

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

LS 3336, LO 3336, LY 3336



Besondere Merkmale

- **Gehäusotyp:** nicht eingefärbtes, klares 3 mm (T1) Gehäuse
- **Besonderheit des Bauteils:** Lötspieße mit Aufsetzebene
- **Wellenlänge:** 633 nm (super-rot), 606 nm (orange), 587 nm (gelb)
- **Abstrahlwinkel:** 50°
- **Technologie:** InGaAlP
- **optischer Wirkungsgrad:** 11 lm/W (gelb, orange), 7 lm/W (super-rot)
- **Gruppierungsparameter:** Lichtstärke
- **Lötmethode:** Wellenlöten (TTW)
- **Verpackung:** Schüttgut, gegurtet lieferbar
- **ESD-Festigkeit:** ESD-sicher bis 2 kV nach EOS/ESD-5.1-1993

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), 606 nm (orange), 587 nm (yellow)
- **viewing angle:** 50°
- **technology:** InGaAlP
- **optical efficiency:** 11 lm/W (yellow, orange), 7 lm/W (super-red)
- **grouping parameter:** luminous intensity
- **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

- 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 Type | Emissions- farbe Color of Emission | Gehäuse- farbe Color of Package | Lichtstärke Luminous Intensity $I_F = 20 \text{ mA}$ $I_V \text{ (mcd)}$ | Lichtstrom Luminous Flux $I_F = 20 \text{ mA}$ $\Phi_V \text{ (mlm)}$ | Bestellnummer Ordering Code |
|--|---|--|--|---|---|
| LS 3336-QT LS 3336-S LS 3336-T LS 3336-RU LS 3336-TU | super-red | colorless clear | 71 ... 450 180 ... 280 280 ... 450 112 ... 710 280 ... 710 | 390 (typ.) 330 (typ.) 520 (typ.) 620 (typ.) 710 (typ.) | Q62703Q3482 Q62703Q3485 Q62703Q3813 Q62703Q3486 Q65110A0609 |
| LO 3336-RU LO 3336-T LO 3336-U LO 3336-V LO 3336-SV | orange | colorless clear | 112 ... 710 280 ... 450 450 ... 710 710 ... 1120 180 ... 1120 | 600 (typ.) 500 (typ.) 800 (typ.) 1300 (typ.) 940 (typ.) | Q62703Q3144 Q62703Q3170 Q62703Q3307 Q62703Q4688 Q62703Q3177 |
| LY 3336-RU LY 3336-S LY 3336-T LY 3336-U LY 3336-SV | yellow | colorless clear | 112 ... 710 180 ... 280 280 ... 450 450 ... 710 180 ... 1120 | 600 (typ.) 320 (typ.) 500 (typ.) 800 (typ.) 940 (typ.) | Q62703Q3487 Q62703Q3489 Q62703Q3490 Q62703Q3814 Q62703Q3491 |

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 | Werte Values | | Einheit Unit |
|--|------------------|-----------------|-----|-----------------|
| | | LS, LO | LY | |
| 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 | 30 | | mA |
| Stoßstrom Surge current $t \leq 10 \mu s, D = 0.005$ | I_{FM} | 1 | 0.2 | A |
| Sperrspannung ¹⁾ Reverse voltage | V_R | 12 | | V |
| Leistungsaufnahme Power consumption $T_A \leq 25 \text{ °C}$ | P_{tot} | 80 | | mW |
| Wärmewiderstand ²⁾ Thermal resistance Sperrschicht/Umgebung Junction/ambient | $R_{th JA}$ | 500 | | 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 | $R_{th JS}$ | 280 | | 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 |
|---|------------------------------|-----------------|------------|------------|--------------------------------|
| | | LS | LO | LY | |
| Wellenlänge des emittierten Lichtes (typ.) Wavelength at peak emission $I_F = 20\text{ mA}$ | λ_{peak} | 645 | 610 | 591 | nm |
| Dominantwellenlänge (typ.) Dominant wavelength $I_F = 20\text{ mA}$ | λ_{dom} | 633 | 606 | 587 | nm |
| Spektrale Bandbreite bei 50 % $I_{\text{rel max}}$ (typ.) Spectral bandwidth at 50 % $I_{\text{rel max}}$ $I_F = 20\text{ mA}$ | $\Delta\lambda$ | 16 | 16 | 15 | nm |
| Abstrahlwinkel bei 50 % I_V (Vollwinkel) (typ.) Viewing angle at 50 % I_V | 2ϕ | 50 | 50 | 50 | Grad deg. |
| Durchlassspannung ¹⁾ (typ.) Forward voltage ¹⁾ (max.) $I_F = 20\text{ mA}$ | V_F V_F | 2.0 2.4 | 2.0 2.4 | 2.0 2.4 | 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 | μA μA |
| Temperaturkoeffizient von λ_{peak} (typ.) Temperature coefficient of λ_{peak} $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$ | $TC_{\lambda_{\text{peak}}}$ | 0.14 | 0.13 | 0.13 | nm/K |
| Temperaturkoeffizient von λ_{dom} (typ.) Temperature coefficient of λ_{dom} $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$ | $TC_{\lambda_{\text{dom}}}$ | 0.05 | 0.07 | 0.10 | 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 | - 2.0 | - 1.7 | - 2.5 | mV/K |
| Optischer Wirkungsgrad (typ.) Optical efficiency $I_F = 20\text{ mA}$ | η_{opt} | 7 | 11 | 11 | lm/W |

¹⁾ 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 (mlm) |
|---|--|---|
| Q | 71 ... 112 | 125 (typ.) |
| R | 112 ... 180 | 210 (typ.) |
| S | 180 ... 280 | 320 (typ.) |
| T | 280 ... 450 | 500 (typ.) |
| U | 450 ... 710 | 800 (typ.) |
| V | 710 ... 1120 | 1250 (typ.) |

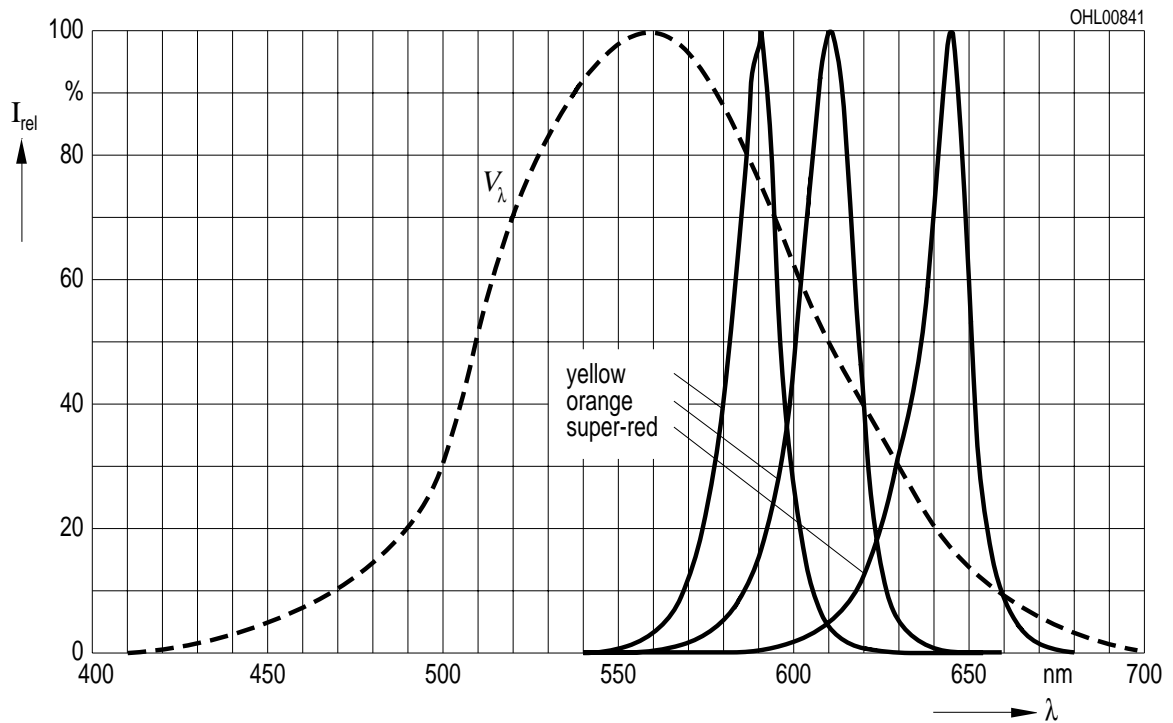
Helligkeitswerte werden mit einer Stromeinprägedauer von 25 ms und einer Genauigkeit von ± 11 % ermittelt.
 Luminous intensity is tested at a current pulse duration of 25 ms and a tolerance of ± 11 %.

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

Relative Spectral Emission

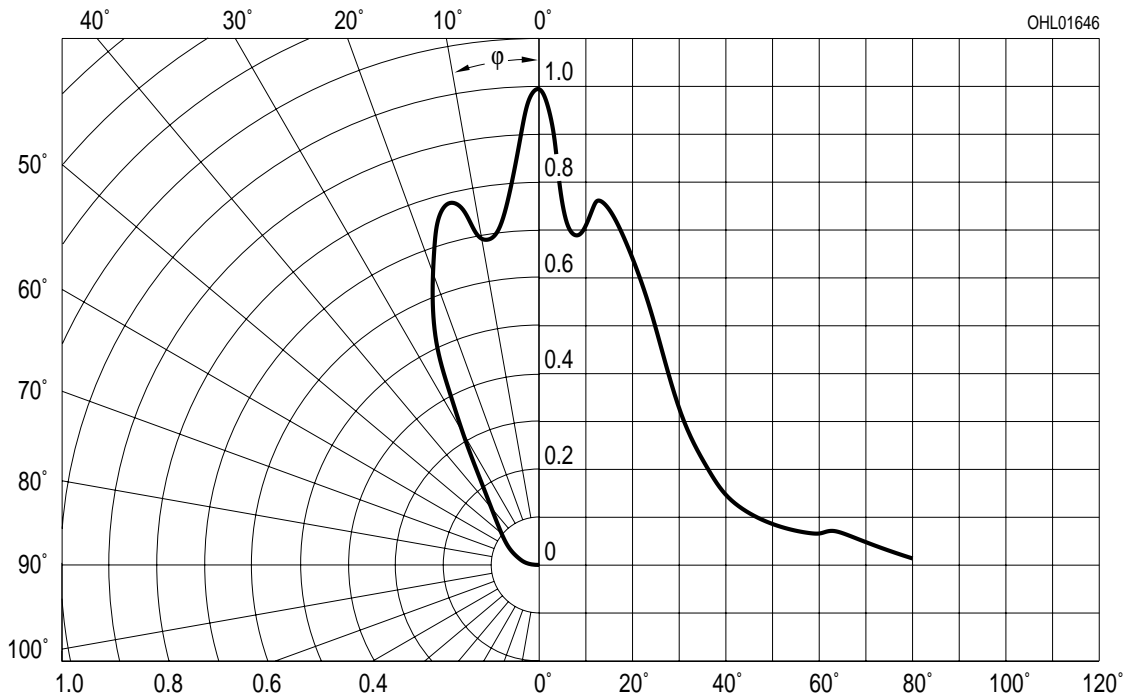
$V(\lambda)$ = spektrale Augenempfindlichkeit

Standard eye response curve



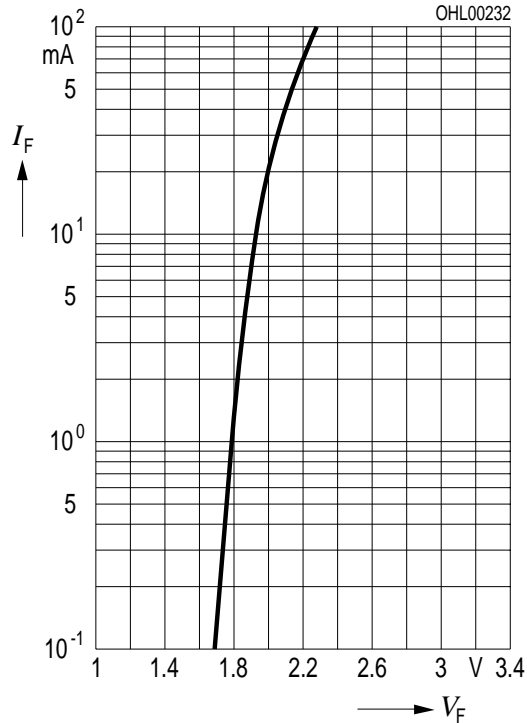
Abstrahlcharakteristik $I_{rel} = f(\varphi)$

Radiation Characteristic



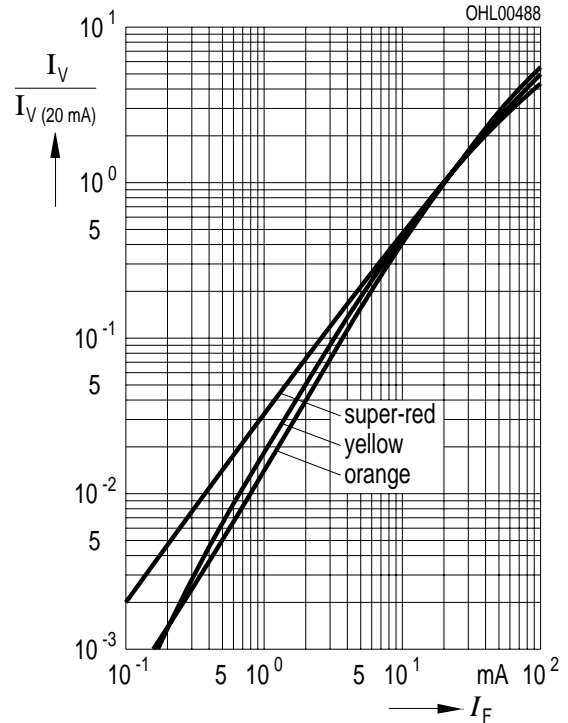
Durchlassstrom $I_F = f(V_F)$
Forward Current

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

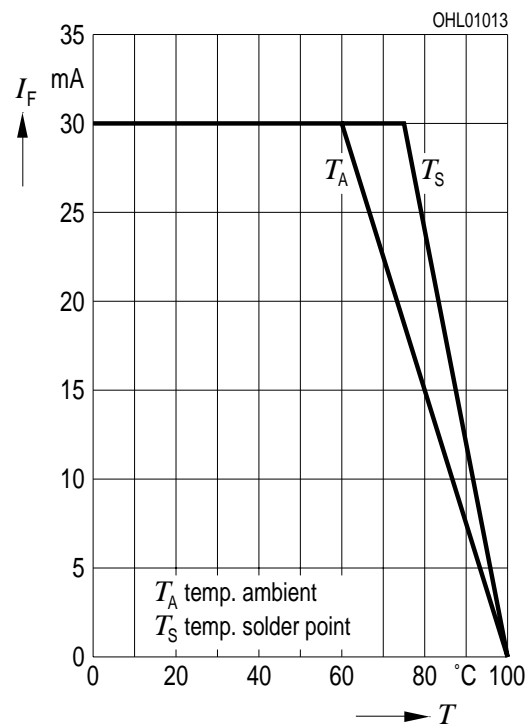


Relative Lichtstärke $I_V/I_{V(20\text{ mA})} = f(I_F)$
Relative Luminous Intensity

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

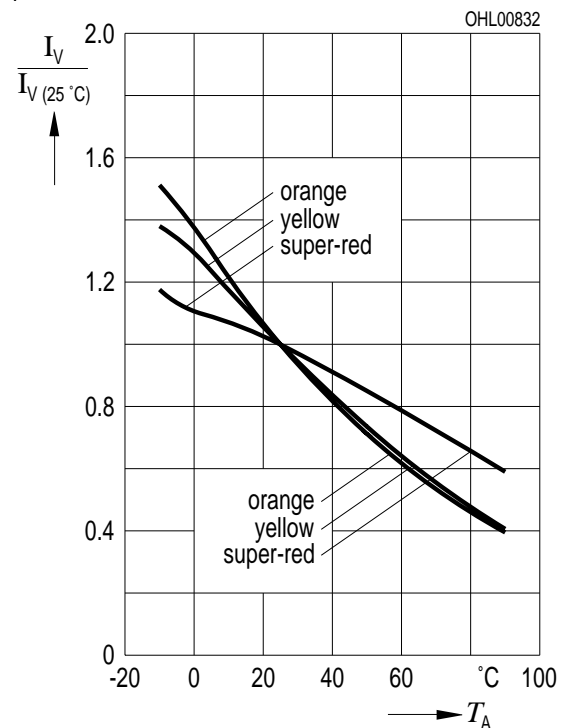


Maximal zulässiger Durchlassstrom $I_F = f(T)$
Max. Permissible Forward Current

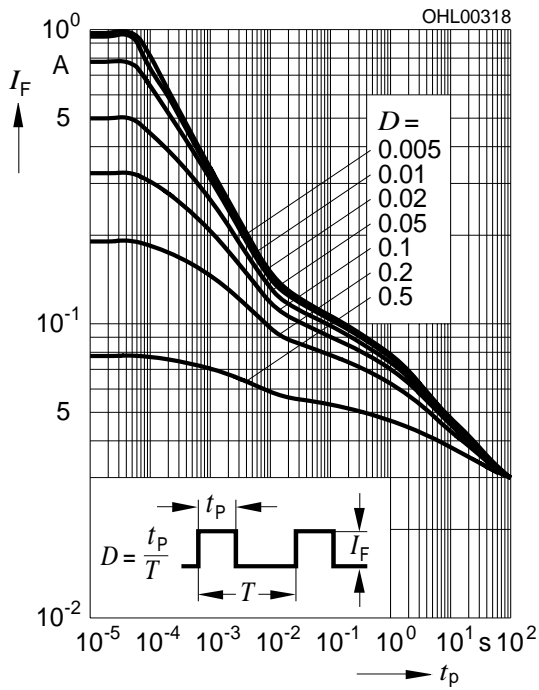


Relative Lichtstärke $I_V/I_{V(25\text{ }^\circ\text{C})} = f(T_A)$
Relative Luminous Intensity

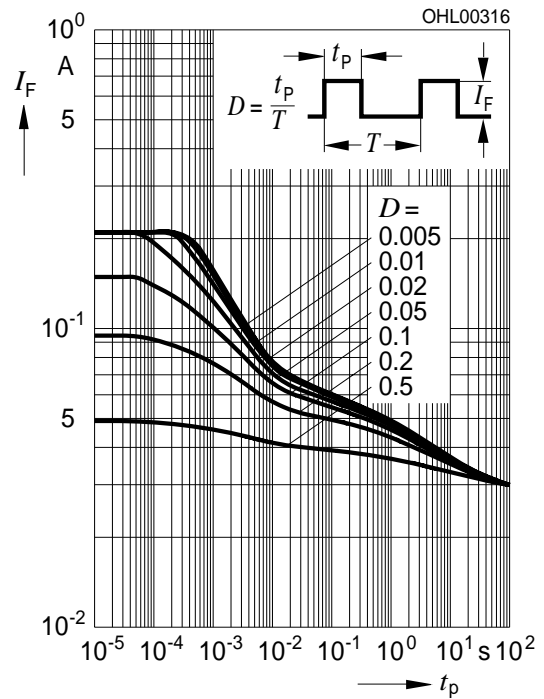
$I_F = 20\text{ mA}$



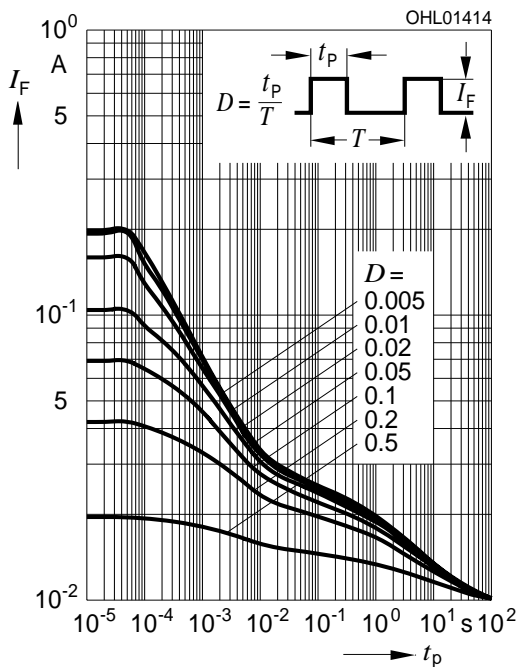
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
 Duty cycle $D =$ parameter, $T_A = 25\text{ °C}$
LS, LO



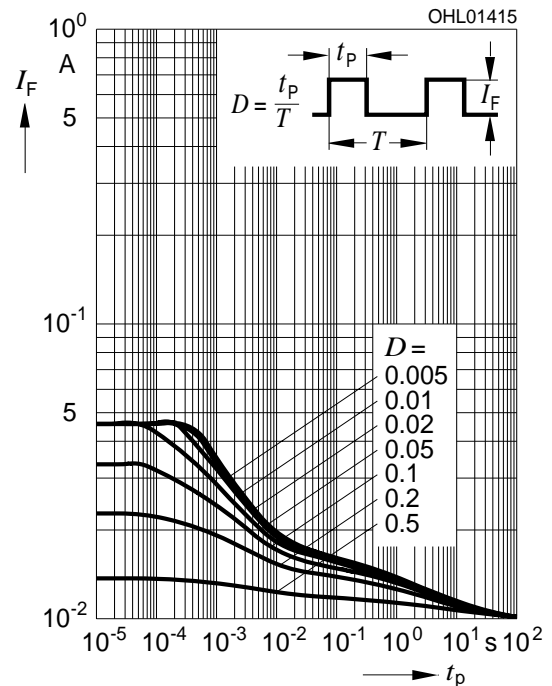
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
 Duty cycle $D =$ parameter, $T_A = 25\text{ °C}$
LY



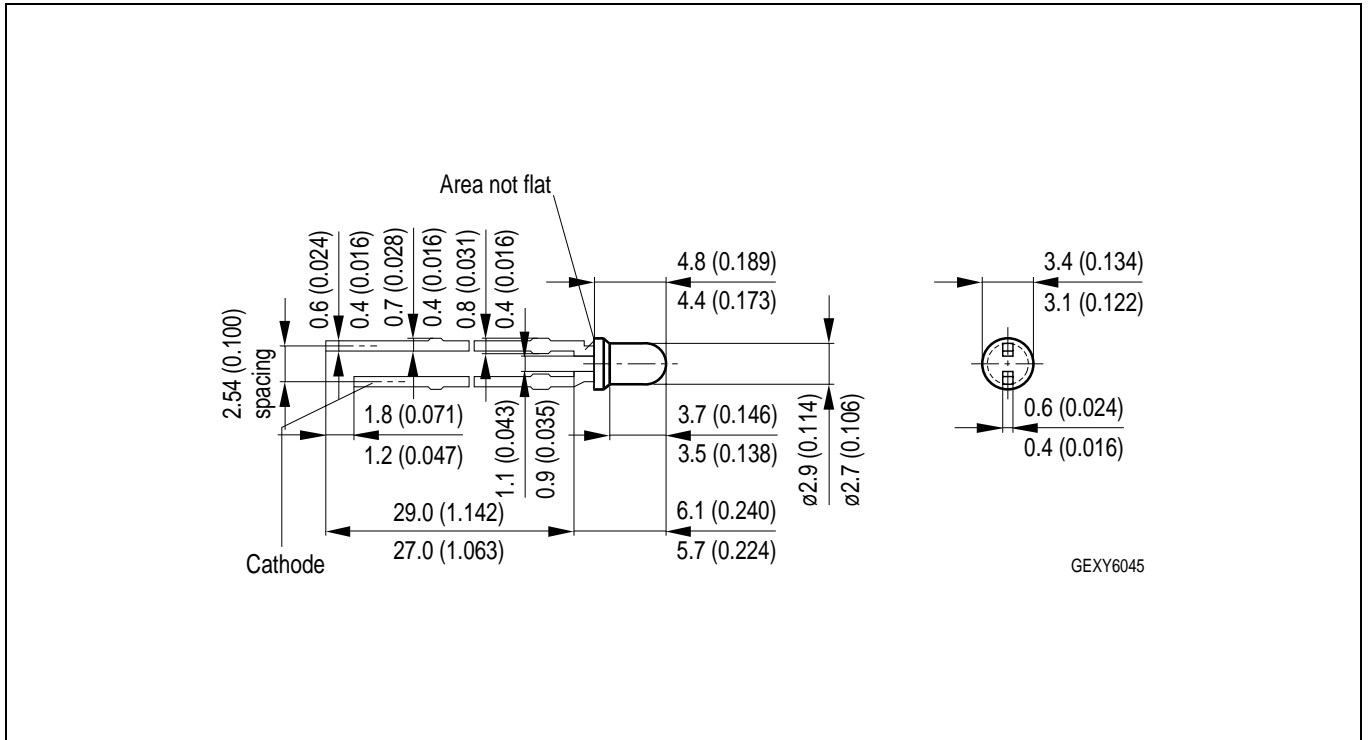
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
 Duty cycle $D =$ parameter, $T_A = 85\text{ °C}$
LS, LO



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



**Maßzeichnung
Package Outlines**

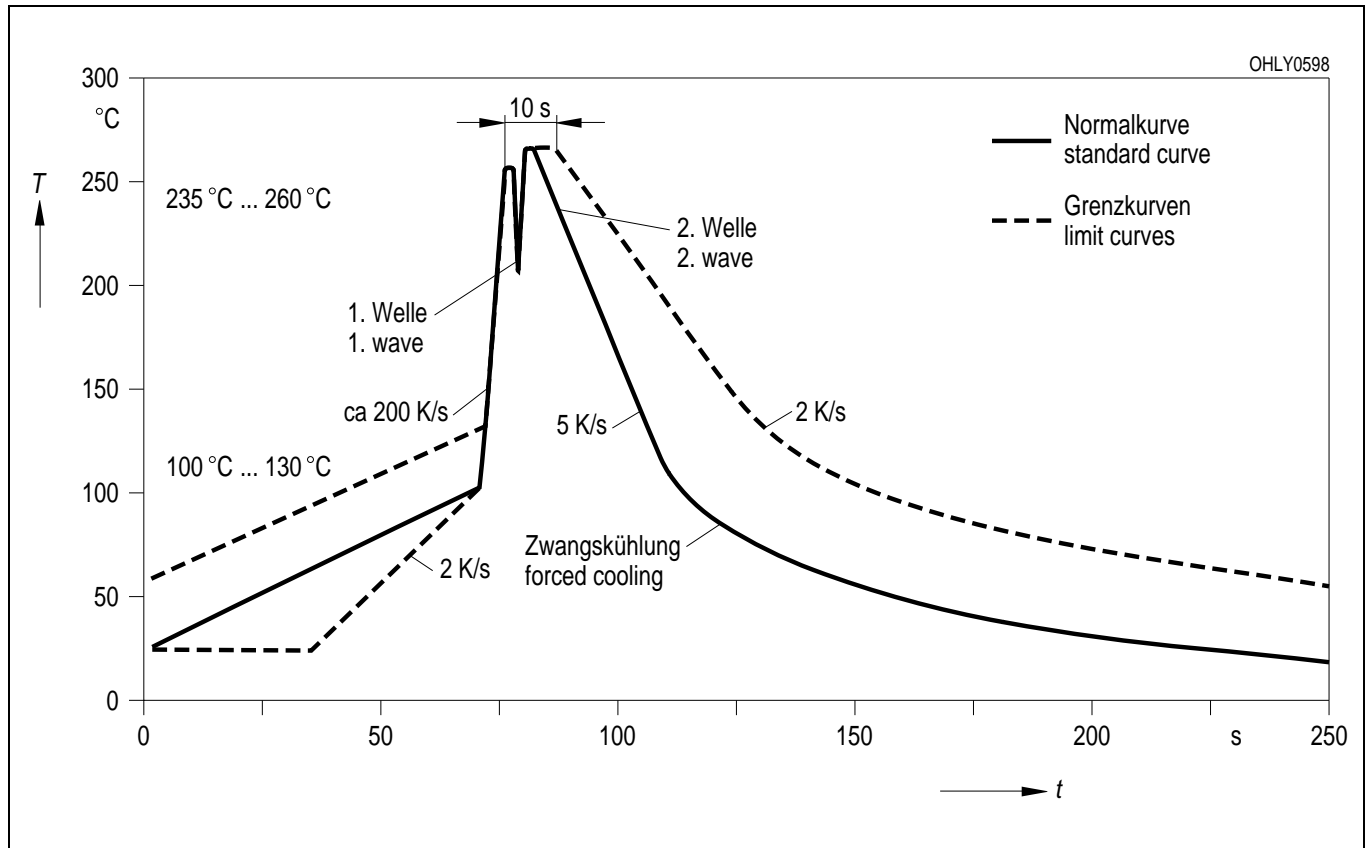


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

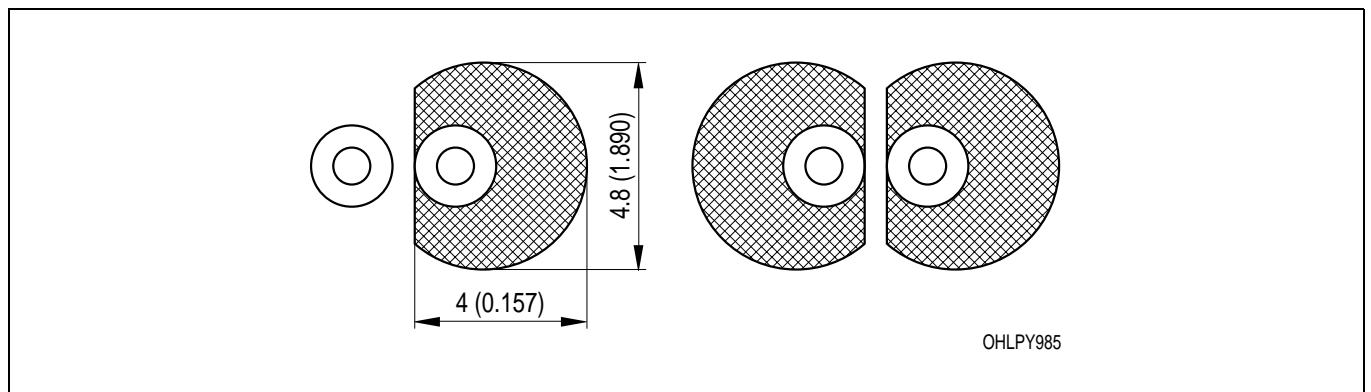
Kathodenkennung: kürzerer Lötspieß
Cathode mark: short solder lead
Gewicht / Approx. weight: 0.15 g

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: 2003-03-11 | | Date of change |
|------------------------------|--|----------------|
| Previous Version: 2003-03-10 | | |
| Page | Subjects (major changes since last revision) | |
| 3 | thermal resistance (footnote) | |
| 4 | value (wavelength amber/yellow) | |
| 10 | annotations | 2002-07-25 |
| 2 | not for new designs: amber | 2002-07-25 |
| 4 | value ($TC_{\lambda_{dom}}$ from 0.01 to 0.05 nm/K) | 2002-07-25 |
| 5 | luminous intensity groups | 2002-07-30 |
| 3, 4 | value (reverse voltage from 3 V to 12 V) | 2002-09-18 |
| all | removal of "amber" | 2002-10-01 |
| 7 | new diagram for rel. lum. intensity (I_F) (OHL00233 to OHL00488) | 2002-10-01 |
| 7 | new diagram for rel. lum. intensity (T_A) (OHL00238 to OHL00832) | 2002-10-01 |
| 5 | new diagram for rel. spec. emission (OHL00235 to OHL00841) | 2002-10-07 |
| 2 | new type: LO 3336-V | 2002-10-02 |
| 1 | ESD-withstand voltage | 2002-12-06 |
| 2 | new type LS 3336-TU | 2003-03-10 |
| all | removal of LS 3336-R | 2003-03-11 |

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