

Power TOPLED with Lens Hyper-Bright LED

LS E655



Vorläufige Daten / Preliminary Data

Besondere Merkmale

- **Gehäusetypp:** weißes P-LCC-4-Gehäuse
- **Besonderheit des Bauteils:** fokussierte Abstrahlung in SMT-Technologie; hohe Helligkeit in Achsrichtung
- **Wellenlänge:** 632 nm (super-rot)
- **Abstrahlwinkel:** 60°
- **Technologie:** InGaAlP
- **optischer Wirkungsgrad:** 12 lm/W
- **Gruppierungsparameter:** Lichtstärke, Durchflussspannung
- **Verarbeitungsmethode:** für alle SMT-Bestücktechniken geeignet
- **Lötmethode:** IR Reflow Löten und Wellenlöten (TTW)
- **Vorbehandlung:** nach JEDEC Level 2
- **Gurtung:** 12-mm Gurt mit 2000/Rolle, ø330 mm
- **ESD-Festigkeit:** ESD-sicher bis 2 kV nach EOS/ESD-5.1-1993

Anwendungen

- Ampelanwendung
- Hinterleuchtung (LCD, Schalter, Tasten, Displays, Werbebeleuchtung)
- Innen- und Außenbeleuchtung im Automobilbereich (z.B. Instrumentenbeleuchtung und Bremslichter)
- 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:** focussed radiation in SMT technology; high brightness in beam direction
- **wavelength:** 632 nm (super-red)
- **viewing angle:** 60°
- **technology:** InGaAlP
- **optical efficiency:** 12 lm/W
- **grouping parameter:** luminous intensity, 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:** 12-mm tape with 2000/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 and exterior automotive lighting (e.g. dashboard backlighting and brake lights)
- substitution of micro incandescent lamps
- marker lights (e.g. steps, exit ways, etc.)
- signal and symbol luminaire

| Typ | Emissions- farbe | Farbe der Lichtaustritts- fläche | Lichtstärke | Lichtstrom | Bestellnummer |
|-----------------|----------------------|--|---|--|---------------|
| Type | Color of Emission | Color of the Light Emitting Area | Luminous Intensity $I_F = 50 \text{ mA}$ $I_V \text{ (mcd)}$ | Luminous Flux $I_F = 50 \text{ mA}$ $\Phi_V \text{ (lm)}$ | Ordering Code |
| LS E655-U2AA-11 | super-red | colorless clear | 560 ...1400 | 1150 (typ.) | Q62703-Q5996 |

Anm.: -11 gesamter Farbbereich (siehe **Seite 4**)

-11 gesamter Durchlassspannungsbereich, 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: -11 Total color tolerance range (please see **page 4**)

-11 Total forward voltage tolerance, delivery in single 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 | + 125 | °C |
| Durchlassstrom Forward current | I_F | 70 | mA |
| Stoßstrom Surge current $t \leq 10 \mu s, D = 0.1$ | I_{FM} | 0.1 | A |
| Sperrspannung Reverse voltage | V_R | 5 | V |
| Leistungsaufnahme Power consumption $T_A \leq 25 \text{ °C}$ | P_{tot} | 180 | mW |
| Wärmewiderstand Thermal resistance Sperrschicht/Umgebung Junction/ambient Sperrschicht/Löt-pad Junction/soldering point Montage auf PC-Board FR 4 (Padgröße $\geq 16 \text{ mm}^2$) mounted on PC board FR 4 (pad size $\geq 16 \text{ mm}^2$) | $R_{th JA}$ $R_{th JS}$ | 300 130 | K/W K/W |

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

| Bezeichnung Parameter | Symbol Symbol | Wert Value | Einheit Unit |
|---|------------------------------|----------------|--------------------------------|
| Wellenlänge des emittierten Lichtes (typ.) Wavelength at peak emission $I_F = 50\text{ mA}$ | λ_{peak} | 645 | nm |
| Dominantwellenlänge ¹⁾ (typ.) Dominant wavelength $I_F = 50\text{ mA}$ | λ_{dom} | 633 ± 6 | nm |
| Spektrale Bandbreite bei 50 % $I_{\text{rel max}}$ (typ.) Spectral bandwidth at 50 % $I_{\text{rel max}}$ $I_F = 50\text{ mA}$ | $\Delta\lambda$ | 16 | nm |
| Abstrahlwinkel bei 50 % I_V (Vollwinkel) (typ.) Viewing angle at 50 % I_V | 2ϕ | 60 | Grad deg. |
| Durchlassspannung ²⁾ (typ.) Forward voltage (max.) $I_F = 50\text{ mA}$ | V_F V_F | 2.1 2.5 | V V |
| Sperrstrom (typ.) Reverse current (max.) $V_R = 5\text{ V}$ | I_R I_R | 0.01 10 | μA μA |
| Temperaturkoeffizient von λ_{peak} (typ.) Temperature coefficient of λ_{peak} $I_F = 50\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$ | $TC_{\lambda_{\text{peak}}}$ | 0.15 | nm/K |
| Temperaturkoeffizient von λ_{dom} (typ.) Temperature coefficient of λ_{dom} $I_F = 50\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$ | $TC_{\lambda_{\text{dom}}}$ | 0.04 | nm/K |
| Temperaturkoeffizient von V_F (typ.) Temperature coefficient of V_F $I_F = 50\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$ | TC_V | - 3.4 | mV/K |
| Optischer Wirkungsgrad (typ.) Optical efficiency $I_F = 50\text{ mA}$ | η_{opt} | 12 | lm/W |

¹⁾ Wellenlängen werden mit einer Stromeinprägungsdauer 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⁾ 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 $\pm 0.1\text{ V}$.

²⁾ Durchlassspannungsgruppen
Forward voltage groups

| Gruppe Group | Durchlassspannung Forward voltage | | Einheit Unit |
|-----------------|--------------------------------------|------|-----------------|
| | min. | max. | |
| 3 | 1.90 | 2.20 | V |
| 4 | 2.20 | 2.50 | V |

Helligkeits-Gruppierungsschema
Luminous Intensity Groups

| Lichtgruppe Luminous Intensity Group | Lichtstärke Luminous Intensity I_V (mcd) | Lichtstrom Luminous Flux Φ_V (mlm) |
|---|--|---|
| U2 | 560 ... 710 | 760 (typ.) |
| V1 | 710 ... 900 | 960 (typ.) |
| V2 | 900 ... 1120 | 1200 (typ.) |
| AA | 1120 ... 1400 | 1500 (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: V2-13
Example: V2-13

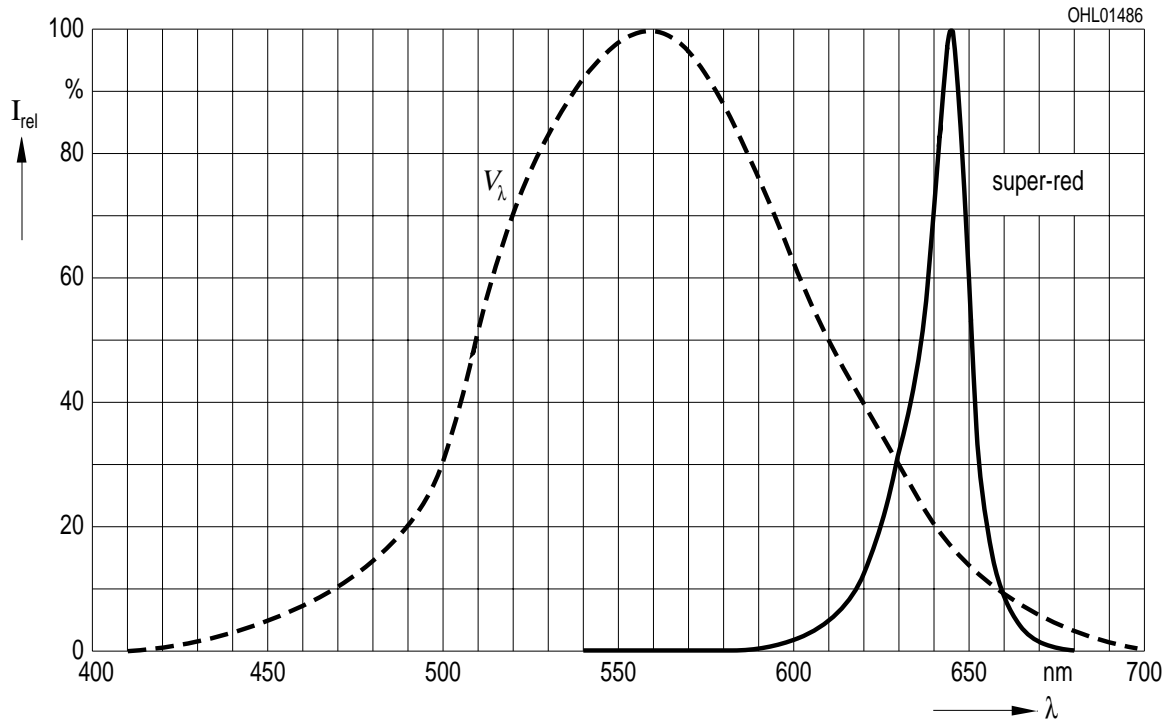
| Lichtgruppe Luminous Intensity Group | Halbgruppe Half Group | Wellenlänge Wavelength | Durchlassspannung Forward Voltage |
|---|--------------------------|---------------------------|--------------------------------------|
| V | 2 | 1 | 3 |

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

Relative Spectral Emission

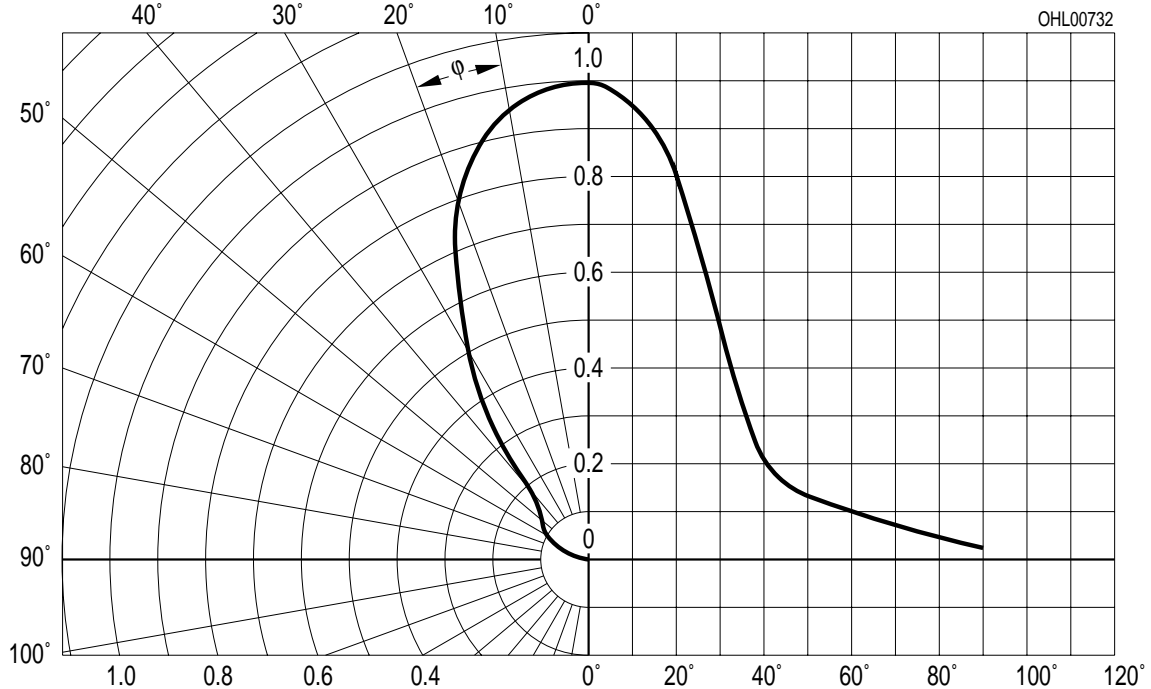
$V(\lambda)$ = spektrale Augenempfindlichkeit

Standard eye response curve



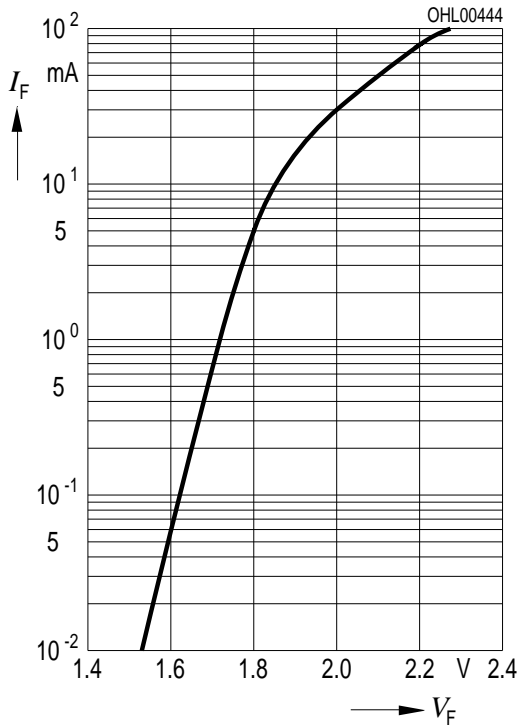
Abstrahlcharakteristik $I_{rel} = f(\varphi)$

Radiation Characteristic



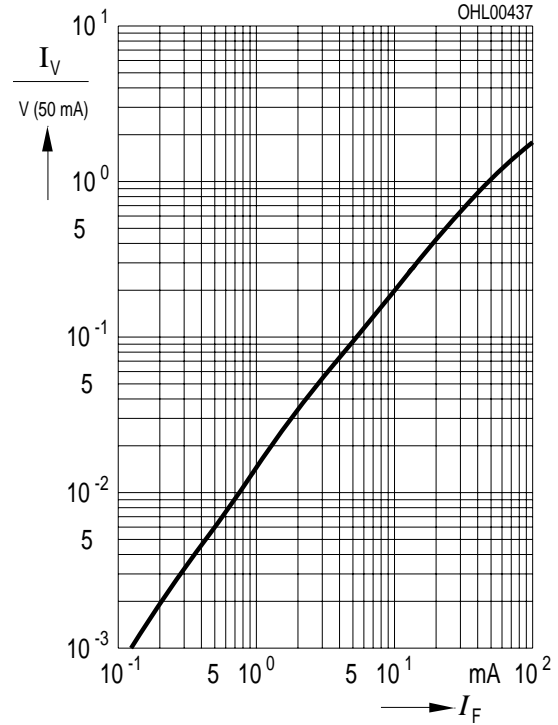
Durchlassstrom $I_F = f(V_F)$
Forward Current

$T_A = 25\text{ °C}$

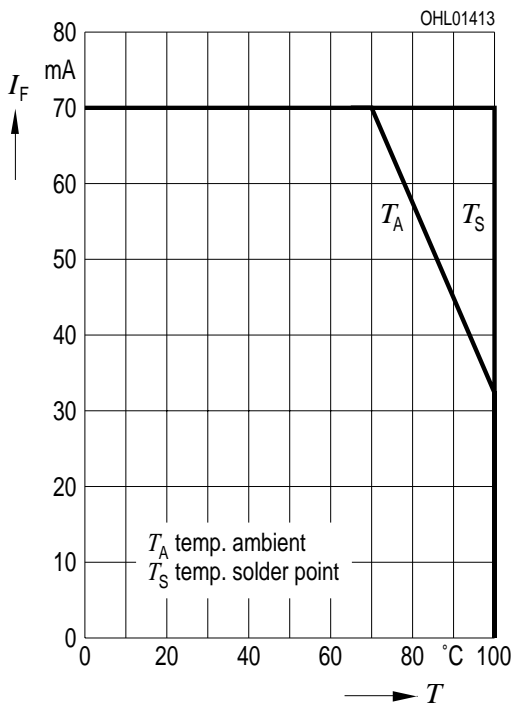


Relative Lichtstärke $I_V/I_{V(50\text{ mA})} = f(I_F)$
Relative Luminous Intensity

$T_A = 25\text{ °C}$

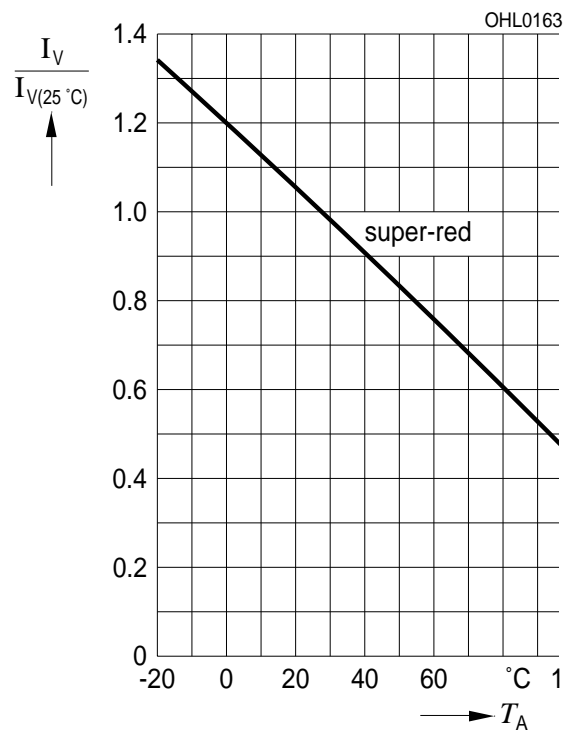


Maximal zulässiger Durchlassstrom $I_F = f(T)$
Max. Permissible Forward Current

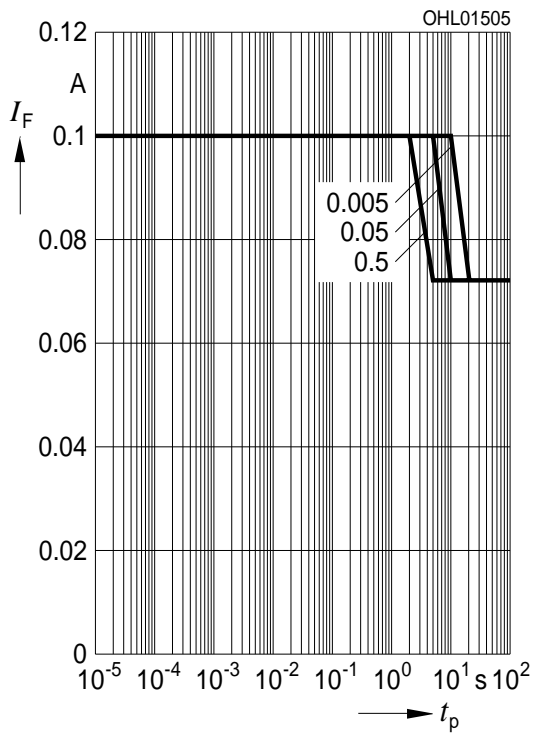


Relative Lichtstärke $I_V/I_{V(25\text{ °C})} = f(T_A)$
Relative Luminous Intensity

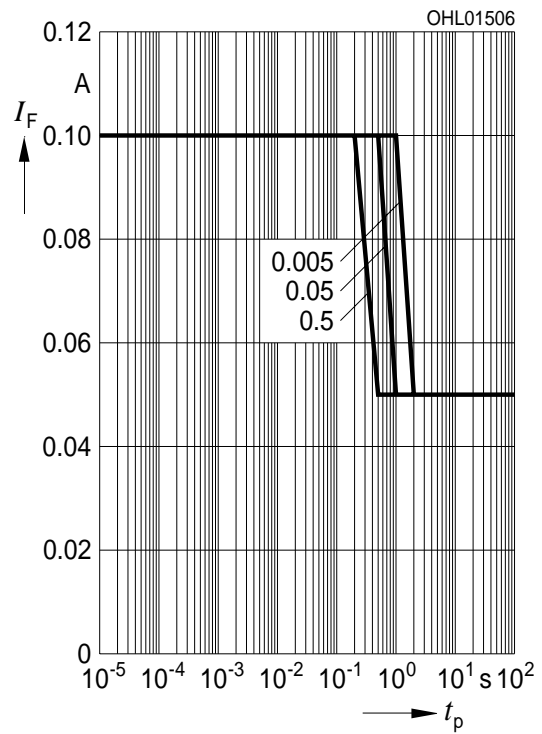
$I_F = 50\text{ mA}$



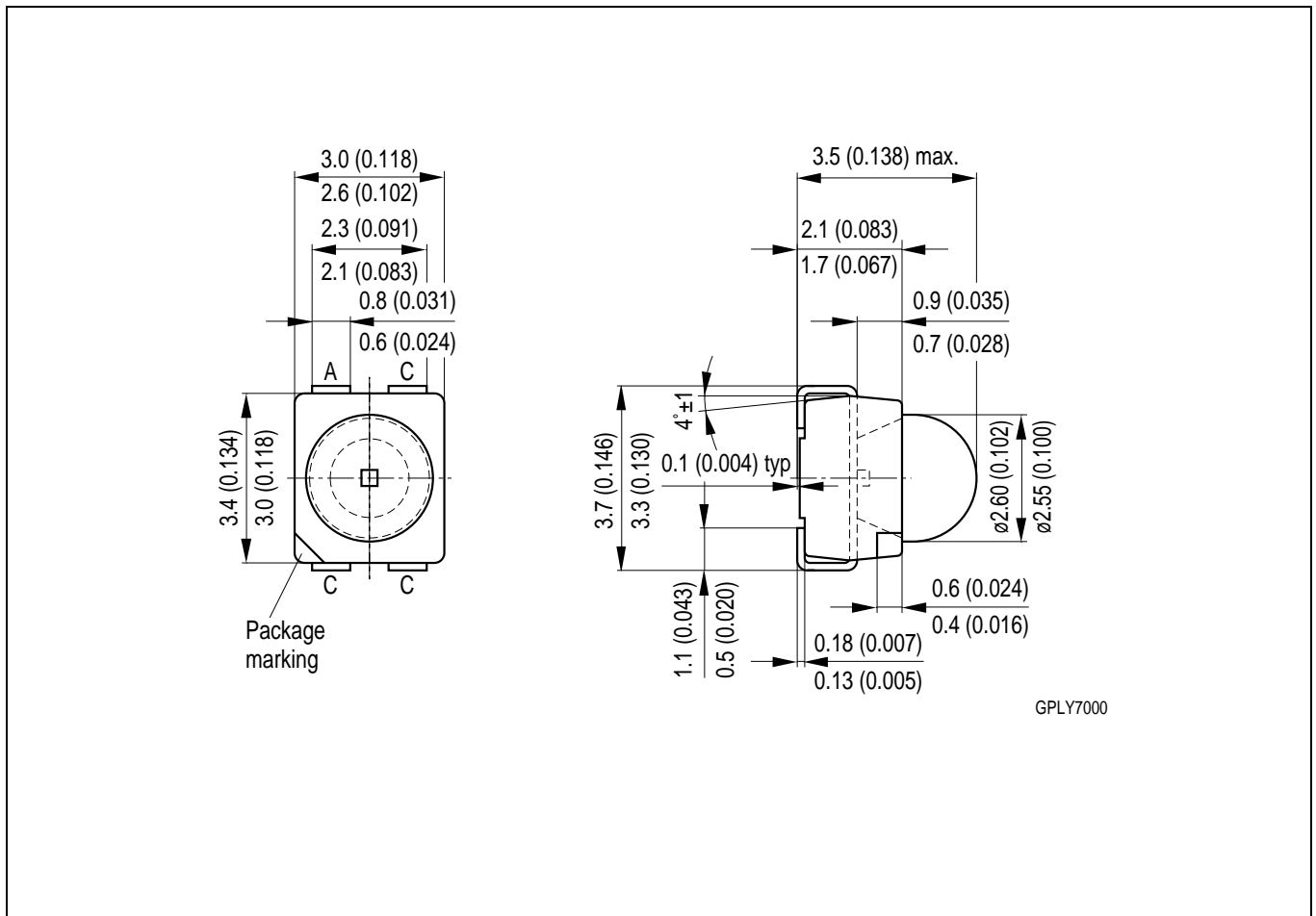
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
 Duty cycle $D =$ parameter, $T_A = 25\text{ °C}$



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



Maßzeichnung
Package Outlines

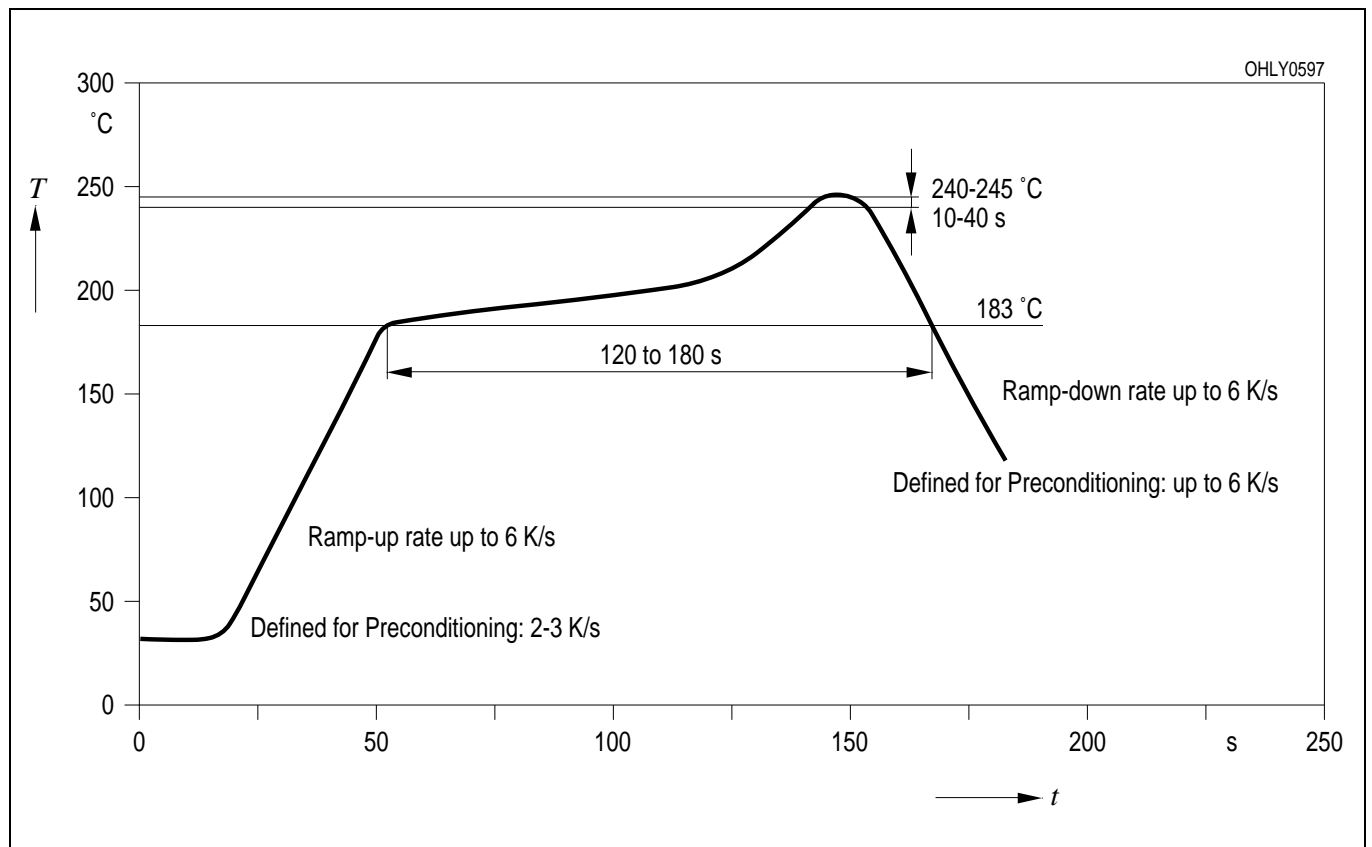


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

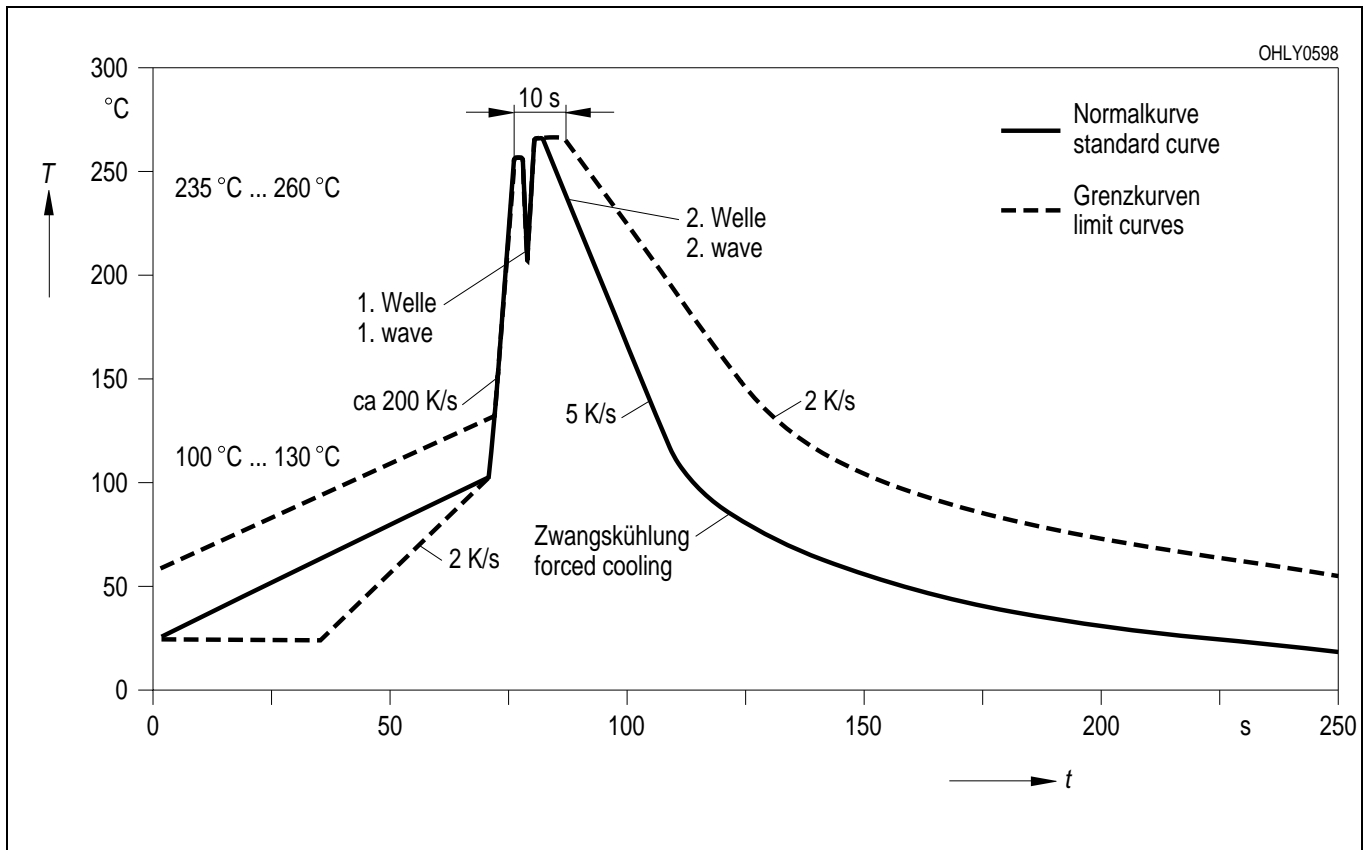
Gewicht / Approx. weight: 38 mg

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

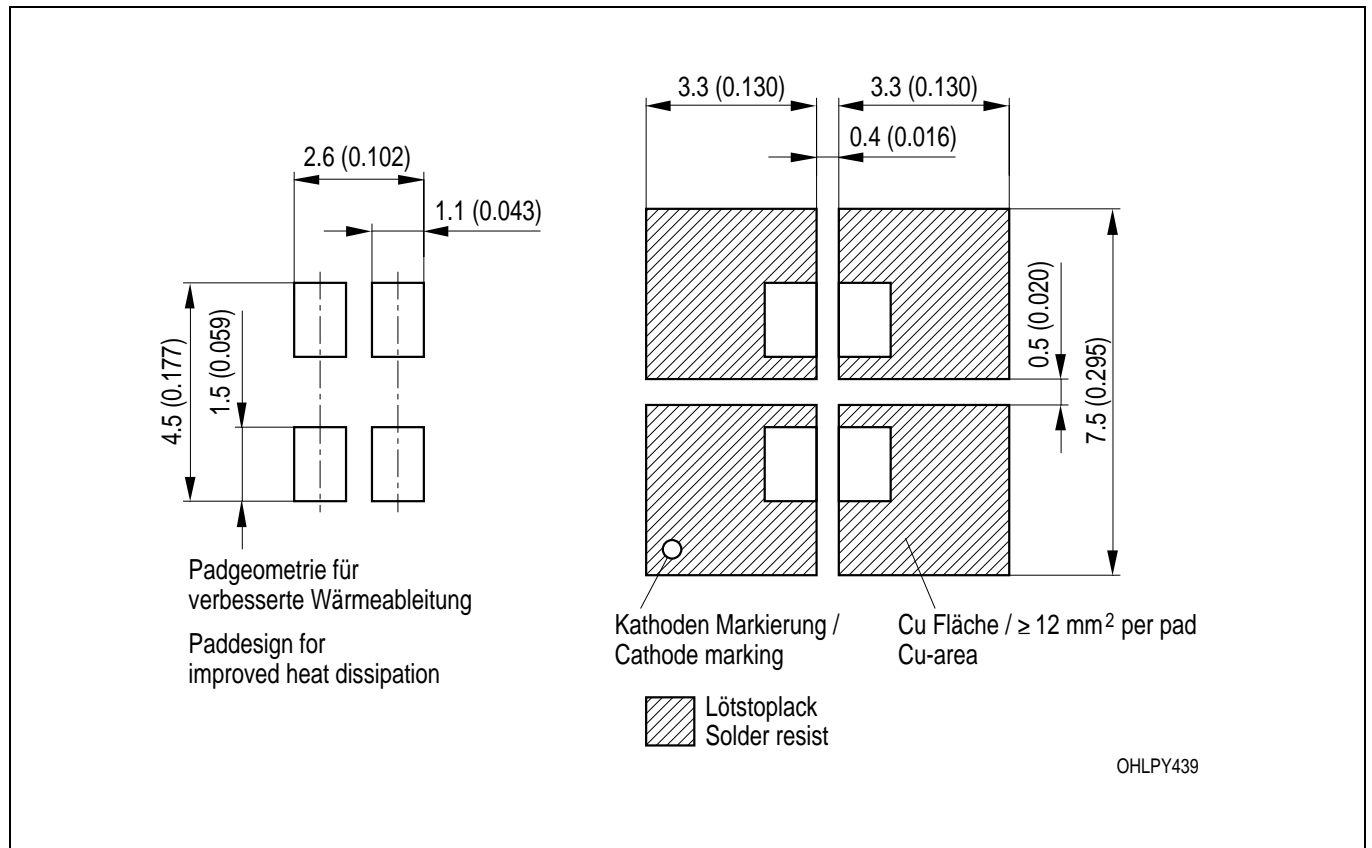
IR-Reflow Lötprofil (nach IPC 9501)
IR Reflow Soldering Profile (acc. to IPC 9501)



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

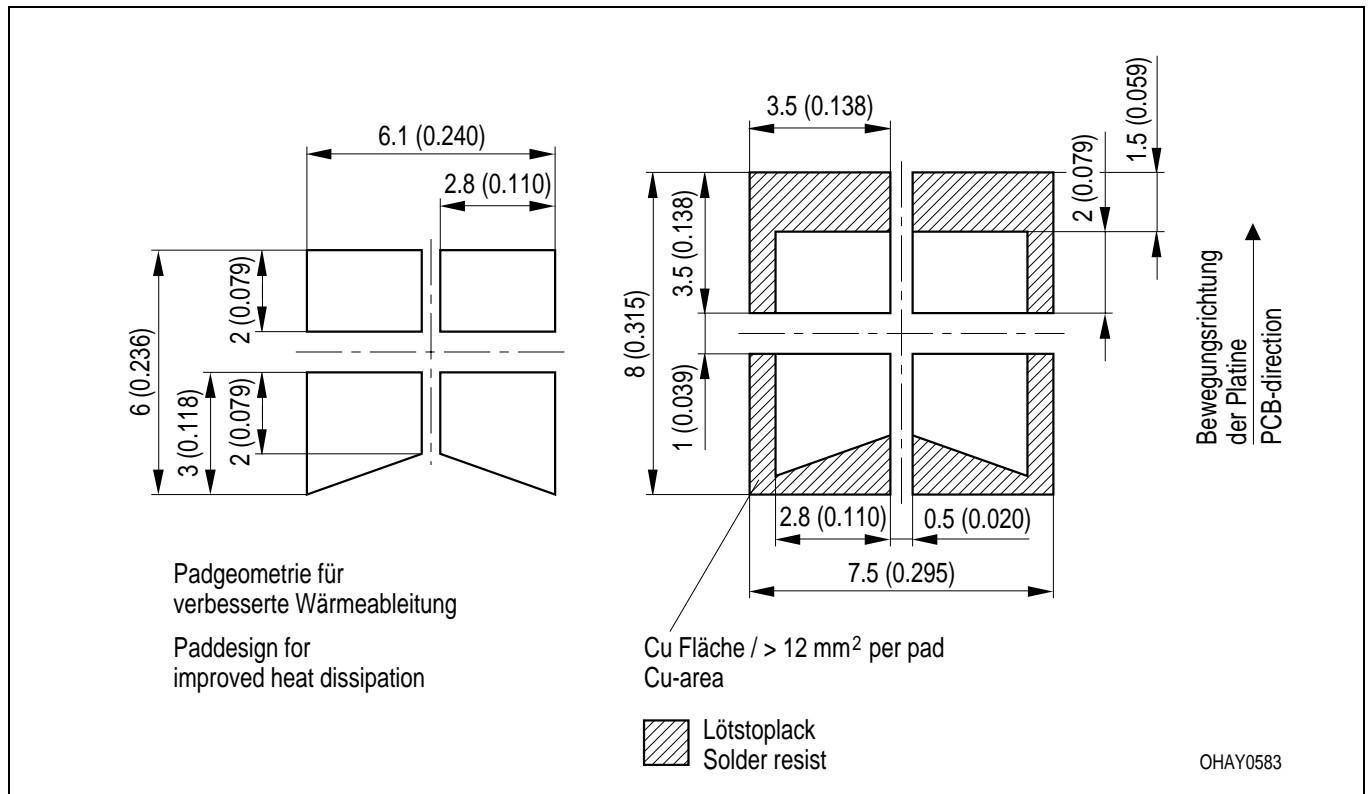


Empfohlenes Lötpad Design IR Reflow Löten
Recommended Solder Pad IR Reflow Soldering



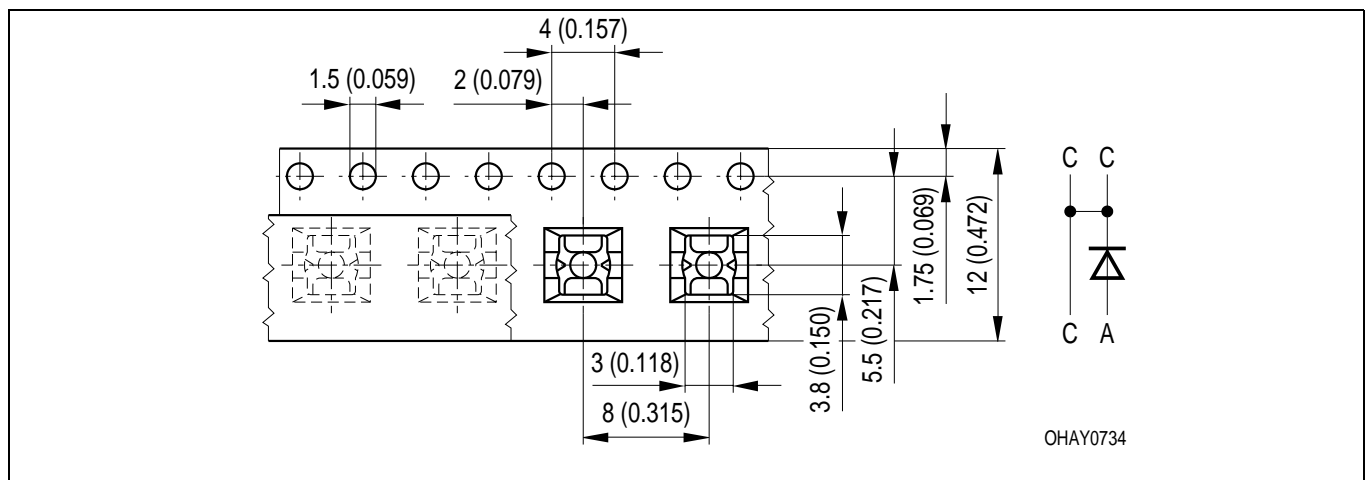
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

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, ø330 mm
Method of Taping / Polarity and Orientation Packing unit 2000/reel, ø330 mm



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

Revision History: 2001-03-05

Previous Version: 2001-03-05

| Page | Subjects (major changes since last revision) |
|------|--|
| | |
| | |

Published by OSRAM Opto Semiconductors GmbH & Co. OHG

Wernerwerkstrasse 2, D-93049 Regensburg

© All Rights Reserved.

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. 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.