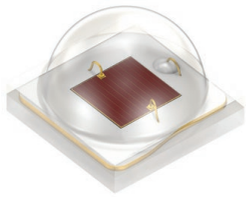
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# GH CSSRM5.24



## OSLON® Square

OSLON® Square Hyper Red with best value for highest PPF/W. Most compact high-power LED with proven robustness, high reliability, long lifetime and low thermal resistance.

## Applications

- Architecture
- Horticulture Lighting

## Features:

- Package: SMD ceramic package with silicone lens
- Typ. Radiation: 120° (Lambertian emitter)
- ESD: 8 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B)
- Radiant Flux: typ. 1064 mW @ 700mA; typ. 538 mW @ 350mA
- Radiant Efficiency: typ. 76% @ 700mA; typ. 82% @ 350mA
- Photosynthetic Photon Flux: typ. 5.82 µmol/s @ 700mA ; typ. 2.95 µmol/s @ 350mA
- Photon Flux Efficacy: typ 4.16 µmol/J @ 700mA ; typ 4.51 µmol/J @ 350mA

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## Ordering Information

| Type | Total radiant flux [1] $I_F$ = 700 mA $\Phi_E$ | Ordering Code |
|---|---|---|
| GH CSSRM5.24-V7A2-1-1 | 995 ... 1165 mW | Q65113A3948 |
| GH CSSRM5.24-V8A2-1-1 | 1035 ... 1165 mW | Q65113A4032 |

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## Maximum Ratings

| Parameter | Symbol | | Values |
|---|---|---|---|
| Operating Temperature | $T_{op}$ | min.<br>max. | -40 °C<br>125 °C |
| Storage Temperature | $T_{stg}$ | min.<br>max. | -40 °C<br>125 °C |
| Junction Temperature | $T_j$ | max. | 135 °C |
| Forward current | $I_F$ | min.<br>max. | 100 mA<br>1400 mA |
| Surge Current<br>t ≤ 10 µs; D = 0.005 ; $T_J$ = 25 °C | $I_{FS}$ | max. | 1500 mA |
| Reverse voltage [2)] | $V_R$ | | Not designed for reverse operation |
| ESD withstand voltage<br>acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B) | $V_{ESD}$ | | 8 kV |

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## Characteristics

$I_F$ = 700 mA; $T_J$ = 25 °C

| Parameter | Symbol | | Values |
|---|---|---|---|
| Peak Wavelength | $\lambda_{peak}$ | typ. | 660 nm |
| Centroid Wavelength [3]<br>$I_F$ = 700 mA | $\lambda_{centroid}$ | min.<br>typ.<br>max. | 646 nm<br>657 nm<br>666 nm |
| Dominant Wavelength [3]<br>$I_F$ = 700 mA | $\lambda_{dom}$ | typ. | 640 nm |
| Spectral Bandwidth at 50% $I_{rel,max}$ | $\Delta\lambda$ | typ. | 25 nm |
| Viewing angle at 50% $I_V$ | $2\varphi$ | typ. | 120 ° |
| Forward Voltage [4]<br>$I_F$ = 700 mA | $V_F$ | min.<br>typ.<br>max. | 1.80 V<br>2.00 V<br>2.20 V |
| Reverse current [2] | $I_R$ | | Not designed for reverse operation |
| Electrical thermal resistance junction/solderpoint with efficiency $\eta_e$ = 73 % | $R_{thJS\ elec.}$ | typ. | 1.4 K / W |

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## Brightness Groups

| Group | Total radiant flux [1] $I_F$ = 700 mA min. $\Phi_E$ | Total radiant flux [1] $I_F$ = 700 mA max. $\Phi_E$ | PPF * min. $\Phi_p$ | PPF * max. $\Phi_p$ | PPF/W * typ. | PF ** min. $\Phi_{p,b}$ | PF ** max. $\Phi_{p,b}$ | PF/W ** typ. |
|---|---|---|---|---|---|---|---|---|
| V7 | 995 mW | 1035 mW | 5.44 µmol/s | 5.65 µmol/s | 3.96 µmol/J | 5.46 µmol/s | 5.68 µmol/s | 3.98 µmol/J |
| V8 | 1035 mW | 1075 mW | 5.65 µmol/s | 5.87 µmol/s | 4.11 µmol/J | 5.68 µmol/s | 5.90 µmol/s | 4.14 µmol/J |
| V9 | 1075 mW | 1120 mW | 5.87 µmol/s | 6.12 µmol/s | 4.28 µmol/J | 5.90 µmol/s | 6.15 µmol/s | 4.30 µmol/J |
| A2 | 1120 mW | 1165 mW | 6.12 µmol/s | 6.36 µmol/s | 4.45 µmol/J | 6.15 µmol/s | 6.39 µmol/s | 4.47 µmol/J |

Note: [*] Photosynthetic Photon Flux includes wavelengths between 400 and 700 nm
Note: [**] Photon Flux includes wavelengths between 280 and 800 nm
Note: PPF and PF values are for reference only

## Forward Voltage Groups

| Group | Forward Voltage [4] $I_F$ = 700 mA min. $V_F$ | Forward Voltage [4] $I_F$ = 700 mA max. $V_F$ |
|---|---|---|
| E1 | 1.80 V | 1.90 V |
| E2 | 1.90 V | 2.00 V |
| F1 | 2.00 V | 2.10 V |
| F2 | 2.10 V | 2.20 V |

## Centroid Wavelength

| Group | Centroid Wavelength [3] $I_F$ = 700 mA min. $\lambda_{centroid}$ | Centroid Wavelength [3] $I_F$ = 700 mA max. $\lambda_{centroid}$ |
|---|---|---|
| 1 | 646 nm | 666 nm |

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## Group Name on Label

**Example: A2-1-E1**

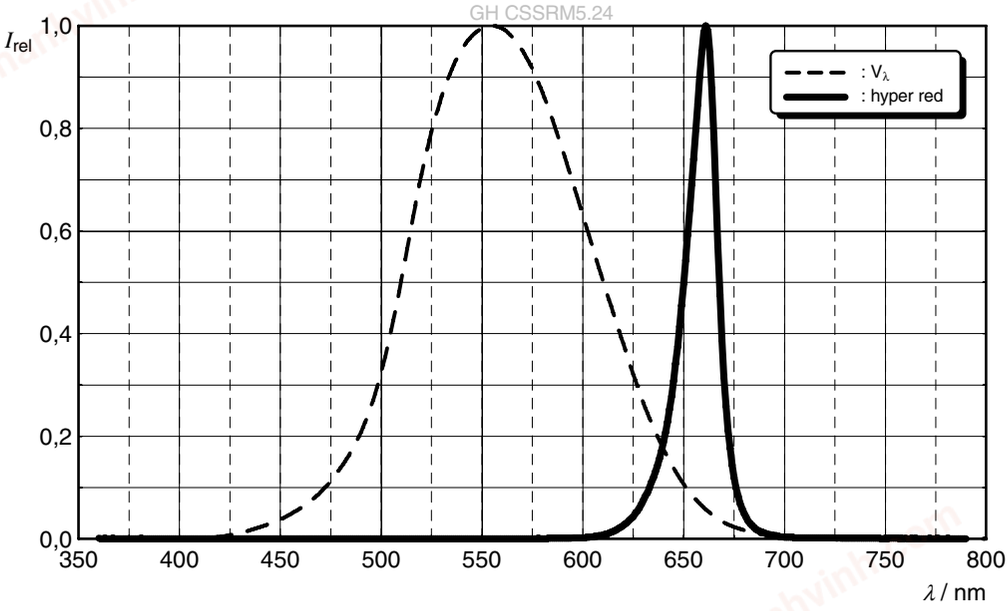
| Brightness | Wavelength | Forward Voltage |
|---|---|---|
| A2 | 1 | E1 |

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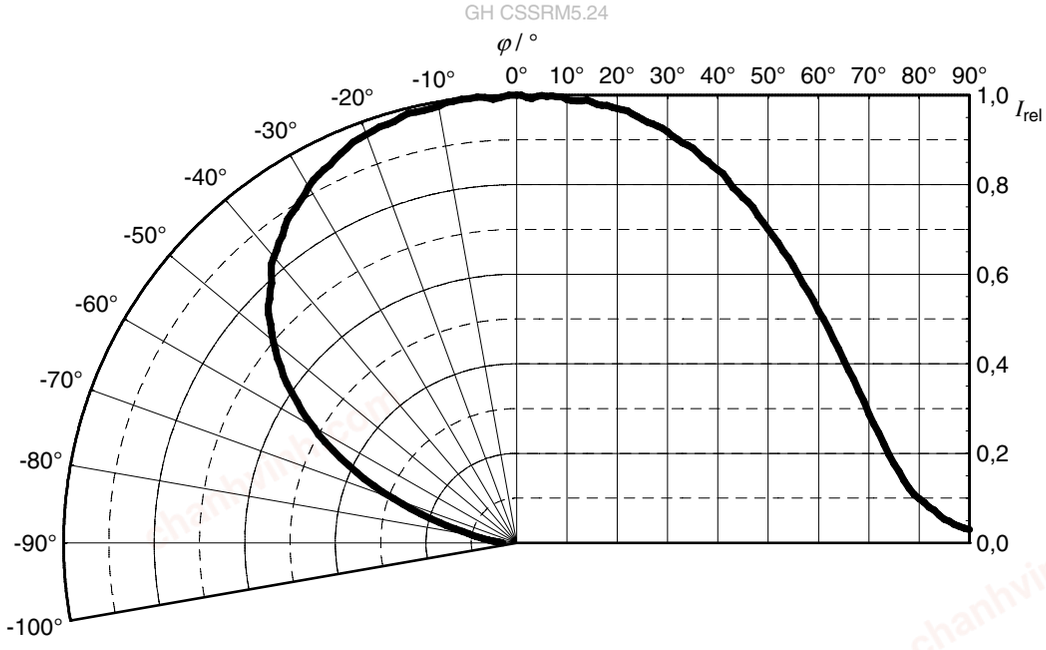
## Relative Spectral Emission [5)]

$I_{rel} = f(\lambda)$; $I_F = 700$ mA; $T_J = 25$ °C




## Radiation Characteristics [5)]

$I_{rel} = f(\phi)$; $T_J = 25$ °C





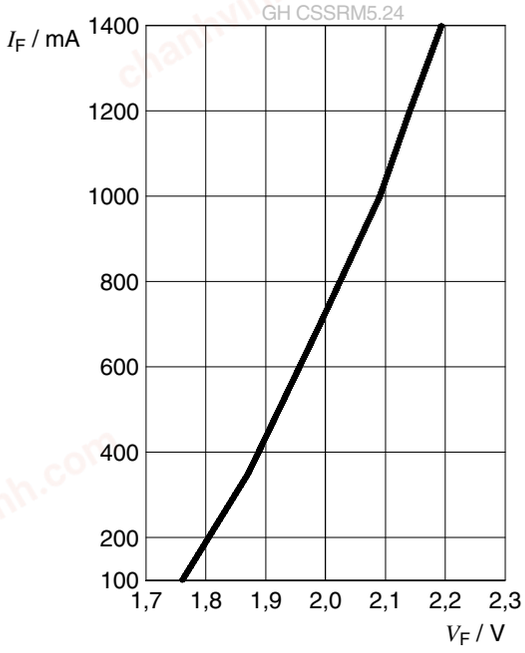

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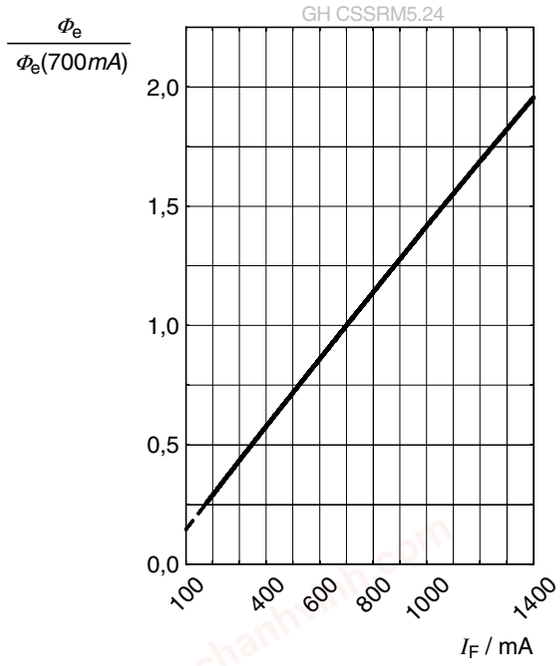
## Forward current [5]

$I_F = f(V_F)$; $T_J$ = 25 °C




## Relative Radiant Power [5], [6]

$\Phi_E/\Phi_E(700\ mA) = f(I_F)$; $T_J$ = 25 °C

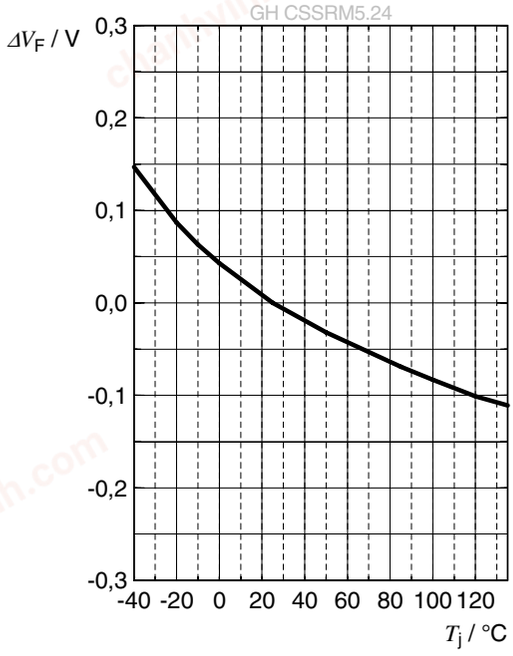


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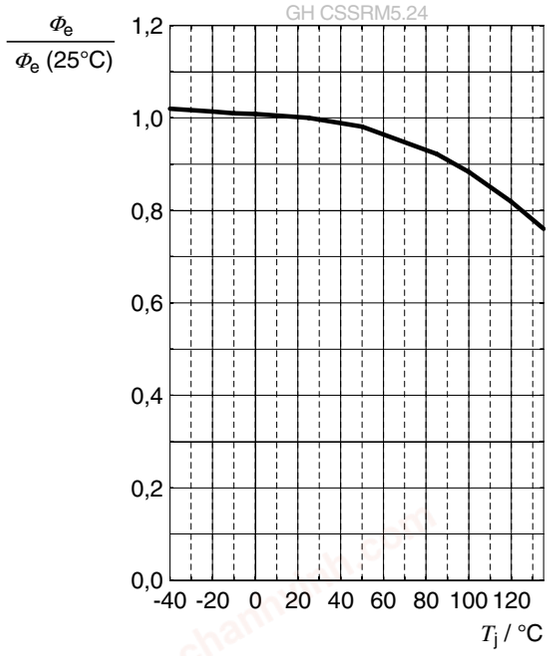
## Forward Voltage [5]

$\Delta V_F = V_F - V_F(25\ °C) = f(T_j);\ I_F = 700\ mA$



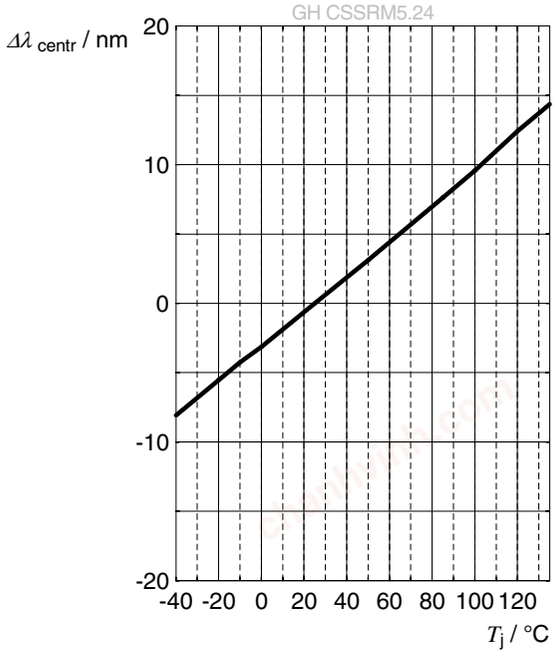

## Relative Radiant Power [5]

$\Phi_E/\Phi_E(25\ °C) = f(T_j);\ I_F = 700\ mA$




## Centroid Wavelength [5]

$\Delta\lambda_{centr} = \lambda_{centr} - \lambda_{centr}(25\ °C) = f(T_j);\ I_F = 700\ mA$

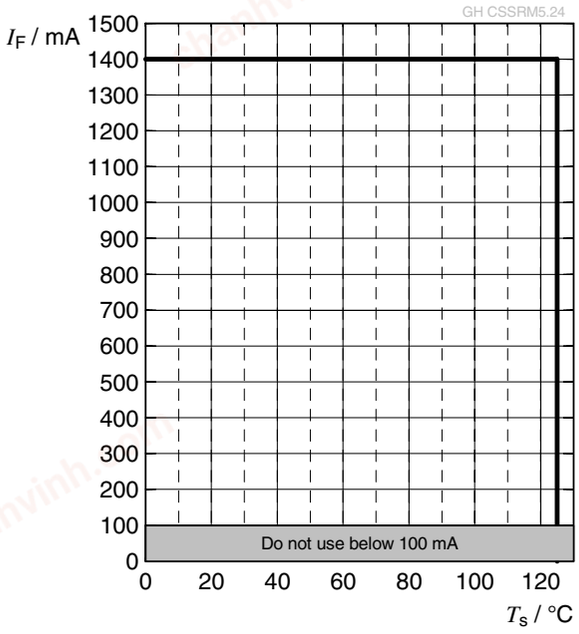


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## Max. Permissible Forward Current

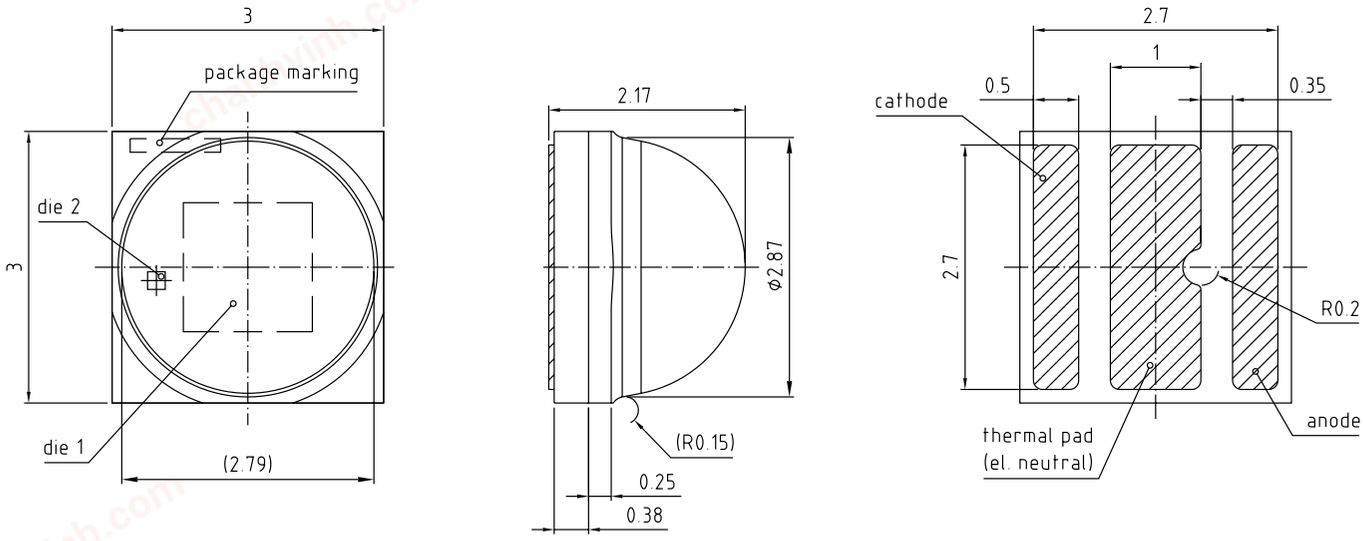
$I_F = f(T)$



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## Dimensional Drawing [7)]




General tolerance ±0.1

Lead finish Au

C67062-A0212-A4-02

## Further Information:

**Approximate Weight:** 28.0 mg

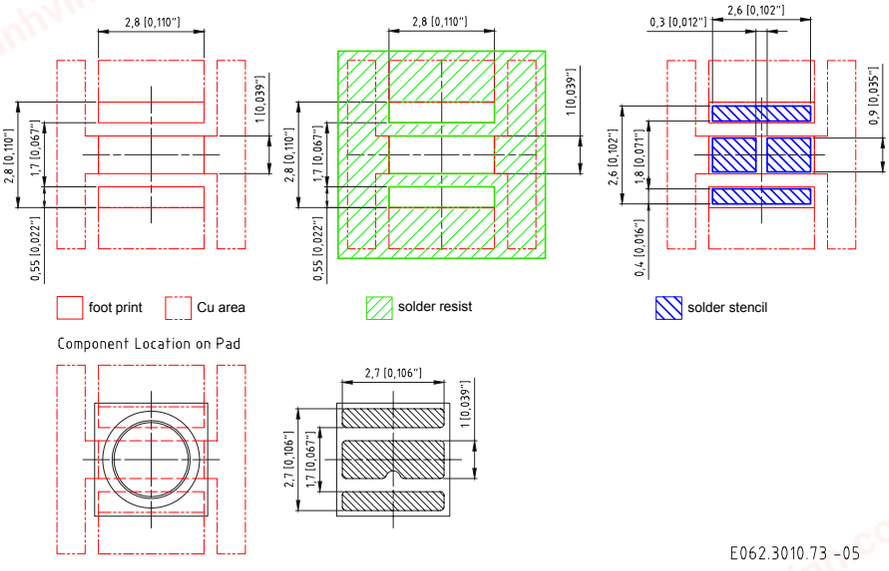
**Package marking:** Anode

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

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## Recommended Solder Pad [7)]



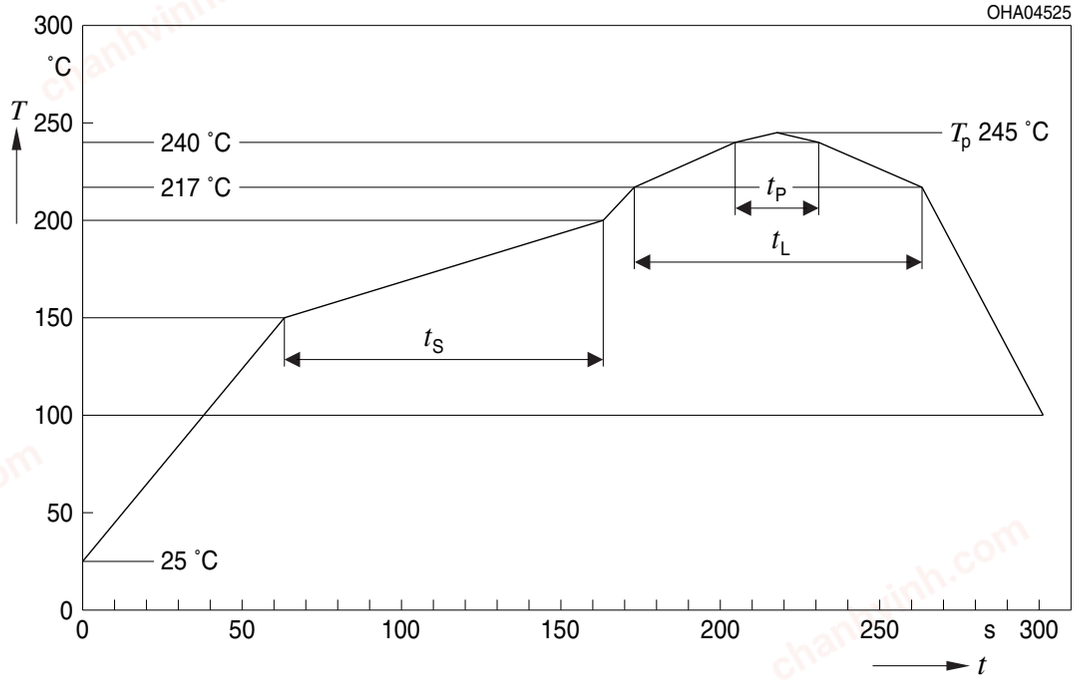

For superior solder joint connectivity results we recommend soldering under standard nitrogen atmosphere. Further information can be found in our Application Note: “Handling and Processing Details for Ceramic LEDs”.

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## Reflow Soldering Profile

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



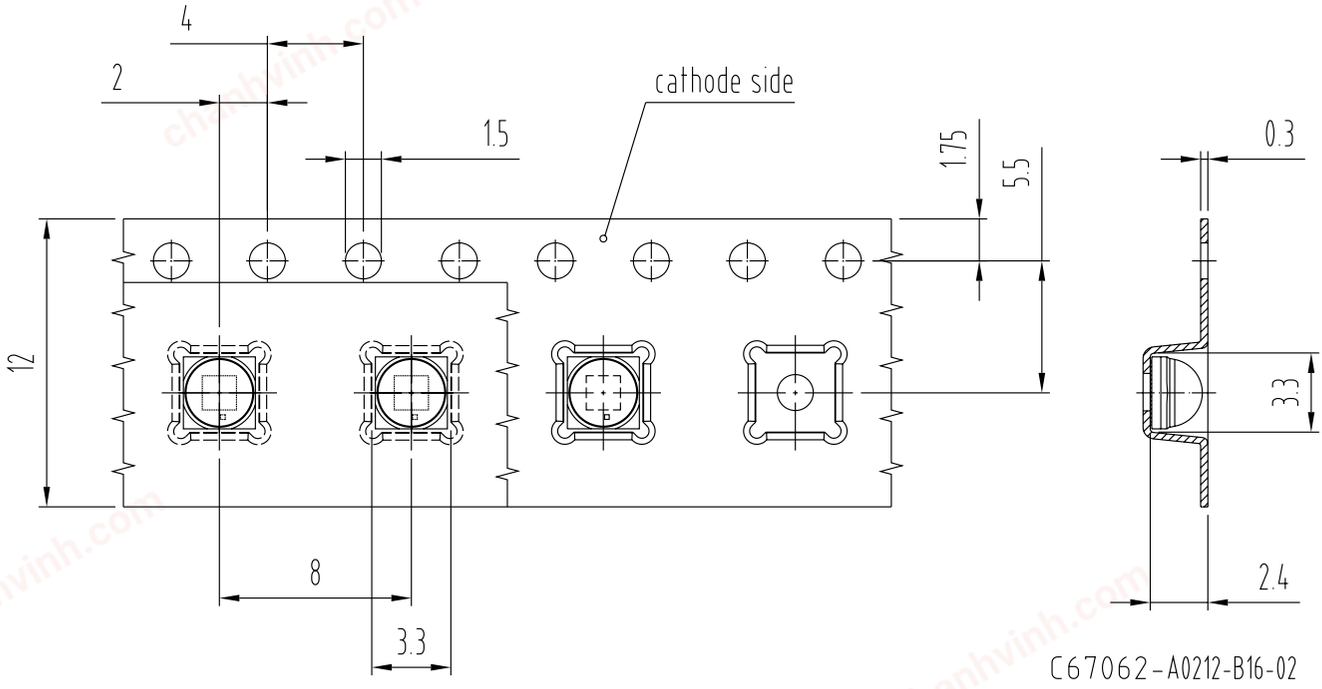

| Profile Feature | Symbol | Pb-Free (SnAgCu) Assembly | | | Unit |
|---|---|---|---|---|---|
| | | Minimum | Recommendation | Maximum | |
| Ramp-up rate to preheat*) 25 °C to 150 °C | | | 2 | 3 | K/s |
| Time $t_S$ $T_{Smin}$ to $T_{Smax}$ | $t_S$ | 60 | 100 | 120 | s |
| Ramp-up rate to peak*) $T_{Smax}$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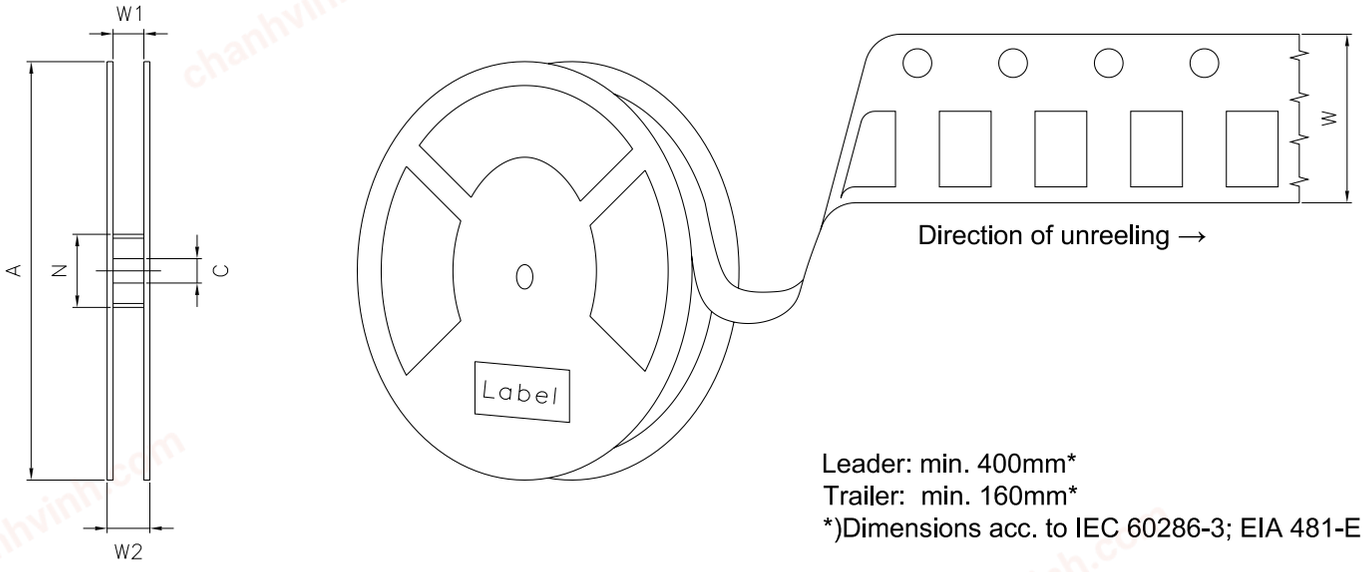


## Taping [7)]



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## Tape and Reel [8)]




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

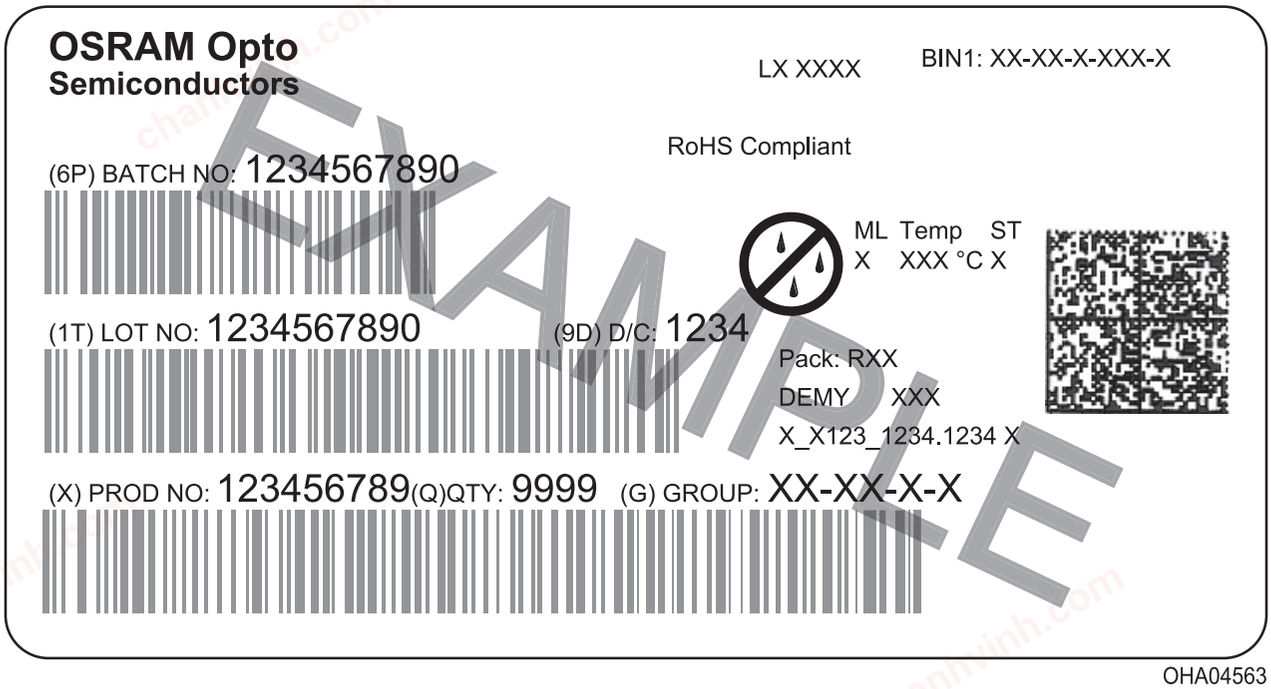
## Reel Dimensions

| A | W | $N_{min}$ | $W_1$ | $W_{2\,max}$ | Pieces per PU |
|---|---|---|---|---|---|
| 330 mm | 12 + 0.3 / - 0.1 mm | 60 mm | 12.4 + 2 mm | 18.4 mm | 3000 |

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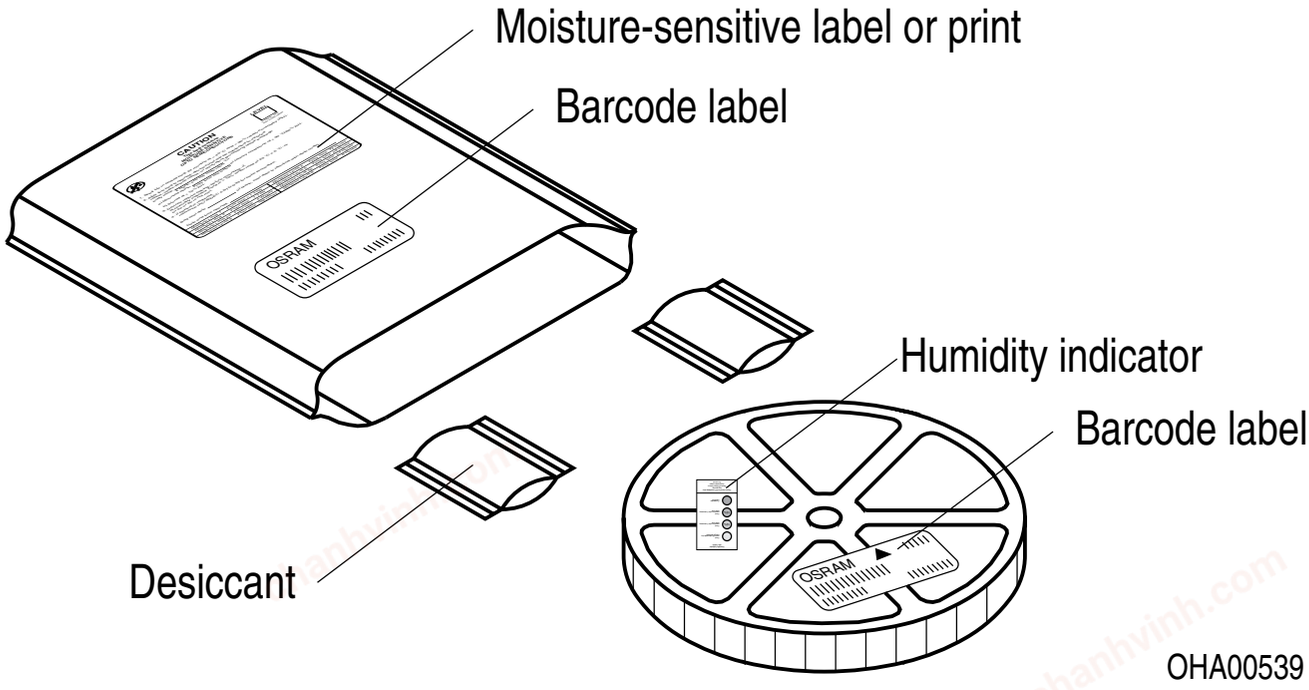


## Barcode-Product-Label (BPL)




OHA04563

## Dry Packing Process and Materials




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 **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

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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 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.

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## Glossary

1) **Brightness:** Brightness values are measured during a current pulse of typically 10 ms, with a tolerance of +/- 7%.

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

3) **Wavelength:** The wavelength is measured at a current pulse of typically 10 ms, with a tolerance of ± 0.5 nm.

4) **Forward Voltage:** The Forward voltage is measured during a current pulse duration of typically 1 ms with a tolerance of ± 0.05V .

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.

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## Revision History

| Version | Date | Change |
|---|---|---|
| 1.0 | 2021-10-04 | Initial Version |

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按照中国的相关法规和标准，不含有毒有害物质或元素。