

## 3 mm (T1) LED, Diffused

LR 3360, LS 3360, LO 3360,  
LY 3360, LG 3360, LP 3360



### fBesondere Merkmale

- **Gehäusetyp:** eingefärbtes, diffuses 3 mm (T1) Gehäuse
- **Besonderheit des Bauteils:** Lötspieße mit Aufsetzebene
- **Wellenlänge:** 645 nm (rot), 628 nm (super-rot), 606 nm (orange), 587 nm (gelb), 570 nm (grün), 560 nm (pure green)
- **Abstrahlwinkel:** 70°
- **Technologie:** GaAIP (rot, super-rot, orange, gelb, grün), GaP (pure green)
- **optischer Wirkungsgrad:** 0,4 lm/W (rot), 1,5 lm/W (super-rot, orange, gelb), 2,5 lm/W (grün), 0,6 lm/W (pure green)
- **Gruppierungsparameter:** Lichtstärke
- **Lötmethode:** Wellenlöten (TTW)
- **Verpackung:** Schüttgut, gegurtet lieferbar

### Anwendungen

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

### Features

- **package:** colored, diffused 3 mm (T1) package
- **feature of the device:** solder leads with stand-off
- **wavelength:** 645 nm (red), 628 nm (super-red), 606 nm (orange), 587 nm (yellow), 570 nm (green), 560 nm (pure green)
- **viewing angle:** 70°
- **technology:** GaAIP (red, super-red, orange, yellow, green), GaP (pure green)
- **optical efficiency:** 0.4 lm/W (red), 1.5 lm/W (super-red, orange, yellow), 2.5 lm/W (green), 0.6 lm/W (pure 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)
- signal and symbol luminaire
- marker lights (e.g. steps, exit ways, etc.)
- interior automotive lighting (e.g. dashboard backlighting, etc.)

# LR 3360, LS 3360, LO 3360, LY 3360, LG 3360, LP 3360

Type	Emissionsfarbe Color of Emission	Gehäusefarbe 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 3360-DG LR 3360-F LR 3360-G LR 3360-FJ	red	red diffused	0.45 ... 2.8 1.12 ... 1.8 1.80 ... 2.8 1.12 ... 7.1	6 (typ.) 5 (typ.) 8 (typ.) 14 (typ.)	Q62703-Q1316 Q62703-Q1317 Q62703-Q1318 Q62703-Q1319
LS 3360-HL LS 3360-K LS 3360-L LS 3360-KN	super-red	red diffused	2.80 ... 18.0 7.10 ... 11.2 11.20 ... 18.0 7.10 ... 45.0	26 (typ.) 20 (typ.) 35 (typ.) 65 (typ.)	Q62703-Q1320 Q62703-Q1321 Q62703-Q1322 Q62703-Q1323
LO 3360-HL LO 3360-K LO 3360-L LO 3360-JM	orange	orange diffused	2.80 ... 18.0 7.10 ... 11.2 11.20 ... 18.0 4.50 ... 28.0	26 (typ.) 20 (typ.) 35 (typ.) 40 (typ.)	Q62703-Q1887 Q62703-Q2400 Q62703-Q2596 Q62703-Q2410
LY 3360-HL LY 3360-K LY 3360-L LY 3360-KN	yellow	yellow diffused	2.80 ... 18.0 7.10 ... 11.2 11.20 ... 18.0 7.10 ... 45.0	26 (typ.) 20 (typ.) 35 (typ.) 65 (typ.)	Q62703-Q1324 Q62703-Q1325 Q62703-Q1326 Q62703-Q1998
LG 3360-HL LG 3360-K LG 3360-L LG 3360-KN	green	green diffused	2.80 ... 18.0 7.10 ... 11.2 11.20 ... 18.0 7.10 ... 45.0	26 (typ.) 20 (typ.) 35 (typ.) 65 (typ.)	Q62703-Q3818 Q62703-Q2008 Q62703-Q3507 Q62703-Q3819
LP 3360-GK LP 3360-H LP 3360-J LP 3360-HL	pure green	green diffused	1.80 ... 11.2 2.80 ... 4.5 4.50 ... 7.1 2.80 ... 18.0	16 (typ.) 9 (typ.) 14 (typ.) 26 (typ.)	Q62703-Q2467 Q62703-Q2914 Q62703-Q2915 Q62703-Q3213

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  $\pm 11 \%$ .

*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
		LS, LO, LY, LG	LR	LP	
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	$I_F$	40	45	30	mA
Stoßstrom Surge current $t \leq 10 \mu s, D = 0.005$	$I_{FM}$	0.5			A
Sperrspannung Reverse voltage	$V_R$	5			V
Leistungsaufnahme Power consumption $T_A = 25 \text{ °C}$	$P_{tot}$	130	95		mW
Wärmewiderstand <sup>1)</sup> Thermal resistance Sperrschicht/Umgebung Junction/ambient	$R_{th JA}$	400			K/W
Sperrschicht/Löt看pad 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	$R_{th JS}$	180			K/W

<sup>1)</sup>  $R_{th}$  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	LO	LY	LG	LP	
Wellenlänge des emittierten Lichtes (typ.) Wavelength at peak emission $I_F = 10\text{ mA}$	$\lambda_{\text{peak}}$	660	635	610	586	572	557	nm
Dominantwellenlänge <sup>1)</sup> (typ.) Dominant wavelength $I_F = 10\text{ mA}$	$\lambda_{\text{dom}}$	645	628	606	587	570	560	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	40	45	25	22	nm
Abstrahlwinkel bei 50 % $I_V$ (Vollwinkel) (typ.) Viewing angle at 50 % $I_V$	$2\phi$	70	70	70	70	70	70	Grad deg.
Durchlassspannung <sup>2)</sup> (typ.) Forward voltage (max.) $I_F = 10\text{ mA}$	$V_F$	1.6	2.0	2.0	2.0	2.0	2.0	V
	$V_F$	1.9	2.5	2.5	2.5	2.5	2.5	V
Sperrstrom (typ.) Reverse current (max.) $V_R = 5\text{ V}$	$I_R$	0.01	0.01	0.01	0.01	0.01	0.01	$\mu\text{A}$
	$I_R$	10	10	10	10	10	10	$\mu\text{A}$
Temperaturkoeffizient von $\lambda_{\text{peak}}$ (typ.) Temperature coefficient of $\lambda_{\text{peak}}$ $I_F = 10\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	$TC_{\lambda_{\text{peak}}}$	0.03	0.11	0.12	0.10	0.11	0.11	nm/K
Temperaturkoeffizient von $\lambda_{\text{dom}}$ (typ.) Temperature coefficient of $\lambda_{\text{dom}}$ $I_F = 10\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	$TC_{\lambda_{\text{dom}}}$	0.06	0.07	0.07	0.07	0.07	0.05	nm/K
Temperaturkoeffizient von $V_F$ (typ.) Temperature coefficient of $V_F$ $I_F = 10\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	$TC_V$	-1.4	-1.9	-1.9	-1.9	-1.4	-2.1	mV/K
Optischer Wirkungsgrad (typ.) Optical efficiency $I_F = 10\text{ mA}$	$\eta_{\text{opt}}$	0.4	1.5	1.5	1.5	2.5	0.6	lm/W

<sup>1)</sup> 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  $\pm 1\text{ nm}$ .

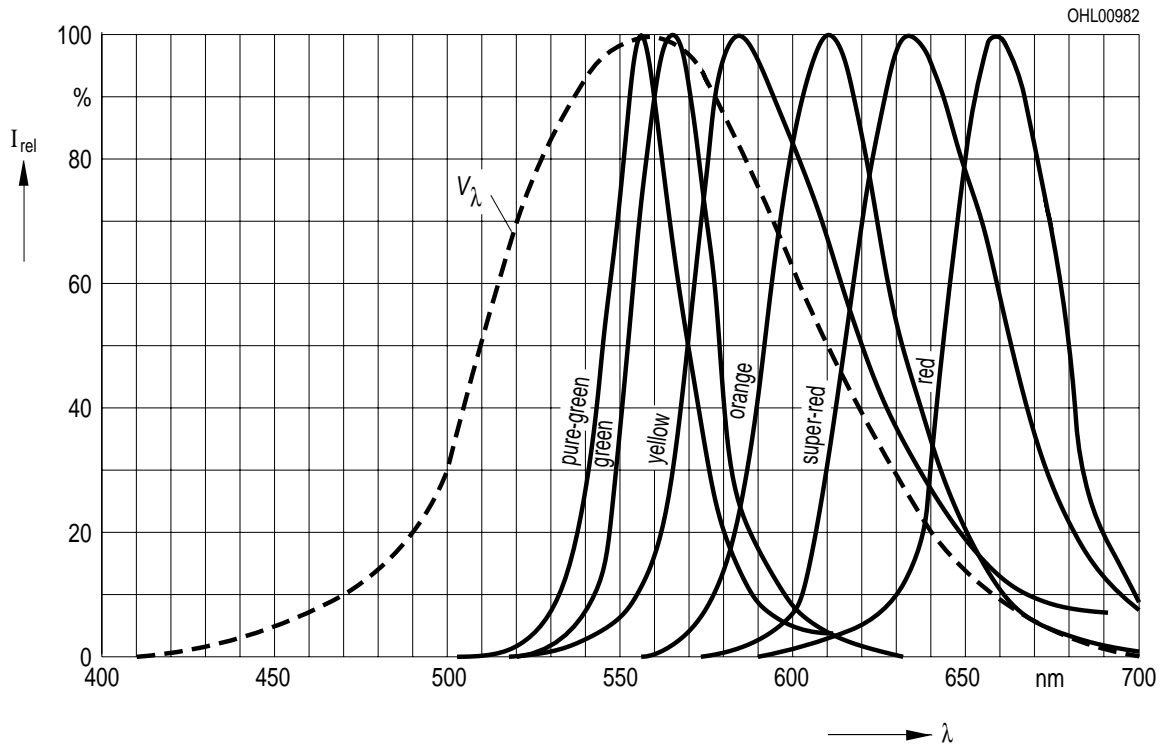
<sup>2)</sup> Spannungswerte werden mit einer Stromeinprägedauer von 1 ms und einer Genauigkeit von  $\pm 0,1\text{ V}$  ermittelt.  
Voltages are tested at a current pulse duration of 1 ms and a tolerance of  $\pm 0.1\text{ V}$ .

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

**Relative Spectral Emission**

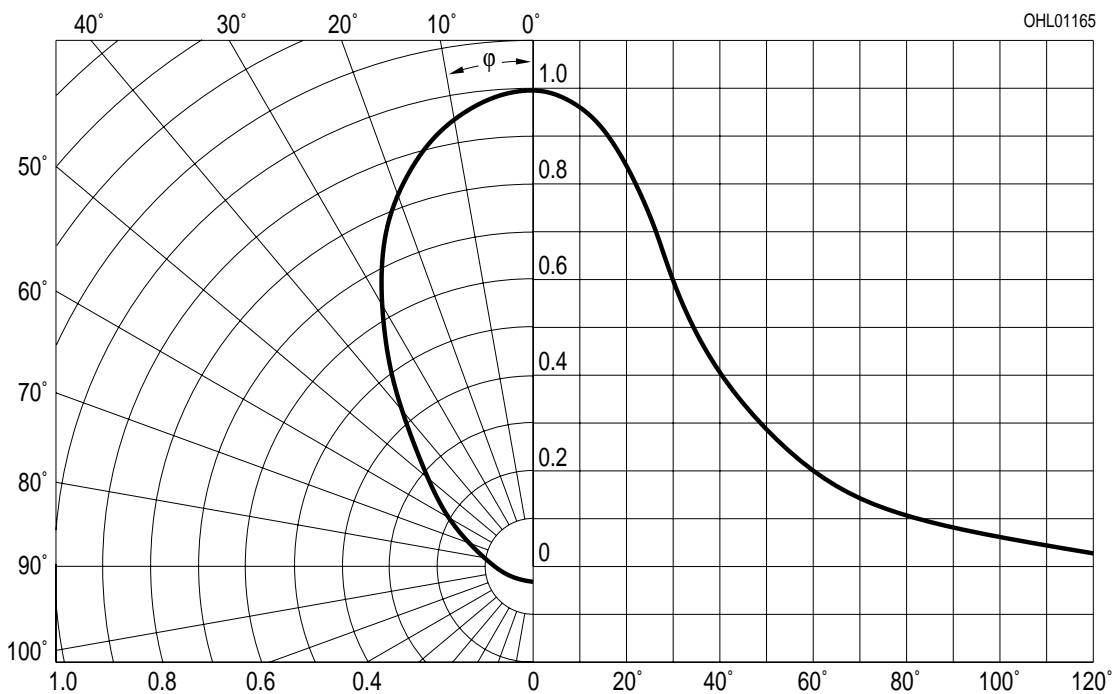
$V(\lambda)$  = spektrale Augenempfindlichkeit

Standard eye response curve



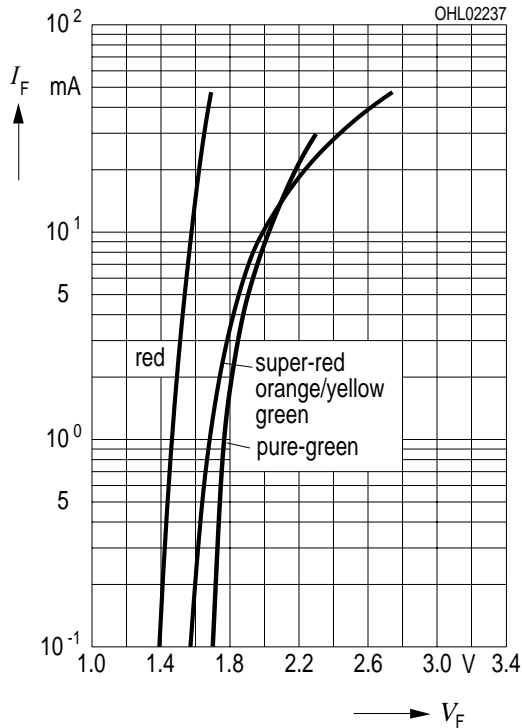
Abstrahlcharakteristik  $I_{rel} = f(\varphi)$

**Radiation Characteristic**



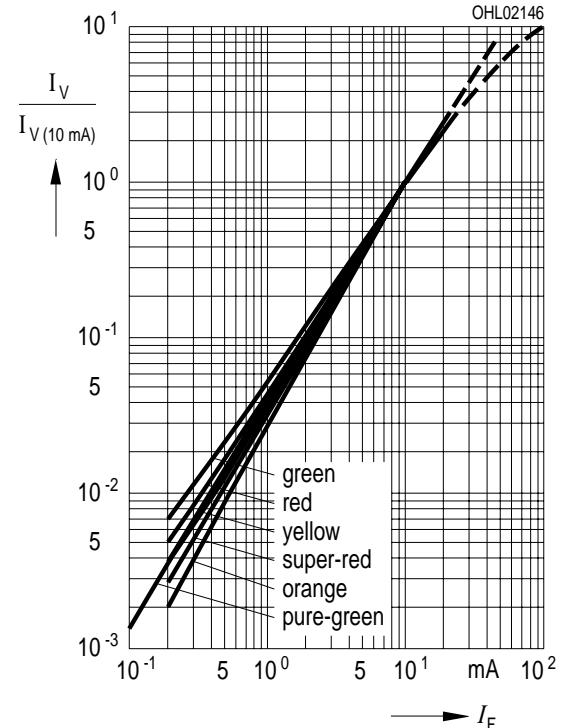
**Durchlassstrom  $I_F = f(V_F)$**   
**Forward Current**

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

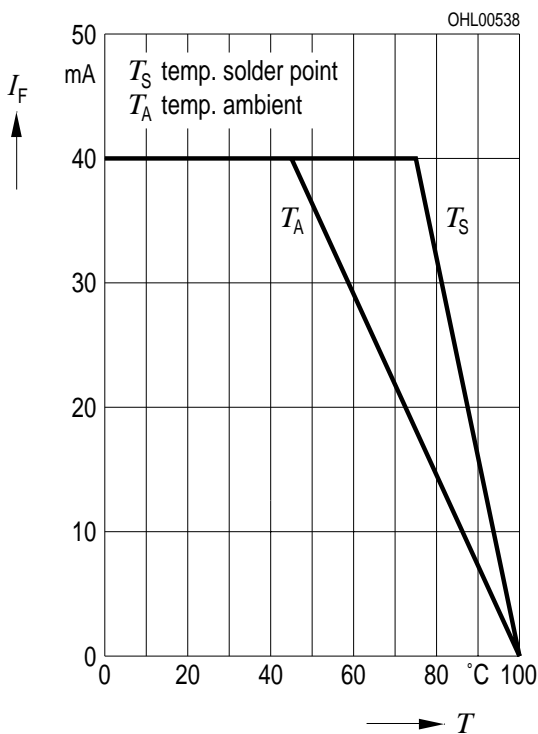


**Relative Lichtstärke  $I_V/I_{V(10\text{ mA})} = f(I_F)$**   
**Relative Luminous Intensity**

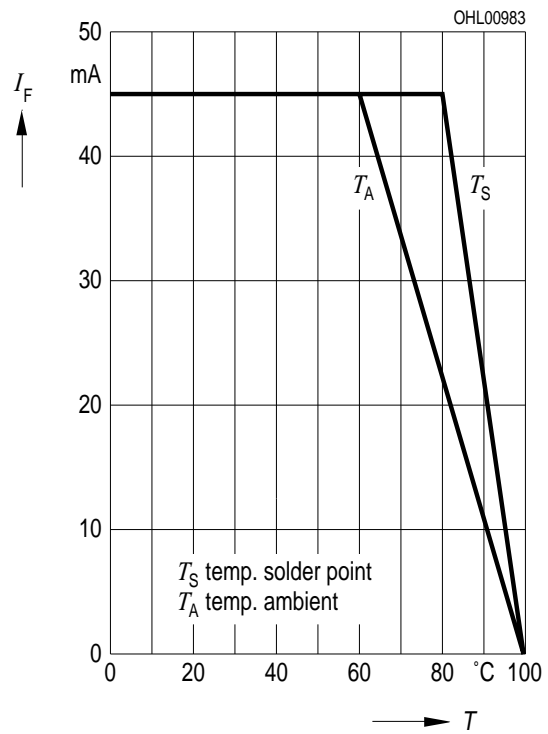
$T_A = 25\text{ }^\circ\text{C}$



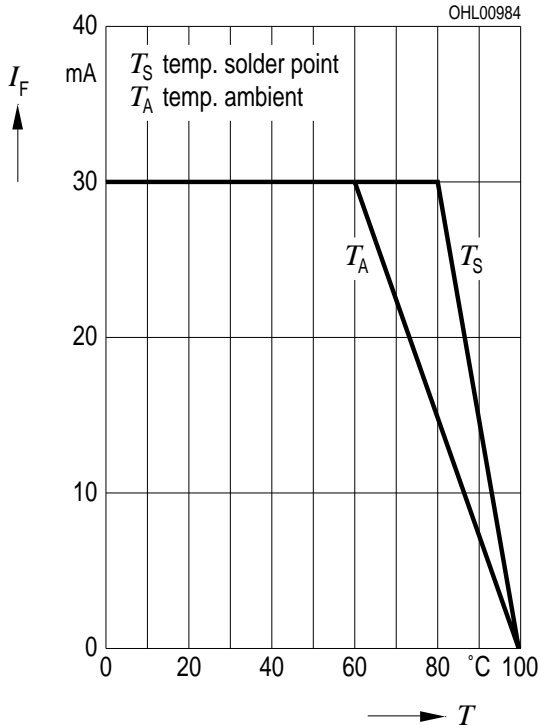
**Maximal zulässiger Durchlassstrom  $I_F = f(T)$**   
**Max. Permissible Forward Current**  
**LS, LO, LY, LG**



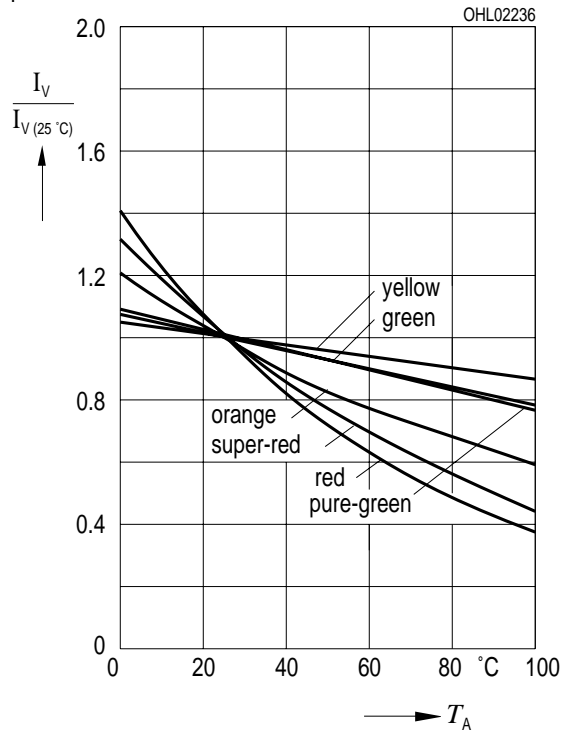
**Maximal zulässiger Durchlassstrom  $I_F = f(T)$**   
**Max. Permissible Forward Current**  
**LR**



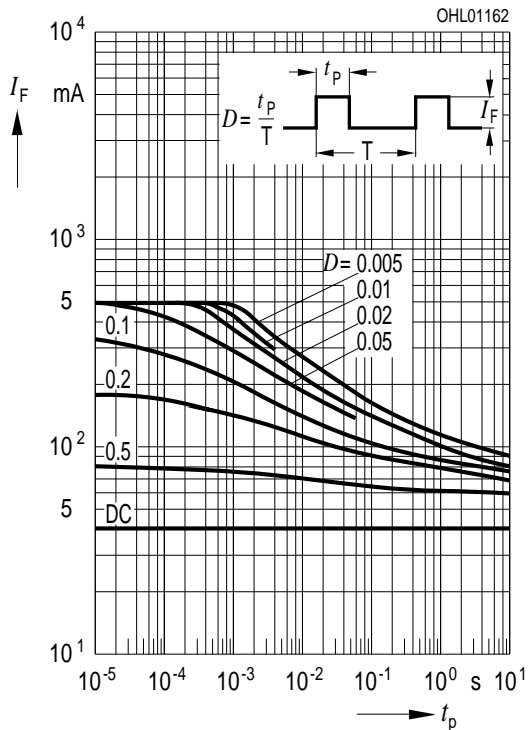
**Maximal zulässiger Durchlassstrom  $I_F = f(T)$**   
**Max. Permissible Forward Current**  
**LP**



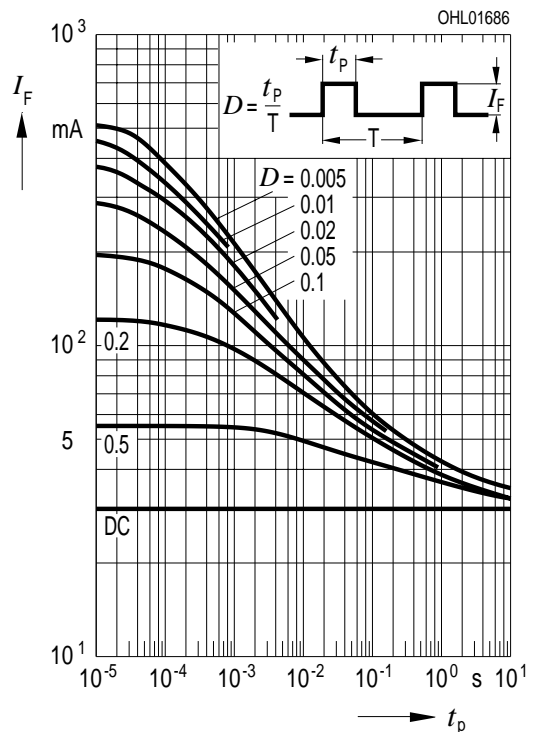
**Relative Lichtstärke  $I_V/I_{V(25^\circ\text{C})} = f(T_A)$**   
**Relative Luminous Intensity**  
 $I_F = 10 \text{ mA}$



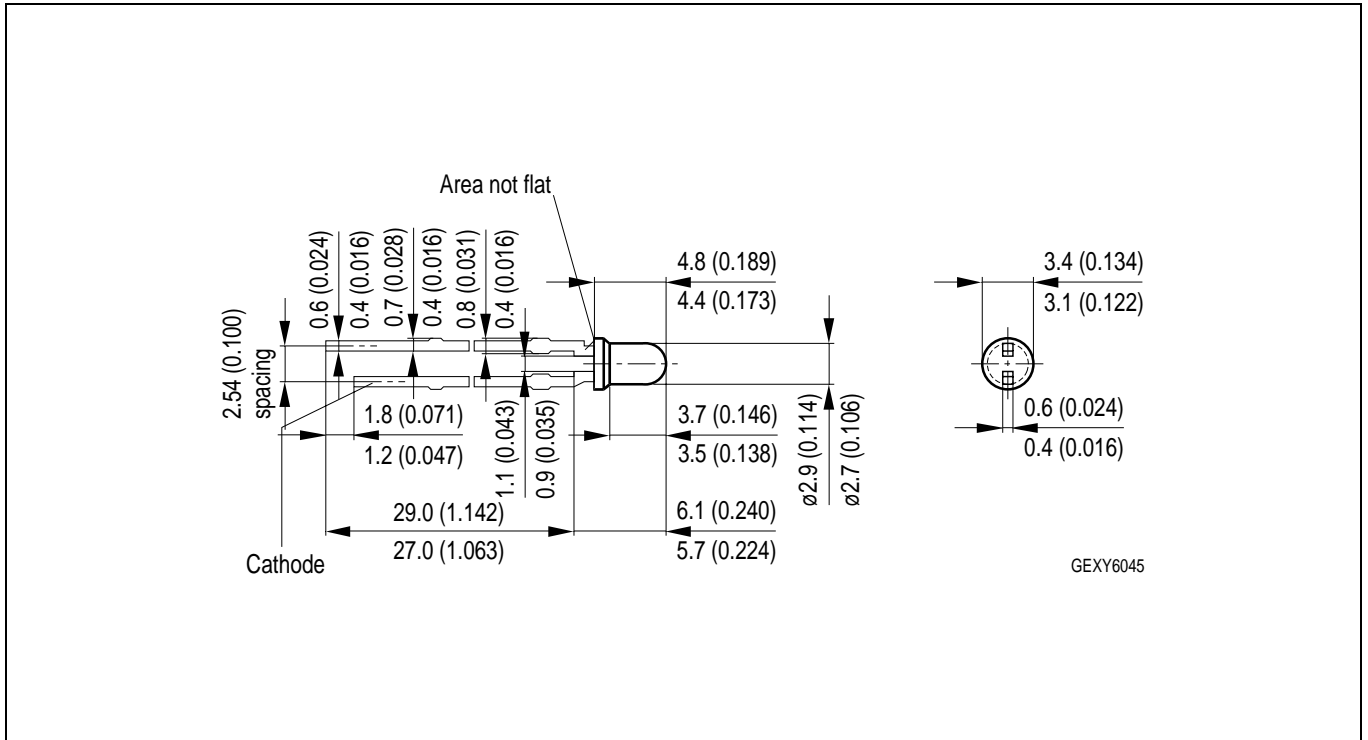
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D = \text{parameter}$ ,  $T_A = 25^\circ\text{C}$   
**LS, LO, LY, LG, LR**



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



**Maßzeichnung**  
**Package Outlines**



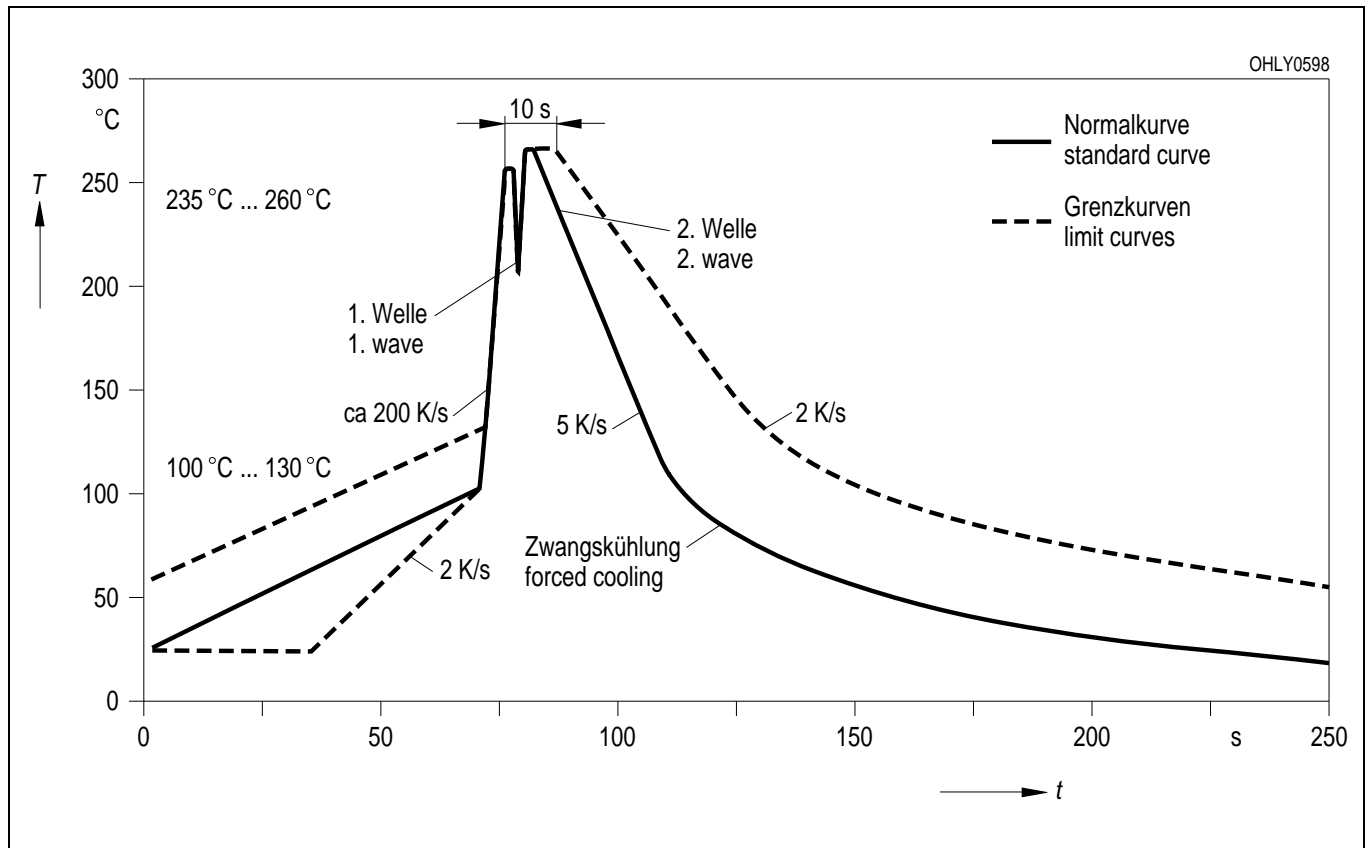
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

**Kathodenkennung:** kürzerer Lötspieß  
**Cathode mark:** short solder lead  
**Gewicht / Approx. weight:** 0.15 g

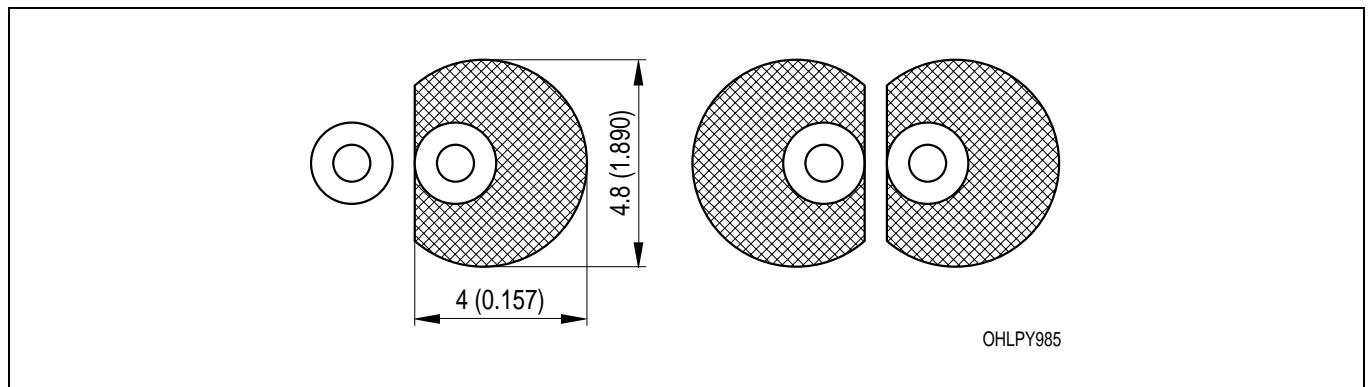


**Lötbedingungen**  
**Soldering Conditions**

**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).

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**Revision History: 2002-03-14**

Previous Version: 2001-03-12

Page	Subjects (major changes since last revision)
3	thermal resistance (footnote)
4	dominant wavelength (orange)

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