# OSRAM KW2 C2LNL3.TK

# Datasheet

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OSRAM

## OSLON™ Submount PL

# KW2 C2LNL3.TK

The OSLON™ Submount PL is able to meet a wide range of requirements in terms of output and adaptability to ambient conditions. It offers a uniform light pattern, thermal stability and great brightness.



## Applications

- Dynamic Forward Lighting
- Static Forward Lighting

## Features

- Package: compact lightsource in multi chip on board technology
- Chip technology: UX:3
- Typ. Radiation: 120° (Lambertian emitter)
- Color: Cx = 0.320, Cy = 0.334 acc. to CIE 1931 (● white)
- Corrosion Robustness Class: 3A
- Qualifications: AEC-Q102 Qualified
- ESD: 8 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B)
- Color over angle: Better than passus 3.7.2.1 of supplement proposal 7 to ECE reg. 128



AEC-Q102 QUALIFIED

## Ordering Information

| Type | Luminous Flux [1] $I_F$ = 1000 mA $\Phi_V$ | Ordering Code |
|---|---|---|
| KW2 C2LNL3.TK-D5T1-5L16M1 | 790 ... 1060 lm | Q65113A5656 |
| KW2 C2LNL3.TK-D5T1-5L25M2 | 790 ... 1060 lm | Q65113A5659 |
| KW2 C2LNL3.TK-D5T1-5L35M3 | 790 ... 1060 lm | Q65113A5655 |

## Maximum Ratings

| Parameter | Symbol | | Values |
|---|---|---|---|
| Operating Temperature [2] | $T_{op}$ | min.<br>max. | -40 °C<br>135 °C |
| Storage Temperature | $T_{stg}$ | min.<br>max. | -40 °C<br>135 °C |
| Junction Temperature | $T_j$ | max. | 150 °C |
| Junction Temperature for short time applications* | $T_j$ | max. | 165 °C |
| Case Temperature | $T_{case}$ | max. | 135 °C |
| Forward current<br>$T_C$ = 25 °C | $I_F$ | min.<br>max. | 50 mA<br>1500 mA |
| Surge current<br>t ≤ 10 µs; D = 0.016 ; $T_C$ = 25 °C | $I_{FS}$ | max. | 2500 mA |
| ESD withstand voltage<br>acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B) | $V_{ESD}$ | | 8 kV |
| Reverse current [3] | $I_R$ | max. | 200 mA |

*The median lifetime (L70/B50) for Tj =165°C is 200h.
For Tc testing, please refer to Application Note: AN085 Thermal measurement point of LEDs

## Characteristics

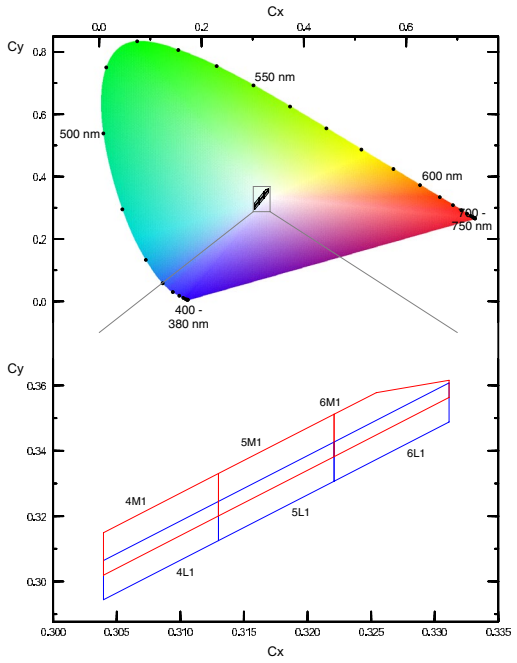
$I_F$ = 1000 mA; $T_C$ = 25 °C

| Parameter | Symbol | | Values |
|---|---|---|---|
| Chromaticity Coordinate [4] | Cx | typ. | 0.320 |
| | Cy | typ. | 0.334 |
| Viewing angle at 50% $I_V$ | 2φ | typ. | 120 ° |
| Radiating surface | $A_{color}$ | typ. | 2.1 mm² |
| Forward Voltage [5] | $V_F$ | min. | 5.60 V |
| $I_F$ = 1000 mA | | typ. | 6.39 V |
| | | max. | 6.75 V |
| Reverse voltage (ESD device) | $V_{R\ ESD}$ | min. | 45 V |
| Reverse voltage [3] | $V_R$ | max. | 1.2 V |
| $I_R$ = 20 mA | | | |
| Real thermal resistance junction/board [6] | $R_{thJB\ real}$ | typ. | 2.1 K / W |
| | | max. | 2.5 K / W |
| Electrical thermal resistance junction/board [6] | $R_{thJB\ elec.}$ | typ. | 1.2 K / W |
| with efficiency $\eta_e$ = 43 % | | max. | 1.4 K / W |

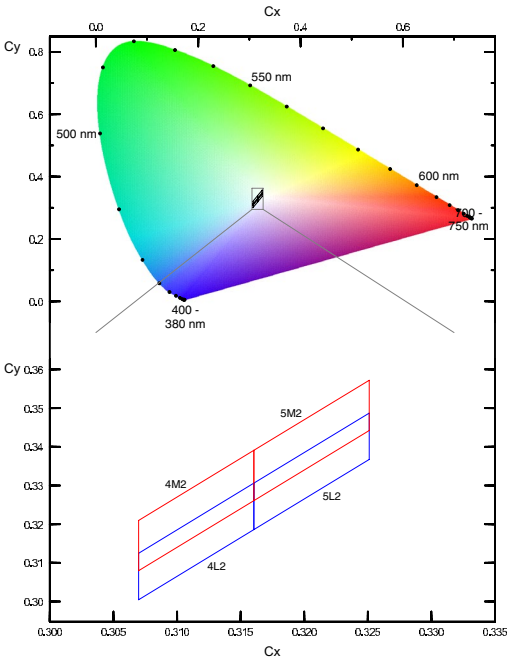
## Brightness Groups

| Group | Luminous Flux [1] $I_F$ = 1000 mA min. $\Phi_V$ | Luminous Flux [1] $I_F$ = 1000 mA max. $\Phi_V$ |
|---|---|---|
| D5 | 790 lm | 825 lm |
| D6 | 825 lm | 860 lm |
| D7 | 860 lm | 900 lm |
| D8 | 900 lm | 940 lm |
| D9 | 940 lm | 980 lm |
| T0 | 980 lm | 1020 lm |
| T1 | 1020 lm | 1060 lm |

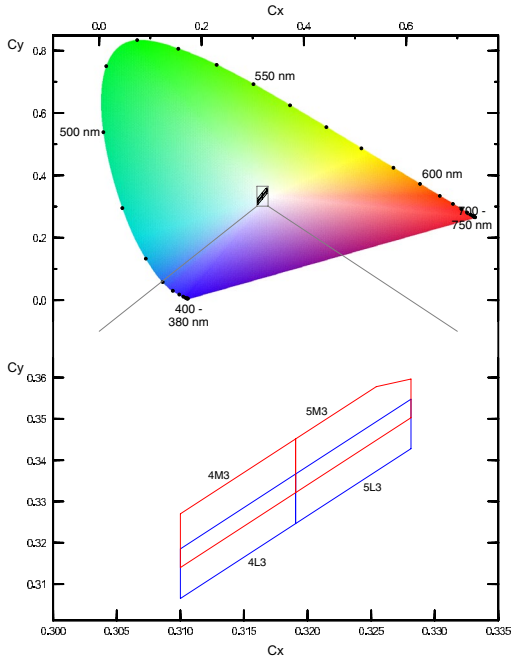
## Chromaticity Coordinate Groups




## Chromaticity Coordinate Groups




## Chromaticity Coordinate Groups



## Chromaticity Coordinate Groups [4)]

| Group | Cx | Cy |
|---|---|---|
| 5L1 | 0.3130 | 0.3125 |
| | 0.3130 | 0.3245 |
| | 0.3221 | 0.3427 |
| | 0.3221 | 0.3307 |
| 5L2 | 0.3160 | 0.3186 |
| | 0.3160 | 0.3306 |
| | 0.3251 | 0.3487 |
| | 0.3251 | 0.3367 |
| 5L3 | 0.3191 | 0.3246 |
| | 0.3191 | 0.3366 |
| | 0.3281 | 0.3548 |
| | 0.3281 | 0.3428 |

| Group | Cx | Cy |
|---|---|---|
| 5M1 | 0.3130 | 0.3200 |
| | 0.3130 | 0.3330 |
| | 0.3221 | 0.3512 |
| | 0.3221 | 0.3382 |
| 5M2 | 0.3160 | 0.3261 |
| | 0.3160 | 0.3391 |
| | 0.3251 | 0.3572 |
| | 0.3251 | 0.3442 |
| 5M3 | 0.3191 | 0.3321 |
| | 0.3191 | 0.3451 |
| | 0.3254 | 0.3578 |
| | 0.3281 | 0.3597 |
| | 0.3281 | 0.3503 |

| Group | Cx | Cy |
|---|---|---|
| 6L1 | 0.3221 | 0.3307 |
| | 0.3221 | 0.3427 |
| | 0.3311 | 0.3608 |
| | 0.3311 | 0.3488 |
| 6M1 | 0.3221 | 0.3382 |
| | 0.3221 | 0.3512 |
| | 0.3254 | 0.3578 |
| | 0.3311 | 0.3616 |
| | 0.3311 | 0.3563 |

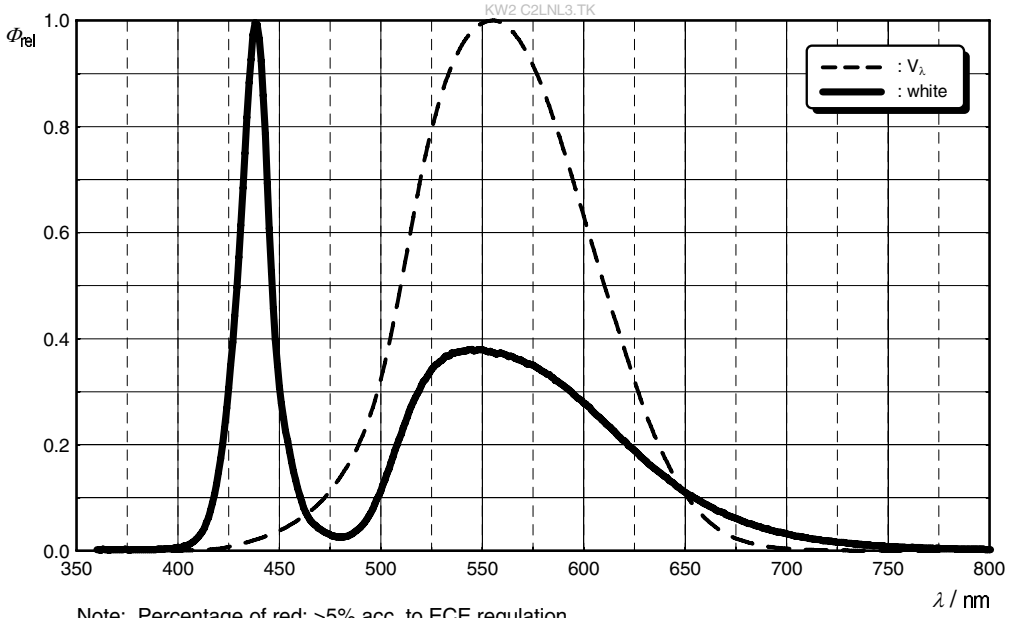
## Group Name on Label

**Example: D5-5L1**

| Brightness | Color Chromaticity |
|---|---|
| D5 | 5L1 |

## Relative Spectral Emission [7)]

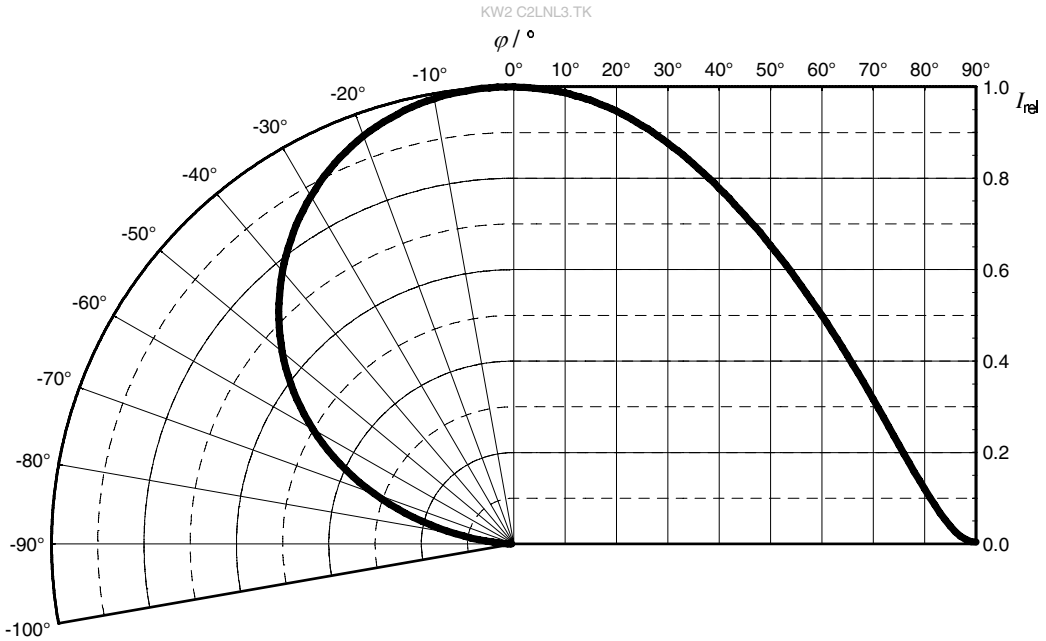
$\Phi_{rel} = f(\lambda)$; $I_F$ = 1000 mA; $T_C$ = 25 °C




Note: Percentage of red: >5% acc. to ECE regulation
Percentage of UV: <$10^{-5}$W/lm acc. to ECE regulation

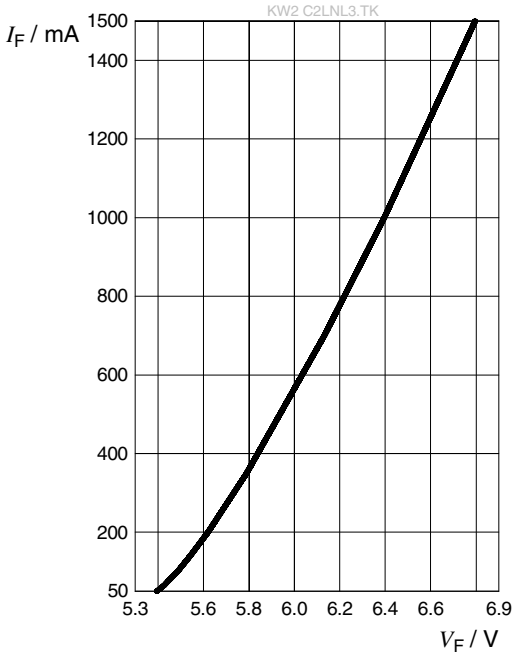
## Radiation Characteristics [7)]

$I_{rel} = f(\varphi)$; $T_C$ = 25 °C



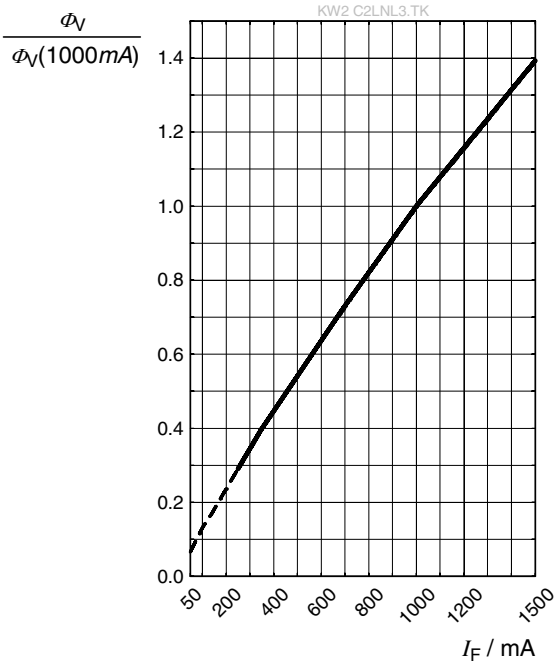
## Forward current [7]

$I_F = f(V_F)$; $T_C$ = 25 °C



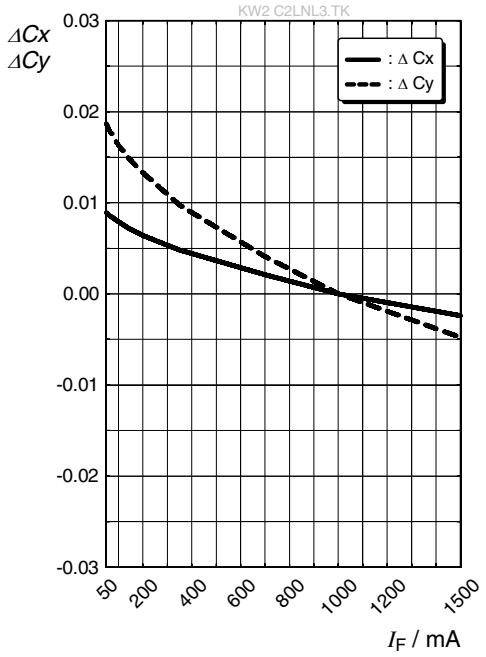

## Relative Luminous Flux [7], [8]

$\Phi_v/\Phi_v(1000\ mA) = f(I_F)$; $T_C$ = 25 °C



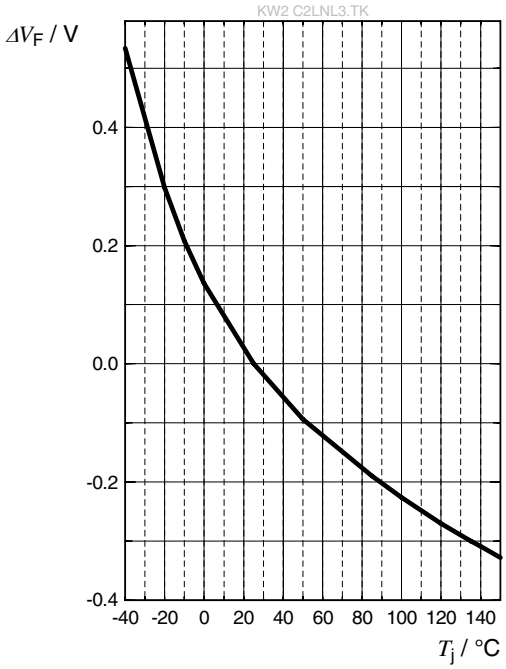

## Chromaticity Coordinate Shift [7]

$\Delta Cx, \Delta Cy = f(I_F)$; $T_C$ = 25 °C



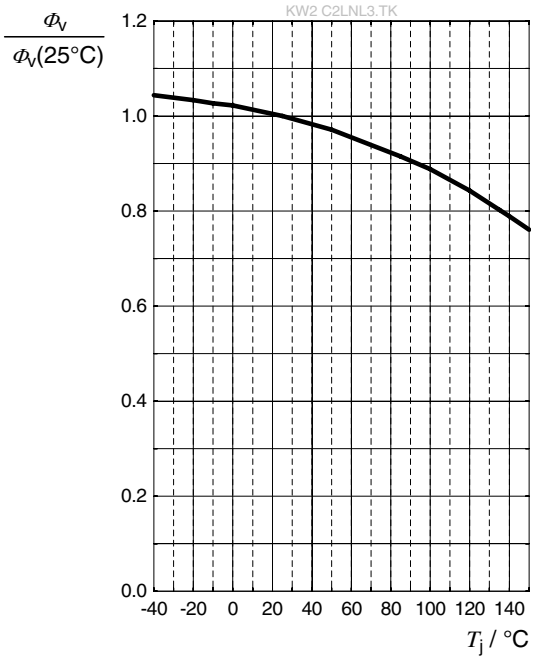
## Forward Voltage [7)]

$\Delta V_F = V_F - V_F(25\ °C) = f(T_j);\ I_F = 1000\ mA$



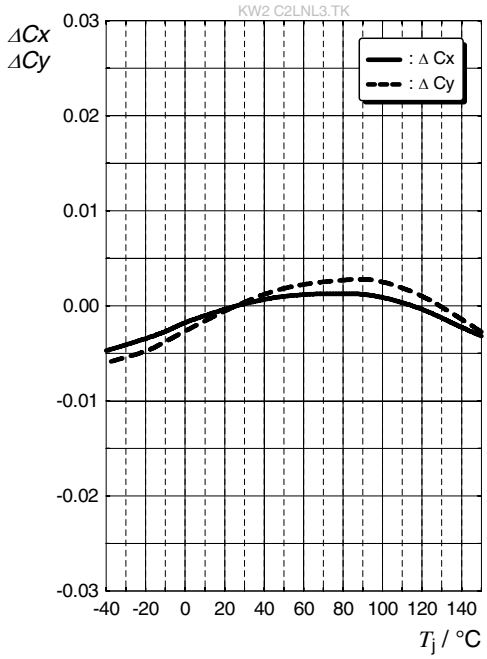

## Relative Luminous Flux [7)]

$\Phi_v/\Phi_v(25\ °C) = f(T_j);\ I_F = 1000\ mA$



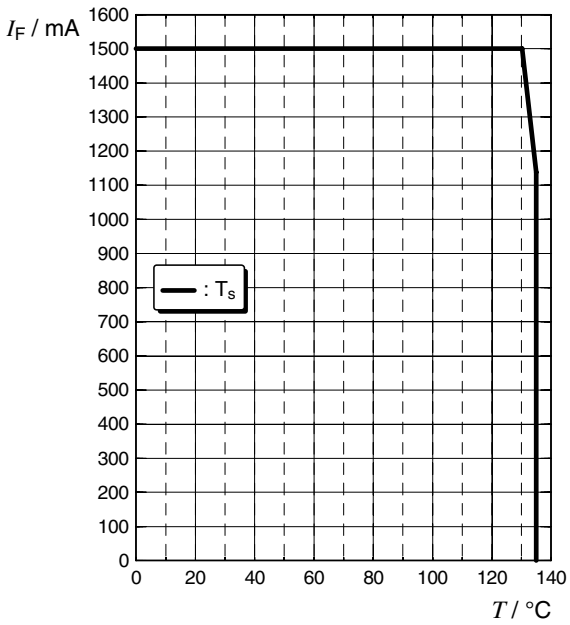

## Chromaticity Coordinate Shift [7)]

$\Delta Cx, \Delta Cy = f(T_j);\ I_F = 1000\ mA$

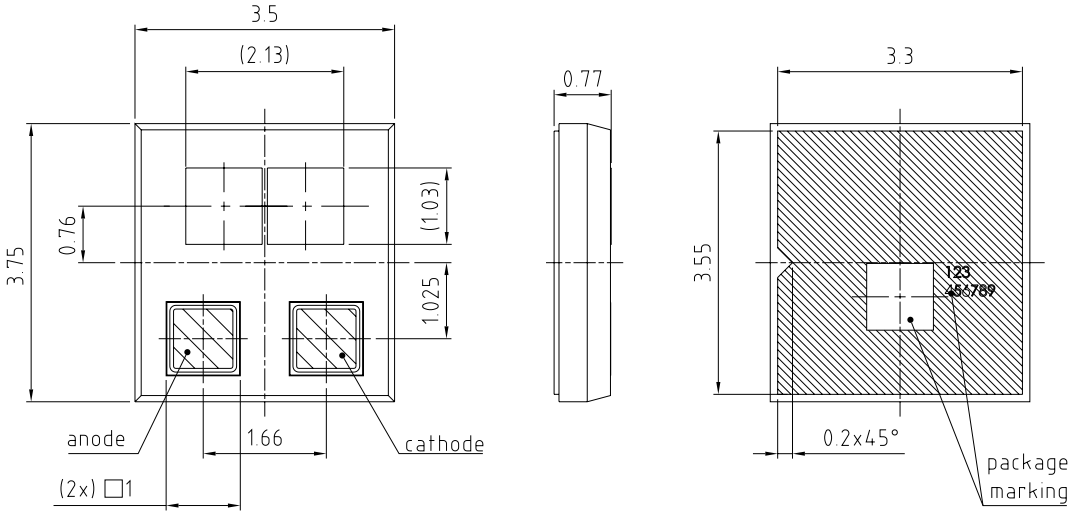


## Max. Permissible Forward Current 6)

$I_F = f(T)$



## Dimensional Drawing [9)]




## Further Information:

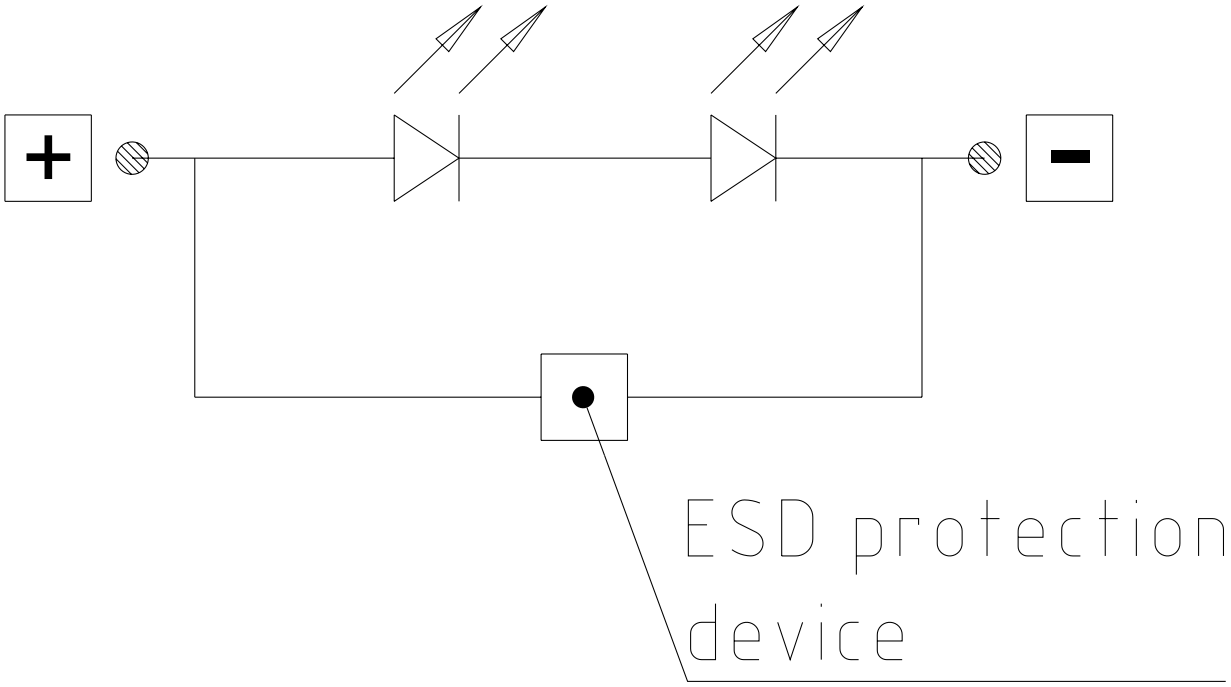
**Approximate Weight:** 28.0 mg

**Corrosion test:** Class: 3A
Test condition: 40°C / 90 % RH / 15 ppm $H_2S$ / 14 days (stricter than IEC 60068-2-43)

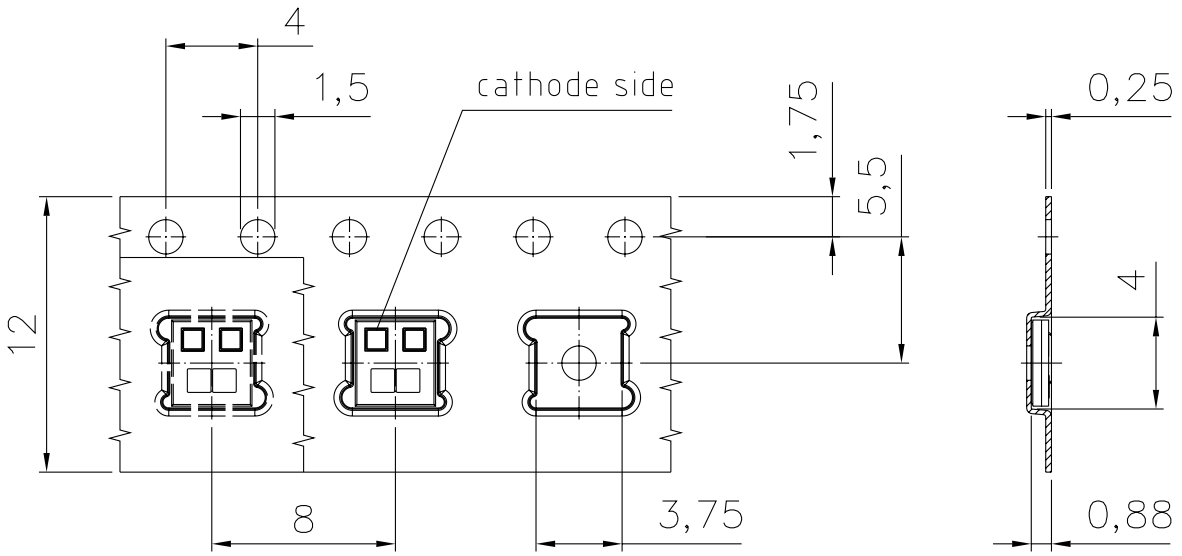
**ESD advice:** The device is protected by ESD device which is connected in parallel to the Chip.

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

## Electrical Internal Circuit

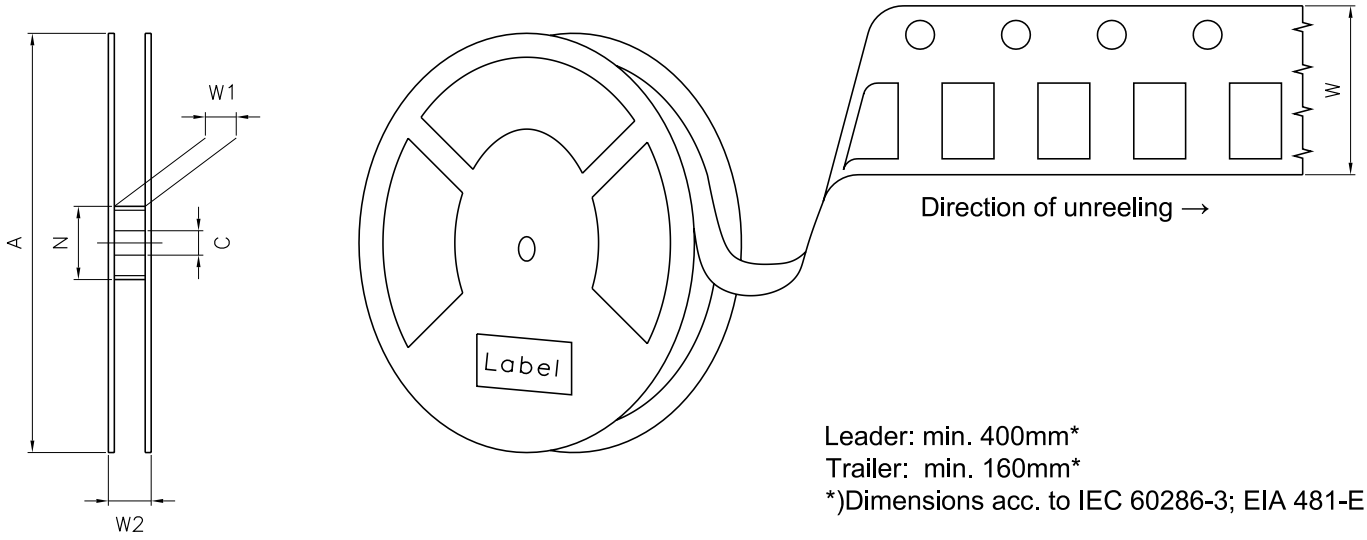


## Taping [9)]




C67062–A0352–B9–01

## Tape and Reel [10)]

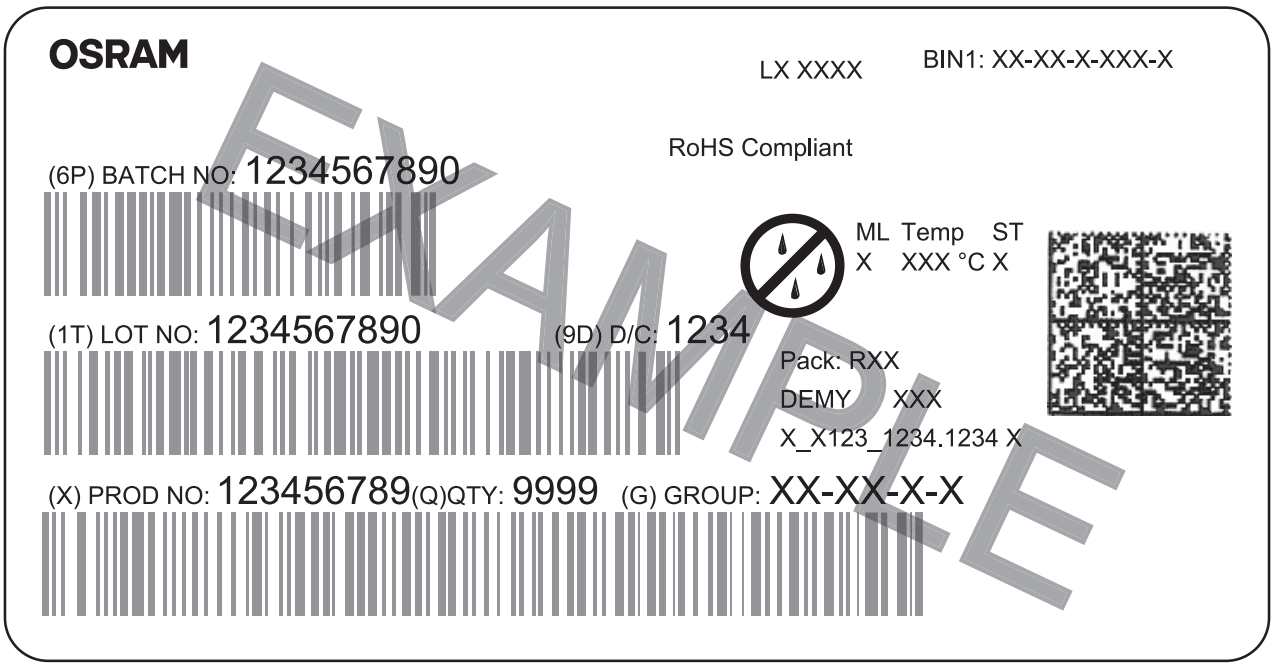



Leader: min. 400mm*
Trailer: min. 160mm*
*)Dimensions acc. to IEC 60286-3; EIA 481-E

## Reel Dimensions

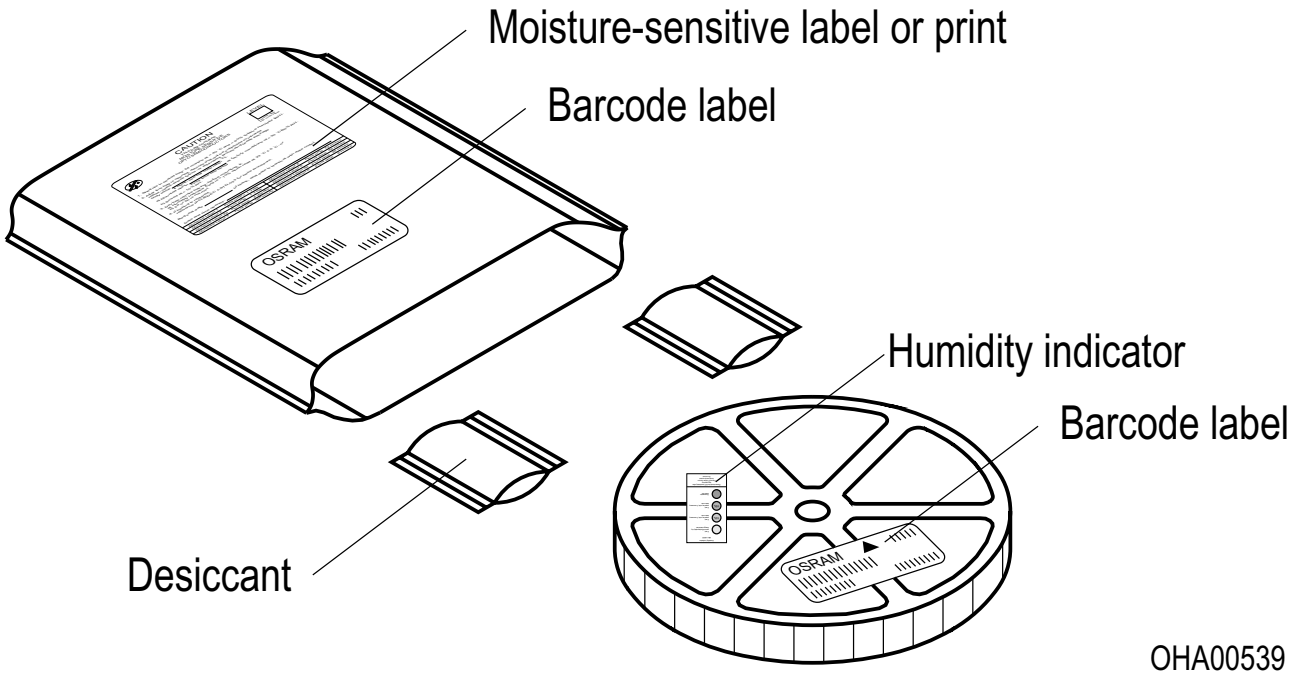
| A | W | $N_{min}$ | $W_1$ | $W_{2\,max}$ | Pieces per PU |
|---|---|---|---|---|---|
| 180 mm | 12 + 0.3 / - 0.1 mm | 60 mm | 12.4 + 2 mm | 18.4 mm | 2000 |

## Barcode-Product-Label (BPL)



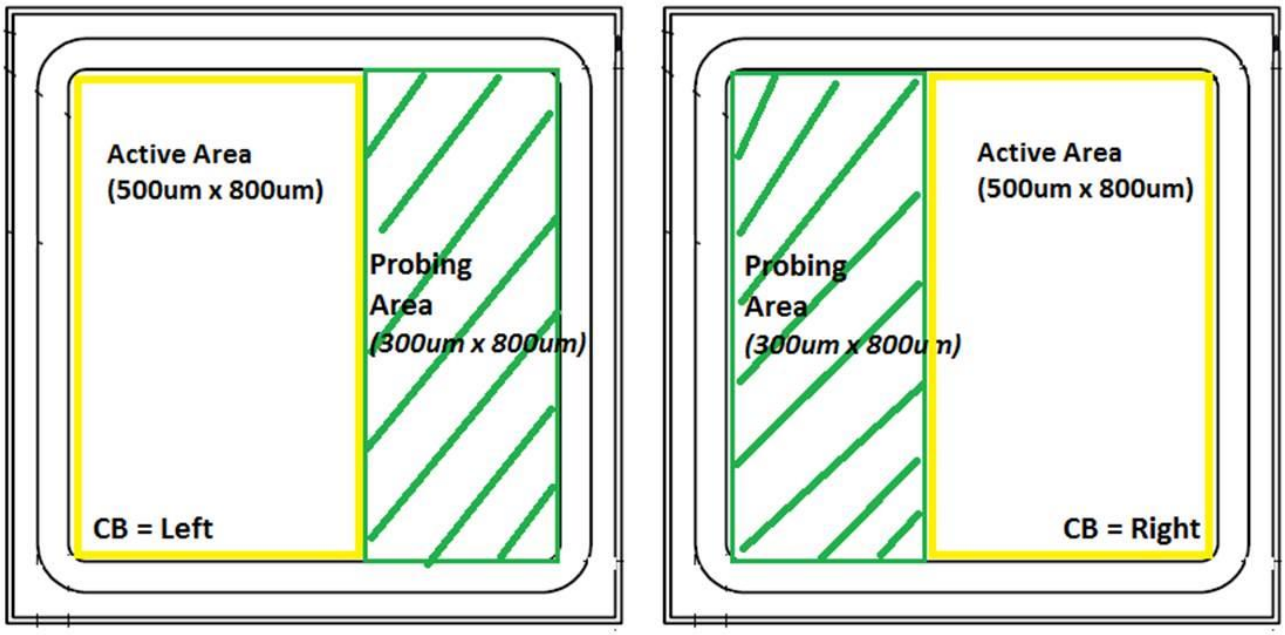

OHA04563

## Dry Packing Process and Materials [9)]




OHA00539

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




wire bonding scheme:

CB = contact block

Active Area = bond area

Probing Area = used by OSRAM OS

## 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 **moderate risk (exposure time 0.25 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. Metal filled materials can be affected by environments that contain traces of aggressive substances. Therefore, we recommend that customers avoid device exposure to aggressive substances during storage, production, and use.

For further application related information please visit https://ams-osram.com/support/application-notes

## 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.
For information on the types in question please contact our Sales Organization.
If printed or downloaded, please find the latest version on our 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 and functional safety devices/applications or medical devices/applications

Our components are not developed, constructed or tested for the application as safety relevant component or for the application in medical devices.
Our products are not qualified at module and system level for such application.

In case buyer – or customer supplied by buyer – considers using our components in product safety devices/ applications or medical devices/applications, buyer and/or customer has to inform our local sales partner immediately and we and buyer and /or customer will analyze and coordinate the customer-specific request between us and buyer and/or customer.

## Glossary

1) **Brightness:** Brightness values are measured during a current pulse of typically 1 ms, with an internal reproducibility of ±8 % and an expanded uncertainty of ±11 % (acc. to GUM with a coverage factor of k = 3).

2) **Operating Temperature:** The Operating Temperatur Top is referenced to the Solderpoint Ts of this device. Proper current derating must be observed to maintain junction temperature below the maximum.

3) **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.

4) **Chromaticity coordinate groups:** Chromaticity coordinates are measured during a current pulse of typically 1 ms, with an internal reproducibility of ±0.005 and an expanded uncertainty of ±0.01 (acc. to GUM with a coverage factor of k = 3).

5) **Forward Voltage:** The forward voltage is measured during a current pulse of typically 1 ms, with an internal reproducibility of ±0.05 V and an expanded uncertainty of ±0.1 V (acc. to GUM with a coverage factor of k = 3).

6) **Thermal Resistance:** Rth max is based on statistic values (6σ) used for Derating.

7) **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.

8) **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.

9) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with ±0.1 and dimensions are specified in mm.

10) **Tape and Reel:** All dimensions and tolerances are specified acc. IEC 60286-3 and specified in mm.

## Revision History

| Version | Date | Change |
|---|---|---|
| 1.0 | 2023-10-09 | Initial Version |
| 1.1 | 2024-01-12 | Features<br>Maximum Ratings<br>Characteristics<br>Electro - Optical Characteristics (Diagrams) |
| 1.2 | 2024-09-26 | Electro - Optical Characteristics (Diagrams) |
| 1.3 | 2025-07-14 | Electro - Optical Characteristics (Diagrams)<br>Characteristics<br>Notes |

EU RoHS and China RoHS compliant product
此产品符合欧盟 RoHS 指令的要求；
按照中国的相关法规和标准，
不含有毒有害物质或元素。

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