

LS E65B

Power TOPLED® Lens

PowerTOPLED with lens, a powerful member of the TOPLED family. Thanks to their high luminous efficacy, the LEDs are ideal for rear light clusters and indicators on vehicles and for display panels for traffic control systems.



Applications

- Interior Illumination (e.g. Ambient Map)
- Signalling
- Traffic Lights

Features:

- Package: white PLCC-4 package, colorless clear resin
- Chip technology: InGaAlP
- Typ. Radiation: 60°
- Color: $\lambda_{\text{dom}} = 633 \text{ nm}$ (● super red)
- Corrosion Robustness Class: 3B
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)

Ordering Information

| Type | Luminous Intensity ¹⁾ $I_F = 50 \text{ mA}$ I_v | Ordering Code |
|------------------|--|---------------|
| LS E65B-V1BB-1-1 | 710 ... 2800 mcd | Q65110A2762 |

Maximum Ratings

| Parameter | Symbol | | Values |
|--|-----------|------|--------|
| Operating Temperature | T_{op} | min. | -40 °C |
| | | max. | 100 °C |
| Storage Temperature | T_{stg} | min. | -40 °C |
| | | max. | 100 °C |
| Junction Temperature | T_j | max. | 125 °C |
| Forward current $T_s = 25\text{ °C}$ | I_F | max. | 70 mA |
| Surge Current $t \leq 10\text{ }\mu\text{s}$; $D = 0.005$; $T_s = 25\text{ °C}$ | I_{FS} | max. | 100 mA |
| Reverse voltage ²⁾ $T_s = 25\text{ °C}$ | V_R | max. | 12 V |
| ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2) | V_{ESD} | | 2 kV |

Characteristics

$I_F = 50 \text{ mA}$; $T_S = 25 \text{ }^\circ\text{C}$

| Parameter | Symbol | | Values |
|---|-------------------------------------|------|--------------------|
| Peak Wavelength ³⁾ | λ_{peak} | typ. | 645 nm |
| Dominant Wavelength ³⁾ $I_F = 50 \text{ mA}$ | λ_{dom} | min. | 627 nm |
| | | typ. | 633 nm |
| | | max. | 639 nm |
| Spectral Bandwidth at 50% $I_{\text{rel,max}}$ | $\Delta\lambda$ | typ. | 15 nm |
| Viewing angle at 50 % I_V | 2φ | typ. | 60 ° |
| Forward Voltage ⁴⁾ $I_F = 50 \text{ mA}$ | V_F | min. | 1.90 V |
| | | typ. | 2.20 V |
| | | max. | 2.50 V |
| Reverse current ²⁾ $V_R = 12 \text{ V}$ | I_R | typ. | 0.01 μA |
| | | max. | 10 μA |
| Temperature Coefficient of Peak Wavelength $-10^\circ\text{C} \leq T \leq 100^\circ\text{C}$ | $\text{TC}_{\lambda_{\text{peak}}}$ | typ. | 0.15 nm / K |
| Temperature Coefficient of Dominant Wavelength $-10^\circ\text{C} \leq T \leq 100^\circ\text{C}$ | $\text{TC}_{\lambda_{\text{dom}}}$ | typ. | 0.05 nm / K |
| Temperature Coefficient of Forward Voltage $-10^\circ\text{C} \leq T \leq 100^\circ\text{C}$ | TC_{V_F} | typ. | -3.4 mV / K |
| Real thermal resistance junction/solderpoint ⁵⁾ | $R_{\text{thJS real}}$ | typ. | 110 K / W |
| | | max. | 130 K / W |

Brightness Groups

| Group | Luminous Intensity ¹⁾ $I_F = 50 \text{ mA}$ min. I_v | Luminous Intensity. ¹⁾ $I_F = 50 \text{ mA}$ max. I_v | Luminous Flux ⁶⁾ $I_F = 50 \text{ mA}$ typ. Φ_v |
|-------|--|---|--|
| V1 | 710 mcd | 900 mcd | 1020 mlm |
| V2 | 900 mcd | 1120 mcd | 1280 mlm |
| AA | 1120 mcd | 1400 mcd | 1590 mlm |
| AB | 1400 mcd | 1800 mcd | 2020 mlm |
| BA | 1800 mcd | 2240 mcd | 2560 mlm |
| BB | 2240 mcd | 2800 mcd | 3190 mlm |

Forward Voltage Groups

| Group | Forward Voltage ⁴⁾ $I_F = 50 \text{ mA}$ min. V_F | Forward Voltage ⁴⁾ $I_F = 50 \text{ mA}$ max. V_F |
|-------|---|---|
| 3 | 1.90 V | 2.20 V |
| 4 | 2.20 V | 2.50 V |

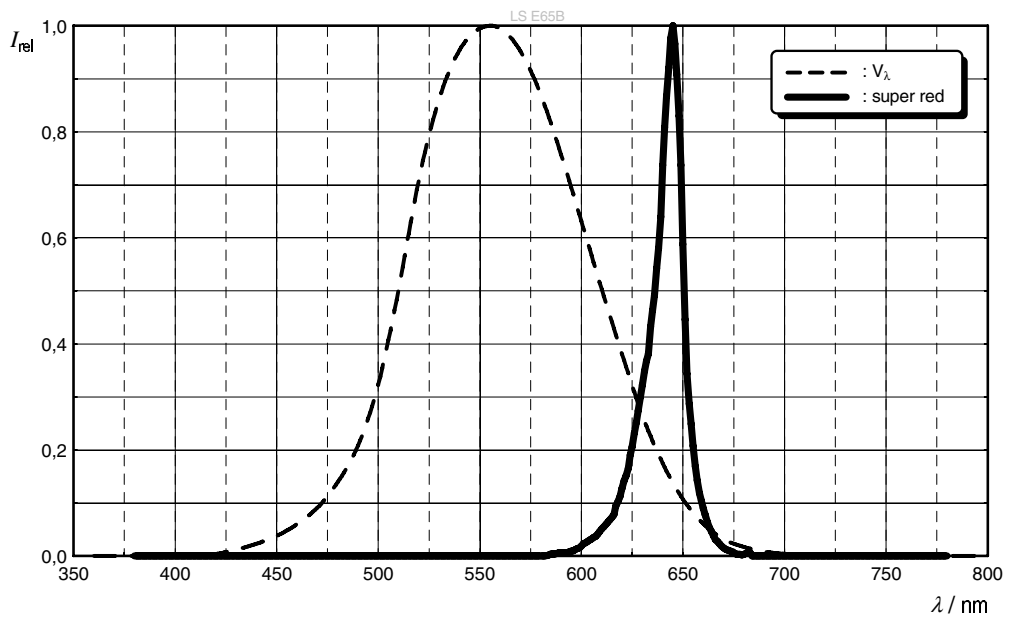
Group Name on Label

Example: AA-1-3

| Brightness | Wavelength | Forward Voltage |
|------------|------------|-----------------|
| AA | 1 | 3 |

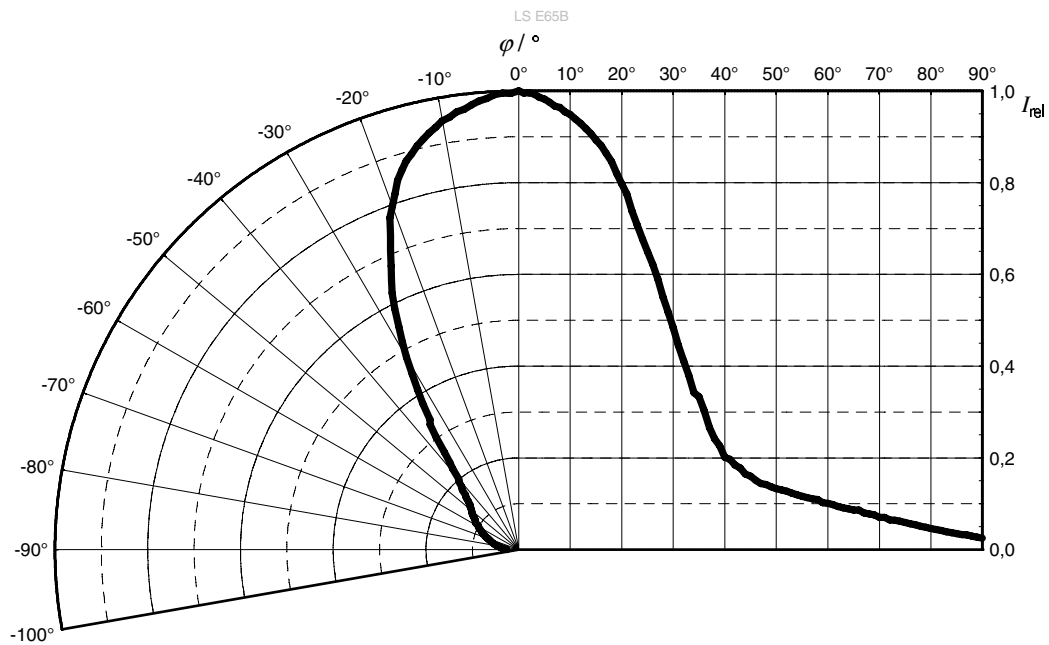
Relative Spectral Emission ⁶⁾

$I_{rel} = f(\lambda); I_F = 50 \text{ mA}; T_S = 25 \text{ }^\circ\text{C}$



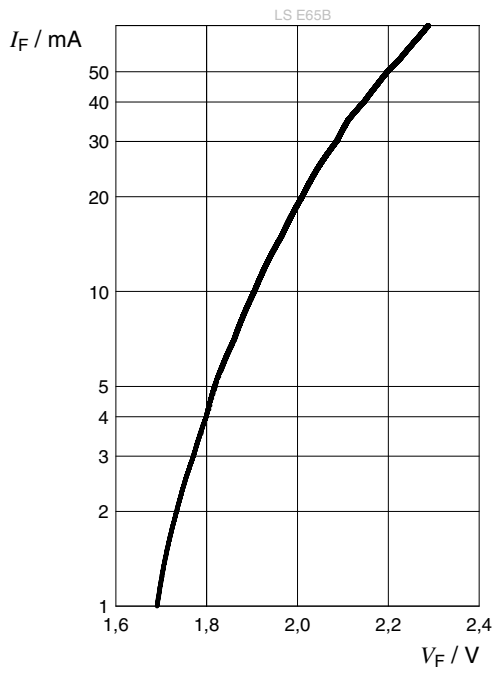
Radiation Characteristics ⁶⁾

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



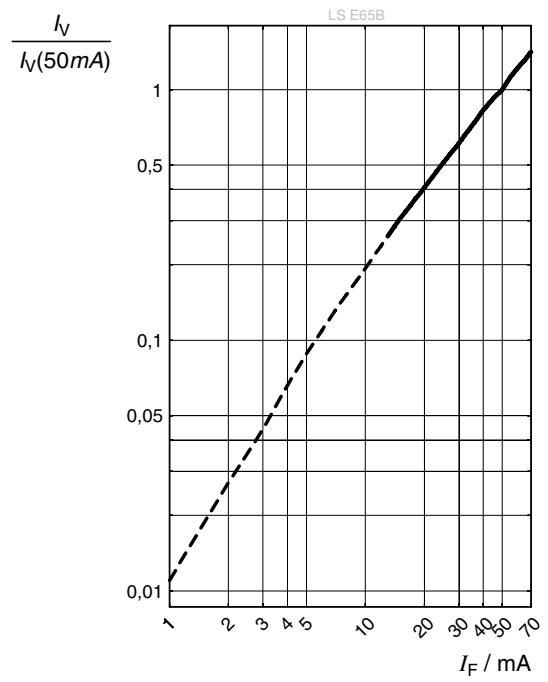
Forward current ^{6), 7)}

$I_F = f(V_F); T_S = 25\text{ °C}$



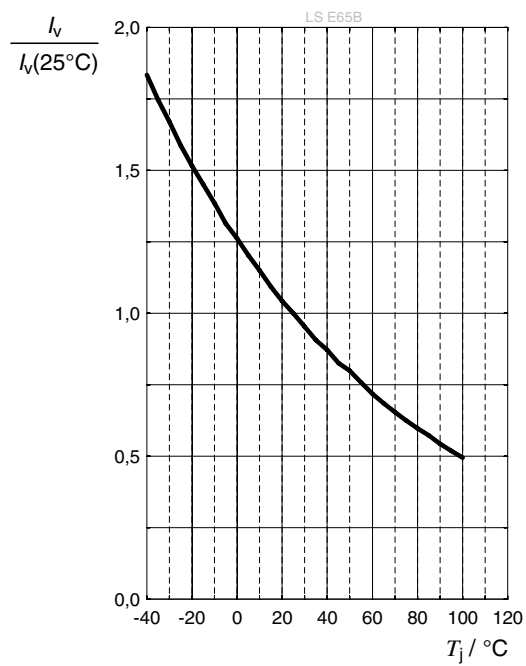
Relative Luminous Intensity ^{6), 7)}

$I_V / I_V(50 mA) = f(I_F); T_S = 25\text{ °C}$



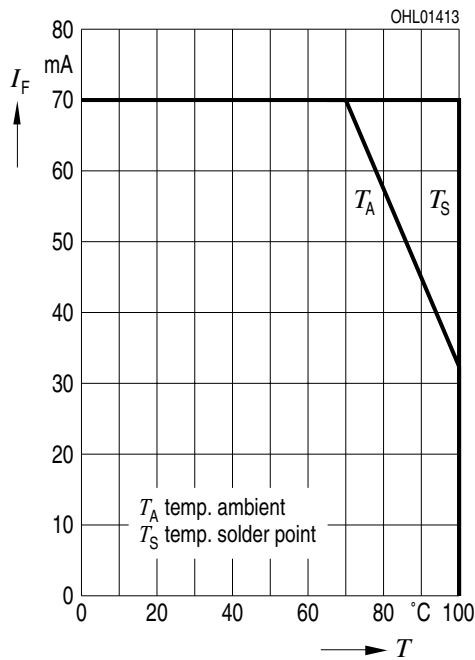
Relative Luminous Intensity ⁶⁾

$$I_V/I_V(25\text{ °C}) = f(T_j); I_F = 50\text{ mA}$$



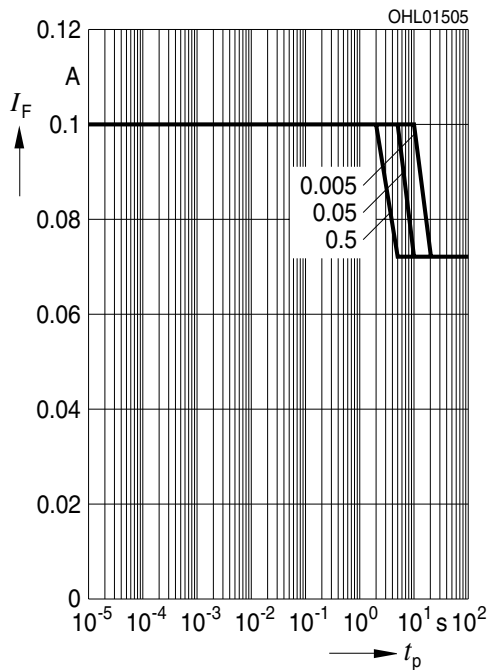
Max. Permissible Forward Current

$I_F = f(T)$



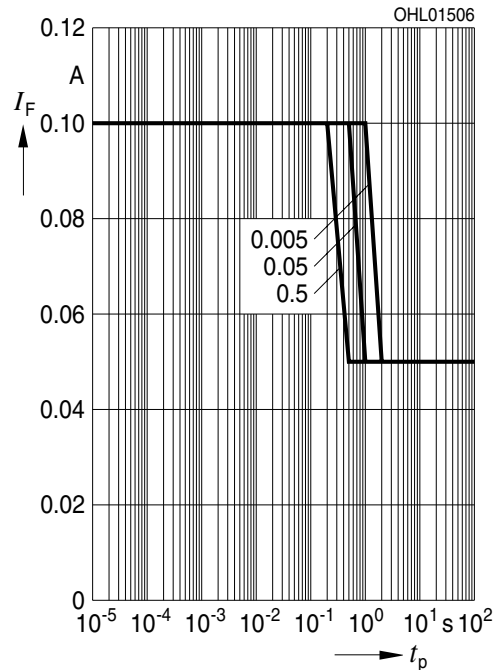
Permissible Pulse Handling Capability

$I_F = f(t_p)$; D: Duty cycle; $T_A = 25$ °C

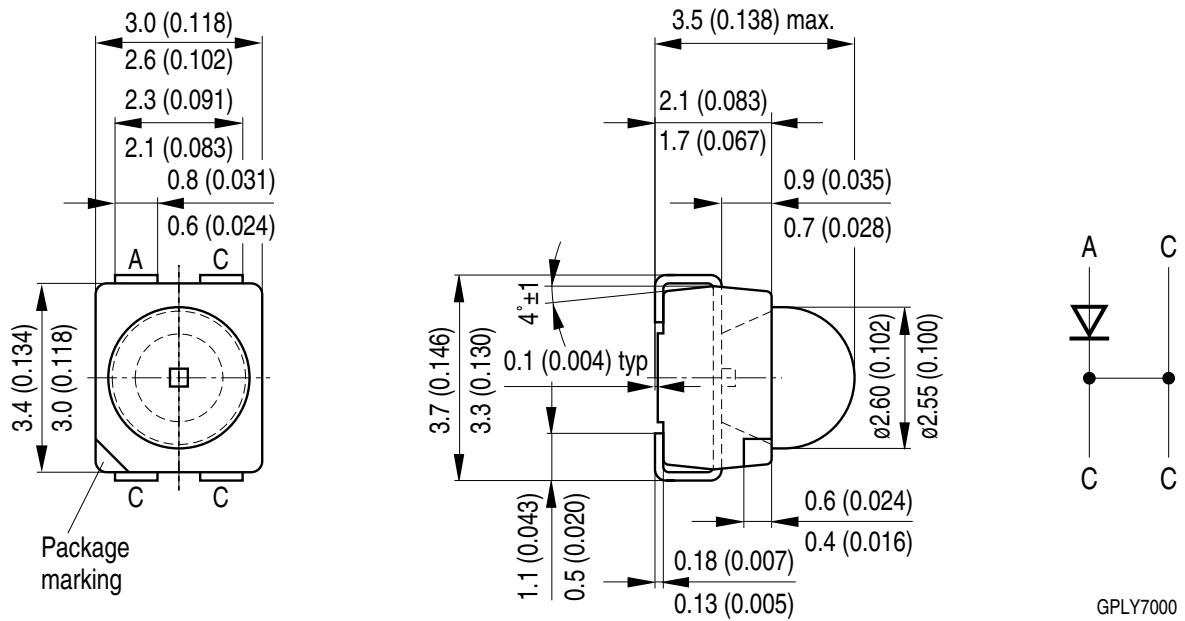


Permissible Pulse Handling Capability

$I_F = f(t_p)$; D: Duty cycle; $T_A = 85$ °C



Dimensional Drawing ⁸⁾

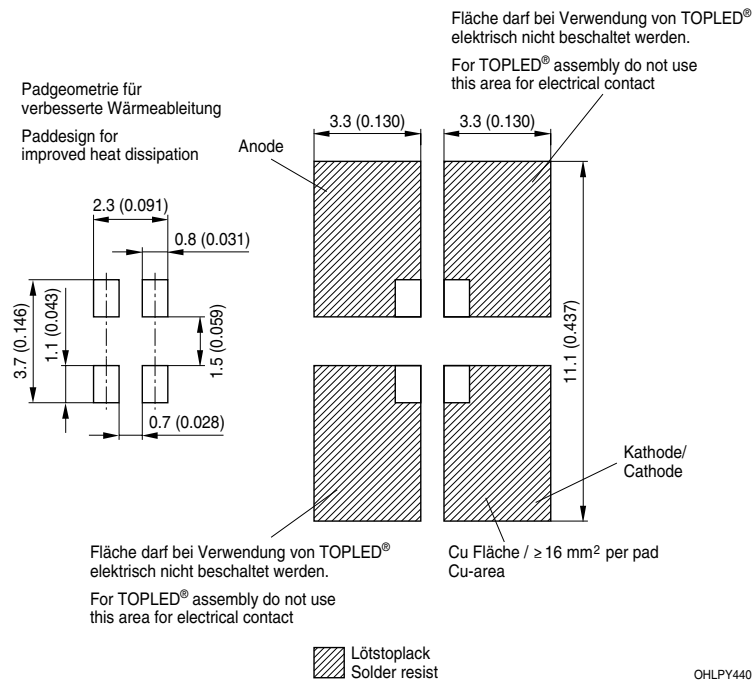


Approximate Weight: 38.0 mg

Package marking: Cathode

Corrosion test: Class: 3B
 Test condition: 40°C / 90 % RH / 15 ppm H₂S / 14 days (stricter than IEC 60068-2-43)

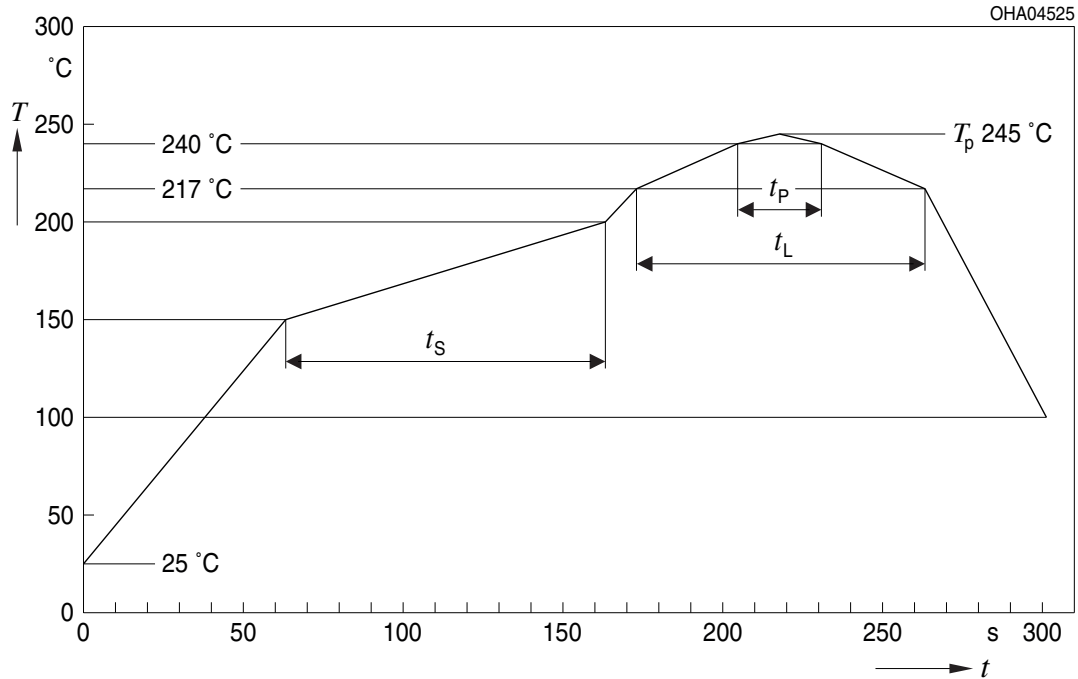
Recommended Solder Pad ⁸⁾



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

Reflow Soldering Profile

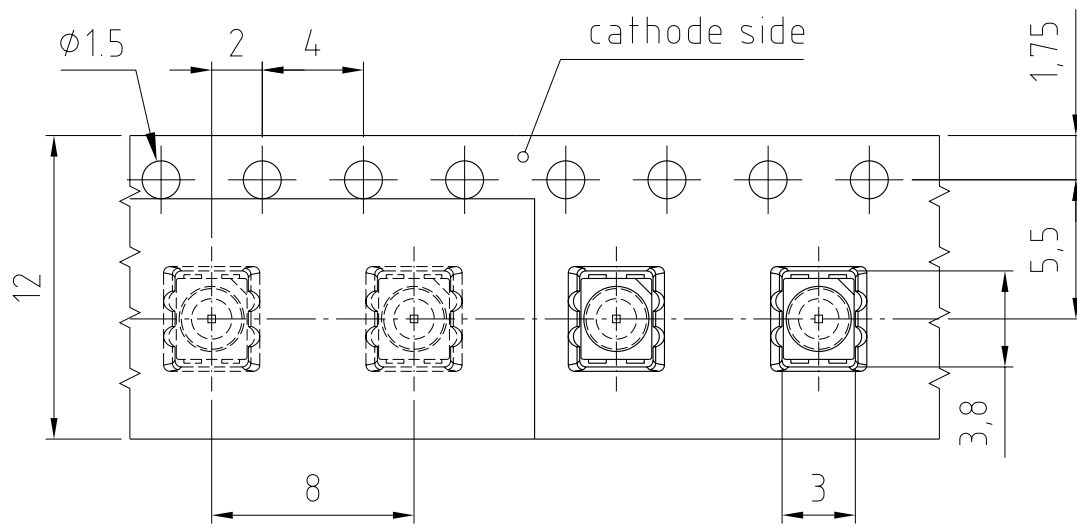
Product complies to MSL Level 2 acc. to JEDEC J-STD-020E



| 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 | 250 | °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 | 4 | K/s |
| Time 25 °C to T_p | | | | 480 | s |

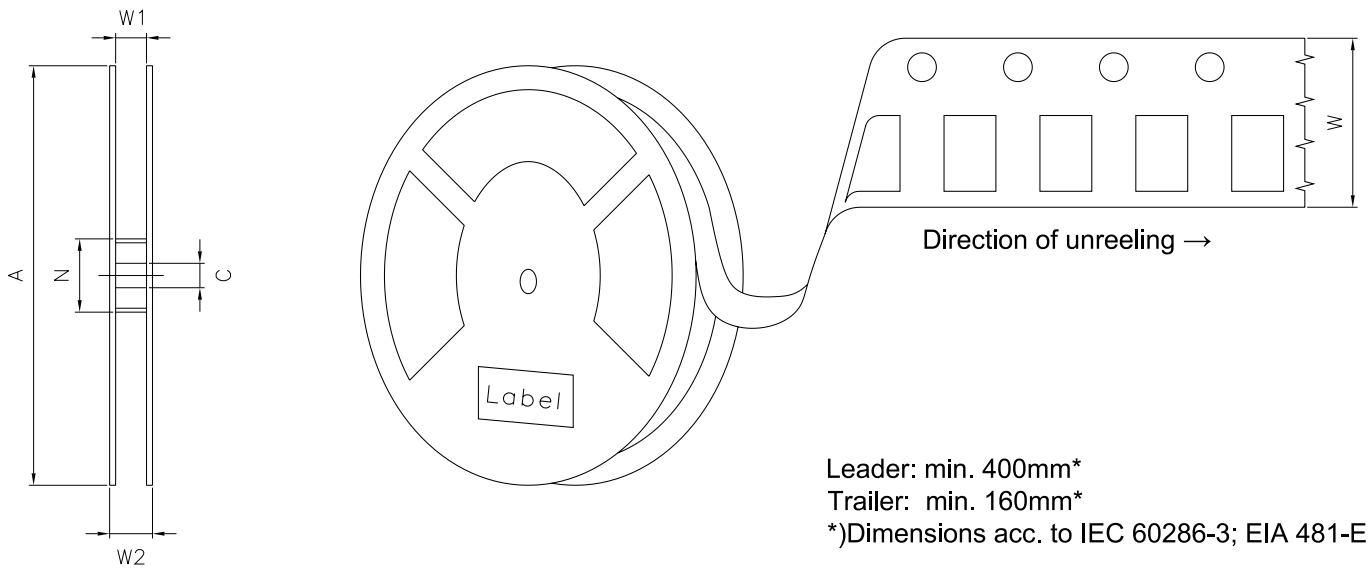
All temperatures refer to the center of the package, measured on the top of the component
 *) slope calculation DT/Dt : Dt max. 5 s; fulfillment for the whole T-range

Taping ⁸⁾



C63062-A3533-B01-02

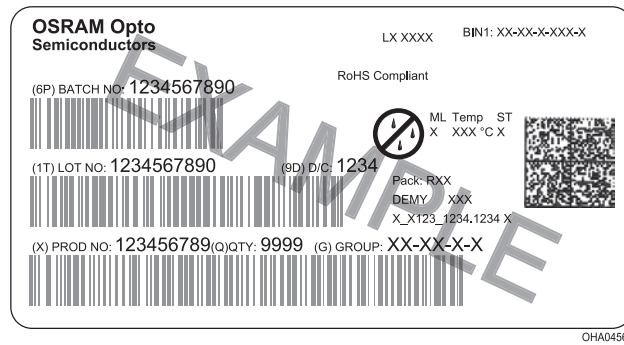
Tape and Reel ⁹⁾



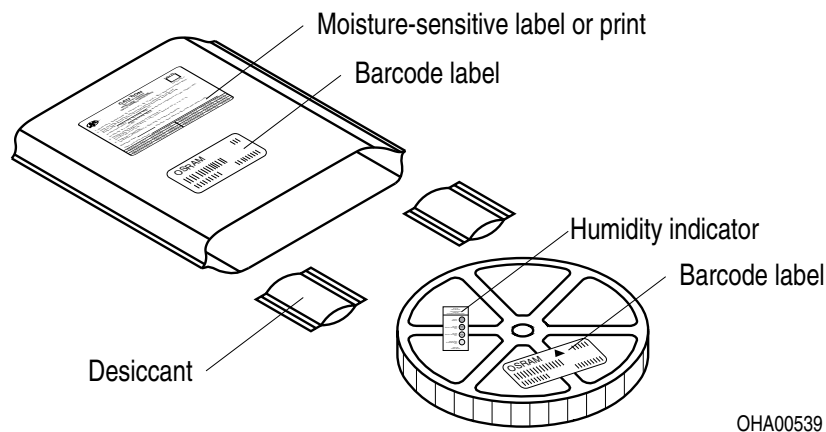
Reel dimensions [mm]

| A | W | N _{min} | W ₁ | W _{2max} | Pieces per PU |
|--------|------------------|------------------|----------------|-------------------|---------------|
| 330 mm | 12 + 0.3 / - 0.1 | 60 | 12.4 + 2 | 18.4 | 2000 |

Barcode-Product-Label (BPL)

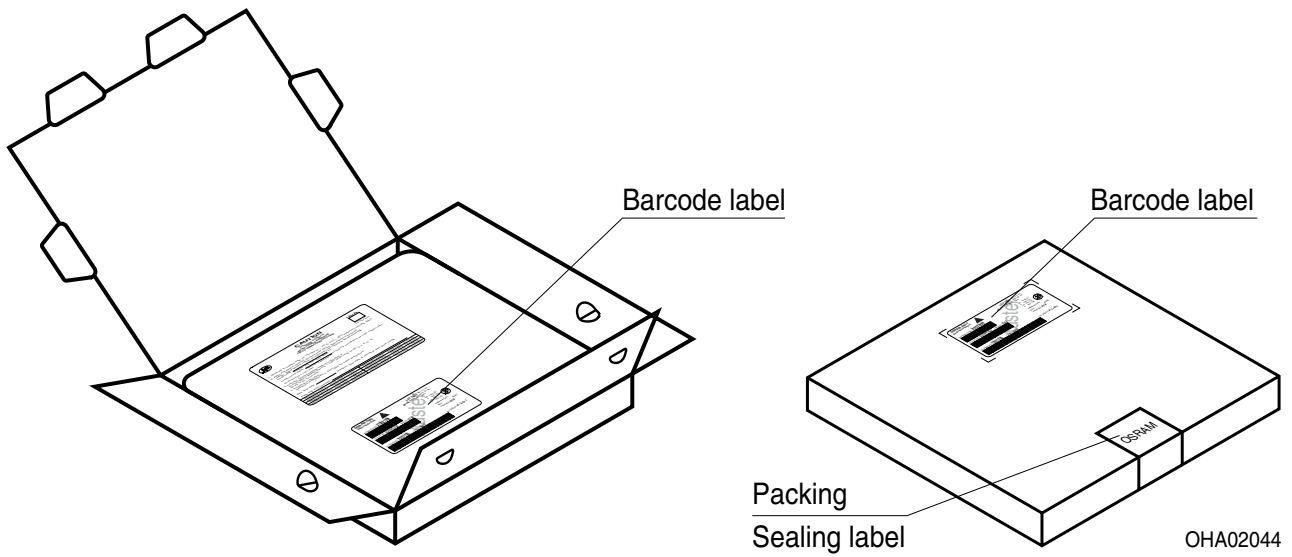


Dry Packing Process and Materials ⁸⁾



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

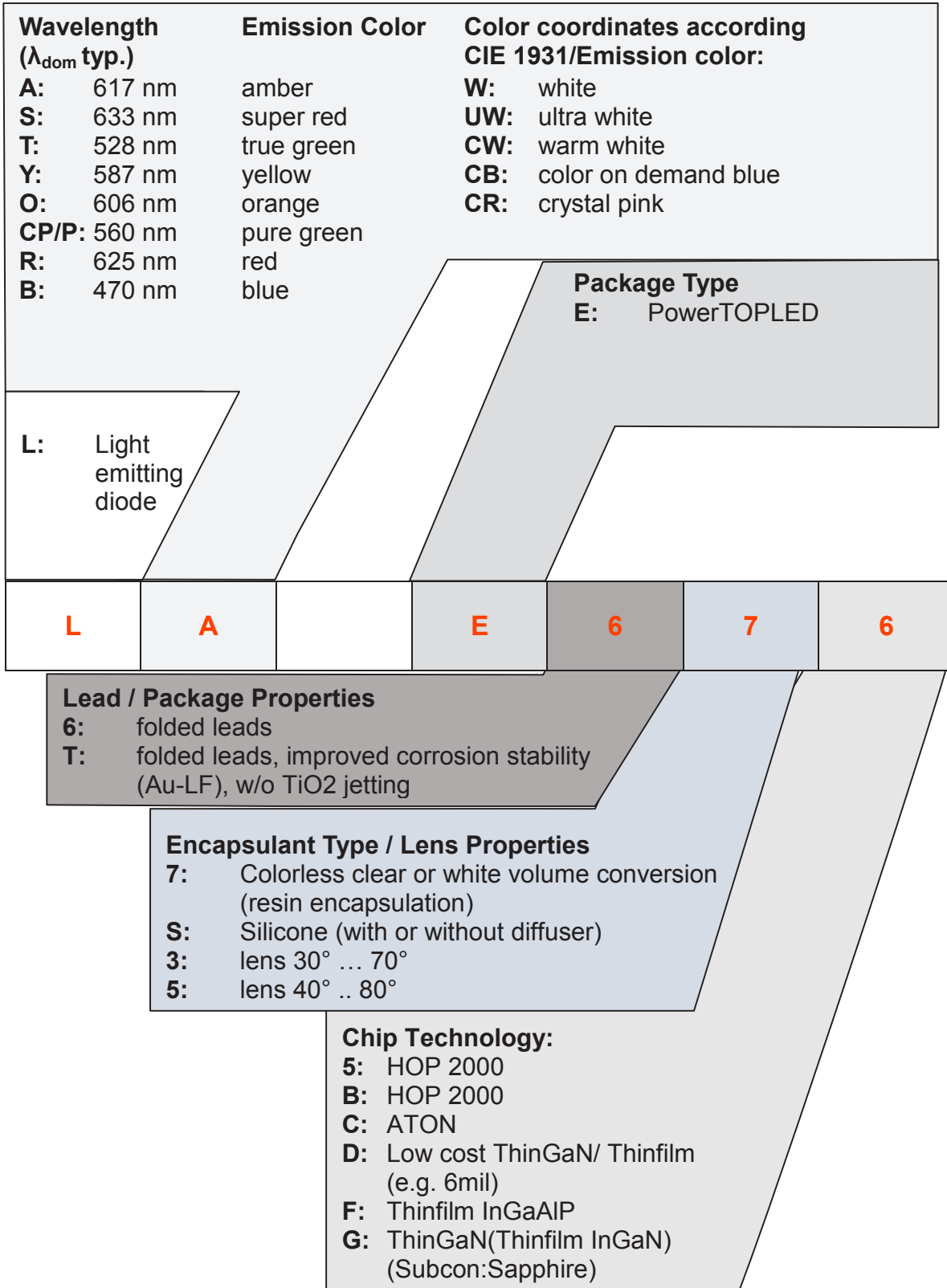
Transportation Packing and Materials ⁸⁾



Dimensions of transportation box in mm

| Width | Length | Height |
|------------|------------|-----------|
| 349 ± 5 mm | 349 ± 5 mm | 33 ± 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 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 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!

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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 $\pm 8\%$ 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 ± 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:** $R_{th\ max}$ is based on statistic values (6σ).
- 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 ± 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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