

Silicon PIN Photodiode

Version 1.2

SFH 2505



Features:

- Wavelength range ($S_{10\%}$) 400 nm to 1100 nm
- SMR® (Surface Mount Radial) package
- Short switching time (typ. 5 ns)

Applications

- Photointerrupters
- Industrial electronics
- For control and drive circuits
- Data transmission

Ordering Information

Type:	Photocurrent I_P [μA] $\lambda = 870 \text{ nm}$, $E_e = 1 \text{ mW/cm}^2$, $V_R = 5 \text{ V}$	Ordering Code
SFH 2505	70 (≥ 50)	Q65110A1203

Maximum Ratings ($T_A = 25\text{ °C}$)

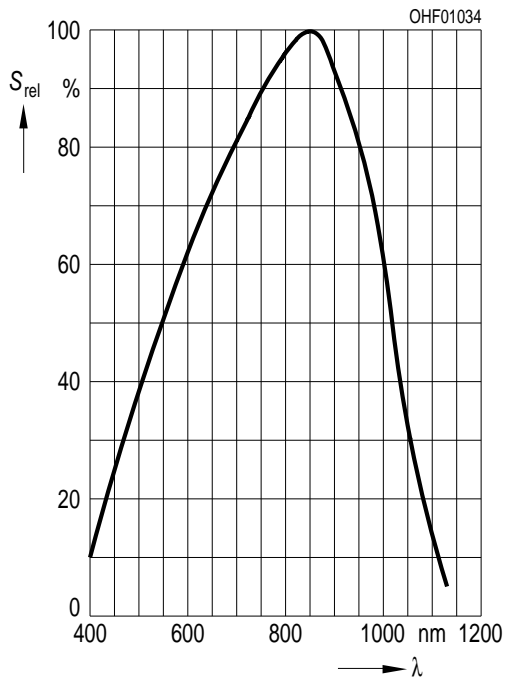
Parameter	Symbol	Values	Unit
Operating and storage temperature range	$T_{op}; T_{stg}$	-40 ... 85	°C
Reverse voltage ($t < 2\text{ min}$)	V_R	50	V
Total Power dissipation	P_{tot}	100	mW
Electrostatic discharge (acc. to ANSI/ ESDA/ JEDEC JS-001 - HBM)	V_{ESD}	2000	V

Characteristics ($T_A = 25\text{ °C}$)

Parameter	Symbol	Values	Unit
Photocurrent ($V_R = 5\text{ V}$, standard light A, $T = 2856\text{ K}$, $E_V = 1000\text{ lx}$)	(typ (min)) I_P	100	μA
Photocurrent ($V_R = 5\text{ V}$, $\lambda = 870\text{ nm}$, $E_e = 1\text{ mW/cm}^2$)	(typ (min)) I_P	70 (≥ 50)	μA
Wavelength of max. sensitivity	(typ) $\lambda_{S\text{ max}}$	850	nm
Spectral range of sensitivity	(typ) $\lambda_{10\%}$	(typ) 400 ... 1100	nm
Half angle	(typ) φ	± 15	°
Open-circuit voltage ($E_V = 1000\text{ lx}$, Std. Light A, $T = 2856\text{ K}$)	(typ (min)) V_O	430	mV
Open-circuit voltage ($E_e = 0.5\text{ mW/cm}^2$, $\lambda = 870\text{ nm}$)	(typ (min)) V_O	390 (> 320)	mV
Short-circuit current ($E_V = 1000\text{ lx}$, Std. Light A, $T = 2856\text{ K}$)	(typ) I_{SC}	100	μA
Short-circuit current ($E_e = 1\text{ mW/cm}^2$, $\lambda = 870\text{ nm}$)	(typ) I_{SC}	70	μA
Temperature coefficient of I_{SC} (Std. Light A)	(typ) TC_I	0.18	% / K
Temperature coefficient of I_{SC} ($\lambda = 870\text{ nm}$)	(typ) TC_I	0.1	% / K

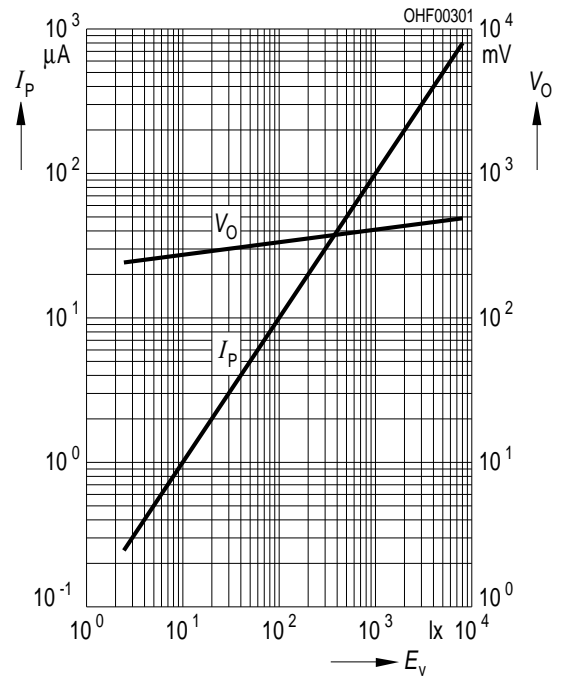
Relative Spectral Sensitivity ^{1) page 11}

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



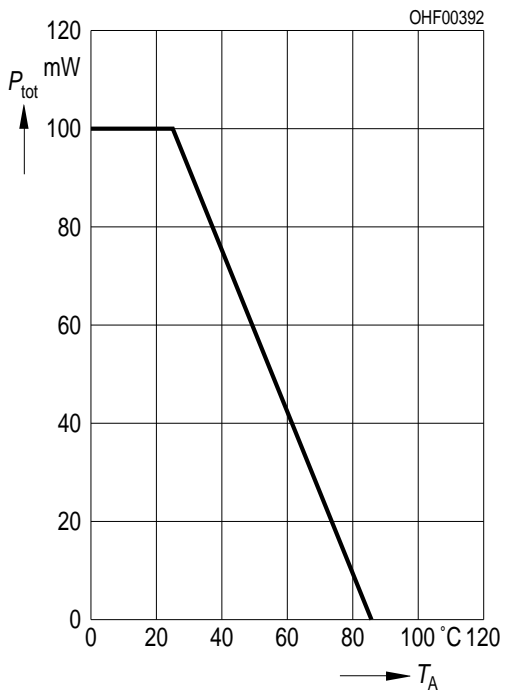
Photocurrent / Open-Circuit Voltage ^{1) page 11}

$I_P (V_R = 5 V) / V_O = f(E_V)$



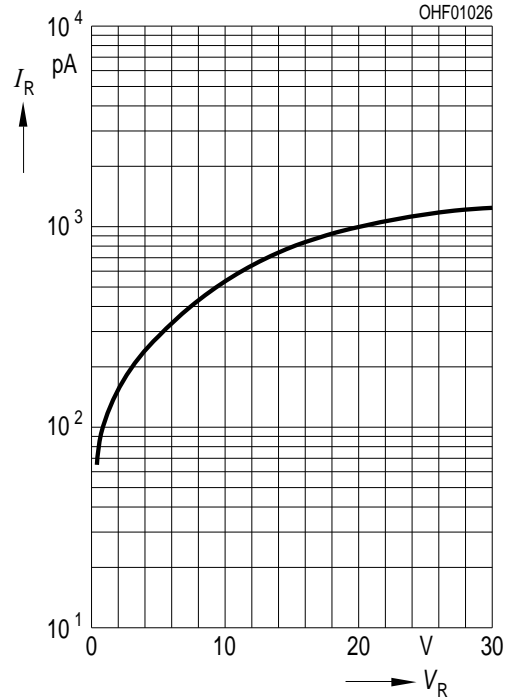
Power Consumption

$P_{tot} = f(T_A)$



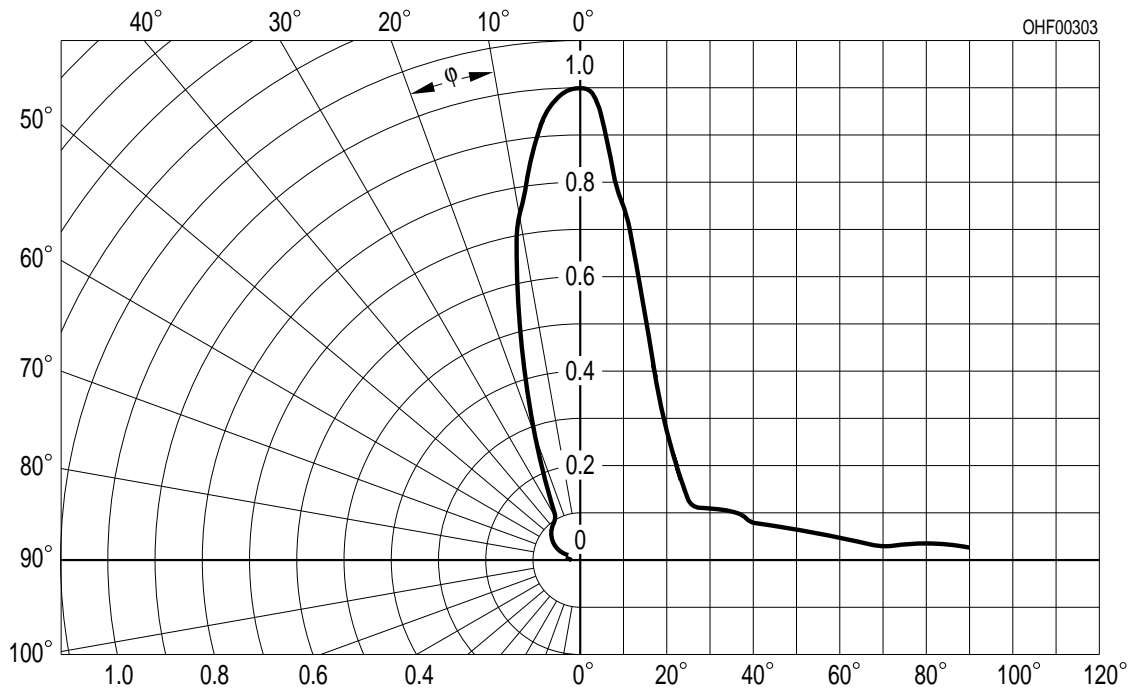
Dark Current ^{1) page 11}

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

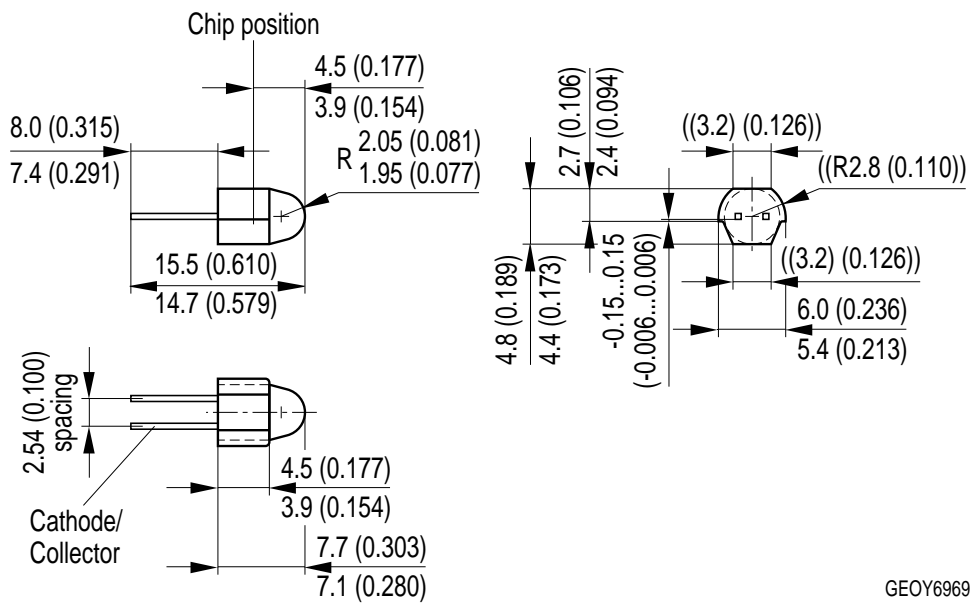


Directional Characteristics ^{1) page 11}

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



Package Outline



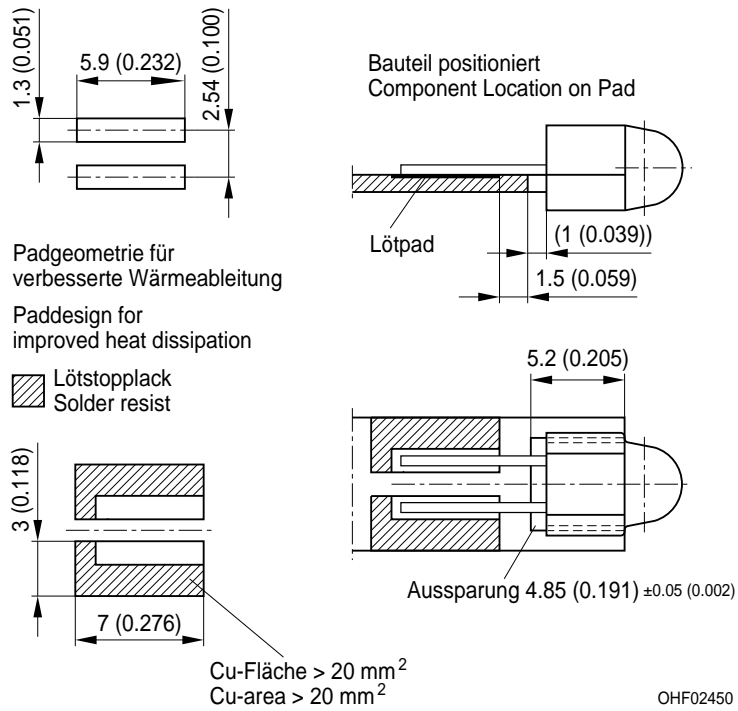
Dimensions in mm (inch).

Package
SMR

Approximate Weight:

0.115 mg

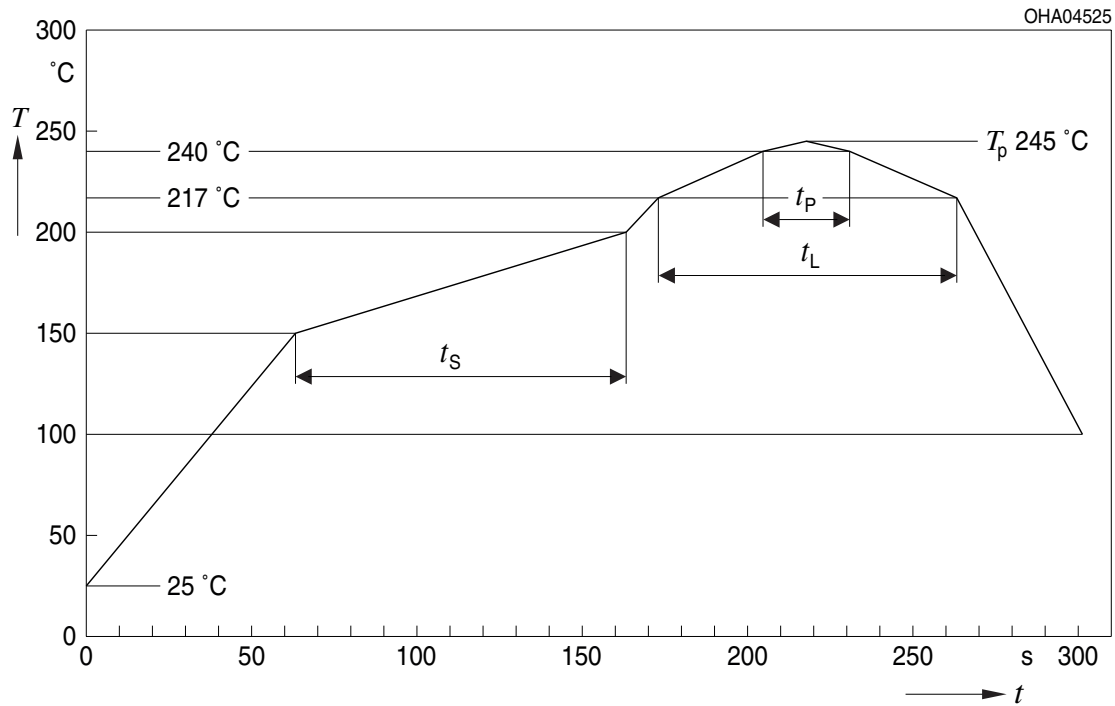
Recommended Solder Pad



Dimensions in mm (inch).

Reflow Soldering Profile

Product complies to MSL Level 3 acc. to JEDEC J-STD-020D.01



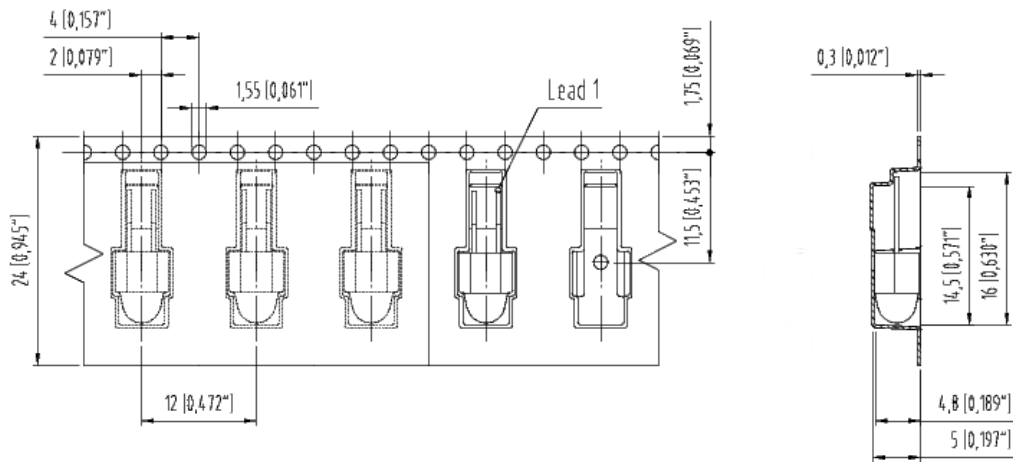
OHA04612

Profile Feature Profil-Charakteristik	Symbol Symbol	Pb-Free (SnAgCu) Assembly			Unit Einheit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat*) $25\text{ }^{\circ}\text{C}$ to $150\text{ }^{\circ}\text{C}$			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			$^{\circ}\text{C}$
Time above liquidus temperature	t_L		80	100	s
Peak temperature	T_P		245	260	$^{\circ}\text{C}$
Time within $5\text{ }^{\circ}\text{C}$ of the specified peak temperature $T_P - 5\text{ K}$	t_P	10	20	30	s
Ramp-down rate* T_P to $100\text{ }^{\circ}\text{C}$			3	6	K/s
Time $25\text{ }^{\circ}\text{C}$ 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



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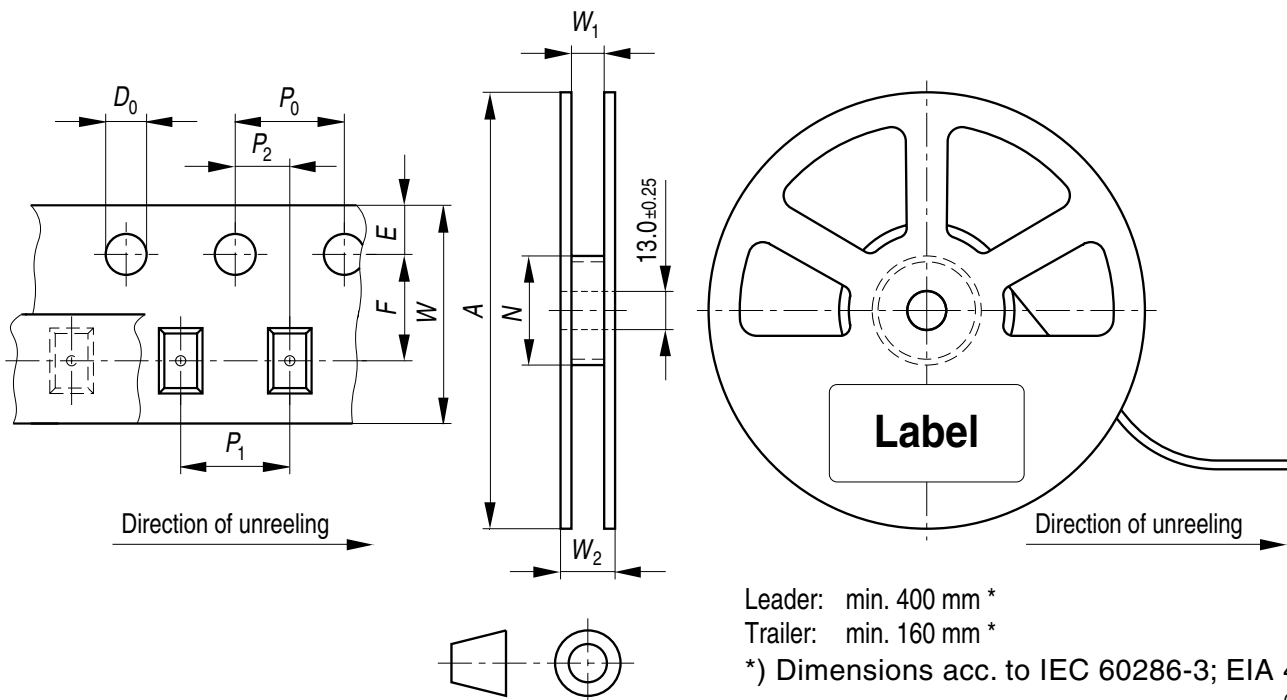
Dimensions in mm (inch).

Note:

Lead 1 = Anode

Tape and Reel

24 mm tape with 1000 pcs. on \varnothing 330 mm reel



Leader: min. 400 mm *

Trailer: min. 160 mm *

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

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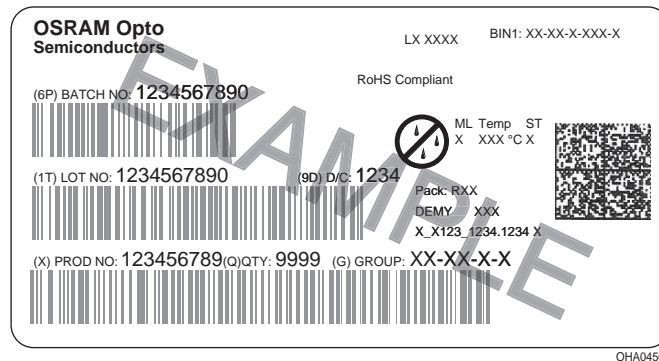
Tape dimensions [mm]

W	P ₀	P ₁	P ₂	D ₀	E	F
24 + 0.3 / - 0.1	4 ± 0.1	8 ± 0.1 or 12 ± 0.1	2 ± 0.1	1.5 ± 0.1	1.75 ± 0.1	11.5 ± 0.05

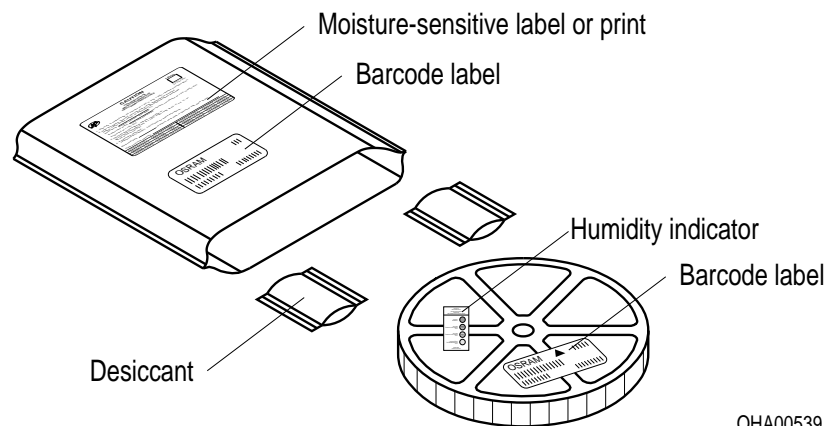
Reel dimensions [mm]

A	W	N _{min}	W ₁	W _{2max}
330	24	60 / 100	24.4 + 2	30.4

Barcode-Product-Label (BPL)



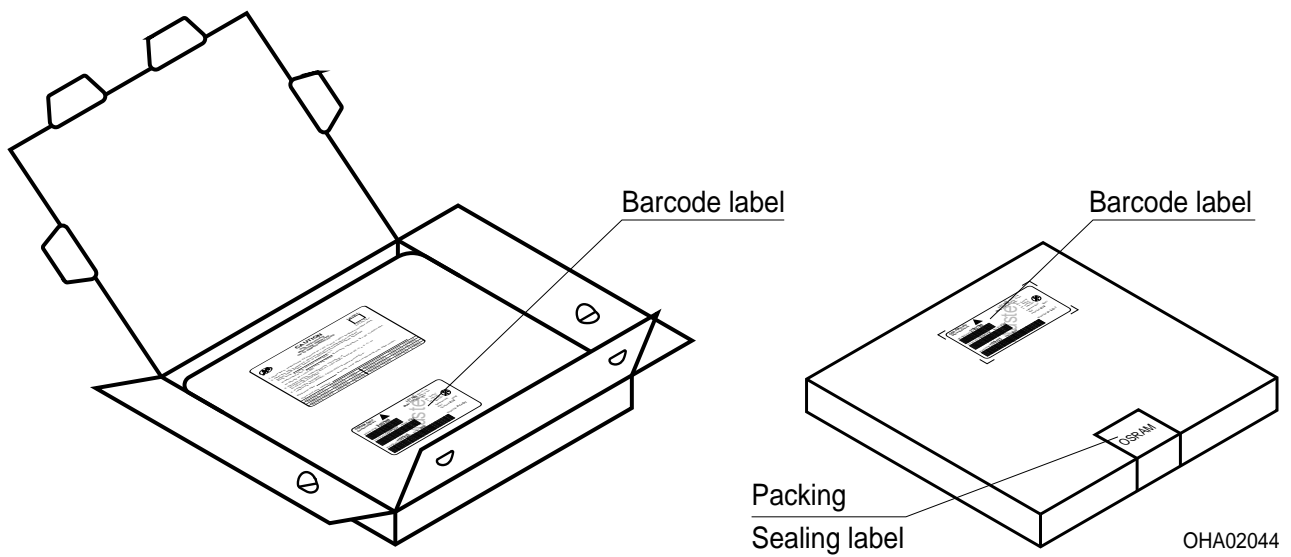
Dry Packing Process and Materials



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
349 ± 5	349 ± 5	38 ± 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.

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 Internet.

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.

Components used in life-support devices or systems must be expressly authorized for such purpose!

Critical components* may only be used in life-support devices** or systems with the express written approval of OSRAM OS.

*) A critical component is a component used in a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or the effectiveness of that device or system.

**) Life support devices or systems are intended (a) to be implanted in the human body, or (b) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health and the life of the user may be endangered.

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.

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