

OSRAM KRTBDSLP31.33

Datasheet

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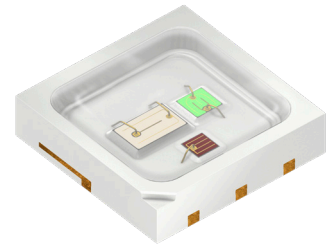
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OSIRE™ E3030

KRTB DSLP31.33

The OSIRE E3030 is especially designed for automotive applications. The 6-lead technology offers an additive mixture of color stimuli by independent driving of each chip. The superior brightness of the mid power device enables design freedom especially for light guide illumination and backlighting of materials with low transmission.



Applications

- Ambient Lighting
- Automotive Aftermarket

Features

- Chip technology: Thinfilm / Volume emitter on Sapphire (AlInGaN)
- Color: $\lambda_{\text{dom}} = 624 \text{ nm}$ (● red); $\lambda_{\text{dom}} = 526 \text{ nm}$ (● true green); $\lambda_{\text{dom}} = 459 \text{ nm}$ (● 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
KRTBDSLP31.33-7G8H-JW+5H6J-D8+5E5G-7Z		Q65113A6935
● red	● $\Phi_V = 22.4 \dots 45.0 \text{ lm}$ ($I_F = 200 \text{ mA}$)	
● true green	● $\Phi_V = 28.0 \dots 56.0 \text{ lm}$ ($I_F = 150 \text{ mA}$)	
● blue	● $\Phi_V = 7.1 \dots 20.1 \text{ lm}$ ($I_F = 200 \text{ mA}$)	



Maximum Ratings

Parameter	Symbol		Values	Values	Values
			● red	● true green	● blue
Operating Temperature	T_{op}	min.	-40 °C	-40 °C	-40 °C
		max.	125 °C	125 °C	125 °C
Storage Temperature	T_{stg}	min.	-40 °C	-40 °C	-40 °C
		max.	125 °C	125 °C	125 °C
Junction Temperature	T_j	max.	150 °C	150 °C	150 °C
Forward Current $T_s = 25\text{ °C}$	I_F	min.	10 mA	10 mA	10 mA
		max.	250 mA	200 mA	250 mA
Forward Current pulsed $t \leq 10\text{ }\mu\text{s}$; $D \leq 0.005$; $T_s = 25\text{ °C}$	$I_{F\text{ pulse}}$		480 mA	400 mA	480 mA
Reverse voltage ²⁾ $T_s = 25\text{ °C}$	V_R	max.	10 V	7 V	7 V
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	V_{ESD}		2 kV	2 kV	2 kV

Characteristics

$T_s = 25\text{ °C}$

Parameter	Symbol		Values ● red	Values ● true green	Values ● blue
Dominant Wavelength ³⁾	λ_{dom}	min.	620 nm	519 nm	447 nm
		typ.	624 nm	526 nm	459 nm
		max.	632 nm	546 nm	476 nm
Forward Voltage ⁴⁾	V_F	min.	1.90 V	2.80 V	2.90 V
$I_F = 200\text{ mA}$ (red), 150 mA (true green), 200 mA (blue)		typ.	2.35 V	3.25 V	3.40 V
		max.	2.60 V	3.50 V	3.70 V
Reverse current ²⁾	I_R	typ.	0.01 μA	0.01 μA	0.01 μA
$V_R = 10\text{ V}$		max.	10 μA	10 μA	10 μA
Real thermal resistance junction/solderpoint ⁵⁾	$R_{\text{thJS real}}$	typ.	19 K / W	48 K / W	41 K / W
		max.	25 K / W	57 K / W	54 K / W
Electrical thermal resistance junction/solderpoint ⁵⁾	$R_{\text{thJS elec.}}$	typ.	12 K / W	40 K / W	23 K / W
with efficiency $\eta_e = 39\%$ (red), 17 % (true green), 43 % (blue)		max.	15 K / W	48 K / W	31 K / W

Brightness Groups

• red

Group	Luminous Flux ¹⁾ $I_F = 200 \text{ mA}$ min. Φ_V	Luminous Flux ¹⁾ $I_F = 200 \text{ mA}$ max. Φ_V
7G	22.4 lm	25.0 lm
8G	25.0 lm	28.0 lm
5H	28.0 lm	31.5 lm
6H	31.5 lm	35.5 lm
7H	35.5 lm	40.0 lm
8H	40.0 lm	45.0 lm

Brightness Groups

• true green

Group	Luminous Flux ¹⁾ $I_F = 150 \text{ mA}$ min. Φ_V	Luminous Flux ¹⁾ $I_F = 150 \text{ mA}$ max. Φ_V
5H	28.0 lm	31.5 lm
6H	31.5 lm	35.5 lm
7H	35.5 lm	40.0 lm
8H	40.0 lm	45.0 lm
5J	45.0 lm	50.0 lm
6J	50.0 lm	56.0 lm

Brightness Groups

- blue

Group	Luminous Flux ¹⁾ $I_F = 200 \text{ mA}$ min. Φ_V	Luminous Flux ¹⁾ $I_F = 200 \text{ mA}$ max. Φ_V
5E	7.1 lm	8.0 lm
6E	8.0 lm	9.0 lm
7E	9.0 lm	10.0 lm
8E	10.0 lm	11.2 lm
5F	11.2 lm	12.5 lm
6F	12.5 lm	14.0 lm
7F	14.0 lm	15.9 lm
8F	15.9 lm	18.0 lm
5G	18.0 lm	20.1 lm

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

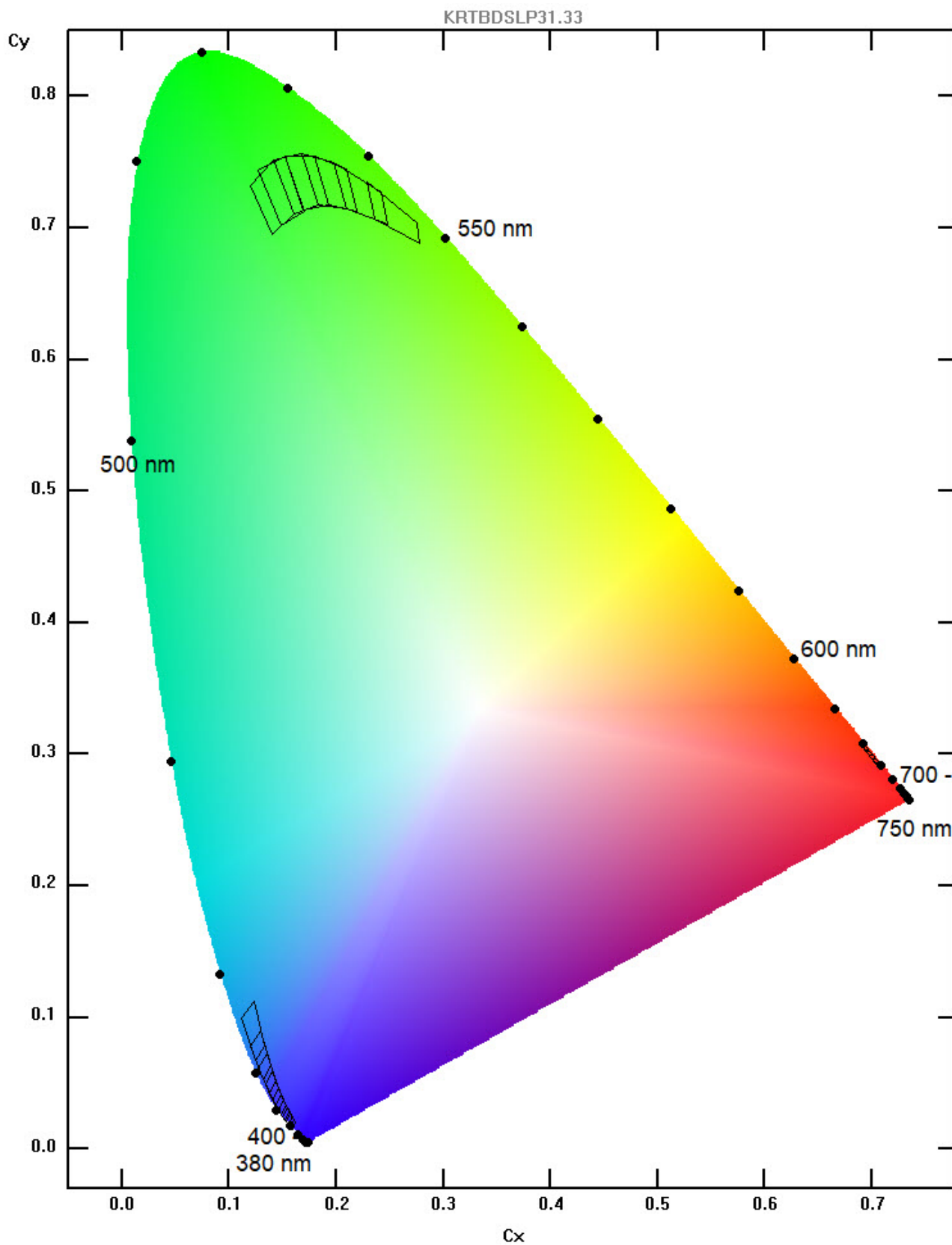
Group	Dominant Wavelength ³⁾ min. λ_{dom}	Dominant Wavelength ³⁾ max. λ_{dom}
DJ	519 nm	524 nm
FL	521 nm	526 nm
JP	524 nm	529 nm
LR	526 nm	531 nm
PU	529 nm	534 nm
RW	531 nm	536 nm
U3	534 nm	541 nm
18	539 nm	546 nm

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
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
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

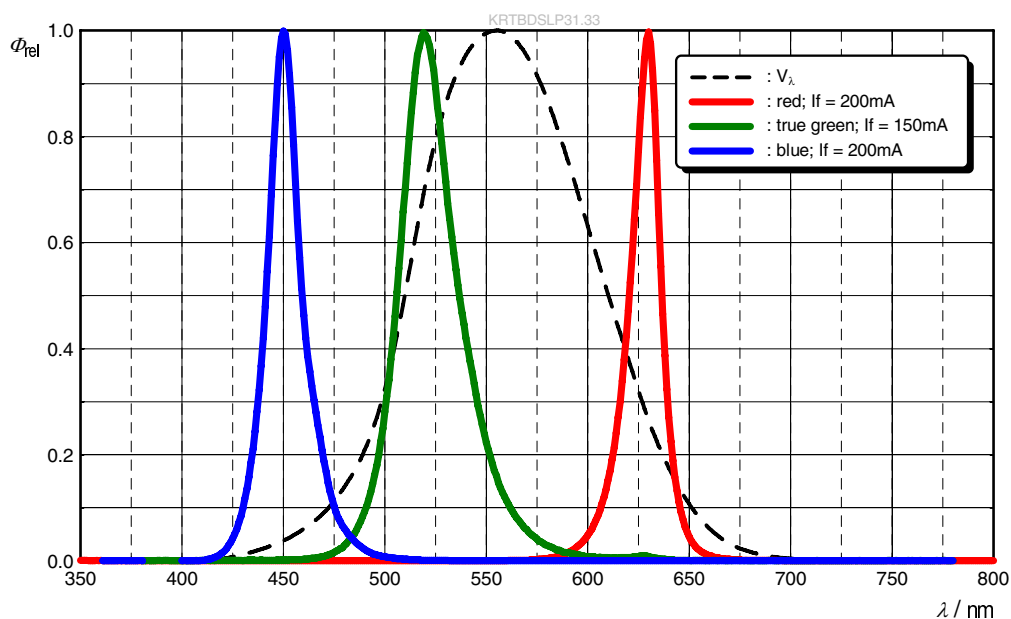
Chromaticity Coordinate Groups

• blue

Group	Cx	Cy
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

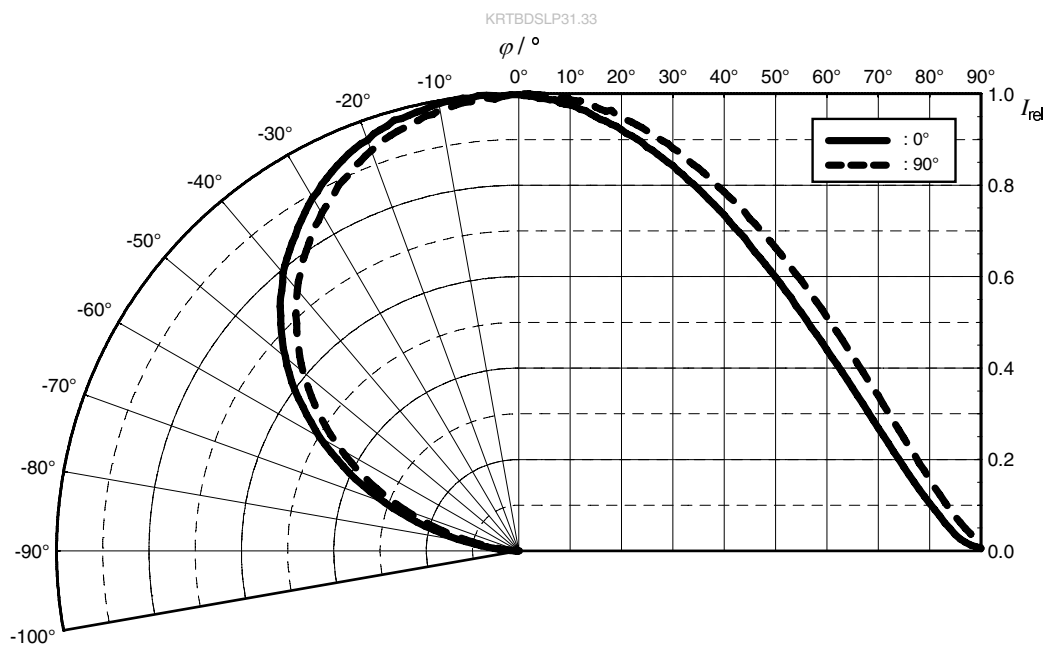
Relative Spectral Emission ⁶⁾

$\Phi_{\text{rel}} = f(\lambda)$; $I_F = 200 \text{ mA}$ (red/blue) $I_F = 150 \text{ mA}$ (true green); $T_S = 25^\circ \text{C}$



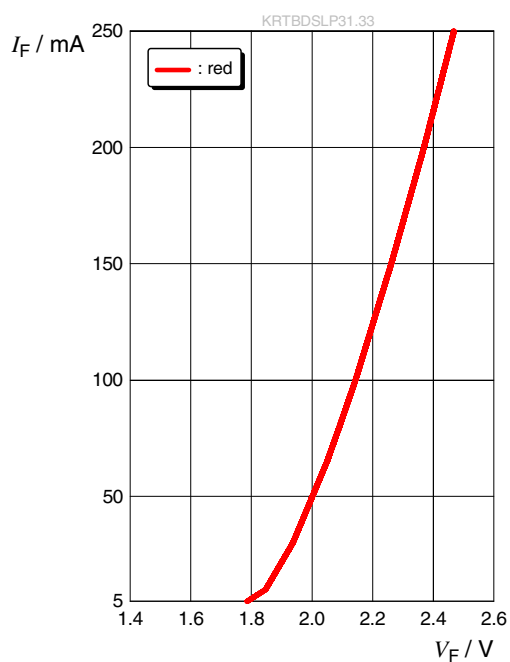
Radiation Characteristics ⁶⁾

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



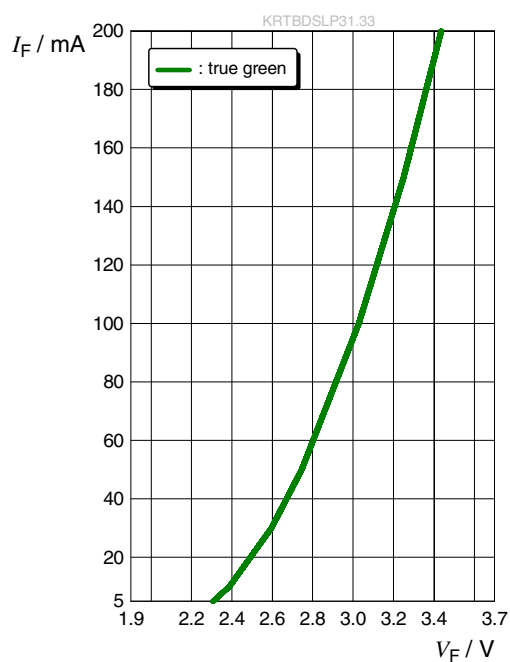
Forward current ⁶⁾

$$I_F = f(V_F); T_S = 25\text{ °C}$$



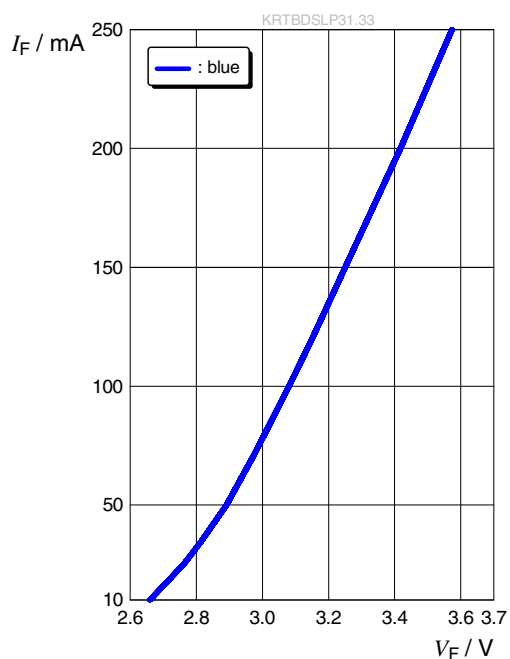
Forward current ⁶⁾

$$I_F = f(V_F); T_S = 25\text{ °C}$$



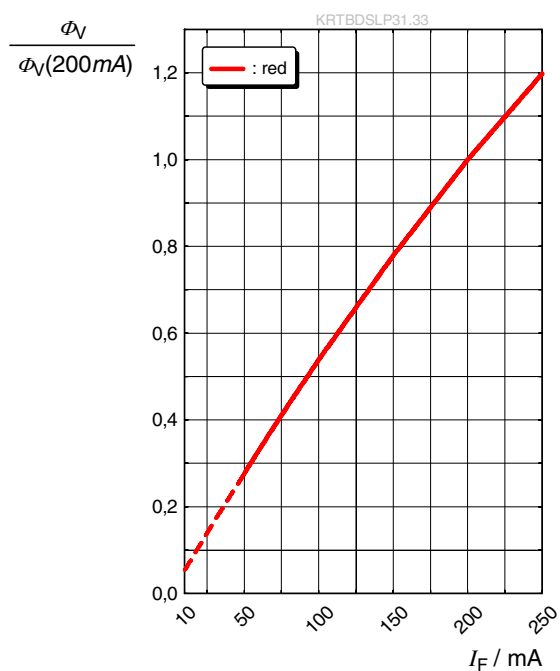
Forward current ⁶⁾

$$I_F = f(V_F); T_S = 25\text{ °C}$$

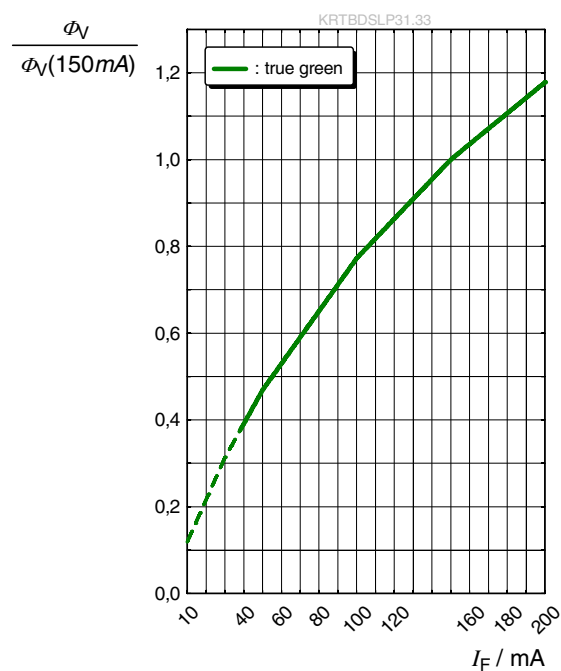


Relative Luminous Flux 6), 7)

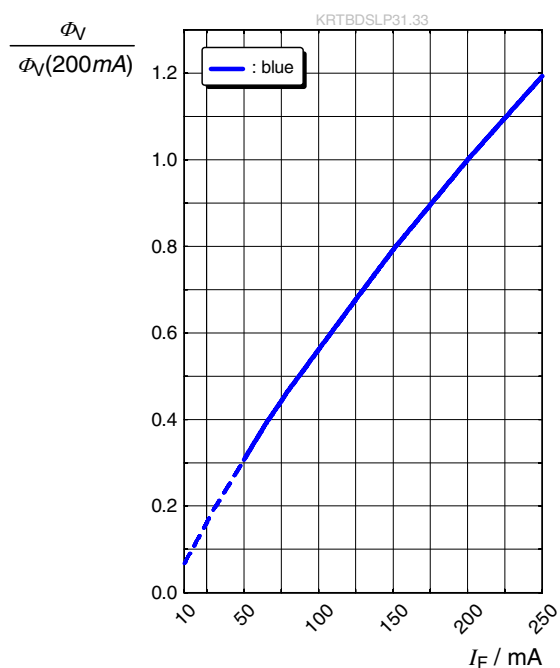
$$\Phi_V / \Phi_V(200 \text{ mA}) = f(I_F); T_S = 25^\circ \text{C}$$

**Relative Luminous Flux** 6), 7)

$$\Phi_V / \Phi_V(150 \text{ mA}) = f(I_F); T_S = 25^\circ \text{C}$$

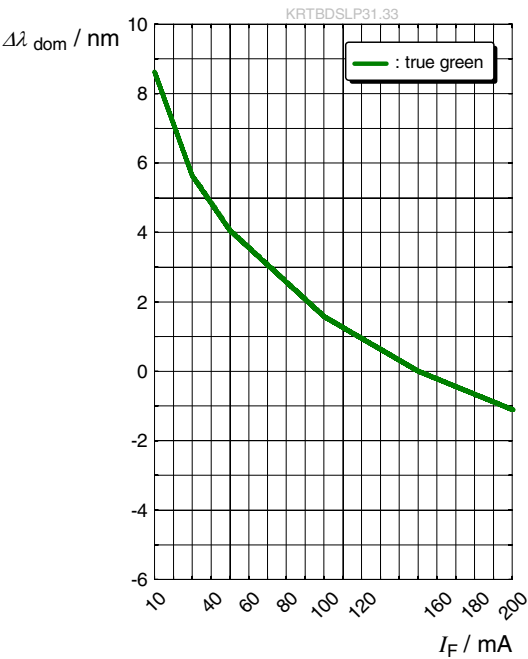
**Relative Luminous Flux** 6), 7)

$$\Phi_V / \Phi_V(200 \text{ mA}) = f(I_F); T_S = 25^\circ \text{C}$$



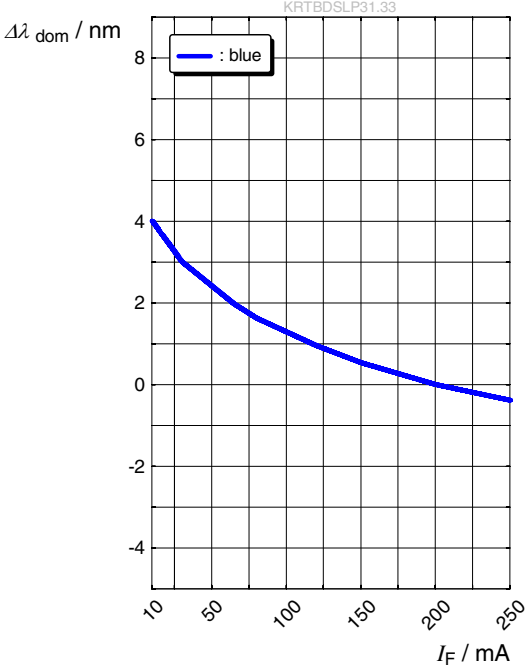
Dominant Wavelength ⁶⁾

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



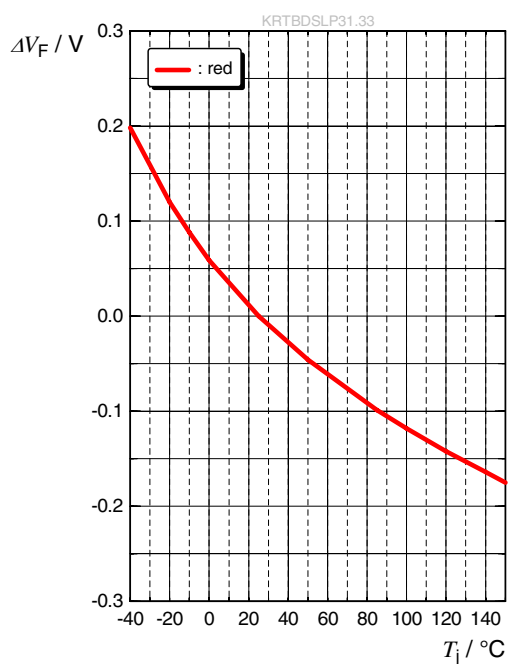
Dominant Wavelength ⁶⁾

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

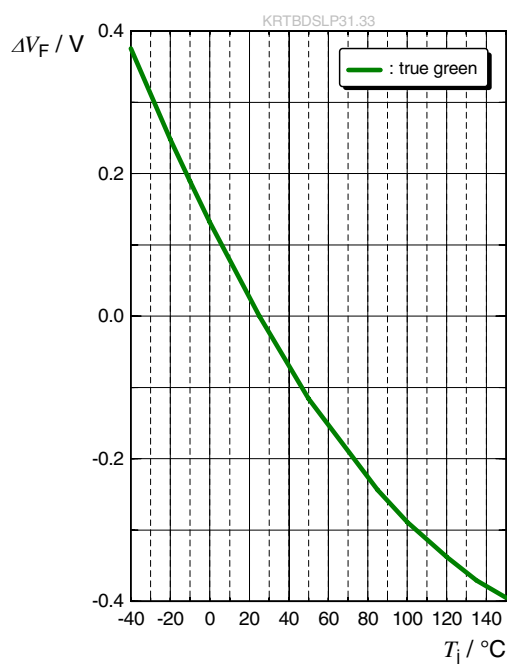


Forward Voltage ⁶⁾

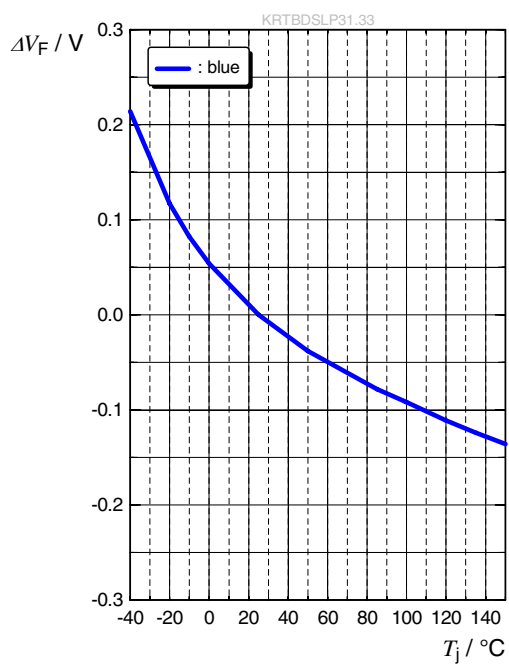
$$\Delta V_F = V_F - V_F(25\text{ }^{\circ}\text{C}) = f(T_j); I_F = 200\text{ mA}$$

**Forward Voltage** ⁶⁾

$$\Delta V_F = V_F - V_F(25\text{ }^{\circ}\text{C}) = f(T_j); I_F = 150\text{ mA}$$

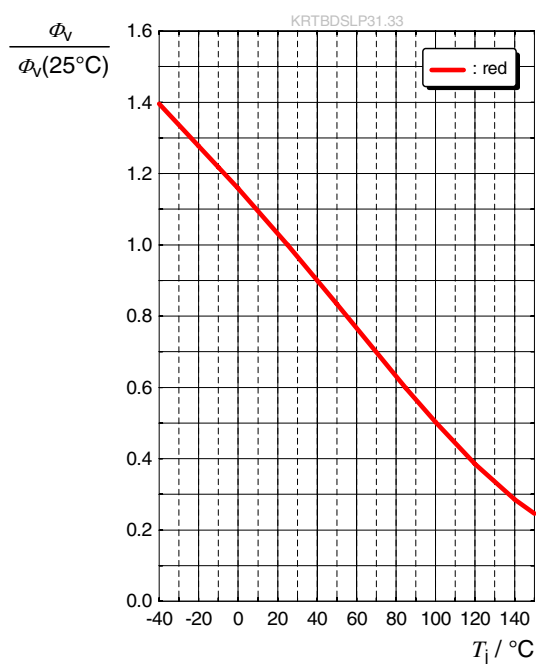
**Forward Voltage** ⁶⁾

$$\Delta V_F = V_F - V_F(25\text{ }^{\circ}\text{C}) = f(T_j); I_F = 200\text{ mA}$$

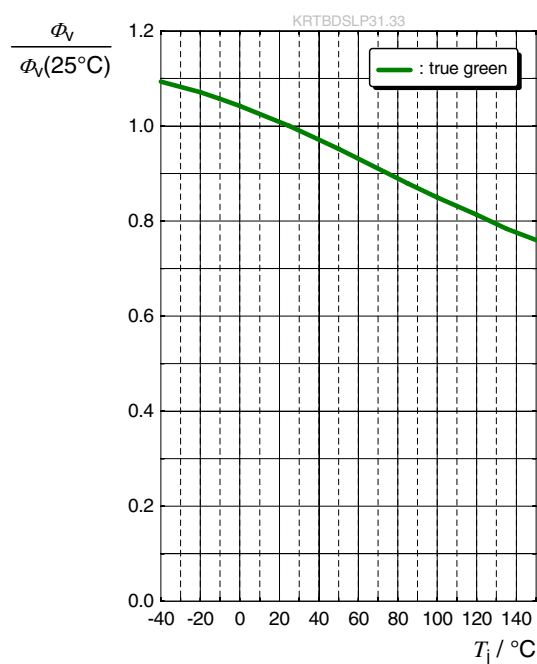


Relative Luminous Flux ⁶⁾

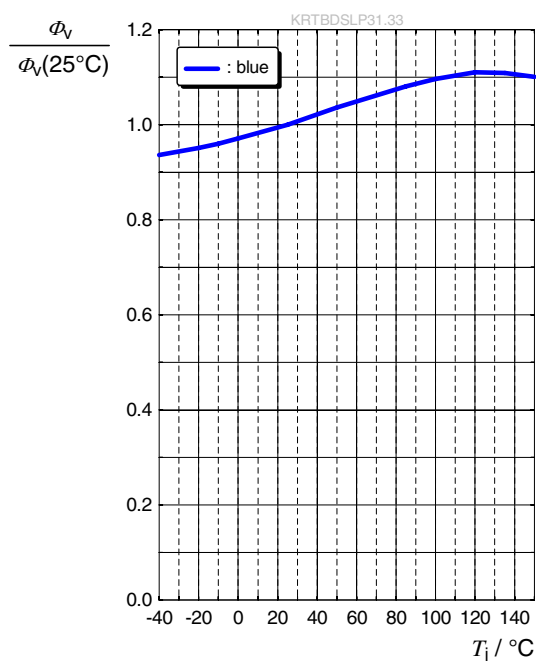
$$\Phi_V / \Phi_V(25^\circ\text{C}) = f(T_j); I_F = 200\text{ mA}$$

**Relative Luminous Flux** ⁶⁾

$$\Phi_V / \Phi_V(25^\circ\text{C}) = f(T_j); I_F = 150\text{ mA}$$

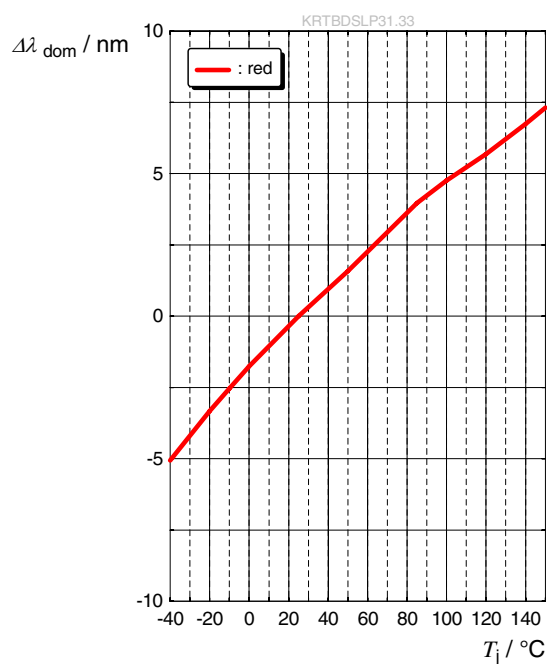
**Relative Luminous Flux** ⁶⁾

$$\Phi_V / \Phi_V(25^\circ\text{C}) = f(T_j); I_F = 200\text{ mA}$$

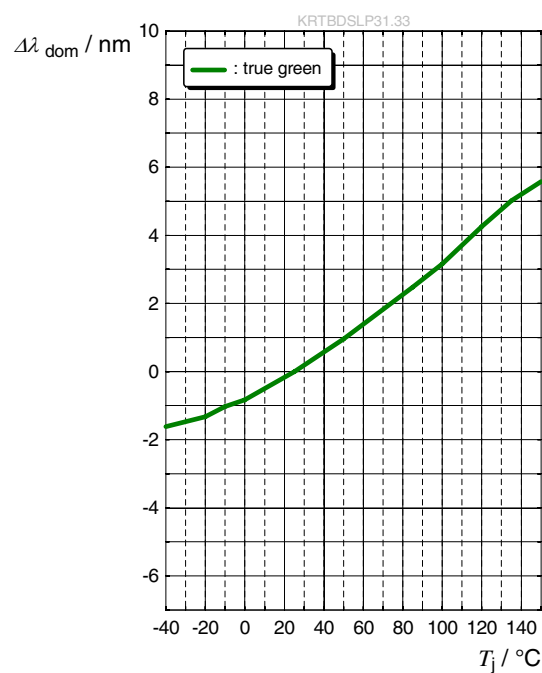


Dominant Wavelength ⁶⁾

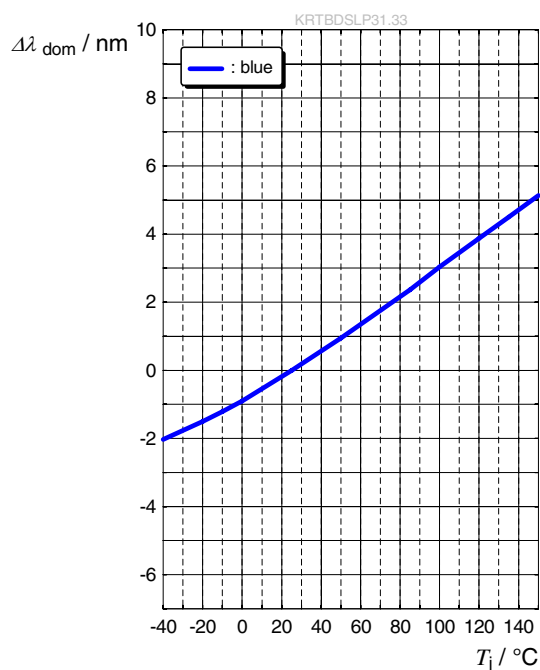
$$\Delta\lambda_{\text{dom}} = \lambda_{\text{dom}} - \lambda_{\text{dom}}(25\text{ °C}) = f(T_j); I_F = 200\text{ mA}$$

**Dominant Wavelength** ⁶⁾

$$\Delta\lambda_{\text{dom}} = \lambda_{\text{dom}} - \lambda_{\text{dom}}(25\text{ °C}) = f(T_j); I_F = 150\text{ mA}$$

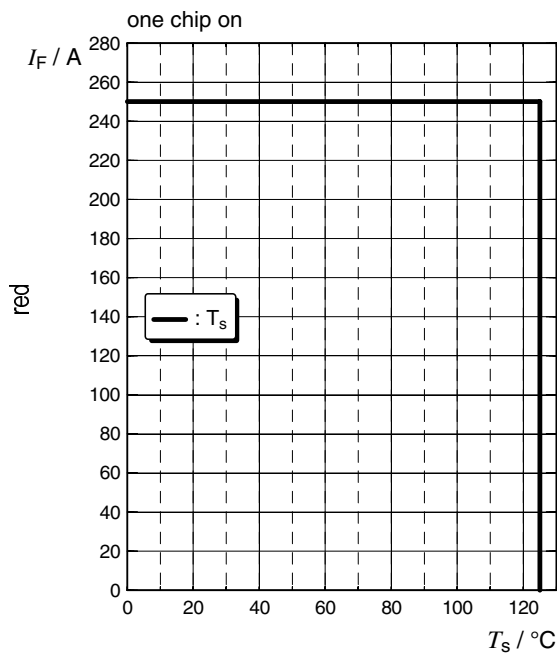
**Dominant Wavelength** ⁶⁾

$$\Delta\lambda_{\text{dom}} = \lambda_{\text{dom}} - \lambda_{\text{dom}}(25\text{ °C}) = f(T_j); I_F = 200\text{ mA}$$



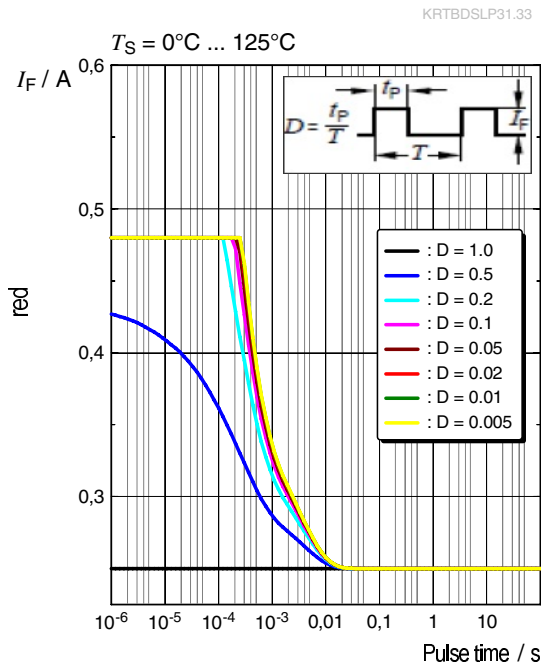
Max. Permissible Forward Current ⁵⁾

$I_F = f(T)$; • red



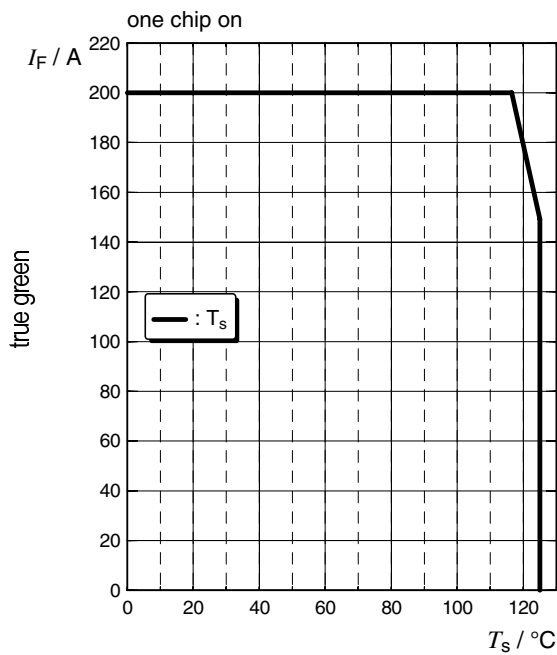
Permissible Pulse Handling Capability

$I_F = f(t_p)$; D: Duty cycle; • red



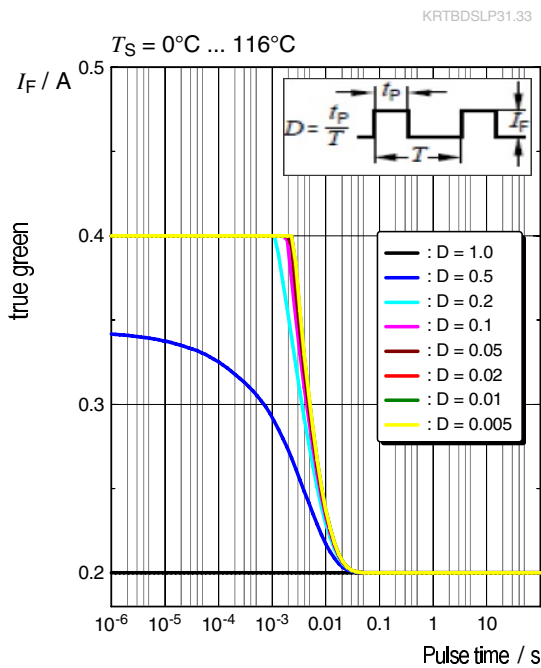
Max. Permissible Forward Current ⁵⁾

$I_F = f(T)$; • true green



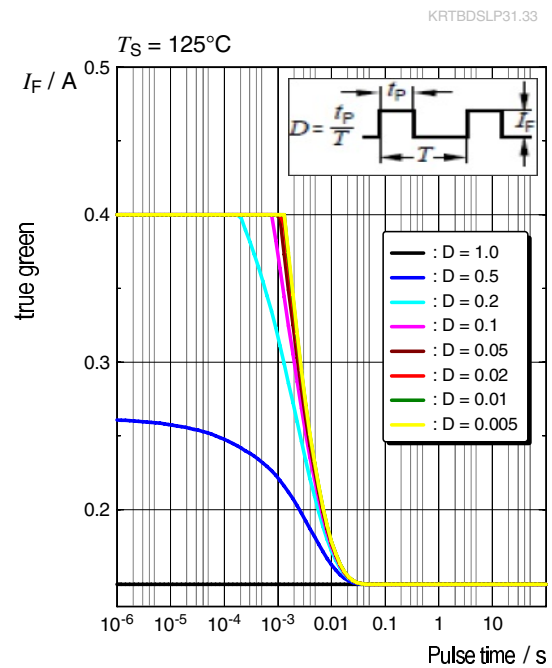
Permissible Pulse Handling Capability

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



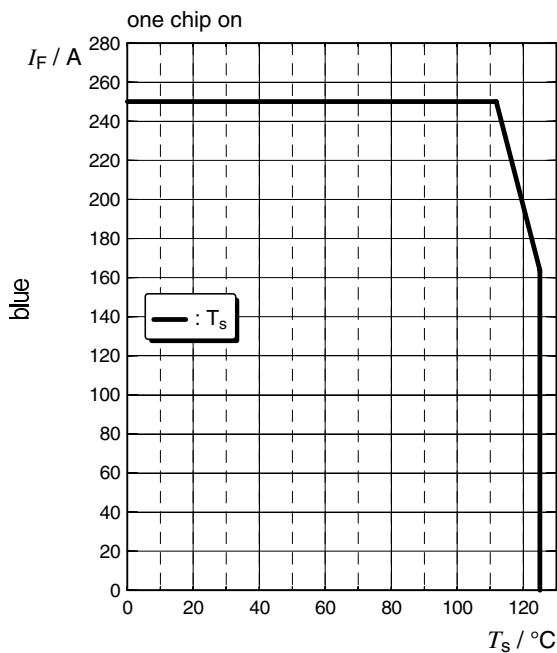
Permissible Pulse Handling Capability

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



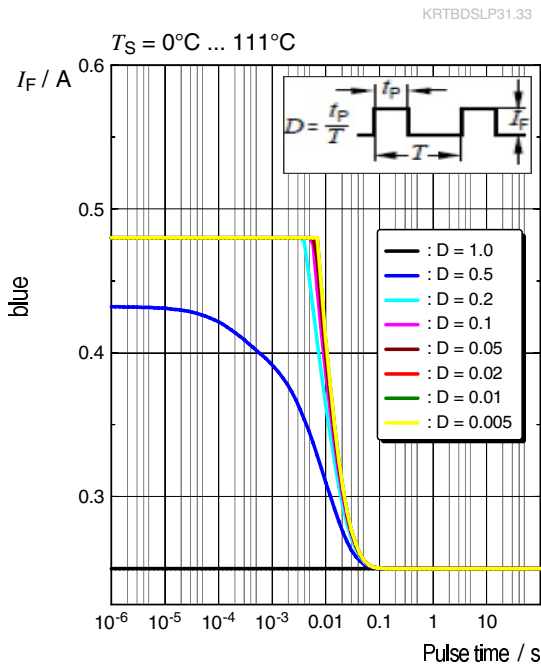
Max. Permissible Forward Current ⁵⁾

$I_F = f(T)$; • blue



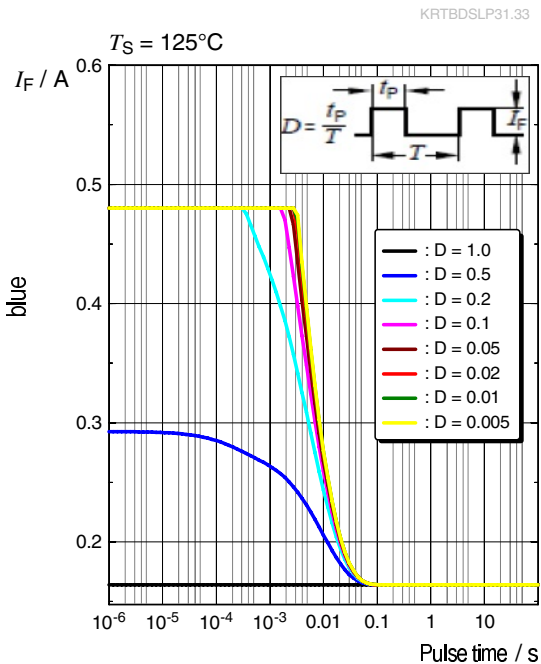
Permissible Pulse Handling Capability

$I_F = f(t_p)$; D: Duty cycle; • blue

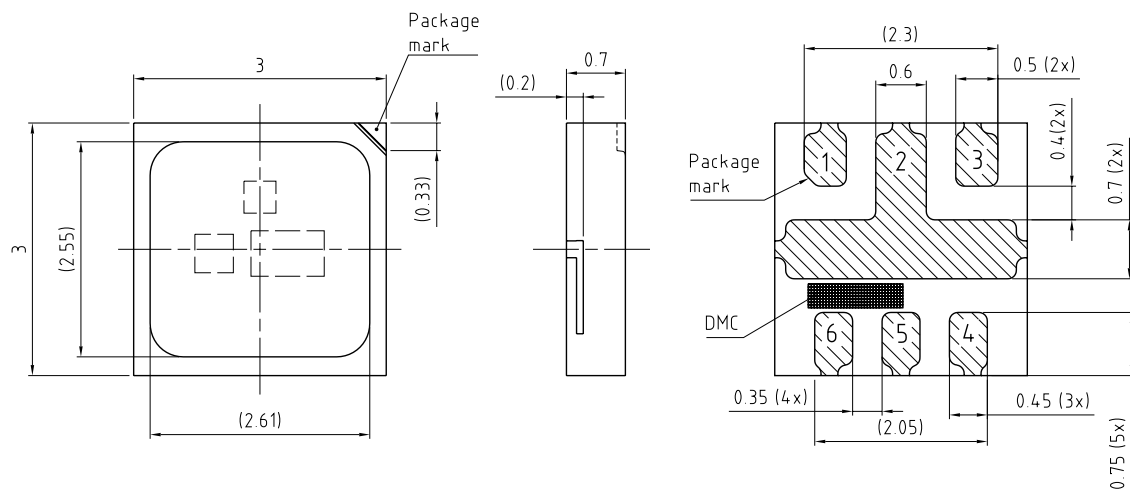


Permissible Pulse Handling Capability

$I_F = f(t_p)$; D: Duty cycle; • blue



Dimensional Drawing ⁸⁾



general tolerance ± 0.1

lead finish Au 

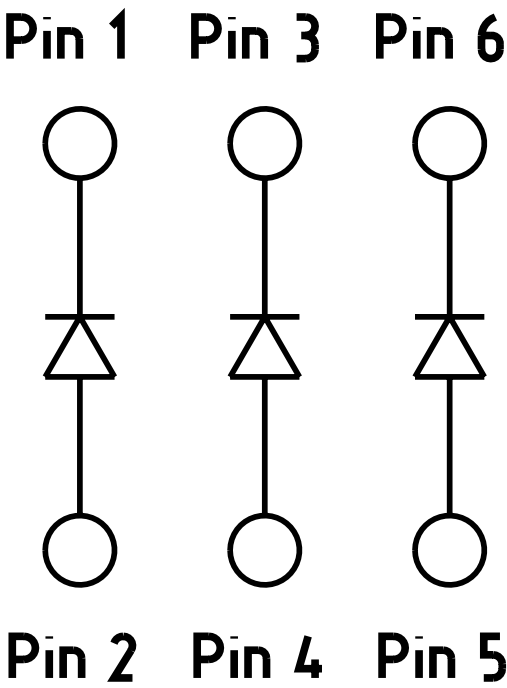
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Further Information:

Approximate Weight: 16.0 mg

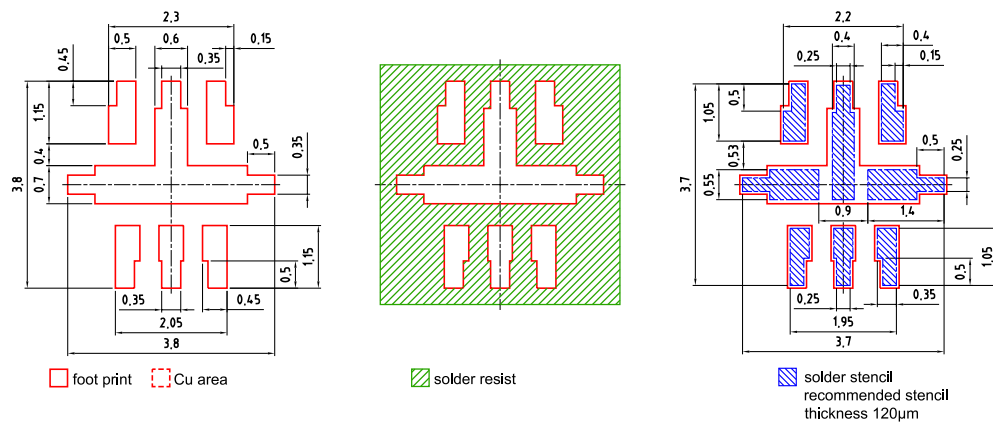
Corrosion test: Class: 3B
Test condition: 40°C / 90 % RH / 15 ppm H₂S / 14 days (stricter than IEC 60068-2-43)

Electrical Internal Circuit

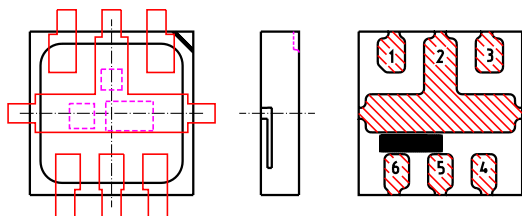


Pin	Description
1	Cathode Red
2	Anode Red
3	Cathode Green
4	Anode Green
5	Anode Blue
6	Cathode Blue

Recommended Solder Pad ⁸⁾



Component Location on Pad

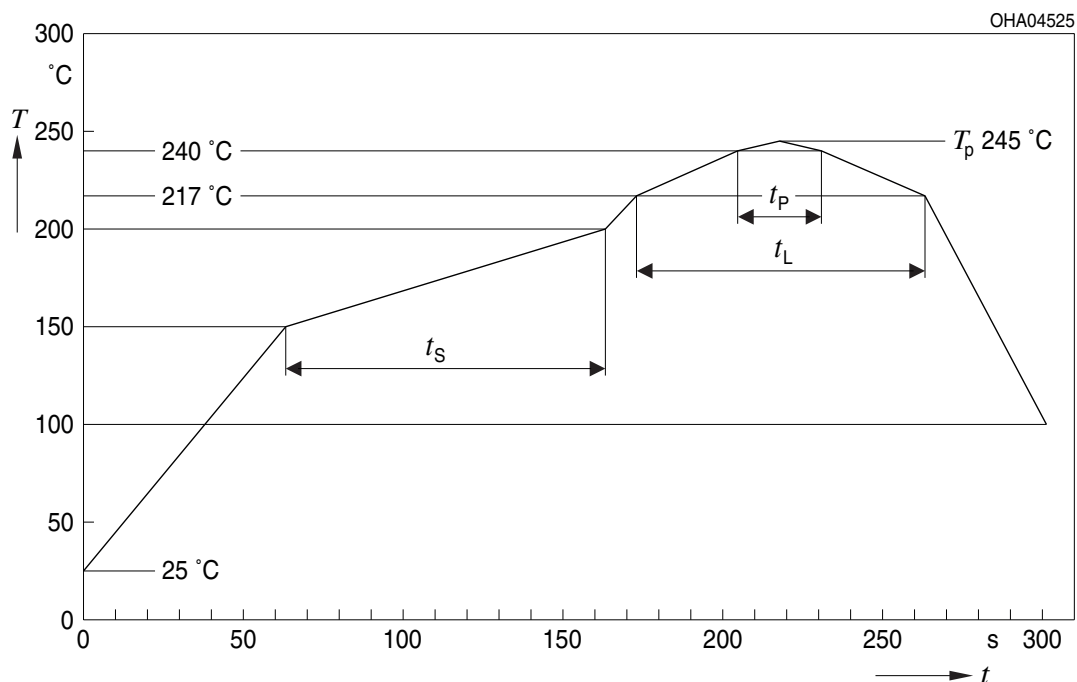


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For superior solder joint connectivity results we recommend soldering under standard nitrogen atmosphere.

Reflow Soldering Profile

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

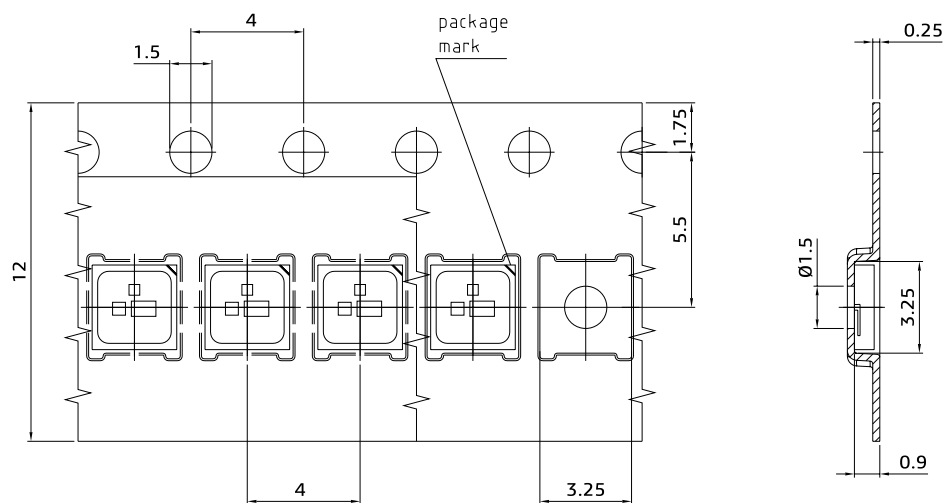


Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat*) 25 °C to 150 °C			2	3	K/s
Time t_s T_{Smin} to T_{Smax}	t_s	60	100	120	s
Ramp-up rate to peak*) T_{Smax} to T_p			2	3	K/s
Liquidus temperature	T_L		217		$^{\circ}\text{C}$
Time above liquidus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

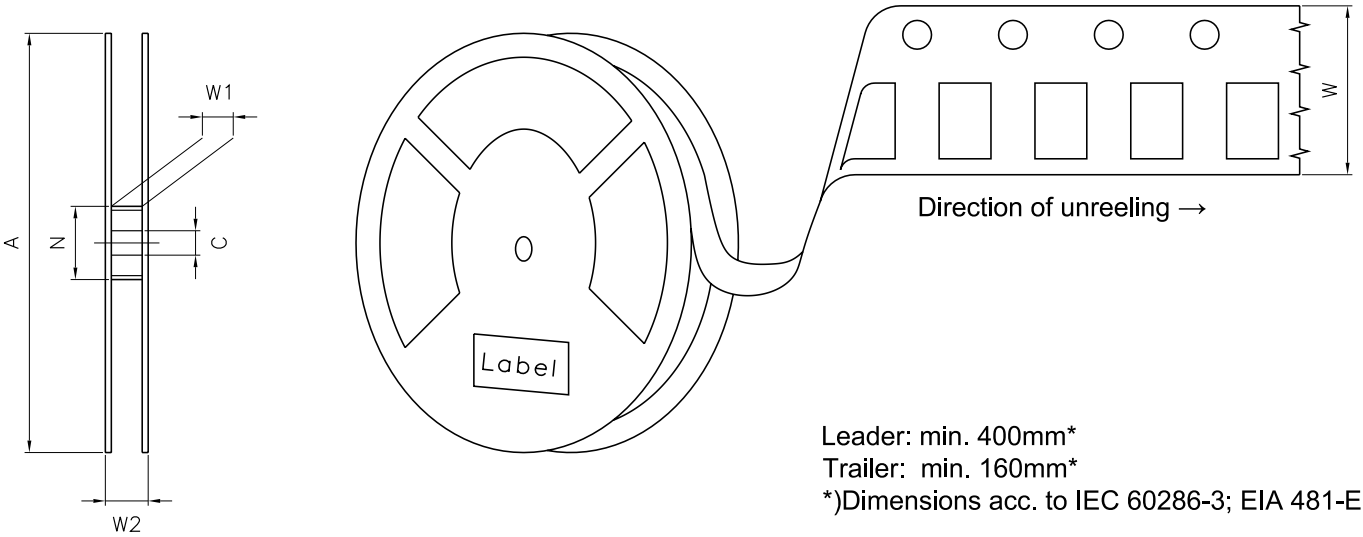
* slope calculation DT/Dt : Dt max. 5 s; fulfillment for the whole T-range

Taping ⁸⁾



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Tape and Reel ⁹⁾



Reel Dimensions

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

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

The diagram illustrates the packaging and labeling requirements for OSA components. It shows two types of components: a rectangular package and a circular disc. Both components are shown with labels and desiccant packets.

Rectangular Package:

- Moisture-sensitive label or print:** A label on the top surface of the package.
- Barcode label:** A label on the bottom surface of the package.
- Desiccant:** Two small packets are shown next to the package.

Circular Disc:

- Humidity indicator:** A label on the top surface of the disc.
- Barcode label:** A label on the bottom surface of the disc.
- Desiccant:** Two small packets are shown next to the disc.

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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 **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 <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) **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:** $R_{th\ max}$ 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	2025-03-07	Initial Version
1.1	2025-07-23	Characteristics Electro - Optical Characteristics (Diagrams) Derating (Diagrams)



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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