

# GW JTLMSX.EM (MacAdam Ellipse)



## DURIS® E 2835

The DURIS® E 2835 combines good efficacy and a wide beam angle into a compact format (2.8 mm x 3.5 mm). This is key to homogeneous illumination applications where the DURIS® E 2835 never fails to impress with its performance on system level.



## Applications

- Area Lights
- Downlights/Spotlights
- Table Lamp

## Features:

- Package: white SMT package, colored diffused silicone resin
- Typ. Radiation: 120° (Lambertian emitter)
- Color temperature: 2200K - 6500K
- CRI: 80 (min.), 82 (typ.)
- Lumen maintenance: Test results according to IESNA LM-80 available
- ESD: 1 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM)
- Luminous Flux: typ. 24.8 lm @ 5700 K
- Luminous efficacy: typ. 133 lm/W @ 5700 K

## Ordering Information

Type	Color temperature	Luminous Flux <sup>1)</sup> $I_F = 60 \text{ mA}$ $\Phi_V$	Ordering Code
GW JTLMSX.EM-B5B8-22S5-1-1	2200 K	16.0 ... 24.0 lm	Q65112A6844
GW JTLMSX.EM-B7A1-27S5-1-1	2700 K	20.0 ... 28.0 lm	Q65112A6829
GW JTLMSX.EM-B7A2-30S5-1-1	3000 K	20.0 ... 30.0 lm	Q65112A6828
GW JTLMSX.EM-B8A2-35S5-1-1	3500 K	22.0 ... 30.0 lm	Q65112A6827
GW JTLMSX.EM-B8A2-40S5-1-1	4000 K	22.0 ... 30.0 lm	Q65112A6826
GW JTLMSX.EM-B8A2-50S5-1-1	5000 K	22.0 ... 30.0 lm	Q65112A6825
GW JTLMSX.EM-B8A2-57S5-1-1	5700 K	22.0 ... 30.0 lm	Q65112A6824
GW JTLMSX.EM-B8A2-65S5-1-1	6500 K	22.0 ... 30.0 lm	Q65112A6823

## Maximum Ratings

Parameter	Symbol		Values
Operating Temperature	$T_{op}$	min.	-30 °C
		max.	85 °C
Storage Temperature	$T_{stg}$	min.	-40 °C
		max.	100 °C
Junction Temperature	$T_j$	max.	115 °C
Forward Current	$I_F$	min.	10 mA
$T_j = 25\text{ °C}$		max.	90 mA
Surge Current	$I_{FS}$	max.	200 mA
$t \leq 10\text{ }\mu\text{s}$ ; $D = 0.005$ ; $T_j = 25\text{ °C}$			
Reverse voltage <sup>2)</sup>	$V_R$		Not designed for reverse operation
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM)	$V_{ESD}$		1 kV

## Characteristics

$I_F = 60 \text{ mA}$ ;  $T_J = 25 \text{ °C}$

Parameter	Symbol		Values
Viewing angle at 50% $I_V$	$2\phi$	typ.	120 °
Forward Voltage <sup>3)</sup>	$V_F$	min.	2.80 V
		typ.	3.15 V
		max.	3.30 V
Reverse current <sup>2)</sup>	$I_R$		Not designed for reverse operation
Color Rendering Index <sup>4)</sup>	CRI	min.	80
		typ.	82
Electrical thermal resistance junction/solderpoint with efficiency $\eta_e = 38.9 \%$	$R_{thJS \text{ elec.}}$	typ.	25 K / W

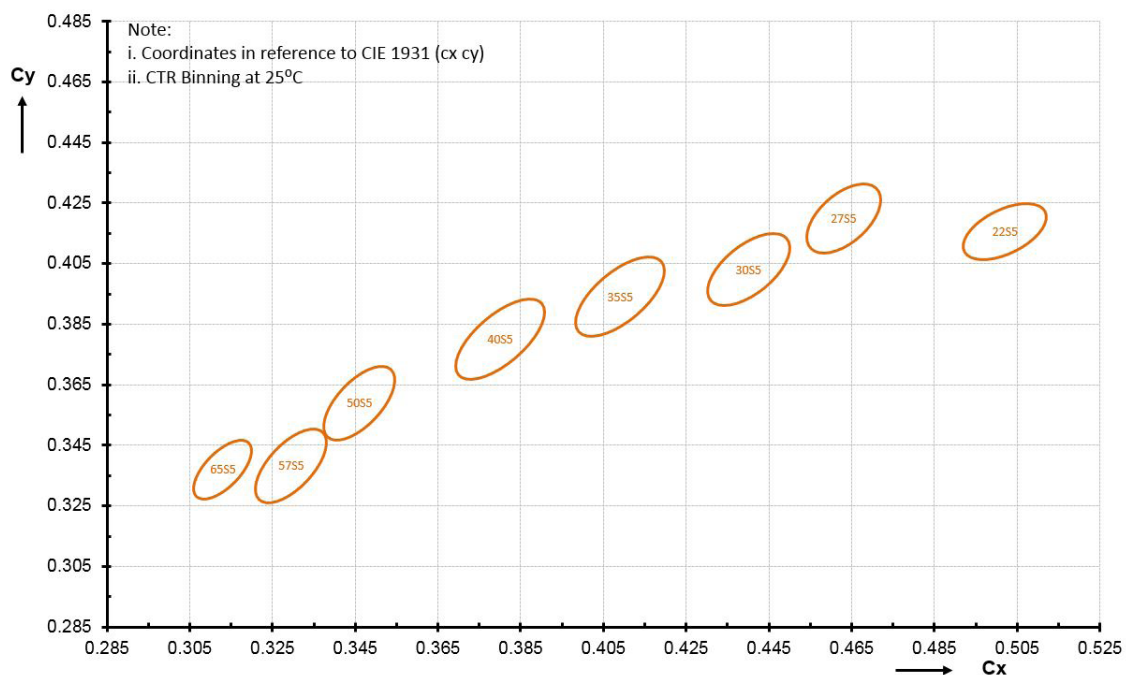
## Brightness Groups

Group	Luminous Flux <sup>1)</sup> $I_F = 60 \text{ mA}$ min. $\Phi_V$	Luminous Flux <sup>1)</sup> $I_F = 60 \text{ mA}$ max. $\Phi_V$
B5	16.0 lm	18.0 lm
B6	18.0 lm	20.0 lm
B7	20.0 lm	22.0 lm
B8	22.0 lm	24.0 lm
B9	24.0 lm	26.0 lm
A1	26.0 lm	28.0 lm
A2	28.0 lm	30.0 lm

## Forward Voltage Groups

Group	Forward Voltage <sup>3)</sup> min. $V_F$	Forward Voltage <sup>3)</sup> max. $V_F$
L1	2.80 V	2.90 V
L2	2.90 V	3.00 V
M1	3.00 V	3.10 V
M2	3.10 V	3.20 V
N1	3.20 V	3.30 V

## Chromaticity Coordinate Groups



Chromaticity Coordinate Groups

CCT	Center Cx	Center Cy	Ø		
2200 K	0.5020	0.4156	0.012	0.0067	39.9
2700 K	0.4630	0.4200	0.0129	0.0067	57.3
3000 K	0.4400	0.4030	0.0139	0.0068	53.2
3500 K	0.4090	0.3940	0.0155	0.0069	54
4000 K	0.3800	0.3800	0.0156	0.0067	53.7
5000 K	0.3460	0.3590	0.0137	0.006	59.6
5700 K	0.3295	0.3382	0.0137	0.006	59.6
6500 K	0.3130	0.3370	0.011	0.0048	58.6

Group Name on Label

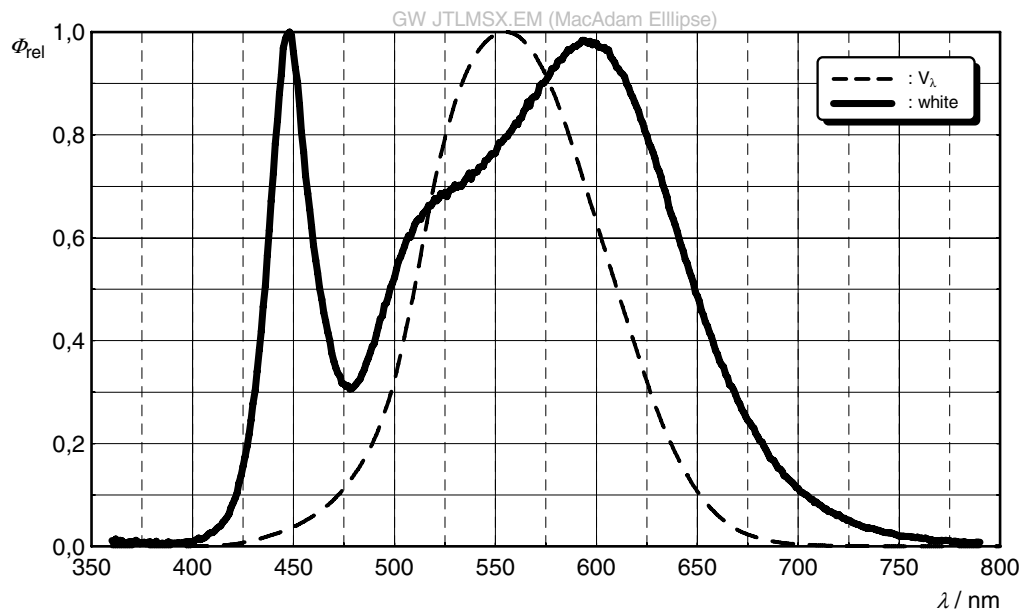
Example: A1-22S5-L1

Brightness	Color Chromaticity	Forward Voltage
A1	22S5	L1



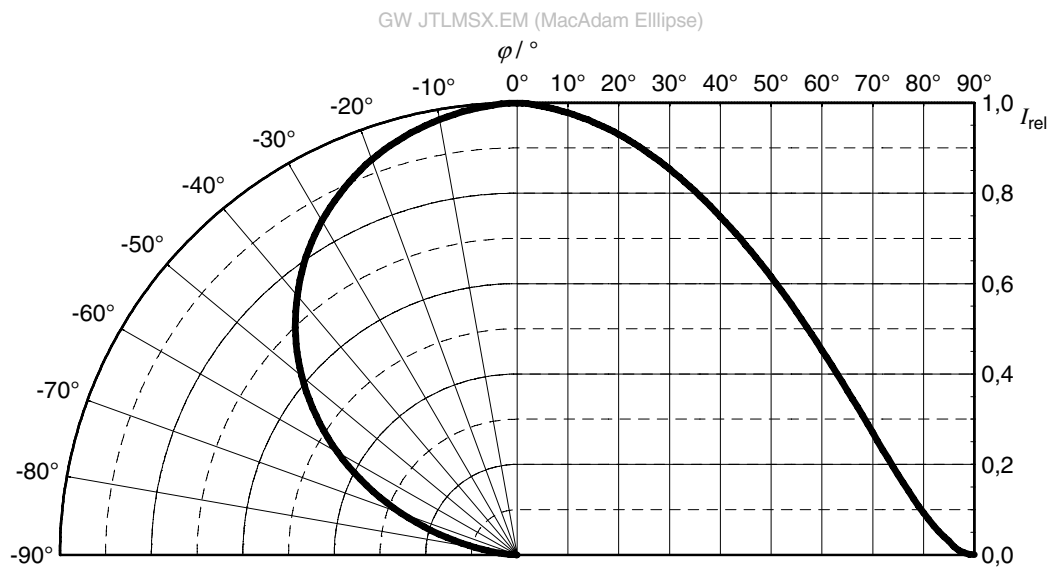
## Relative Spectral Emission <sup>5)</sup>

$$\Phi_{\text{rel}} = f(\lambda); I_F = 60 \text{ mA}; T_J = 25 \text{ °C}$$



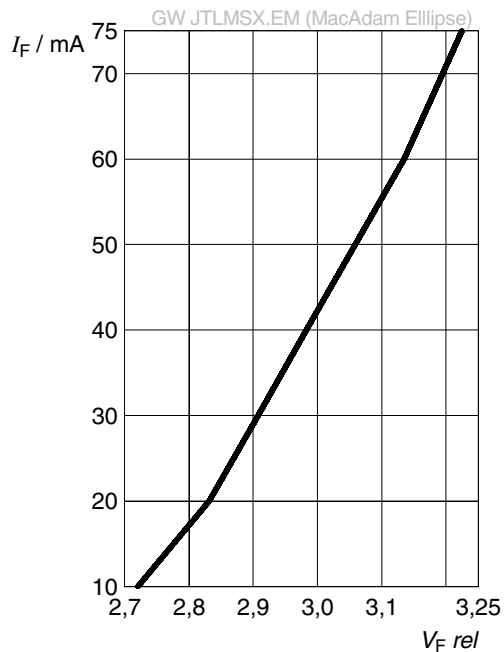
## Radiation Characteristics <sup>5)</sup>

$$I_{\text{rel}} = f(\phi); T_J = 25 \text{ °C}$$



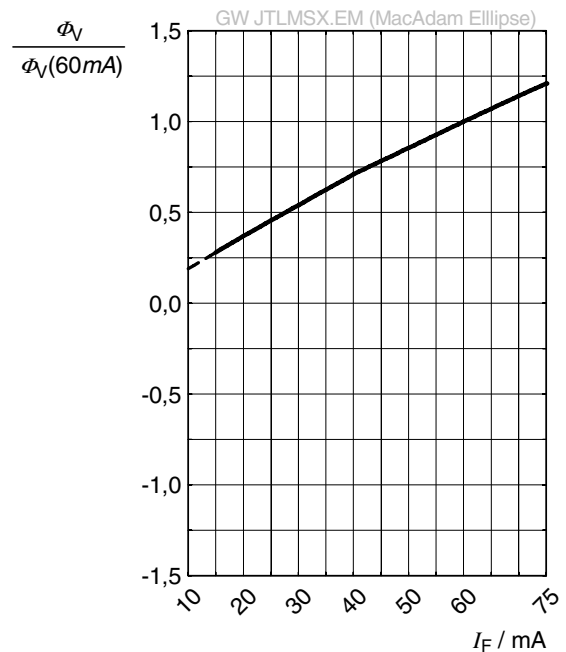
## Forward current <sup>5), 6)</sup>

$$I_F = f(V_F); T_J = 25\text{ °C}$$



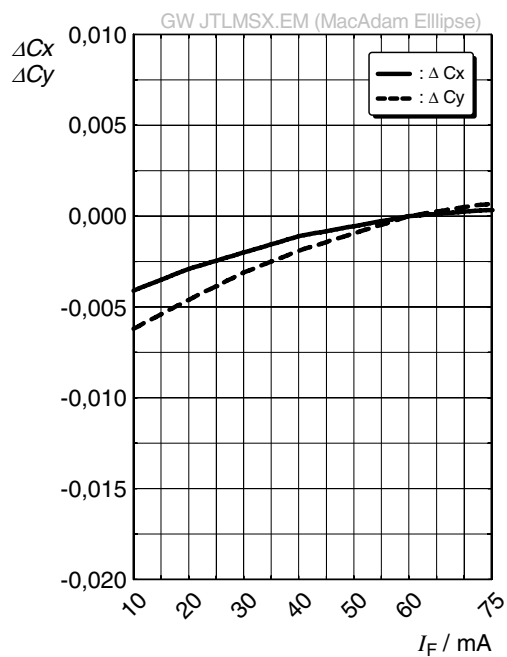
## Relative Luminous Flux <sup>5), 6)</sup>

$$\Phi_V / \Phi_V(60\text{ mA}) = f(I_F); T_J = 25\text{ °C}$$



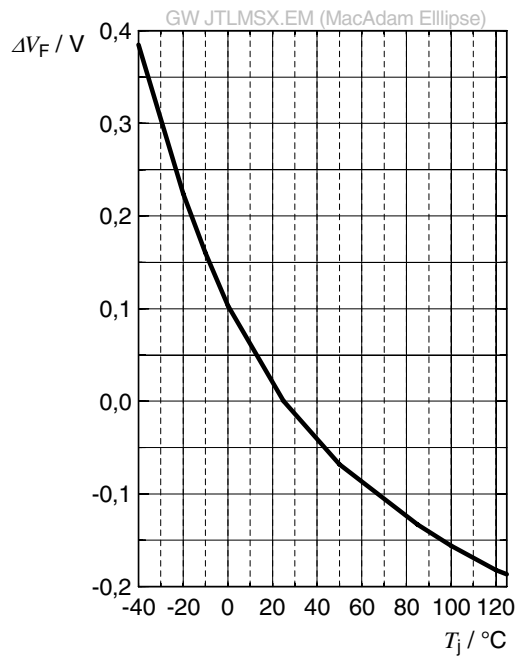
## Chromaticity Coordinate Shift <sup>5)</sup>

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



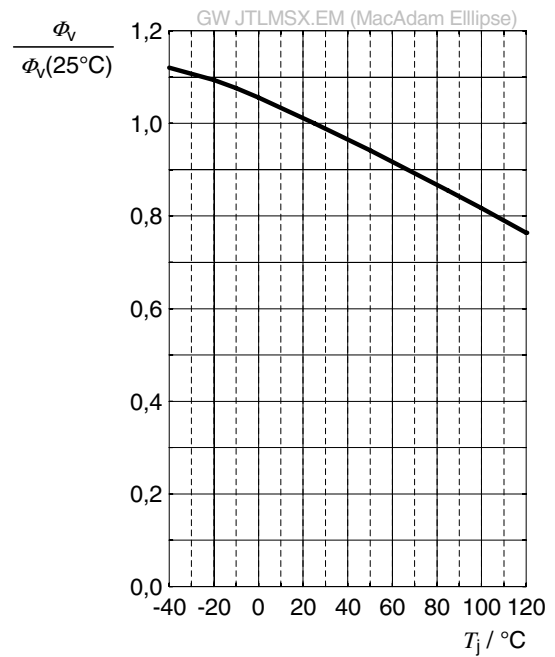
## Forward Voltage <sup>5)</sup>

$$\Delta V_F = V_F - V_F(25^\circ\text{C}) = f(T_j); I_F = 60 \text{ mA}$$



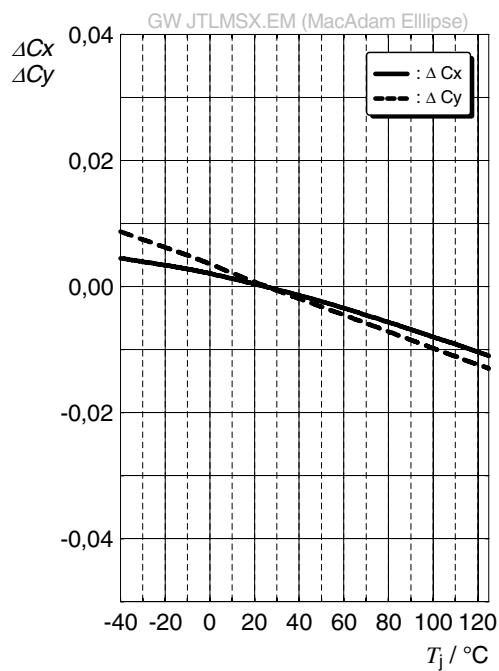
## Relative Luminous Flux <sup>5)</sup>

$$\Phi_V / \Phi_V(25^\circ\text{C}) = f(T_j); I_F = 60 \text{ mA}$$



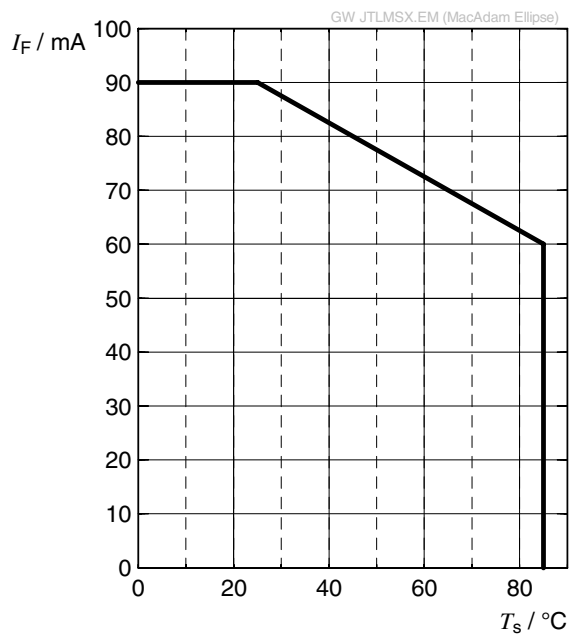
## Chromaticity Coordinate Shift <sup>5)</sup>

$$\Delta C_x, \Delta C_y = f(T_j); I_F = 60 \text{ mA}$$

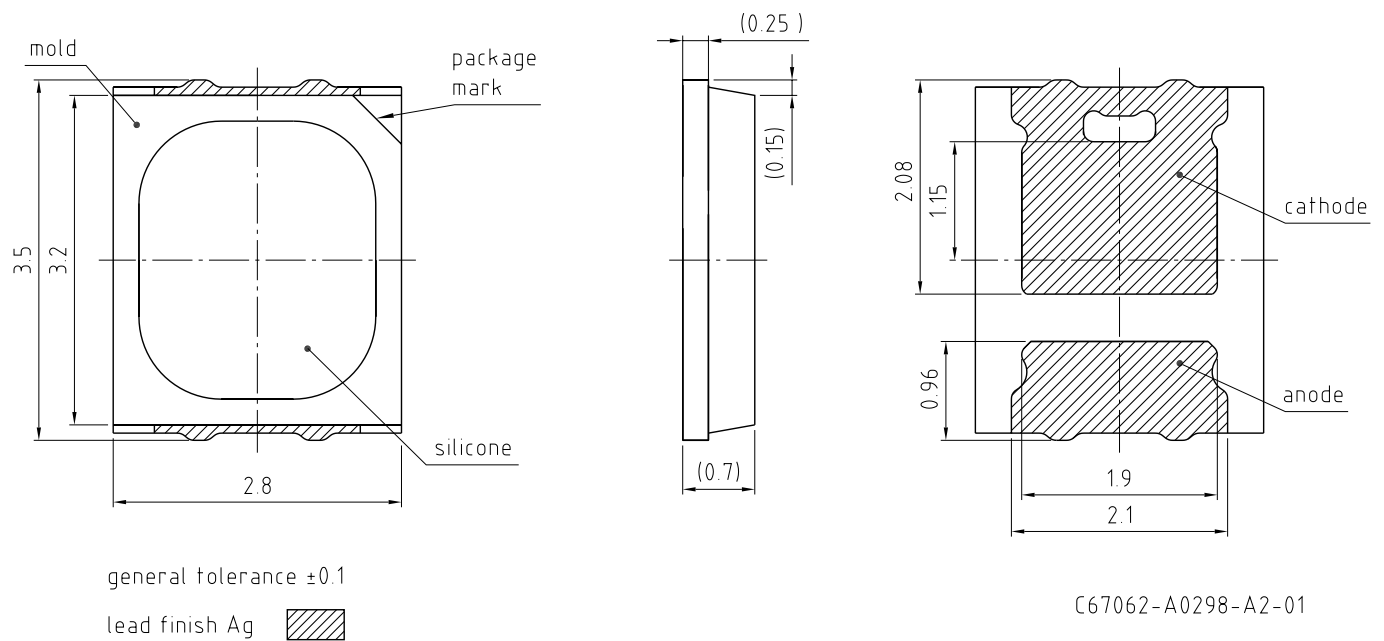


## Max. Permissible Forward Current

$$I_F = f(T)$$



## Dimensional Drawing <sup>7)</sup>

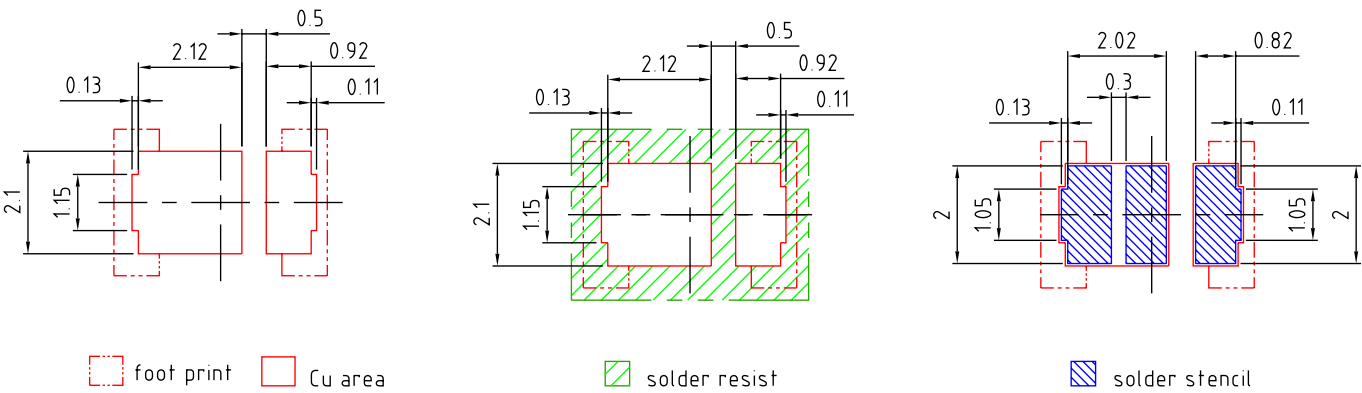


## Further Information:

**Approximate Weight:** 20.0 mg

**Package marking:** Cathode

Recommended Solder Pad <sup>7)</sup>

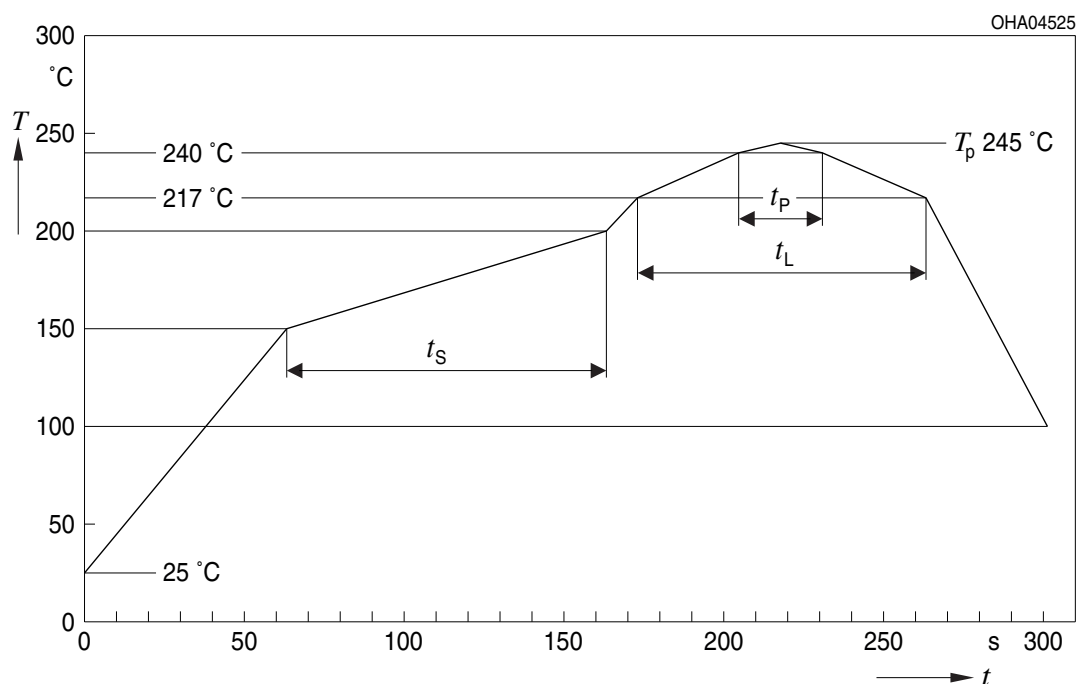


E067.0346.04-01

For superior solder joint connectivity results we recommend soldering under standard nitrogen atmosphere. Package not suitable for ultra sonic cleaning.

## Reflow Soldering Profile

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

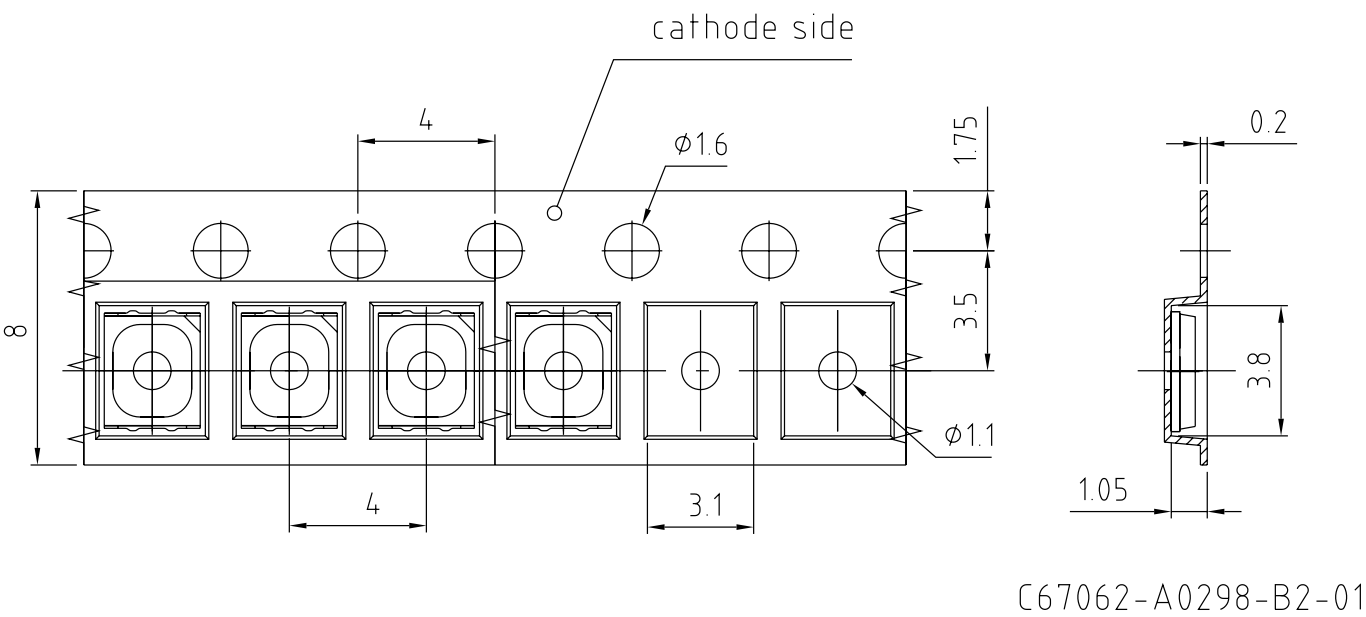


Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat <sup>*)</sup> 25 °C to 150 °C			2	3	K/s
Time $t_s$ $T_{Smin}$ to $T_{Smax}$	$t_s$	60	100	120	s
Ramp-up rate to peak <sup>*)</sup> $T_{Smax}$ to $T_p$			2	3	K/s
Liquidus temperature	$T_L$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

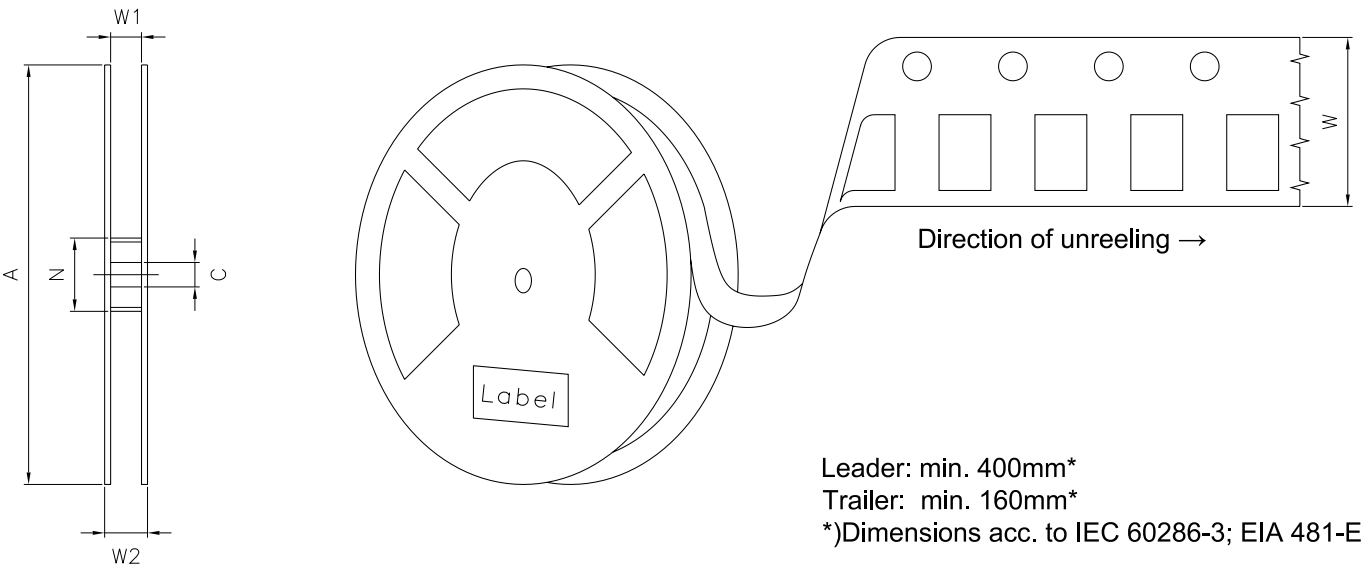
\* slope calculation  $DT/Dt$ :  $Dt$  max. 5 s; fulfillment for the whole T-range

Taping <sup>7)</sup>





Tape and Reel <sup>8)</sup>



Reel Dimensions

A	W	N <sub>min</sub>	W <sub>1</sub>	W <sub>2 max</sub>	Pieces per PU
180 mm	8 + 0.3 / - 0.1 mm	60 mm	8.4 + 2 mm	14.4 mm	3000
330 mm	8 + 0.3 / - 0.1 mm	60 mm	8.4 + 2 mm	14.4 mm	12000

# OSRAM Opto Semiconductors

BIN1: XX-XX-X-XXX-X

(6P) BATCH NO: 1234567890



(1T) LOT NO: 1234567890

(9D) D/C: 1234



DEMY XXX

X X123 1234.1234 X

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



ML Temp ST  
X XXX °C X



OHA04563

The diagram shows a perspective view of a rectangular package and a top-down view of a circular package. The rectangular package has a 'CAUTION' label and an 'OSRAM' label with a barcode. The circular package has a 'Humidity indicator' and a 'Barcode label'. Two small packets labeled 'Desiccant' are shown near the packages. Labels with leader lines identify the 'Moisture-sensitive label or print', 'Barcode label', 'Humidity indicator', 'Barcode label', and 'Desiccant'.

OH A00539

## 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 **low risk (exposure time 100 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.

This device is designed for specific/recommended applications only. Please consult OSRAM Opto Semiconductors Sales Staff in advance for detailed information on other non-recommended applications (e.g. automotive).

Change management for this component is aligned with the requirements of the lighting market.

For further application related information please visit [www.osram-os.com/appnotes](http://www.osram-os.com/appnotes)

## 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 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 and functional 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.

OSRAM OS products are not qualified at module and system level for such application.

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 10 ms, with a tolerance of  $\pm 7\%$ .
- 2) **Reverse Operation:** Not designed for reverse operation. Continuous reverse operation can cause migration and damage of the device.
- 3) **Forward Voltage:** The Forward voltage is measured during a current pulse duration of typically 1 ms with a tolerance of  $\pm 0.05\text{V}$ .
- 4) **Color reproduction index:** Color reproduction index values (CRI-RA) are measured during a current pulse of typically 10 ms and with a tolerance of  $\pm 2$ .
- 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  $\pm 0.1$  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	2019-05-03	Initial Version
1.1	2020-02-14	New Layout Schematic Transportation Box Dimensions of Transportation Box
1.2	2020-03-04	Maximum Ratings Derating (Diagrams)

**Published by OSRAM Opto Semiconductors GmbH**  
**Leibnizstraße 4, D-93055 Regensburg**  
**www.osram-os.com © All Rights Reserved.**

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。