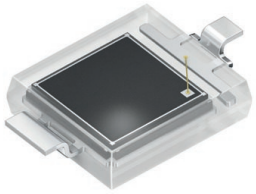
BP 104 SR

DIL SMT

Silicon PIN Photodiode



Applications

- LIDAR, Pre-Crash, ACC
- Rain sensors

Features:

- Package: clear epoxy
- Corrosion Robustness Class: 3B
- Qualifications: The product qualification test plan is based on the guidelines of AEC-Q101-REV-C, Stress Test Qualification for Automotive Grade Discrete Semiconductors.
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)
- Suitable for reflow soldering
- Especially suitable for applications from 400 nm to 1100 nm
- Short switching time (typ. 20 ns)
- Suitable for SMT

Ordering Information

Type	Photocurrent E_v = 1000 lx; Std. Light A; V_R = 5 V I_P	Photocurrent typ. E_v = 1000 lx; Std. Light A; V_R = 5 V I_P	Ordering Code
BP 104 SR-Z	≥ 40 µA	55 µA	Q65110A4262

OSRAM
Opto Semiconductors

Maximum Ratings

T_A = 25 °C

Parameter	Symbol		Values
Operating Temperature	T_{op}	min. max.	-40 °C 100 °C
Storage temperature	T_{stg}	min. max.	-40 °C 100 °C
Reverse voltage	V_R	max.	20 V
Total power dissipation	P_{tot}	max.	150 mW
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	V_{ESD}	max.	2 kV

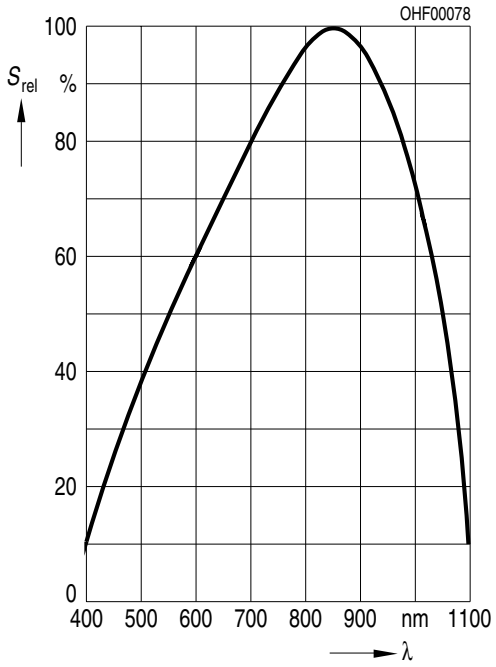
Characteristics

T_A = 25 °C

Parameter	Symbol		Values
Wavelength of max sensitivity	$\lambda_{S\ max}$	typ.	850 nm
Spectral range of sensitivity	$\lambda_{10\%}$	typ.	400 ... 1100 nm
Radiant sensitive area	A	typ.	4.84 mm²
Dimensions of active chip area	L x W	typ.	2.2 x 2.2 mm x mm
Half angle	φ	typ.	60 °
Dark current V_R = 10 V	I_R	typ. max.	2 nA 30 nA
Spectral sensitivity of the chip λ = 850 nm	S_λ	typ.	0.62 A / W
Quantum yield of the chip λ = 850 nm	η	typ.	0.90 Electrons / Photon
Open-circuit voltage E_v = 1000 lx; Std. Light A	V_O	min. typ.	280 mV 360 mV
Short-circuit current E_v = 1000 lx; Std. Light A	I_{SC}	typ.	50 µA
Rise time V_R = 5 V; R_L = 50 Ω; λ = 850 nm	t_r	typ.	0.02 µs
Fall time V_R = 5 V; R_L = 50 Ω; λ = 850 nm	t_f	typ.	0.02 µs
Forward voltage I_F = 100 mA; E = 0	V_F	typ.	1.3 V
Capacitance V_R = 0 V; f = 1 MHz; E = 0	C_0	typ.	48 pF
Temperature coefficient of voltage	TC_V	typ.	-2.6 mV / K
Temperature coefficient of short-circuit current Std. Light A	TC_I	typ.	0.18 % / K
Noise equivalent power V_R = 10 V; λ = 850 nm	NEP	typ.	0.041 pW / $Hz^{1/2}$
Detection limit	D*	typ.	5.4e12 cm x $Hz^{1/2}$ / W

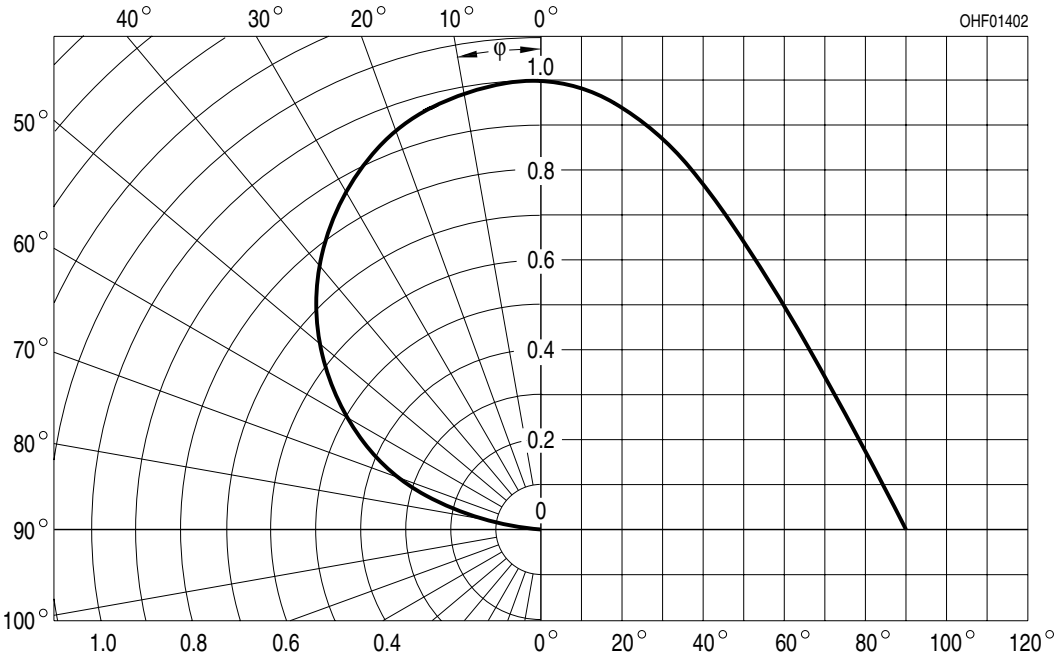
Relative Spectral Sensitivity [1), 2)]

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



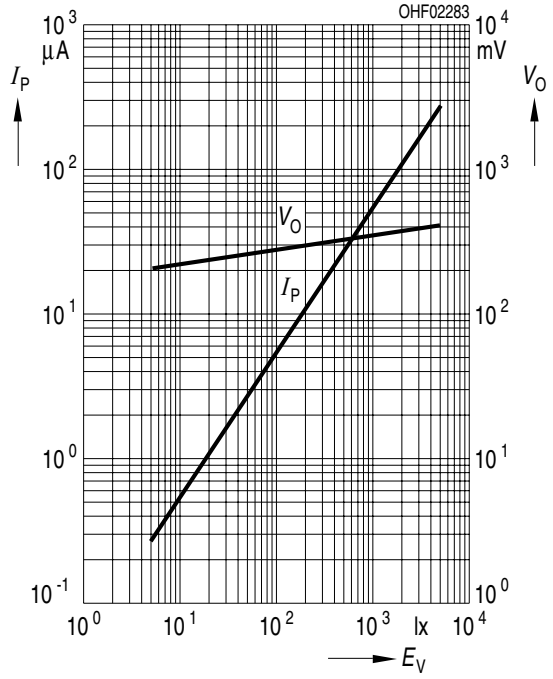
Directional Characteristics [1), 2)]

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



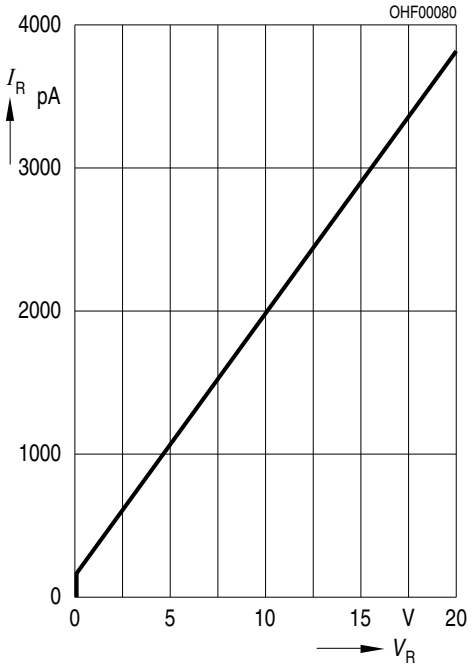
Photocurrent/Open-Circuit Voltage [1), 2)]

I_P (V_R = 5 V) / V_O = f (E_v)



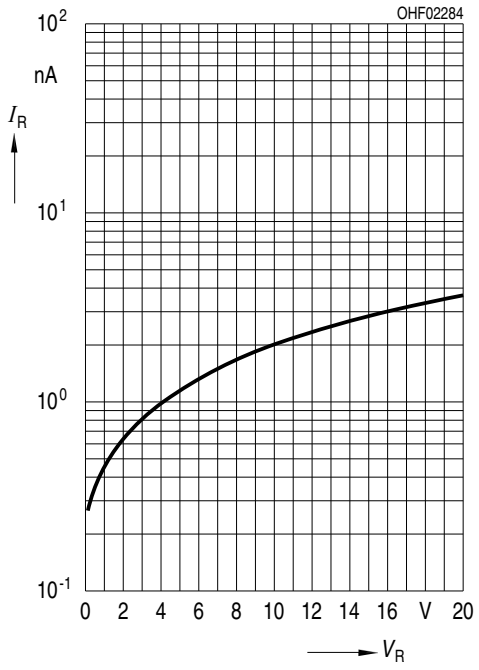
Dark Current [1), 2)]

I_R = f (V_R) ; E = 0



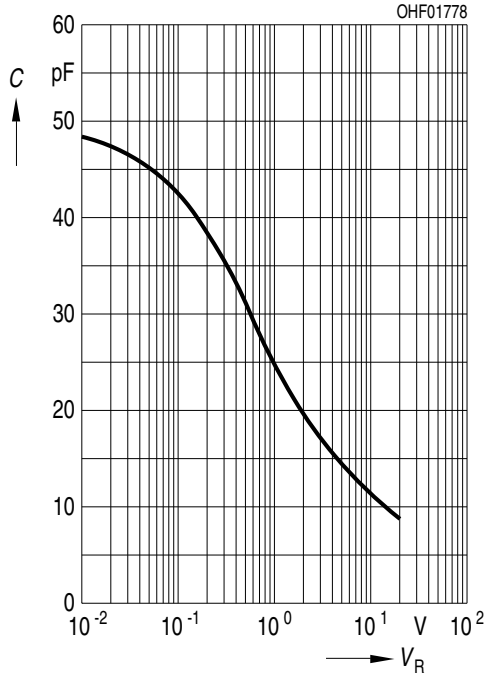
Dark Current [1), 2)]

I_R = f (V_R) ; E = 0



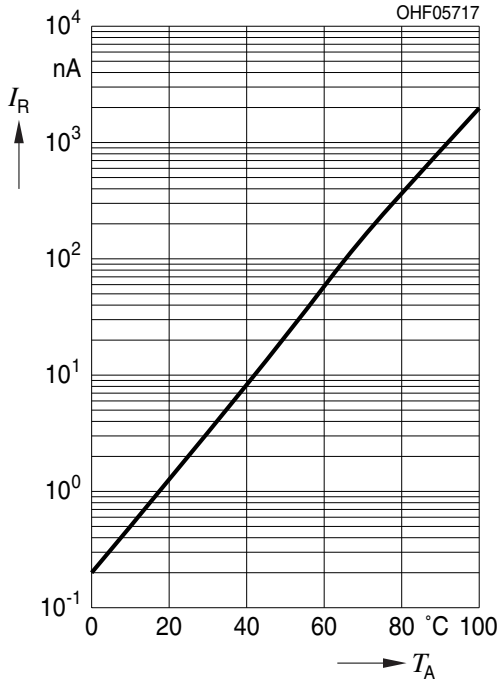
Capacitance [1), 2)]

C = f (V_R); f = 1 MHz; E = 0;



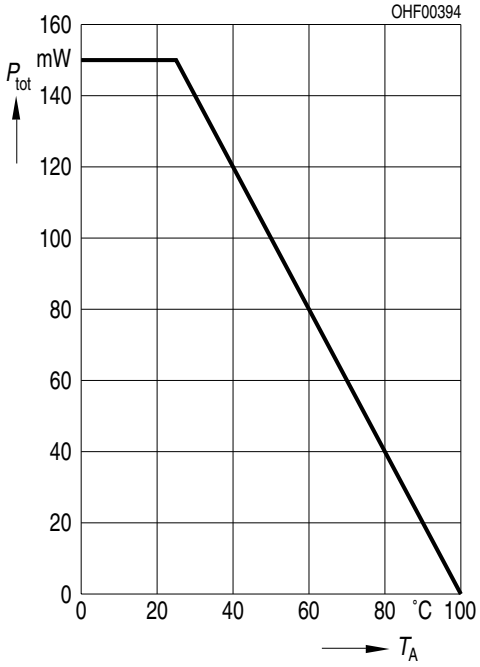
Dark Current [2)]

I_R = f (T_A); E = 0; V_R = 10 V

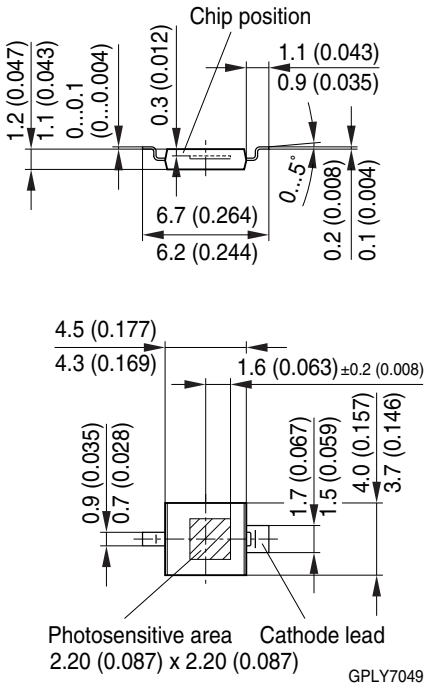


Power Consumption

$P_{tot} = f(T_A)$;



Dimensional Drawing [3)]

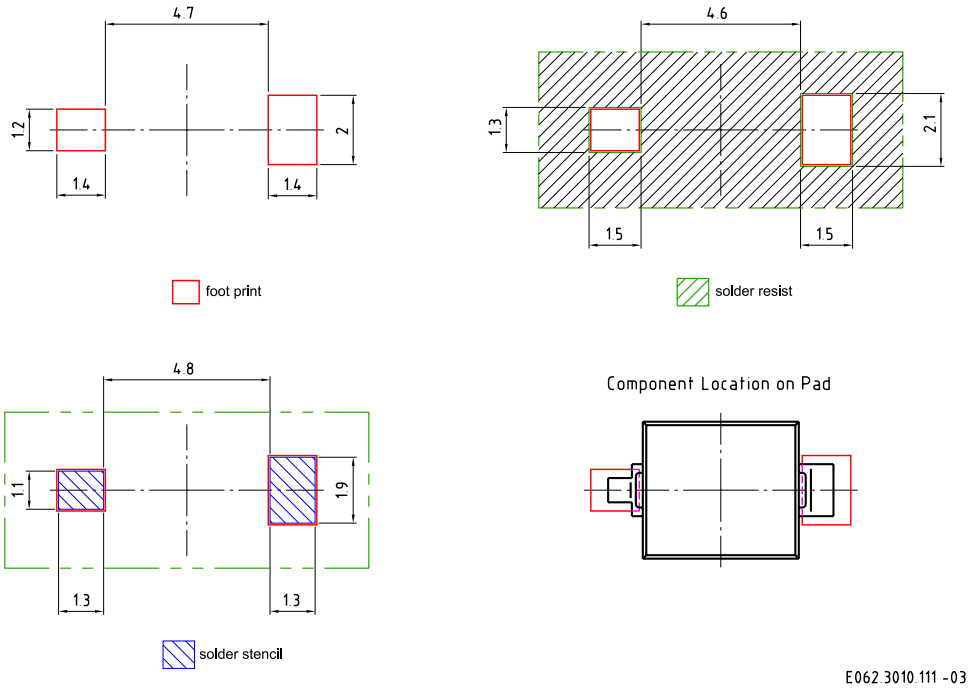


Approximate Weight: 44.0 mg

Package marking: Cathode

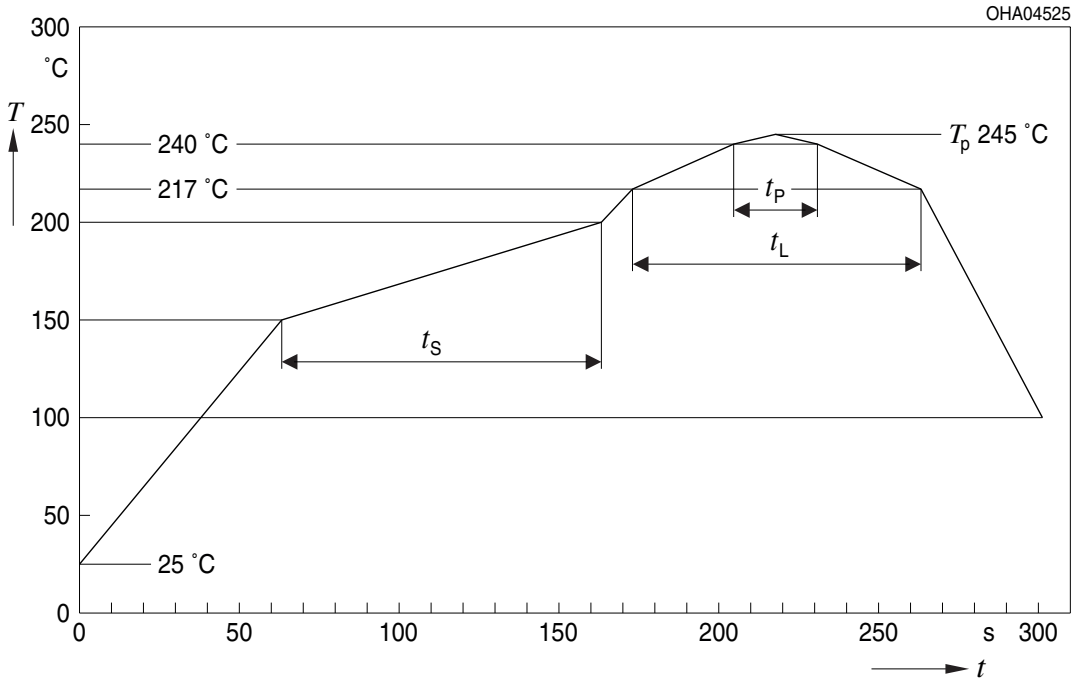
Corrosion test: Class: 3B
Test condition: 40°C / 90 % RH / 15 ppm H_2S / 14 days (stricter then IEC 60068-2-43)

Recommended Solder Pad [3)]



Reflow Soldering Profile

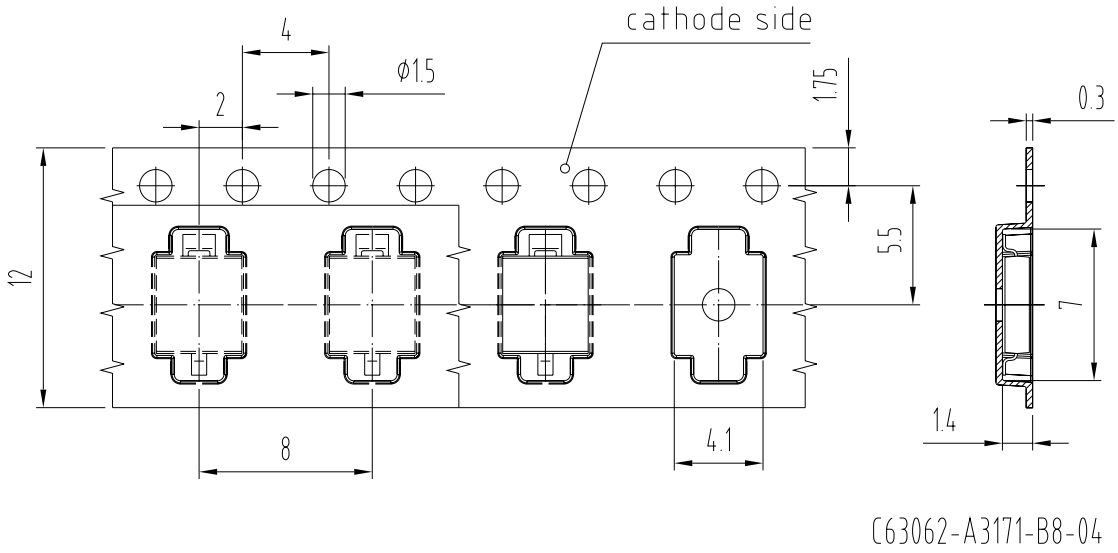
Product complies to MSL Level 4 acc. to JEDEC J-STD-020E



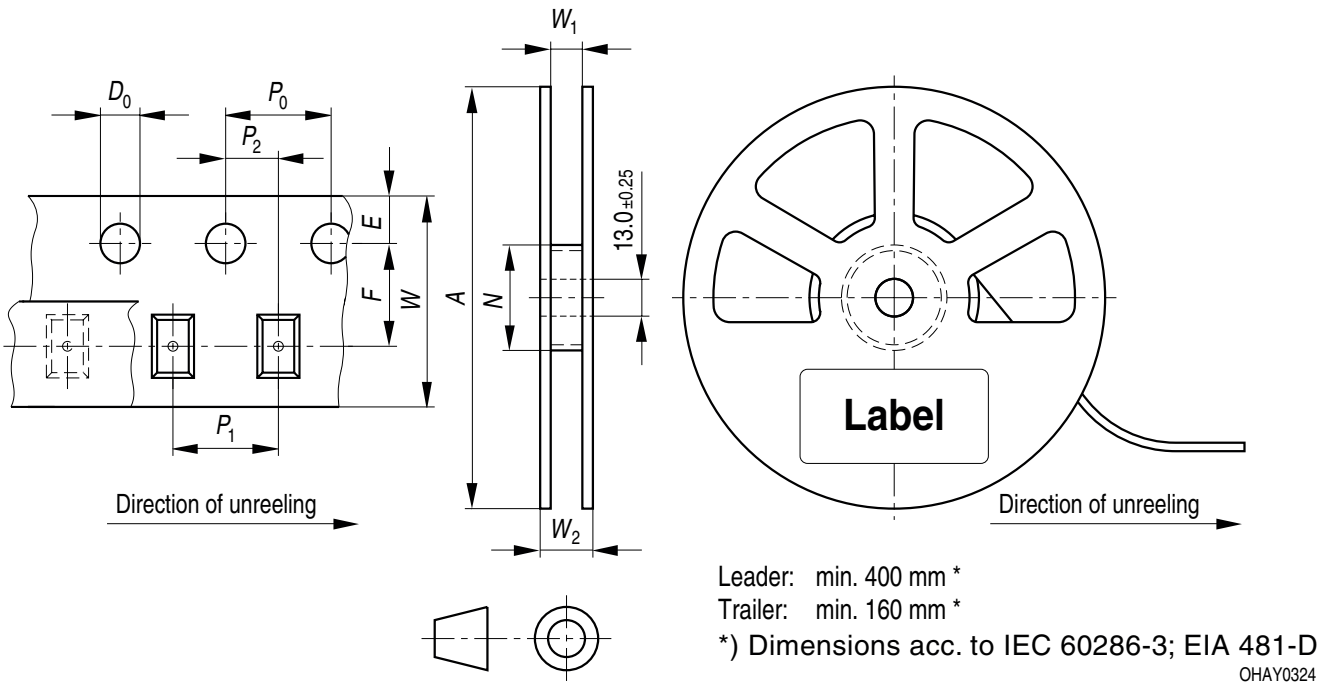
Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat*) 25 °C to 150 °C			2	3	K/s
Time t_S T_{Smin} to T_{Smax}	t_S	60	100	120	s
Ramp-up rate to peak*) T_{Smax} to T_P			2	3	K/s
Liquidus temperature	T_L		217		°C
Time above liquidus temperature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



Tape and Reel [4)]

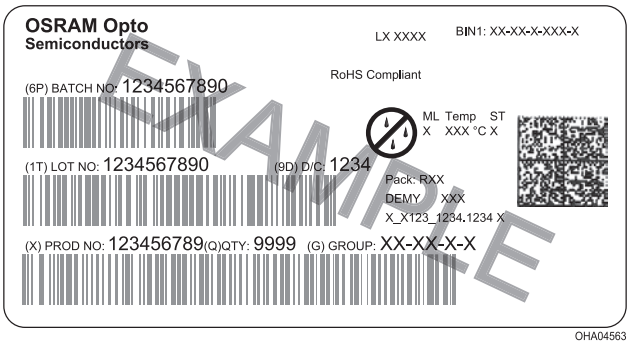


Leader: min. 400 mm *
Trailer: min. 160 mm *
*) Dimensions acc. to IEC 60286-3; EIA 481-D
OHAY0324

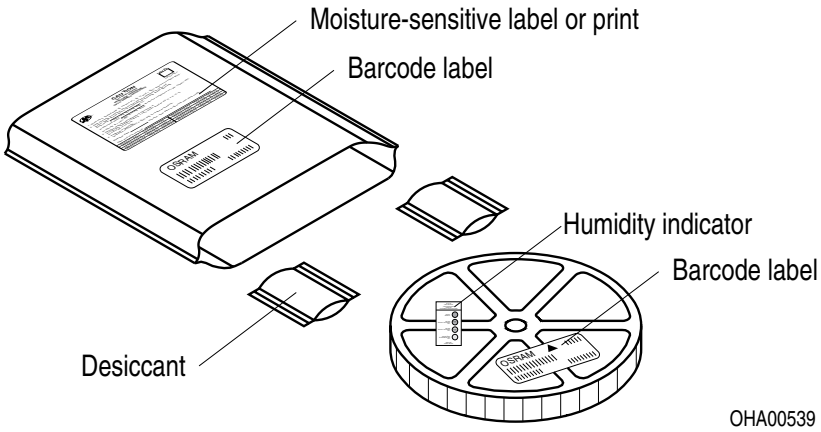
Reel dimensions [mm]

A	W	N_{min}	W_1	$W_{2\ max}$	Pieces per PU
180 mm	12 + 0.3 / - 0.1	60	12.4 + 2	18.4	1500

Barcode-Product-Label (BPL)

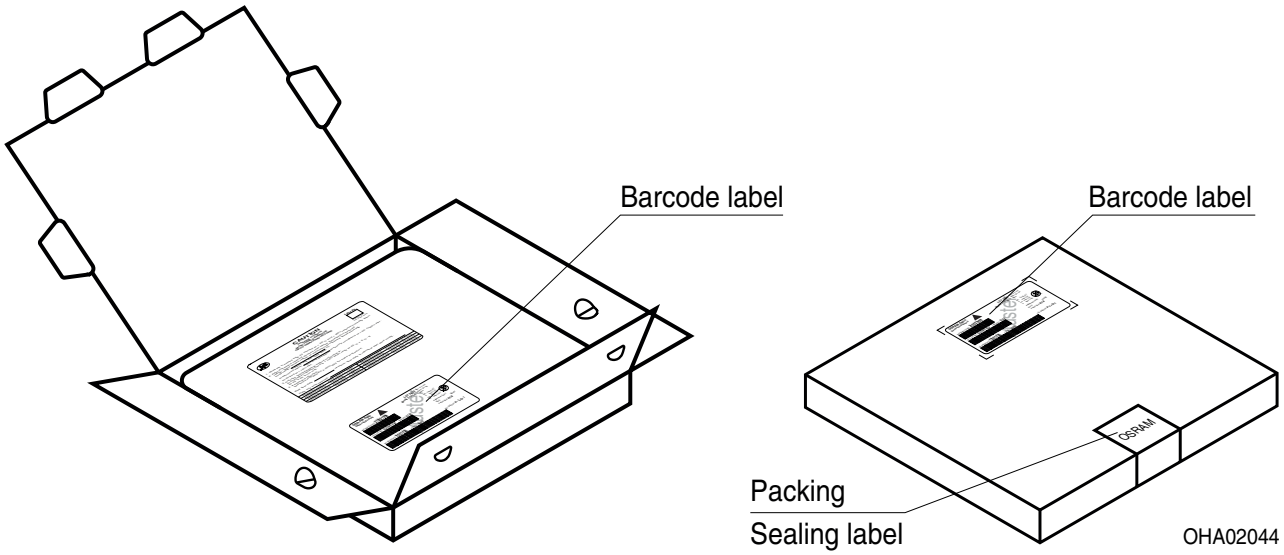


Dry Packing Process and Materials [3)]



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

Transportation Packing and Materials [3)]



Dimensions of transportation box in mm

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

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 LED specified in this data sheet falls into the class **exempt group (exposure time 10000 s)**. Under real circumstances (for exposure time, conditions of the eye pupils, observation distance), it is assumed that no endangerment to the eye exists from these devices. As a matter of principle, however, it should be mentioned that intense light sources have a high secondary exposure potential due to their blinding effect. When looking at bright light sources (e.g. headlights), temporary reduction in visual acuity and afterimages can occur, leading to irritation, annoyance, visual impairment, and even accidents, depending on the situation.

Subcomponents of this LED 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 LED exposure to aggressive substances during storage, production, and use. LEDs 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 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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Glossary

1) **Testing temperature**: T_A = 25°C

2) **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.

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

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

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EU RoHS and China RoHS compliant product

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