

# SFH 4259

## Power TOPLED® Lens

High Power Infrared Emitter (850 nm)



### Applications

- Electronic Equipment
- Industrial Automation (Machine Controls, Light Barriers, Vision Controls)
- Remote Control, Proximity, Ambient Light Sensing
- Safety and Security, CCTV

### Features:

- Package: Epoxy, diffuse
- 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)
- High Power Infrared LED
- Half angle:  $\pm 25^\circ$
- High forward current allowed at high temperature
- Short switching times

### Ordering Information

Type	Radiant intensity <sup>1)</sup> $I_e$ $I_F = 100 \text{ mA}; t_p = 20 \text{ ms}$	Radiant intensity <sup>1)</sup> typ. $I_e$ $I_F = 100 \text{ mA}; t_p = 20 \text{ ms}$	Ordering Code
SFH 4259-T2U	32 ... 80 mW/sr	55 mW/sr	Q65111A4857
SFH 4259-Z	32 ... 100 mW/sr	55 mW/sr	Q65110A2464
SFH 4259-U	40 ... 80 mW/sr	55 mW/sr	Q65111A9681
SFH 4259-UV1	40 ... 100 mW/sr	55 mW/sr	Q65111A6098

## Maximum Ratings

 $T_A = 25\text{ °C}$ 

Parameter	Symbol		Values
Operating temperature	$T_{op}$	min. max.	-40 °C 100 °C
Storage temperature	$T_{stg}$	min. max.	-40 °C 100 °C
Forward current	$I_F$	max.	100 mA
Surge current $t_p \leq 100\ \mu\text{s}; D = 0$	$I_{FSM}$	max.	1 A
Reverse voltage <sup>2)</sup>	$V_R$	max.	12 V
Power consumption	$P_{tot}$	max.	180 mW
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	$V_{ESD}$	max.	2 kV

## Characteristics

$I_F = 100 \text{ mA}$ ;  $t_p = 20 \text{ ms}$ ;  $T_A = 25 \text{ °C}$

Parameter	Symbol		Values
Peak wavelength	$\lambda_{\text{peak}}$	typ.	860 nm
Centroid wavelength	$\lambda_{\text{centroid}}$	typ.	850 nm
Spectral bandwidth at 50% $I_{\text{rel,max}}$	$\Delta\lambda$	typ.	30 nm
Half angle	$\varphi$	typ.	25 °
Dimensions of active chip area	L x W	typ.	0.3 x 0.3 mm x mm
Rise time (10% / 90%) $I_F = 100 \text{ mA}$ ; $R_L = 50 \text{ }\Omega$	$t_r$	typ.	12 ns
Fall time (10% / 90%) $I_F = 100 \text{ mA}$ ; $R_L = 50 \text{ }\Omega$	$t_f$	typ.	12 ns
Forward voltage	$V_F$	typ. max.	1.5 V 1.8 V
Forward voltage $I_F = 1 \text{ A}$ ; $t_p = 100 \text{ }\mu\text{s}$	$V_F$	typ. max.	2.4 V 3 V
Reverse current <sup>2)</sup> $V_R = 5 \text{ V}$	$I_R$	max.	10 $\mu\text{A}$
Radiant intensity <sup>1)</sup> $I_F = 1 \text{ A}$ ; $t_p = 25 \text{ }\mu\text{s}$	$I_e$	typ.	440 mW/sr
Total radiant flux <sup>3)</sup>	$\Phi_e$	typ.	70 mW
Temperature coefficient of voltage	$TC_V$	typ.	-0.7 mV / K
Temperature coefficient of brightness	$TC_I$	typ.	-0.5 % / K
Temperature coefficient of wavelength	$TC_\lambda$	typ.	0.3 nm / K
Thermal resistance junction solder point real <sup>4)</sup>	$R_{\text{thJS}}$	max.	140 K / W
Thermal resistance junction ambient real <sup>5)</sup>	$R_{\text{thJA}}$	max.	300 K / W

## Brightness Groups

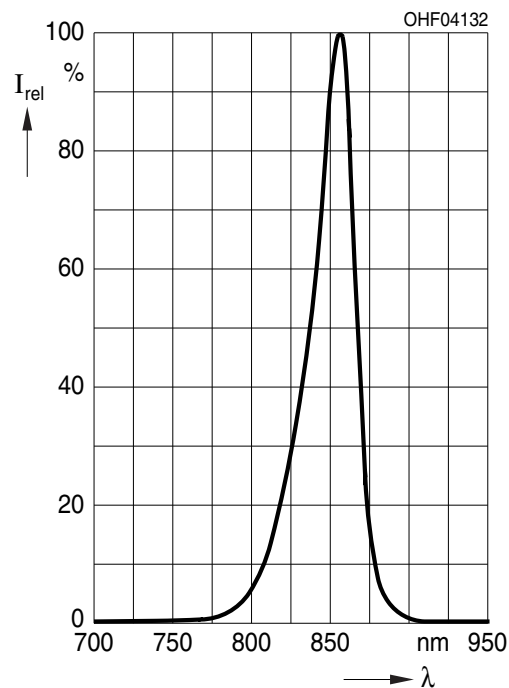
$T_A = 25\text{ °C}$

Group	Radiant intensity	Radiant intensity
	$I_F = 100\text{ mA}; t_p = 20\text{ ms}$ min. $I_e$	$I_F = 100\text{ mA}; t_p = 20\text{ ms}$ max. $I_e$
T2	32 mW/sr	50 mW/sr
U	40 mW/sr	80 mW/sr
V1	63 mW/sr	100 mW/sr

Only one group in one packing unit (variation lower 2:1).

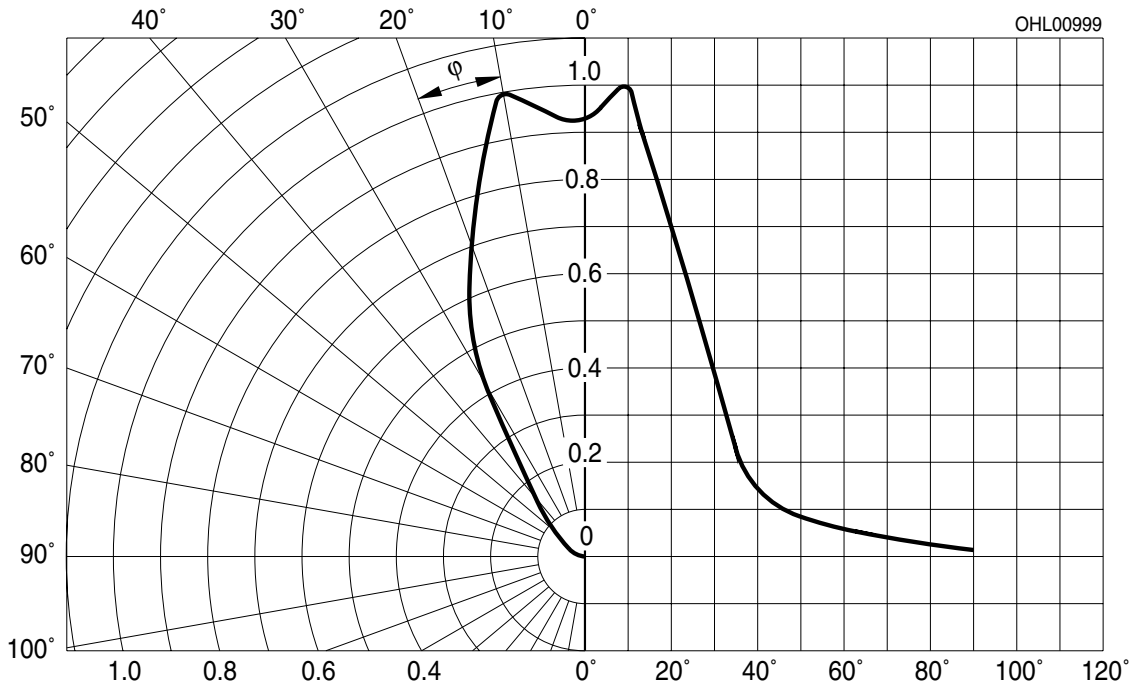
## Relative Spectral Emission <sup>6), 7)</sup>

$I_{e,rel} = f(\lambda); I_F = 100\text{ mA}; t_p = 20\text{ ms}$



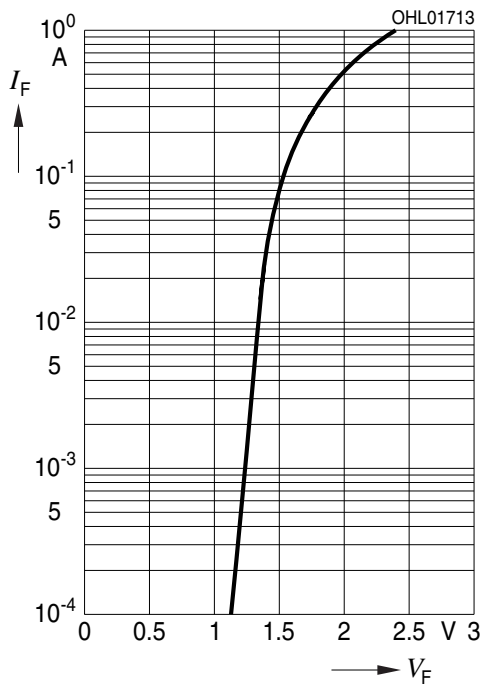
**Radiation Characteristics** (6), (7)

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



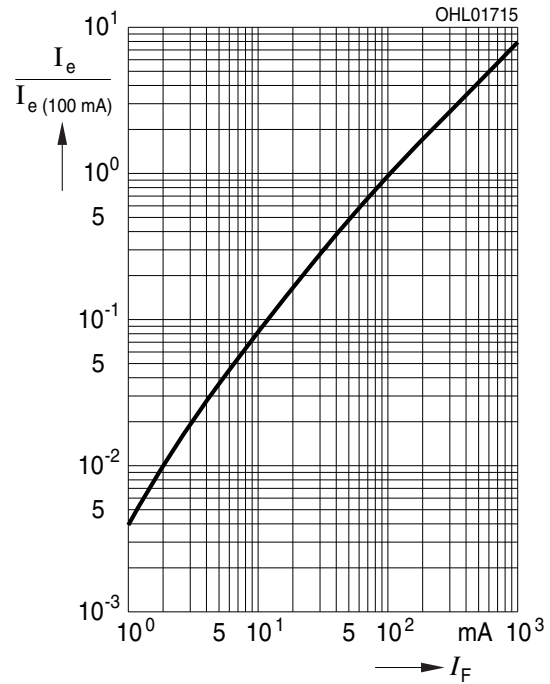
**Forward current** (6), (7)

$I_F = f(V_F)$ ; single pulse;  $t_p = 100 \mu s$



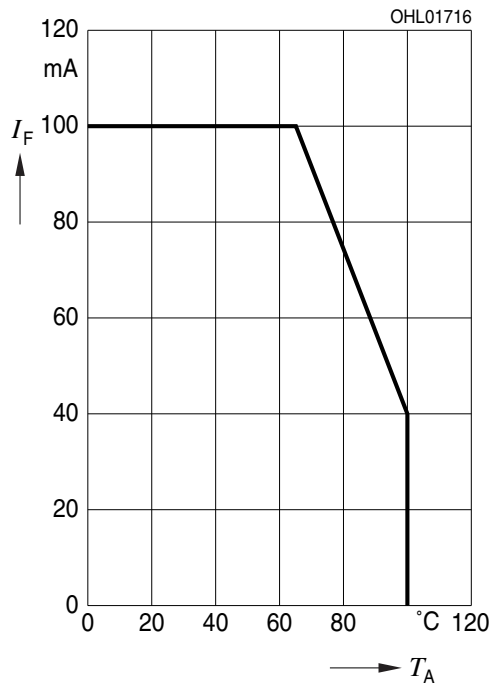
**Relative Radiant Intensity** (6), (7)

$I_e/I_e(100mA) = f(I_F)$ ; single pulse;  $t_p = 25 \mu s$



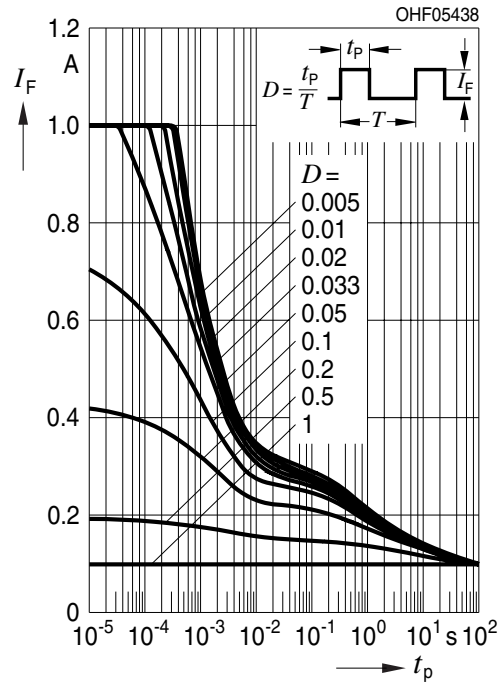
### Max. Permissible Forward Current

$I_{F,max} = f(T_A); R_{thJA} = 300 \text{ K/W}$



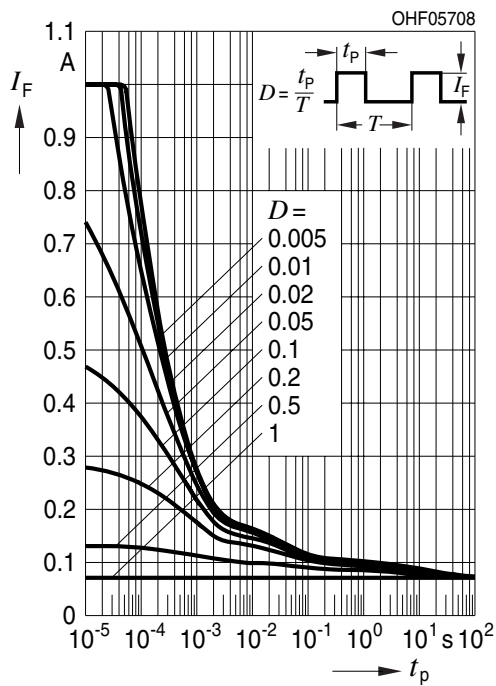
### Permissible Pulse Handling Capability

$I_F = f(t_p); \text{duty cycle } D = \text{parameter}; T_A = 25^\circ\text{C}$

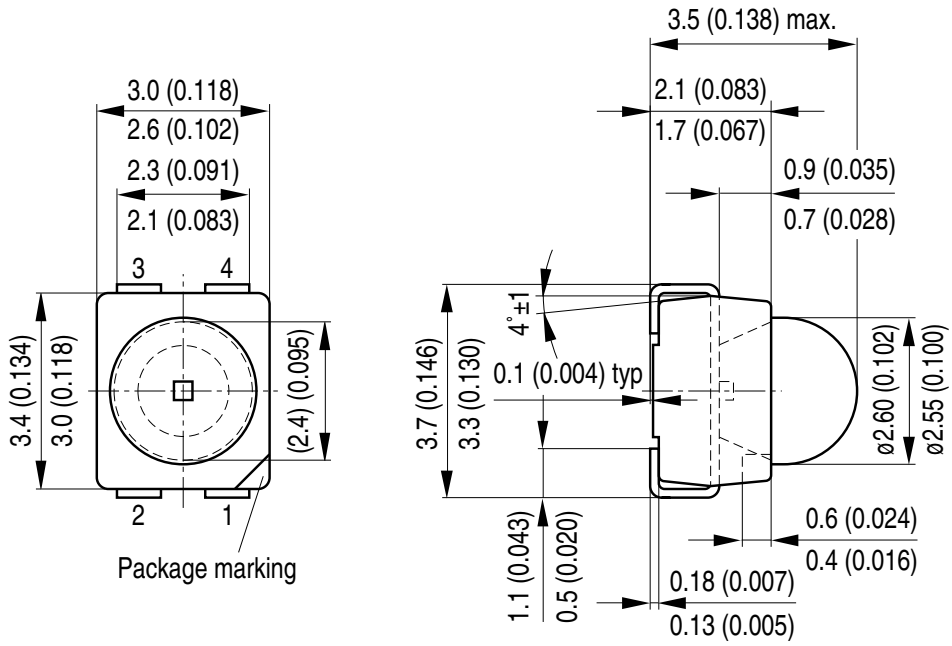


### Permissible Pulse Handling Capability

$I_F = f(t_p); \text{duty cycle } D = \text{parameter}; T_A = 85^\circ\text{C}$



**Dimensional Drawing** <sup>8)</sup>



GPLY6128

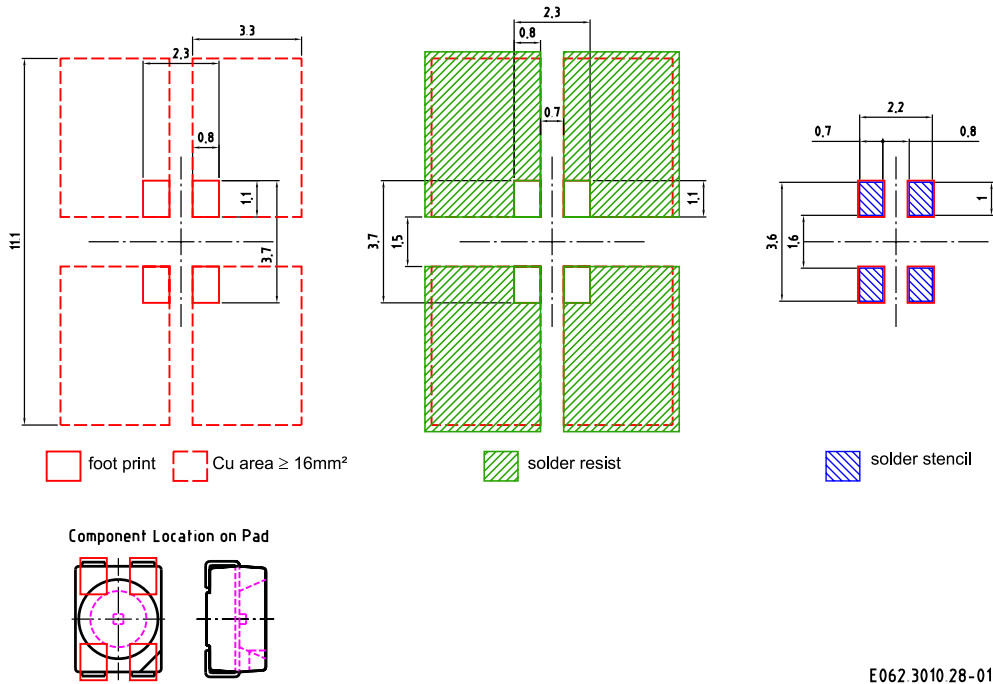
**Further Information**

**Approximate Weight:** 37.0 mg

**Package marking:** Cathode

Pin	Description
1	Cathode
2	Anode
3	Anode
4	Anode

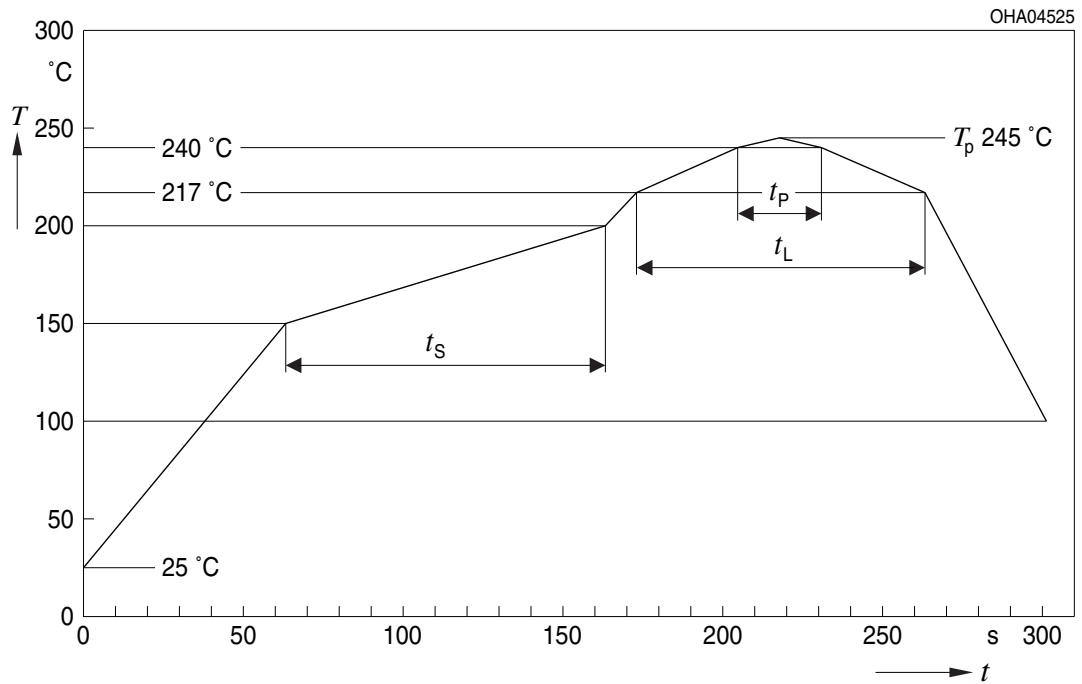
## Recommended Solder Pad <sup>8)</sup>



E062.3010.28-01

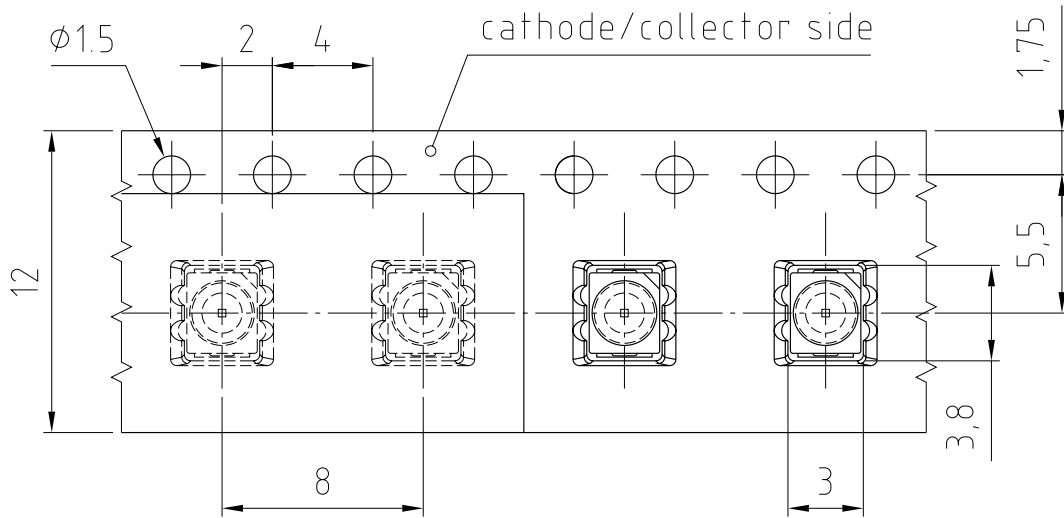
## Reflow Soldering Profile

Product complies to MSL Level 2 acc. to JEDEC J-STD-020E



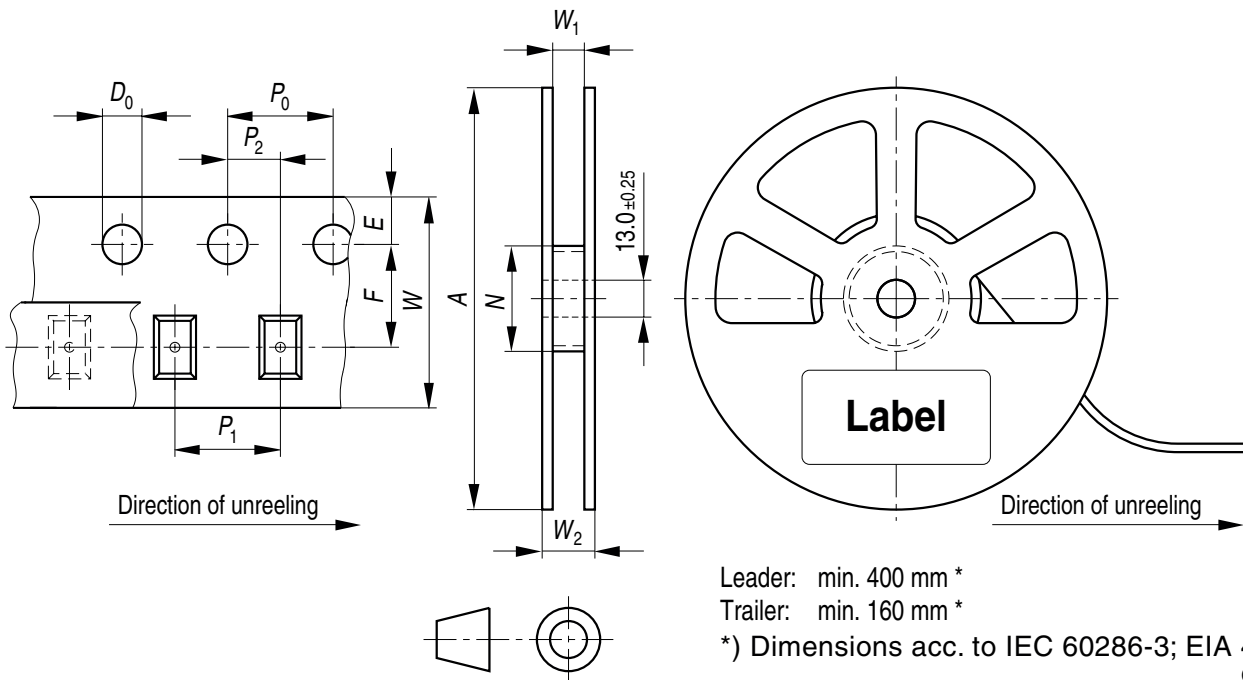


**Taping** <sup>8)</sup>



C63062-A3636-B4-03

**Tape and Reel** <sup>9)</sup>



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

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

### Reel Dimensions

A	W	N <sub>min</sub>	W <sub>1</sub>	W <sub>2max</sub>	Pieces per PU
330 mm	12 + 0.3 / - 0.1	60	12.4 + 2	18.4	2000

### 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

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

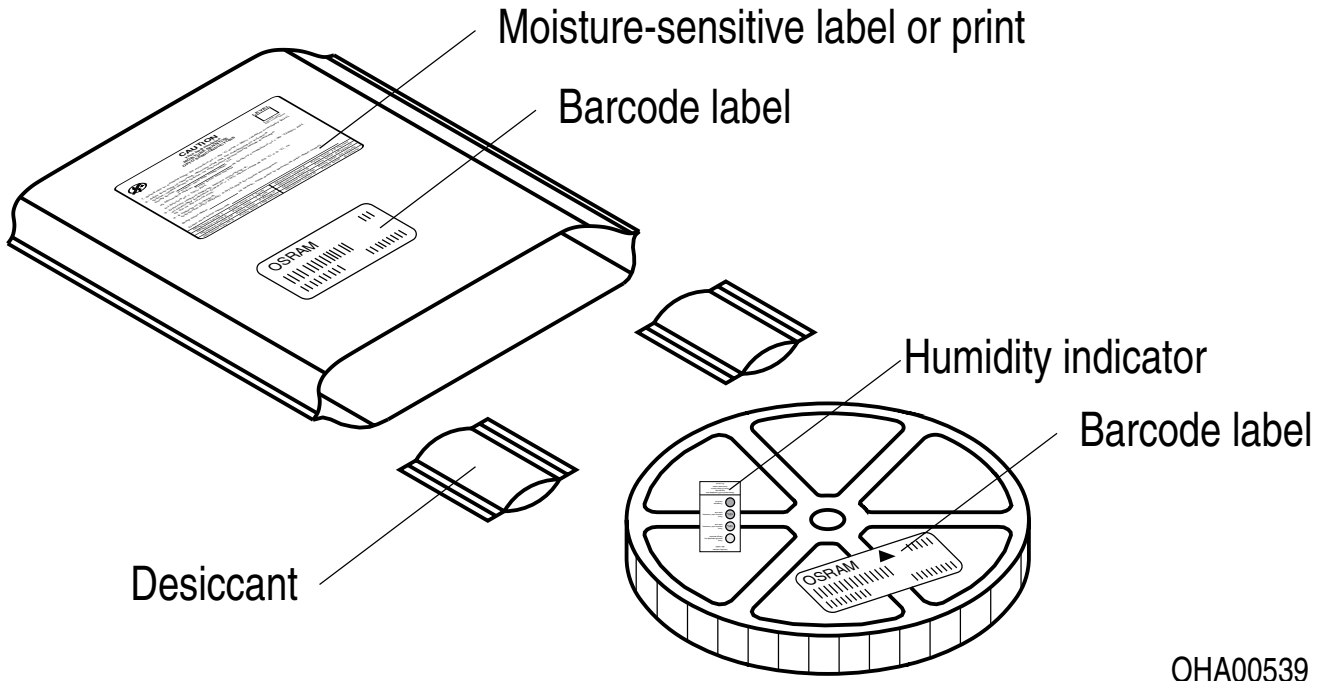
ML Temp ST  
X XXX °C X

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



OHA04563

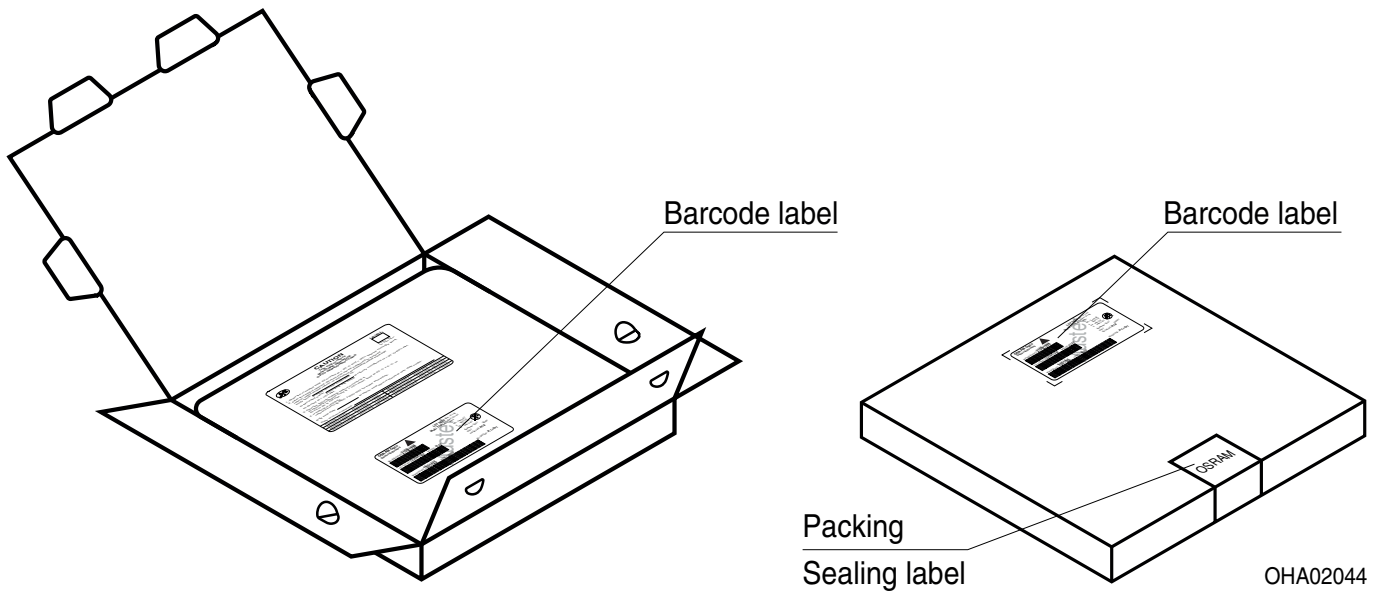
### Dry Packing Process and Materials <sup>8)</sup>



OHA00539

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

### Schematic Transportation Box <sup>8)</sup>



OHA02044

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## Dimensions of Transportation Box

Width

Length

Height

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349 ± 5 mm

349 ± 5 mm

33 ± 5 mm

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

## Disclaimer

### **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 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.

### **Product safety devices/applications or medical devices/applications**

OSRAM OS components are not developed, constructed or tested for the application as safety relevant component or for the application in medical devices.

In case Buyer – or Customer supplied by Buyer– considers using OSRAM OS components in product safety devices/applications or medical devices/applications, Buyer and/or Customer has to inform the local sales partner of OSRAM OS immediately and OSRAM OS and Buyer and /or Customer will analyze and coordinate the customer-specific request between OSRAM OS and Buyer and/or Customer.

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## Glossary

- 1) **Radiant intensity:** Measured at a solid angle of  $\Omega = 0.01$  sr
- 2) **Reverse Operation:** Reverse Operation of 10 hours is permissible in total. Continuous reverse operation is not allowed.
- 3) **Total radiant flux:** Measured with integrating sphere.
- 4) **Thermal resistance:** junction - soldering point, of the device only, mounted on an ideal heatsink (e.g. metal block)
- 5) **Thermal resistance:** junction - ambient, mounted on PC-board (FR4), padsize 16 mm<sup>2</sup> each
- 6) **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.
- 7) **Testing temperature:** TA = 25°C
- 8) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with  $\pm 0.1$  and dimensions are specified in mm.
- 9) **Tape and Reel:** All dimensions and tolerances are specified acc. IEC 60286-3 and specified in mm.

## Revision History

Version	Date	Change
1.7	2019-01-11	Tape and Reel

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