

Hyper TOPLED®

Hyper-Bright, Hyper-Red TS GaAIAs-LED

LH T676



Abgekündigt nach OS-PD-2003-007 - wird durch LH T674 ersetzt werden
Obsolete acc. to OS-PD-2003-007 - will be replaced by LH T674

Besondere Merkmale

- **Gehäusertyp:** weißes P-LCC-2 Gehäuse, farbloser klarer Verguss
- **Besonderheit des Bauteils:** extrem breite Abstrahlcharakteristik; ideal für Hinterleuchtungen und Einkopplungen in Lichtleiter
- **Wellenlänge:** 645 nm (hyper-rot)
- **Abstrahlwinkel:** Lambertscher Strahler (120°)
- **Technologie:** GaAIAs
- **optischer Wirkungsgrad:** 6 lm/W
- **Gruppierungsparameter:** Lichtstärke
- **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

Anwendungen

- optischer Indikator
- Hinterleuchtung (LCD, Schalter, Tasten, Displays, Werbebeleuchtung, Allgemeinbeleuchtung)
- Innenbeleuchtung im Automobilbereich (z.B. Instrumentenbeleuchtung, u.ä.)
- Scanner

Features

- **package:** white P-LCC-2 package, colorless clear resin
- **feature of the device:** extremely wide viewing angle; ideal for backlighting and coupling in light guides
- **wavelength:** 645 nm (hyper-red)
- **viewing angle:** Lambertian Emitter (120°)
- **technology:** GaAIAs
- **optical efficiency:** 6 lm/W
- **grouping parameter:** luminous intensity
- **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

Applications

- optical indicators
- backlighting (LCD, switches, keys, displays, illuminated advertising, general lighting)
- interior automotive lighting. (e.g. dashboard backlighting, etc.)
- scanners

| Typ | Emissions- farbe | Lichtstärke | Lichtstrom | Bestellnummer |
|-----------------|----------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------|---------------|
| Type | Color of Emission | Luminous Intensity $I_F = 20 \text{ mA}$ $I_V \text{ (mcd)}$ | Luminous Flux $I_F = 20 \text{ mA}$ $\Phi_V \text{ (lm)}$ | Ordering Code |
| ■LH T676-P1Q1-1 | hyper-red | 45 ... 90 | 190 (typ.) | Q62703Q5026 |
| ■LH T676-Q1R2-1 | | 71 ... 180 | 350 (typ.) | Q62703Q5027 |

- Abgekündigt nach OS-PD-2003-007 - wird durch LH T674 ersetzt werden
 Obsolete acc. to OS-PD-2003-007 - will be replaced by LH T674
 Letzte Bestellung / Last Order: 2004-02-28
 Letzte Lieferung / Last Delivery: 2004-08-31

Anm.: -1 gesamter Farbbereich (siehe **Seite 4**)

Die Standardlieferform von Serientypen beinhaltet eine untere bzw. eine obere Familiengruppe. Diese besteht aus 3 bzw. 4 Helligkeitshalbgruppen. Einzelne Helligkeitshalbgruppen sind nicht bestellbar.

In einer Verpackungseinheit / Gurt ist immer nur eine Helligkeitshalbgruppe enthalten.

Note: -1 Total color tolerance range (see **page 4**)

The standard shipping format for serial types includes a lower or upper family group of 3 or 4 individual luminous intensity half groups. Individual luminous intensity half groups cannot be ordered.

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 | + 100 | °C |
| Durchlassstrom Forward current ($T_A=25^\circ\text{C}$) | I_F | 50 | mA |
| Stoßstrom Surge current $t \leq 10 \mu\text{s}$, $D = 0.005$, $T_A=25^\circ\text{C}$ | I_{FM} | 0.5 | A |
| Sperrspannung ¹⁾ Reverse voltage ($T_A=25^\circ\text{C}$) | V_R | 5 | V |
| Leistungsaufnahme Power consumption ($T_A=25^\circ\text{C}$) | P_{tot} | 125 | mW |
| Wärmewiderstand Thermal resistance Sperrschicht/Umgebung ²⁾ Junction/air ²⁾ | $R_{th JA}$ | 500 | K/W |
| Sperrschicht/Lötpad Junction/solder point | $R_{th JS}$ | 280 | K/W |

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

²⁾ Montage auf PC-Board FR 4 (Padgröße $\geq 16 \text{ mm}^2$)
mounted on PC board FR 4 (pad size $\geq 16 \text{ mm}^2$)

Kennwerte ($T_A = 25\text{ °C}$)

Characteristics

| Bezeichnung Parameter | | Symbol Symbol | Werte Values | Einheit Unit |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------------------|-----------------|--------------------------------|
| Wellenlänge des emittierten Lichtes Wavelength at peak emission $I_F = 20\text{ mA}$ | (typ.) | λ_{peak} | 660 | nm |
| Dominantwellenlänge ¹⁾ Dominant wavelength $I_F = 20\text{ mA}$ | (typ.) | λ_{dom} | 645 | nm |
| Spektrale Bandbreite bei 50 % $I_{\text{rel max}}$ Spectral bandwidth at 50 % $I_{\text{rel max}}$ $I_F = 20\text{ mA}$ | (typ.) | $\Delta\lambda$ | 22 | nm |
| Abstrahlwinkel bei 50 % I_V (Vollwinkel) Viewing angle at 50 % I_V | (typ.) | 2ϕ | 120 | Grad deg. |
| Durchlassspannung ²⁾ Forward voltage $I_F = 20\text{ mA}$ | (typ.) (max.) | V_F V_F | 1.85 2.2 | V V |
| Sperrstrom Reverse current $V_R = 5\text{ V}$ | (typ.) (max.) | I_R I_R | 0.01 10 | μA μA |
| Temperaturkoeffizient von λ_{peak} Temperature coefficient of λ_{peak} $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$ | (typ.) | $TC_{\lambda_{\text{peak}}}$ | 0.28 | nm/K |
| Temperaturkoeffizient von λ_{dom} Temperature coefficient of λ_{dom} $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$ | (typ.) | $TC_{\lambda_{\text{dom}}}$ | 0.05 | nm/K |
| Temperaturkoeffizient von V_F Temperature coefficient of V_F $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$ | (typ.) | TC_V | -2.5 | mV/K |
| Optischer Wirkungsgrad Optical efficiency $I_F = 20\text{ mA}$ | (typ.) | η_{opt} | 6 | lm/W |

¹⁾ Wellenlängen werden mit einer Stromeinprägedauer von 25 ms und einer Genauigkeit von $\pm 1\text{ nm}$ ermittelt.
Wavelengths are tested at a current pulse duration of 25 ms and a tolerance of $\pm 1\text{ nm}$.

²⁾ 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 $\pm 0.1\text{ V}$.

Helligkeits-Gruppierungsschema
Luminous Intensity Groups

| Lichtgruppe Luminous Intensity Group | Lichtstärke Luminous Intensity I_v (mcd) | Lichtstrom Luminous Flux Φ_v (mlm) |
|-----------------------------------------|--------------------------------------------------|-----------------------------------------------|
| P1 | 45 ... 56 | 150 (typ.) |
| P2 | 56 ... 71 | 190 (typ.) |
| Q1 | 71 ... 90 | 240 (typ.) |
| Q2 | 90 ... 112 | 300 (typ.) |
| R1 | 112 ... 140 | 380 (typ.) |
| R2 | 140 ... 180 | 480 (typ.) |

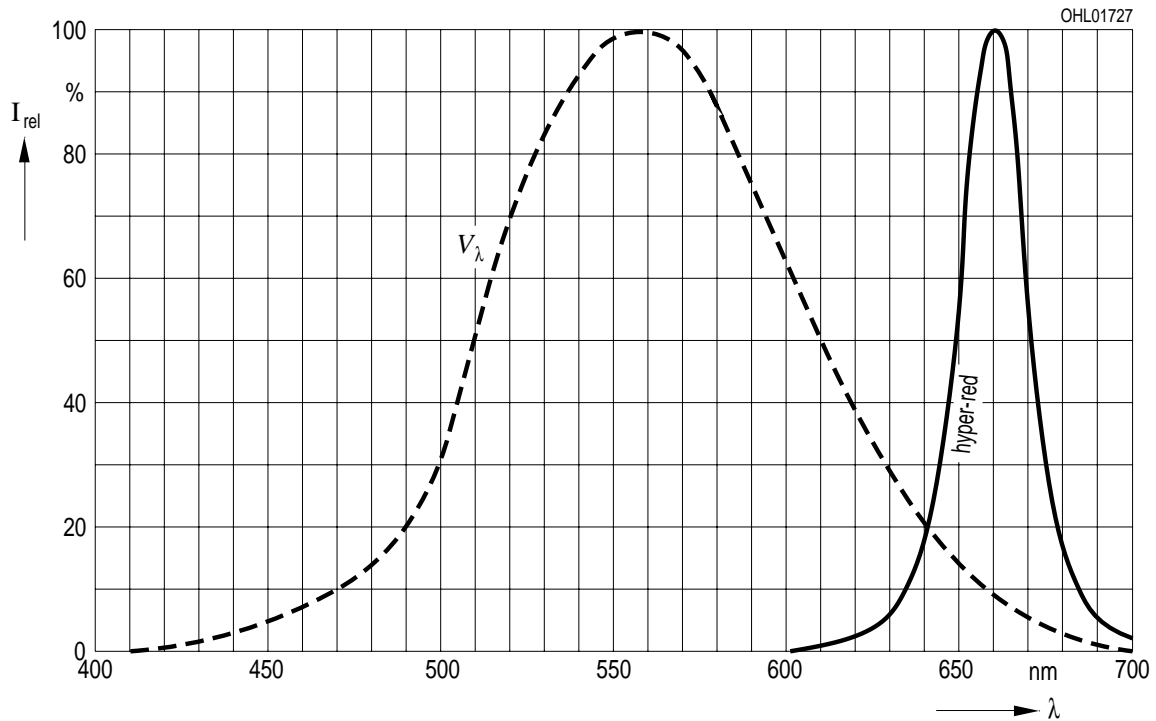
Helligkeitswerte werden mit einer Stromeinprägedauer von 25 ms und einer Genauigkeit von $\pm 11\%$ ermittelt.
 Luminous intensity is tested at a current pulse duration of 25 ms and an accuracy of $\pm 11\%$.

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

Relative Spectral Emission

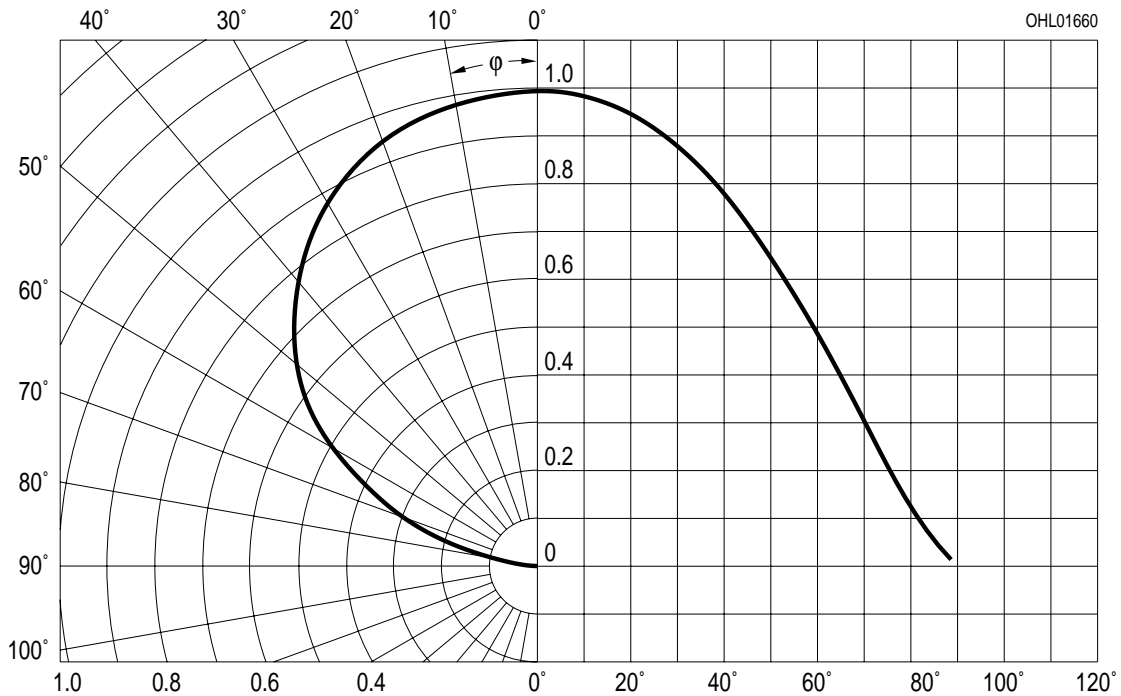
$V(\lambda)$ = spektrale Augenempfindlichkeit

Standard eye response curve



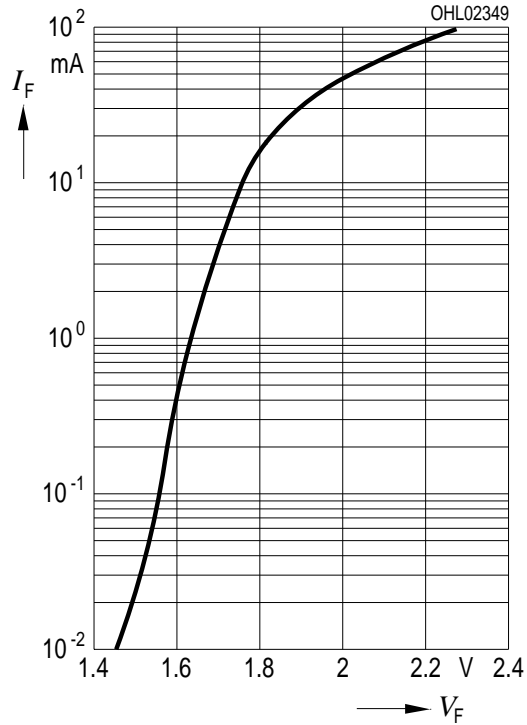
Abstrahlcharakteristik $I_{rel} = f(\varphi)$

Radiation Characteristic



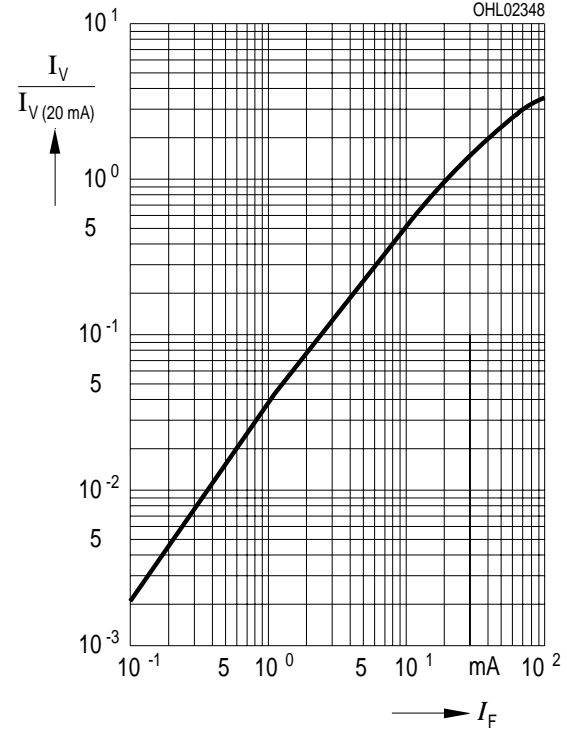
**Durchlassstrom $I_F = f(V_F)$
Forward Current**

$T_A = 25\text{ °C}$

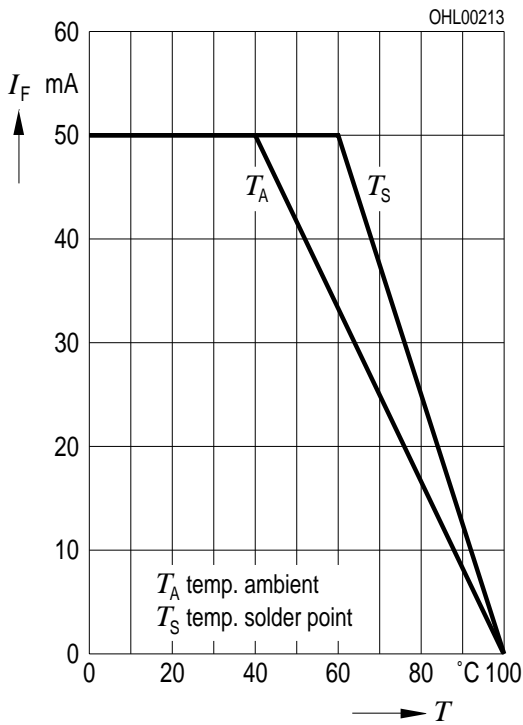


**Relative Lichtstärke $I_V/I_{V(20\text{ mA})} = f(I_F)$
Relative Luminous Intensity**

$T_A = 25\text{ °C}$

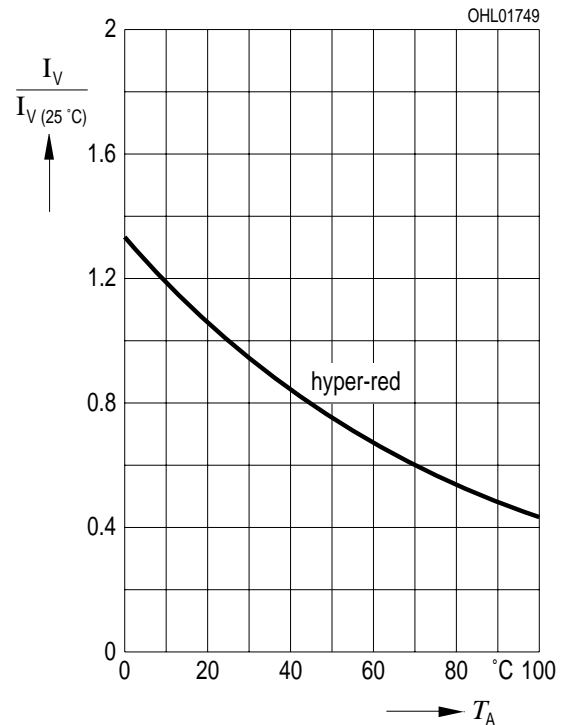


**Maximal zulässiger Durchlassstrom $I_F = f(T)$
Max. Permissible Forward Current**



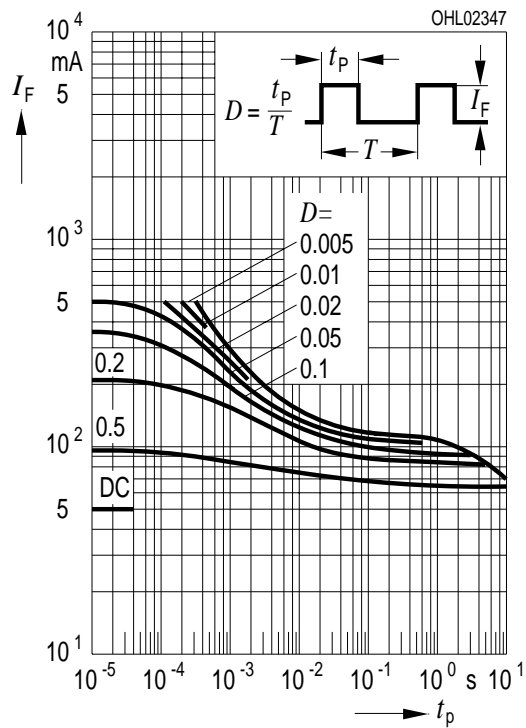
**Relative Lichtstärke $I_V/I_{V(25\text{ °C})} = f(T_A)$
Relative Luminous Intensity**

$I_F = 20\text{ mA}$

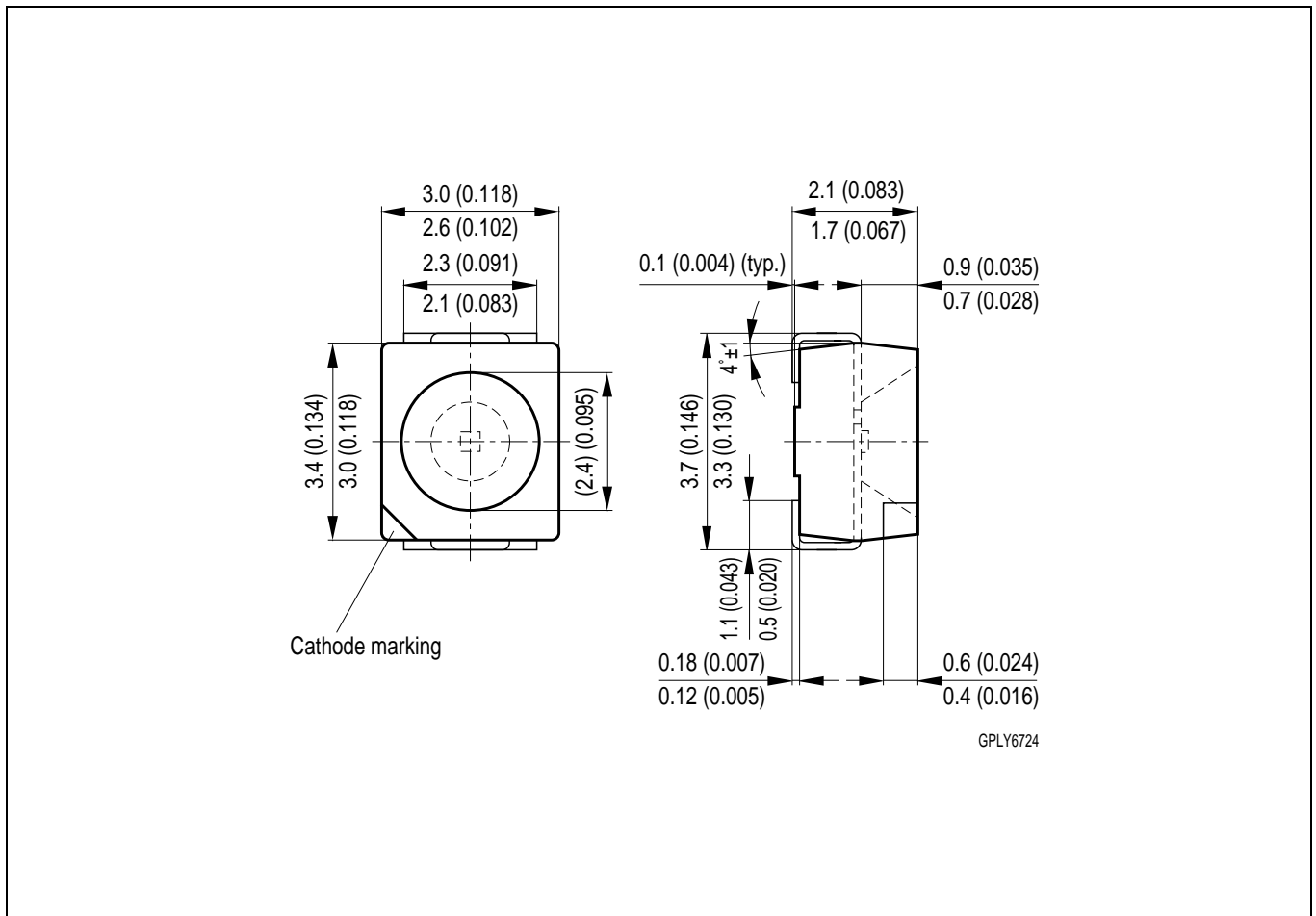


Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability

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



Maßzeichnung
Package Outlines

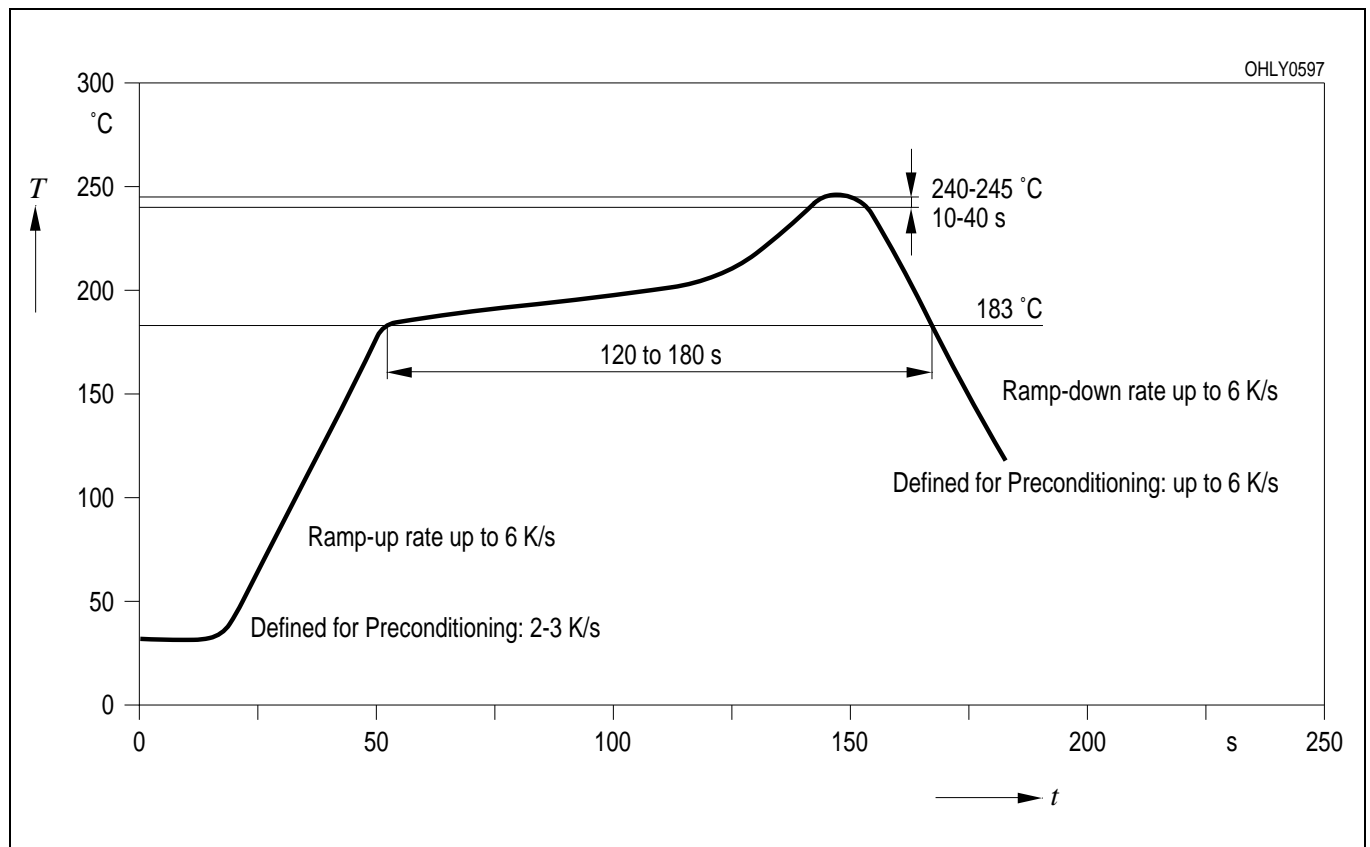


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

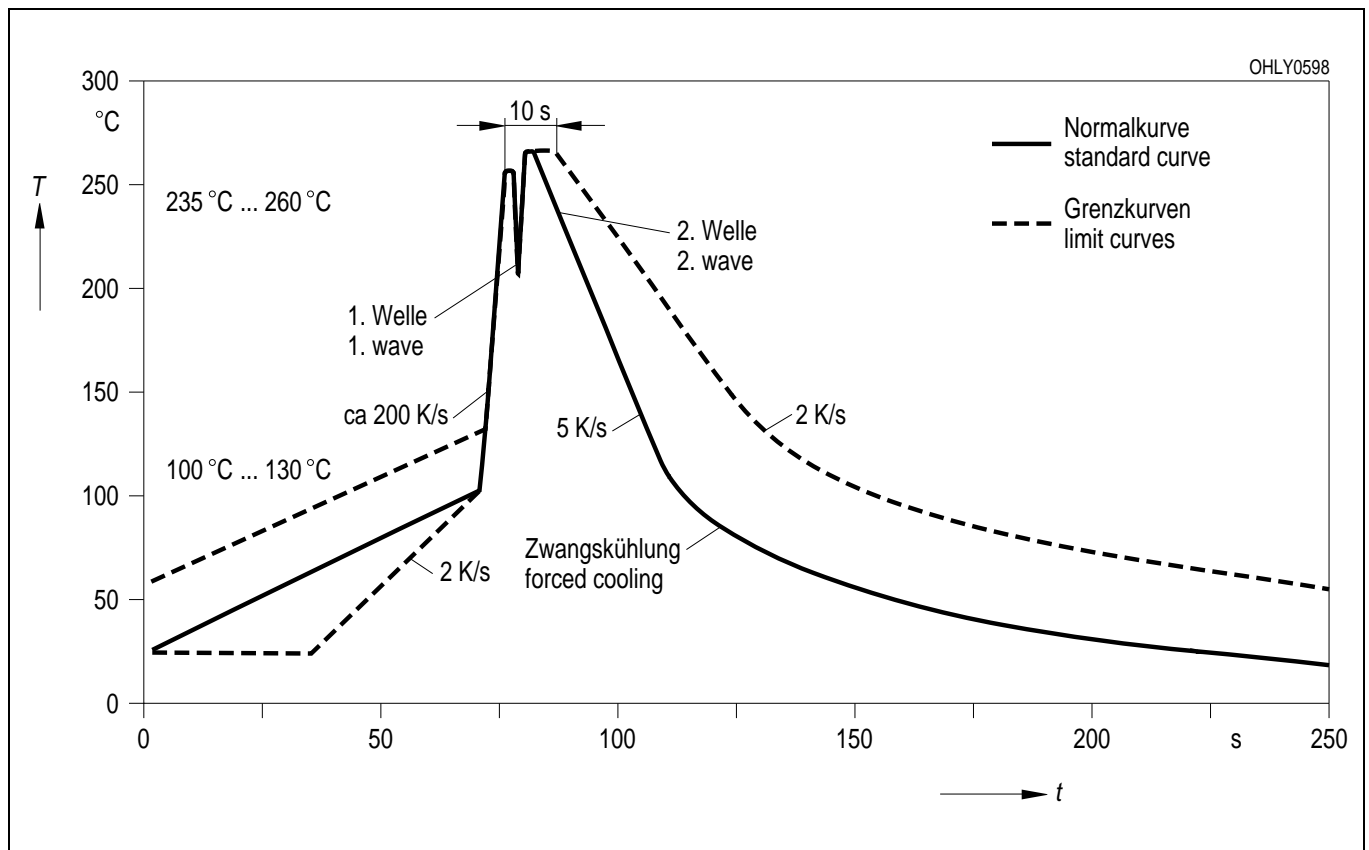
Kathodenkennung: abgeschrägte Ecke
Cathode mark: bevelled edge
Gewicht / Approx. weight: 35 mg

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

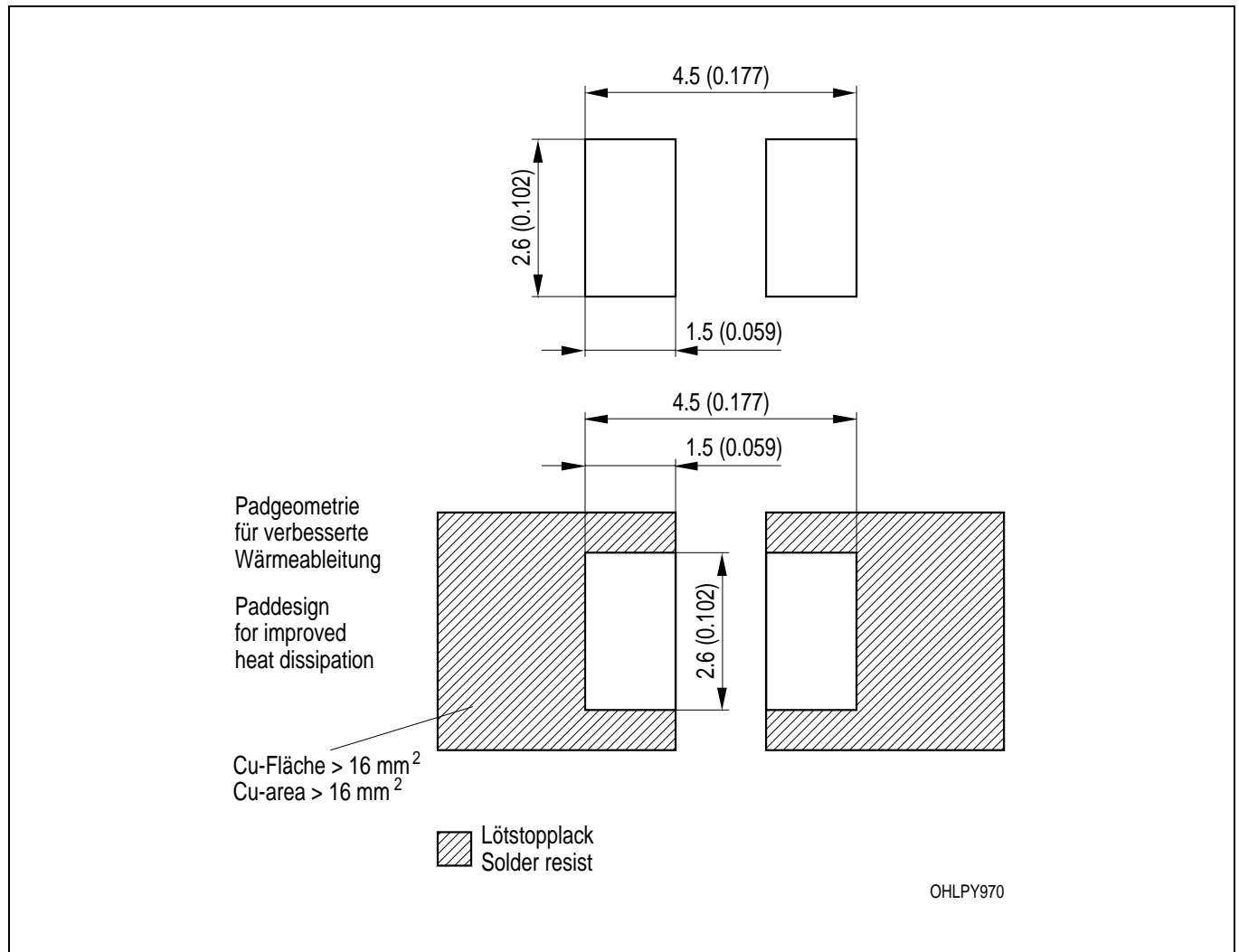
IR-Reflow Lötprofil (nach IPC 9501)
IR Reflow Soldering Profile (acc. to IPC 9501)



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



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



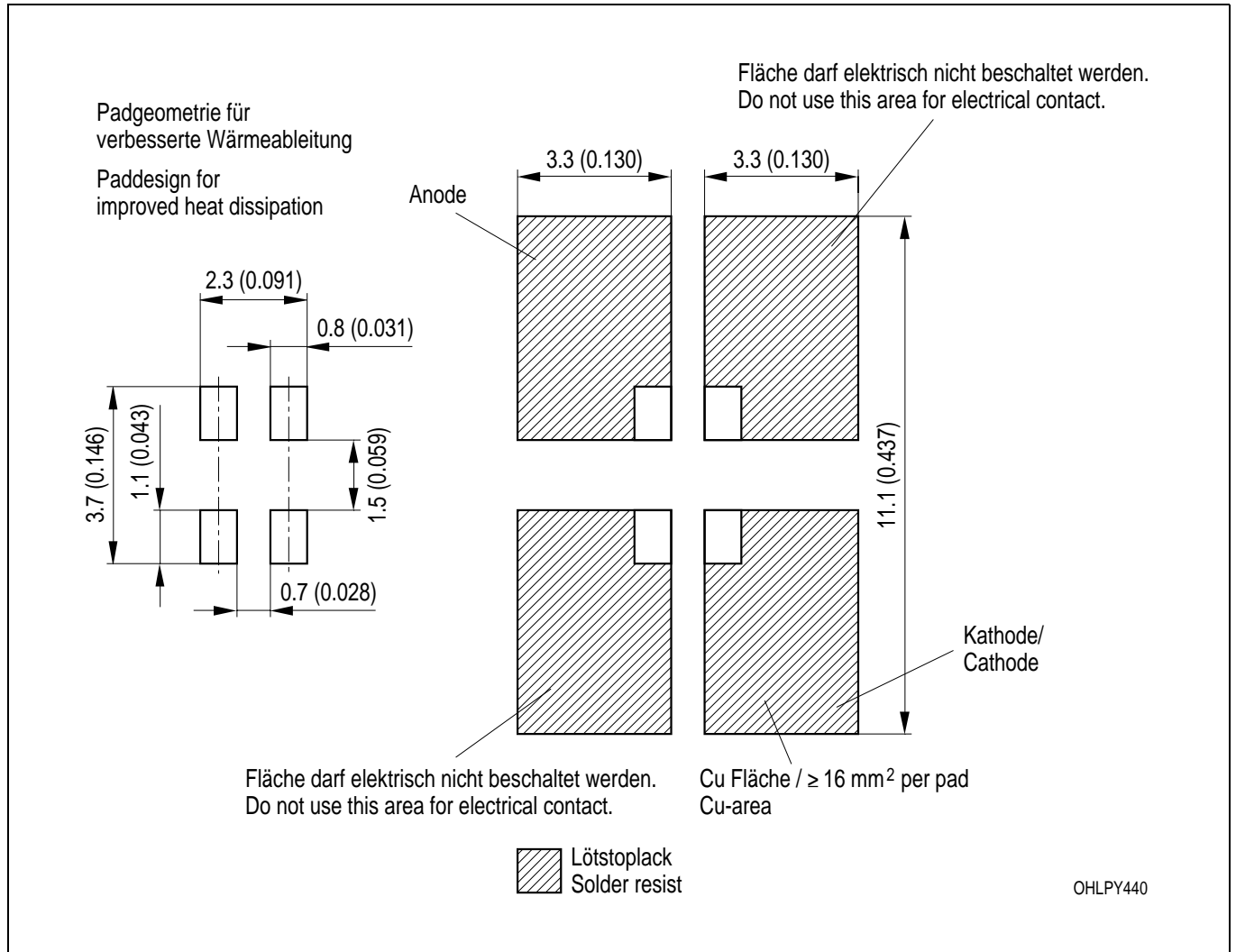
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).
 Gehäuse hält TTW-Löthitze aus / Package able to withstand TTW-soldering heat

Empfohlenes Lötpaddesign verwendbar für TOPLED® und Power TOPLED®

IR Reflow Löten

Recommended Solder Pad useable for TOPLED® and Power TOPLED®

IR Reflow Soldering



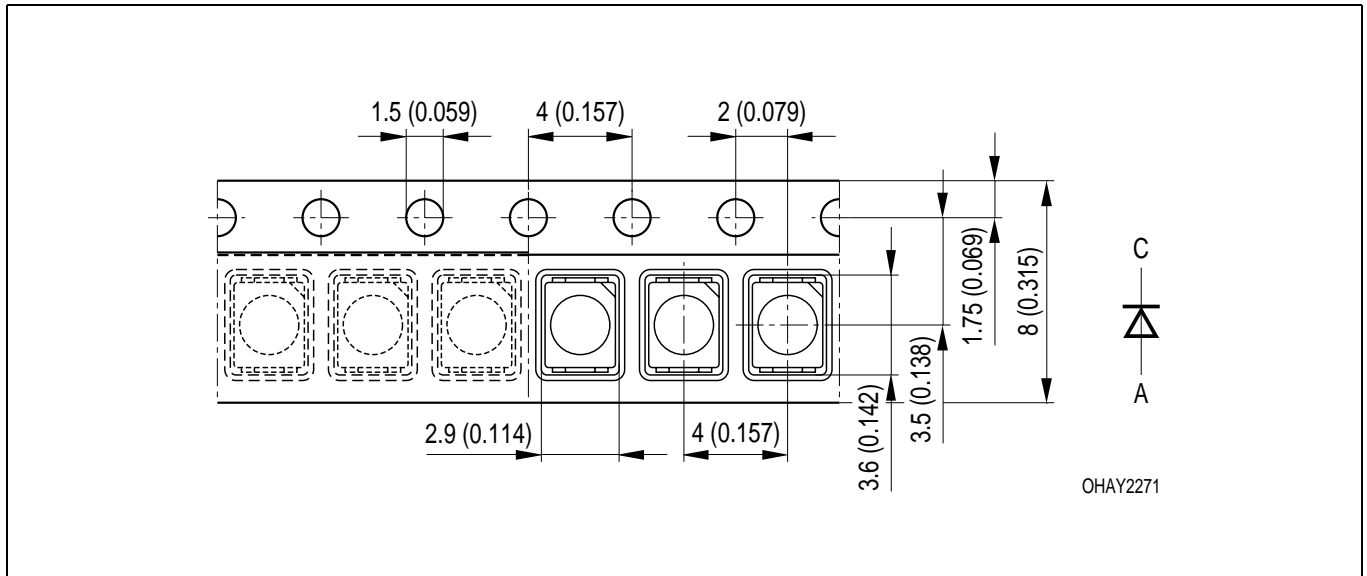
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

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).

Anm.: 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: 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.

| Revision History: 2003-09-09 | | Date of change |
|------------------------------|-------------------------------------------------------------|----------------|
| Previous Version: 2003-08-27 | | |
| Page | Subjects (major changes since last revision) | |
| 9 | change of weight from 40 mg to 35 mg | 2002-07-05 |
| 14 | annotations | 2002-07-23 |
| 13 | recomm. solder pad for TOPLED® and Power TOPLED® (OHLPY440) | 2002-08-05 |
| all | not for new design | 2003-02-20 |
| 1, 2 | obsolete | 2003-08-27 |
| 14 | note: dry pack | 2003-09-09 |
| 3 | ambient temperature | 2003-09-09 |

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Attention please!

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

All typical data and graphs are basing on representative samples, but don't represent the production range. If requested, e.g. because of technical improvements, these typ. data will be changed without any further notice.

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.

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 ¹ may only be used in life-support devices or systems ² with the express written approval of OSRAM OS.

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.