm 0.05\text{ V}$  and an expanded uncertainty of  $\pm 0.1\text{ V}$  (acc. to GUM with a coverage factor of  $k = 3$ ).
- 5) **Thermal Resistance:**  $R_{th\text{ max}}$  is based on statistic values ( $6\sigma$ ).
- 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) **Characteristic curve:** In the range where the line of the graph is broken, you must expect higher differences between single devices within one packing unit.
- 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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