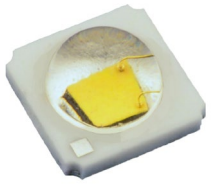
# LZ1-00CW02



## LED ENGIN LuxiGen

Industry most robust high power ceramic package with glass lens for high performance over life.

## Applications

- Architecture
- Building Control (Elevator, Light, ...)
- Display / Wallpaper backlighting
- Displays (Backlighting)
- Downlights/Spotlights
- Electronic Equipment
- Emergency Vehicle Lighting
- Equipment Illumination (e.g. Curing, Endoscope)
- Horticulture Lighting
- Industrial Automation (Machine Controls, Light Barriers, Vision Controls)
- Projection Home LED & Laser
- Safety and Security, CCTV
- Signalling
- Stage Lighting (LED & Laser)
- Street, Tunnel and Outdoor

## Features:

- Package: Ceramic package with integrated glass lens
- Chip technology: UX:3
- Typ. Radiation: 90°
- Color: Cx = 0.33, Cy = 0.33 acc. to CIE 1931 (• white)
- Color temperature: 5500K - 6500K
- CRI: 75 (typ.)

## Ordering Information

| Type | Color temperature | Luminous Flux [1] $I_F$ = 1000 mA $\Phi_V$ | Ordering Code |
|---|---|---|---|
| LZ1-00CW02-0055 | 5500 K | 228 ... 445 lm | Q65113A1992 |
| LZ1-00CW02-0065 | 6500 K | 228 ... 445 lm | Q65113A1991 |

## Maximum Ratings

| Parameter | Symbol | | Values |
|---|---|---|---|
| Operating Temperature | $T_{op}$ | min.<br>max. | -40 °C<br>150 °C |
| Storage Temperature | $T_{stg}$ | min.<br>max. | -40 °C<br>150 °C |
| Junction Temperature [2)] | $T_j$ | max. | 150 °C |
| Forward Current [2)] | $I_F$ | max. | 1200 mA |
| Forward Current pulsed<br>t ≤ 10 ms; D ≤ 0.1 ; $T_C$ = 25 °C | $I_{F\ pulse}$ | max. | 2000 mA |
| ESD withstand voltage<br>acc. ANSI/ESDA/JEDEC JS-001 (HBM, Class 0) | $V_{ESD}$ | | ESD sensitive device |
| Reverse voltage [3)] | $V_R$ | | Not designed for reverse operation |

## Characteristics

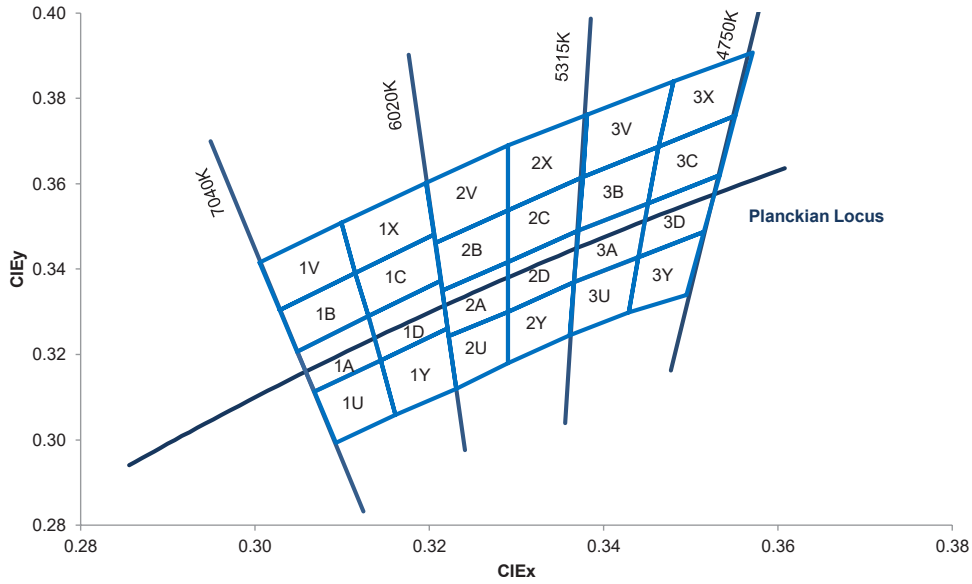
$I_F$ = 1000 mA; $T_C$ = 25 °C

| Parameter | Symbol | | Values |
|---|---|---|---|
| Chromaticity Coordinate [4] | Cx<br>Cy | typ.<br>typ. | 0.33<br>0.33 |
| Luminous Flux [5] | $\Phi_V$ | typ. | 315 lm |
| Photosynthetic Photon Flux (PPF) [5]<br>λ = 400 - 700 nm | $\Phi_P$ | typ. | 4.8 µmol/s |
| Viewing angle at 50% $I_V$ | 2φ | typ. | 95 ° |
| Forward Voltage [6][5]<br>$I_F$ = 1000 mA | $V_F$ | min.<br>typ.<br>max. | 2.80 V<br>3.60 V<br>3.80 V |
| Reverse current [3] | $I_R$ | | Not designed for reverse operation |
| Color Rendering Index [7] | $R_a$ | typ. | 75 |
| Electrical thermal resistance junction/case | $R_{thJC\ elec.}$ | typ. | 6.0 K / W |

## Brightness Groups

| Group | Luminous Flux [1] $I_F$ = 1000 mA min. $\Phi_V$ | Luminous Flux [1] $I_F$ = 1000 mA max. $\Phi_V$ |
|---|---|---|
| Q | 228 lm | 285 lm |
| R | 285 lm | 356 lm |
| S | 356 lm | 445 lm |

## Chromaticity Coordinate Groups




## Chromaticity Coordinate Groups

| Group | Cx | Cy | CCT | Group | Cx | Cy | CCT | Group | Cx | Cy | CCT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2A | 0.3214 | 0.3350 | 5500 | 2U | 0.3222 | 0.3243 | 5500 | 3A | 0.3366 | 0.3369 | 5500 |
| | 0.3290 | 0.3417 | 5500 | | 0.3290 | 0.3300 | 5500 | | 0.3371 | 0.3490 | 5500 |
| | 0.3290 | 0.3300 | 5500 | | 0.3290 | 0.3180 | 5500 | | 0.3451 | 0.3554 | 5500 |
| | 0.3222 | 0.3243 | 5500 | | 0.3231 | 0.3120 | 5500 | | 0.3440 | 0.3427 | 5500 |
| 2B | 0.3206 | 0.3462 | 5500 | 2V | 0.3196 | 0.3602 | 5500 | 3B | 0.3371 | 0.3490 | 5500 |
| | 0.3290 | 0.3538 | 5500 | | 0.3290 | 0.3690 | 5500 | | 0.3376 | 0.3616 | 5500 |
| | 0.3290 | 0.3417 | 5500 | | 0.3290 | 0.3538 | 5500 | | 0.3463 | 0.3687 | 5500 |
| | 0.3214 | 0.3350 | 5500 | | 0.3206 | 0.3462 | 5500 | | 0.3451 | 0.3554 | 5500 |
| 2C | 0.3290 | 0.3417 | 5500 | 2X | 0.3290 | 0.3538 | 5500 | 3U | 0.3361 | 0.3245 | 5500 |
| | 0.3290 | 0.3538 | 5500 | | 0.3290 | 0.3690 | 5500 | | 0.3366 | 0.3369 | 5500 |
| | 0.3376 | 0.3616 | 5500 | | 0.3381 | 0.3762 | 5500 | | 0.3440 | 0.3428 | 5500 |
| | 0.3371 | 0.3490 | 5500 | | 0.3376 | 0.3616 | 5500 | | 0.3429 | 0.3299 | 5500 |
| 2D | 0.3290 | 0.3300 | 5500 | 2Y | 0.3290 | 0.3180 | 5500 | 3V | 0.3376 | 0.3616 | 5500 |
| | 0.3290 | 0.3417 | 5500 | | 0.3290 | 0.3300 | 5500 | | 0.3381 | 0.3762 | 5500 |
| | 0.3371 | 0.3490 | 5500 | | 0.3366 | 0.3369 | 5500 | | 0.3480 | 0.3840 | 5500 |
| | 0.3366 | 0.3369 | 5500 | | 0.3361 | 0.3245 | 5500 | | 0.3463 | 0.3687 | 5500 |

| Group | Cx | Cy | CCT |
|---|---|---|---|
| 1A | 0.3048 | 0.3207 | 6500 |
| | 0.3130 | 0.3290 | 6500 |
| | 0.3144 | 0.3186 | 6500 |
| | 0.3068 | 0.3113 | 6500 |
| 1B | 0.3028 | 0.3304 | 6500 |
| | 0.3115 | 0.3391 | 6500 |
| | 0.3130 | 0.3290 | 6500 |
| | 0.3048 | 0.3207 | 6500 |
| 1C | 0.3115 | 0.3391 | 6500 |
| | 0.3205 | 0.3481 | 6500 |
| | 0.3213 | 0.3373 | 6500 |
| | 0.3130 | 0.3290 | 6500 |

| Group | Cx | Cy | CCT |
|---|---|---|---|
| 1D | 0.3130 | 0.3290 | 6500 |
| | 0.3213 | 0.3373 | 6500 |
| | 0.3221 | 0.3261 | 6500 |
| | 0.3144 | 0.3186 | 6500 |
| 1U | 0.3068 | 0.3113 | 6500 |
| | 0.3144 | 0.3186 | 6500 |
| | 0.3161 | 0.3059 | 6500 |
| | 0.3093 | 0.2993 | 6500 |
| 1V | 0.3005 | 0.3415 | 6500 |
| | 0.3099 | 0.3509 | 6500 |
| | 0.3115 | 0.3391 | 6500 |
| | 0.3028 | 0.3304 | 6500 |

| Group | Cx | Cy | CCT |
|---|---|---|---|
| 1X | 0.3099 | 0.3509 | 6500 |
| | 0.3196 | 0.3602 | 6500 |
| | 0.3205 | 0.3481 | 6500 |
| | 0.3115 | 0.3391 | 6500 |
| 1Y | 0.3144 | 0.3186 | 6500 |
| | 0.3221 | 0.3261 | 6500 |
| | 0.3231 | 0.3120 | 6500 |
| | 0.3161 | 0.3059 | 6500 |

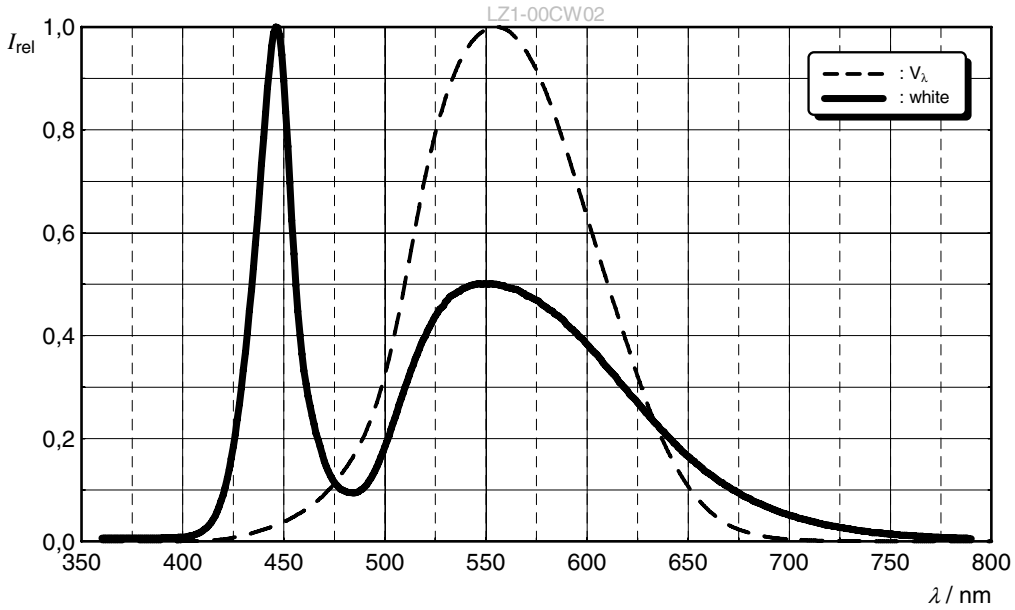
## Group Name on Label

**Example: Q-1A**

| Brightness | Color Chromaticity |
|---|---|
| Q | 1A |

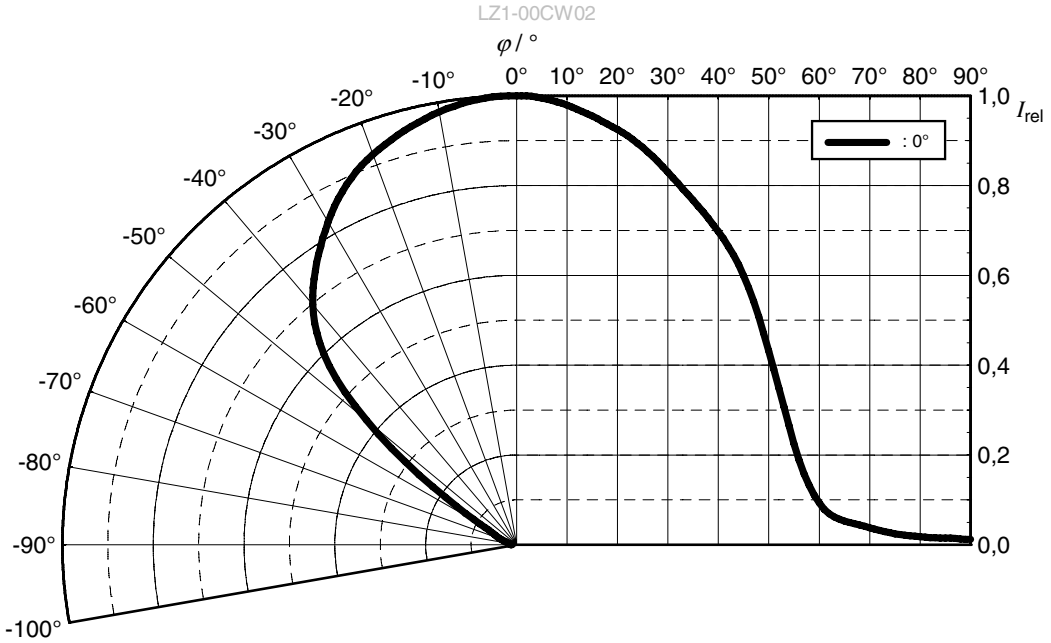
## Relative Spectral Emission [5)]

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



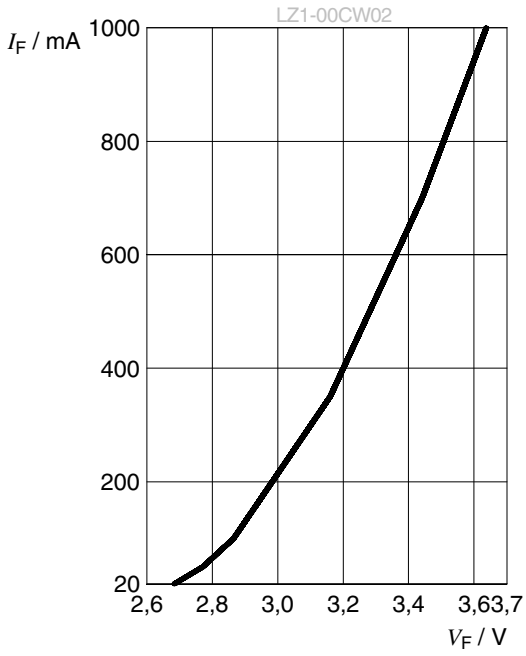

## Radiation Characteristics [5)]

$I_{rel} = f(\phi)$; $T_C$ = 25 °C



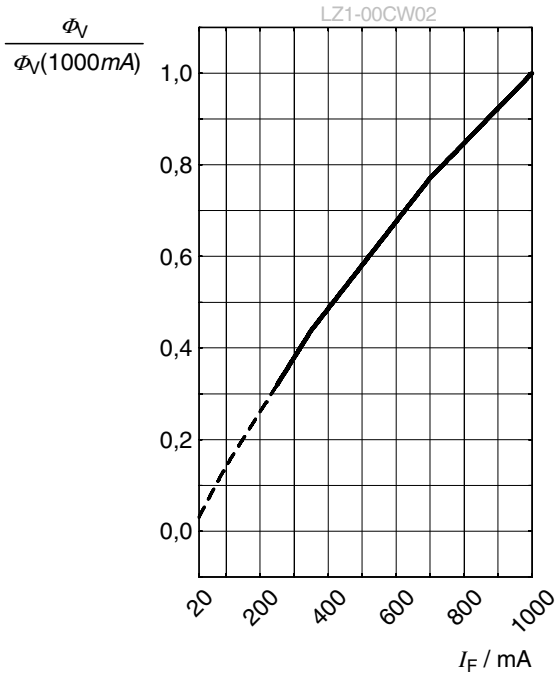
## Forward current [5)]

$I_F = f(V_F)$; $T_C$ = 25 °C



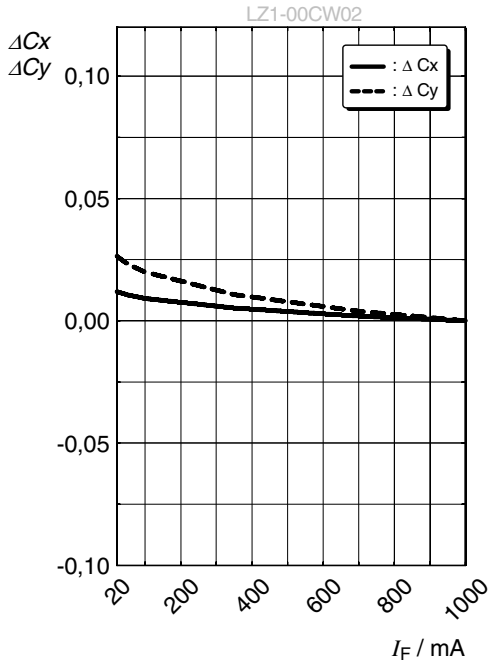

## Relative Luminous Flux [5), 8)]

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



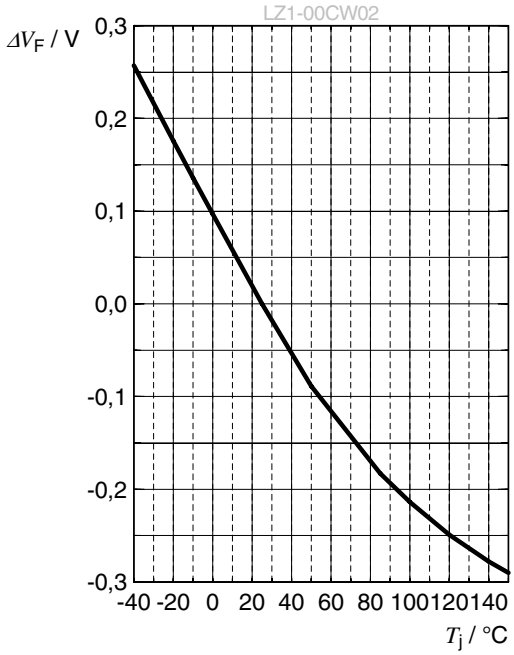

## Chromaticity Coordinate Shift [5)]

ΔCx, ΔCy = $f(I_F)$; $T_C$ = 25 °C



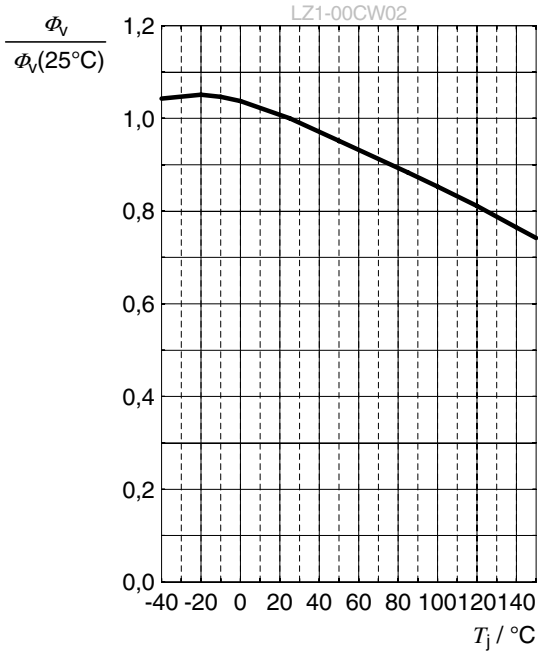
## Forward Voltage [5)]

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



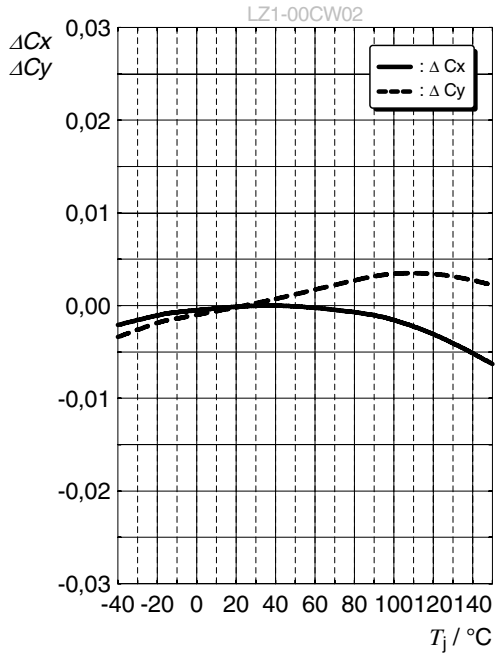

## Relative Luminous Flux [5)]

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



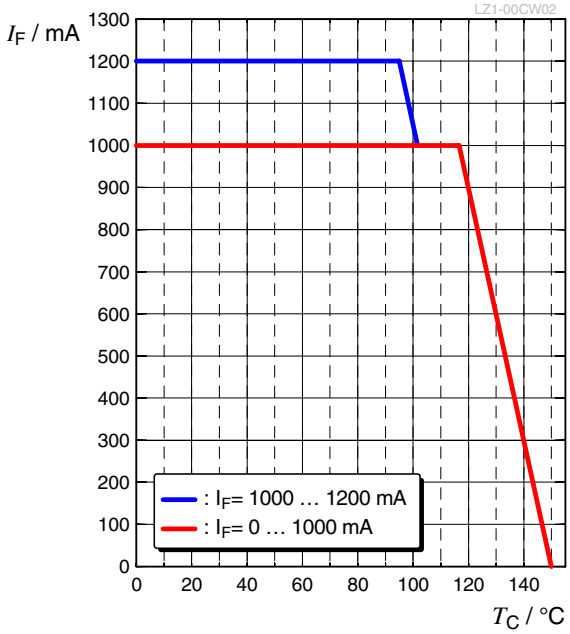

## Chromaticity Coordinate Shift [5)]

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

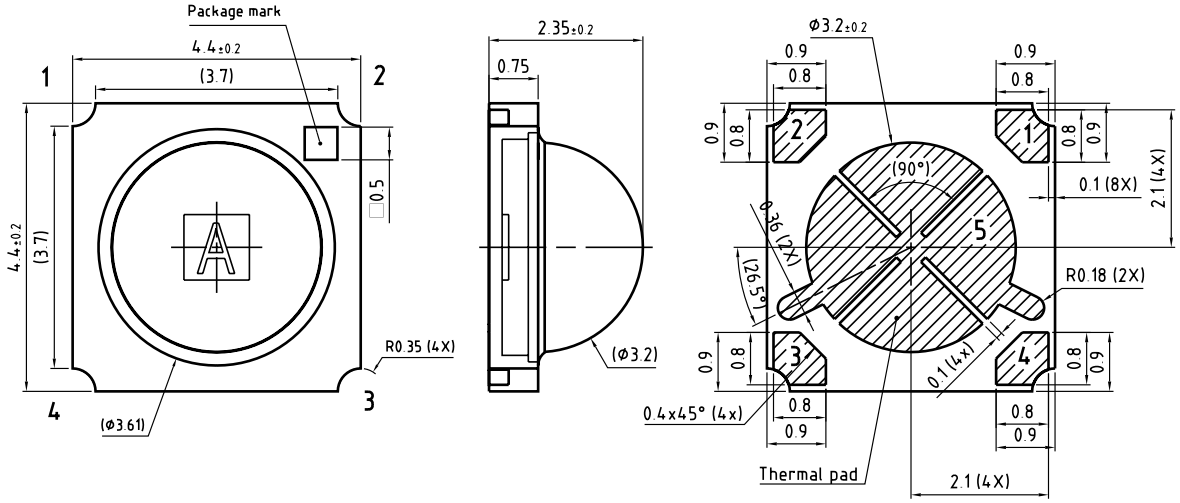


## Max. Permissible Forward Current

$I_F = f(T)$



## Dimensional Drawing [9)]




General tolerance ±0.1
Pad finish silver

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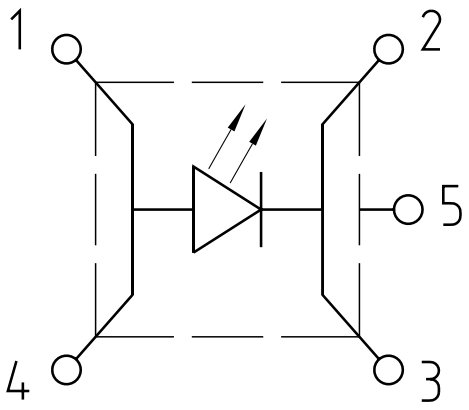
## Further Information:

**Approximate Weight:** 93.9 mg

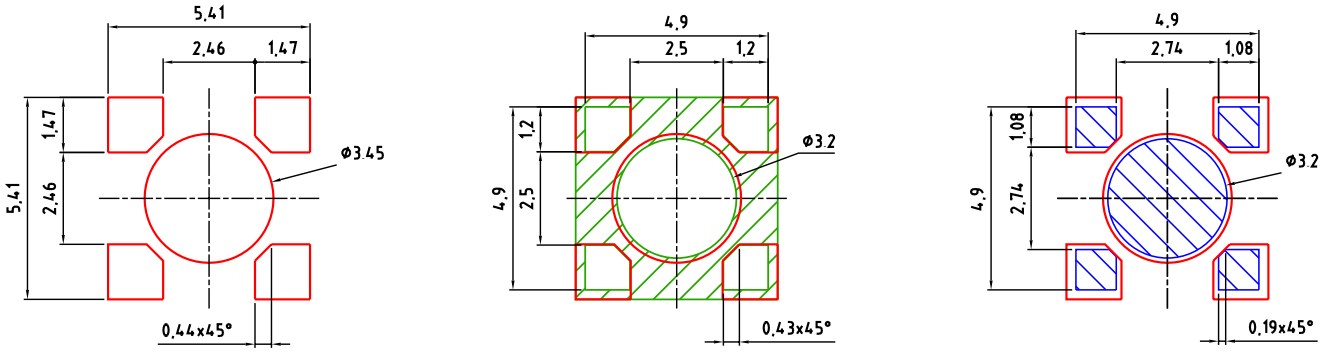
## Electrical Internal Circuit

| Pin Out | |
|---|---|
| Pad | Function |
| 1 | Anode |
| 2 | Cathode |
| 3 | Cathode |
| 4 | Anode |
| 5 | Thermal |

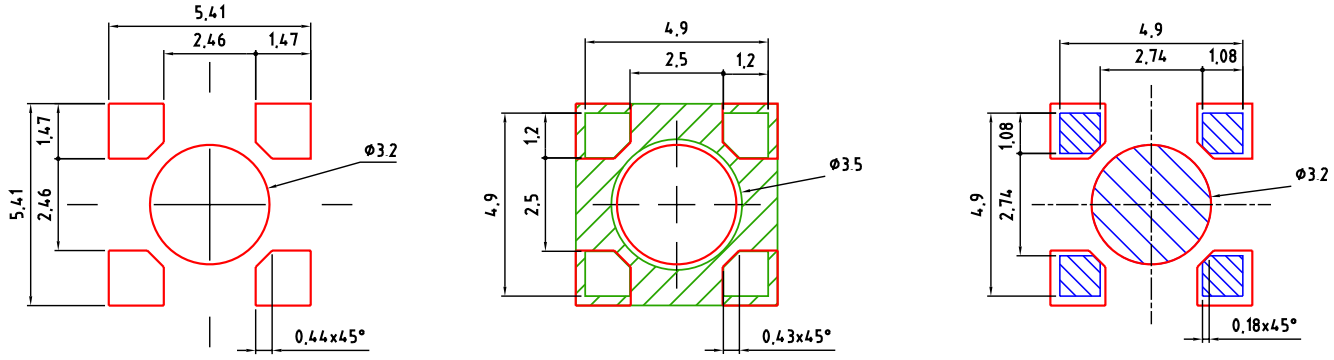


## Recommended Solder Pad [9)]

Non-pedestal MCPCB Design

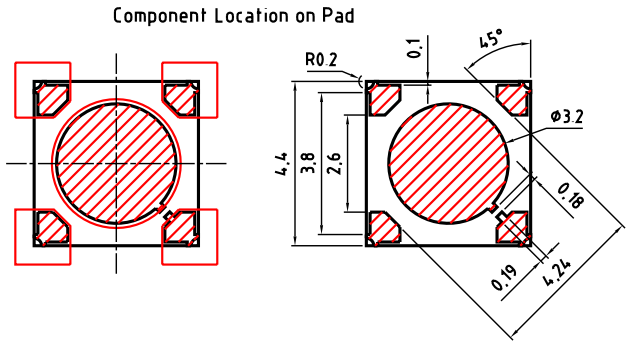



Pedestal MCPCB Design





Component Location on Pad

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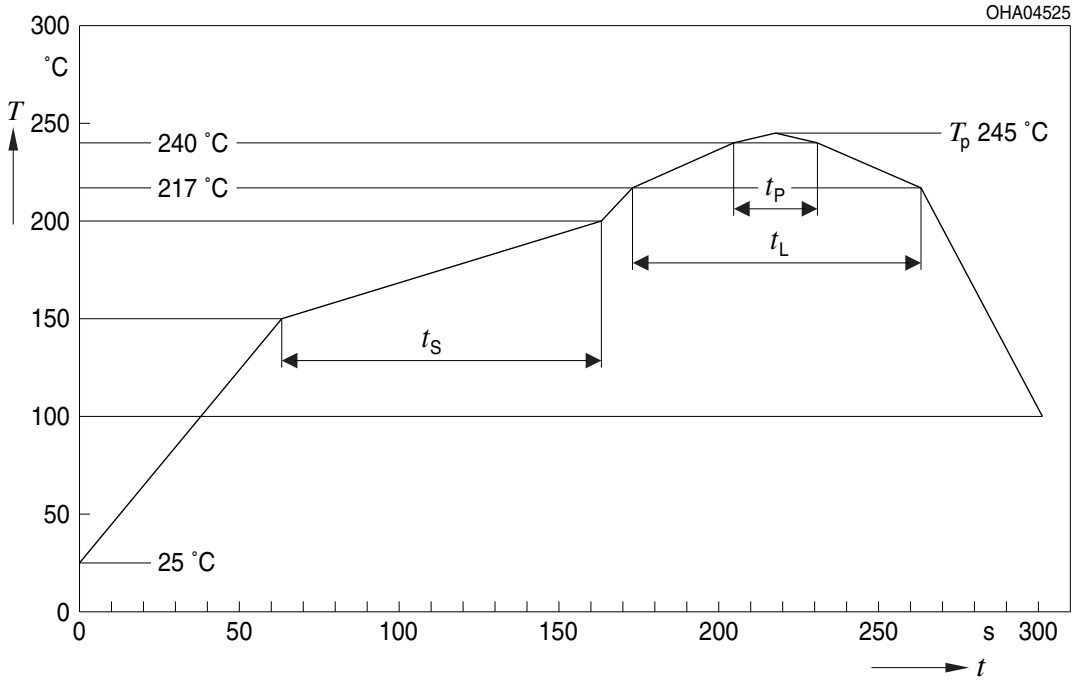
1. For superior solder joint connectivity results we recommend soldering under standard nitrogen atmosphere.
2. Package not suitable for ultra sonic cleaning.
3. Pedestal MCPCB allows the emitter thermal slug to be soldered directly to the metal core of the MCPCB. Such MCPCB eliminate the high thermal resistance dielectric layer that standard MCPCB technologies use in between the emitter thermal slug and the metal core of the MCPCB, thus lowering the overall system thermal resistance.
4. X-ray sample monitoring for solder voids underneath the emitter thermal slug is recommended. The total area covered by solder voids should be less than 20% of the total emitter thermal slug area. Excessive solder voids will increase the emitter to MCPCB thermal resistance and may lead to higher failure rates due to thermal over stress.

## Reflow Soldering Profile

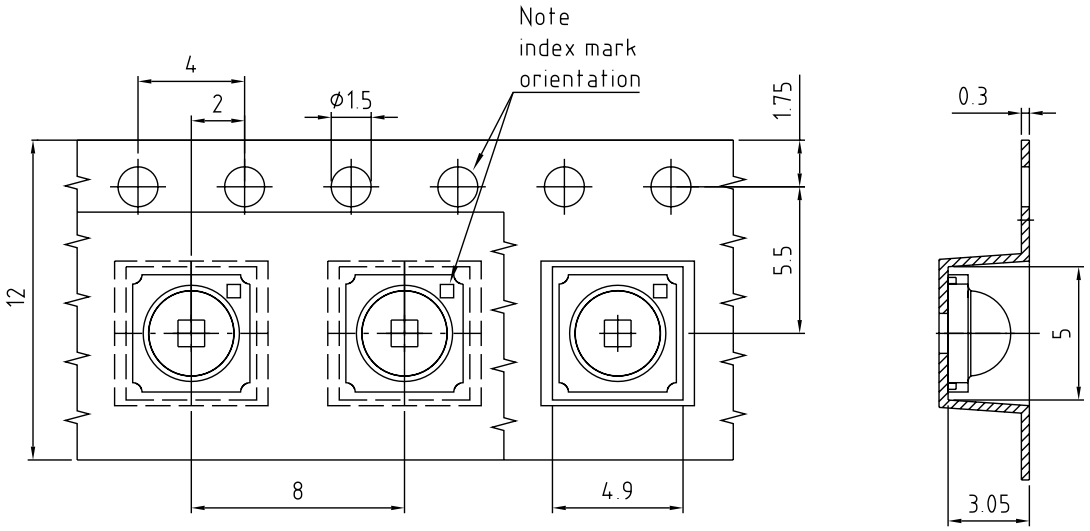
Product complies to MSL Level 1 acc. to JEDEC J-STD-020E




| 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 [9)]

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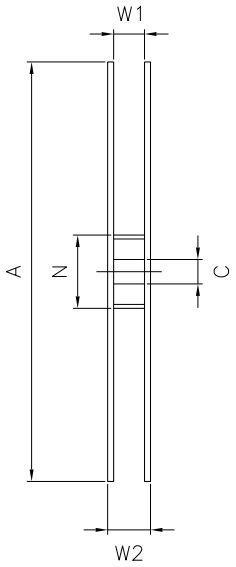
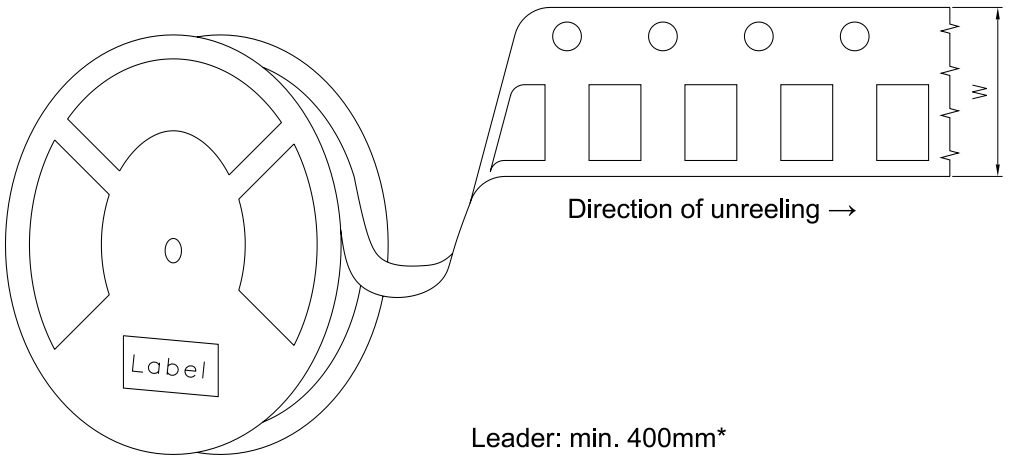
## Tape and Reel [10)]



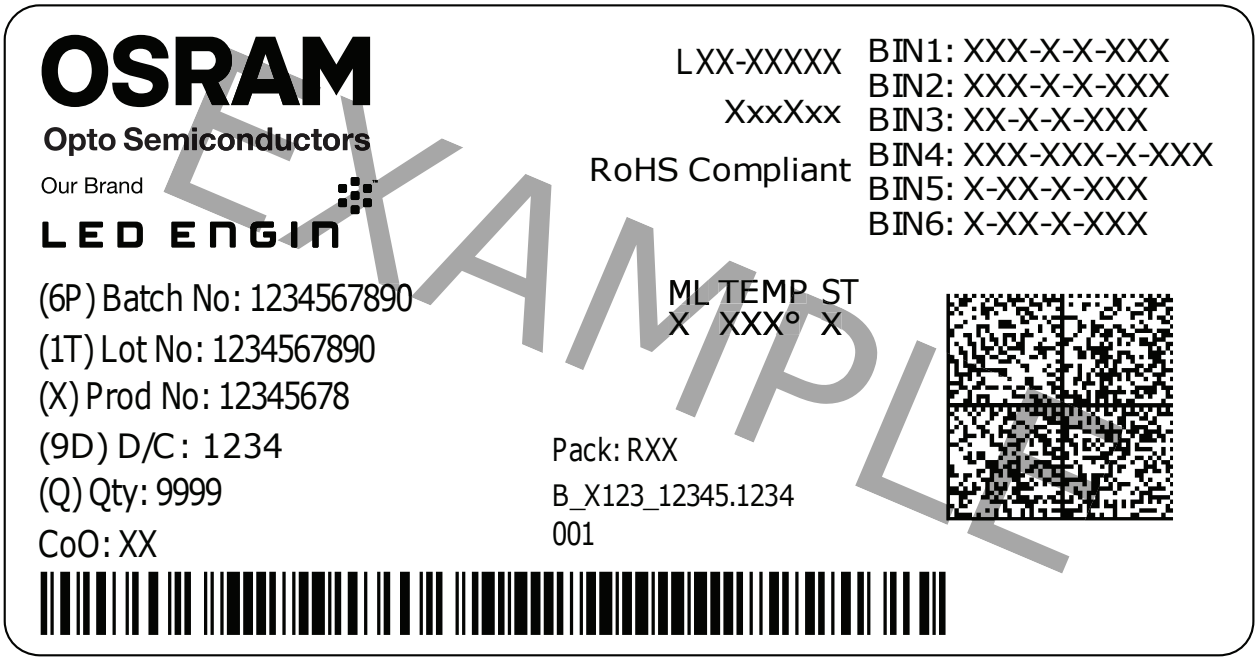




Leader: min. 400mm*
Trailer: min. 160mm*
*)Dimensions acc. to IEC 60286-3; EIA 481-E

## 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 | 500 |

## Barcode-Product-Label (BPL)



## 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.

Tapes and reels are shipped in airtight bags in order to reduce the onset of silver tarnish. We recommend bags only be opened when ready to use emitters. Partially used reels or trays should be stored in airtight bags or in storage purged with nitrogen.

Based on very short life cycle times in chip technology this component is subject to frequent adaption to the latest chip technology.

Changes to the content of this datasheet may occur without further notification. JEDEC 46C constitutes the guideline of the change management for the device specified in this document.

For further application related information please visit 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.

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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 groups are tested at a current pulse duration of 10 ms and a tolerance of ±10 %.

2) **Operating Conditions:** Operating conditions according DC-derating (Max. Permissible Forward Current)

3) **Reverse Operation:** Not designed for reverse operation. Continuous reverse operation can cause migration and damage of the device.

4) **Chromaticity coordinate groups:** Chromaticity coordinate groups are tested at a current pulse duration of 10 ms and a tolerance of ±0.01.

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) **Forward Voltage:** Forward voltages are tested at a current pulse duration of 10 ms and a tolerance of ±0.1 V.

7) **Color reproduction index:** Color reproduction index values (CRI-RA) are measured during a current pulse of typically 25 ms, with an internal reproducibility of ±2 and an expanded uncertainty of ±3 (acc. to GUM with a coverage factor of k = 3).

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.

## Revision History

| Version | Date | Change |
|---|---|---|
| 1.6 | 2021-04-30 | New Layout |

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**Leibnizstraße 4, D-93055 Regensburg**


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。