

# Hyper TOPLED Hyper-Bright LED

LB T673, LV T673, LT T673



## Besondere Merkmale

- **Gehäusotyp:** weißes P-LCC-2 Gehäuse
- **Besonderheit des Bauteils:** extrem breite Abstrahlcharakteristik; ideal für Hinterleuchtungen und Einkopplungen in Lichtleiter
- **Wellenlänge:** 470 nm (blau), 505 nm (verde), 528 nm (true green)
- **Abstrahlwinkel:** Lambertscher Strahler (120°)
- **Technologie:** InGaN
- **optischer Wirkungsgrad:** 2 lm/W (blau), 6 lm/W (verde), 8 lm/W (true green)
- **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
- Informationsanzeigen im Außenbereich
- optischer Indikator
- Hinterleuchtung (LCD, Schalter, Tasten, Displays, Werbebeleuchtung, Allgemeinbeleuchtung)
- Innenbeleuchtung im Automobilbereich (z.B. Instrumentenbeleuchtung, u. ä.)
- Markierungsbeleuchtung (z.B. Stufen, Fluchtwege, u.ä.)
- Signal- und Symbolleuchten
- Scanner

## Features

- **package:** white P-LCC-2 package
- **feature of the device:** extremely wide viewing angle; ideal for backlighting and coupling in light guides
- **wavelength:** 470 nm (blue), 505 nm (verde), 528 nm (true green)
- **viewing angle:** Lambertian Emitter (120°)
- **technology:** InGaN
- **optical efficiency:** 2 lm/W (blue), 6 lm/W (verde), 8 lm/W (true green)
- **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
- outdoor displays
- optical indicators
- backlighting (LCD, switches, keys, displays, illuminated advertising, general lighting)
- interior automotive lighting (e.g. dashboard backlighting, etc.)
- marker lights (e.g. steps, exit ways, etc.)
- signal and symbol luminaire
- scanners

| 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>$I_F = 20 \text{ mA}$<br>$I_V \text{ (mcd)}$ | Luminous<br>Flux<br>$I_F = 20 \text{ mA}$<br>$\Phi_V \text{ (mlm)}$ | Ordering Code |
| LB T673-M2N2-1 | blue                 | colorless clear                        | 22.4 ... 45.0                                                         | 100 (typ.)                                                          | Q62703-Q4838  |
| LB T673-N2Q1-1 |                      |                                        | 35.5 ... 90.0                                                         | 180 (typ.)                                                          | Q62703-Q4887  |
| LV T673-Q1R1-1 | verde                | colorless clear                        | 71.0 ... 140.0                                                        | 310 (typ.)                                                          | Q62703-Q4845  |
| LV T673-R1S2-1 |                      |                                        | 112.0 ... 280.0                                                       | 560 (typ.)                                                          | Q62703-Q4891  |
| LT T673-Q2R2-1 | true green           | colorless clear                        | 90.0 ... 180.0                                                        | 390 (typ.)                                                          | Q62703-Q4851  |
| LT T673-R2T1-1 |                      |                                        | 140.0 ... 355.0                                                       | 700 (typ.)                                                          | Q62703-Q4895  |

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.

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.

**Grenzwerte**  
**Maximum Ratings**

| Bezeichnung<br>Parameter                                                                                                                                                                                                                                          | Symbol<br>Symbol               | Werte<br>Values |        | Einheit<br>Unit |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-----------------|--------|-----------------|
|                                                                                                                                                                                                                                                                   |                                | LB              | LV, LT |                 |
| Betriebstemperatur<br>Operating temperature range                                                                                                                                                                                                                 | $T_{op}$                       | – 40 ... + 100  |        | °C              |
| Lagertemperatur<br>Storage temperature range                                                                                                                                                                                                                      | $T_{stg}$                      | – 40 ... + 100  |        | °C              |
| Sperrschichttemperatur<br>Junction temperature                                                                                                                                                                                                                    | $T_j$                          | + 110           | + 125  | °C              |
| Durchlassstrom<br>Forward current                                                                                                                                                                                                                                 | $I_F$                          | 20              |        | mA              |
| Stoßstrom<br>Surge current<br>$t \leq 10 \mu s, D = 0.005$                                                                                                                                                                                                        | $I_{FM}$                       | 200             | 250    | mA              |
| Sperrspannung<br>Reverse voltage                                                                                                                                                                                                                                  | $V_R$                          | 5               |        | V               |
| Leistungsaufnahme<br>Power consumption<br>$T_A \leq 25 \text{ °C}$                                                                                                                                                                                                | $P_{tot}$                      | 85              |        | mW              |
| Wärmewiderstand<br>Thermal resistance<br>Sperrschicht/Umgebung<br>Junction/ambient<br>Sperrschicht/Lötpad<br>Junction/solder 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>$R_{th JS}$ | 400<br><br>180  |        | K/W<br><br>K/W  |

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

| Bezeichnung<br>Parameter                                                                                                                                                                | Symbol<br>Symbol             | Werte<br>Values |                |                | Einheit<br>Unit                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----------------|----------------|----------------|--------------------------------|
|                                                                                                                                                                                         |                              | LB              | LV             | LT             |                                |
| Wellenlänge des emittierten Lichtes (typ.)<br>Wavelength at peak emission<br>$I_F = 20\text{ mA}$                                                                                       | $\lambda_{\text{peak}}$      | 465             | 503            | 523            | nm                             |
| Dominantwellenlänge <sup>1)</sup> (typ.)<br>Dominant wavelength<br>$I_F = 20\text{ mA}$                                                                                                 | $\lambda_{\text{dom}}$       | 470<br>$\pm 6$  | 505<br>$\pm 7$ | 528<br>$\pm 9$ | nm                             |
| Spektrale Bandbreite bei 50 % $I_{\text{rel max}}$ (typ.)<br>Spectral bandwidth at 50 % $I_{\text{rel max}}$<br>$I_F = 20\text{ mA}$                                                    | $\Delta\lambda$              | 25              | 30             | 33             | nm                             |
| Abstrahlwinkel bei 50 % $I_V$ (Vollwinkel) (typ.)<br>Viewing angle at 50 % $I_V$                                                                                                        | $2\phi$                      | 120             | 120            | 120            | Grad<br>deg.                   |
| Durchlassspannung <sup>2)</sup> (typ.)<br>Forward voltage<br>$I_F = 20\text{ mA}$                                                                                                       | $V_F$<br>(max.) $V_F$        | 3.5<br>4.1      | 3.3<br>4.1     | 3.3<br>4.1     | V<br>V                         |
| Sperrstrom (typ.)<br>Reverse current<br>$V_R = 5\text{ V}$                                                                                                                              | $I_R$<br>(max.) $I_R$        | 0.01<br>10      | 0.01<br>10     | 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>$I_F = 20\text{ mA}; -10^\circ\text{C} \leq T \leq 100^\circ\text{C}$ | $TC_{\lambda_{\text{peak}}}$ | 0.04            | 0.03           | 0.04           | nm/K                           |
| Temperaturkoeffizient von $\lambda_{\text{dom}}$ (typ.)<br>Temperature coefficient of $\lambda_{\text{dom}}$<br>$I_F = 20\text{ mA}; -10^\circ\text{C} \leq T \leq 100^\circ\text{C}$   | $TC_{\lambda_{\text{dom}}}$  | 0.02            | 0.02           | 0.03           | nm/K                           |
| Temperaturkoeffizient von $V_F$ (typ.)<br>Temperature coefficient of $V_F$<br>$I_F = 20\text{ mA}; -10^\circ\text{C} \leq T \leq 100^\circ\text{C}$                                     | $TC_V$                       | - 2.9           | - 3.2          | - 3.6          | mV/K                           |
| Optischer Wirkungsgrad (typ.)<br>Optical efficiency<br>$I_F = 20\text{ mA}$                                                                                                             | $\eta_{\text{opt}}$          | 2               | 6              | 8              | lm/W                           |

<sup>1)</sup> Wellenlängengruppen werden mit einer Stromeinprägedauer 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> Spannungswerte werden mit einer Stromeinprägedauer von 1 ms und einer Genauigkeit von  $\pm 0.1\text{ V}$  ermittelt.  
Voltages 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 | blue |      | verde |      | true green |      | Einheit<br>Unit |
|-----------------|------|------|-------|------|------------|------|-----------------|
|                 | min. | max. | min.  | max. | min.       | max. |                 |
| 3               | 464  | 468  | 498   | 503  | 519        | 525  | nm              |
| 4               | 468  | 472  | 503   | 507  | 525        | 531  | nm              |
| 5               | 472  | 476  | 507   | 512  | 531        | 537  | 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) |
|-----------------------------------------|--------------------------------------------------|----------------------------------------------|
| M2                                      | 22.4 ... 28.0                                    | 75 (typ.)                                    |
| N1                                      | 28.0 ... 35.5                                    | 95 (typ.)                                    |
| N2                                      | 35.5 ... 45.0                                    | 120 (typ.)                                   |
| P1                                      | 45.0 ... 56.0                                    | 150 (typ.)                                   |
| P2                                      | 56.0 ... 71.0                                    | 190 (typ.)                                   |
| Q1                                      | 71.0 ... 90.0                                    | 240 (typ.)                                   |
| Q2                                      | 90.0 ... 112.0                                   | 300 (typ.)                                   |
| R1                                      | 112.0 ... 140.0                                  | 380 (typ.)                                   |
| R2                                      | 140.0 ... 180.0                                  | 480 (typ.)                                   |
| S1                                      | 180.0 ... 224.0                                  | 600 (typ.)                                   |
| S2                                      | 224.0 ... 280.0                                  | 760 (typ.)                                   |
| T1                                      | 280.0 ... 355.0                                  | 950 (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: S2-3

Example: S2-3

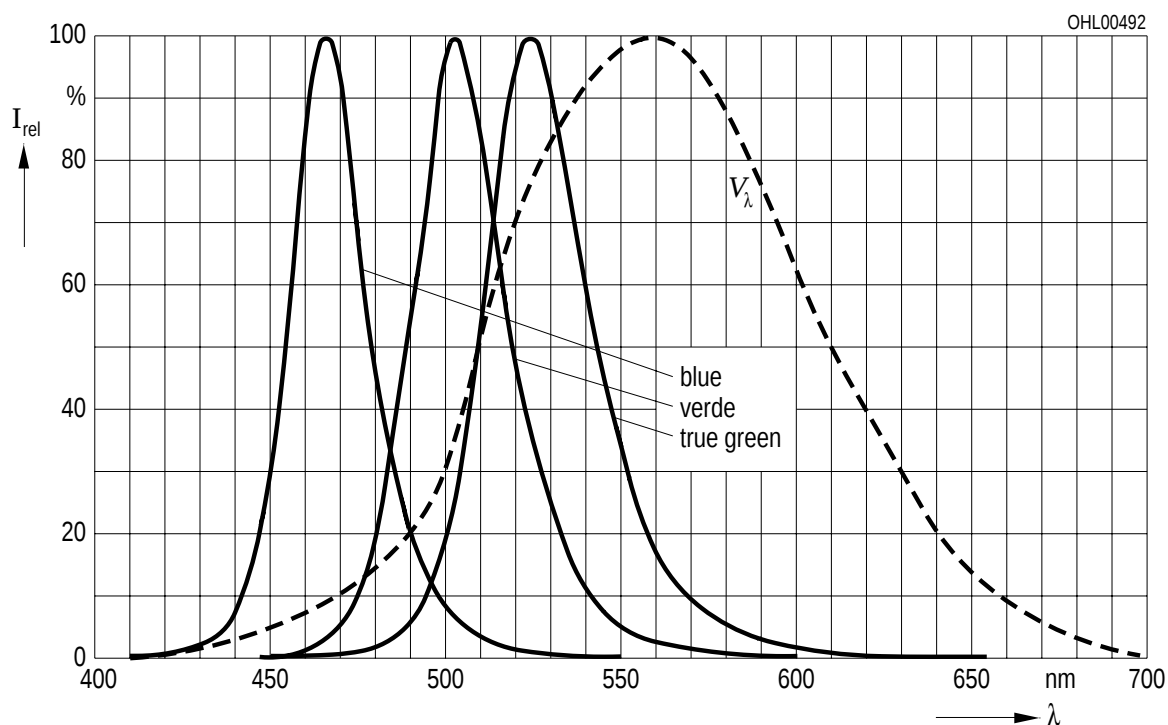
| Lichtgruppe<br>Luminous Intensity Group | Halbgruppe<br>Half Group | Wellenlänge<br>Wavelength |
|-----------------------------------------|--------------------------|---------------------------|
| S                                       | 2                        | 3                         |

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

### Relative Spectral Emission

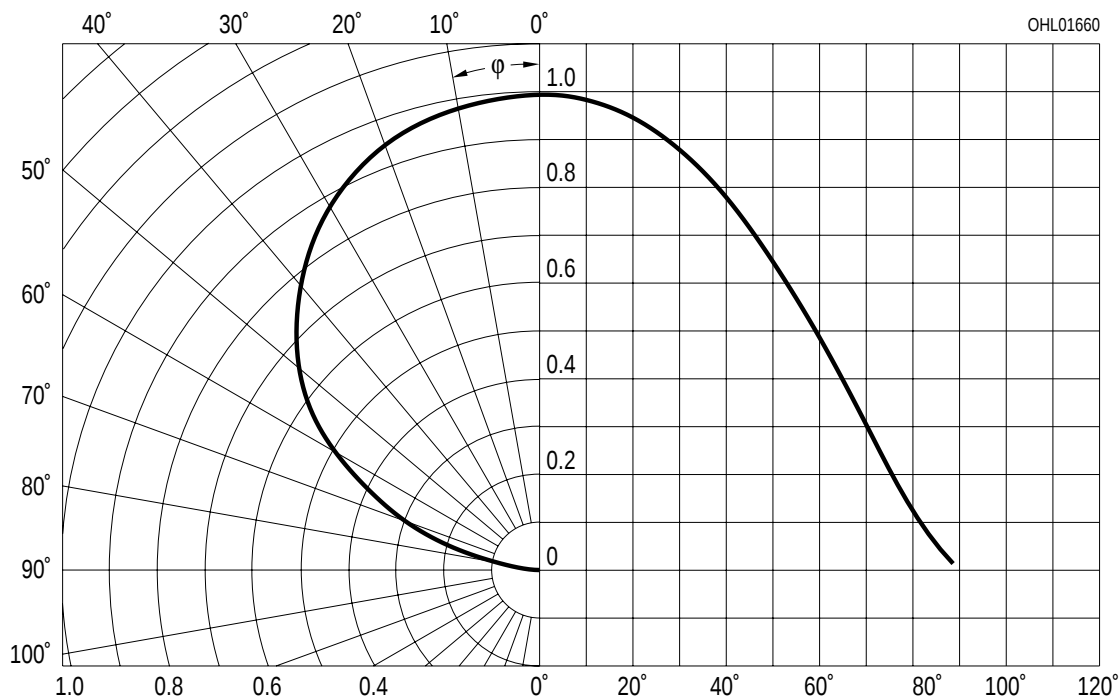
$V(\lambda)$  = spektrale Augenempfindlichkeit

Standard eye response curve



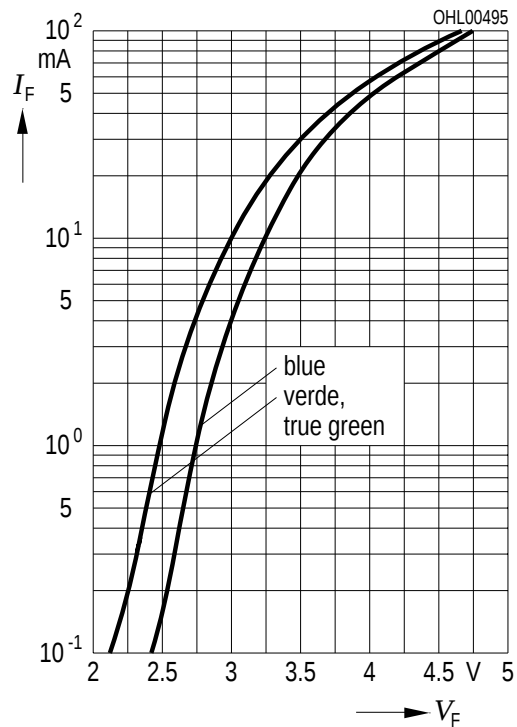
**Abstrahlcharakteristik**  $I_{\text{rel}} = f(\varphi)$

### Radiation Characteristic

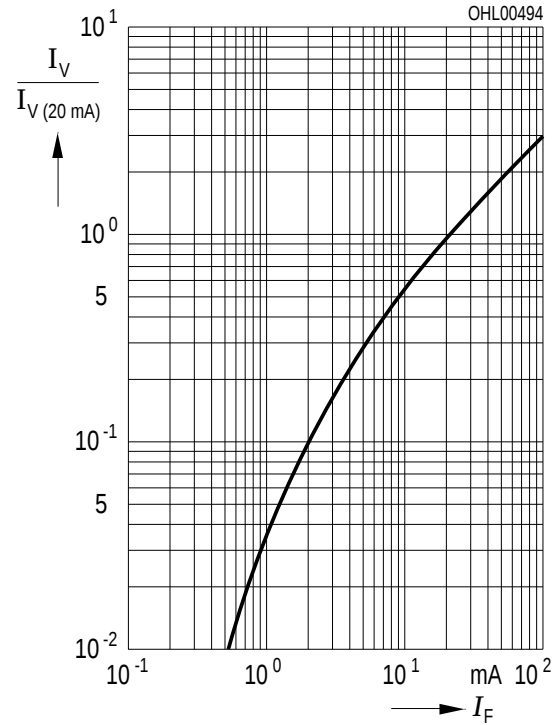


Durchlassstrom  $I_F = f(V_F)$ 

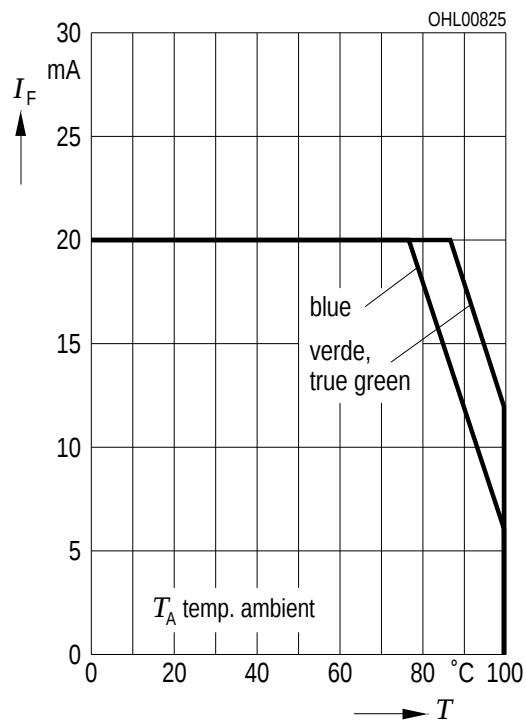
Forward Current

 $T_A = 25\text{ °C}$ Relative Lichtstärke  $I_V/I_{V(20\text{ mA})} = f(I_F)$ 

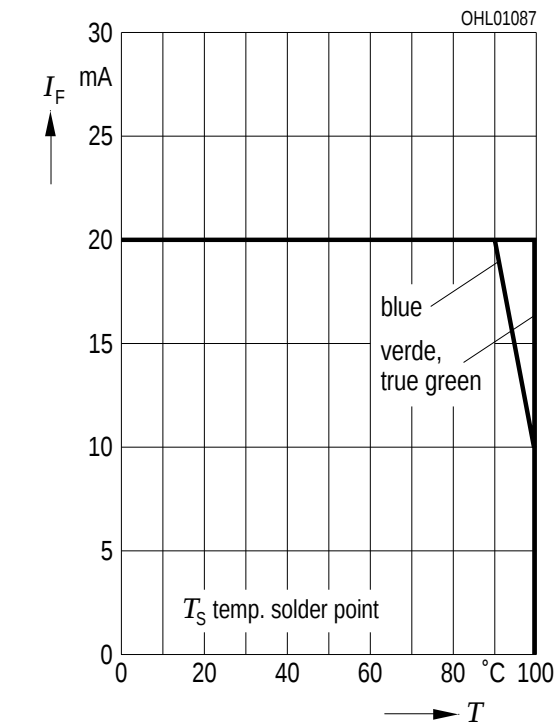
Relative Luminous Intensity

 $T_A = 25\text{ °C}$ Maximal zulässiger Durchlassstrom  $I_F = f(T)$ 

Max. Permissible Forward Current

Maximal zulässiger Durchlassstrom  $I_F = f(T)$ 

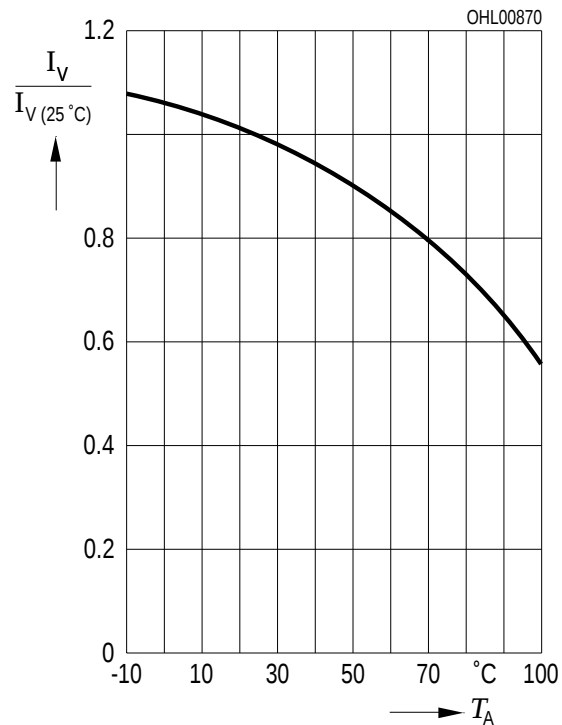
Max. Permissible Forward Current



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

Relative Luminous Intensity

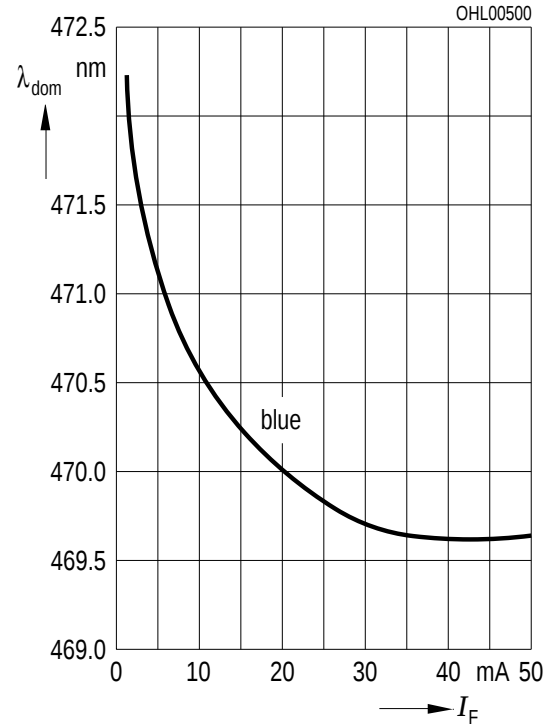
$I_F = 20\text{ mA}$



Dominante Wellenlänge  $\lambda_{\text{dom}} = f(I_F)$

Dominant Wavelength

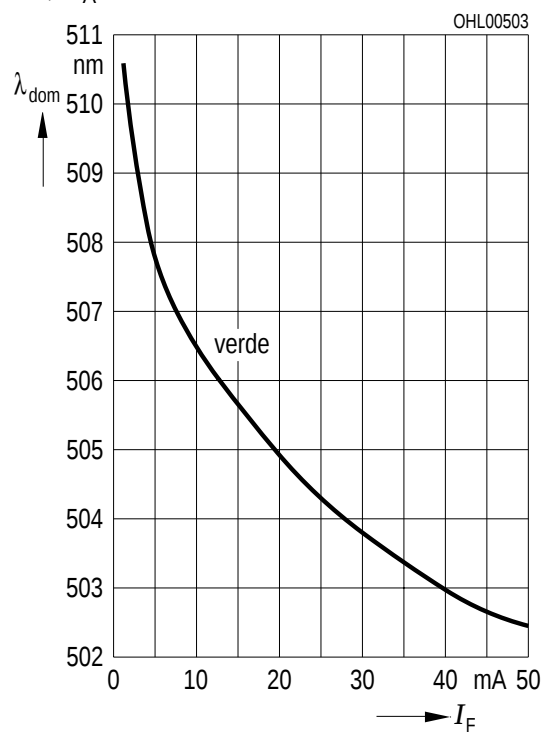
LB,  $T_A = 25\text{ °C}$



Dominante Wellenlänge  $\lambda_{\text{dom}} = f(I_F)$

Dominant Wavelength

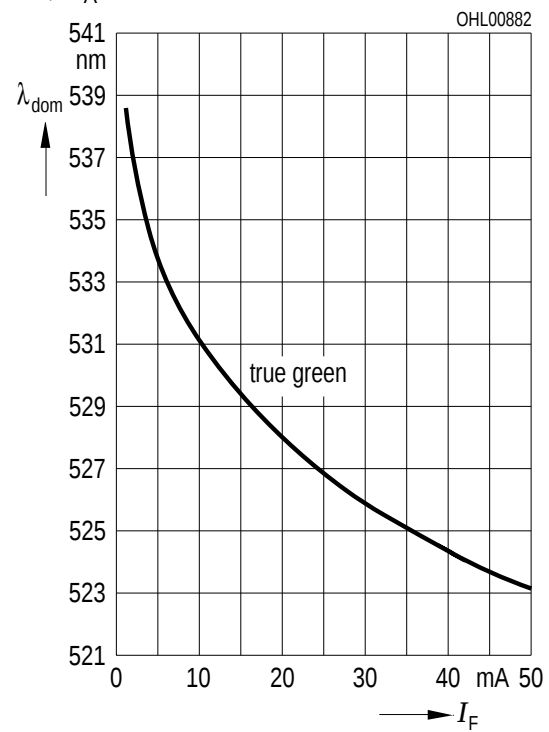
LV,  $T_A = 25\text{ °C}$



Dominante Wellenlänge  $\lambda_{\text{dom}} = f(I_F)$

Dominant Wavelength

LT,  $T_A = 25\text{ °C}$

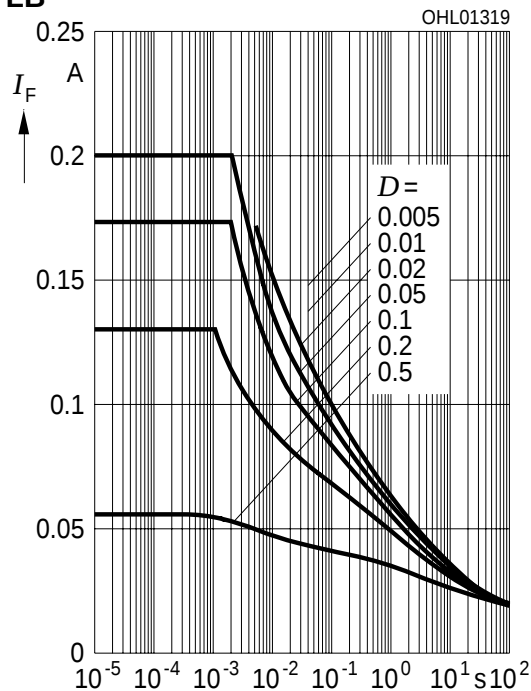


Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$

Permissible Pulse Handling Capability

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

LB

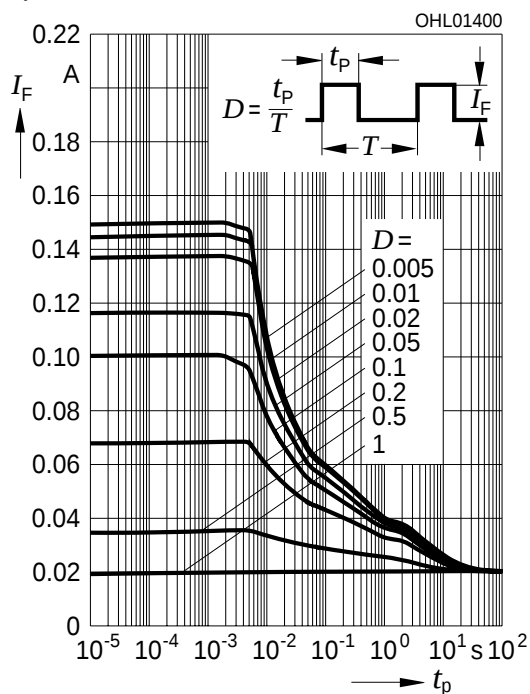


Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$

Permissible Pulse Handling Capability

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

LV, LT

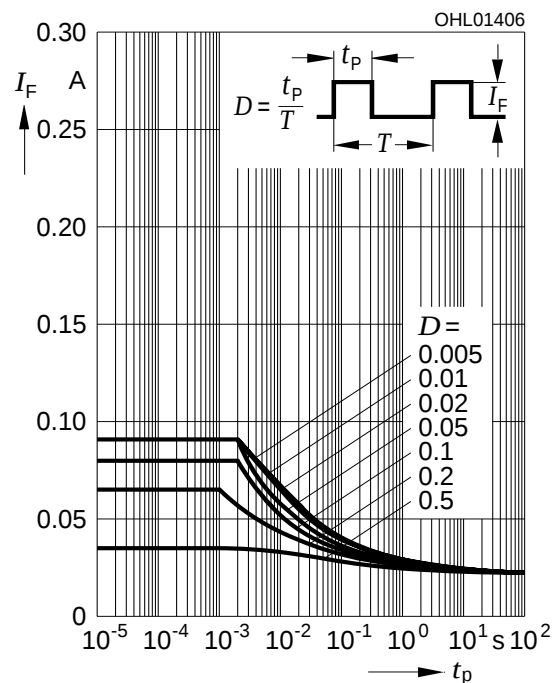


Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$

Permissible Pulse Handling Capability

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

LB

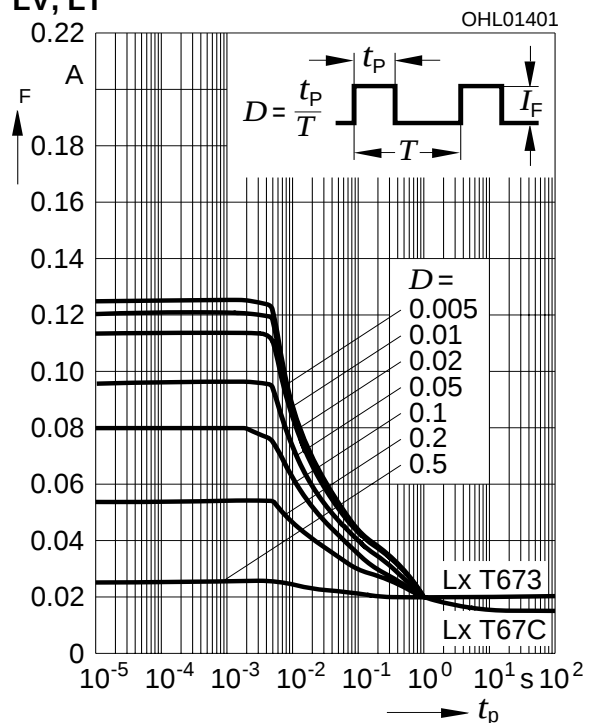


Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$

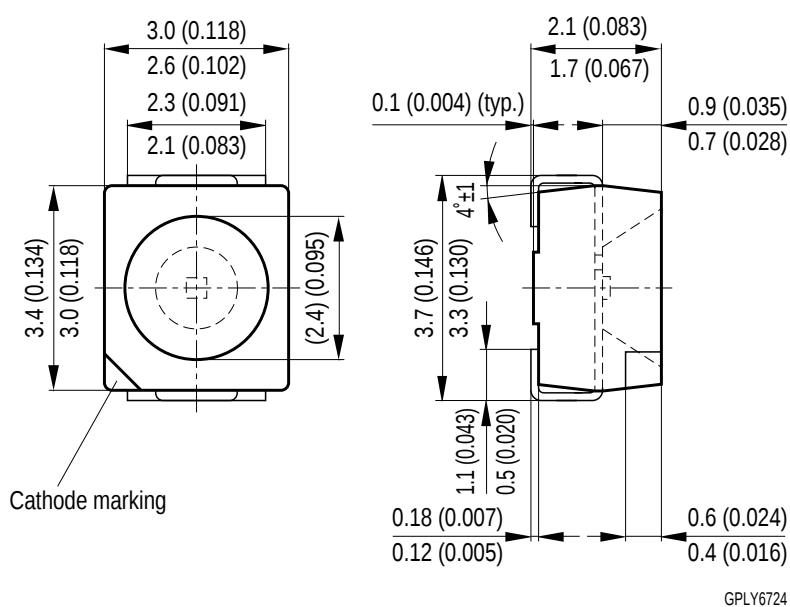
Permissible Pulse Handling Capability

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

LV, LT



## Maßzeichnung Package Outlines

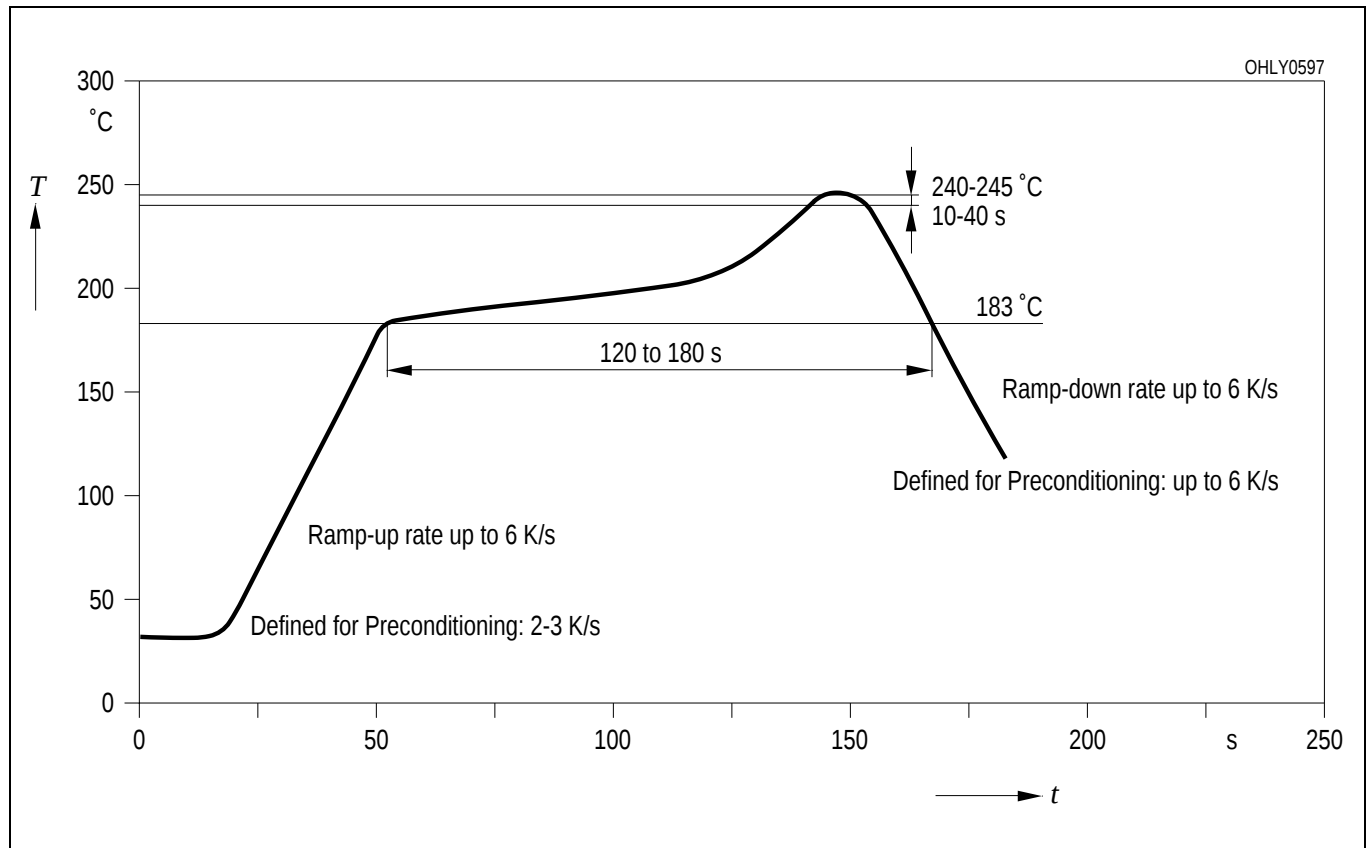


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

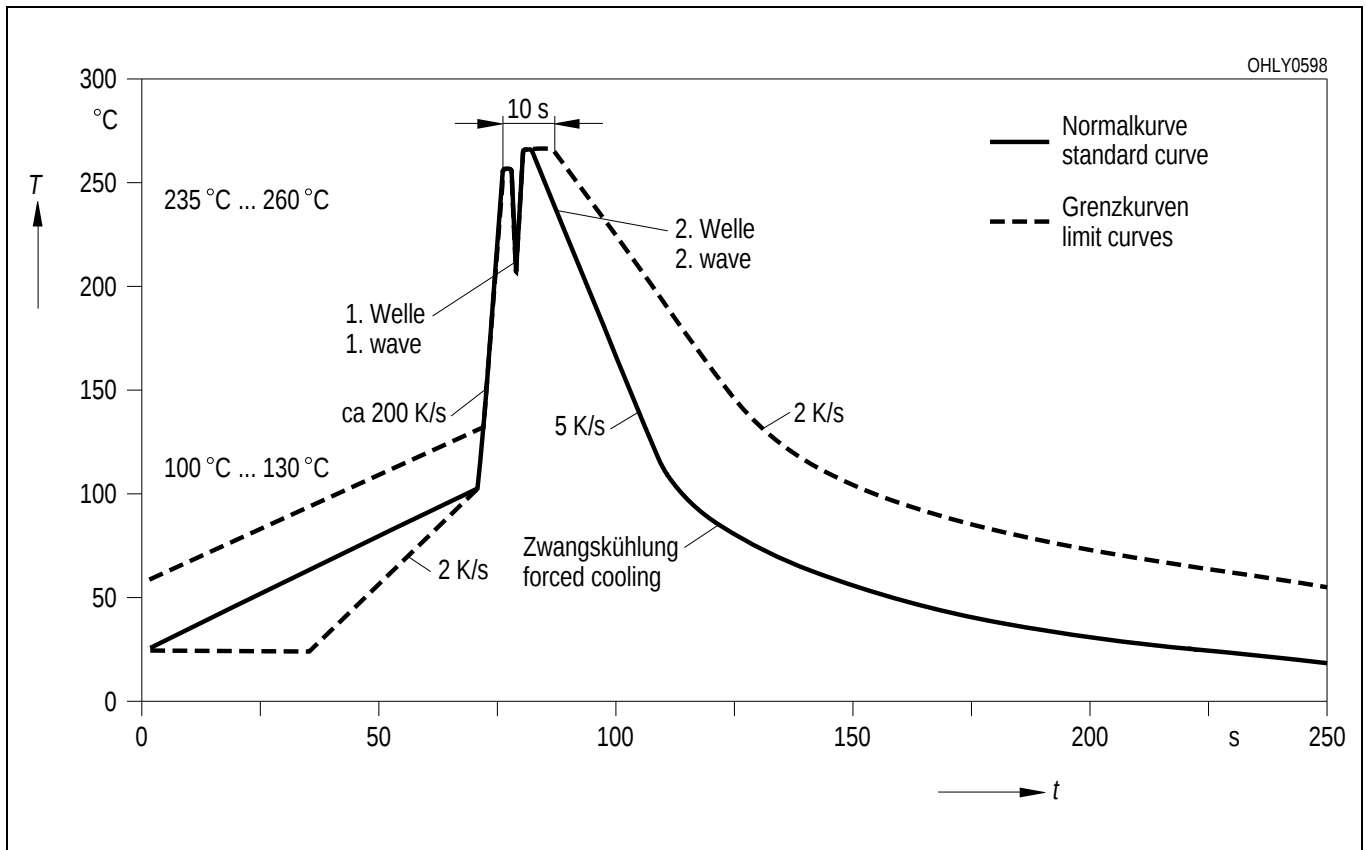
**Kathodenkennung:** abgeschrägte Ecke  
**Cathode mark:** bevelled edge  
**Gewicht / Approx. weight:** 40 mg

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

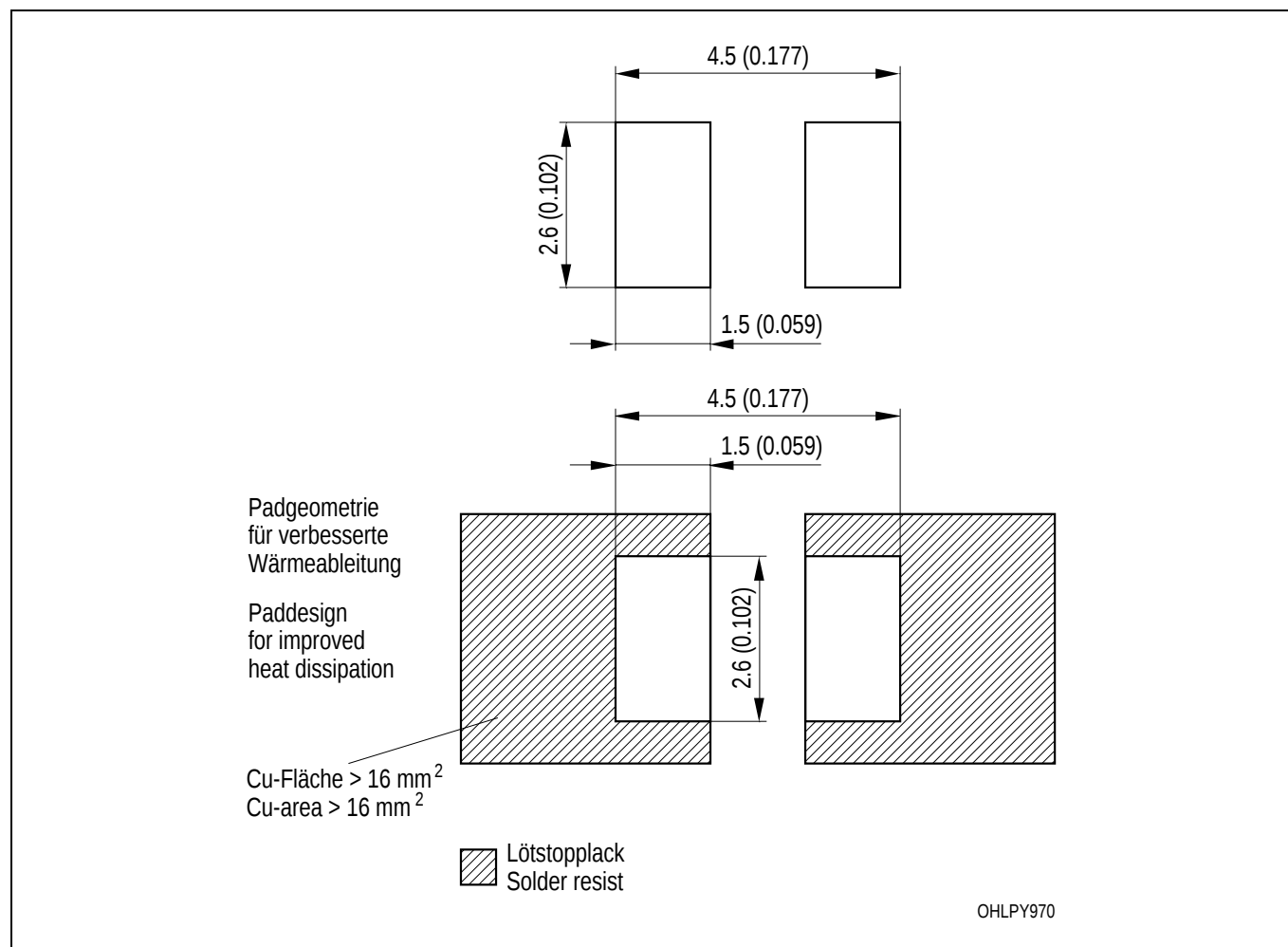
**IR-Reflow Lötprofil** (nach IPC 9501)  
**IR Reflow Soldering Profile** (acc. to IPC 9501)



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



**Empfohlenes Lötpaddesign** IR Reflow Löten / Wellenlöten (TTW)  
**Recommended Solder Pad** IR Reflow Soldering / TTW Soldering



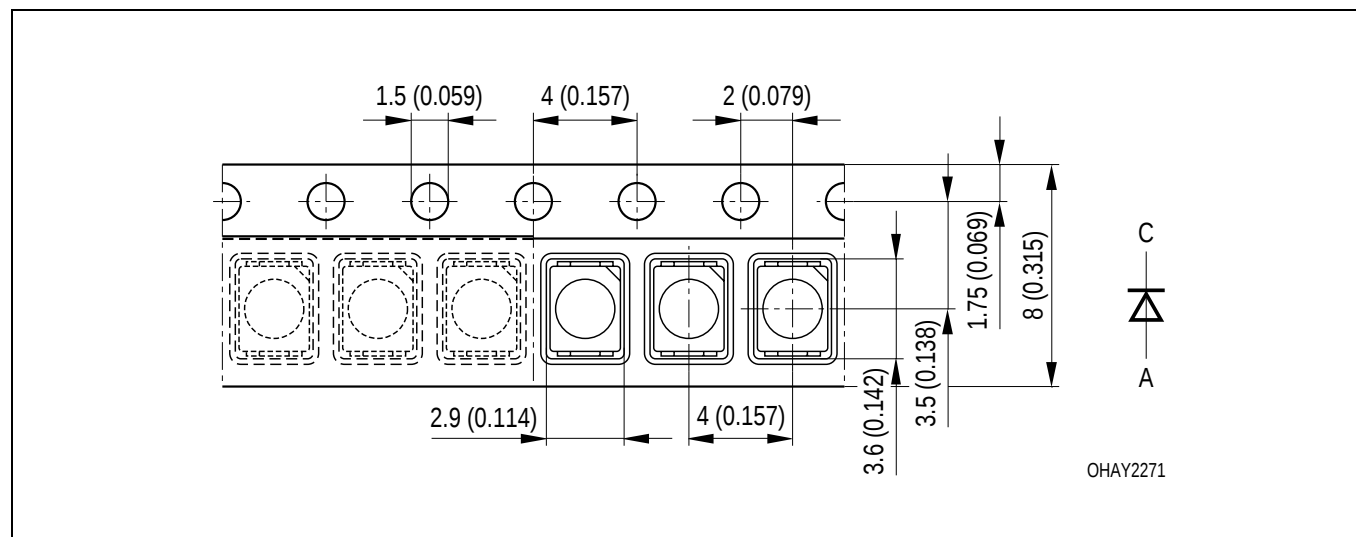
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

**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).

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**Revision History: 2001-06-26**

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Previous Version: 2001-02-21

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| Page | Subjects (major changes since last revision) |
|------|----------------------------------------------|
| 1    | ESD-Festigkeit, ESD-withstand voltage        |
|      |                                              |

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**Attention please!**

The information describes the type of component and shall not be considered as assured characteristics.

Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances. For information on the types in question please contact our Sales Organization.

**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.

**Components used in life-support devices or systems must be expressly authorized for such purpose!** Critical components <sup>1</sup> may only be used in life-support devices or systems <sup>2</sup> with the express written approval of OSRAM OS.

<sup>1</sup> 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.

<sup>2</sup> 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.