OSRAM LRTBGVSR

Datasheet

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Tobelbader Strasse 30, 8141 Premstaetten, Austria
Phone +43 3136 500-0
ams-osram.com

OSRAM

OSIRE® E3635

LRTB GVSR

The OSIRE E3635 is especially designed for automotive applications and RGB displays. The 6-lead technology offers an additive mixture of color stimuli by independent driving of each chip. The white package guarantees high brightness.

Applications

- Ambient Lighting
- Automotive Aftermarket
- Functional Illumination

Features

- Package: white PLCC-6 package, silicone resin
- Chip technology: Thinfilm / UX:3
- Typ. Radiation: 120° (Lambertian emitter)
- Color: λ_{dom} = 626 nm (● red); λ_{dom} = 528 nm (● true green); λ_{dom} = 465 nm (● blue)
- Corrosion Robustness Class: 3B
- Qualifications: AEC-Q102 Qualified
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)

Ordering Information

Type	Brightness [1]	Ordering Code
LRTBGVSR-4U4V-JW+8A8B-D8-3S4U-7Z		Q65113A3998
• red	• I_v = 630 ... 1120 mcd (I_F = 20 mA)	
• true green	• I_v = 1590 ... 2800 mcd (I_F = 20 mA)	
• blue	• I_v = 224 ... 710 mcd (I_F = 20 mA)	

Maximum Ratings

Parameter	Symbol		Values ● red	Values ● true green	Values ● blue
Operating Temperature	T_{op}	min.	-40 °C	-40 °C	-40 °C
		max.	110 °C	110 °C	110 °C
Storage Temperature	T_{stg}	min.	-40 °C	-40 °C	-40 °C
		max.	110 °C	110 °C	110 °C
Junction Temperature	T_j	max.	125 °C	125 °C	125 °C
Forward Current T_S = 25 °C	I_F	min.	5 mA	5 mA	5 mA
		max.	40 mA	50 mA	50 mA
Surge Current t ≤ 10 µs; D = 0.005 ; T_S = 25 °C	I_{FS}	max.	100 mA	300 mA	300 mA
Reverse voltage [2] T_S = 25 °C	V_R	max.	12 V	5 V	5 V
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	V_{ESD}		2 kV	2 kV	2 kV

Characteristics

I_F = 20 mA; T_S = 25 °C

Parameter	Symbol		Values ● red	Values ● true green	Values ● blue
Peak Wavelength	λ_{peak}	typ.	632 nm	523 nm	455 nm
Dominant Wavelength [3]	λ_{dom}	min.	620 nm	519 nm	447 nm
		typ.	626 nm	528 nm	465 nm
		max.	632 nm	546 nm	476 nm
Spectral bandwidth at 50% $I_{rel,max}$	$\Delta\lambda$	typ.	18 nm	33 nm	25 nm
Viewing angle at 50% I_V	2φ	typ.	120 °	120 °	120 °
Forward Voltage [4] I_F = 20 mA	V_F	min.	1.70 V	2.10 V	2.50 V
		typ.	2.05 V	2.60 V	2.85 V
		max.	2.40 V	3.00 V	3.20 V
Reverse current [2] V_R = 12 V	I_R	typ.	0.01 µA	0.01 µA	0.01 µA
		max.	10 µA	10 µA	10 µA
Real thermal resistance junction/solderpoint [5]	$R_{thJS\ real}$	typ.	90 K / W	83 K / W	66 K / W
		max.	120 K / W	100 K / W	90 K / W

Brightness Groups

Color of emission	Group	Luminous Intensity [1] I_F = 20 mA min. I_v	Luminous Intensity [1] I_F = 20 mA max. I_v
● red	4U	630 mcd	710 mcd
● red	1V	710 mcd	800 mcd
● red	2V	800 mcd	900 mcd
● red	3V	900 mcd	1000 mcd
● red	4V	1000 mcd	1120 mcd
● true green	8A	1590 mcd	1800 mcd
● true green	5B	1800 mcd	2010 mcd
● true green	6B	2010 mcd	2240 mcd
● true green	7B	2240 mcd	2500 mcd
● true green	8B	2500 mcd	2800 mcd
● blue	3S	224 mcd	250 mcd
● blue	4S	250 mcd	280 mcd
● blue	1T	280 mcd	315 mcd
● blue	2T	315 mcd	355 mcd
● blue	3T	355 mcd	400 mcd
● blue	4T	400 mcd	450 mcd
● blue	1U	450 mcd	500 mcd
● blue	2U	500 mcd	560 mcd
● blue	3U	560 mcd	630 mcd
● blue	4U	630 mcd	710 mcd

Wavelength Groups

● red

Group	Dominant Wavelength [3] min. λ_{dom}	Dominant Wavelength [3] max. λ_{dom}
JP	620 nm	625 nm
MT	623 nm	629 nm
RW	627 nm	632 nm

Wavelength Groups

- true green

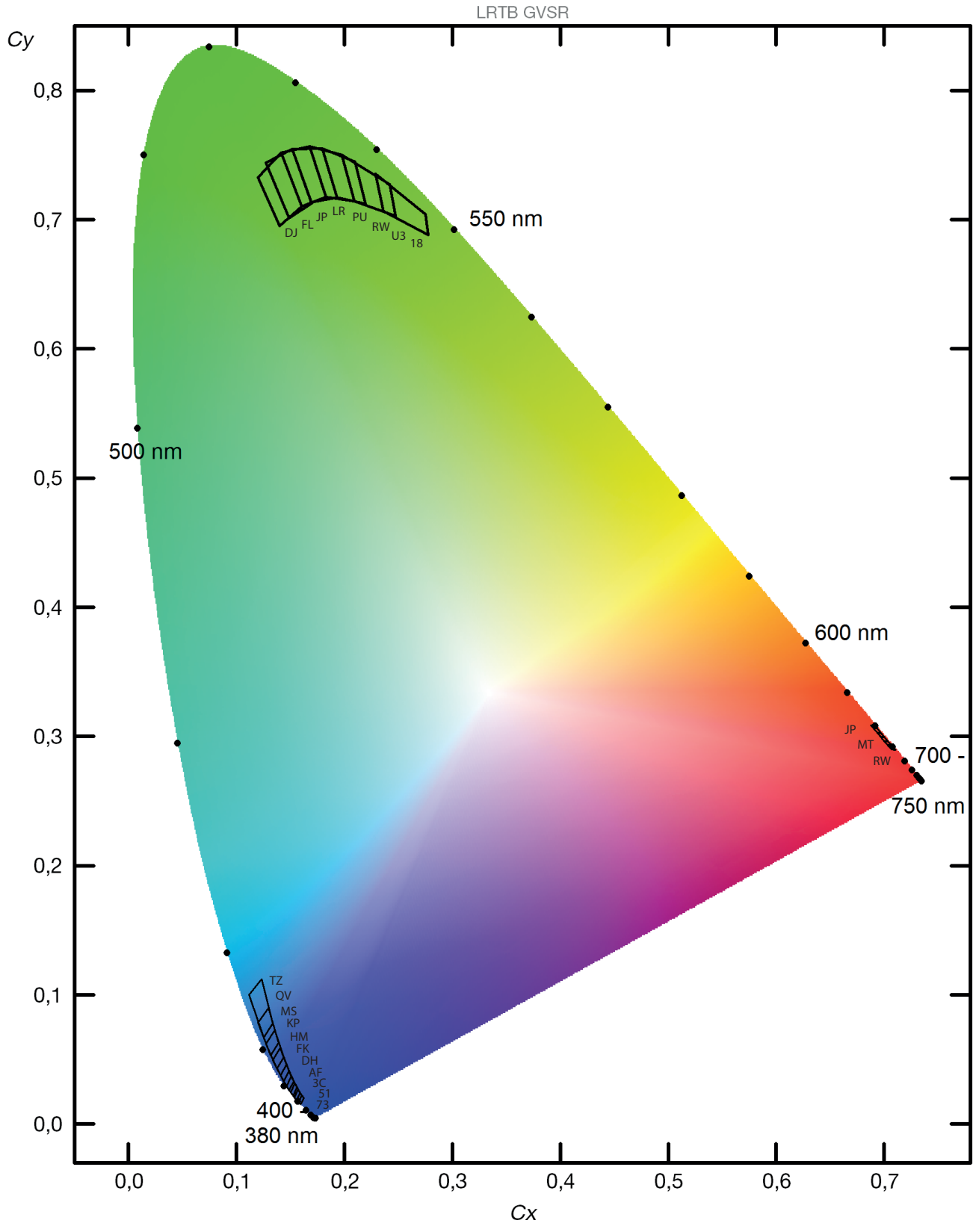
Group	Dominant Wavelength [3] min. λ_{dom}	Dominant Wavelength [3] max. λ_{dom}
DJ	519 nm	524 nm
FL	521 nm	526 nm
JP	524 nm	529 nm
LR	526 nm	531 nm
PU	529 nm	534 nm
RW	531 nm	536 nm
U3	534 nm	541 nm
18	539 nm	546 nm

Wavelength Groups

- blue

Group	Dominant Wavelength [3] min. λ_{dom}	Dominant Wavelength [3] max. λ_{dom}
73	447 nm	451 nm
51	449 nm	453 nm
3C	451 nm	456 nm
AF	454 nm	459 nm
DH	457 nm	461 nm
FK	459 nm	463 nm
HM	461 nm	465 nm
KP	463 nm	467 nm
MS	465 nm	470 nm
QV	468 nm	473 nm
TZ	471 nm	476 nm

Chromaticity Coordinate Groups



Chromaticity Coordinate Groups

● red

Group	Cx	Cy
JP	0.6879	0.3086
	0.6915	0.3083
	0.7006	0.2993
	0.6969	0.2996
MT	0.6936	0.3030
	0.6972	0.3027
	0.7066	0.2934
	0.7028	0.2938
RW	0.7000	0.2966
	0.7037	0.2962
	0.7105	0.2895
	0.7067	0.2899

Chromaticity Coordinate Groups

● true green

Group	Cx	Cy
18	0.2362	0.7067
	0.2288	0.7353
	0.2752	0.7042
	0.2776	0.6881
DJ	0.1401	0.6951
	0.1201	0.7325
	0.1415	0.7518
	0.1606	0.7102
FL	0.1486	0.7014
	0.1273	0.7439
	0.1517	0.7547
	0.1698	0.7127
JP	0.1606	0.7102
	0.1415	0.7518
	0.1679	0.7565
	0.1831	0.7174

Chromaticity Coordinate Groups

- true green

Group	Cx	Cy
LR	0.1694	0.7136
	0.1517	0.7547
	0.1794	0.7549
	0.1933	0.7170
PU	0.1831	0.7174
	0.1678	0.7565
	0.1973	0.7500
	0.2091	0.7142
RW	0.1932	0.7170
	0.1794	0.7549
	0.2098	0.7449
	0.2196	0.7122
U3	0.2091	0.7142
	0.1974	0.7500
	0.2419	0.7273
	0.2474	0.7029

Chromaticity Coordinate Groups

- blue

Group	Cx	Cy
3C	0.1588	0.0243
	0.1556	0.0186
	0.1500	0.0246
	0.1543	0.0317
51	0.1606	0.0222
	0.1576	0.0168
	0.1534	0.0206
	0.1570	0.0268
73	0.1622	0.0203
	0.1595	0.0152
	0.1556	0.0186
	0.1588	0.0243

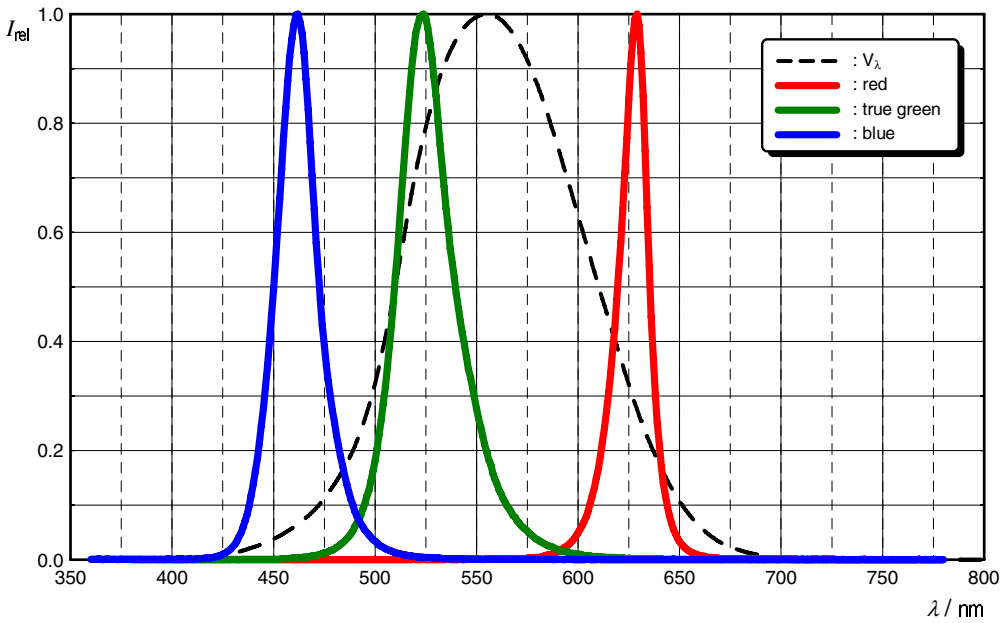
Chromaticity Coordinate Groups

- blue

Group	Cx	Cy
AF	0.1562	0.0285
	0.1524	0.0219
	0.1462	0.0293
	0.1509	0.0370
DH	0.1532	0.0332
	0.1489	0.0262
	0.1436	0.0332
	0.1487	0.0414
FK	0.1509	0.0370
	0.1462	0.0293
	0.1407	0.0376
	0.1463	0.0463
HM	0.1487	0.0414
	0.1436	0.0332
	0.1375	0.0428
	0.1436	0.0519
KP	0.1463	0.0463
	0.1407	0.0376
	0.1338	0.0493
	0.1404	0.0588
MS	0.1436	0.0519
	0.1375	0.0428
	0.1272	0.0620
	0.1354	0.0727
QV	0.1389	0.0631
	0.1317	0.0532
	0.1199	0.0785
	0.1295	0.0899
TZ	0.1335	0.0779
	0.1251	0.0672
	0.1115	0.1000
	0.1231	0.1122

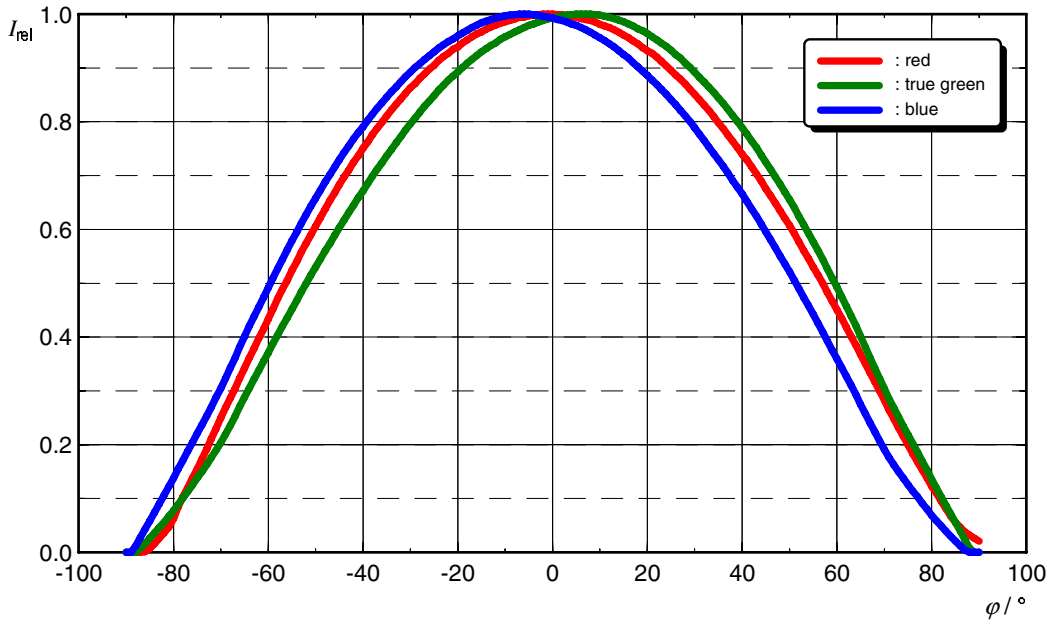
Relative Spectral Emission [6)]

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



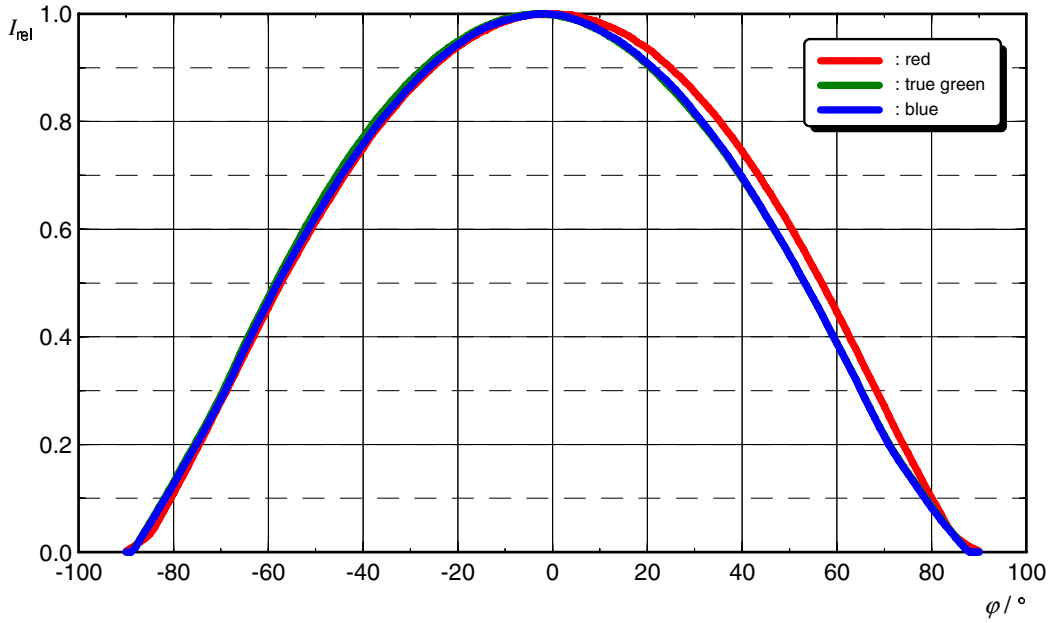
Radiation Characteristic (horizontal) 6)

$I_{rel} = f(\phi)$; $T_S = 25$ °C



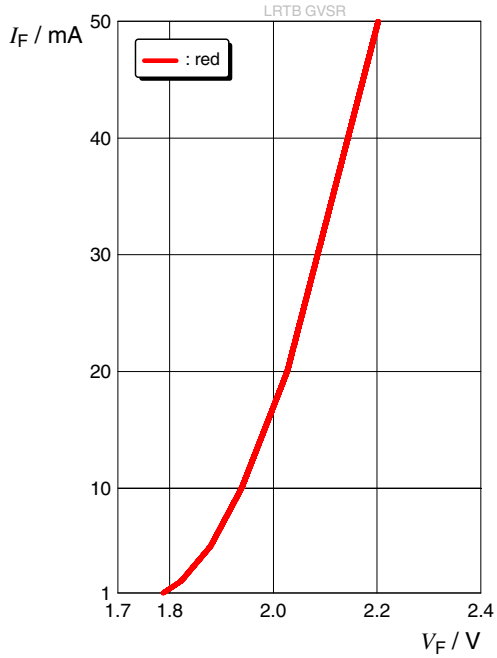
Radiation Characteristic (vertical) 6)

$I_{rel} = f(\phi)$; $T_S = 25$ °C



Forward current [6]

$I_F = f(V_F)$; T_S = 25 °C



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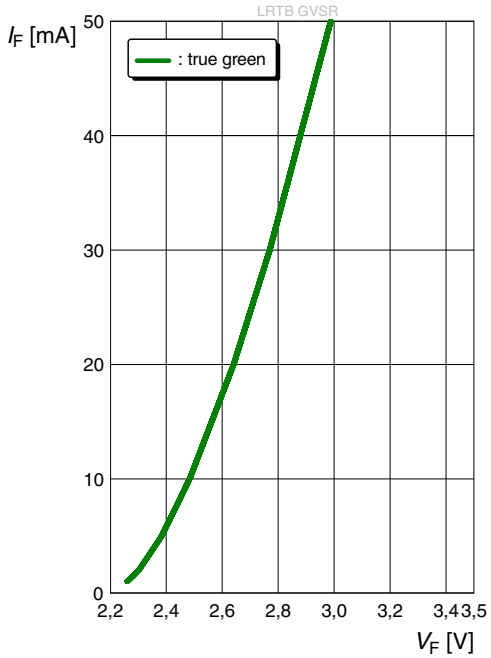

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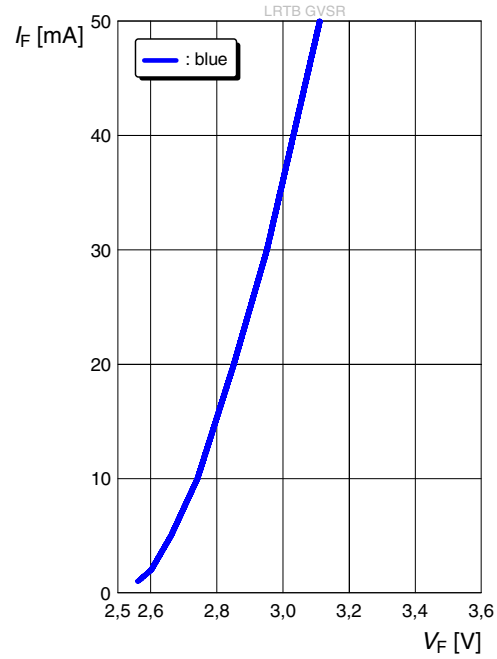
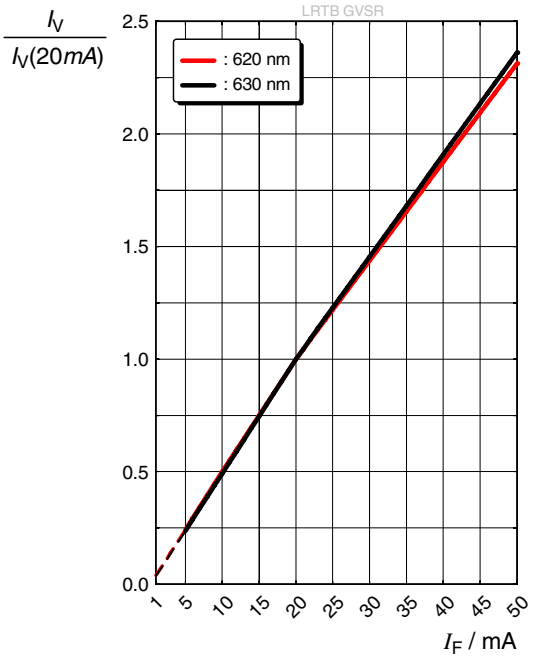


Relative Luminous Intensity 6), 7)

$I_v/I_v(20\ mA) = f(I_F);\ T_S = 25\ °C$



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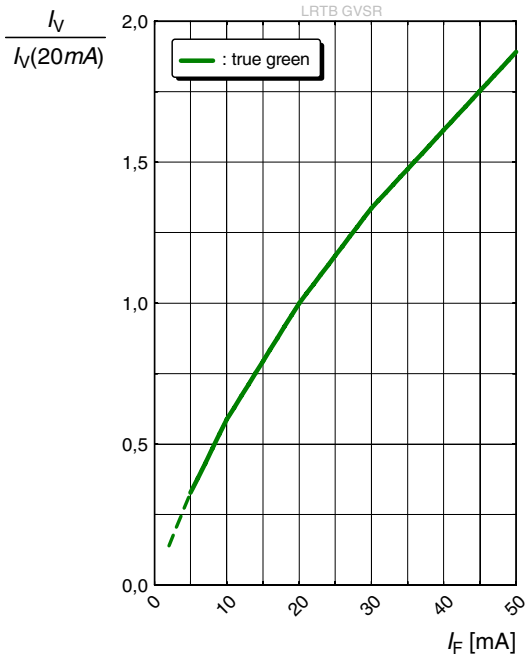

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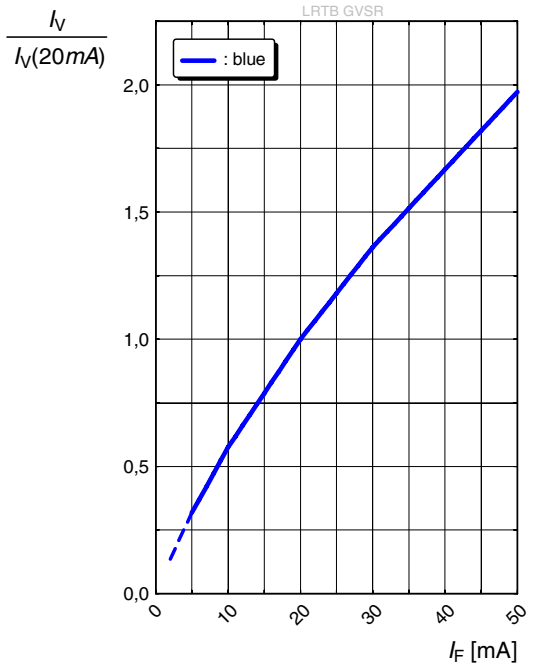
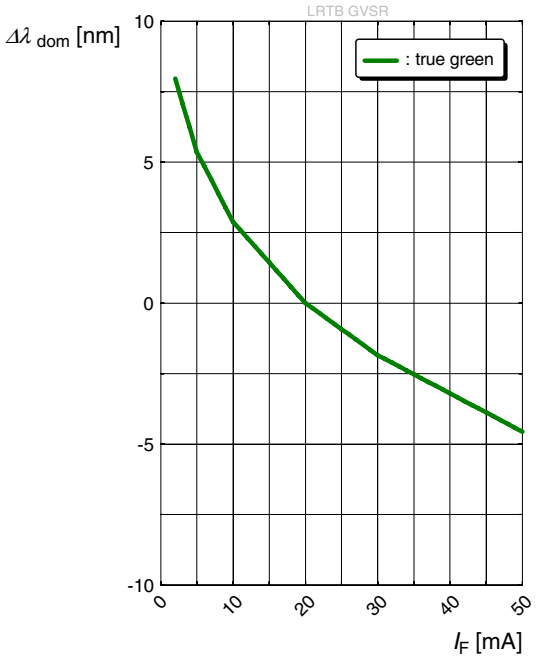


Dominant Wavelength 6)

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



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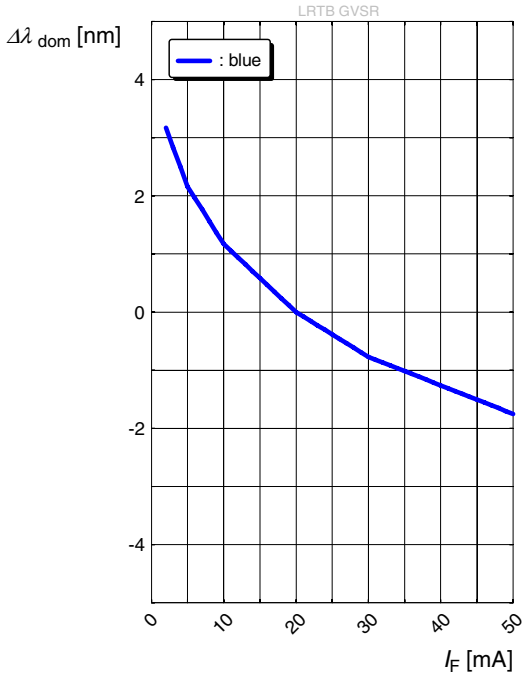
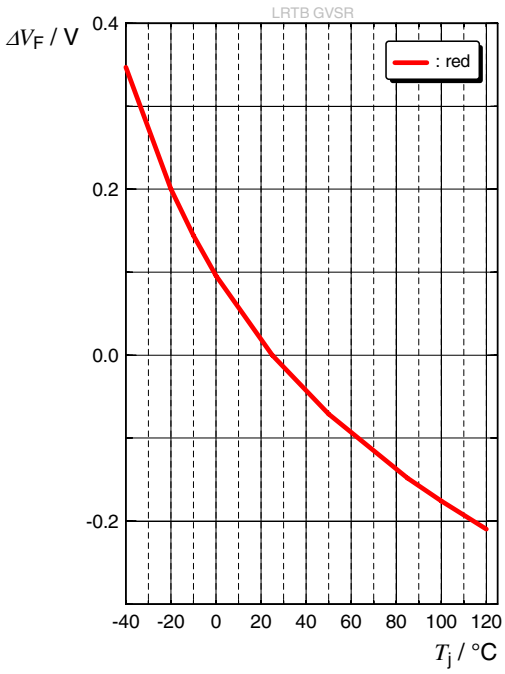


Forward Voltage [6)]

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



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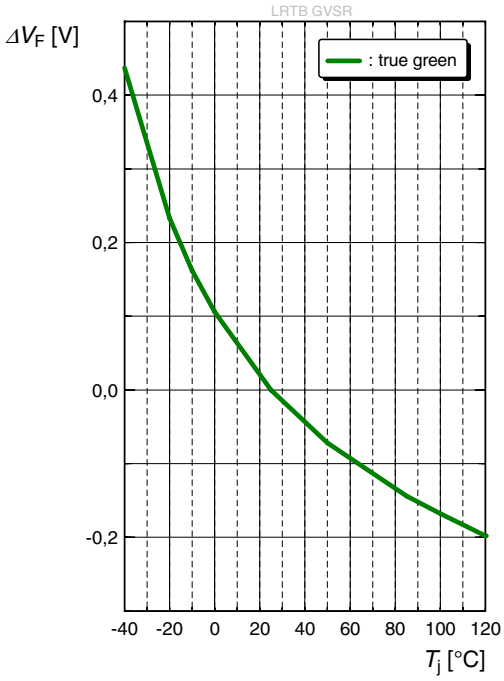

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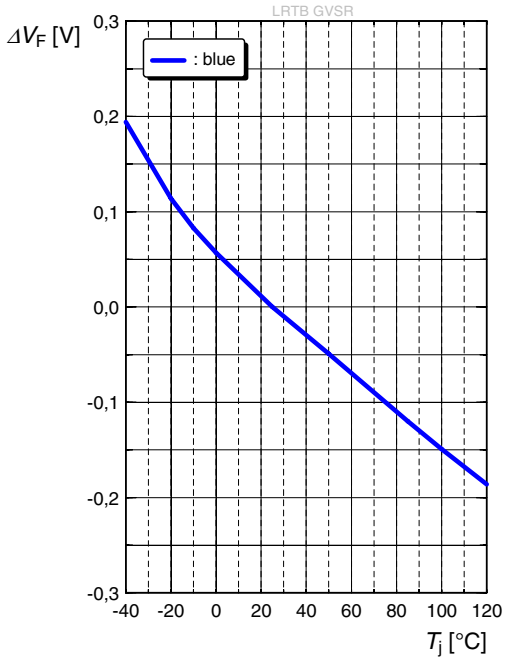
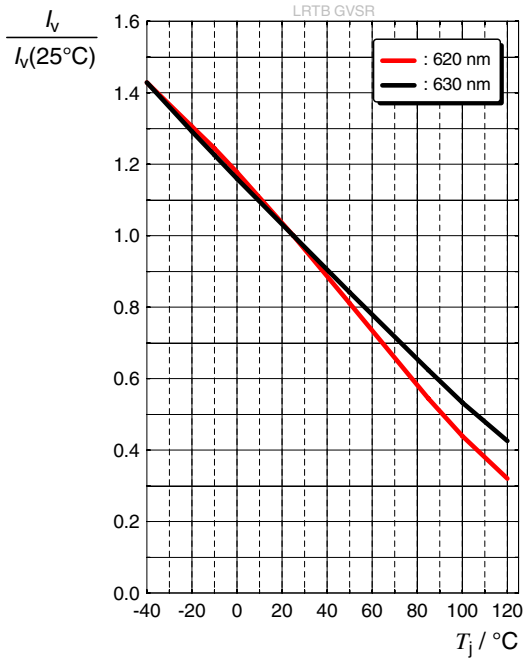


Relative Luminous Intensity 6)

$I_v/I_v(25\ °C) = f(T_j)$; $I_F = 20$ mA



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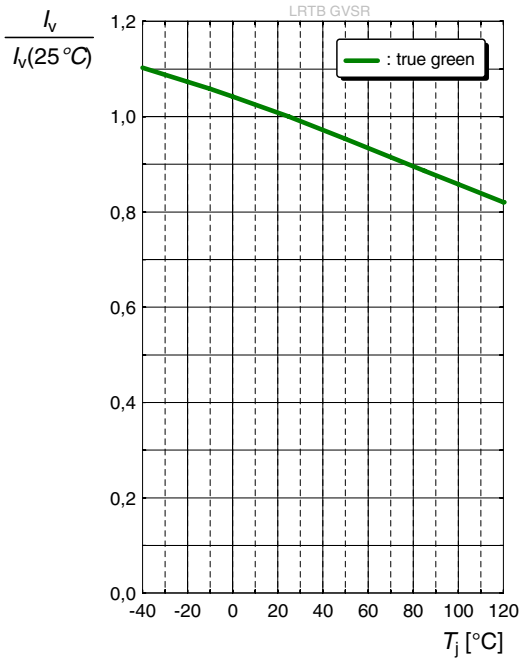

Relative Luminous Intensity 6)

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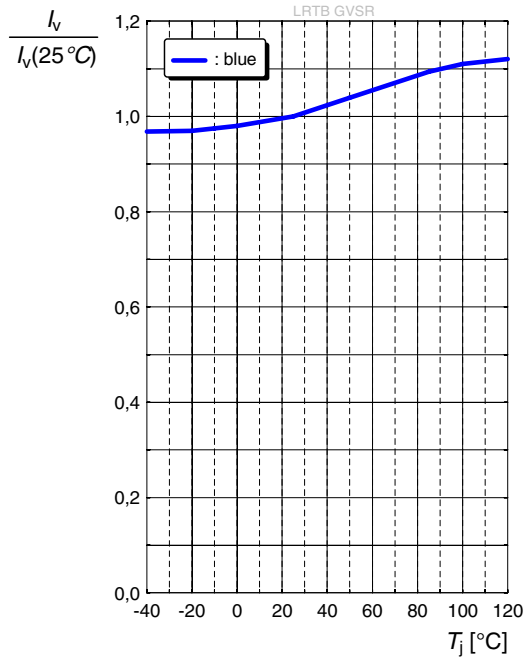
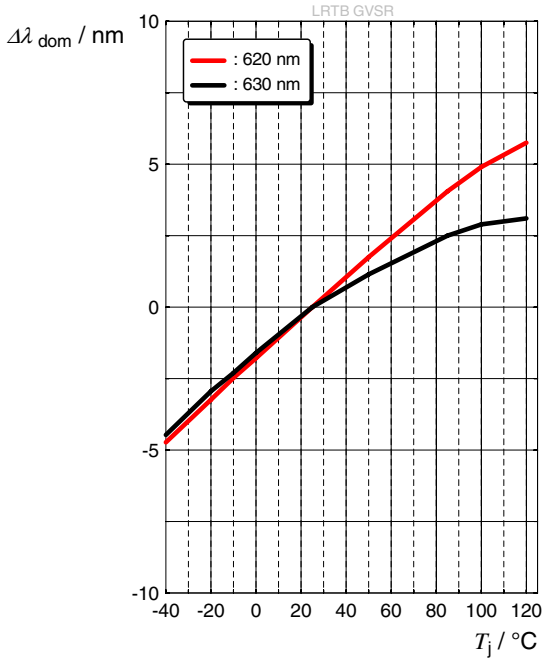


Dominant Wavelength 6)

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



Dominant Wavelength 6)

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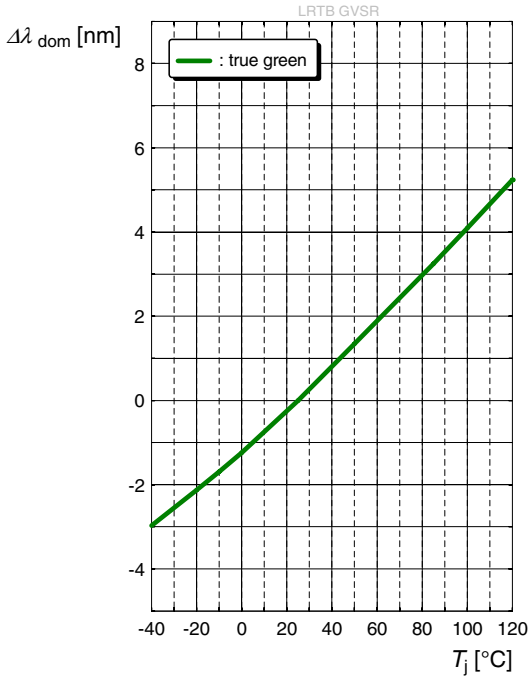
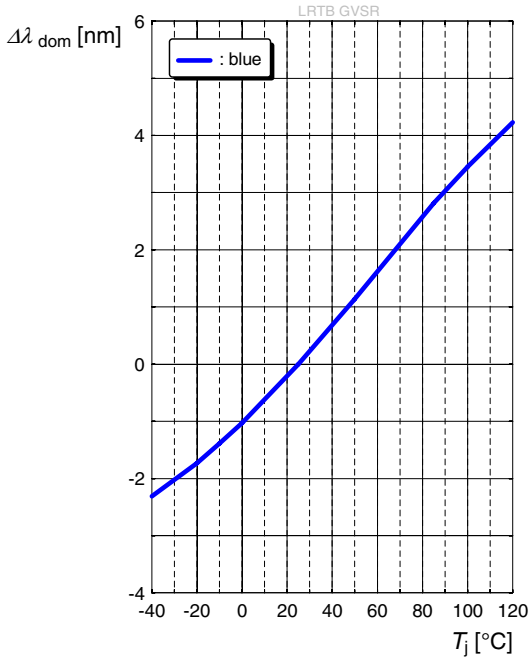


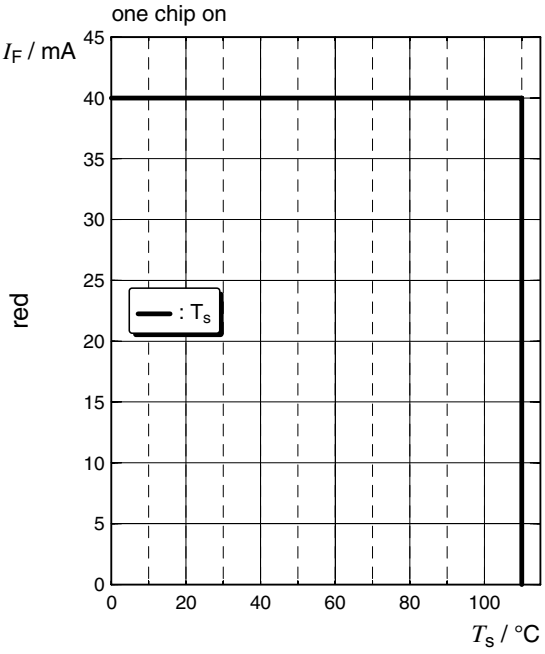
Dominant Wavelength 6)

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



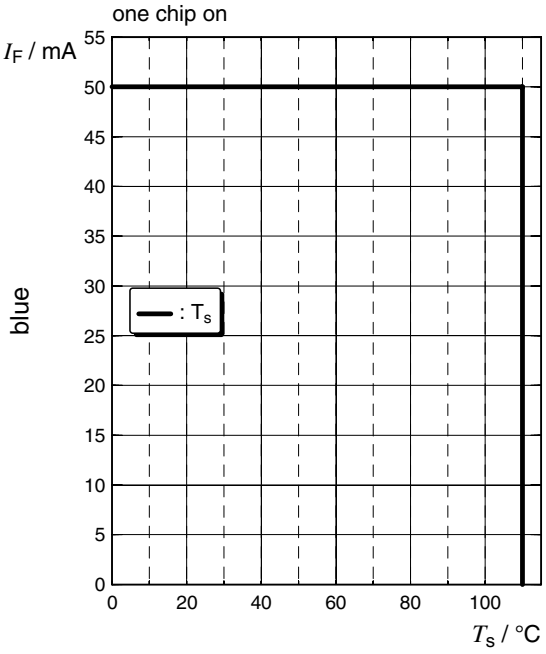
Max. Permissible Forward Current [5]

I_F = f(T); ● red



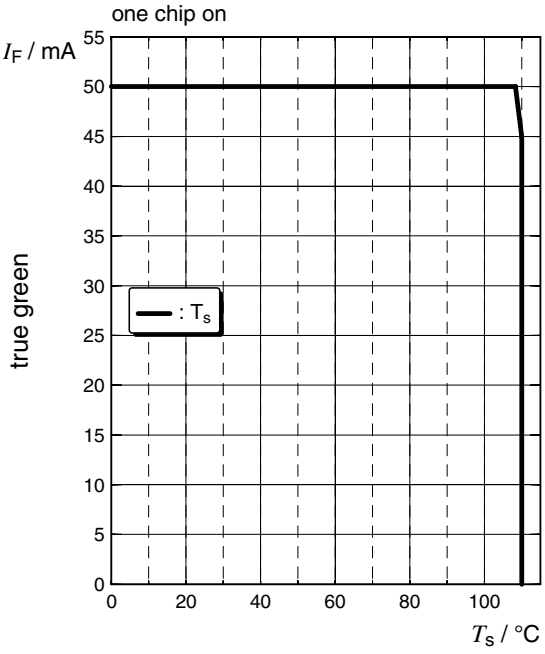
Max. Permissible Forward Current [5]

I_F = f(T); ● blue



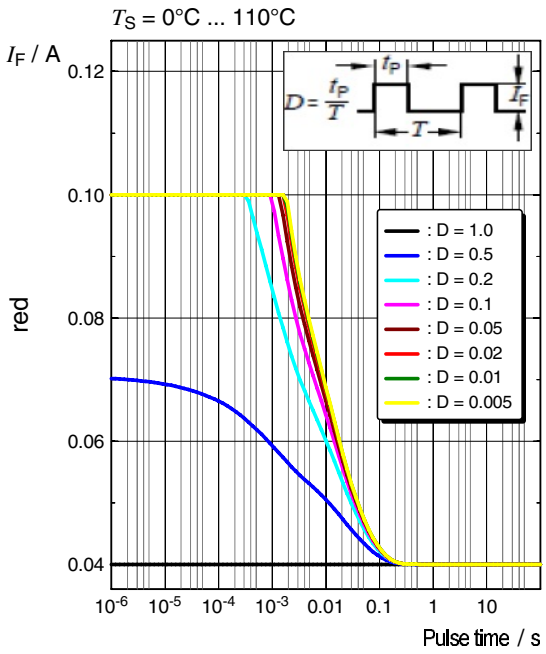
Max. Permissible Forward Current [5]

I_F = f(T); ● true green



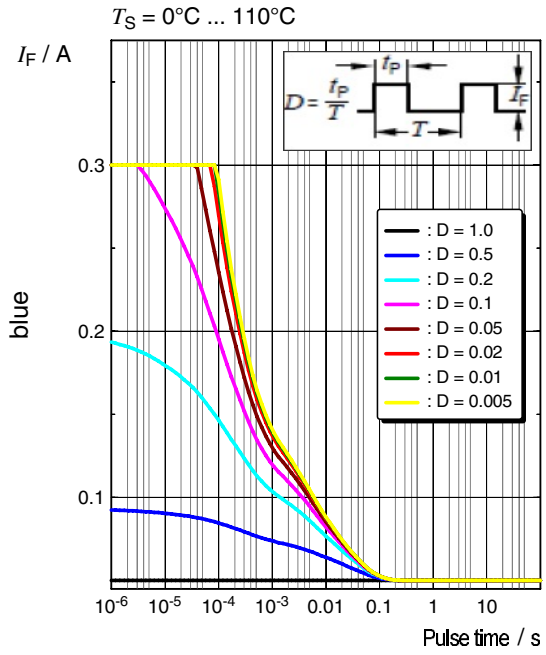
Permissible Pulse Handling Capability

$I_F = f(t_p)$; D: Duty cycle; ● red



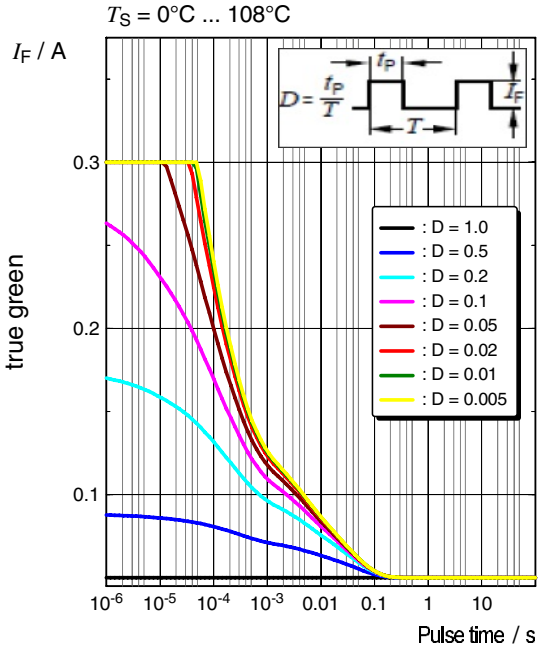
Permissible Pulse Handling Capability

$I_F = f(t_p)$; D: Duty cycle; ● blue



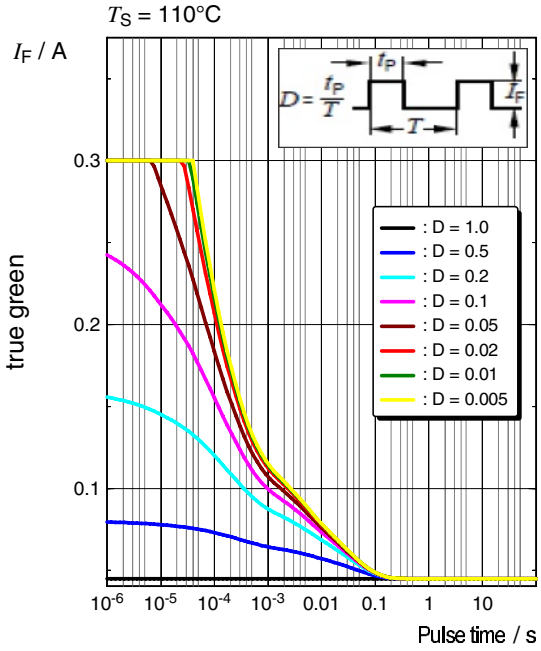
Permissible Pulse Handling Capability

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

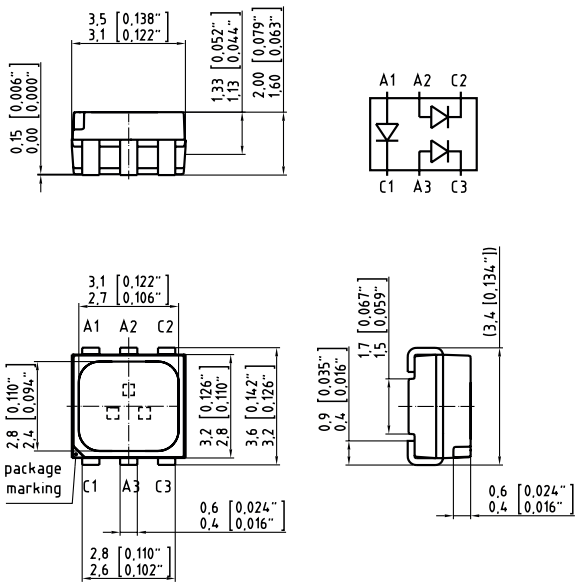


Permissible Pulse Handling Capability

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



Dimensional Drawing [8)]



C63062-A4159-A1-03

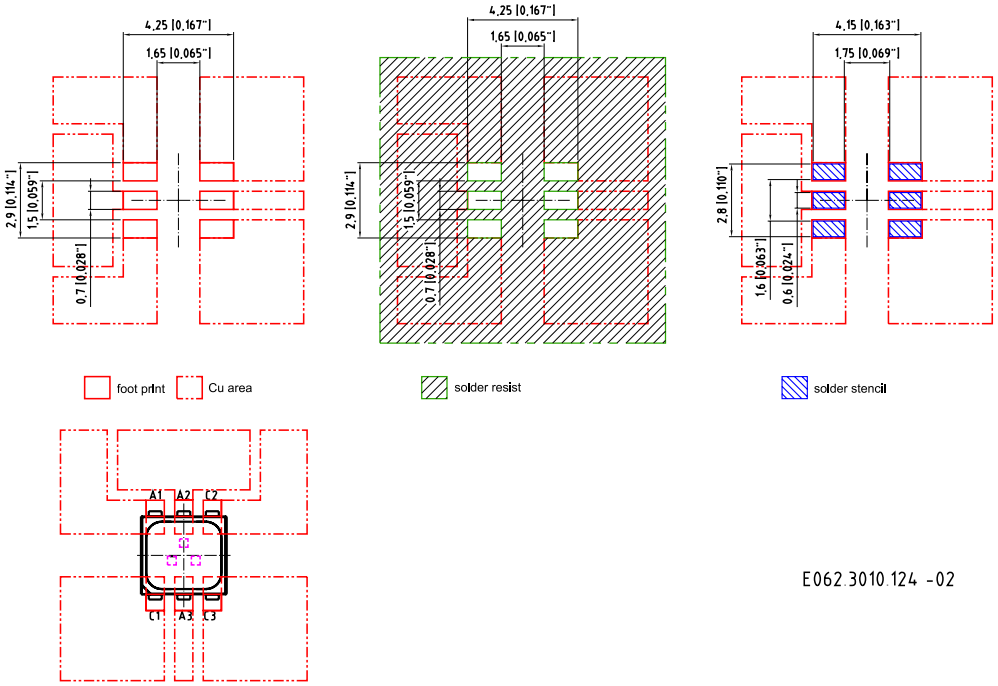
Pin	Description
C1	Cathode True Green
A1	Anode True Green
C2	Cathode Red
A2	Anode Red
C3	Cathode Blue
A3	Anode Blue

Further Information:

Approximate Weight: 38.0 mg

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

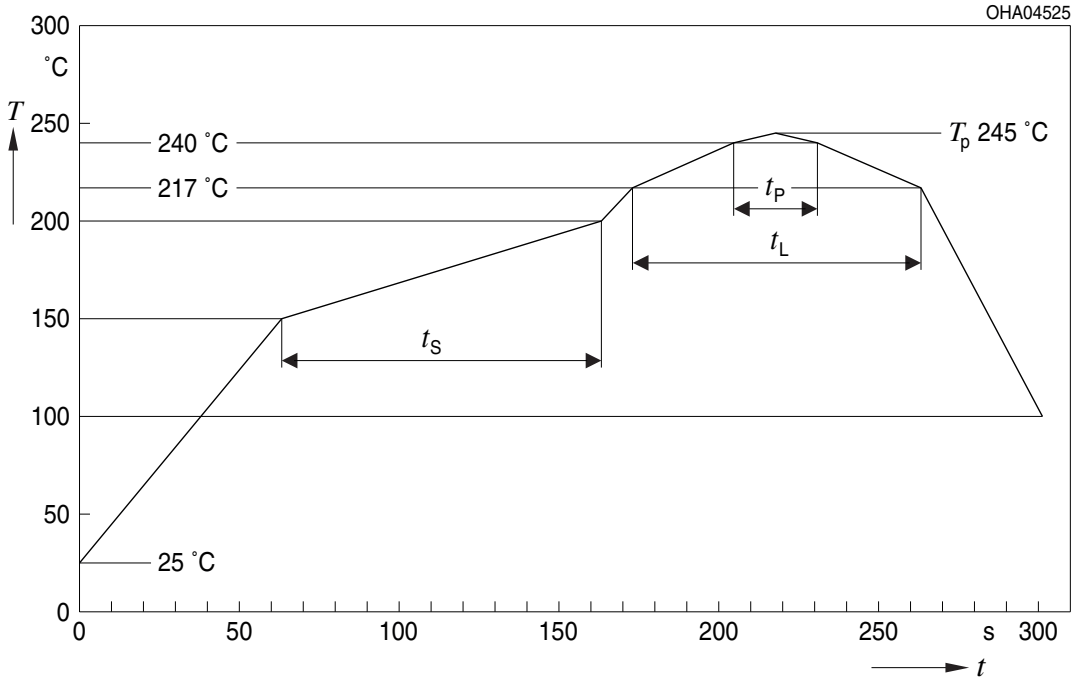
Recommended Solder Pad [8)]



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

Reflow Soldering Profile

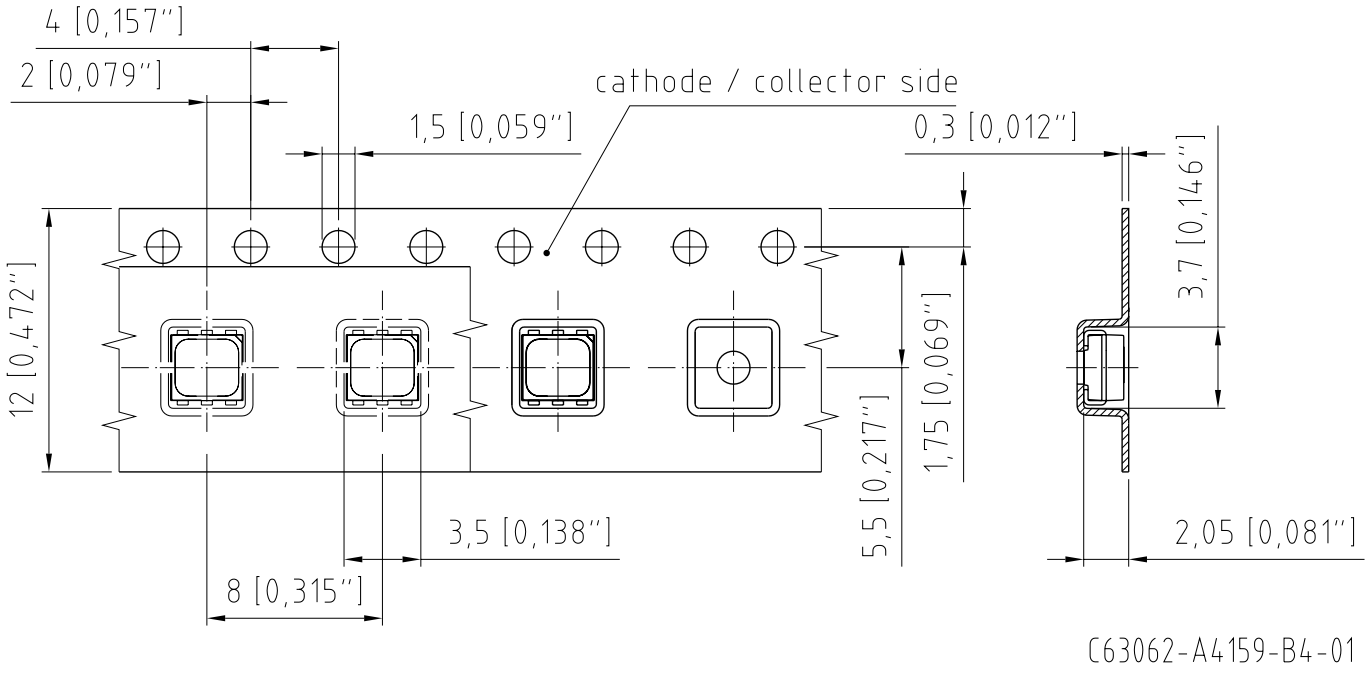
Product complies to MSL Level 2 acc. to JEDEC J-STD-020E



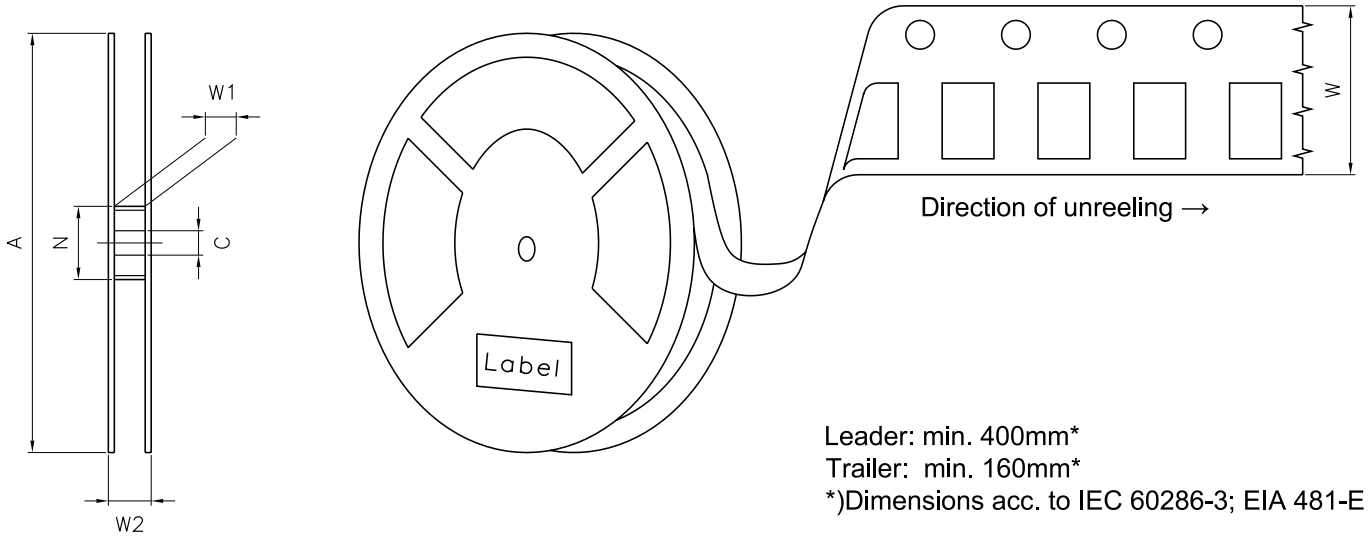
Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat*) 25 °C to 150 °C			2	3	K/s
Time t_S T_{Smin} to T_{Smax}	t_S	60	100	120	s
Ramp-up rate to peak*) T_{Smax} to T_P			2	3	K/s
Liquidus temperature	T_L		217		°C
Time above liquidus temperature	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 [8)]


4 [0,157"]
2 [0,079"]
cathode / collector side
1,5 [0,059"]
0,3 [0,012"]
3,7 [0,146"]
12 [0,472"]
1,75 [0,069"]
5,5 [0,217"]
3,5 [0,138"]
2,05 [0,081"]
8 [0,315"]
C63062-A4159-B4-01

Tape and Reel [9)]

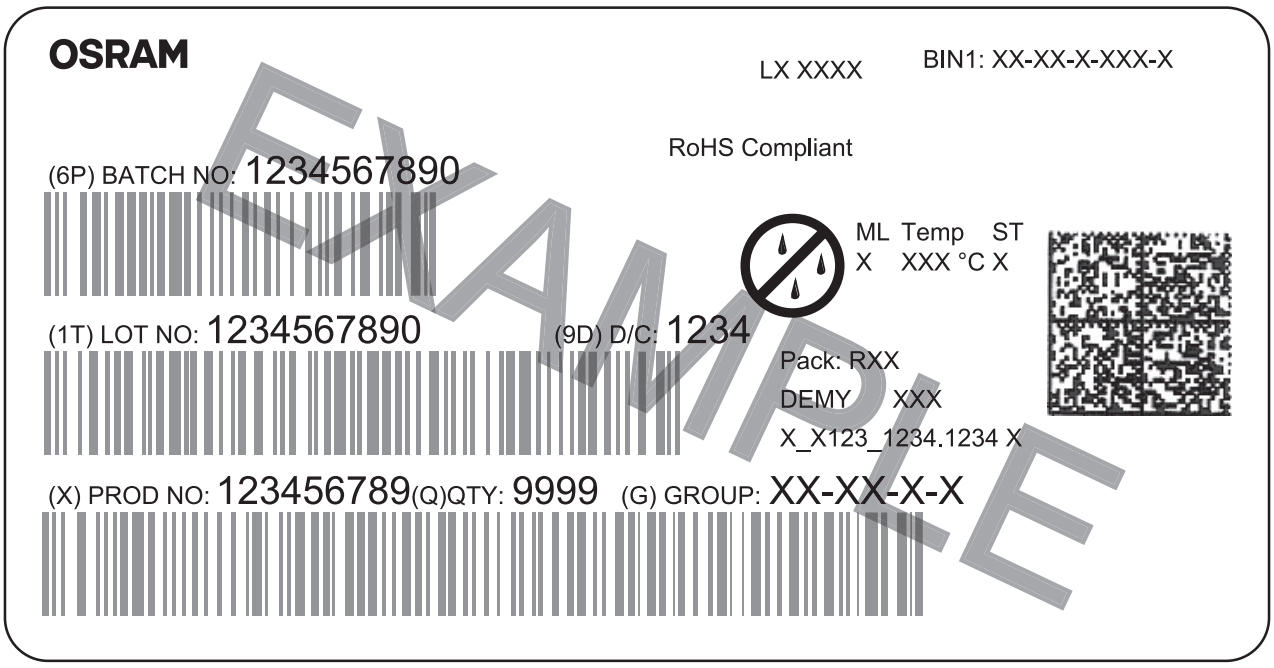


Leader: min. 400mm*
Trailer: min. 160mm*
*)Dimensions acc. to IEC 60286-3; EIA 481-E

Reel Dimensions

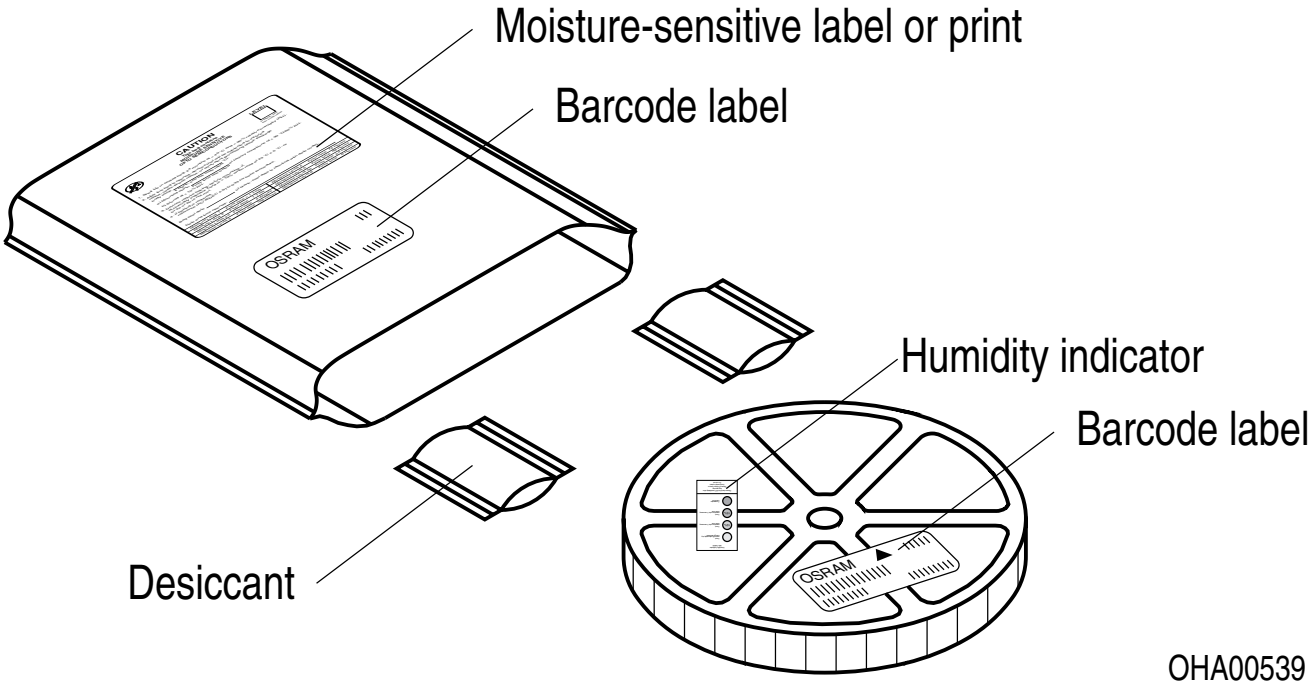
A	W	N_{min}	W_1	$W_{2\,max}$	Pieces per PU
180 mm	12 + 0.3 / - 0.1 mm	60 mm	12.4 + 2 mm	18.4 mm	1000

Barcode-Product-Label (BPL)



OHA04563

Dry Packing Process and Materials [8)]



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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 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 ±8 % and an expanded uncertainty of ±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 ±0.5 nm and an expanded uncertainty of ±1 nm (acc. to GUM with a coverage factor of k = 3).

4) **Forward Voltage:** Forward voltages are tested at a current pulse duration of 1 ms and a tolerance 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:** Rth max is based on statistic values (6σ) used for Derating.

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
1.0	2019-12-11	Initial Version
1.1	2020-05-04	Ordering Information
1.2	2020-05-18	Additional Information
1.3	2022-12-22	Ordering Information New Layout Applications
1.4	2023-09-11	Description

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
Tobelbader Strasse 30, 8141 Premstaetten, Austria
Phone +43 3136 500-0
ams-osram.com