KB DMLN31.13

SYNIOS® P2720

This compact LED device is part of the SYNIOS P2720 family. Given the scalability of this product family, it provides full performance and flexibility with just one footprint.
The KB DMLN31.13 product is meant to provide superior light quality in ¼ mm² chip size class.

Applications

- Architecture
- Interior Illumination (e.g. Ambient Map)
- Signalling

Features:

- Package: SMD epoxy package
- Chip technology: UX:3
- Typ. Radiation: 120° (Lambertian emitter)
- Color: λ_{dom} = 455 nm (● blue)
- Corrosion Robustness Class: 3B
- Qualifications: The product qualification test plan is based on the guidelines of IEC60810, Lamps for road vehicles – Performance requirements – Requirements and test conditions for LED packages.
- ESD: 8 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B)

Ordering Information

Type	Luminous Flux [1] I_F = 200 mA Φ_V	Ordering Code
KB DMLN31.13-7D8F-36-15B5	5.6 ... 18.0 lm	Q65112A0079

Maximum Ratings

Parameter	Symbol		Values
Operating Temperature	T_{op}	min. max.	-40 °C 125 °C
Storage Temperature	T_{stg}	min. max.	-40 °C 125 °C
Junction Temperature	T_j	max.	150 °C
Junction Temperature for short time applications*	T_j	max.	175 °C
Forward current T_S = 25 °C	I_F	min. max.	5 mA 300 mA
Surge Current t ≤ 10 µs; D = 0.005 ; T_S = 25 °C	I_{FS}	max.	750 mA
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B)	V_{ESD}		8 kV
Reverse current [2)]	I_R	max.	200 mA

*The median lifetime (L70/B50) for Tj =175°C is 100h.

Characteristics

I_F = 200 mA; T_S = 25 °C

Parameter	Symbol		Values
Peak Wavelength	λ_{peak}	typ.	450 nm
Dominant Wavelength [3] I_F = 200 mA	λ_{dom}	min. typ. max.	449 nm 455 nm 465 nm
Viewing angle at 50 % I_V	2φ	typ.	120 °
Forward Voltage [4] I_F = 200 mA	V_F	min. typ. max.	2.75 V 3.00 V 3.50 V
Reverse voltage (ESD device)	$V_{R\ ESD}$	min.	45 V
Reverse voltage [2] I_R = 20 mA	V_R	max.	1.2 V
Real thermal resistance junction/solderpoint [5]	$R_{thJS\ real}$	typ. max.	18.0 K / W 20.0 K / W
Electrical thermal resistance junction/solderpoint [5] with efficiency η_e = 45 %	$R_{thJS\ elec.}$	typ. max.	9.9 K / W 11.0 K / W

Brightness Groups

Group	Luminous Flux [1] I_F = 200 mA min. Φ_V	Luminous Flux [1] I_F = 200 mA max. Φ_V	Luminous Intensity [6] I_F = 200 mA typ. I_v
7D	5.6 lm	6.3 lm	2.0 cd
8D	6.3 lm	7.1 lm	2.2 cd
5E	7.1 lm	8.0 lm	2.5 cd
6E	8.0 lm	9.0 lm	2.8 cd
7E	9.0 lm	10.0 lm	3.1 cd
8E	10.0 lm	11.2 lm	3.5 cd
5F	11.2 lm	12.5 lm	3.9 cd
6F	12.5 lm	14.0 lm	4.4 cd
7F	14.0 lm	15.9 lm	4.9 cd
8F	15.9 lm	18.0 lm	5.6 cd

Forward Voltage Groups

Group	Forward Voltage [4] I_F = 200 mA min. V_F	Forward Voltage [4] I_F = 200 mA max. V_F
15	2.75 V	3.00 V
65	3.00 V	3.25 V
B5	3.25 V	3.50 V

Wavelength Groups

Group	Dominant Wavelength [3] I_F = 200 mA min. λ_{dom}	Dominant Wavelength [3] I_F = 200 mA max. λ_{dom}
3	449 nm	453 nm
4	453 nm	457 nm
5	457 nm	461 nm
6	461 nm	465 nm

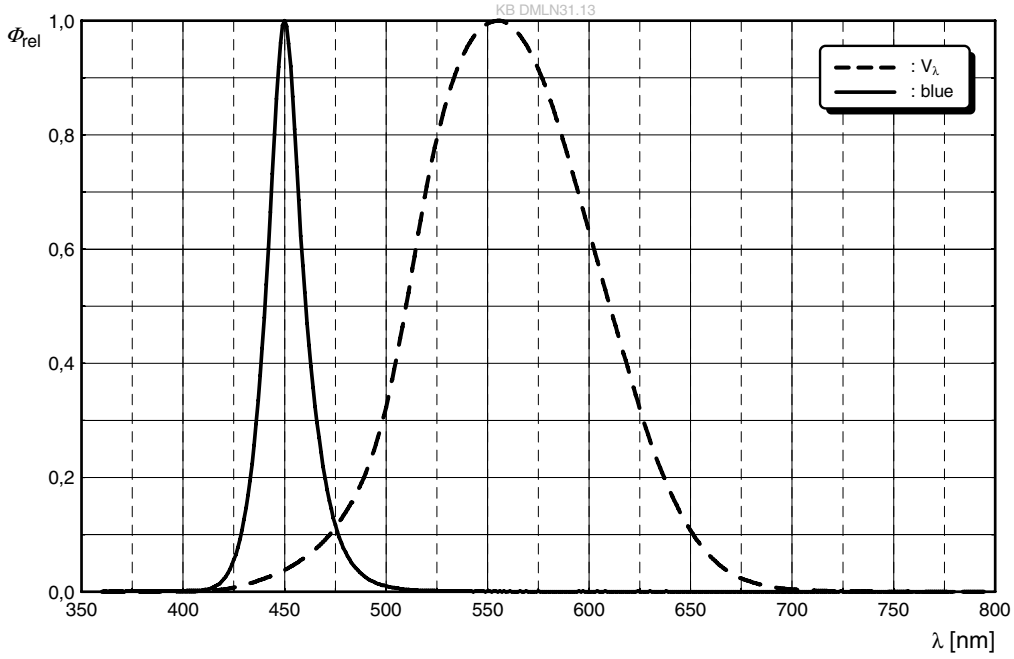
Group Name on Label

Example: 5E-3-15

Brightness	Wavelength	Forward Voltage
5E	3	15

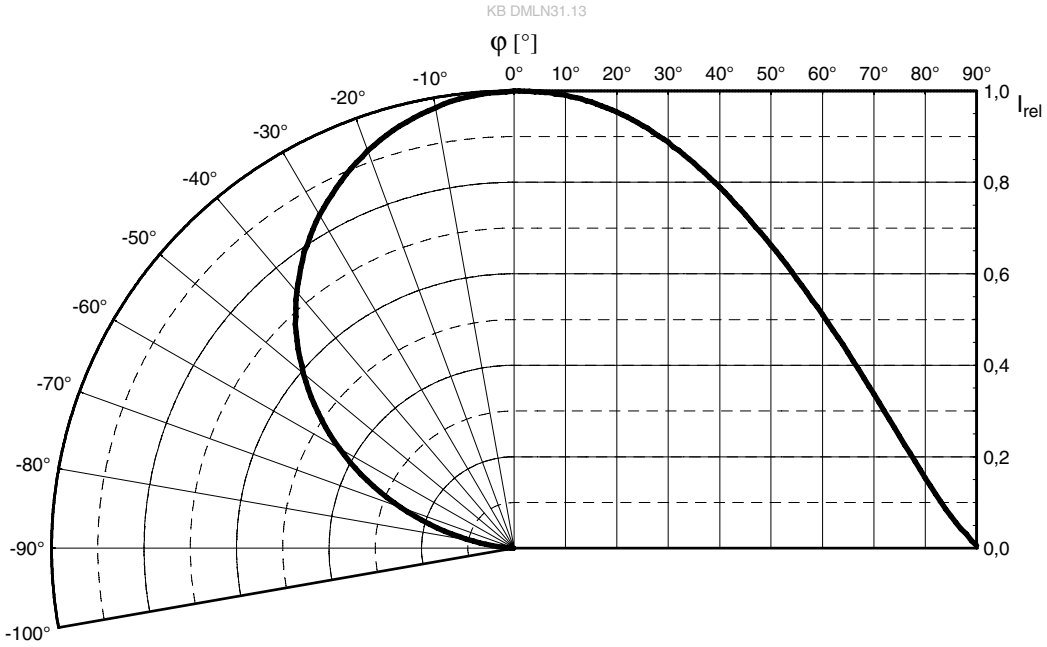
Relative Spectral Emission [6]

$\Phi_{rel} = f(\lambda)$; $I_F = 200$ mA; $T_S = 25$ °C



Radiation Characteristics [6]

$I_{rel} = f(\phi)$; $T_S = 25$ °C



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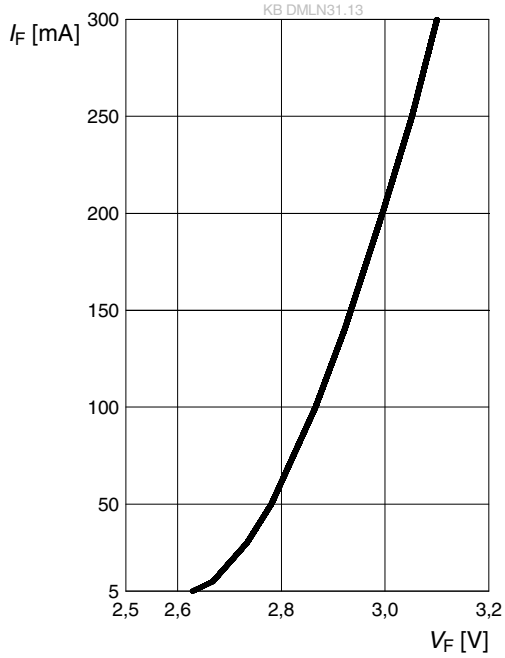
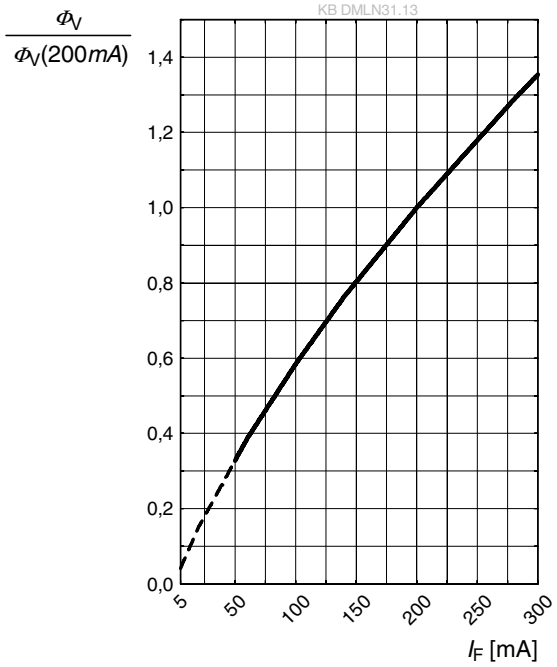
Forward current [6), 7)]

$I_F = f(V_F)$; T_S = 25 °C



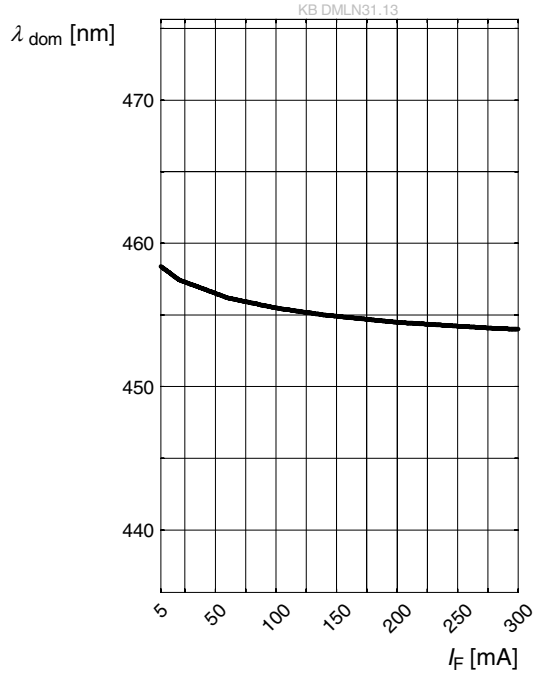
Relative Luminous Flux [6), 7)]

$\Phi_v/\Phi_v(200\ mA) = f(I_F)$; T_S = 25 °C



Dominant Wavelength [6)]

$\lambda_{dom} = f(I_F)$; T_S = 25 °C



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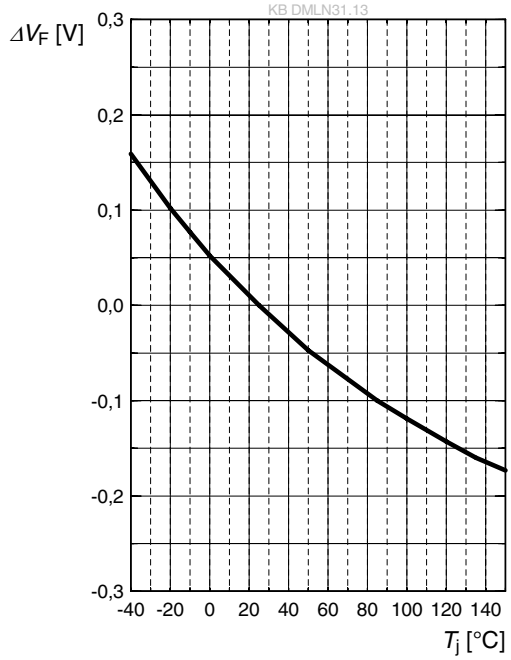
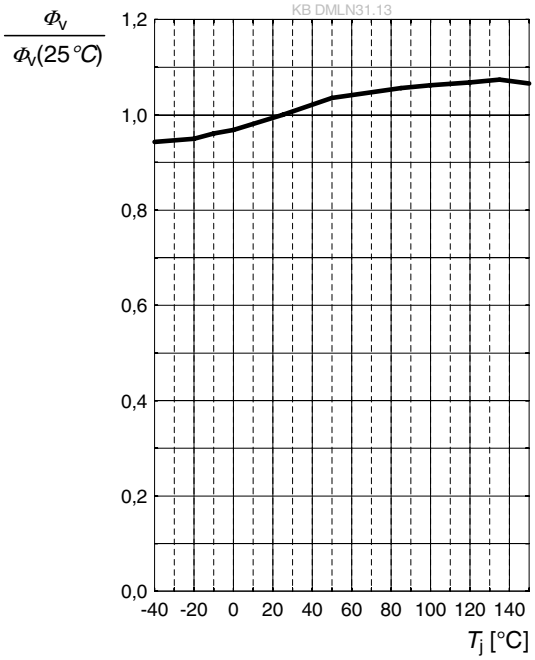
Forward Voltage [6]

$\Delta V_F = V_F - V_F(25\ °C) = f(T_j);\ I_F = 200\ mA$



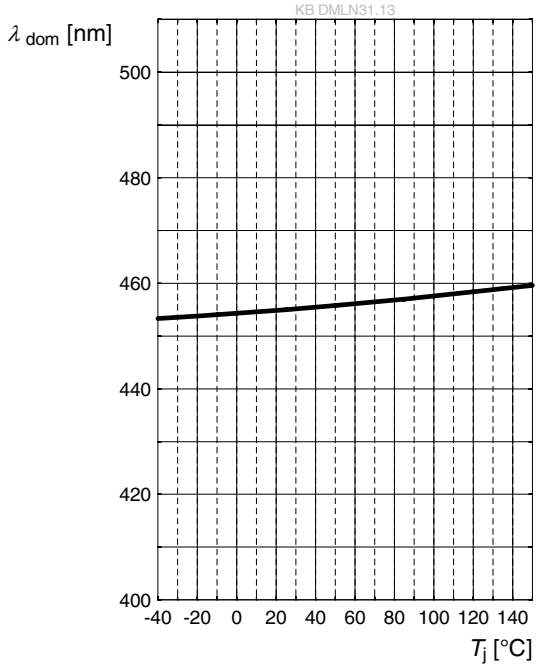
Relative Luminous Flux [6]

$\Phi_v/\Phi_v(25\ °C) = f(T_j);\ I_F = 200\ mA$



Dominant Wavelength [6]

$\lambda_{dom} = f(T_j);\ I_F = 200\ mA$



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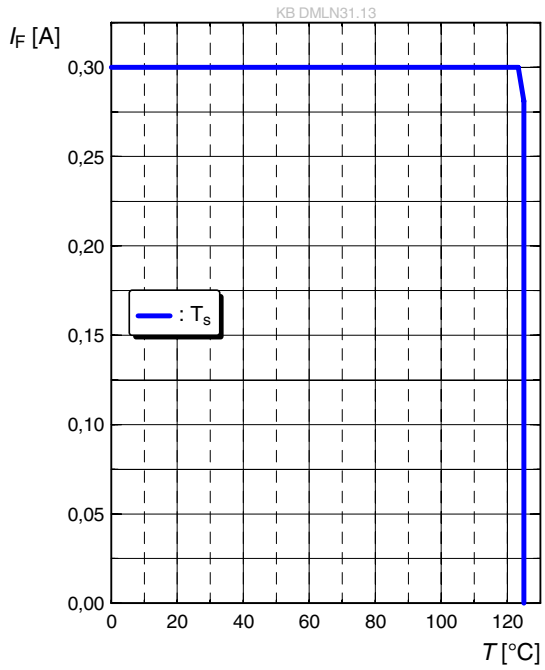
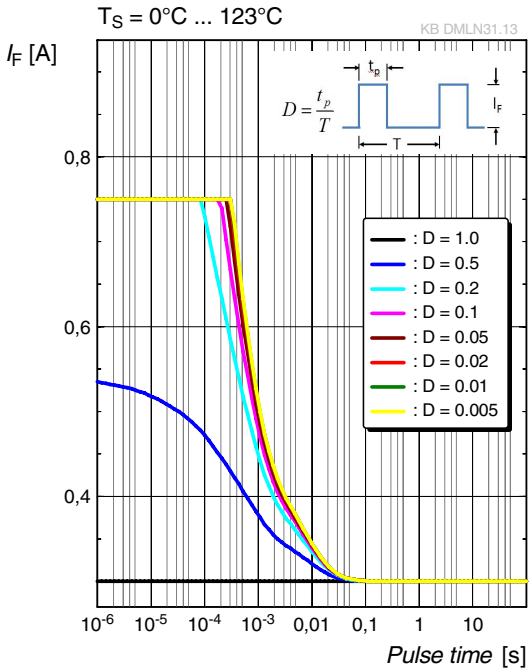
Max. Permissible Forward Current

$I_F = f(T)$



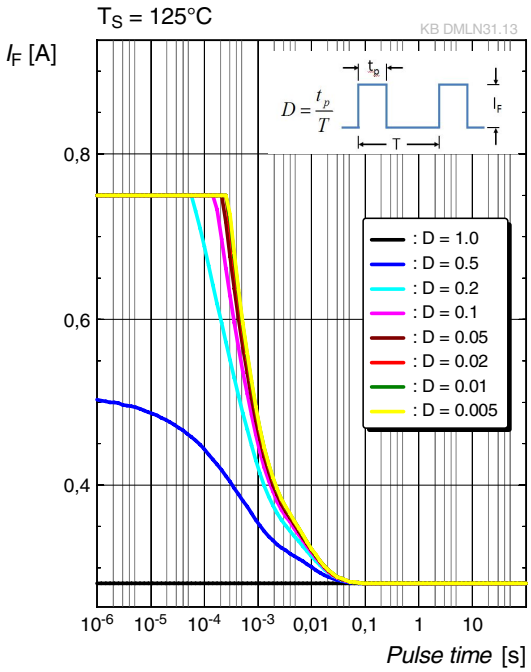
Permissible Pulse Handling Capability

$I_F = f(t_p)$; D: Duty cycle

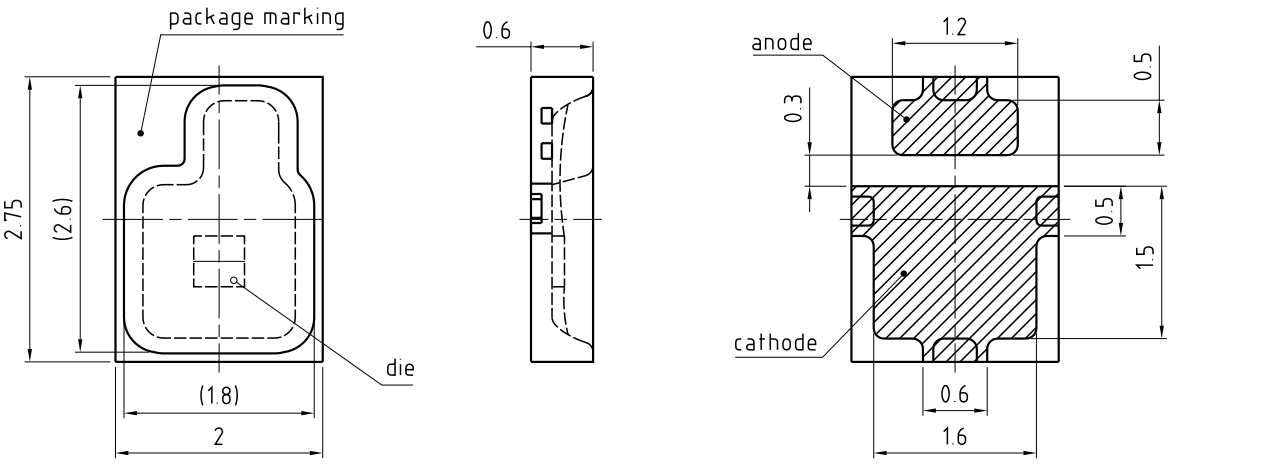


Permissible Pulse Handling Capability

$I_F = f(t_p)$; D: Duty cycle



Dimensional Drawing [8)]



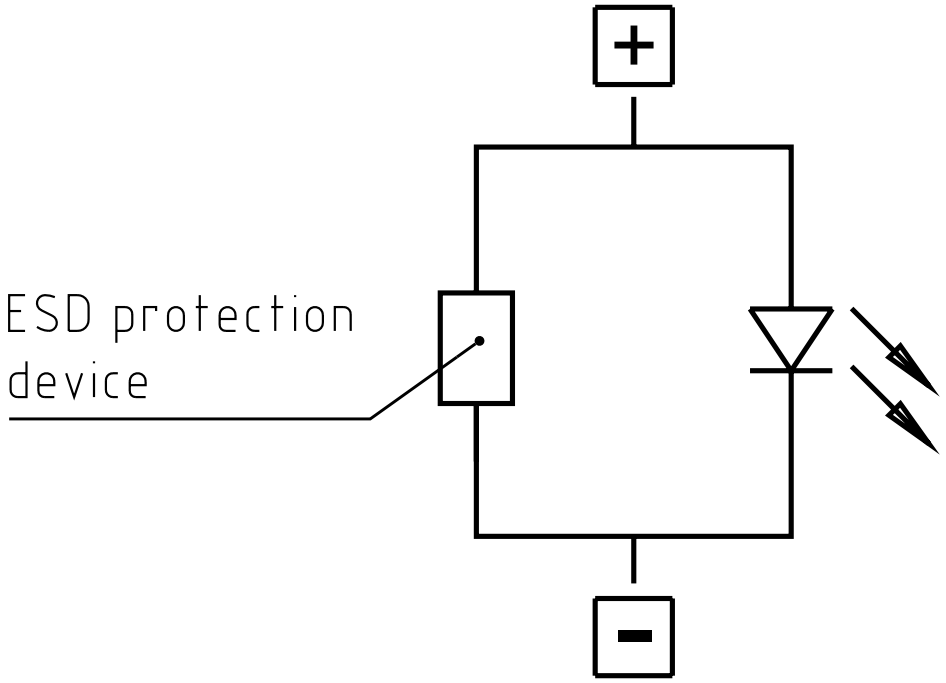
General tolerance ±0.1

Lead finish Au

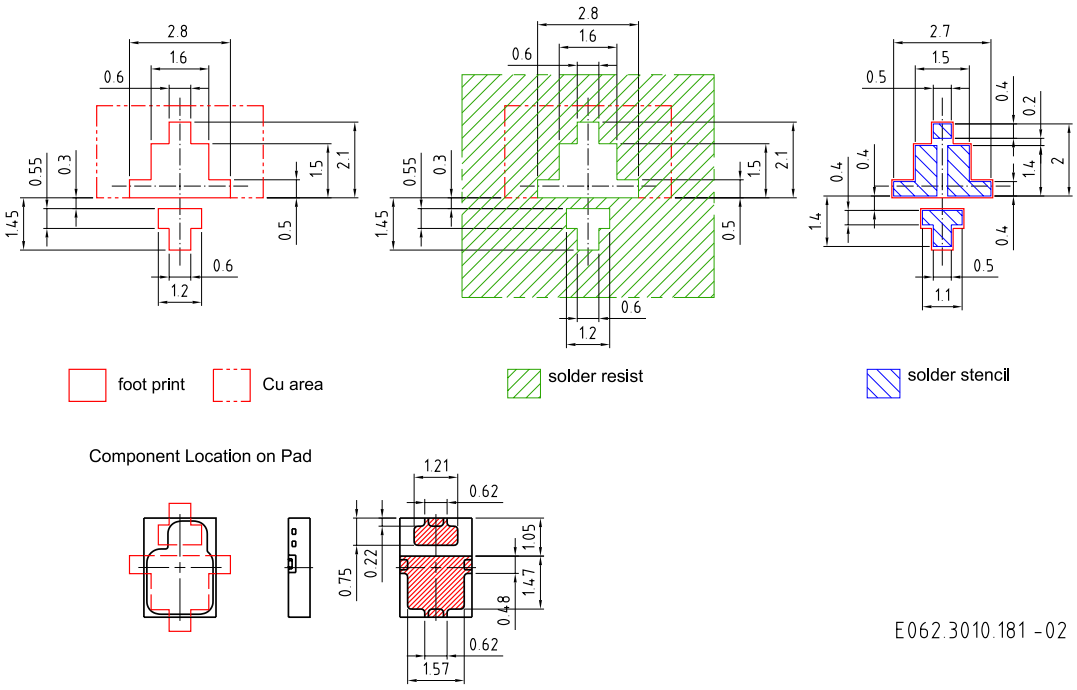
C67062-A0116-A16-01

Approximate Weight:	12.0 mg
Corrosion test:	Class: 3B Test condition: 40°C / 90 % RH / 15 ppm H_2S / 14 days (stricter then IEC 60068-2-43)
ESD advice:	LED is protected by ESD device which is connected in parallel to LED-Chip.

Electrical internal circuit



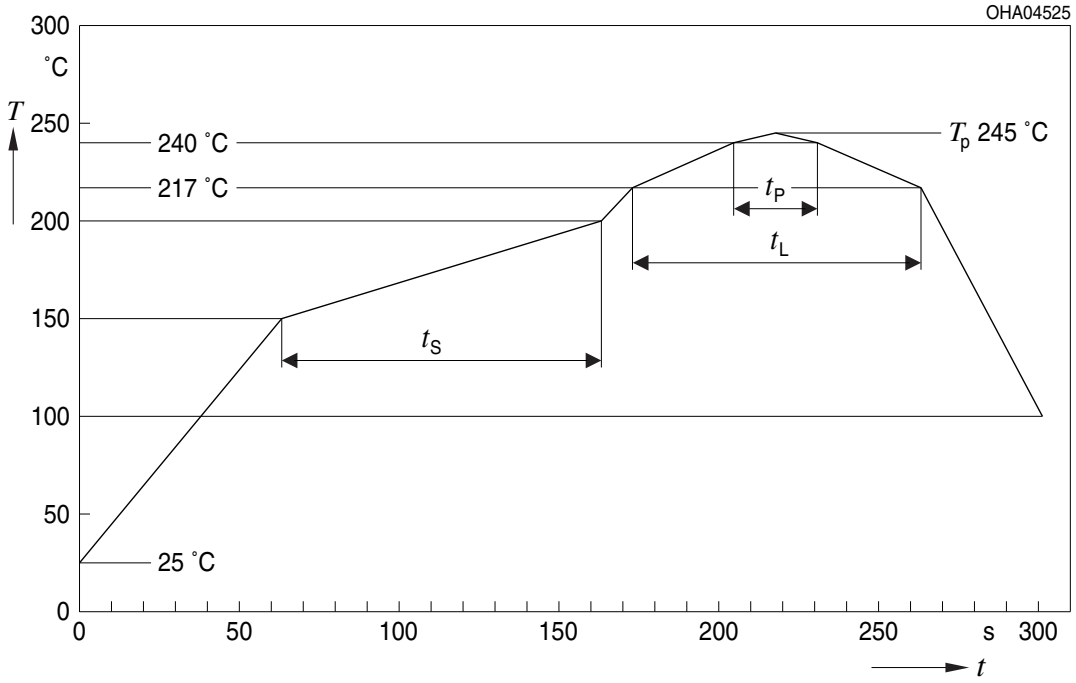
Recommended Solder Pad [8)]



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

Reflow Soldering Profile

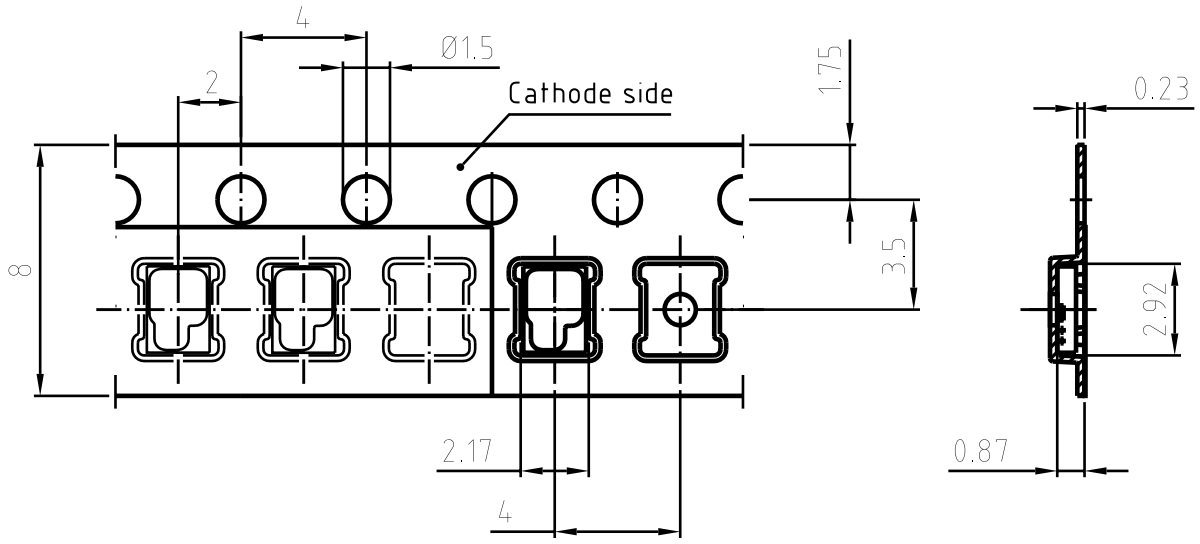
Product complies to MSL Level 2 acc. to JEDEC J-STD-020E



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 [8)]



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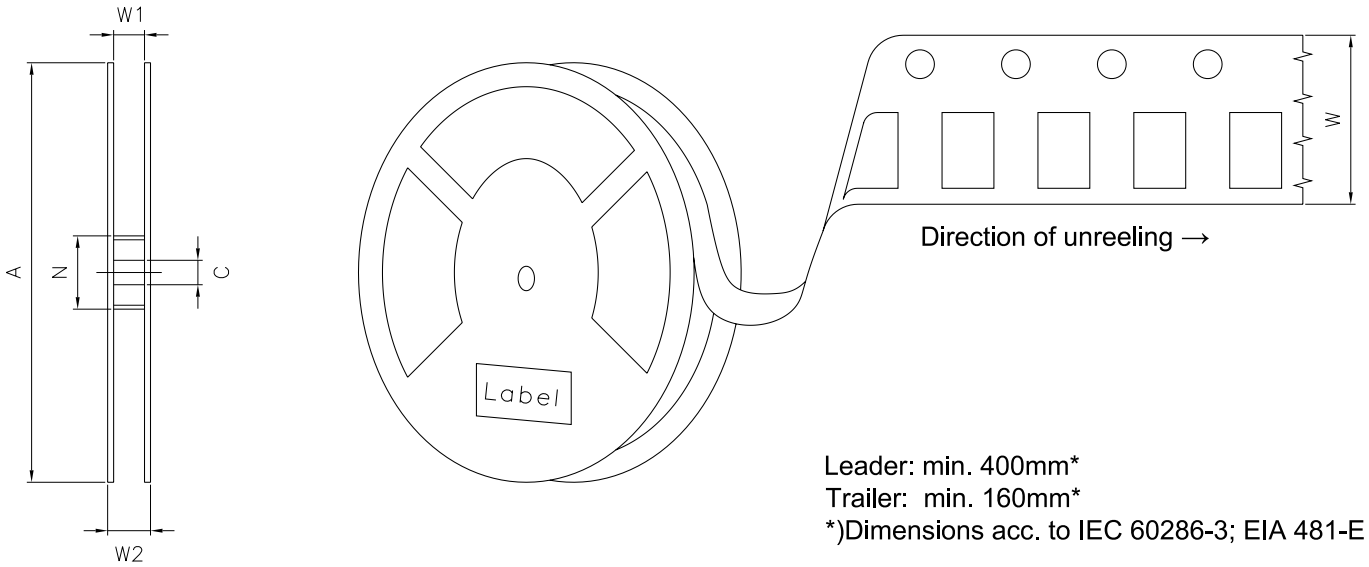
Tape and Reel [9)]

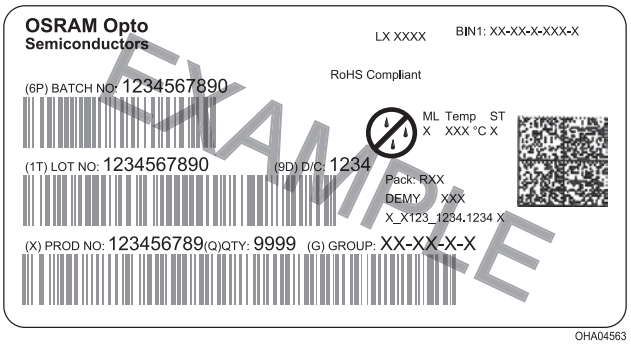


Leader: min. 400mm*
Trailer: min. 160mm*
*)Dimensions acc. to IEC 60286-3; EIA 481-E

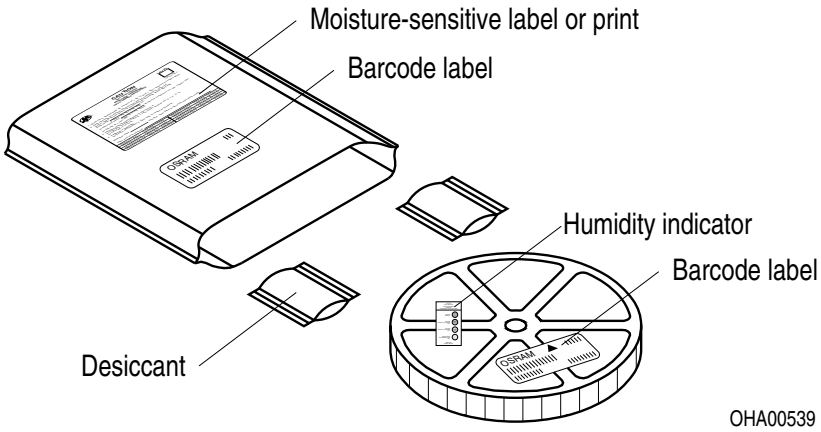
Reel dimensions [mm]

A	W	N_{min}	W_1	$W_{2\,max}$	Pieces per PU
180 mm	8 + 0.3 / - 0.1	60	8.4 + 2	14.4	2000

Barcode-Product-Label (BPL)

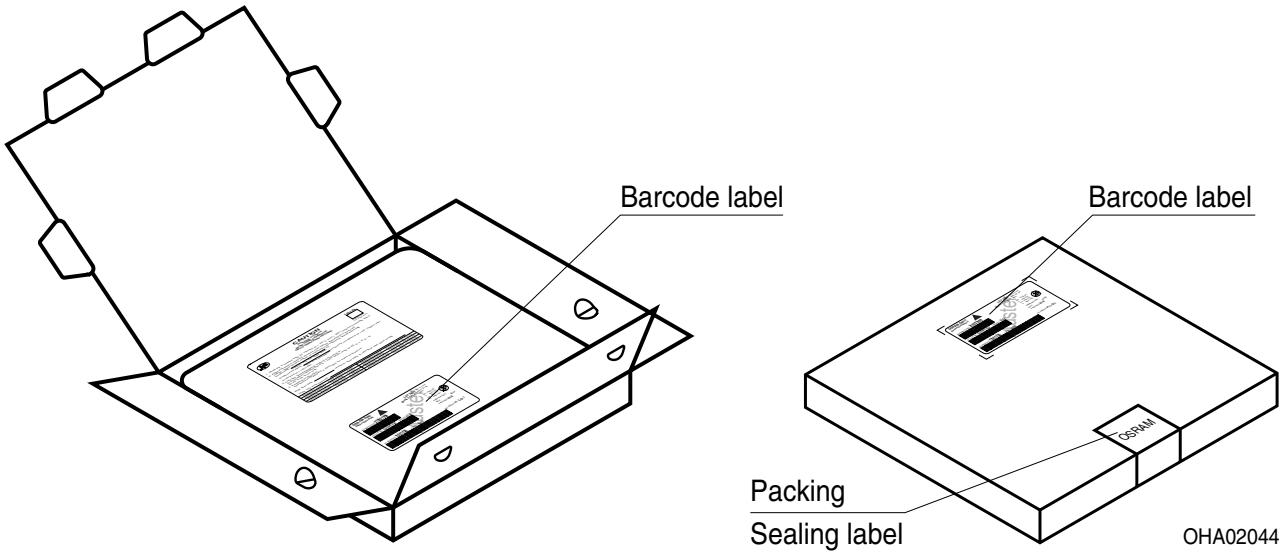


Dry Packing Process and Materials [8)]



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

Transportation Packing and Materials [8)]



Dimensions of transportation box in mm

Width	Length	Height
200 ± 5 mm	195 ± 5 mm	30 ± 5 mm

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 LED specified in this data sheet falls 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 LED 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 LED exposure to aggressive substances during storage, production, and use. LEDs 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 informations please visit www.osram-os.com/appnotes

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 webside.

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.

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Glossary

1) **Brightness**: Brightness values are measured during a current pulse of typically 25 ms, with an internal reproducibility of ±8 % and an expanded uncertainty of ±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 ±0.5 nm and an expanded uncertainty of ±1 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 ±0.05 V and an expanded uncertainty of ±0.1 V (acc. to GUM with a coverage factor of k = 3).

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

6) **Typical Values**: Due to the special conditions of the manufacturing processes of LED, 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 LEDs within one packing unit.

8) **Tolerance of Measure**: Unless otherwise noted in drawing, tolerances are specified with ±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.

Published by OSRAM Opto Semiconductors GmbH
Leibnizstraße 4, D-93055 Regensburg

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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