

Power TOPLED® Enhanced optical Power LED (ATON®)

LW E67C



Vorläufige Daten / Preliminary Data

Besondere Merkmale

- **Gehäusetyp:** weißes P-LCC-4 Gehäuse
- **Besonderheit des Bauteils:** mehr Licht durch einen geringen thermischen Widerstand
- **Farbort:** $x = 0,32$, $y = 0,31$ nach CIE 1931 (weiß)
- **typische Farbtemperatur:** 6500 K
- **Farbwiedergabeindex:** 80
- **Abstrahlwinkel:** Lambertscher Strahler (120°)
- **Technologie:** InGaN
- **optischer Wirkungsgrad:** 12 lm/W
- **Gruppierungsparameter:** Lichtstärke, Farbort, Durchlassspannung
- **Verarbeitungsmethode:** für alle SMT-Bestücktechniken geeignet
- **Lötmethode:** IR Reflow Löten und Wellenlöten (TTW)
- **Vorbehandlung:** nach JEDEC Level 2
- **Gurtung:** 8 mm Gurt mit 2000/Rolle, $\varnothing 180$ mm oder 8000/Rolle, $\varnothing 330$ mm
- **ESD-Festigkeit:** ESD-sicher bis 2 kV nach EOS/ESD-5.1-1993

Anwendungen

- Verkehrssignale
- Hinterleuchtung (LCD, Schalter, Tasten, Displays, Werbebeleuchtung, Allgemeinbeleuchtung)
- Innen- und Außenbeleuchtung im Automobilbereich (z.B. Instrumentenbeleuchtung)
- Ersatz von Kleinst-Glühlampen
- Leselampen
- Rettungsnotleuchten
- Signal- und Symbolleuchten
- Markierungsbeleuchtung (z.B. Stufen, Fluchtwege, u.ä.)
- Scanner

Features

- **package:** white P-LCC-4 package
- **feature of the device:** more brightness due to a lower thermal resistance
- **color coordinates:** $x = 0.32$, $y = 0.31$ acc. to CIE 1931 (white)
- **typ. color temperature:** 6500 K
- **color reproduction index:** 80
- **viewing angle:** Lambertian Emitter (120°)
- **technology:** InGaN
- **optical efficiency:** 12 lm/W
- **grouping parameter:** luminous intensity, color coordinates, forward voltage
- **assembly methods:** suitable for all SMT assembly methods
- **soldering methods:** IR reflow soldering and TTW soldering
- **preconditioning:** acc. to JEDEC Level 2
- **taping:** 8 mm tape with 2000/reel, $\varnothing 180$ mm or 8000/reel, $\varnothing 330$ mm
- **ESD-withstand voltage:** up to 2 kV acc. to EOS/ESD-5.1-1993

Applications

- traffic signals
- backlighting (LCD, switches, keys, displays, illuminated advertising, general lighting)
- Interior and exterior automotive lighting (e.g. dashboard backlighting)
- substitution of micro incandescent lamps
- reading lamps
- emergency lighting
- signal and symbol luminaire
- marker lights (e.g. steps, exit ways, etc.)
- scanners

| Typ | Emissions- farbe | Farbe der Lichtaustritts- fläche | Lichtstärke | Lichtstrom | Bestellnummer |
|---------------------|----------------------|--|---|--|---------------|
| Type | Color of Emission | Color of the Light Emitting Area | Luminous Intensity $I_F = 30 \text{ mA}$ $I_V \text{ (mcd)}$ | Luminous Flux $I_F = 30 \text{ mA}$ $\Phi_V \text{ (lm)}$ | Ordering Code |
| LW E67C-T2U2-3C5D-1 | white | colored | 355 ... 710 | 1600 (typ.) | Q65110A0473 |
| LW E67C-U2V2-3C5D-1 | | diffused | 560 ... 1120 | 2500 (typ.) | Q65110A0571 |

Anm.: **-3C5D-1** Farbselektiert nach Farbortgruppen (siehe **Seite 5**)
-3C5D-1 gesamter Durchlassspannungsbereich, Lieferung in Einzelgruppen (siehe **Seite 6**)

*Die Standardlieferform von Serientypen beinhaltet eine untere bzw. eine obere Familiengruppe, die aus nur 3 bzw. 4 Halbgruppen besteht. Einzelne Halbgruppen sind nicht erhältlich.
 In einer Verpackungseinheit / Gurt ist immer nur eine Halbgruppe enthalten.*

Note: **-3C5D-1** color selection acc. to chromaticity coordinate groups (siehe **Seite 5**)
-3C5D-1 gesamter Durchlassspannungsbereich, delivery in single groups (siehe **Seite 6**)

*The standard shipping format for serial types includes a lower or upper family group of 3 or 4 individual groups. Individual half groups are not available.
 No packing unit / tape ever contains more than one luminous intensity half group.*

Grenzwerte
Maximum Ratings

| Bezeichnung Parameter | Symbol Symbol | Wert Value | Einheit Unit |
|--|------------------|----------------|-----------------|
| Betriebstemperatur Operating temperature range | T_{op} | - 40 ... + 100 | °C |
| Lagertemperatur Storage temperature range | T_{stg} | - 40 ... + 100 | °C |
| Sperrschichttemperatur Junction temperature | T_j | + 110 | °C |
| Durchlassstrom Forward current | I_F | 30 | mA |
| Stoßstrom Surge current $t \leq 10 \mu s, D = 0.1$ | I_{FM} | 300 | mA |
| Sperrspannung ¹⁾ Reverse voltage | V_R | 5 | V |
| Leistungsaufnahme Power consumption | P_{tot} | 135 | mW |
| Wärmewiderstand Thermal resistance Sperrschicht/Umgebung Junction/ambient | $R_{th JA}$ | 350 | K/W |
| Sperrschicht/Löt看垫 Junction/solder point Montage auf PC-Board FR 4 (Padgröße $\geq 16 \text{ mm}^2$) mounted on PC board FR 4 (pad size $\geq 16 \text{ mm}^2$) | $R_{th JS}$ | 180 | K/W |

¹⁾ für kurzzeitigen Betrieb geeignet / suitable for short term application

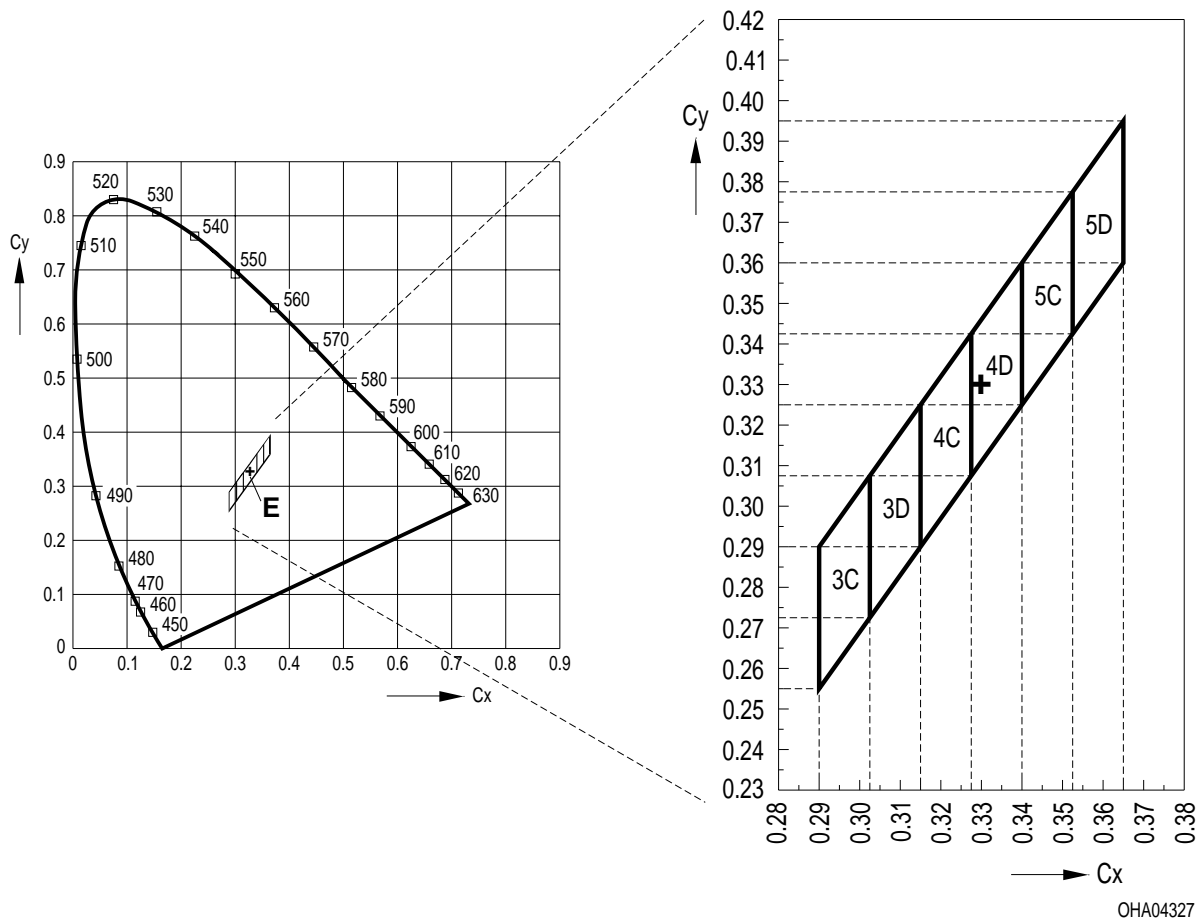
Kennwerte ($T_A = 25\text{ °C}$)**Characteristics**

| Bezeichnung Parameter | Symbol Symbol | Wert Value | Einheit Unit |
|---|-------------------------|----------------------|--------------------------------|
| Farbkoordinate x nach CIE 1931 ¹⁾ (typ.) Chromaticity coordinate x acc. to CIE 1931 $I_F = 30\text{ mA}$ | x | 0.32 | – |
| Farbkoordinate y nach CIE 1931 ¹⁾ (typ.) Chromaticity coordinate y acc. to CIE 1931 $I_F = 30\text{ mA}$ | y | 0.31 | – |
| Abstrahlwinkel bei 50 % I_V (Vollwinkel) (typ.) Viewing angle at 50 % I_V | 2 ϕ | 120 | Grad deg. |
| Durchlassspannung ²⁾ (min.) Forward voltage (typ.) $I_F = 30\text{ mA}$ (max.) | V_F V_F V_F | 3.25 3.90 4.35 | V V V |
| Sperrstrom (typ.) Reverse current (max.) $V_R = 5\text{ V}$ | I_R I_R | 0.01 10 | μA μA |
| Temperaturkoeffizient von x (typ.) Temperature coefficient of x $I_F = 30\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$ | TC_x | –0.1 | $10^{-3}/\text{K}$ |
| Temperaturkoeffizient von y (typ.) Temperature coefficient of y $I_F = 30\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$ | TC_y | –0.2 | $10^{-3}/\text{K}$ |
| Temperaturkoeffizient von V_F (typ.) Temperature coefficient of V_F $I_F = 30\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$ | TC_V | – 3.0 | mV/K |
| Optischer Wirkungsgrad (typ.) Optical efficiency $I_F = 30\text{ mA}$ | η_{opt} | 12 | lm/W |

¹⁾ Farbortgruppen werden mit einer Stromeinprägungsdauer von 25 ms und einer Genauigkeit von $\pm 0,01$ ermittelt.
Chromaticity coordinate groups are tested at a current pulse duration of 25 ms and a tolerance of ± 0.01 .

²⁾ Durchlassspannungsgruppen werden mit einer Stromeinprägungsdauer von 1 ms und einer Genauigkeit von $\pm 0,05\text{ V}$ ermittelt.
Forward voltage groups are tested at a current pulse duration of 1 ms and a tolerance of $\pm 0.05\text{ V}$.

Farbortgruppen
Chromaticity coordinate groups



²⁾ Durchlassspannungsgruppen
Forward voltage groups

| Gruppe Group | Durchlassspannung Forward voltage | | Einheit Unit |
|-----------------|--------------------------------------|------|-----------------|
| | min. | max. | |
| 3 | 3.25 | 3.8 | V |
| 4 | 3.8 | 4.35 | V |

Helligkeits-Gruppierungsschema
Luminous Intensity Groups

| Lichtgruppe Luminous Intensity Group | Lichtstärke Luminous Intensity I_V (mcd) | Lichtstrom Luminous Flux Φ_V (lm) |
|---|--|--|
| T2 | 355 ... 450 | 1200 (typ.) |
| U1 | 450 ... 560 | 1500 (typ.) |
| U2 | 560 ... 710 | 1900 (typ.) |
| V1 | 710 ... 900 | 2400 (typ.) |
| V2 | 900 ... 1120 | 3000 (typ.) |

Helligkeitswerte werden mit einer Stromeinprägedauer von 25 ms und einer Genauigkeit von $\pm 11\%$ ermittelt.
Luminous intensity is tested at a current pulse duration of 25 ms and a tolerance of $\pm 11\%$.

Gruppenbezeichnung auf Etikett
Group Name on Label

Beispiel: T2-4D-3

Example: T2-4D-3

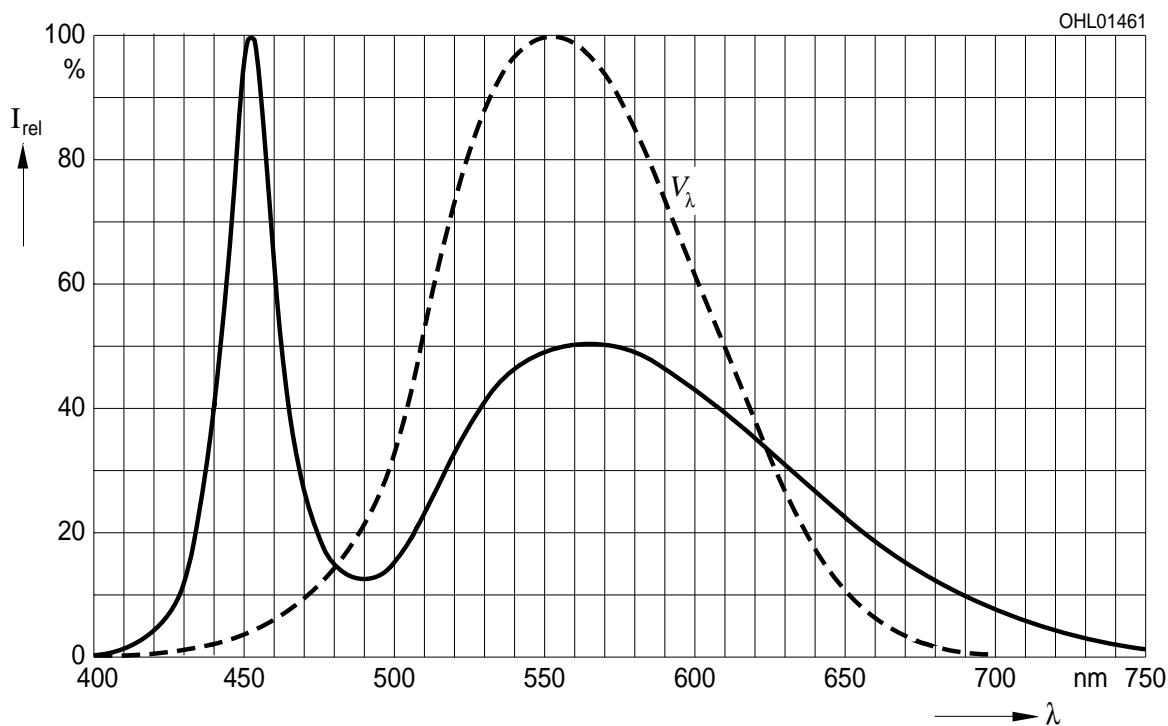
| Lichtgruppe Luminous Intensity Group | Halbgruppe Half Group | Farbortgruppe Chromaticity Coordinate Group | Durchlassspannung Forward Voltage |
|--|--------------------------|---|--------------------------------------|
| T | 2 | 4D | 3 |

Relative spektrale Emission $I_{rel} = f(\lambda)$, $T_A = 25\text{ °C}$, $I_F = 30\text{ mA}$

Relative Spectral Emission

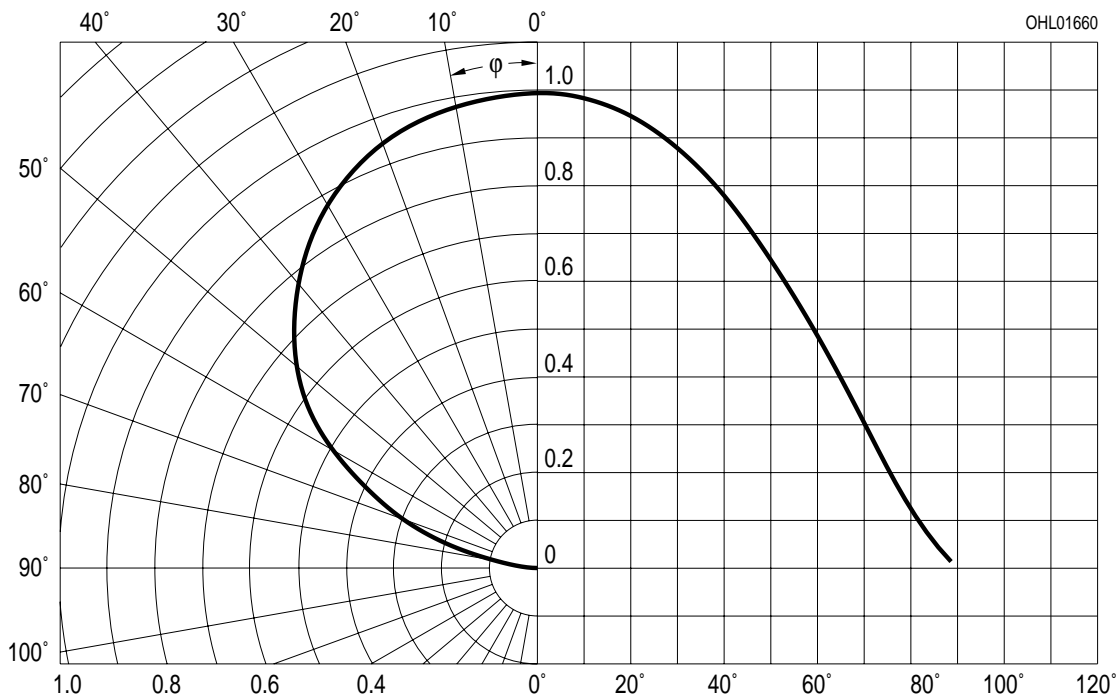
$V(\lambda)$ = spektrale Augenempfindlichkeit

Standard eye response curve



Abstrahlcharakteristik $I_{rel} = f(\varphi)$

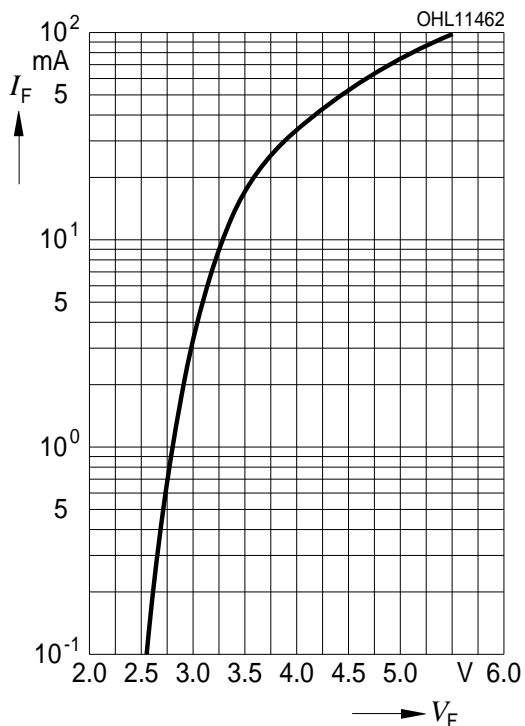
Radiation Characteristic



Durchlassstrom $I_F = f(V_F)$

Forward Current

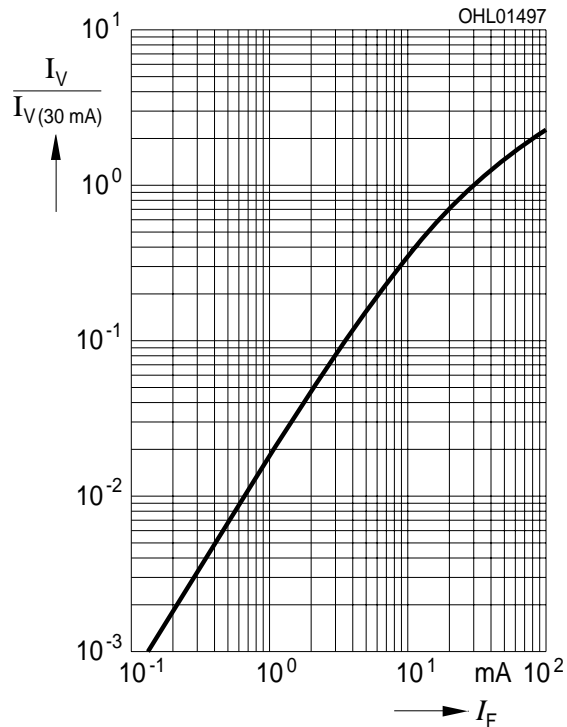
$T_A = 25\text{ °C}$



Relative Lichtstärke $I_V/I_{V(30\text{ mA})} = f(I_F)$

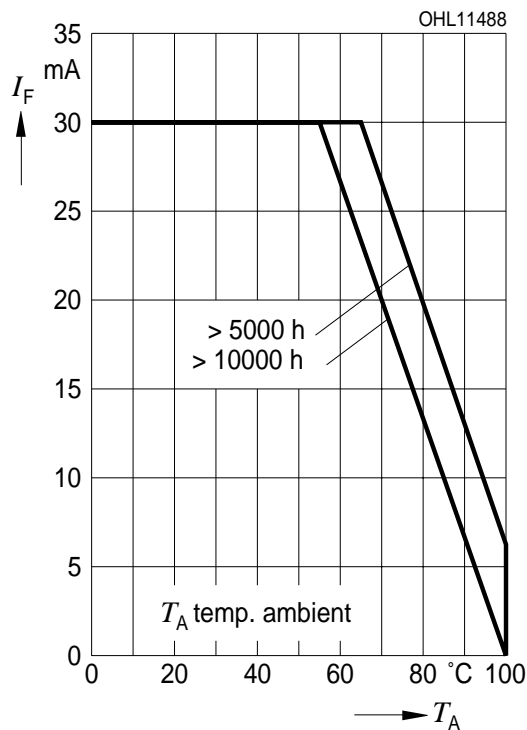
Relative Luminous Intensity

$T_A = 25\text{ °C}$



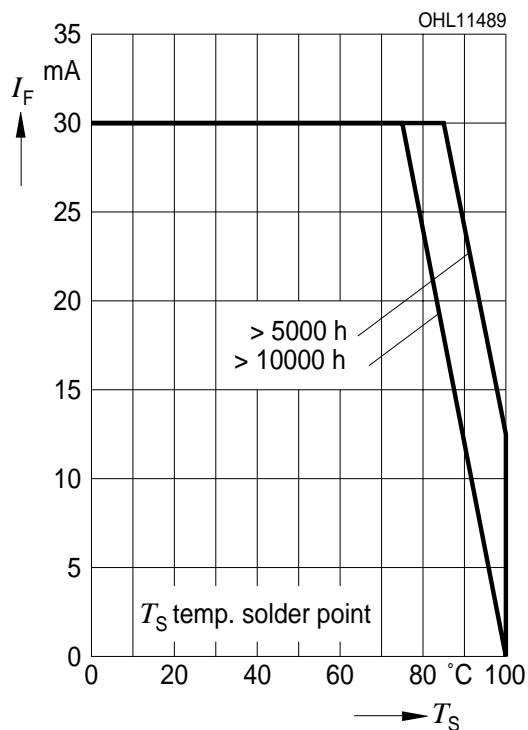
Maximal zulässiger Durchlassstrom $I_F = f(T)$

Max. Permissible Forward Current

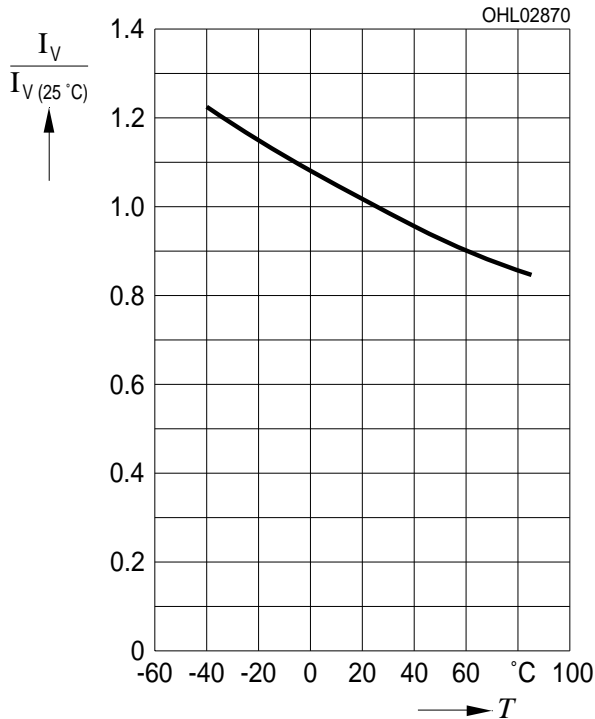


Maximal zulässiger Durchlassstrom $I_F = f(T)$

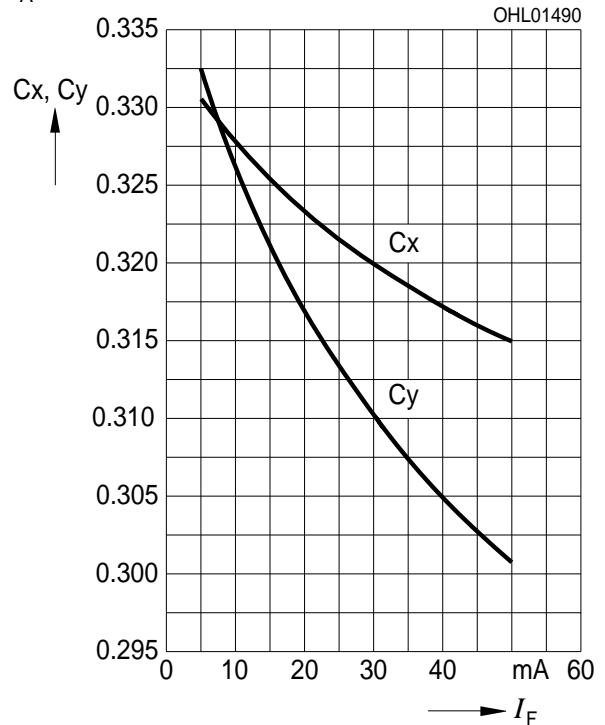
Max. Permissible Forward Current



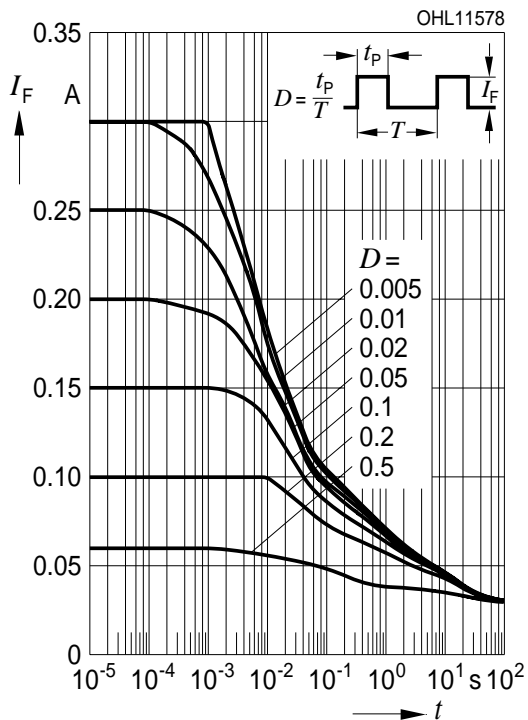
Relative Lichtstärke $I_V/I_{V(25^\circ\text{C})} = f(T_A)$
Relative Luminous Intensity
 $I_F = 30 \text{ mA}$



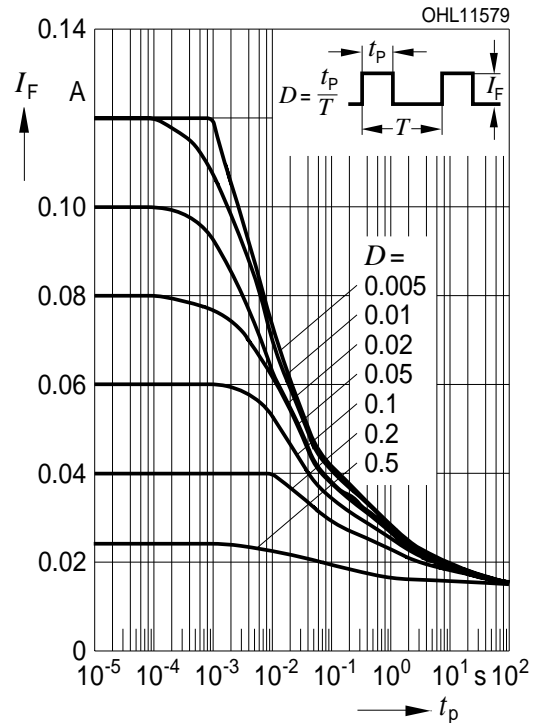
Farbortverschiebung $x, y = f(I_F)$
Chromaticity Coordinate Shift
 $T_A = 25^\circ\text{C}$



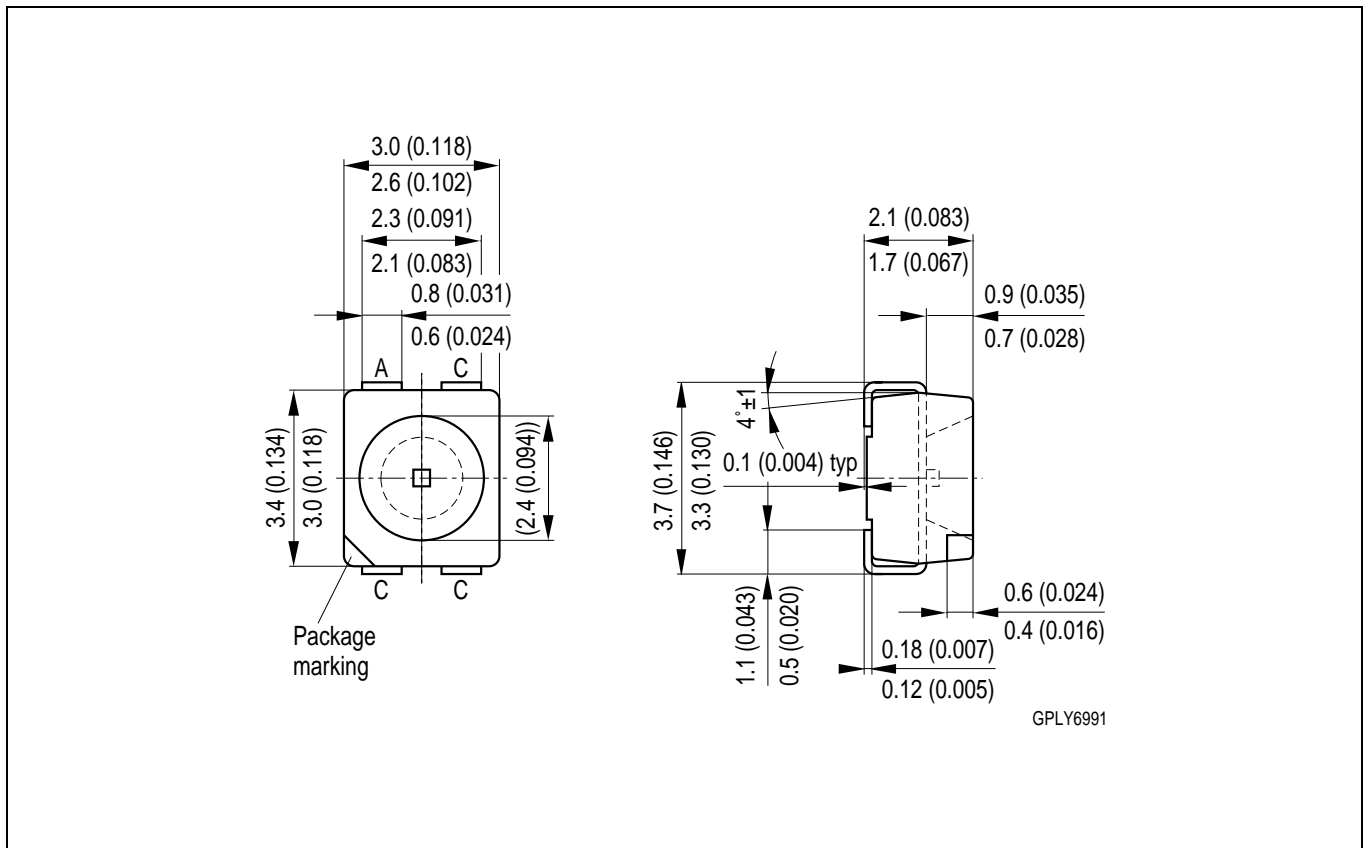
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
 Duty cycle $D = \text{parameter}$, $T_A = 25^\circ\text{C}$



Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
 Duty cycle $D = \text{parameter}$, $T_A = 85^\circ\text{C}$



Maßzeichnung
Package Outlines

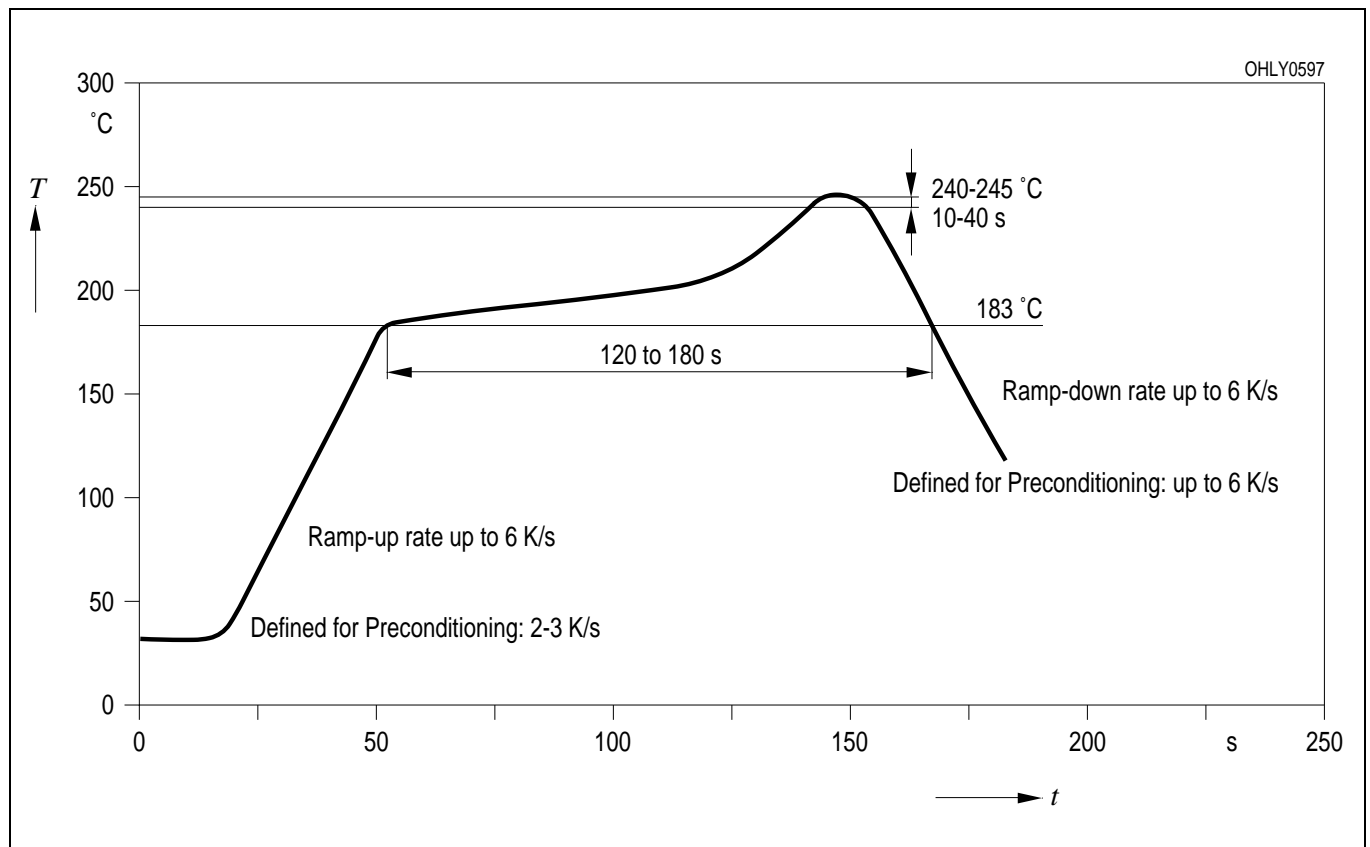


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

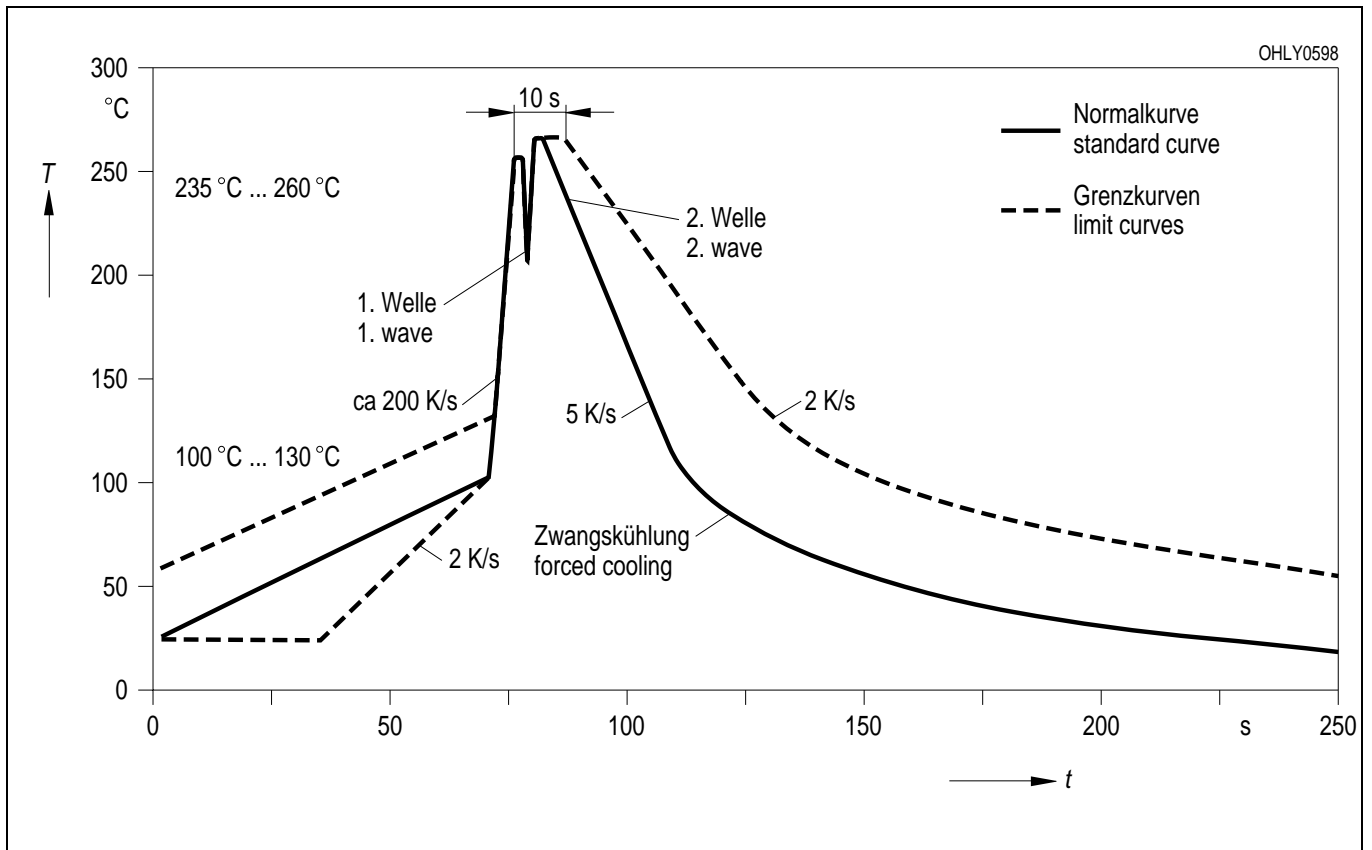
Gewicht / Approx. weight: 35 mg

Lötbedingungen Vorbehandlung nach JEDEC Level 2
Soldering Conditions Preconditioning acc. to JEDEC Level 2

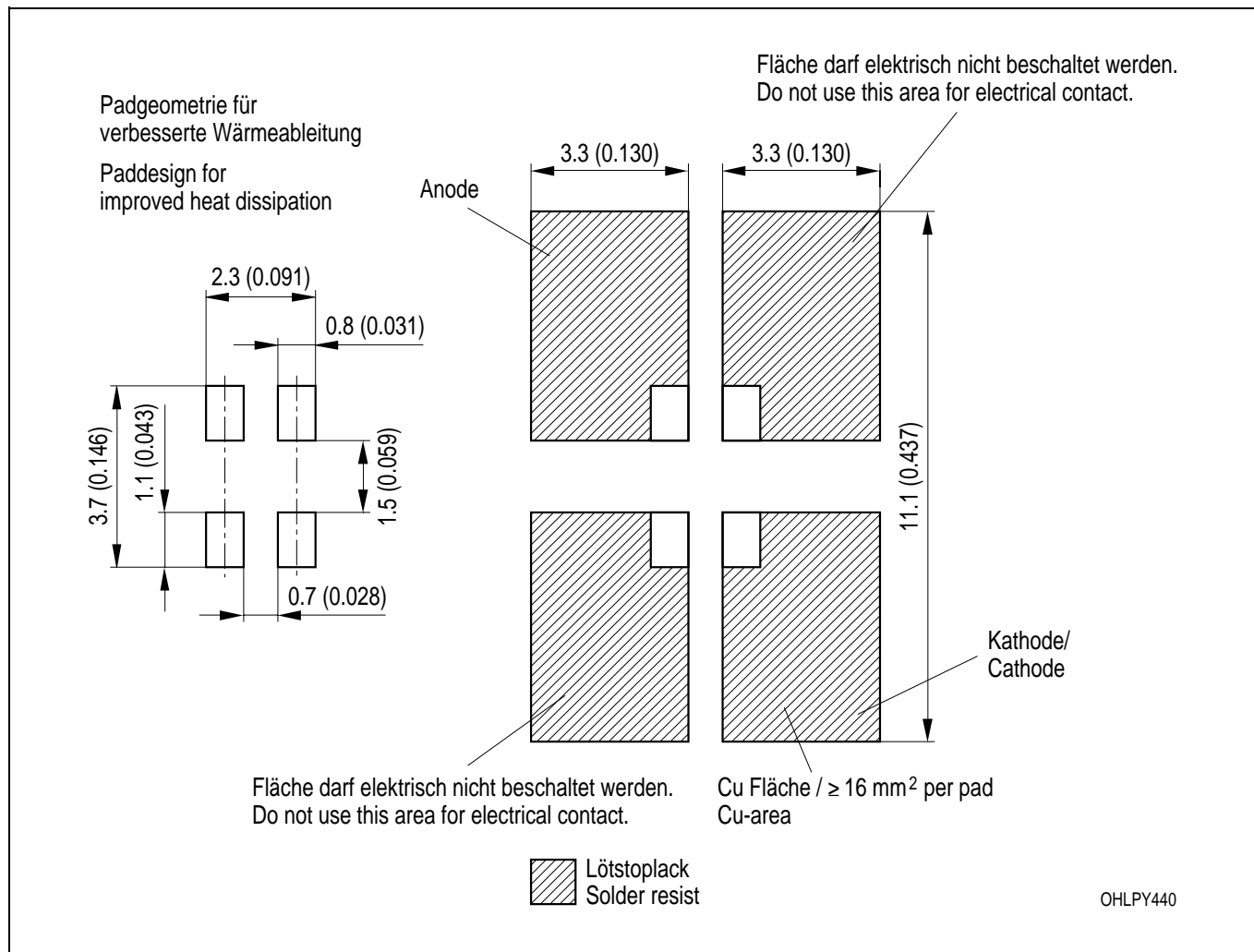
IR-Reflow Lötprofil (nach IPC 9501)
IR Reflow Soldering Profile (acc. to IPC 9501)



Wellenlötten (TTW) (nach CECC 00802)
TTW Soldering (acc. to CECC 00802)

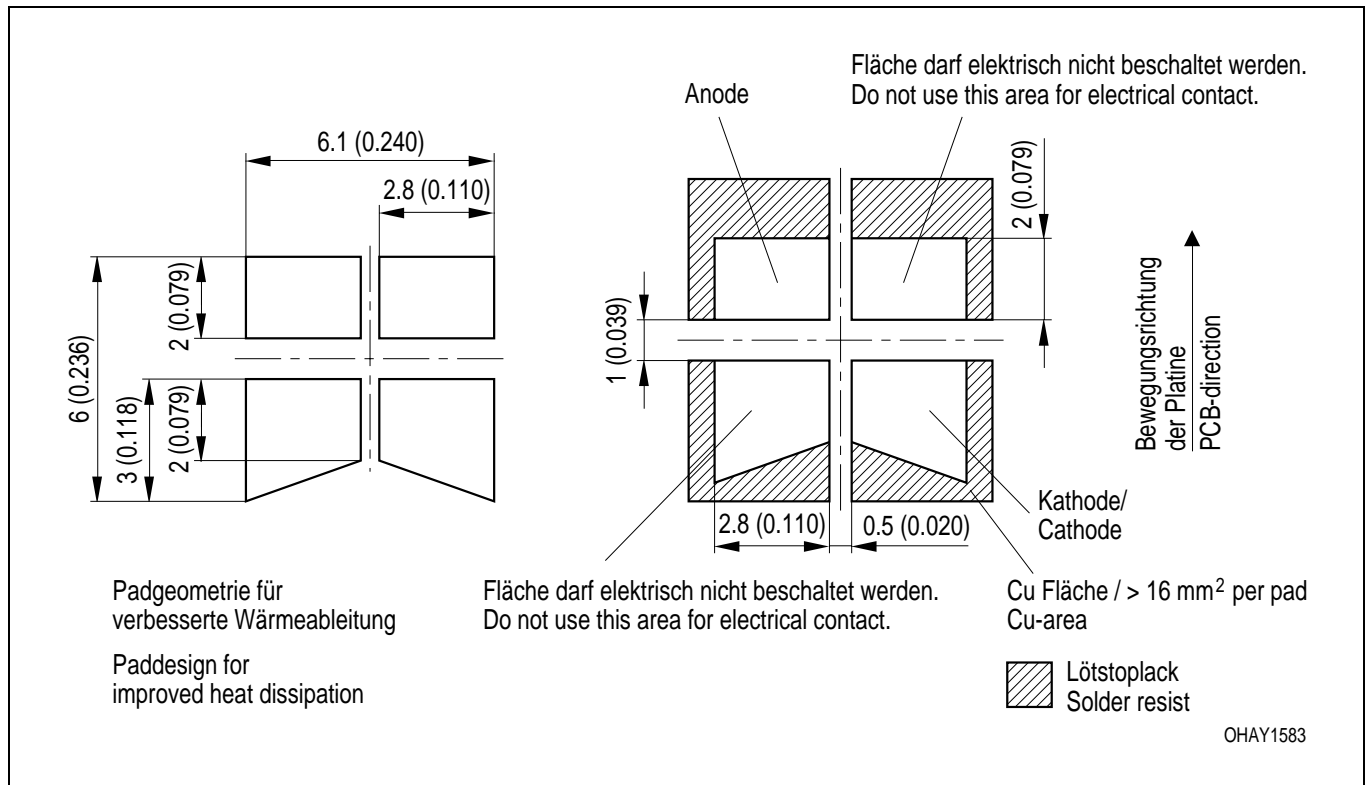


Empfohlenes Lötpad Design IR Reflow Lötten
Recommended Solder Pad IR Reflow Soldering



Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch)

Empfohlenes Lötpad Design Wellenlöten (TTW)
Recommended Solder Pad TTW Soldering



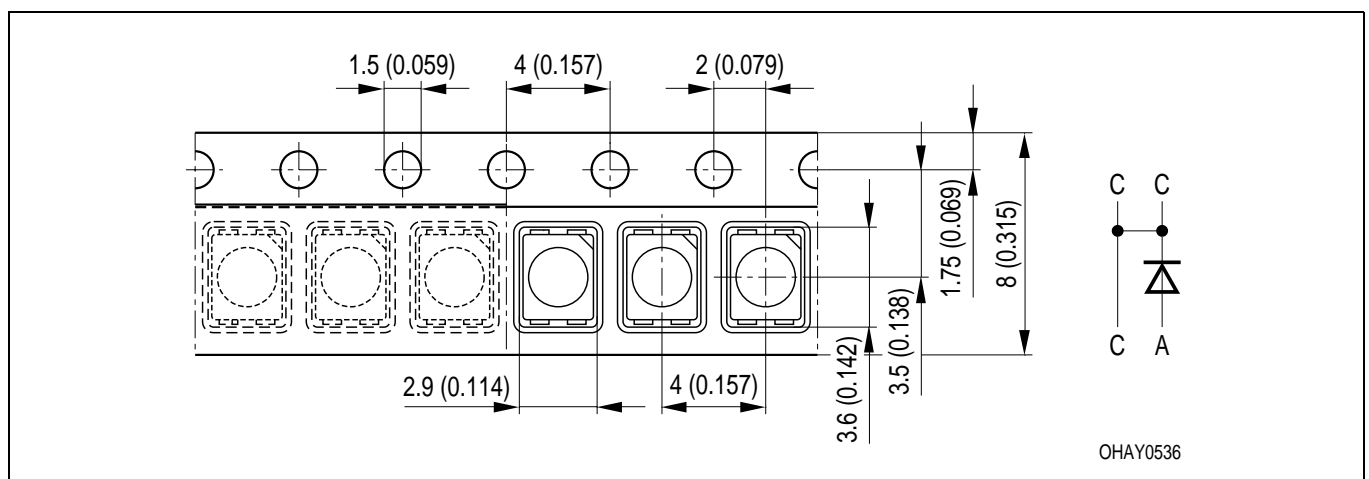
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch)

Gurtung / Polarität und Lage

Verpackungseinheit 2000/Rolle, ø180 mm
 oder 8000/Rolle, ø330 mm

Method of Taping / Polarity and Orientation

Packing unit 2000/reel, ø180 mm
 or 8000/reel, ø330 mm



Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch)

| Revision History: 2003-05-26 | | Date of change |
|-------------------------------------|--|-----------------------|
| Previous Version: 2003-03-04 | | |
| Page | Subjects (major changes since last revision) | |
| 9 | Zulässige Impulsbelastbarkeit / Permissible Pulse Handling Capability | |
| 4 | value (forward voltage) | |
| 8 | diagram luminous intensity OHL01462 to OHL11462 | |
| 8 | diagram max. permissible forward current OHL01489 to OHL11489 | |
| 9 | diagram permissible pulse handling capability OHL01580/01579 to OHL11578/11579 | |
| 2, 5 | color coordinate grouping for white | |
| 8 | Max. Permissible Forward Current | |
| 15 | annotations | 2002-07-25 |
| 13 | new IR solder pad (OHLPY439 to OHLPY440) | 2002-08-05 |
| 3 | reverse voltage (footnote) | 2002-08-21 |
| 2, 5 | new luminous intensity groups and new ordering codes | 2002-10-25 |
| 1, 2, 5 | new grouping parameter: forward voltage | 2002-11-08 |
| 15 | new patent no. | 2003-03-04 |
| 14 | new recommended solder pad | 2003-05-26 |

Patent List

Patent No.

US 6 066 861, US 6 277 301, US 6 245 259

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Attention please!

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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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¹ 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.

² 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 of the user may be endangered.