OSRAM KW3 HNL631.TK

Datasheet

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OSRAM

OSLON® Black Flat X

KW3 HNL631.TK



The OSLON Black Flat X product family offers LED devices with the highest efficiency in the Osram portfolio. This feature makes it the perfect light source for standard forward lighting applications with a high focus on system cost. The SMT device is very stable, durable and can be used with standard processes. The pad geometry of the widely used OSLON Black Flat product platform was further optimized to allow for excellent thermal conditions, while the already known, outstanding contrast of the package concept is kept on the familiar level.



Applications

- Headlamps, LED & Laser & Night Vision

Features

- Package: SMD epoxy package
- Chip technology: UX:3
- Typ. Radiation: 120° (Lambertian emitter)
- Color: Cx = 0.321, Cy = 0.339 acc. to CIE 1931 (● ultra white)
- Corrosion Robustness Class: 3B
- Qualifications: AEC-Q102 Qualified
- ESD: 8 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B)
- Color over angle: Better than passus 3.7.2.1 of supplement proposal 7 to ECE reg. 128

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Ordering Information

Type	Luminous Flux [1] I_F = 1000 mA Φ_V	Ordering Code
KW3 HNL631.TK-6TTB-4L05M0-JCAB	1230 ... 1535 lm	Q65113A1249
KW3 HNL631.TK-6TTC-4L07M0-JCAB	1230 ... 1595 lm	Q65113A4585
KW3 HNL631.TK-7TTC-6L07M0-JCAB	1275 ... 1595 lm	Q65113A1297

During ramp up a smaller amount of pcs are taped on one reel.

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Maximum Ratings

Parameter	Symbol		Values
Operating Temperature [2]	T_{op}	min. max.	-40 °C 135 °C
Storage Temperature	T_{stg}	min. max.	-40 °C 135 °C
Junction Temperature	T_j	max.	150 °C
Junction Temperature for short time applications*	T_j	max.	175 °C
Forward current T_S = 25 °C	I_F	min. max.	50 mA 1500 mA
Forward current pulsed D = 0.005 ; T_S = 25 °C	$I_{F\ pulse}$	max.	1500 mA
Surge current t ≤ 50 µs; D = 0.025; T_J = 150 °C	I_{FS}	max.	2000 mA
Surge current t ≤ 10 µs; D = 0.005 ; T_S = 25 °C	I_{FS}	max.	2500 mA
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B)	V_{ESD}		8 kV
Reverse current [3]	I_R	max.	200 mA

* The median lifetime (L70/B50) for Tj = 175°C is 100h.

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Characteristics

I_F = 1000 mA; T_S = 25 °C

Parameter	Symbol		Values
Chromaticity Coordinate [4]	Cx	typ.	0.321
	Cy	typ.	0.339
Viewing angle at 50% I_V	2φ	typ.	120 °
Radiating surface	A_{color}	typ.	3,3 mm²
Forward Voltage [5]	V_F	min.	8.40 V
I_F = 1000 mA		typ.	9.61 V
		max.	10.15 V
Reverse voltage (ESD device)	$V_{R\ ESD}$	min.	45 V
Reverse voltage [3]	V_R	max.	1.2 V
I_R = 20 mA			
Real thermal resistance junction/solderpoint [6]	$R_{thJS\ real}$	typ.	1.35 K / W
		max.	1.64 K / W
Electrical thermal resistance junction/solderpoint [6]	$R_{thJS\ elec.}$	typ.	0.82 K / W
with efficiency η_e = 39 %		max.	1.00 K / W

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Brightness Groups

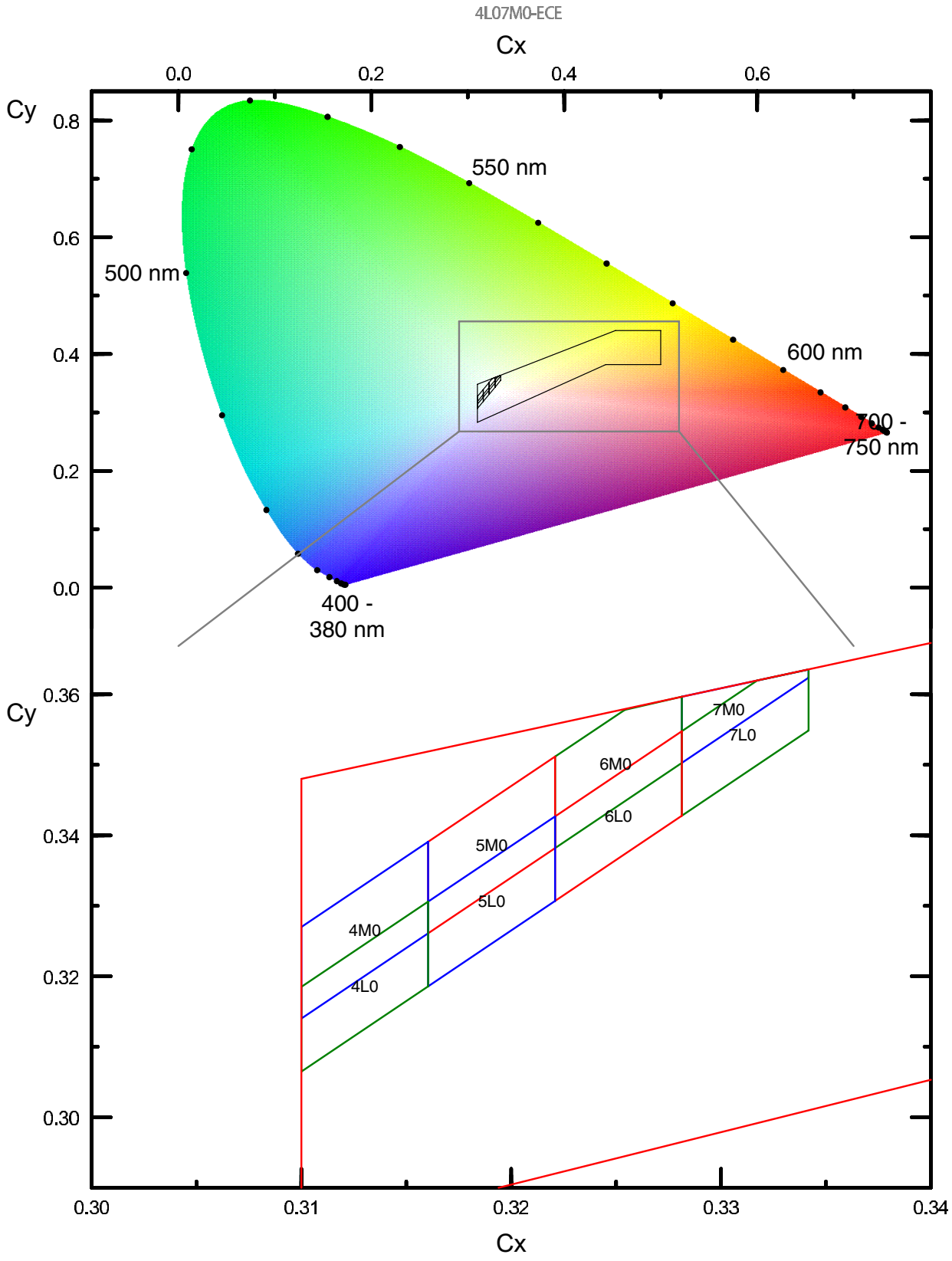
Group	Luminous Flux [1] I_F = 1000 mA min. Φ_V	Luminous Flux [1] I_F = 1000 mA max. Φ_V
6T	1230 lm	1275 lm
7T	1275 lm	1325 lm
T8	1325 lm	1375 lm
T9	1375 lm	1425 lm
TA	1425 lm	1480 lm
TB	1480 lm	1535 lm
TC	1535 lm	1595 lm

Forward Voltage Groups

Group	Forward Voltage [5] I_F = 1000 mA min. V_F	Forward Voltage [5] I_F = 1000 mA max. V_F
JC	8.40 V	9.00 V
WC	9.00 V	9.60 V
AB	9.60 V	10.15 V

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Chromaticity Coordinate Groups



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Chromaticity Coordinate Groups [4)]

Group	Cx	Cy
4L0	0.3100	0.3065
	0.3100	0.3185
	0.3160	0.3306
	0.3160	0.3186
4M0	0.3100	0.3140
	0.3100	0.3270
	0.3160	0.3391
	0.3160	0.3261
5L0	0.3160	0.3186
	0.3160	0.3306
	0.3221	0.3427
	0.3221	0.3307

Group	Cx	Cy
5M0	0.3160	0.3261
	0.3160	0.3391
	0.3221	0.3512
	0.3221	0.3382
6L0	0.3221	0.3307
	0.3221	0.3427
	0.3281	0.3548
	0.3281	0.3428
6M0	0.3221	0.3382
	0.3221	0.3512
	0.3254	0.3578
	0.3281	0.3597
	0.3281	0.3503

Group	Cx	Cy
7L0	0.3281	0.3428
	0.3281	0.3548
	0.3317	0.3620
	0.3342	0.3635
	0.3342	0.3549
7M0	0.3281	0.3503
	0.3281	0.3597
	0.3342	0.3635
	0.3342	0.3624

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Group Name on Label

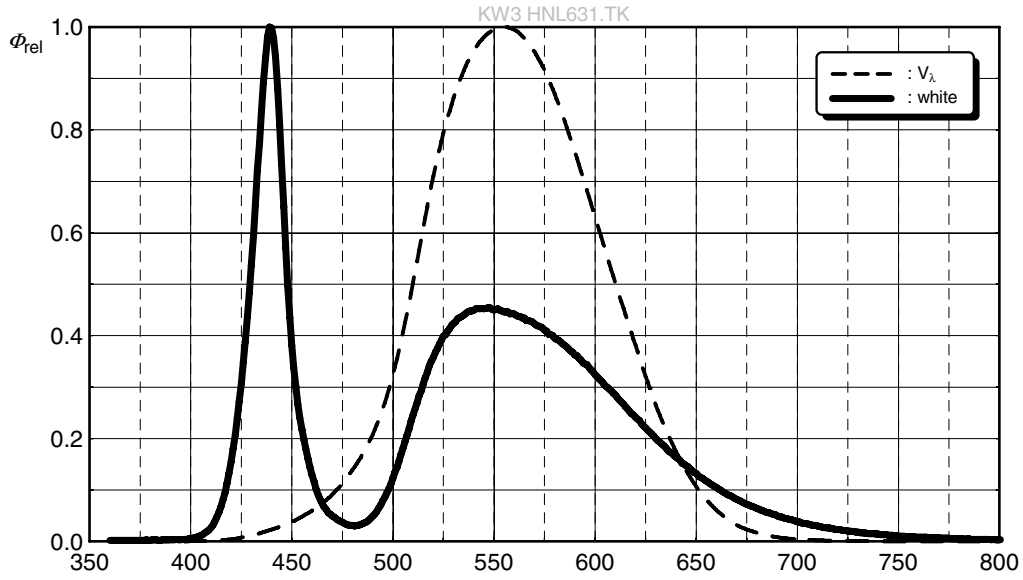
Example: 6T-4L0-AB

Brightness	Color Chromaticity	Forward Voltage
6T	4L0	AB

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Relative Spectral Emission [7)]

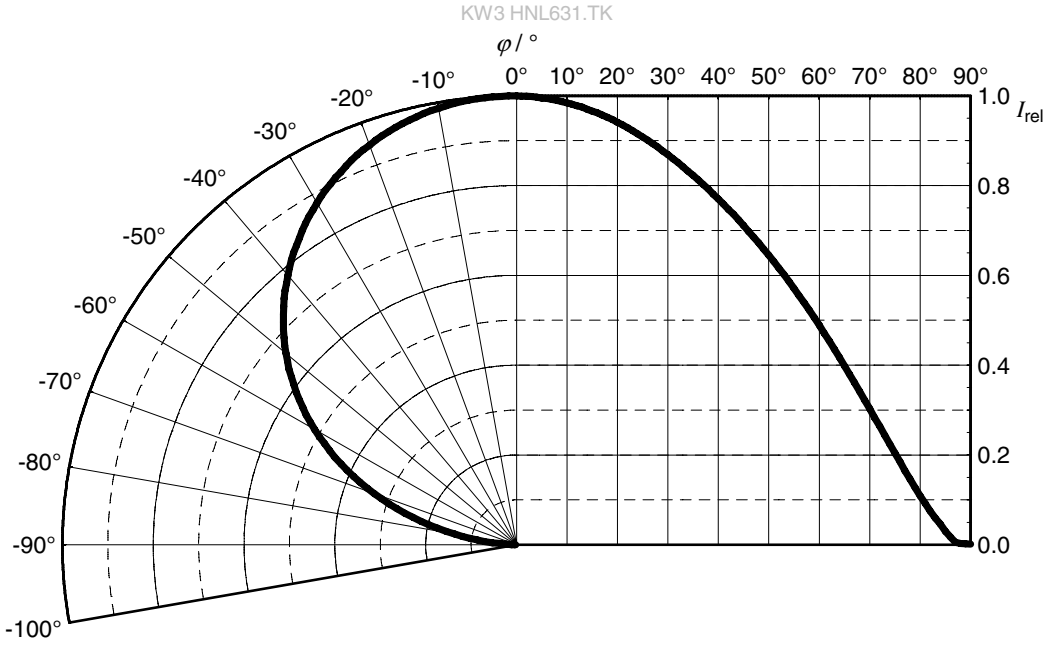
$\Phi_{rel} = f(\lambda)$; I_F = 1000 mA; T_J = 25 °C



Note: Percentage of red: >5% acc. to ECE regulation
Percentage of UV: <10^{-5}W/lm acc. to ECE regulation

Radiation Characteristics [7)]

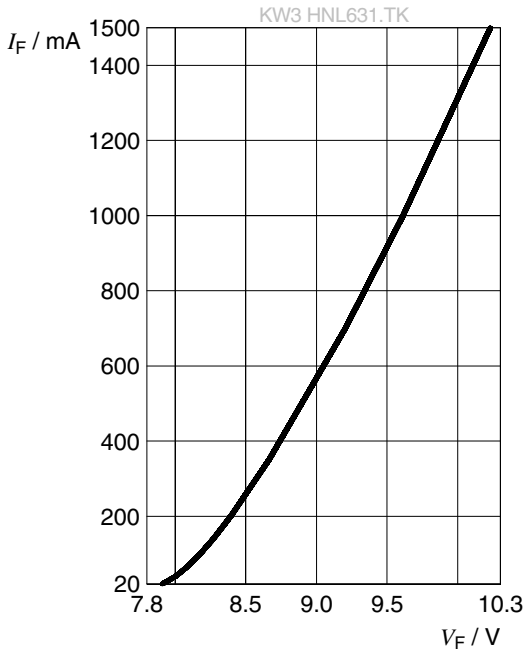
$I_{rel} = f(\phi)$; T_J = 25 °C



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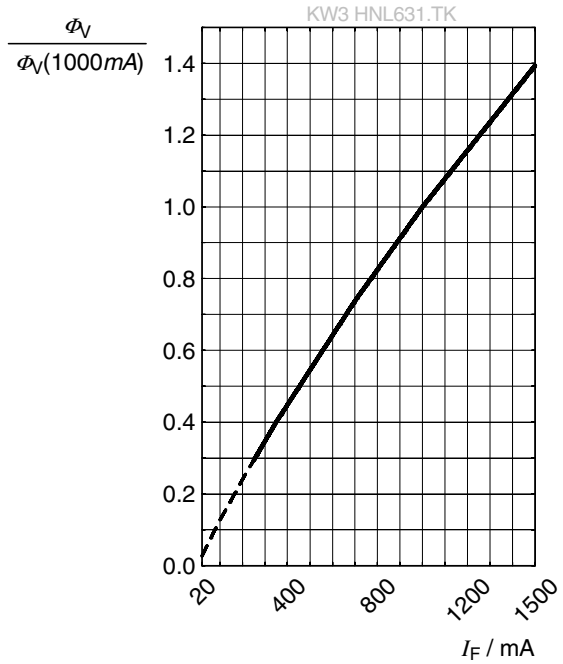
Forward current [7)]

$I_F = f(V_F)$; T_J = 25 °C



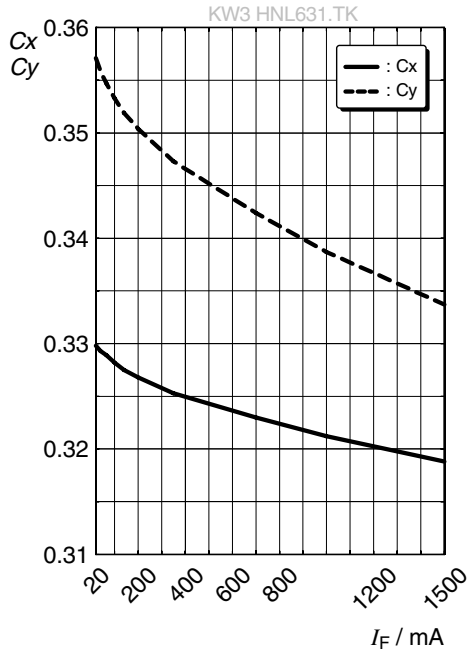
Relative Luminous Flux [7), 8)]

$\Phi_v/\Phi_v(1000\ mA) = f(I_F)$; T_J = 25 °C



Chromaticity Coordinate Shift [7)]

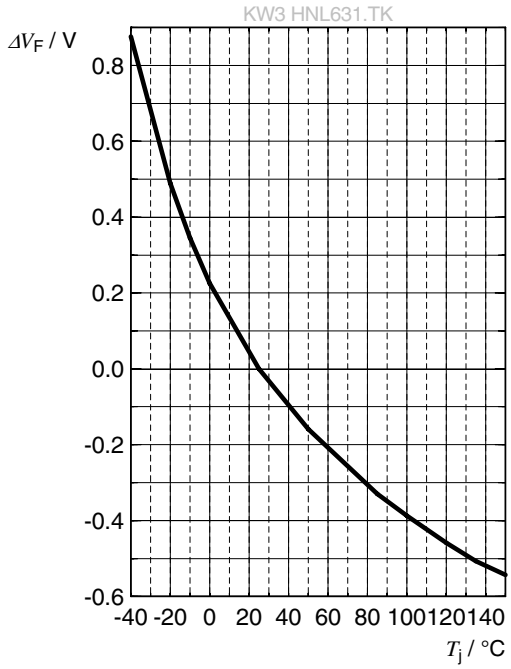
Cx, Cy = $f(I_F)$; T_J = 25 °C



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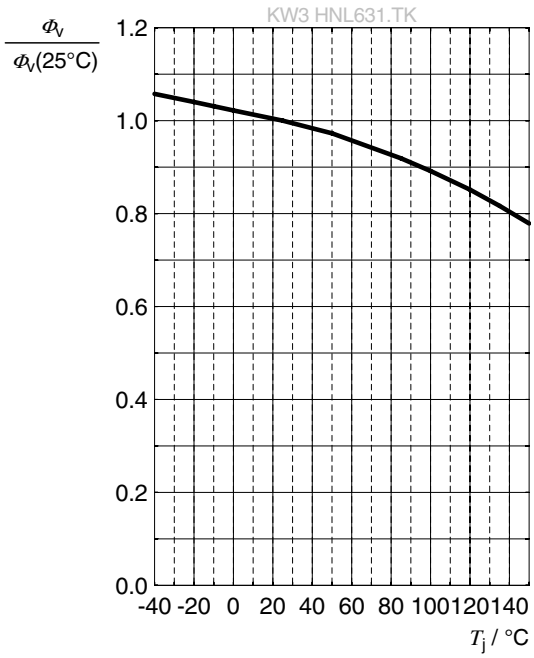
Forward Voltage [7)]

$\Delta V_F = V_F - V_F(25\ °C) = f(T_j);\ I_F = 1000\ mA$



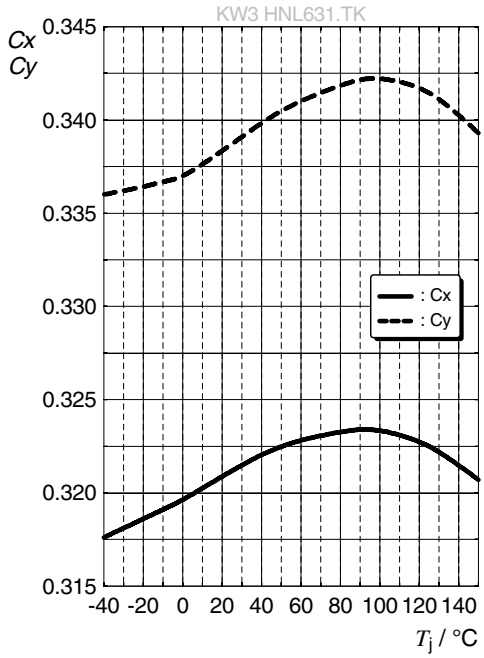
Relative Luminous Flux [7)]

$\Phi_v/\Phi_v(25\ °C) = f(T_j);\ I_F = 1000\ mA$



Chromaticity Coordinate Shift [7)]

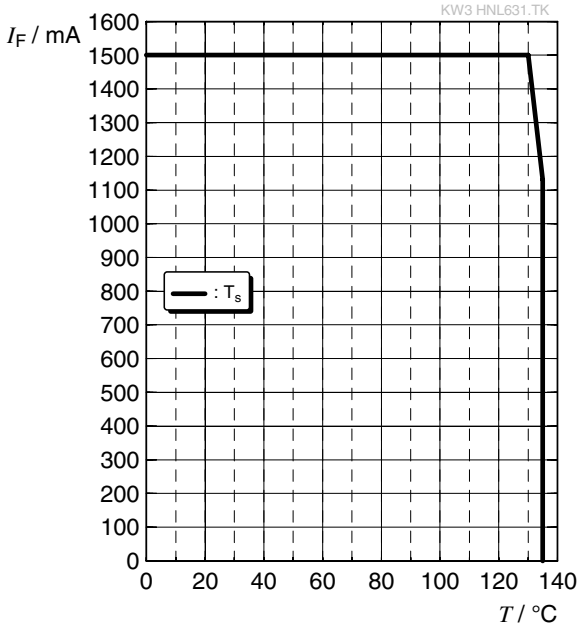
$Cx, Cy = f(T_j);\ I_F = 1000\ mA$



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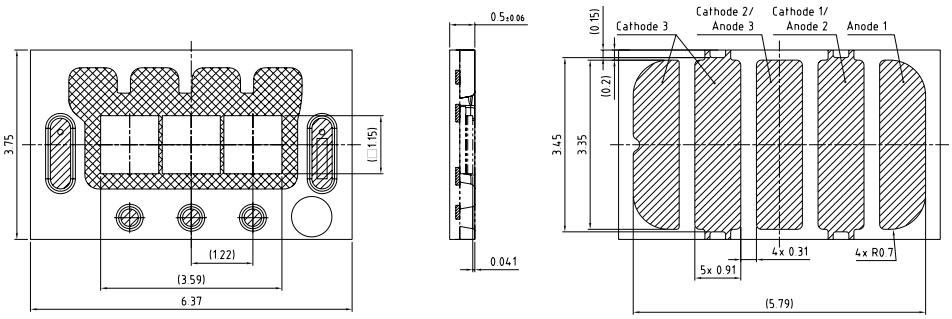
Max. Permissible Forward Current

$I_F = f(T)$



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Dimensional Drawing [9)]



C67062-A0348-A1-04

Further Information:

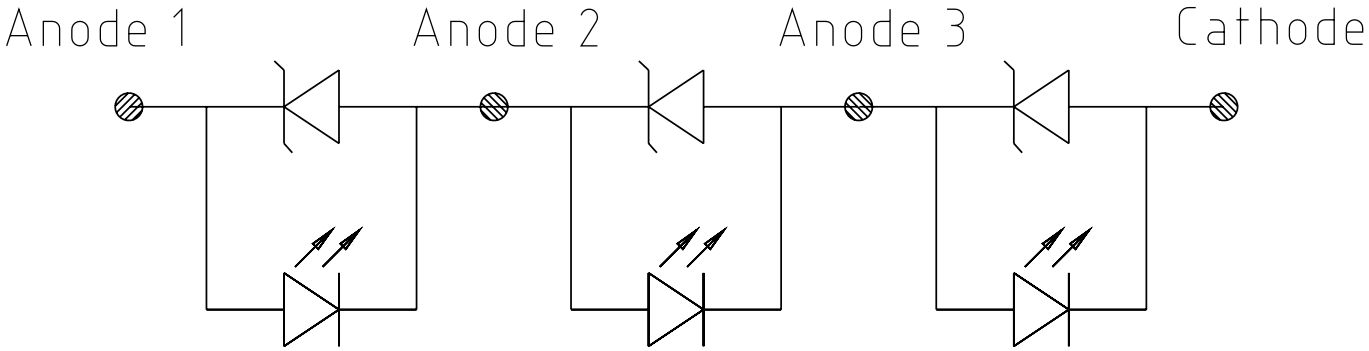
Approximate Weight: 30.0 mg

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

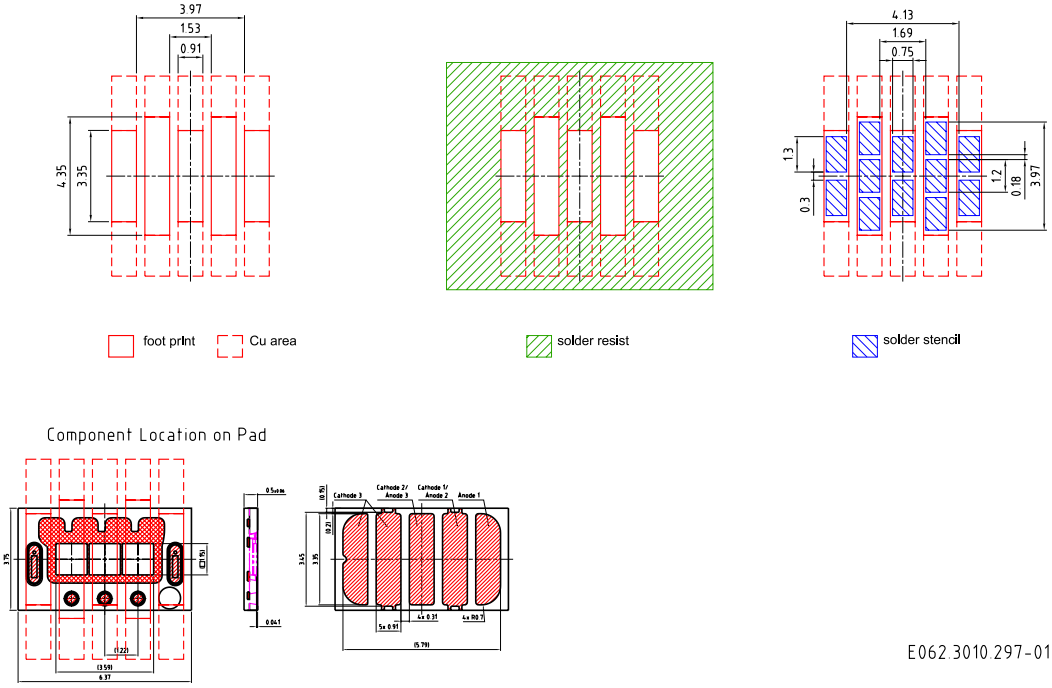
ESD advice: The device is protected by ESD device which is connected in parallel to the Chip.

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Electrical Internal Circuit



Recommended Solder Pad 9)

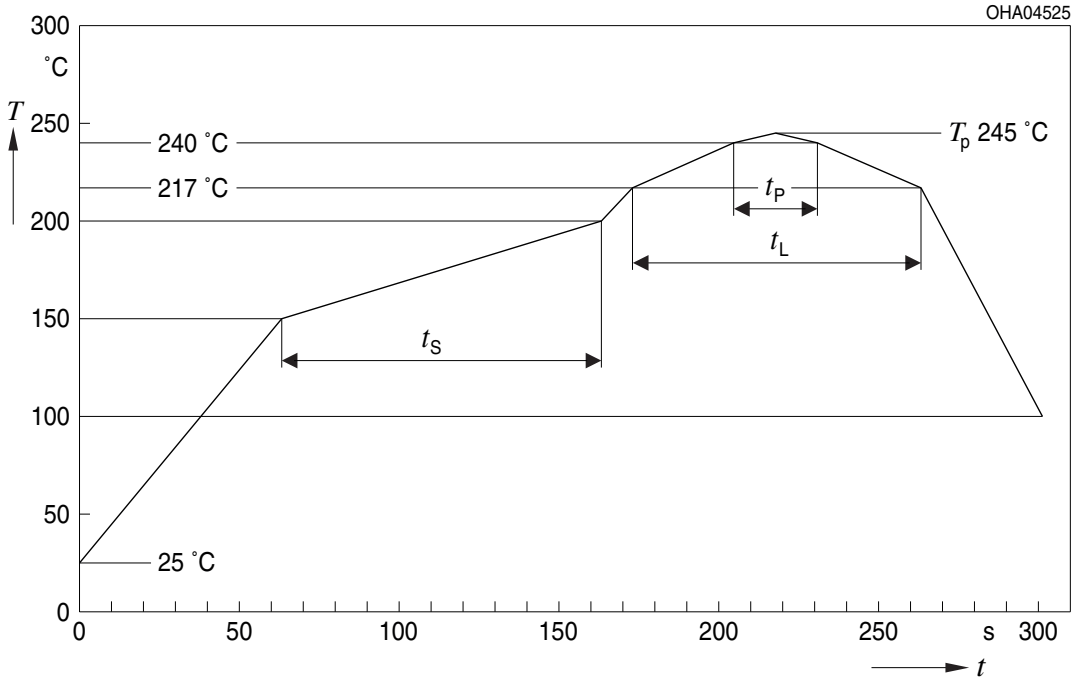


For superior solder joint connectivity results we recommend soldering under standard nitrogen atmosphere. Package not suitable for ultra sonic cleaning. To ensure a high solder joint reliability and to minimize the risk of solder joint cracks, the customer is responsible to evaluate the combination of PCB board and solder paste material for his application.

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Reflow Soldering Profile

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

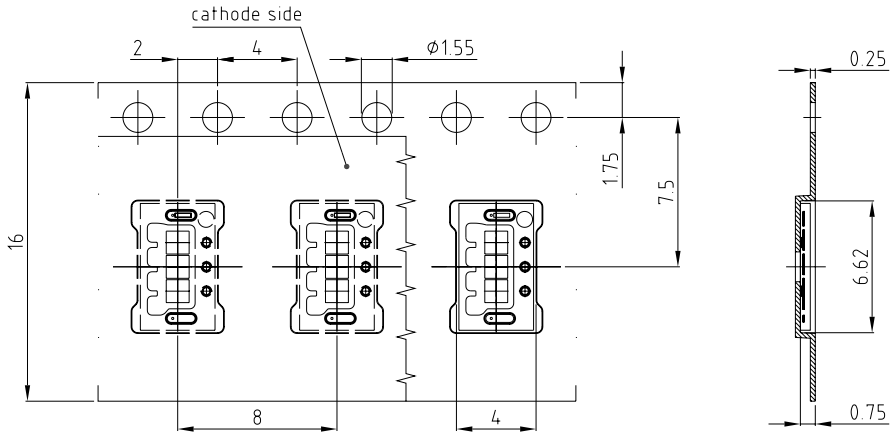


Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat*) 25 °C to 150 °C			2	3	K/s
Time t_S T_{Smin} to T_{Smax}	t_S	60	100	120	s
Ramp-up rate to peak*) T_{Smax} to T_P			2	3	K/s
Liquidus temperature	T_L		217		°C
Time above liquidus temperature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

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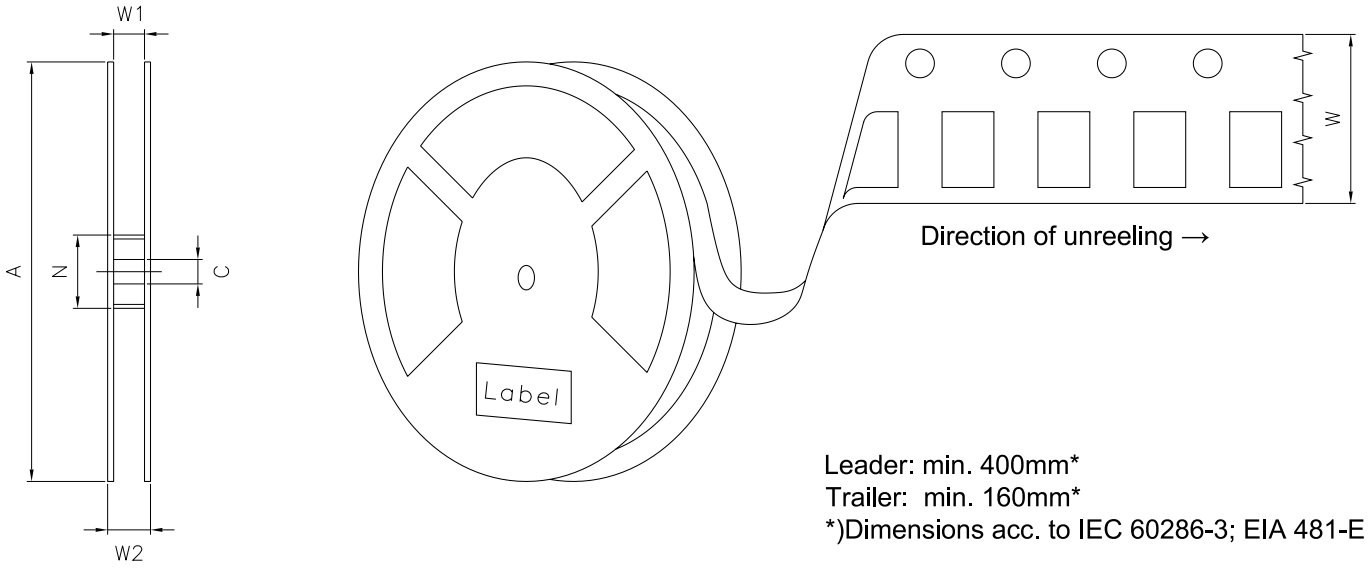
Taping [9)]



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Tape and Reel [10)]



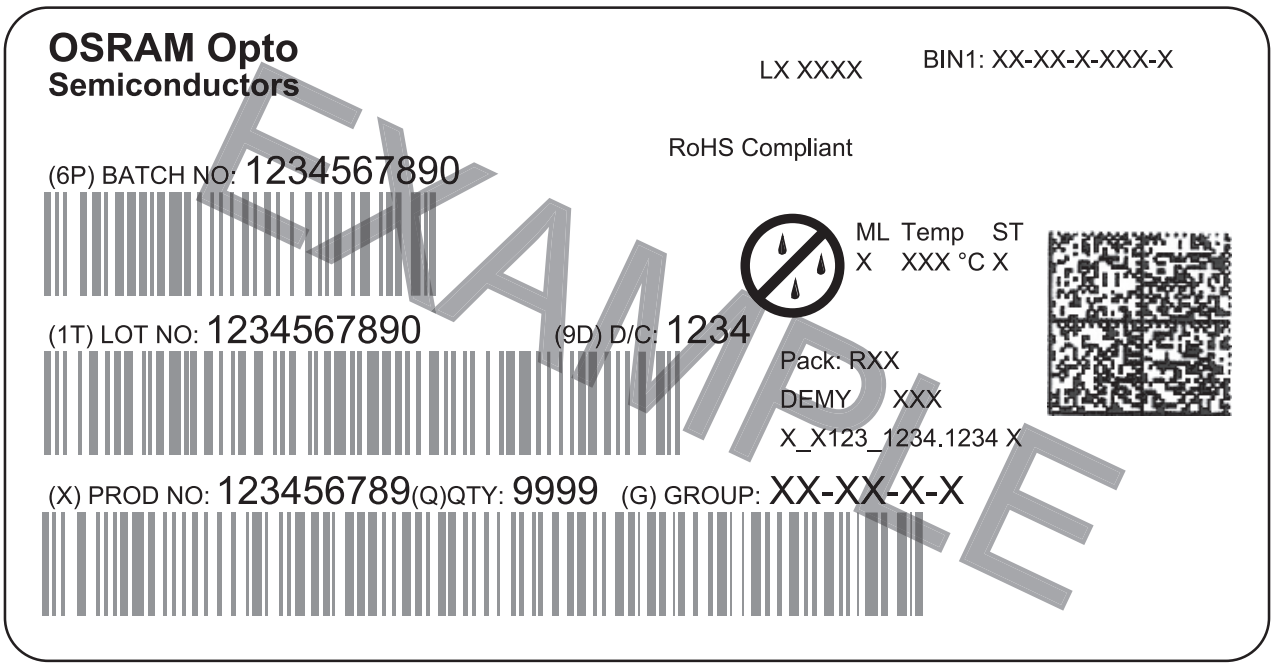
Leader: min. 400mm*
Trailer: min. 160mm*
*)Dimensions acc. to IEC 60286-3; EIA 481-E

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	2000

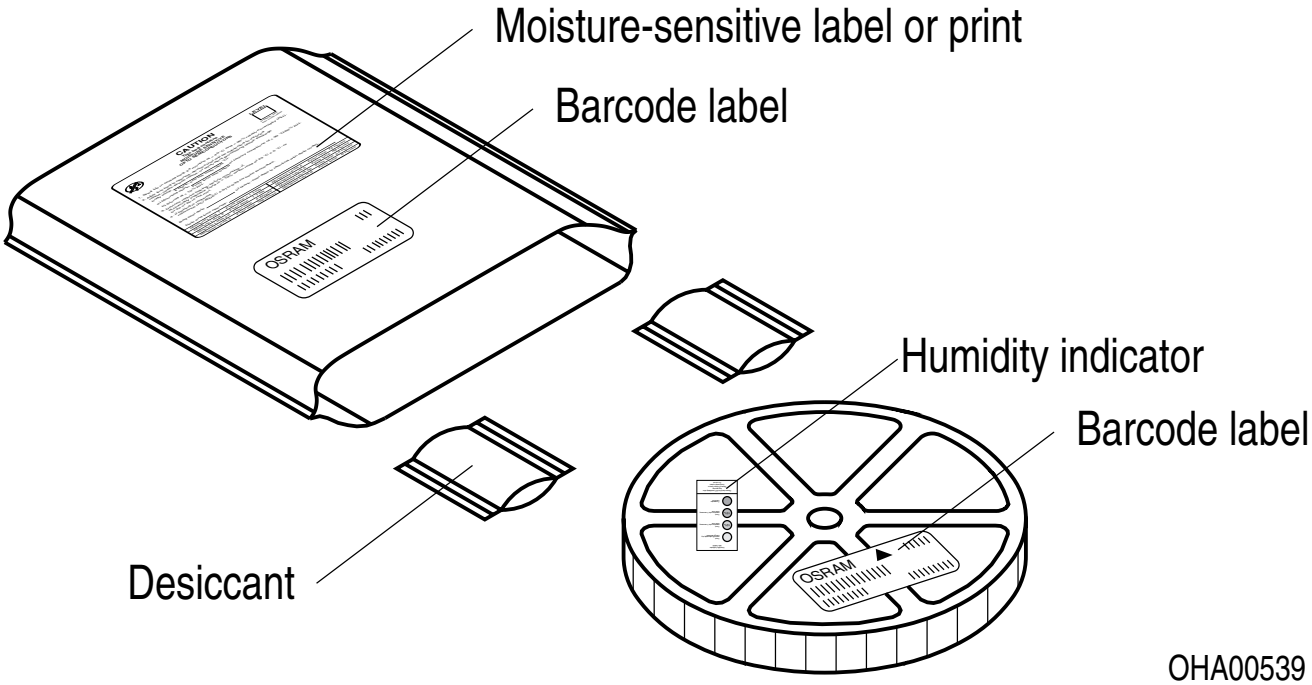
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Barcode-Product-Label (BPL)



OHA04563

Dry Packing Process and Materials [9)]



OHA00539

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

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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 www.osram-os.com/appnotes

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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.

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Glossary

1) **Brightness:** Brightness values are measured during a current pulse of typically 1 ms, with an internal reproducibility of ±8 % and an expanded uncertainty of ±11 % (acc. to GUM with a coverage factor of k = 3).

2) **Operating Temperature:** The Operating Temperatur Top is referenced to the Solderpoint Ts of this device. Proper current derating must be observed to maintain junction temperature below the maximum.

3) **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.

4) **Chromaticity coordinate groups:** Chromaticity coordinates are measured during a current pulse of typically 1 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).

5) **Forward Voltage:** The forward voltage is measured during a current pulse of typically 1 ms, with an internal reproducibility of ±0.05 V and an expanded uncertainty of ±0.1 V (acc. to GUM with a coverage factor of k = 3).

6) **Thermal Resistance:** Rth max is based on statistic values (6σ).

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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Revision History

Version	Date	Change
1.0	2021-12-02	Initial Version
1.1	2022-01-17	Product Image Dimensional Drawing Taping
1.2	2022-02-22	New Layout Ordering Information

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