# High Power Infrared Emitter (850 nm)
# Version 1.0

## SFH 4279S



**Features:**

- High Power Infrared LED
- Double Stack emitter
- Half angle: ± 25°
- High forward current allowed at high temperature

**Applications**

- Industrial applications
- Infrared Illumination for cameras
- IR data transmission
- Sensor technology

**Notes**

Depending on the mode of operation, these devices emit highly concentrated non visible infrared light which can be hazardous to the human eye. Products which incorporate these devices have to follow the safety precautions given in IEC 60825-1 and IEC 62471.

**Ordering Information**

| **Type:** | **Radiant Intensity** $I_e$ [mW/sr] **$I_F$=100 mA, $t_p$=20 ms** | **Ordering Code** |
|---|---|---|
| SFH 4279S | 75 (≥ 40) | Q65112A0074 |

*Note: Measured at a solid angle of Ω = 0.01 sr*



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**Maximum Ratings** ($T_A$ = 25 °C)

| Parameter | Symbol | Values | Unit |
|---|---|---|---|
| Operation and storage temperature range | $T_{op}$; $T_{stg}$ | -40 ... 100 | °C |
| Reverse voltage | $V_R$ | 5 | V |
| Forward current | $I_F$ | 100 | mA |
| Surge current ($t_p \leq 300$ µs, D = 0) | $I_{FSM}$ | 0.7 | A |
| Power consumption | $P_{tot}$ | 245 | mW |
| ESD withstand voltage (acc. to ANSI/ ESDA/ JEDEC JS-001 - HBM) | $V_{ESD}$ | 2 | kV |
| Thermal resistance junction - ambient [1] *page 12* | $R_{thJA}$ | 300 | K / W |
| Thermal resistance junction - soldering point [2] *page 12* | $R_{thJS}$ | 140 | K / W |

**Characteristics** ($T_A$ = 25 °C)

| Parameter | | Symbol | Values | Unit |
|---|---|---|---|---|
| Peak wavelength ($I_F$ = 100 mA, $t_p$ = 20 ms) | (typ) | $\lambda_{peak}$ | 860 | nm |
| Centroid wavelength ($I_F$ = 100 mA, $t_p$ = 20 ms) | (typ) | $\lambda_{centroid}$ | 850 | nm |
| Spectral bandwidth at 50% of $I_{max}$ ($I_F$ = 100 mA, $t_p$ = 20 ms) | (typ) | $\Delta\lambda$ | 30 | nm |
| Half angle | (typ) | $\varphi$ | ± 25 | ° |
| Dimensions of active chip area | (typ) | L x W | 0.3 x 0.3 | mm x mm |
| Rise and fall time of $I_e$ ( 10% and 90% of $I_{e\,max}$) ($I_F$ = 100 mA, $R_L$ = 50 Ω) | (typ) | $t_r$, $t_f$ | 15 | ns |
| Forward voltage ($I_F$ = 100 mA, $t_p$ = 20 ms) | (typ (max)) | $V_F$ | 3.1 (≤ 3.6) | V |
| Forward voltage ($I_F$ = 700 mA, $t_p$ = 100 µs) | (typ (max)) | $V_F$ | 4 (≤ 5.2) | V |
| Reverse current ($V_R$ = 5 V) | | $I_R$ | not designed for reverse operation | µA |
| Total radiant flux ($I_F$= 100 mA, $t_p$=20 ms) | (typ) | $\Phi_e$ | 95 | mW |



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| Parameter | | Symbol | Values | Unit |
|---|---|---|---|---|
| Temperature coefficient of $I_e$ or $\Phi_e$ ($I_F$ = 100 mA, $t_p$ = 20 ms) | (typ) | $TC_I$ | -0.5 | % / K |
| Temperature coefficient of $V_F$ ($I_F$ = 100 mA, $t_p$ = 20 ms) | (typ) | $TC_V$ | -2 | mV / K |
| Temperature coefficient of wavelength ($I_F$ = 100 mA, $t_p$ = 20 ms) | (typ) | $TC_\lambda$ | 0.3 | nm / K |

**Grouping** ($T_A$ = 25 °C)

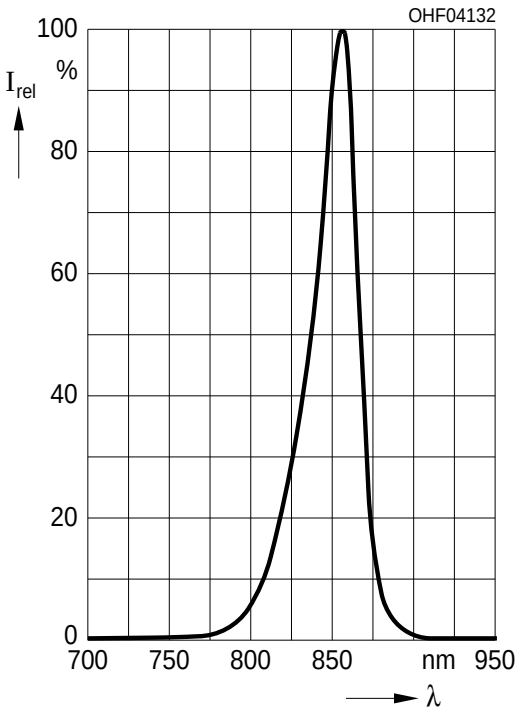
| Group | Min Radiant Intensity $I_F$=100 mA, $t_p$=20 ms $I_{e,min}$ [mW / sr] | Max Radiant Intensity $I_F$=100 mA, $t_p$=20 ms $I_{e,max}$ [mW / sr] | Typ Radiant Intensity $I_F$ = 700 mA, $t_p$ = 25 µs $I_{e,typ}$ [mW / sr] |
|---|---|---|---|
| SFH 4279S-U | 40 | 80 | 315 |
| SFH 4279S-V | 63 | 125 | 495 |
| SFH 4279S-AW | 100 | 200 | 795 |

*Note: measured at a solid angle of Ω = 0.01 sr*

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

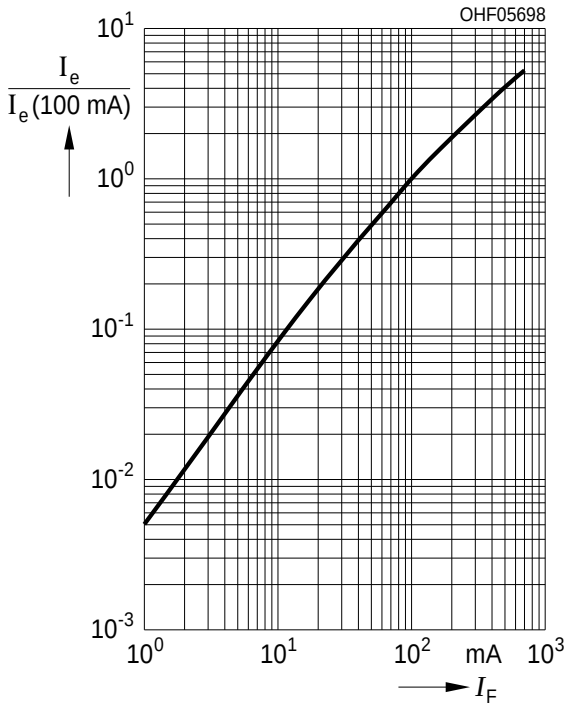
**Relative Spectral Emission** 3) *page 12*

$I_{rel}$ = f(λ), $T_A$ = 25°C




**Radiant Intensity** 3) *page 12*

$I_e$ / $I_e$(100 mA) = f($I_F$), single pulse, $t_p$ = 25 µs, $T_A$= 25°C

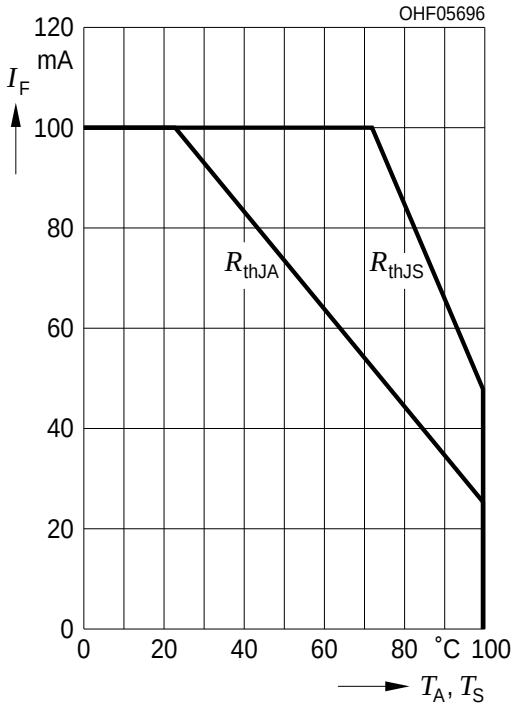





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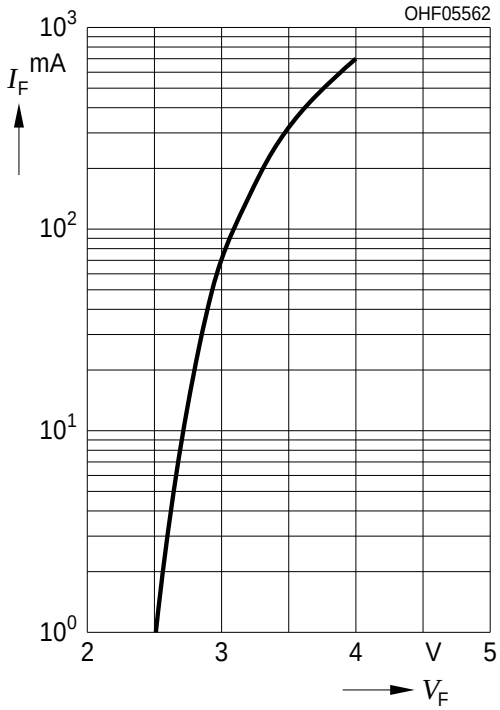
**Max. Permissible Forward Current**

$I_{F, max} = f(T_A)$, $R_{thJA}$ = 300 K / W, $R_{thJS}$ = 140 K / W



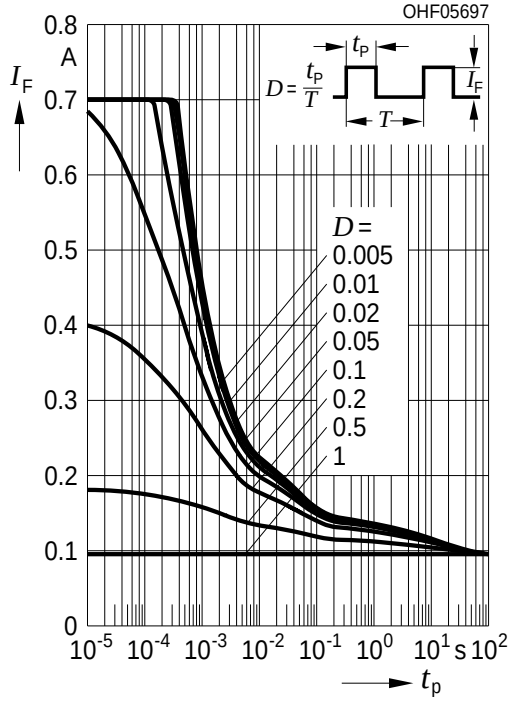

**Forward Current** [3] *page 12*

$I_F = f(V_F)$, single pulse, $t_p$ = 100 µs, $T_A$= 25°C



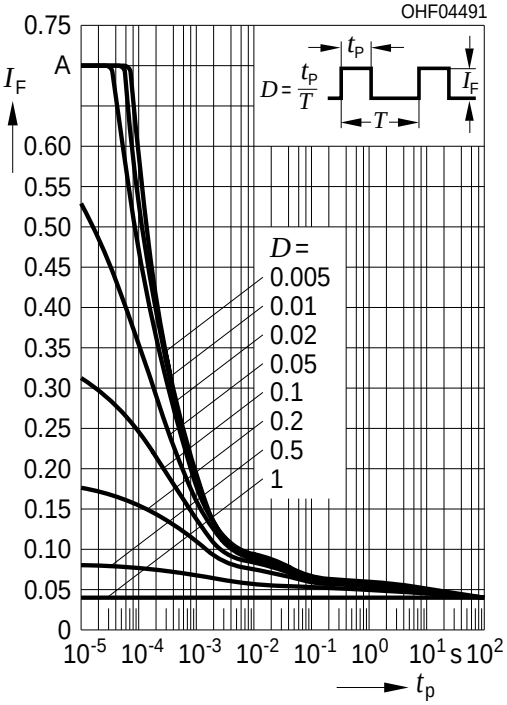

**Permissible Pulse Handling Capability**

$I_F = f(t_p)$, $T_A$ = 25 °C, duty cycle D = parameter




**Permissible Pulse Handling Capability**

$I_F = f(t_p)$, $T_A$ = 85 °C, duty cycle D = parameter

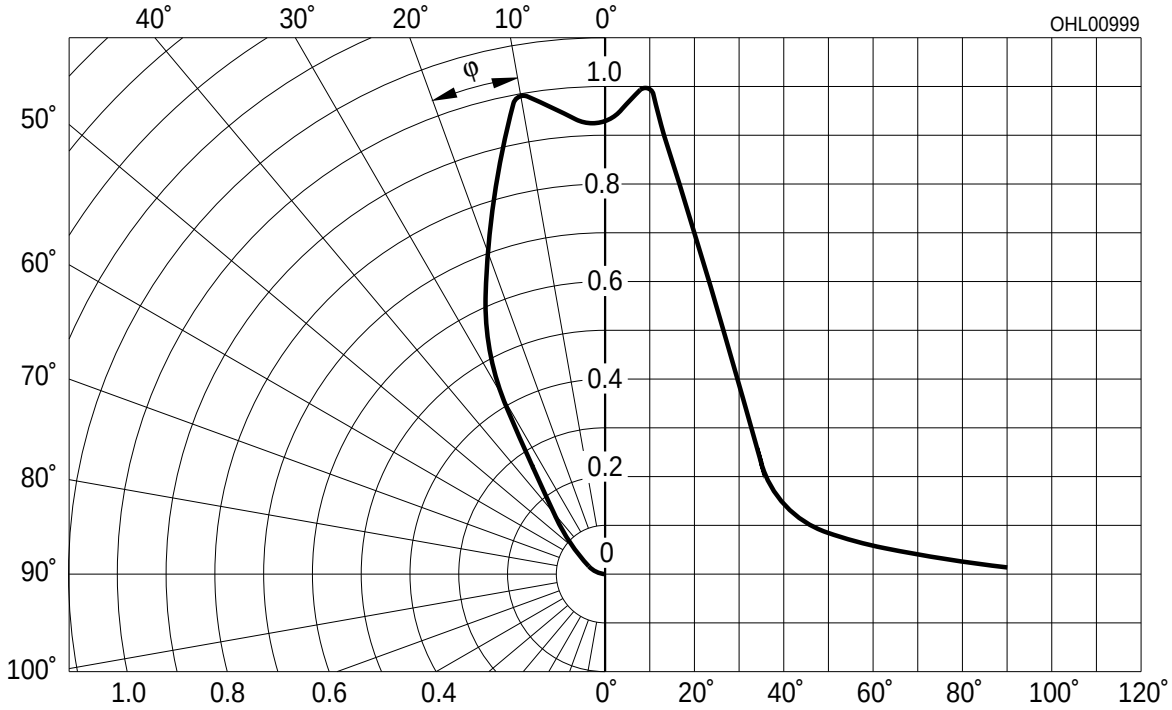




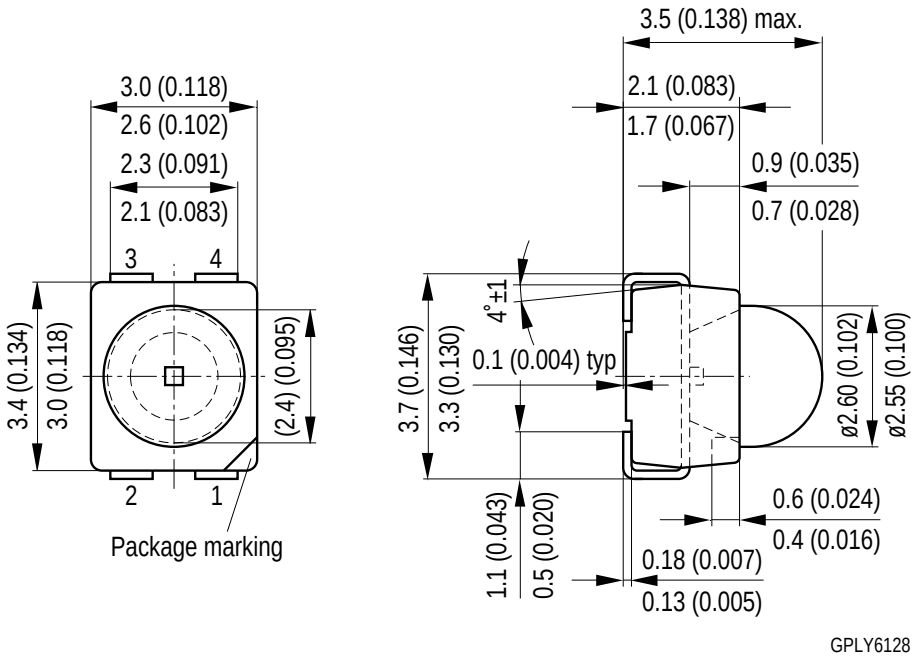

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**Radiation Characteristics** 3) *page 12*

$I_{rel} = f(\phi)$, $T_A = 25°C$




**Package Outline**




*Dimensions in mm (inch).*



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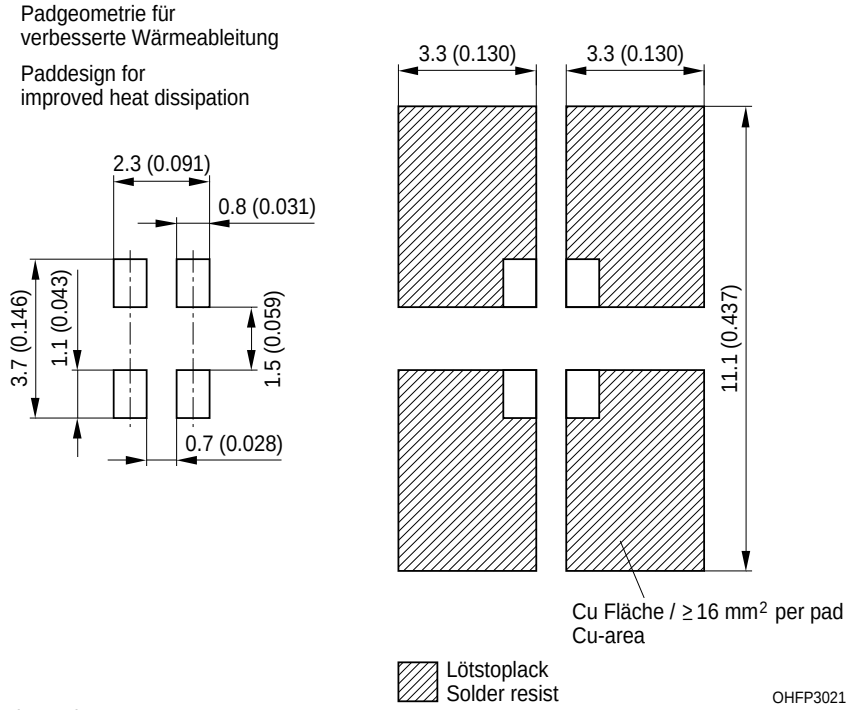
### Pinning

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

**Package**
Power TOPLED with Lens

**Approximate Weight:**
37 mg

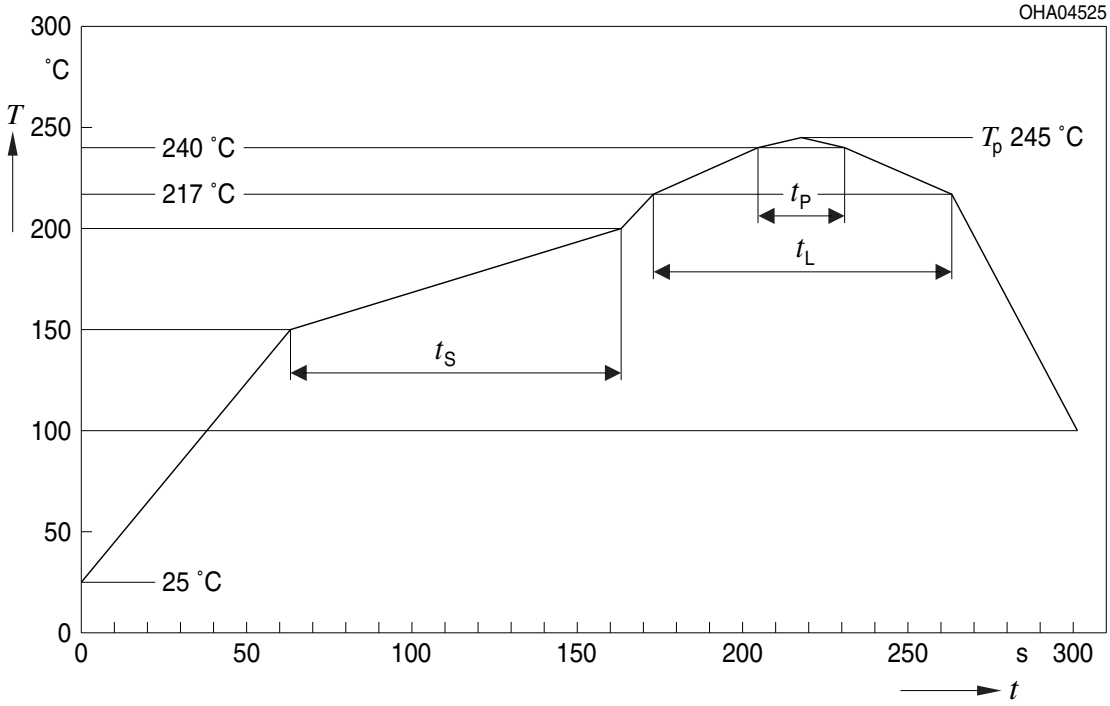
**Recommended Solder Pad**
Reflow Soldering




*Dimensions in mm (inch).*

### Reflow Soldering Profile

Product complies to MSL Level 2 acc. to JEDEC J-STD-020D.01




| Profil-Charakteristik<br>Profile Feature | Symbol<br>Symbol | Pb-Free (SnAgCu) Assembly | | | Einheit<br>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 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 |

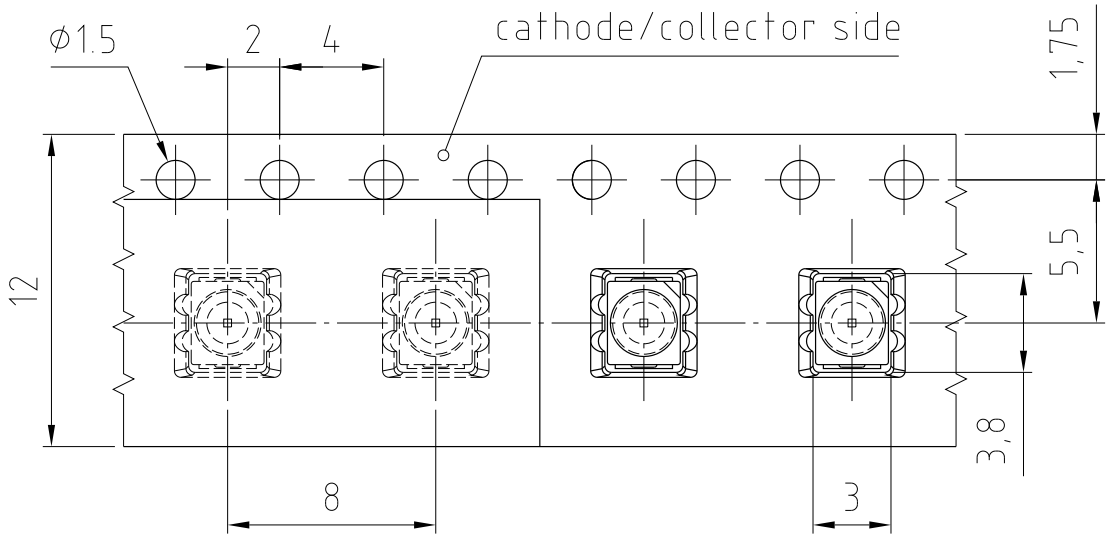
All temperatures refer to the center of the package, measured on the top of the component

* slope calculation DT/Dt: Dt max. 5 s; fulfillment for the whole T-range



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### Taping

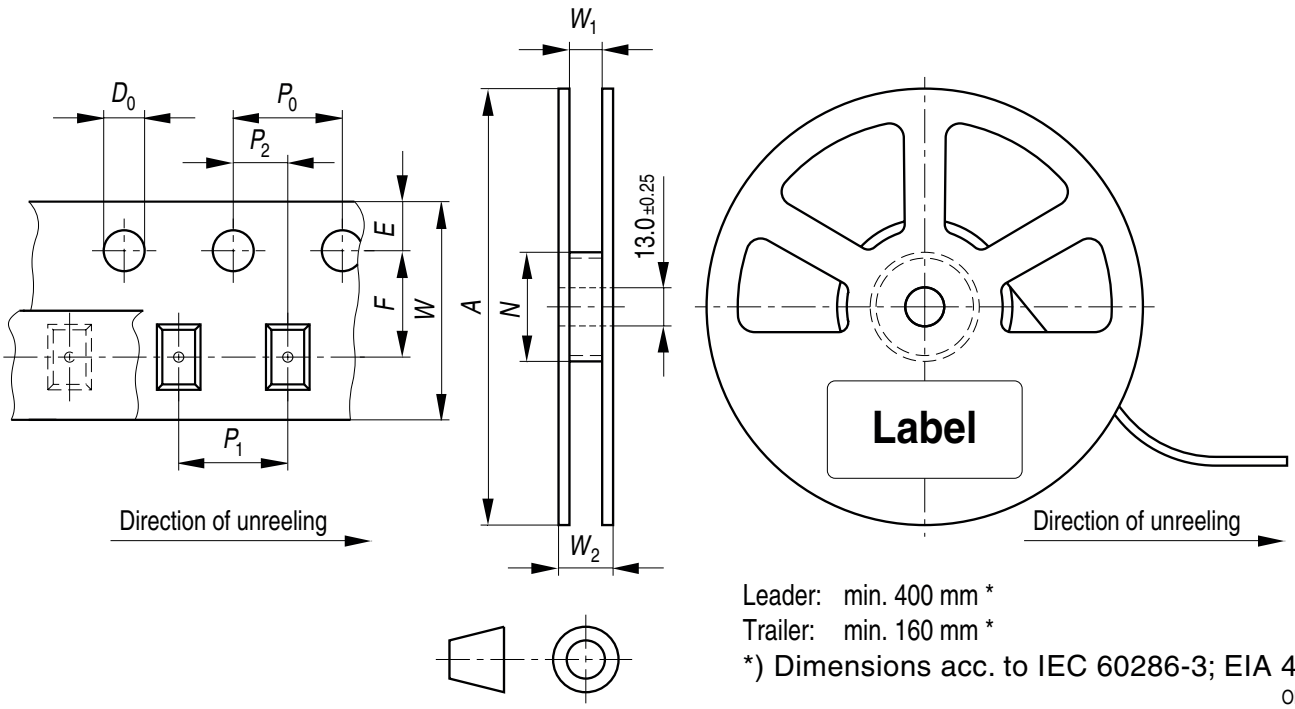



C63062-A3636-B4-03

Dimensions in mm.

### Tape and Reel

12 mm tape with 2000 pcs. on ∅ 180 mm reel




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

OHAY0324



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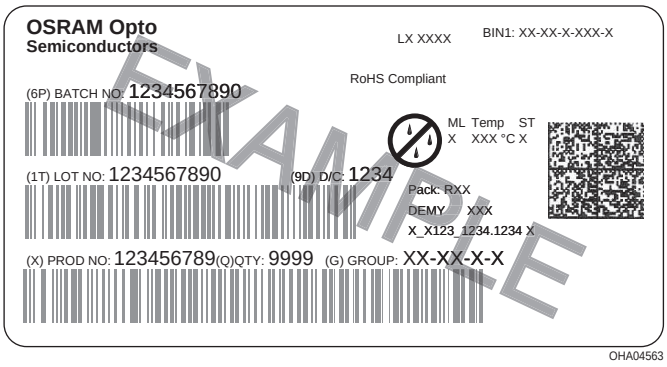
### Tape dimensions [mm]

| W | $P_0$ | $P_1$ | $P_2$ | $D_0$ | E | F |
|---|---|---|---|---|---|---|
| 12 + 0.3 / - 0.1 | 4 ± 0.1 | 4 ± 0.1<br>or<br>8 ± 0.1 | 2 ± 0.05 | 1.5 ± 0.1 | 1.75 ± 0.1 | 5.5 ± 0.05 |

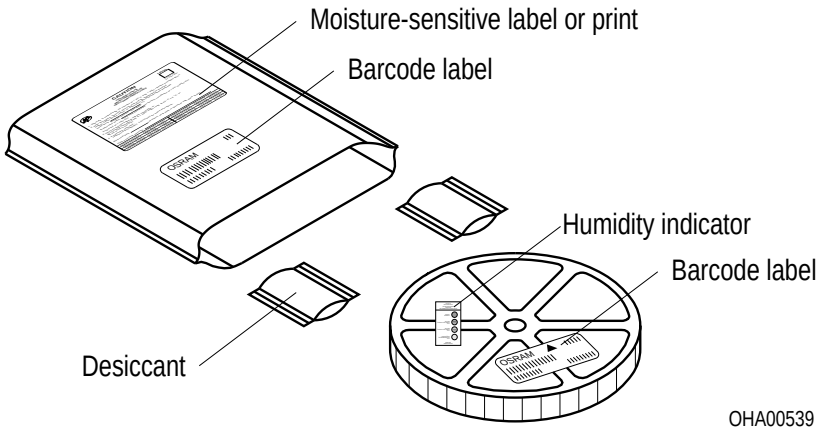
### Reel dimensions [mm]

| A | W | $N_{min}$ | $W_1$ | $W_{2max}$ |
|---|---|---|---|---|
| 180 | 12 | 60 | 12.4 + 2 | 18.4 |

### Barcode-Product-Label (BPL)

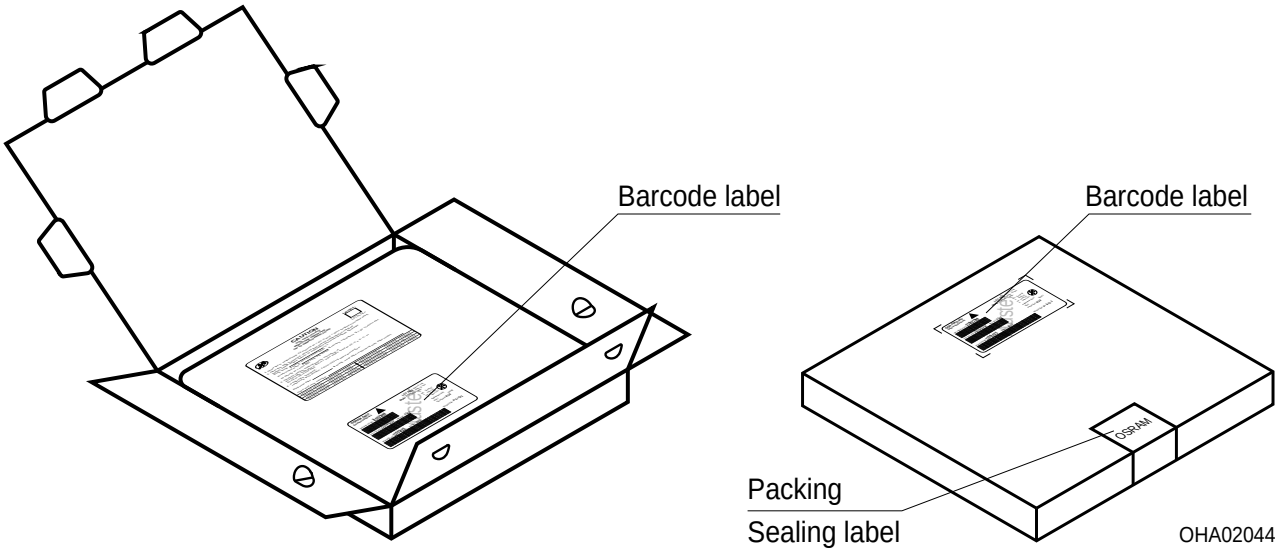



### Dry Packing Process and Materials




Note:
Moisture-sensitive product is packed in a dry bag containing desiccant and a humidity card.
Regarding dry pack you will find further information in the internet. Here you will also find the normative references like JEDEC.

### Transportation Packing and Materials




### Dimensions of transportation box in mm

| Width | Length | Height |
|---|---|---|
| 195 ± 5 | 195 ± 5 | 30 ± 5 |

## 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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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] **Thermal resistance:** junction -ambient, mounted on PC-board (FR4), padsize 16 $mm^2$ each

[2] **Thermal resistance:** junction - soldering point, of the device only, mounted on an ideal heatsink (e.g. metal block)

[3] **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.

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