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

## LS 3336, LA 3336, LO 3336, LY 3336

### Besondere Merkmale

- **Gehäusetyp:** nicht eingefärbtes, klares 3 mm (T1) Gehäuse
- **Besonderheit des Bauteils:** Lötspieße mit Aufsetzebene
- **Wellenlänge:** 633 nm (super-rot), 615 nm (amber), 606 nm (orange), 587 nm (gelb)
- **Abstrahlwinkel:** 50°
- **Technologie:** InGaAlP
- **optischer Wirkungsgrad:** 11 lm/W (gelb, orange, amber), 7 lm/W (super-rot)
- **Gruppierungsparameter:** Lichtstärke
- **Lötmethode:** Wellenlöten (TTW)
- **Verpackung:** Schüttgut, gegurtet lieferbar

### Anwendungen

- Informationsanzeigen im Innen- und Außenbereich (z. B. im Verkehrsbereich)
- optischer Indikator
- Hinterleuchtung (LCD, Handy, Schalter, Tasten, Displays, Werbebeleuchtung, Allgemeinbeleuchtung)
- Innenbeleuchtung im Automobilbereich (z.B. Instrumentenbeleuchtung, u.ä.)
- Ersatz von Kleinst-Glühlampen
- Markierungsbeleuchtung (z.B. Stufen, Fluchtwege, u.ä.)
- Signal- und Symbolleuchten

### Features

- **package:** colorless, clear 3 mm (T1) package
- **feature of the device:** solder leads with stand-off
- **wavelength:** 633 nm (super-red), 615 nm (amber), 606 nm (orange), 587 nm (yellow)
- **viewing angle:** 50°
- **technology:** InGaAlP
- **optical efficiency:** 11 lm/W (yellow, orange, amber), 7 lm/W (super-red)
- **grouping parameter:** luminous intensity
- **soldering methods:** TTW soldering
- **preconditioning:** acc. to JEDEC Level 2
- **packing:** bulk, available taped on reel

### Applications

- indoor and outdoor displays (e.g. displays for traffic)
- optical indicators
- backlighting (LCD, cellular phones, switches, keys, displays, illuminated advertising, general lighting)
- interior automotive lighting. (e.g. dashboard backlighting, etc.)
- substitution of micro incandescent lamps
- marker lights (e.g. steps, exit ways, etc.)
- signal and symbol luminaire

| Typ<br>Type | Emissions-farbe<br>Color of Emission | Gehäuse-farbe<br>Color of Package | Lichtstärke<br>Luminous Intensity<br>$I_F$ = 20 mA<br>$I_V$ (mcd) | Lichtstrom<br>Luminous Flux<br>$I_F$ = 20 mA<br>$\Phi_V$ (mlm) | Bestellnummer<br>Ordering Code |
|---|---|---|---|---|---|
| LS 3336-QT | super-red | colorless clear | 71 ... 450 | 390 (typ.) | Q62703-Q3482 |
| LS 3336-R | | | 112 ... 180 | 210 (typ.) | Q62703-Q3484 |
| LS 3336-S | | | 180 ... 280 | 330 (typ.) | Q62703-Q3485 |
| LS 3336-T | | | 280 ... 450 | 520 (typ.) | Q62703-Q3813 |
| LS 3336-RU | | | 112 ... 710 | 620 (typ.) | Q62703-Q3486 |
| ■ LA 3336-RU | amber | colorless clear | 112 ... 710 | 600 (typ.) | Q62703-Q3554 |
| ■ LA 3336-S | | | 180 ... 280 | 320 (typ.) | Q62703-Q3551 |
| ■ LA 3336-T | | | 280 ... 450 | 500 (typ.) | Q62703-Q3552 |
| ■ LA 3336-U | | | 450 ... 710 | 800 (typ.) | Q62703-Q3553 |
| ■ LA 3336-SV | | | 180 ...1120 | 940 (typ.) | Q62703-Q3555 |
| LO 3336-RU | orange | colorless clear | 112 ... 710 | 600 (typ.) | Q62703-Q3144 |
| LO 3336-S | | | 180 ... 280 | 320 (typ.) | Q62703-Q3176 |
| LO 3336-T | | | 280 ... 450 | 500 (typ.) | Q62703-Q3170 |
| LO 3336-U | | | 450 ... 710 | 800 (typ.) | Q62703-Q3307 |
| LO 3336-SV | | | 180 ...1120 | 940 (typ.) | Q62703-Q3177 |
| LY 3336-RU | yellow | colorless clear | 112 ... 710 | 600 (typ.) | Q62703-Q3487 |
| LY 3336-S | | | 180 ... 280 | 320 (typ.) | Q62703-Q3489 |
| LY 3336-T | | | 280 ... 450 | 500 (typ.) | Q62703-Q3490 |
| LY 3336-U | | | 450 ... 710 | 800 (typ.) | Q62703-Q3814 |
| LY 3336-SV | | | 180 ...1120 | 940 (typ.) | Q62703-Q3491 |

■ Nicht für Neuentwicklungen/ Not for new designs

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 %

*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**<br>**Parameter** | **Symbol**<br>**Symbol** | **Werte**<br>**Values** | | **Einheit**<br>**Unit** |
|---|---|---|---|---|
| | | **LS, LO, LA** | **LY** | |
| Betriebstemperatur<br>Operating temperature range | $T_{op}$ | – 55 … + 100 | | °C |
| Lagertemperatur<br>Storage temperature range | $T_{stg}$ | – 55 … + 100 | | °C |
| Sperrschichttemperatur<br>Junction temperature | $T_j$ | + 100 | | °C |
| Durchlassstrom<br>Forward current | $I_F$ | 30 | | mA |
| Stoßstrom<br>Surge current<br>$t \leq 10$ µs, $D = 0.005$ | $I_{FM}$ | 1 | 0.2 | A |
| Sperrspannung<br>Reverse voltage | $V_R$ | 3 | | V |
| Leistungsaufnahme<br>Power consumption<br>$T_A \leq 25$ °C | $P_{tot}$ | 80 | | mW |
| Wärmewiderstand [1]<br>Thermal resistance<br>Sperrschicht/Umgebung<br>Junction/ambient<br>Sperrschicht/Lötpad<br>Junction/solder point<br>Montage auf PC-Board FR 4 (Padgröße ≥ 16 mm²)<br>mounted on PC board FR 4 (pad size ≥ 16 mm²)<br>Minimale Beinchenlänge<br>Minimum lead length | <br><br>$R_{th\ JA}$<br><br>$R_{th\ JS}$ | <br><br>500<br><br>280 | | <br><br>K/W<br><br>K/W |

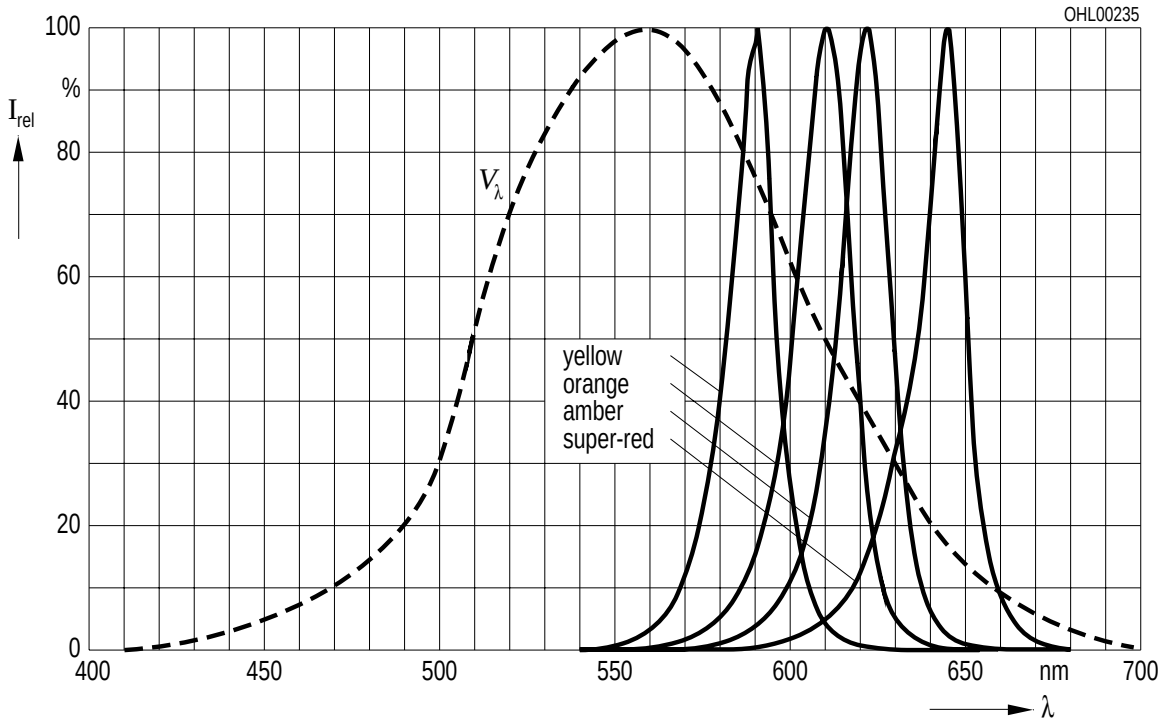
[1] $R_{th}$ erhöht sich um 13 K/W pro mm Beinchenlänge.
Each additional 1 mm of lead length increases $R_{th}$ by 13 K/W.

**Kennwerte** ($T_A$ = 25 °C)
**Characteristics**

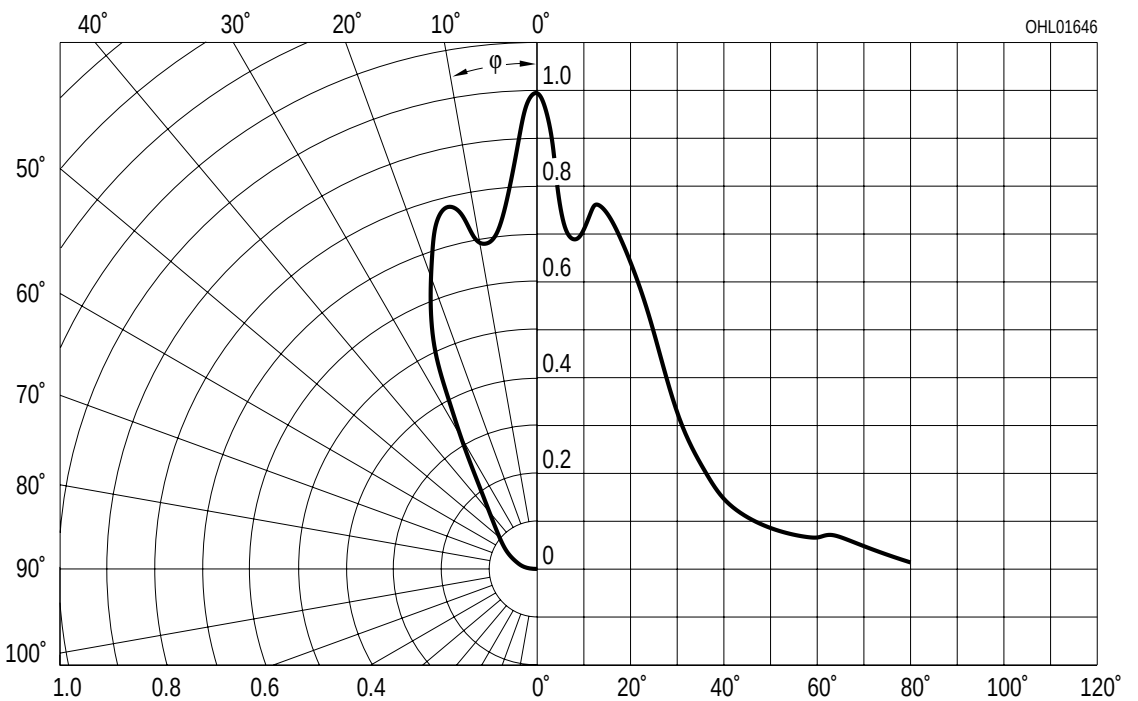
| **Bezeichnung**<br>**Parameter** | | **Symbol**<br>**Symbol** | **Werte**<br>**Values** | | | | **Einheit**<br>**Unit** |
|---|---|---|---|---|---|---|---|
| | | | **LS** | **LA** | **LO** | **LY** | |
| Wellenlänge des emittierten Lichtes<br>Wavelength at peak emission<br>$I_F$ = 20 mA | (typ.) | $\lambda_{peak}$ | 645 | 622 | 610 | 591 | nm |
| Dominantwellenlänge<br>Dominant wavelength<br>$I_F$ = 20 mA | (typ.) | $\lambda_{dom}$ | 633 | 615 | 606 | 587 | nm |
| Spektrale Bandbreite bei 50 % $I_{rel\ max}$<br>Spectral bandwidth at 50 % $I_{rel\ max}$<br>$I_F$ = 20 mA | (typ.) | $\Delta\lambda$ | 16 | 16 | 16 | 15 | nm |
| Abstrahlwinkel bei 50 % $I_V$ (Vollwinkel)<br>Viewing angle at 50 % $I_V$ | (typ.) | $2\varphi$ | 50 | 50 | 50 | 50 | Grad<br>deg. |
| Durchlassspannung [1)]<br>Forward voltage [1)]<br>$I_F$ = 20 mA | (typ.)<br>(max.) | $V_F$<br>$V_F$ | 2.0<br>2.4 | 2.0<br>2.4 | 2.0<br>2.4 | 2.0<br>2.4 | V<br>V |
| Sperrstrom<br>Reverse current<br>$V_R$ = 3 V | (typ.)<br>(max.) | $I_R$<br>$I_R$ | 0.01<br>10 | 0.01<br>10 | 0.01<br>10 | 0.01<br>10 | µA<br>µA |
| Temperaturkoeffizient von $\lambda_{peak}$<br>Temperature coefficient of $\lambda_{peak}$<br>$I_F$ = 20 mA; –10°C ≤ $T$ ≤ 100°C | (typ.) | $TC_{\lambda peak}$ | 0.14 | 0.13 | 0.13 | 0.13 | nm/K |
| Temperaturkoeffizient von $\lambda_{dom}$<br>Temperature coefficient of $\lambda_{dom}$<br>$I_F$ = 20 mA; –10°C ≤ $T$ ≤ 100°C | (typ.) | $TC_{\lambda dom}$ | 0.01 | 0.06 | 0.07 | 0.10 | nm/K |
| Temperaturkoeffizient von $V_F$<br>Temperature coefficient of $V_F$<br>$I_F$ = 20 mA; –10°C ≤ $T$ ≤ 100°C | (typ.) | $TC_V$ | – 2.0 | – 1.8 | – 1.7 | – 2.5 | mV/K |
| Optischer Wirkungsgrad<br>Optical efficiency<br>$I_F$ = 20 mA | (typ.) | $\eta_{opt}$ | 7 | 11 | 11 | 11 | lm/W |

[1)] Spannungswerte werden mit einer Stromeinprägedauer von 1 ms und einer Genauigkeit von ±0,1 V ermittelt.
Voltages are tested at a current pulse duration of 1 ms and a tolerance of ±0.1 V.

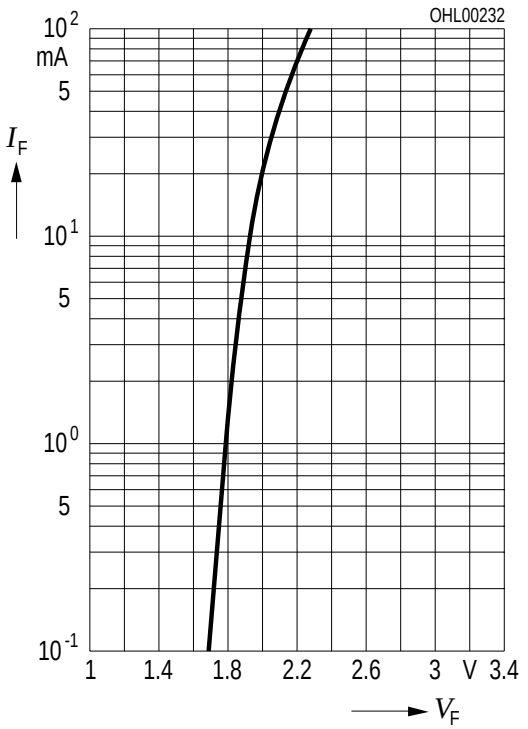
**Relative spektrale Emission** $I_{rel} = f(\lambda)$, $T_A$ = 25 °C, $I_F$ = 20 mA
**Relative Spectral Emission**
V(λ) = spektrale Augenempfindlichkeit
Standard eye response curve



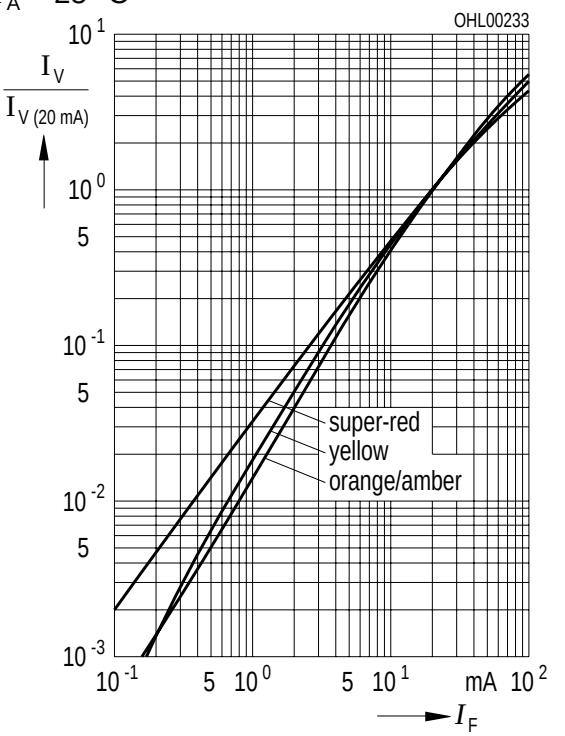

**Abstrahlcharakteristik** $I_{rel} = f(\varphi)$
**Radiation Characteristic**



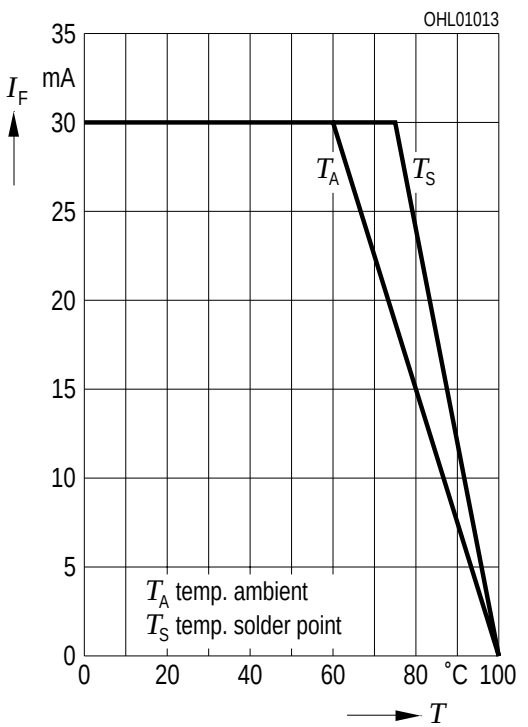
**Durchlassstrom $I_F = f(V_F)$**
**Forward Current**
$T_A$ = 25 °C



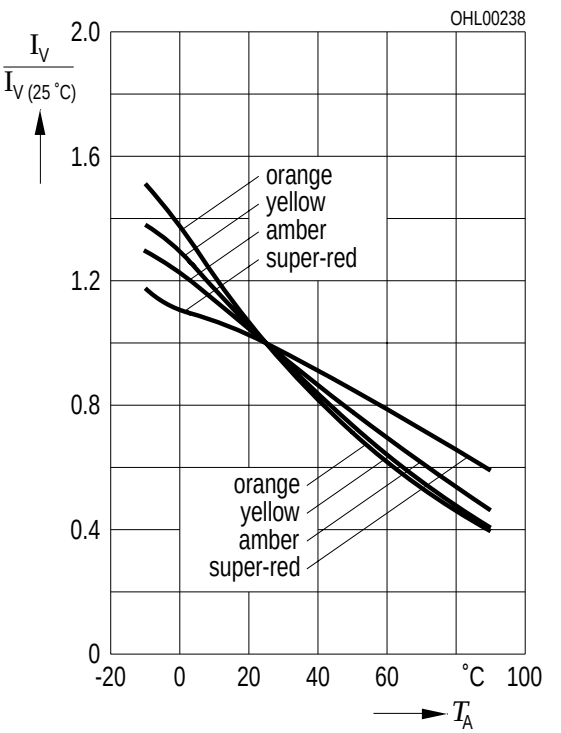

**Relative Lichtstärke $I_V/I_{V(20\ mA)} = f(I_F)$**
**Relative Luminous Intensity**
$T_A$ = 25 °C



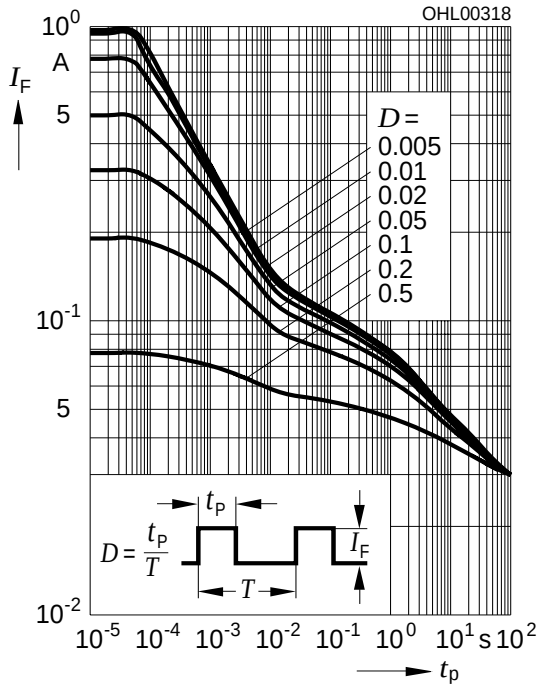

**Maximal zulässiger Durchlassstrom $I_F = f(T)$**
**Max. Permissible Forward Current**



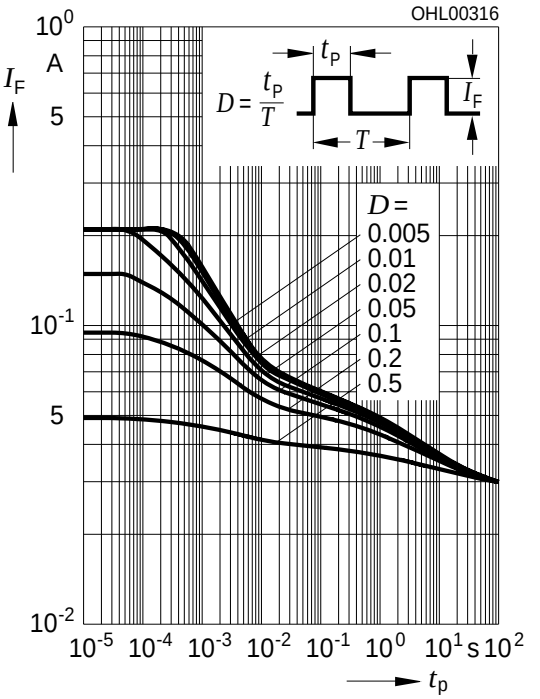

**Relative Lichtstärke $I_V/I_{V(25\ °C)} = f(T_A)$**
**Relative Luminous Intensity**
$I_F$ = 20 mA



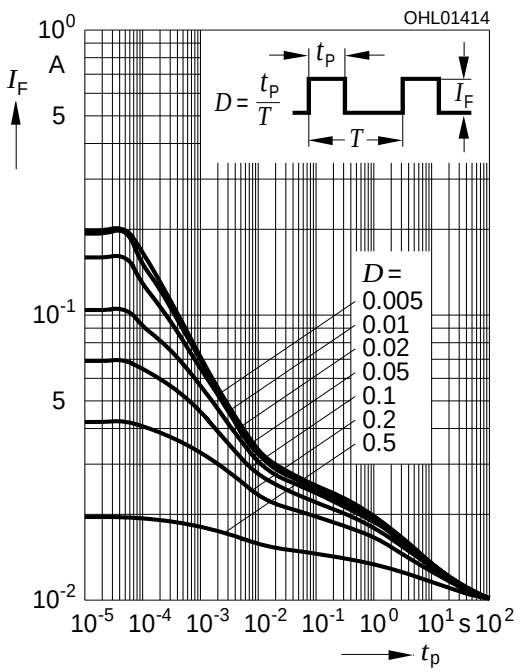
**Zulässige Impulsbelastbarkeit $I_F = f(t_p)$**
**Permissible Pulse Handling Capability**
Duty cycle $D$ = parameter, $T_A$ = 25 °C
**LS, LA, LO**



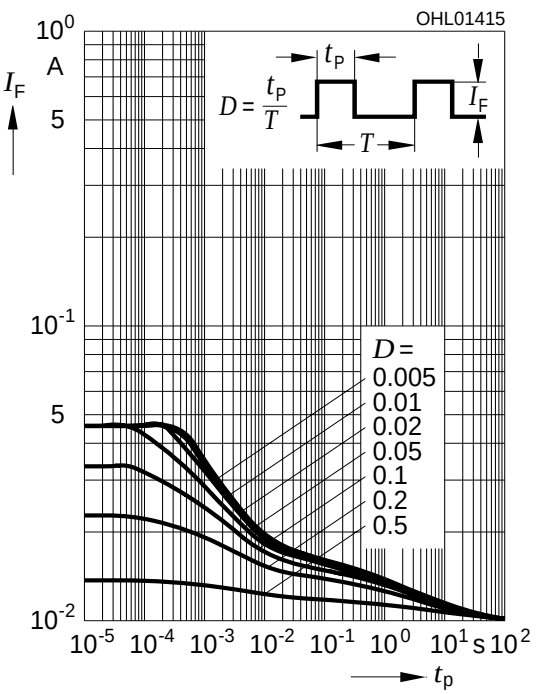

**Zulässige Impulsbelastbarkeit $I_F = f(t_p)$**
**Permissible Pulse Handling Capability**
Duty cycle $D$ = parameter, $T_A$ = 25 °C
**LY**



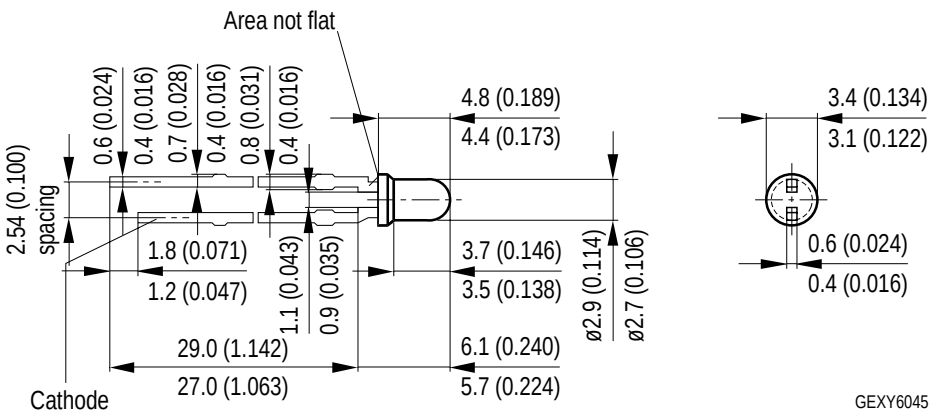

**Zulässige Impulsbelastbarkeit $I_F = f(t_p)$**
**Permissible Pulse Handling Capability**
Duty cycle $D$ = parameter, $T_A$ = 85 °C
**LS, LA, LO**




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



## Maßzeichnung
## Package Outlines

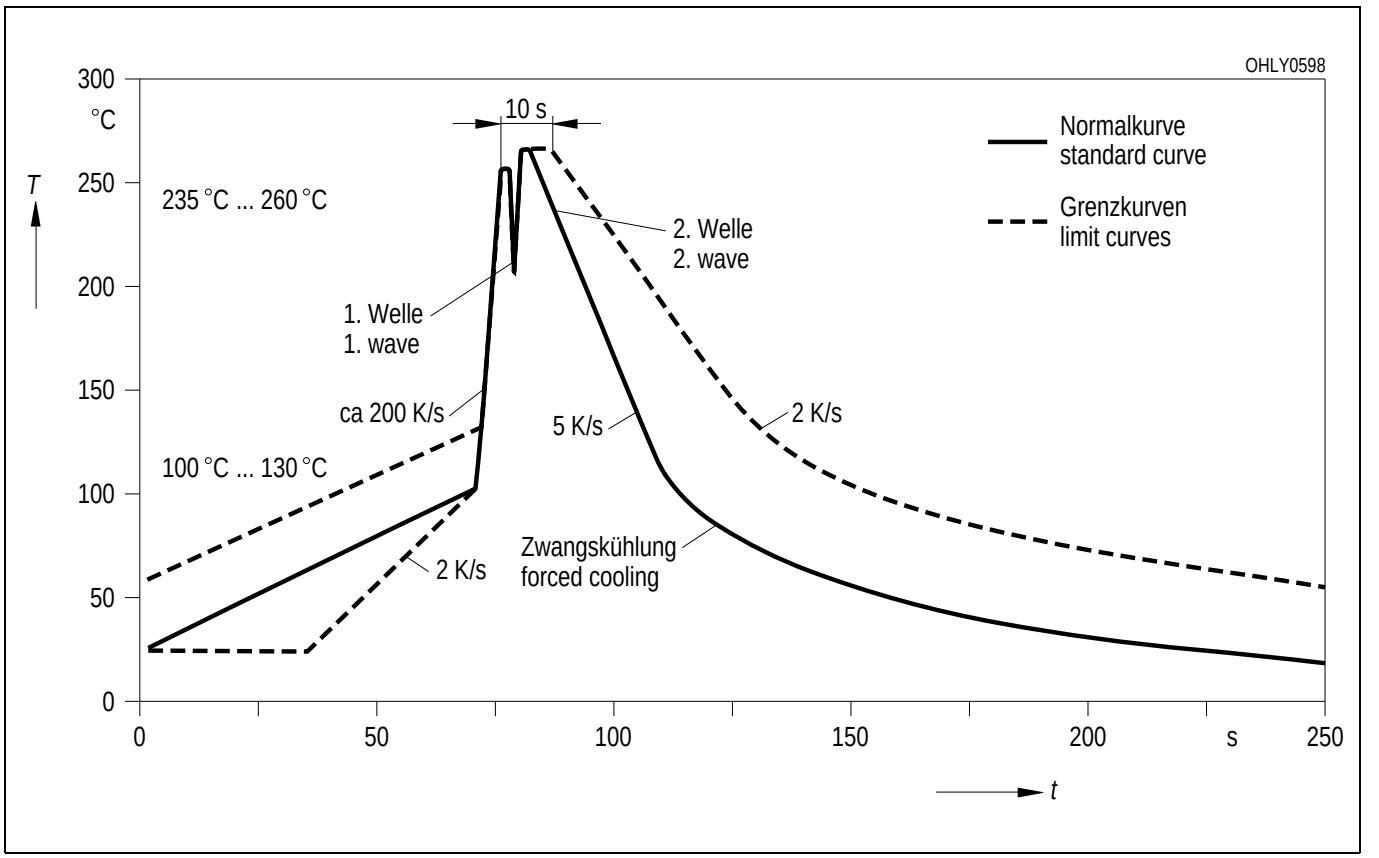



Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

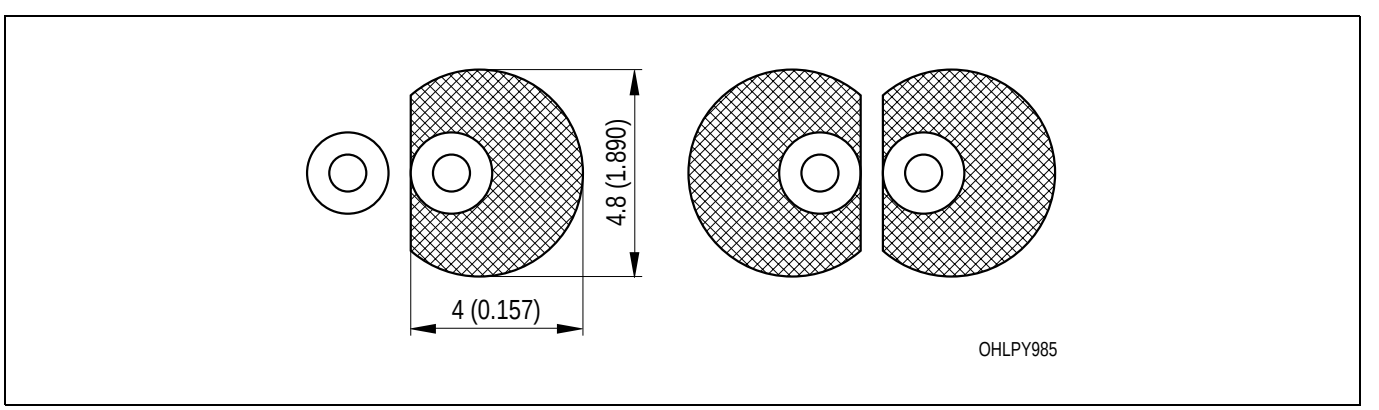
**Kathodenkennung:** kürzerer Lötspieß
**Cathode mark:** short solder lead
**Gewicht / Approx. weight:** 0.15 g

**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)

| **Revision History: 2002-03-14** | |
|---|---|
| Previous Version: 2001-02-12 | |
| **Page** | **Subjects (major changes since last revision)** |
| 3 | thermal resistance (footnote) |
| 4 | value (wavelength amber/yellow) |

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