

OSRAM LW TVSG.BB

Datasheet

Published by **ams-OSRAM AG**

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TOPLED®

LW TVSG.BB

TOPLED, SMT LED with integrated reflector. With our great experience in SMT LED we are able to offer a high quality product for all kind of applications.



Applications

- Access Control & Security
- Appliances & Tools
- Display Backlighting
- Dynamic Signaling
- Factory Automation
- Home & Building Automation
- Projection & Display
- Robotics
- Static Signaling

Features

- Package: white PLCC-2 package, colored diffused silicone resin
- Chip technology: UX:3
- Typ. Radiation: 120° (Lambertian emitter)
- Color: Cx = 0.33, Cy = 0.34 acc. to CIE 1931 (● white)
- Corrosion Robustness Class: 3B
- Qualifications: AEC-Q102 Qualified
- ESD: 8 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B)

Ordering Information

Type	Luminous Intensity ¹⁾ $I_F = 20 \text{ mA}$ I_v	Ordering Code
LW TVSG.BB-AZBZ-FBKC-Z486	1500 ... 2800 mcd	Q65111A4047
LW TVSG.BB-BXCY-JBNC-Z486	1800 ... 3900 mcd	Q65112A5035

Maximum Ratings

Parameter	Symbol		Values
Operating Temperature	T_{op}	min.	-40 °C
		max.	110 °C
Storage Temperature	T_{stg}	min.	-40 °C
		max.	110 °C
Junction Temperature	T_j	max.	125 °C
Forward current $T_s = 25\text{ °C}$	I_F	min.	3 mA
		max.	50 mA
Surge current $t \leq 10\text{ }\mu\text{s}$; $D = 0.005$; $T_s = 25\text{ °C}$	I_{FS}	max.	300 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

$I_F = 20 \text{ mA}$; $T_S = 25 \text{ °C}$

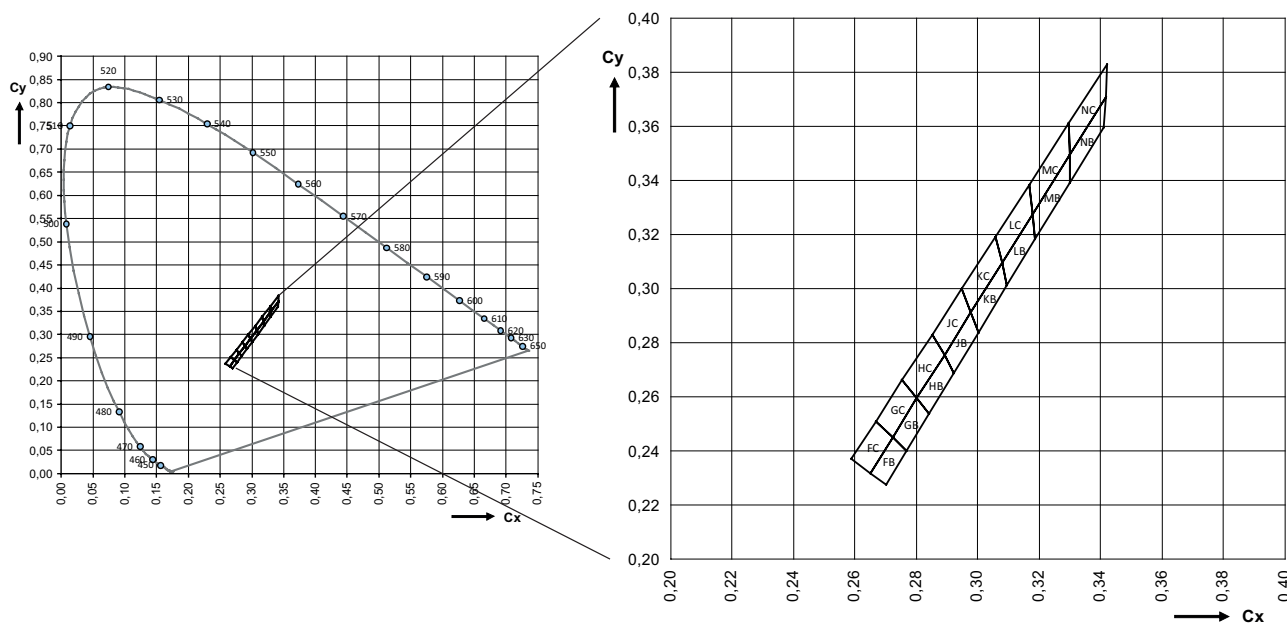
Parameter	Symbol		Values
Chromaticity Coordinate ³⁾	Cx	typ.	0.33
	Cy	typ.	0.34
Viewing angle at 50% I_V	2ϕ	typ.	120 °
Forward Voltage ⁴⁾ $I_F = 20 \text{ mA}$	V_F	min.	2.70 V
		typ.	3.05 V
		max.	3.40 V
Reverse voltage (ESD device)	$V_{R \text{ ESD}}$	min.	5 V
Reverse voltage ²⁾ $I_R = 20 \text{ mA}$	V_R	max.	1.2 V
Real thermal resistance junction/ambient ⁵⁾⁶⁾	$R_{thJA \text{ real}}$	max.	300 K / W
Real thermal resistance junction/solderpoint ⁵⁾	$R_{thJS \text{ real}}$	max.	140 K / W

Brightness Groups

Group	Luminous Intensity ¹⁾ $I_F = 20 \text{ mA}$ min. I_v	Luminous Intensity ¹⁾ $I_F = 20 \text{ mA}$ max. I_v	Luminous Flux ⁷⁾ $I_F = 20 \text{ mA}$ typ. Φ_v
AZ	1500 mcd	1800 mcd	4950 mlm
BX	1800 mcd	2100 mcd	5850 mlm
BY	2100 mcd	2400 mcd	6750 mlm
BZ	2400 mcd	2800 mcd	7800 mlm
CX	2800 mcd	3300 mcd	9150 mlm
CY	3300 mcd	3900 mcd	10800 mlm

Forward Voltage Groups

Group	Forward Voltage ⁴⁾ $I_F = 20 \text{ mA}$ min. V_F	Forward Voltage ⁴⁾ $I_F = 20 \text{ mA}$ max. V_F
Z4	2.70 V	2.90 V
44	2.90 V	3.10 V
86	3.10 V	3.40 V

Chromaticity Coordinate Groups ³⁾Chromaticity Coordinate Groups ³⁾

Group	Cx	Cy	Group	Cx	Cy	Group	Cx	Cy
FB	0.2722	0.2450	HB	0.2890	0.2754	KB	0.3078	0.3095
	0.2768	0.2402		0.2922	0.2689		0.3095	0.3011
	0.2700	0.2275		0.2841	0.2538		0.3002	0.2838
	0.2649	0.2318		0.2801	0.2594		0.2977	0.2912
FC	0.2667	0.2509	HC	0.2851	0.2831	KC	0.3057	0.3193
	0.2722	0.2450		0.2890	0.2754		0.3078	0.3095
	0.2649	0.2318		0.2801	0.2594		0.2977	0.2912
	0.2587	0.2369		0.2754	0.2661		0.2947	0.2999
GB	0.2801	0.2594	JB	0.2977	0.2912	LB	0.3177	0.3276
	0.2841	0.2538		0.3002	0.2838		0.3187	0.3182
	0.2768	0.2402		0.2922	0.2689		0.3095	0.3011
	0.2722	0.2450		0.2890	0.2754		0.3078	0.3095
GC	0.2754	0.2661	JC	0.2947	0.2999	LC	0.3166	0.3383
	0.2801	0.2594		0.2977	0.2912		0.3177	0.3276
	0.2722	0.2450		0.2890	0.2754		0.3078	0.3095
	0.2667	0.2509		0.2851	0.2831		0.3057	0.3193

Group	Cx	Cy	Group	Cx	Cy
MB	0.3298	0.3494	NB	0.3415	0.3707
	0.3299	0.3390		0.3408	0.3594
	0.3187	0.3182		0.3299	0.3390
	0.3177	0.3276		0.3298	0.3494
MC	0.3297	0.3611	NC	0.3422	0.3831
	0.3298	0.3494		0.3415	0.3707
	0.3177	0.3276		0.3298	0.3494
	0.3166	0.3383		0.3297	0.3611

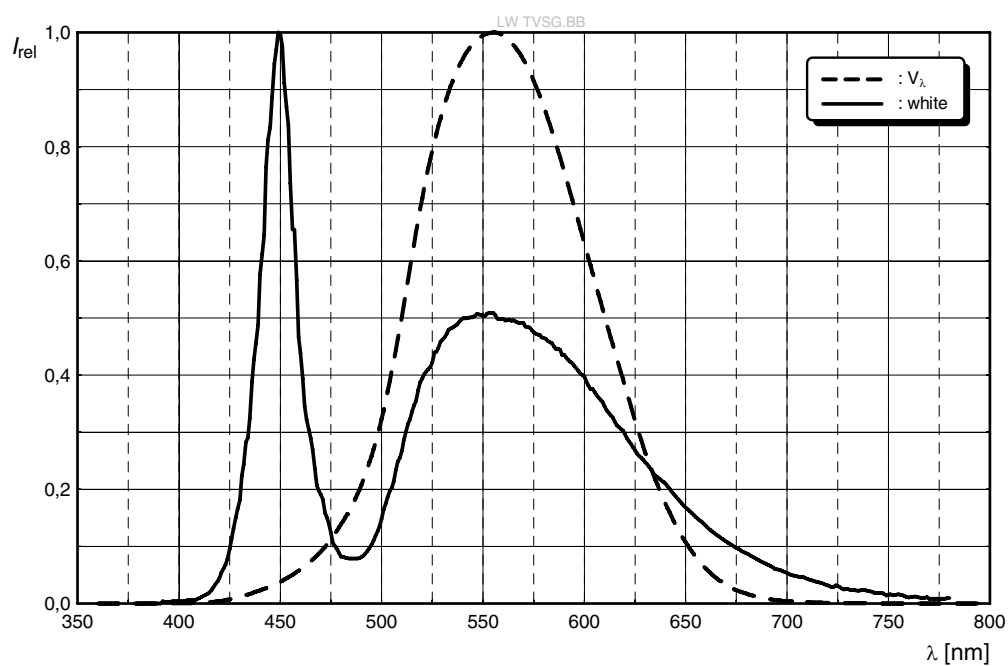
Group Name on Label

Example: AZ-FB-44

Brightness	Color Chromaticity	Forward Voltage
AZ	FB	44

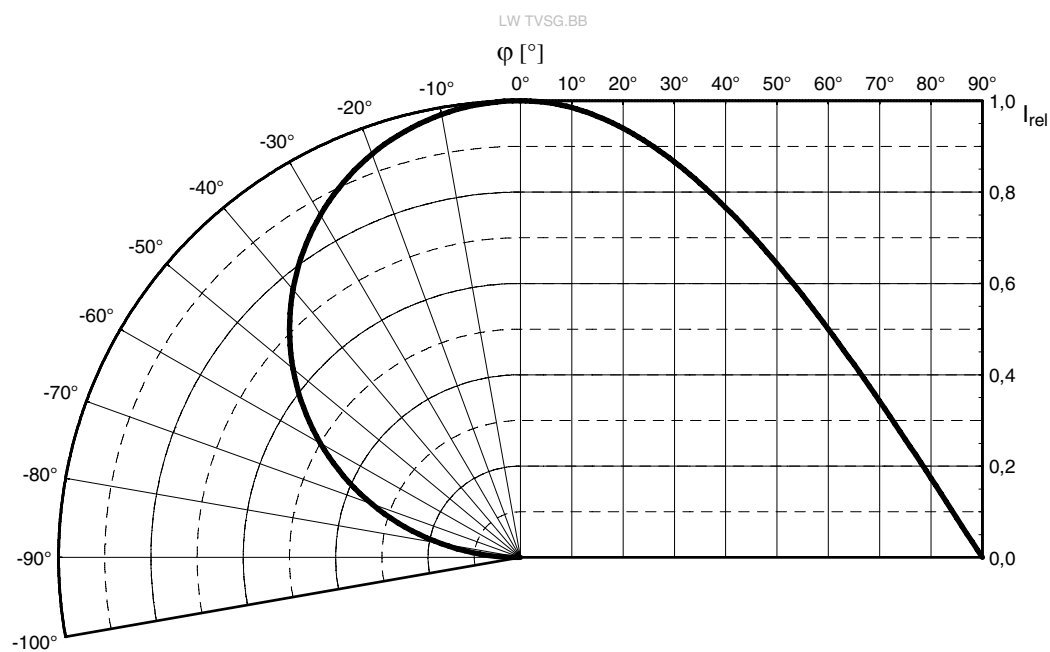
Relative Spectral Emission ⁷⁾

$I_{\text{rel}} = f(\lambda)$; $I_F = 20 \text{ mA}$; $T_S = 25 \text{ °C}$



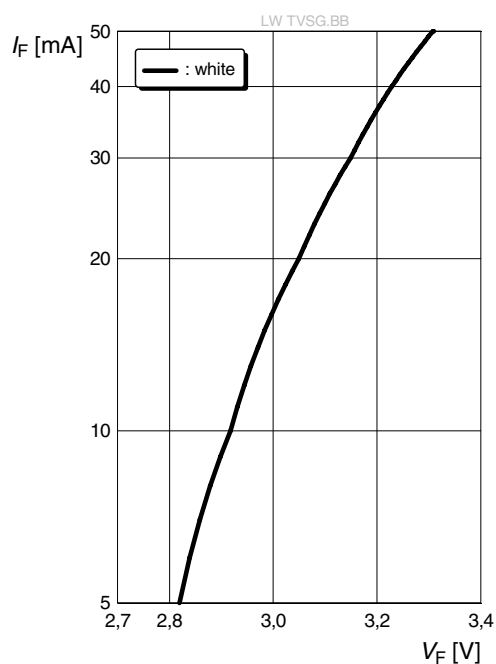
Radiation Characteristics ⁷⁾

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

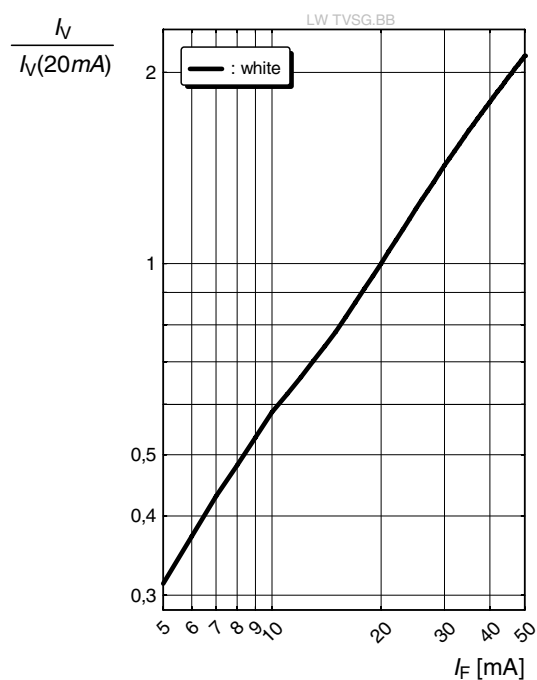


Forward current 7), 8)

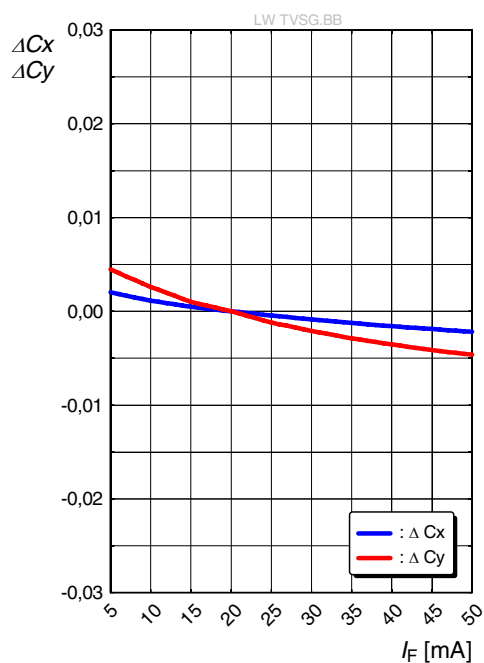
$$I_F = f(V_F); T_S = 25\text{ °C}$$

**Relative Luminous Intensity** 7), 8)

$$I_V/I_V(20\text{ mA}) = f(I_F); T_S = 25\text{ °C}$$

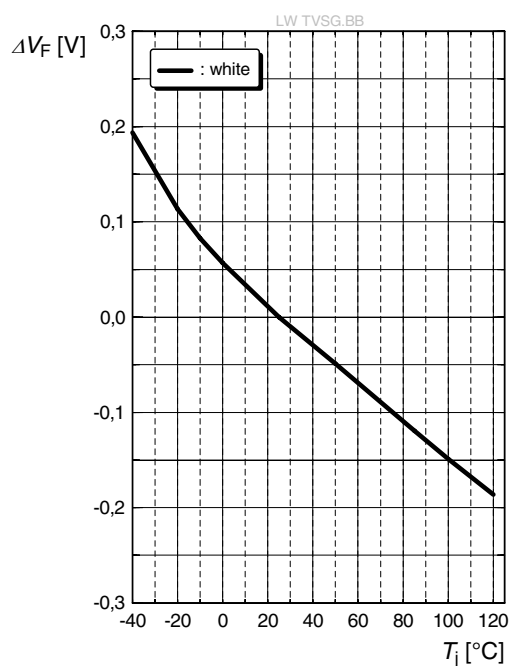
**Chromaticity Coordinate Shift** 7)

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

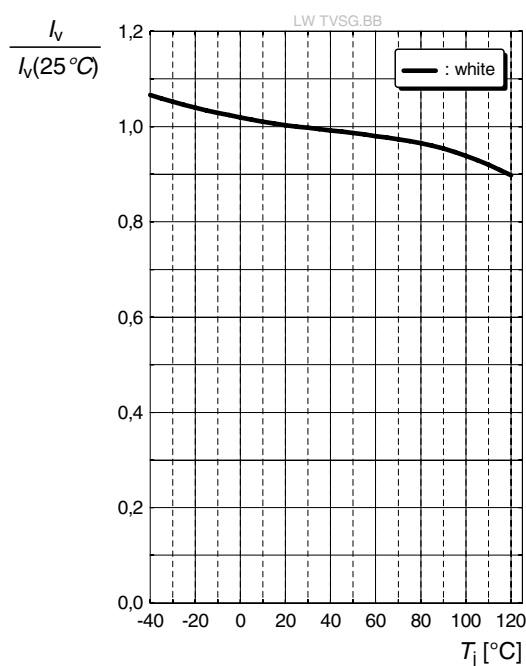


Forward Voltage ⁷⁾

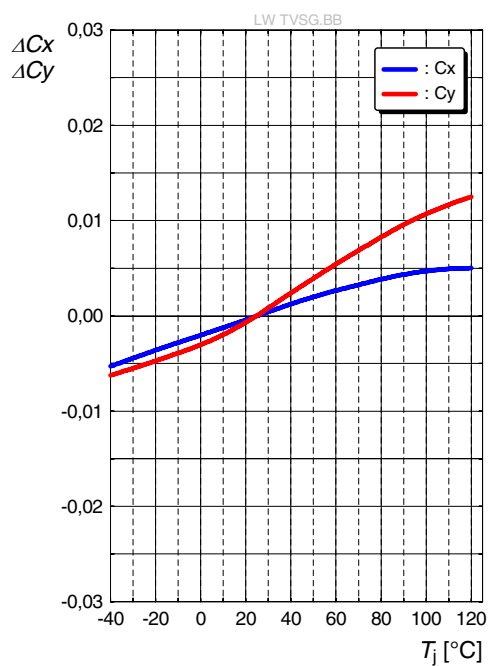
$$\Delta V_F = V_F - V_F(25^\circ\text{C}) = f(T_j); I_F = 20\text{ mA}$$

**Relative Luminous Intensity** ⁷⁾

$$I_V/I_V(25^\circ\text{C}) = f(T_j); I_F = 20\text{ mA}$$

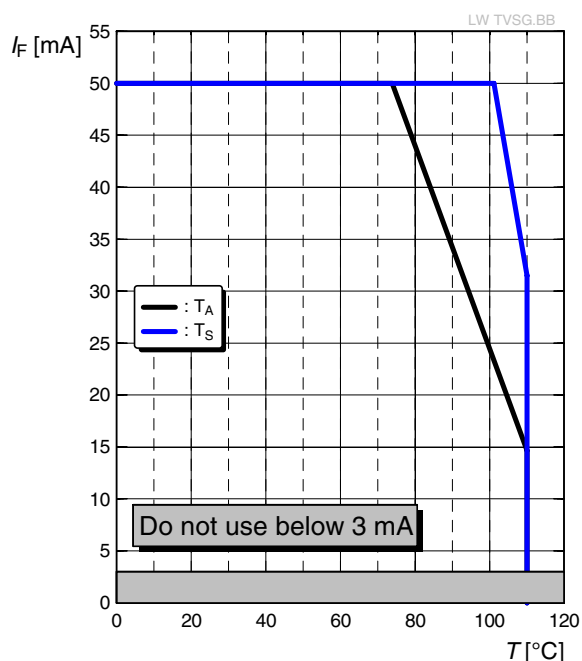
**Chromaticity Coordinate Shift** ⁷⁾

$$\Delta C_x, \Delta C_y = f(T_j); I_F = 20\text{ mA}$$

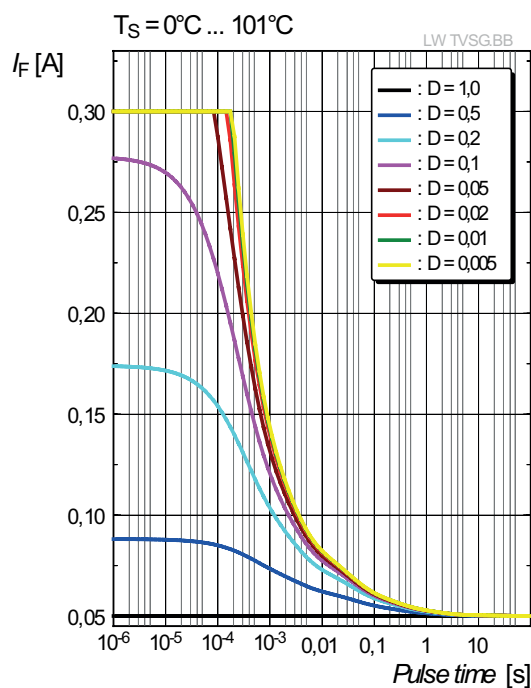


Max. Permissible Forward Current ⁵⁾

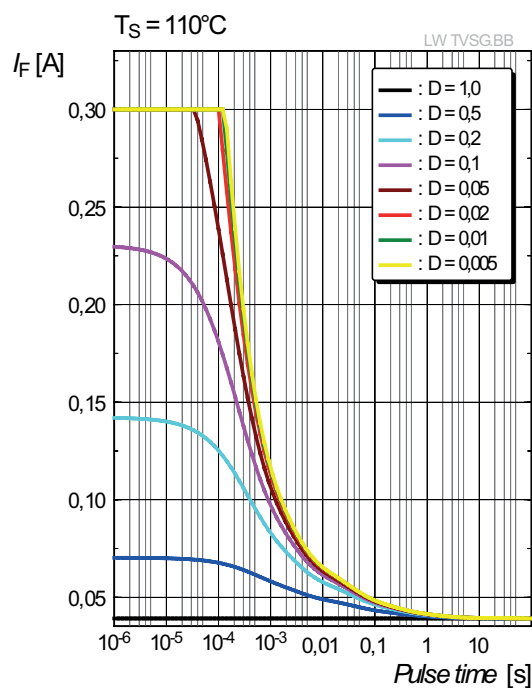
$$I_F = f(T)$$

**Permissible Pulse Handling Capability**

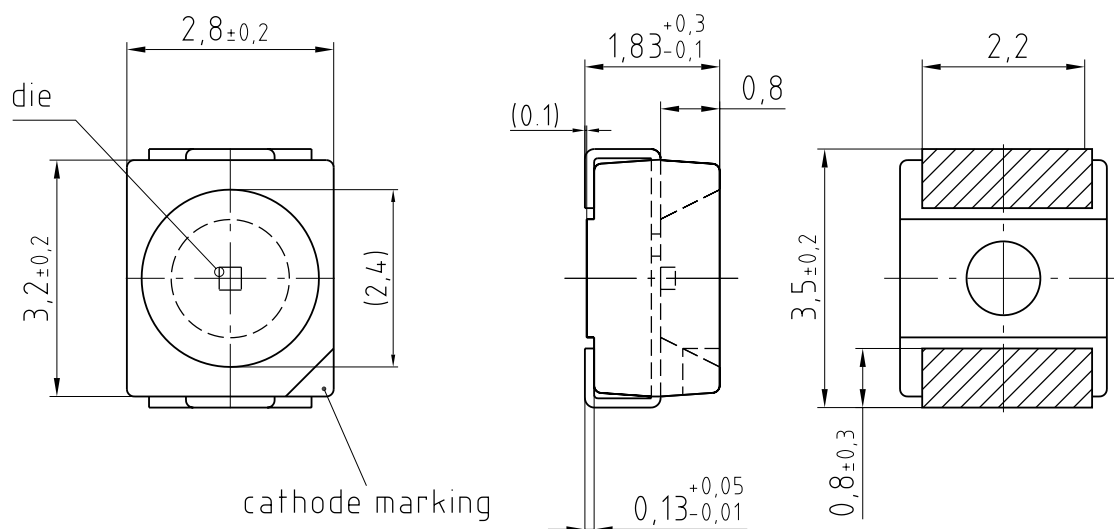
$$I_F = f(t_p); D: \text{Duty cycle}$$

**Permissible Pulse Handling Capability**

$$I_F = f(t_p); D: \text{Duty cycle}$$



Dimensional Drawing ⁹⁾



general tolerance $\pm 0,1$

lead finish Au



C63062-A4140-A1..-06

Further Information:

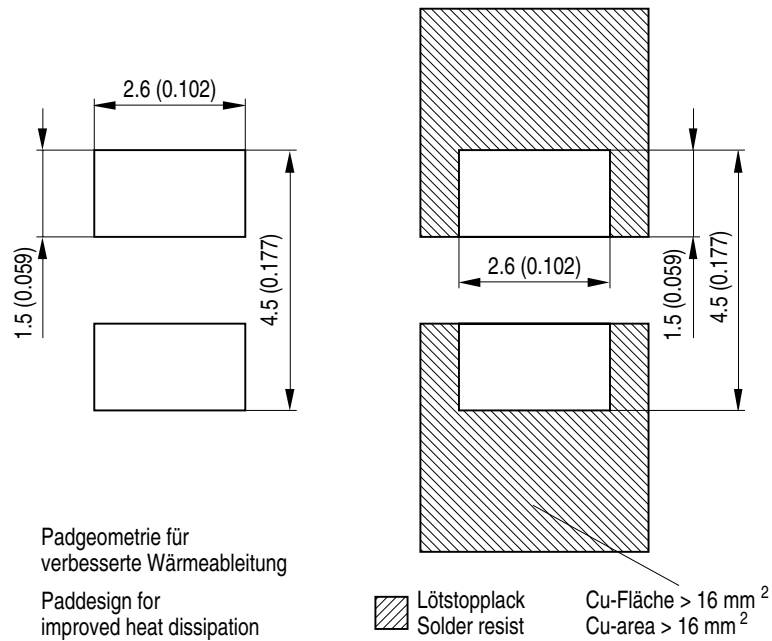
Approximate Weight: 33.0 mg

Package marking: Cathode

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

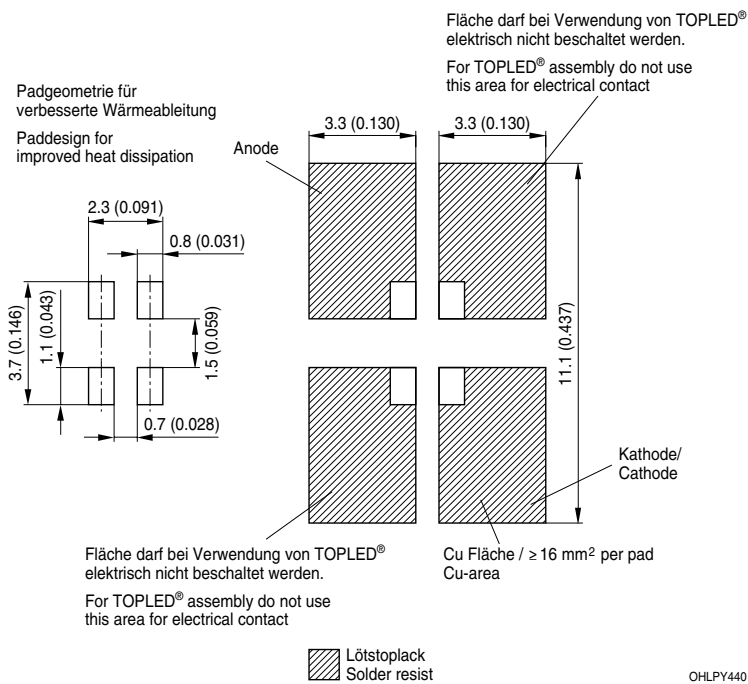
ESD advice: The device is protected by ESD device which is connected in parallel to the Chip.

Recommended Solder Pad ⁹⁾



OHLPY970

Recommended Solder Pad ⁹⁾

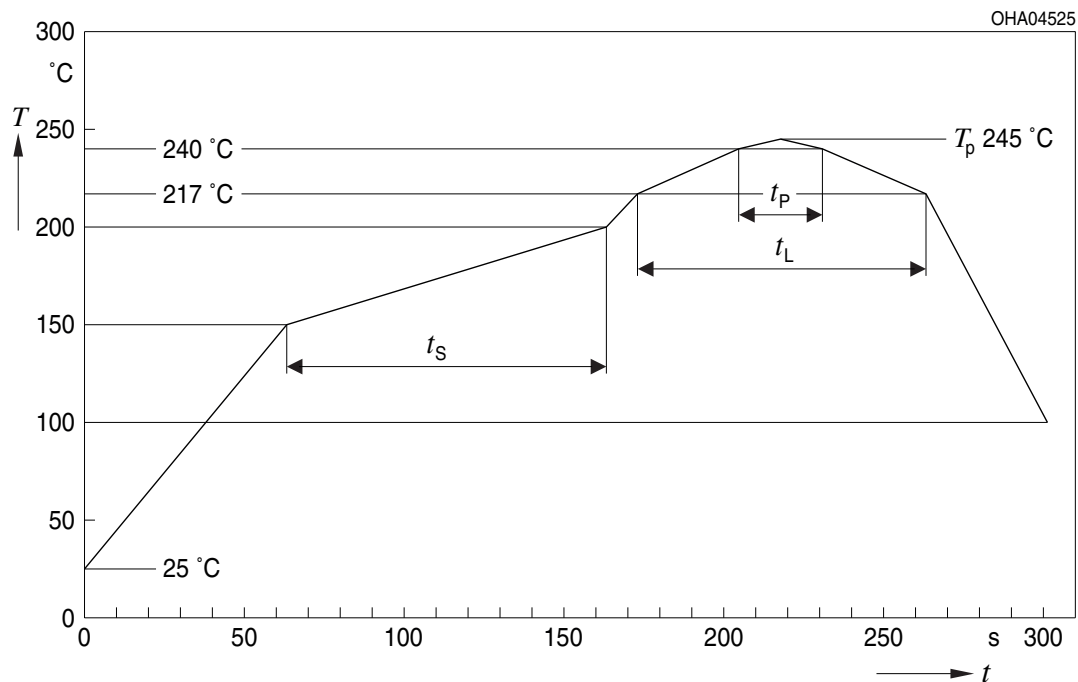


OHLPY440

For superior solder joint connectivity results we recommend soldering under standard nitrogen atmosphere.

Reflow Soldering Profile

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

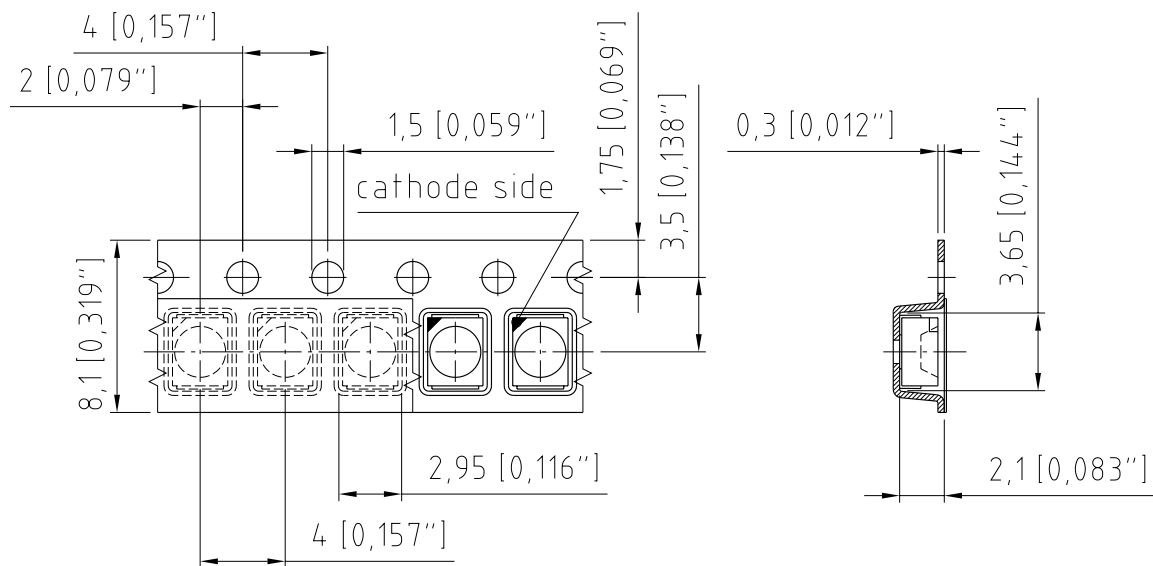


Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat ^{*)} 25°C to 150°C			2	3	K/s
Time t_s T_{Smin} to T_{Smax}	t_s	60	100	120	s
Ramp-up rate to peak ^{*)} T_{Smax} to T_p			2	3	K/s
Liquidus temperature	T_L		217		$^{\circ}\text{C}$
Time above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

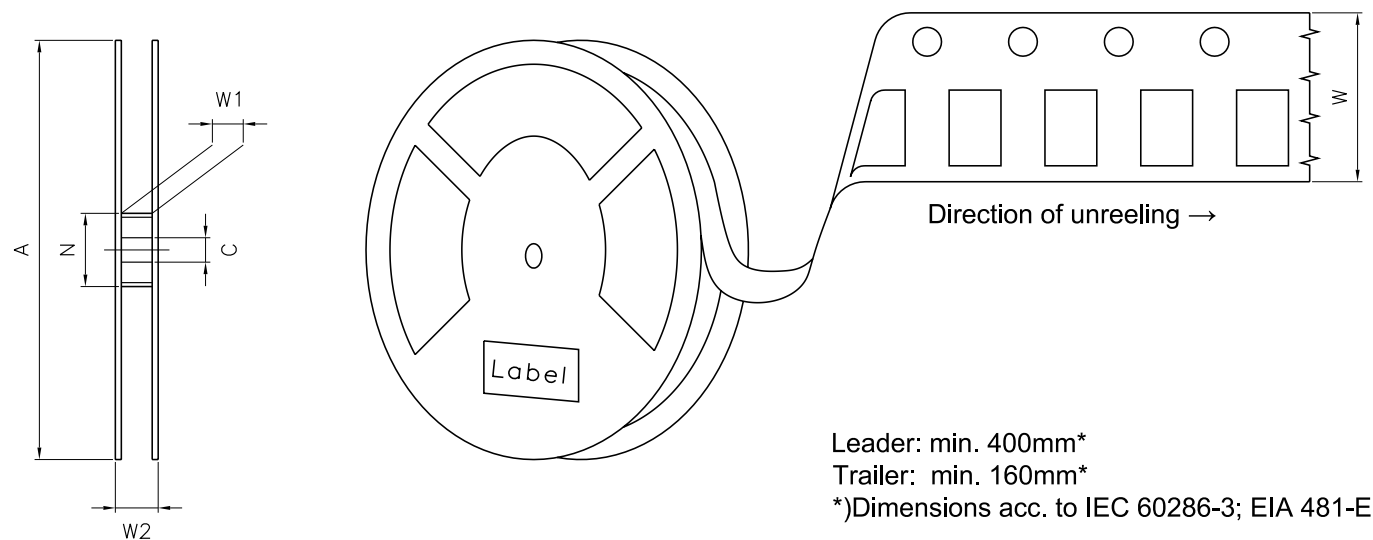
All temperatures refer to the center of the package, measured on the top of the component

* slope calculation DT/Dt : Dt max. 5 s; fulfillment for the whole T-range

Taping ⁹⁾



C63062-A3863-B3 -02

Tape and Reel ¹⁰⁾

Reel Dimensions

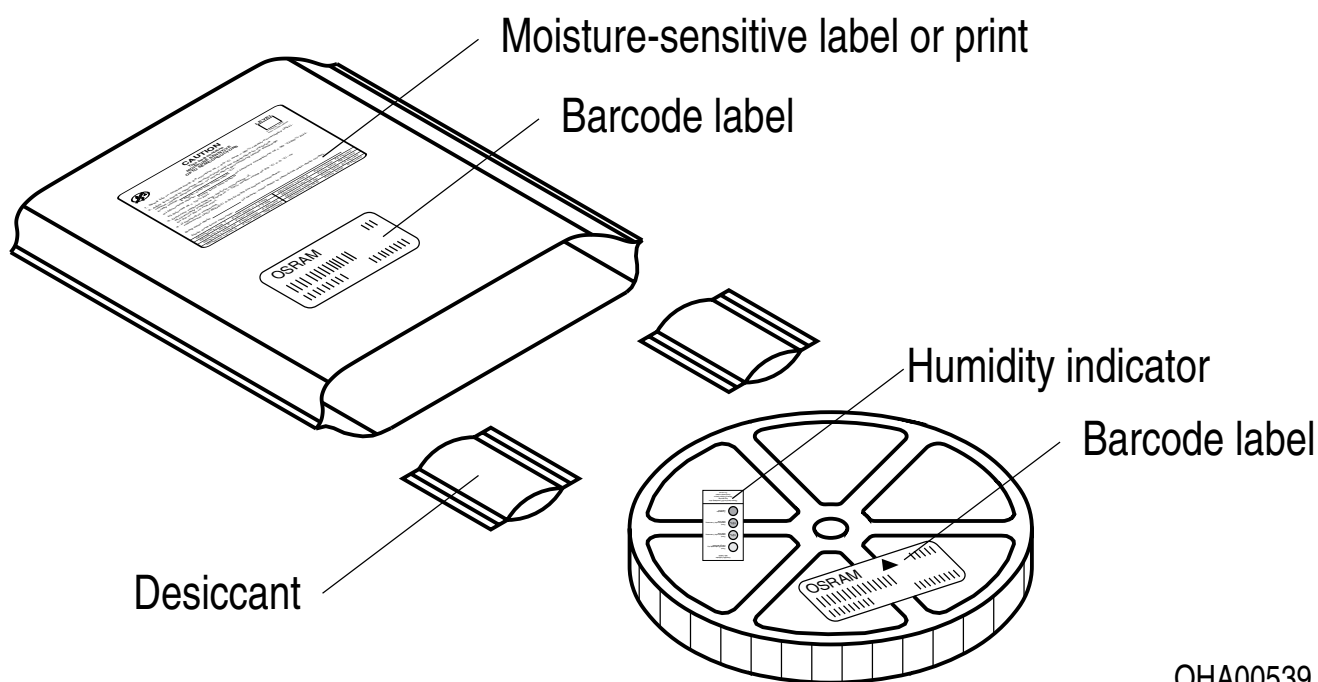
A	W	N _{min}	W ₁	W _{2 max}	Pieces per PU
180 mm	8 + 0.3 / - 0.1 mm	60 mm	8.4 + 2 mm	14.4 mm	2000
330 mm	8 + 0.3 / - 0.1 mm	60 mm	8.4 + 2 mm	14.4 mm	8000

Barcode-Product-Label (BPL)

OSRAM		LX XXXX	BIN1: XX-XX-X-XXX-X
(6P) BATCH NO: 1234567890		RoHS Compliant	
			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

Dry Packing Process and Materials ⁹⁾



OH A00539

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

Type Designation System

Wavelength ($\lambda_{\text{dom typ.}}$)		Emission Color		Color coordinates according CIE 1931/Emission color:		
A:	617 nm	amber		W:	white	
S:	633 nm	super red		UW:	ultra white	
T:	528 nm	true green		CB:	color on demand blue	
Y:	587 nm	yellow		CG:	color on demand green	
O:	606 nm	orange		CL:	color on demand lagune	
G:	570 nm	green				
P:	560 nm	pure green				
R:	625 nm	red				
B:	470 nm	blue				
H:	645 nm	hyper-red				
V:	505 nm	verde green				
L: Light emitting diode				Package Type		
				T: TOPLED		
L	A		T	6	7	6
Lead / Package Properties 6: folded leads 7: reverse gullwing leads T: folded leads, improved corrosion stability (Au-LF), w/o TiO ₂ jetting V: folded leads and UX:3 w/ improved corrosion stability (Au-LF), TiO ₂ jetting						
Encapsulant Type / Lens Properties 7: Colorless clear or white volume conversion (resin encapsulation) S: Silicone (with or without diffuser)						
Chip Technology: 1: TSN 3: standard InGaN 4: AlGaAs 5: HOP 2000 6: Standard InGaP 9: TSN low current B: HOP 2000 C: ATON D: Small ThinGaN/ Thinfilm (e.g. 6mil) F: Thinfilm InGaAlP G: ThinGaN(Thinfilm InGaN) K: InGaAlP low current S: standard InGaN low current 0: TSN						

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 <https://ams-osram.com/support/application-notes>

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 $\pm 0.05\text{ V}$ and an expanded uncertainty of $\pm 0.1\text{ V}$ (acc. to GUM with a coverage factor of $k = 3$).
- 5) **Thermal Resistance:** $R_{th\text{ max}}$ is based on statistic values (6σ) used for Derating.
- 6) **Thermal Resistance:** R_{thJA} results from mounting on PC board FR 4 (pad size 16 mm^2 per pad)
- 7) **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.
- 8) **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.
- 9) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with ± 0.1 and dimensions are specified in mm.
- 10) **Tape and Reel:** All dimensions and tolerances are specified acc. IEC 60286-3 and specified in mm.

Revision History

Version	Date	Change
1.4	2025-02-14	New Layout Applications Features



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。

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