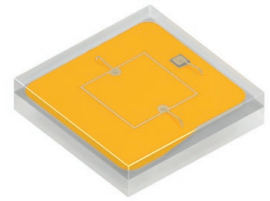


KW CSLPM2.CC

OSLON® Square Flat

This most compact 3 x 3 mm high-power LED with electrically isolated thermal pad allows superior heat dissipation designs. The flat package enhances color quality due to a reduced color over angle variation. Its extremely low thermal resistance helps to keep the efficiency remarkably high even when driven at high currents.



Applications

- Architecture
- Downlights/Spotlights
- Highbay Retail
- Industrial Automation (Machine Controls, Light Barriers, Vision Controls)
- Lamp Retrofits
- Transportation, Plane, Ship

Features:

- Package: Ceramic package
- Chip technology: UX:3
- Typ. Radiation: 120° (Lambertian emitter)
- Color: Cx = 0.41, Cy = 0.39 acc. to CIE 1931 (• white)
- Corrosion Robustness Class: 3B
- Color temperature: 3000K - 4000K
- CRI: 90 (min.)
- ESD: 8 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B)

Ordering Information

Type	Color temperature	Luminous Flux ¹⁾ $I_F = 700 \text{ mA}$ Φ_V	Ordering Code
KW CSLPM2.CC-8L8M-4R9T	3000 K	159 ... 280 lm	Q65112A2579
KW CSLPM2.CC-8L8M-4O9Q	3500 K	159 ... 280 lm	Q65112A2578
KW CSLPM2.CC-8L8M-4L8N	4000 K	159 ... 280 lm	Q65112A2445

Maximum Ratings

Parameter	Symbol		Values
Operating Temperature	T_{op}	min.	-40 °C
		max.	125 °C
Storage Temperature	T_{stg}	min.	-40 °C
		max.	125 °C
Junction Temperature	T_j	max.	135 °C
Forward Current $T_s = 25\text{ °C}$	I_F	min.	200 mA
		max.	1800 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

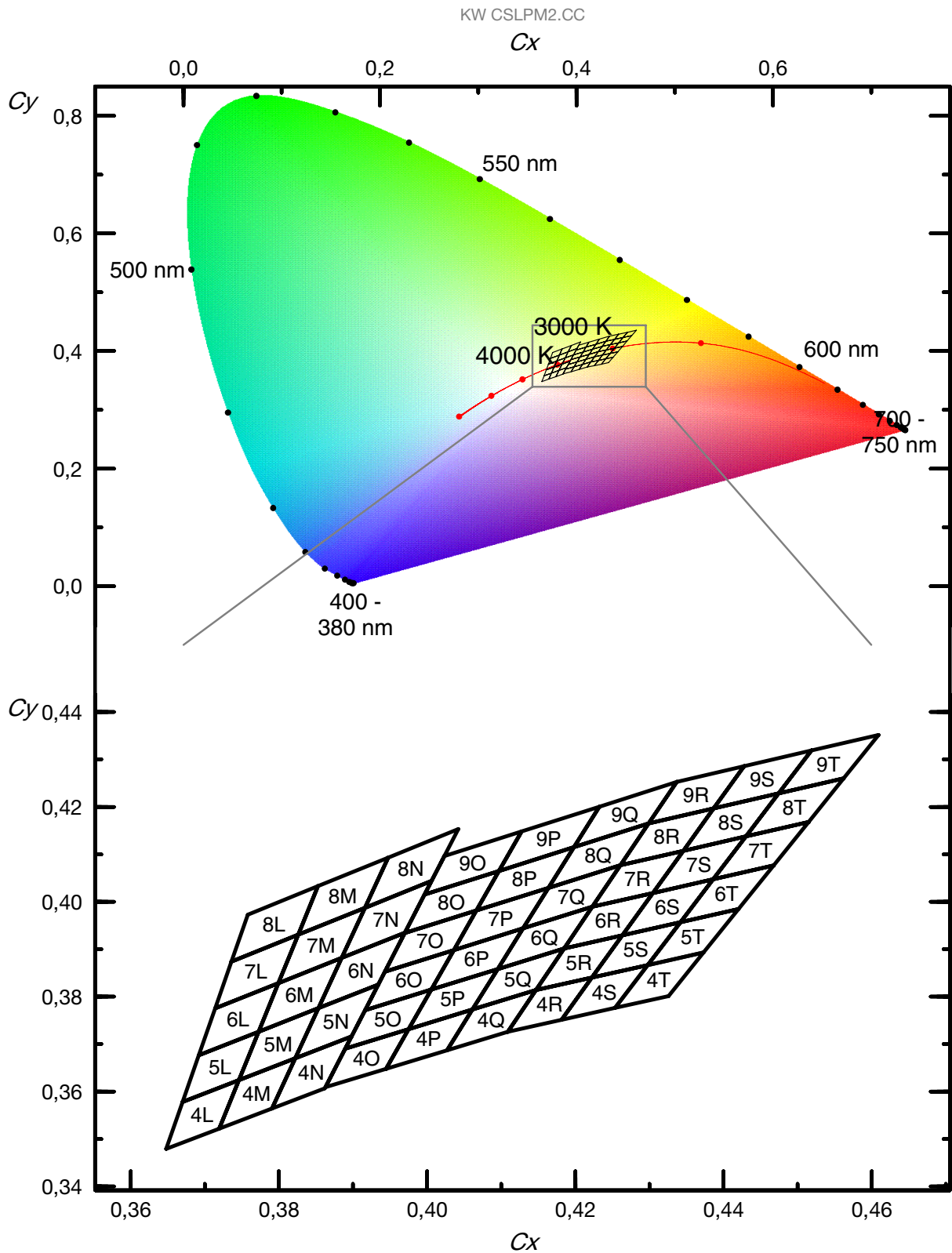
$I_F = 700 \text{ mA}$; $T_s = 25 \text{ °C}$

Parameter	Symbol		Values
Chromaticity Coordinate ³⁾	C_x	typ.	0.41
	C_y	typ.	0.39
Viewing angle at 50 % I_v	2ϕ	typ.	120 °
Forward Voltage ⁴⁾ $I_F = 700 \text{ mA}$	V_F	min.	2.70 V
		typ.	2.85 V
		max.	3.20 V
Reverse voltage (ESD device)	$V_{R\text{ESD}}$	min.	45 V
Reverse voltage ²⁾ $I_R = 20 \text{ mA}$	V_R	max.	1.2 V
Color Rendering Index	CRI	min.	90
Real thermal resistance junction/solderpoint ⁵⁾	$R_{\text{thJS real}}$	typ.	3.0 K / W
		max.	3.9 K / W
Electrical thermal resistance junction/solderpoint ⁵⁾ with efficiency $\eta_e = 29 \%$	$R_{\text{thJS elec.}}$	typ.	2.1 K / W
		max.	2.8 K / W

Brightness Groups

Group	Luminous Flux ¹⁾ $I_F = 700 \text{ mA}$ min. Φ_V	Luminous Flux ¹⁾ $I_F = 700 \text{ mA}$ max. Φ_V	Luminous Intensity ⁶⁾ $I_F = 700 \text{ mA}$ typ. I_v
8L	159 lm	180 lm	51 cd
5M	180 lm	201 lm	57 cd
6M	201 lm	224 lm	64 cd
7M	224 lm	250 lm	71 cd
8M	250 lm	280 lm	80 cd

Chromaticity Coordinate Groups



Color Chromaticity Groups ³⁾

Group	Cx	Cy	CCT	Group	Cx	Cy	CCT	Group	Cx	Cy	CCT
4R	0.4109	0.3726	3000	6T	0.4342	0.3957	3000	9S	0.4387	0.4197	3000
	0.4147	0.3814	3000		0.4386	0.4048	3000		0.4428	0.4286	3000
	0.4222	0.3840	3000		0.4468	0.4077	3000		0.4519	0.4319	3000
	0.4181	0.3751	3000		0.4420	0.3985	3000		0.4474	0.4228	3000
4S	0.4181	0.3751	3000	7R	0.4223	0.3990	3000	9T	0.4474	0.4228	3000
	0.4222	0.3840	3000		0.4261	0.4077	3000		0.4519	0.4319	3000
	0.4298	0.3867	3000		0.4346	0.4108	3000		0.4609	0.4352	3000
	0.4254	0.3776	3000		0.4305	0.4019	3000		0.4562	0.4260	3000
4T	0.4254	0.3776	3000	7S	0.4305	0.4019	3000	4O	0.3863	0.3609	3500
	0.4298	0.3867	3000		0.4346	0.4108	3000		0.3890	0.3690	3500
	0.4373	0.3893	3000		0.4430	0.4138	3000		0.3975	0.3731	3500
	0.4326	0.3801	3000		0.4386	0.4048	3000		0.3945	0.3648	3500
5R	0.4147	0.3814	3000	7T	0.4386	0.4048	3000	4P	0.3945	0.3648	3500
	0.4185	0.3902	3000		0.4430	0.4138	3000		0.3975	0.3731	3500
	0.4263	0.3929	3000		0.4515	0.4168	3000		0.4061	0.3773	3500
	0.4222	0.3840	3000		0.4468	0.4077	3000		0.4027	0.3687	3500
5S	0.4222	0.3840	3000	8R	0.4261	0.4077	3000	4Q	0.4027	0.3687	3500
	0.4263	0.3929	3000		0.4299	0.4165	3000		0.4061	0.3773	3500
	0.4342	0.3957	3000		0.4387	0.4197	3000		0.4147	0.3814	3500
	0.4298	0.3867	3000		0.4346	0.4108	3000		0.4109	0.3726	3500
5T	0.4298	0.3867	3000	8S	0.4346	0.4108	3000	5O	0.3890	0.3690	3500
	0.4342	0.3957	3000		0.4387	0.4197	3000		0.3916	0.3772	3500
	0.4420	0.3985	3000		0.4474	0.4228	3000		0.4006	0.3815	3500
	0.4373	0.3893	3000		0.4430	0.4138	3000		0.3975	0.3731	3500
6R	0.4185	0.3902	3000	8T	0.4430	0.4138	3000	5P	0.3975	0.3731	3500
	0.4223	0.3990	3000		0.4474	0.4228	3000		0.4006	0.3815	3500
	0.4305	0.4019	3000		0.4562	0.4260	3000		0.4095	0.3858	3500
	0.4263	0.3929	3000		0.4515	0.4168	3000		0.4061	0.3773	3500
6S	0.4263	0.3929	3000	9R	0.4299	0.4165	3000	5Q	0.4061	0.3773	3500
	0.4305	0.4019	3000		0.4337	0.4253	3000		0.4095	0.3858	3500
	0.4386	0.4048	3000		0.4428	0.4286	3000		0.4185	0.3902	3500
	0.4342	0.3957	3000		0.4387	0.4197	3000		0.4147	0.3814	3500

Group	Cx	Cy	CCT	Group	Cx	Cy	CCT	Group	Cx	Cy	CCT
6O	0.3916	0.3772	3500	8Q	0.4164	0.4029	3500	5M	0.3746	0.3624	4000
	0.3943	0.3853	3500		0.4198	0.4115	3500		0.3773	0.3726	4000
	0.4036	0.3898	3500		0.4299	0.4165	3500		0.3853	0.3776	4000
	0.4006	0.3815	3500		0.4261	0.4077	3500		0.3822	0.3670	4000
6P	0.4006	0.3815	3500	9O	0.3997	0.4015	3500	5N	0.3822	0.3670	4000
	0.4036	0.3898	3500		0.4023	0.4097	3500		0.3853	0.3776	4000
	0.4130	0.3944	3500		0.4128	0.4148	3500		0.3934	0.3825	4000
	0.4095	0.3858	3500		0.4097	0.4065	3500		0.3898	0.3716	4000
6Q	0.4095	0.3858	3500	9P	0.4097	0.4065	3500	6L	0.3692	0.3677	4000
	0.4130	0.3944	3500		0.4128	0.4148	3500		0.3714	0.3775	4000
	0.4223	0.3990	3500		0.4232	0.4201	3500		0.3799	0.3828	4000
	0.4185	0.3902	3500		0.4198	0.4115	3500		0.3773	0.3726	4000
7O	0.3943	0.3853	3500	9Q	0.4198	0.4115	3500	6M	0.3773	0.3726	4000
	0.3970	0.3934	3500		0.4232	0.4201	3500		0.3799	0.3828	4000
	0.4067	0.3982	3500		0.4337	0.4253	3500		0.3885	0.3882	4000
	0.4036	0.3898	3500		0.4299	0.4165	3500		0.3853	0.3776	4000
7P	0.4036	0.3898	3500	4L	0.3648	0.3479	4000	6N	0.3853	0.3776	4000
	0.4067	0.3982	3500		0.3670	0.3578	4000		0.3885	0.3882	4000
	0.4164	0.4029	3500		0.3746	0.3624	4000		0.3970	0.3935	4000
	0.4130	0.3944	3500		0.3719	0.3522	4000		0.3934	0.3825	4000
7Q	0.4130	0.3944	3500	4M	0.3719	0.3522	4000	7L	0.3714	0.3775	4000
	0.4164	0.4029	3500		0.3746	0.3624	4000		0.3736	0.3874	4000
	0.4261	0.4077	3500		0.3822	0.3670	4000		0.3826	0.3931	4000
	0.4223	0.3990	3500		0.3791	0.3564	4000		0.3799	0.3828	4000
8O	0.3970	0.3934	3500	4N	0.3791	0.3564	4000	7M	0.3799	0.3828	4000
	0.3997	0.4015	3500		0.3822	0.3670	4000		0.3826	0.3931	4000
	0.4097	0.4065	3500		0.3898	0.3716	4000		0.3916	0.3987	4000
	0.4067	0.3982	3500		0.3862	0.3607	4000		0.3885	0.3882	4000
8P	0.4067	0.3982	3500	5L	0.3670	0.3578	4000	7N	0.3885	0.3882	4000
	0.4097	0.4065	3500		0.3692	0.3677	4000		0.3916	0.3987	4000
	0.4198	0.4115	3500		0.3773	0.3726	4000		0.4006	0.4044	4000
	0.4164	0.4029	3500		0.3746	0.3624	4000		0.3970	0.3935	4000

Group	Cx	Cy	CCT	Group	Cx	Cy	CCT	Group	Cx	Cy	CCT
8L	0.3736	0.3874	4000	8M	0.3826	0.3931	4000	8N	0.3916	0.3987	4000
	0.3758	0.3973	4000		0.3853	0.4033	4000		0.3947	0.4093	4000
	0.3853	0.4033	4000		0.3947	0.4093	4000		0.4042	0.4153	4000
	0.3826	0.3931	4000		0.3916	0.3987	4000		0.4006	0.4044	4000

Group Name on Label

Example: 5M-4L

Brightness

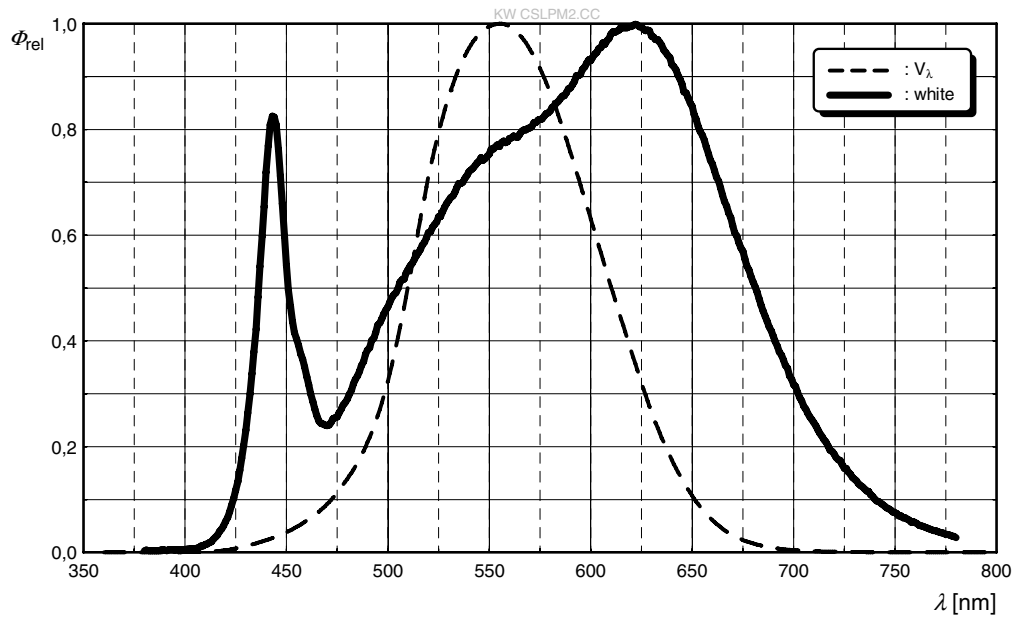
Color Chromaticity

5M

4L

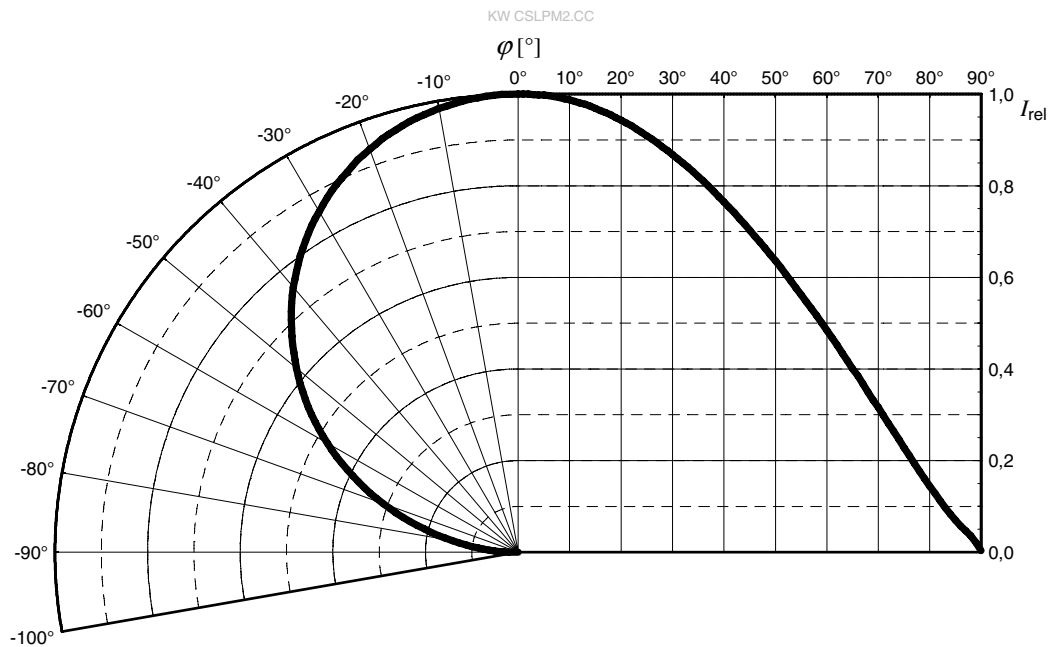
Relative Spectral Emission ⁶⁾

$\Phi_{rel} = f(\lambda); I_F = 700 \text{ mA}; T_S = 25 \text{ }^\circ\text{C}$



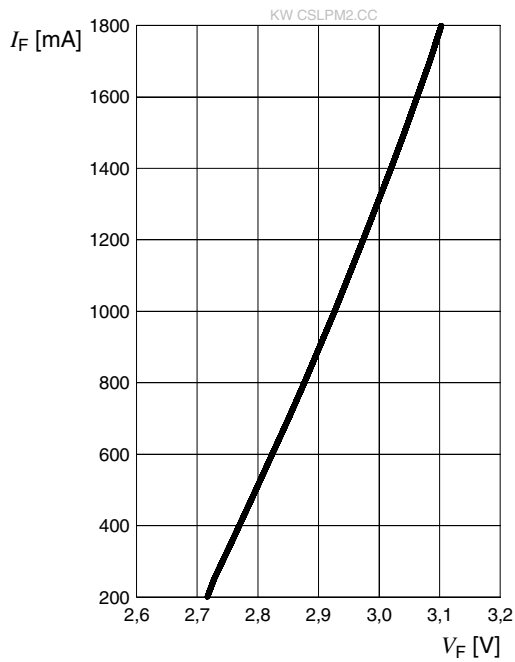
Radiation Characteristics ⁶⁾

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



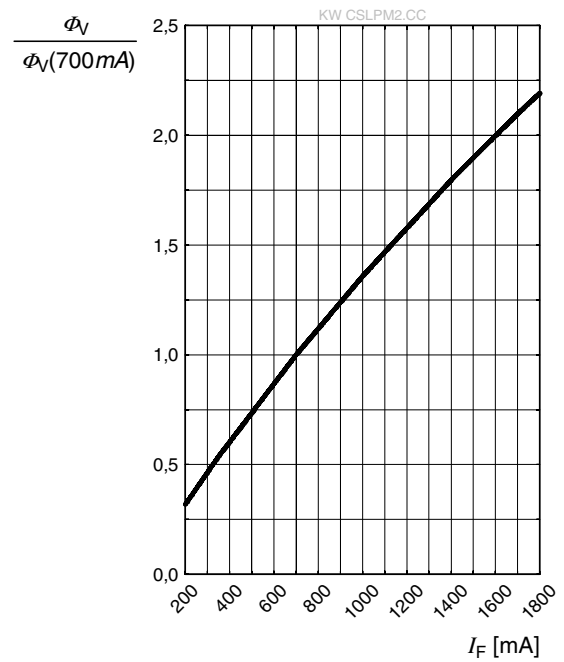
Forward current ^{6), 7)}

$I_F = f(V_F); T_S = 25\text{ °C}$



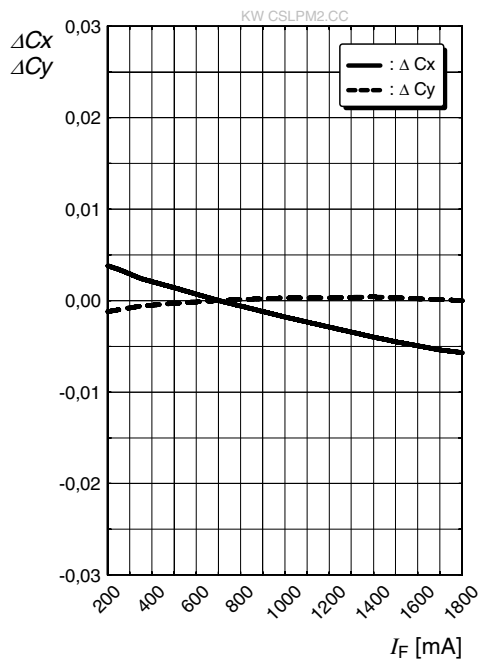
Relative Luminous Flux ^{6), 7)}

$\Phi_V/\Phi_V(700\text{ mA}) = f(I_F); T_S = 25\text{ °C}$



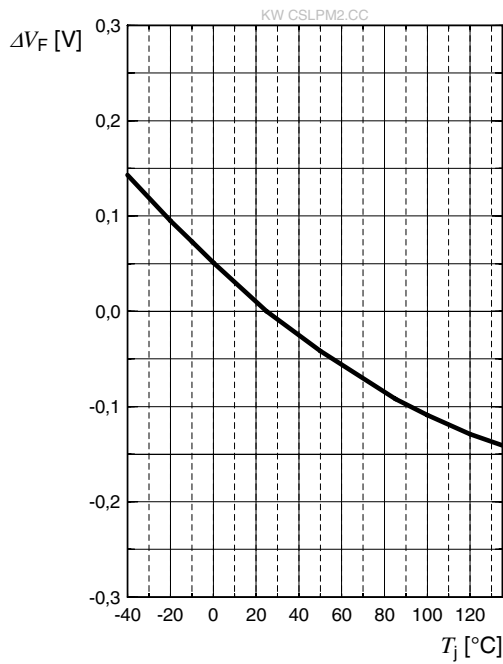
Chromaticity Coordinate Shift ⁶⁾

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



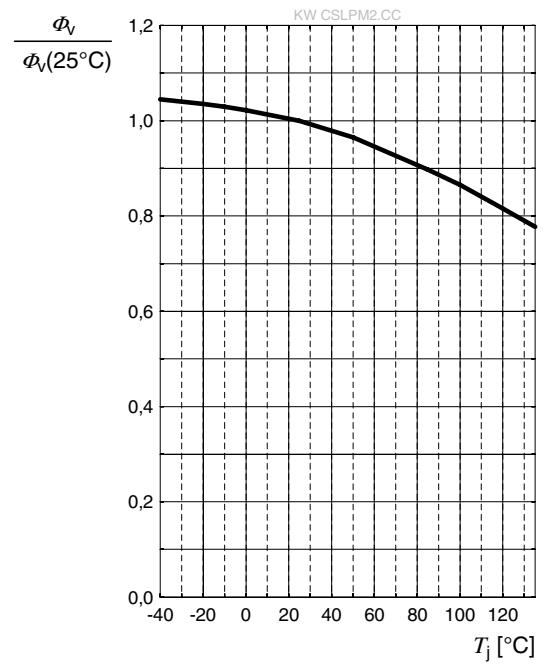
Forward Voltage ⁶⁾

$$\Delta V_F = V_F - V_F(25\text{ °C}) = f(T_j); I_F = 700\text{ mA}$$



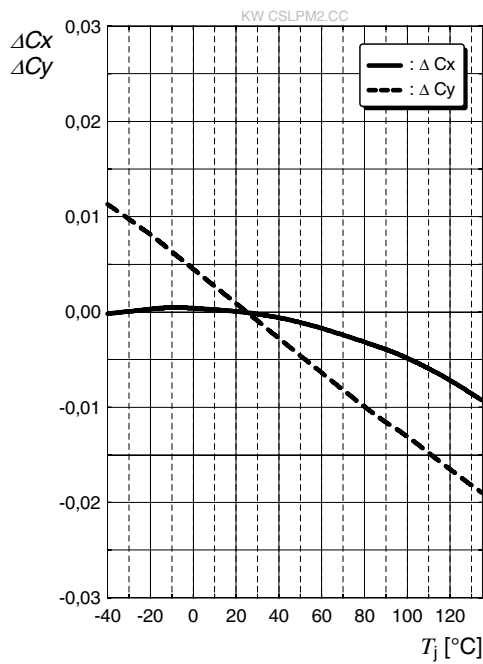
Relative Luminous Flux ⁶⁾

$$\Phi_V / \Phi_V(25\text{ °C}) = f(T_j); I_F = 700\text{ mA}$$



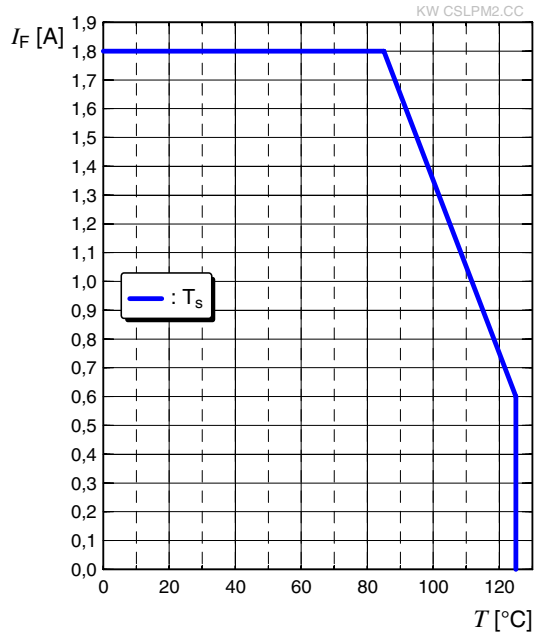
Chromaticity Coordinate Shift ⁶⁾

$$\Delta C_x, \Delta C_y = f(T_j); I_F = 700\text{ mA}$$

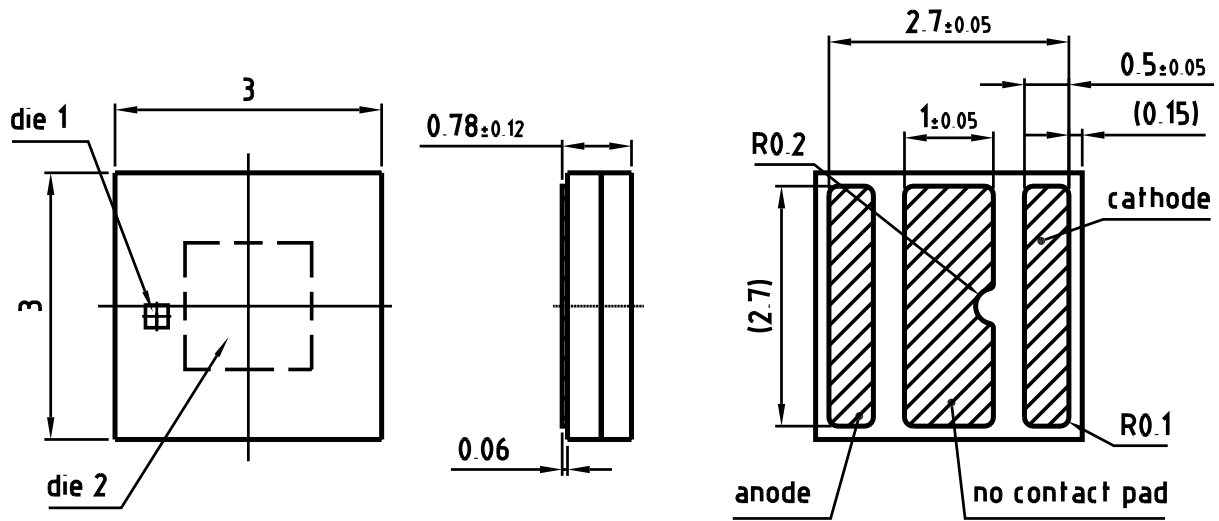


Max. Permissible Forward Current

$$I_F = f(T)$$



Dimensional Drawing ⁸⁾



C67062-A0240-A1-01

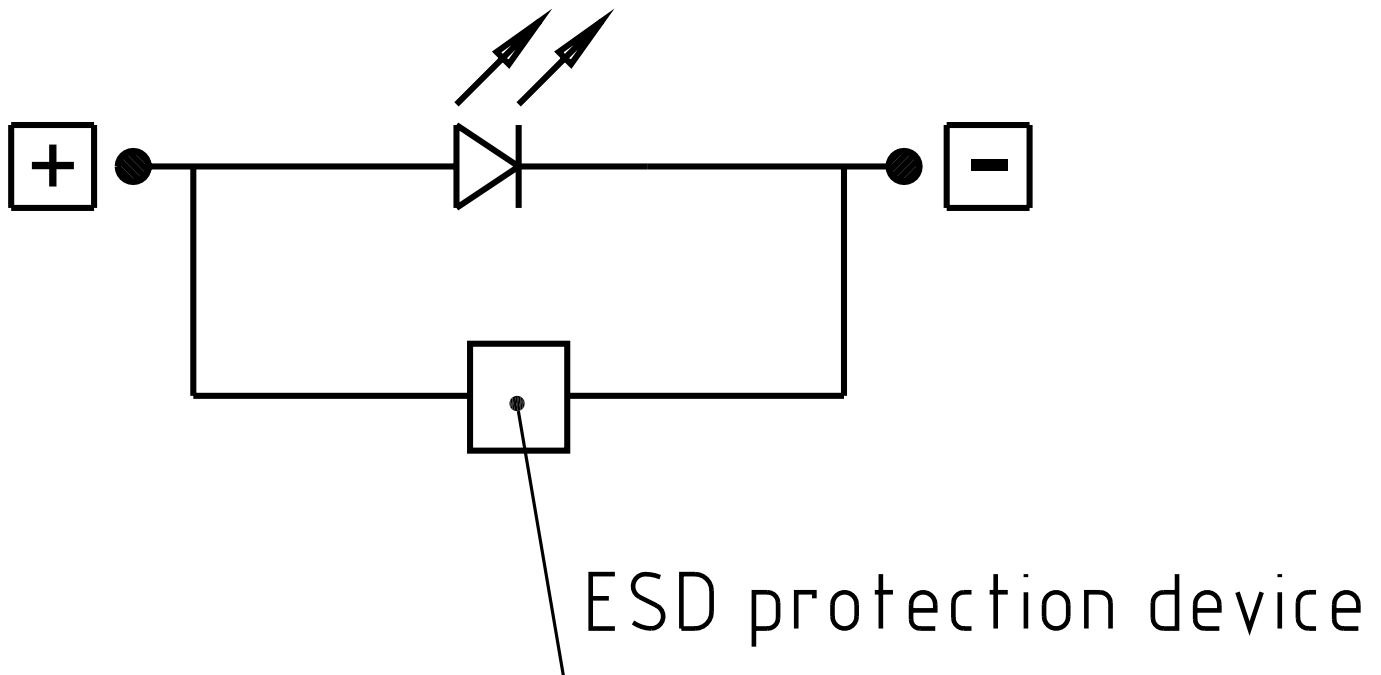
Approximate Weight: 21.2 mg

Package marking: Cathode

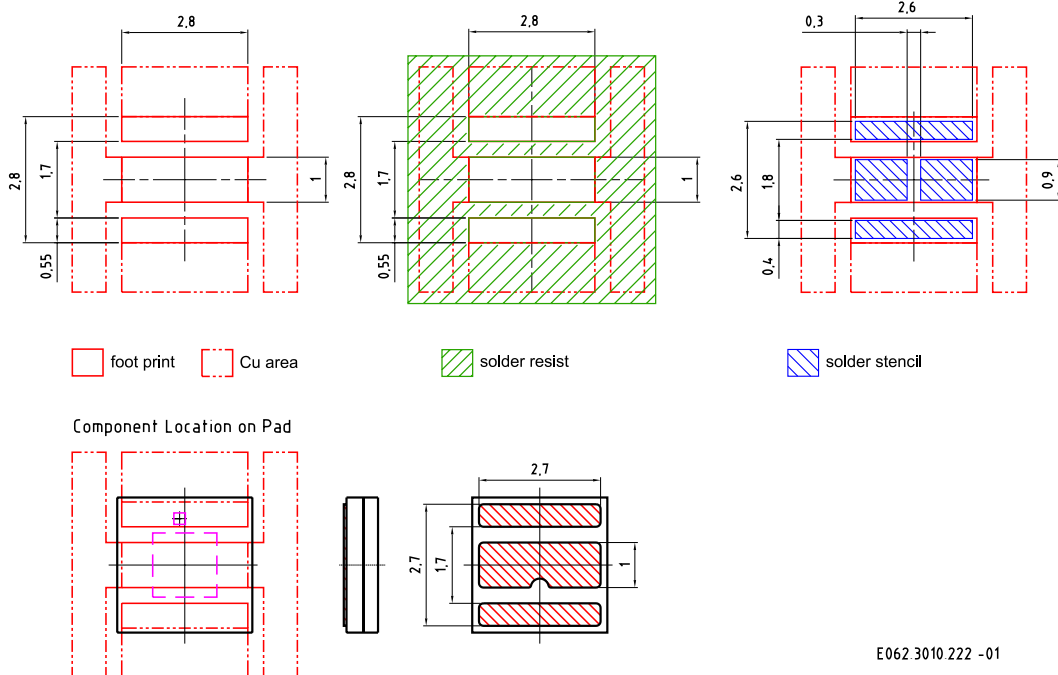
Corrosion test: Class: 3B
 Test condition: 40°C / 90 % RH / 15 ppm H₂S / 14 days (stricter than IEC 60068-2-43)

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

Electrical internal circuit



Recommended Solder Pad ⁸⁾

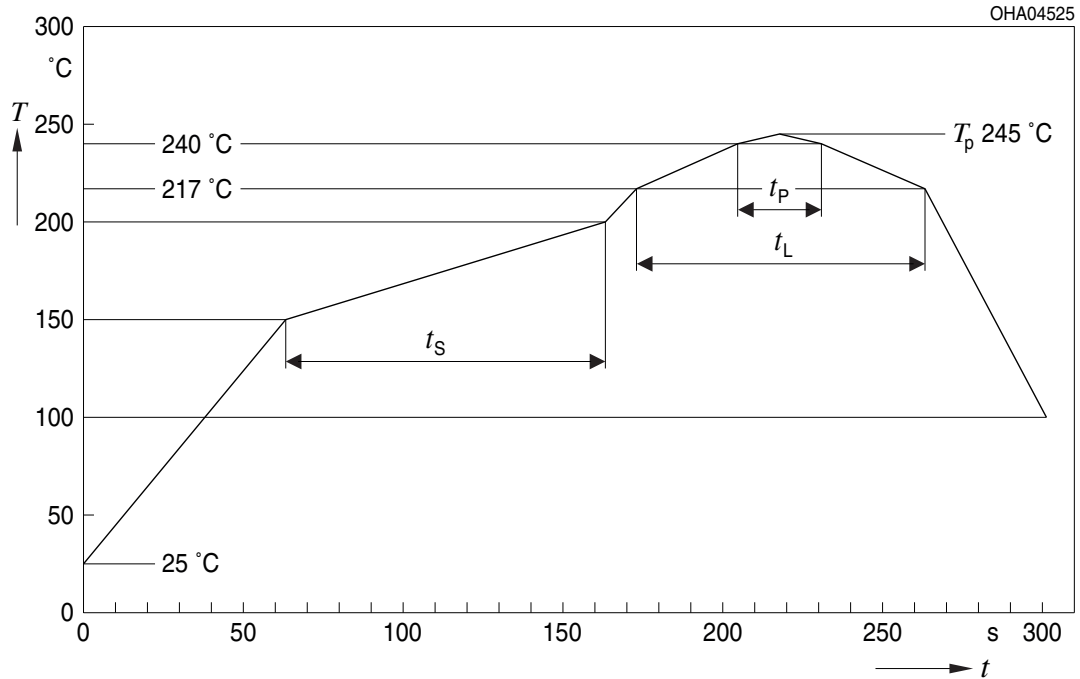


E062.3010.222 -01

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

Reflow Soldering Profile

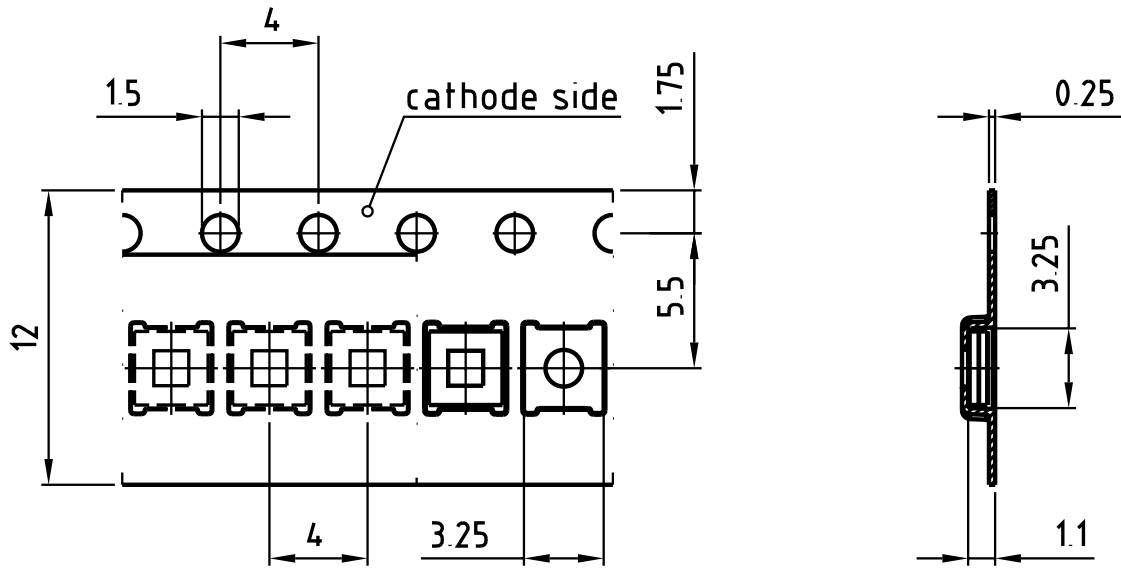
Product complies to MSL Level 2 acc. to JEDEC J-STD-020E



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 $T_p - 5\text{ K}$	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

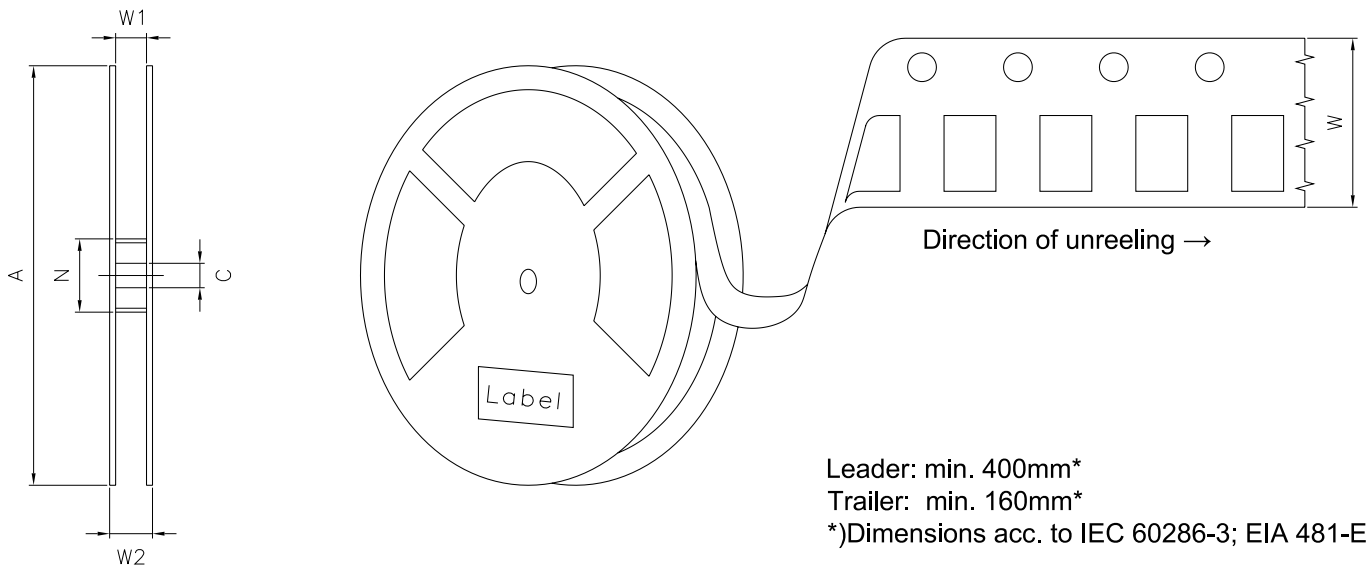
All temperatures refer to the center of the package, measured on the top of the component
 *) slope calculation DT/Dt : Dt max. 5 s; fulfillment for the whole T-range

Taping ⁸⁾



C67062-A0240-B5-01

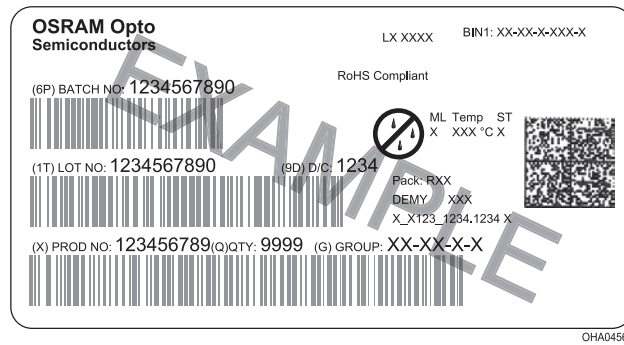
Tape and Reel ⁹⁾



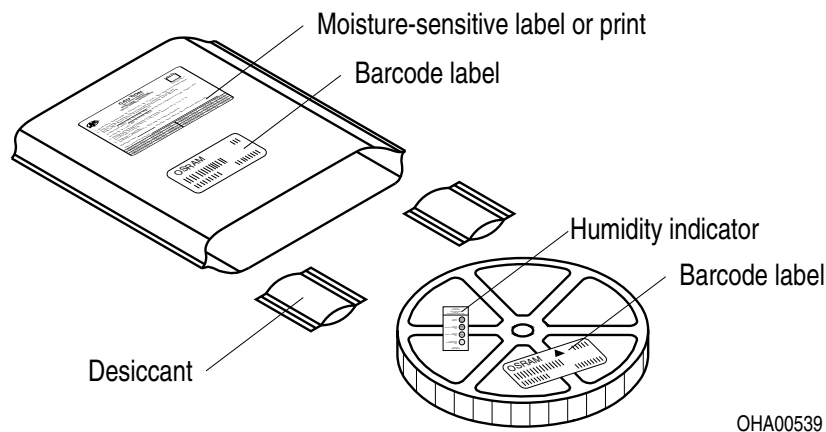
Reel dimensions [mm]

A	W	N _{min}	W ₁	W _{2max}	Pieces per PU
180 mm	12 + 0.3 / - 0.1	60	12.4 + 2	18.4	600

Barcode-Product-Label (BPL)

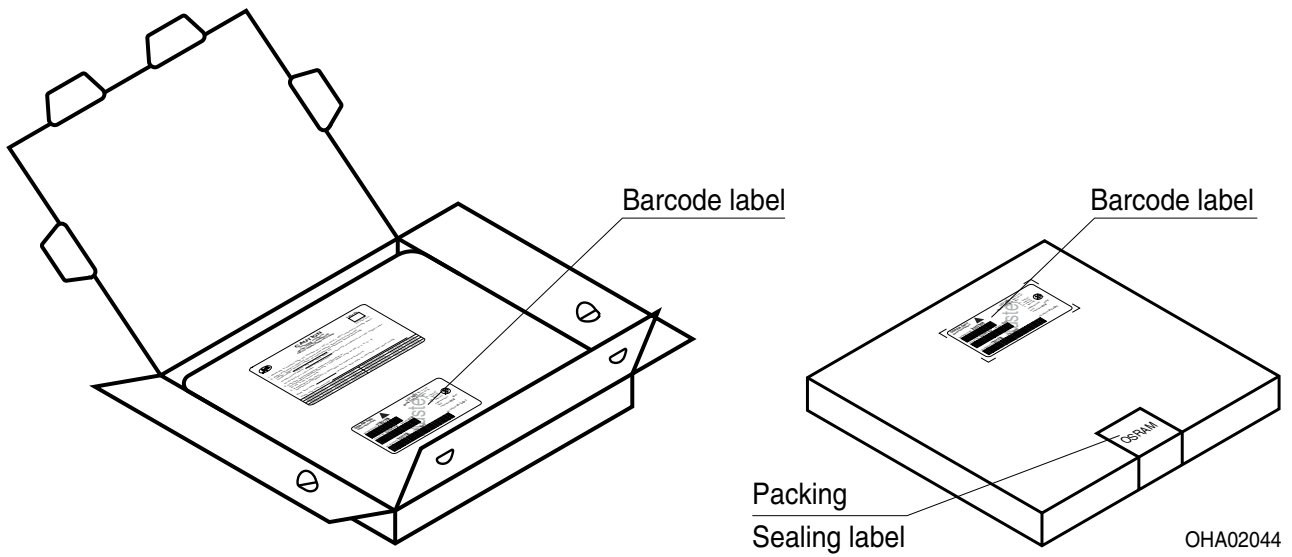


Dry Packing Process and Materials ⁸⁾



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

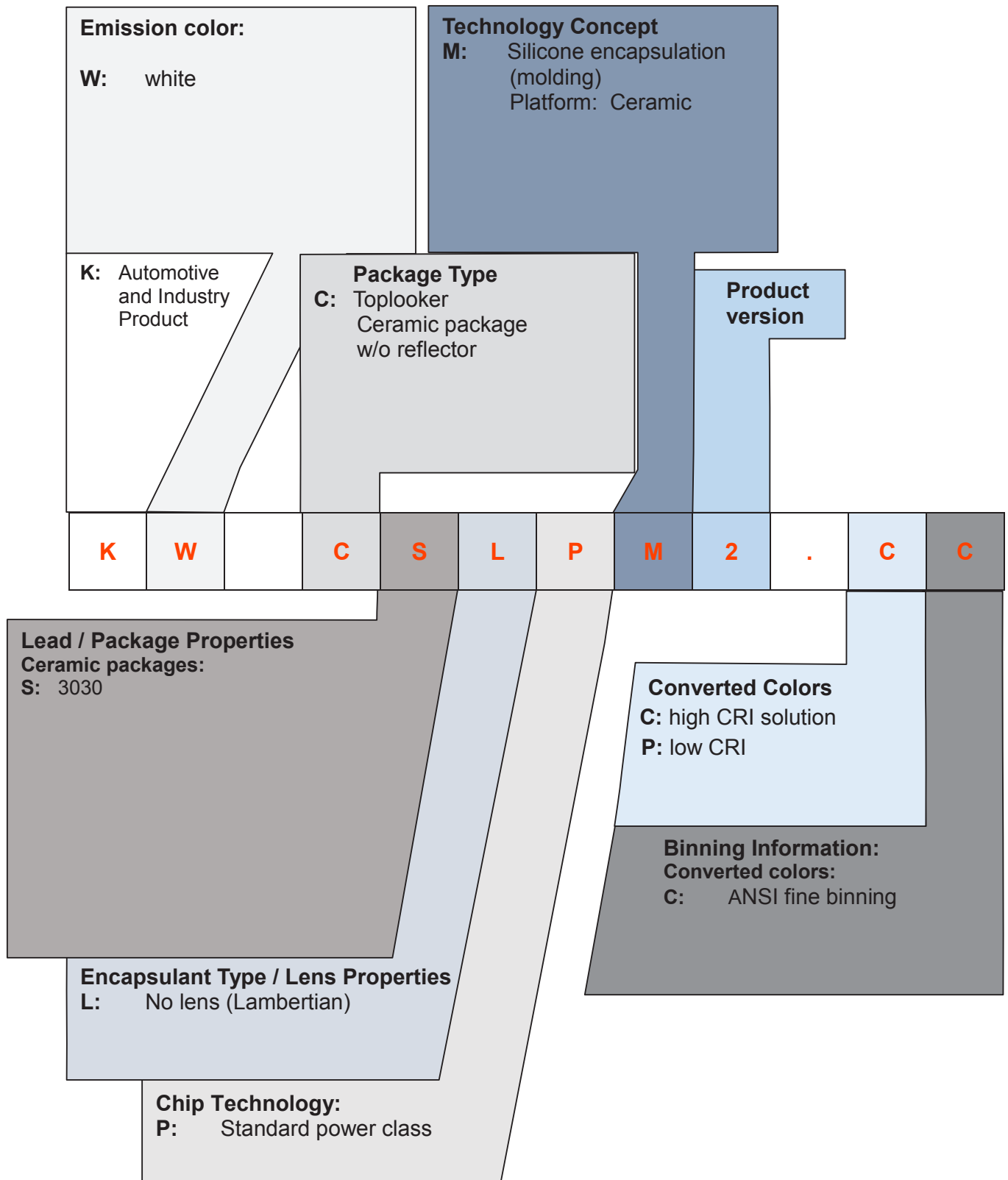
Transportation Packing and Materials ⁸⁾



Dimensions of transportation box in mm

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

Type Designation System



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 **moderate risk (exposure time 0.25 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

Disclaimer

Disclaimer

Language english will prevail in case of any discrepancies or deviations between the two language wordings.

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.

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:** Reverse Operation of 10 hours is permissible in total. Continuous reverse operation is not allowed.
- 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 $\pm 0.05\text{ V}$ and an expanded uncertainty of $\pm 0.1\text{ V}$ (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.

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EU RoHS and China RoHS compliant product



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按照中国的相关法规和标准，不含有毒有害物质或元素。