

# SFH 4258S

## Power TOPLED® Lens

High Power Infrared Emitter (850 nm)



## Applications

- Electronic Equipment
- Industrial Automation (Machine controls, Light barriers, Vision controls)
- Remote Control, Proximity, Ambient Light Sensing
- Safety systems and CCTV

## Features:

- Package: Epoxy, diffuse
- 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)
- High Power Infrared LED
- Double stack emitter
- Half angle:  $\pm 15^\circ$
- High forward current allowed at high temperature

## Ordering Information

| Type      | Radiant intensity <sup>1)</sup><br>$I_F = 100 \text{ mA}; t_p = 20 \text{ ms}$<br>$I_e$ | Radiant intensity <sup>1)</sup><br>typ.<br>$I_F = 100 \text{ mA}; t_p = 20 \text{ ms}$<br>$I_e$ | Ordering Code |
|-----------|---|---|---------------|
| SFH 4258S | 80 ... 400 mW/sr  | 185 mW/sr   | Q65111A1158   |

## Maximum Ratings

 $T_A = 25\text{ °C}$ 

| Parameter  | Symbol    |      | Values |
|--|-----------|------|--------|
| Operating temperature  | $T_{op}$  | min. | -40 °C |
|  |           | max. | 100 °C |
| Storage temperature  | $T_{stg}$ | min. | -40 °C |
|  |           | max. | 100 °C |
| Reverse voltage <sup>2)</sup>  | $V_R$     | max. | 12 V   |
| Forward current  | $I_F$     | max. | 100 mA |
| Surge current<br>$t_p \leq 300\ \mu\text{s}; D = 0$                    | $I_{FSM}$ | max. | 0.7 A  |
| Power consumption  | $P_{tot}$ | max. | 245 mW |
| ESD withstand voltage<br>acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2) | $V_{ESD}$ | max. | 2 kV   |

## Characteristics

$I_F = 100 \text{ mA}$ ;  $t_p = 20 \text{ ms}$ ;  $T_A = 25 \text{ °C}$

| Parameter   | Symbol                      |              | Values                                 |
|---|-----------------------------|--------------|--|
| Peak wavelength   | $\lambda_{\text{peak}}$     | typ.         | 860 nm                                 |
| Centroid wavelength   | $\lambda_{\text{centroid}}$ | typ.         | 850 nm                                 |
| Spectral bandwidth at 50% $I_{\text{rel,max}}$  | $\Delta\lambda$             | typ.         | 30 nm                                  |
| Half angle  | $\varphi$                   | typ.         | 15 °                                   |
| Dimensions of active chip area  | L x W                       | typ.         | 0.3 x 0.3<br>mm x mm                   |
| Rise time (10% / 90%)<br>$I_F = 100 \text{ mA}$ ; $R_L = 50 \text{ } \Omega$                | $t_r$                       | typ.         | 15 ns                                  |
| Fall time (10% / 90%)<br>$I_F = 100 \text{ mA}$ ; $R_L = 50 \text{ } \Omega$                | $t_f$                       | typ.         | 15 ns                                  |
| Forward voltage   | $V_F$                       | typ.<br>max. | 3.1 V<br>3.6 V                         |
| Forward voltage<br>$I_F = 700 \text{ mA}$ ; $t_p = 100 \text{ } \mu\text{s}$                | $V_F$                       | typ.<br>max. | 4 V<br>5.2 V                           |
| Reverse current <sup>2)</sup><br>$V_R = 5 \text{ V}$  | $I_R$                       | max.<br>typ. | 10 $\mu\text{A}$<br>0.01 $\mu\text{A}$ |
| Total radiant flux <sup>3)</sup>  | $\Phi_e$                    | typ.         | 115 mW                                 |
| Radiant intensity <sup>1)</sup><br>$I_F = 700 \text{ mA}$ ; $t_p = 25 \text{ } \mu\text{s}$ | $I_e$                       | typ.         | 970 mW/sr                              |
| Temperature coefficient of brightness   | $TC_I$                      | typ.         | -0.5 % / K                             |
| Temperature coefficient of voltage  | $TC_V$                      | typ.         | -2 mV / K                              |
| Temperature coefficient of wavelength   | $TC_\lambda$                | typ.         | 0.3 nm / K                             |
| Thermal resistance junction ambient real <sup>4)</sup>                                      | $R_{\text{thJA}}$           | max.         | 300 K / W                              |
| Thermal resistance junction solder point real <sup>5)</sup>                                 | $R_{\text{thJS}}$           | max.         | 140 K / W                              |

## Brightness Groups

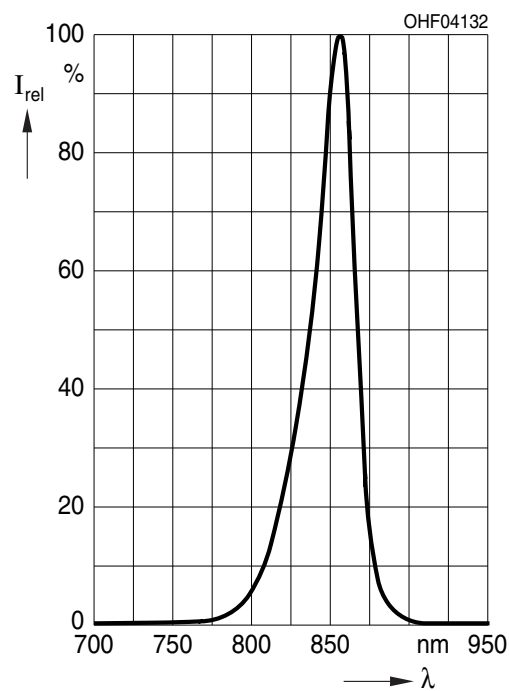
$T_A = 25\text{ °C}$

| Group | Radiant intensity<br>$I_F = 100\text{ mA}; t_p = 20\text{ ms}$<br>min.<br>$I_e$ | Radiant intensity<br>$I_F = 100\text{ mA}; t_p = 20\text{ ms}$<br>max.<br>$I_e$ |
|-------|---|---|
| V2    | 80 mW/sr  | 125 mW/sr   |
| AW    | 100 mW/sr   | 200 mW/sr   |
| BW    | 160 mW/sr   | 320 mW/sr   |
| CW1   | 250 mW/sr   | 400 mW/sr   |

Only one group in one packing unit (variation lower 2:1).

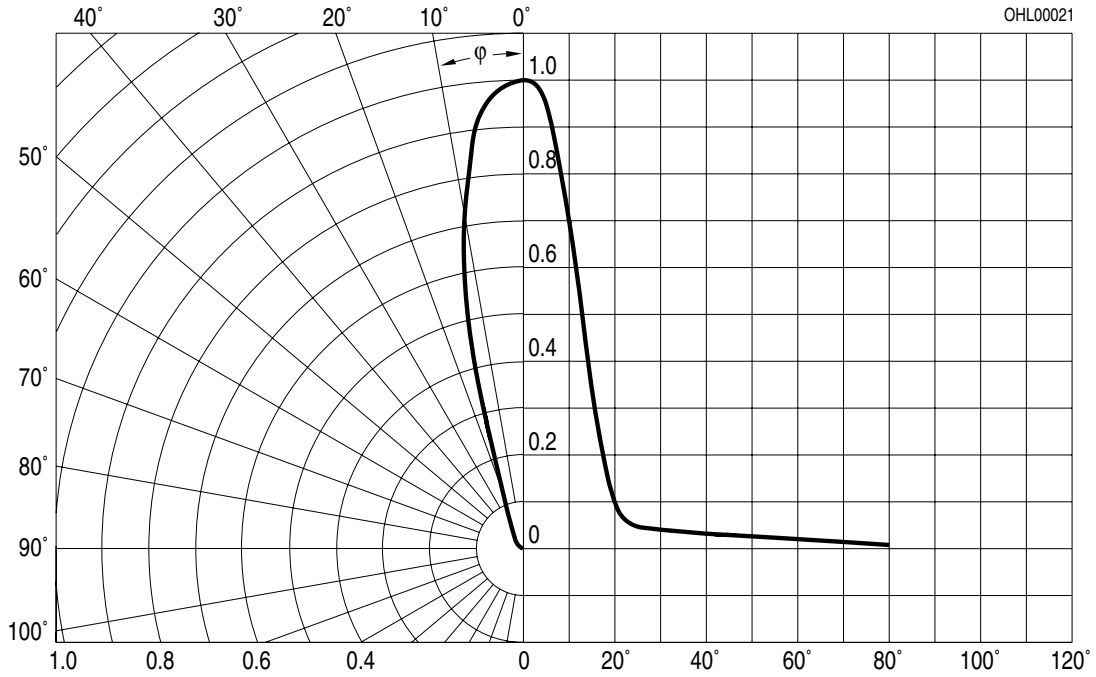
## Relative Spectral Emission <sup>6), 7)</sup>

$I_{rel} = f(\lambda); I_F = 100\text{ mA}; t_p = 20\text{ ms}$



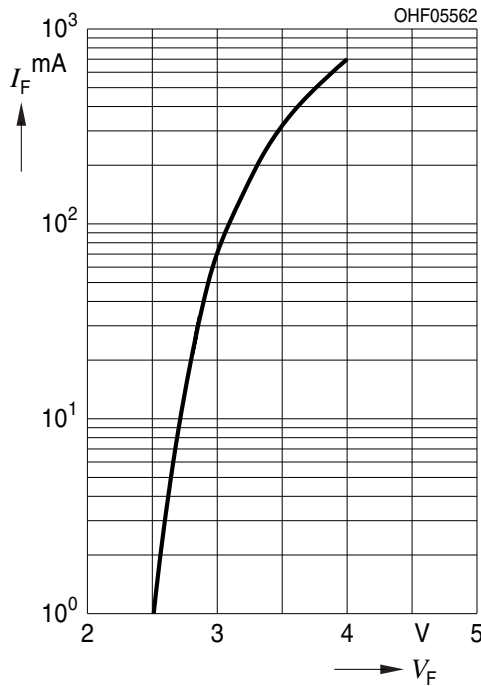
**Radiation Characteristics** (6), 7)

$I_{rel} = f(\varphi)$



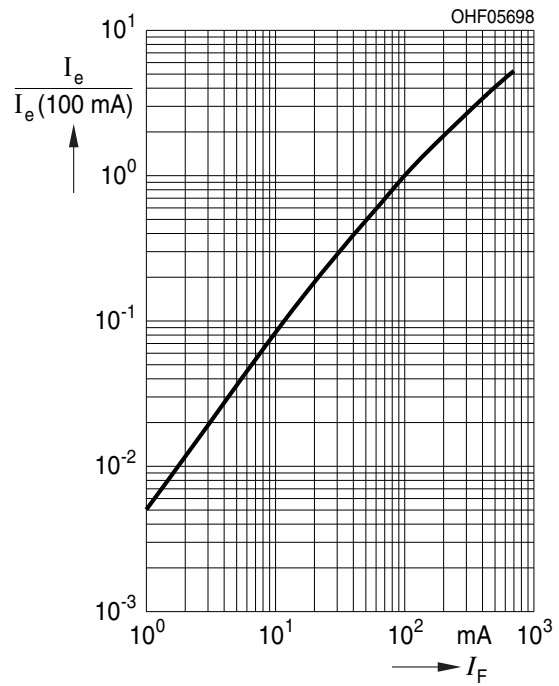
**Forward current** (6), 7)

$I_F = f(V_F)$ ; single pulse;  $t_p = 100 \mu s$



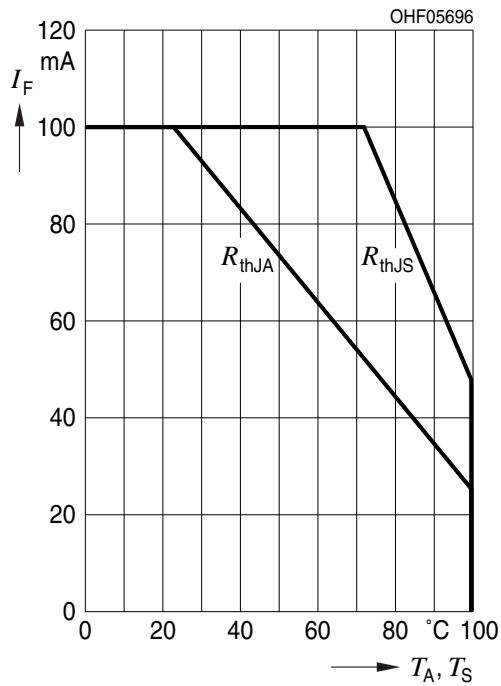
**Relative Radiant Intensity** (6), 7)

$I_e/I_e(100mA) = f(I_F)$ ; single pulse;  $t_p = 25 \mu s$



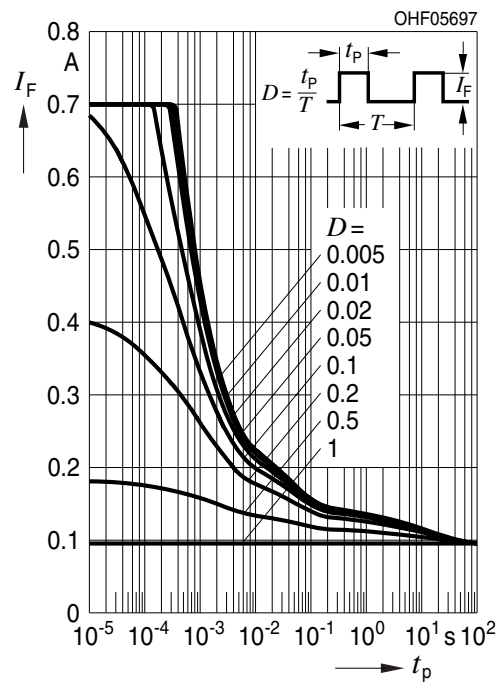
### Max. Permissible Forward Current

$I_{F,max} = f(T_A), R_{THJA} = 300 \text{ K/W}, R_{THJS} = 140 \text{ K/W}$



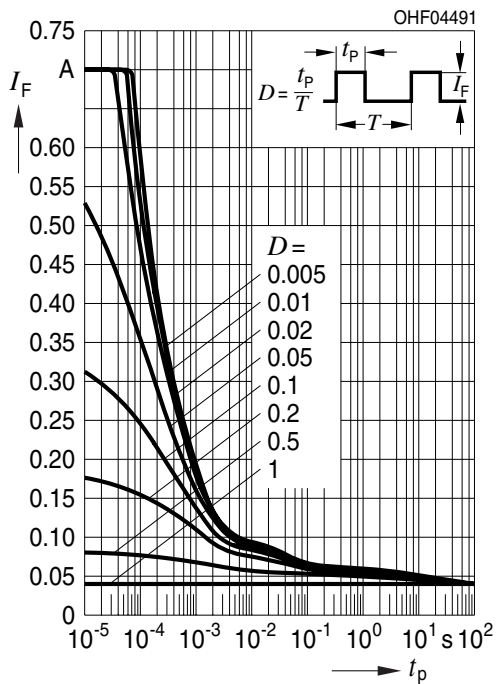
### Permissible Pulse Handling Capability

$I_F = f(t_p); \text{ duty cycle } D = \text{parameter}; T_A = 25^\circ\text{C}$

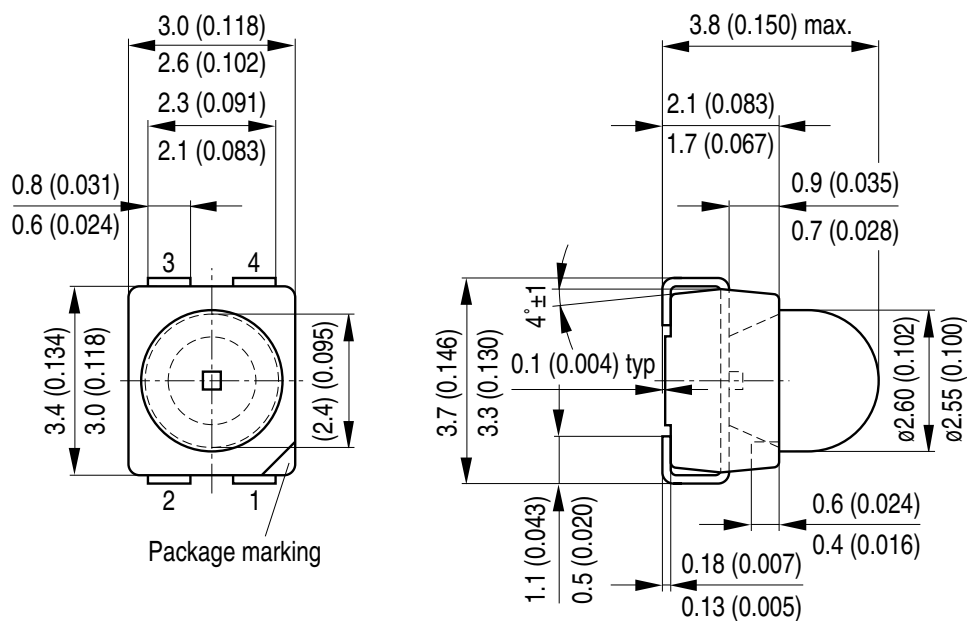


### Permissible Pulse Handling Capability

$I_F = f(t_p); \text{ duty cycle } D = \text{parameter}; T_A = 85^\circ\text{C}$



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



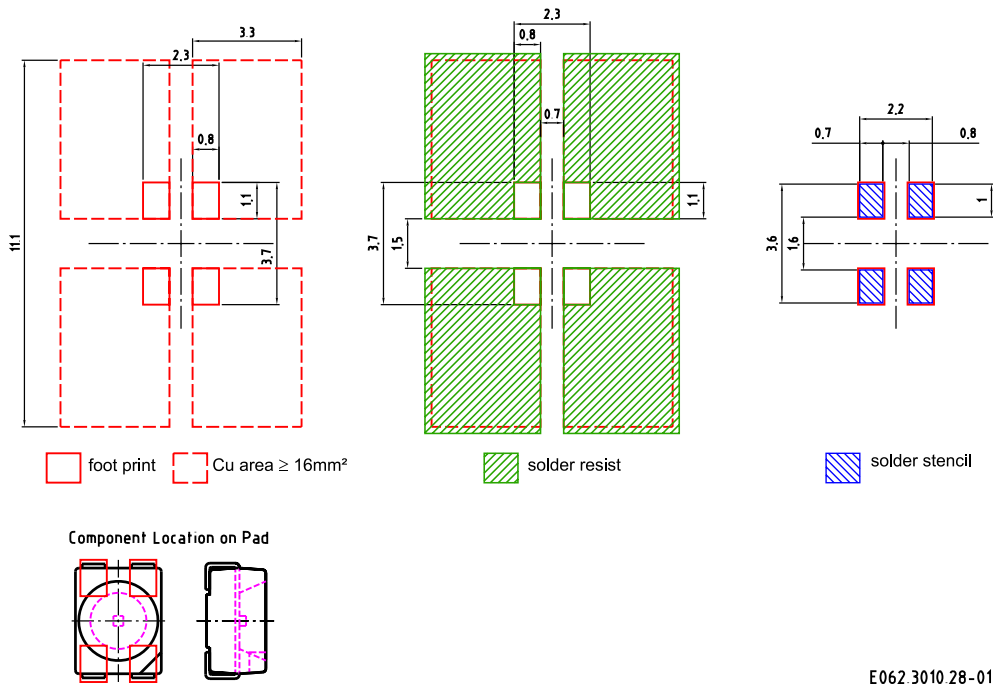
GPLY6127

**Approximate Weight:** 37.0 mg

**Package marking:** Cathode

| Pin | Description |
|-----|-------------|
| 1   | Cathode     |
| 2   | Anode       |
| 3   | Anode       |
| 4   | Anode       |

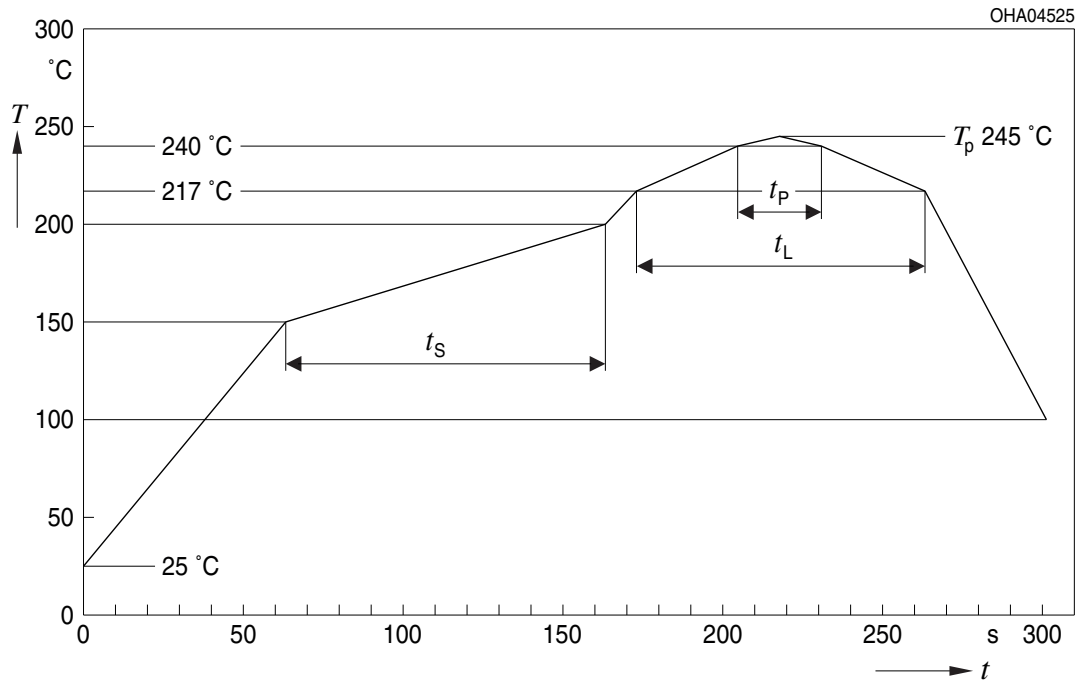
## Recommended Solder Pad <sup>8)</sup>



E062.3010.28-01

## Reflow Soldering Profile

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

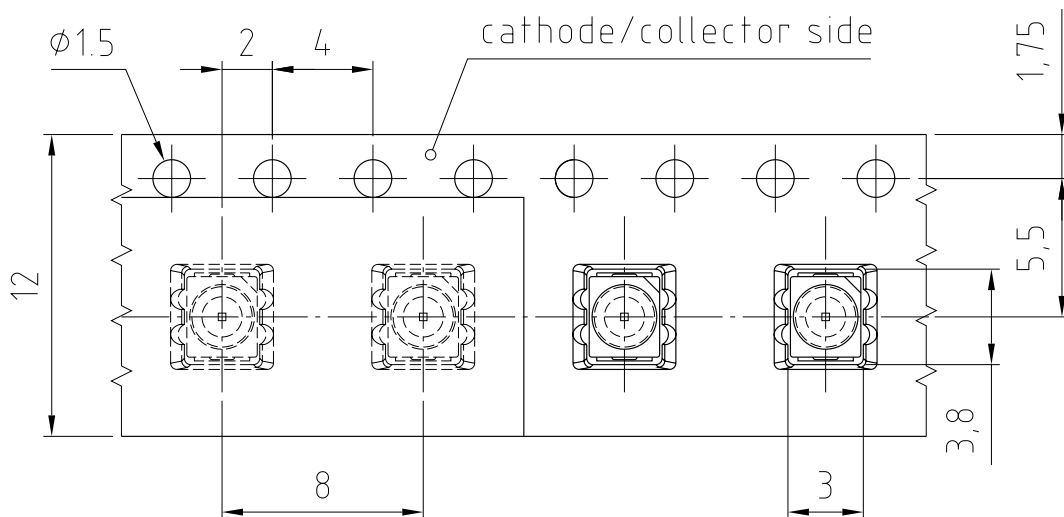




| Profile Feature   | Symbol | Pb-Free (SnAgCu) Assembly |                |         | Unit |
|---|--------|---------------------------|----------------|---------|------|
|   |        | Minimum                   | Recommendation | Maximum |      |
| Ramp-up rate to preheat*)<br>25 °C to 150 °C                      |        |                           | 2              | 3       | K/s  |
| Time $t_s$<br>$T_{Smin}$ to $T_{Smax}$                            | $t_s$  | 60                        | 100            | 120     | s    |
| Ramp-up rate to peak*)<br>$T_{Smax}$ 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<br>temperature $T_p - 5$ K | $t_p$  | 10                        | 20             | 30      | s    |
| Ramp-down rate*<br>$T_p$ to 100 °C                                |        |                           | 3              | 4       | K/s  |
| Time<br>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-A3636-B4-03

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



Leader: min. 400 mm \*  
 Trailer: min. 160 mm \*

\*) Dimensions acc. to IEC 60286-3; EIA 481-D  
 OHAY0324

**Reel dimensions [mm]**

| A      | W                | N <sub>min</sub> | W <sub>1</sub> | W <sub>2max</sub> | Pieces per PU |
|--------|------------------|------------------|----------------|-------------------|---------------|
| 180 mm | 12 + 0.3 / - 0.1 | 60               | 12.4 + 2       | 18.4              | 2000          |

## Barcode-Product-Label (BPL)

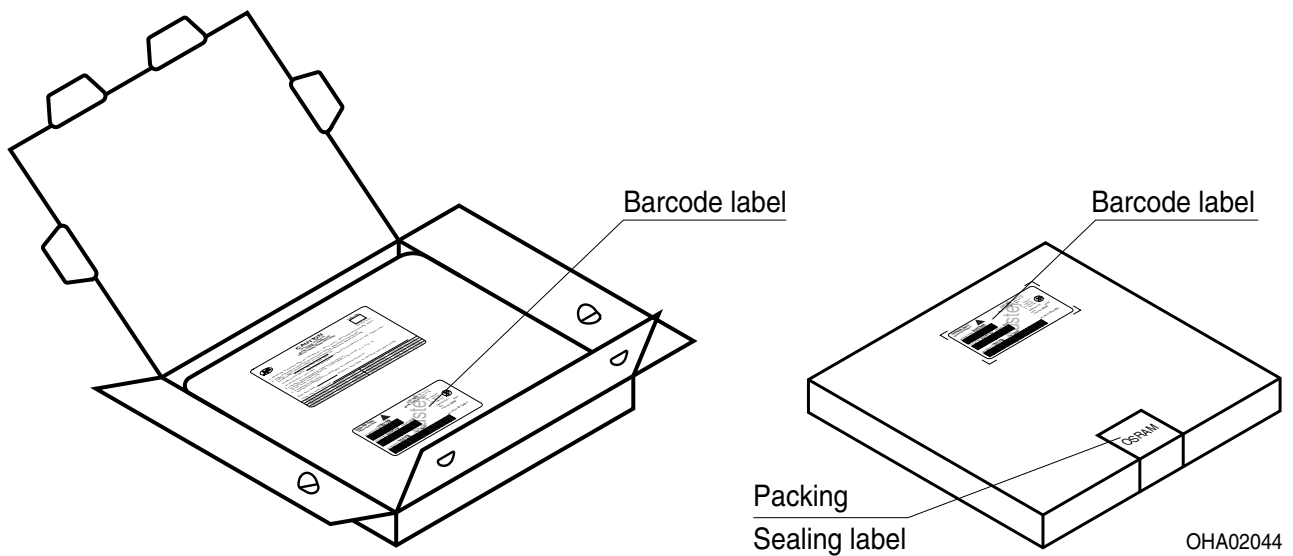


## Dry Packing Process and Materials <sup>8)</sup>



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 |

## 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.

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 in 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

OSRAM OS components are not developed, constructed or tested for the application as safety relevant component or for the application in medical devices.

In case Buyer – or Customer supplied by Buyer– considers using OSRAM OS components in product safety devices/applications or medical devices/applications, Buyer and/or Customer has to inform the local sales partner of OSRAM OS immediately and OSRAM OS and Buyer and /or Customer will analyze and coordinate the customer-specific request between OSRAM OS and Buyer and/or Customer.

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## Glossary

- 1) **Radiant intensity:** Measured at a solid angle of  $\Omega = 0.01$  sr
- 2) **Reverse Operation:** Reverse Operation of 10 hours is permissible in total. Continuous reverse operation is not allowed.
- 3) **Total radiant flux:** Measured with integrating sphere.
- 4) **Thermal resistance:** junction - ambient, mounted on PC-board (FR4), pads size 16 mm<sup>2</sup> each
- 5) **Thermal resistance:** junction - soldering point, of the device only, mounted on an ideal heatsink (e.g. metal block)
- 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) **Testing temperature:**  $T_A = 25^\circ\text{C}$
- 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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