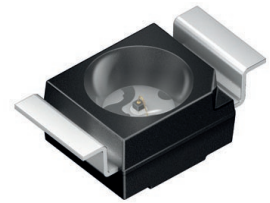


SFH 2270R

TOPLED® Reverse Gullwing

High Precision Ambient Light Photodiode



Applications

- Industrial Automation (Machine controls, Light barriers, Vision controls)
- Measurement Levelling

Features:

- Package: black epoxy
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)
- Nearly perfect match with Human Eye Sensitivity (V_{λ})
- Black coloured TOPLED®-package
- Low leakage current

Ordering Information

Type	Photocurrent	Photocurrent typ.	Ordering Code
	$E_e = 0.01 \text{ mW/cm}^2; \lambda = 560 \text{ nm};$ $V_R = 1 \text{ V}$ I_P	$E_e = 0.01 \text{ mW/cm}^2; \lambda = 560 \text{ nm}; V_R = 1 \text{ V}$ I_P	
SFH 2270R	$\geq 4.4 \text{ nA}$	5.6 nA	Q65110A9911

Note: corresponds to an illuminance of app. 55 lx

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	V_R	max.	2 V
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	V_{ESD}		2 kV

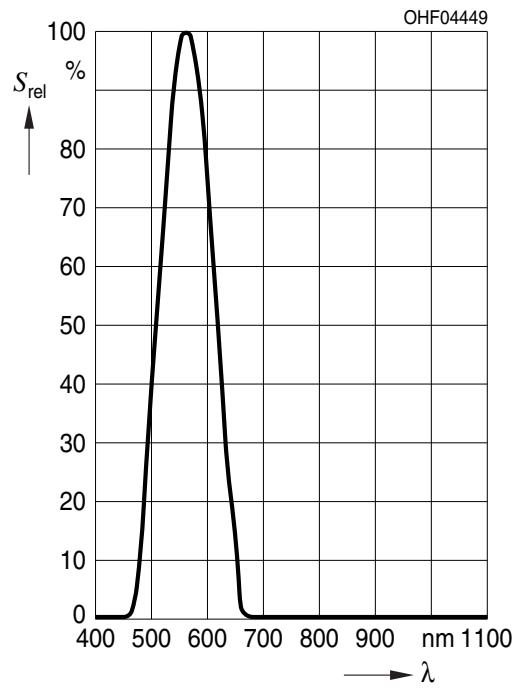
Characteristics

$T_A = 25\text{ °C}$

Parameter	Symbol		Values
Recommended operating range for illuminance	E_v	typ.	5 ... 100000 lx
Photocurrent $E_v = 1000\text{ lx}$; Std. Light A; $V_R = 1\text{ V}$	I_p	typ.	0.1 μA
Wavelength of max sensitivity	$\lambda_{S\text{ max}}$	typ.	560 nm
Spectral range of sensitivity	$\lambda_{10\%}$	typ.	480 ... 650 nm
Radiant sensitive area	A	typ.	0.16 mm ²
Dimensions of active chip area	L x W	typ.	0.4 x 0.4 mm x mm
Half angle	φ	typ.	60 °
Dark current $V_R = 1\text{ V}$	I_R	typ. max.	0.005 nA 0.15 nA
Rise time $V_R = 1\text{ V}$; $R_L = 50\text{ k}\Omega$; $I_p = 4\text{ }\mu\text{A}$; white LED	t_r	typ.	6 μs
Fall time $V_R = 1\text{ V}$; $R_L = 50\text{ k}\Omega$; $I_p = 4\text{ }\mu\text{A}$; White LED	t_f	typ.	6 μs
Capacitance $V_R = 0\text{ V}$; $f = 1\text{ MHz}$; $E = 0$	C_0	typ.	42 pF
Temperature coefficient of short-circuit current	TC_1	typ.	0.17 % / K

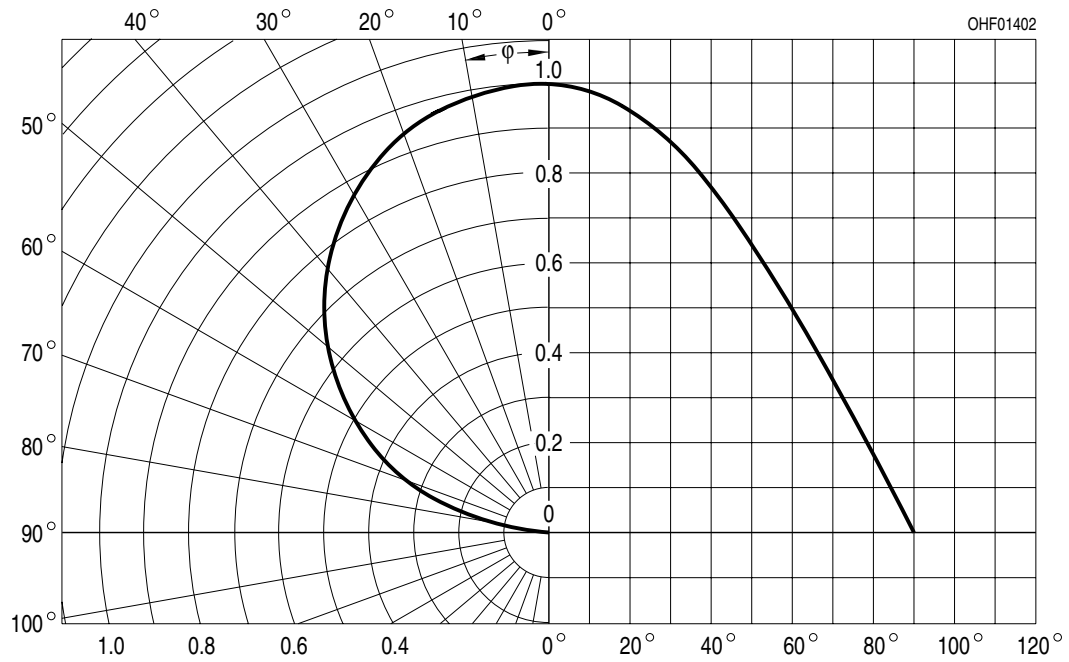
Relative Spectral Sensitivity ¹⁾

$$S_{rel} = f(\lambda)$$



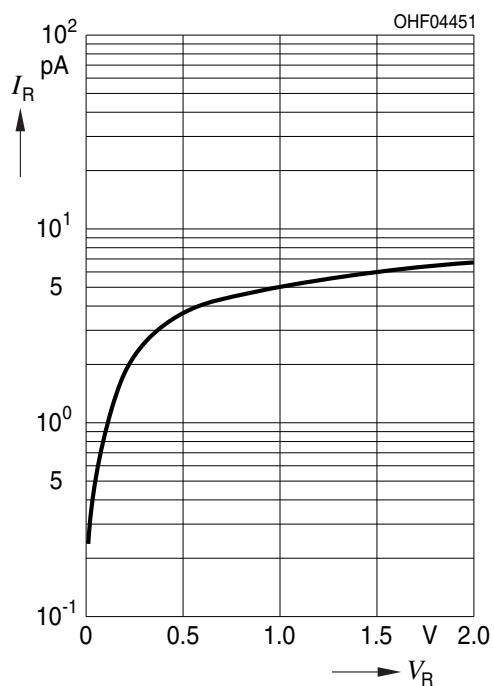
Directional Characteristics ¹⁾

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



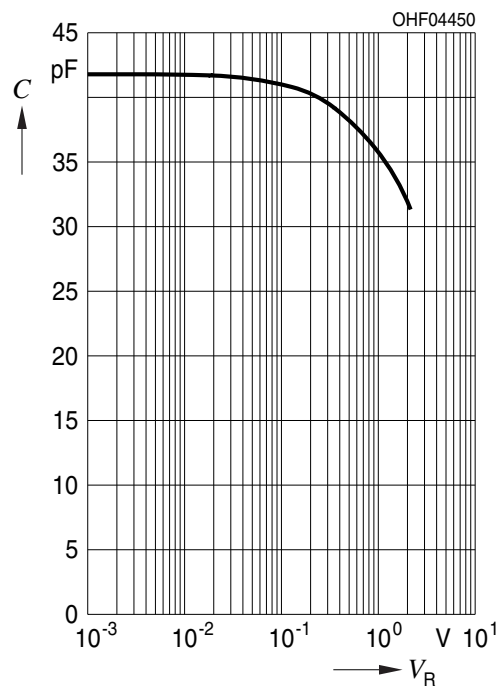
Dark Current ¹⁾

$$I_R = f(V_R); E = 0$$

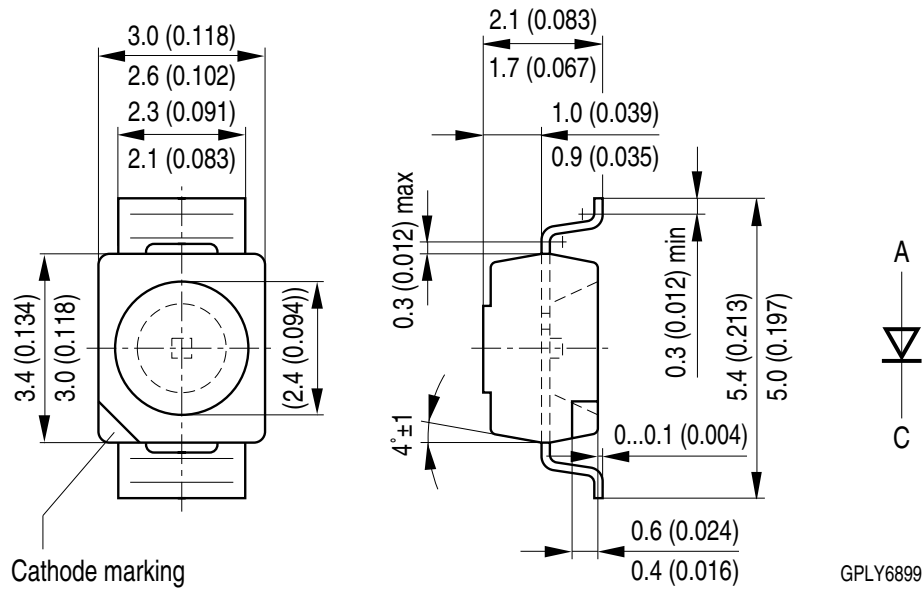


Capacitance ¹⁾

$$C = f(V_R); f = 1 \text{ MHz}; E = 0;$$



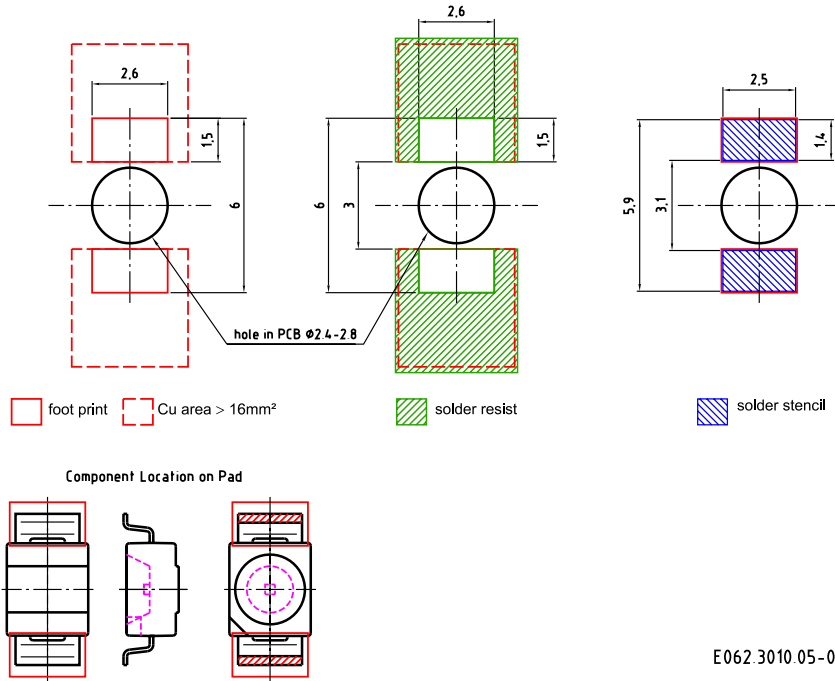
Dimensional Drawing ²⁾



Approximate Weight: 35.0 mg

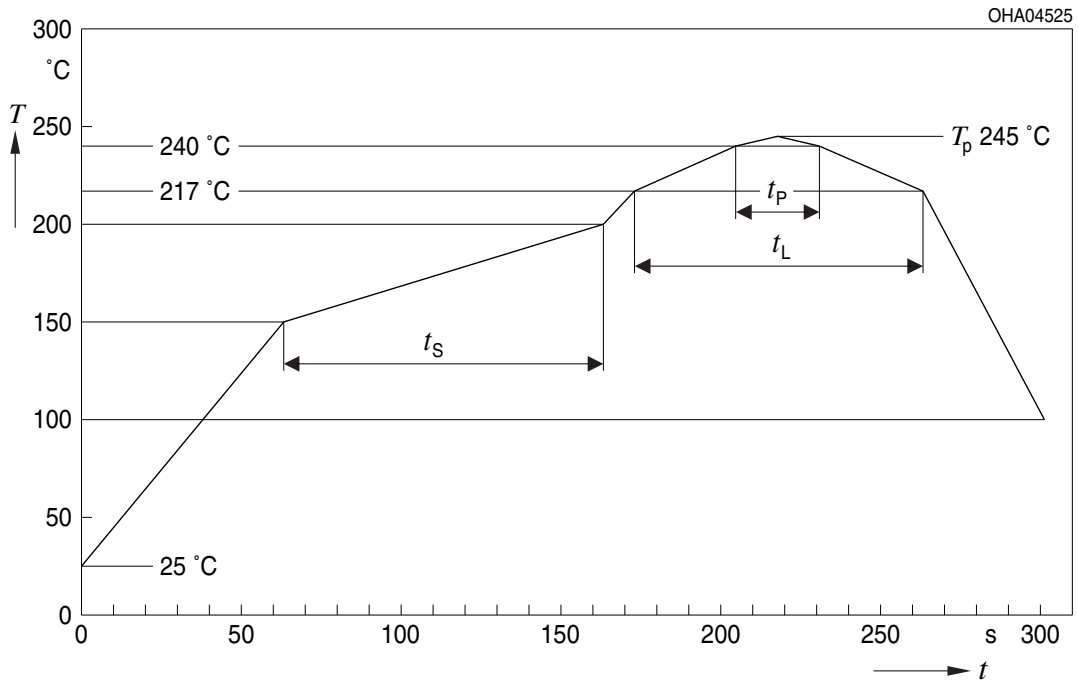
Package marking: Cathode

Recommended Solder Pad ²⁾



Reflow Soldering Profile

Product complies to MSL Level 3 acc. to JEDEC J-STD-020E

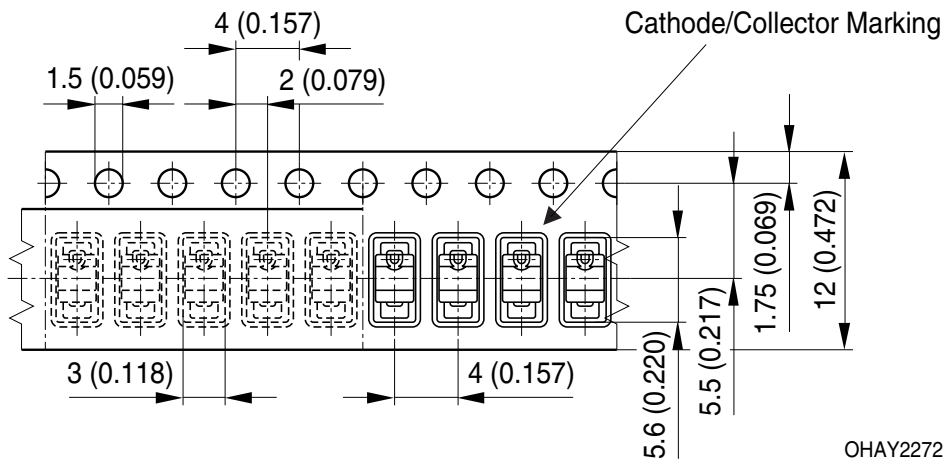


Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat ^{*)} 25 °C to 150 °C			2	3	K/s
Time t_s T_{Smin} to T_{Smax}	t_s	60	100	120	s
Ramp-up rate to peak ^{*)} T_{Smax} to T_p			2	3	K/s
Liquidus temperature	T_L		217		°C
Time above liquidus temperature	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

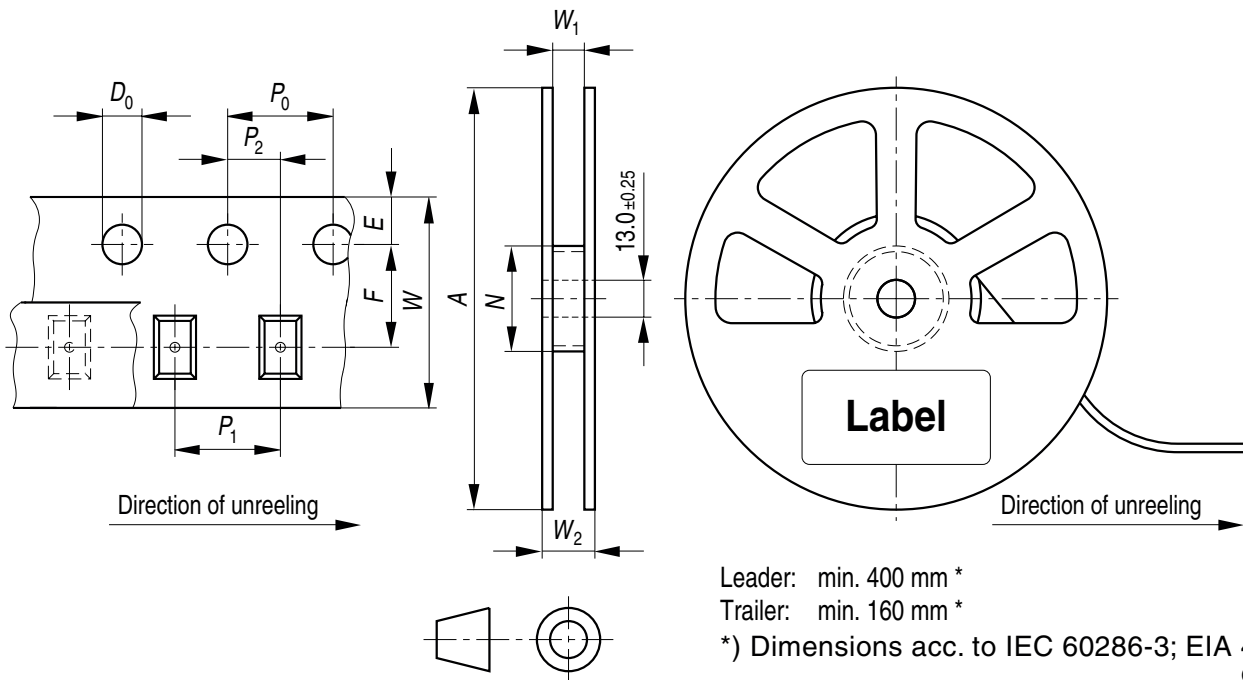
All temperatures refer to the center of the package, measured on the top of the component

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

Taping ²⁾



Tape and Reel ³⁾



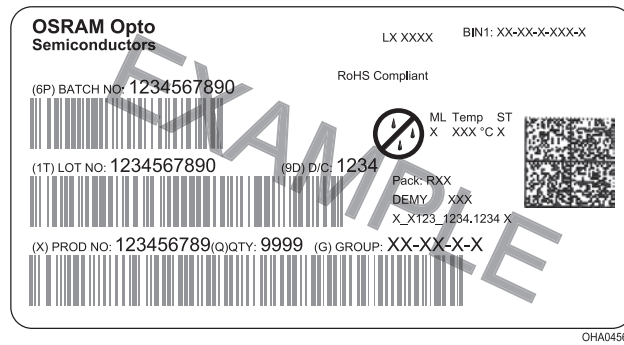
Leader: min. 400 mm *
 Trailer: min. 160 mm *

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

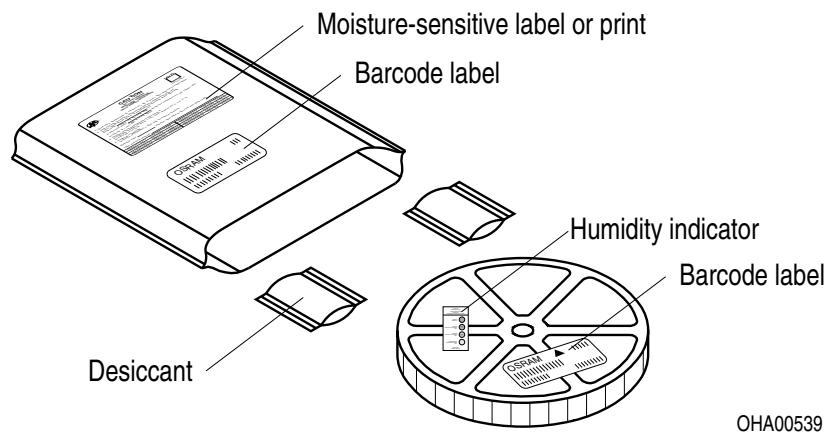
Reel dimensions [mm]

A	W	N _{min}	W ₁	W _{2max}	Pieces per PU
180 mm	12 + 0.3 / - 0.1	60	12.4 + 2	18.4	2000
330 mm	12 + 0.3 / - 0.1	60	12.4 + 2	18.4	8000

Barcode-Product-Label (BPL)

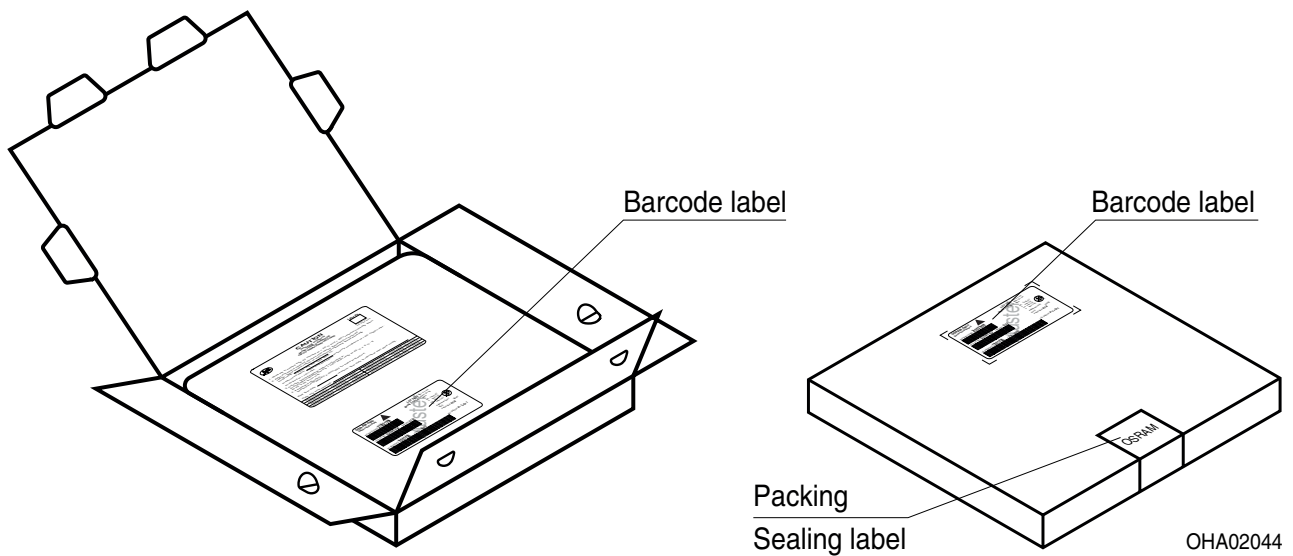


Dry Packing Process and Materials ²⁾



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

Transportation Packing and Materials ²⁾



Dimensions of transportation box in mm

Width	Length	Height
195 ± 5 mm	195 ± 5 mm	30 ± 5 mm
349 ± 5 mm	349 ± 5 mm	33 ± 5 mm

Notes

Depending on the mode of operation, these devices emit highly concentrated visible and non visible 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.

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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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) **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.
- 2) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with ± 0.1 and dimensions are specified in mm.
- 3) **Tape and Reel:** All dimensions and tolerances are specified acc. IEC 60286-3 and specified in mm.

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