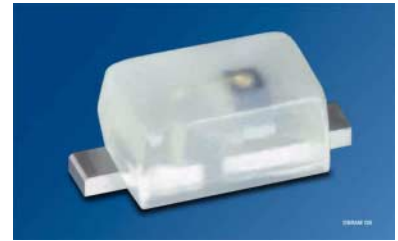


SmartLED™ Hyper-Bright LED

LB L89S



Vorläufige Daten / Preliminary Data

Besondere Merkmale

- **Gehäusetypp:** SMT Gehäuse SCD 80
- **Besonderheit des Bauteils:** kleinste Bauform 1,7 x 0,8 x 0,65 mm (LxBxH)
- **Wellenlänge:** 470 nm (blau)
- **Abstrahlwinkel:** 160°
- **Technologie:** InGaN
- **optischer Wirkungsgrad:** 2 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 10000/Rolle, ø180 mm oder 40000/Rolle, ø330 mm
- **ESD-Festigkeit:** ESD-sicher bis 2 kV nach EOS/ESD-5.1-1993

Anwendungen

- flache Hinterleuchtung (LCD, Mobile Phone, Schalter, Display)
- Spielsachen
- Informationsanzeigen im Aussenbereich
- Signal- und Symbolleuchten
- Markierungsbeleuchtung (Stufen, Fluchtwege u. ä.)

Features

- **package:** SMT package SCD 80
- **feature of the device:** smallest package 1.7 x 0.8 x 0.65 mm (LxWxH)
- **wavelength:** 470 nm (blue)
- **viewing angle:** 160°
- **technology:** InGaN
- **optical efficiency:** 2 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 10000/reel, ø180 mm or 40000/reel, ø330 mm
- **ESD-withstand voltage:** up to 2 kV acc. to EOS/ESD-5.1-1993

Applications

- flat backlighting (LCD, cellular phones, switches, displays)
- toys
- outdoor displays
- signal and symbol luminary
- marker lights (e.g. steps, exit ways, etc.)

Typ Type	Emissions- farbe Color of Emission	Gehäusefarbe Color of Package	Lichtstärke Luminous Intensity $I_F = 10 \text{ mA}$ $I_V \text{ (mcd)}$	Lichtstrom Luminous Flux $I_F = 10 \text{ mA}$ $\Phi_V \text{ (lm)}$	Bestellnummer Ordering Code
LB L89S-K1L1-1 LB L89S-L1M2-1	blue	colorless diffused	7.1 ... 14.0 11.2 ... 28.0	40 (typ.) 80 (typ.)	Q62703-Q5993 Q62703-Q6159

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 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	I_F	15	mA
Stoßstrom Surge current $t = 10 \mu s, D = 0.1$	I_{FM}	100	mA
Sperrspannung Reverse voltage	V_R	5	V
Leistungsaufnahme Power consumption	P_{tot}	60	mW
Wärmewiderstand Thermal resistance Sperrschicht/Umgebung Junction/ambient	$R_{th JA}$	450	K/W
Sperrschicht/Löt看 Junction/solder point Montage auf PC-Board FR 4 (Padgröße $\geq 16 \text{ mm}^2$) mounted on PC board FR 4 (pad size $\geq 16 \text{ mm}^2$)	$R_{th JS}$	260	K/W

Kennwerte ($T_A = 25\text{ °C}$)

Characteristics

Bezeichnung Parameter	Symbol Symbol	Werte Values	Einheit Unit
Wellenlänge des emittierten Lichtes Wavelength at peak emission $I_F = 10\text{ mA}$	(typ.) λ_{peak}	465	nm
Dominantwellenlänge ¹⁾ Dominant wavelength $I_F = 10\text{ mA}$	(typ.) λ_{dom}	470 ± 6	nm
Spektrale Bandbreite bei 50 % $I_{\text{rel max}}$ Spectral bandwidth at 50 % $I_{\text{rel max}}$ $I_F = 10\text{ mA}$	(typ.) $\Delta\lambda$	25	nm
Abstrahlwinkel bei 50 % I_V (Vollwinkel) Viewing angle at 50 % I_V	(typ.) 2ϕ	160	Grad deg.
Durchlassspannung ²⁾ Forward voltage $I_F = 10\text{ mA}$	(typ.) V_F (max.) V_F	3.4 3.8	V V
Sperrstrom Reverse current $V_R = 5\text{ V}$	(typ.) I_R (max.) I_R	0.01 10	μA μA
Temperaturkoeffizient von λ_{peak} Temperature coefficient of λ_{peak} $I_F = 10\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	(typ.) $TC_{\lambda_{\text{peak}}}$	0.04	nm/K
Temperaturkoeffizient von λ_{dom} Temperature coefficient of λ_{dom} $I_F = 10\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	(typ.) $TC_{\lambda_{\text{dom}}}$	0.02	nm/K
Temperaturkoeffizient von V_F Temperature coefficient of V_F $I_F = 10\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	(typ.) TC_V	-2.9	mV/K
Optischer Wirkungsgrad Optical efficiency $I_F = 10\text{ mA}$	(typ.) η_{opt}	2	lm/W

¹⁾ 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 $\pm 1\text{ nm}$.

²⁾ Spannungswerte werden mit einer Stromeinprägungsdauer 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 Group	Wellenlänge Wavelength		Einheit Unit
	min.	max.	
3	464	468	nm
4	468	472	nm
5	472	476	nm

Helligkeits-Gruppierungsschema

Luminous Intensity Groups

Lichtgruppe Luminous Intensity Group	Lichtstärke Luminous Intensity I_V (mcd)	Lichtstrom Luminous Flux Φ_V (mlm)
K1	7.1 ... 9.0	32 (typ.)
K2	9.0 ... 11.2	40(typ.)
L1	11.2 ... 14.0	50(typ.)
L2	14.0 ... 18.0	64(typ.)
M1	18.0 ... 22.4	80(typ.)
M2	22.4 ... 28.0	100(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: L1-3

Example: L1-3

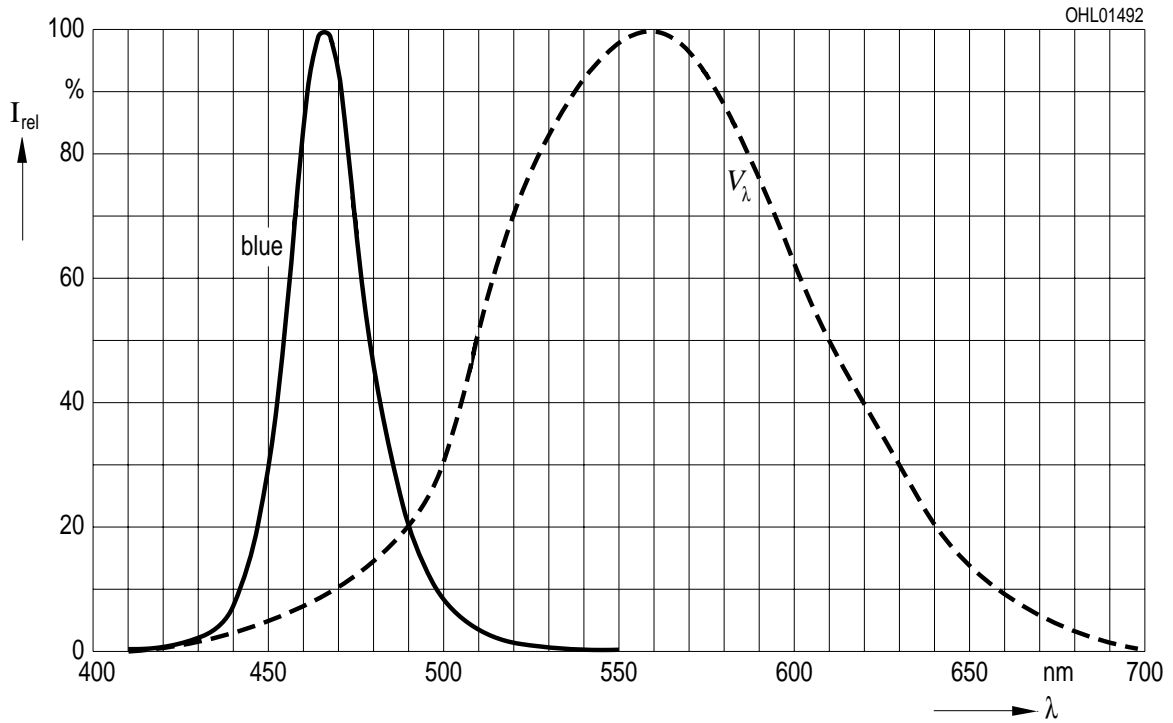
Lichtgruppe Luminous Intensity Group	Halbgruppe Half Group	Wellenlänge Wavelength
L	1	3

Relative spektrale Emission $I_{rel} = f(\lambda)$, $T_A = 25\text{ °C}$, $I_F = 10\text{ mA}$

Relative Spectral Emission

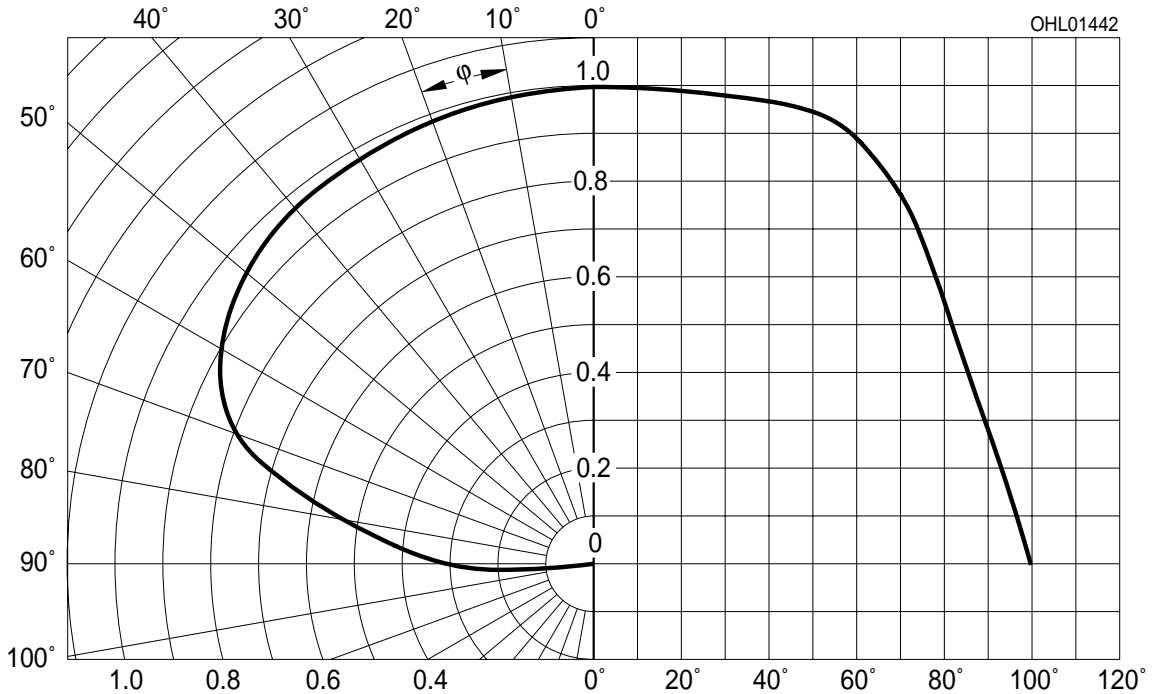
$V(\lambda)$ = spektrale Augenempfindlichkeit

Standard eye response curve



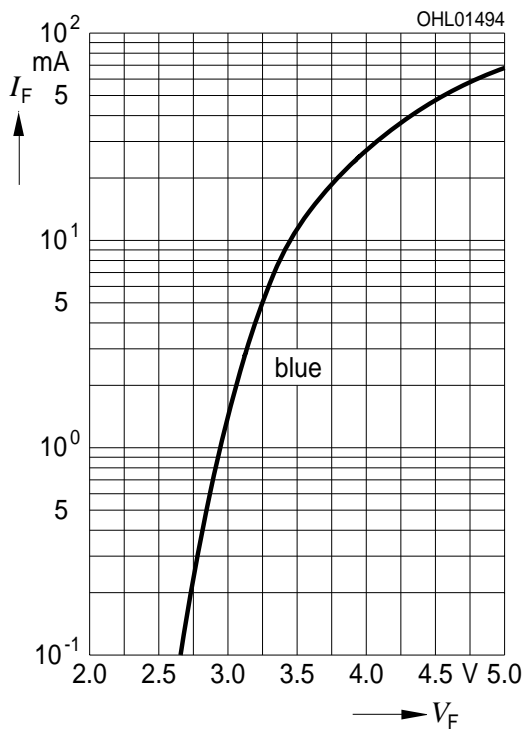
Abstrahlcharakteristik $I_{rel} = f(\varphi)$

Radiation Characteristic



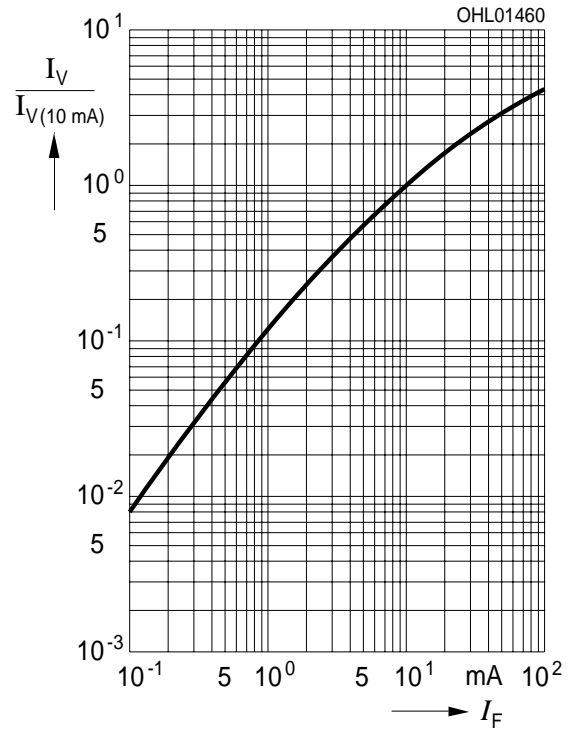
Durchlassstrom $I_F = f(V_F)$
Forward Current

$T_A = 25\text{ °C}$



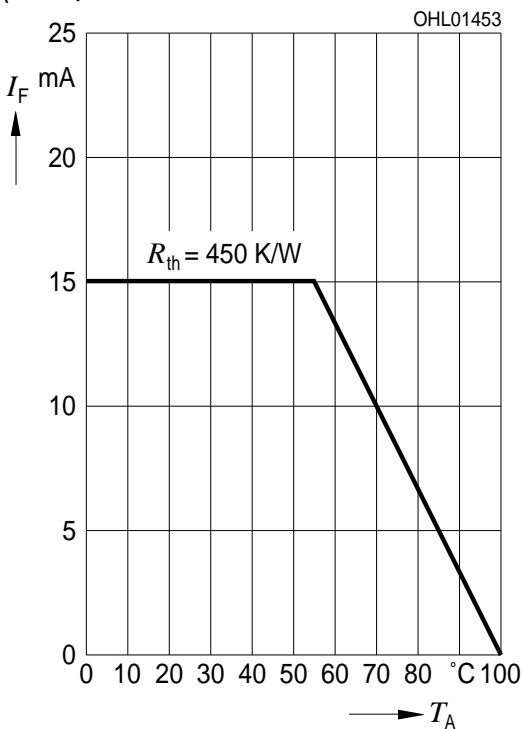
Relative Lichtstärke $I_V/I_{V(10\text{ mA})} = f(I_F)$
Relative Luminous Intensity

$T_A = 25\text{ °C}$



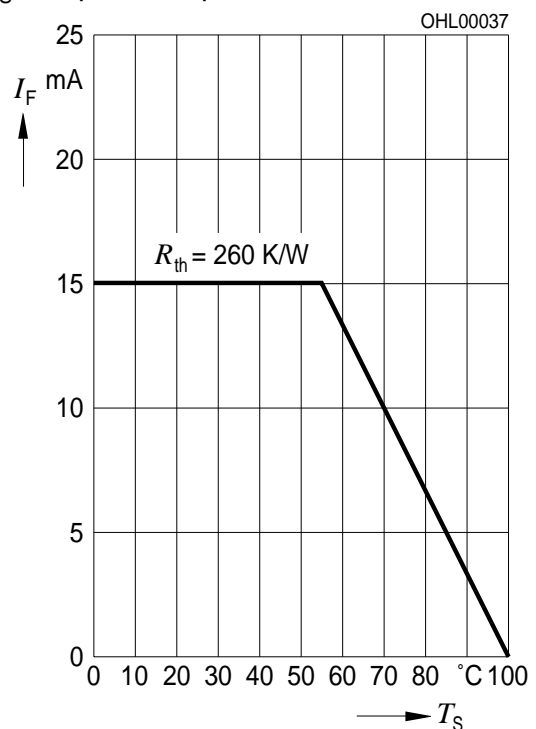
Maximal zulässiger Durchlassstrom $I_F = f(T_A)$
Max. Permissible Forward Current

T_A : temp. ambient



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

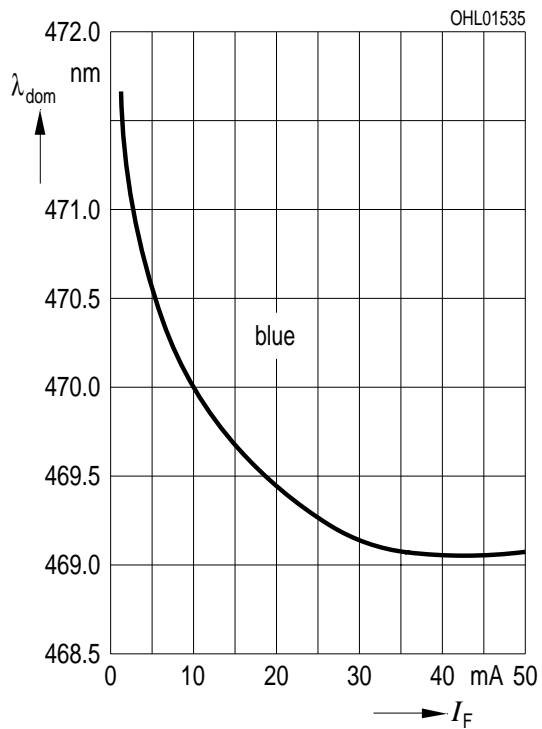
T_S : temp. solder point



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

Dominant wavelength

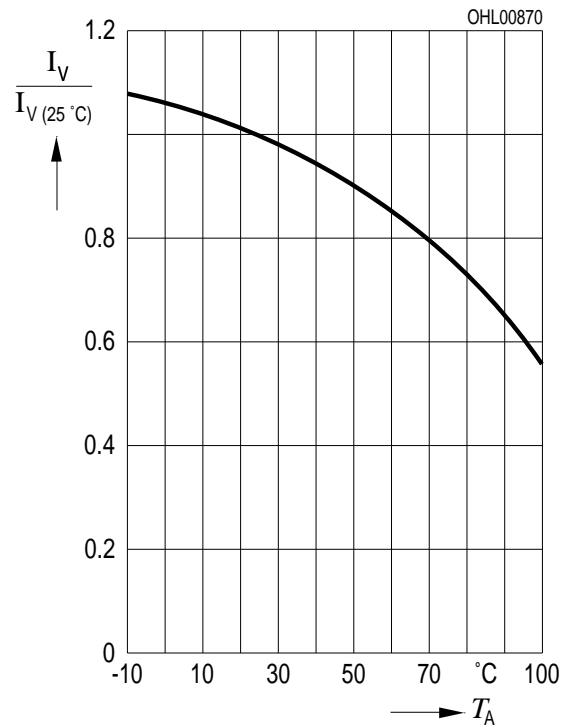
LB, $T_A = 25\text{ °C}$

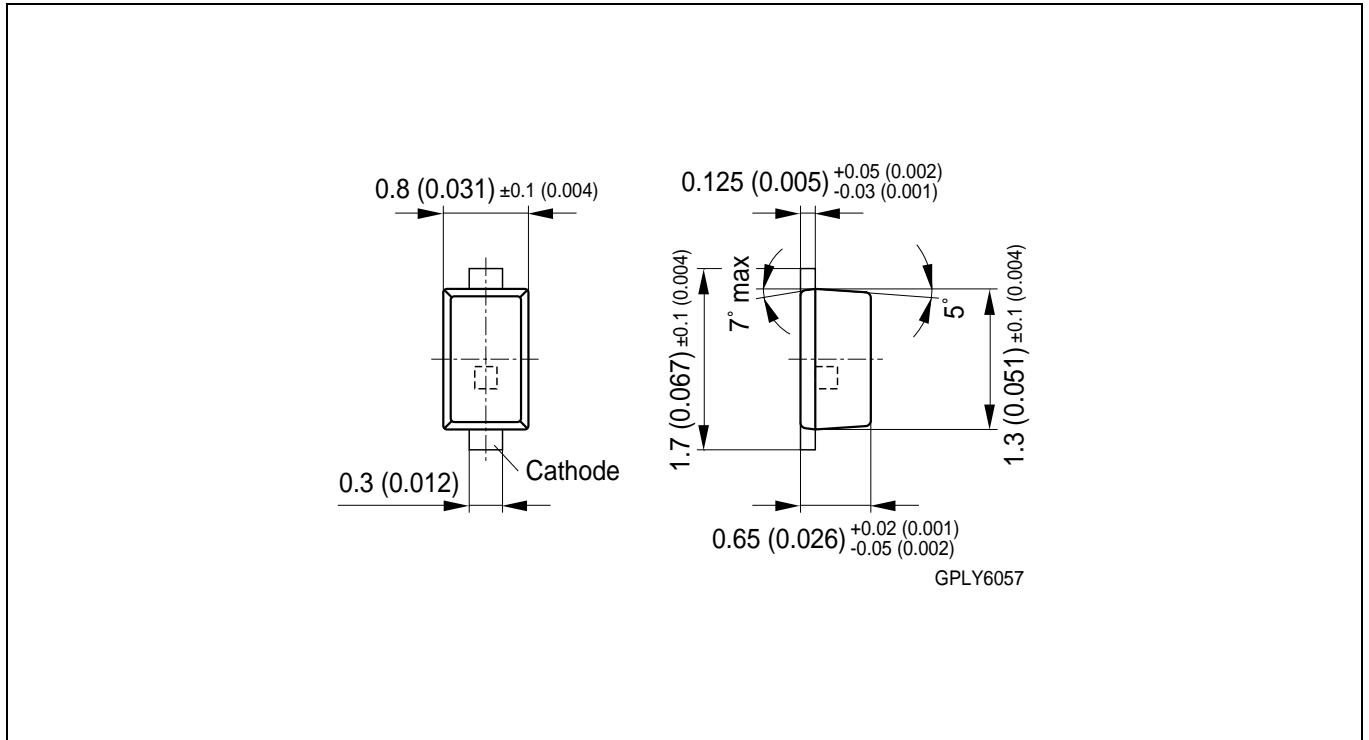


Relative Lichtstärke $I_V/I_{V(25\text{ °C})} = f(T_A)$

Relative Luminous Intensity

$I_F = 10\text{ mA}$



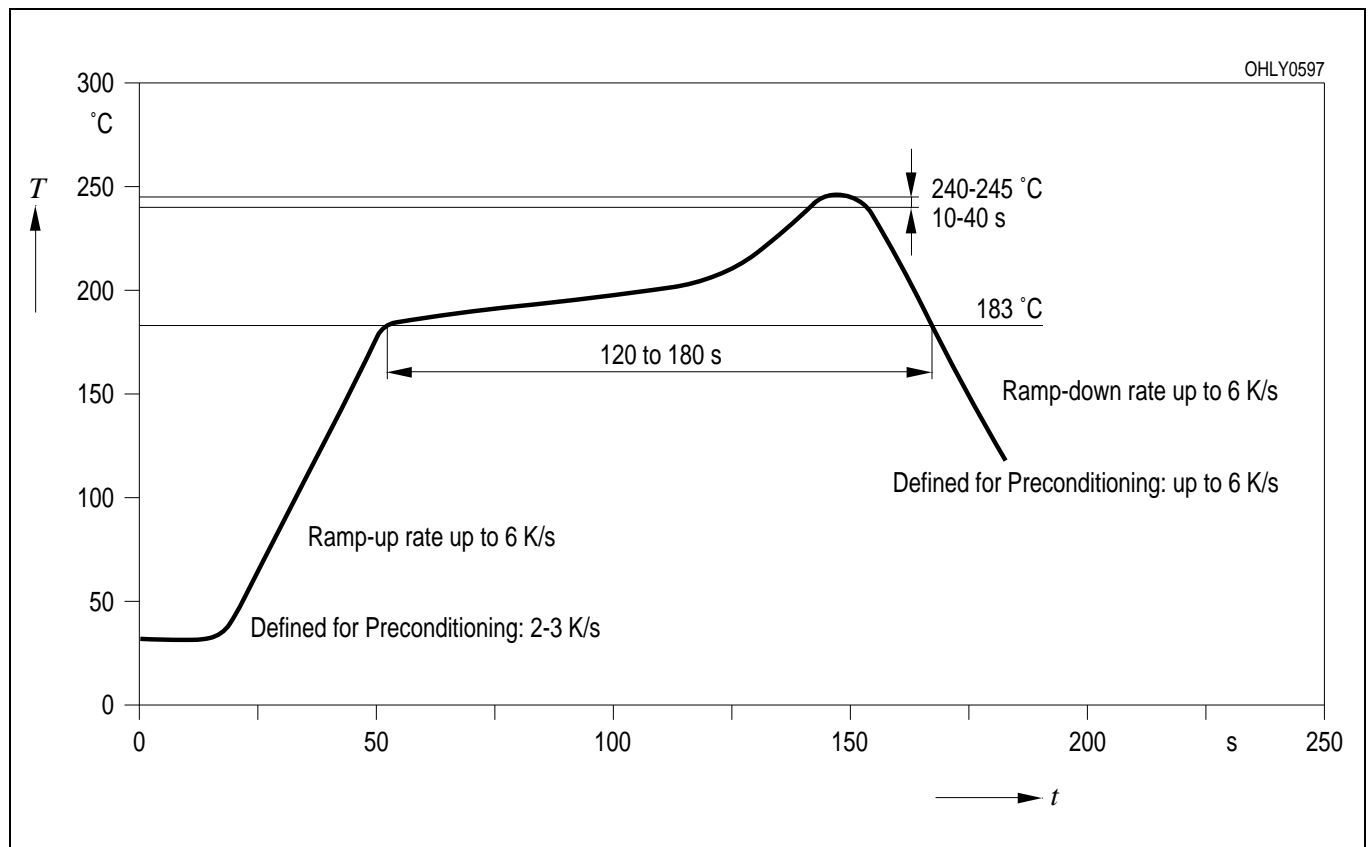
**Maßzeichnung
Package Outlines**

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

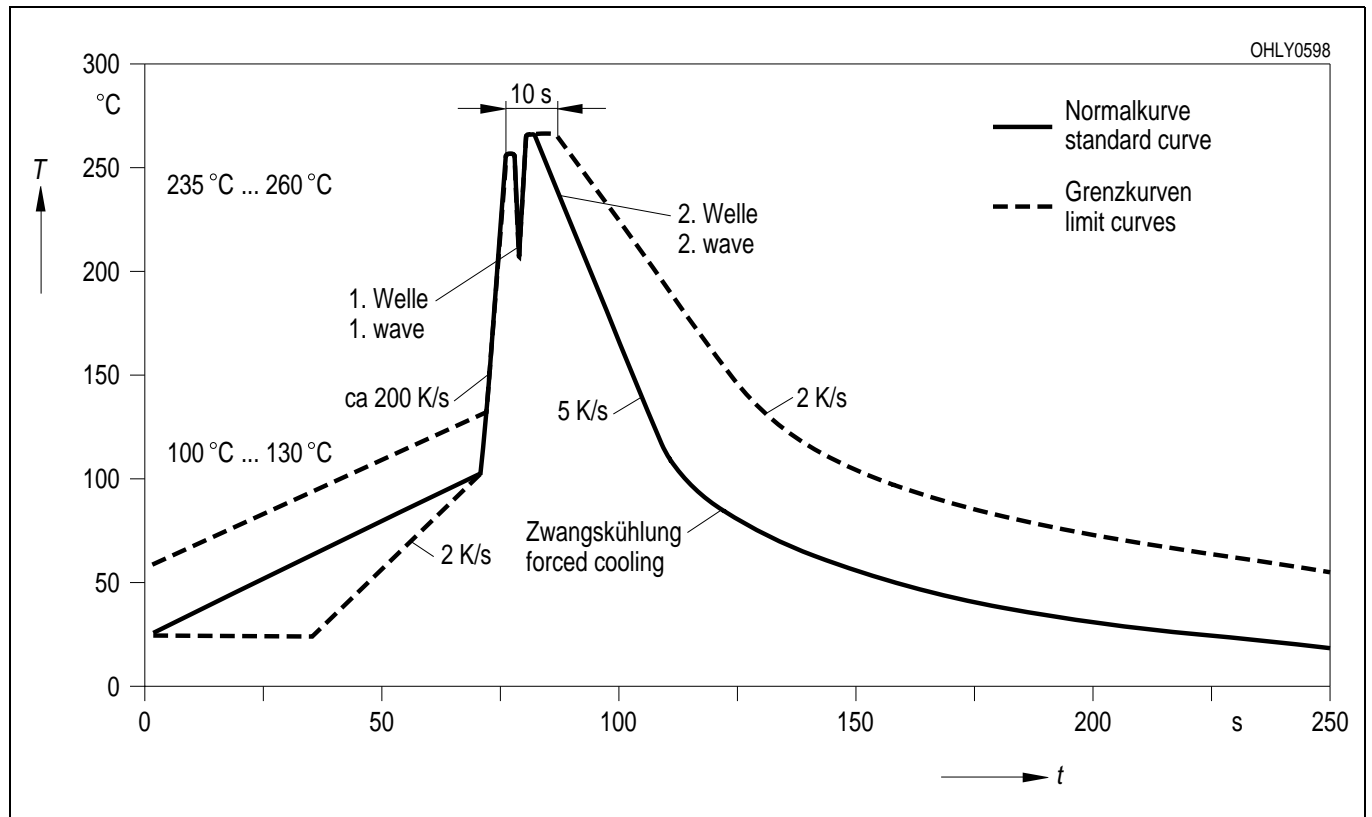
Gewicht / Approx. weight: 1,4 mg

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

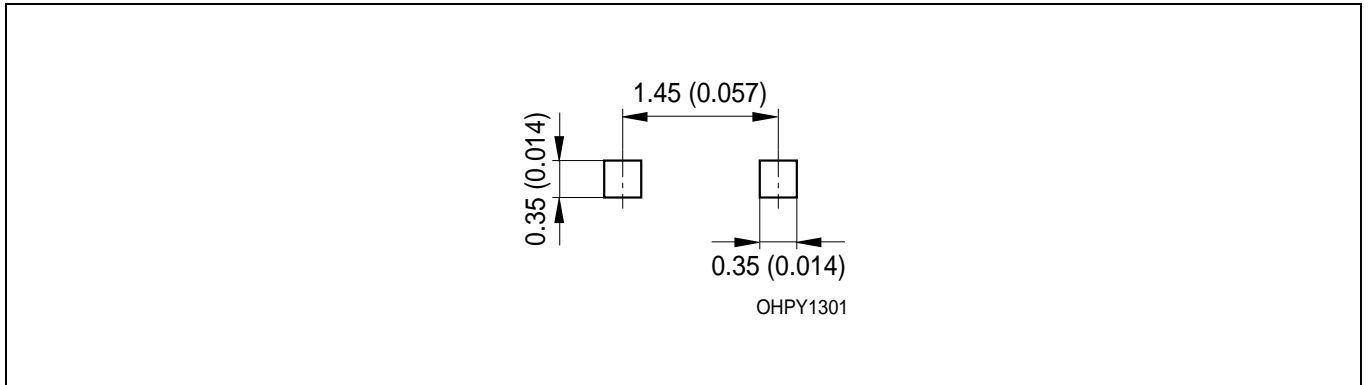
IR-Reflow Lötprofil (nach CECC 00802)
IR Reflow Soldering Profile (acc. to CECC 00802)



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

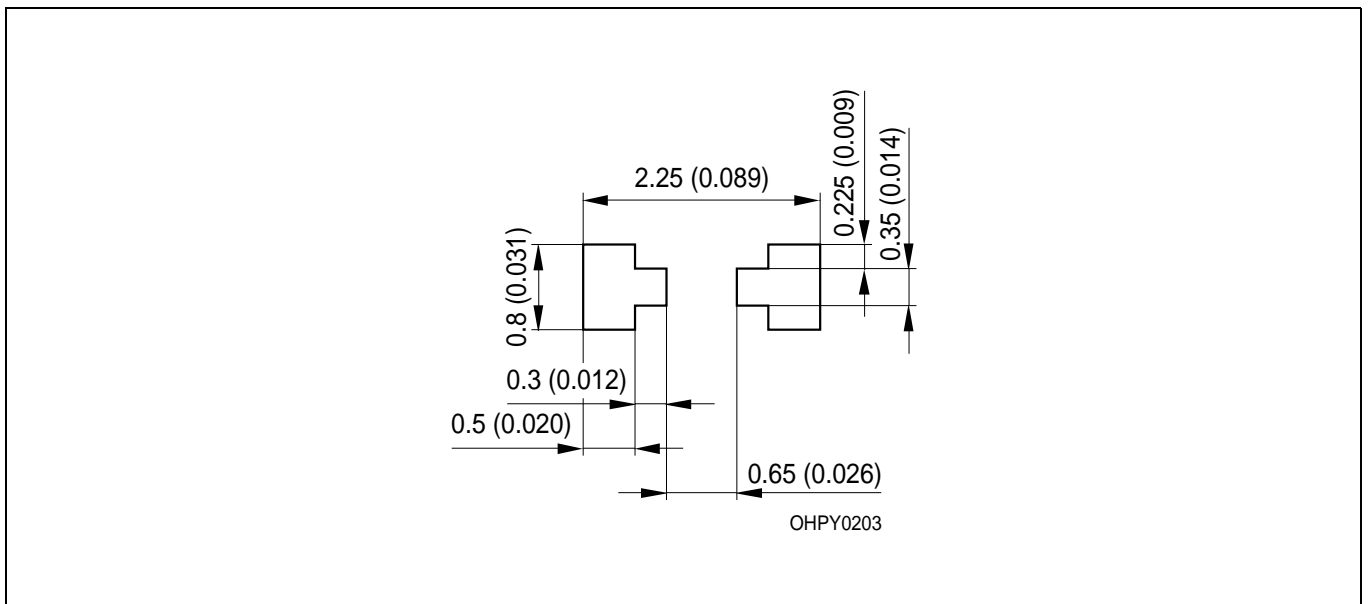


Empfohlenes Lötpad Design IR Reflow Lötén
Recommended Solder Pad IR Reflow Soldering



Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).
 Gehäuse für Wellenlötén (TTW) geeignet / Package suitable for TTW-soldering

Empfohlenes Lötpad Design verwendbar für SmartLED™ und Chipléd - Bauform 0603
 IR Reflow Lötén
Recommended Solder Pad useable for SmartLED™ and Chipléd - Package 0603
 IR Reflow Soldering



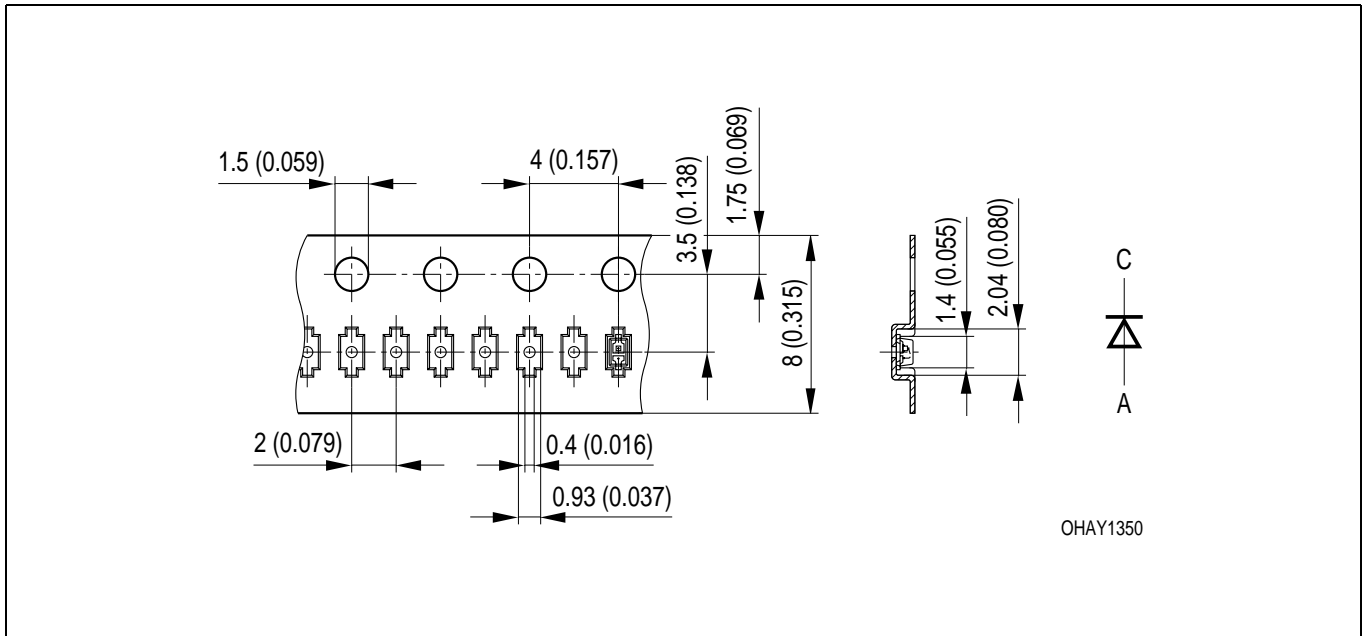
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).
 Empfohlene Lötpastendicke: 120 µm / recommended thickness of solder paste: 120 µm
 Gehäuse für Wellenlötén (TTW) geeignet / Package suitable for TTW-soldering

Gurtung / Polarität und Lage

Verpackungseinheit 8 mm Gurt mit 10000/Rolle,
 ø180 mm oder 40000/Rolle, ø330 mm

Method of Taping / Polarity and Orientation

Packing unit 8 mm tape with 10000/reel, ø180 mm
 or 40000/reel, ø330 mm



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

Revision History: 2001-11-30

Previous Version: 2001-03-07

Page	Subjects (major changes since last revision)
2	changed resin from colorless clear to colorless diffused
1	taping changed from 5000 to 10000/reel, ø180 mm and from 20000 to 40000/reel, ø330 mm
12	recommended solder pad

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