# OSRAM SFH 4717CS

# Datasheet

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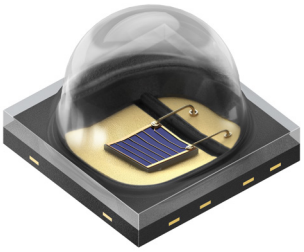
OSRAM

## OSLON™ Black

# SFH 4717CS

High Power 50° Infrared LEDs for various industrial/automotive applications such as object tracking, presence detection, machine vision etc. It offers outstanding quality, robustness and efficacy using IR:6 technology. AEC-Q102 qualification makes them ready for tough conditions.



## Applications

- Access control & security
- Authentication
- Exterior sensing for ADAS
- Eye, face and hand tracking
- Factory automation
- Home & building automation
- In-Cabin sensing
- Medical lighting

## Features

- Package: clear silicone lens
- Corrosion Robustness Class: 3B
- Qualifications: AEC-Q102 Qualified
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)
- IR lightsource with high efficiency
- Double stack emitter
- Centroid wavelength 850 nm
- High current pulse operation
- Low thermal resistance (Typ. 4.5 K/W)

## Ordering Information

| Type | Radiant intensity [1)2)]<br>$I_F$ = 1 A; $t_p$ = 10 ms<br>$I_e$ | Radiant intensity [1)]<br>typ.<br>$I_F$ = 1 A; $t_p$ = 10 ms<br>$I_e$ | Ordering Code |
|---|---|---|---|
| SFH 4717CS R33 | 1400 ... 2000 mW/sr | 1,800 mW/sr | Q65115A3392 |

## Maximum Ratings

$T_S$ = 25 °C

| Parameter | Symbol | | Values |
|---|---|---|---|
| Operating temperature | $T_{op}$ | min.<br>max. | -40 °C<br>125 °C |
| Storage temperature | $T_{stg}$ | min.<br>max. | -40 °C<br>125 °C |
| Junction temperature | $T_j$ | max. | 165 °C |
| Forward current | $I_F$ | min.<br>max. | 20 mA<br>1500 mA |
| Forward current pulsed<br>$t_p \leq 2$ ms; D ≤ 0.005 | $I_{F\ pulse}$ | max. | 5000 mA |
| Reverse voltage [3)] | $V_R$ | max. | 5 V |
| ESD withstand voltage<br>acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2) | $V_{ESD}$ | max. | 2 kV |

## Characteristics

$I_F$ = 1000 mA; $t_p$ = 10 ms; $T_S$ = 25 °C

| Parameter | Symbol | | Values |
|---|---|---|---|
| Peak wavelength | $\lambda_{peak}$ | typ. | 859 nm |
| Centroid wavelength [4] | $\lambda_{centroid}$ | min.<br>typ.<br>max. | 842 nm<br>850 nm<br>858 nm |
| Spectral bandwidth at 50% $I_{rel,max}$ (FWHM) | $\Delta\lambda$ | typ. | 27 nm |
| Half angle | $\varphi$ | typ. | 25 ° |
| Rise time (10% / 90%)<br>$I_F$ = 5 A; $R_L$ = 2 Ω | $t_r$ | typ. | 15 ns |
| Fall time (10% / 90%)<br>$I_F$ = 5 A; $R_L$ = 2 Ω | $t_f$ | typ. | 20 ns |
| Forward voltage [5] | $V_F$ | min.<br>typ.<br>max. | 2.90 V<br>2.95 V<br>3.30 V |
| Forward voltage [5]<br>$I_F$ = 1.5 A; $t_p$ = 100 µs | $V_F$ | typ.<br>max. | 3.05 V<br>3.50 V |
| Forward voltage [5]<br>$I_F$ = 5 A; $t_p$ = 100 µs | $V_F$ | typ.<br>max. | 3.55 V<br>4.40 V |
| Reverse current [3]<br>$V_R$ = 5 V | $I_R$ | typ.<br>max. | 0.01 µA<br>10 µA |
| Radiant intensity [1]<br>$I_F$ = 1.5 A; $t_p$ = 100 µs | $I_e$ | typ. | 2650 mW/sr |
| Radiant intensity [1]<br>$I_F$ = 5 A; $t_p$ = 100 µs | $I_e$ | typ. | 7850 mW/sr |
| Total radiant flux [6]<br>$I_F$ = 1 A; $t_p$ = 100 µs | $\Phi_e$ | typ. | 1920 mW |
| Total radiant flux [6]<br>$I_F$ = 1.5 A; $t_p$ = 100 µs | $\Phi_e$ | typ. | 2830 mW |
| Total radiant flux [6]<br>$I_F$ = 5 A; $t_p$ = 100 µs | $\Phi_e$ | typ. | 8400 mW |
| Thermal resistance junction solder point electrical [7]<br>with efficiency $\eta_e$ = 65 % | $R_{thJS\ elec.}$ | typ.<br>max. | 1.6 K / W<br>1.9 K / W |
| Thermal resistance junction solder point real [7] | $R_{thJS\ real}$ | typ.<br>max. | 4.5 K / W<br>5.5 K / W |

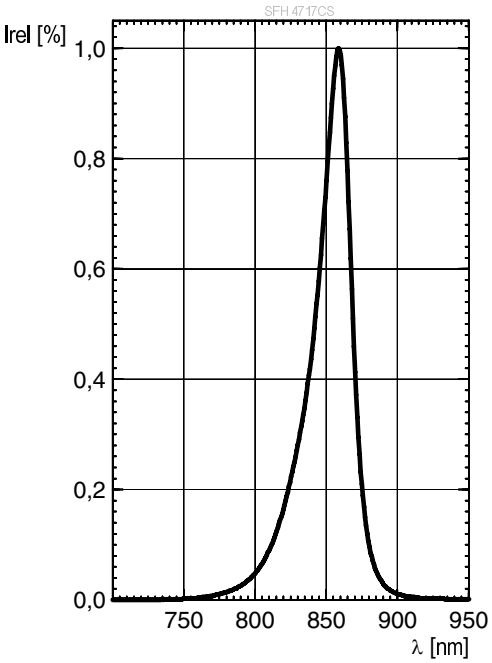
## Brightness Groups

| Group | Radiant intensity [1)2)] $I_F$ = 1 A; $t_p$ = 10 ms min. $I_e$ | Radiant intensity [1)2)] $I_F$ = 1 A; $t_p$ = 10 ms max. $I_e$ |
|---|---|---|
| FB1 | 1400 mW/sr | 1600 mW/sr |
| FB2 | 1600 mW/sr | 1800 mW/sr |
| GA1 | 1800 mW/sr | 2000 mW/sr |

Only one group in one packing unit.

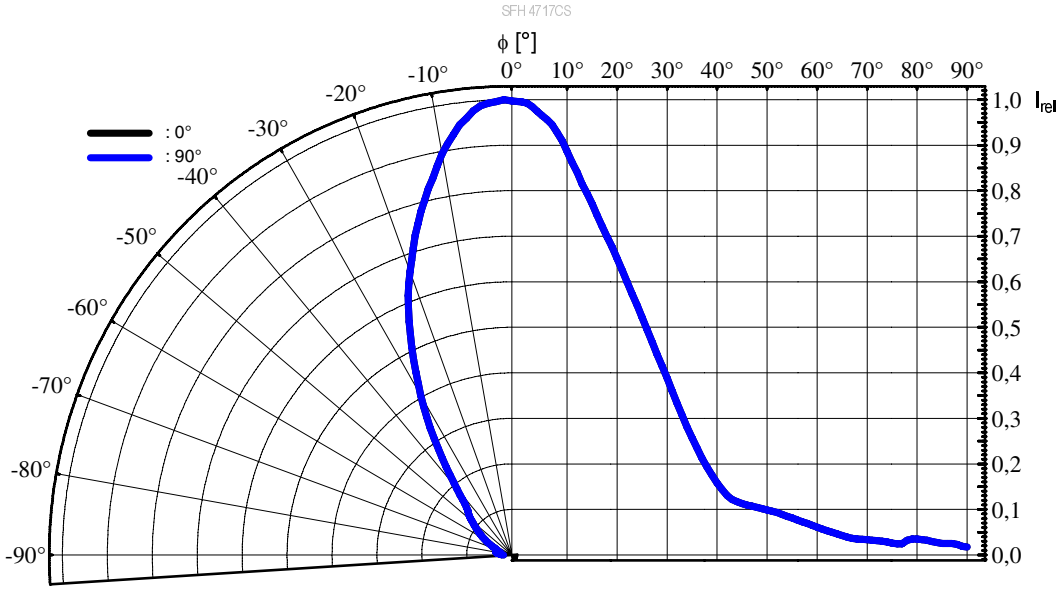
## Relative Spectral Emission 8), 9)

$I_{e,rel} = f(\lambda)$; $I_F$ = 1000 mA; $t_p$ = 10 ms



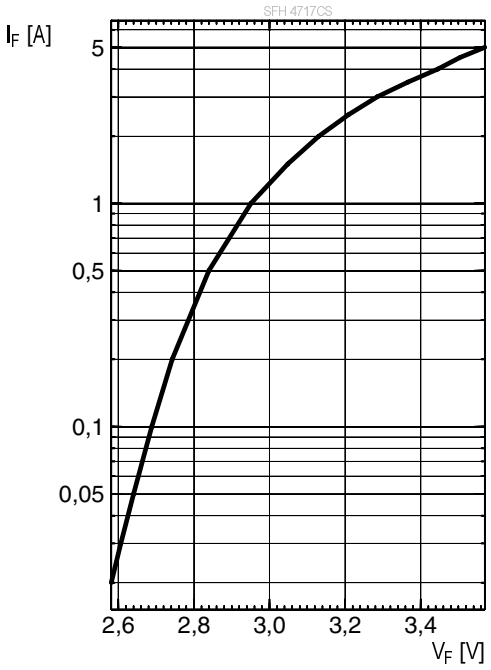

## Radiation Characteristics 8), 9)

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



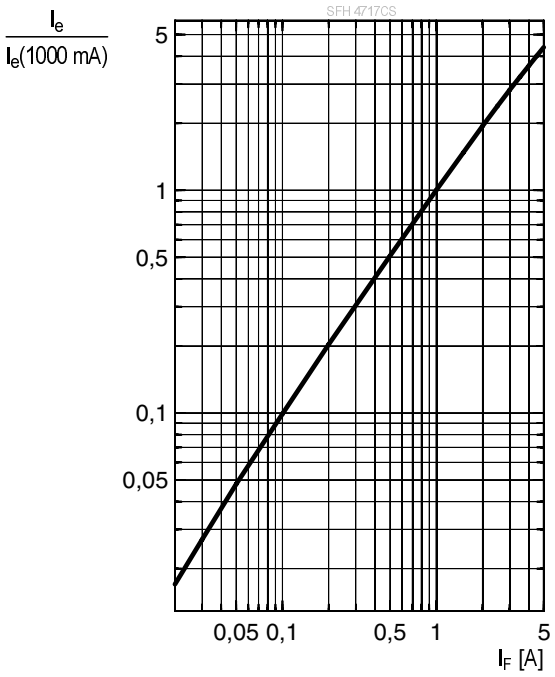
## Forward current [8], [9]

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



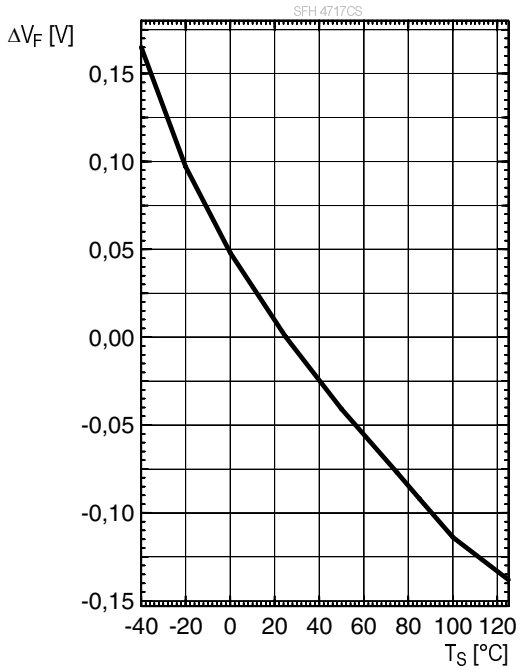

## Relative Radiant Intensity [8], [9]

$I_e/I_e(1A) = f(I_F)$; single pulse; $t_p = 100\ \mu s$



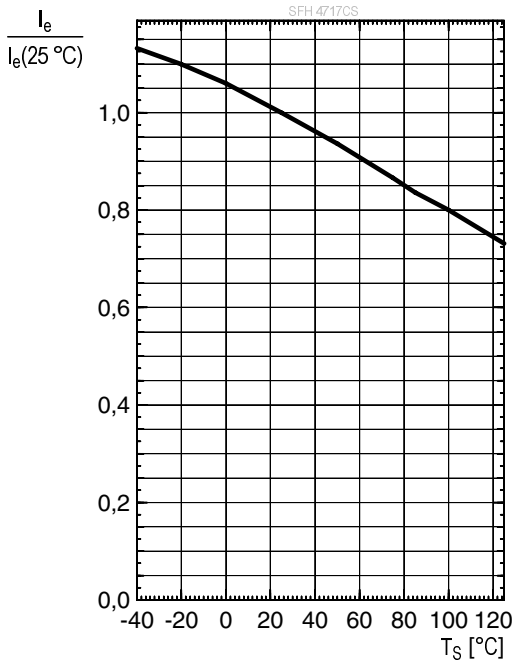
## Forward Voltage [8)]

$V_F = f(T_S)$; $I_F$ = 1A; $t_p$ = 100µs



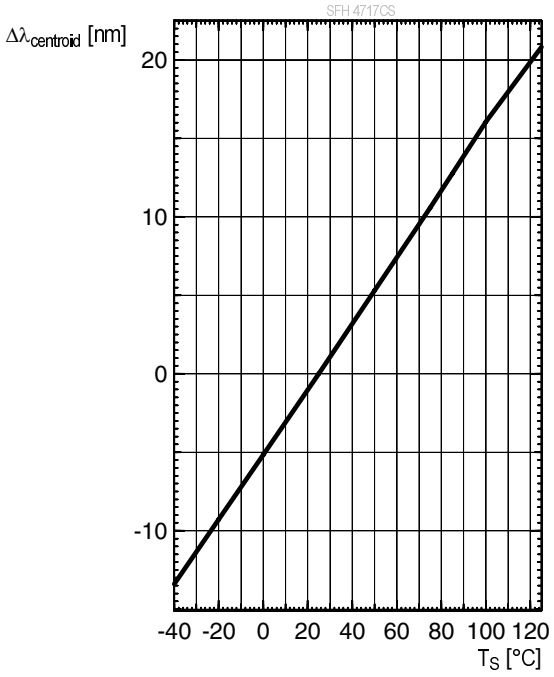

## Relative Radiant Intensity [8)]

$I_{e,rel} = f(T_S)$; $I_F$ = 1A; $t_p$ = 100µs



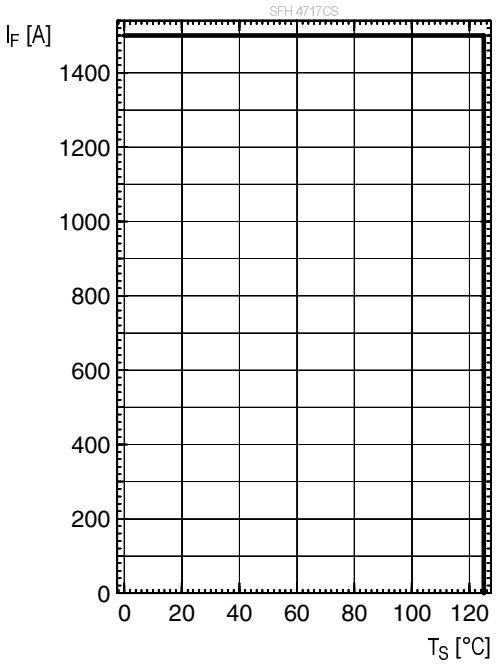

## Centroid Wavelength [8)]

$\lambda_{centroid} = f(T_S)$; $I_F$ = 1A; $t_p$ = 100µs



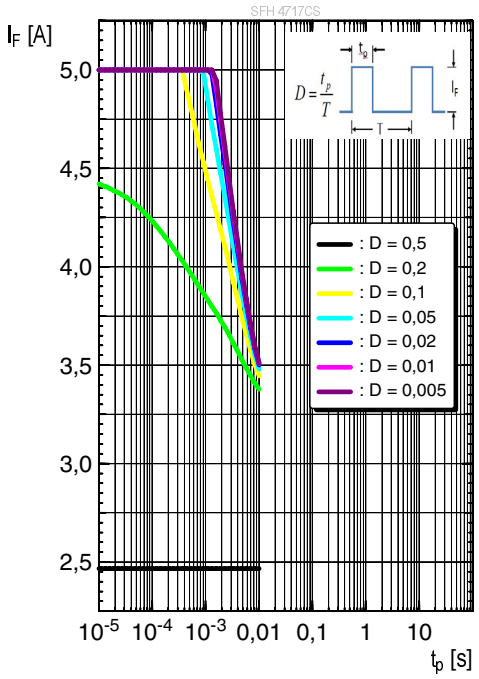
## Max. Permissible Forward Current

$I_F = f(T_S)$; $Rth_{js}$ = 5.5 K / W



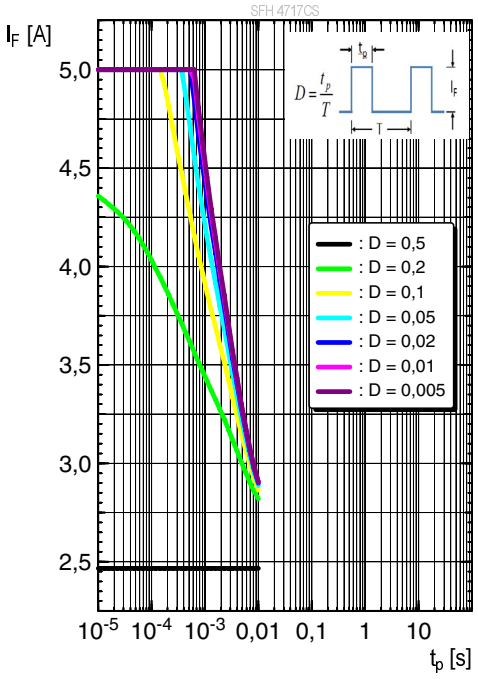

## Permissible Pulse Handling Capability

$I_F = f(t_p)$; D = parameter; $T_S$ = 85 °C



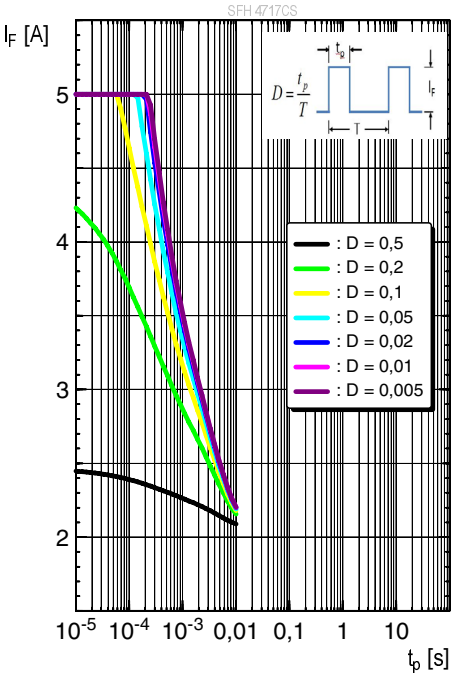

## Permissible Pulse Handling Capability

$I_F = f(t_p)$; D = parameter; $T_S$ = 105 °C

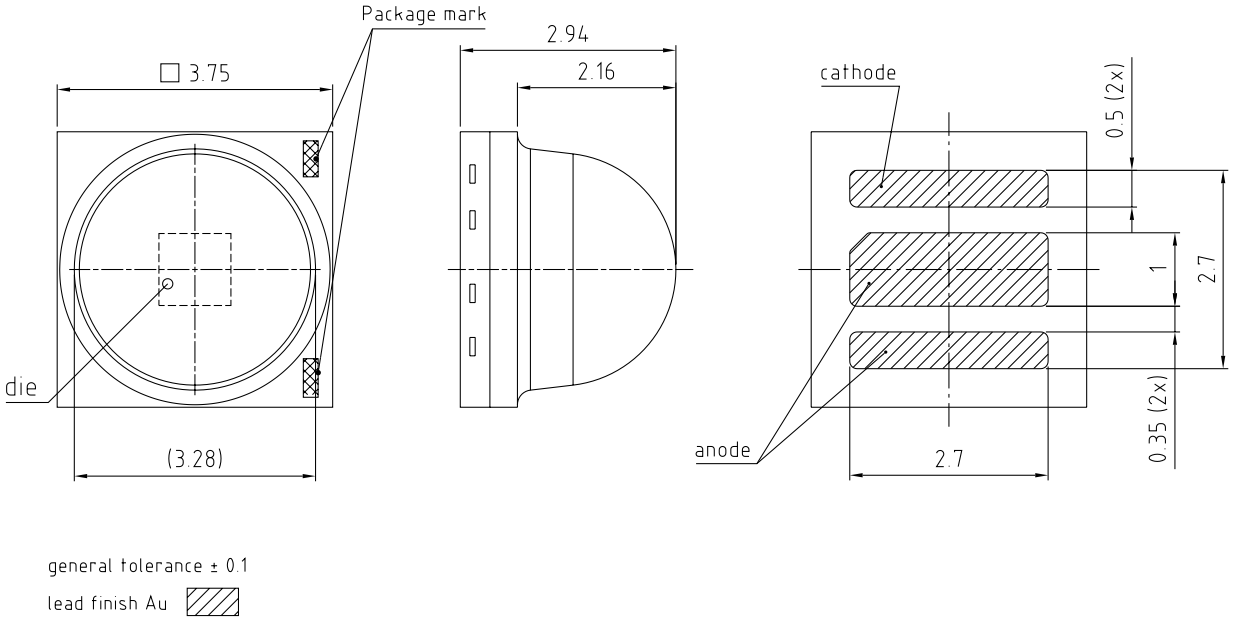



## Permissible Pulse Handling Capability

$I_F = f(t_p)$; D = parameter; $T_S$ = 125 °C



## Dimensional Drawing [10)]

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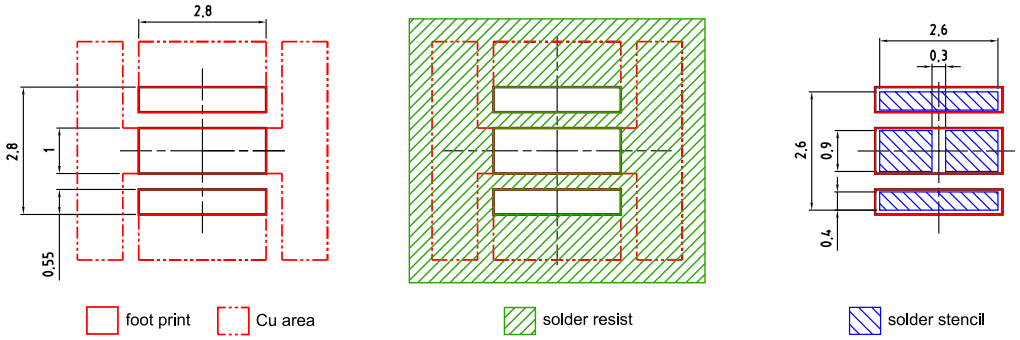
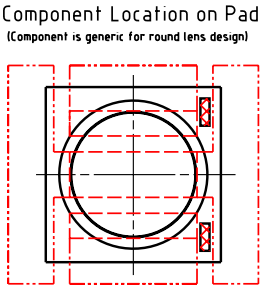
## Further Information:

**Approximate Weight:** 42.0 mg

**Corrosion test:** Class: 3B
Test condition: 40°C / 90 % RH / 15 ppm $H_2S$ / 14 days (stricter than IEC 60068-2-43)

## Recommended Solder Pad [10)]

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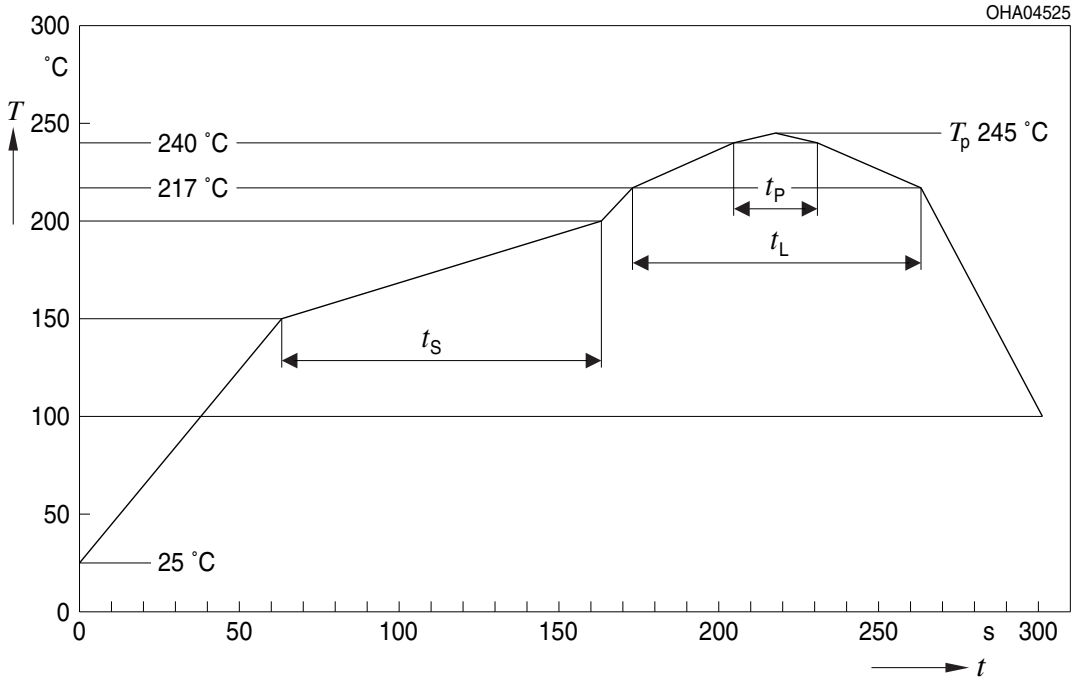
For superior solder joint connectivity results we recommend soldering under standard nitrogen atmosphere. Package not suitable for ultra sonic cleaning.

## Reflow Soldering Profile

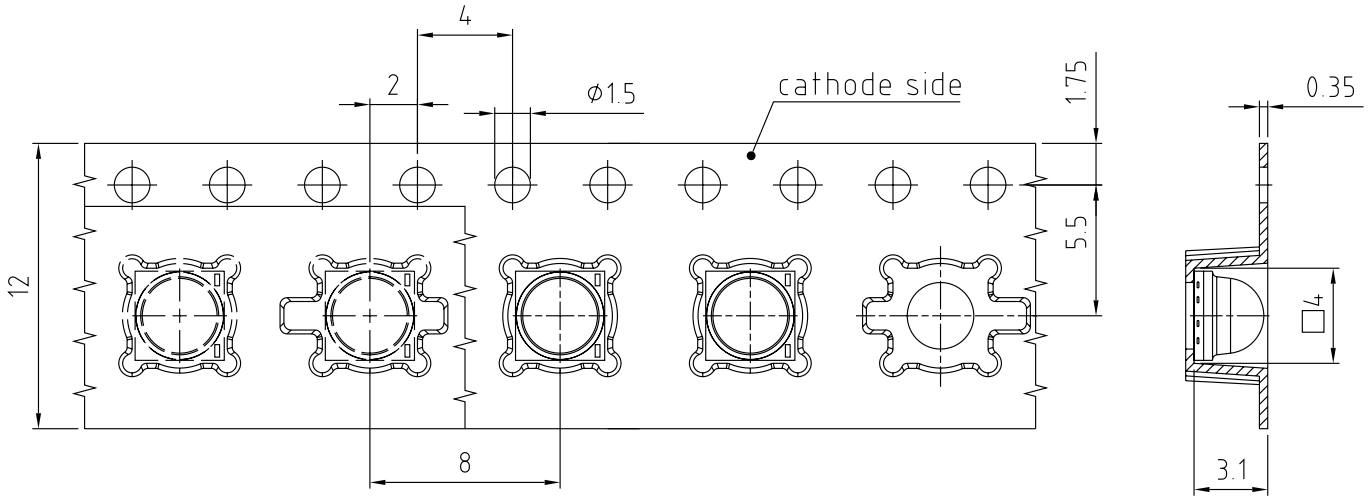
Product complies to MSL Level 2 acc. to JEDEC J-STD-020E




| 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 [10)]

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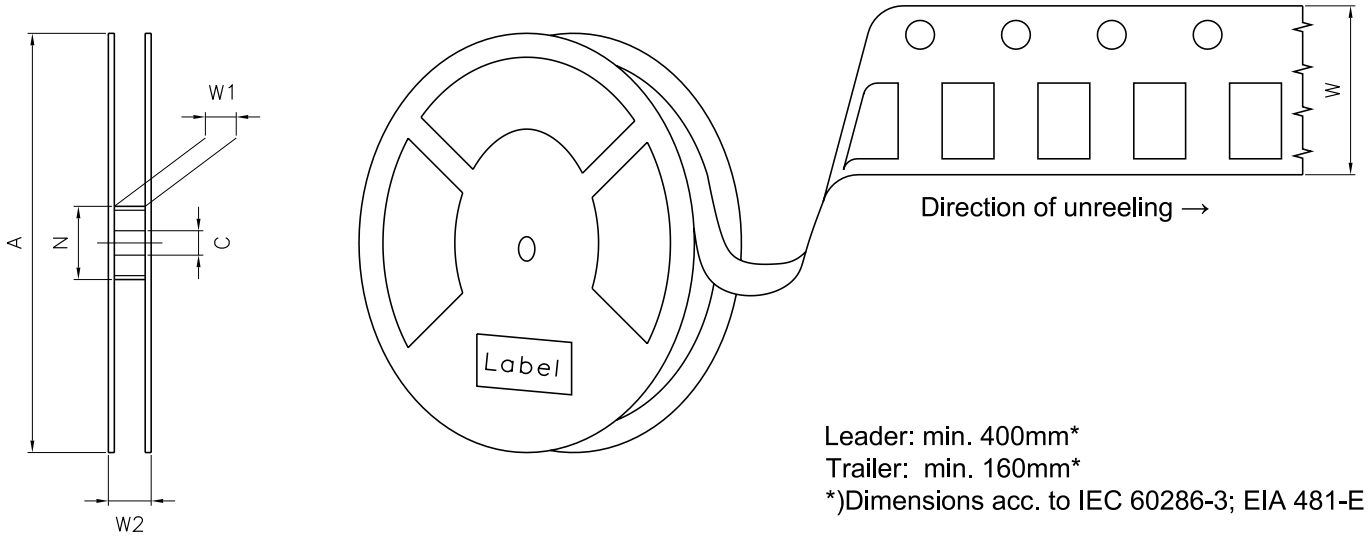
## Tape and Reel [11)]

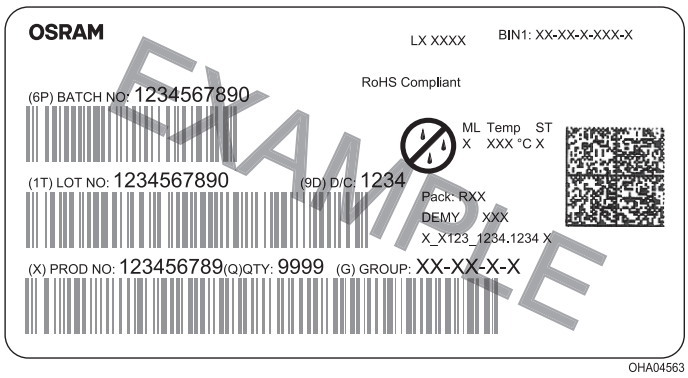



Leader: min. 400mm*
Trailer: min. 160mm*
*)Dimensions acc. to IEC 60286-3; EIA 481-E

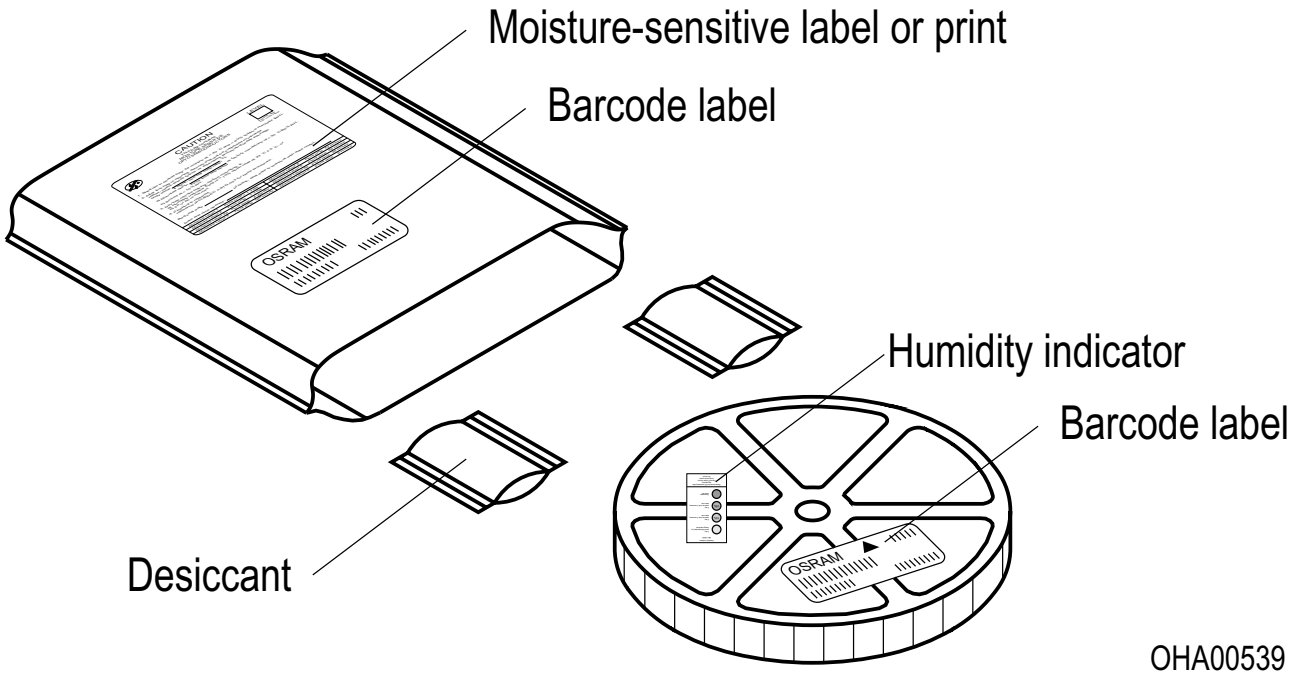
## Reel Dimensions

| A | W | $N_{min}$ | $W_1$ | $W_{2\,max}$ | Pieces per PU |
|---|---|---|---|---|---|
| 330 mm | 12 + 0.3 / - 0.1 mm | 60 mm | 12.4 + 2 mm | 18.4 mm | 3000 |

## Barcode-Product-Label (BPL)




## Dry Packing Process and Materials [10)]




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

## 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 **exempt risk group - Exempt**.

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 information please visit https://ams-osram.com/support/application-notes

## Disclaimer

### 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 our 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 and functional safety devices/applications or medical devices/applications

Our components are not developed, constructed or tested for the application as safety relevant component or for the application in medical devices.
Our products are not qualified at module and system level for such application.

In case buyer – or customer supplied by buyer – considers using our components in product safety devices/ applications or medical devices/applications, buyer and/or customer has to inform our local sales partner immediately and we and buyer and /or customer will analyze and coordinate the customer-specific request between us and buyer and/or customer.

## Glossary

1) **Radiant intensity:** Measured at a solid angle of Ω = 0.01 sr

2) **Brightness:** The brightness values are measured with a tolerance of ±11%.

3) **Reverse Operation:** This product is intended to be operated applying a forward current within the specified range. Applying any continuous reverse bias or forward bias below the voltage range of light emission shall be avoided because it may cause migration which can change the electro-optical characteristics or damage the LED.

4) **Wavelength:** The wavelengths are measured with a tolerance of ±1 nm.

5) **Forward Voltage:** The forward voltages are measured with a tolerance of ±0.1 V.

6) **Total radiant flux:** Measured with integrating sphere.

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

8) **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.

9) **Testing temperature:** TA = 25°C (unless otherwise specified)

10) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with ±0.1 and dimensions are specified in mm.

11) **Tape and Reel:** All dimensions and tolerances are specified acc. IEC 60286-3 and specified in mm.

## Revision History

| Version | Date | Change |
|---|---|---|
| 1.0 | 2026-08-03 | Initial Version |
| 1.1 | 2026-08-11 | Derating (Diagrams) |
| 1.2 | 2026-08-24 | Description |
| 1.3 | 2026-09-02 | Features |
| 1.4 | 2026-10-22 | Maximum Ratings<br>Derating (Diagrams) |

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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