

SmartLED™

Enhanced optical power LED (ATON®)

LW L88C



Vorläufige Daten / Preliminary Data

Besondere Merkmale

- **Gehäusetyp:** SMT Gehäuse SCD 80
- **Besonderheit des Bauteils:** kleinste Bauform 1,7 x 0,8 x 0,65 mm (LxBxH)
- **Farbort:** x = 0,33, y = 0,33 nach CIE 1931 (weiß)
- **typische Farbtemperatur:** 5600 K
- **Farbwiedergabeindex:** 80
- **Abstrahlwinkel:** horizontal 170°, vertikal 130°
- **Technologie:** InGaN
- **optischer Wirkungsgrad:** 10 lm/W
- **Gruppierungsparameter:** Lichtstärke, Farbort
- **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)
- elektrische 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)
- **color coordinates:** x = 0.33, y = 0.33 acc. to CIE 1931 (white)
- **typ. color temperature:** 5600 K
- **color reproduction index:** 80
- **viewing angle:** horizontal 170°, vertical 130°
- **technology:** InGaN
- **optical efficiency:** 10 lm/W
- **grouping parameter:** luminous intensity, color coordinates
- **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)
- electrical toys
- outdoor displays
- signal and symbol luminary
- marker lights (e.g. steps, exit ways, etc.)

Typ	Emissions- farbe	Farbe der Lichtaustritts- fläche	Lichtstärke	Lichtstrom	Bestellnummer
Type	Color of Emission	Color of the Light Emitting Area	Luminous Intensity $I_F = 20 \text{ mA}$ $I_V \text{ (mcd)}$	Luminous Flux $I_F = 20 \text{ mA}$ $\Phi_V \text{ (mlm)}$	Ordering Code
LW L88C-Q1R1-35	white	colored	71 ... 140	400 (typ.)	on request
LW L88C-R1S2-35		diffused	112 ... 280	750 (typ.)	on request

Anm.: -35 Farbselektiert nach Farbortgruppen, 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 Color selection acc. to chromaticity coordinate groups, 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	+ 110	°C
Durchlassstrom Forward current	I_F	20	mA
Stoßstrom Surge current $t \leq 10 \mu s, D = 0.005$	I_{FM}	300	mA
Sperrspannung Reverse voltage	V_R	5	V
Leistungsaufnahme Power consumption $T_A \leq 25 \text{ °C}$	P_{tot}	85	mW
Wärmewiderstand Thermal resistance Sperrschicht/Umgebung Junction/ambient Sperrschicht/Lötpad 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

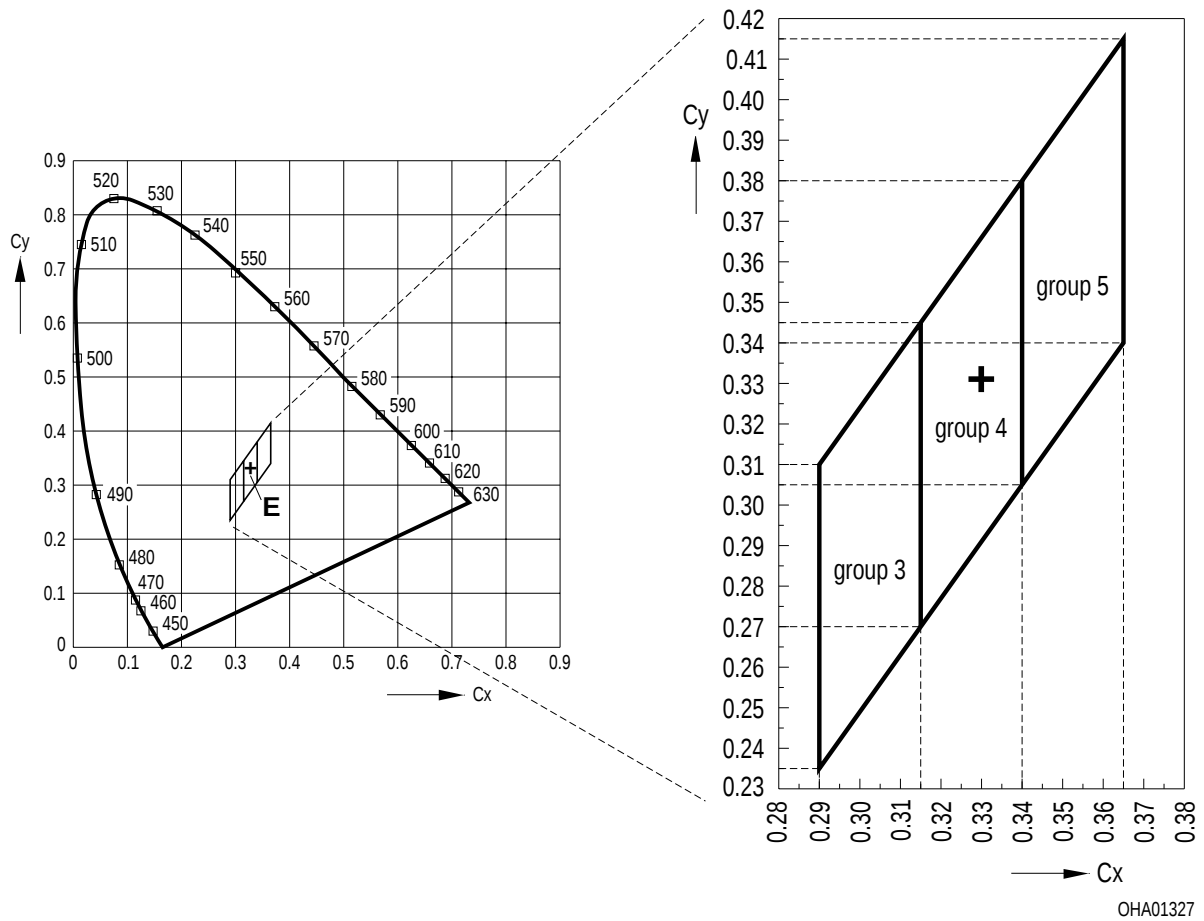
Kennwerte ($T_A = 25\text{ °C}$)**Characteristics**

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Farbkoordinate x nach CIE 1931 ¹⁾ (typ.) Chromaticity coordinate x acc. to CIE 1931 $I_F = 20\text{ mA}$	x	0.33	–
Farbkoordinate y nach CIE 1931 (typ.) Chromaticity coordinate y acc. to CIE 1931 $I_F = 20\text{ mA}$	y	0.33	–
Abstrahlwinkel bei 50 % I_V (Vollwinkel) (typ.) Viewing angle at 50 % I_V	2φ	170 (horizontal) 130 (vertical)	Grad deg.
Durchlassspannung ²⁾ (min.) Forward voltage (typ.) $I_F = 20\text{ mA}$ (max.)	V_F V_F V_F	3.0 3.6 4.1	V V V
Sperrstrom (typ.) Reverse current (max.) $V_R = 5\text{ V}$	I_R I_R	0.01 10	μA μA
Temperaturkoeffizient von x (typ.) Temperature coefficient of x $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	TC_x	–0.1	$10^{-3}/\text{K}$
Temperaturkoeffizient von y (typ.) Temperature coefficient of y $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	TC_y	–0.2	$10^{-3}/\text{K}$
Temperaturkoeffizient von V_F (typ.) Temperature coefficient of V_F $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	TC_V	– 3.0	mV/K
Optischer Wirkungsgrad (typ.) Optical efficiency $I_F = 20\text{ mA}$	η_{opt}	10	lm/W

¹⁾ Farbortgruppen werden mit einer Stromeinprägungsdauer von 25 ms und einer Genauigkeit von $\pm 0,01$ ermittelt.
Chromaticity coordinate groups are tested at a current pulse duration of 25 ms and a tolerance of ± 0.01 .

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 $\pm 0.1\text{ V}$.

1) **Farbortgruppen**
Chromaticity coordinate groups



Helligkeits-Gruppierungsschema Luminous Intensity Groups

Lichtgruppe Luminous Intensity Group	Lichtstärke Luminous Intensity I_v (mcd)	Lichtstrom Luminous Flux Φ_v (lm)
Q1	71 ... 90	320 (typ.)
Q2	90 ... 112	400 (typ.)
R1	112 ... 140	500 (typ.)
R2	140 ... 180	640 (typ.)
S1	180 ... 224	800 (typ.)
S2	224 ... 280	1000 (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: R1-4

Example: R1-4

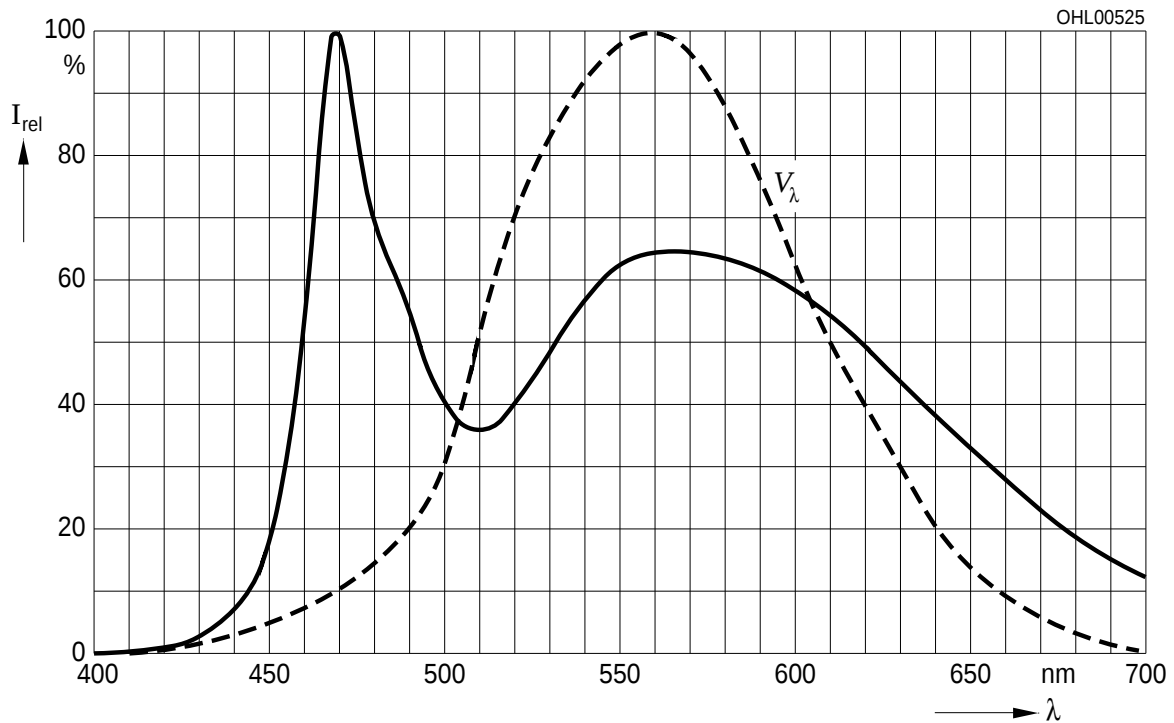
Lichtgruppe Luminous Intensity Group	Halbgruppe Half Group	Farbortgruppe Chromaticity Coordinate Group
R	1	4

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

Relative Spectral Emission

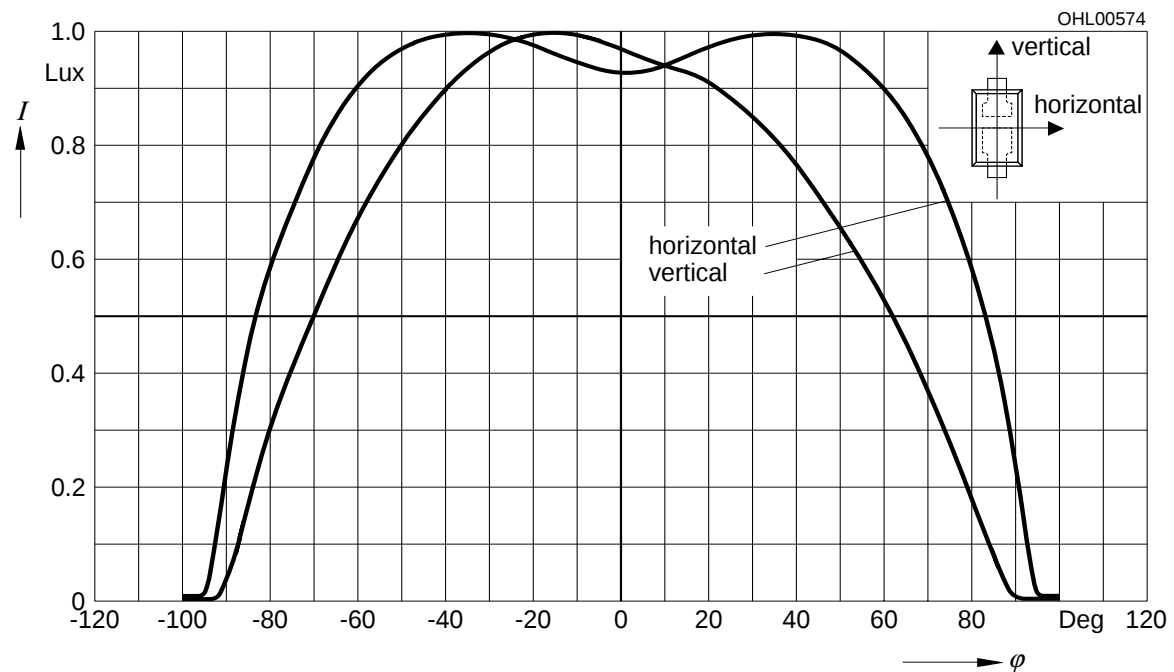
$V(\lambda)$ = spektrale Augenempfindlichkeit

Standard eye response curve



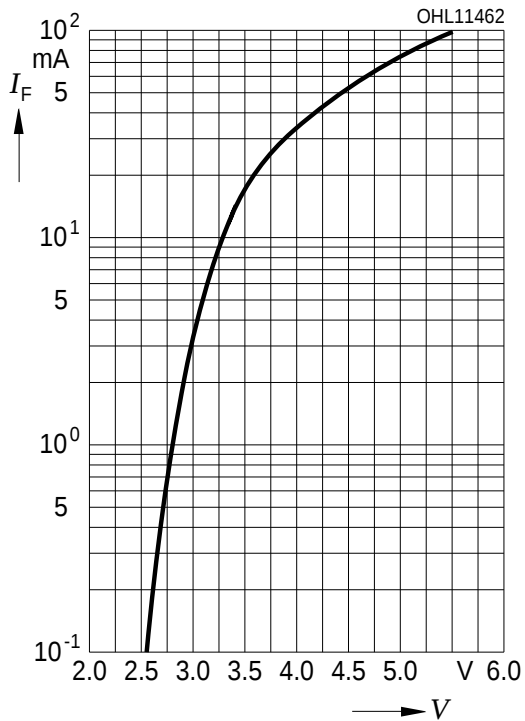
Abstrahlcharakteristik $I_{\text{rel}} = f(\varphi)$

Radiation Characteristic

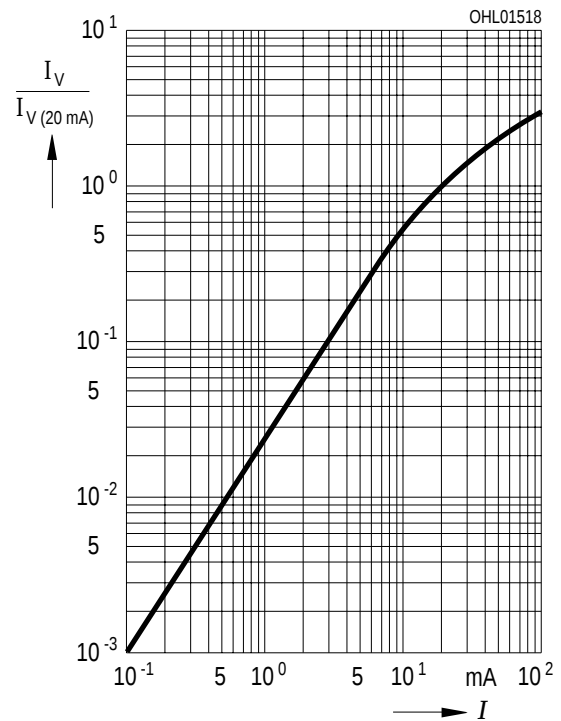


Durchlassstrom $I_F = f(V_F)$

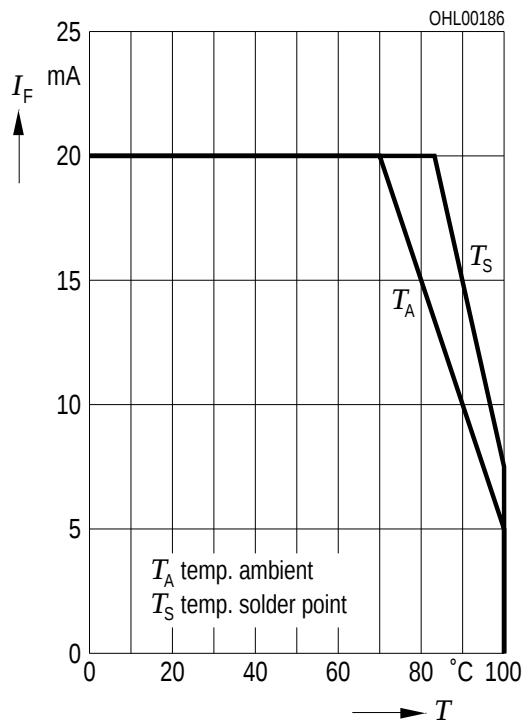
Forward Current

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

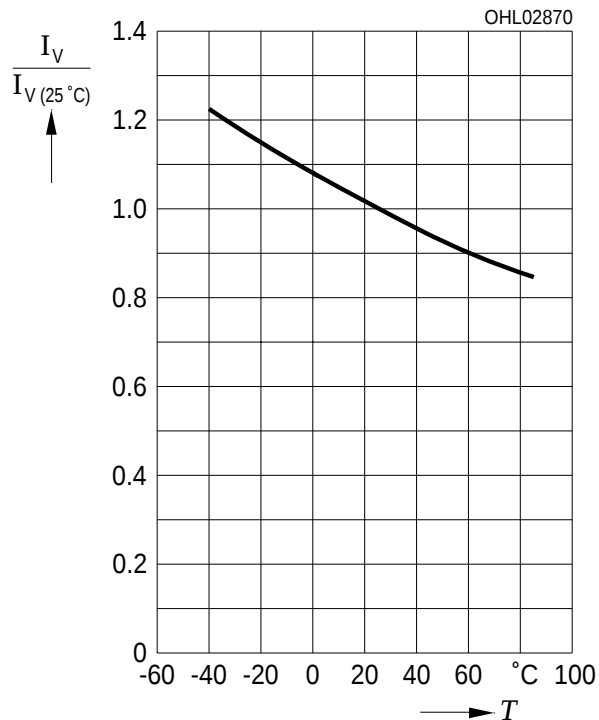
Relative Luminous Intensity

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

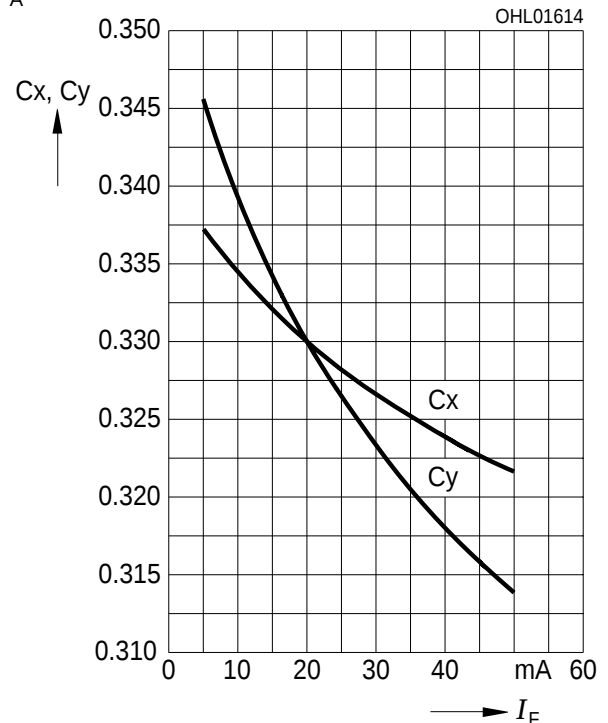
Max. Permissible Forward Current



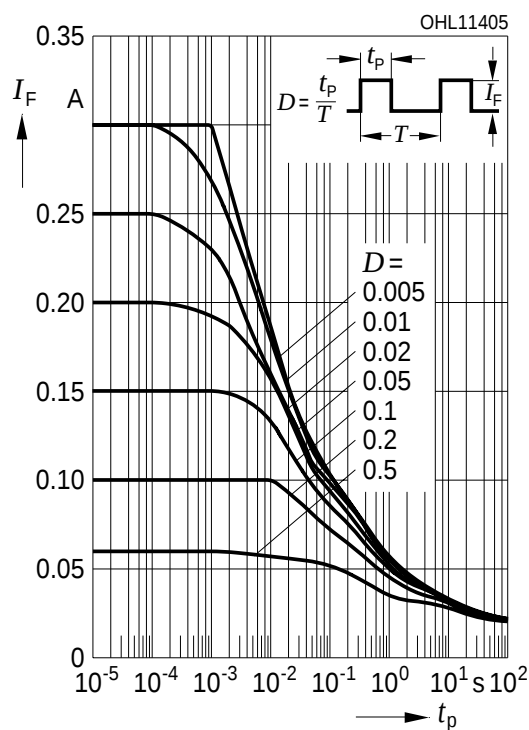
Relative Lichtstärke $I_V/I_{V(25^\circ\text{C})} = f(T_A)$
Relative Luminous Intensity
 $I_F = 20 \text{ mA}$



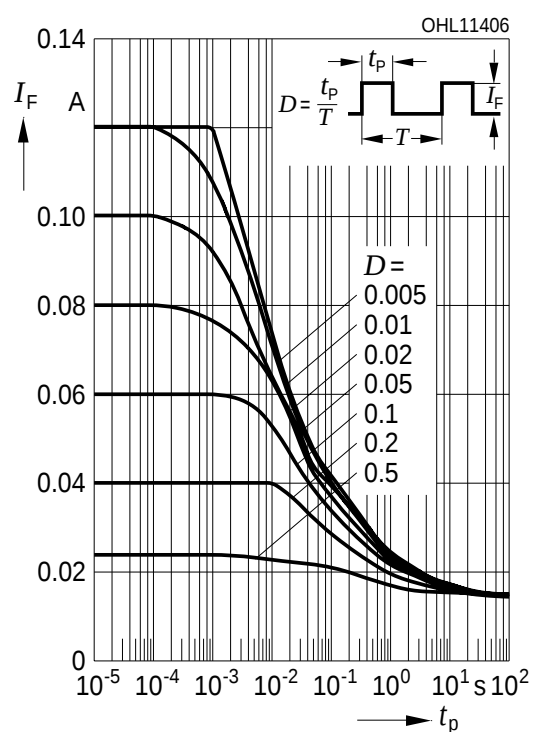
Farbortverschiebung $x, y = f(I_F)$
Chromaticity Coordinate Shift
 $T_A = 25^\circ\text{C}$



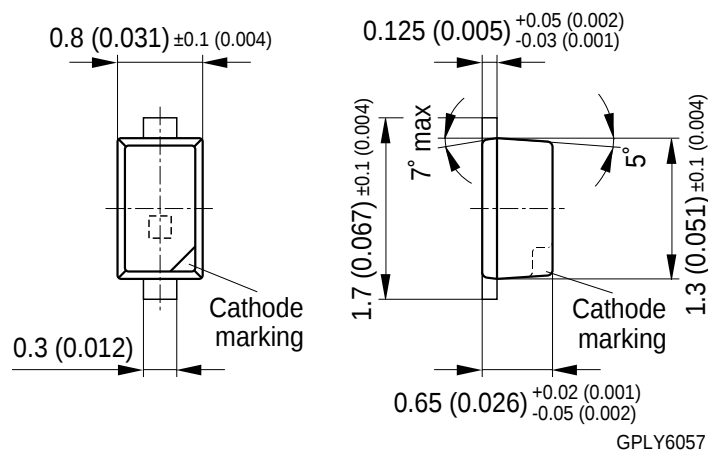
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle $D = \text{parameter}$, $T_A = 25^\circ\text{C}$



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



Maßzeichnung Package Outlines

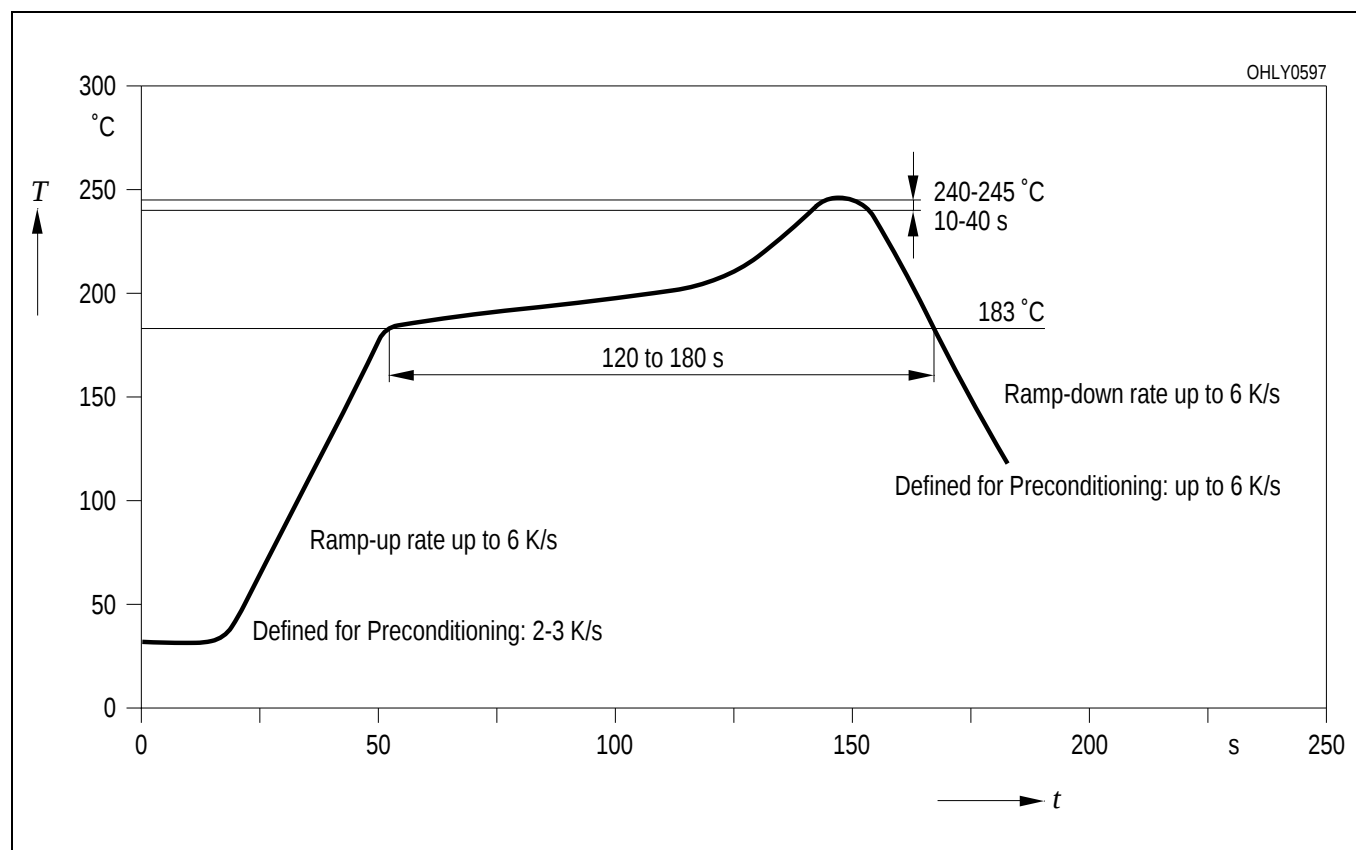


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

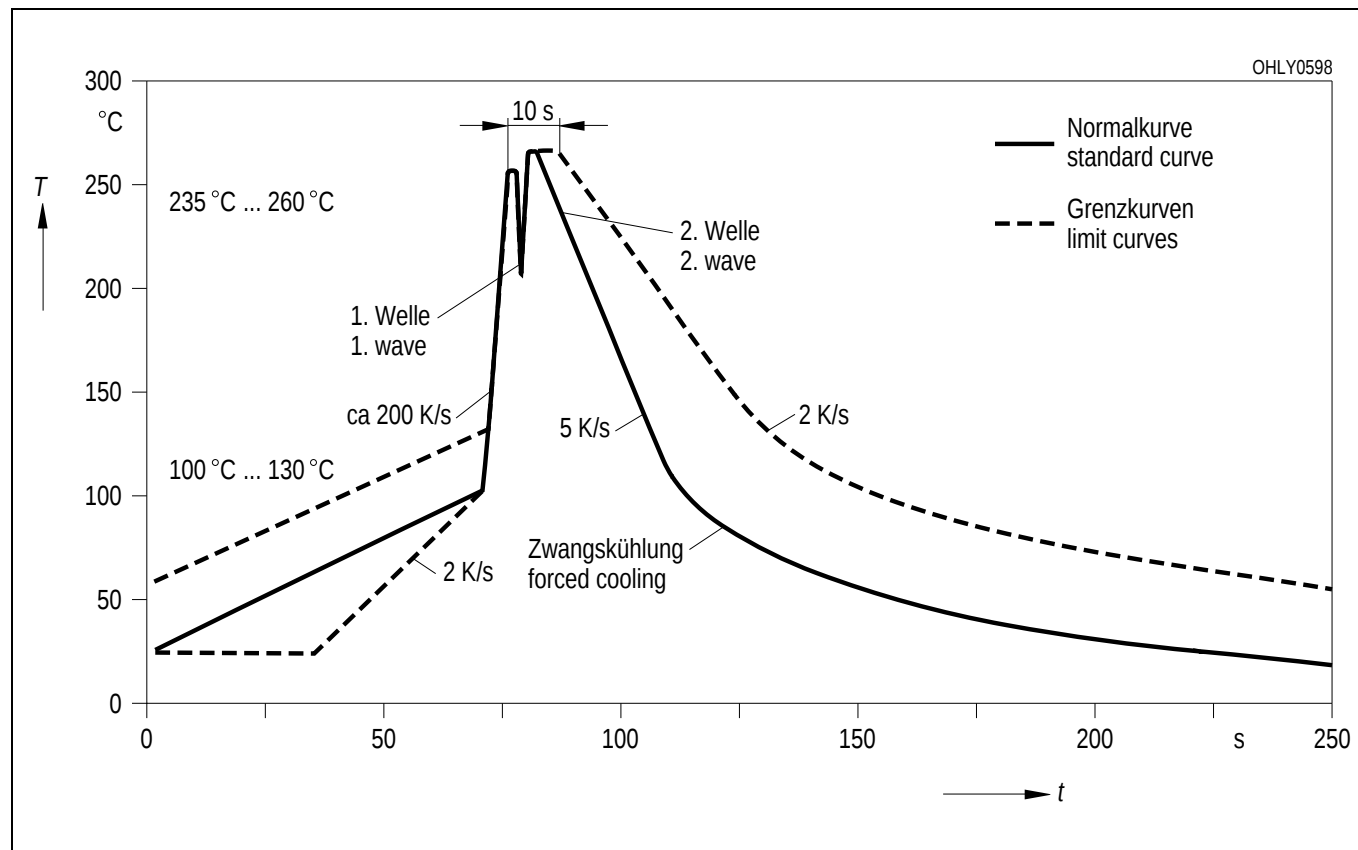
Gewicht / Approx. weight: 1.4 mg

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

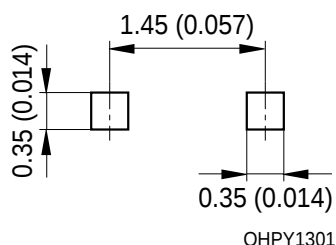
IR-Reflow Lötprofil (nach IPC 9501)
IR Reflow Soldering Profile (acc. to IPC 9501)



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

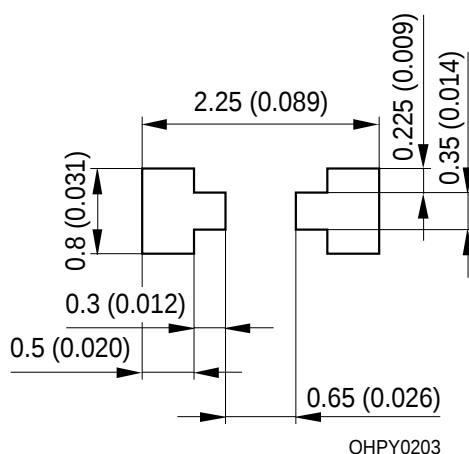


Empfohlenes Lötpaddesign IR Reflow Lötén
Recommended Solder Pad IR Reflow Soldering



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



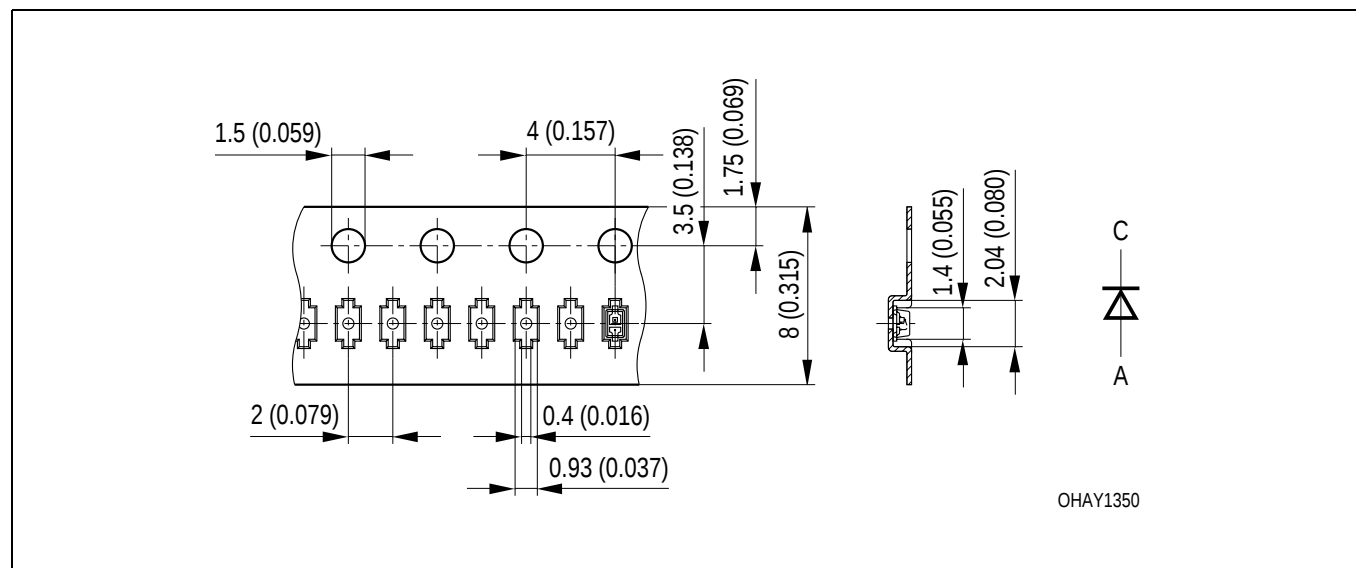
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).
 Empfohlene Lötpastendicke: 120 µm / recommended thickness of solder paste: 120 µm
 Gehäuse für Wellenlötén (TTW) geeignet / Package suitable for TTW-soldering

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: 2002-04-05

Previous Version: 2002-04-03

Page	Subjects (major changes since last revision)
3	power consumption from 90 mW to 85 mW
8	diagram luminous intensity from OHL01462 to OHL11462
3	surge current
	diagram permissible pulse handling capability from OHL01405/01406 to 11405/11406
2	wavelength grouping for white
3	pad size from 16 mm ² to 5 mm ²

Patent List**Patent No.**

US 6 066 861, US 6 277 301

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.