

Hyper 5 mm (T1 ¾) LED, Non Diffused Enhanced optical Power LED (ATON®)

LW 541C



Vorläufige Daten / Preliminary Data

Besondere Merkmale

- **Gehäusotyp:** nicht eingefärbtes, klares 5 mm (T1¾) Gehäuse
- **Besonderheit des Bauteils:** enge Abstrahlcharakteristik; Lötspieße ohne Aufsetzebene
- **Farbort:** $x = 0.32$, $y = 0.31$ nach CIE 1931 (weiß)
- **typ. Farbtemperatur:** 6500 K
- **Farbwiedergabeindex:** 80
- **Abstrahlwinkel:** 20°
- **Technologie:** InGaN
- **optischer Wirkungsgrad:** 12 lm/W
- **Gruppierungsparameter:** Lichtstärke, Farbort
- **Lötmethode:** Wellenlöten (TTW)
- **Verpackung:** Schüttgut, gegurtet lieferbar
- **ESD-Festigkeit:** ESD-sicher bis 2 kV nach EOS/ESD-5.1-1993

Anwendungen

- Informationsanzeigen im Außenbereich
- optischer Indikator
- Signal- und Symbolleuchten
- Markierungsbeleuchtung (z.B. Stufen, Fluchtwege, u.ä.)
- Effektbeleuchtung (z.B. Sternenhimmel)
- Ersatz von Miniaturlampen
- Möbelbeleuchtung (z.B. Vitrinen)

Features

- **package:** colorless, clear 5 mm (T1¾) package
- **feature of the device:** narrow viewing angle, solder leads without stand-off
- **color coordinates:** $x = 0.32$, $y = 0.31$ acc. to CIE 1931 (white)
- **typ. color temperature:** 6500 K
- **color reproduction index:** 80
- **viewing angle:** 20°
- **technology:** InGaN
- **optical efficiency:** 12 lm/W
- **grouping parameter:** luminous intensity, color coordinates
- **soldering methods:** TTW soldering
- **packing:** bulk, available taped on reel
- **ESD-withstand voltage:** up to 2 kV acc. to EOS/ESD-5.1-1993

Applications

- outdoor displays
- optical indicators
- signal and symbol luminaire
- marker lights (e.g. steps, exit ways, etc.)
- lighting for special effects (e.g. starry sky)
- substitute for miniature flashlight
- furniture lighting (e.g. glass cupboards)

Typ	Emissions- farbe	Gehäusefarbe	Lichtstärke	Lichtstrom	Bestellnummer
Type	Color of Emission	Color of Package	Luminous Intensity $I_F = 20 \text{ mA}$ $I_V \text{ (mcd)}$	Luminous Flux $I_F = 20 \text{ mA}$ $\Phi_V \text{ (lm)}$	Ordering Code
LW 541C-BWCW-35	white	colorless clear	1800 ...4500	950(typ.)	Q62703Q6401
LW 541C-CWDW-35			2800 ...7100	1500(typ.)	Q65110A0630

Anm.: -35 Farbselektiert nach Farbortgruppen (siehe **Seite 5**).

Die Standardlieferform von Serientypen beinhaltet eine untere bzw. eine obere Familiengruppe oder mindestens zwei Einzelgruppen.

In einer Verpackungseinheit / Gurt ist immer nur eine Helligkeitsgruppe enthalten.

Die technologiebedingte Helligkeits-Streuung der heutigen LED-Herstellprozesse über einen längeren Fertigungszeitraum (Halbleitermaterial - Chipherstellung - Montageprozess) erlaubt keine Zusage einer einzelnen Helligkeitsgruppe. Daher müssen mindestens zwei Helligkeitsgruppen vorgesehen werden!

Note: -35 Color selection acc. to Chromaticity coordinate groups (see **page 5**)

The standard shipping format for serial types includes a lower or upper family group or at least two individual groups.

No packing unit / tape ever contains more than one luminous intensity group.

Luminosity variations caused by the technology used in current LED manufacturing processes over a protracted manufacturing period (semiconductor material - chip fabrication - assembly process) mean that it is not possible to assign LEDs to a single luminous intensity group. For this reason at least two luminous intensity groups must be provided!

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	20	mA
Stoßstrom Surge current $t \leq 10 \mu s, D = 0.005$	I_{FM}	200	mA
Sperrspannung ¹⁾ Reverse voltage	V_R	5	V
Leistungsaufnahme Power consumption $T_A \leq 25 \text{ °C}$	P_{tot}	85	mW
Wärmewiderstand ²⁾ Thermal resistance Sperrschicht/Umgebung Junction/ambient Sperrschicht/Lötpad Junction/solder point Montage auf PC-Board FR 4 (Padgröße $\geq 16 \text{ mm}^2$) mounted on PC board FR 4 (pad size $\geq 16 \text{ mm}^2$) Minimale Beinchenlänge Minimum lead length	$R_{th JA}$ $R_{th JS}$	450 230	K/W K/W

¹⁾ für kurzzeitigen Betrieb geeignet / suitable for short term application

²⁾ R_{th} erhöht sich um 13 K/W pro mm Beinchenlänge.
Each additional 1 mm of lead length increases R_{th} by 13 K/W.

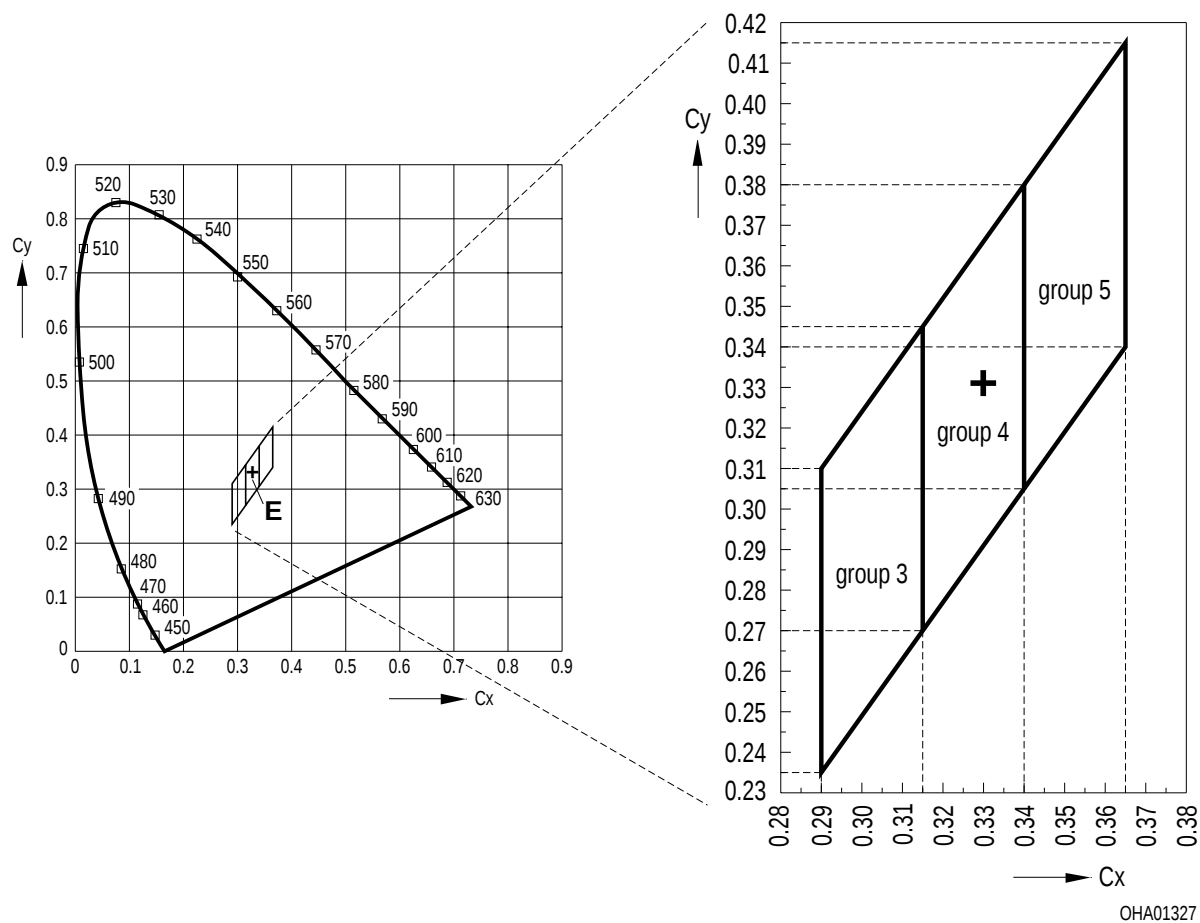
Kennwerte ($T_A = 25\text{ °C}$)**Characteristics**

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Farbkoordinate x nach CIE 1931 ¹⁾ Chromaticity coordinate x acc. to CIE 1931 $I_F = 20\text{ mA}$	x	0.32	–
Farbkoordinate y nach CIE 1931 ¹⁾ Chromaticity coordinate y acc. to CIE 1931 $I_F = 20\text{ mA}$	y	0.31	–
Abstrahlwinkel bei 50 % I_V (Vollwinkel) Viewing angle at 50 % I_V	2φ	20	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 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 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 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}	12	lm/W

¹⁾ Farbortgruppen werden mit einer Stromeinprägedauer 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 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) **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)
BW	1800 ... 2800	690 (typ.)
CW	2800 ... 4500	1090 (typ.)
DW	4500 ... 7100	1750 (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: BW-3

Example: BW-3

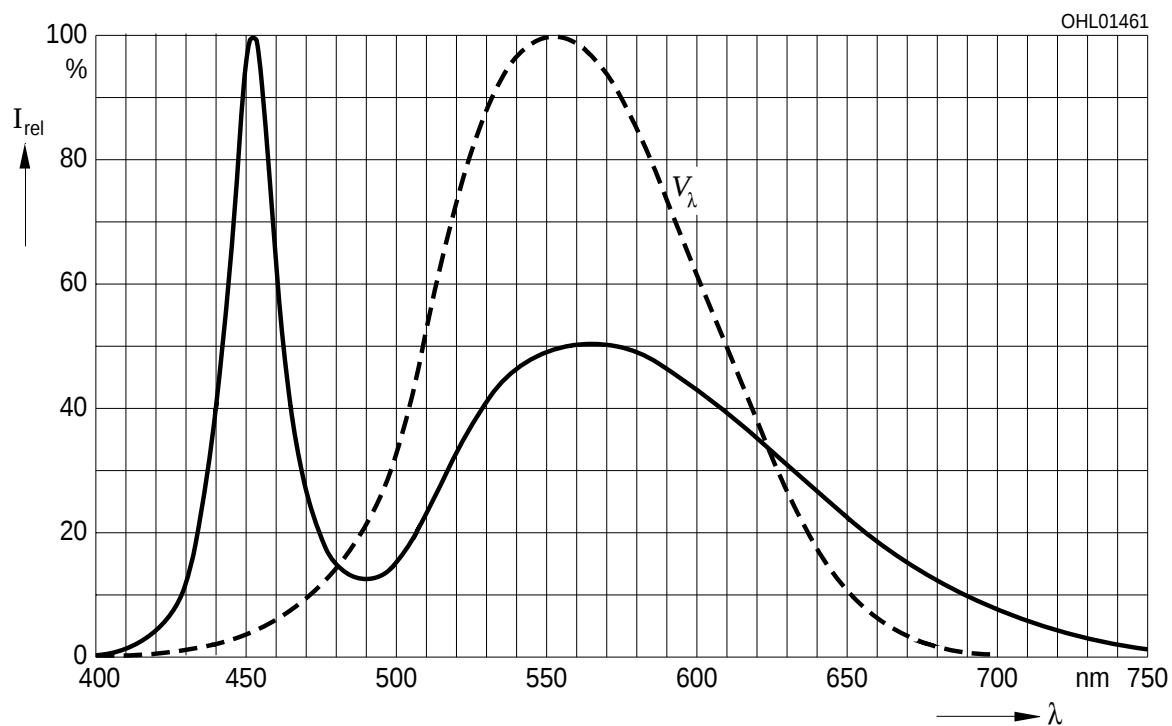
Lichtgruppe Luminous Intensity Group	Farbortgruppe Chromaticity Coordinate Group
BW	3

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

Relative Spectral Emission

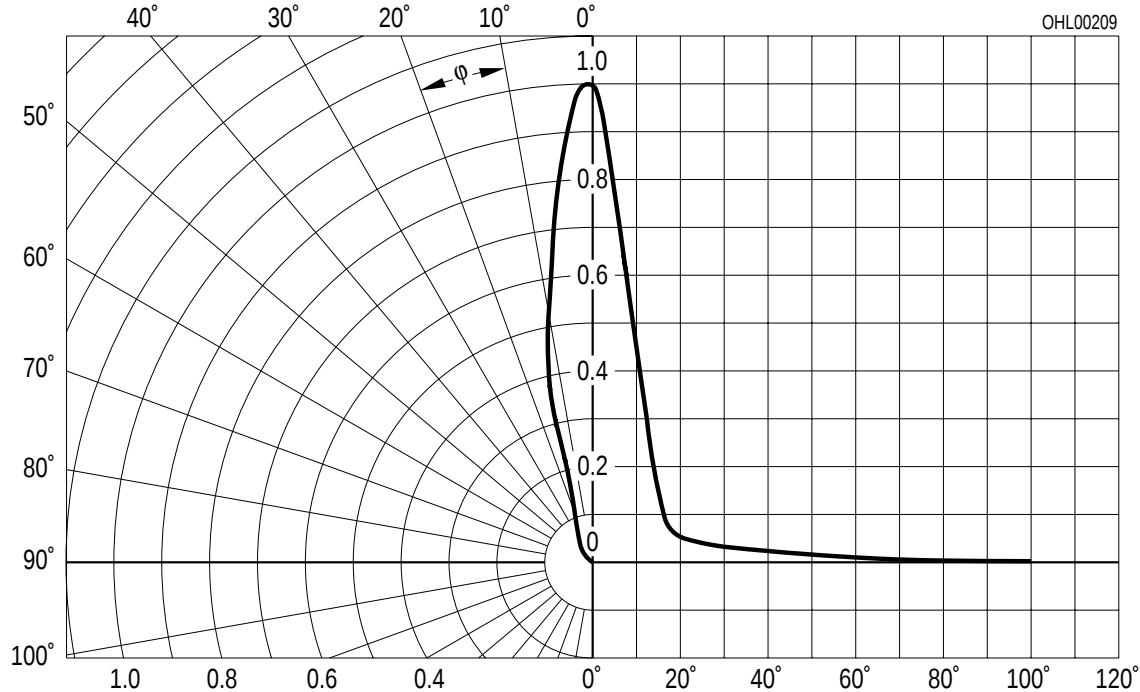
$V(\lambda)$ = spektrale Augenempfindlichkeit

Standard eye response curve

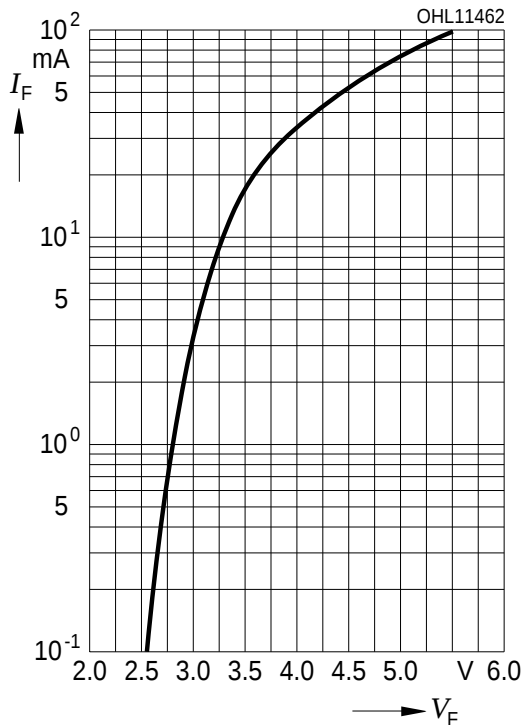


Abstrahlcharakteristik $I_{\text{rel}} = f(\varphi)$

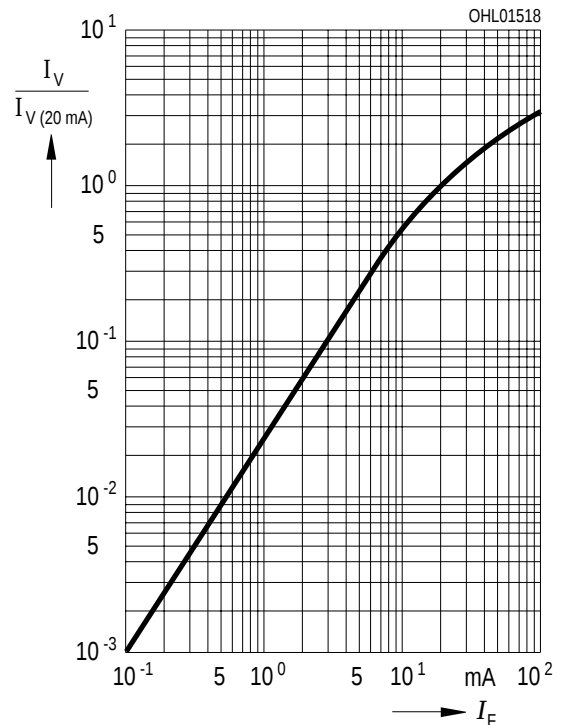
Radiation Characteristic



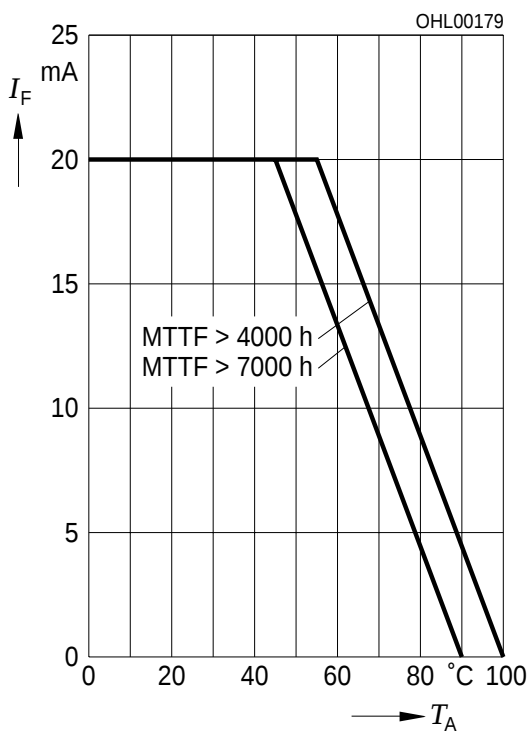
Durchlassstrom $I_F = f(V_F)$
Forward Current
 $T_A = 25\text{ °C}$



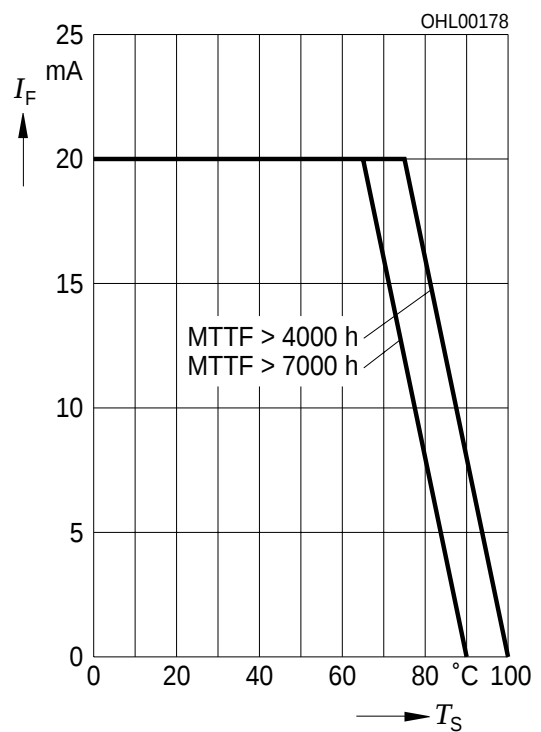
Relative Lichtstärke $I_V/I_{V(20\text{ mA})} = f(I_F)$
Relative Luminous Intensity
 $T_A = 25\text{ °C}$



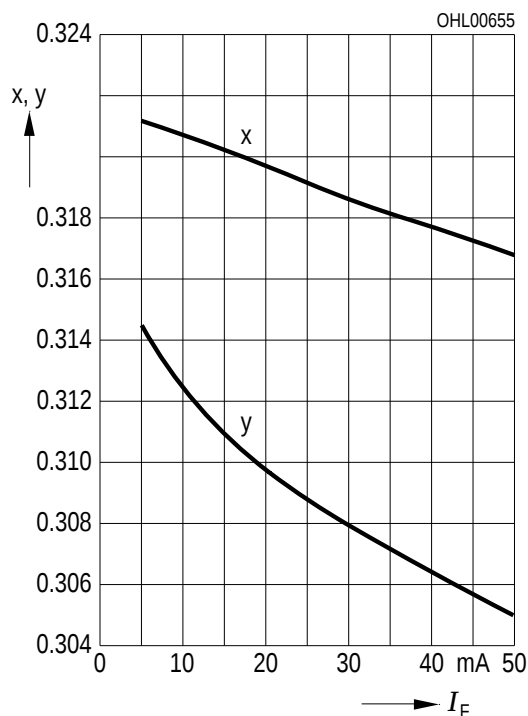
Maximal zulässiger Durchlassstrom
Max. Permissible Forward Current
 $I_F = f(T_A)$



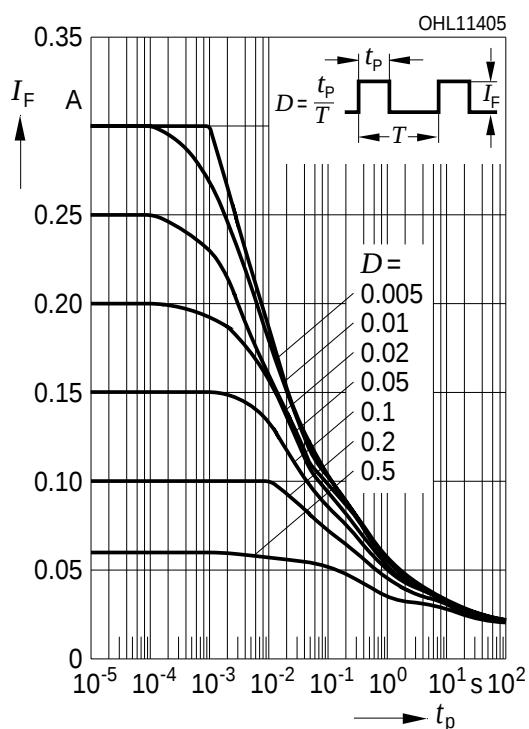
Maximal zulässiger Durchlassstrom
Max. Permissible Forward Current
 $I_F = f(T_S)$



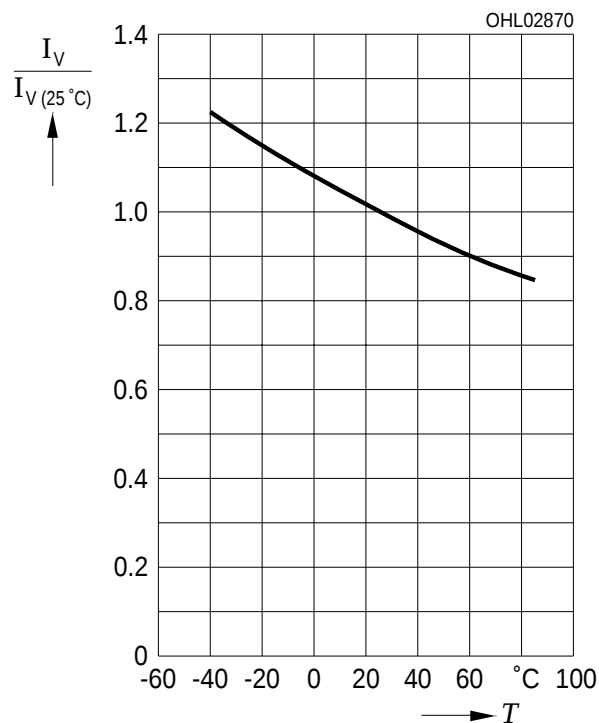
Farbortverschiebung $x, y = f(I_F)$
Chromaticity Coordinate Shift
 $T_A = 25\text{ °C}$



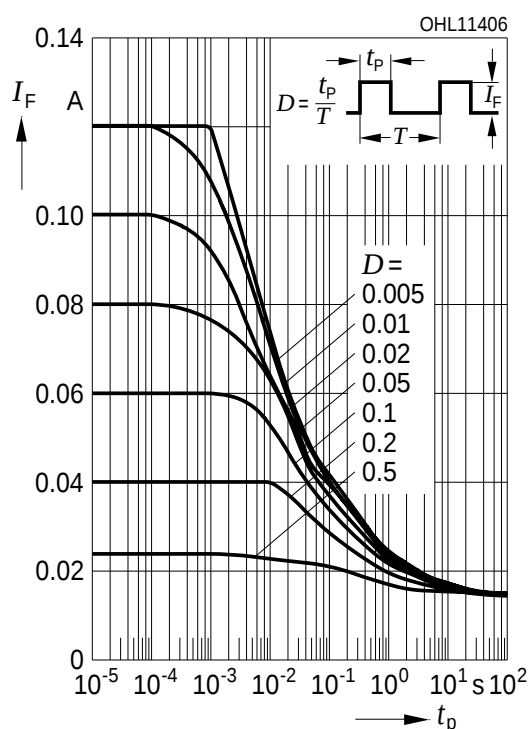
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle $D = \text{parameter}$, $T_A = 25\text{ °C}$



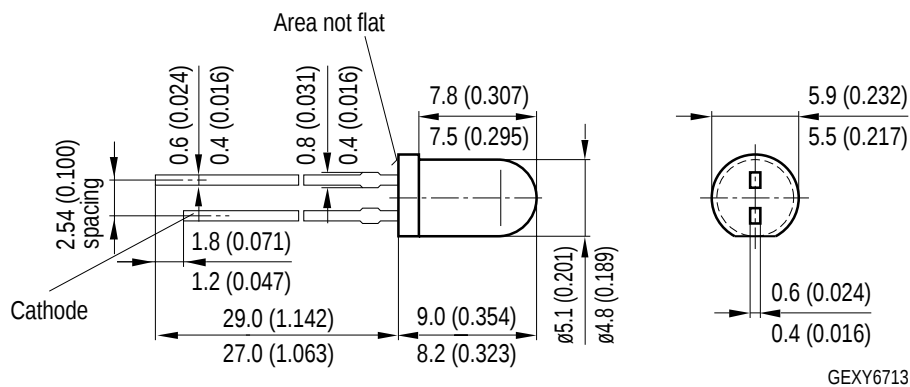
Relative Lichtstärke $I_V/I_{V(25\text{ °C})} = f(T_A)$
Relative Luminous Intensity
 $I_F = 20\text{ mA}$



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



Maßzeichnung Package Outlines

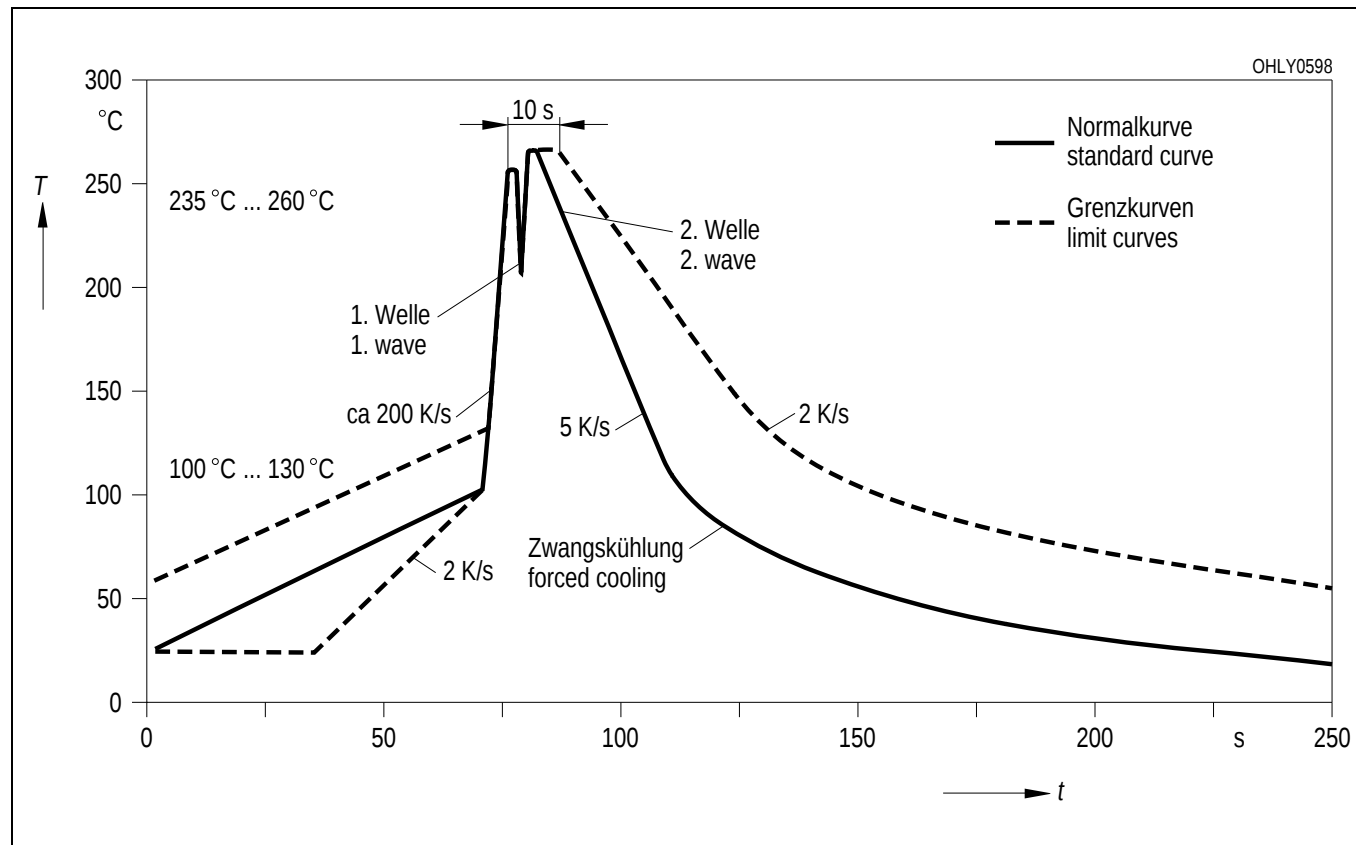


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

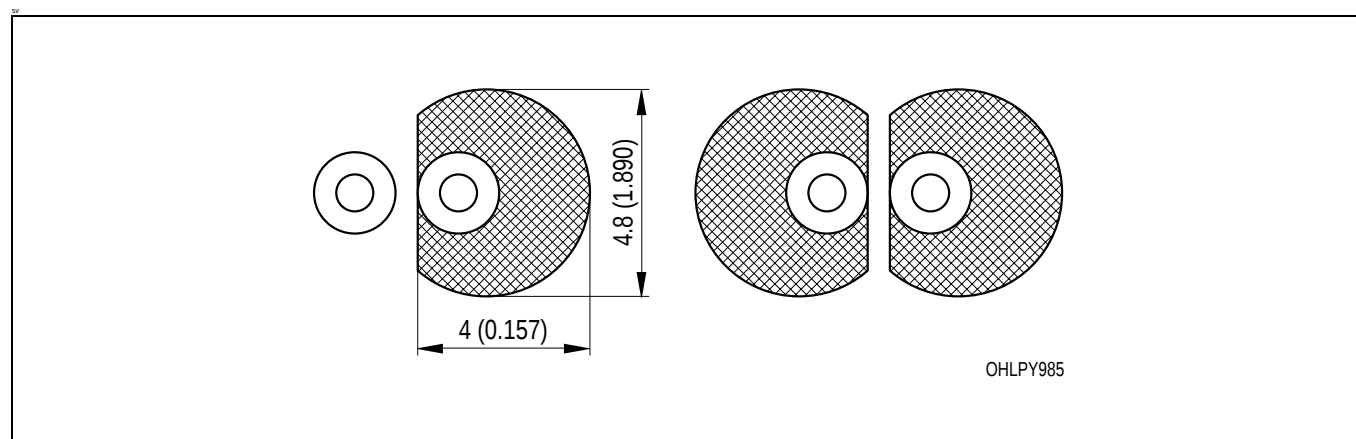
Kathodenkennung: kürzerer Lötspieß
Cathode mark: short solder lead
Gewicht / Approx. weight: 0.35 g

Lötbedingungen Soldering Conditions

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



Empfohlenes Lötpaddesign Wellenlöten (TTW) Recommended Solder Pad TTW Soldering



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

Revision History: 2003-03-04		Date of change
Previous Version: 2002-11-28		
Page	Subjects (major changes since last revision)	
3	thermal resistance (footnote)	
4	value (forward voltage)	
2	change grouping from ABBB to AWBW and from BBCB to BWCW	
6	change grouping from half groups to single groups acc. to page 2	
3	power consumption from 90 mW to 85 mW	
8	diagram luminous intensity from OHL01462 to OHL11462	
2	value of R_{th} from 470 to 450 K/W	
9	diagram pulse handling from OHL01405 to OHL00064 and from OHL01406 to OHL00060	
12	annotations	2002-07-25
9	diagram pulse handling (25°C) OHL00064 to OHL11405	2002-08-13
9	diagram pulse handling (85°C) OHL00060 to OHL11406	2002-08-13
3	reverse voltage (footnote)	2002-08-21
2, 5	new luminous intensity groups and new ordering codes	2002-11-18
12	new patent no.	2003-03-04

Patent List

Patent No.

US 6 066 861, US 6 277 301, US 6 245 259

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Attention please!

The information describes the type of component and shall not be considered as assured characteristics.

All typical data and graphs are basing on representative samples, but don't represent the production range. If requested, e.g. because of technical improvements, these typ. data will be changed without any further notice.

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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.