

LB T64G

TOPLED® Black

TOPLED Black is especially designed for variable message signs (VMS) and price changers. The black package offers premium contrast for display panels.



Applications

- VMS

Features:

- Package: black PLCC-2 package, colorless resin
- Chip technology: UX:3
- Typ. Radiation: 30°
- Color: $\lambda_{\text{dom}} = 469 \text{ nm}$ (● blue)
- Corrosion Robustness Class: 3B
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)

Ordering Information

Type	Partial Flux ¹⁾ $I_F = 20 \text{ mA}$ E_v	Ordering Code
LB T64G-AACB-59-Z484	1120 ... 4500 lx	Q65112A7292

Maximum Ratings

Parameter	Symbol		Values
Operating Temperature	T_{op}	min.	-40 °C
		max.	100 °C
Storage Temperature	T_{stg}	min.	-40 °C
		max.	100 °C
Junction Temperature	T_j	max.	125 °C
Forward current	I_F	min.	5 mA
$T_s = 25\text{ °C}$		max.	50 mA
Surge Current	I_{FS}	max.	300 mA
$t \leq 10\text{ }\mu\text{s}$; $D = 0.1$; $T_s = 25\text{ °C}$			
Reverse voltage ²⁾	V_R	max.	5 V
$T_s = 25\text{ °C}$			
ESD withstand voltage	V_{ESD}		2 kV
acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)			

Characteristics

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

Parameter	Symbol		Values
Peak Wavelength	λ_{peak}	typ.	462 nm
Dominant Wavelength ³⁾ $I_F = 20 \text{ mA}$	λ_{dom}	min. typ. max.	461 nm 469 nm 477 nm
Spectral Bandwidth at 50% $I_{\text{rel,max}}$	$\Delta\lambda$	typ.	24 nm
Viewing angle at 50% I_V	2ϕ	typ.	30 °
Forward Voltage ⁴⁾ $I_F = 20 \text{ mA}$	V_F	min. typ. max.	2.70 V 2.85 V 3.30 V
Reverse current ²⁾ $V_R = 5 \text{ V}$	I_R	typ. max.	0.01 μA 10 μA
Real thermal resistance junction/solderpoint ⁵⁾	$R_{\text{thJS real}}$	max.	280 K / W

Brightness Groups

Group	Partial Flux ¹⁾ $I_F = 20 \text{ mA}$ min. E_v	Partial Flux ¹⁾ $I_F = 20 \text{ mA}$ max. E_v	Luminous Intensity ⁶⁾ $I_F = 20 \text{ mA}$ typ. I_v
AA	1120 lx	1400 lx	820 mcd
AB	1400 lx	1800 lx	1040 mcd
BA	1800 lx	2240 lx	1310 mcd
BB	2240 lx	2800 lx	1640 mcd
CA	2800 lx	3550 lx	2060 mcd
CB	3550 lx	4500 lx	2610 mcd

Forward Voltage Groups

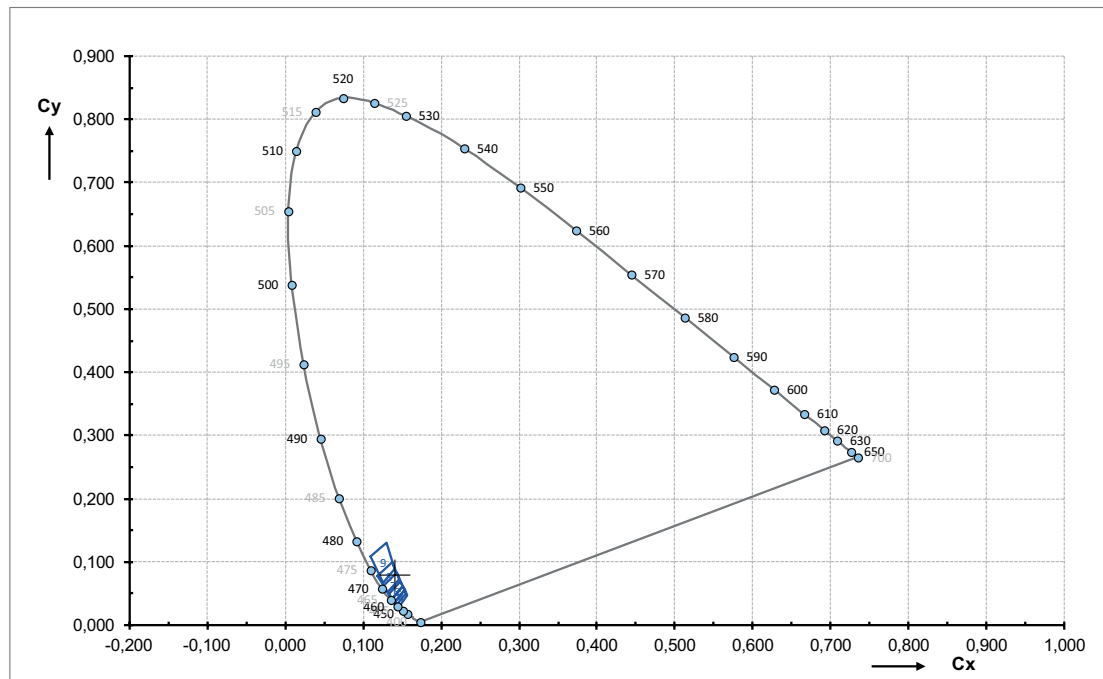
Group	Forward Voltage ⁴⁾ $I_F = 20 \text{ mA}$ min. V_F	Forward Voltage ⁴⁾ $I_F = 20 \text{ mA}$ max. V_F
Z4	2.70 V	2.90 V
44	2.90 V	3.10 V
84	3.10 V	3.30 V

Wavelength Groups

- blue

Group	Dominant Wavelength ³⁾ $I_F = 20 \text{ mA}$ min. λ_{dom}	Dominant Wavelength ³⁾ $I_F = 20 \text{ mA}$ max. λ_{dom}
5	461 nm	465 nm
6	463 nm	467 nm
7	465 nm	470 nm
8	468 nm	473 nm
9	471 nm	477 nm

Chromaticity Coordinate Groups



Chromaticity Coordinate Groups

• blue

Group	C_x	C_y
5	0.1430	0.0330
	0.1550	0.0510
	0.1500	0.0620
	0.1370	0.0420
6	0.1400	0.0370
	0.1530	0.0560
	0.1480	0.0690
	0.1330	0.0480
7	0.1370	0.0420
	0.1500	0.0620
	0.1430	0.0830
	0.1260	0.0610
8	0.1310	0.0520
	0.1460	0.0730
	0.1380	0.1000
	0.1190	0.0780

Chromaticity Coordinate Groups

- blue

Group	Cx	Cy
9	0.1250	0.0670
	0.1410	0.0880
	0.1300	0.1300
	0.1090	0.1090

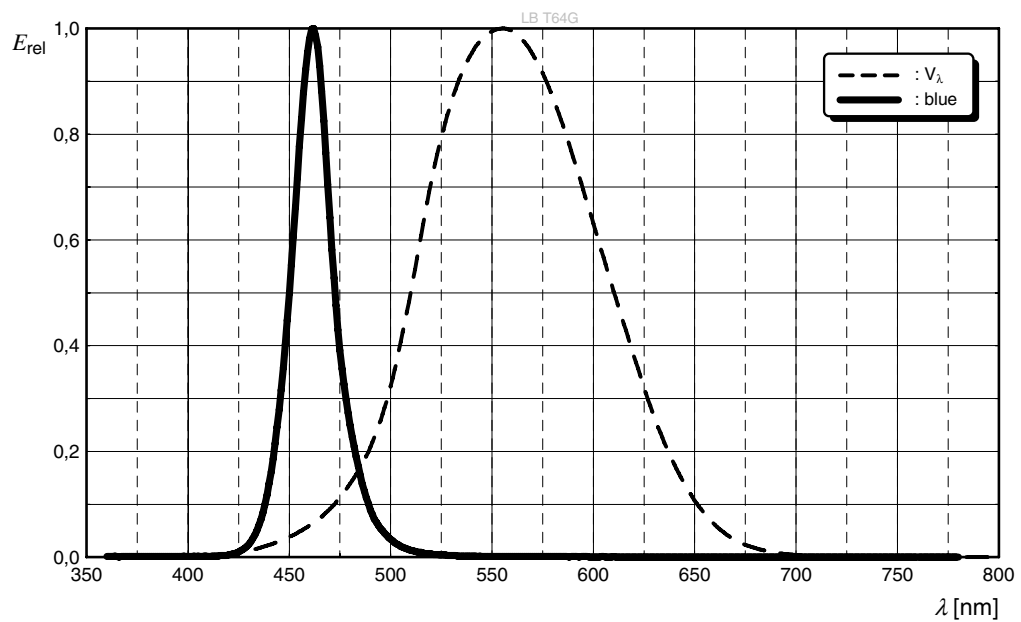
Group Name on Label

Example: AA-5-44

Brightness	Wavelength	Forward Voltage
AA	5	44

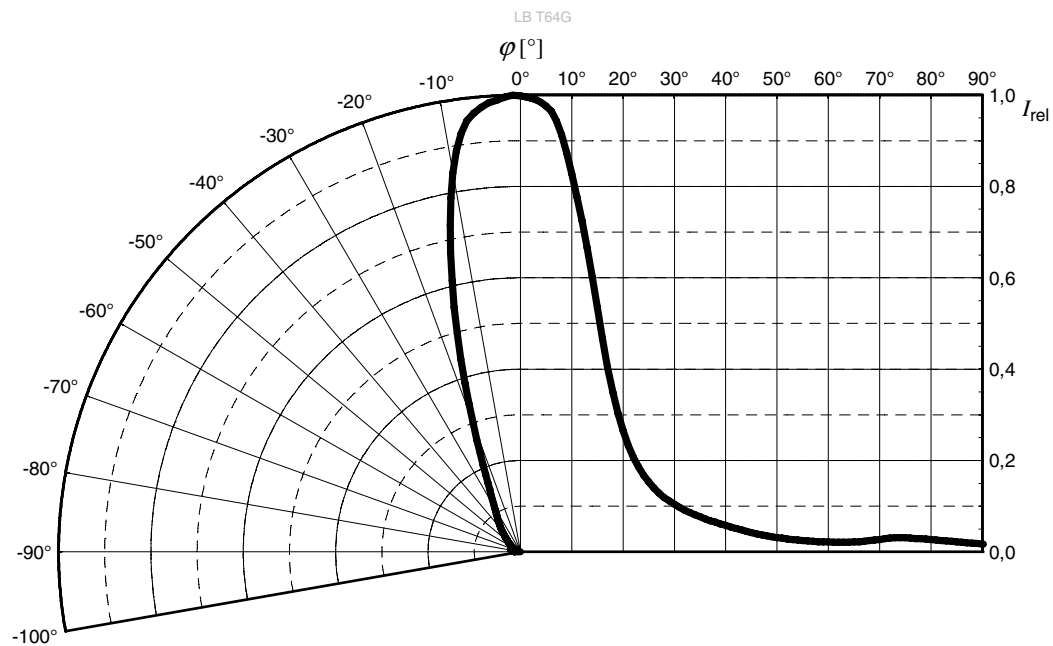
Relative Spectral Emission ⁶⁾

$$E_{\text{rel}} = f(\lambda); I_F = 20 \text{ mA}; T_S = 25 \text{ }^{\circ}\text{C}$$



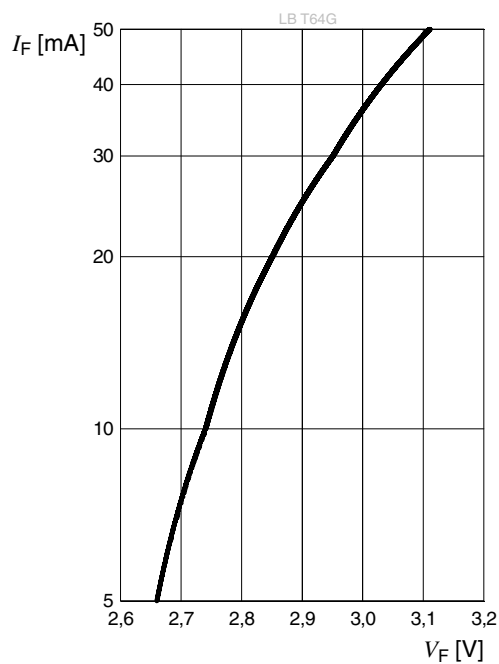
Radiation Characteristics ⁶⁾

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

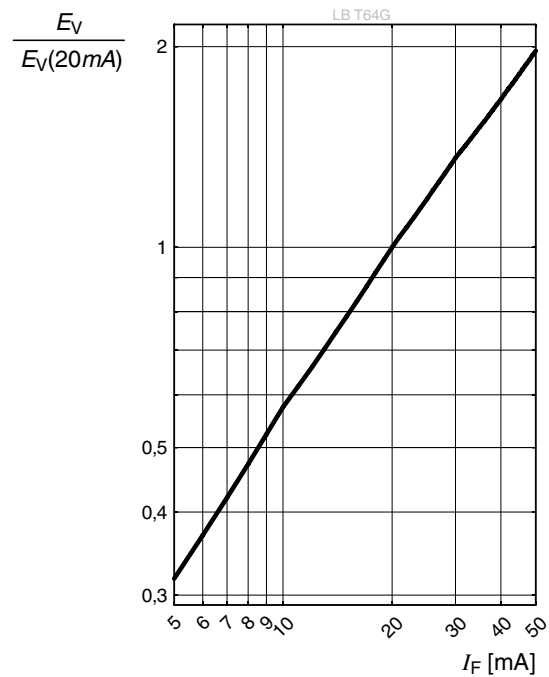


Forward current ⁶⁾

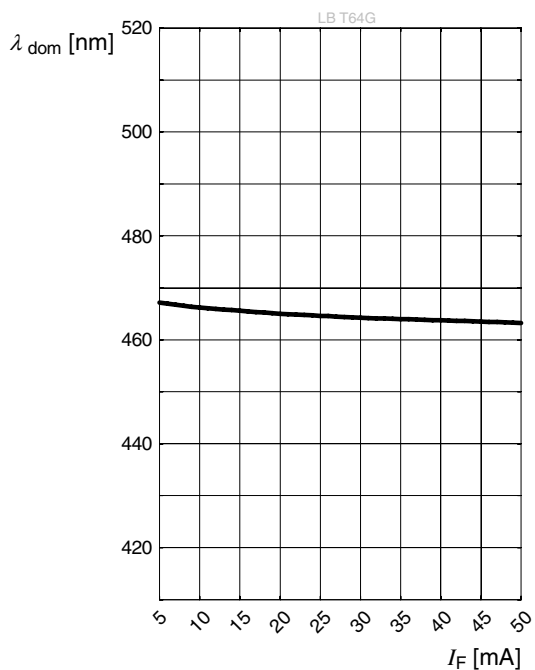
$$I_F = f(V_F); T_S = 25\text{ °C}$$

**Relative Illuminance** ^{6), 7)}

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

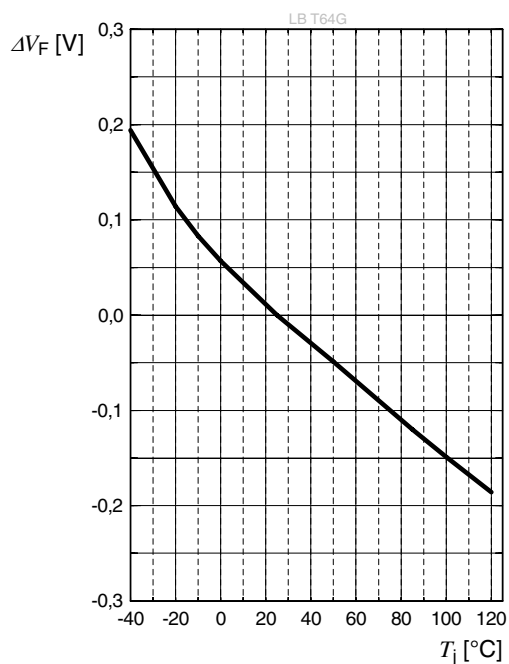
**Dominant Wavelength** ⁶⁾

$$\lambda_{\text{dom}} = f(I_F); T_S = 25\text{ °C}$$

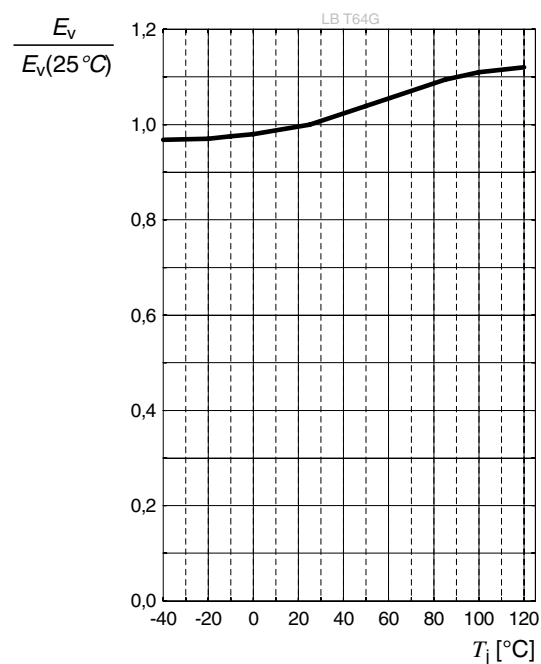


Forward Voltage ⁶⁾

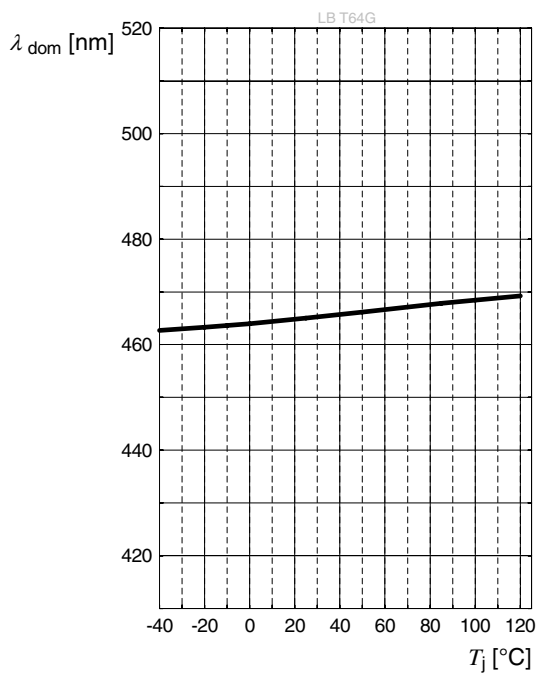
$$\Delta V_F = V_F - V_F(25\text{ °C}) = f(T_j); I_F = 20\text{ mA}$$

**Relative Illuminance** ⁶⁾

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

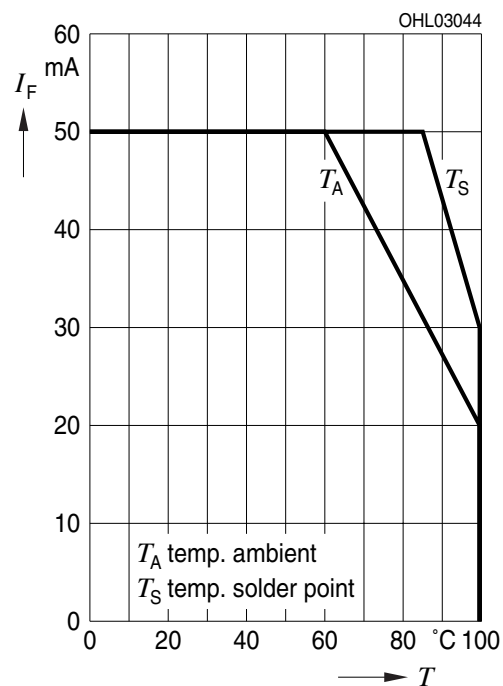
**Dominant Wavelength** ⁶⁾

$$\lambda_{\text{dom}} = f(T_j); I_F = 20\text{ mA}$$



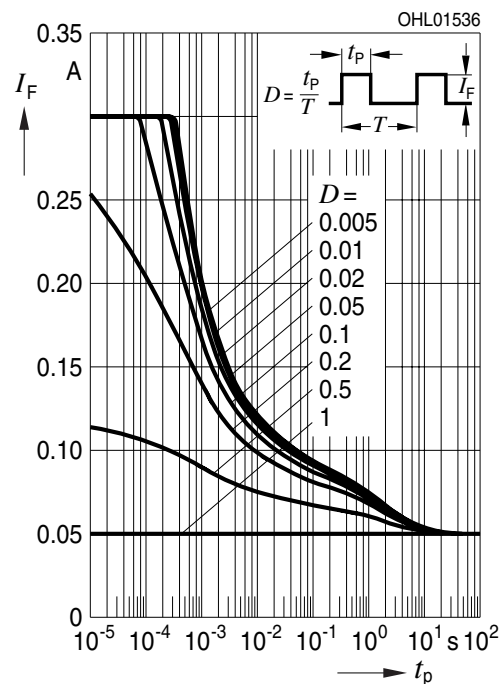
Max. Permissible Forward Current

$$I_F = f(T)$$



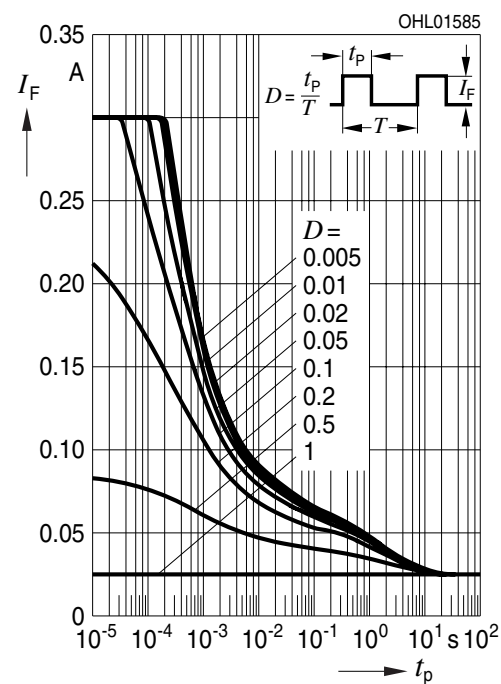
Permissible Pulse Handling Capability

$$I_F = f(t_p); D: \text{Duty cycle}; T_S = 25^\circ\text{C}$$

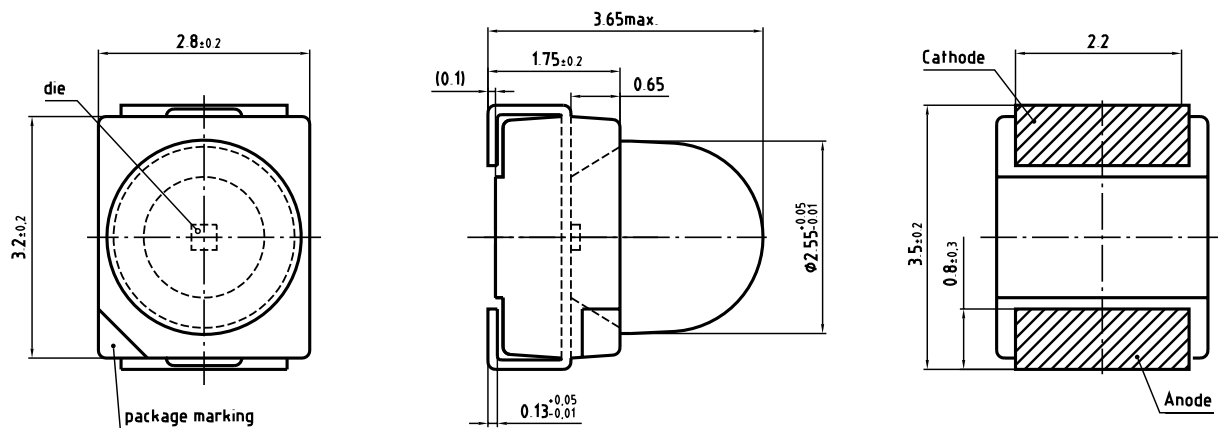


Permissible Pulse Handling Capability

$$I_F = f(t_p); D: \text{Duty cycle}; T_S = 85^\circ\text{C}$$



Dimensional Drawing ⁸⁾



general tolerance ± 0.1

lead finish Ag 

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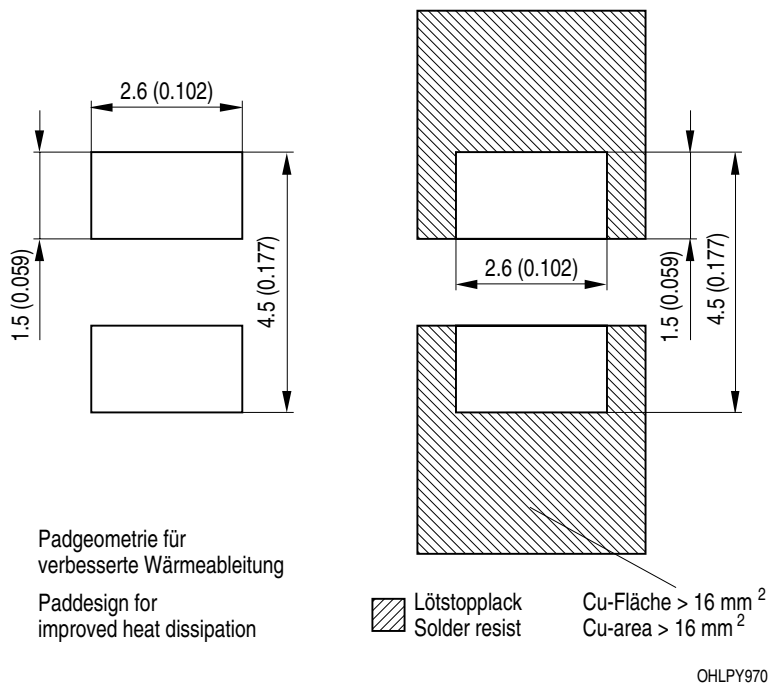
Further Information:

Approximate Weight: 40.0 mg

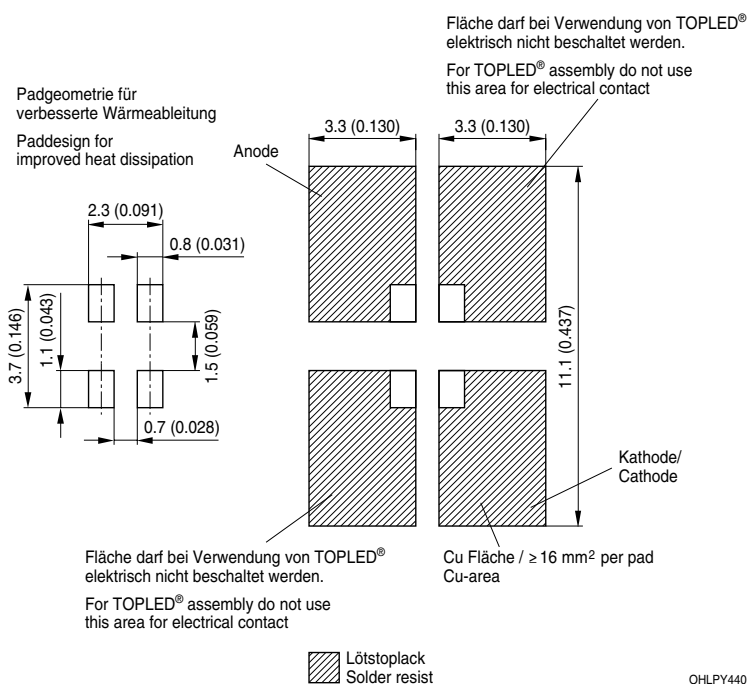
Package marking: Anode

Corrosion test: Class: 3B
 Test condition: 40°C / 90 % RH / 15 ppm H_2S / 14 days (stricter than IEC 60068-2-43)

Recommended Solder Pad ⁸⁾



Recommended Solder Pad ⁸⁾



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

Reflow Soldering Profile

Product complies to MSL Level 4 acc. to JEDEC J-STD-020E

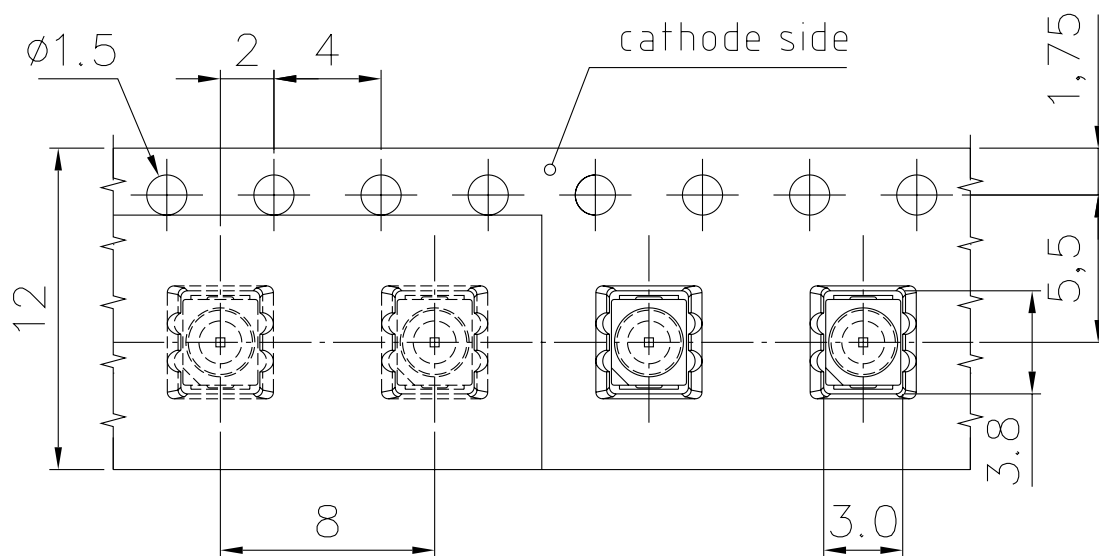


Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat ^{*)} 25°C to 150°C			2	3	K/s
Time t_s T_{Smin} to T_{Smax}	t_s	60	100	120	s
Ramp-up rate to peak ^{*)} T_{Smax} to T_p			2	3	K/s
Liquidus temperature	T_L		217		$^{\circ}\text{C}$
Time above liquidus temperature	t_L		80	100	s
Peak temperature	T_p		245	250	$^{\circ}\text{C}$
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	4	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

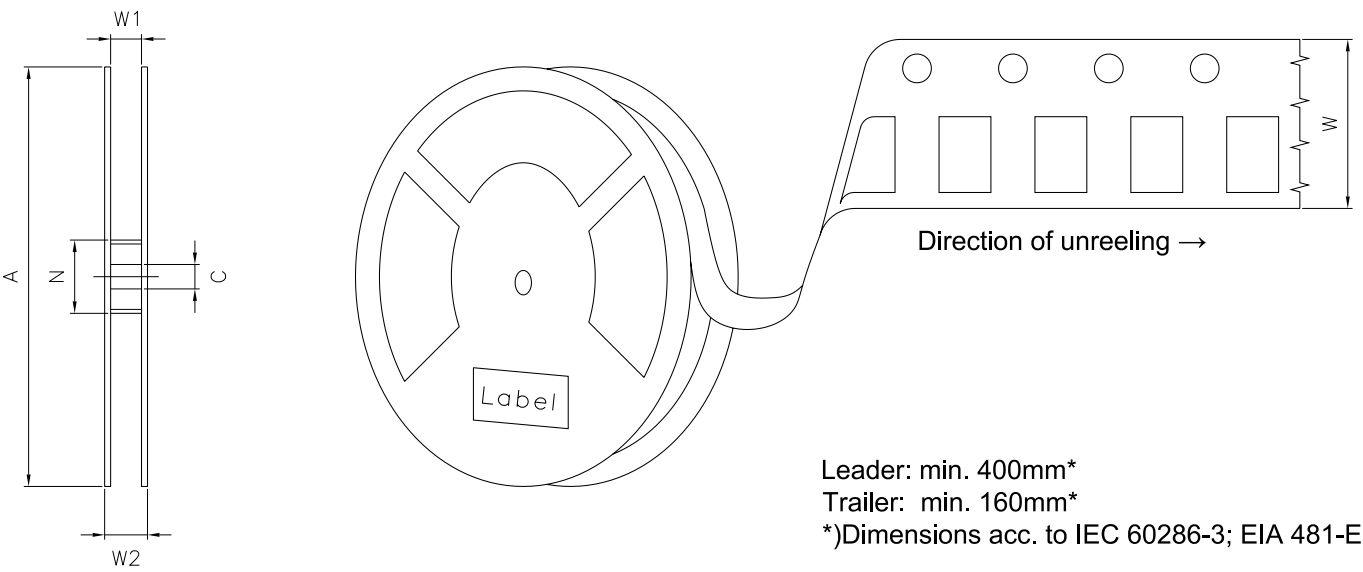
* slope calculation DT/Dt : Dt max. 5 s; fulfillment for the whole T-range

Taping 8)



C67062-A0257-B23-01

Tape and Reel ⁹⁾



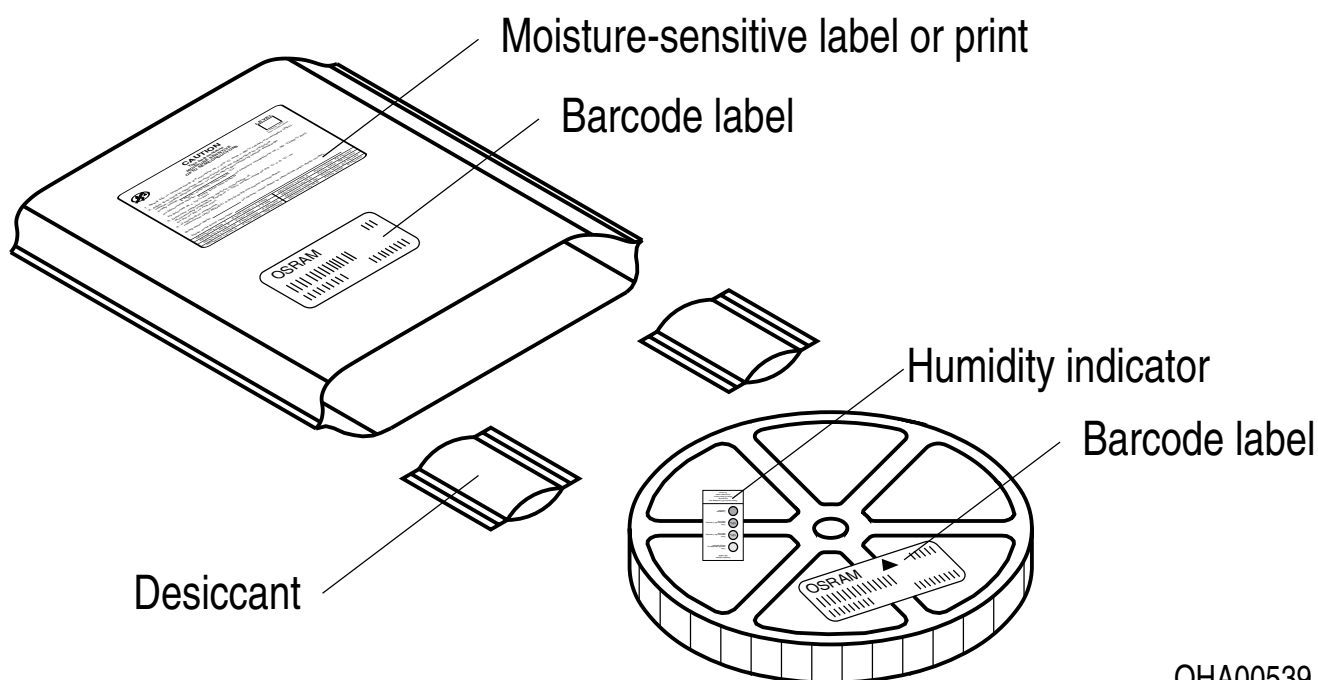
Reel Dimensions

A	W	N _{min}	W ₁	W _{2 max}	Pieces per PU
330 mm	12 + 0.3 / - 0.1 mm	60 mm	12.4 + 2 mm	18.4 mm	2000

Barcode-Product-Label (BPL)

OSRAM Opto Semiconductors		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 ⁸⁾

OHA00539

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

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 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 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 and functional 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.

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

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:** 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) **Wavelength:** The wavelength is measured at a current pulse of typically 25 ms, with an internal reproducibility of $\pm 0.5\text{ nm}$ and an expanded uncertainty of $\pm 1\text{ nm}$ (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).
- 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
1.4	2020-07-14	Schematic Transportation Box Dimensions of Transportation Box Brightness Groups Taping

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