

# Hyper 5 mm (T1 3/4) LED, Non Diffused Hyper-Bright LED

LB 5433, LV 5433, LT 5433

LV 5433 abgekündigt nach PD\_078\_02 - wird durch  
LV 543C ersetzt werden  
LV 5433 obsolete acc. to PD\_078\_02 - will be  
replaced by LV 543C



## Besondere Merkmale

- **Gehäusotyp:** klares 5 mm (T1 3/4) 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, Wellenlänge
- **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 3/4) 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, 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

## 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	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 $I_F = 20 \text{ mA}$ $\Phi_V \text{ (mlm)}$	Ordering Code
LB 5433-QU-35	blue	colorless clear	71 ... 710	210 (typ.)	Q62703Q4843
■ LV 5433-TBW-35	verde	colorless clear	280 ... 2800	750 (typ.)	Q62703Q4850
LT 5433-TBW-35	true green	colorless clear	280 ... 2800	750 (typ.)	Q62703Q4857

- LV 5433 abgekündigt nach PD\_078\_02 - wird durch LV 543C ersetzt werden  
 LV 5433 obsolete acc. to PD\_078\_02 - will be replaced by LV 543C  
 Letzte Bestellung / Last Order: 30.09.2003  
 Letzte Lieferung / Last Delivery: 31.03.2004

*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 $t \leq 10 \mu s, D = 0.005$	$I_{FM}$	200	250	mA
Sperrspannung <sup>1)</sup> Reverse voltage	$V_R$	5		V
Leistungsaufnahme Power consumption $T_A \leq 25 \text{ °C}$	$P_{tot}$	80		mW
Wärmewiderstand <sup>2)</sup> Thermal resistance Sperrschicht/Umgebung Junction/ambient	$R_{th JA}$	400		K/W
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	$R_{th JS}$	180		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	Werte Values			Einheit Unit
		LB	LV	LT	
Wellenlänge des emittierten Lichtes (typ.) Wavelength at peak emission $I_F = 20\text{ mA}$	$\lambda_{\text{peak}}$	465	503	523	nm
Dominantwellenlänge <sup>1)</sup> (typ.) Dominant wavelength $I_F = 20\text{ mA}$	$\lambda_{\text{dom}}$	470 $\pm 6$	505 $\pm 7$	528 $\pm 9$	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 % $I_V$	$2\phi$	40	40	40	Grad deg.
Durchlassspannung <sup>2)</sup> (min.) Forward voltage (typ.) $I_F = 20\text{ mA}$ (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 (typ.) Reverse current (max.) $V_R = 5\text{ V}$	$I_R$ $I_R$	0.01 10	0.01 10	0.01 10	$\mu\text{A}$ $\mu\text{A}$
Temperaturkoeffizient von $\lambda_{\text{peak}}$ (typ.) Temperature coefficient of $\lambda_{\text{peak}}$ $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	$TC_{\lambda_{\text{peak}}}$	0.04	0.03	0.04	nm/K
Temperaturkoeffizient von $\lambda_{\text{dom}}$ (typ.) Temperature coefficient of $\lambda_{\text{dom}}$ $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	$TC_{\lambda_{\text{dom}}}$	0.03	0.04	0.04	nm/K
Temperaturkoeffizient von $V_F$ (typ.) Temperature coefficient of $V_F$ $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	$TC_V$	- 4.5	- 3.6	- 3.6	mV/K
Optischer Wirkungsgrad (typ.) Optical efficiency $I_F = 20\text{ mA}$	$\eta_{\text{opt}}$	2	6	8	lm/W

<sup>1)</sup> Wellenlängengruppen werden mit einer Stromeinprägungsdauer 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  $\pm 1\text{ nm}$ .

<sup>2)</sup> Durchlassspannungsguppen werden mit einer Stromeinprägungsdauer von 1 ms und einer Genauigkeit von  $\pm 0,05\text{ V}$  ermittelt.  
Forward voltage groups are tested at a current pulse duration of 1 ms and a tolerance of  $\pm 0.05\text{ V}$ .

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 $\Phi_V$ (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

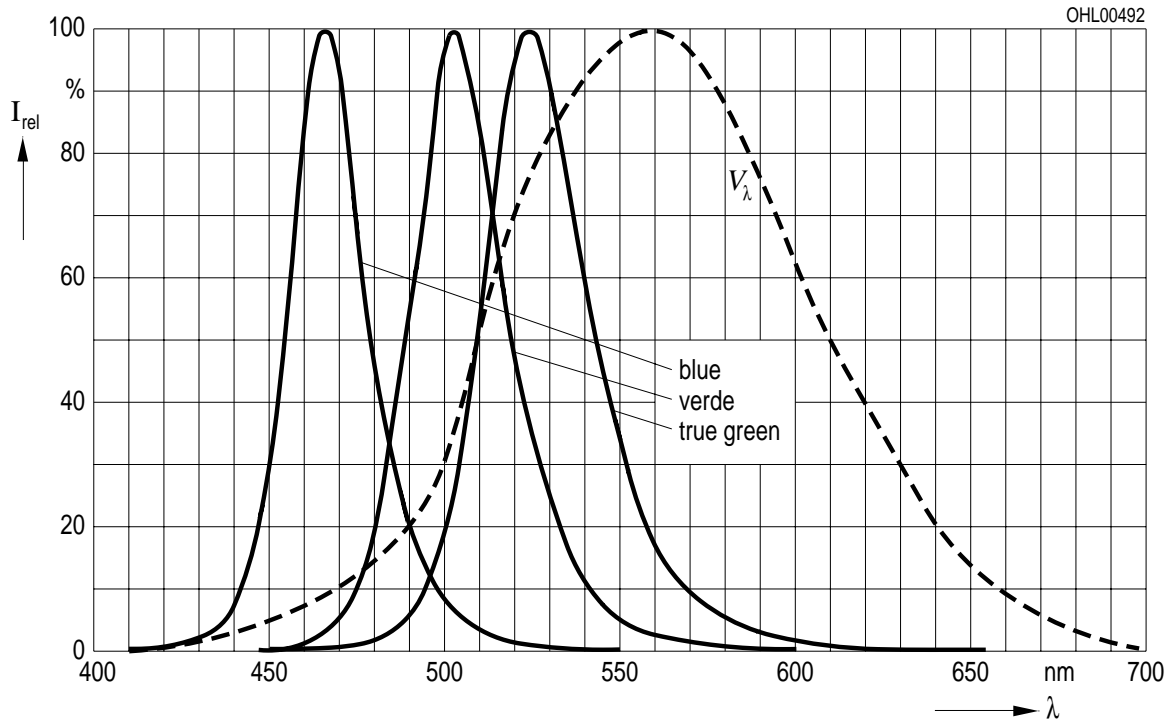
Lichtgruppe Luminous Intensity Group	Wellenlänge Wavelength
T	1

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

**Relative Spectral Emission**

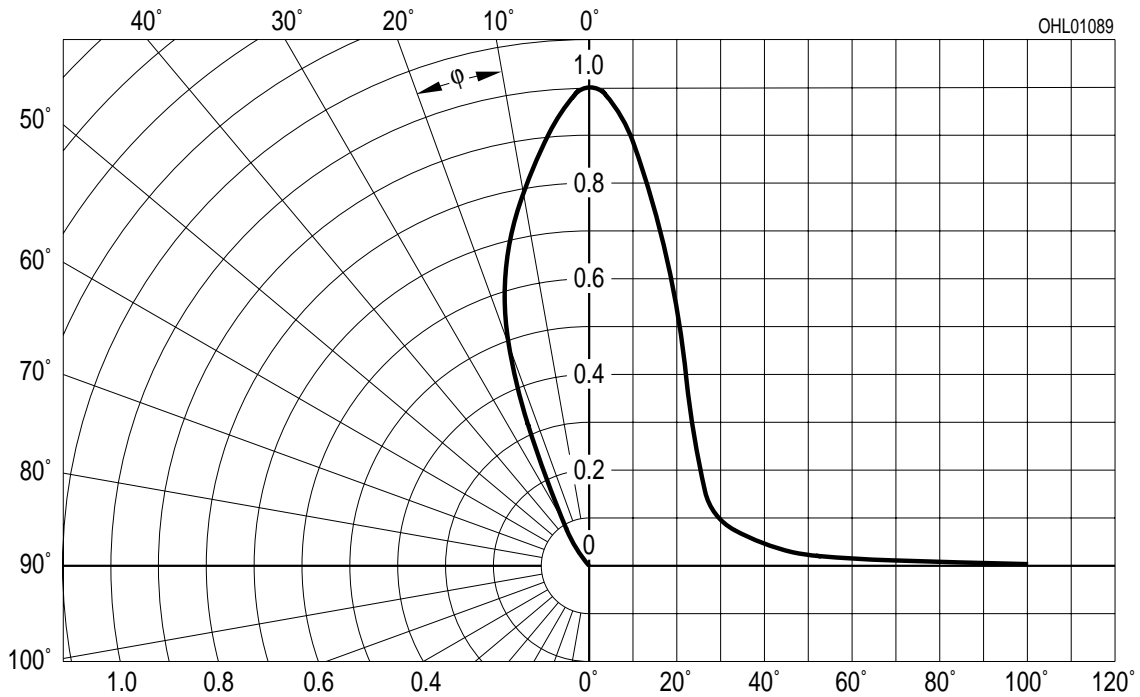
$V(\lambda)$  = spektrale Augenempfindlichkeit

Standard eye response curve



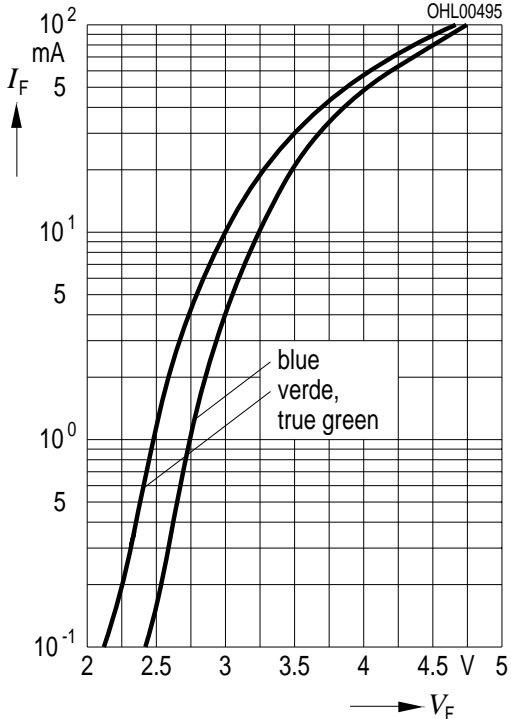
Abstrahlcharakteristik  $I_{rel} = f(\varphi)$

**Radiation Characteristic**



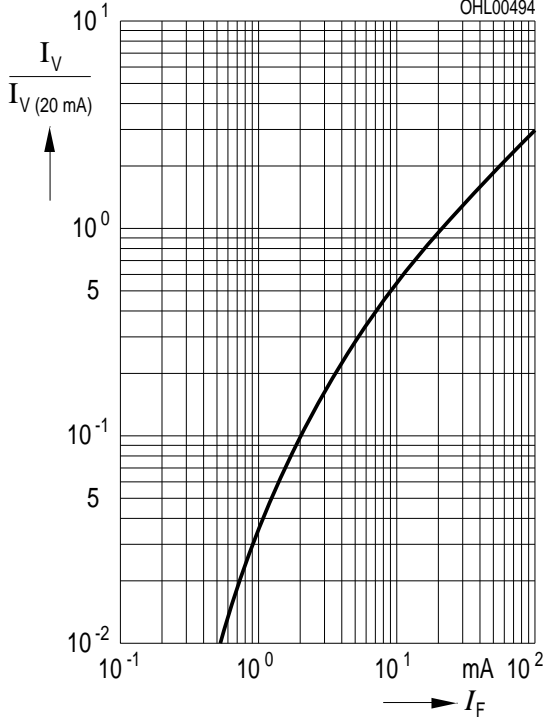
**Durchlassstrom  $I_F = f(V_F)$**   
**Forward Current**

$T_A = 25\text{ °C}$

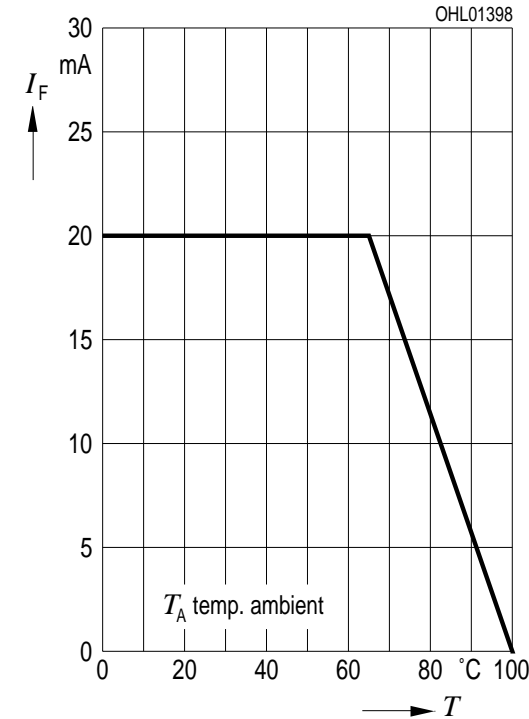


**Relative Lichtstärke  $I_V/I_{V(20\text{ mA})} = f(I_F)$**   
**Relative Luminous Intensity**

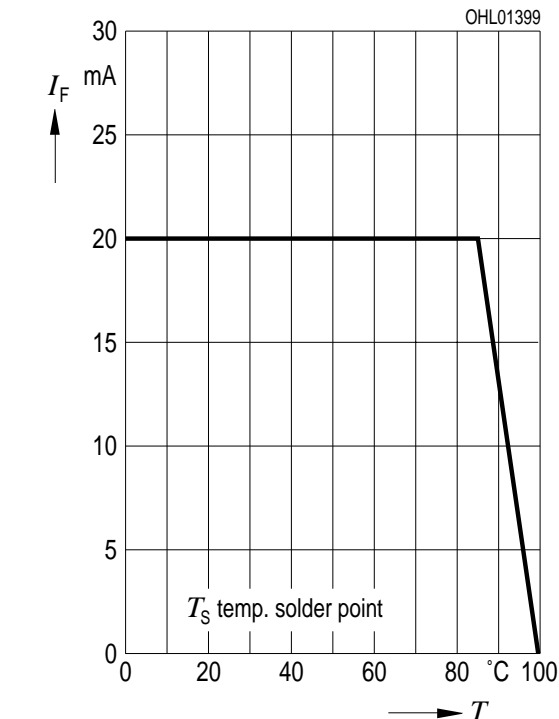
$T_A = 25\text{ °C}$



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

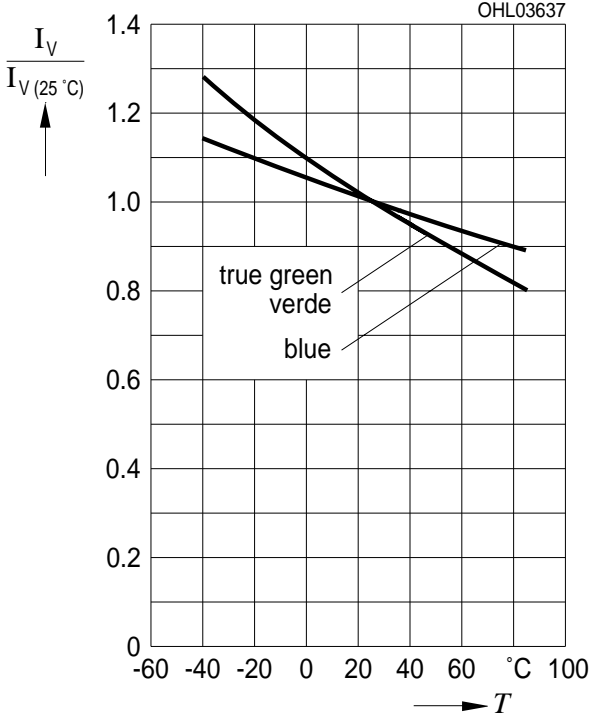


**Maximal zulässiger Durchlassstrom  $I_F = f(T)$**   
**Max. Permissible Forward Current**



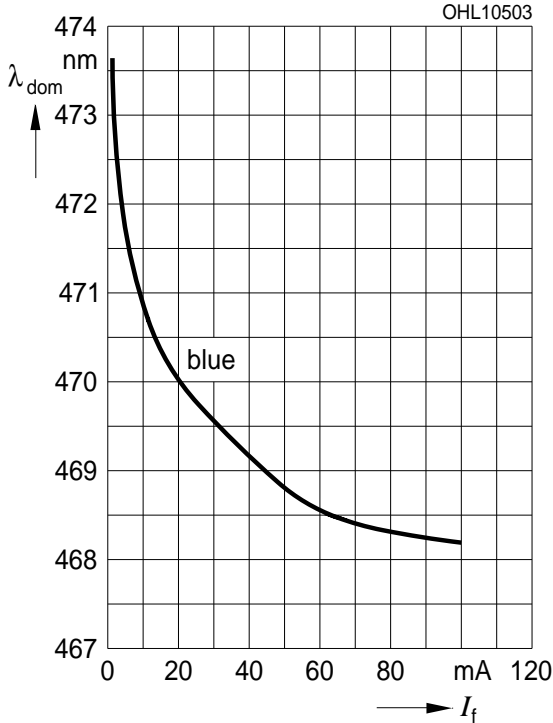
Relative Lichtstärke  $I_V/I_{V(25^\circ\text{C})} = f(T_A)$   
 Relative Luminous Intensity

$I_F = 20 \text{ mA}$



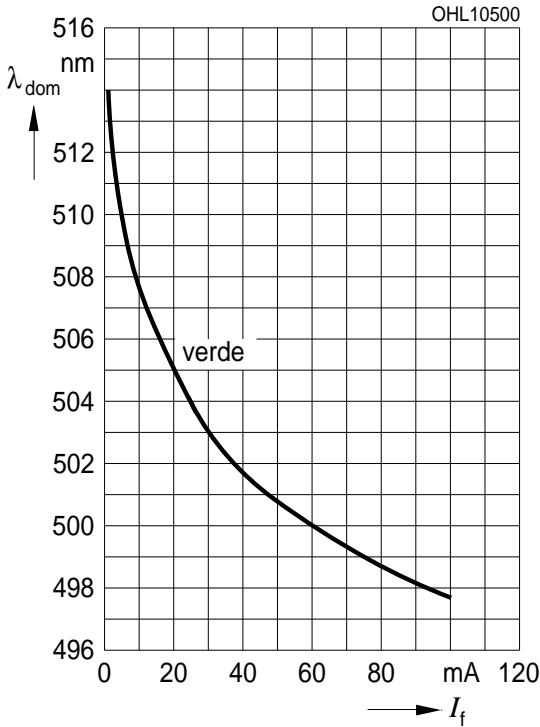
Dominante Wellenlänge  $\lambda_{\text{dom}} = f(I_F)$   
 Dominant Wavelength

LB,  $T_A = 25^\circ\text{C}$



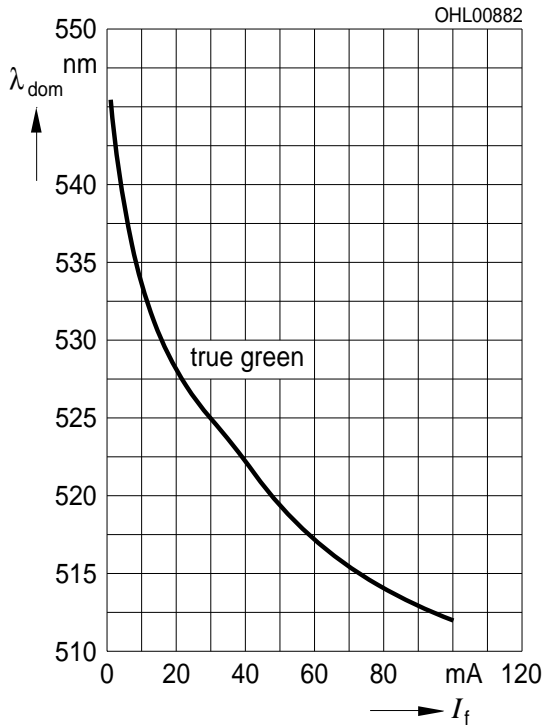
Dominante Wellenlänge  $\lambda_{\text{dom}} = f(I_F)$   
 Dominant Wavelength

LV,  $T_A = 25^\circ\text{C}$



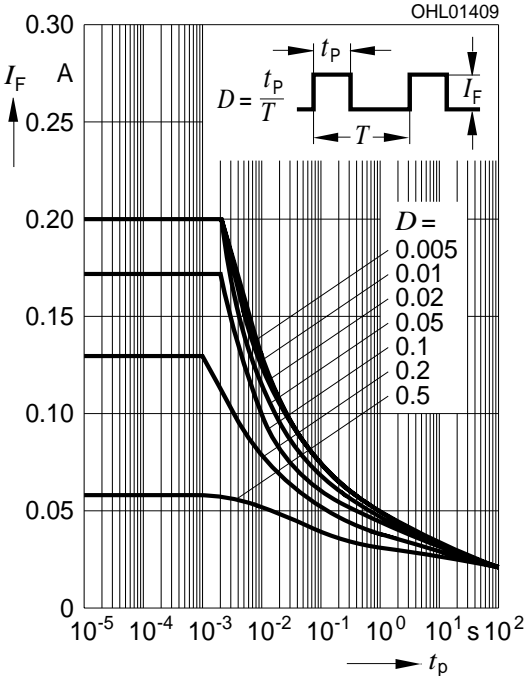
Dominante Wellenlänge  $\lambda_{\text{dom}} = f(I_F)$   
 Dominant Wavelength

LT,  $T_A = 25^\circ\text{C}$

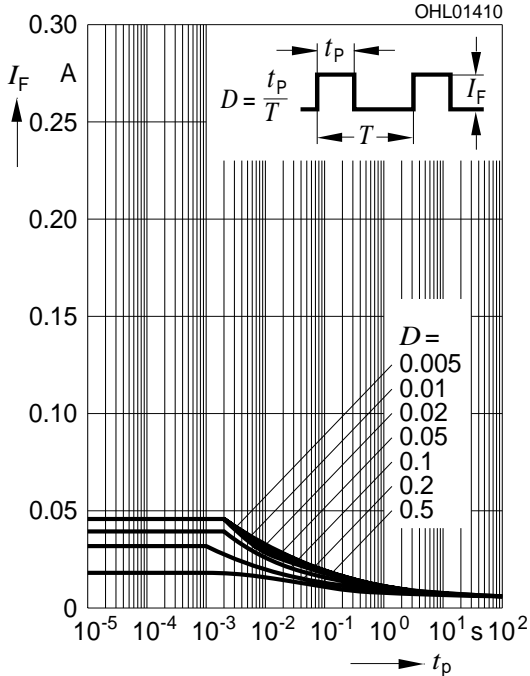




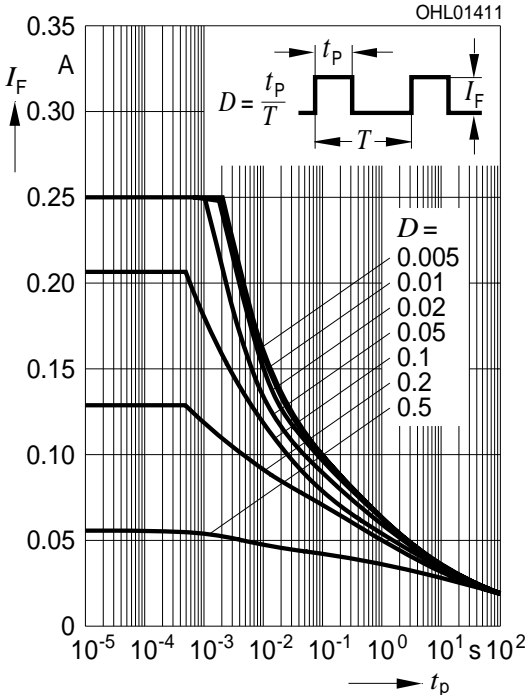
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 25\text{ °C}$   
**LB**



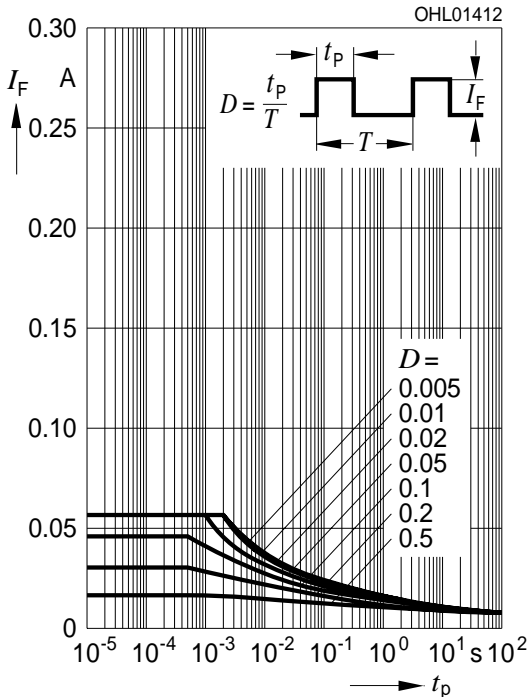
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 85\text{ °C}$   
**LB**



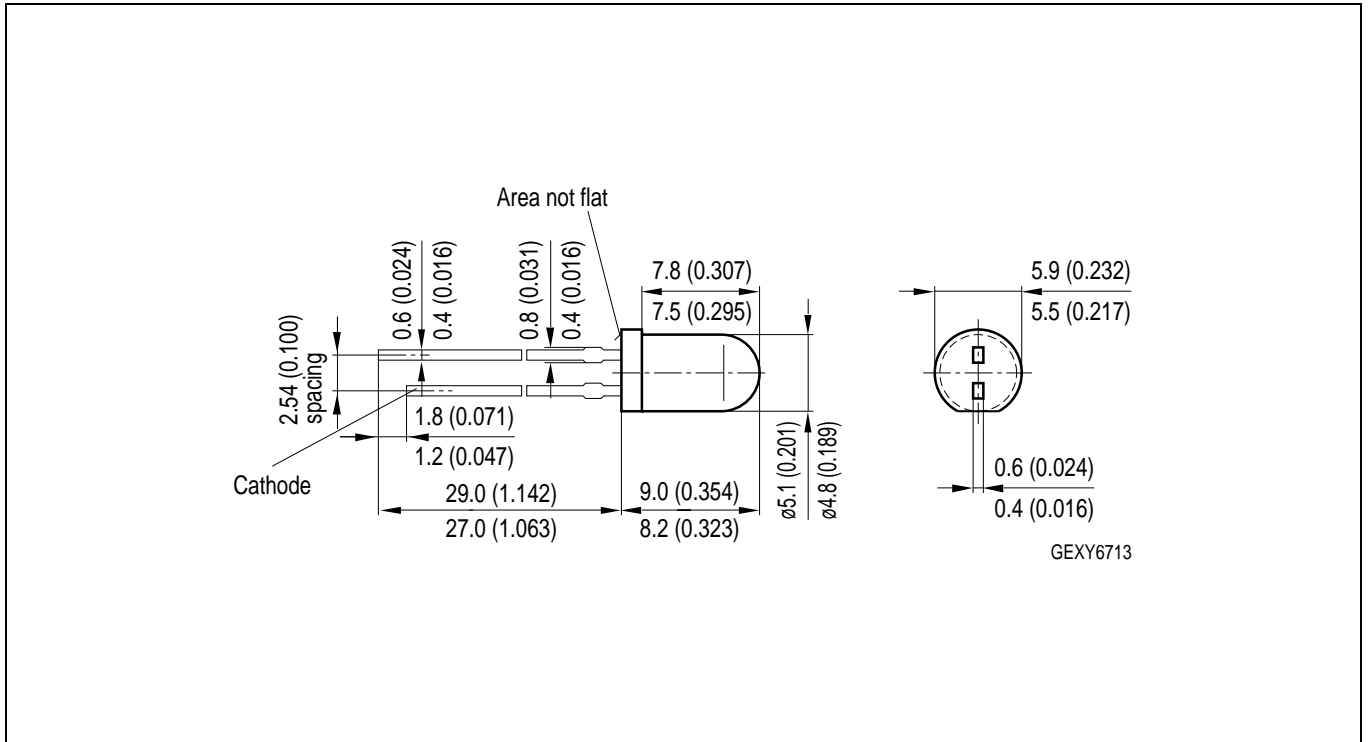
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 25\text{ °C}$   
**LV, LT**



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



**Maßzeichnung**  
**Package Outlines**

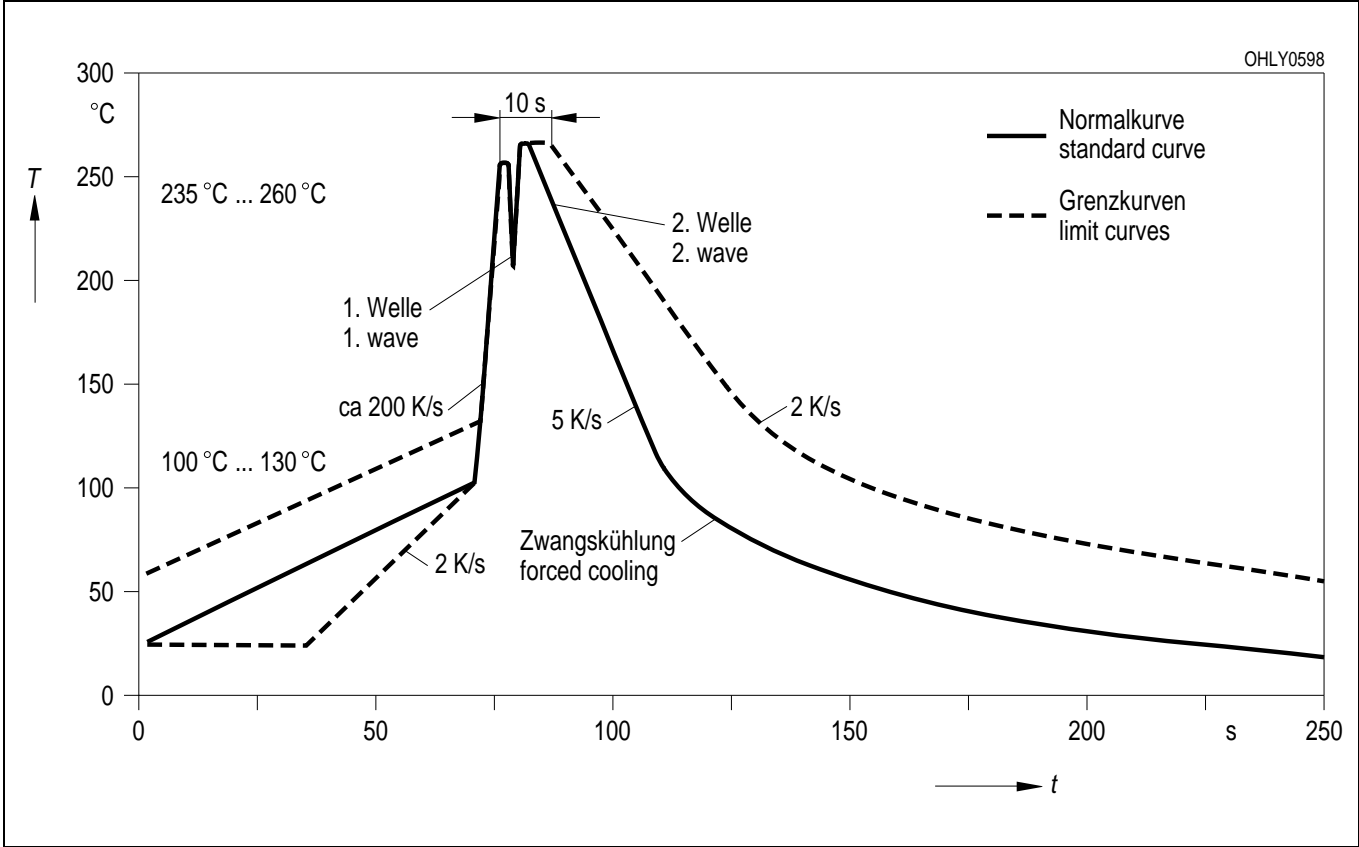


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

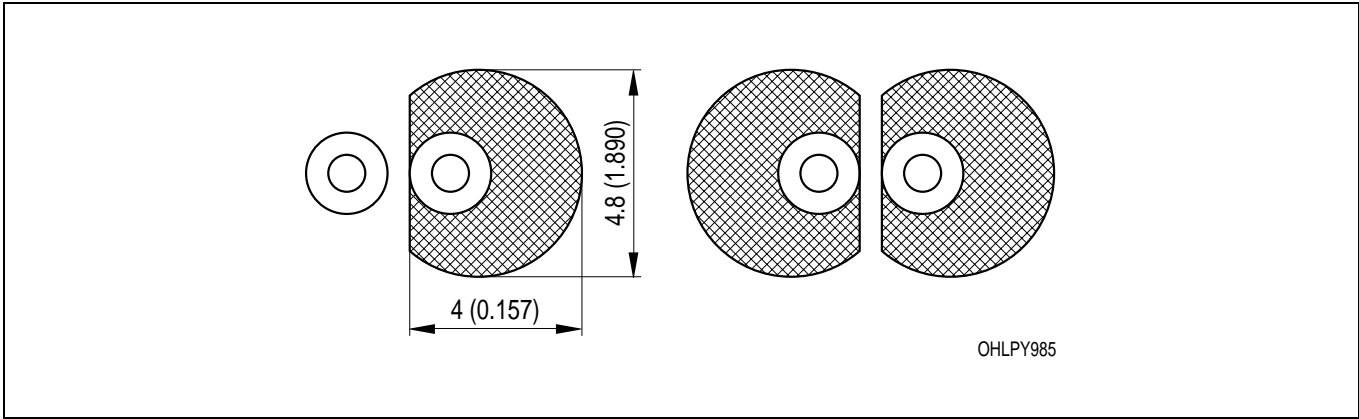
**Kathodenkennung:** kürzerer Lötspieß  
**Cathode mark:** short solder lead  
**Gewicht / Approx. weight:** 0.35 g

**Lötbedingungen**  
**Soldering Conditions**

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



**Empfohlenes Lötpaddesign** Wellenlöten (TTW)  
**Recommended Solder Pad** TTW Soldering



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

Revision History: 2003-08-05		Date of change
Previous Version: 2003-04-14		
Page	Subjects (major changes since last revision)	
3	thermal resistance (footnote)	
4	value (forward voltage)	
3	power consumption from 85 mW to 80 mW	
2	verde not for new designs	
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 $\lambda_{\text{dom}}$ and $V_F$ )	2003-04-14
1, 2	verde: obsolete	2003-08-05

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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.

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