

Hyper 5 mm (T1 ¾) LED, Non Diffused Hyper-Bright LED

LB 5433, LV 5433, LT 5433



Vorläufige Daten / Preliminary Data

Besondere Merkmale

- **Gehäusotyp:** klares 5 mm (T1 ¾) Gehäuse
- **Besonderheit des Bauteils:** enge Abstrahlcharakteristik
- **Wellenlänge:** 470 nm (blau), 505 nm (verde), 528 nm (true green)
- **Abstrahlwinkel:** 40°
- **Technologie:** InGaN
- **optischer Wirkungsgrad:** 2 lm/W (blau), 6 lm/W (verde), 8 lm/W (true green)
- **Gruppierungsparameter:** Lichtstärke
- **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
- Hinterleuchtung (Tasten, Displays, Werbebeleuchtung, Allgemeinbeleuchtung)
- Innenbeleuchtung im Automobilbereich (z.B. Instrumentenbeleuchtung, u. ä.)
- Ersatz von Kleinst-Glühlampen
- Signal- und Symbolleuchten
- Markierungsbeleuchtung (z.B. Stufen, Fluchtwege, u.ä.)

Features

- **package:** clear 5 mm (T1 ¾) package
- **feature of the device:** narrow viewing angle
- **wavelength:** 470 nm (blue), 505 nm (verde), 528 nm (true green)
- **viewing angle:** 40°
- **technology:** InGaN
- **optical efficiency:** 2 lm/W (blue), 6 lm/W (verde), 8 lm/W (true green)
- **grouping parameter:** luminous intensity
- **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
- backlighting (keys, displays, illuminated advertising, general lighting)
- interior automotive lighting (e.g. dashboard backlighting, etc.)
- substitution of micro incandescent lamps
- signal and symbol luminaire
- 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 5433-QS LB 5433-SU	blue	colorless clear	71 ... 280 180 ... 710	120 (typ.) 300 (typ.)	Q62703-Q4843
LV 5433-TV LV 5433-VBW	verde	colorless clear	280 ... 1120 710 ... 2800	470 (typ.) 1000 (typ.)	Q62703-Q4850
LT 5433-TV LT 5433-VBW	true green	colorless clear	280 ... 1120 710 ... 2800	470 (typ.) 1000 (typ.)	Q62703-Q4857

Anm.: - gesamter Farbbereich, Lieferung in Einzelgruppen (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: - 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 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
		LB	LV, LT	
Betriebstemperatur Operating temperature range	T_{op}	– 55 ... + 100		°C
Lagertemperatur Storage temperature range	T_{stg}	– 55 ... + 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	250	mA
Sperrspannung Reverse voltage	V_R	5		V
Leistungsaufnahme Power consumption $T_A \leq 25 \text{ °C}$	P_{tot}	85		mW
Wärmewiderstand ¹⁾ Thermal resistance Sperrschicht/Umgebung Junction/ambient 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 $\geq 16 \text{ mm}^2$) Minimale Beinchenlänge Minimum lead length	$R_{th JA}$ $R_{th JS}$	400 180		K/W K/W

¹⁾ 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	Werte Values			Einheit Unit
		LB	LV	LT	
Wellenlänge des emittierten Lichtes (typ.) Wavelength at peak emission $I_F = 20\text{ mA}$	λ_{peak}	465	503	523	nm
Dominantwellenlänge ¹⁾ (typ.) Dominant wavelength $I_F = 20\text{ mA}$	λ_{dom}	470 ± 6	505 ± 7	528 ± 9	nm
Spektrale Bandbreite bei 50 % $I_{\text{rel max}}$ (typ.) Spectral bandwidth at 50 % $I_{\text{rel max}}$ $I_F = 20\text{ mA}$	$\Delta\lambda$	25	30	33	nm
Abstrahlwinkel bei 50 % I_V (Vollwinkel) (typ.) Viewing angle at 50 % I_V	2ϕ	40	40	40	Grad deg.
Durchlassspannung ²⁾ (typ.) Forward voltage (max.) $I_F = 20\text{ mA}$	V_F V_F	3.4 3.9	3.2 3.9	3.2 3.9	V V
Sperrstrom (typ.) Reverse current (max.) $V_R = 5\text{ V}$	I_R I_R	0.01 10	0.01 10	0.01 10	μA μA
Temperaturkoeffizient von λ_{peak} (typ.) Temperature coefficient of λ_{peak} $I_F = 20\text{ mA}; -10^\circ\text{C} \leq T \leq 100^\circ\text{C}$	$TC_{\lambda_{\text{peak}}}$	0.04	0.03	0.04	nm/K
Temperaturkoeffizient von λ_{dom} (typ.) Temperature coefficient of λ_{dom} $I_F = 20\text{ mA}; -10^\circ\text{C} \leq T \leq 100^\circ\text{C}$	$TC_{\lambda_{\text{dom}}}$	0.02	0.02	0.03	nm/K
Temperaturkoeffizient von V_F (typ.) Temperature coefficient of V_F $I_F = 20\text{ mA}; -10^\circ\text{C} \leq T \leq 100^\circ\text{C}$	TC_V	- 2.9	- 3.2	- 3.6	mV/K
Optischer Wirkungsgrad (typ.) Optical efficiency $I_F = 20\text{ mA}$	η_{opt}	2	6	8	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⁾ Spannungswerte werden mit einer Stromeinprägedauer 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	blue		verde		true green		Einheit Unit
	min.	max.	min.	max.	min.	max.	
3	464	468	498	503	519	525	nm
4	468	472	503	507	525	531	nm
5	472	476	507	512	531	537	nm

Helligkeits-Gruppierungsschema
Luminous Intensity Groups

Lichtgruppe Luminous Intensity Group	Lichtstärke Luminous Intensity I_V (mcd)	Lichtstrom Luminous Flux Φ_V (lm)
Q	71 ... 112	60 (typ.)
R	112 ... 180	90 (typ.)
S	180 ... 280	150 (typ.)
T	280 ... 450	240 (typ.)
U	450 ... 710	380 (typ.)
V	710 ... 1120	590 (typ.)
AW	1120 ... 1800	940 (typ.)
BW	1800 ... 2800	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: T-1

Example: T-1

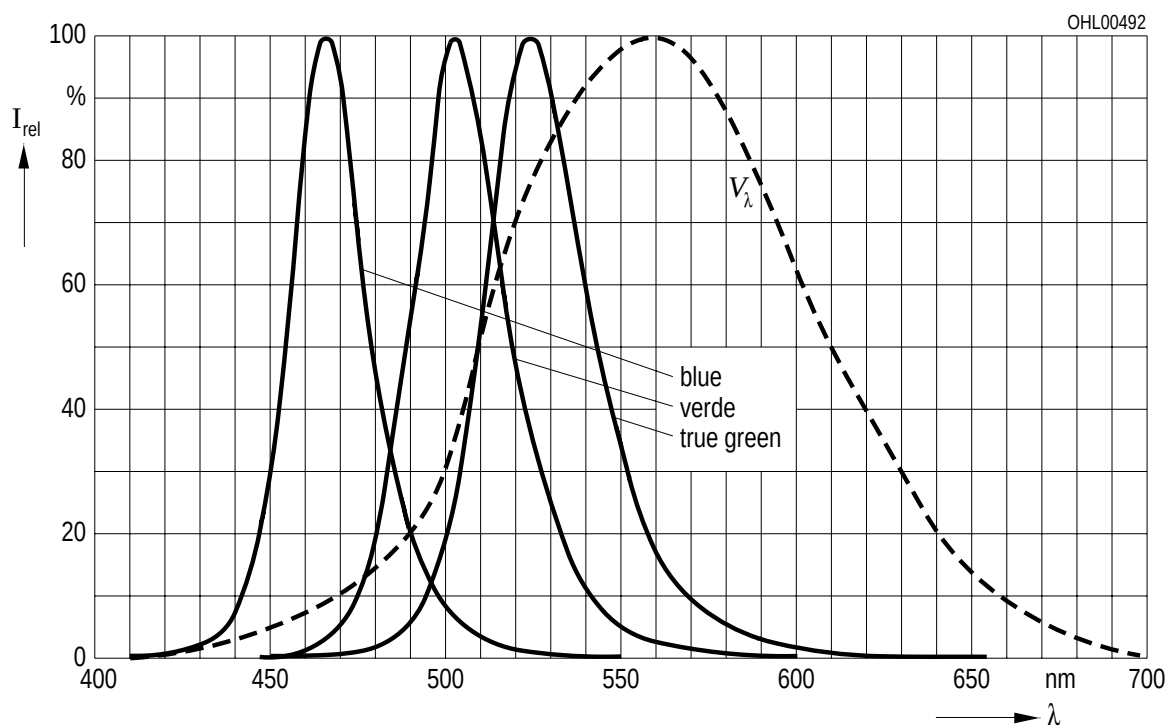
Lichtgruppe Luminous Intensity Group	Wellenlänge Wavelength
T	1

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

Relative Spectral Emission

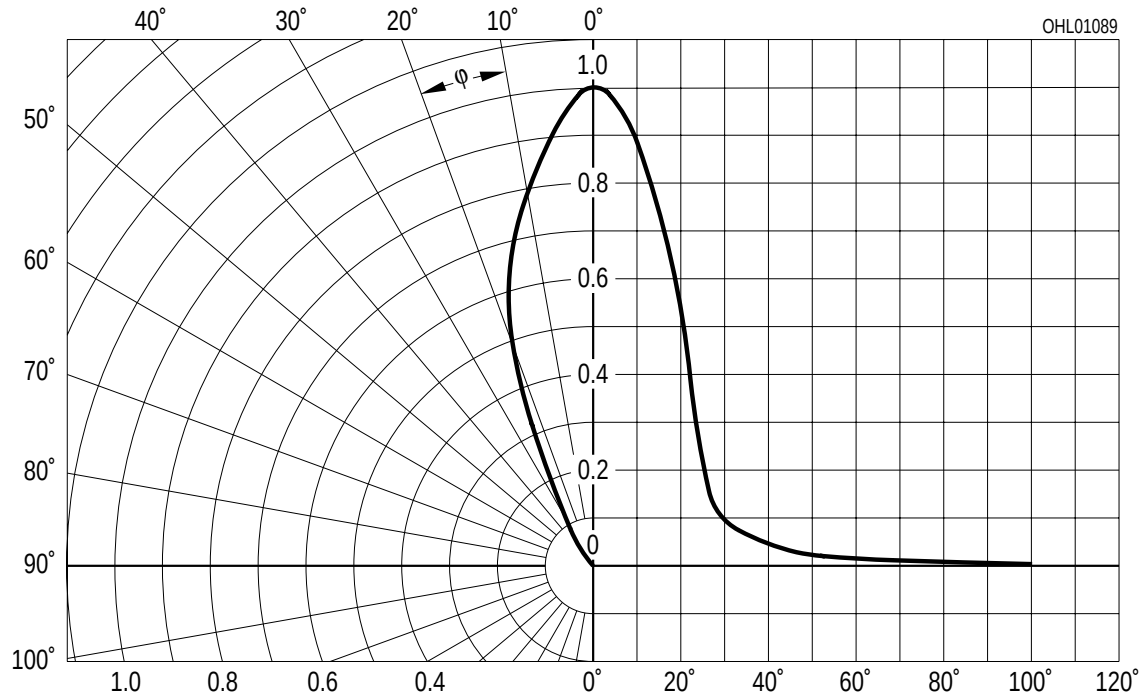
$V(\lambda)$ = spektrale Augenempfindlichkeit

Standard eye response curve



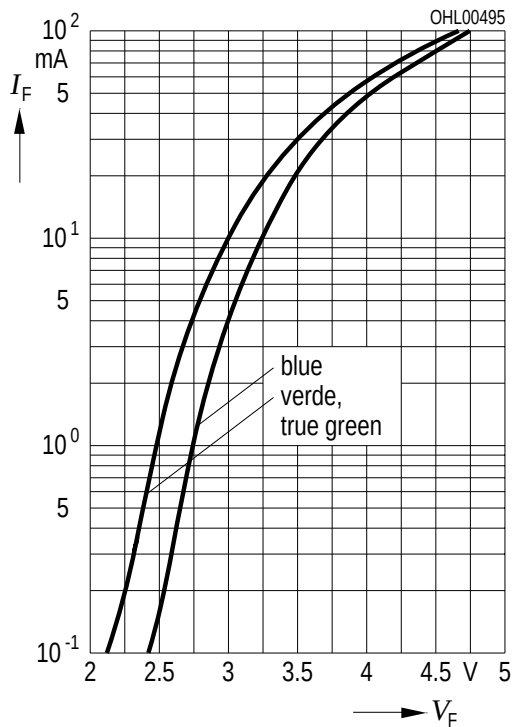
Abstrahlcharakteristik $I_{\text{rel}} = f(\varphi)$

Radiation Characteristic



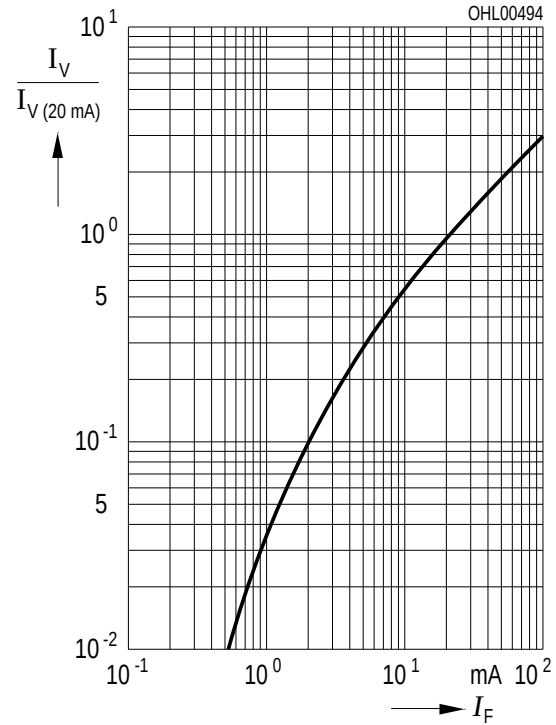
Durchlassstrom $I_F = f(V_F)$
Forward Current

$T_A = 25\text{ °C}$

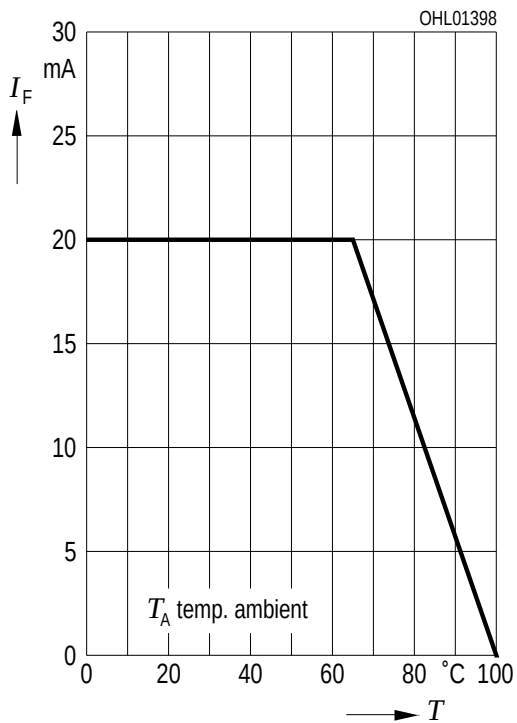


Relative Lichtstärke $I_V/I_{V(20\text{ mA})} = f(I_F)$
Relative Luminous Intensity

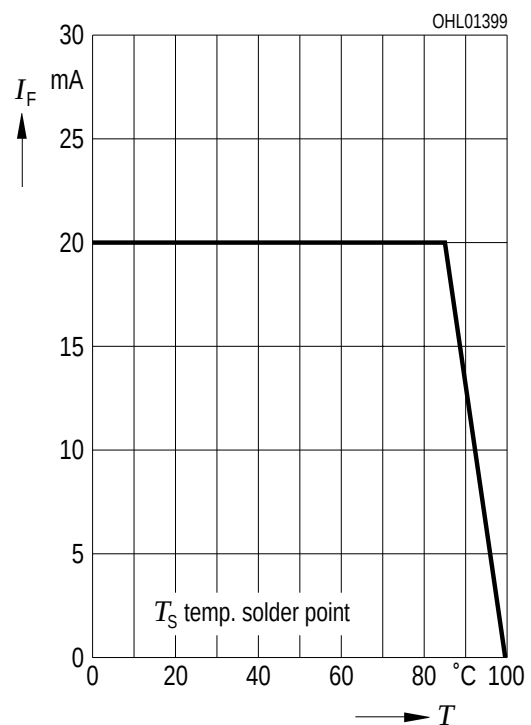
$T_A = 25\text{ °C}$



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



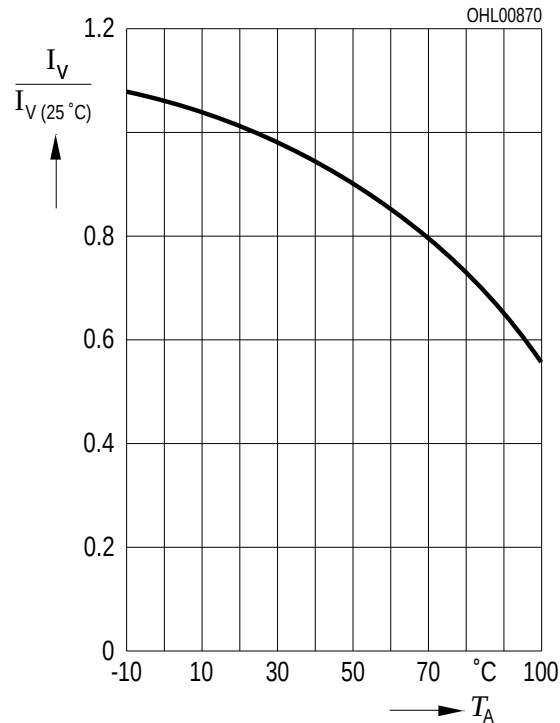
Maximal zulässiger Durchlassstrom $I_F = f(T)$
Max. Permissible Forward Current



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

Relative Luminous Intensity

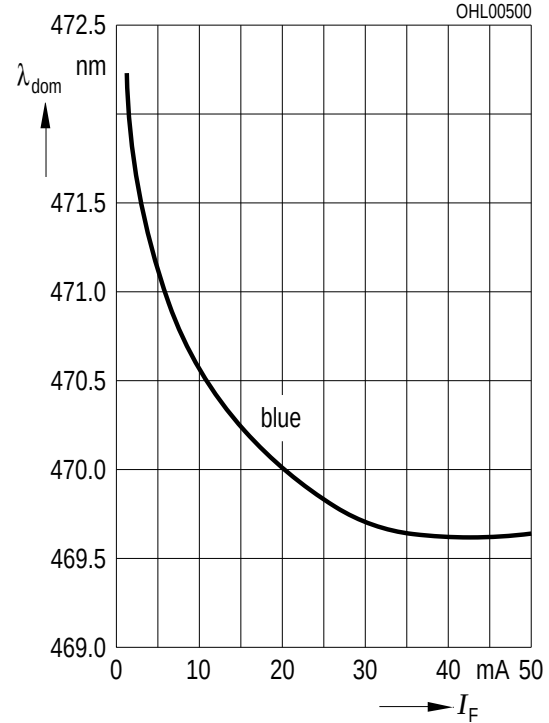
$I_F = 20\text{ mA}$



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

Dominant Wavelength

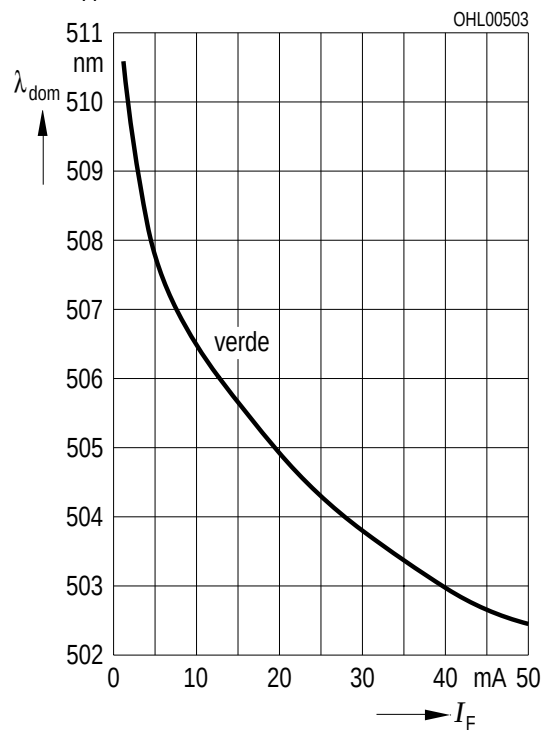
LB, $T_A = 25\text{ °C}$



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

Dominant Wavelength

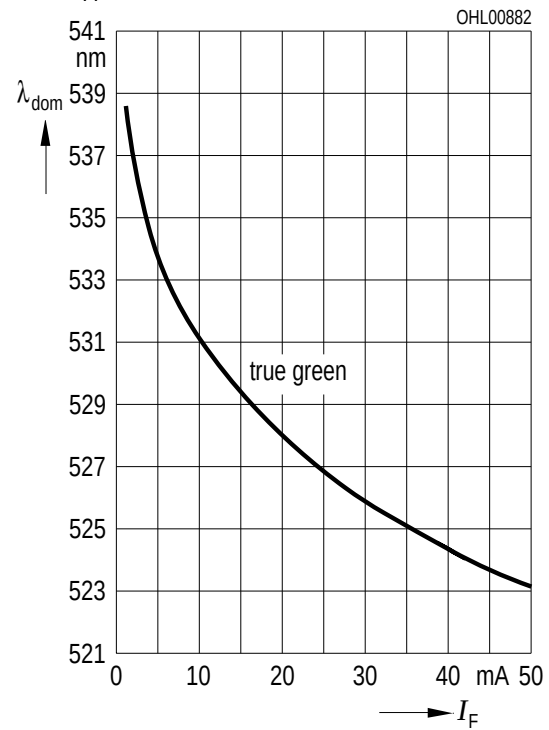
LV, $T_A = 25\text{ °C}$



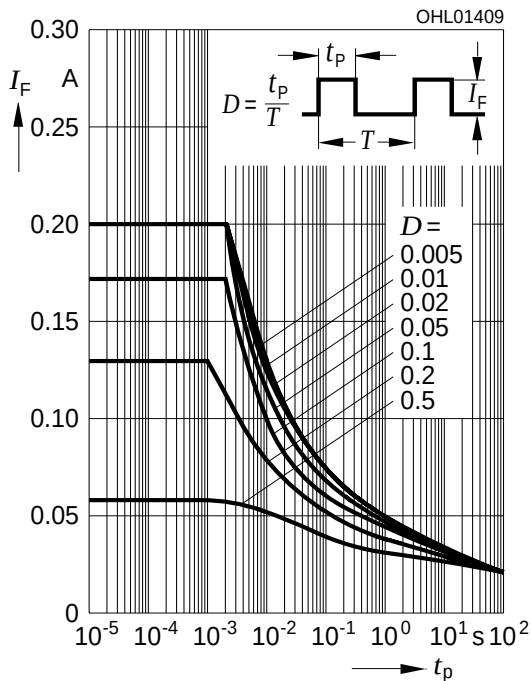
Dominante Wellenlänge $\lambda_{\text{dom}} = f(I_F)$

Dominant Wavelength

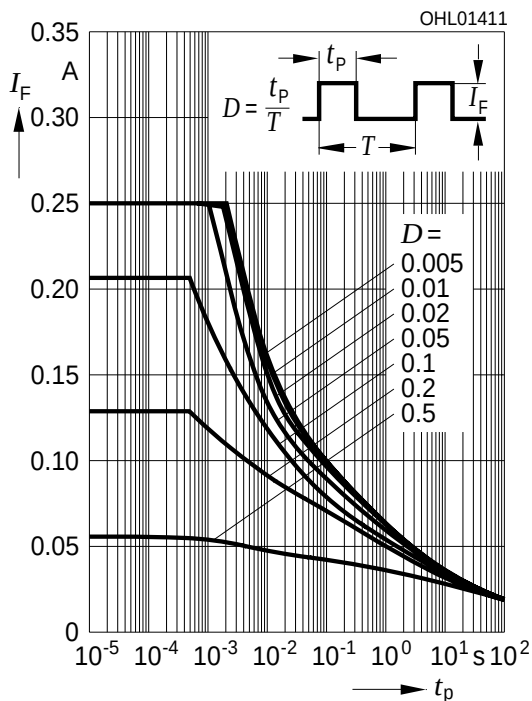
LT, $T_A = 25\text{ °C}$



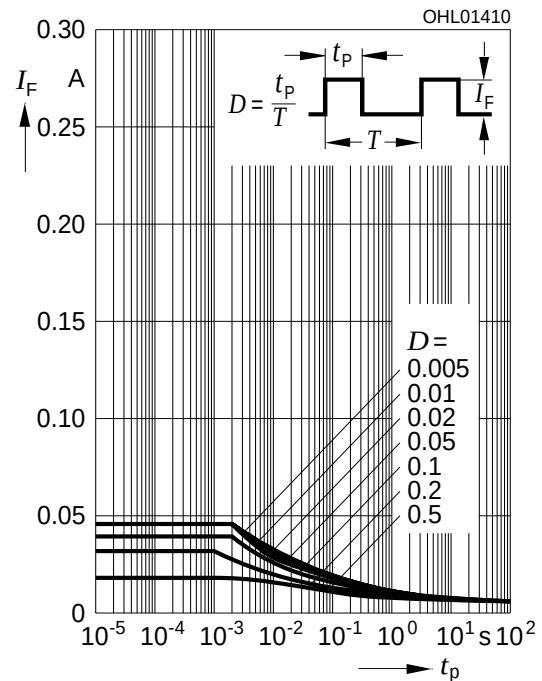
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
 Duty cycle $D = \text{parameter}$, $T_A = 25^\circ\text{C}$
LB



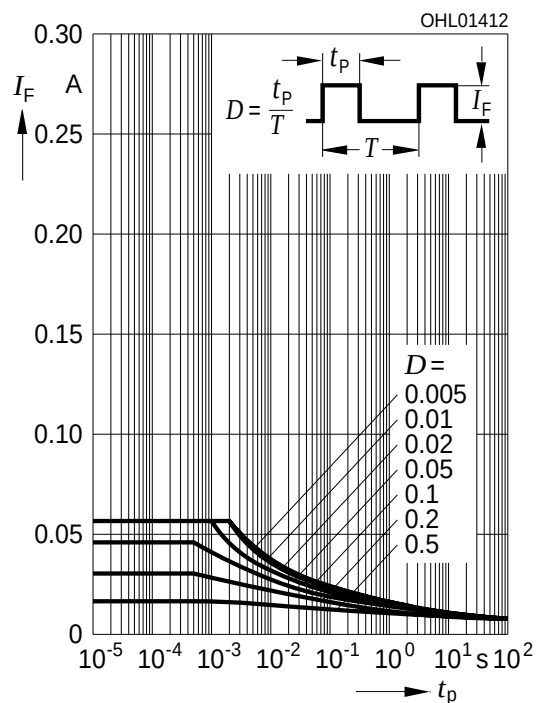
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
 Duty cycle $D = \text{parameter}$, $T_A = 25^\circ\text{C}$
LV, LT



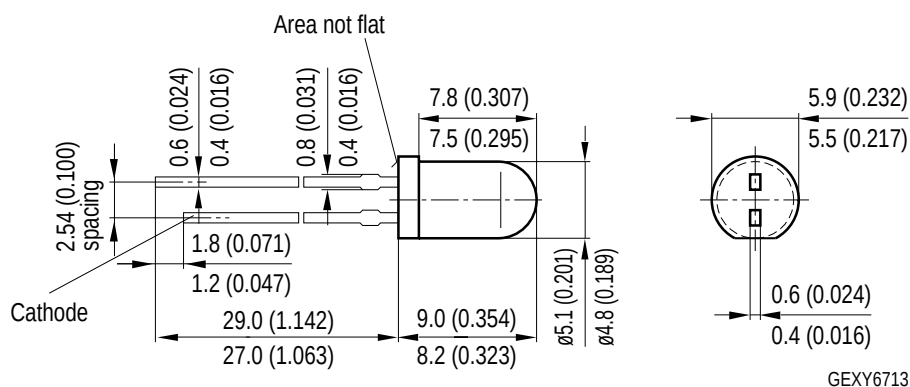
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
 Duty cycle $D = \text{parameter}$, $T_A = 85^\circ\text{C}$
LB



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



Maßzeichnung Package Outlines



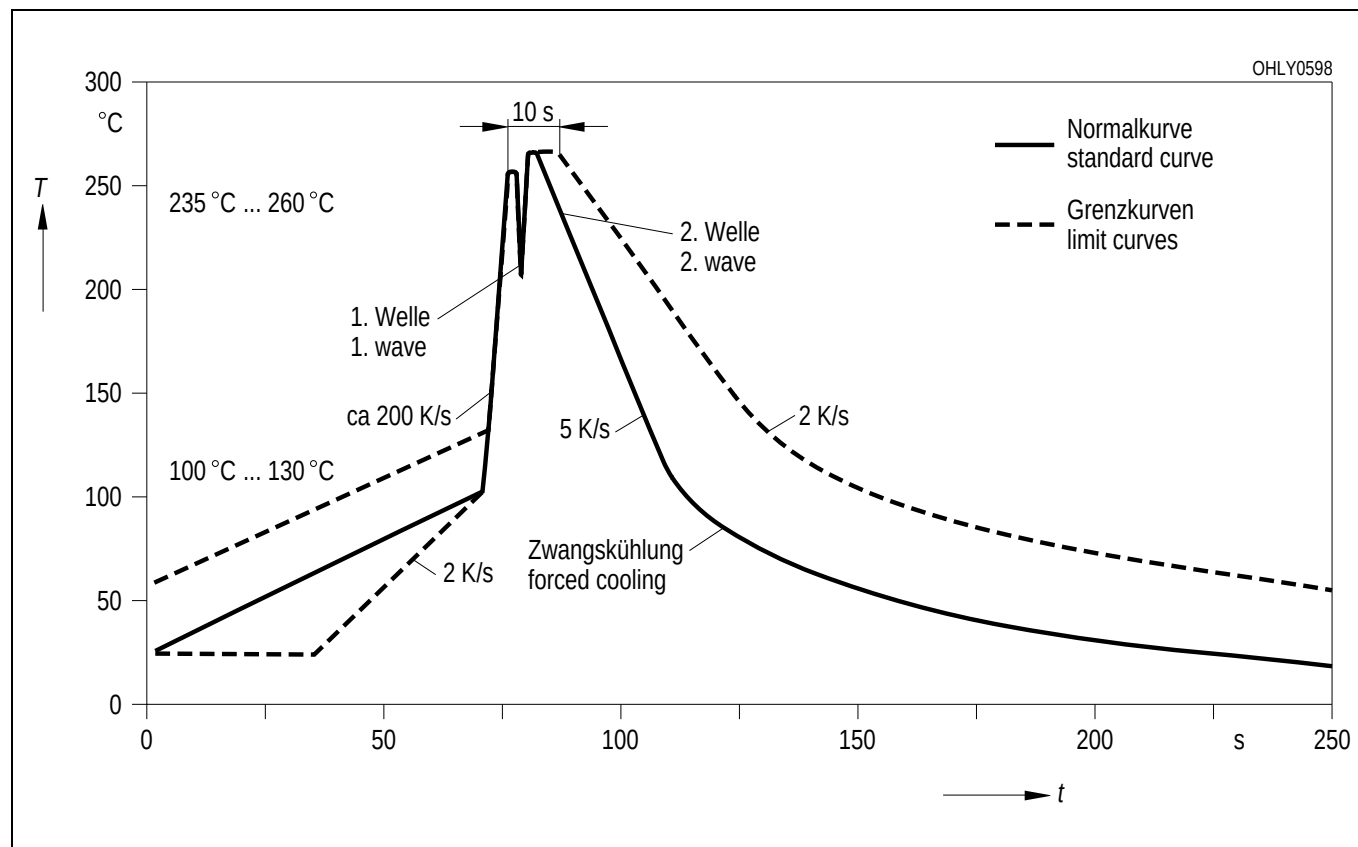
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

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

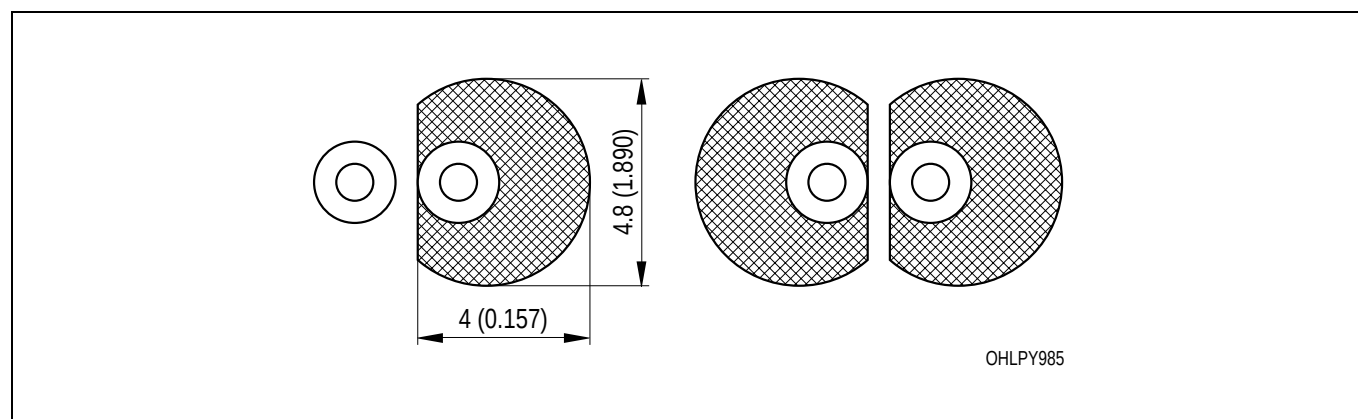
Lötbedingungen Soldering Conditions

Wellenlöten (TTW)(nach CECC 00802)

TTW Soldering(acc. to CECC 00802)



Empfohlenes Lötpad Design Wellenlöten (TTW)
Recommended Solder Pad TTW Soldering



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

Revision History: 2001-10-02

Previous Version: 2001-03-01

Page	Subjects (major changes since last revision)
3	thermal resistance (footnote)
4	value (forward voltage)

Published by OSRAM Opto Semiconductors GmbH & Co. OHG

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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.

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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.