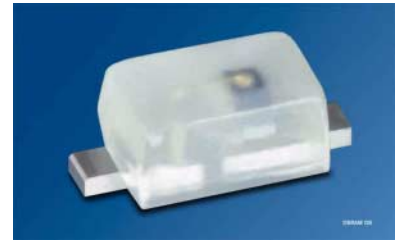


SmartLED™ Enhanced Optical Power LED (ATON®)

LB L89C



Vorläufige Daten / Preliminary Data

Besondere Merkmale

- **Gehäusotyp:** SMT Gehäuse SCD 80
- **Besonderheit des Bauteils:** kleinste Bauform 1,7 x 0,8 x 0,65 mm (LxBxH); mehr Licht durch erhöhten optischen Wirkungsgrad
- **Wellenlänge:** 470 nm (blau)
- **Abstrahlwinkel:** horizontal 160°, vertikal 130°
- **Technologie:** InGaN
- **optischer Wirkungsgrad:** 3 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); more light due to higher optical efficiency
- **wavelength:** 470 nm (blue)
- **viewing angle:** horizontal 160°, vertical 130°
- **technology:** InGaN
- **optical efficiency:** 3 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 $I_F = 20 \text{ mA}$ $I_V \text{ (mcd)}$	Lichtstrom Luminous Flux $I_F = 20 \text{ mA}$ $\Phi_V \text{ (lm)}$	Bestellnummer Ordering Code
LB L89C-M1N1-35 LB L89C-N1P2-35	blue	colorless diffused	18.0 ... 35.5 28.0 ... 71.0	105 (typ.) 190 (typ.)	on request on request

Anm.: -35 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: -35 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	+ 110	°C
Durchlassstrom Forward current	I_F	20	mA
Stoßstrom Surge current $t = 10 \mu s, D = 0.1$	I_{FM}	200	mA
Sperrspannung Reverse voltage	V_R	5	V
Leistungsaufnahme Power consumption	P_{tot}	85	mW
Wärmewiderstand Thermal resistance Sperrschicht/Umgebung Junction/ambient Sperrschicht/Löt看 Junction/solder point Montage auf PC-Board FR 4 (Padgröße $\geq 5 \text{ mm}^2$) mounted on PC board FR 4 (pad size $\geq 5 \text{ mm}^2$)	$R_{th JA}$ $R_{th JS}$	500 310	K/W K/W

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

Bezeichnung Parameter		Symbol Symbol	Wert Value	Einheit Unit
Wellenlänge des emittierten Lichtes Wavelength at peak emission $I_F = 20\text{ mA}$	(typ.)	λ_{peak}	465	nm
Dominantwellenlänge ¹⁾ Dominant wavelength $I_F = 20\text{ mA}$	(typ.)	λ_{dom}	470 ± 6	nm
Spektrale Bandbreite bei 50 % $I_{\text{rel max}}$ Spectral bandwidth at 50 % $I_{\text{rel max}}$ $I_F = 20\text{ mA}$	(typ.)	$\Delta\lambda$	25	nm
Abstrahlwinkel bei 50 % I_V (Vollwinkel) Viewing angle at 50 % I_V	(typ.)	2ϕ	160 (horizontal) 130 (verical)	Grad deg.
Durchlassspannung ²⁾ Forward voltage $I_F = 20\text{ mA}$	(min.) (typ.) (max.)	V_F V_F V_F	3.0 3.6 4.1	V 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} $I_F = 20\text{ mA}; -10^\circ\text{C} \leq T \leq 100^\circ\text{C}$	(typ.)	$TC_{\lambda_{\text{peak}}}$	0.05	nm/K
Temperaturkoeffizient von λ_{dom} Temperature coefficient of λ_{dom} $I_F = 20\text{ mA}; -10^\circ\text{C} \leq T \leq 100^\circ\text{C}$	(typ.)	$TC_{\lambda_{\text{dom}}}$	0.04	nm/K
Temperaturkoeffizient von V_F Temperature coefficient of V_F $I_F = 20\text{ mA}; -10^\circ\text{C} \leq T \leq 100^\circ\text{C}$	(typ.)	TC_V	- 3.1	mV/K
Optischer Wirkungsgrad Optical efficiency $I_F = 20\text{ mA}$	(typ.)	η_{opt}	3	lm/W

¹⁾ 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 $\pm 1\text{ nm}$.

²⁾ 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 $\pm 0.1\text{ V}$.

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)
M1	18.0 ... 22.4	80 (typ.)
M2	22.4 ... 28.0	100 (typ.)
N1	28.0 ... 35.5	125 (typ.)
N2	35.5 ... 45.0	160 (typ.)
P1	45.0 ... 56.0	200 (typ.)
P2	56.0 ... 71.0	250 (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: N1-4

Example: N1-4

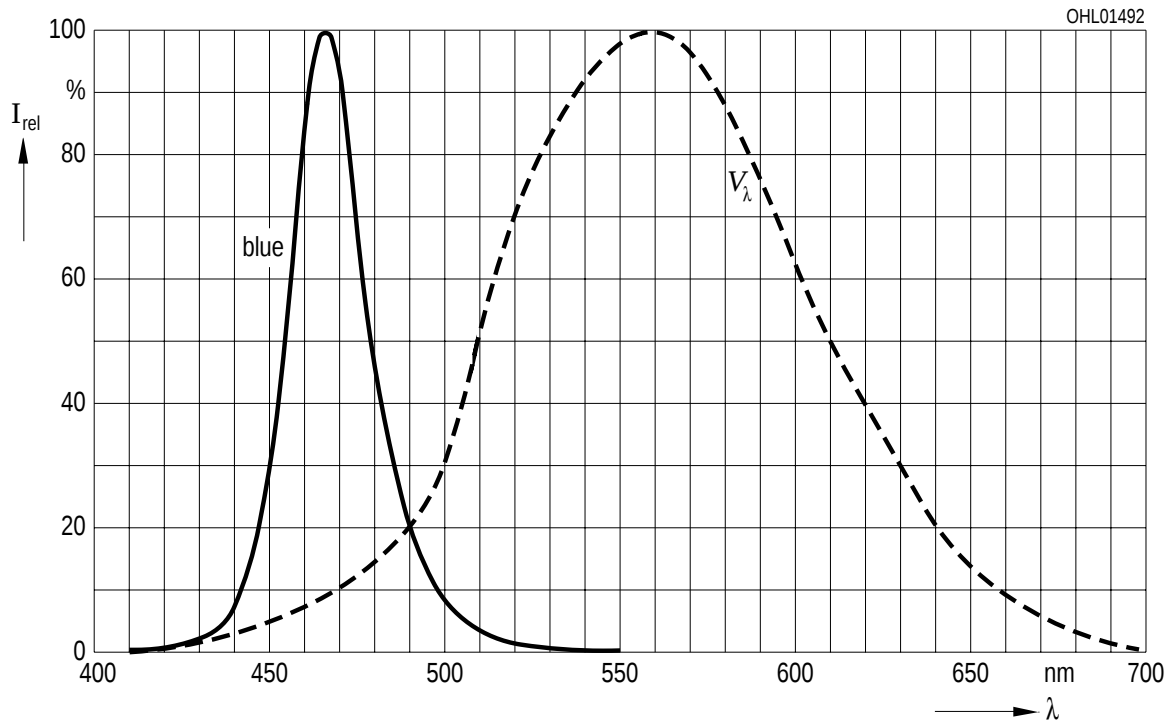
Lichtgruppe Luminous Intensity Group	Halbgruppe Half Group	Wellenlänge Wavelength
N	1	4

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

Relative Spectral Emission

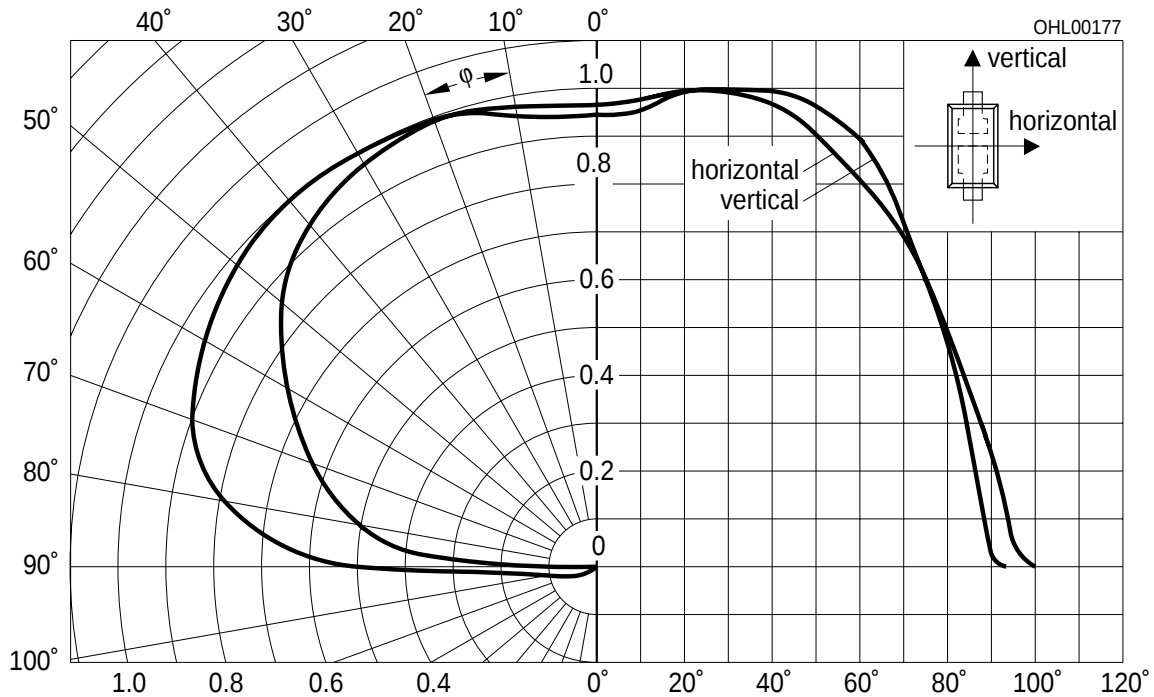
$V(\lambda)$ = spektrale Augenempfindlichkeit

Standard eye response curve



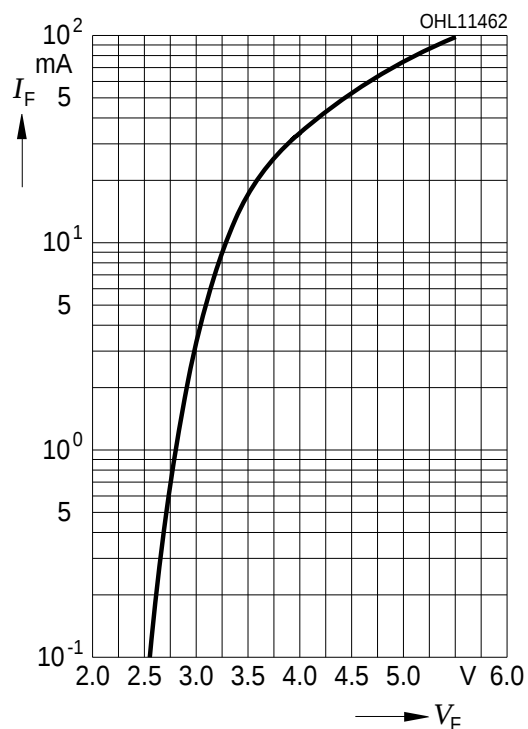
Abstrahlcharakteristik $I_{\text{rel}} = f(\varphi)$

Radiation Characteristic

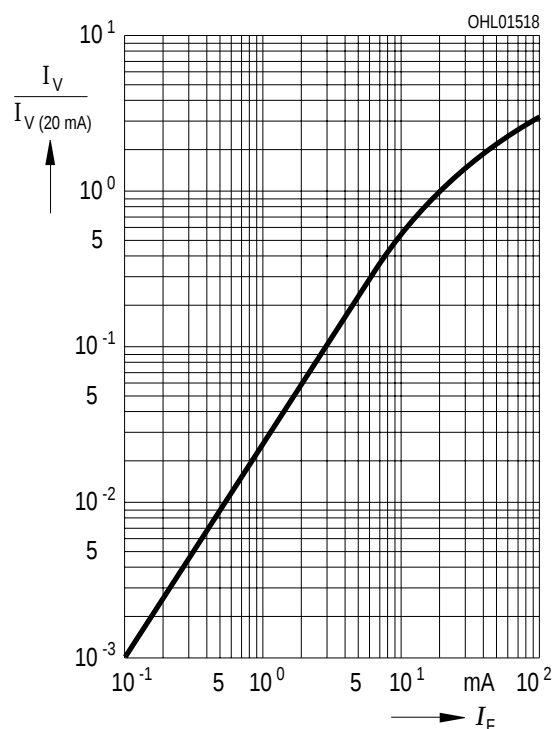


Durchlassstrom $I_F = f(V_F)$

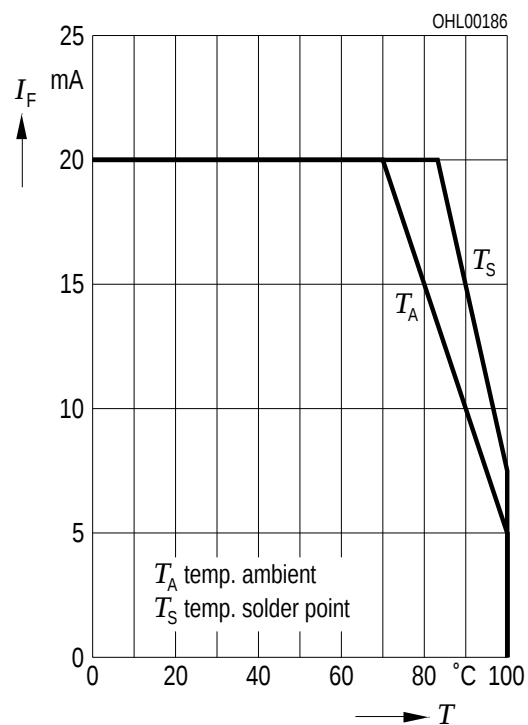
Forward Current

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

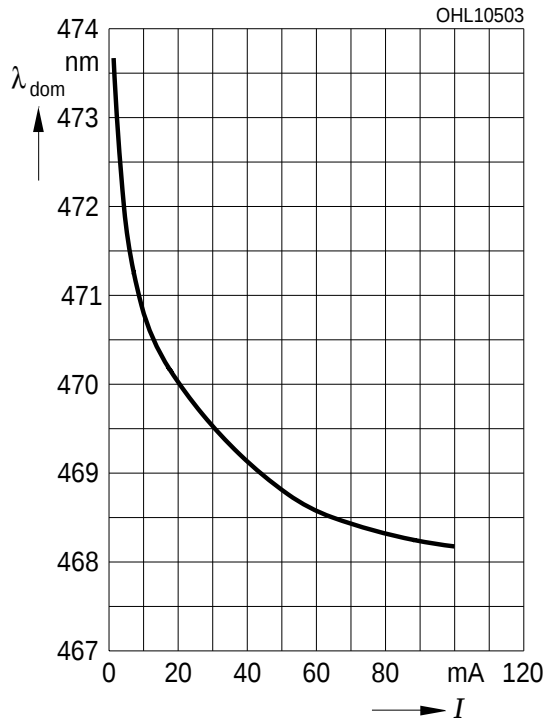
Relative Luminous Intensity

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

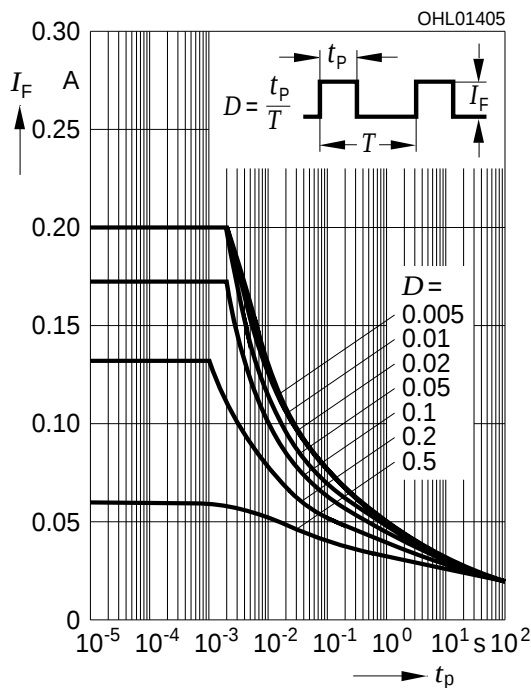
Max. Permissible Forward Current



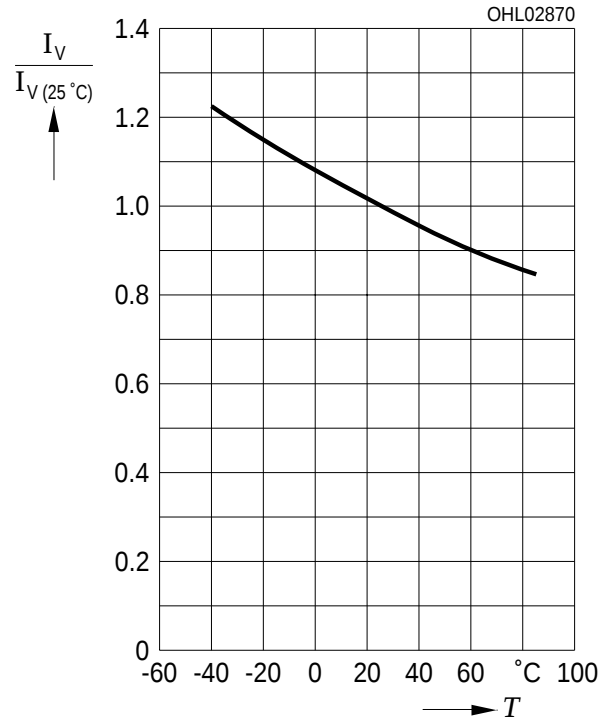
Dominante Wellenlänge $\lambda_{\text{dom}} = f(I_F)$
Dominant wavelength
 $T_A = 25\text{ °C}$



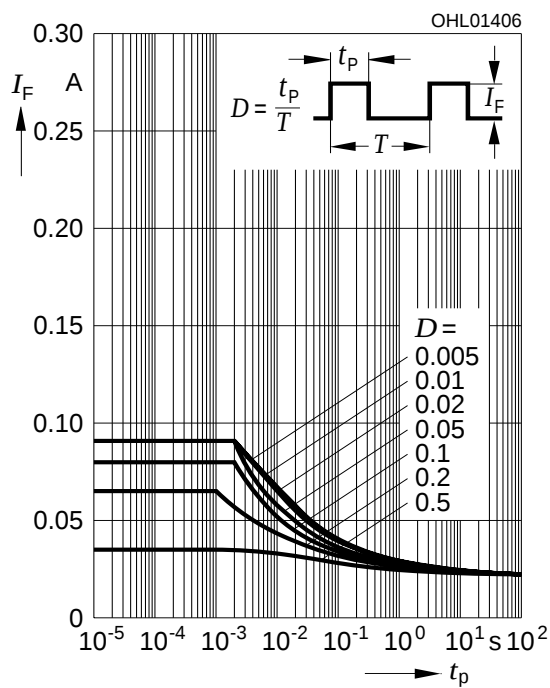
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle $D = \text{parameter}$, $T_A = 25\text{ °C}$



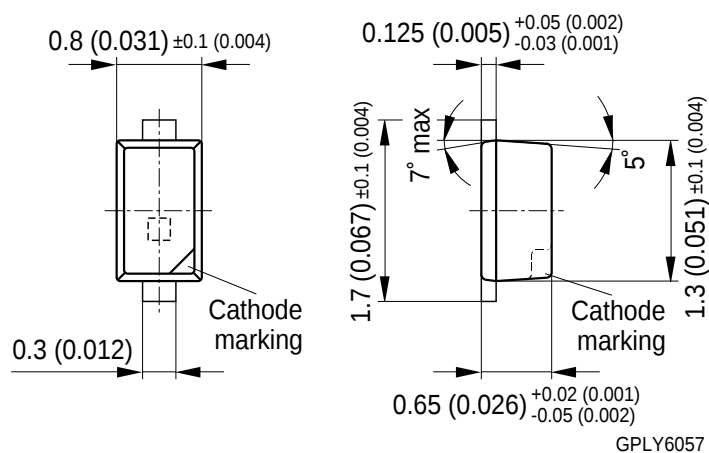
Relative Lichtstärke $I_V/I_{V(25\text{ °C})} = f(T_A)$
Relative Luminous Intensity
 $I_F = 20\text{ mA}$



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



Maßzeichnung Package Outlines

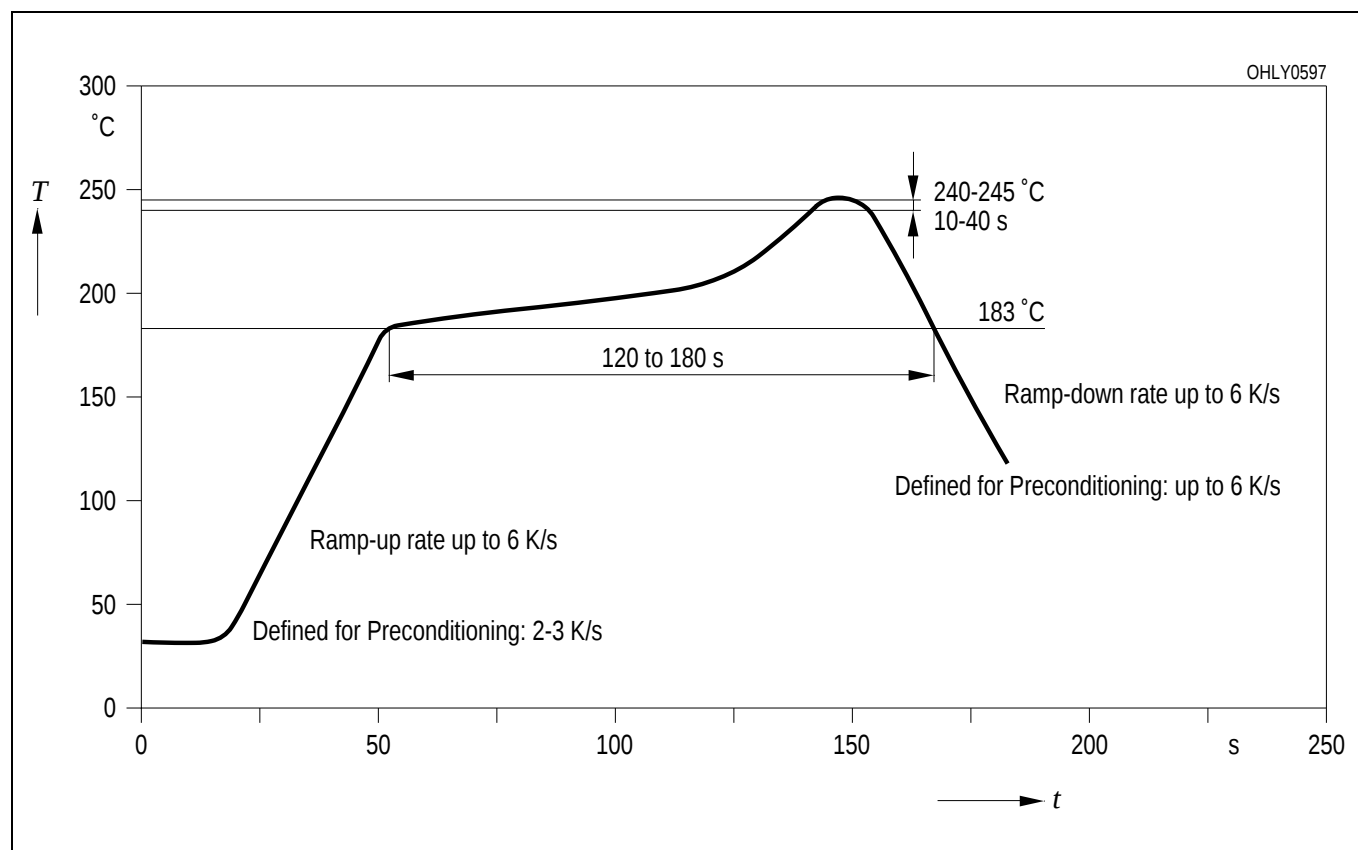


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

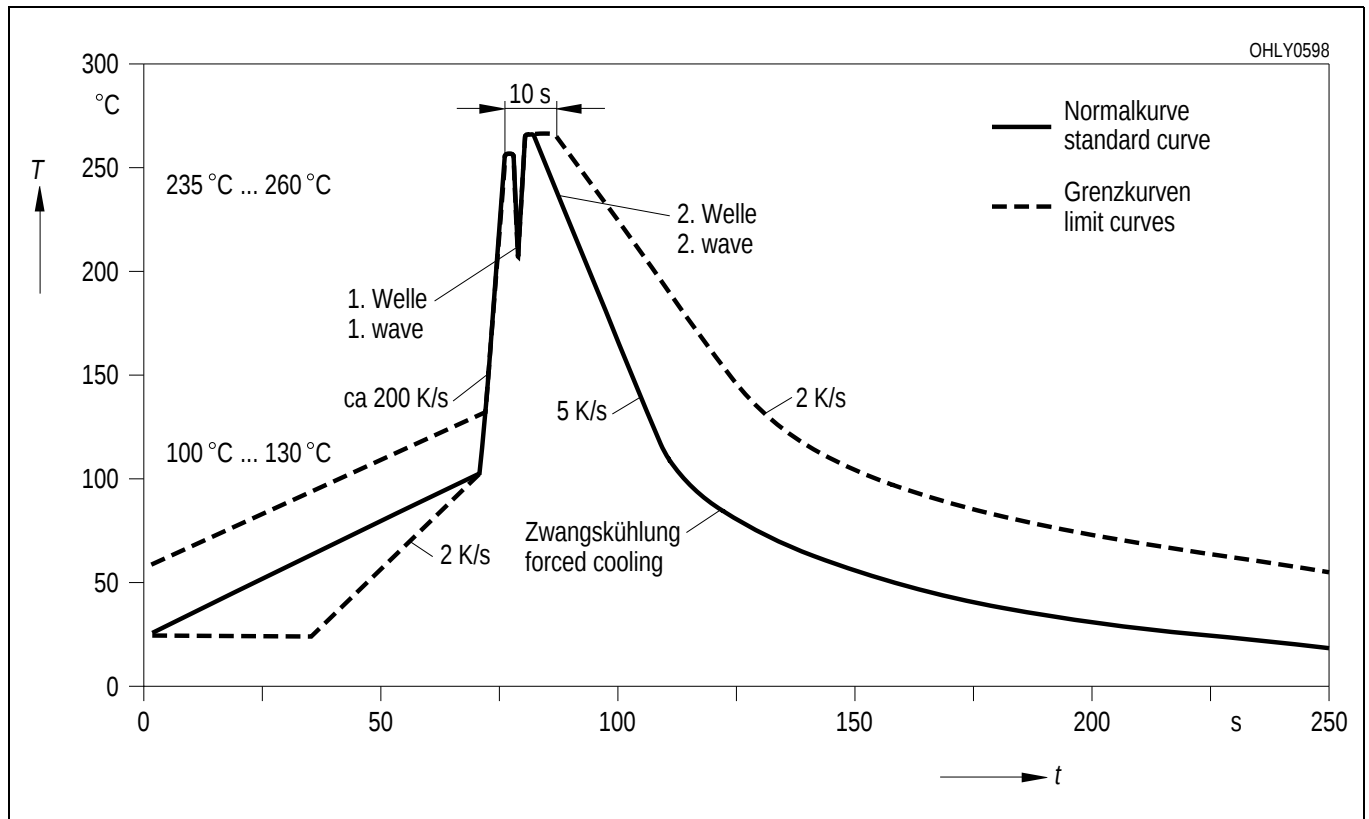
Gewicht / Approx. weight: 1,4 mg

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

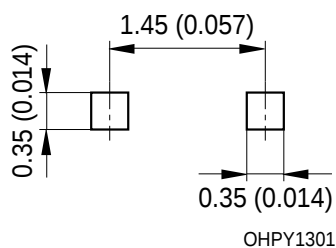
IR-Reflow Lötprofil (nach CECC 00802)
IR Reflow Soldering Profile (acc. to CECC 00802)



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

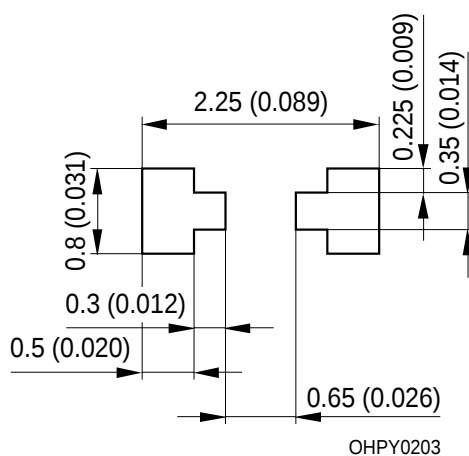


Empfohlenes Lötpaddesign IR Reflow Löten
Recommended Solder Pad IR Reflow Soldering



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

Empfohlenes Lötpaddesign verwendbar für SmartLED™ und Chipled - Bauform 0603
 IR Reflow Löten
Recommended Solder Pad useable for SmartLED™ and Chipled - Package 0603
 IR Reflow Soldering



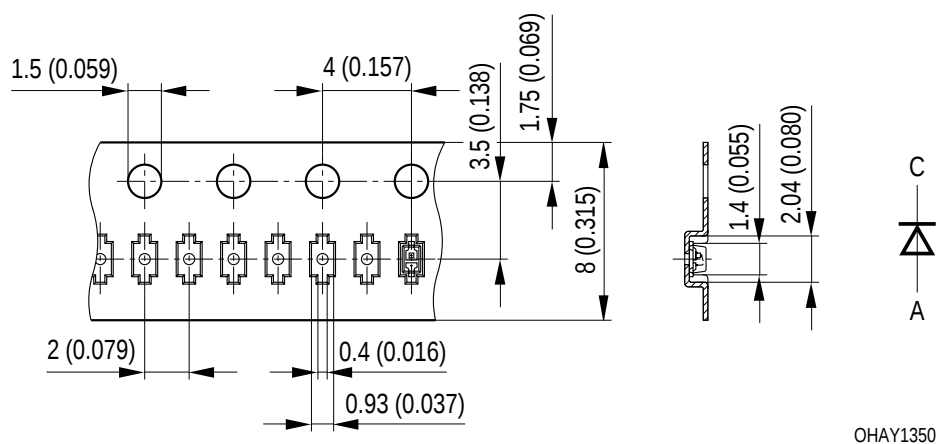
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).
 Empfohlene Lötpastendicke: 120 µm / recommended thickness of solder paste: 120 µm
 Gehäuse für Wellenlöten (TTW) geeignet / Package suitable for TTW-soldering

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: 2002-05-13

Previous Version: 2001-03-07

Page	Subjects (major changes since last revision)
1	taping changed from 5000 to 10000/reel, ø180 mm and from 20000 to 40000/reel, ø330 mm
6	Radiation Characteristic
4	value (forward voltage)
12	recommended solder pad
3	power consumption from 90 mW to 85 mW
8	diagram luminous intensity from OHL01462 to OHL11462
2	wavelength grouping for blue
3	pad size from 16 mm ² to 5 mm ²

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