

Hyper TOPLED® Enhanced optical Power LED (ATON®)

LW T67C



Vorläufige Daten / Preliminary Data

Besondere Merkmale

- **Gehäusetyp:** weißes P-LCC-2 Gehäuse
- **Besonderheit des Bauteils:** extrem breite Abstrahlcharakteristik; ideal für Hinterleuchtungen und Einkopplungen in Lichtleiter
- **Farbort:** $x = 0,32$, $y = 0,31$ nach CIE 1931 (weiß)
- **typische Farbtemperatur:** 6500 K
- **Farbwiedergabeindex:** 80
- **Abstrahlwinkel:** Lambertischer Strahler (120°)
- **Technologie:** InGaN
- **optischer Wirkungsgrad:** 12 lm/W
- **Gruppierungsparameter:** Lichtstärke, Farbort
- **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

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

Features

- **package:** white P-LCC-2 package
- **feature of the device:** extremely wide viewing angle; ideal for backlighting and coupling in light guides
- **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
- **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

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

| Typ | Emissions- farbe | Farbe der Lichtaustritts- fläche | Lichtstärke | Lichtstrom | Bestellnummer |
|-------------------|----------------------|--|---|---|---------------|
| Type | Color of Emission | Color of the Light Emitting Area | Luminous Intensity $I_F = 20 \text{ mA}$ $I_V \text{ (mcd)}$ | Luminous Flux $I_F = 20 \text{ mA}$ $\Phi_V \text{ (mlm)}$ | Ordering Code |
| LW T67C-S2T2-3C5D | white | colored - | 224 ... 450 | 980 (typ.) | Q65110A0260 |
| LW T67C-T2U2-3C5D | | diffused | 355 ... 710 | 1550 (typ.) | Q65110A0522 |

Anm.: -3C5D Farbselektiert nach Farbortgruppen (Siehe **Seite 5**)

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 Color selection acc. to Chromaticity coordinate groups (see **page 5**)

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 | 20 | mA |
| Stoßstrom Surge current $t \leq 10 \mu s, D = 0.005$ | I_{FM} | 0.3 | A |
| Sperrspannung ¹⁾ Reverse voltage | V_R | 5 | V |
| Leistungsaufnahme Power consumption $T_A \leq 25 \text{ °C}$ | P_{tot} | 85 | mW |
| Wärmewiderstand Thermal resistance Sperrschicht/Umgebung Junction/ambient | $R_{th JA}$ | 450 | K/W |
| Sperrschicht/Löt看 Junction/solder point Montage auf PC-Board FR 4 (Padgröße $\geq 16 \text{ mm}^2$) mounted on PC board FR 4 (pad size $\geq 16 \text{ mm}^2$) | $R_{th JS}$ | 230 | K/W |

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

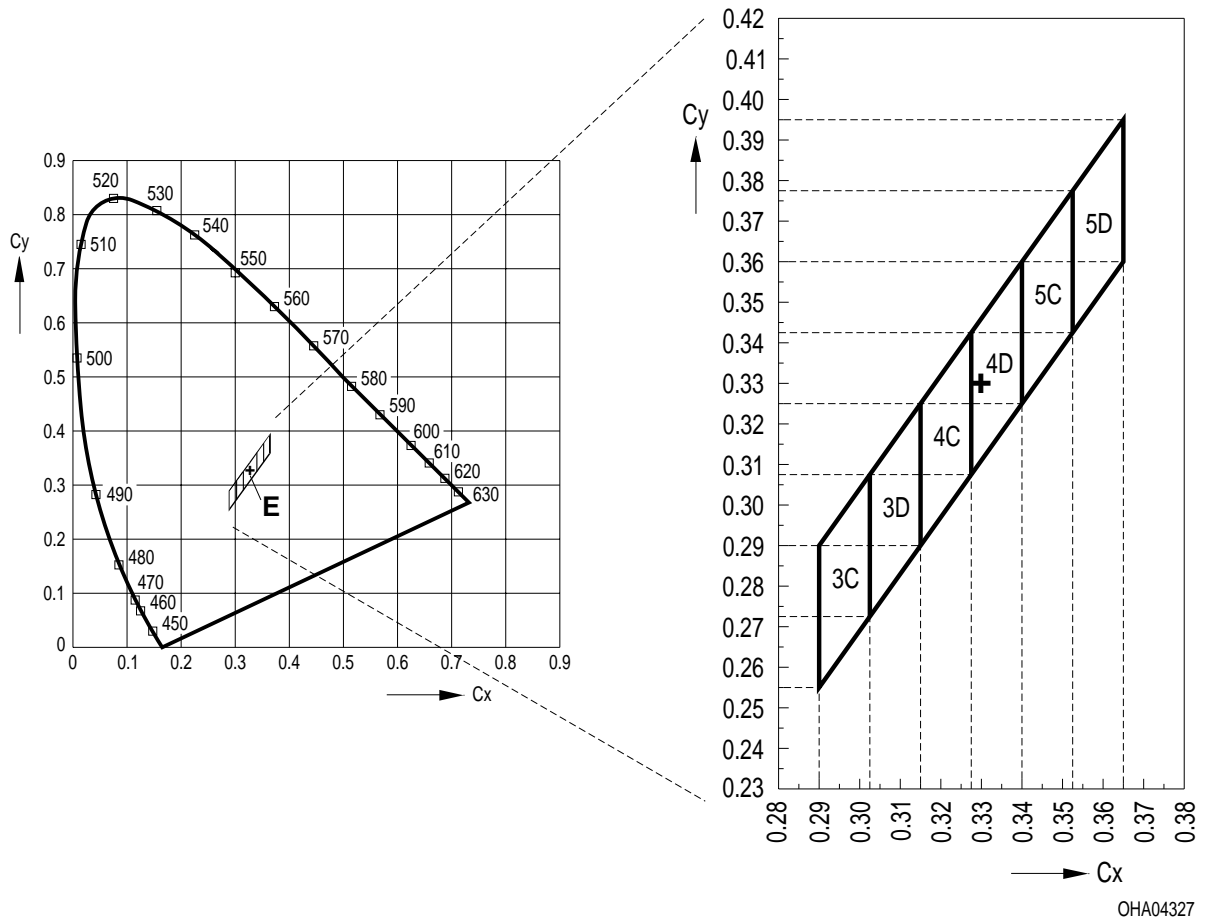
Kennwerte ($T_A = 25\text{ °C}$)**Characteristics**

| Bezeichnung Parameter | Symbol Symbol | Wert Value | Einheit Unit |
|---|-------------------------|-------------------|--------------------------------|
| Farbkoordinate x nach CIE 1931 ¹⁾ (typ.) Chromaticity coordinate x acc. to CIE 1931 $I_F = 20\text{ mA}$ | x | 0.32 | – |
| Farbkoordinate y nach CIE 1931 ¹⁾ (typ.) Chromaticity coordinate y acc. to CIE 1931 $I_F = 20\text{ mA}$ | y | 0.31 | – |
| Abstrahlwinkel bei 50 % I_V (Vollwinkel) (typ.) Viewing angle at 50 % I_V | 2ϕ | 120 | Grad deg. |
| Durchlassspannung ²⁾ (min.) Forward voltage (typ.) $I_F = 20\text{ mA}$ (max.) | V_F V_F V_F | 3.0 3.6 4.1 | 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 $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$ | TC_x | –0.1 | $10^{-3}/\text{K}$ |
| Temperaturkoeffizient von y (typ.) Temperature coefficient of y $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$ | TC_y | –0.2 | $10^{-3}/\text{K}$ |
| Temperaturkoeffizient von V_F (typ.) Temperature coefficient of V_F $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$ | TC_V | – 5.0 | mV/K |
| Optischer Wirkungsgrad (typ.) Optical efficiency $I_F = 20\text{ mA}$ | 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 $\pm 0,1\text{ V}$ ermittelt.
Forward voltage groups are tested at a current pulse duration of 1 ms and a tolerance of $\pm 0.1\text{ V}$.

1) Farbortgruppen
Chromaticity coordinate groups



Helligkeits-Gruppierungsschema
Luminous Intensity Groups

| Lichtgruppe Luminous Intensity Group | Lichtstärke Luminous Intensity I_V (mcd) | Lichtstrom Luminous Flux Φ_V (mlm) |
|---|--|---|
| S2 | 224 ... 280 | 760 (typ.) |
| T1 | 280 ... 355 | 950 (typ.) |
| T2 | 355 ... 450 | 1200 (typ.) |
| U1 | 450 ... 560 | 1500 (typ.) |
| U2 | 560 ... 710 | 1900 (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: S2-4C

Example: S2-4C

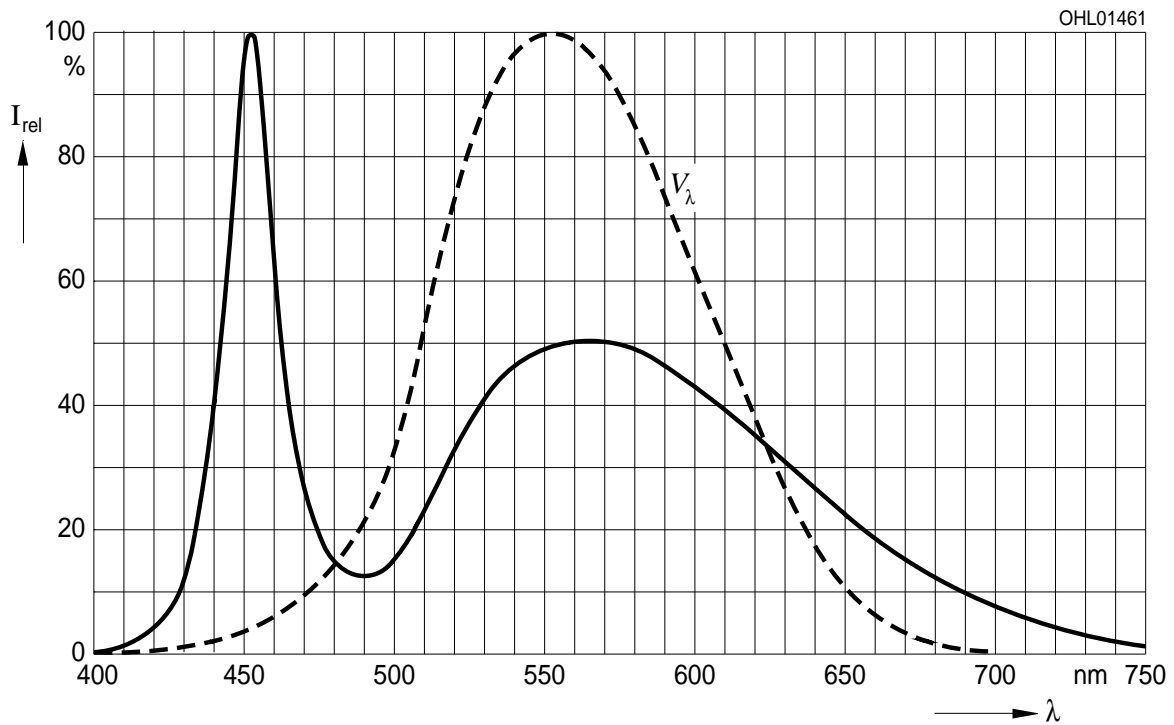
| Lichtgruppe Luminous Intensity Group | Halbgruppe Half Group | Farbortgruppe Chromaticity Coordinate Group |
|---|--------------------------|--|
| S | 2 | 4C |

Relative spektrale Emission $I_{rel} = f(\lambda)$, $T_A = 25\text{ °C}$, $I_F = 20\text{ mA}$

Relative Spectral Emission

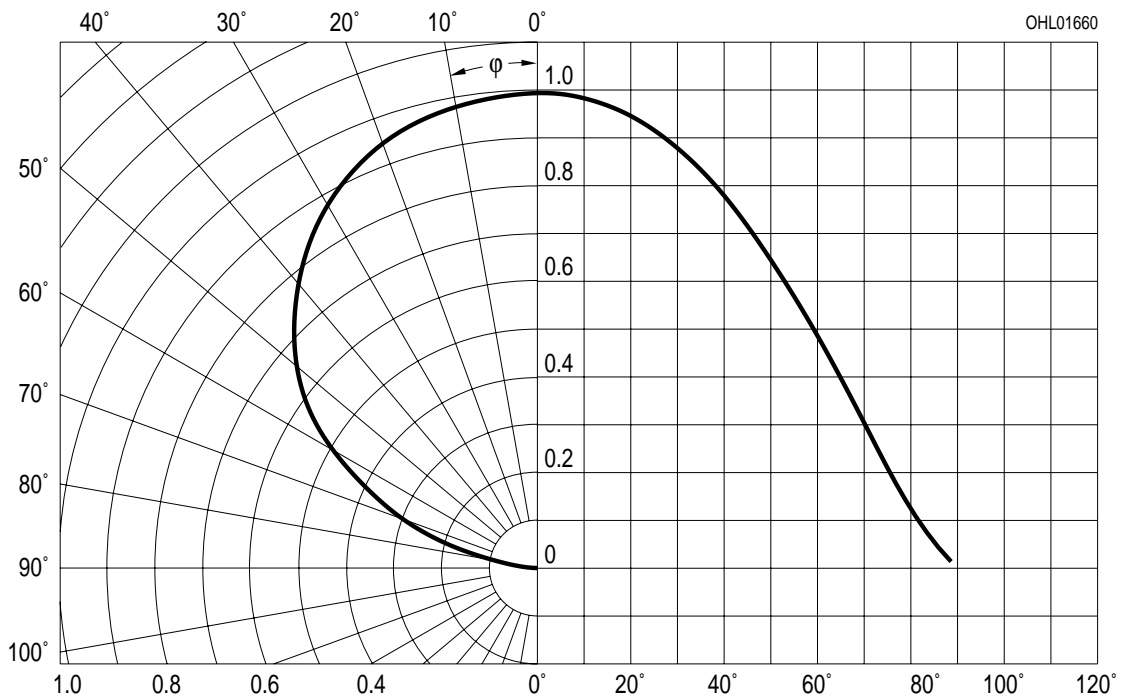
$V(\lambda)$ = spektrale Augenempfindlichkeit

Standard eye response curve



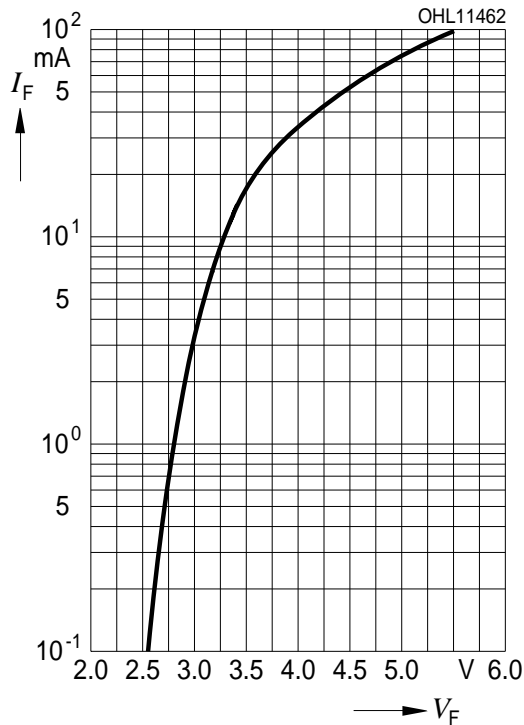
Abstrahlcharakteristik $I_{rel} = f(\varphi)$

Radiation Characteristic



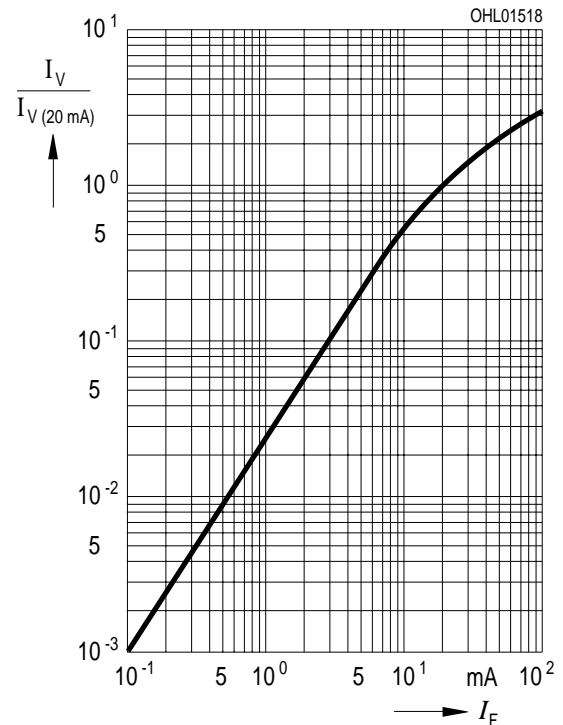
Durchlassstrom $I_F = f(V_F)$
Forward Current

$T_A = 25\text{ °C}$

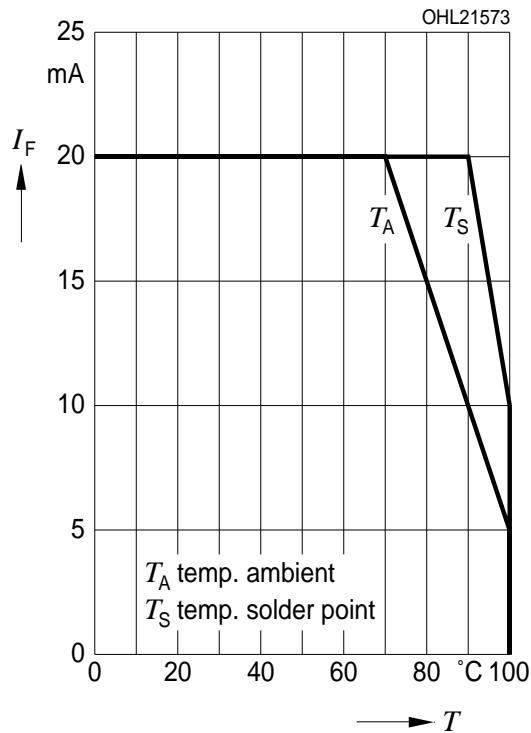


Relative Lichtstärke $I_V/I_{V(20\text{ mA})} = f(I_F)$
Relative Luminous Intensity

$T_A = 25\text{ °C}$

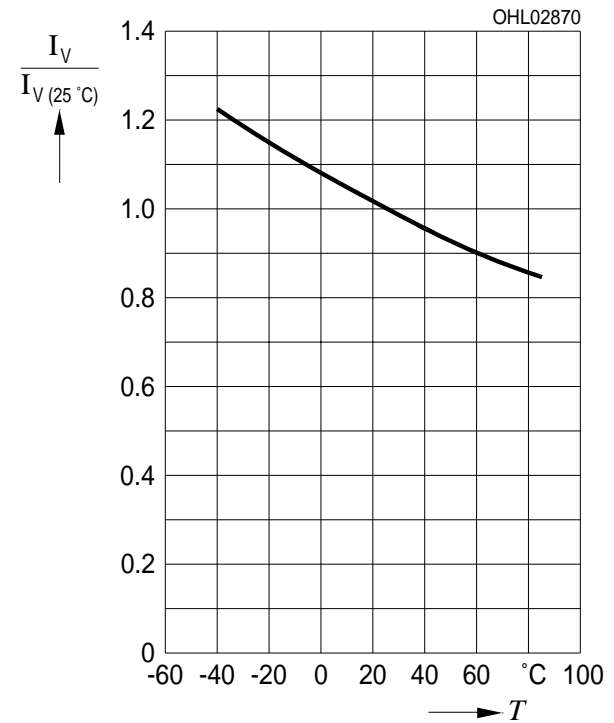


Maximal zulässiger Durchlassstrom $I_F = f(T)$
Max. Permissible Forward Current

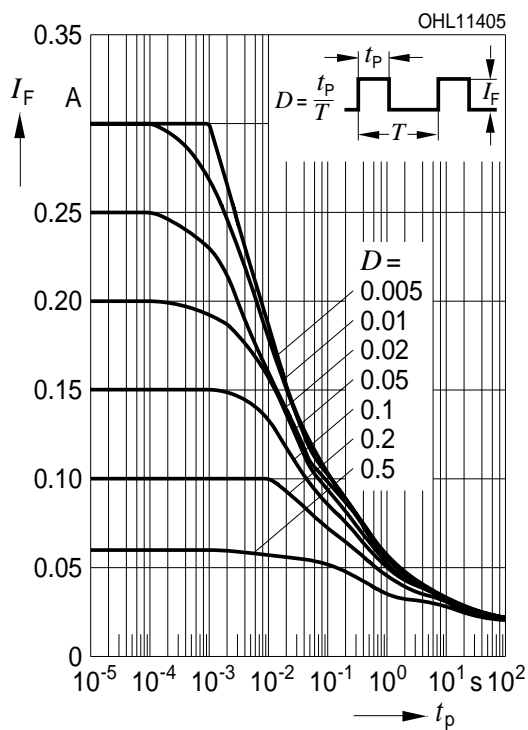


Relative Lichtstärke $I_V/I_{V(25\text{ °C})} = f(T_A)$
Relative Luminous Intensity

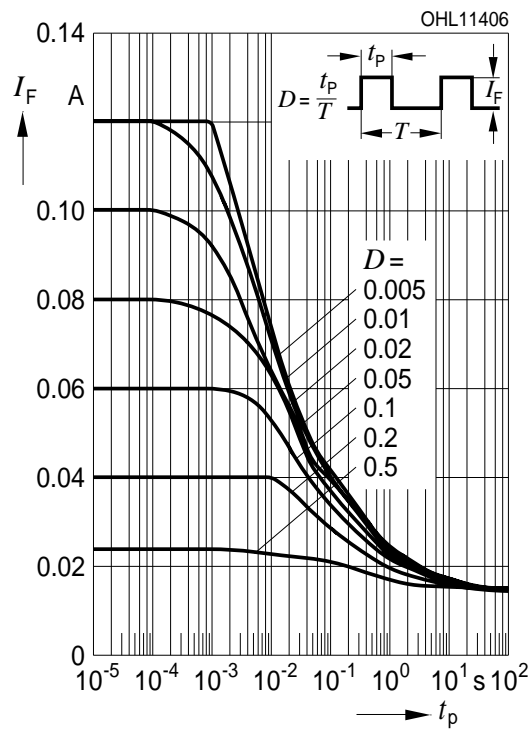
$I_F = 20\text{ mA}$



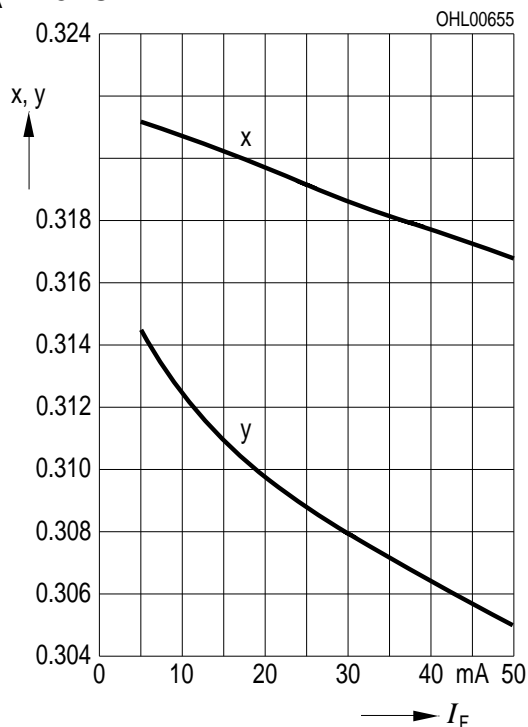
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
 Duty cycle $D =$ parameter, $T_A = 25\text{ °C}$



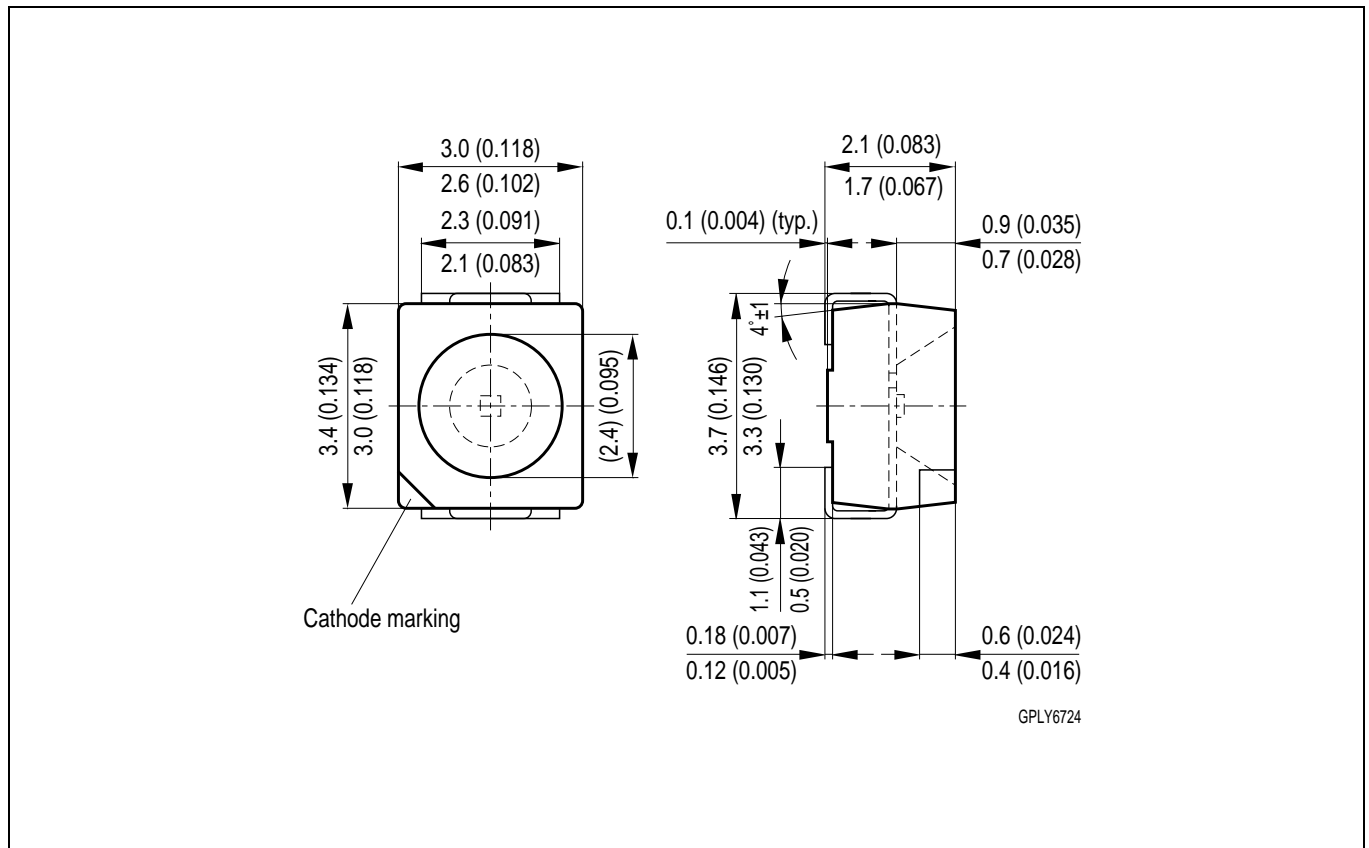
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
 Duty cycle $D =$ parameter, $T_A = 85\text{ °C}$



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



Maßzeichnung
Package Outlines

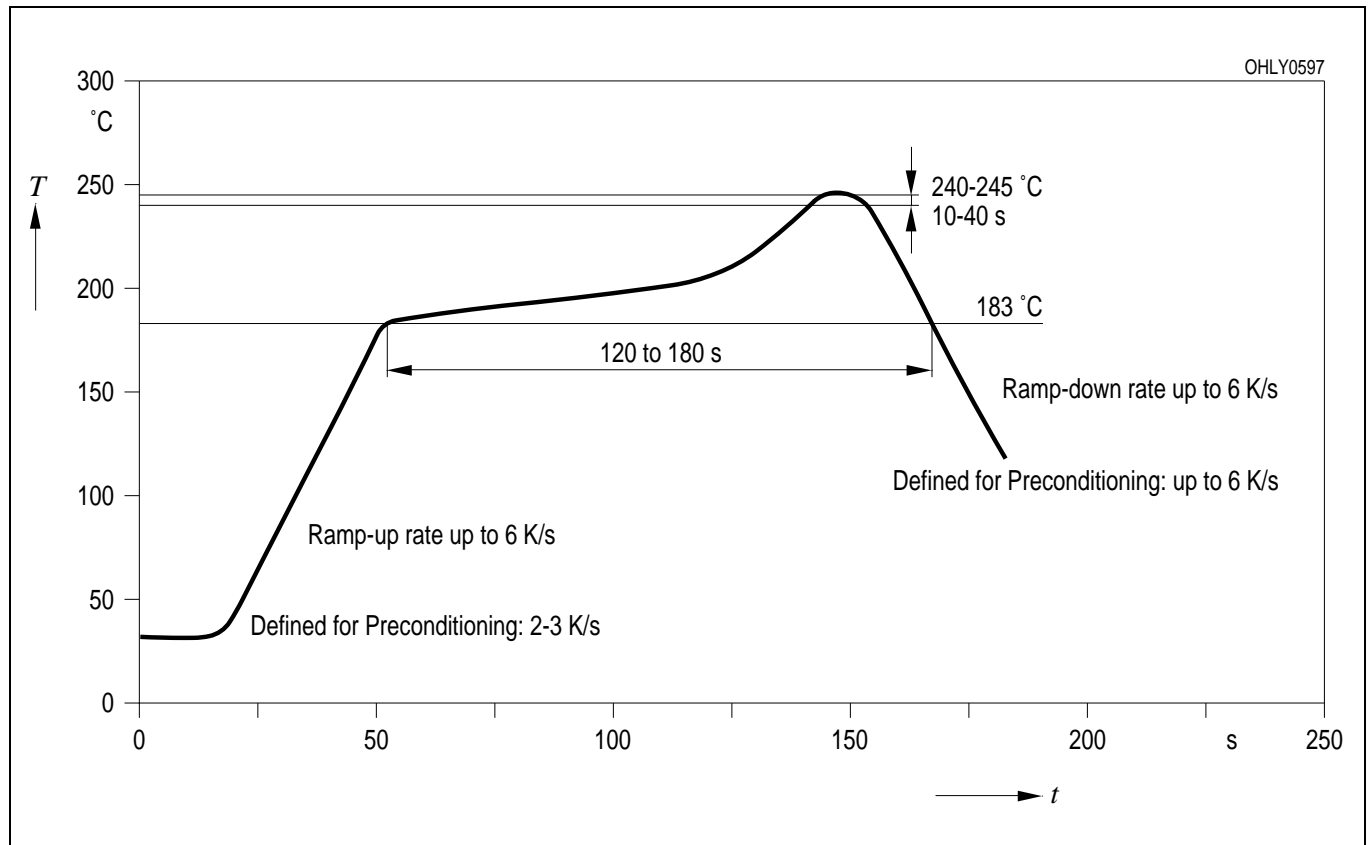


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

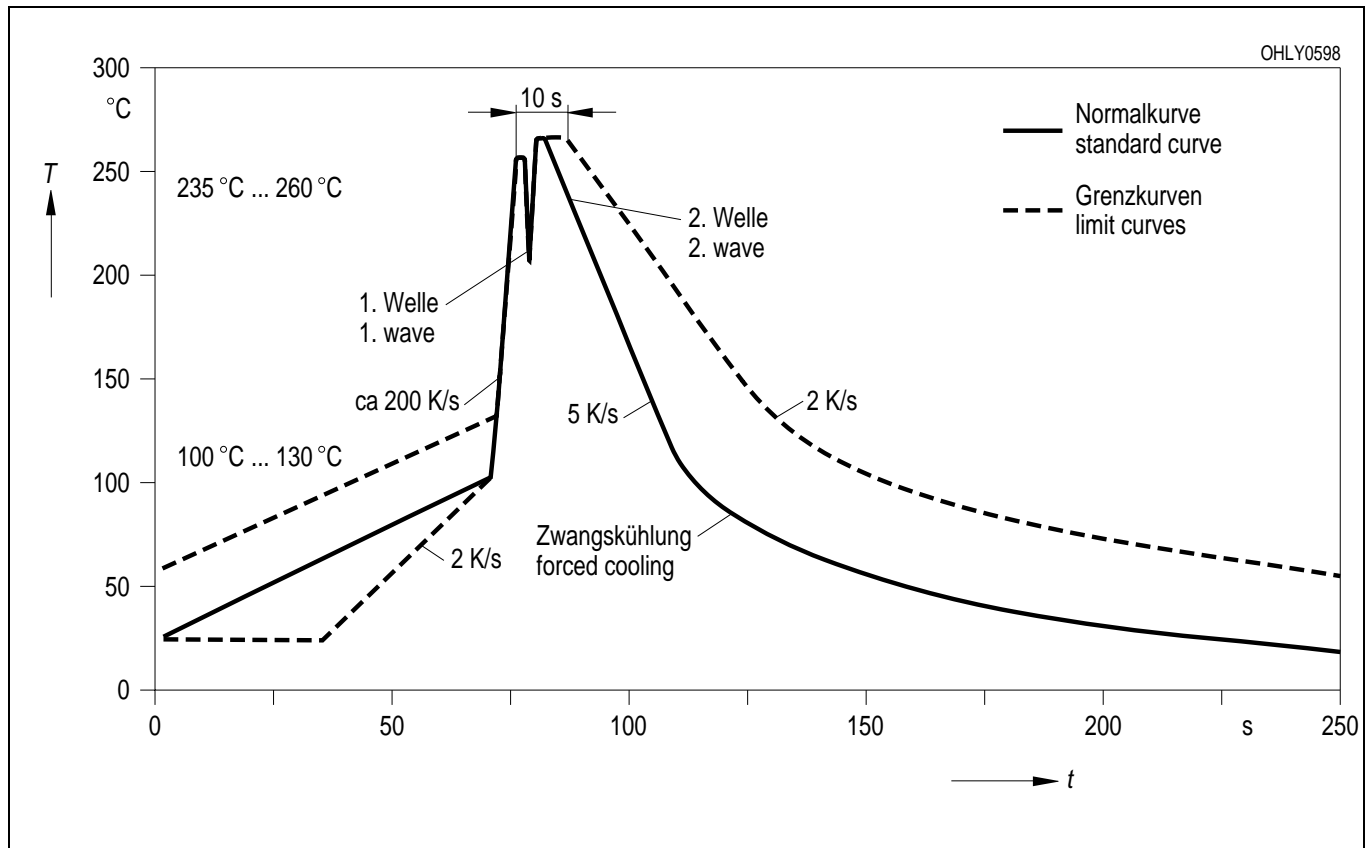
Kathodenkennung: abgeschrägte Ecke
Cathode mark: bevelled edge
Gewicht / Approx. weight: 35 mg

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

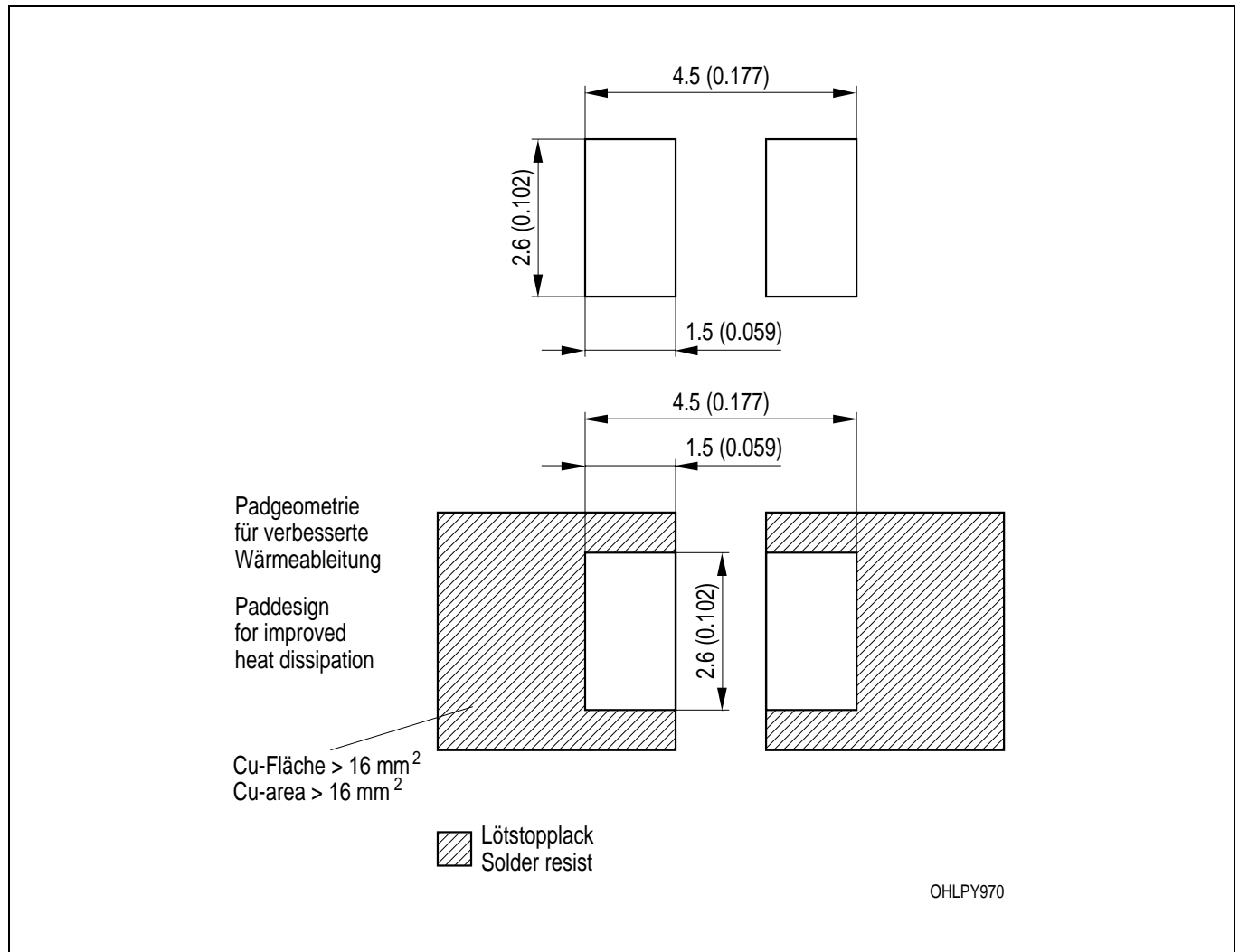
IR-Reflow Lötprofil (nach IPC 9501)
IR Reflow Soldering Profile (acc. to IPC 9501)



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



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



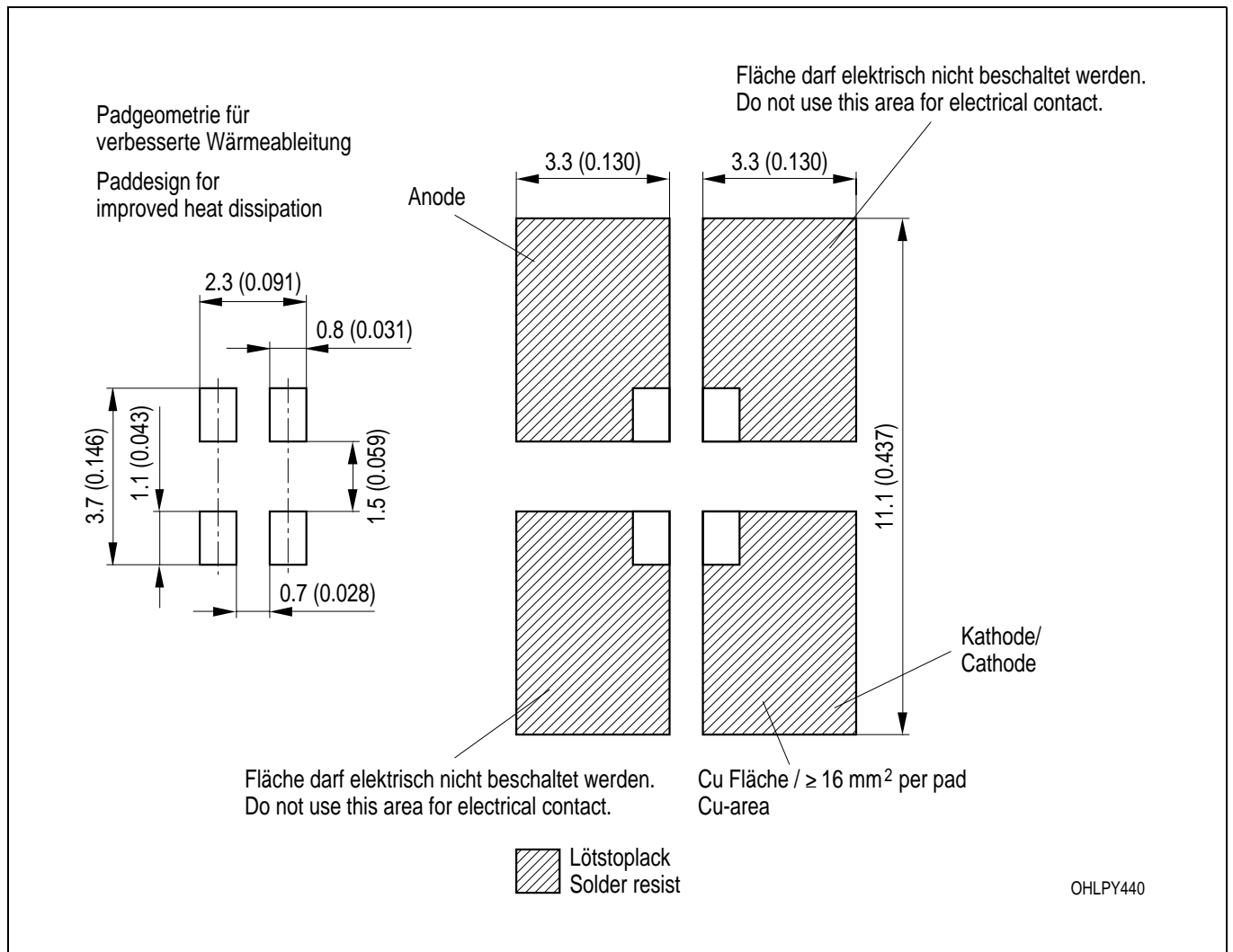
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).
 Gehäuse hält TTW-Löthitze aus / Package able to withstand TTW-soldering heat

Empfohlenes Lötpaddesign verwendbar für TOPLED® und Power TOPLED®

IR Reflow Löten

Recommended Solder Pad useable for TOPLED® and Power TOPLED®

IR Reflow Soldering



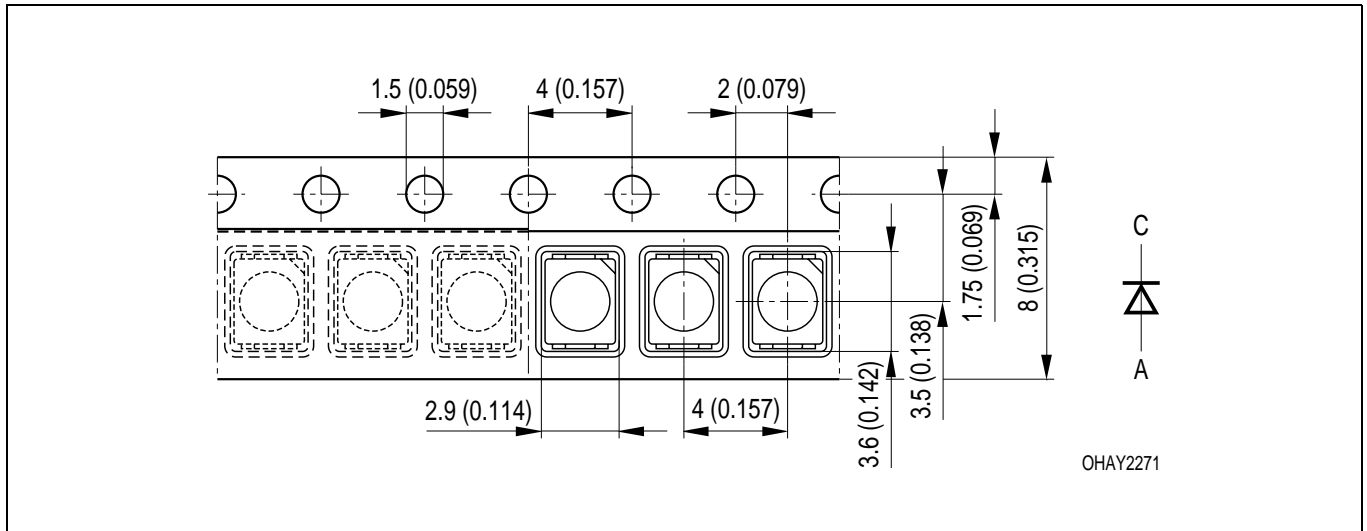
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

Gurtung / Polarität und Lage

Verpackungseinheit 2000/Rolle, \varnothing 180 mm
 oder 8000/Rolle, \varnothing 330 mm

Method of Taping / Polarity and Orientation

Packing unit 2000/reel, \varnothing 180 mm
 or 8000/reel, \varnothing 330 mm



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

| Revision History: 2003-06-02 | | Date of change |
|------------------------------|---|----------------|
| Previous Version: 2003-03-20 | | |
| Page | Subjects (major changes since last revision) | |
| 7 | relative spectral emission I_{rel} | |
| 4 | value (forward voltage) | |
| 3 | power consumption from 90 mW to 85 mW | |
| 8 | diagram forward current from OHL01462 to OHL11462 | |
| 8 | diagram maximal permissible forward current from OHL01573/01574 to OHL11573/11574 | |
| 9 | diagram relative luminous intensity from OHL02870 to OHL01637 | |
| 9 | diagram permissible pulse handling capability 01580/01579 to 11405/11406 | |
| 3 | surge current from 0.2 to 0.3 A | |
| 5 | color coordinate grouping | |
| 2 | color coordinate grouping / luminous intensity grouping | |
| 2 | value R_{th} from 470 to 450 K/W | |
| 10 | change of weight from 40 mg to 35 mg | 2002-07-05 |
| 15 | annotations | 2002-07-25 |
| 14 | recomm. solder pad for TOPLED® and Power TOPLED® (OHLPY440) | 2002-08-05 |
| 3 | reverse voltage (footnote) | 2002-08-21 |
| 2, 5 | new luminous intensity groups and new ordering codes | 2002-10-25 |
| 16 | new patent no. | 2003-03-04 |
| 4 | value: temperature coefficient of V_F | 2003-03-20 |
| 8 | new diagram permissible forward current | 2003-06-02 |

Patent List

Patent No.

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

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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.

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