

# PLPVQ 940A

## BIDOS®

VCSEL pulsed laser in small footprint QFN



### Applications

- Flash & Autofocus
- Gesture Recognition

### Features:

- Multimode VCSEL
- Laser aperture 10 µm (diameter) x 40 µm (pitch)
- Cost effective package for high volume applications

### Ordering Information

Type	Peak output power typ. $I_F = 1 \text{ A}; t_p = 9 \text{ ms}; f = 60 \text{ Hz}; T_A = 25 \text{ °C}$ $P_{opt}$	Ordering Code
PLPVQ 940A	0.6 W	Q65112A6002

## Maximum Ratings

$T_A = 25\text{ °C}$

Parameter	Symbol		Values
Operating temperature	$T_{op}$	min.	0 °C
		max.	60 °C
Storage temperature	$T_{stg}$	min.	-40 °C
		max.	85 °C
Junction temperature <sup>1)</sup>	$T_j$	max.	110 °C
Output power (continuous wave)	$P_{cw}$	max.	0.48 W
Forward current	$I_F$	max.	0.75 A
Pulse current	$I_{FSM}$	max.	1.2 A
Reverse voltage <sup>2)</sup>	$V_R$	max.	5 V

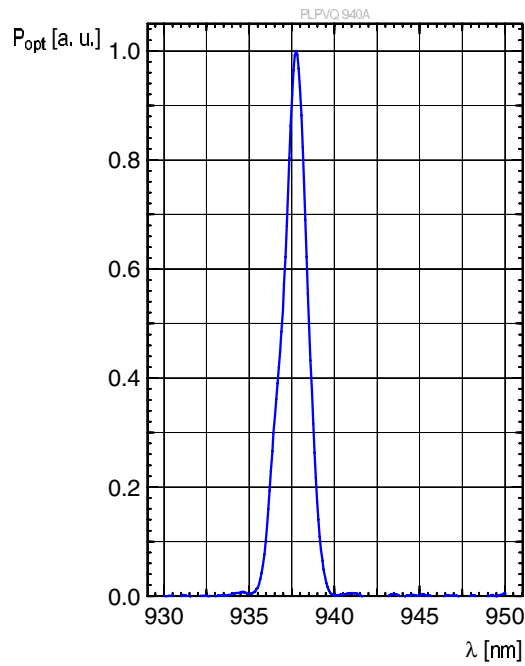
## Characteristics

$I_F = 1 \text{ A}$ ;  $t_p = 9 \text{ ms}$ ;  $f = 60 \text{ Hz}$ ;  $T_A = 25 \text{ °C}$

Parameter	Symbol		Values
Peak wavelength	$\lambda_{\text{peak}}$	min.	932 nm
		typ.	940 nm
		max.	948 nm
Spectral bandwidth at 50% $I_{e,\text{rel,max}}$	$\Delta\lambda$	typ.	1.5 nm
Peak output power	$P_{\text{opt}}$	min.	0.5 W
		typ.	0.6 W
		max.	0.75 W
Field of view (HFOV)	$\Theta$	typ.	65 °
Field of view (VFOV)	$\Theta_{\perp}$	typ.	78 °
Wall plug efficiency (after diffusor)	WPE	typ.	27 %
Threshold current	$I_{\text{th}}$	typ.	0.11 A
Forward voltage	$V_F$	min.	1.5 V
		typ.	2.2 V
		max.	2.5 V
Rise time	$t_r$	typ.	1 ns
Fall time	$t_f$	typ.	1 ns
Aperture size (diameter)		typ.	10 $\mu\text{m}$
Temperature coefficient of wavelength	$TC_{\lambda}$	typ.	0.07 nm / K
		max.	0.1 nm / K
Thermal resistance junction solder point real	$R_{\text{thJS}}$	max.	22 K / W

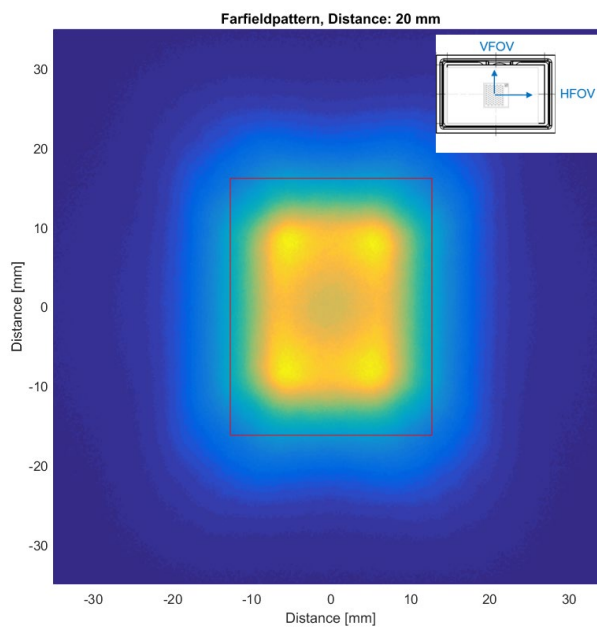
### Relative Spectral Emission 3), 4)

$$P_{opt} = f(\lambda); t_p = 9 \text{ ms}$$



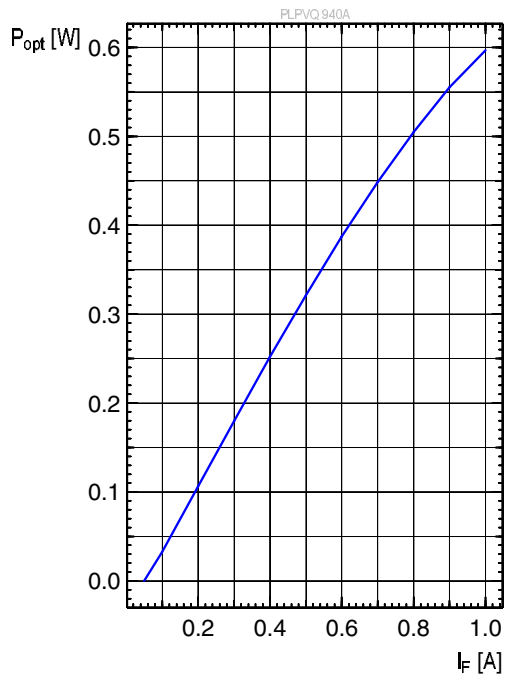
### Far-Field Illumination Pattern 3), 4)

$$P_{opt} = 0.6 \text{ W}; d = 20 \text{ mm (distance to flat screen)}$$



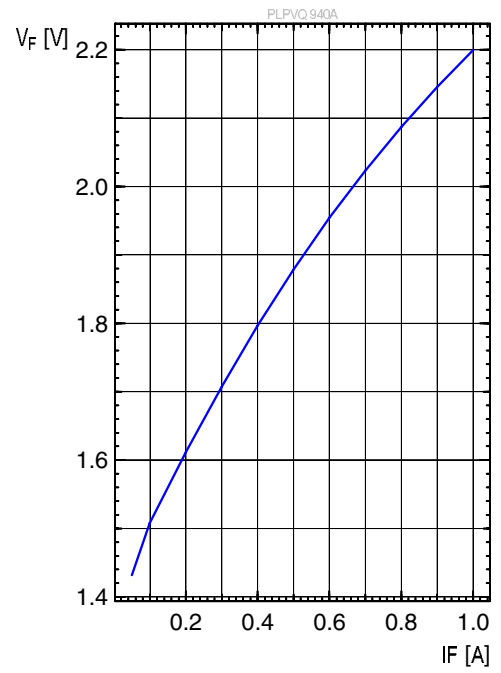
### Optical Output Power <sup>3), 4)</sup>

$$P_{opt} = f(I_F), t_p = 9 \text{ ms}$$

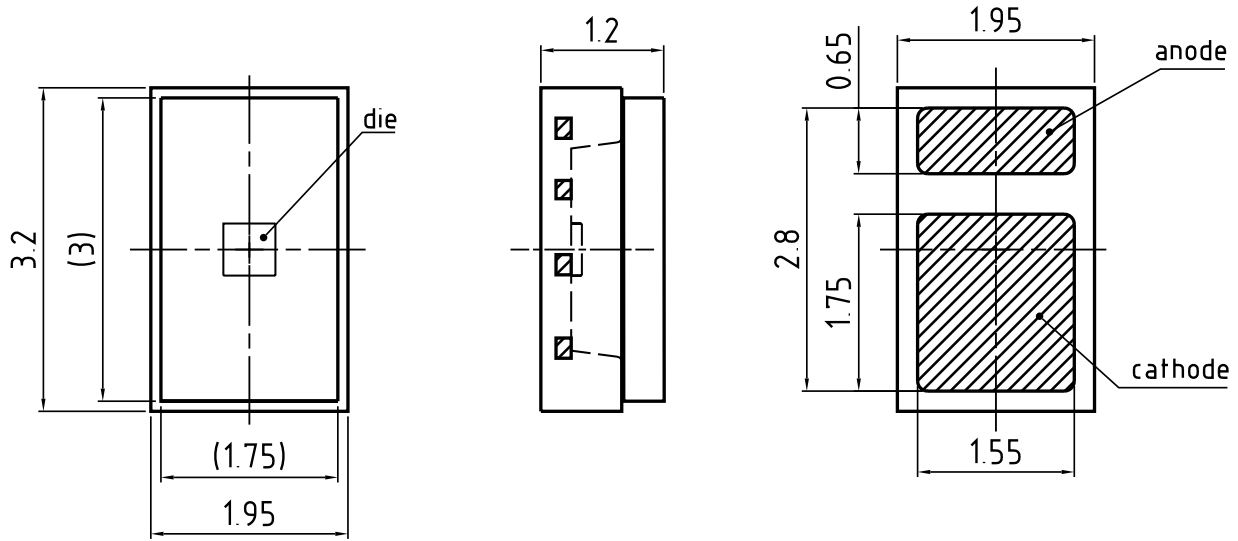


### Forward Voltage <sup>3)</sup>

$$V_F = f(I_F); t_p = 9 \text{ ms}$$



Dimensional Drawing <sup>5)</sup>

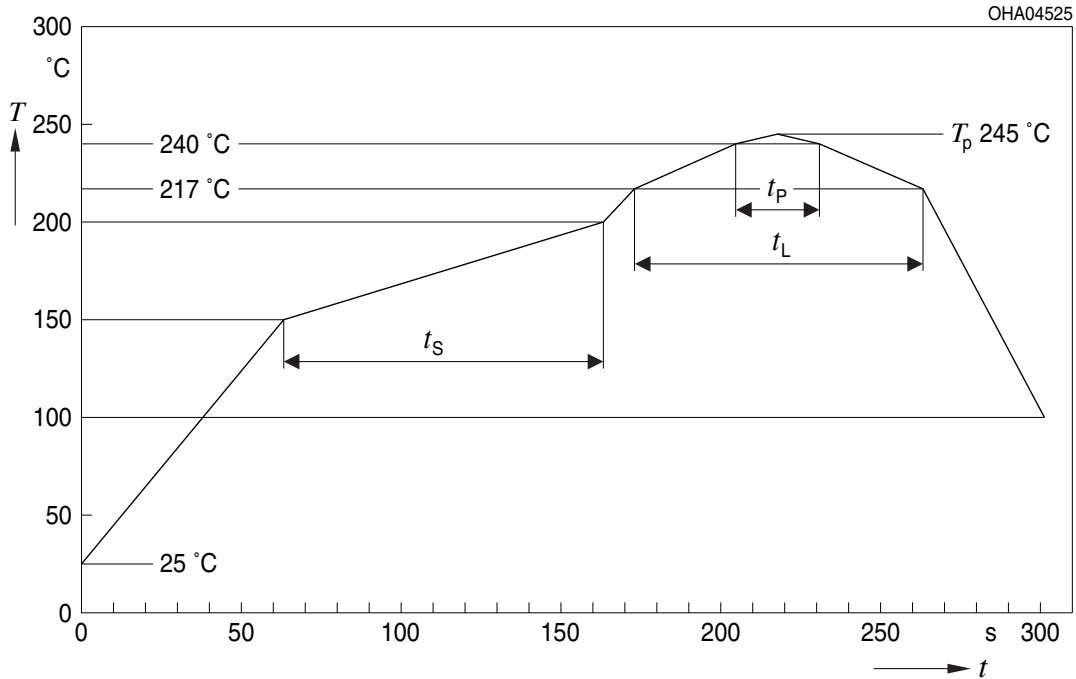


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Approximate Weight: 5.0 mg

## Reflow Soldering Profile

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

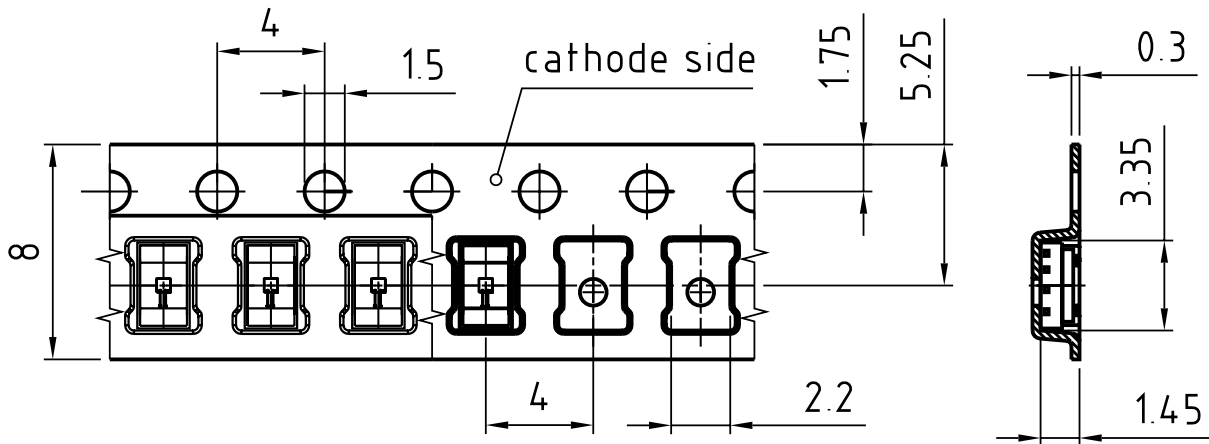


Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat <sup>*)</sup> 25 °C to 150 °C			2	3	K/s
Time $t_s$ $T_{Smin}$ to $T_{Smax}$	$t_s$	60	100	120	s
Ramp-up rate to peak <sup>*)</sup> $T_{Smax}$ to $T_p$			2	3	K/s
Liquidus temperature	$T_L$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

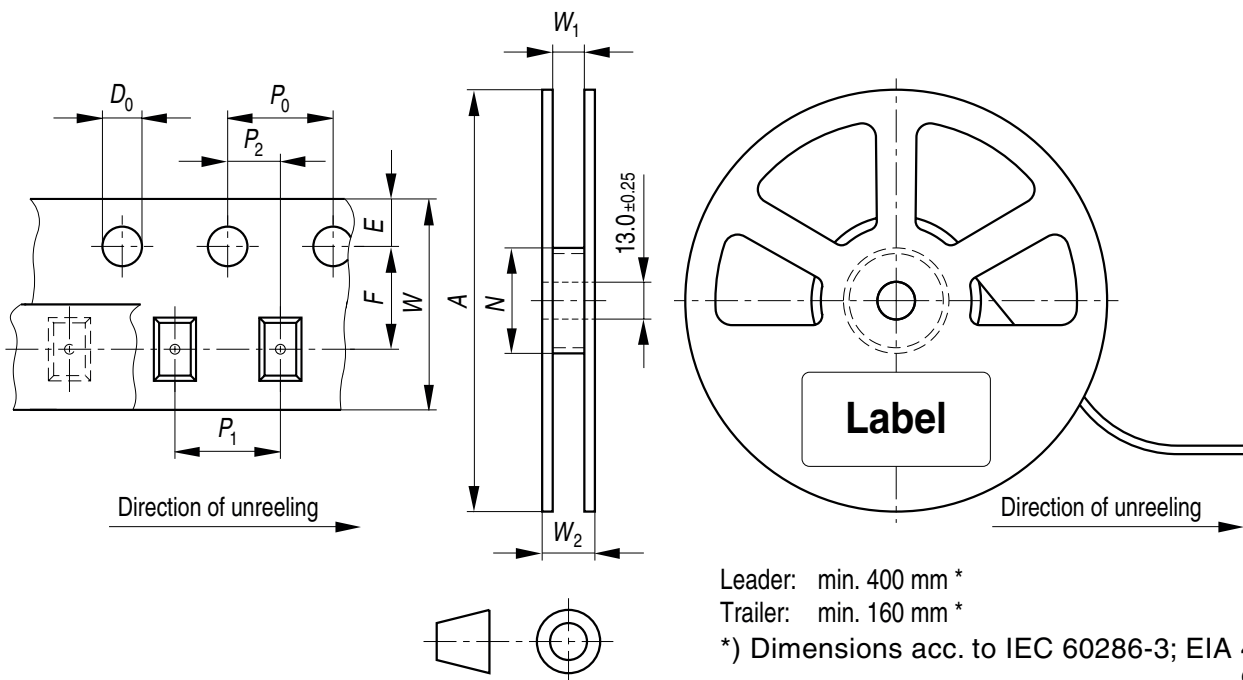
Preliminary datasheet version

**Taping** <sup>5)</sup>



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**Tape and Reel** <sup>6)</sup>



Leader: min. 400 mm \*

Trailer: min. 160 mm \*

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

OHAY0324



### Reel dimensions [mm]




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	60	8.4 + 2	14.4	2500

### Barcode-Product-Label (BPL)


**OSRAM Opto Semiconductors** LX XXXX    BIN1: XX-XX-X-XXX-X

RoHS Compliant

(6P) BATCH NO: 1234567890 ML Temp    ST  
X    XXX °C X






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



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

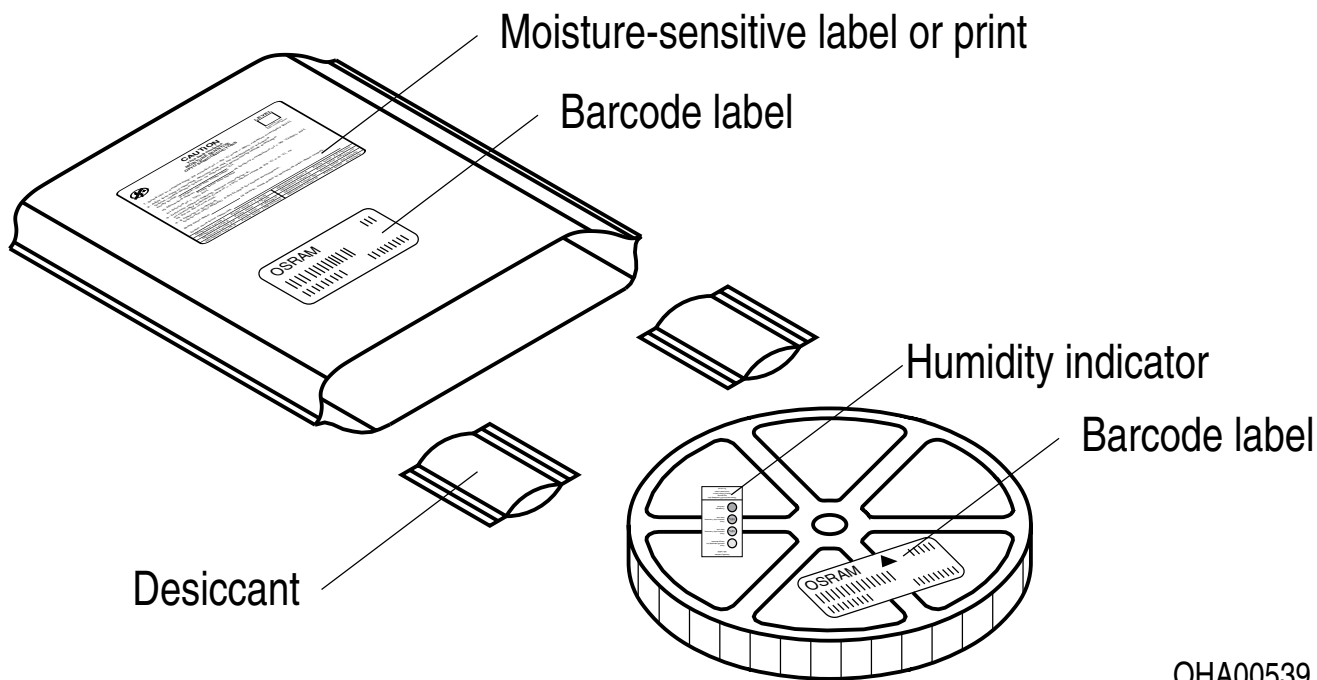
(X) PROD NO: 123456789 (Q) QTY: 9999    (G) GROUP: XX-XX-X-X



OHA04563

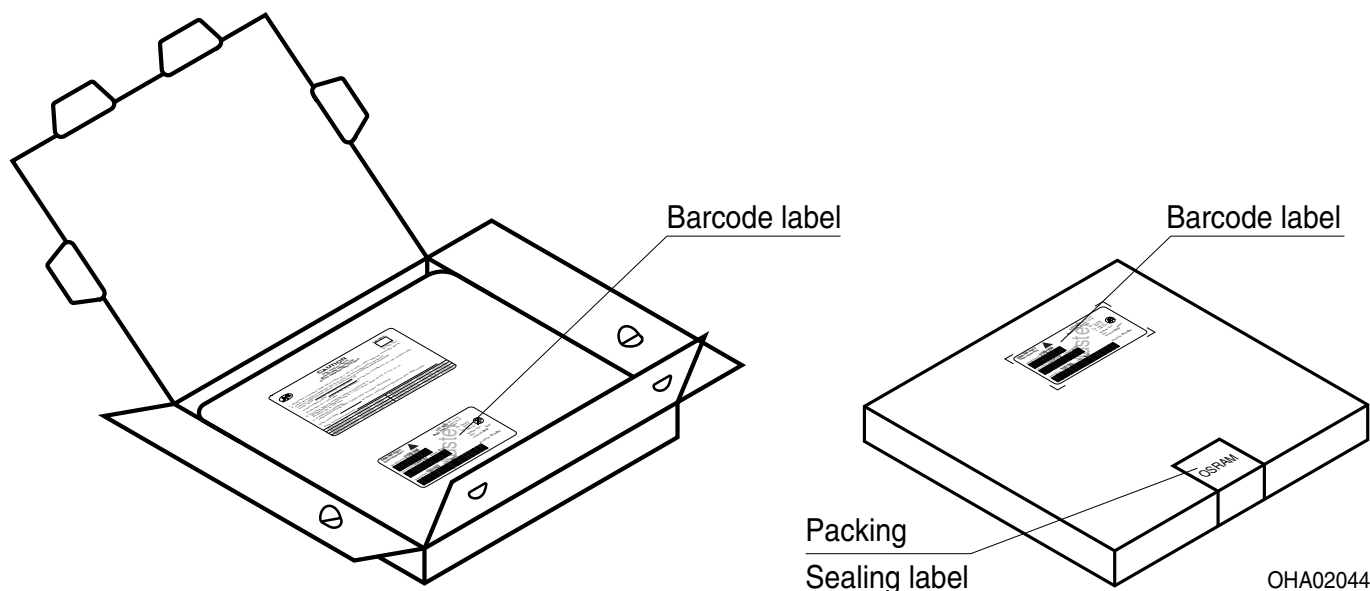
Preliminary datasheet version

### Dry Packing Process and Materials <sup>5)</sup>



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

### Schematic transportation box <sup>5)</sup>



Preliminary datasheet version

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## Dimensions of transportation box in mm

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

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## 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.

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 informations please visit [www.osram-os.com/apnotes](http://www.osram-os.com/apnotes)

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For information on the types in question please contact our Sales Organization.

If printed or downloaded, please find the latest version on the OSRAM OS website.

### 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.

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## Glossary

- 1) **Junction temperature:** Limited due to plastic package, not due to laser chip.
- 2) **Reverse Operation:** Reverse Operation of 10 hours is permissible in total. Continuous reverse operation is not allowed.
- 3) **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.
- 4) **Testing temperature:** TA = 25°C
- 5) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with  $\pm 0.1$  and dimensions are specified in mm.
- 6) **Tape and Reel:** All dimensions and tolerances are specified acc. IEC 60286-3 and specified in mm.

## Revision History

Version	Date	Change
0.1	2018-11-30	Brand

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