KY DELPS1.22

TOPLED® E1608

The TOPLED E1608 expands OSRAM Opto Semiconductors' low power portfolio by offering one of the smallest LED Industry standard footprints in a highly reliable and well proved package concept.
Its outstanding performance is suitable for a huge variety of applications especially automotive interior where a small package design with excellent reliability is needed. The TOPLED E1608 is available in different colors and brightness levels.

Applications

- Cluster, Button Backlighting
- Electronic Equipment
- Interior Illumination e.g. Ambient Map

Features:

- Package: white SMT package, colorless clear resin
- Chip technology: Thinfilm
- Typ. Radiation: 120° (Lambertian emitter)
- Color: λ_{dom} = 589 nm (● yellow)
- Corrosion Robustness Class: 1B
- ESD: 1 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM)

Ordering Information

Type	Luminous Intensity [1] I_F = 20 mA I_v	Ordering Code
KY DELPS1.22-UGVI-36-J3S5	450 ... 1120 mcd	Q65112A4009

Maximum Ratings

Parameter	Symbol		Values
Operating Temperature	T_{op}	min. max.	-40 °C 110 °C
Storage Temperature	T_{stg}	min. max.	-40 °C 110 °C
Junction Temperature	T_j	max.	125 °C
Forward current T_S = 25 °C	I_F	min. max.	1 mA 30 mA
Surge Current t ≤ 10 µs; D = 0.005 ; T_S = 25 °C	I_{FS}	max.	70 mA
Reverse voltage [2)] T_S = 25 °C	V_R	max.	12 V
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM)	V_{ESD}		1 kV

Characteristics

I_F = 20 mA; T_S = 25 °C

Parameter	Symbol		Values
Peak Wavelength	λ_{peak}	typ.	593 nm
Dominant Wavelength [3] I_F = 20 mA	λ_{dom}	min. typ. max.	583 nm 589 nm 595 nm
Viewing angle at 50 % I_V	2φ	typ.	120 °
Forward Voltage [4] I_F = 20 mA	V_F	min. typ. max.	2.00 V 2.30 V 2.65 V
Reverse current [2] V_R = 12 V	I_R	typ. max.	0.01 µA 10 µA
Temperature Coefficient of Peak Wavelength -10°C ≤ T ≤ 100°C	$TC_{\lambda peak}$	typ.	0.14 nm / K
Temperature Coefficient of Dominant Wavelength -10°C ≤ T ≤ 100°C	$TC_{\lambda dom}$	typ.	0.11 nm / K
Real thermal resistance junction/solderpoint [5]	$R_{thJS\ real}$	typ. max.	120 K / W 150 K / W

Brightness Groups

Group	Luminous Intensity [1] I_F = 20 mA min. I_v	Luminous Intensity. [1] I_F = 20 mA max. I_v	Luminous Flux [6] I_F = 20 mA typ. Φ_V
UG	450 mcd	520 mcd	1600 mlm
UH	520 mcd	610 mcd	1900 mlm
UI	610 mcd	710 mcd	2200 mlm
VG	710 mcd	820 mcd	2500 mlm
VH	820 mcd	970 mcd	3000 mlm
VI	970 mcd	1120 mcd	3400 mlm

Forward Voltage Groups

Group	Forward Voltage [4] I_F = 20 mA min. V_F	Forward Voltage [4] I_F = 20 mA max. V_F
J3	2.00 V	2.15 V
M5	2.15 V	2.40 V
S5	2.40 V	2.65 V

Wavelength Groups

Group	Dominant Wavelength [3] I_F = 20 mA min. λ_{dom}	Dominant Wavelength [3] I_F = 20 mA max. λ_{dom}
3	583 nm	586 nm
4	586 nm	589 nm
5	589 nm	592 nm
6	592 nm	595 nm

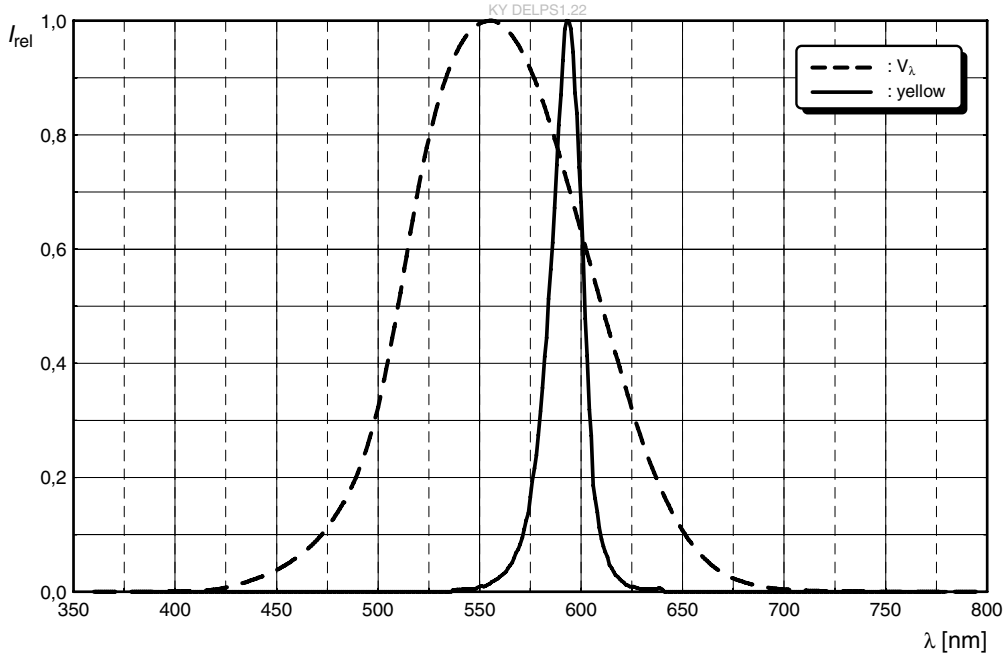
Group Name on Label

Example: UG-3-J3

Brightness	Wavelength	Forward Voltage
UG	3	J3

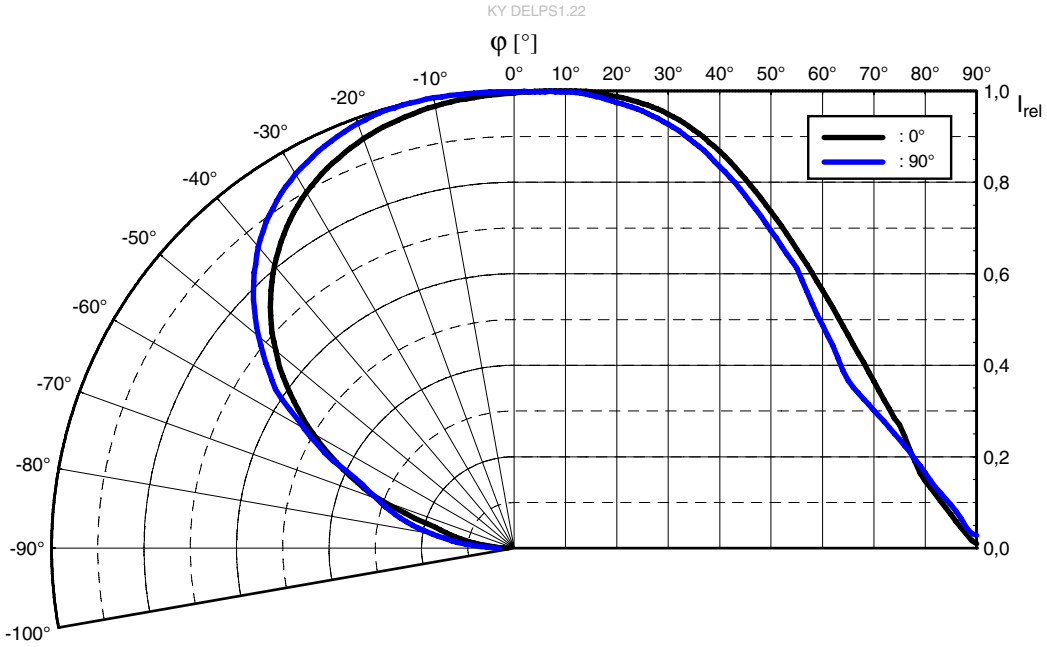
Relative Spectral Emission [6]

$I_{rel} = f(\lambda)$; $I_F = 20$ mA; $T_S = 25$ °C



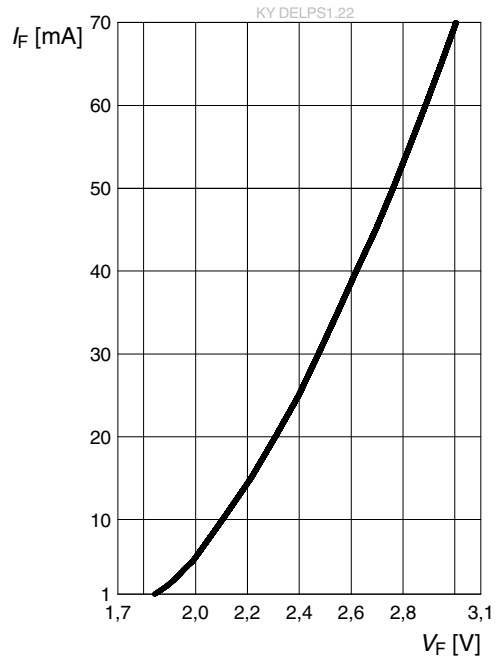
Radiation Characteristics [6]

$I_{rel} = f(\phi)$; $T_S = 25$ °C



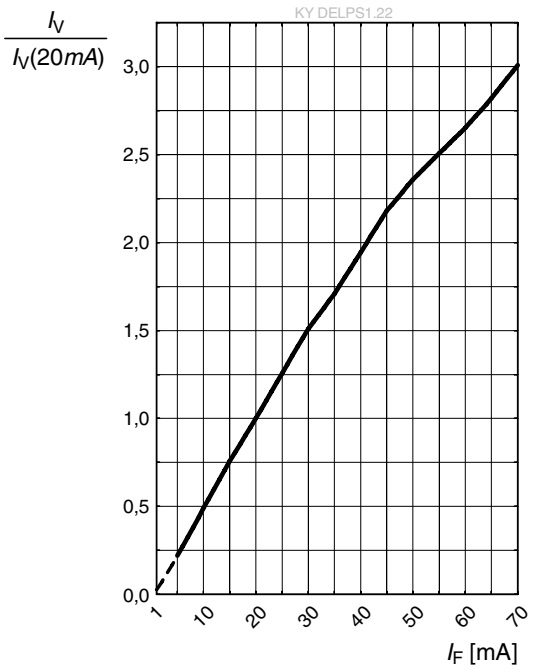
Forward current [6), 7)]

$I_F = f(V_F)$; T_S = 25 °C



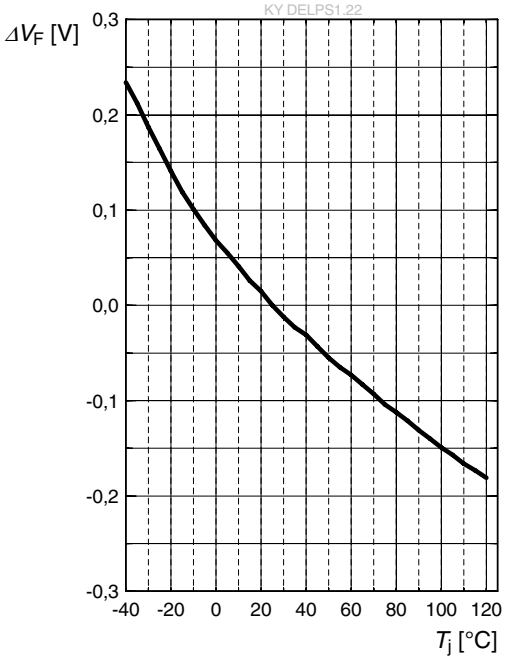
Relative Luminous Intensity [6), 7)]

$I_v/I_v(20\ mA) = f(I_F)$; T_S = 25 °C



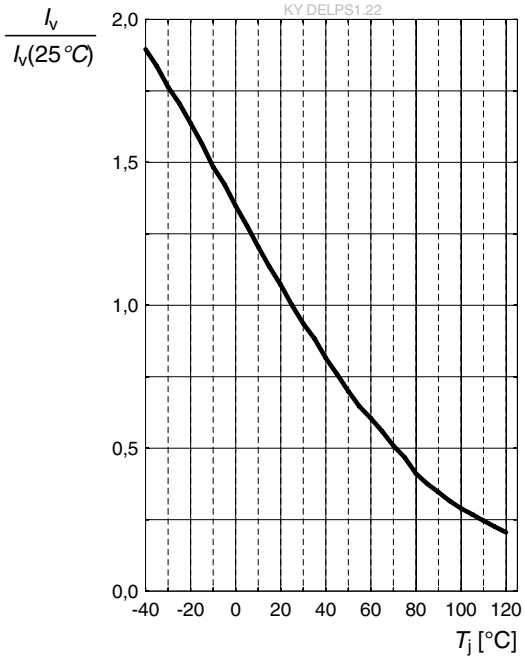
Forward Voltage [6)]

$\Delta V_F = V_F - V_F(25\ °C) = f(T_j);\ I_F = 20\ mA$



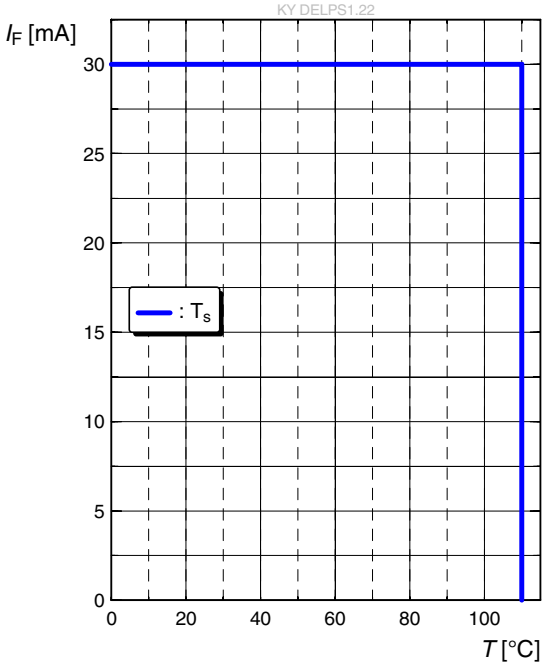
Relative Luminous Intensity [6)]

$I_v/I_v(25\ °C) = f(T_j);\ I_F = 20\ mA$



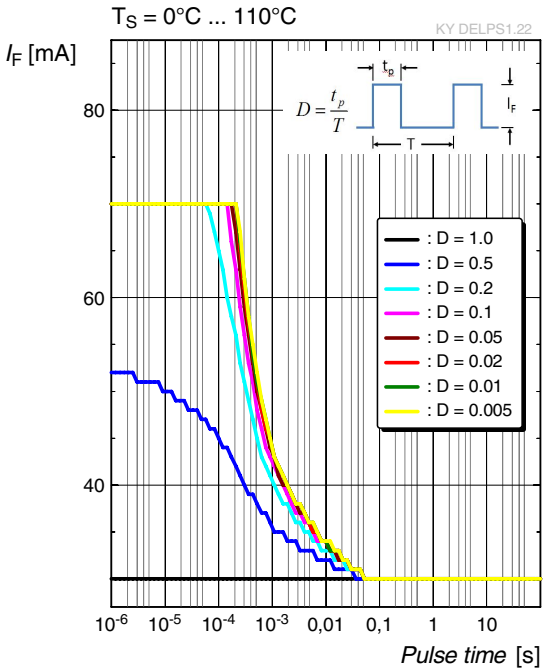
Max. Permissible Forward Current

$I_F = f(T)$

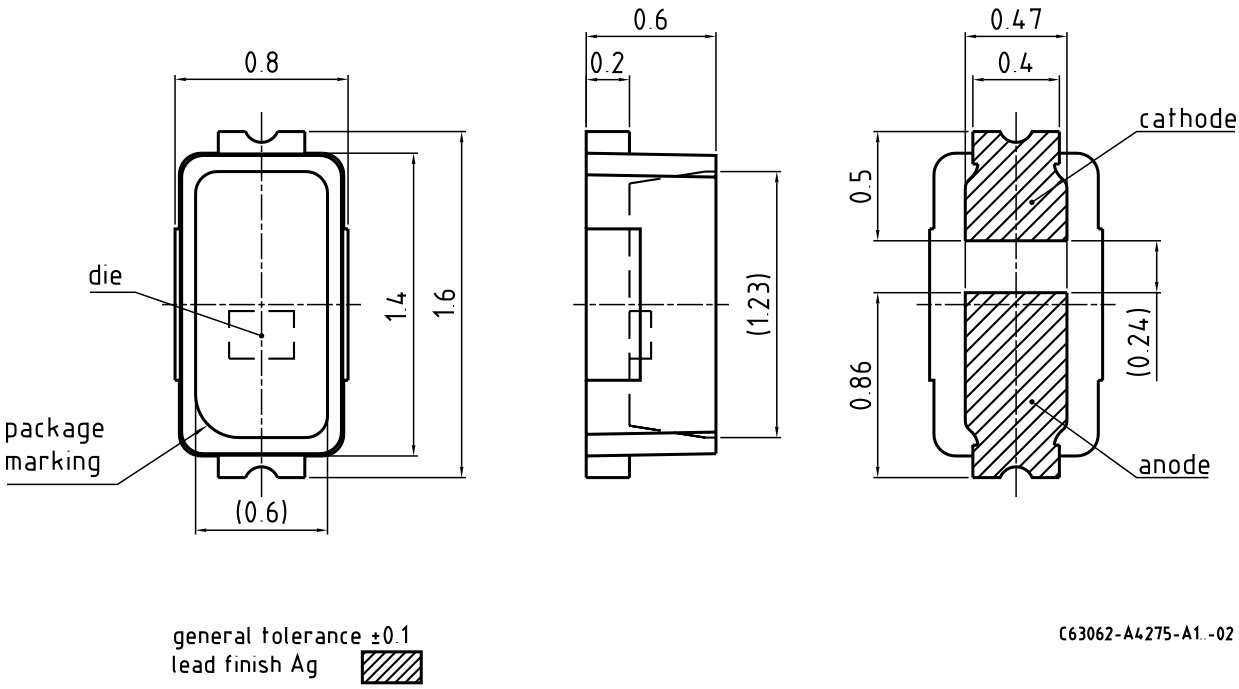


Permissible Pulse Handling Capability

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



Dimensional Drawing [8)]

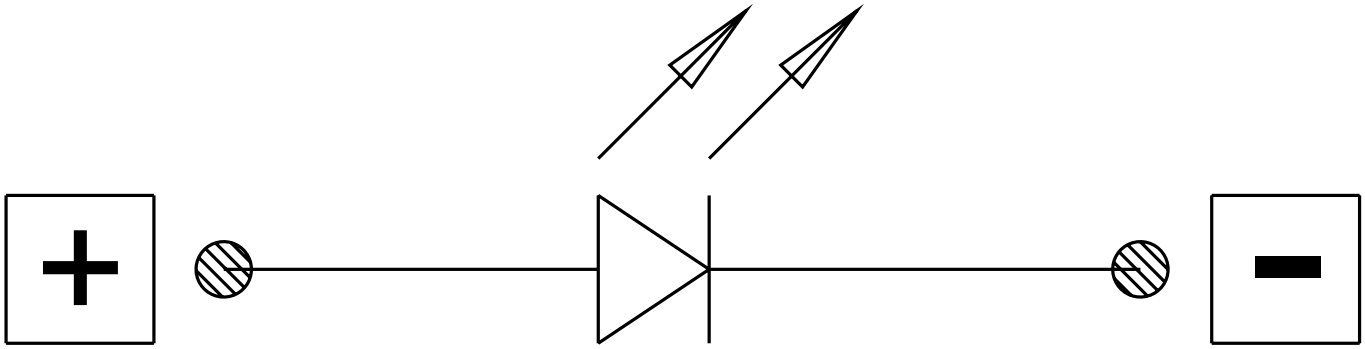


Approximate Weight: 2.0 mg

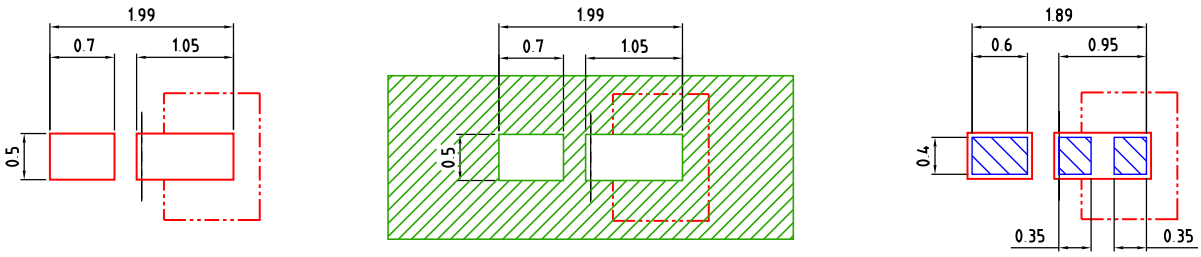
Package marking: Anode

Corrosion test: Class: 1B
Test condition: 25°C / 75 % RH / 200ppb SO_2, 200ppb NO_2, 10ppb H_2S, 10ppb Cl_2 / 21 days (EN 60068-2-60 (Method 4))

Electrical internal circuit



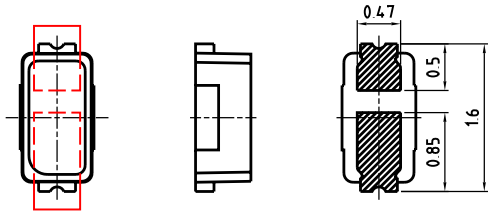
Recommended Solder Pad [8)]



foot print Cu area solder resist solder stencil

The usage of solder resist between anode and cathode pads is mandatory for applications where water may condense

Component Location on Pad



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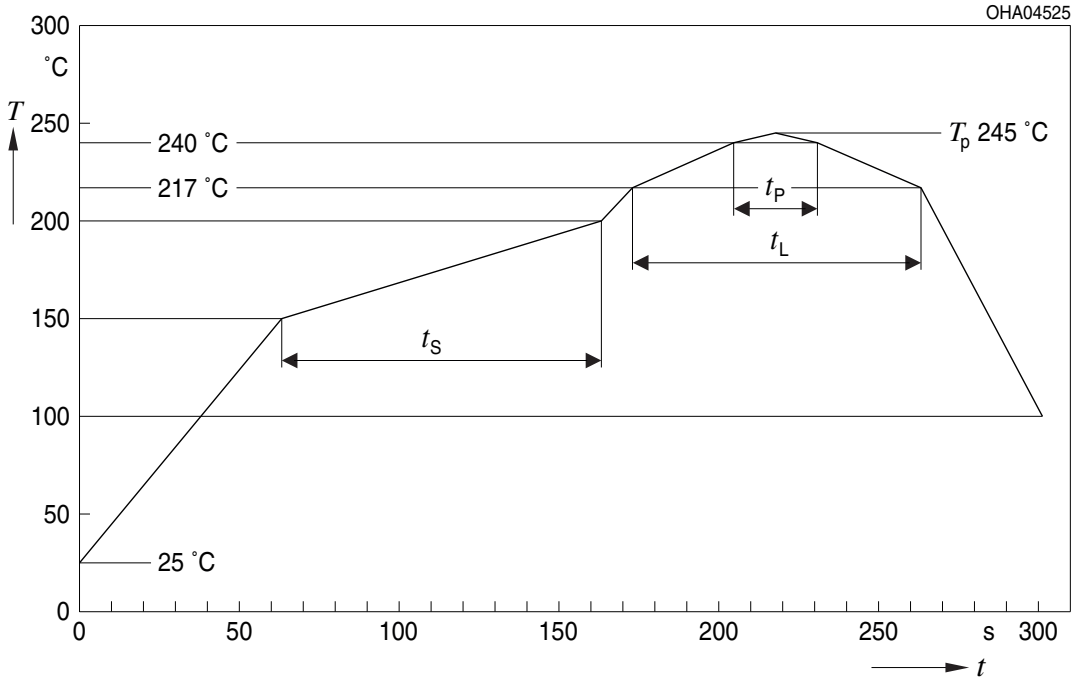
For superior solder joint connectivity results we recommend soldering under standard nitrogen atmosphere.

Reflow Soldering Profile

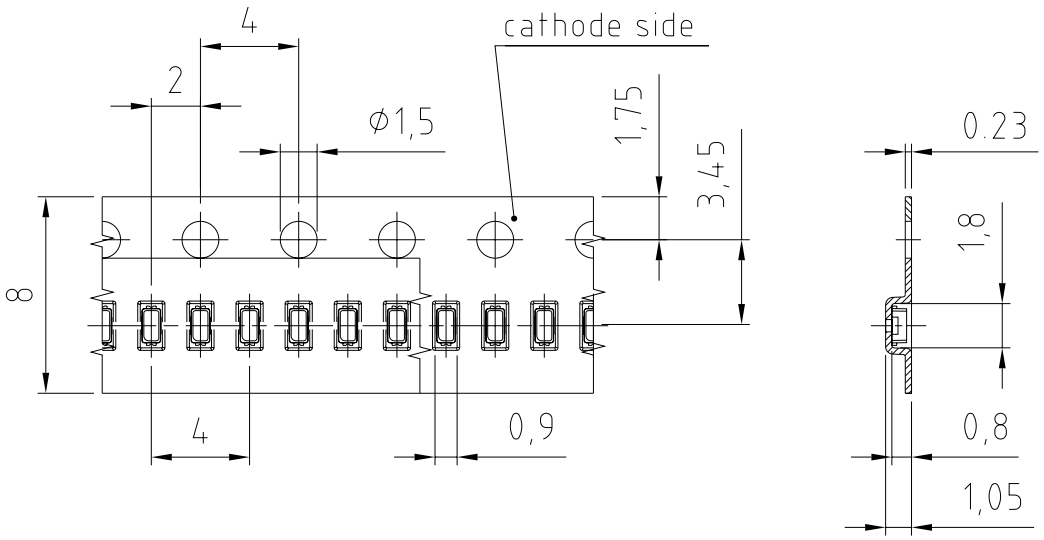
Product complies to MSL Level 3 acc. to JEDEC J-STD-020E



Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat*) 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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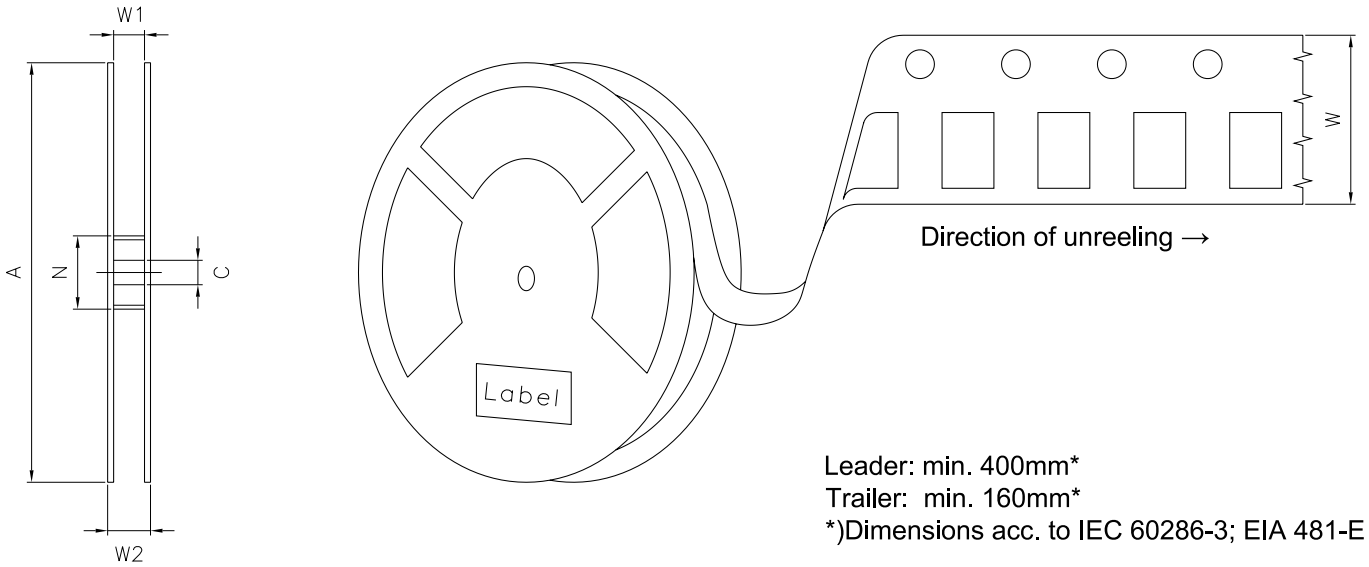
Tape and Reel [9)]

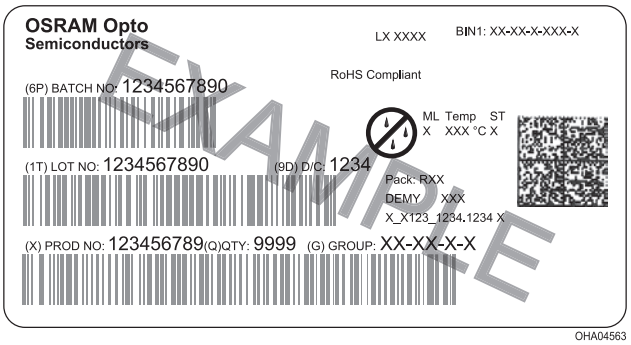


Leader: min. 400mm*
Trailer: min. 160mm*
*)Dimensions acc. to IEC 60286-3; EIA 481-E

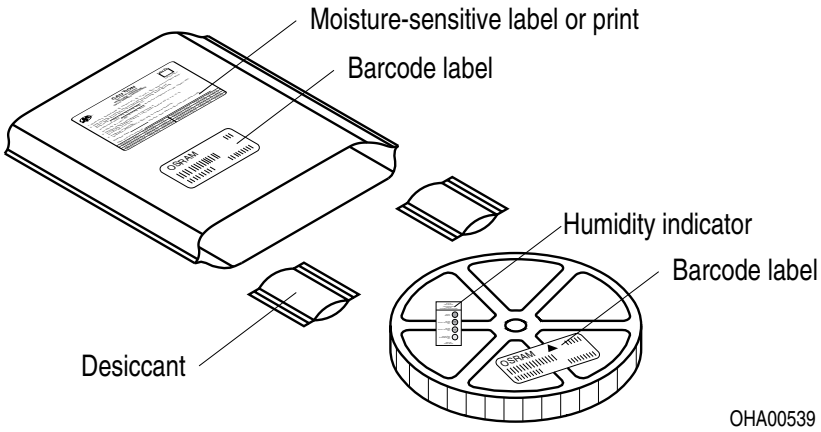
Reel dimensions [mm]

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	5000

Barcode-Product-Label (BPL)

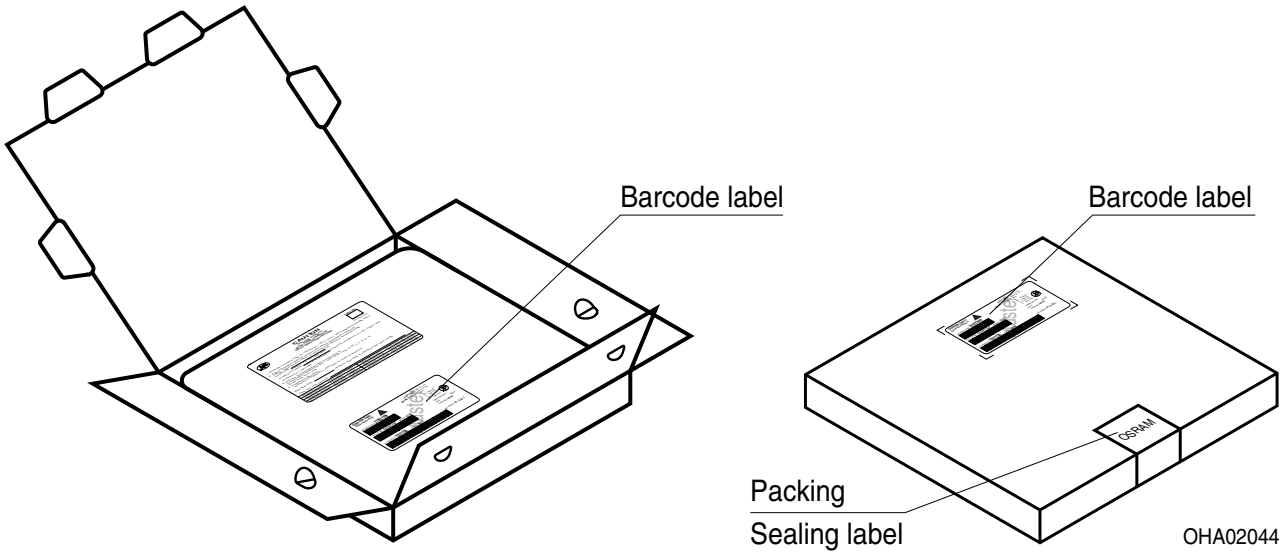


Dry Packing Process and Materials [8)]



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

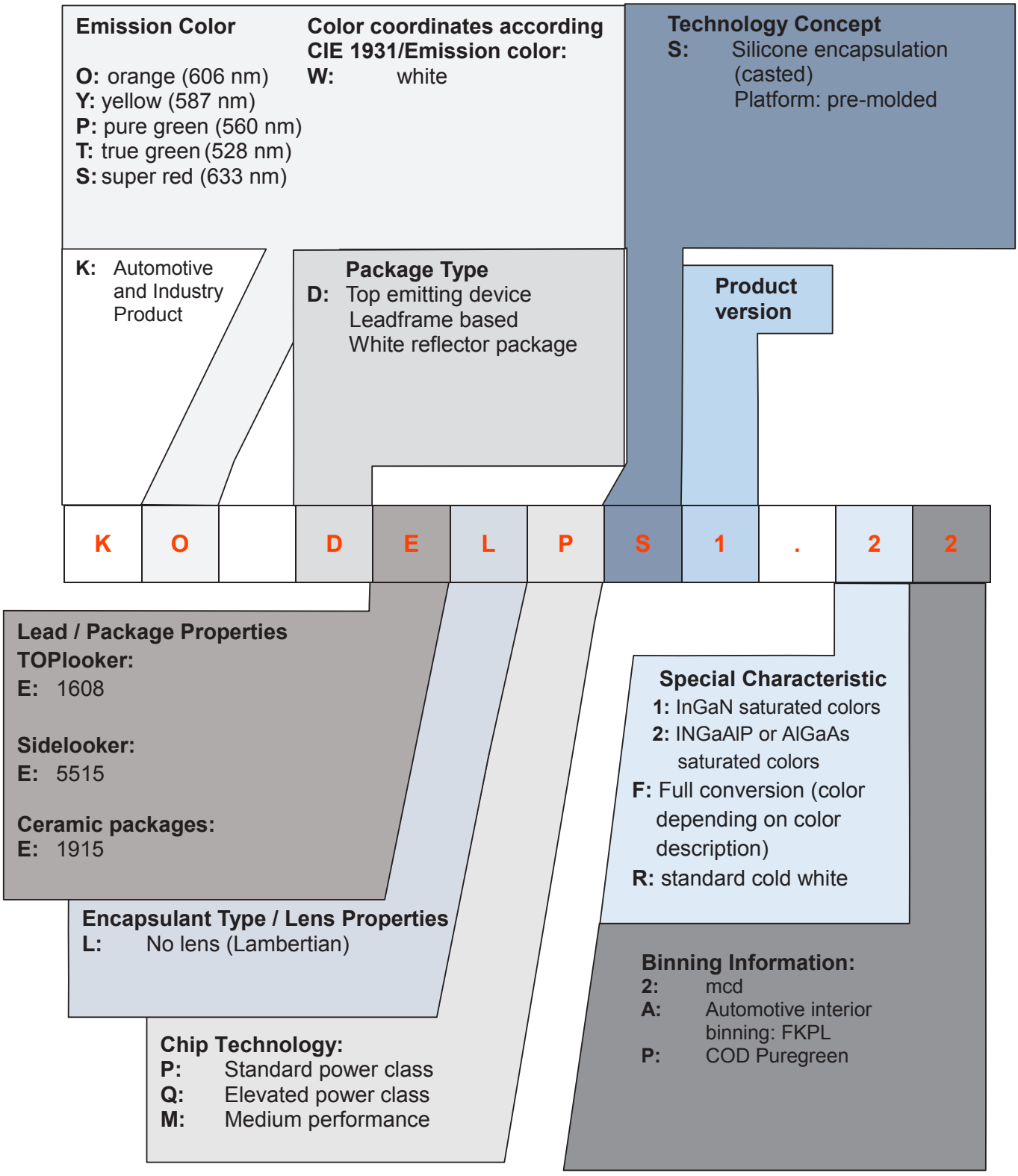
Transportation Packing and Materials [8)]



Dimensions of transportation box in mm

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

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

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EU RoHS and China RoHS compliant product

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按照中国的相关法规和标准，不含有毒有害物质或元素。