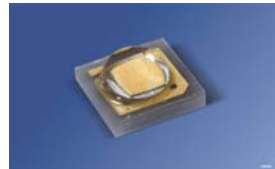


**OSLON SSL**  
**Ceramic package - 150° radiation pattern**  
**Lead (Pb) Free Product - RoHS Compliant**

**LCW CQDP.EC**



**Released**

**Besondere Merkmale**

- **Gehäusetyp:** SMD-Keramikgehäuse mit Silikonverguss und Linse
- **Typischer Lichtstrom:** 94 lm bei 350 mA und bis zu 161 lm bei 700 mA (4000 K)
- **Besonderheit des Bauteils:** Kompakte Lichtquelle für platzsparende Designs
- **Farbtemperatur:** 2700 K bis 5000 K
- **Farbwiedergabeindex:** 82 (typ.)
- **Abstrahlwinkel:** 150°
- **Typischer optischer Wirkungsgrad:** 84 lm/W bei 350 mA (4000 K)
- **Gruppierungsparameter:** Lichtstrom, Farbort, Durchlassspannung
- **Lötmethode:** Reflow-Löten
- **Vorbehandlung:** nach JEDEC Level 2
- **Gurtung:** 12-mm Gurt mit 600/Rolle, ø180 mm
- **ESD-Festigkeit:** ESD-sicher bis 8 kV nach JESD22-A114-D
- **Erweiterte Korrosionsfestigkeit:** Details siehe **Seite 16**

**Anwendungen**

- Lampen- und Leuchten-Retrofits
- Spot-Lichtquellen
- Schreibtischleuchten
- Akzentbeleuchtung
- Einbau-Deckenleuchten
- Ladenbeleuchtung
- Der Hersteller übernimmt keine Haftung für Applikationen mit hoher Luftfeuchte (beispielsweise Außenbeleuchtung)

**Features**

- **package:** SMD ceramic package with silicon resin with lens
- **typical Luminous Flux:** 94 lm at 350 mA and up to 161 lm at 700 mA (4000 K)
- **feature of the device:** small size high-flux LED for slim designs
- **typ. color temperature:** 2700 K to 5000 K
- **color reproduction index:** 82 (typ.)
- **viewing angle:** 150°
- **typical optical efficiency:** 84 lm/W at 350 mA (4000 K)
- **grouping parameter:** luminous flux, color coordinates, forward voltage
- **soldering methods:** reflow soldering
- **preconditioning:** acc. to JEDEC Level 2
- **taping:** 12-mm tape with 600/reel, ø180 mm
- **ESD-withstand voltage:** up to 8 kV acc. to JESD22-A114-D
- **Superior Corrosion Robustness:** details see **page 16**

**Applications**

- Residential retrofits & fixtures
- Spot lights
- Task lights
- Accent lights
- Professional downlights
- Shop lighting
- The manufacturer disclaims all Liability for applications in high humidity levels at it may appear in outdoor applications

**Bestellinformation**  
**Ordering Information**

| Type                                               | Farb-<br>temperatur  | Lichtstrom<br>1) Seite 23                                                                   | Lichtstärke<br>2) Seite 23                                                                    | Bestellnummer              |
|----------------------------------------------------|----------------------|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|----------------------------|
| Type                                               | color<br>temperature | Luminous<br>Flux <sup>1)</sup> page 23<br><br>$I_F = 350 \text{ mA}$<br>$\Phi_V(\text{lm})$ | Luminous<br>Intensity <sup>2)</sup> page 23<br><br>$I_F = 350 \text{ mA}$<br>$I_V(\text{cd})$ | Ordering Code              |
| LCW CQDP.EC-KRKT-5U8X-1<br>LCW CQDP.EC-KQKS-5U8X-1 | 2700 K               | 82.0 ... 104.2<br>76.3 ... 97.0                                                             | 24.0 (typ.)<br>22.5 (typ.)                                                                    | Q65111A0785<br>Q65111A0787 |
| LCW CQDP.EC-KSKU-5R8T-1<br>LCW CQDP.EC-KRKT-5R8T-1 | 3000 K               | 89.2 ... 112.0<br>82.0 ... 104.2                                                            | 26.0 (typ.)<br>24.0(typ.)                                                                     | Q65111A0788<br>Q65111A0767 |
| LCW CQDP.EC-KSKU-5O8Q-1<br>LCW CQDP.EC-KRKT-5O8Q-1 | 3500 K               | 89.2 ... 112.0<br>82.0 ... 104.2                                                            | 26.0 (typ.)<br>24.0(typ.)                                                                     | Q65111A0789<br>Q65111A0786 |
| LCW CQDP.EC-KSKU-5L7N-1<br>LCW CQDP.EC-KRKT-5L7N-1 | 4000 K               | 89.2 ... 112.0<br>82.0 ... 104.2                                                            | 26.0 (typ.)<br>24.0(typ.)                                                                     | Q65111A0790<br>Q65111A0766 |
| LCW CQDP.EC-KTLP-5J7K-1<br>LCW CQDP.EC-KSKU-5J7K-1 | 4500 K               | 97.0... 121.0<br>89.2 ... 112.0                                                             | 28.0 (typ.)<br>26.0 (typ.)                                                                    | Q65111A0780<br>Q65111A0791 |
| LCW CQDP.EC-KTLP-5H7I-1<br>LCW CQDP.EC-KSKU-5H7I-1 | 5000 K               | 97.0... 121.0<br>89.2 ... 112.0                                                             | 28.0 (typ.)<br>26.0 (typ.)                                                                    | Q65111A0781<br>Q65111A0792 |

Anm.: Die oben genannten Typbezeichnungen umfassen die bestellbaren Selektionen. Diese bestehen aus wenigen Helligkeitsgruppen (siehe **Seite 11** für nähere Informationen). Es wird nur eine einzige Helligkeitsgruppe pro Gurt geliefert. Z.B.: LCW CQDP.EC-KRKT-5U8X-1 bedeutet, dass auf dem Gurt nur eine der Helligkeitsgruppen KR, KS oder KT enthalten ist.

Um die Liefersicherheit zu gewährleisten, können einzelne Helligkeitsgruppen nicht bestellt werden.

Gleiches gilt für die Farben, bei denen Farbortgruppen gemessen und gruppiert werden. Pro Gurt wird nur eine Farbortgruppe geliefert. Z.B.: LCW CQDP.EC-KRKT-5U8X-1 bedeutet, dass auf dem Gurt nur eine der Farbortgruppen -5U bis -8X enthalten ist (siehe **Seite 6** für nähere Information).

Um die Liefersicherheit zu gewährleisten, können einzelne Farbortgruppen nicht bestellt werden.

Gleiches gilt für die LEDs, bei denen die Durchlassspannungsgruppen gemessen und gruppiert werden. Pro Gurt wird nur eine Durchlassspannungsgruppe geliefert. Z.B.: LCW CQDP.EC-KRKT-5U8X-1 bedeutet, dass nach Durchlassspannung gruppiert wird. Auf einem Gurt ist nur eine der Durchlassspannungsgruppen -3, -4 oder -5 enthalten (siehe **Seite 11** für nähere Information).

Um die Liefersicherheit zu gewährleisten, können einzelne Durchlassspannungsgruppen nicht direkt bestellt werden.

Note: The above Type Numbers represent the order groups which include only a few brightness groups (see **page 11** for explanation). Only one group will be shipped on each reel (there will be no mixing of two groups on each reel). E.g. LCW CQDP.EC-KRKT-5U8X-1 means that only one group KR, KS or KT will be shippable for any one reel.

In order to ensure availability, single brightness groups will not be orderable.

In a similar manner for colors where chromaticity coordinate groups are measured and binned, single chromaticity coordinate groups will be shipped on any one reel. E.g. LCW CQDP.EC-KRKT-5U8X-1 means that only 1 chromaticity coordinate group -5U to -8X will be shippable (see **page 6** for explanation).

In order to ensure availability, single chromaticity coordinate groups will not be orderable.

In a similar manner for LED, where forward voltage groups are measured and binned, single forward voltage groups will be shipped on any one reel. E.g. LCW CQDP.EC-KRKT-5U8X-1 means that only 1 forward voltage group -3, -4 or -5 will be shippable. In order to ensure availability, single forward voltage groups will not be orderable (see **page 11** for explanation).

**Grenzwerte**  
**Maximum Ratings**

| Bezeichnung<br>Parameter                                                                    | Symbol<br>Symbol             | Wert<br>Value                         | Einheit<br>Unit |
|---------------------------------------------------------------------------------------------|------------------------------|---------------------------------------|-----------------|
| Betriebstemperatur<br>Operating temperature range                                           | $T_{op}$                     | - 40 ... + 110                        | °C              |
| Lagertemperatur<br>Storage temperature range                                                | $T_{stg}$                    | - 40 ... + 110                        | °C              |
| Sperrschichttemperatur<br>Junction temperature                                              | $T_j$                        | 125                                   | °C              |
| Durchlassstrom<br>Forward current<br>( $T_S=25^\circ\text{C}$ )                             | (min.) $I_F$<br>(max.) $I_F$ | 100<br>800                            | mA<br>mA        |
| Stoßstrom<br>Surge current<br>$t \leq 50 \text{ ms}$ , $D = 0.016$ , $T_S=25^\circ\text{C}$ | $I_{FM}$                     | 2000                                  | mA              |
| Sperrspannung<br>Reverse voltage<br>( $T_S=25^\circ\text{C}$ )                              | $V_R$                        | not designed for<br>reverse operation | V               |

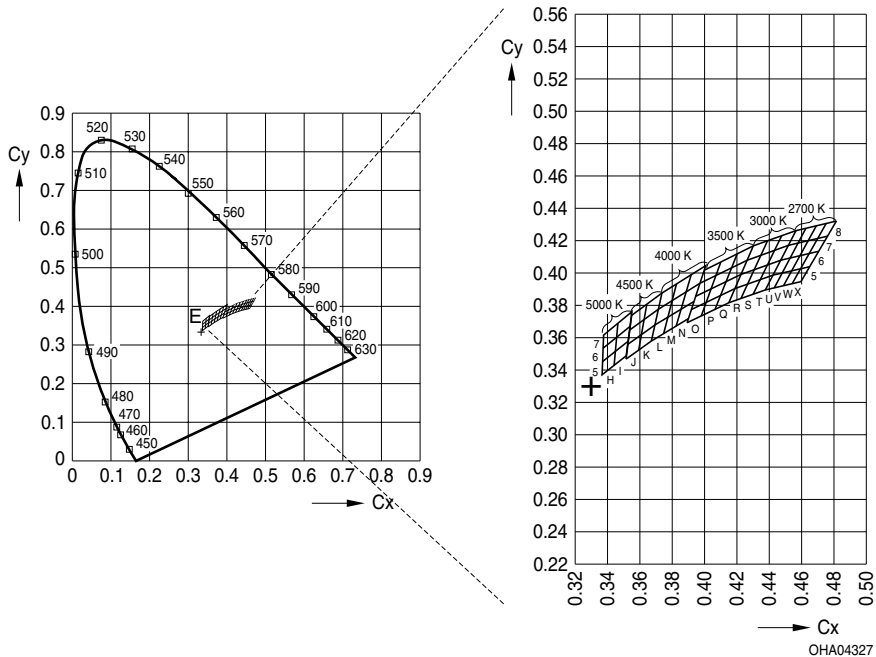
**Kennwerte**  
**Characteristics**
 $(T_S = 25\text{ }^{\circ}\text{C})$ 

| Bezeichnung<br>Parameter                                                                                                                                  | Symbol<br>Symbol                         | Wert<br>Value                         | Einheit<br>Unit |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------|-----------------|
| Farbkoordinate x nach CIE 1931 <sup>3)</sup> Seite 23 (typ.)<br>Chromaticity coordinate x acc. to CIE 1931 <sup>3)</sup> page 23<br>$I_F = 350\text{ mA}$ | x                                        | 0.42                                  | —               |
| Farbkoordinate y nach CIE 1931 <sup>3)</sup> Seite 23 (typ.)<br>Chromaticity coordinate y acc. to CIE 1931 <sup>3)</sup> page 23<br>$I_F = 350\text{ mA}$ | y                                        | 0.40                                  | —               |
| Farbtemperatur <sup>2)</sup> Seite 23 (min.)<br>Color temperature <sup>2)</sup> page 23<br>$I_F = 350\text{ mA}$ (max.)                                   | $T$<br>$T$                               | 2700<br>5000                          | K<br>K          |
| Abstrahlwinkel bei 50 % $I_V$ (Vollwinkel) (typ.)<br>Viewing angle at 50 % $I_V$                                                                          | $2\varphi$                               | 150                                   | Grad<br>deg.    |
| Durchlassspannung <sup>4)</sup> Seite 23 (min.)<br>Forward voltage <sup>4)</sup> page 23 (typ.)<br>$I_F = 350\text{ mA}$ (max.)                           | $V_F$<br>$V_F$<br>$V_F$                  | 2.75<br>3.2<br>3.5                    | V<br>V<br>V     |
| Sperrstrom<br>Reverse current (max.)                                                                                                                      | $I_R$                                    | not designed for<br>reverse operation | $\mu\text{A}$   |
| Wärmewiderstand<br>Thermal resistance<br>Sperrschicht/Lötpad (typ.)<br>Junction/solder point (max.)                                                       | $R_{th\text{ JS}}$<br>$R_{th\text{ JS}}$ | 7<br>9.4*                             | K/W<br>K/W      |

\* $R_{th}(\text{max})$  basiert auf statistischen Werten

$R_{th}(\text{max})$  is based on statistic values

Farbortgruppen<sup>3)</sup> Seite 23  
Chromaticity Coordinate Groups<sup>3)</sup> page 23



**Farbtemperatur 2700 K**  
**Color temperature 2700K**

| Gruppe<br>Group | Cx    | Cy    |
|-----------------|-------|-------|
| 5U              | 0.437 | 0.389 |
|                 | 0.442 | 0.398 |
|                 | 0.448 | 0.400 |
|                 | 0.443 | 0.391 |
| 6U              | 0.442 | 0.398 |
|                 | 0.447 | 0.408 |
|                 | 0.453 | 0.409 |
|                 | 0.448 | 0.400 |
| 7U              | 0.447 | 0.408 |
|                 | 0.451 | 0.417 |
|                 | 0.458 | 0.418 |
|                 | 0.453 | 0.409 |
| 8U              | 0.451 | 0.417 |
|                 | 0.456 | 0.426 |
|                 | 0.462 | 0.427 |
|                 | 0.458 | 0.418 |
| 5V              | 0.443 | 0.391 |
|                 | 0.448 | 0.400 |
|                 | 0.453 | 0.401 |
|                 | 0.448 | 0.392 |
| 6V              | 0.448 | 0.400 |
|                 | 0.453 | 0.409 |
|                 | 0.459 | 0.410 |
|                 | 0.453 | 0.401 |

| Gruppe<br>Group | Cx    | Cy    |
|-----------------|-------|-------|
| 7V              | 0.453 | 0.409 |
|                 | 0.458 | 0.418 |
|                 | 0.464 | 0.420 |
|                 | 0.459 | 0.410 |
| 8V              | 0.458 | 0.418 |
|                 | 0.462 | 0.427 |
|                 | 0.469 | 0.429 |
|                 | 0.464 | 0.420 |
| 5W              | 0.448 | 0.392 |
|                 | 0.453 | 0.401 |
|                 | 0.459 | 0.402 |
|                 | 0.454 | 0.393 |
| 6W              | 0.453 | 0.401 |
|                 | 0.459 | 0.410 |
|                 | 0.464 | 0.412 |
|                 | 0.459 | 0.402 |
| 6W              | 0.453 | 0.401 |
|                 | 0.459 | 0.410 |
|                 | 0.464 | 0.412 |
|                 | 0.459 | 0.402 |
| 7W              | 0.459 | 0.410 |
|                 | 0.464 | 0.420 |
|                 | 0.470 | 0.421 |
|                 | 0.464 | 0.412 |

| Gruppe<br>Group | Cx     | Cy     |
|-----------------|--------|--------|
| 8W              | 0.464  | 0.420  |
|                 | 0.469  | 0.429  |
|                 | 0.475  | 0.430  |
|                 | 0.470  | 0.421  |
| 5X              | 0.454  | 0.393  |
|                 | 0.459  | 0.402  |
|                 | 0.465  | 0.404  |
|                 | 0.459  | 0.394  |
| 6X              | 0.459  | 0.402  |
|                 | 0.464  | 0.412  |
|                 | 0.470  | 0.413  |
|                 | 0.465  | 0.404  |
| 7X              | 0.464  | 0.412  |
|                 | 0.470  | 0.421  |
|                 | 0.476  | 0.423  |
|                 | 0.470  | 0.413  |
| 8X              | 0.4697 | 0.4211 |
|                 | 0.4750 | 0.4304 |
|                 | 0.4758 | 0.4225 |
|                 | 0.4697 | 0.4211 |

**Farbtemperatur 3000 K**  
**Color temperature 3000 K**

| Gruppe<br>Group | Cx    | Cy    |
|-----------------|-------|-------|
| 5R              | 0.415 | 0.381 |
|                 | 0.419 | 0.390 |
|                 | 0.426 | 0.393 |
|                 | 0.422 | 0.384 |
| 6R              | 0.419 | 0.390 |
|                 | 0.422 | 0.399 |
|                 | 0.430 | 0.402 |
|                 | 0.426 | 0.293 |
| 7R              | 0.422 | 0.399 |
|                 | 0.426 | 0.408 |
|                 | 0.435 | 0.411 |
|                 | 0.430 | 0.402 |
| 8R              | 0.426 | 0.408 |
|                 | 0.430 | 0.417 |
|                 | 0.439 | 0.420 |
|                 | 0.435 | 0.411 |

| Gruppe<br>Group | Cx    | Cy    |
|-----------------|-------|-------|
| 5S              | 0.422 | 0.384 |
|                 | 0.426 | 0.393 |
|                 | 0.434 | 0.396 |
|                 | 0.430 | 0.387 |
| 6S              | 0.426 | 0.393 |
|                 | 0.430 | 0.402 |
|                 | 0.439 | 0.405 |
|                 | 0.434 | 0.396 |
| 7S              | 0.430 | 0.402 |
|                 | 0.435 | 0.411 |
|                 | 0.443 | 0.414 |
|                 | 0.439 | 0.405 |
| 8S              | 0.435 | 0.411 |
|                 | 0.439 | 0.420 |
|                 | 0.447 | 0.423 |
|                 | 0.443 | 0.414 |

| Gruppe<br>Group | Cx    | Cy    |
|-----------------|-------|-------|
| 5T              | 0.430 | 0.387 |
|                 | 0.434 | 0.396 |
|                 | 0.442 | 0.398 |
|                 | 0.437 | 0.389 |
| 6T              | 0.434 | 0.396 |
|                 | 0.439 | 0.405 |
|                 | 0.447 | 0.408 |
|                 | 0.442 | 0.398 |
| 7T              | 0.439 | 0.405 |
|                 | 0.443 | 0.414 |
|                 | 0.451 | 0.417 |
|                 | 0.447 | 0.408 |
| 8T              | 0.443 | 0.414 |
|                 | 0.447 | 0.423 |
|                 | 0.456 | 0.426 |
|                 | 0.451 | 0.417 |

**Farbtemperatur 3500 K**  
**Color temperature 3500 K**

| Gruppe<br>Group | Cx    | Cy    |
|-----------------|-------|-------|
| 5O              | 0.389 | 0.369 |
|                 | 0.392 | 0.377 |
|                 | 0.401 | 0.381 |
|                 | 0.398 | 0.373 |
| 6O              | 0.392 | 0.377 |
|                 | 0.394 | 0.385 |
|                 | 0.404 | 0.390 |
|                 | 0.401 | 0.381 |
| 7O              | 0.394 | 0.385 |
|                 | 0.397 | 0.393 |
|                 | 0.407 | 0.398 |
|                 | 0.404 | 0.390 |
| 8O              | 0.397 | 0.393 |
|                 | 0.400 | 0.401 |
|                 | 0.410 | 0.408 |
|                 | 0.407 | 0.398 |

| Gruppe<br>Group | Cx    | Cy    |
|-----------------|-------|-------|
| 5P              | 0.398 | 0.373 |
|                 | 0.401 | 0.381 |
|                 | 0.410 | 0.386 |
|                 | 0.406 | 0.377 |
| 6P              | 0.401 | 0.381 |
|                 | 0.404 | 0.390 |
|                 | 0.413 | 0.394 |
|                 | 0.410 | 0.386 |
| 7P              | 0.404 | 0.390 |
|                 | 0.407 | 0.398 |
|                 | 0.416 | 0.403 |
|                 | 0.413 | 0.394 |
| 8P              | 0.407 | 0.398 |
|                 | 0.410 | 0.406 |
|                 | 0.420 | 0.412 |
|                 | 0.416 | 0.403 |

| Gruppe<br>Group | Cx    | Cy    |
|-----------------|-------|-------|
| 5Q              | 0.406 | 0.377 |
|                 | 0.410 | 0.386 |
|                 | 0.419 | 0.390 |
|                 | 0.415 | 0.381 |
| 6Q              | 0.410 | 0.386 |
|                 | 0.413 | 0.394 |
|                 | 0.422 | 0.399 |
|                 | 0.419 | 0.390 |
| 7Q              | 0.413 | 0.394 |
|                 | 0.416 | 0.403 |
|                 | 0.426 | 0.408 |
|                 | 0.422 | 0.399 |
| 8Q              | 0.416 | 0.403 |
|                 | 0.420 | 0.412 |
|                 | 0.430 | 0.417 |
|                 | 0.426 | 0.408 |



**Farbtemperatur 4000 K**  
**Color temperature 4000 K**

| Gruppe<br>Group | Cx    | Cy    |
|-----------------|-------|-------|
| 5L              | 0.367 | 0.358 |
|                 | 0.369 | 0.368 |
|                 | 0.377 | 0.373 |
|                 | 0.375 | 0.362 |
| 6L              | 0.369 | 0.368 |
|                 | 0.371 | 0.378 |
|                 | 0.380 | 0.383 |
|                 | 0.377 | 0.373 |
| 7L              | 0.371 | 0.378 |
|                 | 0.374 | 0.387 |
|                 | 0.383 | 0.393 |
|                 | 0.380 | 0.383 |

| Gruppe<br>Group | Cx    | Cy    |
|-----------------|-------|-------|
| 5M              | 0.375 | 0.362 |
|                 | 0.377 | 0.373 |
|                 | 0.385 | 0.378 |
|                 | 0.382 | 0.367 |
| 6M              | 0.377 | 0.373 |
|                 | 0.380 | 0.383 |
|                 | 0.388 | 0.388 |
|                 | 0.385 | 0.376 |
| 7M              | 0.380 | 0.383 |
|                 | 0.383 | 0.393 |
|                 | 0.392 | 0.399 |
|                 | 0.388 | 0.388 |

| Gruppe<br>Group | Cx    | Cy    |
|-----------------|-------|-------|
| 5N              | 0.382 | 0.367 |
|                 | 0.385 | 0.376 |
|                 | 0.393 | 0.383 |
|                 | 0.390 | 0.372 |
| 6N              | 0.385 | 0.378 |
|                 | 0.388 | 0.388 |
|                 | 0.397 | 0.393 |
|                 | 0.393 | 0.383 |
| 7N              | 0.388 | 0.388 |
|                 | 0.392 | 0.399 |
|                 | 0.401 | 0.404 |
|                 | 0.397 | 0.393 |

**Farbtemperatur 4500 K**  
**Color temperature 4500 K**

| Gruppe<br>Group | Cx    | Cy    |
|-----------------|-------|-------|
| 5J              | 0.351 | 0.347 |
|                 | 0.352 | 0.356 |
|                 | 0.361 | 0.362 |
|                 | 0.359 | 0.352 |
| 6J              | 0.352 | 0.356 |
|                 | 0.354 | 0.365 |
|                 | 0.363 | 0.371 |
|                 | 0.361 | 0.362 |
| 7J              | 0.354 | 0.365 |
|                 | 0.355 | 0.374 |
|                 | 0.364 | 0.381 |
|                 | 0.363 | 0.371 |

| Gruppe<br>Group | Cx    | Cy    |
|-----------------|-------|-------|
| 5K              | 0.359 | 0.352 |
|                 | 0.361 | 0.362 |
|                 | 0.369 | 0.368 |
|                 | 0.367 | 0.358 |
| 6K              | 0.361 | 0.362 |
|                 | 0.363 | 0.371 |
|                 | 0.371 | 0.378 |
|                 | 0.369 | 0.368 |
| 7K              | 0.363 | 0.371 |
|                 | 0.364 | 0.381 |
|                 | 0.374 | 0.387 |
|                 | 0.371 | 0.378 |

Farbtemperatur 5000 K  
Color temperature 5000 K

| Gruppe<br>Group | Cx    | Cy    |
|-----------------|-------|-------|
| 5H              | 0.337 | 0.337 |
|                 | 0.337 | 0.345 |
|                 | 0.345 | 0.352 |
|                 | 0.344 | 0.343 |
| 6H              | 0.337 | 0.345 |
|                 | 0.337 | 0.353 |
|                 | 0.346 | 0.360 |
|                 | 0.345 | 0.352 |
| 7H              | 0.337 | 0.353 |
|                 | 0.338 | 0.362 |
|                 | 0.346 | 0.369 |
|                 | 0.346 | 0.360 |
| 8H              | 0.338 | 0.362 |
|                 | 0.338 | 0.370 |
|                 | 0.347 | 0.378 |
|                 | 0.346 | 0.369 |

| Gruppe<br>Group | Cx    | Cy    |
|-----------------|-------|-------|
| 5I              | 0.344 | 0.343 |
|                 | 0.345 | 0.352 |
|                 | 0.353 | 0.358 |
|                 | 0.352 | 0.349 |
| 6I              | 0.345 | 0.352 |
|                 | 0.346 | 0.360 |
|                 | 0.354 | 0.367 |
|                 | 0.353 | 0.358 |
| /I              | 0.346 | 0.360 |
|                 | 0.346 | 0.369 |
|                 | 0.355 | 0.376 |
|                 | 0.354 | 0.367 |
| 8I              | 0.346 | 0.369 |
|                 | 0.347 | 0.378 |
|                 | 0.356 | 0.385 |
|                 | 0.355 | 0.376 |

**Durchlassspannungsgruppen**<sup>6)</sup> Seite 23**Forward Voltage Groups**<sup>6)</sup> page 23

| Gruppe<br>Group | Durchlassspannung<br>Forward voltage |      | Einheit<br>Unit |
|-----------------|--------------------------------------|------|-----------------|
|                 | min.                                 | max. |                 |
| 3               | 2.75                                 | 3.0  | V               |
| 4               | 3.0                                  | 3.25 | V               |
| 5               | 3.25                                 | 3.5  | V               |

**Helligkeits-Gruppierungsschema****Brightness Groups**

| Helligkeitsgruppe<br>Brightness Group | Lichtstrom <sup>1)</sup> Seite 23<br>Luminous Flux <sup>1)</sup> page 23<br>$\Phi_V$ (lm) | Lichtstärke <sup>2)</sup> Seite 23<br>Luminous Intensity <sup>2)</sup> page 23<br>$I_V$ (cd) |
|---------------------------------------|-------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
|                                       |                                                                                           |                                                                                              |
| KQ                                    | 76.3 ... 82.0                                                                             | 20.5 (typ.)                                                                                  |
| KR                                    | 82.0 ... 89.2                                                                             | 22.0 (typ.)                                                                                  |
| KS                                    | 89.2 ... 97.0                                                                             | 24.0 (typ.)                                                                                  |
| KT                                    | 97.0 ... 104.2                                                                            | 26.0 (typ.)                                                                                  |
| KU                                    | 104.2 ... 112.0                                                                           | 28.0 (typ.)                                                                                  |
| LP                                    | 112.0 ... 121.0                                                                           | 30.0 (typ.)                                                                                  |

Anm.: Die Standardlieferform von Serientypen beinhaltet eine Familiengruppe. Diese besteht aus nur wenigen Helligkeitsgruppen. Einzelne Helligkeitsgruppen sind nicht bestellbar.

Note: The standard shipping format for serial types includes a family group of only a few individual brightness groups. Individual brightness groups cannot be ordered.

**Gruppenbezeichnung auf Etikett****Group Name on Label**

Beispiel: KR-5U-3

Example: KR-5U-3

| Helligkeitsgruppe<br>Brightness Group | Farbortgruppe<br>Chromaticity Coordinate Group | Durchlassspannung<br>Forward Voltage |
|---------------------------------------|------------------------------------------------|--------------------------------------|
| KR                                    | 5U                                             | 3                                    |

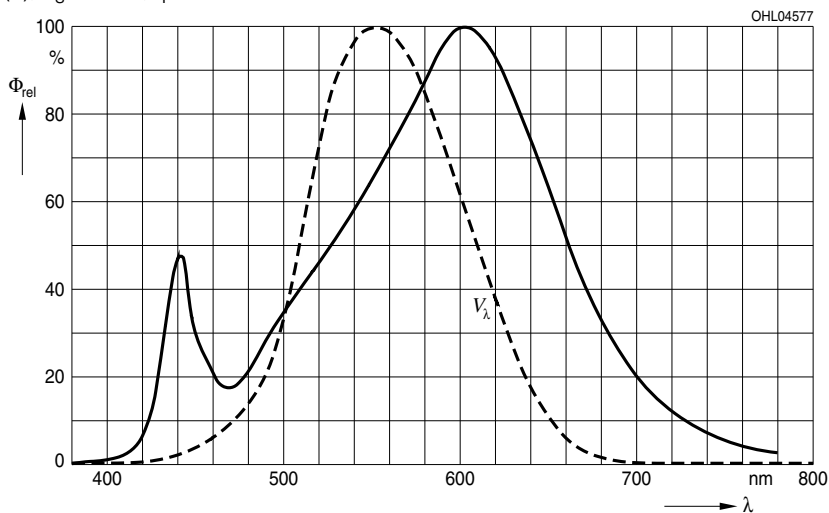
Anm.: In einer Verpackungseinheit / Gurt ist immer nur eine Helligkeitsgruppe enthalten.

Note: No packing unit / tape ever contains more than one brightness group.

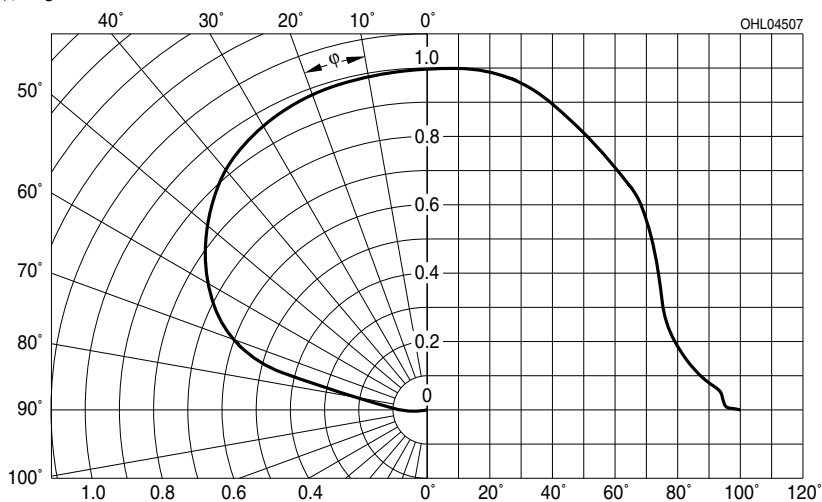
**Relative spektrale Emission**<sup>2)</sup> Seite 23**Relative Spectral Emission**<sup>2)</sup> page 23

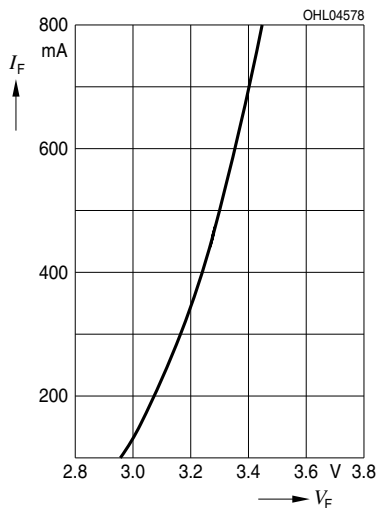
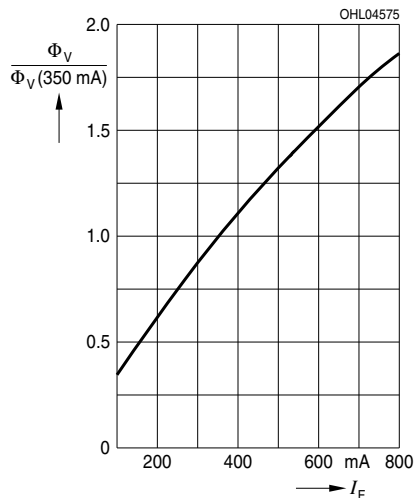
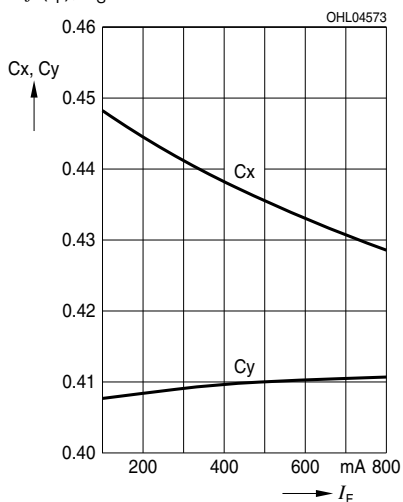
$V(\lambda)$  = spektrale Augenempfindlichkeit / Standard eye response curve

$\Phi_{\text{rel}} = f(\lambda)$ ;  $T_S = 25\text{ °C}$ ;  $I_F = 350\text{ mA}$

**Abstrahlcharakteristik**<sup>2)</sup> Seite 23**Radiation Characteristic**<sup>2)</sup> page 23

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

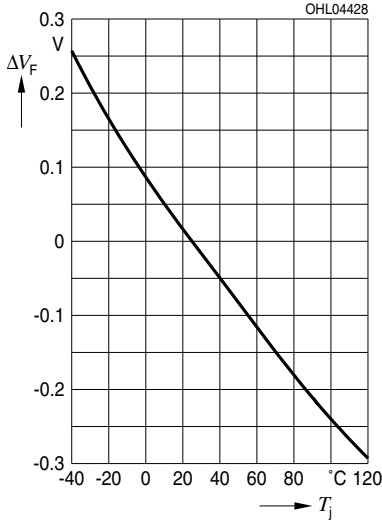


Durchlassstrom<sup>2)</sup> Seite 23Forward Current<sup>2)</sup> page 23 $I_F = f(V_F); T_S = 25\text{ °C}$ Relativer Lichtstrom<sup>2)</sup> Seite 23Relative Luminous Flux<sup>2)</sup> page 23 $\Phi_V / \Phi_V(350\text{ mA}) = f(I_F); T_S = 25\text{ °C}$ Farbortverschiebung<sup>2)</sup> Seite 23Chromaticity Coordinate Shift<sup>2)</sup> page 23 $x, y = f(I_F); T_S = 25\text{ °C}$ 

**Relative Vorwärtsspannung**<sup>2)</sup> Seite 23

**Relative Forward Voltage**<sup>2)</sup> page 23

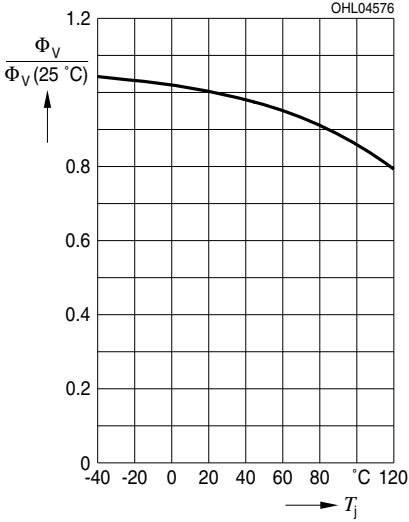
$\Delta V_F = V_F - V_F(25^\circ\text{C}) = f(T_j); I_F = 350\text{ mA}$



**Relative Lichtstrom**<sup>2)</sup> Seite 23

**Relative Luminous Flux**<sup>2)</sup> page 23

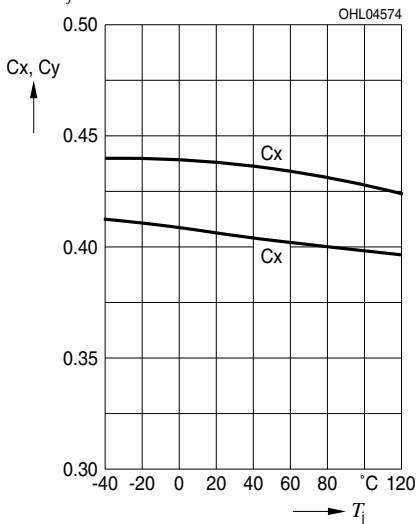
$\Phi_V/\Phi_V(25^\circ\text{C}) = f(T_j); I_F = 350\text{ mA}$



**Farbortverschiebung**<sup>2)</sup> Seite 23

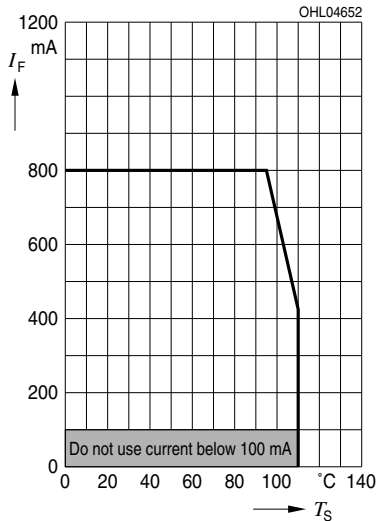
**Chromaticity Coordinate Shift**<sup>2)</sup> page 23

$x, y = f(T_j); I_F = 350\text{ mA}$



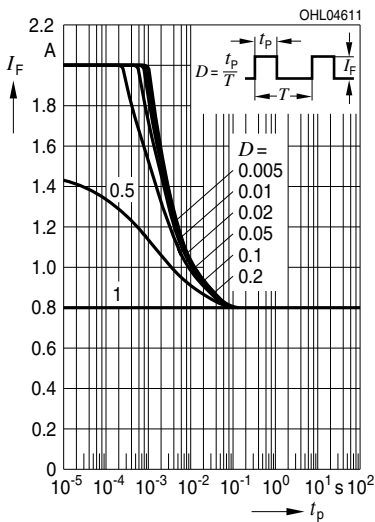
**Maximal zulässiger Durchlassstrom**  
**Max. Permissible Forward Current**

$I_F = f(T_S)$



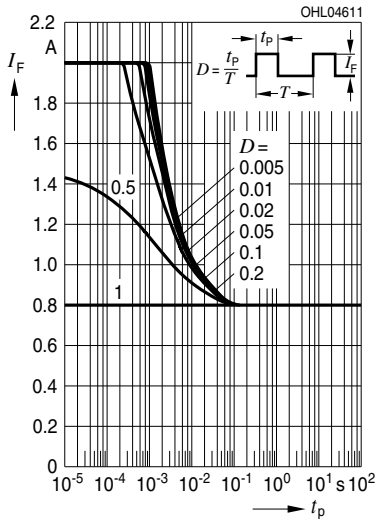
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**

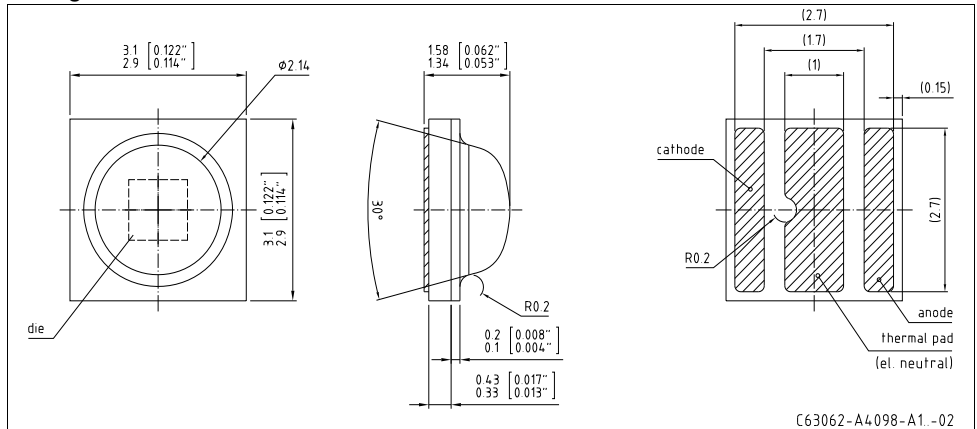
Duty cycle  $D =$  parameter,  $T_S = 25^\circ\text{C}$



**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**

Duty cycle  $D =$  parameter,  $T_S = 85^\circ\text{C}$



Maßzeichnung<sup>5)</sup> Seite 23Package Outlines<sup>5)</sup> page 23

Anm.: Die LED enthält ein ESD-Bauteil, das parallel zum Chip geschaltet ist.

Note: LED is protected by ESD device which is connected in parallel to LED-Chip.

Anm.: Das Gehäuse ist für Ultraschallreinigung nicht geeignet

Note: Package not suitable for ultra sonic cleaning

**Kathodenkennung:**

**Cathode mark:**

**Gewicht / Approx. weight:**

Markierung

mark

2.5 mg

**Korrosionsfestigkeit besser als EN 60068-2-60 (method 4):**

mit erweitertem Korrosionstest: 40°C / 90%rh / 15ppm H<sub>2</sub>S / 336h

**Corrosion robustness better than EN 60068-2-60 (method 4):**

with enhanced corrosion test: 40°C / 90%rh / 15ppm H<sub>2</sub>S / 336h

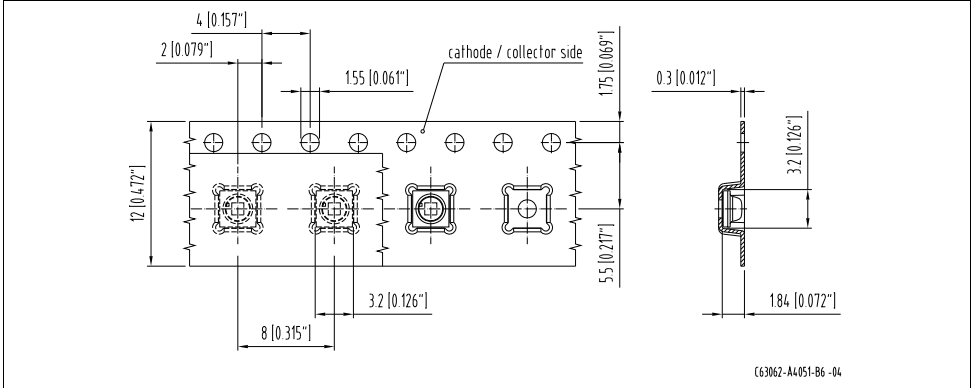


Gurtung / Polarität und Lage<sup>5)</sup> Seite 23

Verpackungseinheit 600/Rolle, ø180 mm

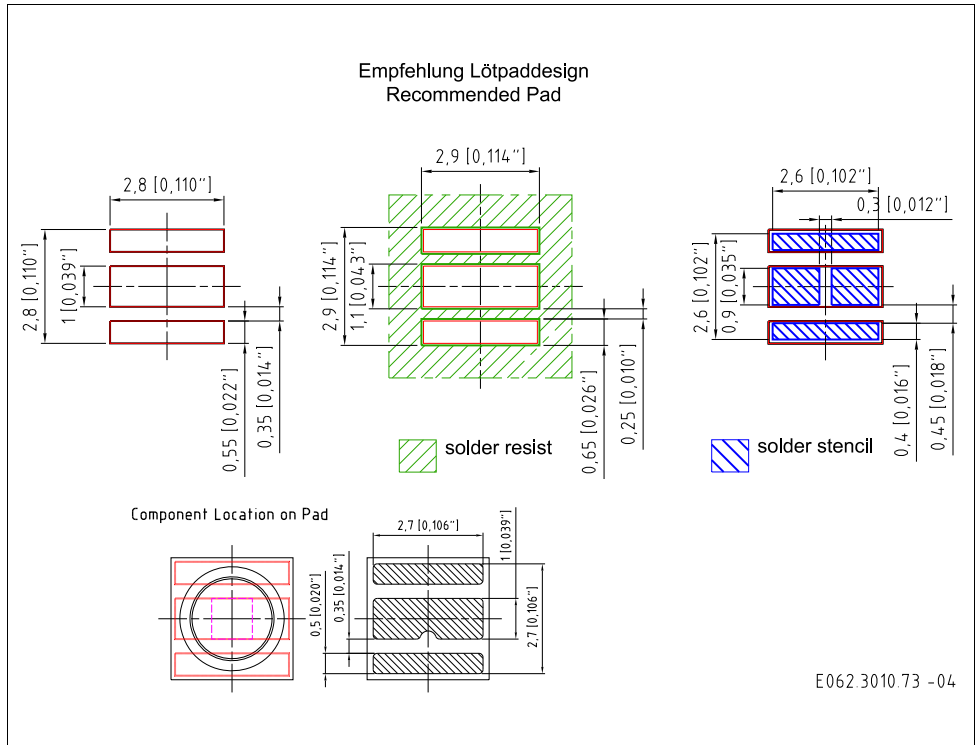
Method of Taping / Polarity and Orientation<sup>5)</sup> page 23

Packing unit 600/reel, ø180 mm



**Empfohlenes Lötpadding<sup>5)</sup>** Seite 23  
**Recommended Solder Pad<sup>5)</sup>** page 23

Reflow Löten  
 Reflow Soldering



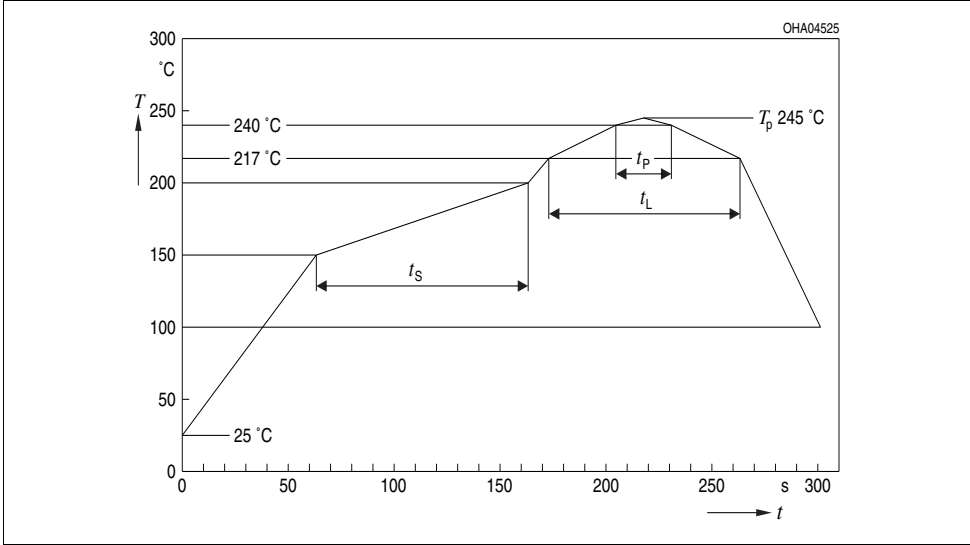
Anm.: Weitere Informationen finden Sie in der Applikationsschrift „Handling and Processing Details for Ceramic LEDs“

Note: For further information please refer to our Application Note „Handling and Processing Details for Ceramic LEDs“

Lötbedingungen  
Soldering Conditions

Reflow Lötprofil für bleifreies Löten  
Reflow Soldering Profile for lead free soldering

Vorbehandlung nach JEDEC Level 2  
Preconditioning acc. to JEDEC Level 2  
(nach J-STD-020D.01)  
(acc. to J-STD-020D.01)



| Profile Feature                                                       | Pb-Free (SnAgCu) Assembly |                      |
|-----------------------------------------------------------------------|---------------------------|----------------------|
|                                                                       | Recommendation            | Max. Ratings         |
| Ramp-up Rate to Preheat*)<br>25°C to 150°C                            | 2 °C / s                  | 3 °C / s             |
| Time $t_s$ from $T_{Smin}$ to $T_{Smax}$<br>(150°C to 200°C)          | 100 s                     | min. 60 s max. 120 s |
| Ramp-up Rate to Peak*)<br>180°C to $T_P$                              | 2 °C / s                  | 3 °C / s             |
| Liquidus Temperature $T_L$                                            | 217°C                     |                      |
| Time $t_L$ above $T_L$                                                | 80 s                      | max. 100 s           |
| Peak Temperature $T_P$                                                | 245 °C                    | max. 260 °C          |
| Time $t_P$ within 5°C of the specified<br>peak temperature $T_P$ - 5K | 20 s                      | min. 10 s max. 30 s  |
| Ramp-down Rate*<br>$T_P$ to 100°C                                     | 3 K / s                   | 6 K / s maximum      |
| Time 25°C to Peak temperature                                         |                           | max. 8 min.          |

All temperatures refer to the center of the package, measured on the top of the component  
\*) slope calculation  $\Delta T/\Delta t$ :  $\Delta t$  max. 5 sec; fulfillment for the whole T-range

Barcode-Produkt-Etikett (BPL)  
Barcode-Product-Label (BPL)

OSRAM Opto Semiconductors

(6P) BATCH NO: 1004067407

(1T) LOT NO: 1234567890

(9D) D/C: 1013

(X) PROD NO: 11058300

(Q) QTY: 2000

(G) GROUP: EA-50-0-D

LMW CNAP BIN1: EA-50-0-140-D

OSLON

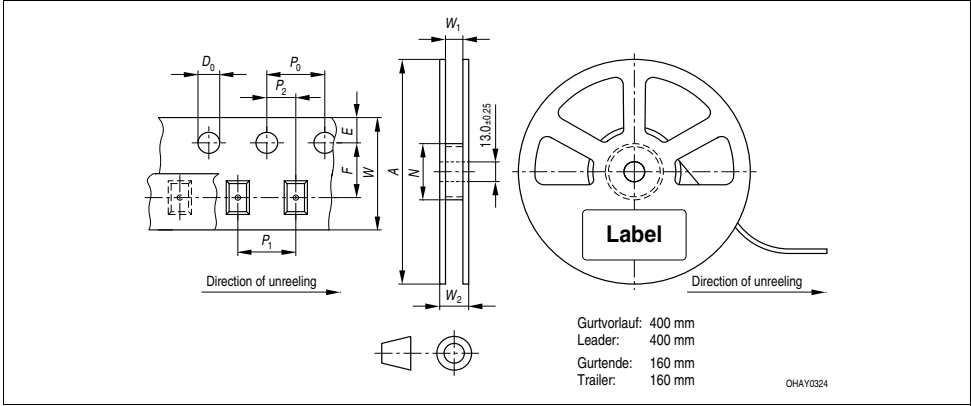
RoHS Compliant

ML Temp ST  
2 260 °C R

Pack: R18  
DEMY 022  
B\_R999\_1880.1642 R

OH404563

Gurtverpackung  
Tape and Reel



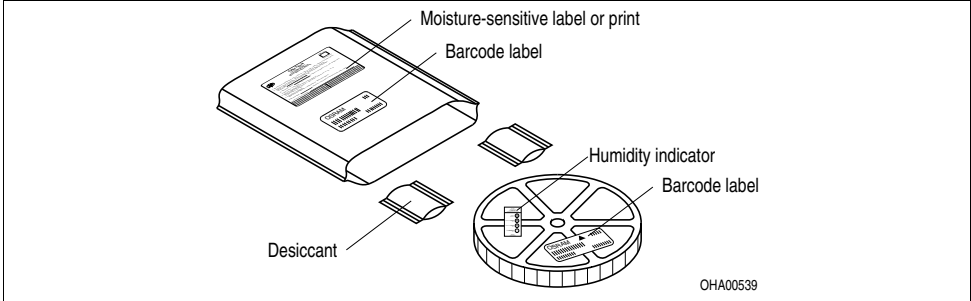
Tape dimensions in mm (inch)

| $W$                | $P_0$                              | $P_1$                              | $P_2$                               | $D_0$                                | $E$                                   | $F$                                   |
|--------------------|------------------------------------|------------------------------------|-------------------------------------|--------------------------------------|---------------------------------------|---------------------------------------|
| $12^{+0.3}_{-0.1}$ | $4 \pm 0.1$<br>(0.157 $\pm$ 0.004) | $8 \pm 0.1$<br>(0.315 $\pm$ 0.004) | $2 \pm 0.05$<br>(0.079 $\pm$ 0.002) | $1.5 \pm 0.1$<br>(0.059 $\pm$ 0.004) | $1.75 \pm 0.1$<br>(0.069 $\pm$ 0.004) | $5.5 \pm 0.05$<br>(0.217 $\pm$ 0.002) |

Reel dimensions in mm (inch)

| $A$     | $W$       | $N_{\min}$ | $W_1$                           | $W_{2 \max}$ |
|---------|-----------|------------|---------------------------------|--------------|
| 180 (7) | 8 (0.315) | 60 (2.362) | $8.4 \pm 2$ (0.331 $\pm$ 0.079) | 14.4 (0.567) |

Trockenverpackung und Materialien  
Dry Packing Process and Materials

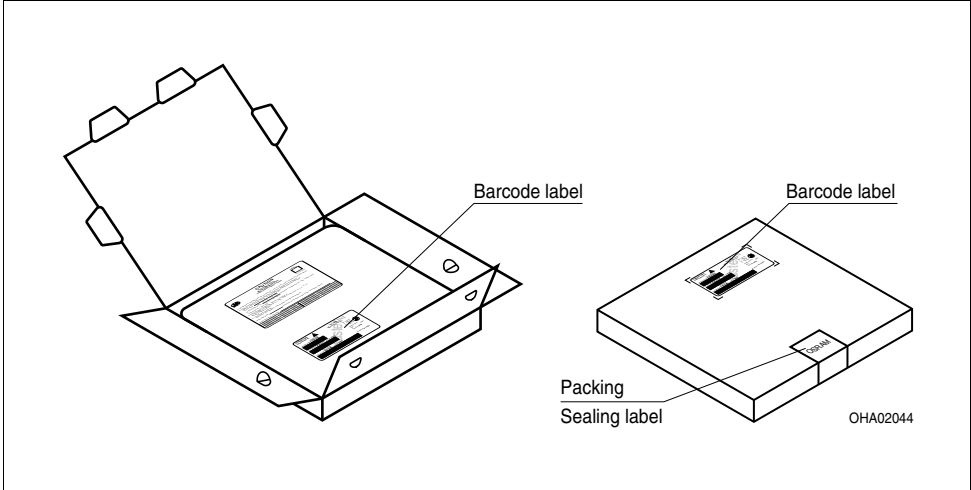


Anm.: Feuchteempfindliche Produkte sind verpackt in einem Trockenbeutel zusammen mit einem Trockenmittel und einer Feuchteindikatorkarte

Bezüglich Trockenverpackung finden Sie weitere Hinweise im Internet und in unserem Short Form Catalog im Kapitel "Gurtung und Verpackung" unter dem Punkt "Trockenverpackung". Hier sind Normenbezüge, unter anderem ein Auszug der JEDEC-Norm, enthalten.

Note: Moisture-sensitive product is packed in a dry bag containing desiccant and a humidity card.  
Regarding dry pack you will find further information in the internet and in the Short Form Catalog in chapter "Tape and Reel" under the topic "Dry Pack". Here you will also find the normative references like JEDEC.

Kartonverpackung und Materialien  
Transportation Packing and Materials



Dimensions of transportation box in mm (inch)

| Breite / Width         | Länge / length         | Höhe / height          |
|------------------------|------------------------|------------------------|
| 200 ±5 (7,874 ±0,1968) | 200 ±5 (7,874 ±0,1968) | 30 ±5 (1,1811 ±0,1968) |

[illegible]

| Patent No.   |
|--------------|
| US 6 066 861 |
| US 6 277 301 |
| US 6 245 259 |

Due to the cancellation of the LE from IEC 60825, the evaluation of eye safety occurs according to the standard IEC 62471:2006 ("photobiological safety of lamps and lamp systems"). Within the risk grouping system of this CIE standard, the LEDs specified in this data sheet fall into the "exempt" group (relating to devices in the visible spectrum with an exposure time of 10000 s). Under real circumstances (for exposure time, 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. As is also true when viewing other 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.

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 in the Internet.

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.

**Components used in life-support devices or systems must be expressly authorized for such purpose!** Critical components<sup>6)</sup> page 23 may only be used in life-support devices or systems<sup>7)</sup> page 23 with the express written approval of QSRM OS.

**Fußnoten:**

- 1) Helligkeitswerte werden während eines Strompulses einer typischen Dauer von 25 ms, mit einer internen Reproduzierbarkeit von +/- 8 % und einer erweiterten Messunsicherheit von +/- 11 % gemessen (gemäß GUM mit Erweiterungsfaktor  $k = 3$ ).
- 2) Wegen der besonderen Prozessbedingungen bei der Herstellung von LED können typische oder abgeleitete technische Parameter nur aufgrund statistischer Werte wiedergegeben werden. Diese stimmen nicht notwendigerweise mit den Werten jedes einzelnen Produktes überein, dessen Werte sich von typischen und abgeleiteten Werten oder typischen Kennlinien unterscheiden können. Falls erforderlich, z.B. aufgrund technischer Verbesserungen, werden diese typischen Werte ohne weitere Ankündigung geändert.
- 3) Farbkoordinaten werden während eines Strompulses einer typischen Dauer von 25 ms, mit einer internen Reproduzierbarkeit von +/- 0,005 und einer erweiterten Messunsicherheit von +/- 0,01 gemessen (gemäß GUM mit Erweiterungsfaktor  $k = 3$ ).
- 4) Vorwärtsspannungen werden während eines Strompulses einer typischen Dauer von 8 ms, mit einer internen Reproduzierbarkeit von +/- 0,05 V und einer erweiterten Messunsicherheit von +/- 0,1 V gemessen (gemäß GUM mit Erweiterungsfaktor  $k=3$ ).
- 5) Maße werden wie folgt angegeben: mm (inch)
- 6) Ein kritisches Bauteil ist ein Bauteil, das in lebenserhaltenden Apparaten oder Systemen eingesetzt wird und dessen Defekt voraussichtlich zu einer Fehlfunktion dieses lebenserhaltenden Apparates oder Systems führen wird oder die Sicherheit oder Effektivität dieses Apparates oder Systems beeinträchtigt.
- 7) Lebenserhaltende Apparate oder Systeme sind für
  - (a) die Implantierung in den menschlichen Körper oder
  - (b) für die Lebenserhaltung bestimmt.
 Falls sie versagen, kann davon ausgegangen werden, dass die Gesundheit und das Leben des Patienten in Gefahr ist.

**Remarks:**

- 1) Brightness values are measured during a current pulse of typical 25 ms, with an internal reproducibility of +/- 8 % and an expanded uncertainty of +/- 11 % (acc. to GUM with a coverage factor of  $k = 3$ ).
- 2) Due to the special conditions of the manufacturing processes of LED, 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.
- 3) Chromaticity coordinates are measured during a current pulse of typical 25 ms, with an internal reproducibility of +/- 0,005 and an expanded uncertainty of +/- 0,01 (acc. to GUM with a coverage factor of  $k = 3$ ).
- 4) The forward voltage is measured during a current pulse of typical 8 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  $k=3$ ).
- 5) Dimensions are specified as follows: mm (inch).
- 6) A critical component is a component used in a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or the effectiveness of that device or system.
- 7) Life support devices or systems are intended
  - (a) to be implanted in the human body, or
  - (b) to support and/or maintain and sustain human life.
 If they fail, it is reasonable to assume that the health and the life of the user may be endangered.

