

LW TWTG.BB

TOPLED® Black Surface

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

- Traffic Lights
- VMS

Features:

- Package: white PLCC-2 package, black surface, colored diffused silicone resin
- Chip technology: UX:3
- Typ. Radiation: 120°
- Color: Cx = 0.32, Cy = 0.33 acc. to CIE 1931 (● white)
- Corrosion Robustness Class: 1B
- 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 TWTG.BB-BYBZ-2C12C3-Z486	2100 ... 2800 mcd	Q65112A5793
LW TWTG.BB-BYBZ-2B12C3-Z486	2100 ... 2800 mcd	Q65112A5795
LW TWTG.BB-BXBY-2B12B3-Z486	1800 ... 2400 mcd	Q65112A5796
LW TWTG.BB-BXCX-2B12C3-Z486	1800 ... 3300 mcd	Q65112A5797

Maximum Ratings

Parameter	Symbol		Values
Operating Temperature	T_{op}	min. max.	-40 °C 100 °C
Storage Temperature	T_{stg}	min. max.	-40 °C 100 °C
Junction Temperature	T_j	max.	110 °C
Forward Current $T_s = 25\text{ °C}$	I_F	max.	30 mA
Surge Current $t \leq 10\text{ }\mu\text{s}$; $D = 0.005$; $T_s = 25\text{ °C}$	I_{FS}	max.	100 mA
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B)	V_{ESD}		8 kV
Reverse current ²⁾	I_R	max.	50 mA

Characteristics

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

Parameter	Symbol		Values
Chromaticity Coordinate ³⁾	C_x	typ.	0.32
	C_y	typ.	0.33
Viewing angle at 50 % I_v	2ϕ	typ.	110 °
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⁾ $I_R = 5 \text{ mA}$	V_R	max.	7 V
Real thermal resistance junction/ambient ^{5), 6)}	$R_{\text{thJA real}}$	max.	230 K / W
Real thermal resistance junction/solderpoint ⁵⁾	$R_{\text{thJS real}}$	max.	78 K / W

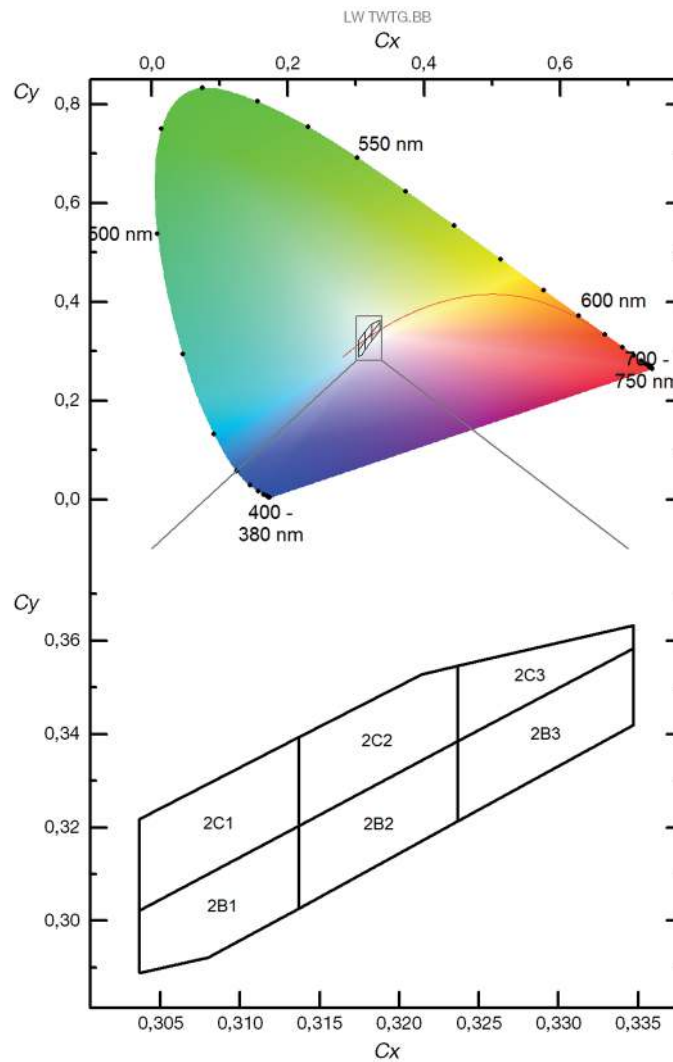
Brightness Groups

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
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

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



Color Chromaticity Groups ³⁾

Group	Cx	Cy	Group	Cx	Cy	Group	Cx	Cy
2B1	0.3080	0.2921	2B2	0.3137	0.3203	2C1	0.3037	0.3218
	0.3037	0.2888		0.3237	0.3385		0.3137	0.3393
	0.3037	0.3022		0.3237	0.3214		0.3137	0.3203
	0.3137	0.3203		0.3137	0.3027		0.3037	0.3022
	0.3137	0.3027		2B3	0.3237		0.3385	
		0.3347	0.3584					
		0.3347	0.3419					
		0.3237	0.3214					

Group	Cx	Cy	Group	Cx	Cy
2C2	0.3137	0.3203	2C3	0.3237	0.3546
	0.3137	0.3393		0.3347	0.3633
	0.3214	0.3528		0.3347	0.3584
	0.3237	0.3546		0.3237	0.3385
	0.3237	0.3385			

Group Name on Label

Example: BX-2B1-44

Brightness

Color chromaticity

Forward Voltage

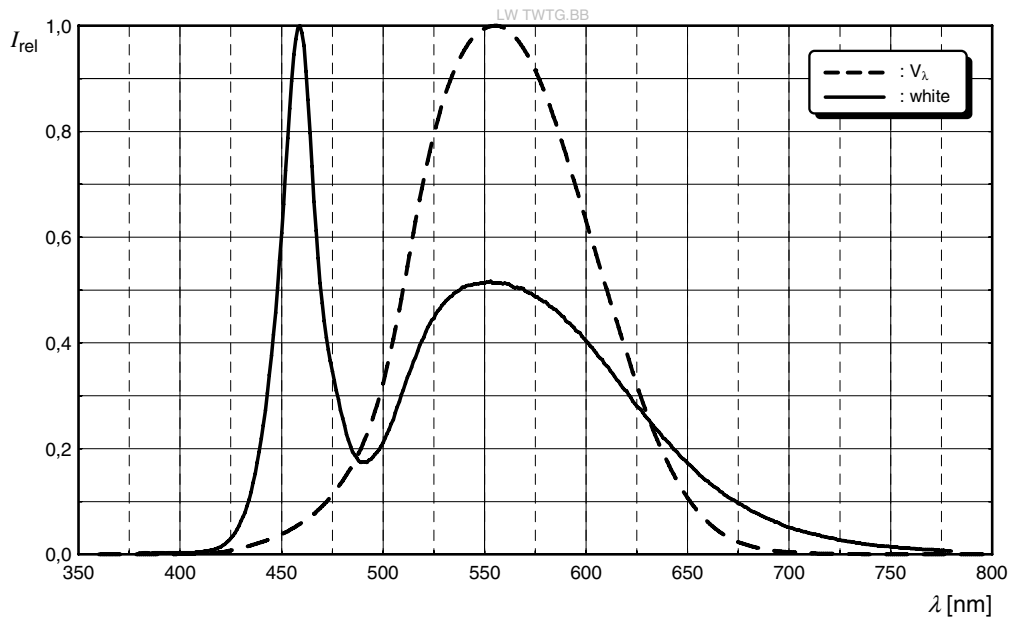
BX

2B1

44

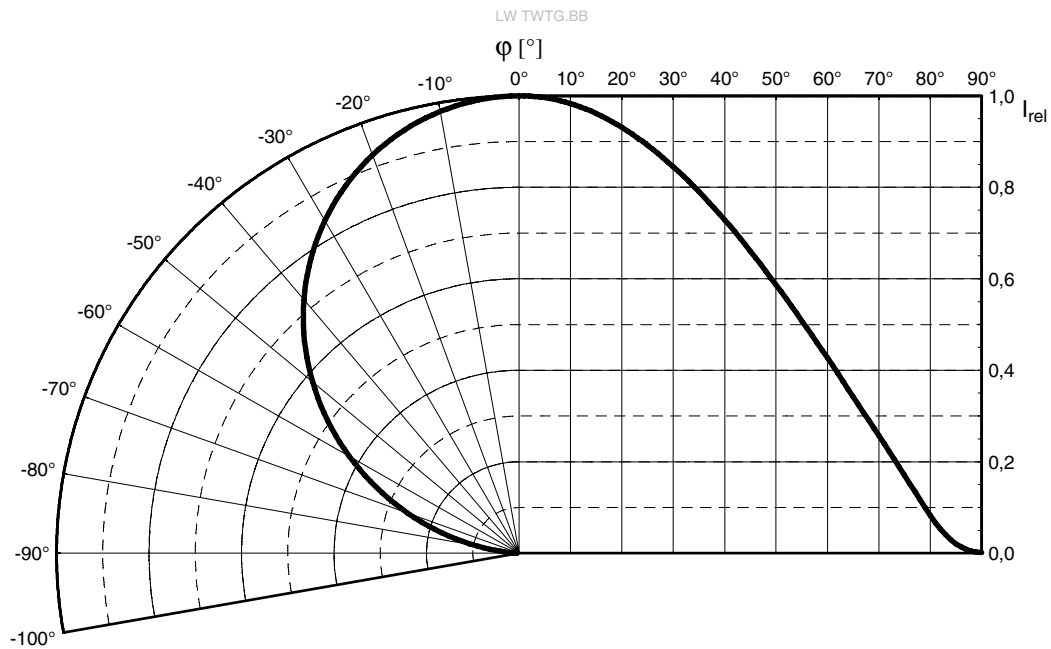
Relative Spectral Emission ⁷⁾

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



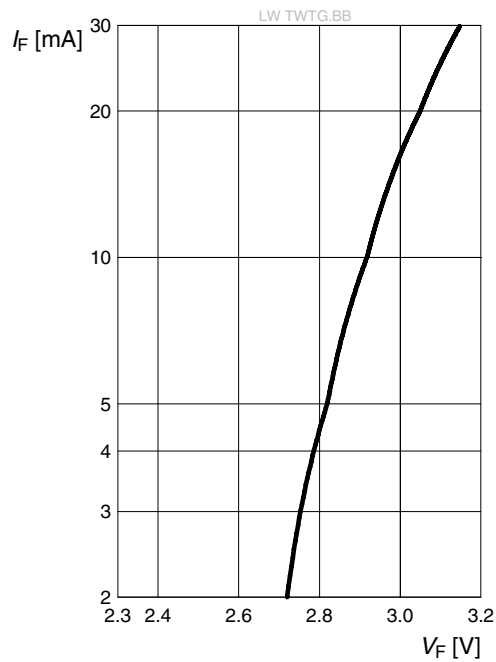
Radiation Characteristics ⁷⁾

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



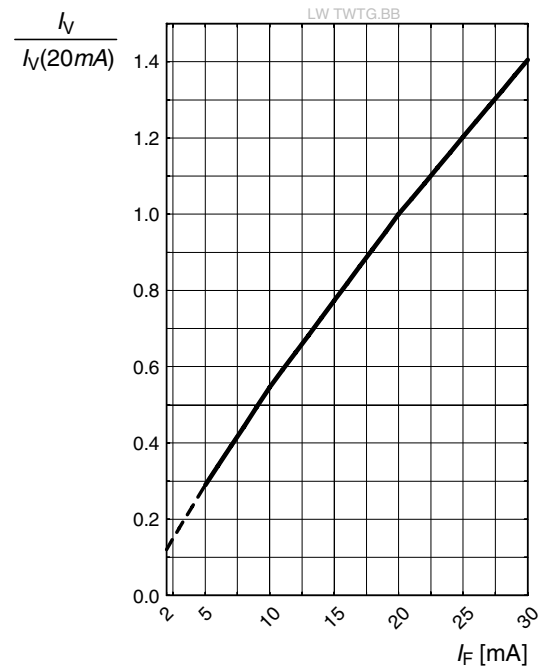
Forward current ⁷⁾

$$I_F = f(V_F); T_S = 25\text{ °C}$$



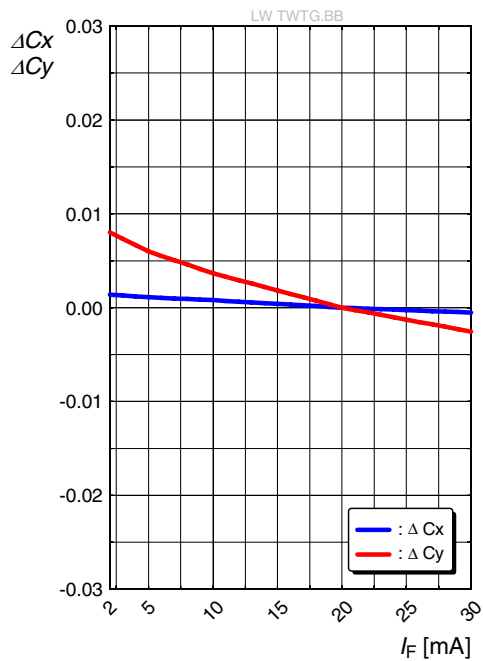
Relative Luminous Intensity ^{7), 8)}

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



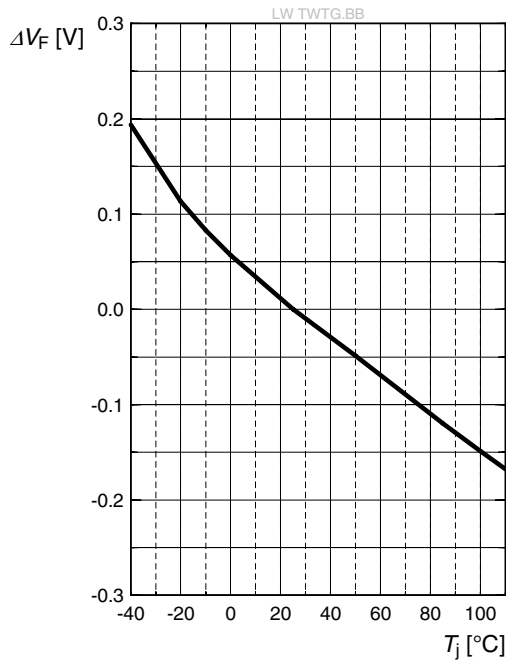
Chromaticity Coordinate Shift ⁷⁾

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



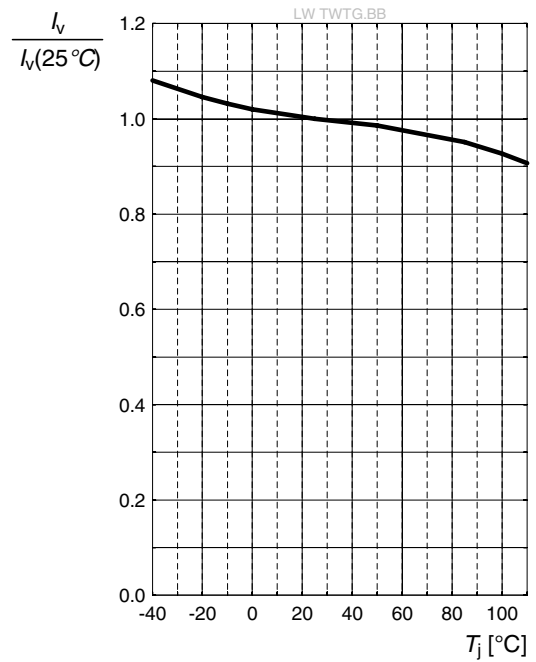
Forward Voltage ⁷⁾

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



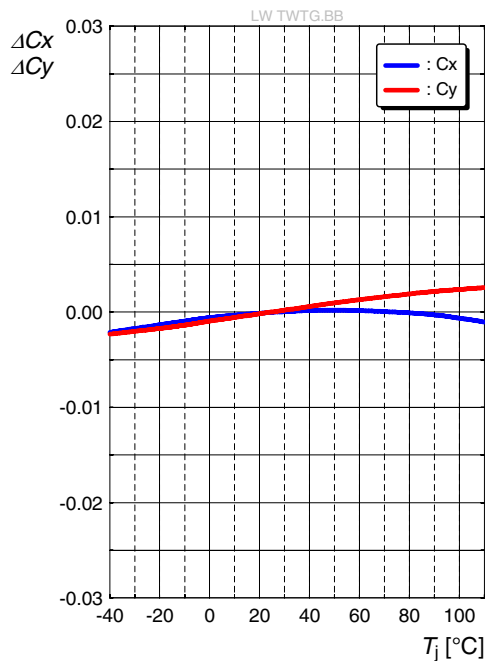
Relative Luminous Intensity ⁷⁾

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



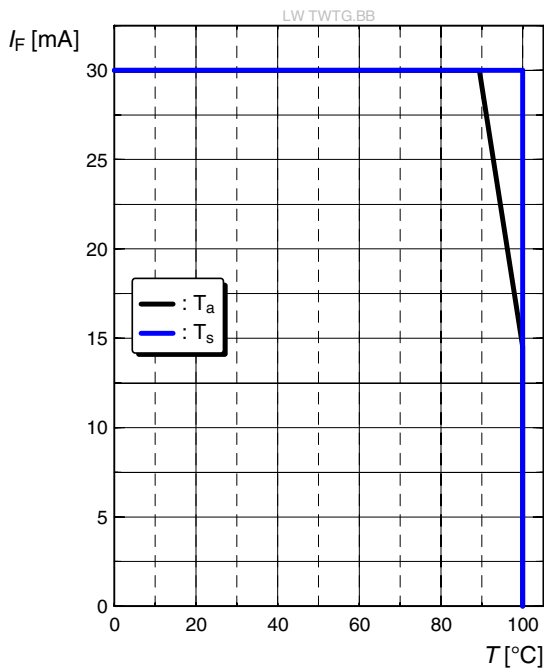
Chromaticity Coordinate Shift ⁷⁾

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



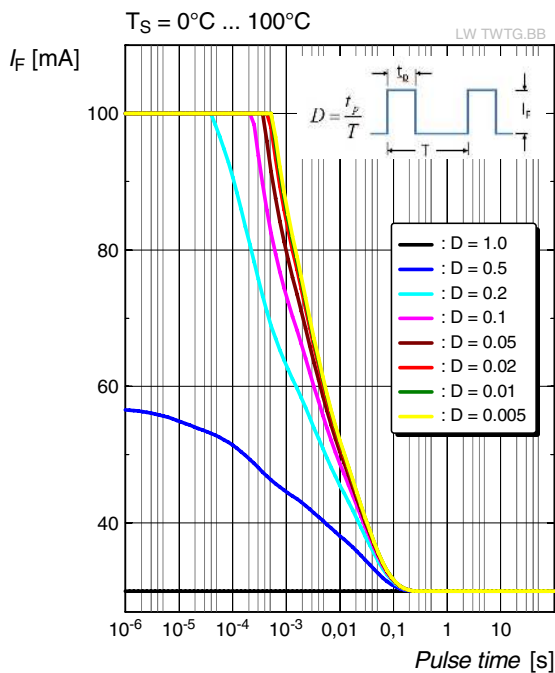
Max. Permissible Forward Current

$$I_F = f(T)$$

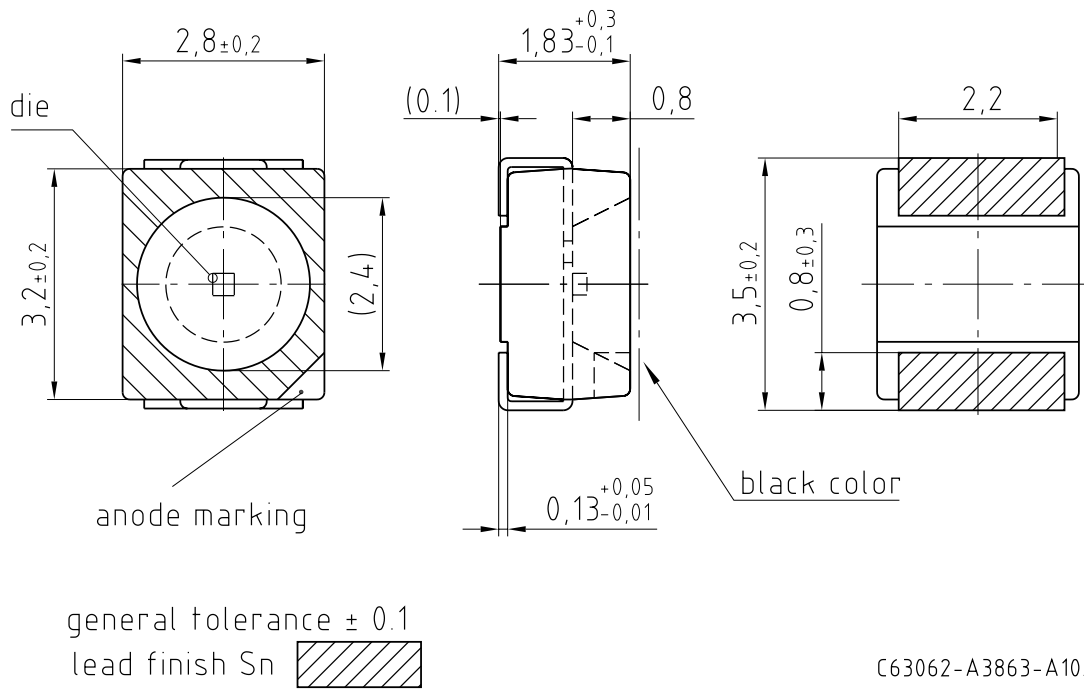


Permissible Pulse Handling Capability

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



Dimensional Drawing ⁹⁾



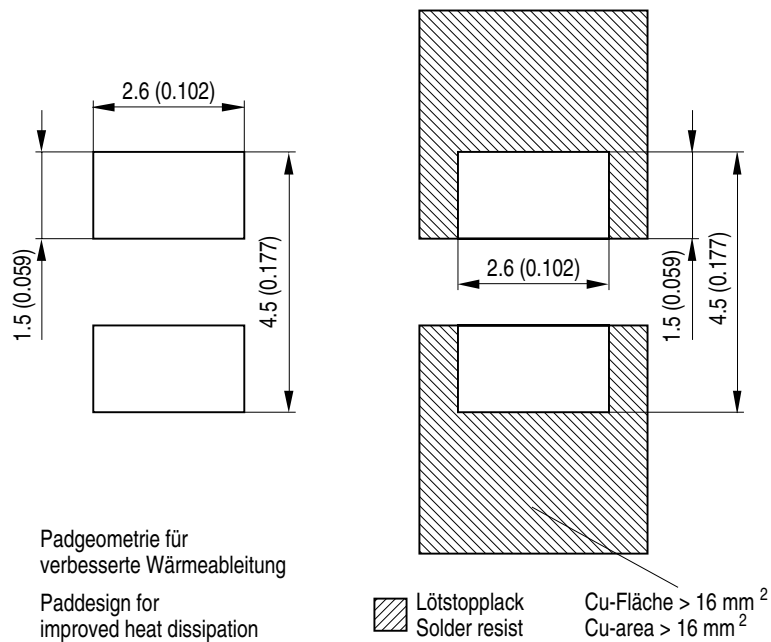
Approximate Weight: 33.0 mg

Package marking: Anode

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.

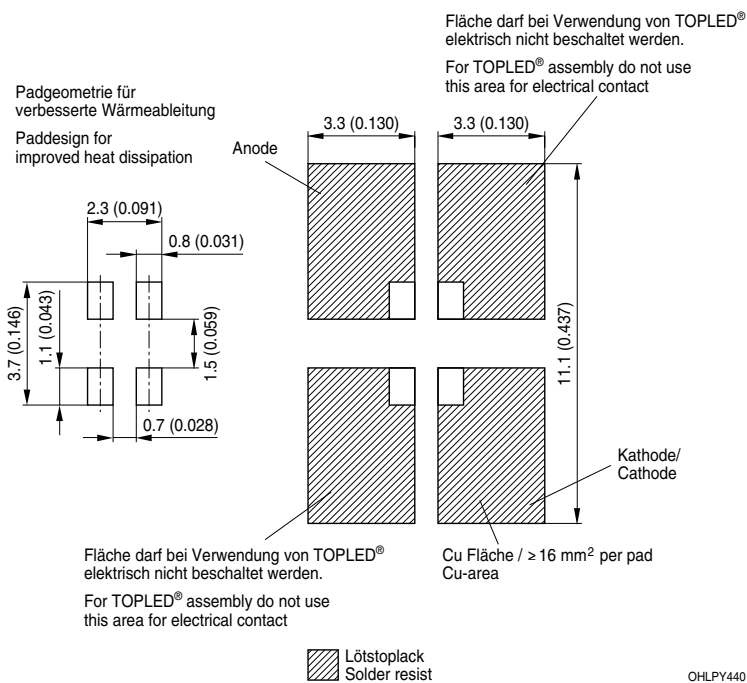
Recommended Solder Pad ⁹⁾



OHLPY970

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

Recommended Solder Pad ⁹⁾

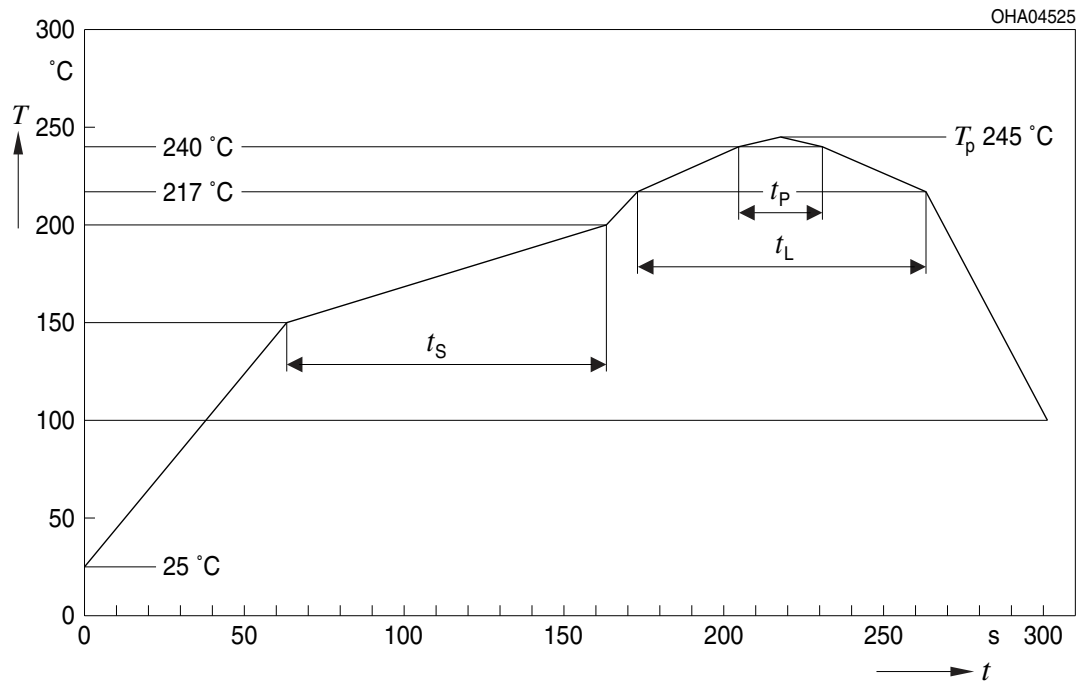


OHLPY440

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

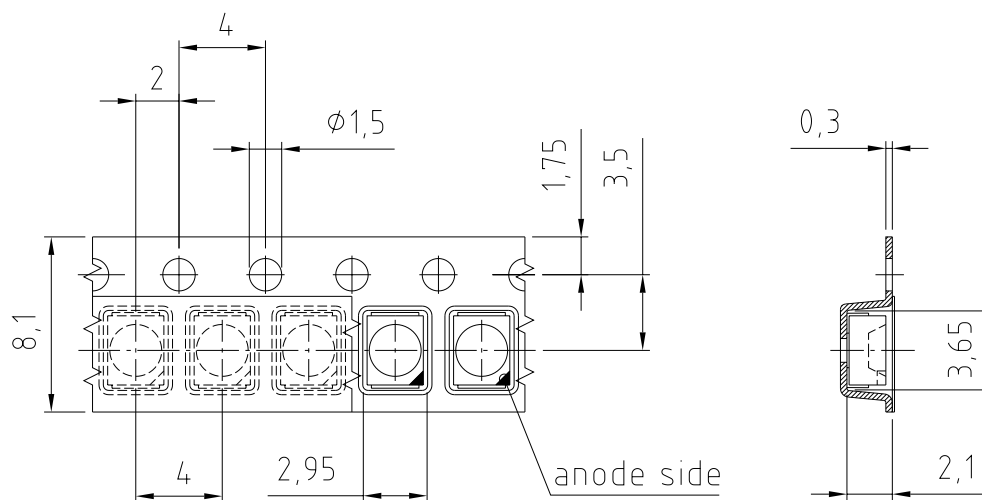


Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat*) 25 °C to 150 °C			2	3	K/s
Time t_s T_{Smin} to T_{Smax}	t_s	60	100	120	s
Ramp-up rate to peak*) T_{Smax} to T_p			2	3	K/s
Liquidus temperature	T_L		217		°C
Time above liquidus temperature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

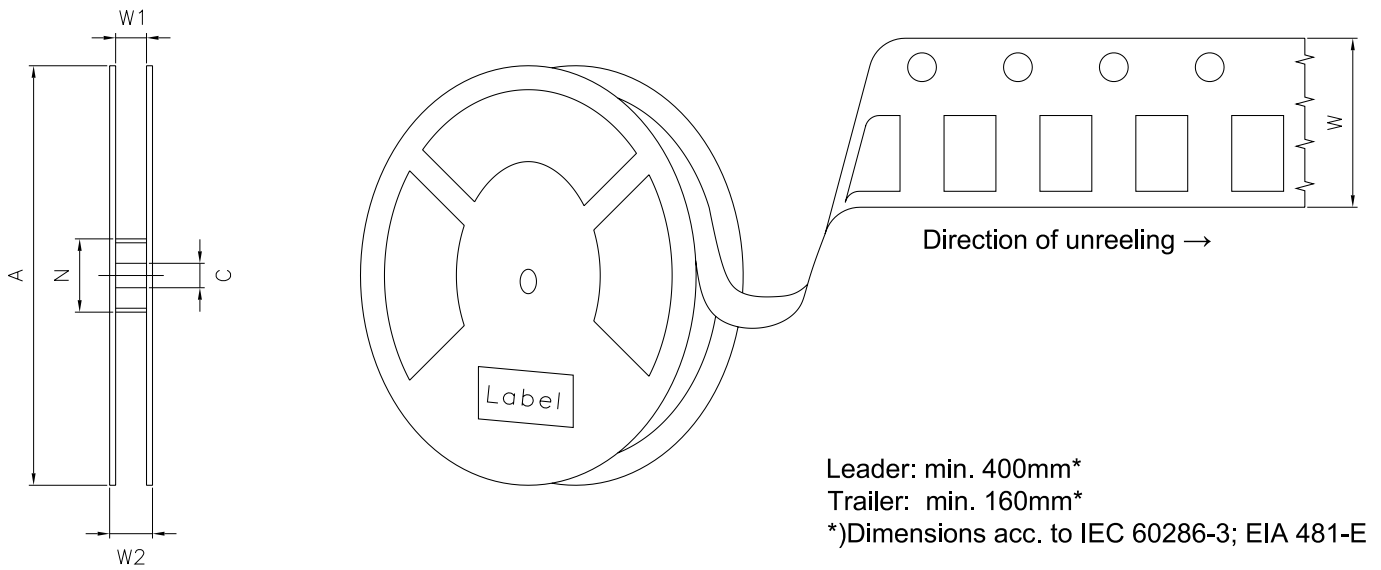
* slope calculation DT/Dt : Dt max. 5 s; fulfillment for the whole T-range

Taping ⁹⁾



C63062-A3863-B9 -03

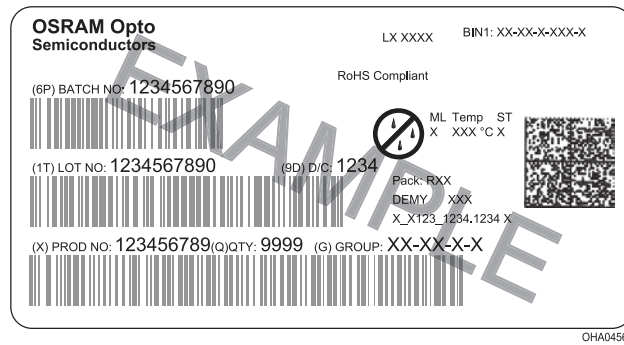
Tape and Reel ¹⁰⁾



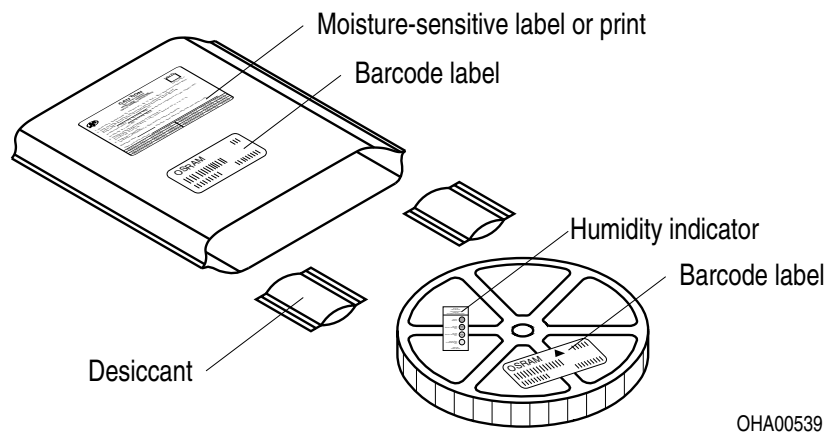
Reel dimensions [mm]

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

Barcode-Product-Label (BPL)

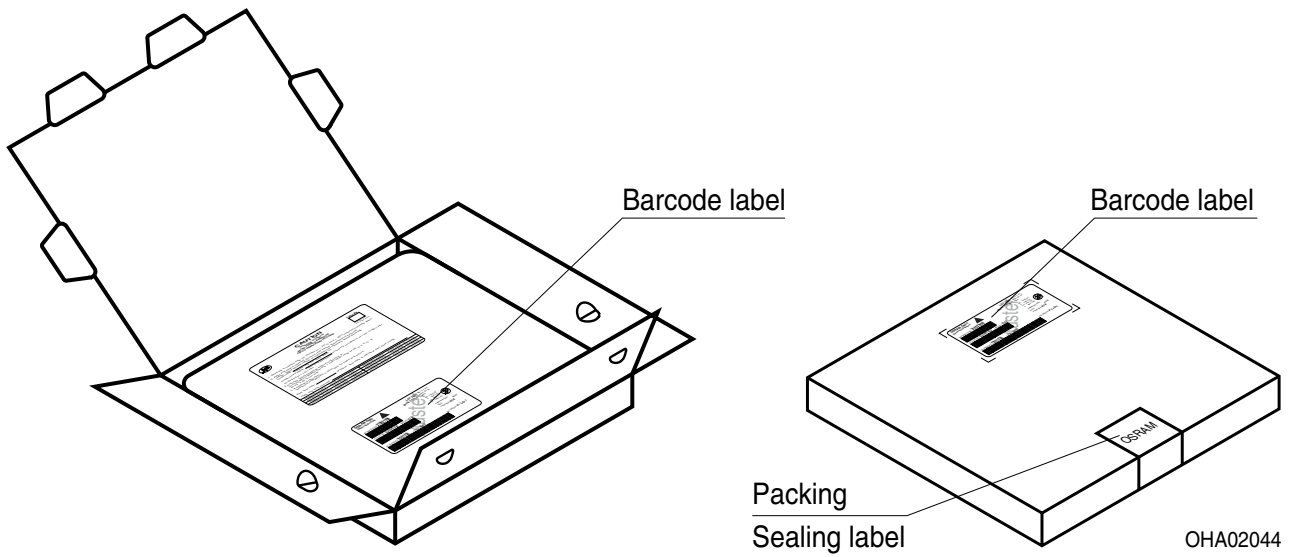


Dry Packing Process and Materials ⁹⁾



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

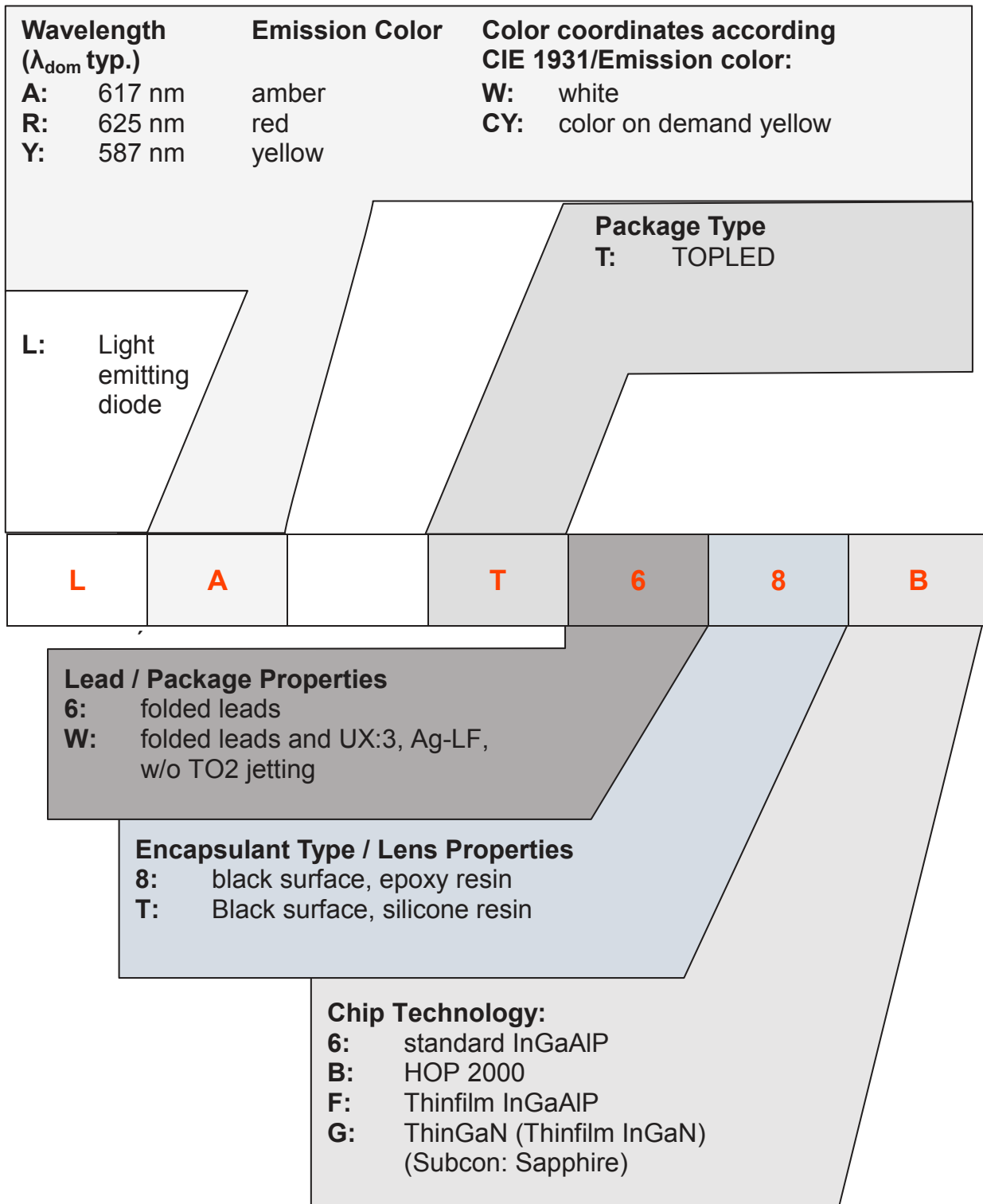
Transportation Packing and Materials ⁹⁾



Dimensions of transportation box in mm

Width	Length	Height
352 ± 5 mm	352 ± 5 mm	33 ± 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 **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 LED 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 LED exposure to aggressive substances during storage, production, and use. LEDs 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) **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.

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