

# Power TOPLED Hyper-Bright LED

## LO E67B



### Vorläufige Daten / Preliminary Data

#### Besondere Merkmale

- **Gehäusotyp:** weißes P-LCC-4 Gehäuse
- **Besonderheit des Bauteils:** mehr Licht durch erhöhten optischen Wirkungsgrad; höhere Umgebungstemperatur bei gleichem Strom im Vergleich zur TOPLED möglich
- **Wellenlänge:** 606 nm (orange)
- **Abstrahlwinkel:** Lambertscher Strahler (120°)
- **Technologie:** InGaAlP
- **optischer Wirkungsgrad:** 24 lm/W
- **Gruppierungsparameter:** Lichtstärke, Wellenlänge
- **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, ø180 mm oder 8000/Rolle, ø330 mm
- **ESD-Festigkeit:** ESD-sicher bis 2 kV nach EOS/ESD-5.1-1993

#### Anwendungen

- Ampelanwendung
- Hinterleuchtung (LCD, Schalter, Tasten, Displays, Werbebeleuchtung)
- Innenbeleuchtung im Automobilbereich (z.B. Instrumentenbeleuchtung)
- Ersatz von Kleinst-Glühlampen
- Markierungsbeleuchtung (z.B. Stufen, Fluchtwege, u.ä.)
- Signal- und Symbolleuchten

#### Features

- **package:** white P-LCC-4 package
- **feature of the device:** more light due to higher optical efficiency; higher ambient temperature at the same current possible compared to TOPLED
- **wavelength:** 606 nm (orange)
- **viewing angle:** Lambertian Emitter (120°)
- **technology:** InGaAlP
- **optical efficiency:** 24 lm/W
- **grouping parameter:** luminous intensity, wavelength
- **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, ø180 mm or 8000/reel, ø330 mm
- **ESD-withstand voltage:** up to 2 kV acc. to EOS/ESD-5.1-1993

#### Applications

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

| Typ            | Emissions-<br>farbe  | Farbe der<br>Lichtaustritts-<br>fläche | Lichtstärke                                                           | Lichtstrom                                                          | Bestellnummer |
|----------------|----------------------|----------------------------------------|-----------------------------------------------------------------------|---------------------------------------------------------------------|---------------|
| Type           | Color of<br>Emission | Color of the<br>Light Emitting<br>Area | Luminous<br>Intensity<br>$I_F = 50 \text{ mA}$<br>$I_V \text{ (mcd)}$ | Luminous<br>Flux<br>$I_F = 50 \text{ mA}$<br>$\Phi_V \text{ (mlm)}$ | Ordering Code |
| LO E67B-U2AA-1 | orange               | colorless clear                        | 560 ...1400                                                           | 2900 (typ.)                                                         | Q62703-Q6010  |

Anm.: -1 gesamter Farbbereich, Lieferung in Einzelgruppen (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.  
Dimmverhältnis im Gleichstrom-Betrieb max. 5:1*

Note: -1 Total color tolerance range, delivery in single groups (please 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.  
Dimming range for direct current mode max. 5:1*

**Grenzwerte**  
**Maximum Ratings**

| Bezeichnung<br>Parameter                                                                                                                                                                                                                                             | Symbol<br>Symbol               | Wert<br>Value  | Einheit<br>Unit |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|----------------|-----------------|
| Betriebstemperatur<br>Operating temperature range                                                                                                                                                                                                                    | $T_{op}$                       | – 40 ... + 100 | °C              |
| Lagertemperatur<br>Storage temperature range                                                                                                                                                                                                                         | $T_{stg}$                      | – 40 ... + 100 | °C              |
| Sperrschichttemperatur<br>Junction temperature                                                                                                                                                                                                                       | $T_j$                          | + 125          | °C              |
| Durchlassstrom<br>Forward current                                                                                                                                                                                                                                    | $I_F$                          | 70             | mA              |
| Stoßstrom<br>Surge current<br>$t \leq 10 \mu s, D = 0.1$                                                                                                                                                                                                             | $I_{FM}$                       | 0.1            | A               |
| Sperrspannung<br>Reverse voltage                                                                                                                                                                                                                                     | $V_R$                          | 5              | V               |
| Leistungsaufnahme<br>Power consumption<br>$T_A \leq 25 \text{ °C}$                                                                                                                                                                                                   | $P_{tot}$                      | 180            | mW              |
| Wärmewiderstand<br>Thermal resistance<br>Sperrschicht/Umgebung<br>Junction/ambient<br>Sperrschicht/Lötpad<br>Junction/soldering point<br>Montage auf PC-Board FR 4 (Padgröße $\geq 16 \text{ mm}^2$ )<br>mounted on PC board FR 4 (pad size $\geq 16 \text{ mm}^2$ ) | $R_{th JA}$<br><br>$R_{th JS}$ | 300<br><br>130 | K/W<br><br>K/W  |

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

| Bezeichnung<br>Parameter                                                                                                                                                                | Symbol<br>Symbol             | Wert<br>Value     | Einheit<br>Unit                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------------------|--------------------------------|
| Wellenlänge des emittierten Lichtes (typ.)<br>Wavelength at peak emission<br>$I_F = 50\text{ mA}$                                                                                       | $\lambda_{\text{peak}}$      | 610               | nm                             |
| Dominantwellenlänge <sup>1)</sup> (typ.)<br>Dominant wavelength<br>$I_F = 50\text{ mA}$                                                                                                 | $\lambda_{\text{dom}}$       | 606<br>$\pm 6$    | nm                             |
| Spektrale Bandbreite bei 50 % $I_{\text{rel max}}$ (typ.)<br>Spectral bandwidth at 50 % $I_{\text{rel max}}$<br>$I_F = 50\text{ mA}$                                                    | $\Delta\lambda$              | 16                | nm                             |
| Abstrahlwinkel bei 50 % $I_V$ (Vollwinkel) (typ.)<br>Viewing angle at 50 % $I_V$                                                                                                        | $2\phi$                      | 120               | Grad<br>deg.                   |
| Durchlassspannung <sup>2)</sup> (min.)<br>Forward voltage (typ.)<br>$I_F = 50\text{ mA}$ (max.)                                                                                         | $V_F$<br>$V_F$<br>$V_F$      | 1.9<br>2.2<br>2.5 | V<br>V<br>V                    |
| Sperrstrom (typ.)<br>Reverse current (max.)<br>$V_R = 5\text{ V}$                                                                                                                       | $I_R$<br>$I_R$               | 0.01<br>10        | $\mu\text{A}$<br>$\mu\text{A}$ |
| Temperaturkoeffizient von $\lambda_{\text{peak}}$ (typ.)<br>Temperature coefficient of $\lambda_{\text{peak}}$<br>$I_F = 50\text{ mA}; -10^\circ\text{C} \leq T \leq 100^\circ\text{C}$ | $TC_{\lambda_{\text{peak}}}$ | 0.14              | nm/K                           |
| Temperaturkoeffizient von $\lambda_{\text{dom}}$ (typ.)<br>Temperature coefficient of $\lambda_{\text{dom}}$<br>$I_F = 50\text{ mA}; -10^\circ\text{C} \leq T \leq 100^\circ\text{C}$   | $TC_{\lambda_{\text{dom}}}$  | 0.08              | nm/K                           |
| Temperaturkoeffizient von $V_F$ (typ.)<br>Temperature coefficient of $V_F$<br>$I_F = 50\text{ mA}; -10^\circ\text{C} \leq T \leq 100^\circ\text{C}$                                     | $TC_V$                       | - 1.8             | mV/K                           |
| Optischer Wirkungsgrad (typ.)<br>Optical efficiency<br>$I_F = 50\text{ mA}$                                                                                                             | $\eta_{\text{opt}}$          | 24                | lm/W                           |

<sup>1)</sup> Wellenlängengruppen werden mit einer Stromeinprägungsdauer von 25 ms und einer Genauigkeit von  $\pm 1\text{ nm}$  ermittelt.  
Wavelength groups are tested at a current pulse duration of 25 ms and a tolerance of  $\pm 1\text{ nm}$ .

<sup>2)</sup> 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) Wellenlängengruppen / Wavelength groups

| Gruppe<br>Group | Wellenlänge<br>Wavelength |      | Einheit<br>Unit |
|-----------------|---------------------------|------|-----------------|
|                 | min.                      | max. |                 |
| 2               | 600                       | 603  | nm              |
| 3               | 603                       | 606  | nm              |
| 4               | 606                       | 609  | nm              |
| 5               | 609                       | 612  | nm              |

**Helligkeits-Gruppierungsschema**  
**Luminous Intensity Groups**

| Lichtgruppe<br>Luminous Intensity Group | Lichtstärke<br>Luminous Intensity<br>$I_V$ (mcd) | Lichtstrom<br>Luminous Flux<br>$\Phi_V$ (lm) |
|-----------------------------------------|--------------------------------------------------|----------------------------------------------|
| U2                                      | 560 ... 710                                      | 1900 (typ.)                                  |
| V1                                      | 710 ... 900                                      | 2400 (typ.)                                  |
| V2                                      | 900 ... 1120                                     | 3000 (typ.)                                  |
| AA                                      | 1120 ... 1400                                    | 3700 (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: U2-2  
 Example: U2-2

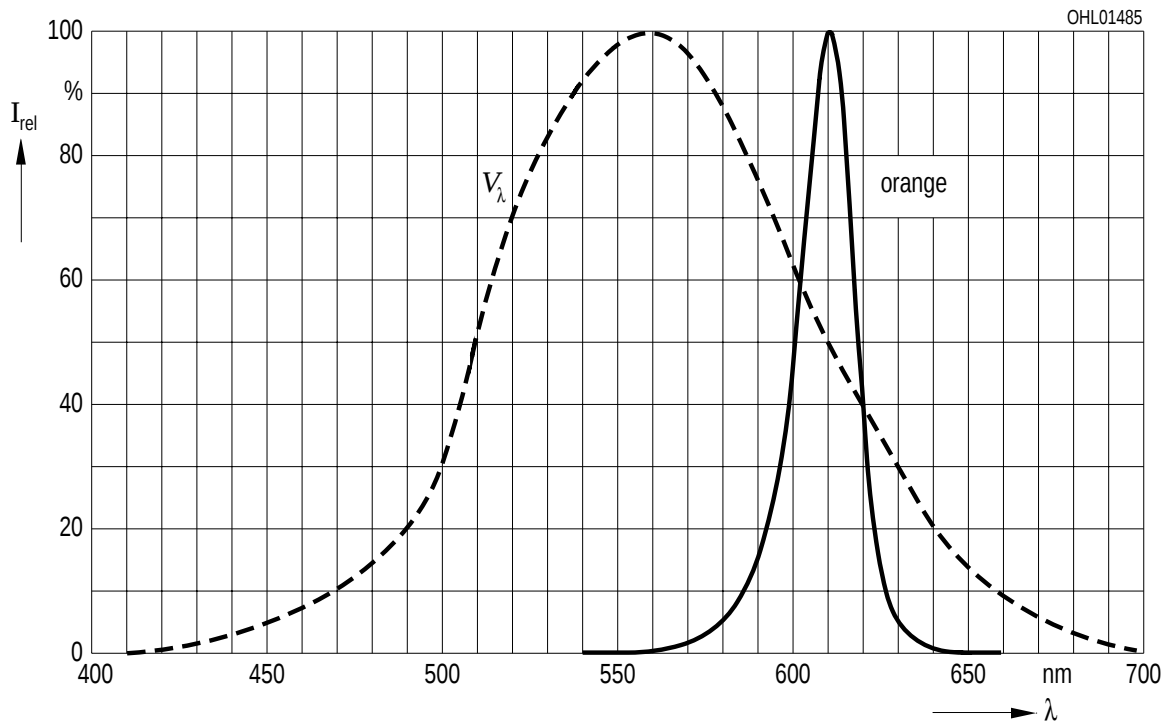
| Lichtgruppe<br>Luminous Intensity Group | Halbgruppe<br>Half Group | Wellenlänge<br>Wavelength |
|-----------------------------------------|--------------------------|---------------------------|
| U                                       | 2                        | 2                         |

**Relative spektrale Emission**  $I_{\text{rel}} = f(\lambda)$ ,  $T_A = 25\text{ °C}$ ,  $I_F = 50\text{ mA}$

**Relative Spectral Emission**

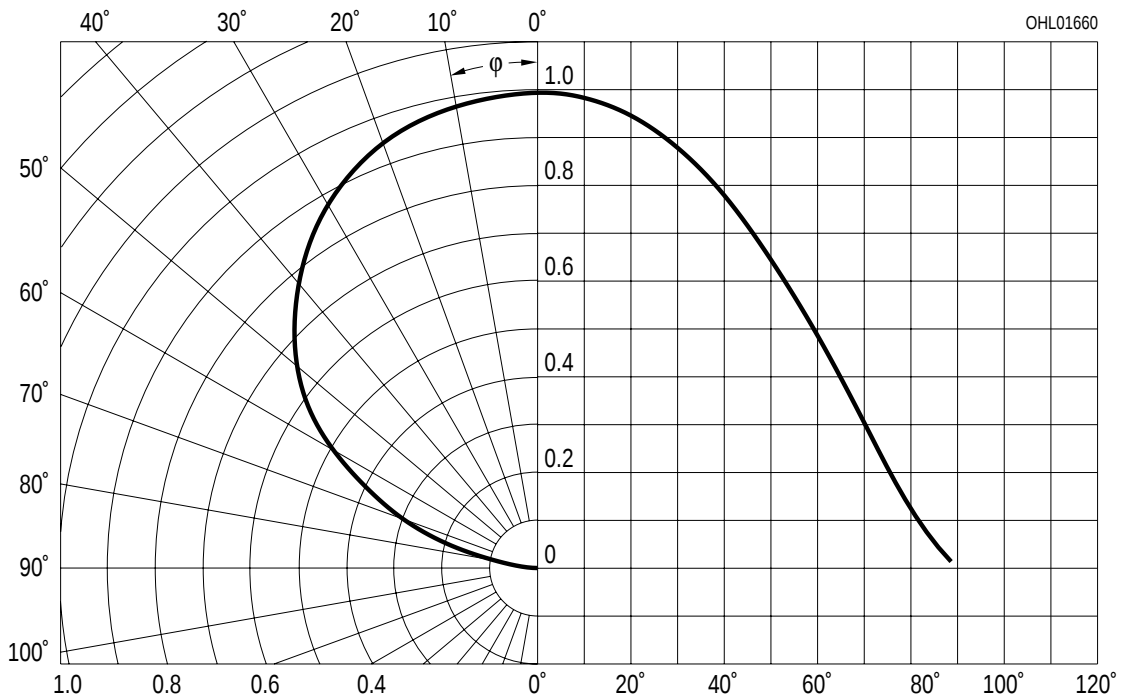
$V(\lambda)$  = spektrale Augenempfindlichkeit

Standard eye response curve



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

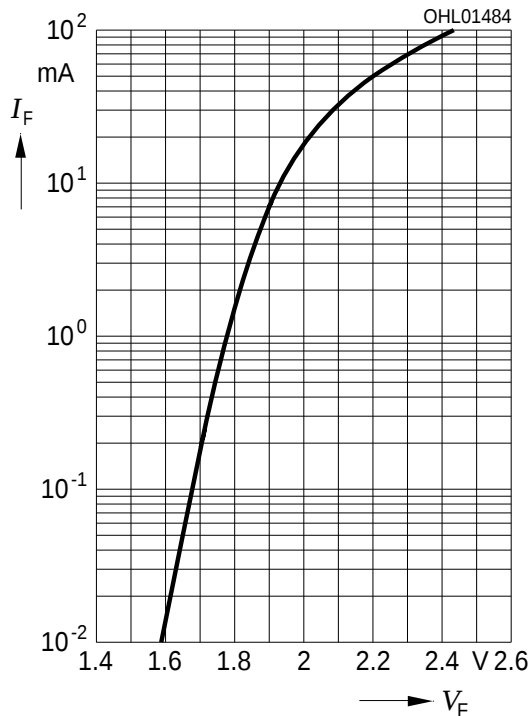
**Radiation Characteristic**



Durchlassstrom  $I_F = f(V_F)$

Forward Current

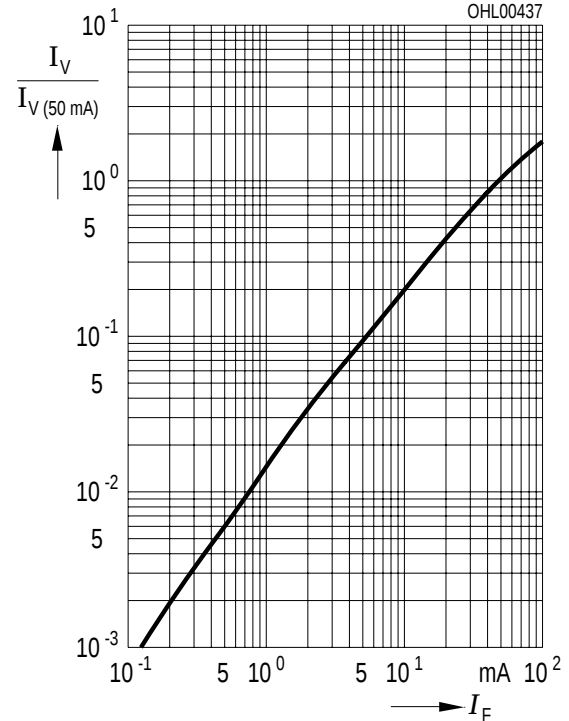
$T_A = 25\text{ °C}$



Relative Lichtstärke  $I_V/I_{V(50\text{ mA})} = f(I_F)$

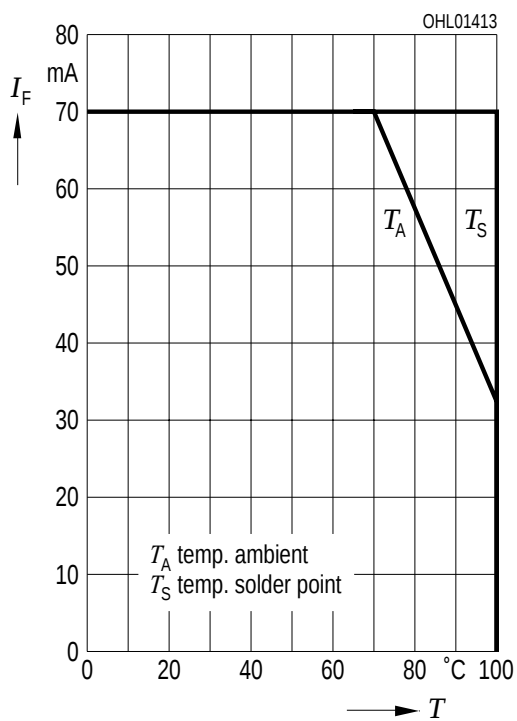
Relative Luminous Intensity

$T_A = 25\text{ °C}$



Maximal zulässiger Durchlassstrom  $I_F = f(T)$

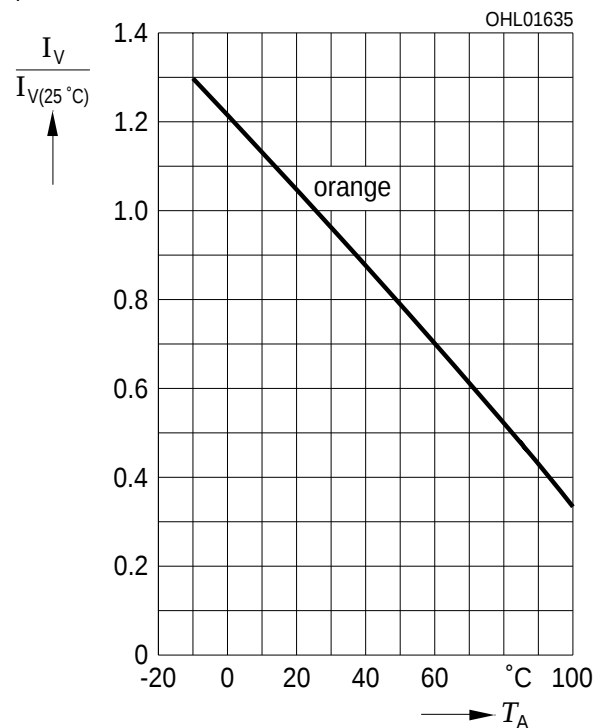
Max. Permissible Forward Current



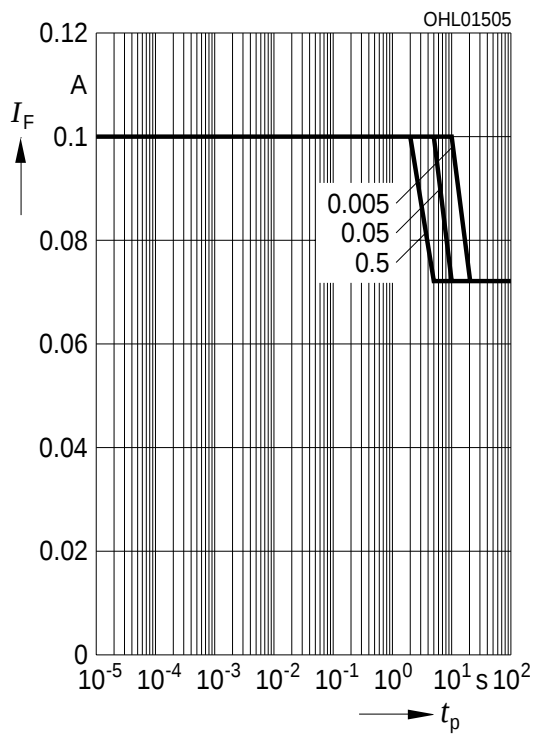
Relative Lichtstärke  $I_V/I_{V(25\text{ °C})} = f(T_A)$

Relative Luminous Intensity

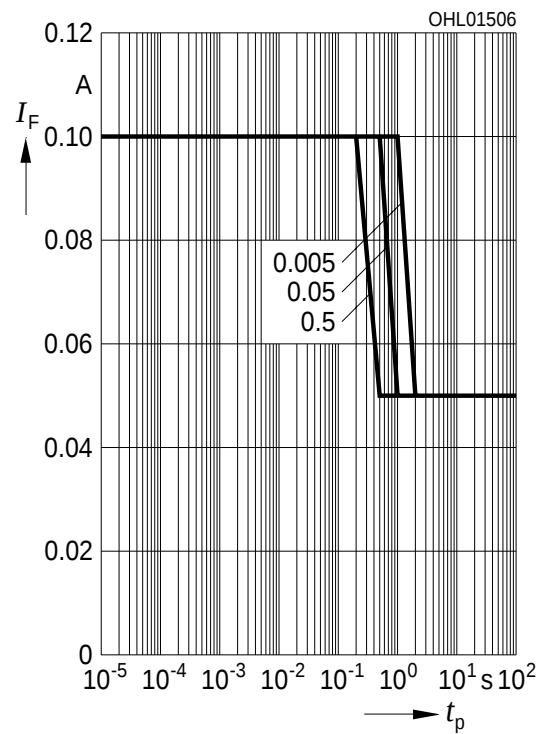
$I_F = 50\text{ mA}$



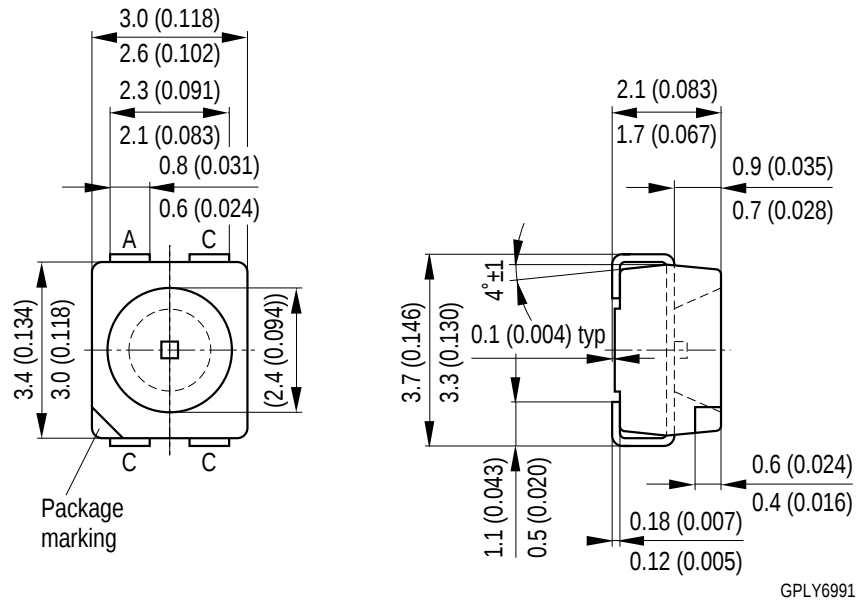
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D$  = parameter,  $T_A = 25\text{ °C}$



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



# Maßzeichnung Package Outlines

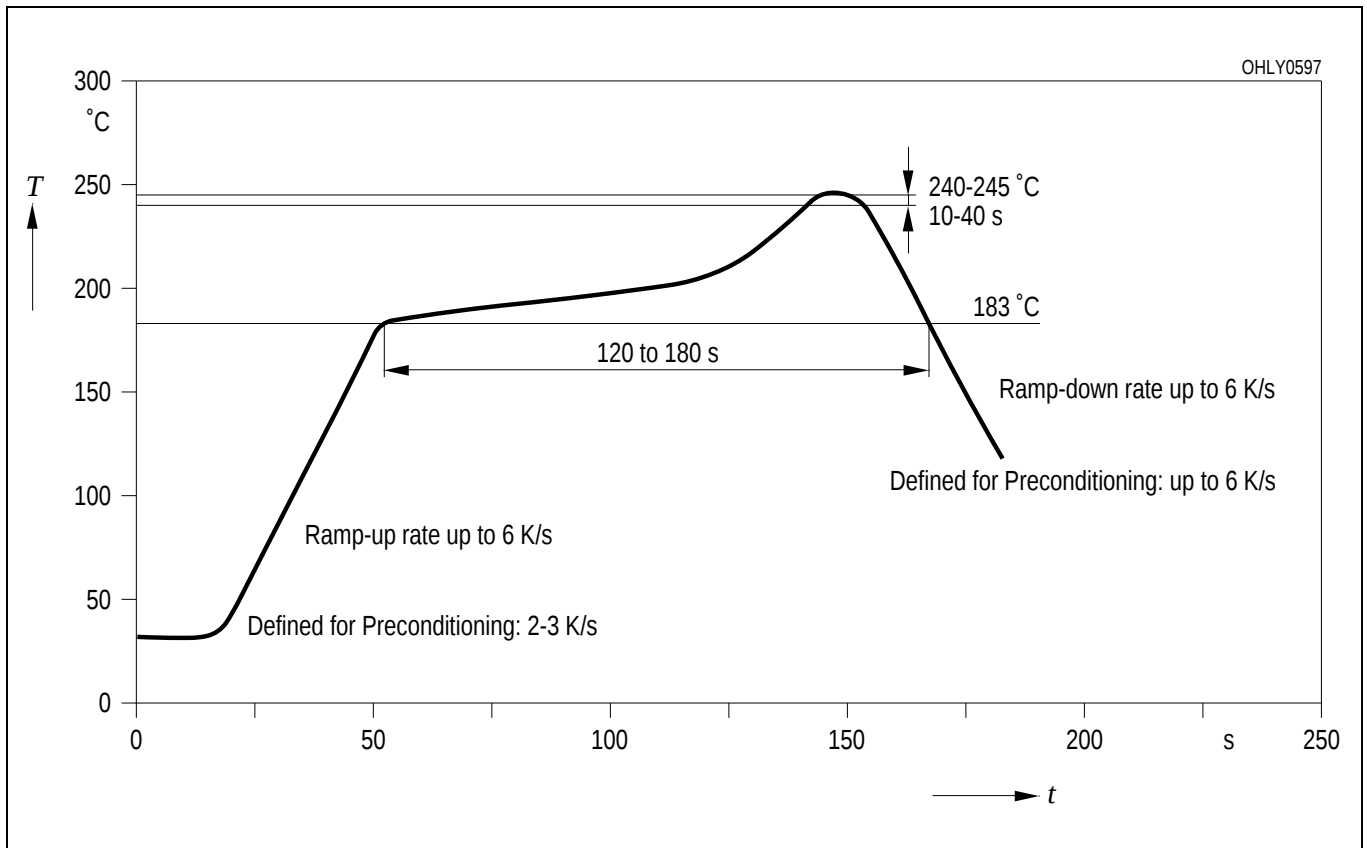


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

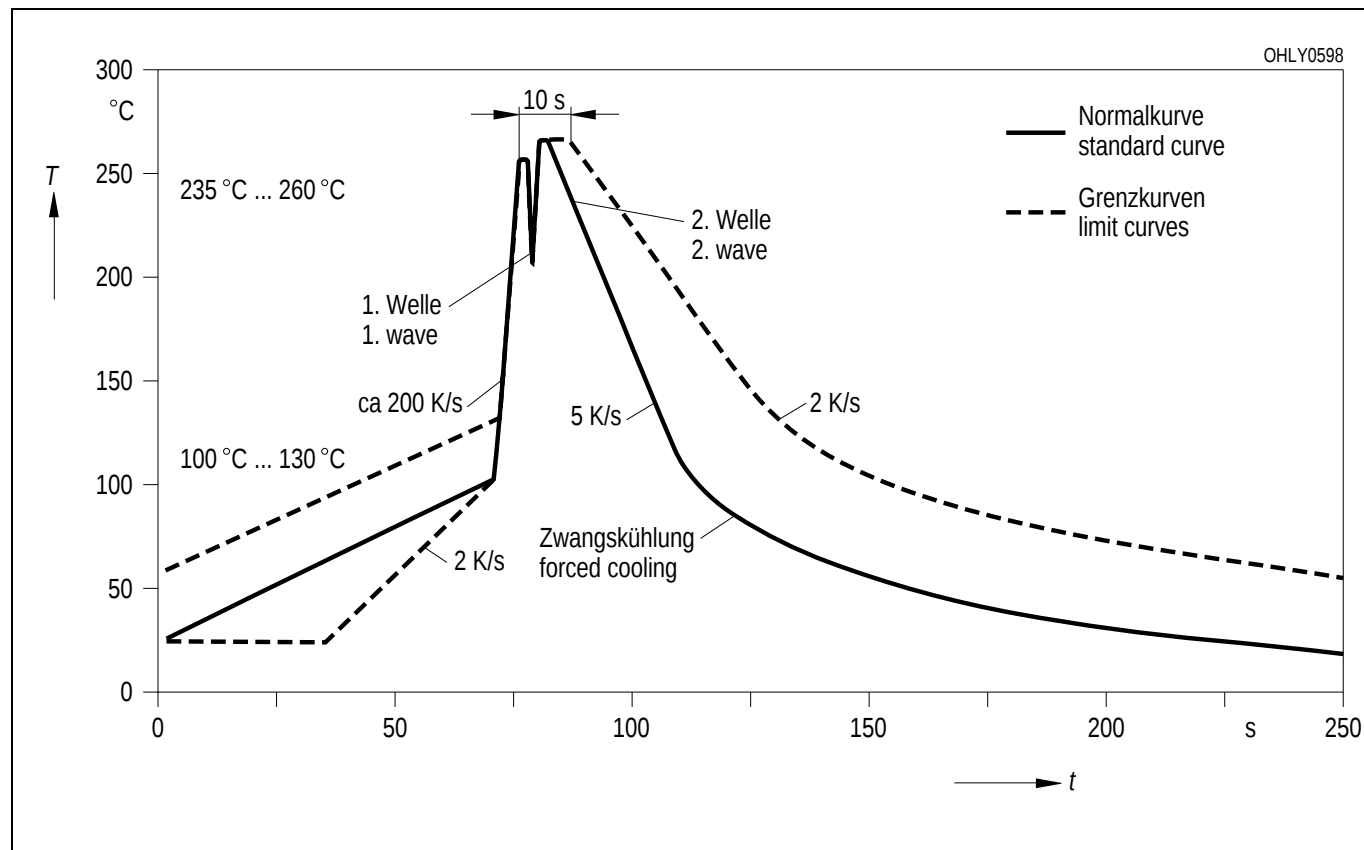
**Gewicht / Approx. weight:** 31 mg

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

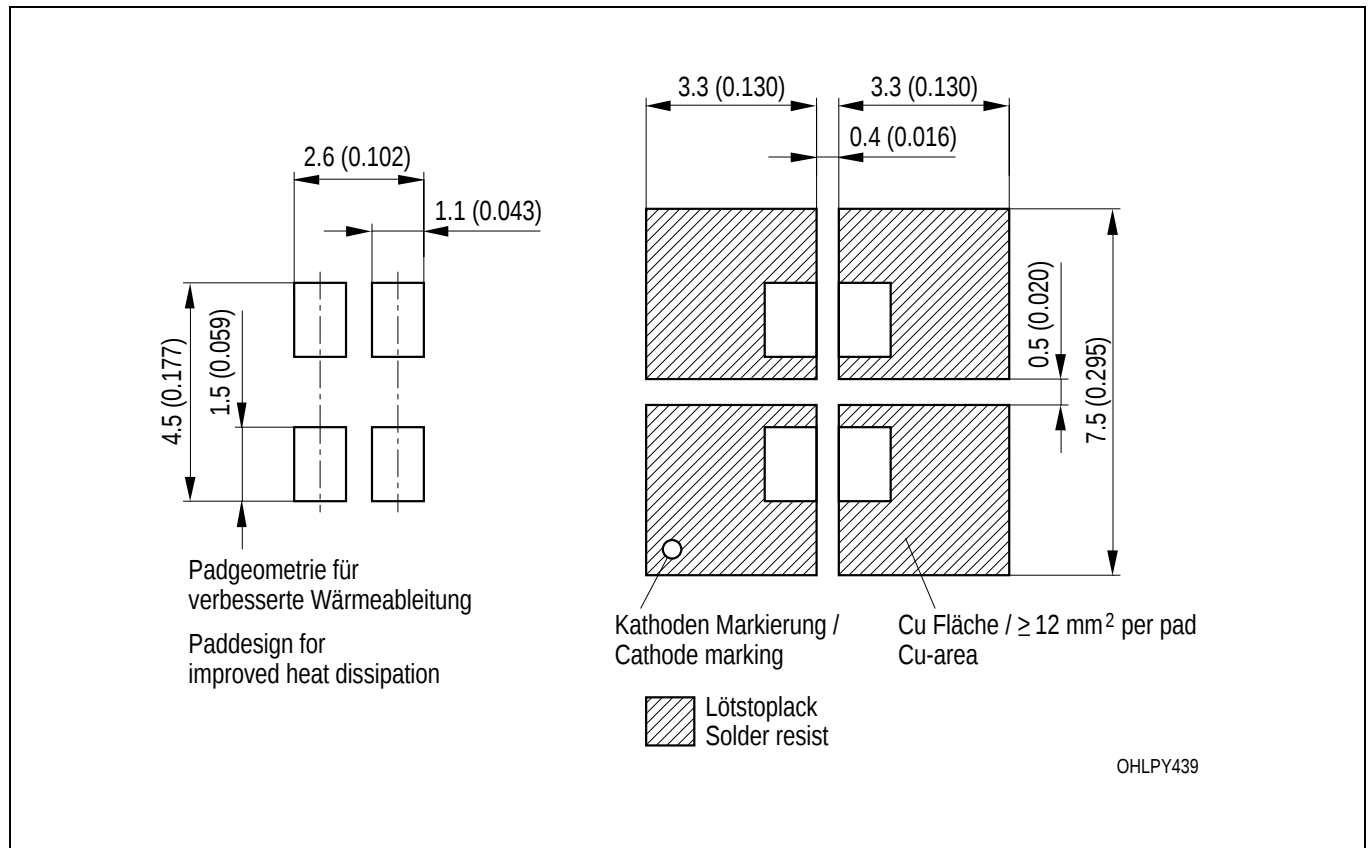
**IR-Reflow Lötprofil** (nach IPC 9501)  
**IR Reflow Soldering Profile** (acc. to IPC 9501)



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

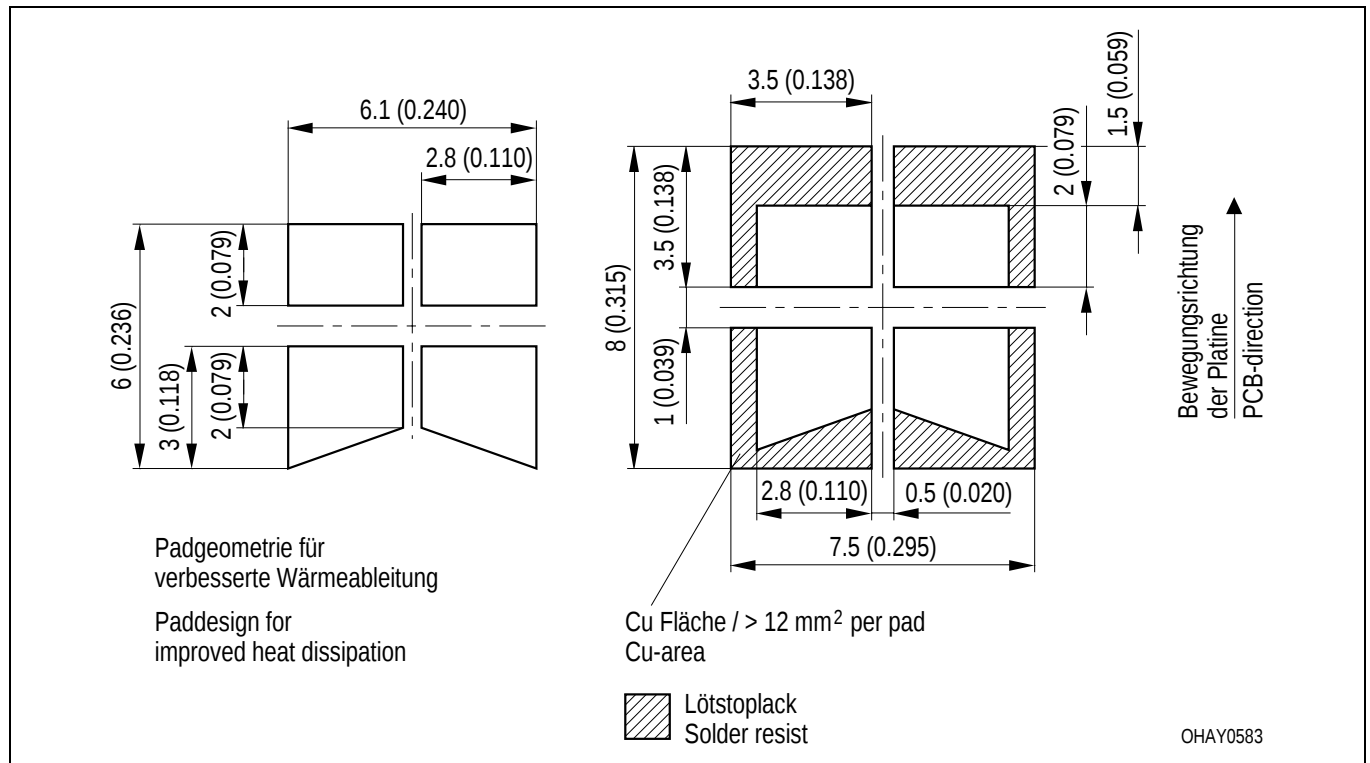


**Empfohlenes Lötpad design** IR Reflow Löten  
**Recommended Solder Pad** IR Reflow Soldering



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

**Empfohlenes Lötpaddesign** Wellenlöten (TTW)  
**Recommended Solder Pad** TTW Soldering



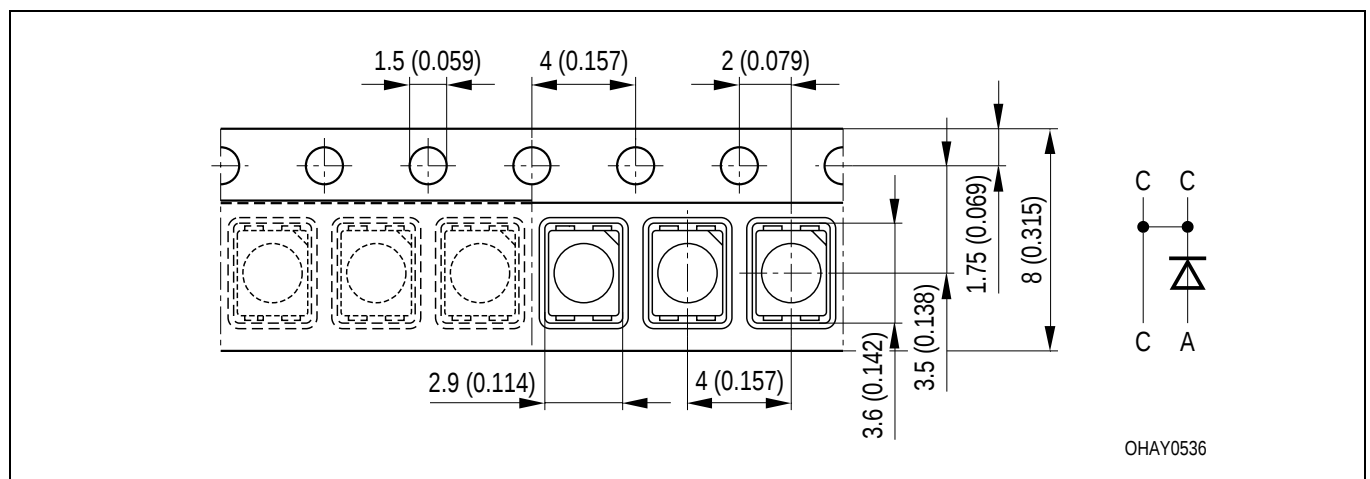
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

**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).

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**Revision History: 2001-12-17**

Previous Version: 2001-03-07

| Page | Subjects (major changes since last revision) |
|------|----------------------------------------------|
| 2    | Dimming range inserted                       |
| 4    | value (forward voltage, min.)                |
| 4    | value (optical efficiency)                   |

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