

5 mm (T1 ¾) LED, Diffused

LR 5460, LS 5460, LY 5460, LG 5460



LR 5460 abgekündigt nach PD_078_02 - wird durch
LS 5460 ersetzt werden
LR 5460 obsolete acc. to PD_078_02 - will be replaced
by LS 5460

Besondere Merkmale

- **Gehäusotyp:** eingefärbtes, diffuses 5 mm (T1 ¾) Gehäuse
- **Besonderheit des Bauteils:** Lötspieße ohne Aufsetzebene
- **Wellenlänge:** 645 nm (rot), 628 nm (super-rot), 587 nm (gelb), 570 nm (grün)
- **Abstrahlwinkel:** 50°
- **Technologie:** GaAlP
- **optischer Wirkungsgrad:** 0,4 lm/W (rot), 1,5 lm/W (super-rot, gelb), 2,5 lm/W (grün)
- **Gruppierungsparameter:** Lichtstärke
- **Lötmethode:** Wellenlöten (TTW)
- **Verpackung:** Schüttgut, gegurtet lieferbar

Anwendungen

- optischer Indikator
- Hinterleuchtung (LCD, Handy, Schalter, Tasten, Displays, Werbebeleuchtung, Allgemeinbeleuchtung)
- Innenbeleuchtung im Automobilbereich (z.B. Instrumentenbeleuchtung, u.ä.)
- Markierungsbeleuchtung (z.B. Stufen, Fluchtwege, u.ä.)

Features

- **package:** colored, diffused 5 mm (T1 ¾) package
- **feature of the device:** solder leads without stand-off
- **wavelength:** 645 nm (red), 628 nm (super-red), 587 nm (yellow), 570 nm (green)
- **viewing angle:** 50°
- **technology:** GaAlP
- **optical efficiency:** 0.4 lm/W (red), 1.5 lm/W (super-red, yellow), 2.5 lm/W (green)
- **grouping parameter:** luminous intensity
- **soldering methods:** TTW soldering
- **packing:** bulk, available taped on reel

Applications

- optical indicators
- backlighting (LCD, cellular phones, switches, keys, displays, illuminated advertising, general lighting)
- interior automotive lighting (e.g. dashboard backlighting, etc.)
- marker lights (e.g. steps, exit ways, etc.)

Type	Emissions- farbe Color of Emission	Gehäuse- farbe Color of Package	Lichtstärke Luminous Intensity $I_F = 10 \text{ mA}$ $I_V \text{ (mcd)}$	Lichtstrom Luminous Flux $I_F = 10 \text{ mA}$ $\Phi_V \text{ (lm)}$	Bestellnummer Ordering Code
■ LR 5460-DG	red	red diffused	0.45 ... 2.8	4 (typ.)	Q62703Q1392
■ LR 5460-F			1.12 ... 1.8	3 (typ.)	Q62703Q1393
■ LR 5460-G			1.80 ... 2.8	5 (typ.)	Q62703Q1394
■ LR 5460-FJ			1.12 ... 7.1	6 (typ.)	Q62703Q1395
LS 5460-HL	super-red	red diffused	2.80 ... 18.0	35 (typ.)	Q62703Q1396
LS 5460-J			4.50 ... 7.1	20 (typ.)	Q62703Q1746
LS 5460-K			7.10 ... 11.2	30 (typ.)	Q62703Q1397
LS 5460-L			11.20 ... 18.0	45 (typ.)	Q62703Q1398
LS 5460-JM			4.50 ... 28.0	60 (typ.)	Q62703Q3225
LY 5460-HL	yellow	yellow diffused	2.80 ... 18.0	35 (typ.)	Q62703Q1400
LY 5460-K			7.10 ... 11.2	30 (typ.)	Q62703Q1402
LY 5460-L			11.20 ... 18.0	45 (typ.)	Q62703Q2403
LY 5460-JM			4.50 ... 28.0	60 (typ.)	Q62703Q1403
LG 5460-GK	green	green diffused	1.80 ... 11.2	20 (typ.)	Q62703Q1407
LG 5460-J			4.50 ... 7.1	20 (typ.)	Q62703Q1867
LG 5460-K			7.10 ... 11.2	30 (typ.)	Q62703Q2014
LG 5460-HL			2.80 ... 18.0	50 (typ.)	Q62703Q3190

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Letzte Bestellung / Last Order: 30.09.2003

Letzte Lieferung / Last Delivery: 31.03.2004

Anm.: 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: 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
		LR	LS, LY, LG	
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	45	40	mA
Stoßstrom Surge current $t \leq 10 \mu s, D = 0.005$	I_{FM}	0.5		A
Sperrspannung ¹⁾ Reverse voltage	V_R	12		V
Leistungsaufnahme Power consumption $T_A \leq 25 \text{ °C}$	P_{tot}	95	130	mW
Wärmewiderstand ²⁾ Thermal resistance Sperrschicht/Umgebung Junction/ambient Sperrschicht/Löt看 Junction/soldering 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⁾ 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
		LR	LS	LY	LG	
Wellenlänge des emittierten Lichtes (typ.) Wavelength at peak emission $I_F = 10\text{ mA}$	λ_{peak}	660	635	586	572	nm
Dominantwellenlänge ¹⁾ (typ.) Dominant wavelength $I_F = 10\text{ mA}$	λ_{dom}	645	628	587	570	nm
Spektrale Bandbreite bei 50 % $I_{\text{rel max}}$ (typ.) Spectral bandwidth at 50 % $I_{\text{rel max}}$ $I_F = 10\text{ mA}$	$\Delta\lambda$	35	45	45	25	nm
Abstrahlwinkel bei 50 % I_V (Vollwinkel) (typ.) Viewing angle at 50 % I_V	2ϕ	50	50	50	50	Grad deg.
Durchlassspannung ²⁾ (typ.) Forward voltage (max.) $I_F = 10\text{ mA}$	V_F V_F	1.6 1.9	2.0 2.5	2.0 2.5	2.0 2.5	V V
Sperrstrom (typ.) Reverse current (max.) $V_R = 12\text{ V}$	I_R I_R	0.01 10	0.01 10	0.01 10	0.01 10	μA μA
Temperaturkoeffizient von λ_{peak} (typ.) Temperature coefficient of λ_{peak} $I_F = 10\text{ mA}; -10^\circ\text{C} \leq T \leq 100^\circ\text{C}$	$TC_{\lambda_{\text{peak}}}$	0.03	0.11	0.10	0.11	nm/K
Temperaturkoeffizient von λ_{dom} (typ.) Temperature coefficient of λ_{dom} $I_F = 10\text{ mA}; -10^\circ\text{C} \leq T \leq 100^\circ\text{C}$	$TC_{\lambda_{\text{dom}}}$	0.06	0.07	0.07	0.07	nm/K
Temperaturkoeffizient von V_F (typ.) Temperature coefficient of V_F $I_F = 10\text{ mA}; -10^\circ\text{C} \leq T \leq 100^\circ\text{C}$	TC_V	- 1.4	- 1.9	- 1.9	- 1.4	mV/K
Optischer Wirkungsgrad (typ.) Optical efficiency $I_F = 10\text{ mA}$	η_{opt}	0.4	1.5	1.5	2.5	lm/W

¹⁾ Wellenlängen werden mit einer Stromeinprägedauer von 25 ms und einer Genauigkeit von $\pm 1\text{ nm}$ ermittelt.
Wavelengths 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 $\pm 0.1\text{ V}$.

Helligkeits-Gruppierungsschema
Luminous Intensity Groups

Lichtgruppe Luminous Intensity Group	Lichtstärke Luminous Intensity I_V (mcd)	Lichtstrom Luminous Flux Φ_V (lm)
D	0.45 ... 0.71	2 (typ.)
E	0.71 ... 1.12	3 (typ.)
F	1.12 ... 1.80	5 (typ.)
G	1.80 ... 2.80	7 (typ.)
H	2.80 ... 4.50	11 (typ.)
J	4.50 ... 7.10	20 (typ.)
K	7.10 ... 11.20	30 (typ.)
L	11.20 ... 18.00	45 (typ.)

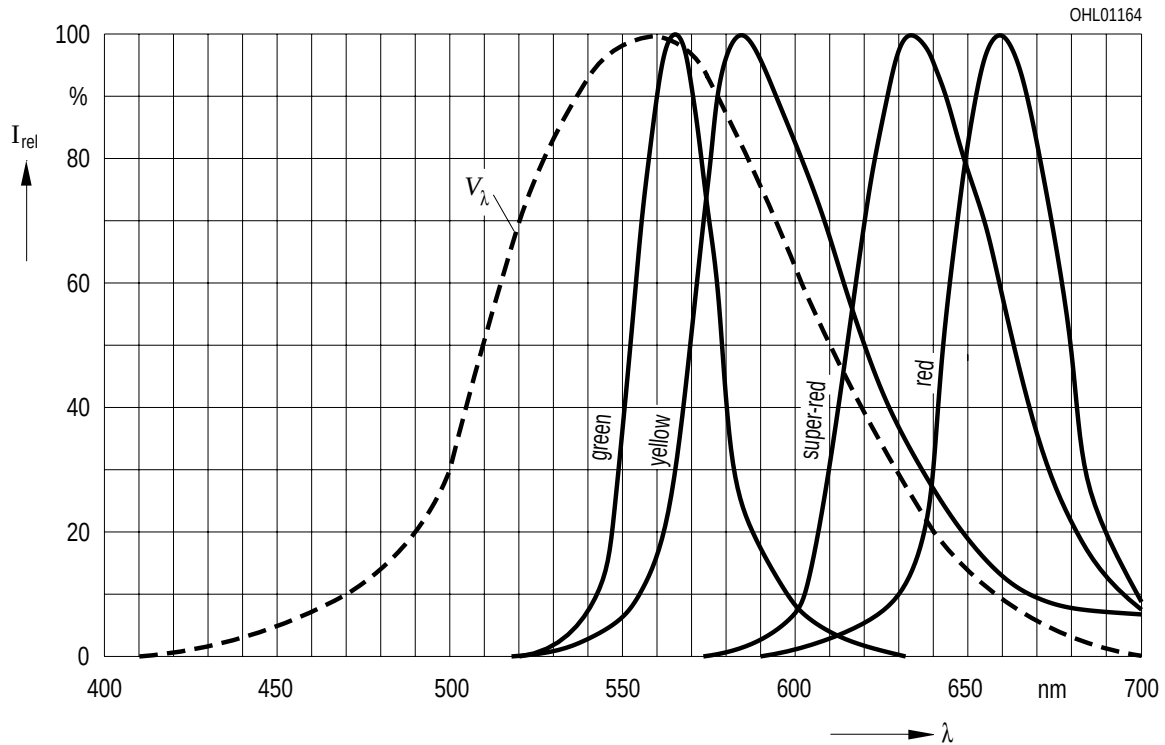
Helligkeitswerte werden mit einer Stromeinprägedauer von 25 ms und einer Genauigkeit von ± 11 % ermittelt.
 Luminous intensity is tested at a current pulse duration of 25 ms and a tolerance of ± 11 %.

Relative spektrale Emission $I_{\text{rel}} = f(\lambda)$, $T_A = 25^\circ\text{C}$, $I_F = 10\text{ mA}$

Relative Spectral Emission

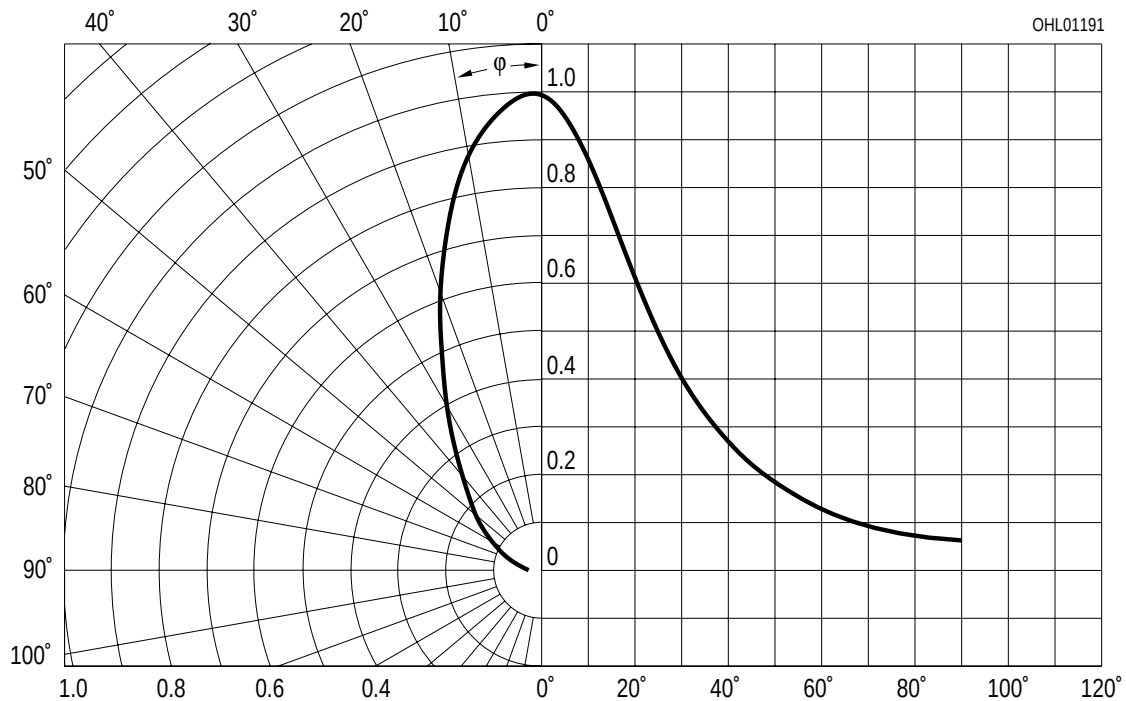
$V(\lambda)$ = spektrale Augenempfindlichkeit

Standard eye response curve



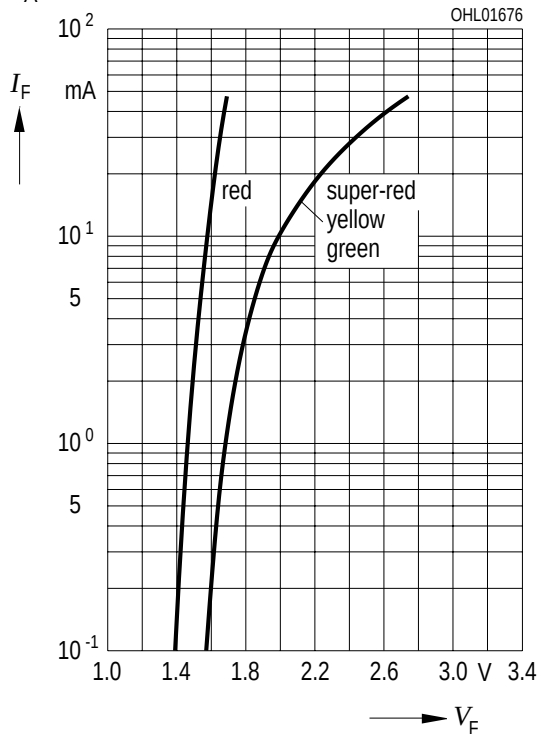
Abstrahlcharakteristik $I_{\text{rel}} = f(\varphi)$

Radiation Characteristic



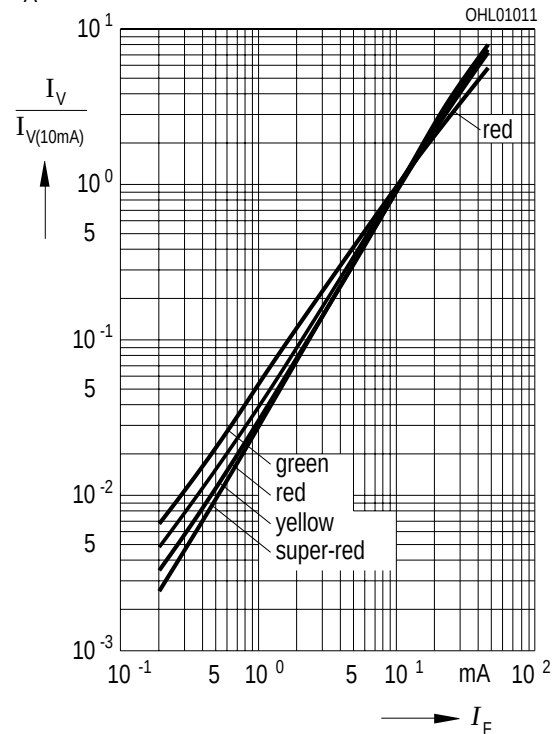
Durchlassstrom $I_F = f(V_F)$
Forward Current

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

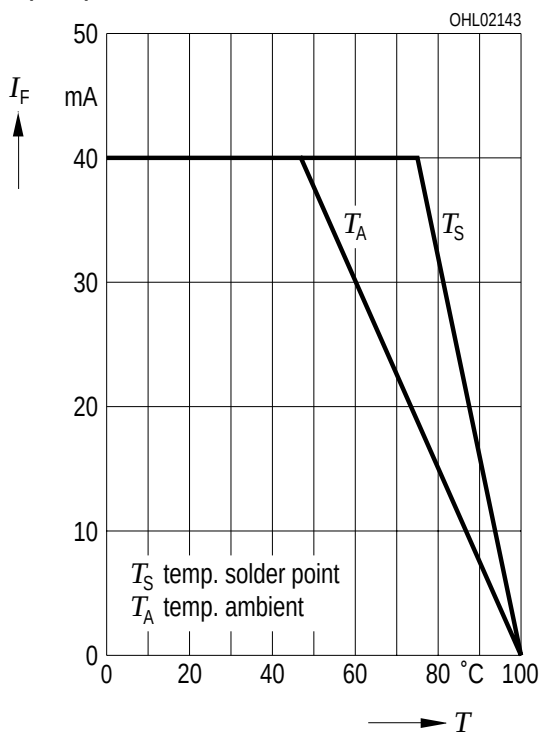


Relative Lichtstärke $I_V/I_{V(10\text{ mA})} = f(I_F)$
Relative Luminous Intensity

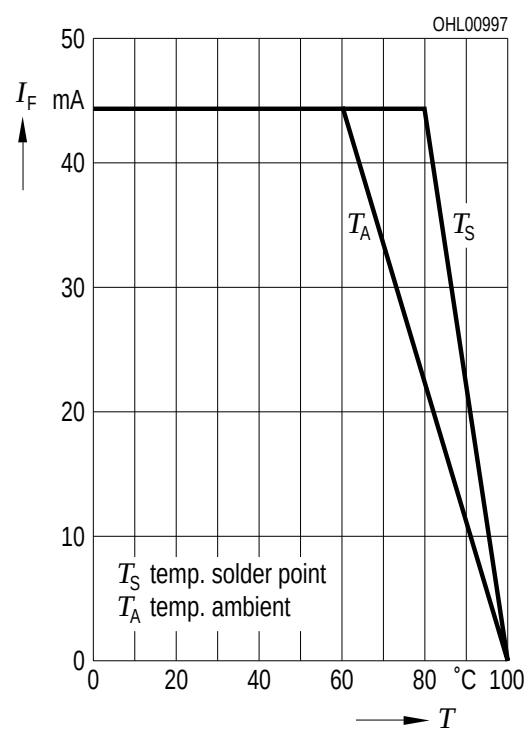
$T_A = 25^\circ\text{C}$



Maximal zulässiger Durchlassstrom $I_F = f(T)$
Max. Permissible Forward Current
LS, LY, LG



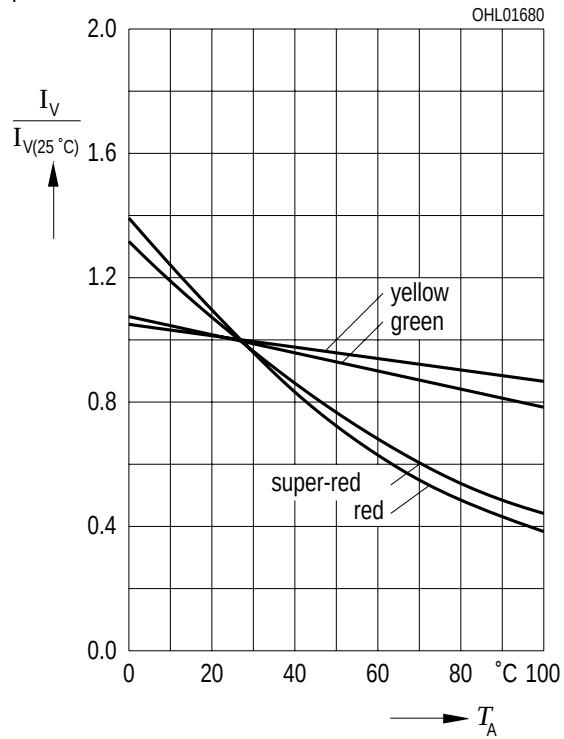
Maximal zulässiger Durchlassstrom $I_F = f(T)$
Max. Permissible Forward Current
LR



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

Relative Luminous Intensity

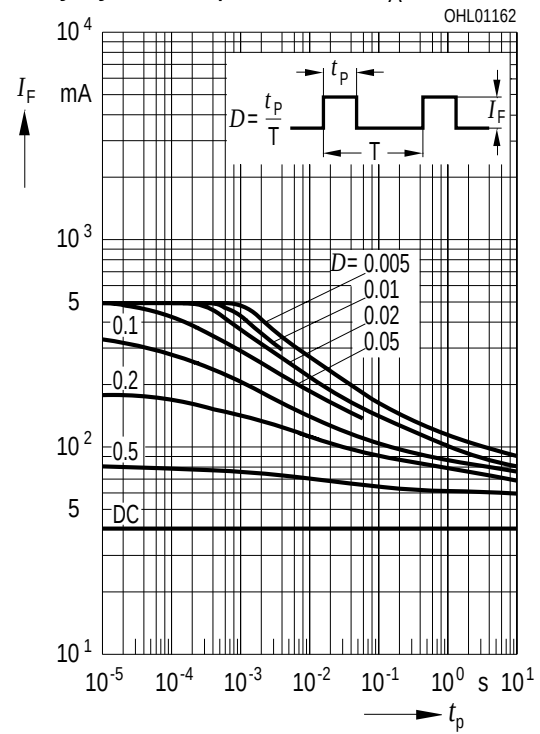
$I_F = 10\text{ mA}$



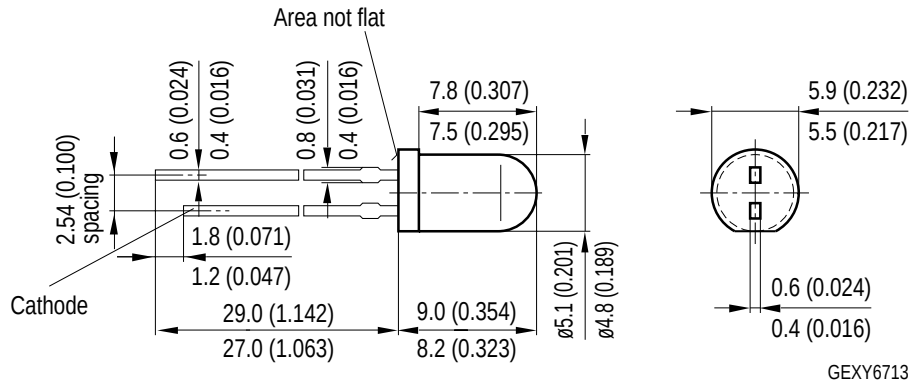
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$

Permissible Pulse Handling Capability

Duty cycle $D = \text{parameter}$, $T_A = 25\text{ °C}$



**Maßzeichnung
Package Outlines**

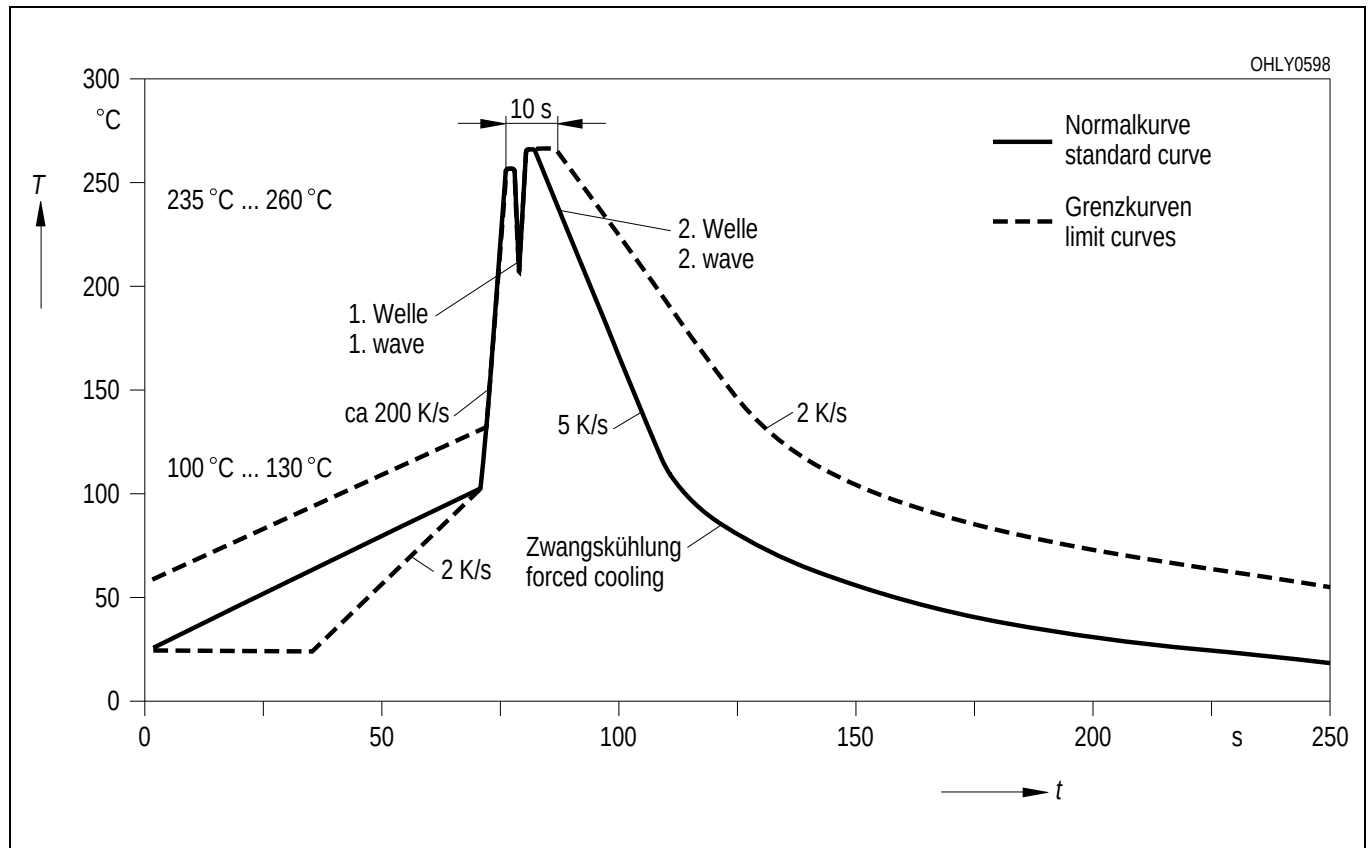


Maße in mm, wenn nicht anders angegeben / Dimensions in mm, unless otherwise specified.

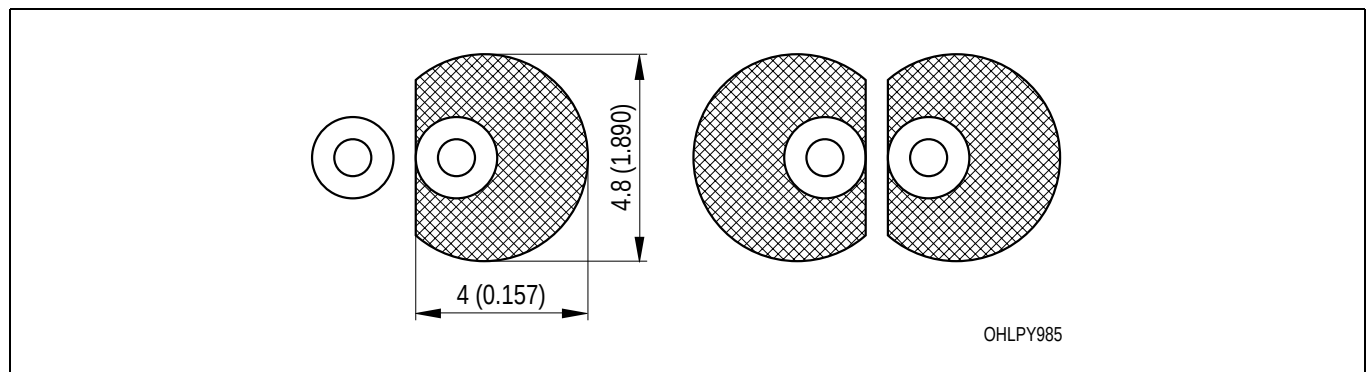
Kathodenkennung: kürzerer Lötspieß
Cathode mark: short solder lead
Gewicht / Approx. weight: 0.35 g

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: 2003-09-03		Date of change
Previous Version: 2003-08-07		
Page	Subjects (major changes since last revision)	
3	thermal resistance (footnote)	
10	annotations	2002-07-23
5	luminous intensity groups	2002-07-30
3, 4	value (reverse voltage from 5 V to 12 V)	2002-09-18
all	red: not for new designs	2002-11-22
1, 2	red: obsolete	2003-08-07
2	low yield groups deleted	2003-09-03

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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.