

OSRAM KRTB AILMS1

Datasheet

Published by **ams-OSRAM AG**

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Micro SIDELED® 3806

KRTB AILMS1

This Micro SIDELED® is a RGB device in an SMT package with side emission. Due to its low package height it is ideal for applications in limited space environments and perfect for coupling into lightguides.



Applications

- Access Control & Security
- Appliances & Tools
- Factory Automation
- Home & Building Automation
- Material Processing
- Projection & Display
- Robotics

Features

- Package: SMT package, silicone resin
- Chip technology: Thinfilm / Volume emitter on Sapphire (AlInGaN)
- Typ. Radiation: 120° (Lambertian emitter)
- Color: $\lambda_{\text{dom}} = 625 \text{ nm}$ (● red); $\lambda_{\text{dom}} = 520 \text{ nm}$ (● true green); $\lambda_{\text{dom}} = 470 \text{ nm}$ (● blue)
- Corrosion Robustness Class: 1B
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)
- Binned in white color: $C_x = 0.313$, $C_y = 0.329$ acc to CIE 1931
- Typ. Luminous Intensity @20mA: red = 690 mcd; green = 1749 mcd; blue = 488 mcd

Ordering Information

Type

KRTB AILMS1-5B5C-B1B12

Ordering Code

Q65113A2872

Maximum Ratings

Parameter	Symbol		Values	Values	Values
			● red	● true green	● blue
Operating Temperature	T_{op}	min.	-40 °C	-40 °C	-40 °C
		max.	85 °C	85 °C	85 °C
Storage Temperature	T_{stg}	min.	-40 °C	-40 °C	-40 °C
		max.	100 °C	100 °C	100 °C
Junction Temperature	T_j	max.	100 °C	100 °C	100 °C
Forward Current $T_s = 25\text{ °C}$	I_F	min.	1 mA	1 mA	1 mA
		max.	30 mA	30 mA	30 mA
Surge Current $t \leq 10\text{ }\mu\text{s}$; $D = 0.005$; $T_s = 25\text{ °C}$	I_{FS}	max.	100 mA	100 mA	100 mA
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	V_{ESD}		2 kV	2 kV	2 kV

Notes:
1. The product is not designed for reverse operation.

Characteristics

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

Parameter	Symbol		Values	Values	Values
			● red	● true green	● blue
Dominant Wavelength ¹⁾	λ_{dom}	typ.	625 nm	520 nm	470 nm
Spectral bandwidth at 50% $I_{\text{rel,max}}$	$\Delta\lambda$	typ.	15 nm	26 nm	20 nm
Viewing angle at 50% I_V	2ϕ	typ.	120 °	120 °	120 °
Forward Voltage ²⁾ $I_F = 20 \text{ mA}$	V_F	min.	1.9 V	2.8 V	2.9 V
		typ.	2.2 V	3.0 V	3.1 V
		max.	2.5 V	3.4 V	3.5 V
Real thermal resistance junction/solderpoint ³⁾	$R_{\text{thJS real}}$	typ.	160 K / W	190 K / W	210 K / W
		max.	200 K / W	220 K / W	250 K / W
Electrical thermal resistance junction/solderpoint ³⁾ with optical efficiency of each color	$R_{\text{thJS elec.}}$	typ.	120 K / W	150 K / W	130 K / W
		max.	150 K / W	170 K / W	160 K / W

Notes:

1. Efficiency of each color: Red 24%; Green 22%; Blue 39%

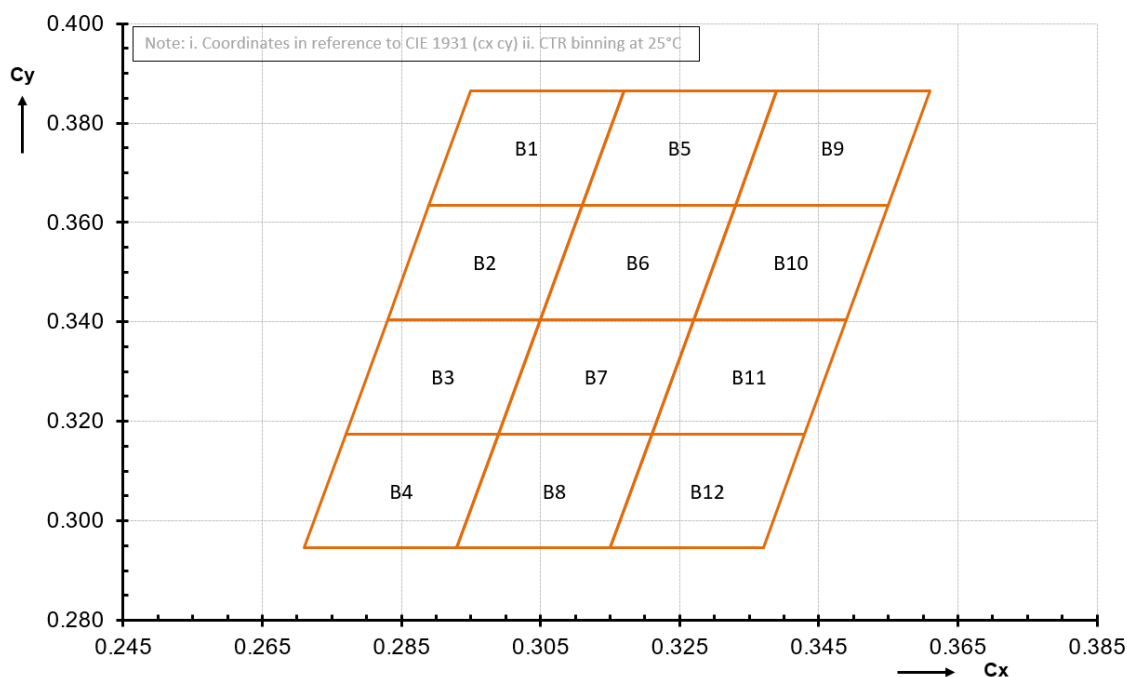
Brightness Groups

$I_F(\bullet \text{ red}) = 20 \text{ mA}$; $I_F(\bullet \text{ green}) = 15 \text{ mA}$; $I_F(\bullet \text{ blue}) = 7 \text{ mA}$

Group	Luminous Intensity ⁴⁾ IF = f(T); all chips on min. I_v	Luminous Intensity ⁴⁾ IF = f(T); all chips on max. I_v
5B	1800 mcd	2010 mcd
6B	2010 mcd	2240 mcd
7B	2240 mcd	2500 mcd
8B	2500 mcd	2800 mcd
5C	2800 mcd	3150 mcd

Chromaticity Coordinate Groups

I_F (● red) = 20 mA; I_F (● true green) = 15 mA; I_F (● blue) = 7 mA



Chromaticity Coordinate Groups

Group	Cx	Cy	Group	Cx	Cy	Group	Cx	Cy
B1	0.2890	0.3635	B2	0.2830	0.3405	B6	0.3050	0.3405
	0.2950	0.3865		0.2890	0.3635		0.3110	0.3635
	0.3170	0.3865		0.3110	0.3635		0.3330	0.3635
	0.3110	0.3635		0.3050	0.3405		0.3270	0.3405
B10	0.3270	0.3405	B3	0.2770	0.3175	B7	0.2990	0.3175
	0.3330	0.3635		0.2830	0.3405		0.3050	0.3405
	0.3550	0.3635		0.3050	0.3405		0.3270	0.3405
	0.3490	0.3405		0.2990	0.3175		0.3210	0.3175
B11	0.3210	0.3175	B4	0.2710	0.2945	B8	0.2930	0.2945
	0.3270	0.3405		0.2770	0.3175		0.2990	0.3175
	0.3490	0.3405		0.2990	0.3175		0.3210	0.3175
	0.3430	0.3175		0.2930	0.2945		0.3150	0.2945
B12	0.3150	0.2945	B5	0.3110	0.3635	B9	0.3330	0.3635
	0.3210	0.3175		0.3170	0.3865		0.3390	0.3865
	0.3430	0.3175		0.3390	0.3865		0.3610	0.3865
	0.3370	0.2945		0.3330	0.3635		0.3550	0.3635

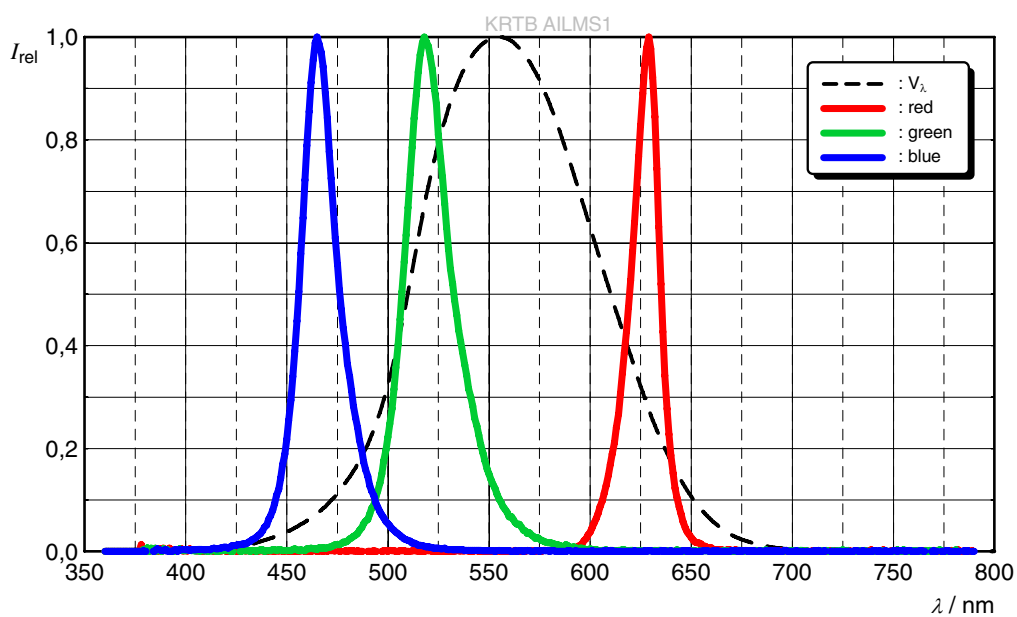
Group Name on Label

Example: 5B-B1

Brightness	Color Chromaticity
5B	B1

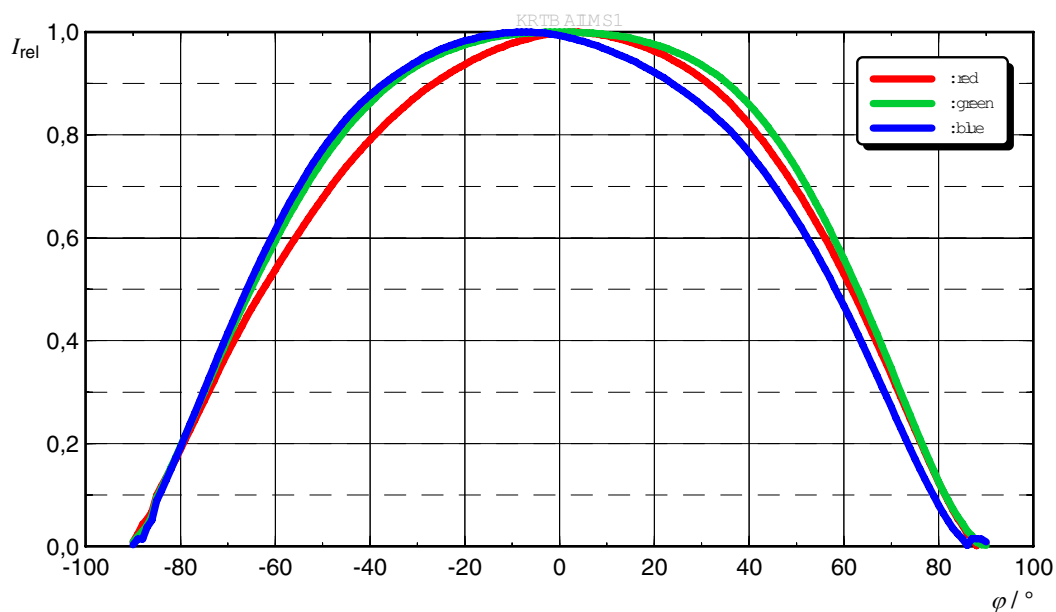
Relative Spectral Emission ⁵⁾

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

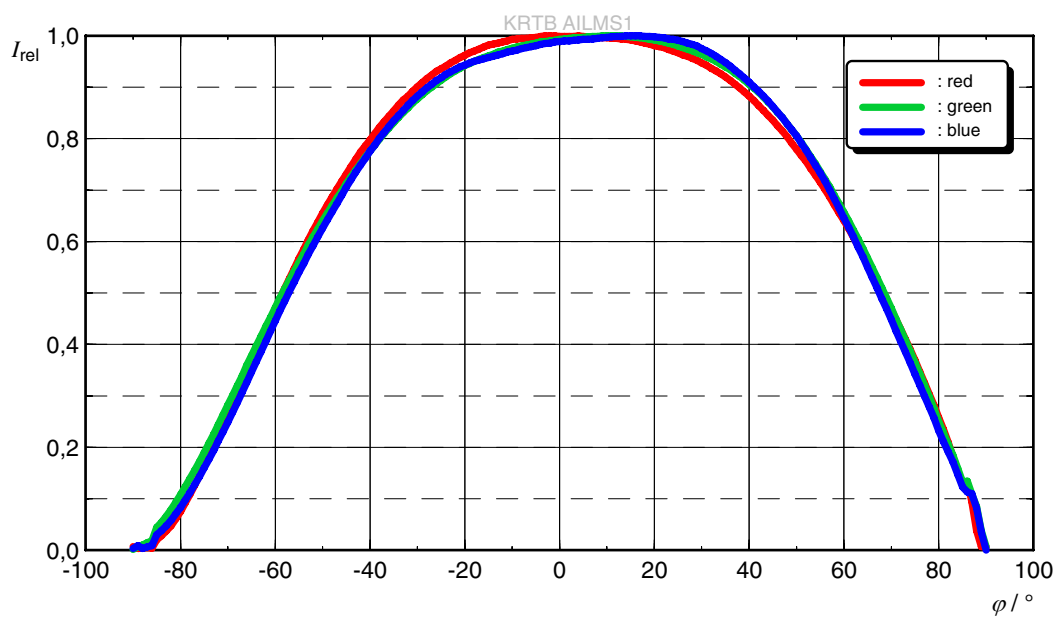


Radiation Characteristic (horizontal) ⁵⁾

$$I_{\text{rel}} = f(\varphi); T_{\text{S}} = 25\text{ °C}$$

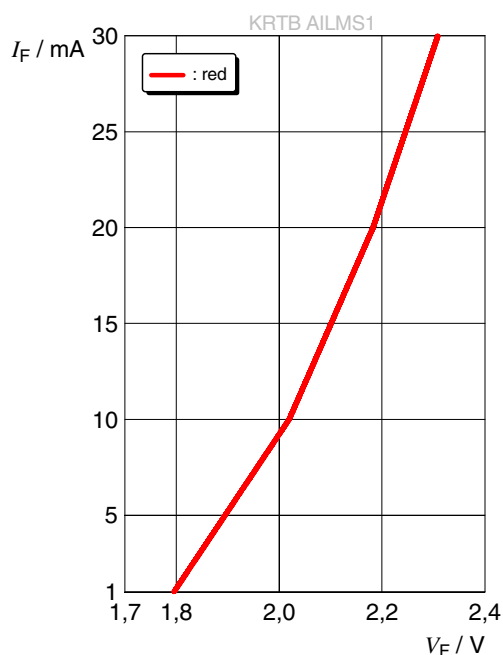
**Radiation Characteristic (vertical) ⁵⁾**

$$I_{\text{rel}} = f(\varphi); T_{\text{S}} = 25\text{ °C}$$

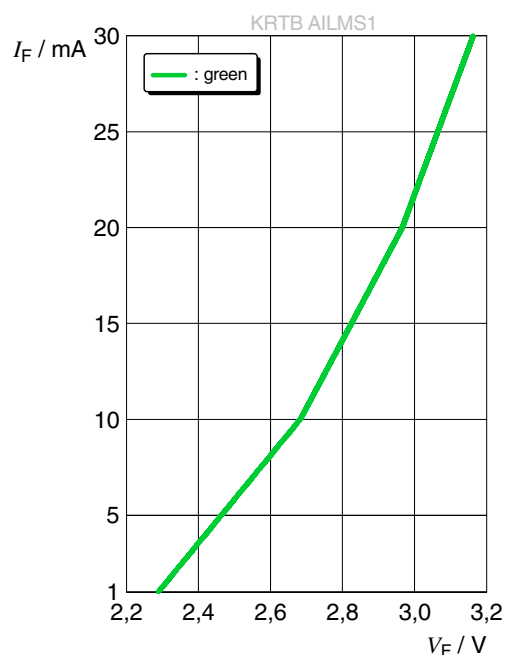


Forward current ⁵⁾

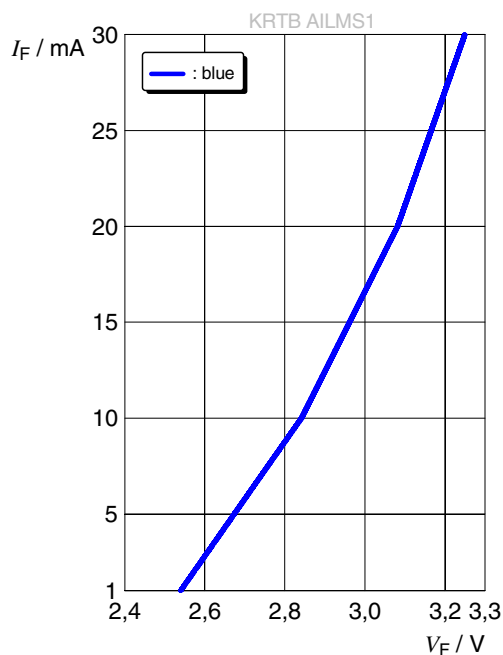
$$I_F = f(V_F); T_S = 25\text{ °C}$$

**Forward current** ⁵⁾

$$I_F = f(V_F); T_S = 25\text{ °C}$$

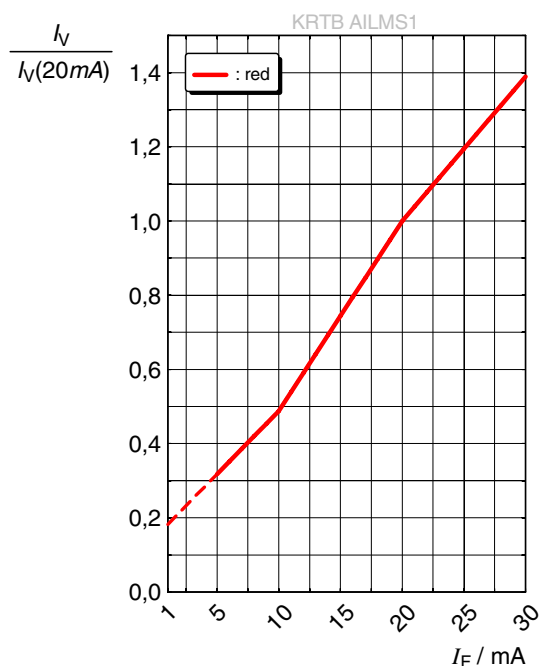
**Forward current** ⁵⁾

$$I_F = f(V_F); T_S = 25\text{ °C}$$

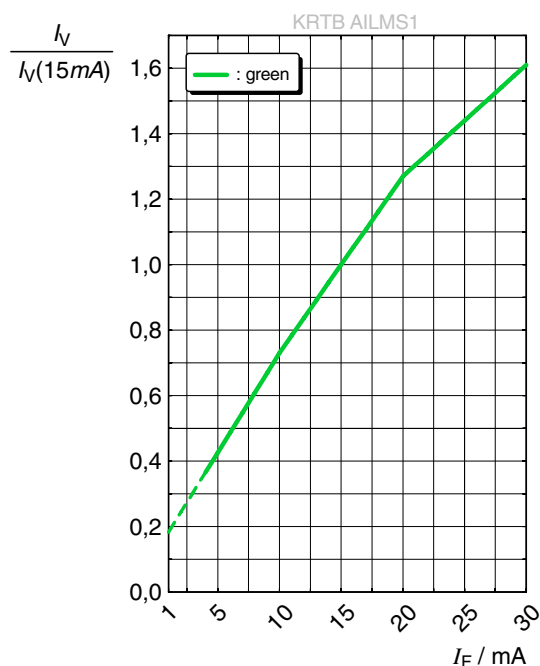


Relative Luminous Intensity ^{5), 6)}

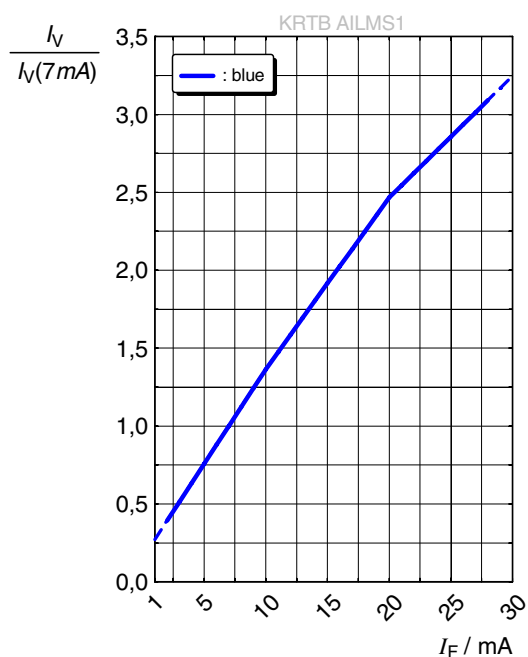
$$I_V/I_V(20\text{ mA}) = f(I_F); T_s = 25\text{ °C}$$

**Relative Luminous Intensity** ^{5), 6)}

$$I_V/I_V(15\text{ mA}) = f(I_F); T_s = 25\text{ °C}$$

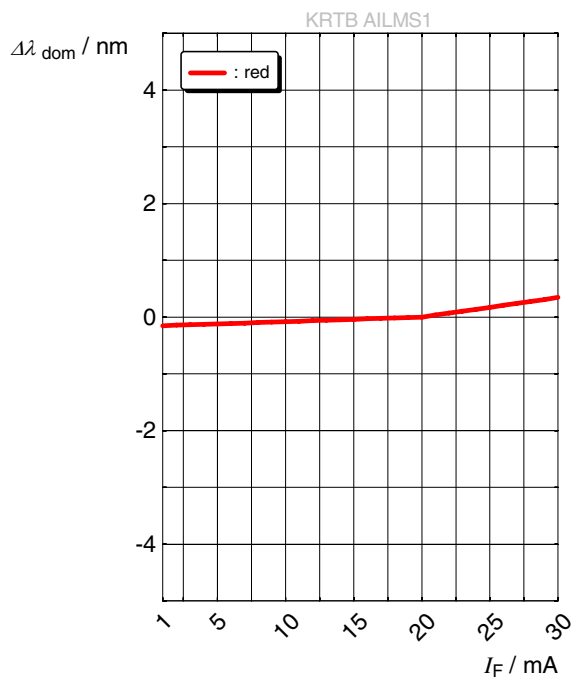
**Relative Luminous Intensity** ^{5), 6)}

$$I_V/I_V(7\text{ mA}) = f(I_F); T_s = 25\text{ °C}$$



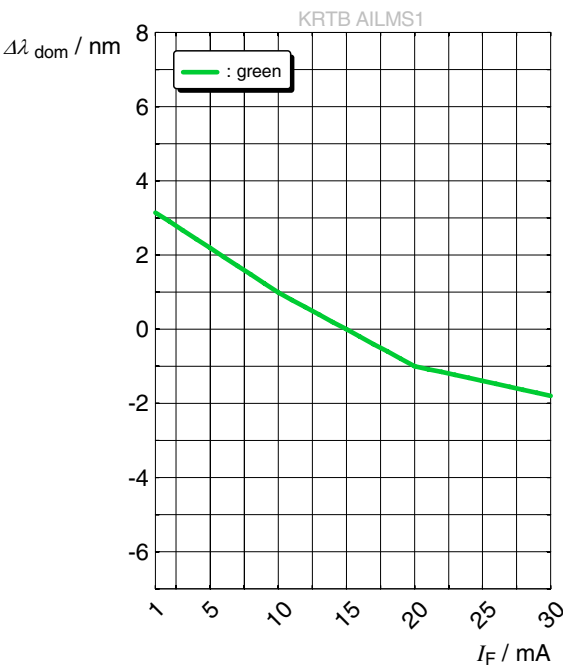
Dominant Wavelength ⁵⁾

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



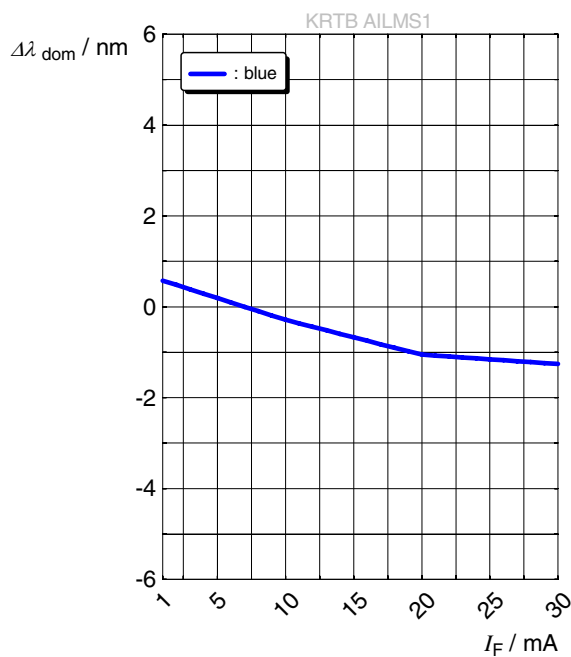
Dominant Wavelength ⁵⁾

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



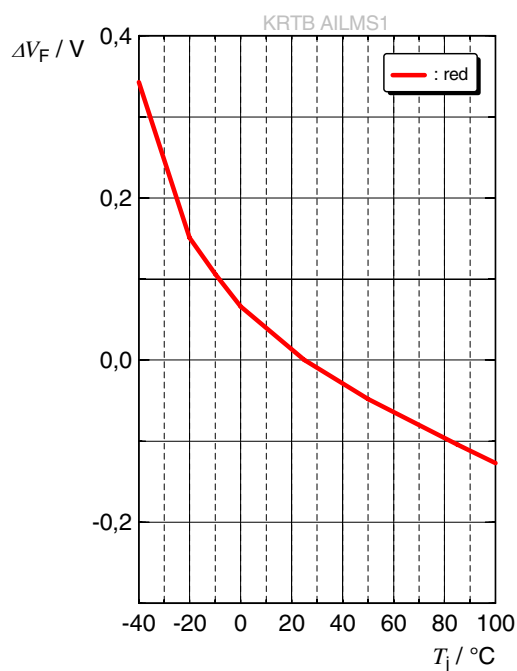
Dominant Wavelength ⁵⁾

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

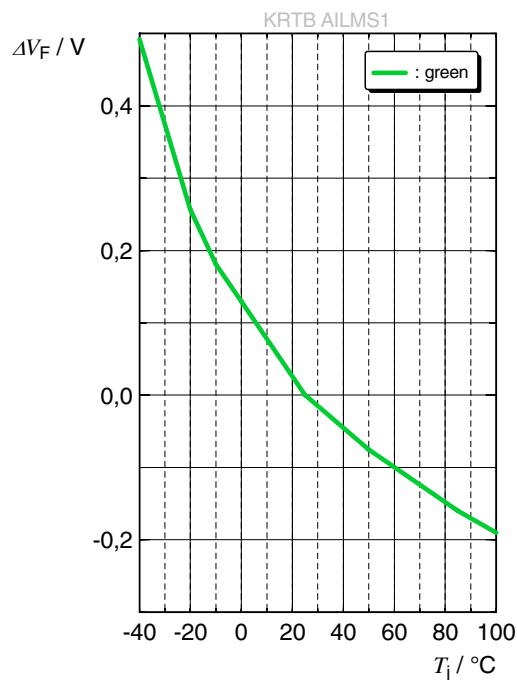


Forward Voltage ⁵⁾

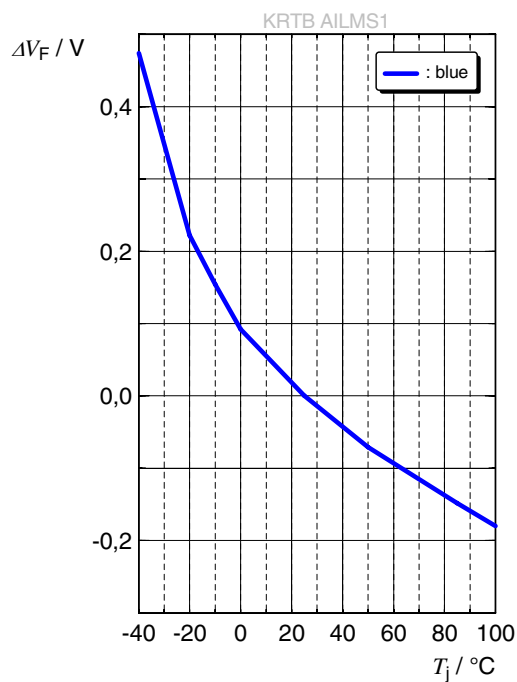
$$\Delta V_F = V_F - V_F(25\text{ °C}) = f(T_j); I_F = 20\text{ mA}$$

**Forward Voltage** ⁵⁾

$$\Delta V_F = V_F - V_F(25\text{ °C}) = f(T_j); I_F = 15\text{ mA}$$

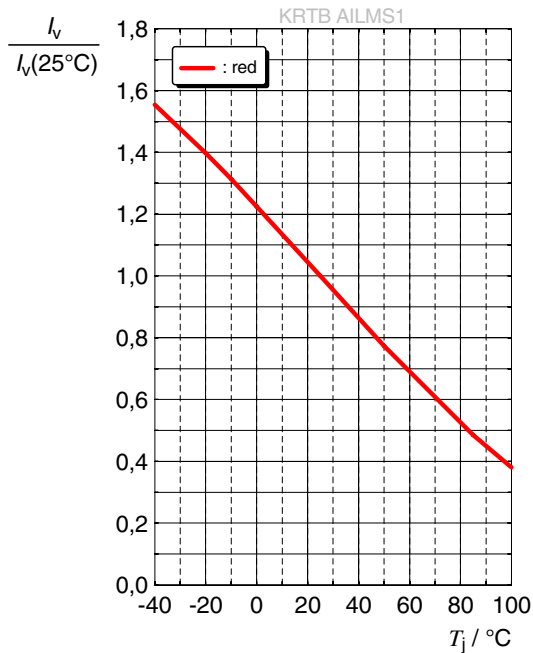
**Forward Voltage** ⁵⁾

$$\Delta V_F = V_F - V_F(25\text{ °C}) = f(T_j); I_F = 7\text{ mA}$$



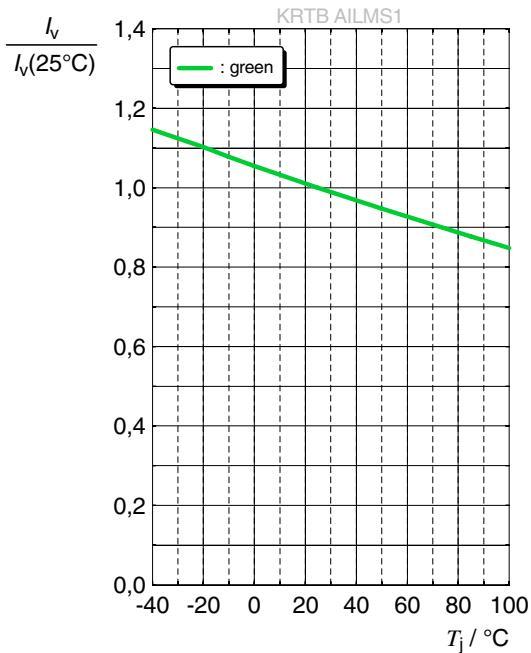
Relative Luminous Intensity ⁵⁾

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



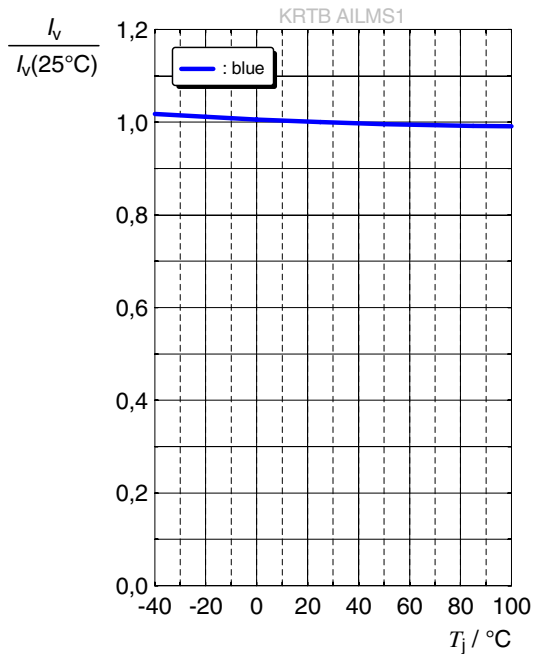
Relative Luminous Intensity ⁵⁾

$I_v/I_v(25\text{ °C}) = f(T_j); I_F = 15\text{ mA}$



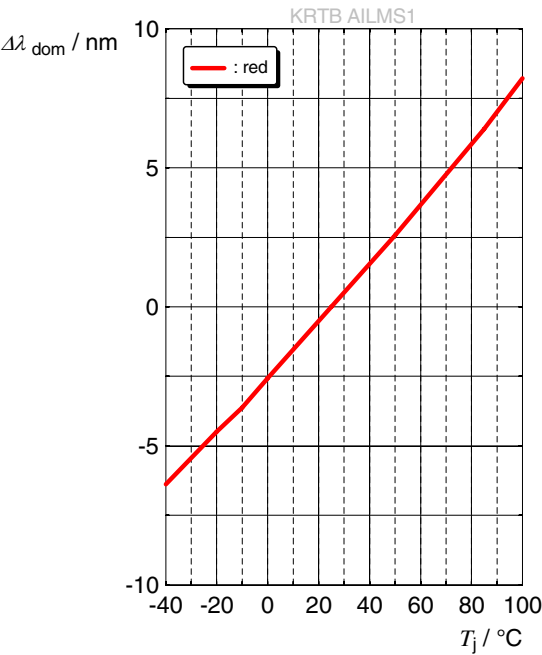
Relative Luminous Intensity ⁵⁾

$I_v/I_v(25\text{ °C}) = f(T_j); I_F = 7\text{ mA}$



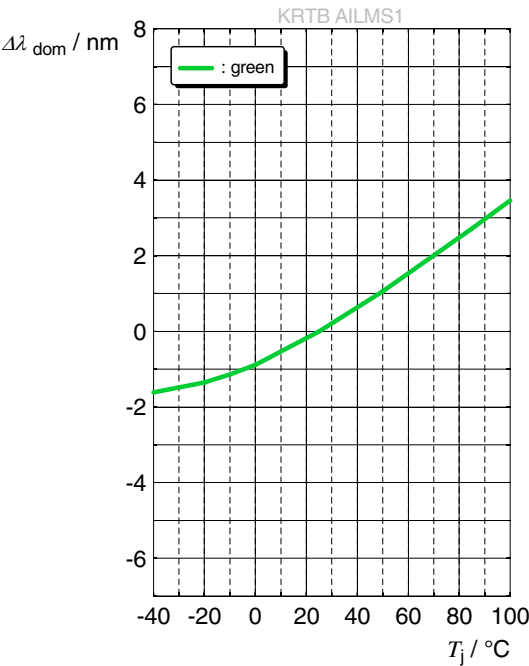
Dominant Wavelength ⁵⁾

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



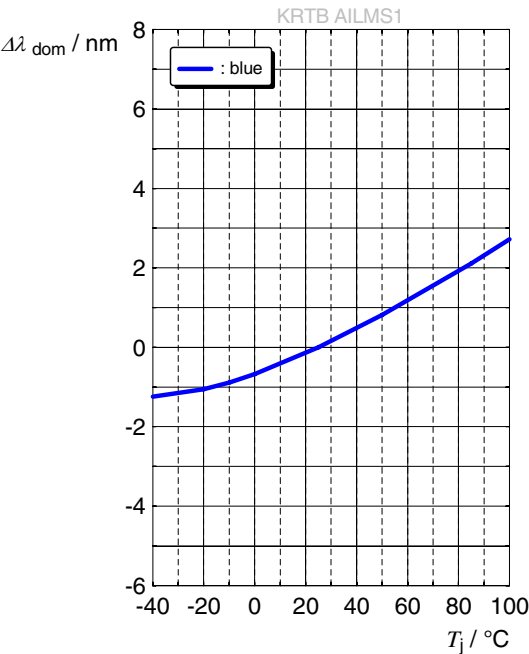
Dominant Wavelength ⁵⁾

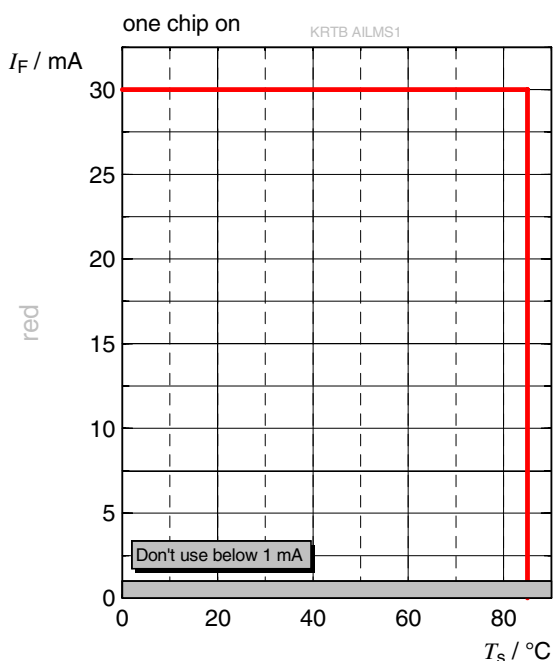
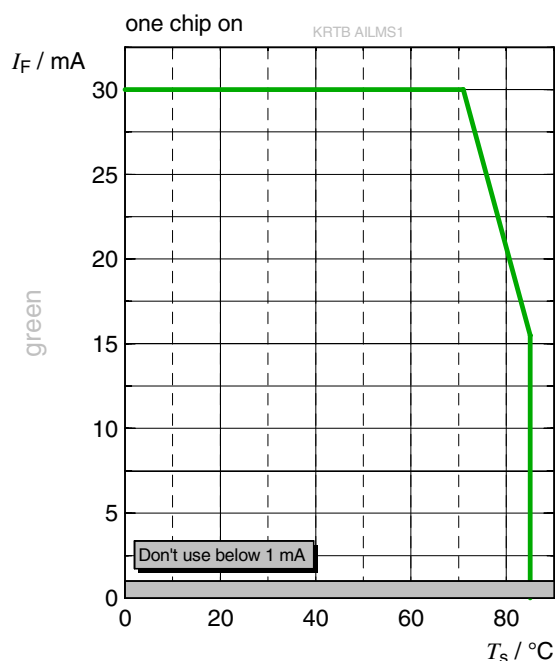
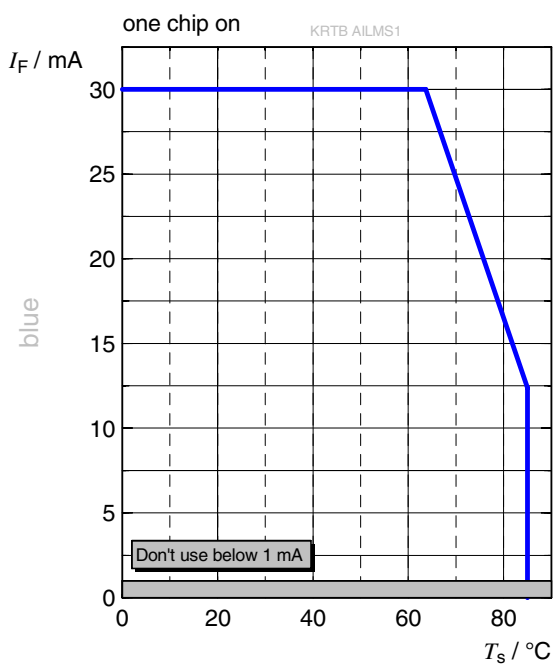
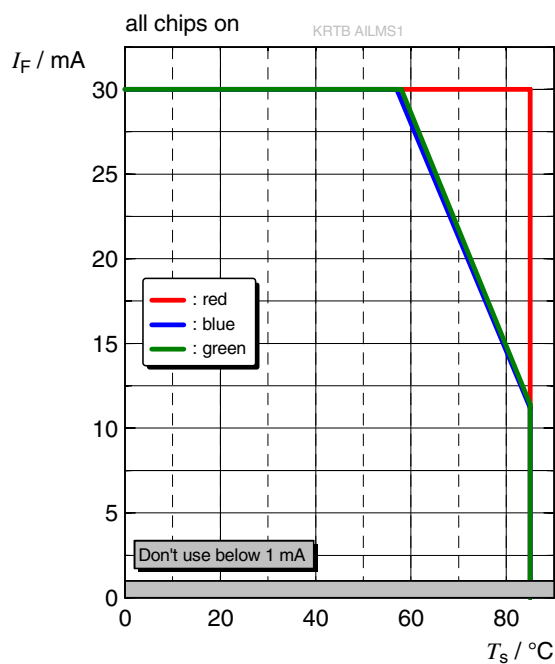
$\lambda_{\text{dom}} = f(T_j); I_F = 15 \text{ mA}$



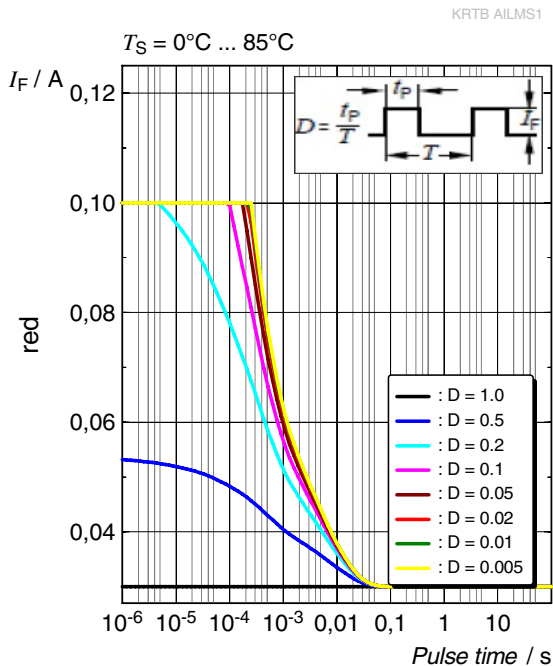
Dominant Wavelength ⁵⁾

$\lambda_{\text{dom}} = f(T_j); I_F = 7 \text{ mA}$

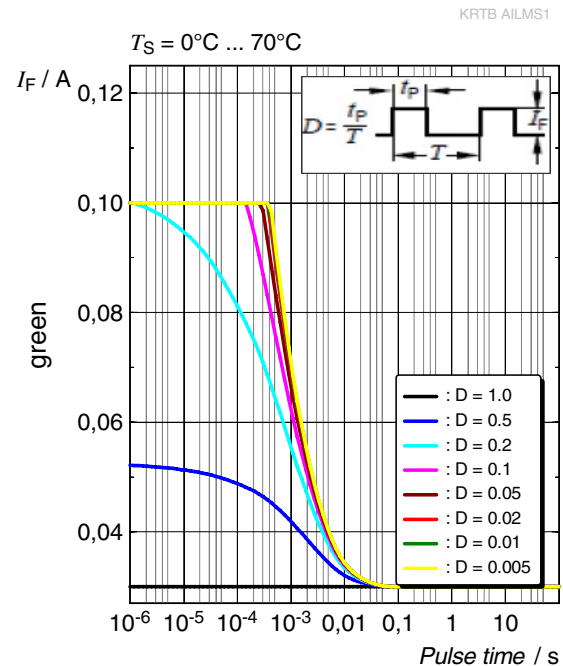


Max. Permissible Forward Current ³⁾ $I_F = f(T)$; • red**Max. Permissible Forward Current** ³⁾ $I_F = f(T)$; • true green**Max. Permissible Forward Current** ³⁾ $I_F = f(T)$; • blue**Max. Permissible Forward Current** ³⁾ $I_F = f(T)$; all chips on

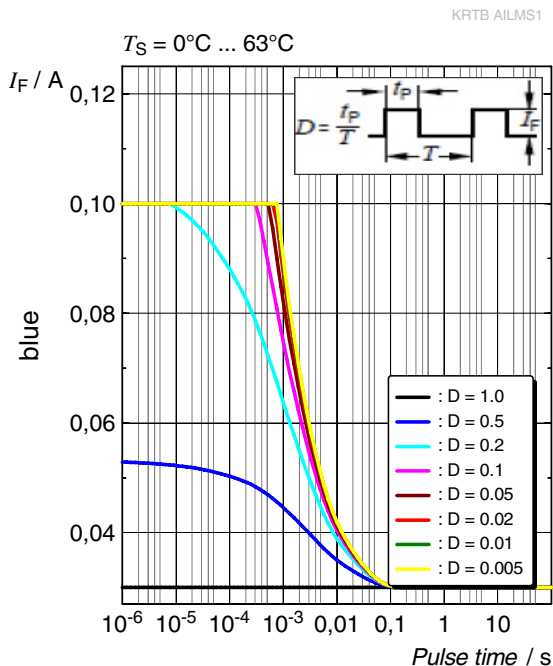
Permissible Pulse Handling Capability

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

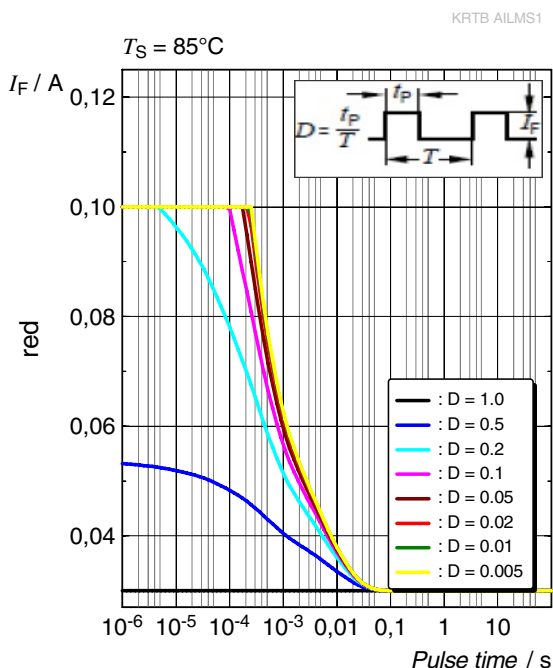
Permissible Pulse Handling Capability

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

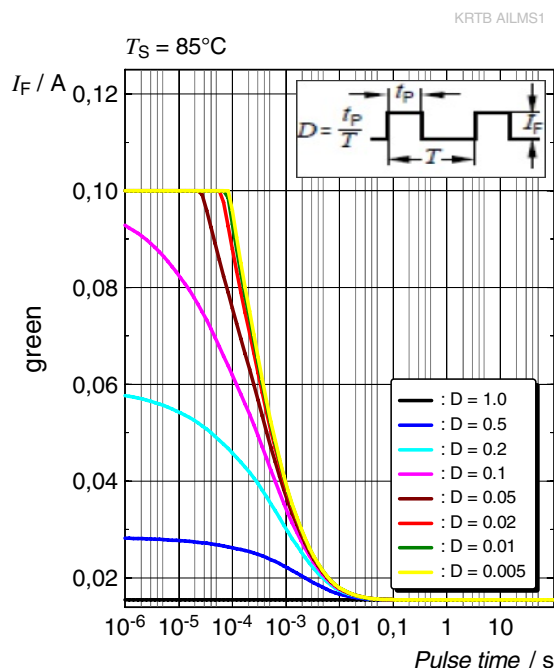
Permissible Pulse Handling Capability

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

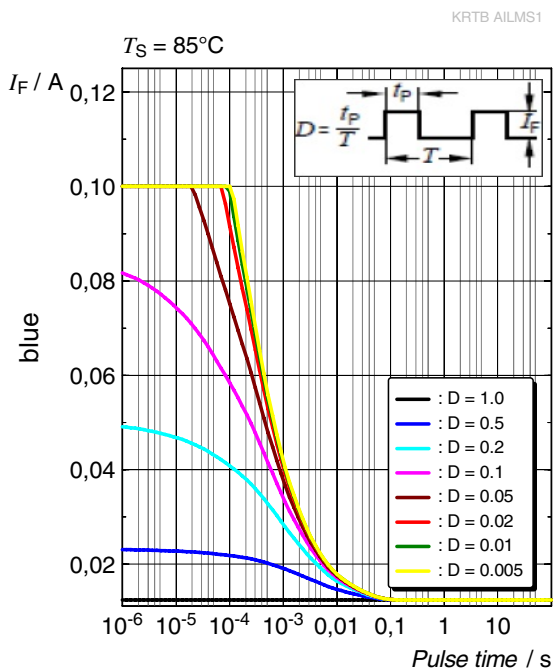
Permissible Pulse Handling Capability

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

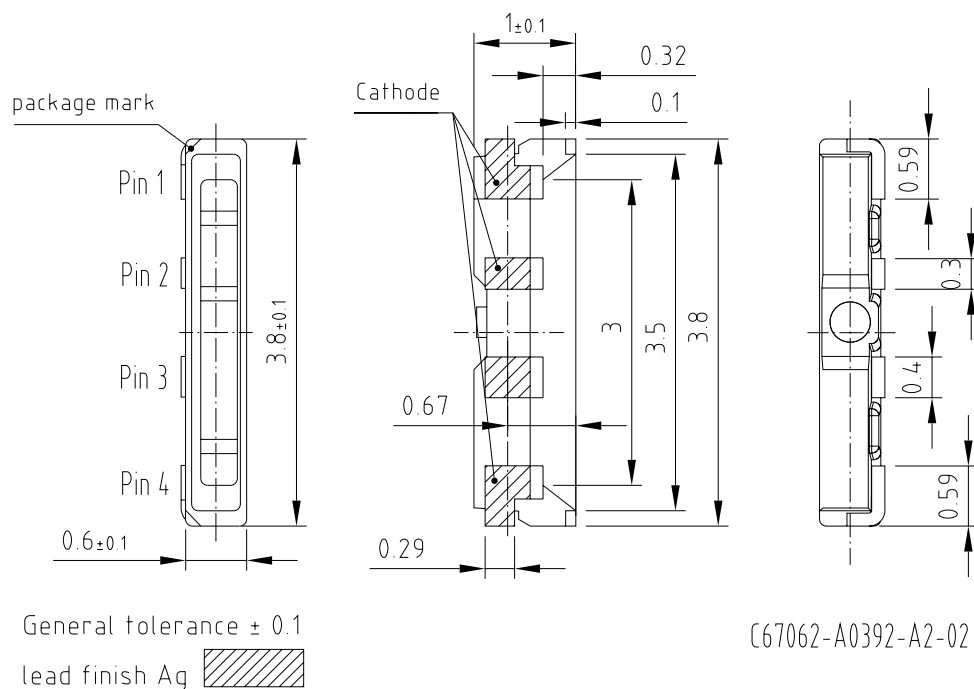
Permissible Pulse Handling Capability

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

Permissible Pulse Handling Capability

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

Dimensional Drawing ⁷⁾

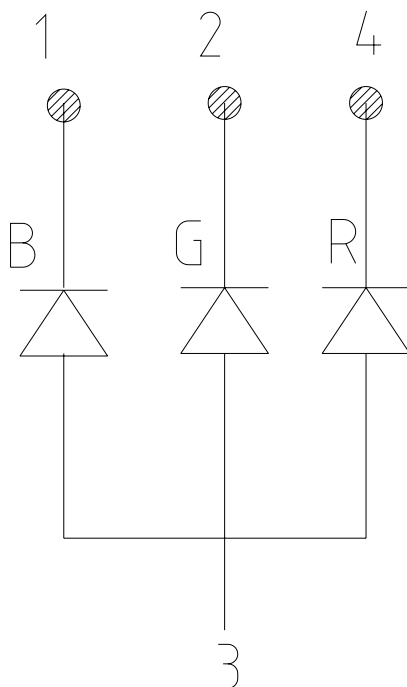
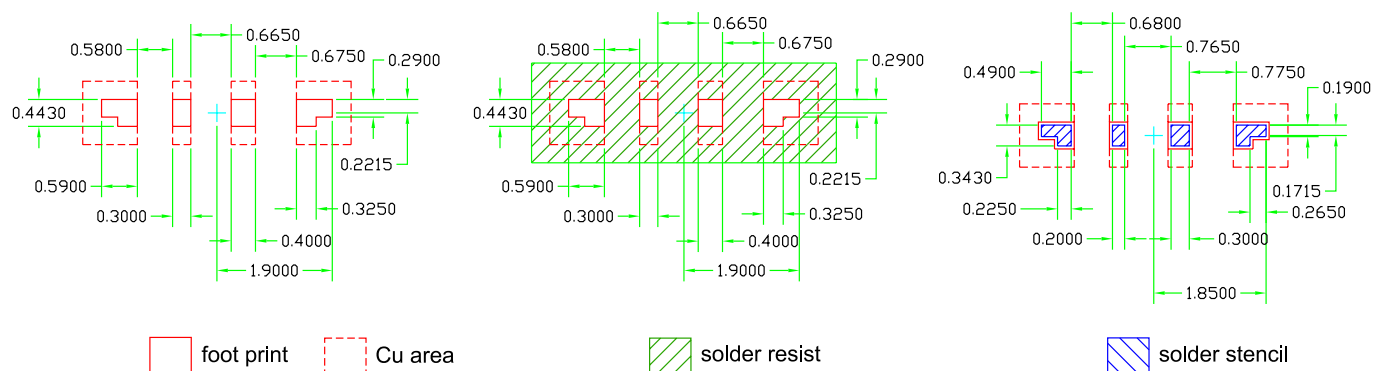


Further Information:

Approximate Weight: 4.7 mg

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))

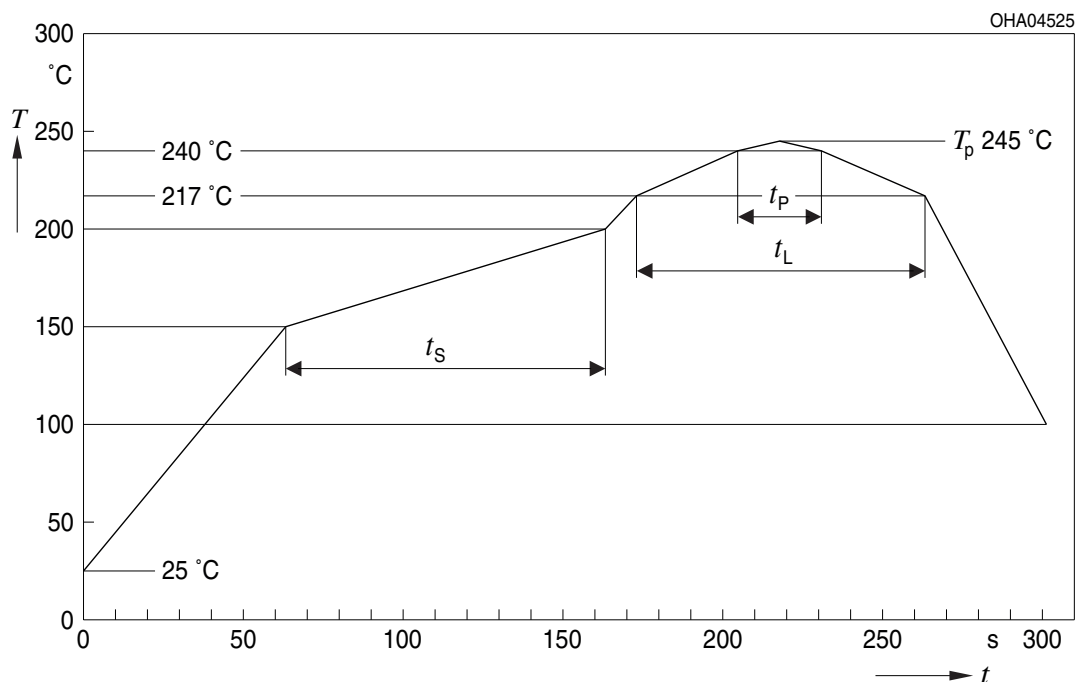
Electrical Internal Circuit

Recommended Solder Pad ⁷⁾

For superior solder joint connectivity results we recommend soldering under standard nitrogen atmosphere. Package not suitable for any kind of wet cleaning or ultrasonic cleaning.

Reflow Soldering Profile

Product complies to MSL Level 3 acc. to JEDEC J-STD-020E

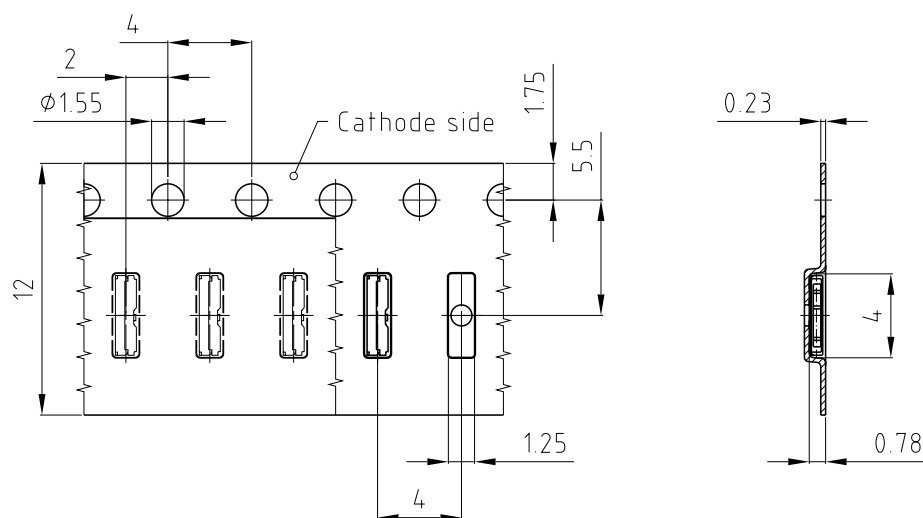


Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat*) 25°C to 150°C			2	3	K/s
Time t_s T_{Smin} to T_{Smax}	t_s	60	100	120	s
Ramp-up rate to peak*) T_{Smax} to T_p			2	3	K/s
Liquidus temperature	T_L		217		$^{\circ}\text{C}$
Time above liquidus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

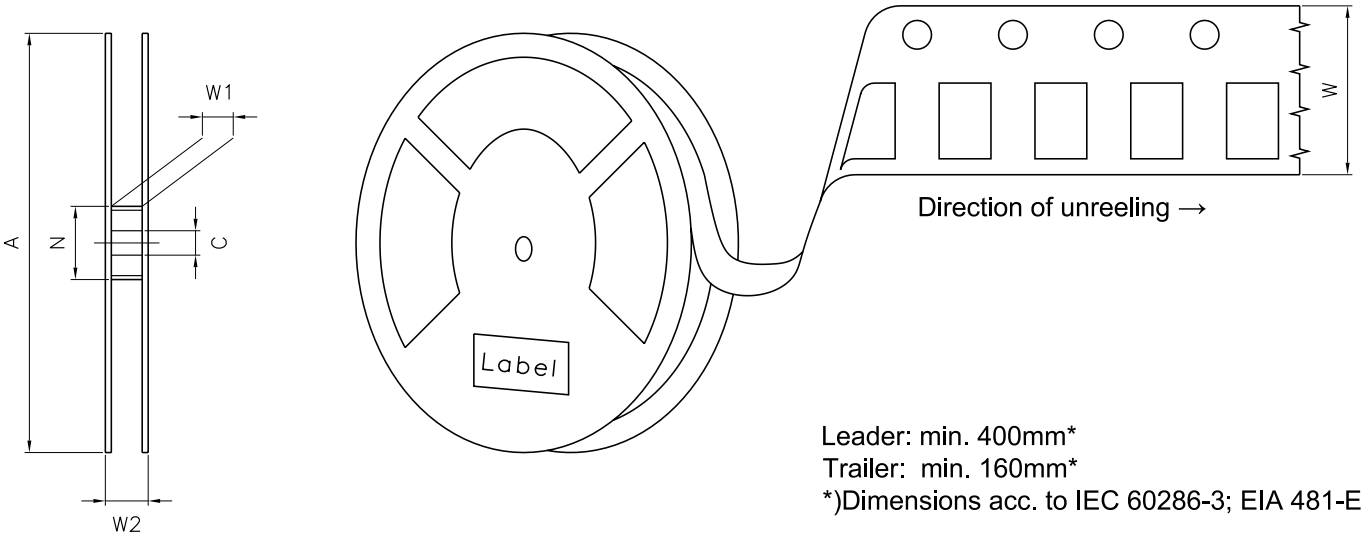
*) slope calculation DT/Dt : Dt max. 5 s; fulfillment for the whole T-range

Taping ⁷⁾



C67062-A0392-B2-03

Tape and Reel ⁸⁾



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	3000

Barcode-Product-Label (BPL)

OSRAM

LX XXXX

BIN1: XX-XX-X-XXX-X

RoHS Compliant

(6P) BATCH NO: 1234567890

(1T) LOT NO: 1234567890

(9D) D/C: 1234

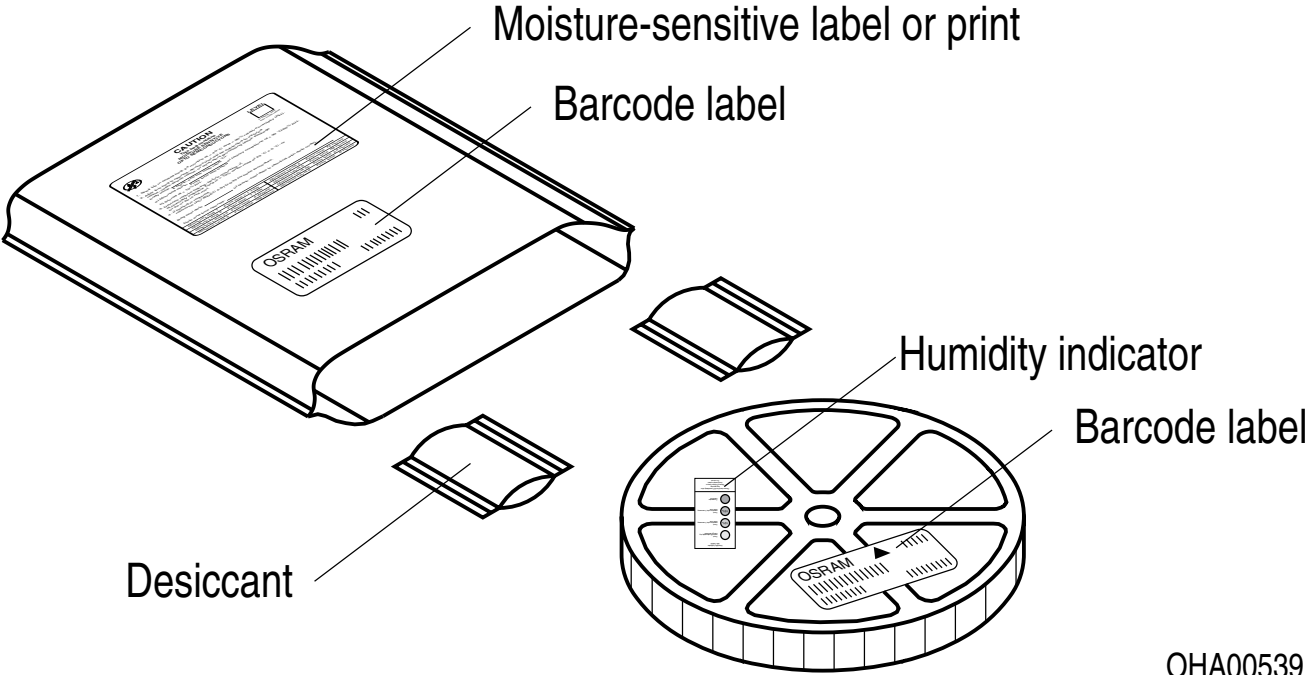
(X) PROD NO: 123456789(Q)QTY: 9999 (G) GROUP: XX-XX-X-X

ML Temp ST
X XXX °C X

Pack: RXX
DEMY XXX
X_X123_1234.1234 X

OHA04563

Dry Packing Process and Materials ⁷⁾



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 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) **Wavelength:** Wavelengths are tested at a current pulse duration of 25 ms and a tolerance of ± 1 nm.
- 2) **Forward Voltage:** Forward voltages are tested at a current pulse duration of 1 ms and a tolerance of ± 0.1 V.
- 3) **Thermal Resistance:** $R_{th\ max}$ is based on statistic values (6σ) used for Derating.
- 4) **Brightness:** Brightness groups are tested at a current pulse duration of 25 ms and a tolerance of ± 11 %.
- 5) **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.
- 6) **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.
- 7) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with ± 0.1 and dimensions are specified in mm.
- 8) **Tape and Reel:** All dimensions and tolerances are specified acc. IEC 60286-3 and specified in mm.

Revision History

Version	Date	Change
1.0	2021-06-02	Initial Version
1.1	2021-07-29	Derating (Diagrams)
1.2	2022-01-11	Dimensional Drawing Taping
1.3	2022-07-27	New Layout Applications
1.4	2024-08-15	Maximum Ratings
1.5	2024-11-27	Taping



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

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