OSRAM SFH 47267AS A01

Datasheet

Preliminary datasheet version

Published by ams-OSRAM AG
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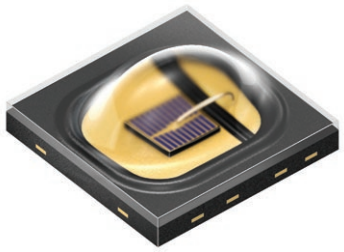
OSRAM

OSLON® Black

SFH 47267AS A01

OSLON Black Series (940 nm) - 110 ° x 135 °



High power infrared LED for In-Cabin Sensing applications like driver monitoring, occupant monitoring, interior monitoring, gesture sensing and child presence detection.

Applications

- In-Cabin Sensing

Features

- Package: clear silicone lens
- Corrosion Robustness Class: 3B
- Qualifications: The product qualification test plan is based on the guidelines of AEC-Q102, failure mechanism based Stress Test Qualification for Discrete Optoelectronic Semiconductors in Automotive applications.
- ESD: 8 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B)
- IR lightsource with high efficiency
- Double stack emitter
- Low thermal resistance
- Centroid wavelength 940 nm
- Optimized for high current pulse operation

Ordering Information

Type	Radiant intensity [1)2)] I_F = 1 A; t_p = 10 ms I_e	Radiant intensity [1)] typ. I_F = 1 A; t_p = 10 ms I_e	Ordering Code
SFH 47267AS A01	355 ... 450 mW/sr	390 mW/sr	Q65113A3916

Maximum Ratings

T_A = 25 °C

Parameter	Symbol		Values
Operating temperature	T_{op}	min. max.	-40 °C 125 °C
Storage temperature	T_{stg}	min. max.	-40 °C 125 °C
Junction temperature	T_j	max.	145 °C
Forward current	I_F	min. max.	100 mA 1500 mA
Forward current pulsed $t_p \leq 750$ µs; D ≤ 0.004	$I_{F\ pulse}$	max.	5 A
Reverse current [3)]	I_R	max.	200 mA
Power consumption	P_{tot}	max.	5.2 W
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B)	V_{ESD}	max.	8 kV

For the forward current and power consumption please see “maximum permissible forward current” diagram

Characteristics

I_F = 1000 mA; t_p = 10 ms; T_A = 25 °C

Parameter	Symbol		Values
Peak wavelength	λ_{peak}	typ.	950 nm
Centroid wavelength	$\lambda_{centroid}$	typ.	940 nm
Spectral bandwidth at 50% $I_{rel,max}$ (FWHM)	$\Delta\lambda$	typ.	37 nm
Half angle short axis	φ	typ.	55 °
Half angle long axis	φ	typ.	67.5 °
Dimensions of active chip area	L x W	typ.	1 x 1 mm x mm
Rise time (10% / 90%) I_F = 5 A; R_L = 50 Ω	t_r	typ.	10 ns
Fall time (10% / 90%) I_F = 5 A; R_L = 50 Ω	t_f	typ.	15 ns
Forward voltage [4] I_F = 1 A; t_p = 100 µs	V_F	min. typ. max.	2.50 V 2.65 V 3.10 V
Forward voltage [4] I_F = 1.5 A; t_p = 100 µs	V_F	min. typ. max.	2.6 V 2.75 V 3.35 V
Forward voltage [4] I_F = 5 A; t_p = 100 µs	V_F	min. typ. max.	2.9 V 3.2 V 4.2 V
Reverse voltage [3] I_R = 20 mA	V_R	max.	1.2 V
Reverse voltage (ESD device) [3]	$V_{R\ ESD}$	min.	5 V
Radiant intensity [1] I_F = 1.5 A; t_p = 100 µs	I_e	typ.	570 mW/sr
Total radiant flux [5] I_F = 1 A; t_p = 100 µs	Φ_e	typ.	1280 mW
Total radiant flux [5] I_F = 1.5 A; t_p = 100 µs	Φ_e	typ.	1900 mW
Total radiant flux [5] I_F = 5 A; t_p = 100 µs	Φ_e	typ.	5400 mW
Temperature coefficient of voltage	TC_V	typ.	-2 mV / K
Temperature coefficient of wavelength	TC_λ	typ.	0.3 nm / K

Characteristics

I_F = 1000 mA; t_p = 10 ms; T_A = 25 °C

Parameter	Symbol		Values
Thermal resistance junction solder point real	$R_{thJS\ real}$	typ.	6.0 K / W
		max.	9.0 K / W

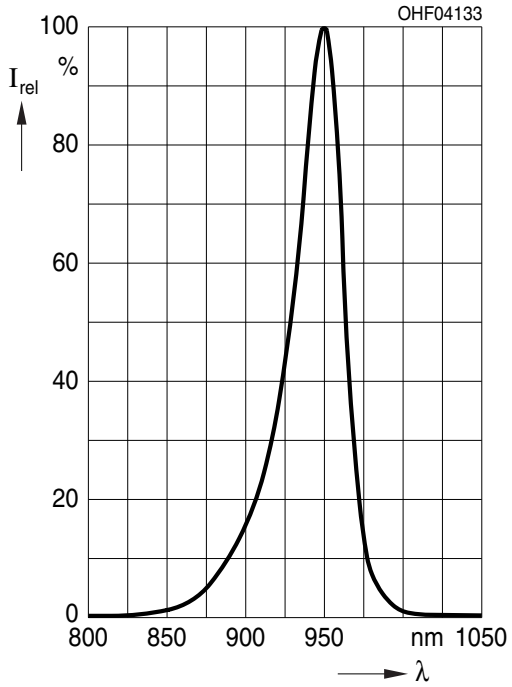
Brightness Groups

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
CB1	355 mW/sr	400 mW/sr
CB2	400 mW/sr	450 mW/sr

Only one group in one packing unit.

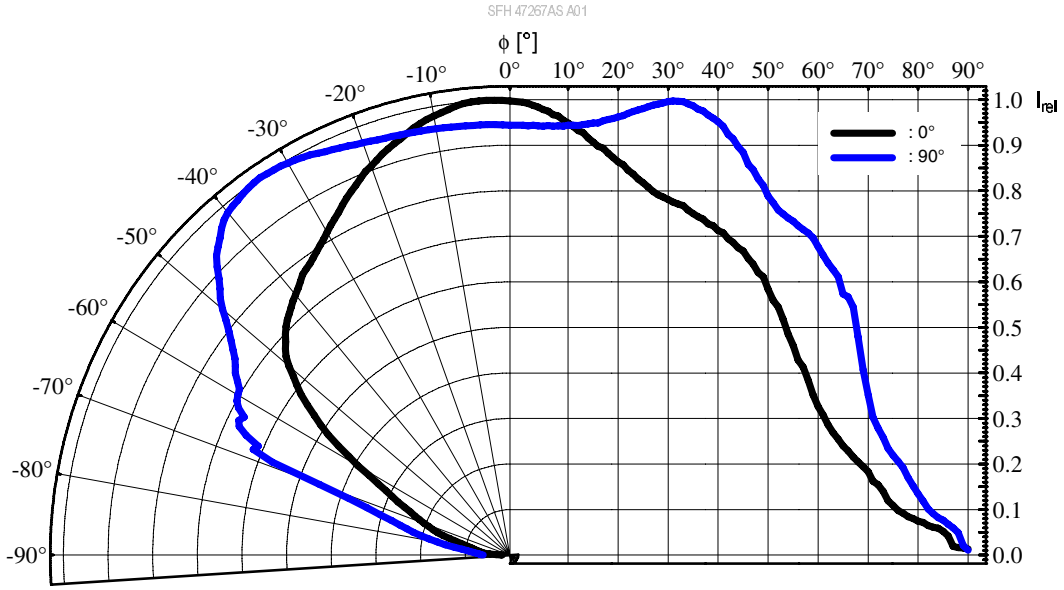
Relative Spectral Emission 7), 8)

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



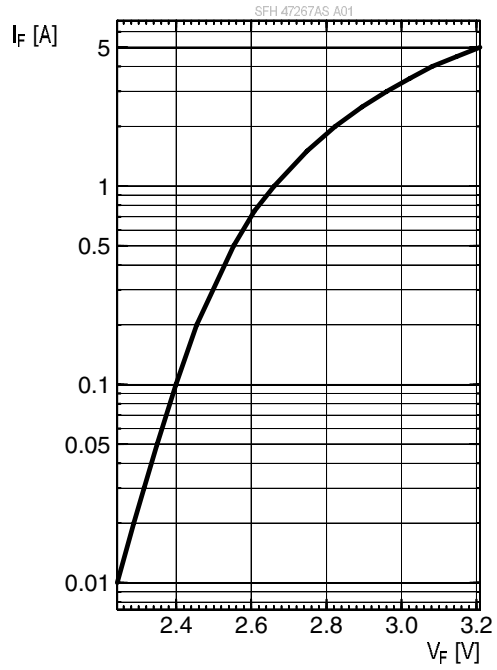
Radiation Characteristics 7), 8)

$I_{e,rel} = f(\varphi)$; black = short axis/ blue = long axis



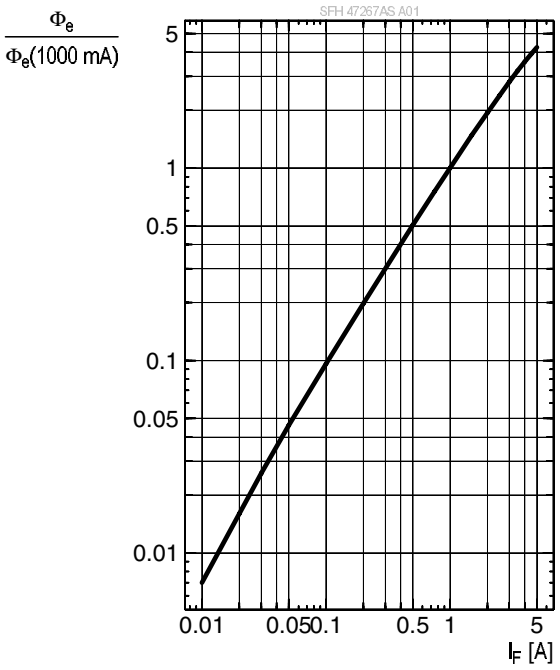
Forward current [7], [8]

$I_F = f(V_F)$; single pulse; t_p = 100 µs



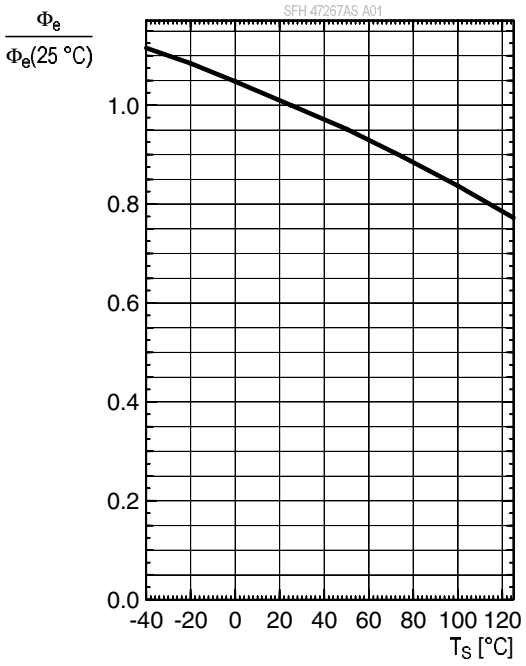
Relative Total Radiant Flux [7], [8]

$\Phi_e/\Phi_e(1000mA) = f(I_F)$; single pulse; t_p = 100 µs



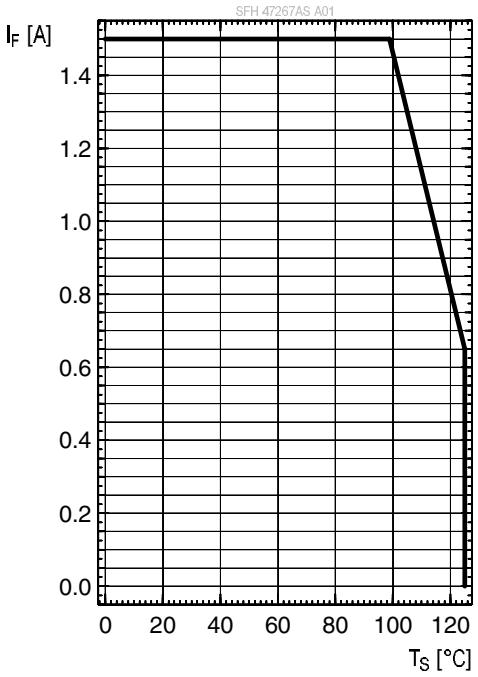
Relative Total Radiant Flux [7]

$\Phi_{rel} = f(T_S)$; I_F = 1A; t_p = 100µs; D = 0.004; single pulse



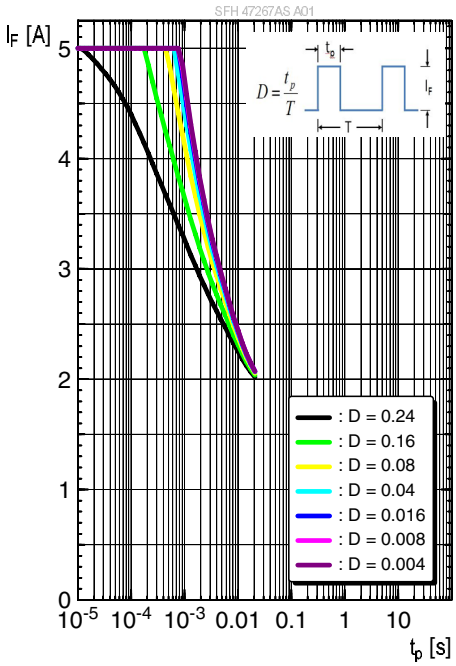
Max. Permissible Forward Current

$I_F = f(T_S)$; Rth_{js} = 9 K / W

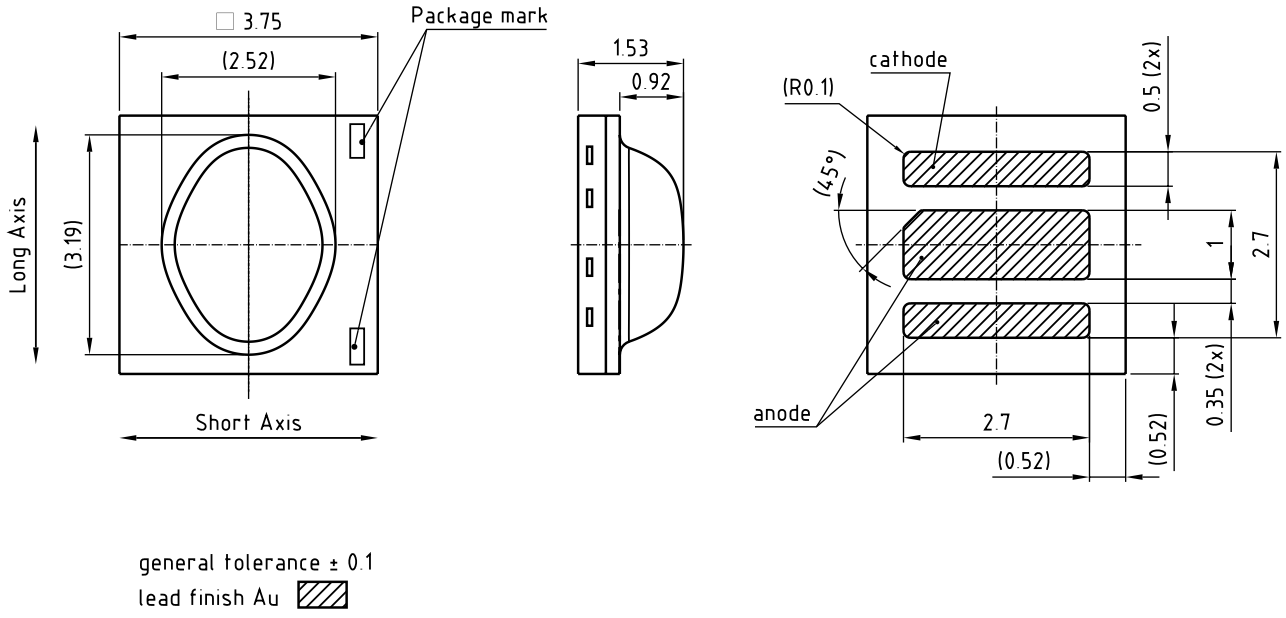


Permissible Pulse Handling Capability

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



Dimensional Drawing [9)]



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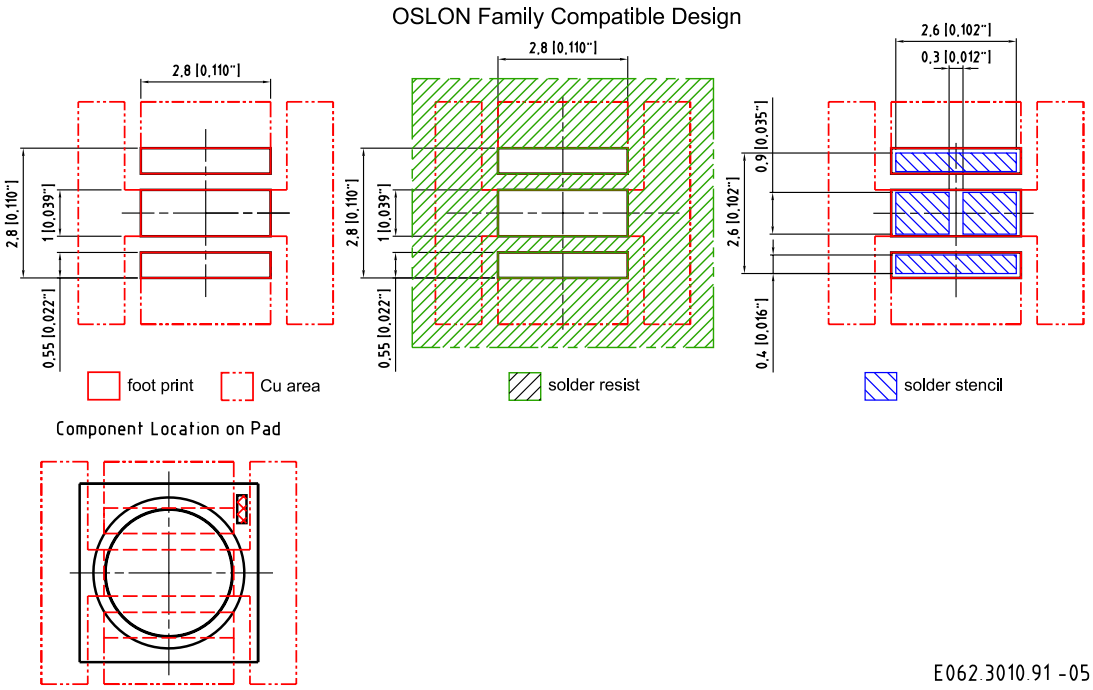
Further Information:

Approximate Weight: 31.0 mg

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

ESD advice: The device is protected by ESD device which is connected in parallel to the Chip.

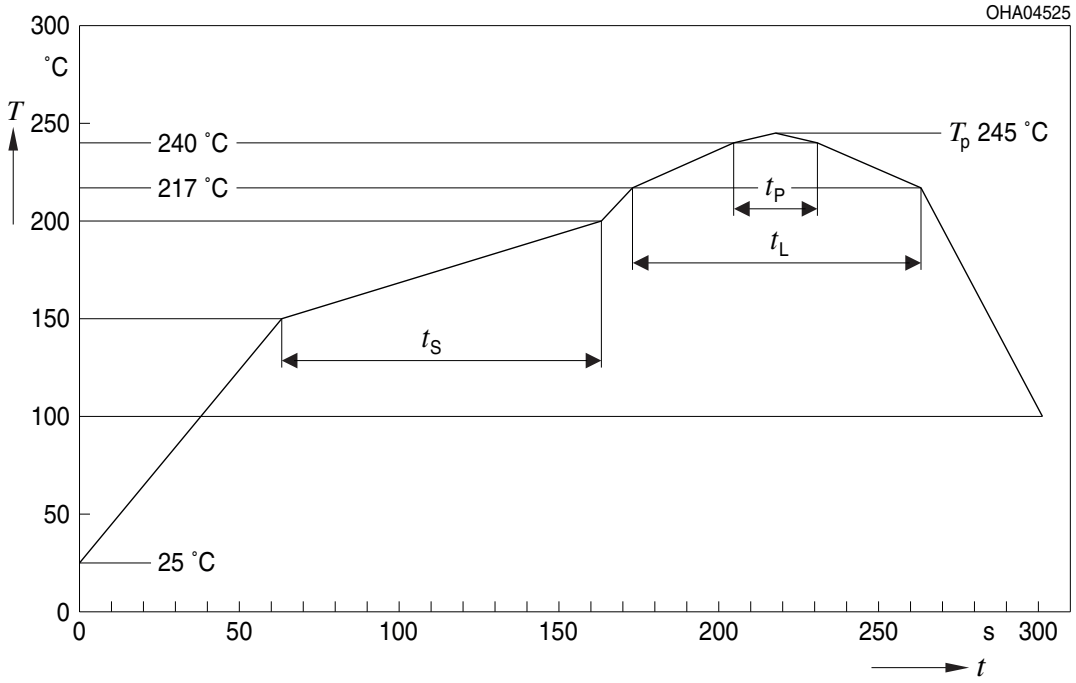
Recommended Solder Pad [9)]



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

Reflow Soldering Profile

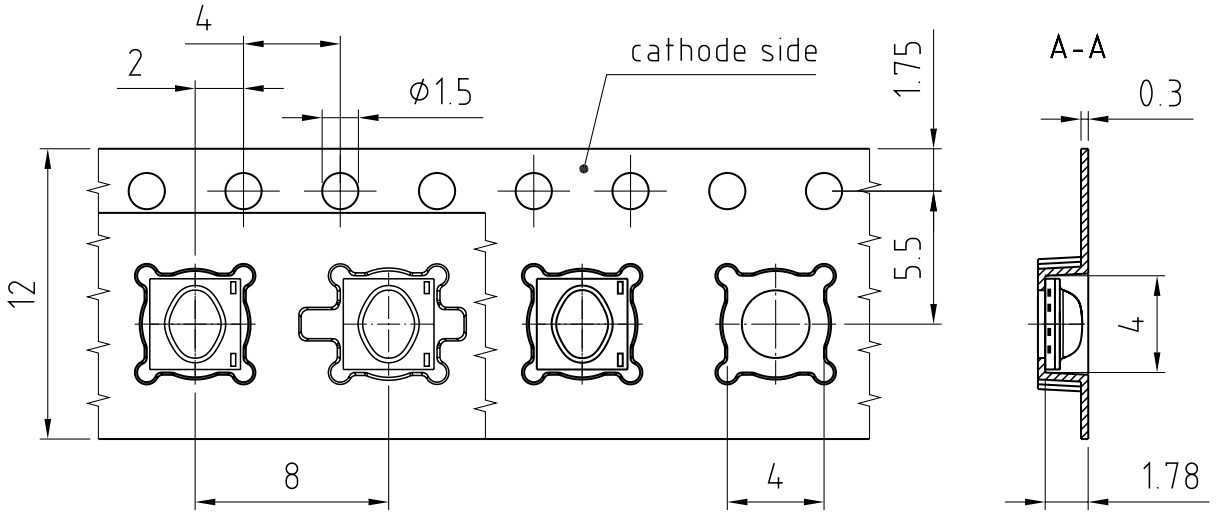
Product complies to MSL Level 2 acc. to JEDEC J-STD-020E



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	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 [9)]



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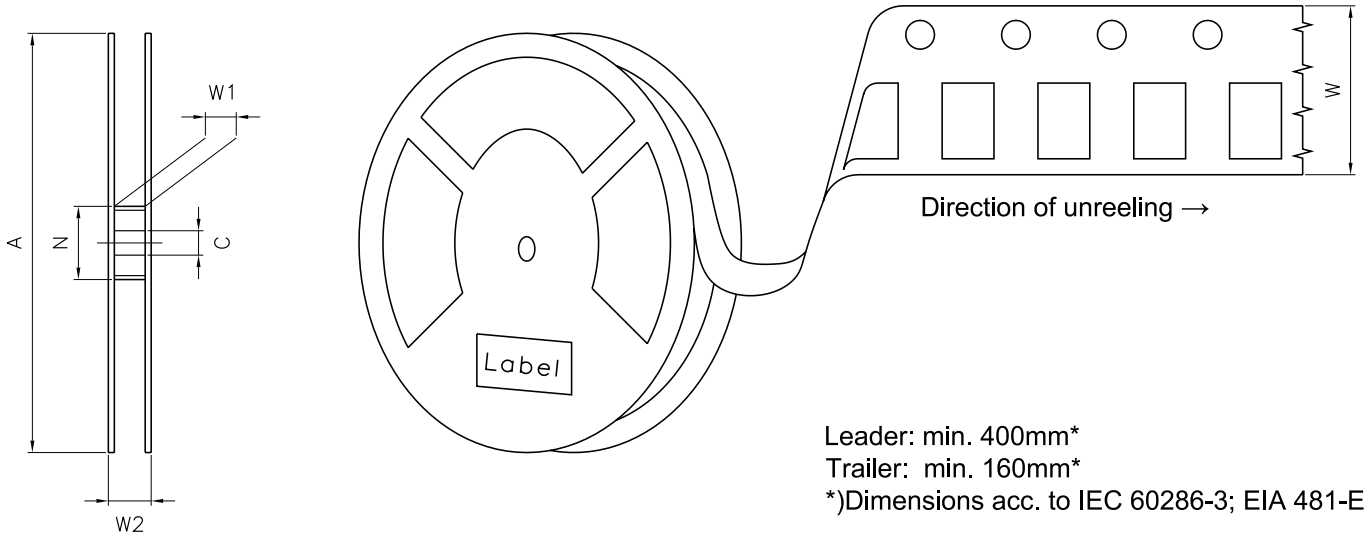
Tape and Reel [10)]

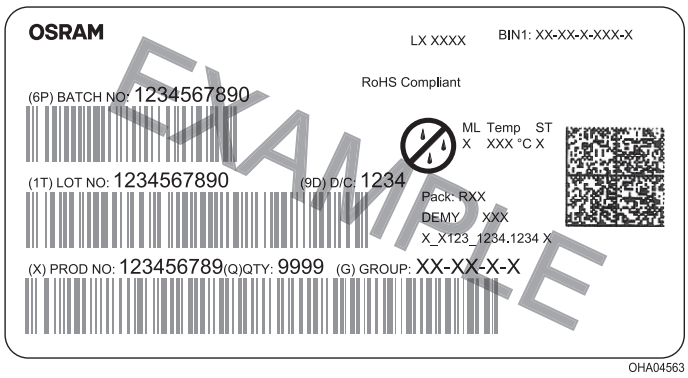


Leader: min. 400mm*
Trailer: min. 160mm*
*)Dimensions acc. to IEC 60286-3; EIA 481-E

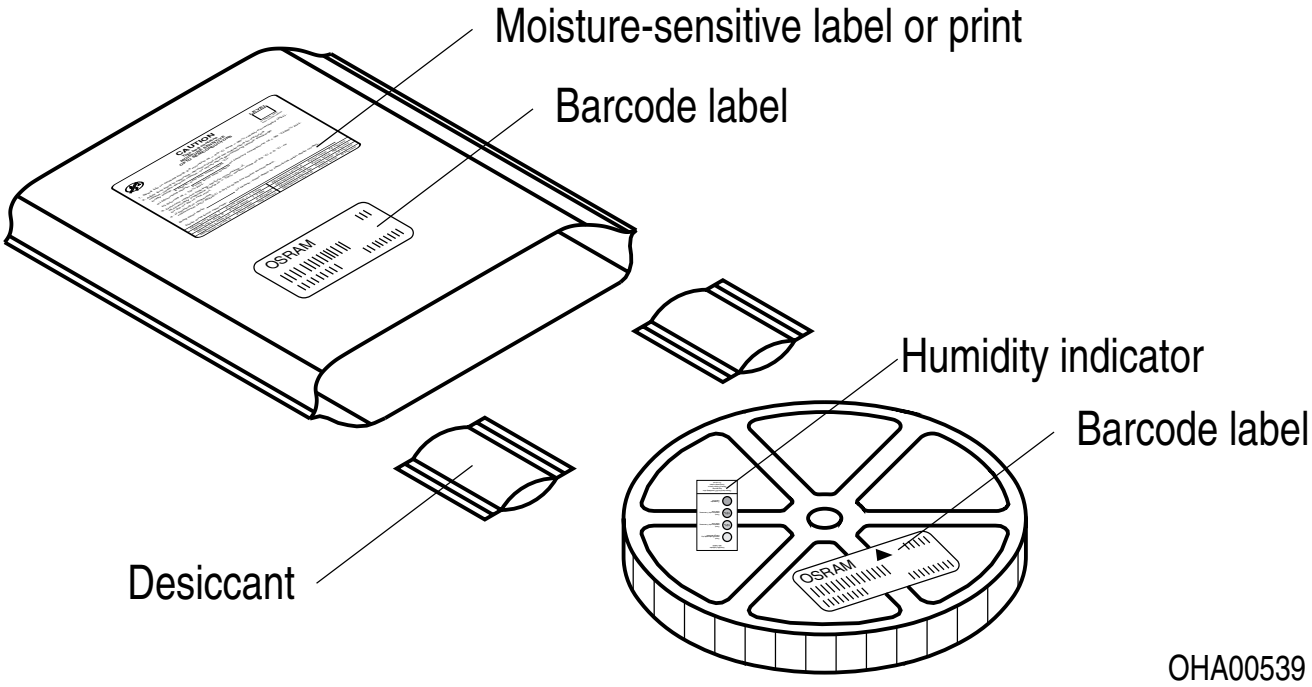
Reel Dimensions

A	W	N_{min}	W_1	$W_{2\,max}$	Pieces per PU
180 mm	12 + 0.3 / - 0.1 mm	60 mm	12.4 + 2 mm	18.4 mm	600

Barcode-Product-Label (BPL)



Dry Packing Process and Materials [9)]



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 www.osram-os.com/appnotes

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

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

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

7) **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.

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

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

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

Revision History

Version	Date	Change
0.0	2022-10-24	Initial Version
0.1	2023-03-02	Derating (Diagrams)

Preliminary datasheet version

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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