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

LB 5413, LV 5413, LT 5413

LB_LV_LT 5413 abgekündigt - werden durch LB_LT 543C, LB_LT 5433 und LV 541C ersetzt werden
LB_LV_LT 5413 obsolete - will be replaced by LB_LT 543C, LB_LT 5433 and LV 541C

Besondere Merkmale

- **Gehäusetyp:** nicht eingefärbtes, klares 5 mm (T1 ¾) Gehäuse
- **Besonderheit des Bauteils:** enge Abstrahlcharakteristik für große Lichtstärken
- **Wellenlänge:** 470 nm (blau), 505 nm (verde), 528 nm (true green)
- **Abstrahlwinkel:** engwinklig (15°)
- **Technologie:** InGaN
- **optischer Wirkungsgrad:** 2 lm/W (blau), 6 lm/W (verde), 8 lm/W (true green)
- **Gruppierungsparameter:** Lichtstärke, Wellenlänge
- **Lötmethode:** Wellenlöten (TTW)
- **Verpackung:** Schüttgut, gegurtet lieferbar
- **ESD-Festigkeit:** ESD-sicher bis 2 kV nach EOS/ESD-5.1-1993

Features

- **package:** colorless, clear 5 mm (T1 ¾) package
- **feature of the device:** narrow viewing angle for more brightness
- **wavelength:** 470 nm (blue), 505 nm (verde), 528 nm (true green)
- **viewing angle:** narrow (15°)
- **technology:** InGaN
- **optical efficiency:** 2 lm/W (blue), 6 lm/W (verde), 8 lm/W (true green)
- **grouping parameter:** luminous intensity, wavelength
- **soldering methods:** TTW soldering
- **packing:** bulk, available taped on reel
- **ESD-withstand voltage:** up to 2 kV acc. to EOS/ESD-5.1-1993

Anwendungen

- Ampelanwendungen
- Hinterleuchtung (LCD, Schalter, Tasten, Displays, Werbebeleuchtung, Allgemeinbeleuchtung)
- Innenbeleuchtung im Automobilbereich (z.B. Tastenbeleuchtung, u. ä.)
- Ersatz von Kleinst-Glühlampen

Applications

- traffic lights
- backlighting (LCD, switches, keys, displays, illuminated advertising, general lighting)
- interior automotive lighting (e.g. key backlighting, etc.)
- substitution of micro incandescent lamps

Typ Type	Emissions-farbe Color of Emission	Gehäusefarbe Color of Package	Lichtstärke Luminous Intensity I_F = 20 mA I_V (mcd)	Lichtstrom Luminous Flux I_F = 20 mA Φ_V (mlm)	Bestellnummer Ordering Code
◆ LB 5413-TV-35	blue	colorless clear	280 ... 1120	120 (typ.)	Q62703Q5930
◆ LB 5413-VBW-35			710 ... 2800	300 (typ.)	Q62703Q5931
■ LV 5413-VBW-35	verde	colorless clear	710 ... 2800	470 (typ.)	Q62703Q5932
■ LV 5413-BWDW-35			1800 ... 7100	1200 (typ.)	Q62703Q5933
◆ LT 5413-VBW-35	true green	colorless clear	710 ... 2800	470 (typ.)	Q62703Q5934
◆ LT 5413-BWDW-35			1800 ... 7100	1200 (typ.)	Q62703Q5935

■ LV 5413 abgekündigt nach PD_078_02 - wird durch LV 541C ersetzt werden
LV 5413 obsolete acc. to PD_078_02 - will be replaced by LV 541C
Letzte Bestellung / Last Order: 2003-09-30
Letzte Lieferung / Last Delivery: 2004-03-31

◆ LB 5413, LT 5413 abgekündigt nach OS-PD-2003-007- werden durch LB 543C / LB 5433, LT 543C / LT 5433 ersetzt werden
LB 5413, LT 5413 obsolete acc. to OS-PD-2003-007 - will be replaced by LB 543C / LB 5433, LT 543C / LT 5433
Letzte Bestellung / Last Order: 2004-02-28
Letzte Lieferung / Last Delivery: 2004-08-31

*Anm.: -35 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: -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 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 $t \leq 10$ µs, $D = 0.005$	I_{FM}	200	250	mA
Sperrspannung[1)] Reverse voltage	V_R	5		V
Leistungsaufnahme Power consumption $T_A \leq 25$ °C	P_{tot}	80		mW
Wärmewiderstand [2)] Thermal resistance Sperrschicht/Umgebung Junction/ambient Sperrschicht/Lötpad Junction/solder point Montage auf PC-Board FR 4 (Padgröße ≥ 16 mm²) mounted on PC board FR 4 (pad size ≥ 16 mm²) Minimale Beinchenlänge Minimum lead length	 $R_{th\ JA}$ $R_{th\ JS}$	 400 180		 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 °C)
Characteristics

Bezeichnung **Parameter**		**Symbol** **Symbol**	**Werte** **Values**			**Einheit** **Unit**
			LB	**LV**	**LT**	
Wellenlänge des emittierten Lichtes Wavelength at peak emission I_F = 20 mA	(typ.)	λ_{peak}	465	503	523	nm
Dominantwellenlänge [1] Dominant wavelength I_F = 20 mA	(typ.)	λ_{dom}	470 ± 6	505 ± 7	528 ± 9	nm
Spektrale Bandbreite bei 50 % $I_{rel\ max}$ Spectral bandwidth at 50 % $I_{rel\ max}$ I_F = 20 mA	(typ.)	$\Delta\lambda$	25	30	33	nm
Abstrahlwinkel bei 50 % I_V (Vollwinkel) Viewing angle at 50 % I_V	(typ.)	2φ	15	15	15	Grad deg.
Durchlassspannung [2] Forward voltage I_F = 20 mA	(min.) (typ.) (max.)	V_F V_F V_F	2.9 3.5 3.9	2.9 3.3 3.9	2.9 3.3 3.9	V V V
Sperrstrom Reverse current V_R = 5 V	(typ.) (max.)	I_R I_R	0.01 10	0.01 10	0.01 10	µA µA
Temperaturkoeffizient von λ_{peak} Temperature coefficient of λ_{peak} I_F = 20 mA; –10°C ≤ T ≤ 100°C	(typ.)	$TC_{\lambda peak}$	0.04	0.03	0.04	nm/K
Temperaturkoeffizient von λ_{dom} Temperature coefficient of λ_{dom} I_F = 20 mA; –10°C ≤ T ≤ 100°C	(typ.)	$TC_{\lambda dom}$	0.03	0.04	0.04	nm/K
Temperaturkoeffizient von V_F Temperature coefficient of V_F I_F = 20 mA; –10°C ≤ T ≤ 100°C	(typ.)	TC_V	– 4.5	– 3.6	– 3.6	mV/K
Optischer Wirkungsgrad Optical efficiency I_F = 20 mA	(typ.)	η_{opt}	2	6	8	lm/W

[1] Wellenlängengruppen werden mit einer Stromeinprägedauer von 25 ms und einer Genauigkeit von ±1 nm ermittelt.
Wavelength groups are tested at a current pulse duration of 25 ms and a tolerance of ±1 nm.

[2] Durchlassspannungsgruppen werden mit einer Stromeinprägedauer von 1 ms und einer Genauigkeit von ±0,05 V ermittelt.
Forward voltage groups are tested at a current pulse duration of 1 ms and a tolerance of ±0.05 V.

[1] **Wellenlängengruppen / Wavelength groups**

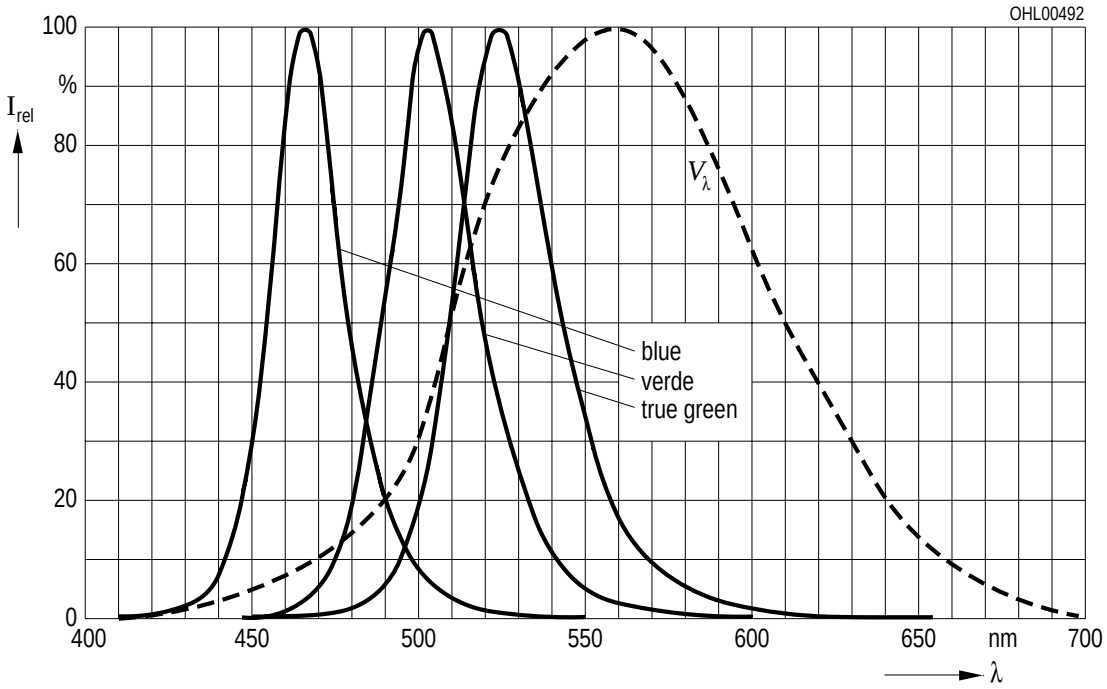
Gruppe Group	blue		verde		true green		Einheit Unit
	min.	max.	min.	max.	min.	max.	
3	464	468	498	503	519	525	nm
4	468	472	503	507	525	531	nm
5	472	476	507	512	531	537	nm

Helligkeits-Gruppierungsschema
Luminous Intensity Groups

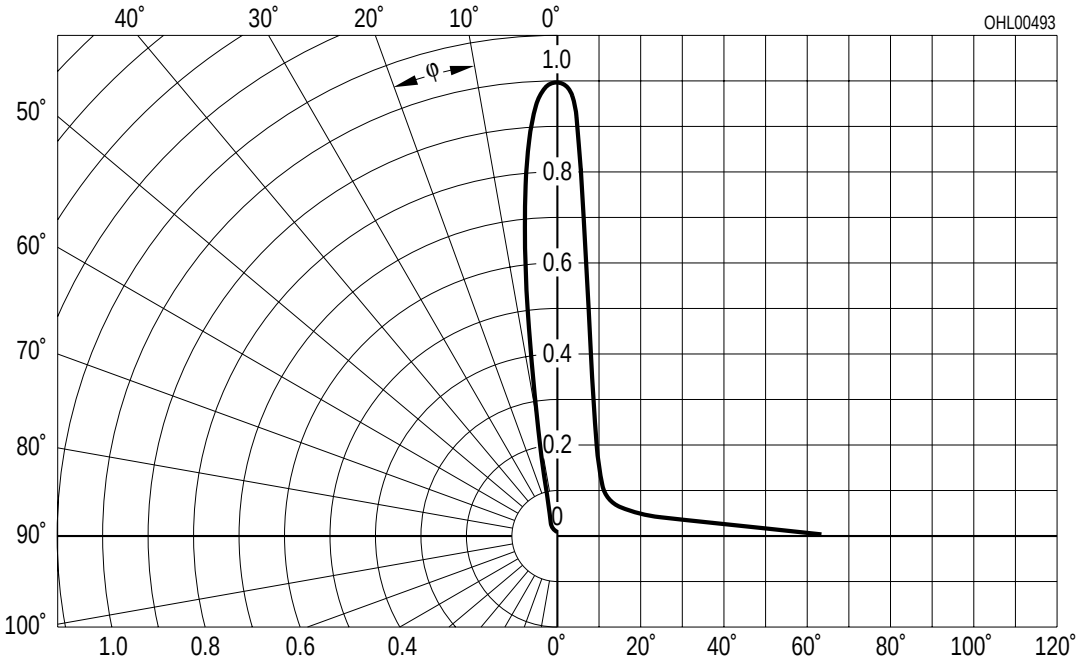
Lichtgruppe Luminous Intensity Group	Lichtstärke Luminous Intensity I_V (mcd)	Lichtstrom Luminous Flux Φ_V (mlm)
T	280 ... 450	60 (typ.)
U	450 ... 710	100 (typ.)
V	710 ... 1120	150 (typ.)
AW	1120 ... 1800	240 (typ.)
BW	1800 ... 2800	380 (typ.)
CW	2800 ... 4500	900 (typ.)
DW	4500 ... 7100	1400 (typ.)

Helligkeitswerte werden mit einer Stromeinprägedauer von 25 ms und einer Genauigkeit von ± 11% ermittelt.
Luminous intensity is tested at a current pulse duration of 25 ms and a tolerance of ± 11%.

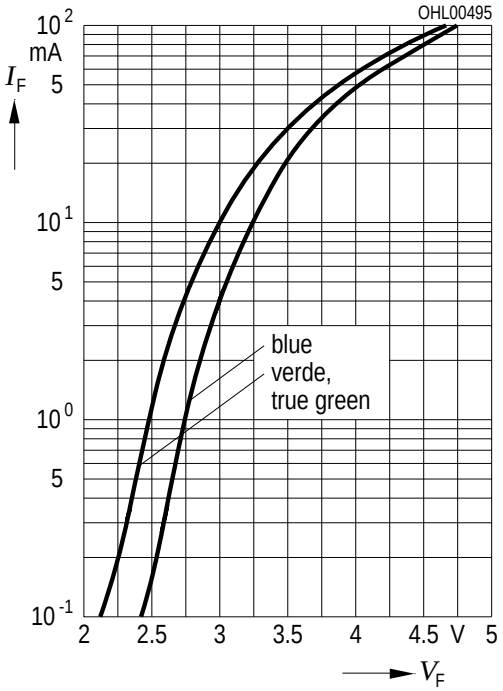
Relative spektrale Emission $I_{rel} = f(\lambda)$, $T_A = 25$ °C, $I_F = 20$ mA
Relative Spectral Emission
V(λ) = spektrale Augenempfindlichkeit
Standard eye response curve



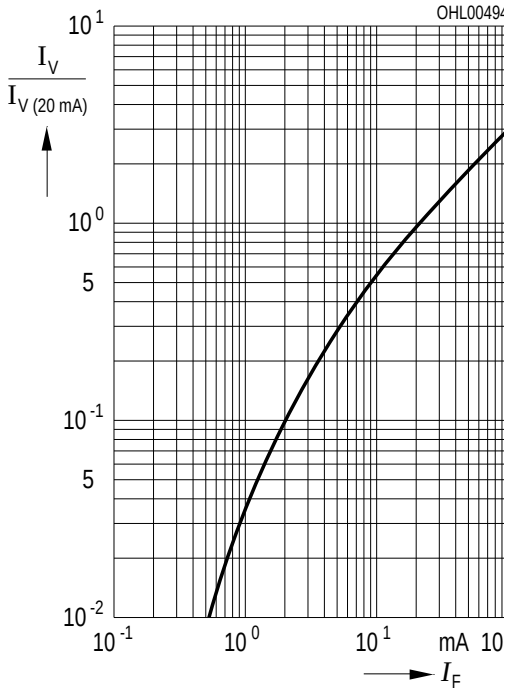
Abstrahlcharakteristik $I_{rel} = f(\varphi)$
Radiation Characteristic



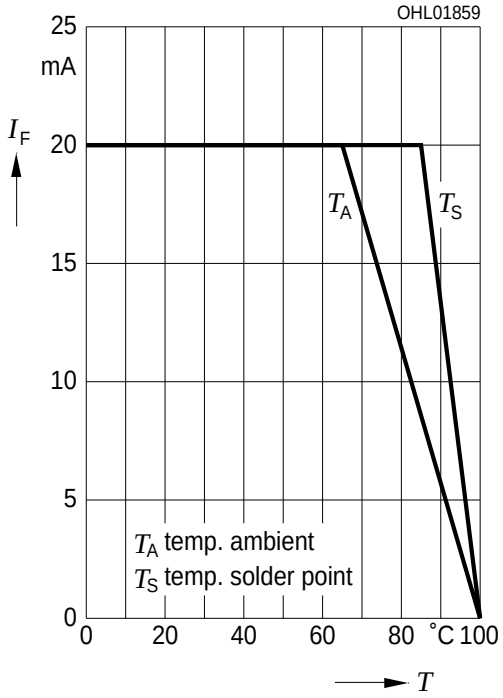
Durchlassstrom $I_F = f(V_F)$
Forward Current
T_A = 25 °C



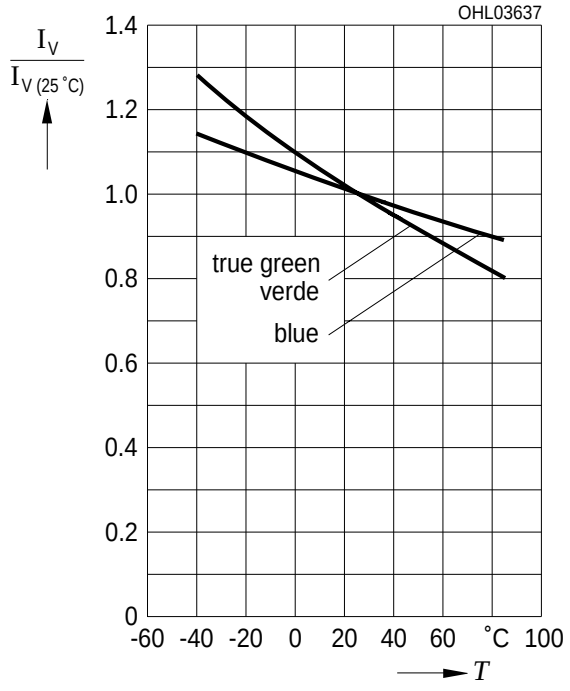
Relative Lichtstärke $I_V/I_{V(20\ mA)} = f(I_F)$
Relative Luminous Intensity
T_A = 25 °C



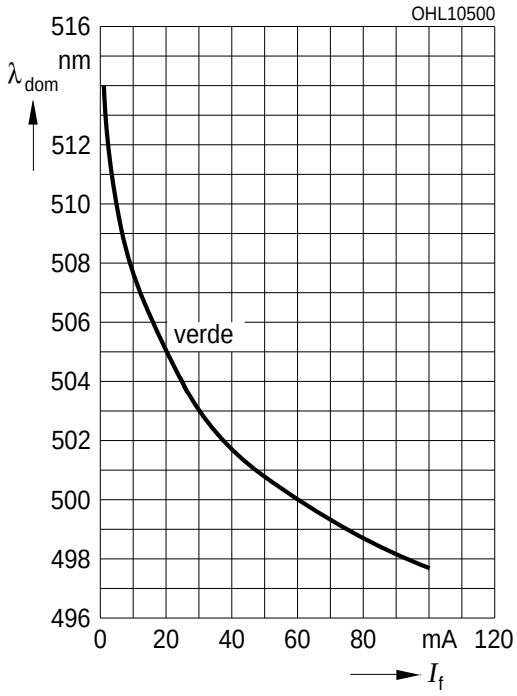
Maximal zulässiger Durchlassstrom $I_F = f(T)$
Max. Permissible Forward Current



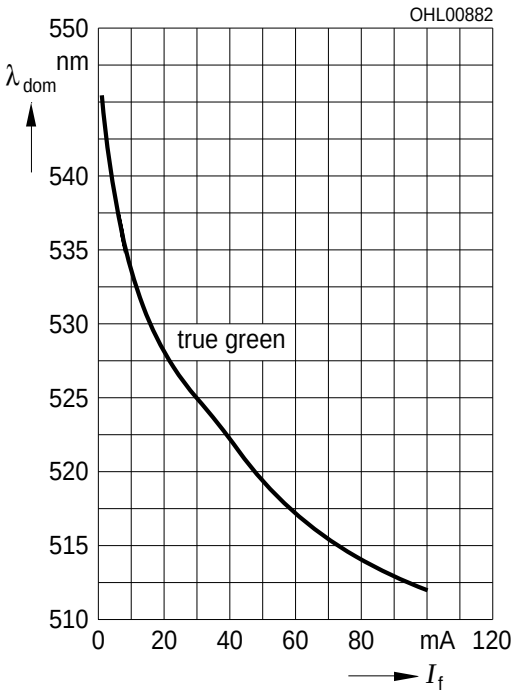
Relative Lichtstärke $I_V/I_{V(25\ °C)} = f(T_A)$
Relative Luminous Intensity
I_F = 20 mA



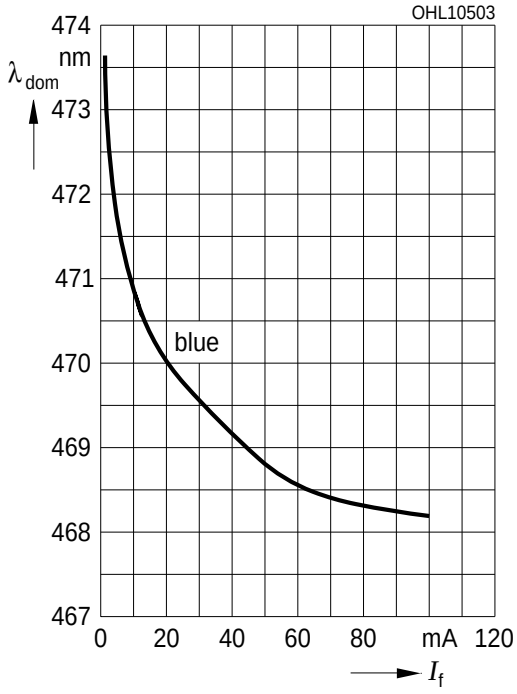
Dominante Wellenlänge $\lambda_{dom} = f(I_F)$
Dominant Wavelength
LV, T_A = 25 °C



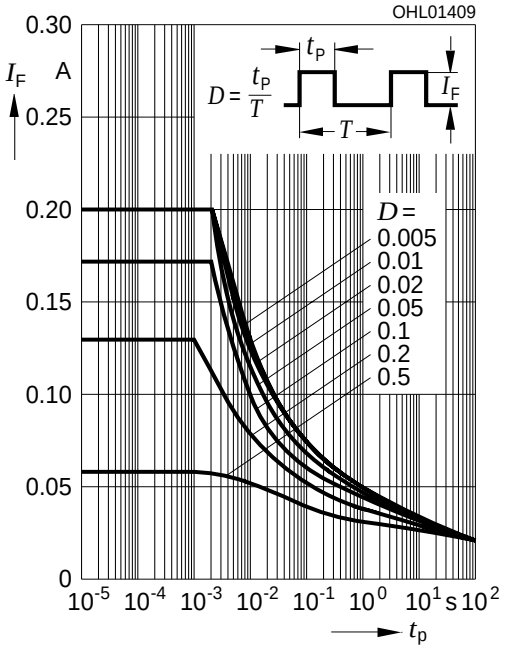
Dominante Wellenlänge $\lambda_{dom} = f(I_F)$
Dominant Wavelength
LT, T_A = 25 °C



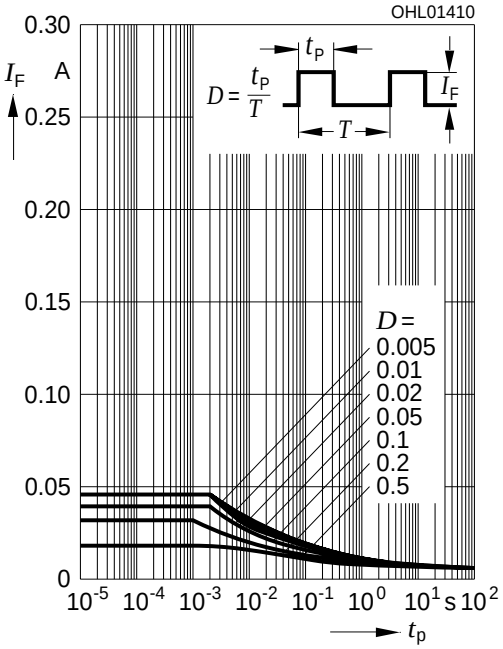
Dominante Wellenlänge $\lambda_{dom} = f(I_F)$
Dominant Wavelength
LB, T_A = 25 °C



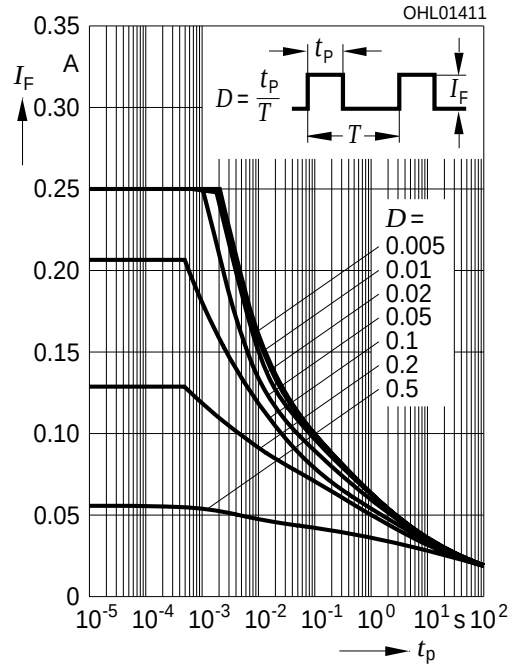
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle D = parameter, T_A= 25 °C
LB



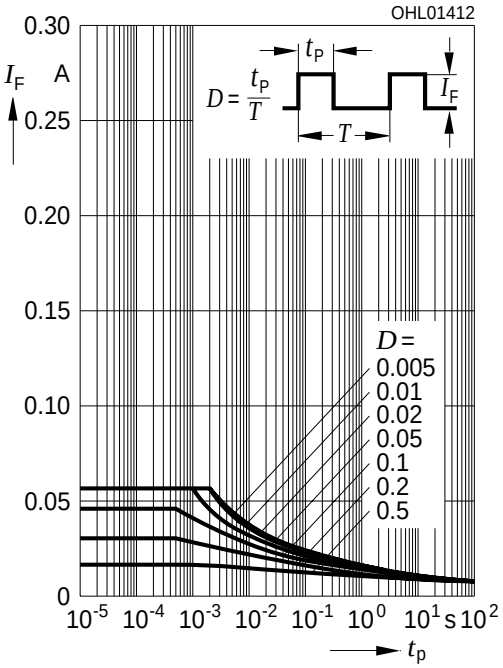
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle D = parameter, T_A= 85 °C
LB



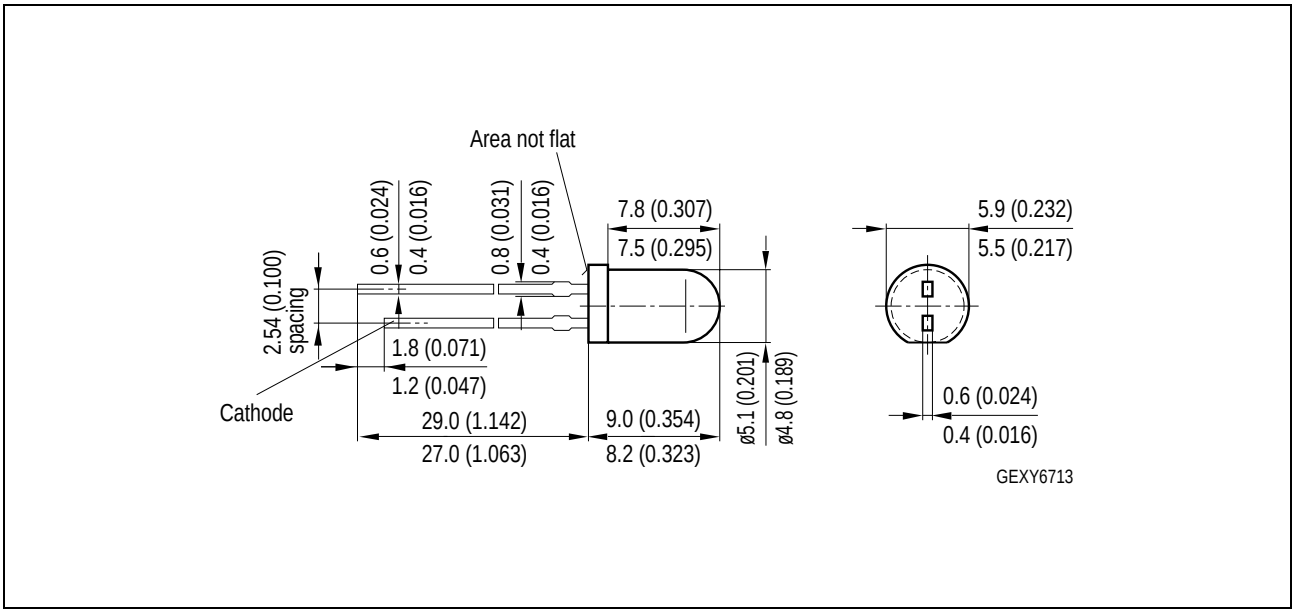
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle D = parameter, T_A= 25 °C
LV, LT



Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle D = parameter, T_A= 85 °C
LV, LT



Maßzeichnung
Package Outlines

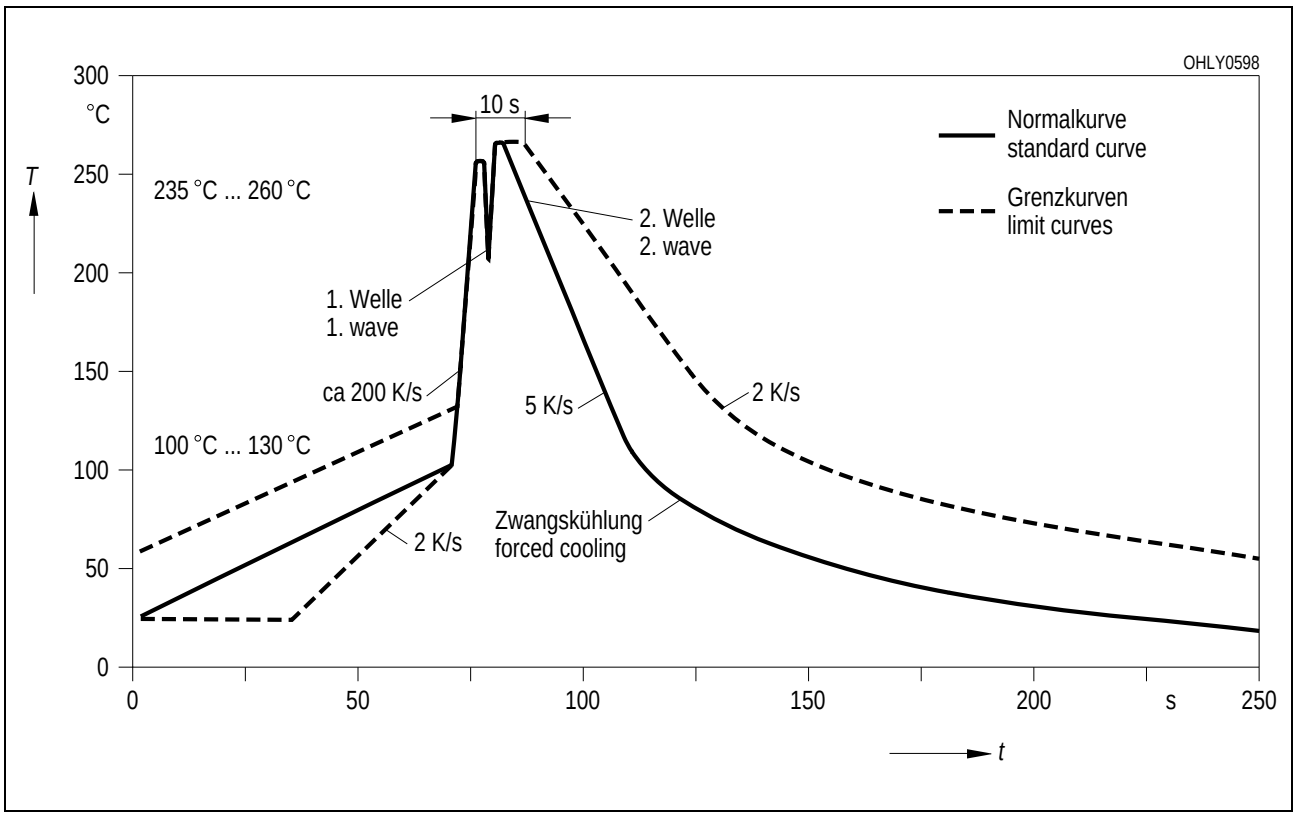


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

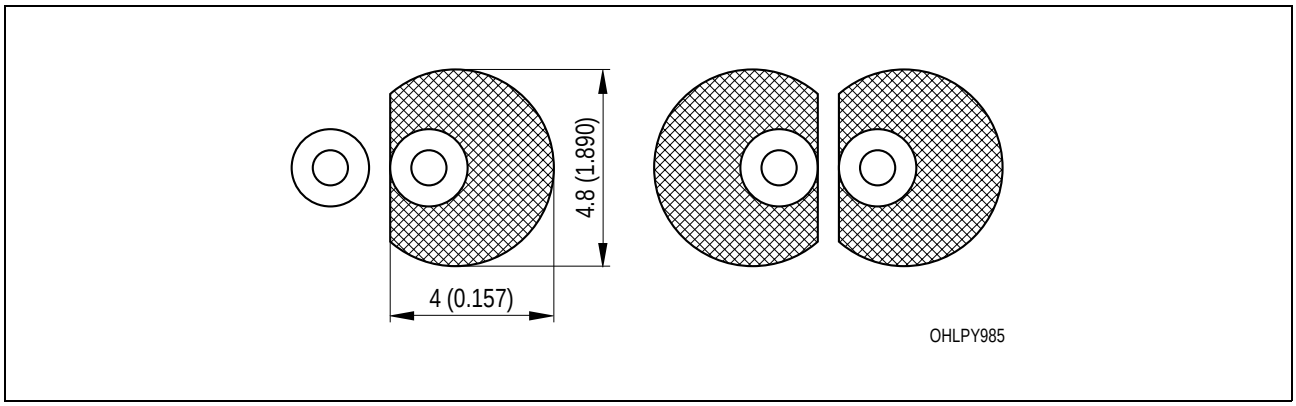
Kathodenkennung: kürzerer Lötspieß
Cathode mark: short solder lead
Gewicht / Approx. weight: 0.35 g

Lötbedingungen
Soldering Conditions

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



Empfohlenes Lötpaddesign Wellenlöten (TTW)
Recommended Solder Pad TTW Soldering



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

Revision History: 2003-08-25		Date of change
Previous Version: 2003-08-04		
Page	**Subjects (major changes since last revision)**	
3	thermal resistance (footnote)	
4	value (forward voltage)	
3	power consumption from 85 mW to 80 mW	
12	annotations	2002-07-23
3	reverse voltage (footnote)	2002-08-21
all	verde: not for new designs	2002-11-18
4	values (temperature coefficient of λ_{dom} and V_F)	2003-04-14
7	new diagram permissible forward current	2003-06-02
1, 2	verde: obsolete	2003-08-04
1, 2	blue, true green: obsolete	2003-08-25

Published by OSRAM Opto Semiconductors GmbH
Wernerwerkstrasse 2, D-93049 Regensburg

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.
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.