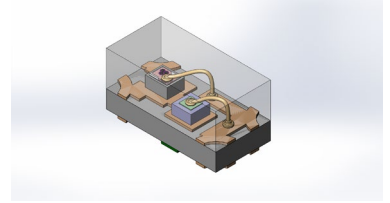


# PLPVYL1 940A\_E

## BIDOS® E1005 L

VCSEL (940 nm)



### Applications

- Gesture Recognition

### Features:

- Package: clear epoxy
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)
- Multimode VCSEL
- Very small package: (LxWxH) 1.0 mm x 0.5 mm x 0.45 mm

### Ordering Information

$I_F = 15 \text{ mA}$ ;  $t_p = 20 \text{ ms}$

Type	Optical output power $P_{opt}$	Optical output power typ. $P_{opt}$	Ordering Code
PLPVYL1 940A_E	$\geq 7 \text{ mW}$	11 mW	Q65112A9493

## Maximum Ratings

$T_A = 25\text{ °C}$

Parameter	Symbol		Values
Operating temperature	$T_{op}$	min. max.	-40 °C 85 °C
Storage temperature	$T_{stg}$	min. max.	-40 °C 85 °C
Forward current	$I_F$	max.	20 mA
Surge current $t_p \leq 1\text{ ms}$ ; $D = 0.024$	$I_{FSM}$	max.	25 mA
Reverse voltage <sup>1)</sup>	$V_R$	max.	10 V
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	$V_{ESD}$	max.	2 kV

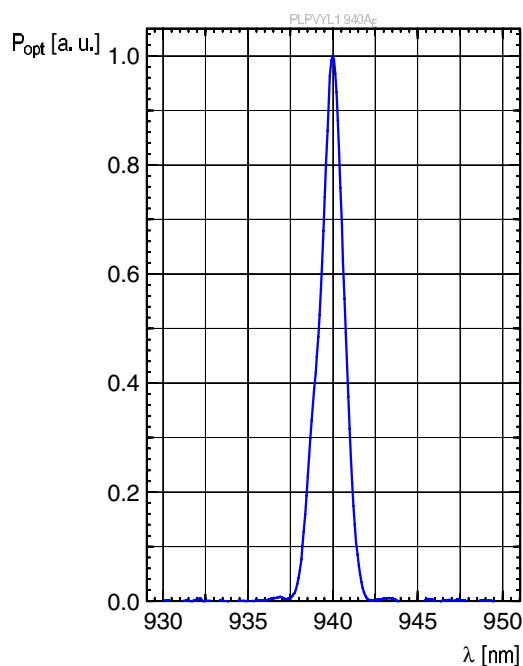
## Characteristics

$I_F = 15 \text{ mA}$ ;  $t_p = 20 \text{ ms}$ ;  $T_A = 25 \text{ °C}$

Parameter	Symbol	Values	
Peak wavelength <sup>2)</sup>	$\lambda_{\text{peak}}$	min. typ. max.	931.0 nm 940.0 nm 949.0 nm
Spectral bandwidth at 50% $I_{e,rel,max}$	$\Delta\lambda$	typ.	4.0 nm
Optical output power <sup>3)</sup>	$P_{\text{opt}}$	min. typ.	7 mW 10 mW
Beam divergence ( $1/e^2$ ) parallel to pn-junction	$\Theta_{\parallel}$	typ. max.	18 ° 25 °
Beam divergence ( $1/e^2$ ) perpendicular to pn-junction	$\Theta_{\perp}$	typ. max.	18 ° 25 °
Threshold current	$I_{\text{th}}$	typ.	2 mA
Forward voltage <sup>4)</sup>	$V_F$	min. typ. max.	1.8 V 2.0 V 2.4 V
Forward voltage <sup>4)</sup> $I_F = 10 \text{ }\mu\text{A}$ ; $t_p = 20 \text{ ms}$	$V_F$	min.	0.7 V

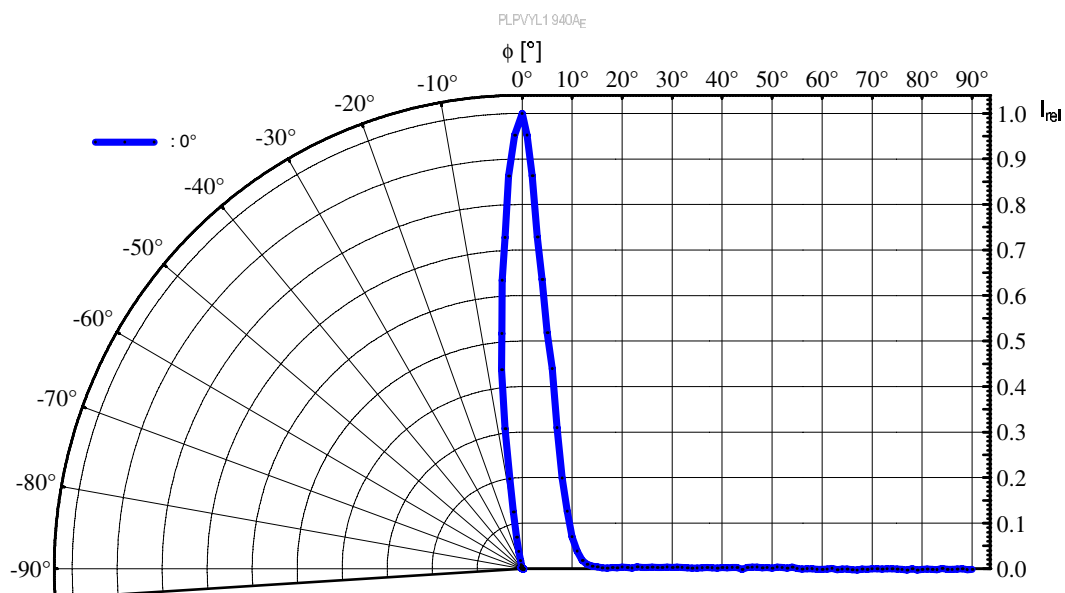
## Relative Spectral Emission <sup>5), 6)</sup>

$$I_{e,rel} = f(\lambda); I_F = 15 \text{ mA}; t_p = 20 \text{ ms}$$



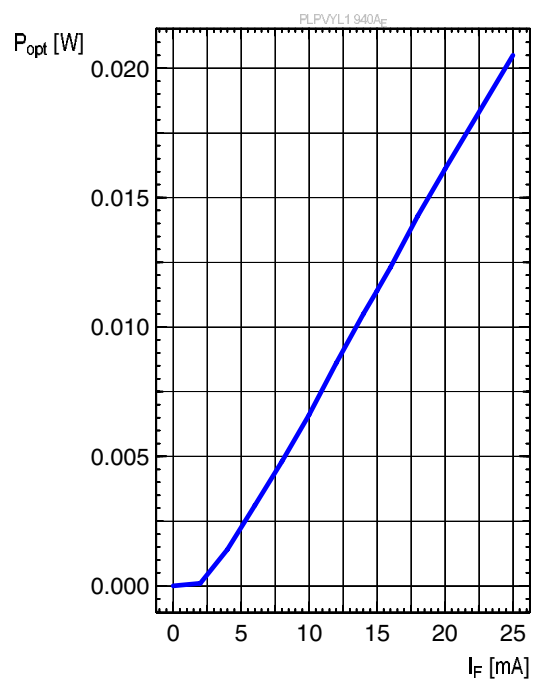
## Radiation Characteristics <sup>5), 6)</sup>

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

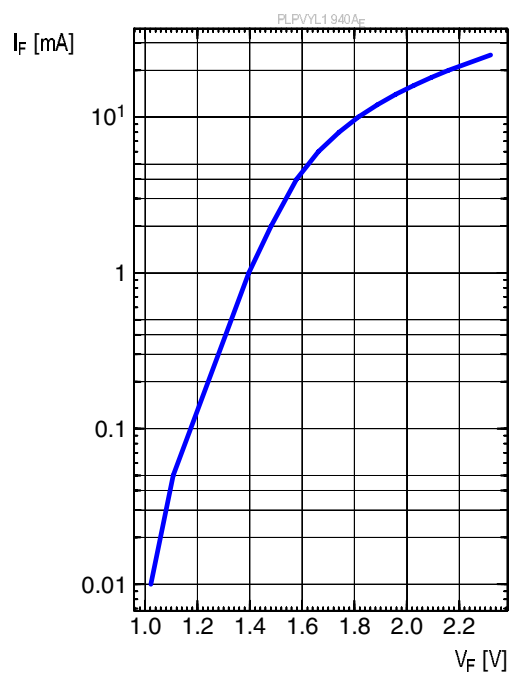


**Optical Output Power** 5), 6)

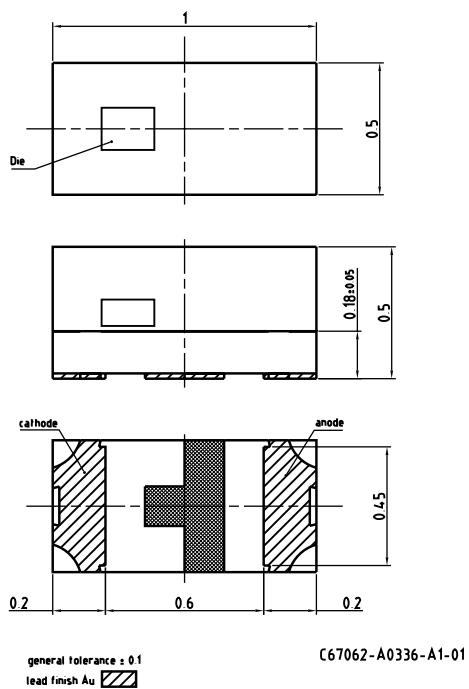
$$P_{\text{opt}} = f(I_F)$$

**Forward Voltage** 5), 6)

$$V_F = f(I_F)$$



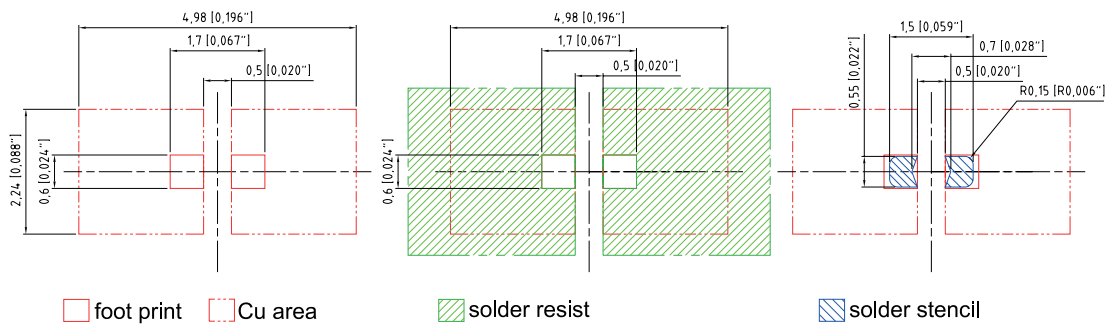
## Dimensional Drawing <sup>7)</sup>



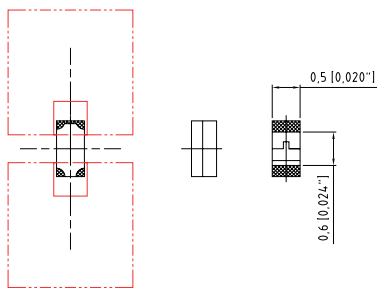
## Further Information:

Approximate Weight: 0.6 mg

Recommended Solder Pad 7)



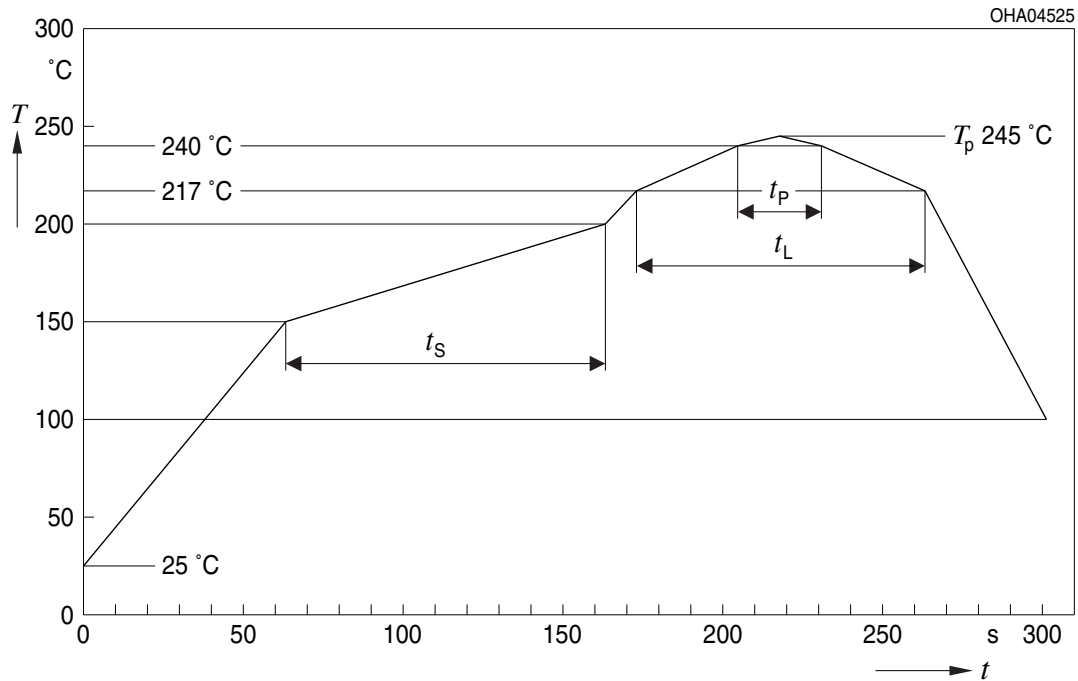
Component Location on Pad



E062.3010.122 -01

## Reflow Soldering Profile

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



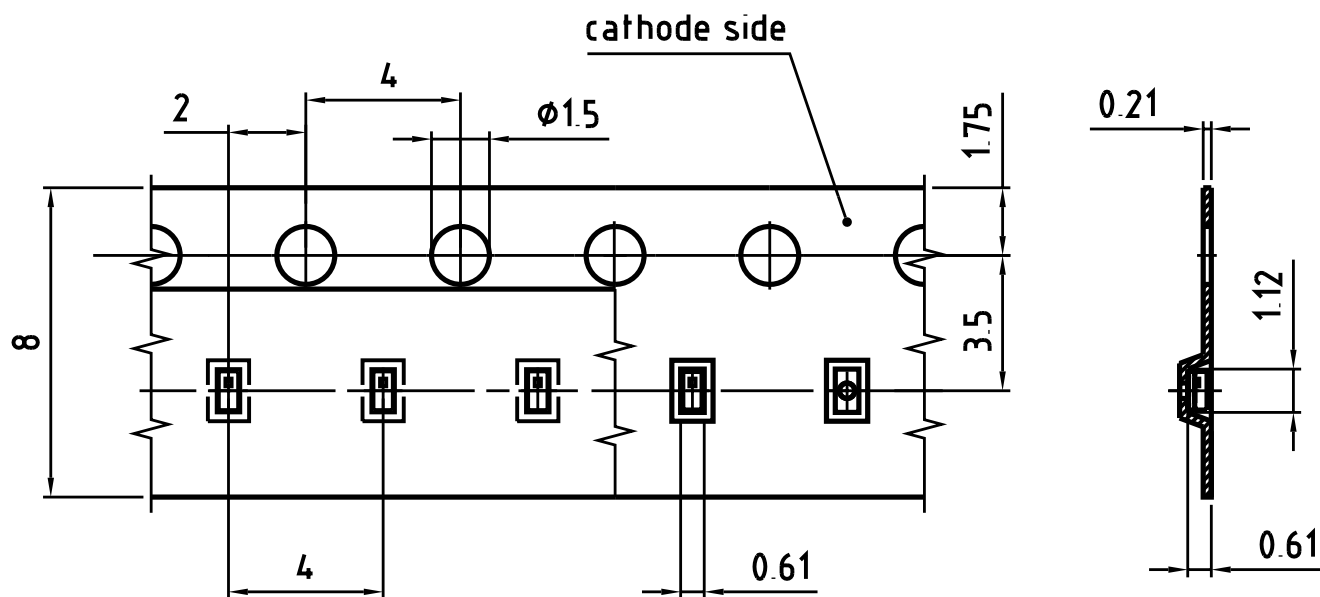
Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat*) 25 °C to 150 °C			2	3	K/s
Time $t_s$ $T_{Smin}$ to $T_{Smax}$	$t_s$	60	100	120	s
Ramp-up rate to peak*) $T_{Smax}$ to $T_p$			2	3	K/s
Liquidus temperature	$T_L$		217		$^{\circ}\text{C}$
Time above liquidus temperature	$t_L$		80	100	s
Peak temperature	$T_p$		245	260	$^{\circ}\text{C}$
Time within 5 °C of the specified peak temperature $T_p - 5\text{ K}$	$t_p$	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

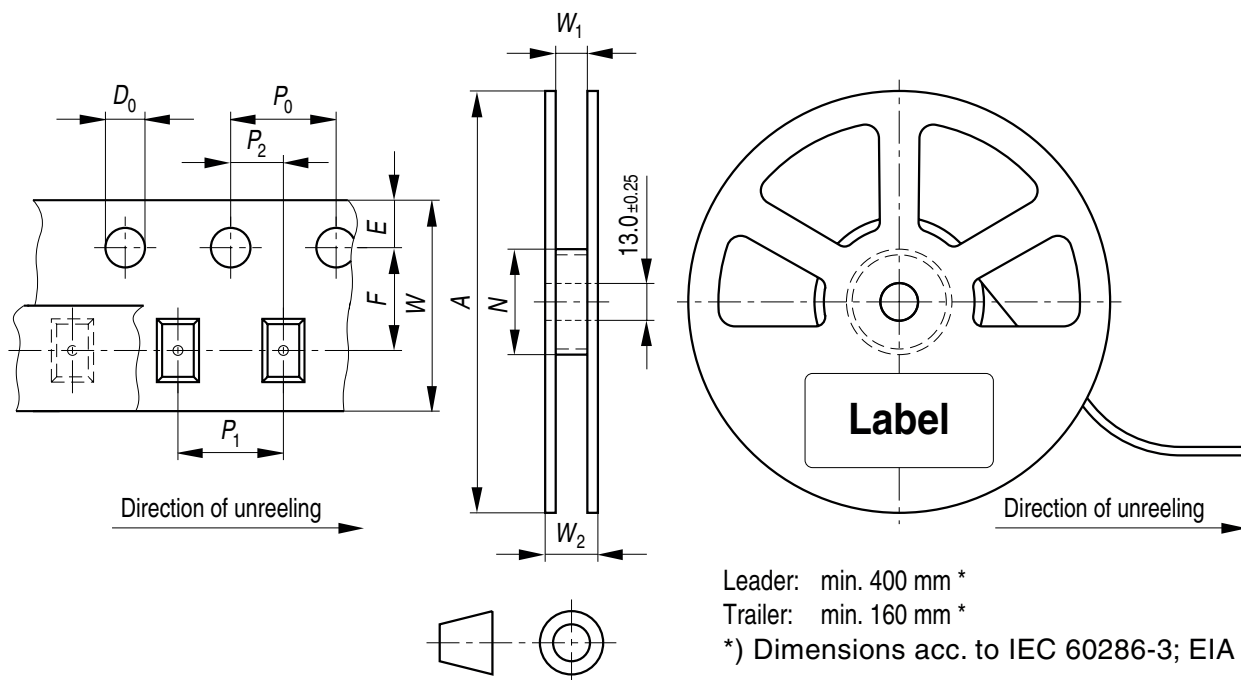


## Taping <sup>7)</sup>



C67062-A0339-B1-01

## Tape and Reel <sup>8)</sup>



## Reel Dimensions

A	W	N <sub>min</sub>	W <sub>1</sub>	W <sub>2 max</sub>	Pieces per PU
180 mm	8 + 0.3 / - 0.1 mm	60 mm	8.4 + 2 mm	14.4 mm	3000

## Barcode-Product-Label (BPL)

**OSRAM Opto Semiconductors**

LX XXXX BIN1: XX-XX-X-XXX-X

RoHS Compliant

(6P) BATCH NO: 1234567890

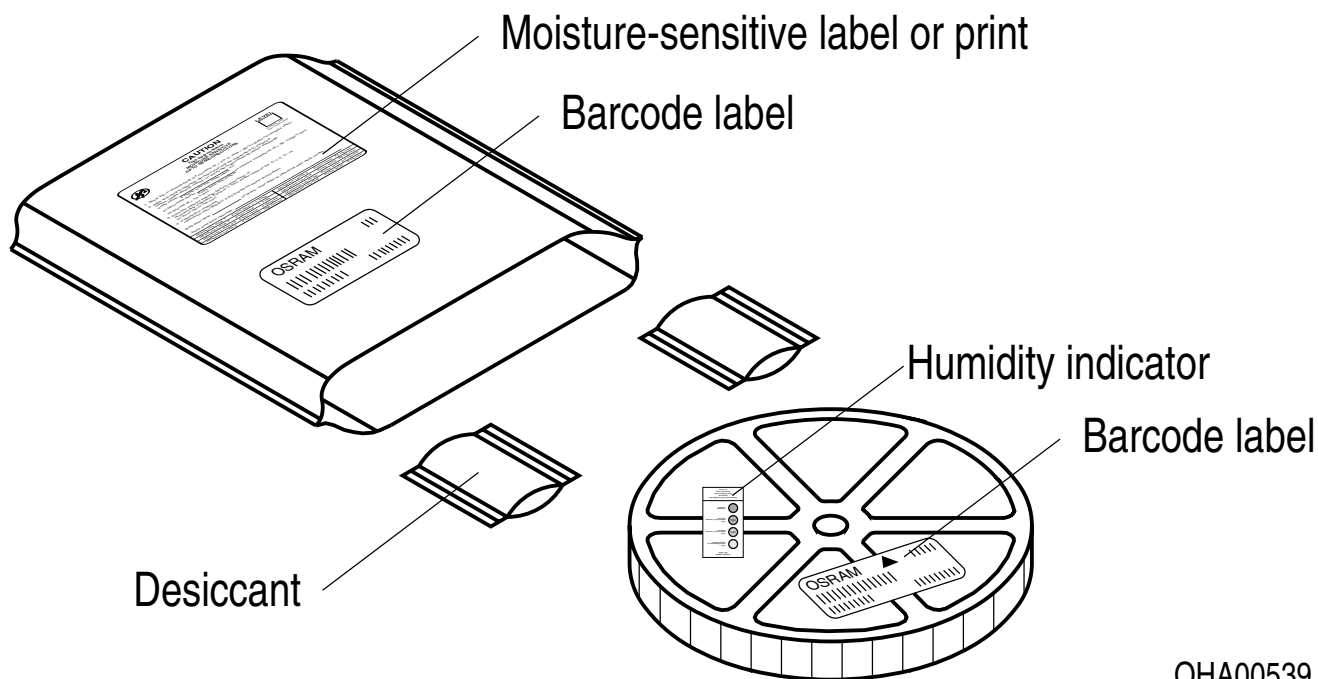
(1T) LOT NO: 1234567890 (9D) D/C: 1234

ML Temp ST  
X XXX °C X

Pack: RXX  
DEMY XXX  
X\_X123\_1234.1234 X

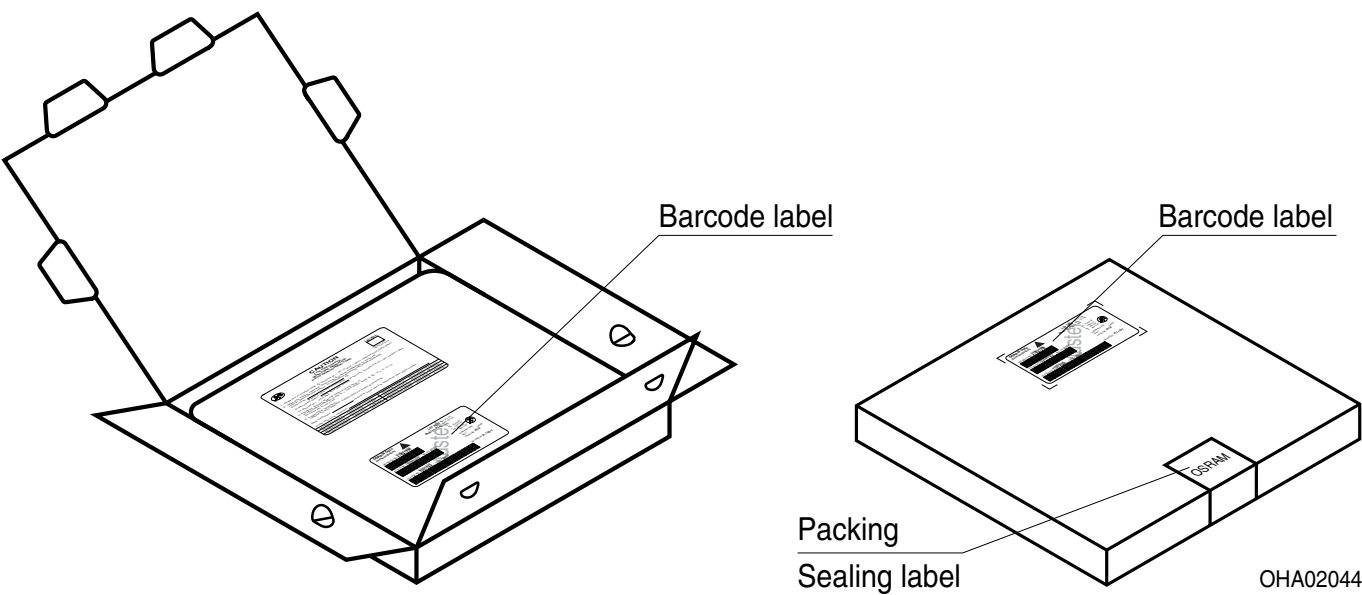
(X) PROD NO: 123456789 (Q) QTY: 9999 (G) GROUP: XX-XX-X-X

OHA04563

Dry Packing Process and Materials <sup>7)</sup>

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

Schematic Transportation Box <sup>7)</sup>



Dimensions of Transportation Box

Width	Length	Height
200 ± 5 mm	195 ± 5 mm	30 ± 5 mm

DRAFT – For reference only. Subject to change without notice.

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## 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 fall 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 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](http://www.osram-os.com/appnotes)

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## Glossary

- 1) **Reverse Operation:** Reverse Operation of 10 hours is permissible in total. Continuous reverse operation is not allowed.
- 2) **Wavelength:**  $\lambda_{\text{peak}}$  is measured with an internal reproducibility of  $\pm 0.7$  nm (acc. to GUM with a coverage factor of  $k = 3$ ).
- 3) **Brightness:** The brightness values are measured with a tolerance of  $\pm 11\%$ .
- 4) **Forward Voltage:** The forward voltages are measured with a tolerance of  $\pm 0.1$  V.
- 5) **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.
- 6) **Testing temperature:**  $T_A = 25^\circ\text{C}$  (unless otherwise specified)
- 7) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with  $\pm 0.1$  and dimensions are specified in mm.
- 8) **Tape and Reel:** All dimensions and tolerances are specified acc. IEC 60286-3 and specified in mm.

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## Revision History

Version	Date	Change
α.0	2019-12-10	Initial Version

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