

# 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:** InGaAIP
- **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:** InGaAIP
- **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 $I_F = 50 \text{ mA}$ $\Phi_V \text{ (mlm)}$	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看pad Junction/soldering point Montage auf PC-Board FR 4 (Padgröße $\geq 16 \text{ mm}^2$ ) mounted on PC board FR 4 (pad size $\geq 16 \text{ mm}^2$ )	$R_{th JA}$	300	K/W
	$R_{th JS}$	130	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 $I_F = 50\text{ mA}$	$\lambda_{\text{peak}}$	645	nm
Dominantwellenlänge <sup>1)</sup> (typ.) Dominant wavelength $I_F = 50\text{ mA}$	$\lambda_{\text{dom}}$	633 $\pm 6$	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 % $I_V$	$2\phi$	60	Grad deg.
Durchlassspannung <sup>2)</sup> (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	$\mu\text{A}$ $\mu\text{A}$
Temperaturkoeffizient von $\lambda_{\text{peak}}$ (typ.) Temperature coefficient of $\lambda_{\text{peak}}$ $I_F = 50\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	$TC_{\lambda_{\text{peak}}}$	0.15	nm/K
Temperaturkoeffizient von $\lambda_{\text{dom}}$ (typ.) Temperature coefficient of $\lambda_{\text{dom}}$ $I_F = 50\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	$TC_{\lambda_{\text{dom}}}$	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 $I_F = 50\text{ mA}$	$\eta_{\text{opt}}$	12	lm/W

<sup>1)</sup> 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  $\pm 1\text{ nm}$ .

<sup>2)</sup> Durchlassspannungsgruppen werden mit einer Stromeinprägedauer 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  $\pm 0.1\text{ V}$ .

<sup>2)</sup> 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 $\Phi_V$ (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

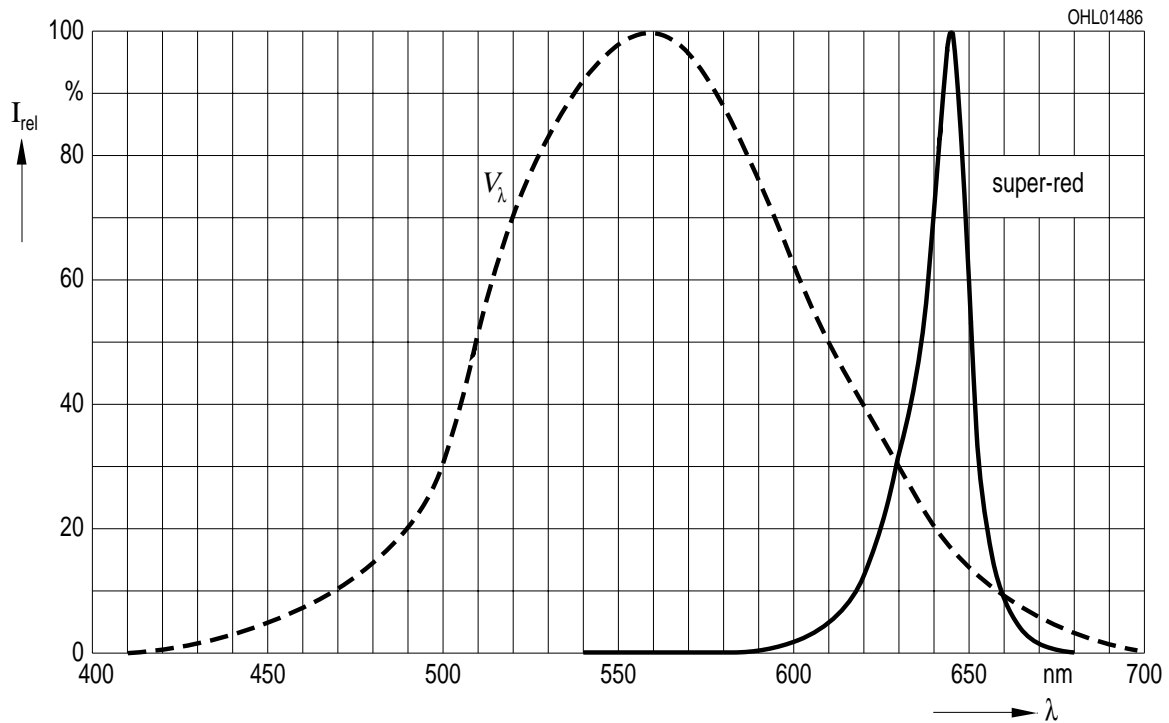
Lichtgruppe Luminous Intensity Group	Halbgruppe Half Group	Wellenlänge Wavelength	Durchlassspannung Forward Voltage
V	2	1	3

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

**Relative Spectral Emission**

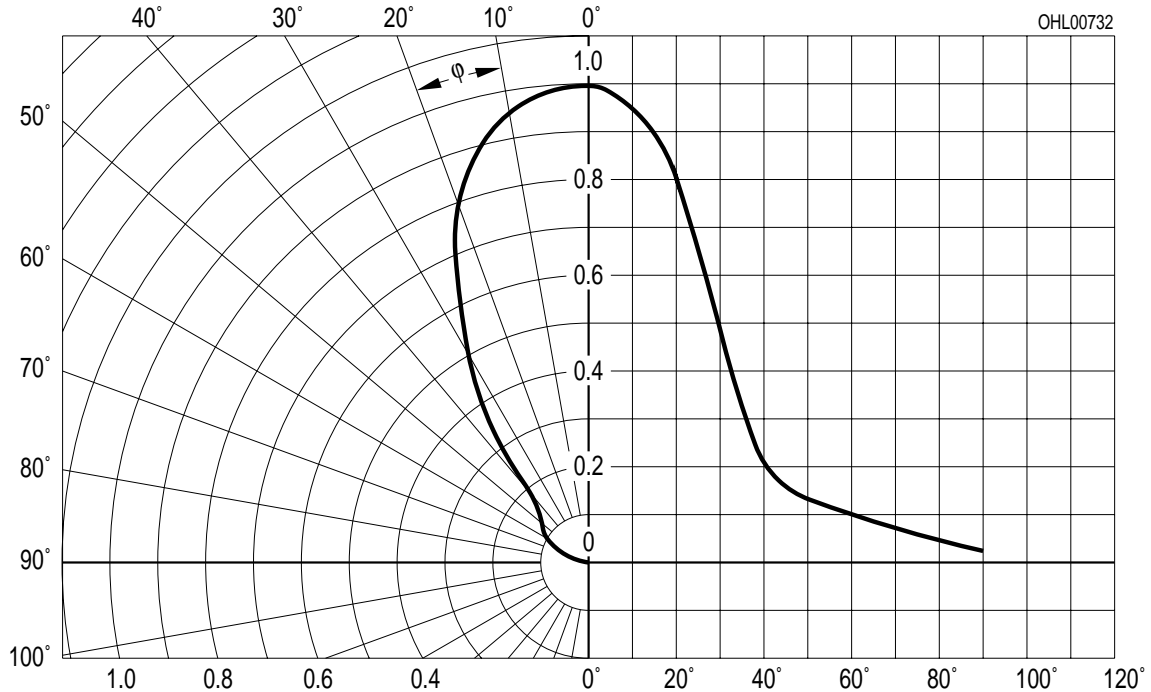
$V(\lambda)$  = spektrale Augenempfindlichkeit

Standard eye response curve



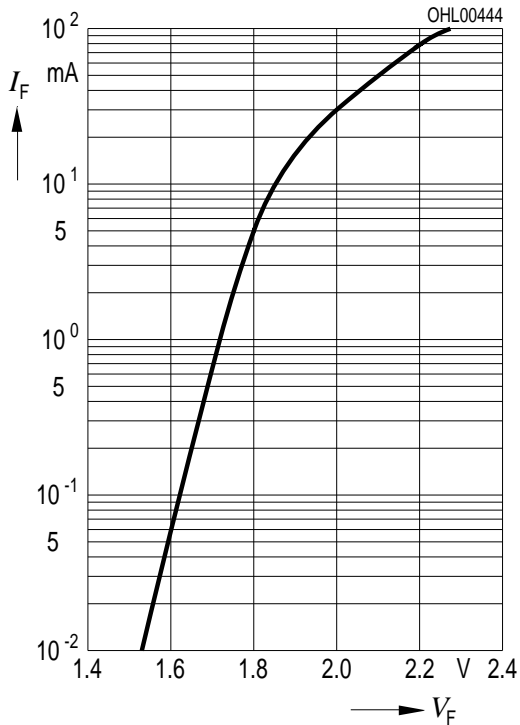
Abstrahlcharakteristik  $I_{rel} = f(\varphi)$

**Radiation Characteristic**



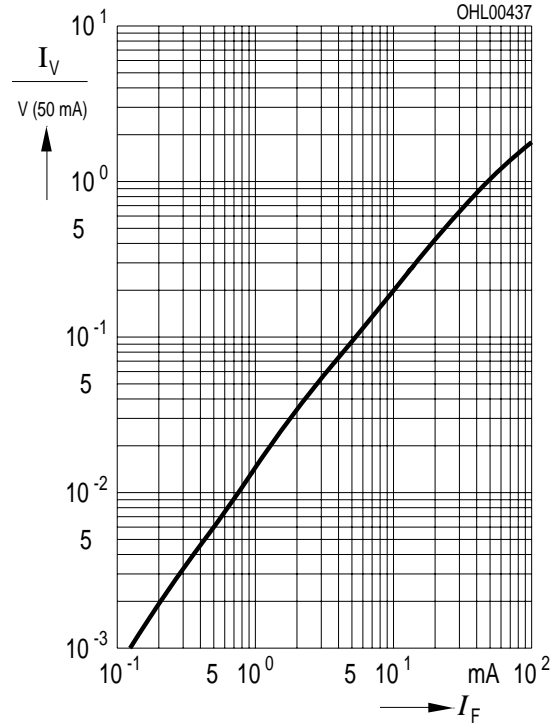
**Durchlassstrom  $I_F = f(V_F)$**   
**Forward Current**

$T_A = 25\text{ °C}$

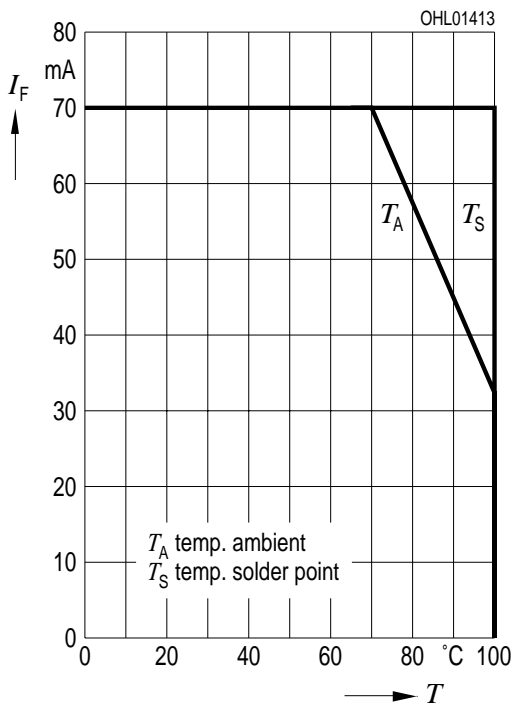


**Relative Lichtstärke  $I_V/I_{V(50\text{ mA})} = f(I_F)$**   
**Relative Luminous Intensity**

$T_A = 25\text{ °C}$

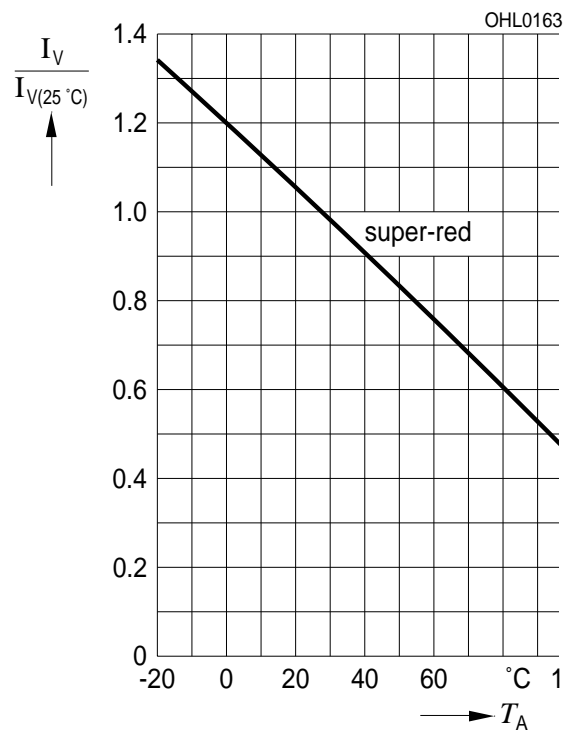


**Maximal zulässiger Durchlassstrom  $I_F = f(T)$**   
**Max. Permissible Forward Current**

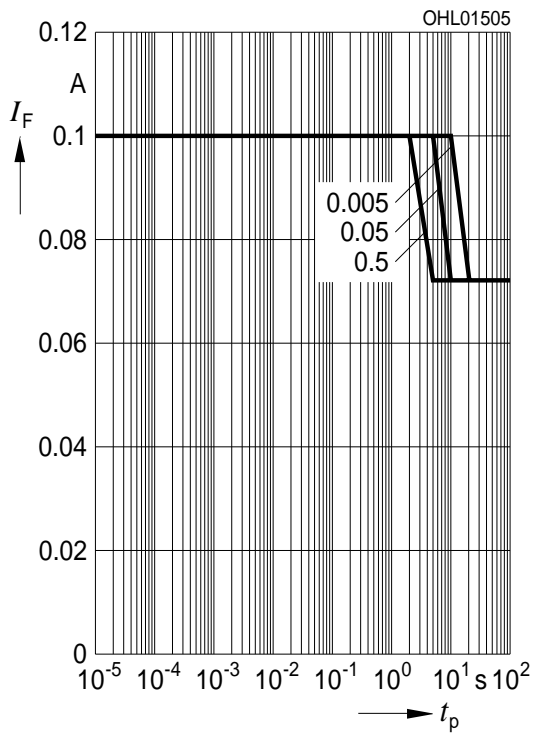


**Relative Lichtstärke  $I_V/I_{V(25\text{ °C})} = f(T_A)$**   
**Relative Luminous Intensity**

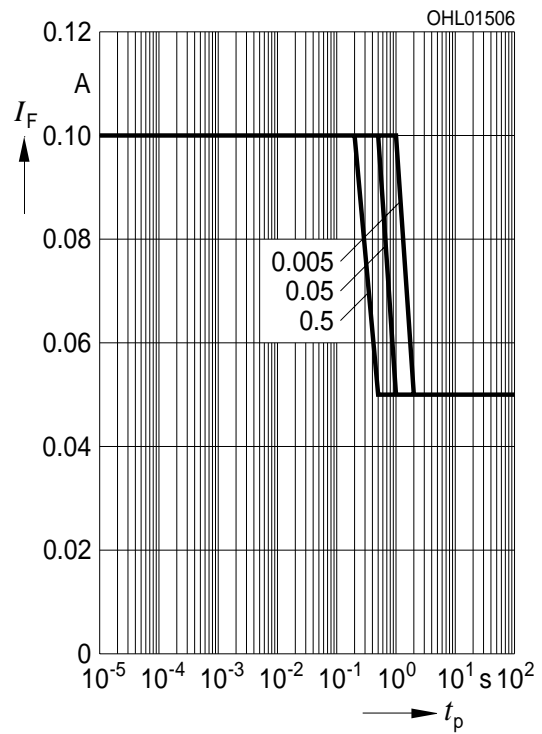
$I_F = 50\text{ mA}$



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

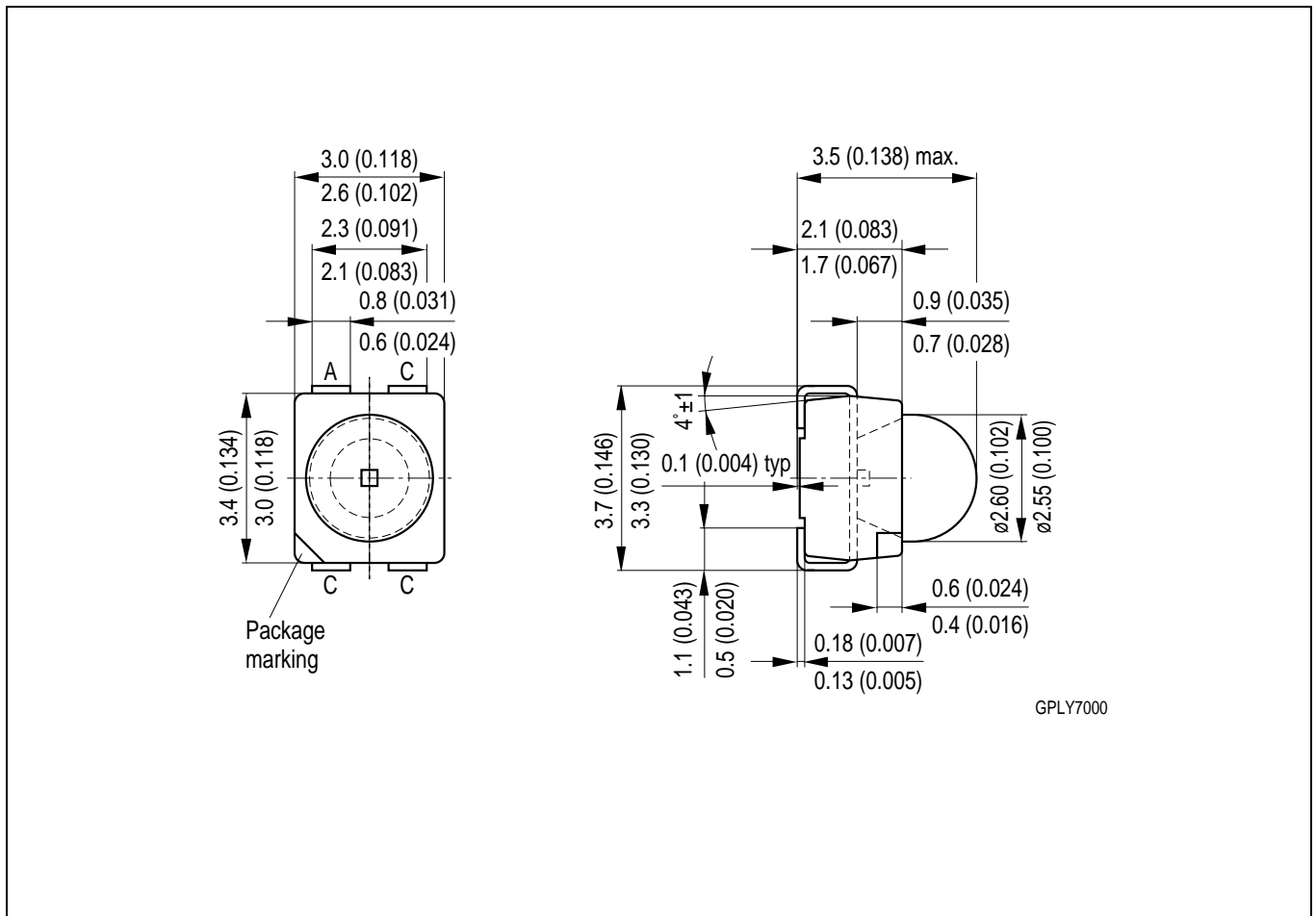


**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 85\text{ °C}$





## Maßzeichnung Package Outlines

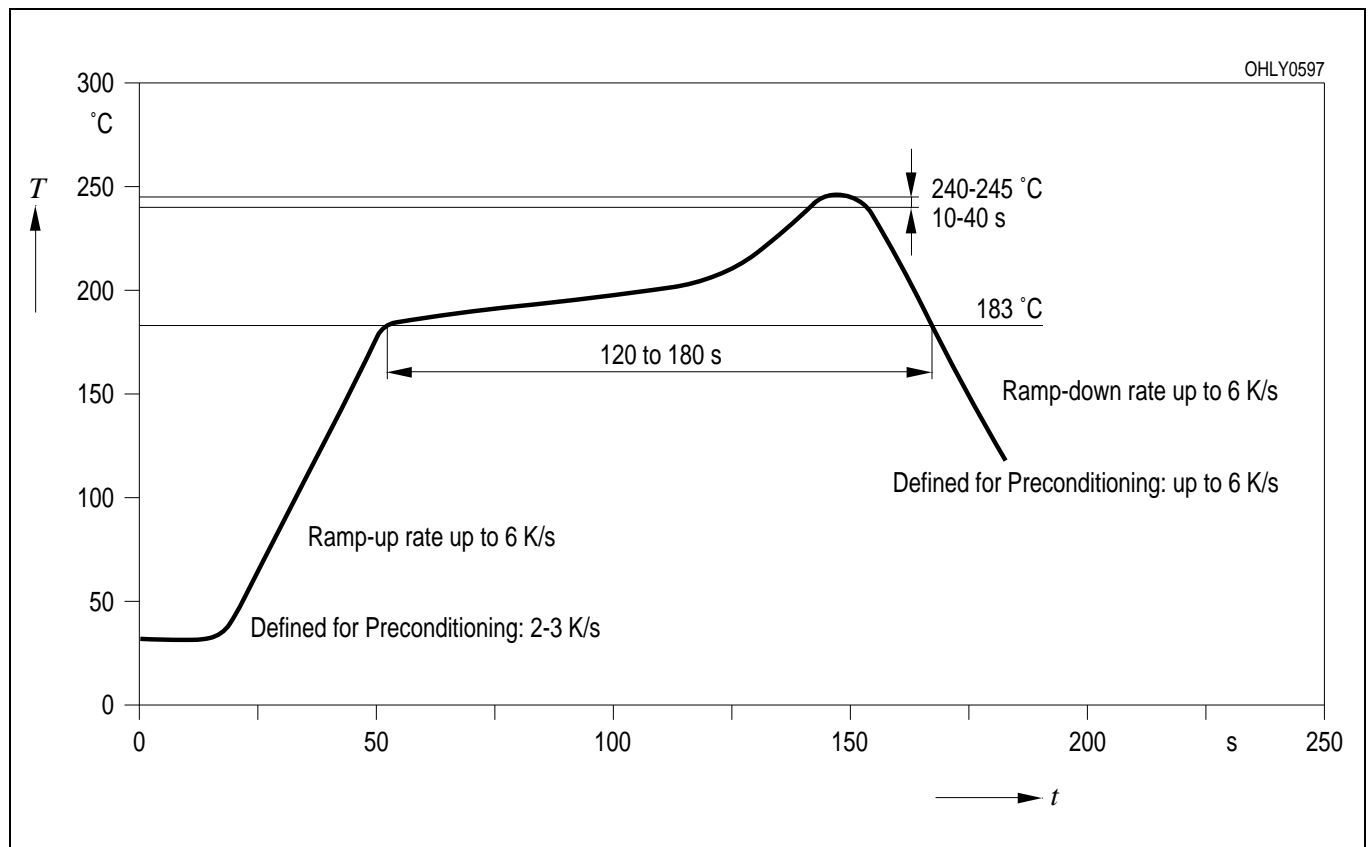


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

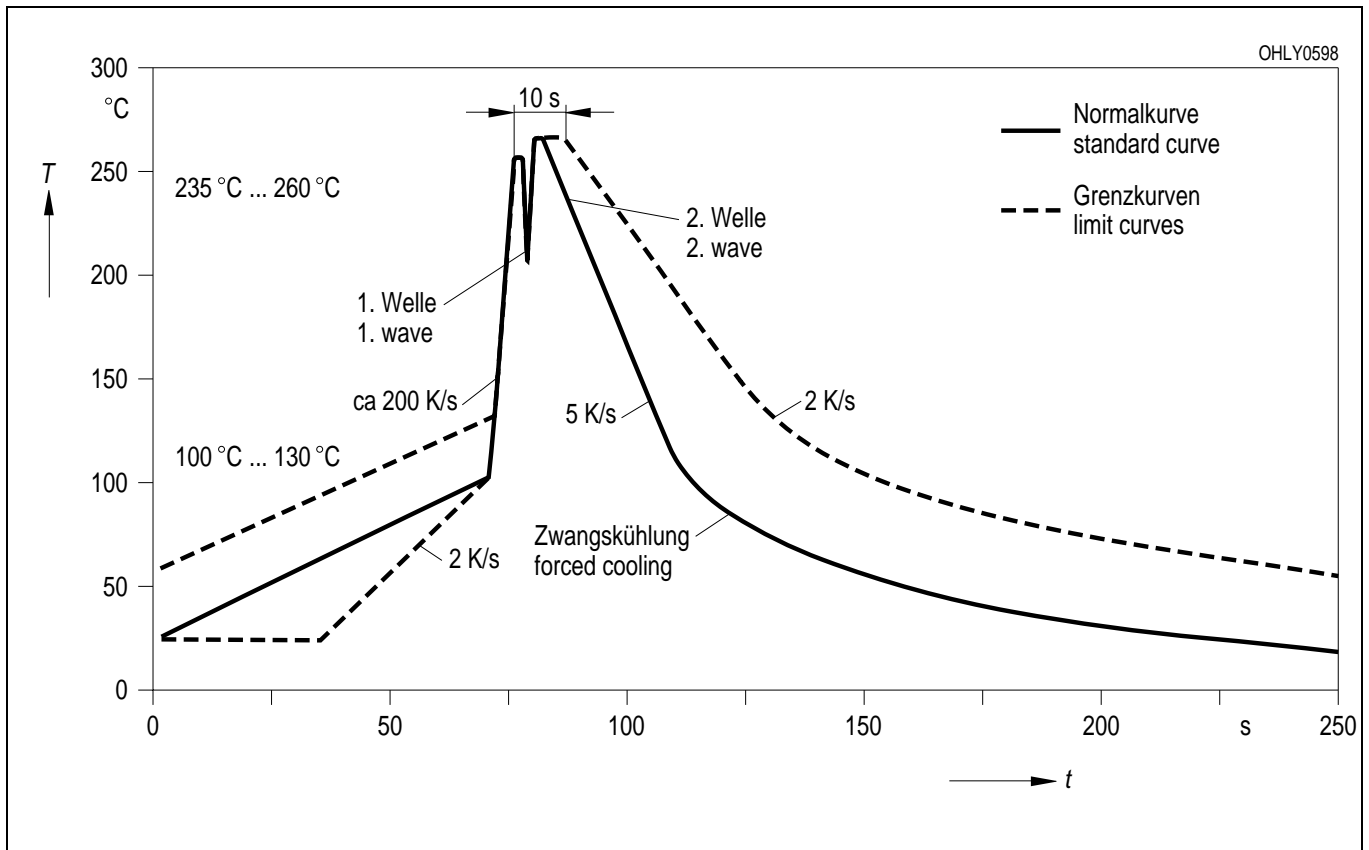
**Gewicht / Approx. weight:** 38 mg

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

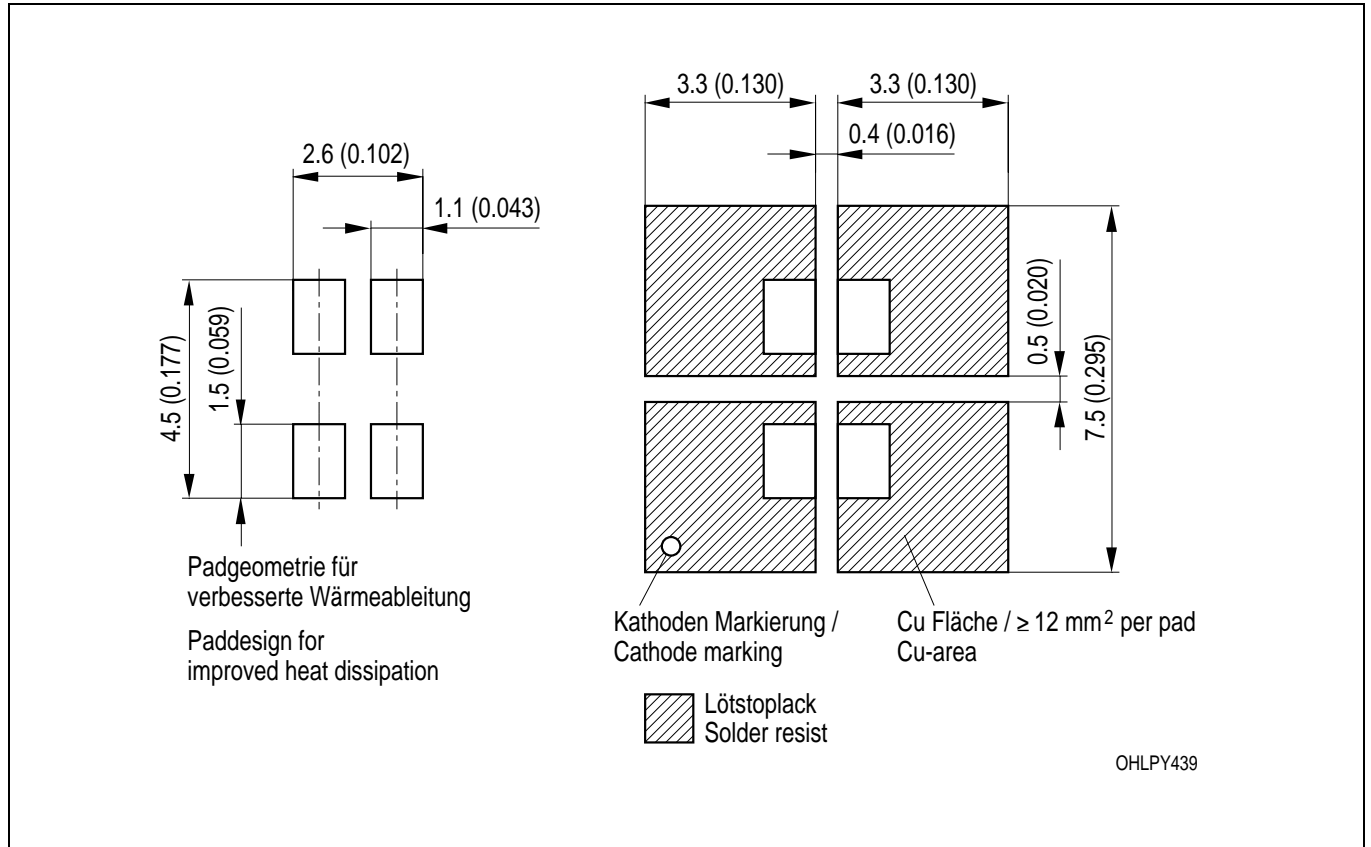
**IR-Reflow Lötprofil** (nach IPC 9501)  
**IR Reflow Soldering Profile** (acc. to IPC 9501)



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

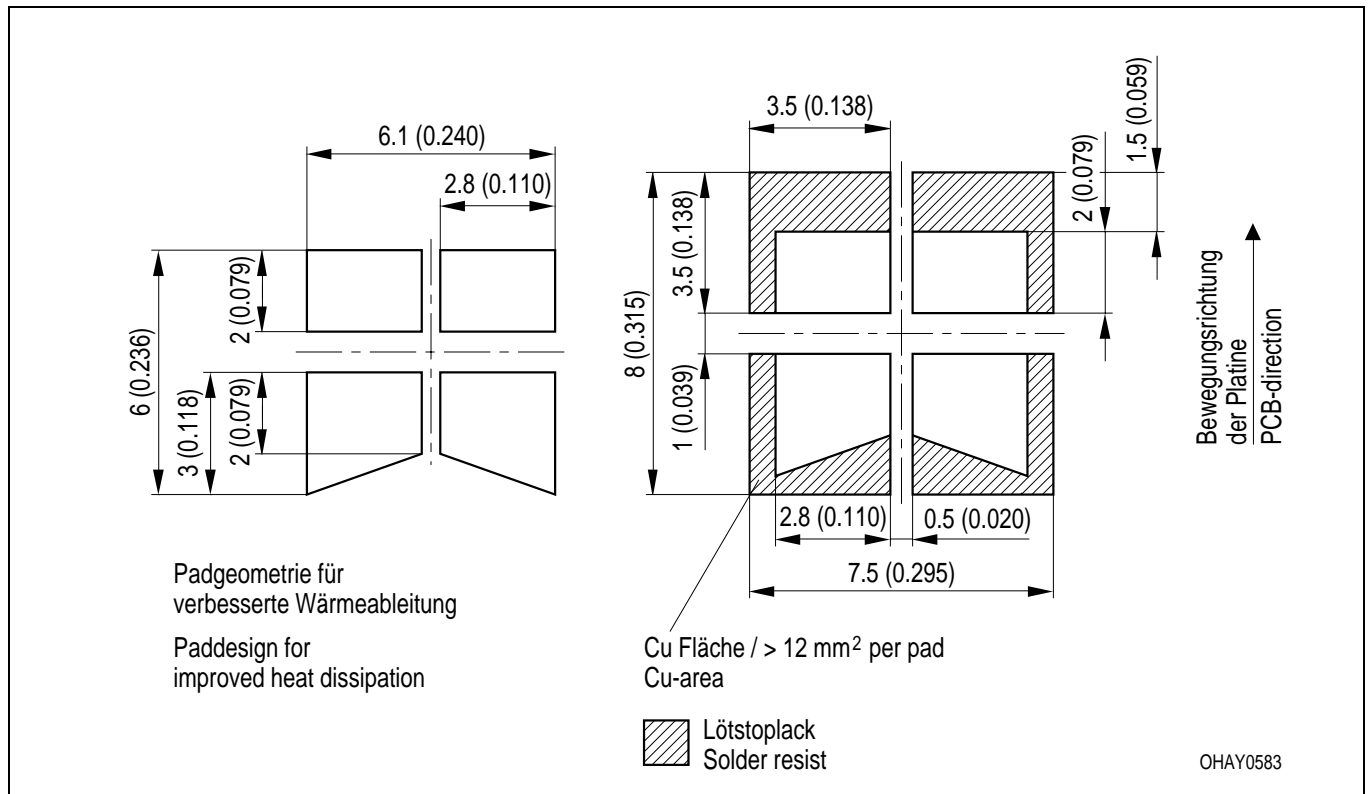


**Empfohlenes Lötpad Design** IR Reflow Löten  
**Recommended Solder Pad** IR Reflow Soldering



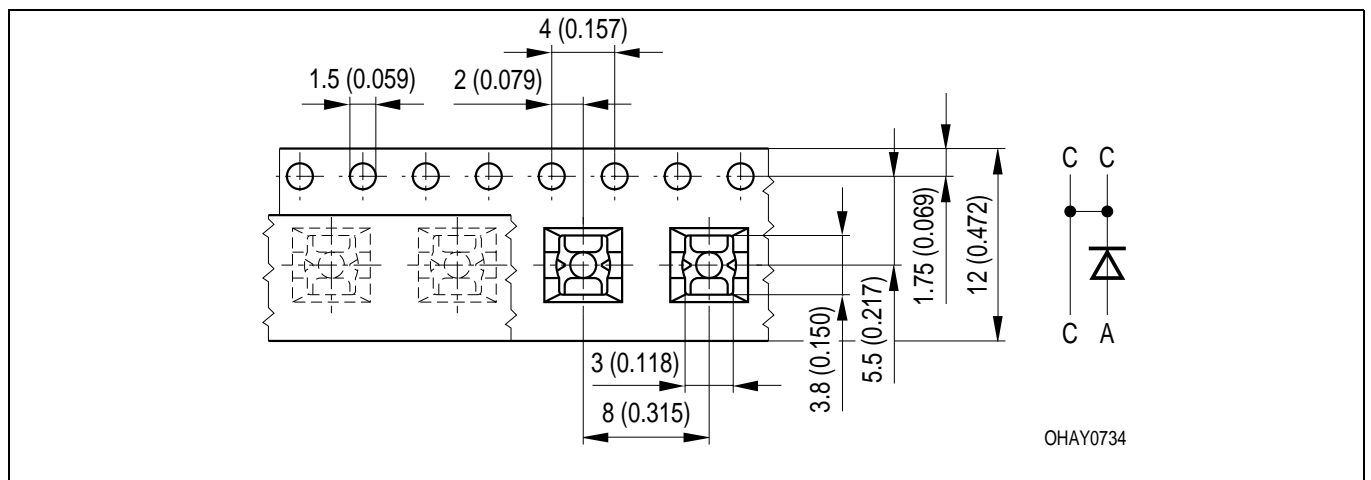
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

**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).

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**Revision History: 2001-03-05**

Previous Version: 2001-03-05

Page	Subjects (major changes since last revision)

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