

OSRAM KW DPLS32.SB

Datasheet

Discontinued

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SYNIOS® P4014

KW DPLS32.SB

This compact LED offers an extremely low-profile and compact design of 4.0 x 1.4 x 0.65 mm, uniform distribution of light and rugged plastic housing.

The target application of the cold white KW DPLS32.SB is the backlighting of LCD displays.

Thanks to the longer lifetime it is perfectly suitable for the use in displays in the industrial sector.

The use of a special white coating in the LED ensures an improved color and brightness stability.



Applications

- Displays (Backlighting)

- Industry Monitors (Backlighting)

Features

- Package: SMD epoxy package, colored silicone resin
- Chip technology: UX:3
- Typ. Radiation: 120° (Lambertian emitter)
- Color: Cx = 0.29, Cy = 0.28 acc. to CIE 1931 (● white)
- Corrosion Robustness Class: 1B
- 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: 8 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B)

Ordering Information

Type	Luminous Flux ¹⁾ $I_F = 120 \text{ mA}$ Φ_V	Ordering Code
KW DPLS32.SB-6H6J-E5P7-EG-Z264	31.5 ... 56.0 lm	Q65112A4398

Maximum Ratings

Parameter	Symbol		Values
Operating Temperature	T_{op}	min.	-40 °C
		max.	120 °C
Storage Temperature	T_{stg}	min.	-40 °C
		max.	120 °C
Junction Temperature	T_j	max.	125 °C
Forward Current $T_s = 25\text{ °C}$	I_F	min.	5 mA
		max.	180 mA
Surge Current $t \leq 10\ \mu\text{s}$; $D = 0.005$; $T_s = 25\text{ °C}$	I_{FS}	max.	180 mA
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B)	V_{ESD}		8 kV
Reverse current ²⁾	I_R	max.	200 mA

Characteristics

 $I_F = 120 \text{ mA}; T_s = 25 \text{ }^\circ\text{C}$

Parameter	Symbol		Values
Chromaticity Coordinate ³⁾	C_x	typ.	0.29
	C_y	typ.	0.28
Peak Wavelength $I_F = 120 \text{ mA}$	λ_{peak}	min.	436 nm
		max.	461 nm
Viewing angle at 50% I_v	2ϕ	typ.	120 °
Forward Voltage ⁴⁾ $I_F = 120 \text{ mA}$	V_F	min.	2.70 V
		typ.	2.90 V
		max.	3.20 V
Reverse voltage (ESD device)	V_{RESD}	min.	5 V
Reverse voltage ²⁾ $I_R = 20 \text{ mA}$	V_R	max.	1.2 V
Real thermal resistance junction/solderpoint ⁵⁾	$R_{\text{thJS real}}$	typ.	19 K / W
		max.	23 K / W
Electrical thermal resistance junction/solderpoint ⁵⁾ with efficiency $\eta_e = 40 \text{ } \%$	$R_{\text{thJS elec.}}$	typ.	11 K / W
		max.	14 K / W

Brightness Groups

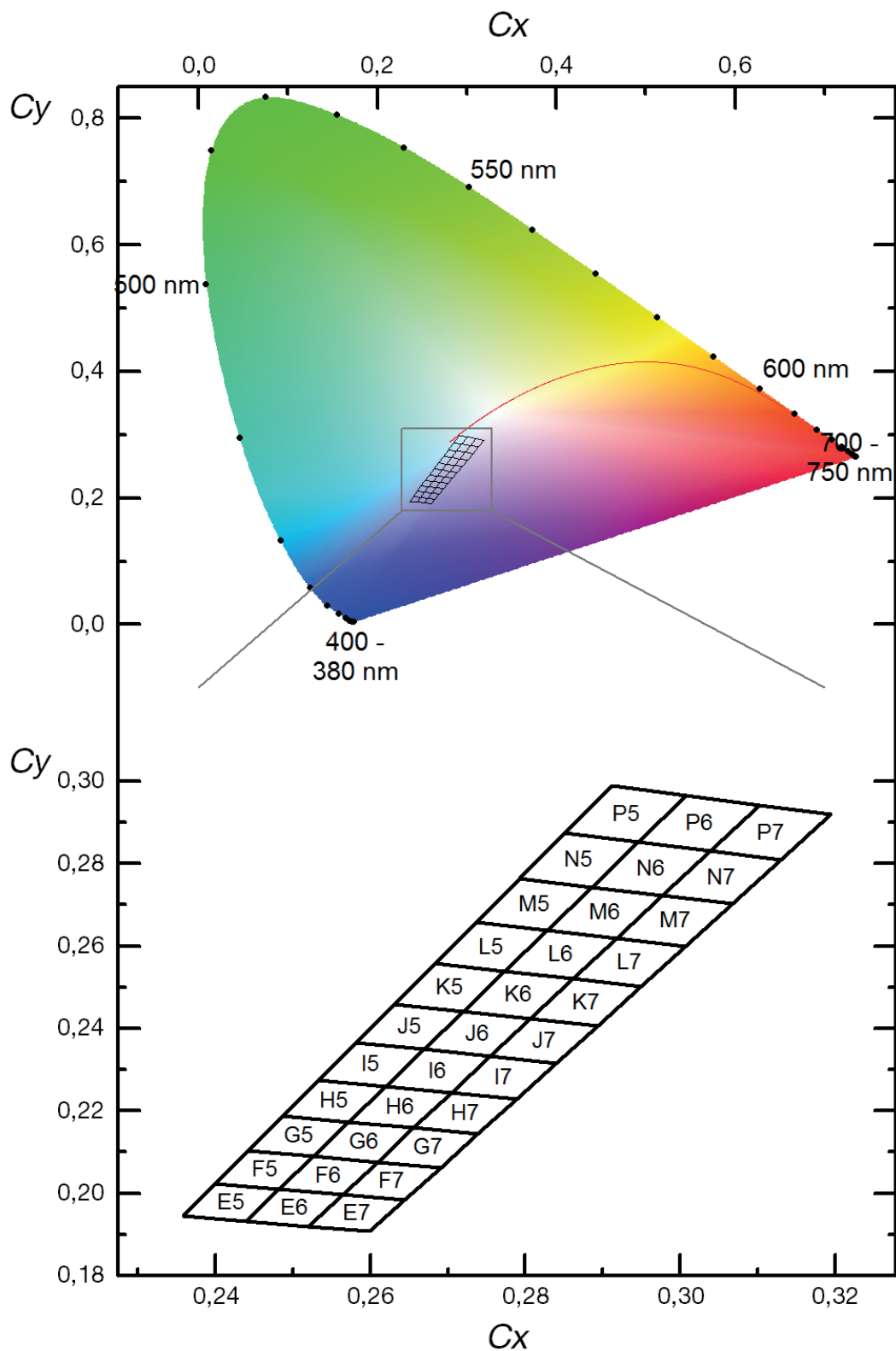
Group	Luminous Flux ¹⁾ $I_F = 120 \text{ mA}$ min. Φ_V	Luminous Flux ¹⁾ $I_F = 120 \text{ mA}$ max. Φ_V
6H	31.5 lm	35.5 lm
7H	35.5 lm	40.0 lm
8H	40.0 lm	45.0 lm
5J	45.0 lm	50.0 lm
6J	50.0 lm	56.0 lm

Forward Voltage Groups

Group	Forward Voltage ⁴⁾ $I_F = 120 \text{ mA}$ min. V_F	Forward Voltage ⁴⁾ $I_F = 120 \text{ mA}$ max. V_F
Z2	2.70 V	2.80 V
24	2.80 V	3.00 V
64	3.00 V	3.20 V

Chromaticity Coordinate Groups

KW DPLS32.SB



Discontinued

Chromaticity Coordinate Groups ³⁾

Group	Cx	Cy	Group	Cx	Cy	Group	Cx	Cy
E5	0.2440	0.1932	G7	0.2691	0.2063	J6	0.2755	0.2332
	0.2482	0.2010		0.2739	0.2144		0.2807	0.2424
	0.2400	0.2023		0.2656	0.2159		0.2720	0.2442
	0.2358	0.1945		0.2609	0.2076		0.2669	0.2349
E6	0.2520	0.1920	H5	0.2572	0.2173	J7	0.2840	0.2316
	0.2564	0.1997		0.2620	0.2259		0.2894	0.2407
	0.2482	0.2010		0.2533	0.2275		0.2807	0.2424
	0.2440	0.1932		0.2487	0.2188		0.2755	0.2332
E7	0.2599	0.1908	H6	0.2656	0.2159	K5	0.2720	0.2442
	0.2644	0.1984		0.2705	0.2244		0.2773	0.2538
	0.2564	0.1997		0.2620	0.2259		0.2683	0.2557
	0.2520	0.1920		0.2572	0.2173		0.2631	0.2459
F5	0.2482	0.2010	H7	0.2739	0.2144	K6	0.2807	0.2424
	0.2526	0.2090		0.2789	0.2229		0.2862	0.2520
	0.2443	0.2104		0.2705	0.2244		0.2773	0.2538
	0.2400	0.2023		0.2656	0.2159		0.2720	0.2442
F6	0.2564	0.1997	I5	0.2620	0.2259	K7	0.2894	0.2407
	0.2609	0.2076		0.2669	0.2349		0.2949	0.2502
	0.2526	0.2090		0.2581	0.2365		0.2862	0.2520
	0.2482	0.2010		0.2533	0.2275		0.2807	0.2424
F7	0.2644	0.1984	I6	0.2705	0.2244	L5	0.2773	0.2538
	0.2691	0.2063		0.2755	0.2332		0.2828	0.2638
	0.2609	0.2076		0.2669	0.2349		0.2737	0.2658
	0.2564	0.1997		0.2620	0.2259		0.2683	0.2557
G5	0.2526	0.2090	I7	0.2789	0.2229	L6	0.2862	0.2520
	0.2572	0.2173		0.2840	0.2316		0.2918	0.2619
	0.2487	0.2188		0.2755	0.2332		0.2828	0.2638
	0.2443	0.2104		0.2705	0.2244		0.2773	0.2538
G6	0.2609	0.2076	J5	0.2669	0.2349	L7	0.2949	0.2502
	0.2656	0.2159		0.2720	0.2442		0.3007	0.2600
	0.2572	0.2173		0.2631	0.2459		0.2918	0.2619
	0.2526	0.2090		0.2581	0.2365		0.2862	0.2520

Discontinued

Group	Cx	Cy	Group	Cx	Cy	Group	Cx	Cy
M5	0.2828	0.2638	N5	0.2886	0.2743	P5	0.2946	0.2852
	0.2886	0.2743		0.2946	0.2852		0.3008	0.2965
	0.2793	0.2764		0.2851	0.2874		0.2912	0.2989
	0.2737	0.2658		0.2793	0.2764		0.2851	0.2874
M6	0.2918	0.2619	N6	0.2977	0.2722	P6	0.3039	0.2830
	0.2977	0.2722		0.3039	0.2830		0.3102	0.2942
	0.2886	0.2743		0.2946	0.2852		0.3008	0.2965
	0.2828	0.2638		0.2886	0.2743		0.2946	0.2852
M7	0.3007	0.2600	N7	0.3068	0.2702	P7	0.3130	0.2808
	0.3068	0.2702		0.3130	0.2808		0.3195	0.2919
	0.2977	0.2722		0.3039	0.2830		0.3102	0.2942
	0.2918	0.2619		0.2977	0.2722		0.3039	0.2830

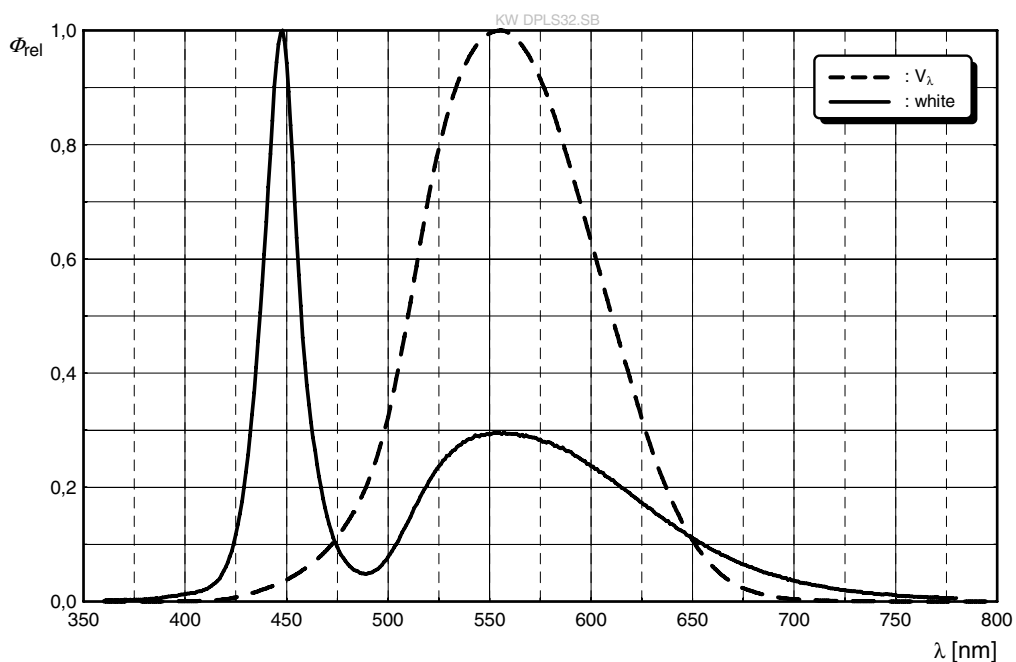
Group Name on Label

Example: 5J-E5-E-24

Brightness	Color Chromaticity	Wavelength Groups	Forward Voltage
5J	E5	E	24

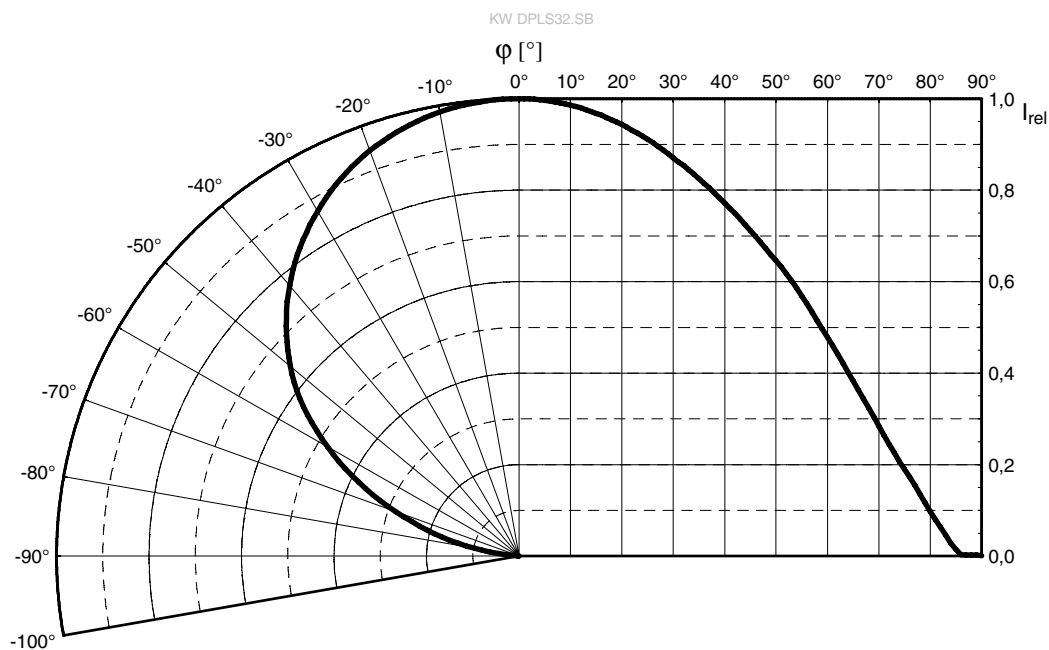
Relative Spectral Emission ⁶⁾

$\Phi_{rel} = f(\lambda); I_F = 120 \text{ mA}; T_S = 25 \text{ }^\circ\text{C}$



Radiation Characteristics ⁶⁾

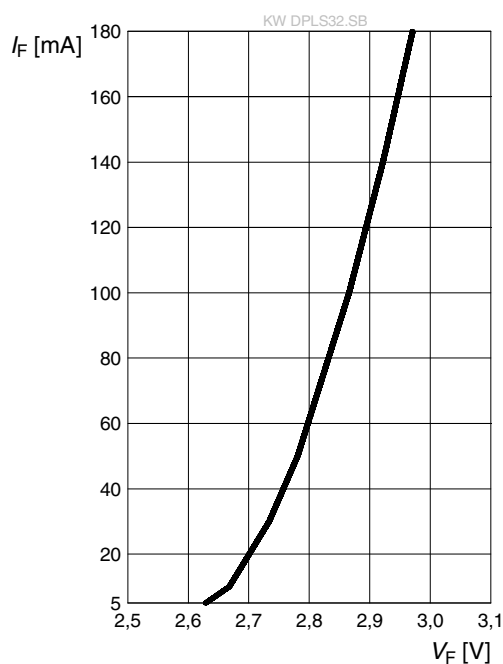
$I_{rel} = f(\phi); T_S = 25 \text{ }^\circ\text{C}$



Discontinued

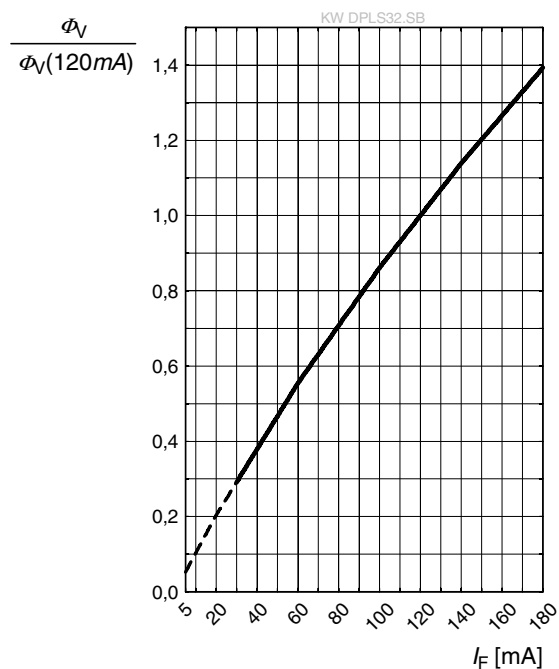
Forward current ⁶⁾

$$I_F = f(V_F); T_S = 25\text{ °C}$$



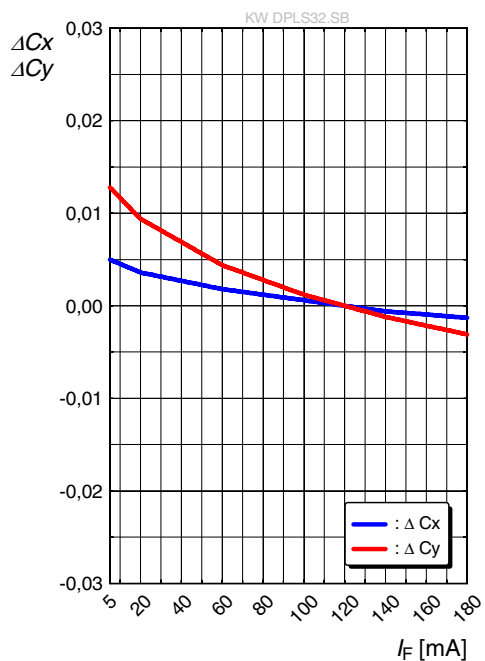
Relative Luminous Flux ^{6), 7)}

$$\Phi_V / \Phi_V(120\text{ mA}) = f(I_F); T_S = 25\text{ °C}$$



Chromaticity Coordinate Shift ⁶⁾

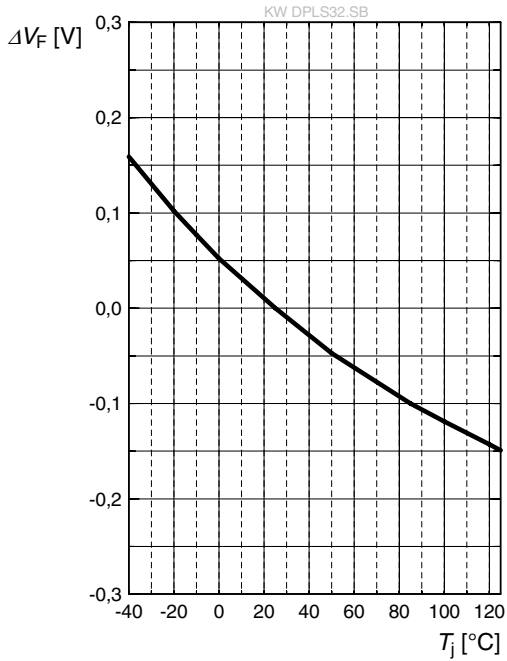
$$\Delta C_x, \Delta C_y = f(I_F); T_S = 25\text{ °C}$$



Discontinued

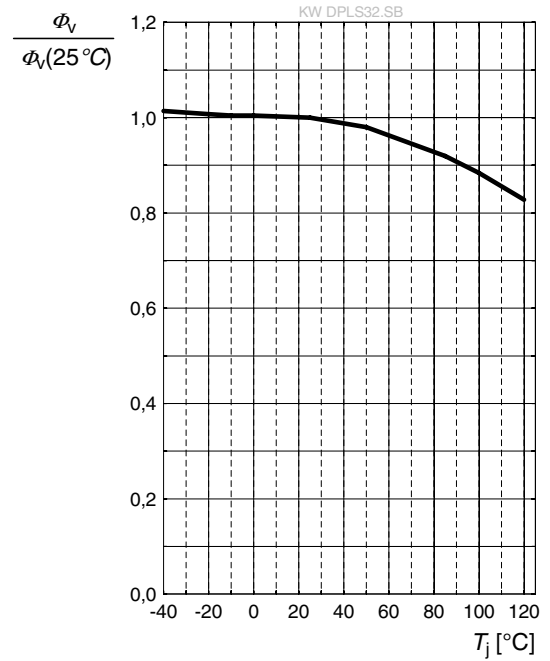
Forward Voltage ⁶⁾

$\Delta V_F = V_F - V_F(25\text{ }^\circ\text{C}) = f(T_j); I_F = 120\text{ mA}$



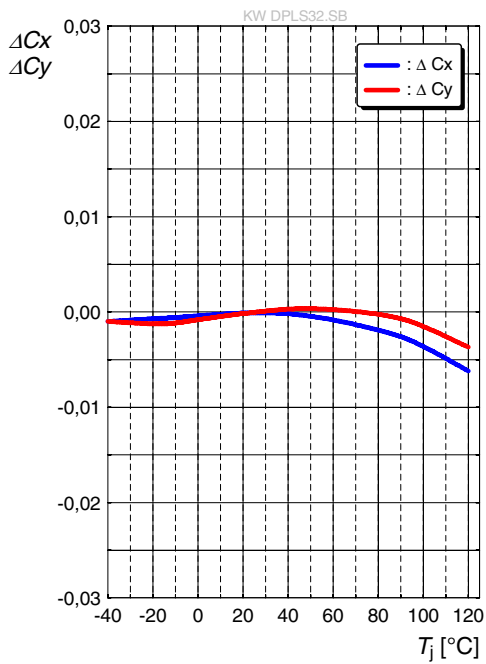
Relative Luminous Flux ⁶⁾

$\Phi_v / \Phi_v(25\text{ }^\circ\text{C}) = f(T_j); I_F = 120\text{ mA}$



Chromaticity Coordinate Shift ⁶⁾

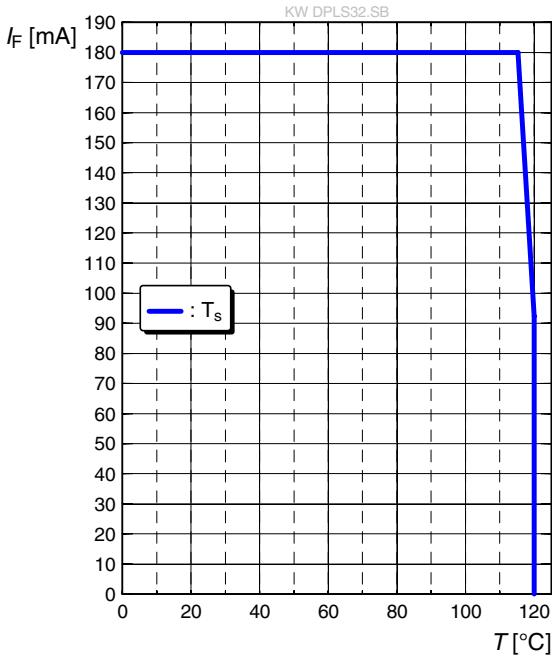
$\Delta C_x, \Delta C_y = f(T_j); I_F = 120\text{ mA}$



Discontinued

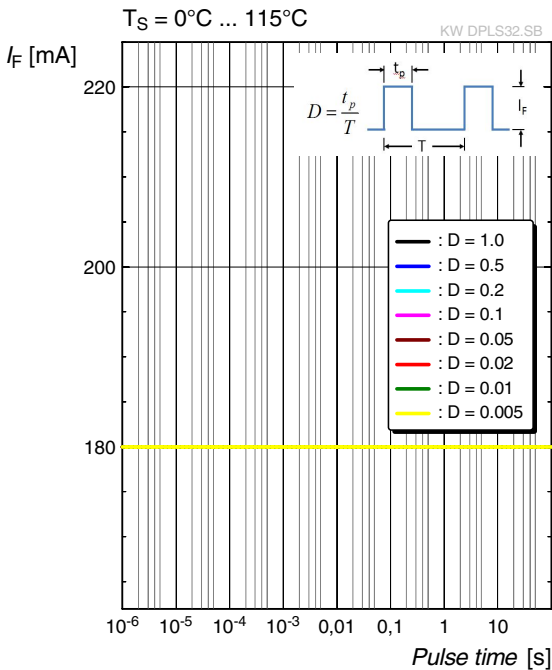
Max. Permissible Forward Current

$I_F = f(T)$



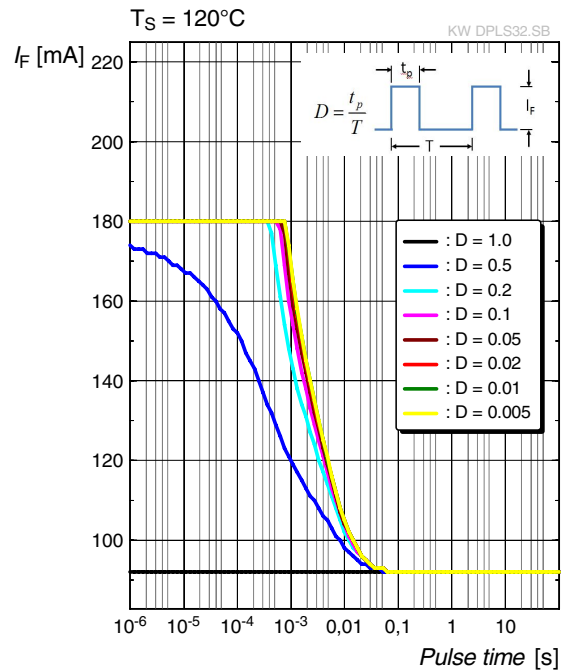
Permissible Pulse Handling Capability

$I_F = f(t_p)$; D: Duty cycle



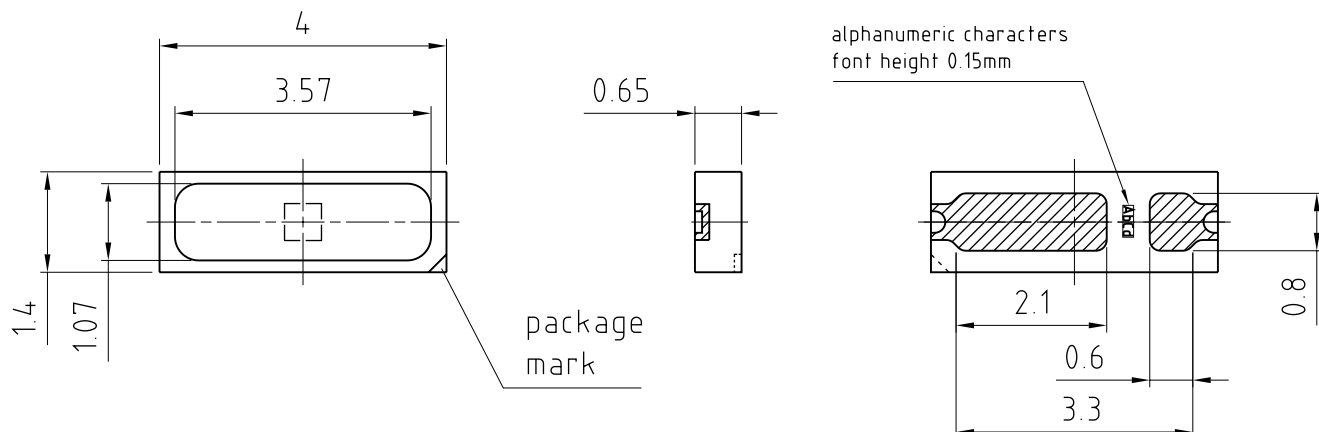
Permissible Pulse Handling Capability

$I_F = f(t_p)$; D: Duty cycle



Discontinued

Dimensional Drawing ⁸⁾



general tolerance ± 0.1
lead finish Ag 

C63062-A4326-A1.-02

Further Information:

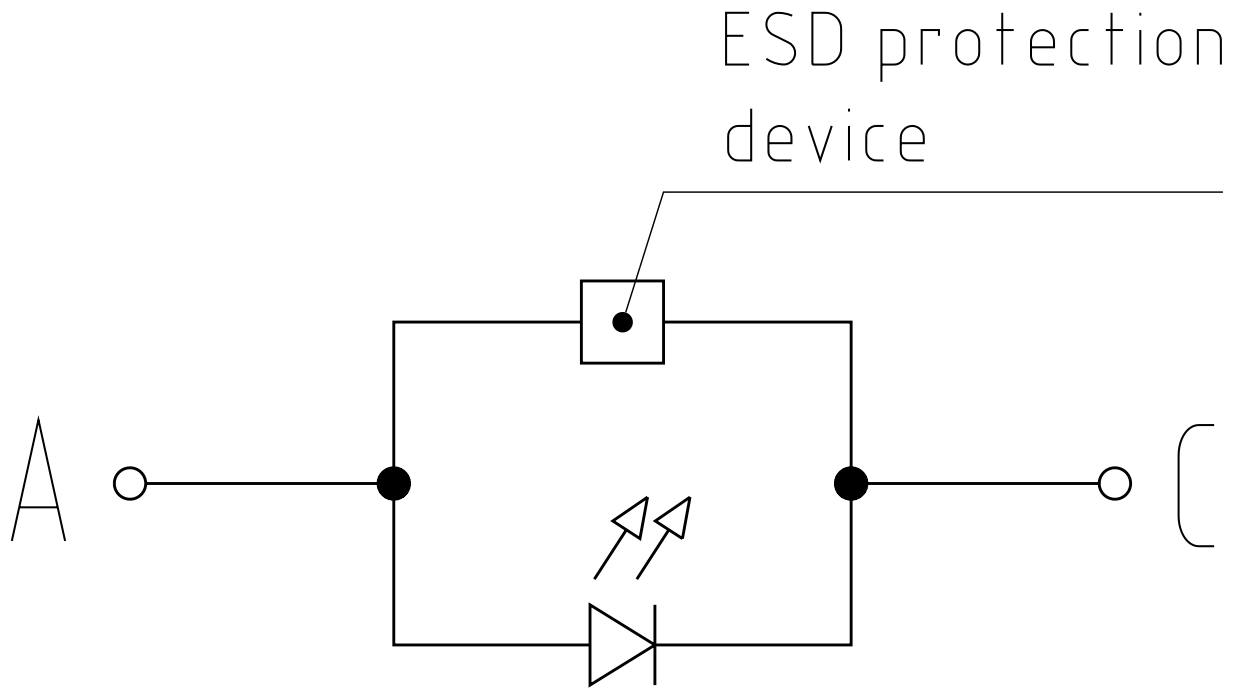
Approximate Weight: 10.0 mg

Package marking: Cathode

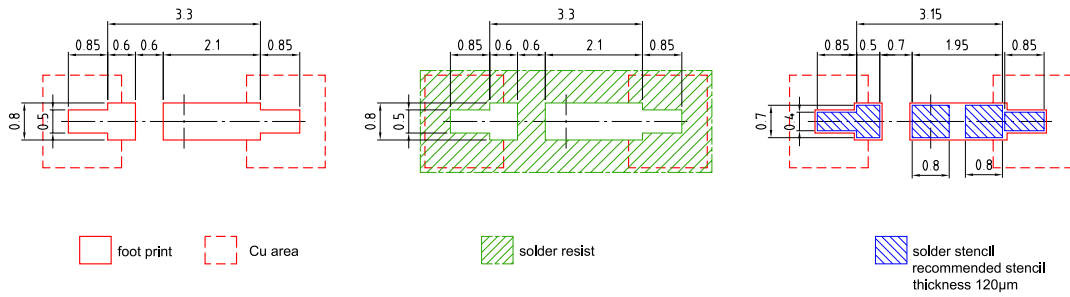
Corrosion test: Class: 1B
Test condition: 25°C / 75 % RH / 200ppb SO₂, 200ppb NO₂, 10ppb H₂S,
10ppb Cl₂ / 21 days (EN 60068-2-60 (Method 4))

ESD advice: The device is protected by ESD device which is connected in parallel to the Chip.

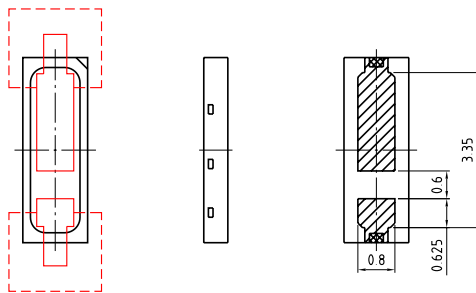
Electrical Internal Circuit



Recommended Solder Pad ⁸⁾



Component Location on Pad

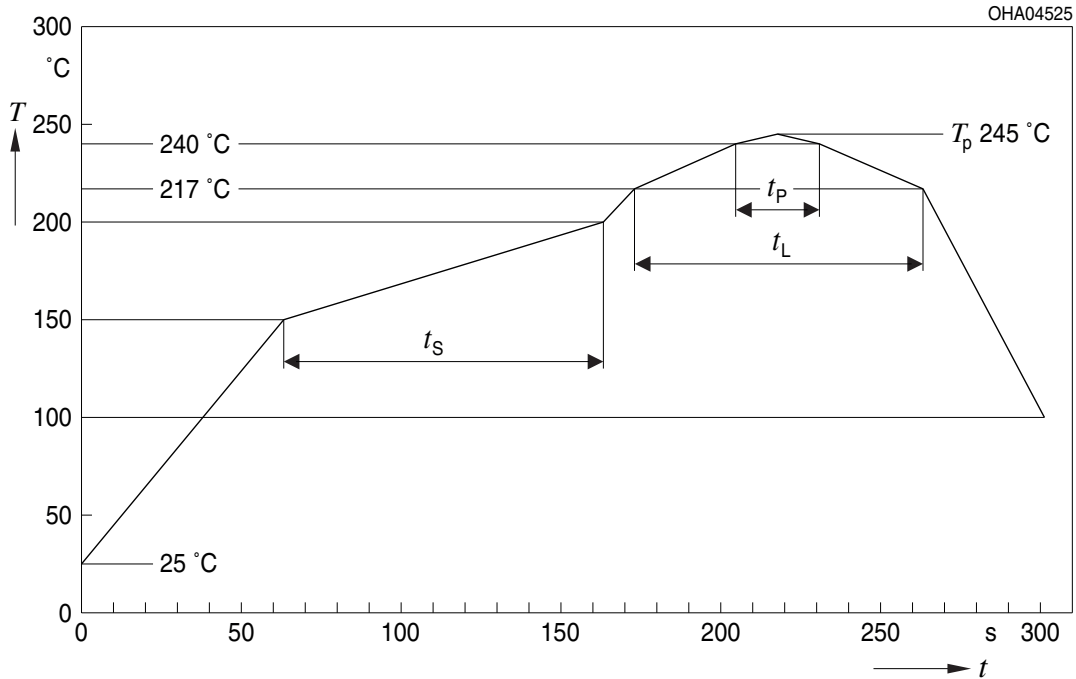


E062.3010.228-01

For superior solder joint connectivity results we recommend soldering under standard nitrogen atmosphere. Package not suitable for ultra sonic cleaning.

Reflow Soldering Profile

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

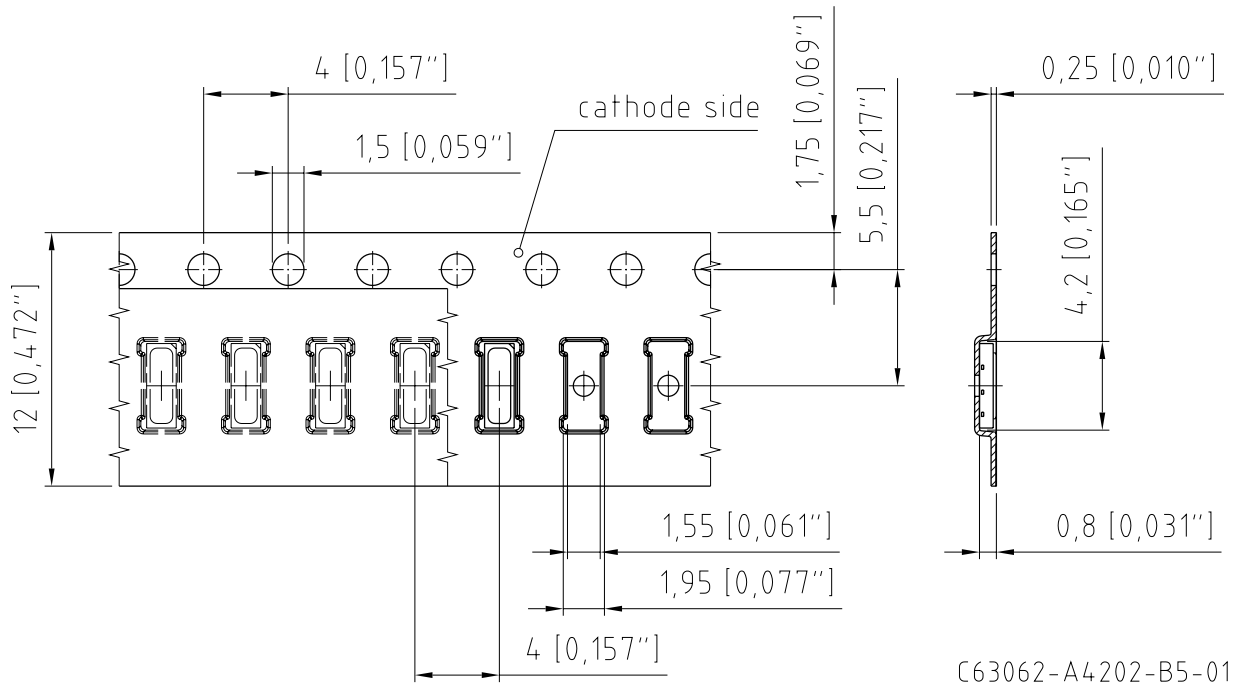


Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat ^{*)} 25 °C to 150 °C			2	3	K/s
Time t_s T_{Smin} to T_{Smax}	t_s	60	100	120	s
Ramp-up rate to peak ^{*)} T_{Smax} to T_p			2	3	K/s
Liquidus temperature	T_L		217		°C
Time above liquidus temperature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

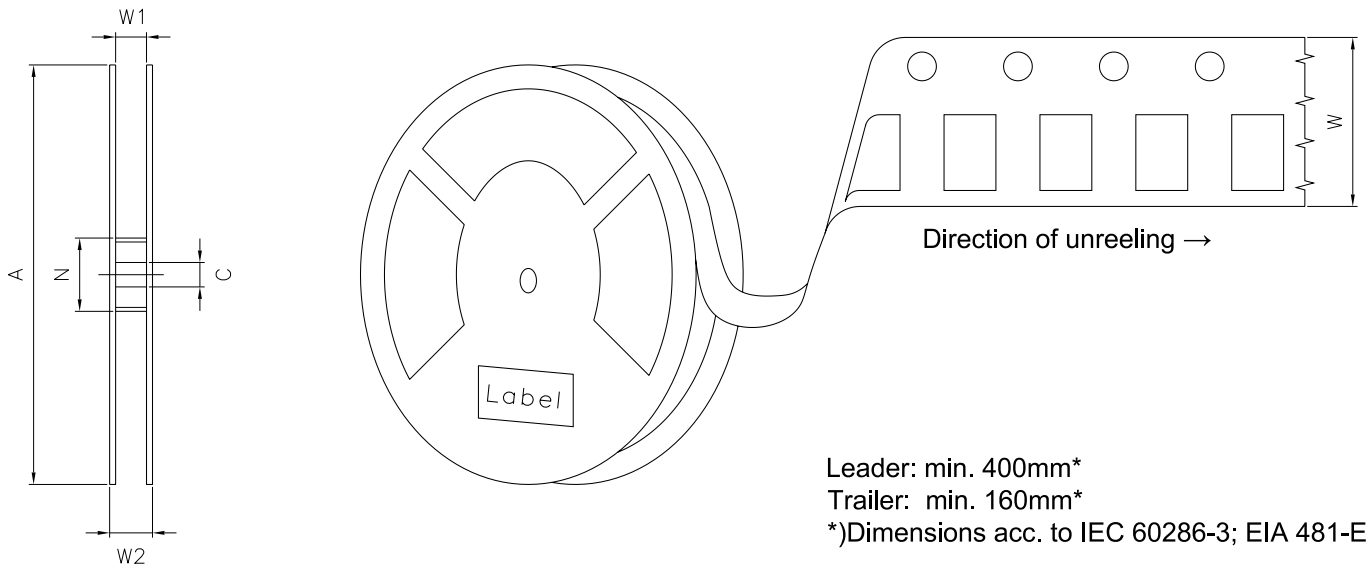
All temperatures refer to the center of the package, measured on the top of the component
^{*)} slope calculation DT/Dt : Dt max. 5 s; fulfillment for the whole T-range

Discontinued

Taping ⁸⁾



Tape and Reel ⁹⁾



Reel Dimensions

A	W	N _{min}	W ₁	W _{2max}	Pieces per PU
180 mm	24 + 0.3 / - 0.1 mm	60/100 mm	24.4 + 2 mm	30.4 mm	3000

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

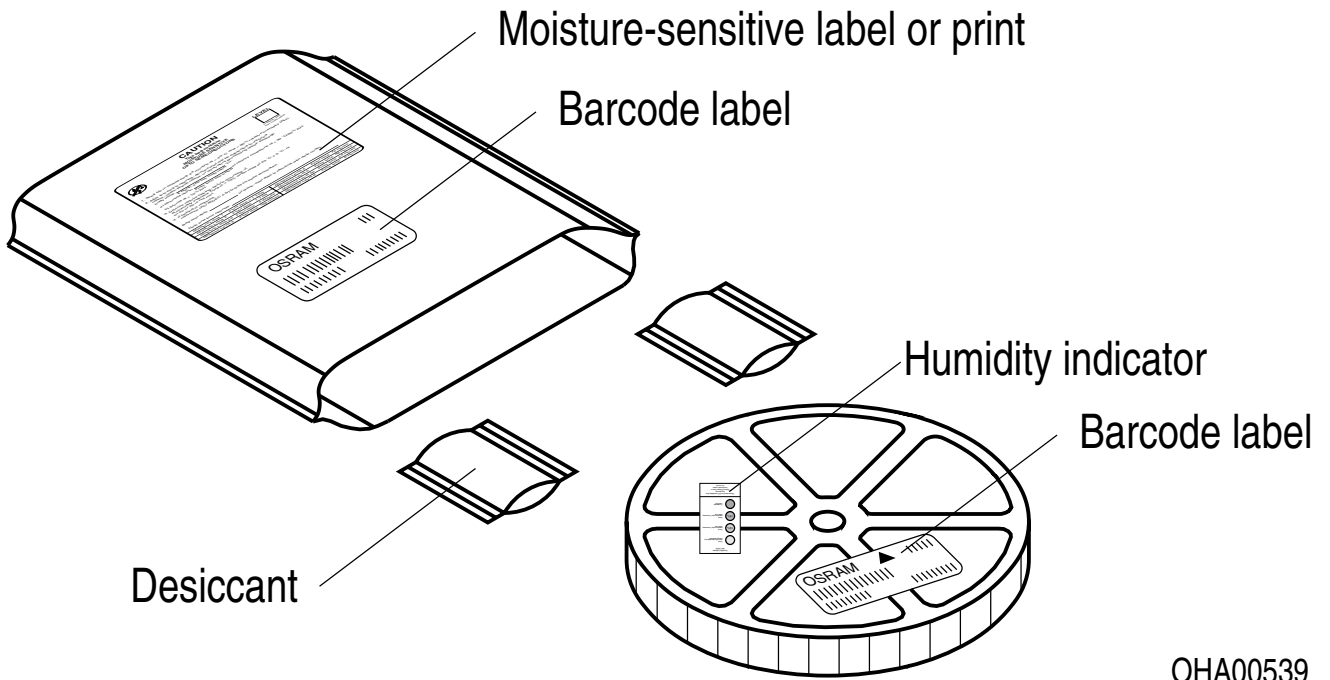
(1T) LOT NO: 1234567890 (9D) D/C: 1234

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

Pack: RXX
DEMY XXX
X_X123_1234.1234 X

OHA04563

Dry Packing Process and Materials ⁸⁾

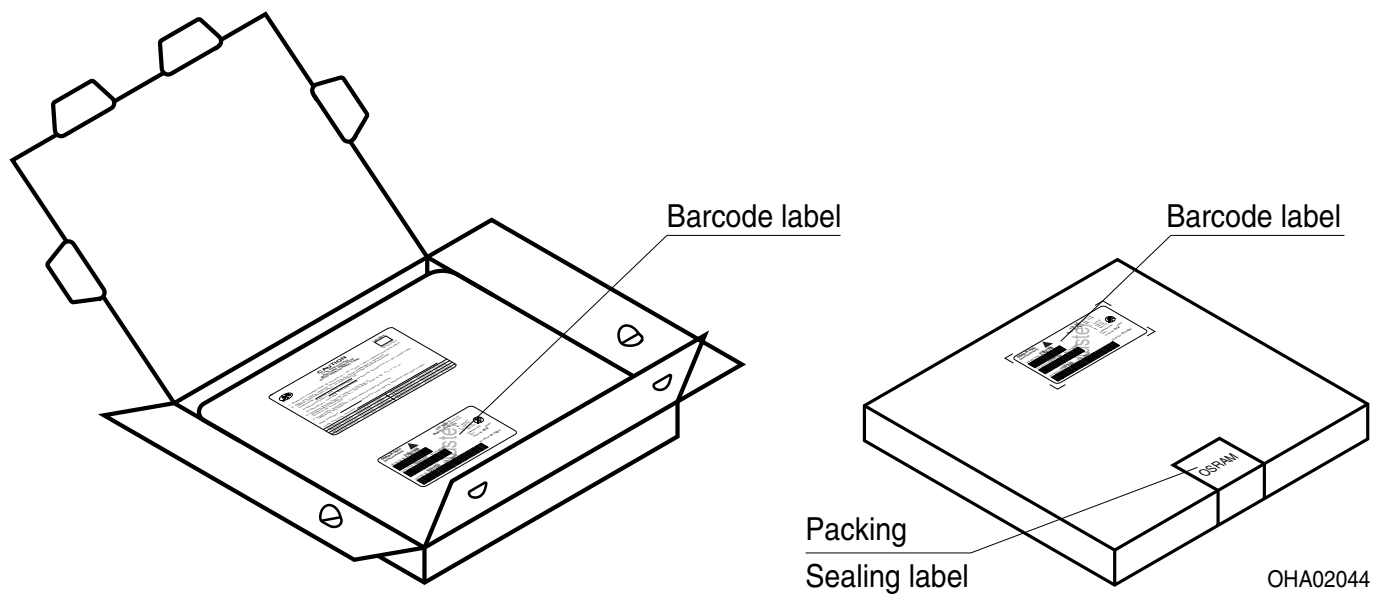


OHA00539

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

Discontinued

Schematic Transportation Box ⁸⁾



Dimensions of Transportation Box

Width	Length	Height
195 ± 5 mm	195 ± 5 mm	42 ± 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 device specified in this data sheet fall into the class **low risk (exposure time 100 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

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 our 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 and functional safety devices/applications or medical devices/applications

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

Our products are not qualified at module and system level for such application.

In case buyer – or customer supplied by buyer – considers using our components in product safety devices/ applications or medical devices/applications, buyer and/or customer has to inform our local sales partner immediately and we and buyer and /or customer will analyze and coordinate the customer-specific request between us and buyer and/or customer.

Glossary

- 1) **Brightness:** Brightness values are measured during a current pulse of typically 25 ms, with an internal reproducibility of $\pm 8\%$ and an expanded uncertainty of $\pm 11\%$ (acc. to GUM with a coverage factor of $k = 3$).
- 2) **Reverse Operation:** This product is intended to be operated applying a forward current within the specified range. Applying any continuous reverse bias or forward bias below the voltage range of light emission shall be avoided because it may cause migration which can change the electro-optical characteristics or damage the LED.
- 3) **Chromaticity coordinate groups:** Chromaticity coordinates are measured during a current pulse of typically 25 ms, with an internal reproducibility of ± 0.005 and an expanded uncertainty of ± 0.01 (acc. to GUM with a coverage factor of $k = 3$).
- 4) **Forward Voltage:** The forward voltage is measured during a current pulse of typically 8 ms, with an internal reproducibility of ± 0.05 V and an expanded uncertainty of ± 0.1 V (acc. to GUM with a coverage factor of $k = 3$).
- 5) **Thermal Resistance:** $R_{th\ max}$ is based on statistic values (6σ).
- 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) **Characteristic curve:** In the range where the line of the graph is broken, you must expect higher differences between single devices within one packing unit.
- 8) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with ± 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
1.1	2021-01-20	Not for new design
1.1	2022-06-03	Discontinued

Discontinued



EU RoHS and China RoHS compliant product

此产品符合欧盟 RoHS 指令的要求；
按照中国的相关法规和标准，
不含有毒有害物质或元素。

Published by ams-OSRAM AG

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