

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

LW 3333



Vorläufige Daten / Preliminary Data

Besondere Merkmale

- **Gehäusotyp:** nicht eingefärbtes, klares 3 mm (T1) Gehäuse
- **Besonderheit des Bauteils:** enge Abstrahlcharakteristik; Lötspieße mit Aufsetzebene
- **Farbort:** $x = 0.32$, $y = 0.31$ nach CIE 1931 (weiß)
- **typ. Farbtemperatur:** 6500 K
- **Abstrahlwinkel:** 40°
- **Technologie:** InGaN
- **optischer Wirkungsgrad:** 6 lm/W
- **Gruppierungsparameter:** Lichtstärke, Farbort
- **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
- Signal- und Symbolleuchten
- Markierungsbeleuchtung (z.B. Stufen, Fluchtwege, u.ä.)
- Effektbeleuchtung (z.B. Sternenhimmel)
- Ersatz von Miniaturlampen
- Möbelbeleuchtung (z.B. Vitrinen)

Features

- **package:** colorless, clear 3 mm (T1) package
- **feature of the device:** narrow viewing angle, solder leads with stand-off
- **color coordinates:** $x = 0.32$, $y = 0.31$ acc. to CIE 1931 (white)
- **typ. color temperature:** 6500 K
- **viewing angle:** 40°
- **technology:** InGaN
- **optical efficiency:** 6 lm/W
- **grouping parameter:** luminous intensity, color coordinates
- **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
- signal and symbol luminaire
- marker lights (e.g. steps, exit ways, etc.)
- lighting for special effects (e.g. starry sky)
- substitute for miniature flashlight
- furniture lighting (e.g. glass cupboards)

| 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 $I_F = 20 \text{ mA}$ $\Phi_V \text{ (lm)}$ | Ordering Code |
| LW 3333-S2T2-1 | white | colorless clear | 224 ... 450 | 390 (typ.) | Q62703-Q5704 |
| LW 3333-T2V1-1 | | | 355 ... 900 | 630 (typ.) | Q62703-Q5705 |

Anm.: -1 Farbselektiert nach Farbortgruppen (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: -1 Color selection acc. to Chromaticity coordinate groups (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 |
|--|--------------------------------|----------------|-----------------|
| Betriebstemperatur Operating temperature range | T_{op} | – 40 ... + 100 | °C |
| Lagertemperatur Storage temperature range | T_{stg} | – 40 ... + 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 | mA |
| Sperrspannung Reverse voltage | V_R | 5 | V |
| Leistungsaufnahme Power consumption $T_A \leq 25 \text{ °C}$ | P_{tot} | 85 | mW |
| Wärmewiderstand ¹⁾ Thermal resistance Sperrschicht/Umgebung Junction/ambient Sperrschicht/Lötpad 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 | $R_{th JA}$ $R_{th JS}$ | 400 180 | K/W 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.

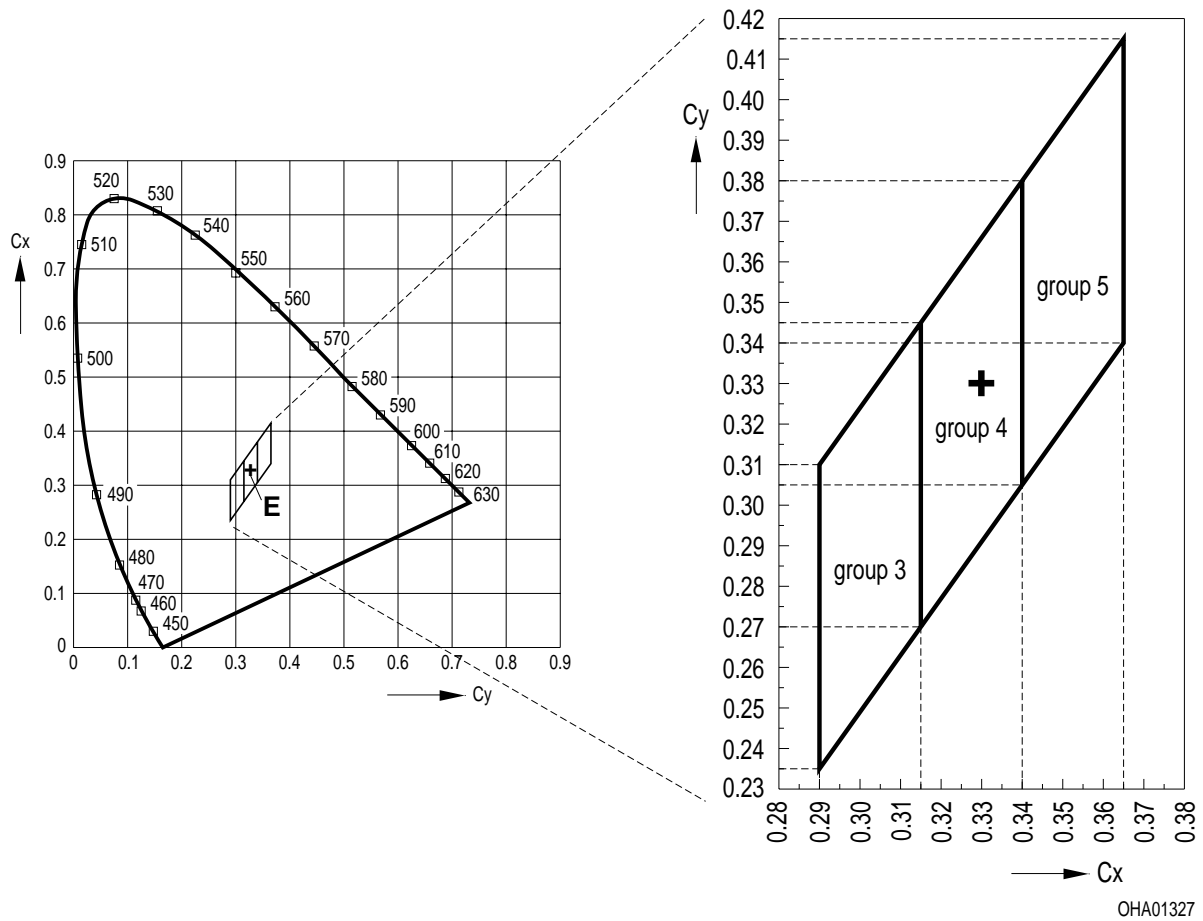
Kennwerte ($T_A = 25\text{ °C}$)**Characteristics**

| Bezeichnung Parameter | Symbol Symbol | Werte Values | Einheit Unit |
|--|------------------------------|-----------------|--------------------|
| Farbkoordinate x nach CIE 1931 ¹⁾ Chromaticity coordinate x acc. to CIE 1931 $I_F = 20\text{ mA}$ | x | 0.32 | – |
| Farbkoordinate y nach CIE 1931 ¹⁾ Chromaticity coordinate y acc. to CIE 1931 $I_F = 20\text{ mA}$ | y | 0.31 | – |
| Abstrahlwinkel bei 50 % I_V (Vollwinkel) Viewing angle at 50 % I_V | 2φ | 40 | Grad deg. |
| Durchlassspannung ²⁾ Forward voltage $I_F = 20\text{ mA}$ | (typ.) V_F (max.) V_F | 3.5 4.1 | V V |
| Sperrstrom Reverse current $V_R = 5\text{ V}$ | (typ.) I_R (max.) I_R | 0.01 10 | μA μA |
| Temperaturkoeffizient von x Temperature coefficient of x $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$ | TC_X | –0.1 | $10^{-3}/\text{K}$ |
| Temperaturkoeffizient von y Temperature coefficient of y $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$ | TC_Y | –0.2 | $10^{-3}/\text{K}$ |
| Temperaturkoeffizient von V_F Temperature coefficient of V_F $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$ | TC_V | –3.0 | mV/K |
| Optischer Wirkungsgrad Optical efficiency $I_F = 20\text{ mA}$ | (typ.) η_{opt} | 6 | lm/W |

¹⁾ Farbortgruppen werden mit einer Stromeinprägungsdauer von 25 ms und einer Genauigkeit von $\pm 0,01$ ermittelt.
Chromaticity coordinate groups are tested at a current pulse duration of 25 ms and a tolerance of ± 0.01 .

²⁾ Spannungswerte werden mit einer Stromeinprägungsdauer 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 $\pm 0.1\text{ V}$.

1) Farbortgruppen
Chromaticity coordinate groups



Helligkeits-Gruppierungsschema Luminous Intensity Groups

| Lichtgruppe Luminous Intensity Group | Lichtstärke Luminous Intensity I_v (mcd) | Lichtstrom Luminous Flux Φ_v (lm) |
|---|--|--|
| S2 | 224 ... 280 | 300 (typ.) |
| T1 | 280 ... 355 | 380 (typ.) |
| T2 | 355 ... 450 | 480 (typ.) |
| U1 | 450 ... 560 | 600 (typ.) |
| U2 | 560 ... 710 | 760 (typ.) |
| V1 | 710 ... 900 | 950 (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: U2-3

Example: U2-3

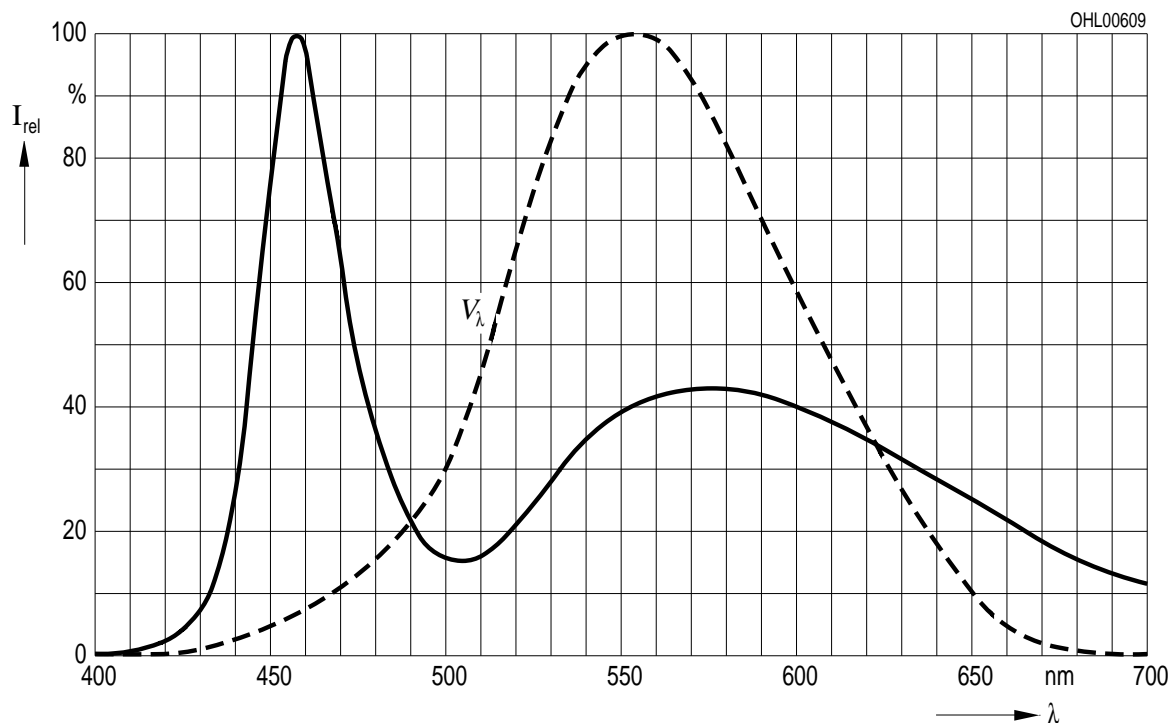
| Lichtgruppe Luminous Intensity Group | Halbgruppe Half Group | Farbortgruppe Chromaticity coordinate group |
|---|--------------------------|--|
| U | 2 | 3 |

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

Relative Spectral Emission

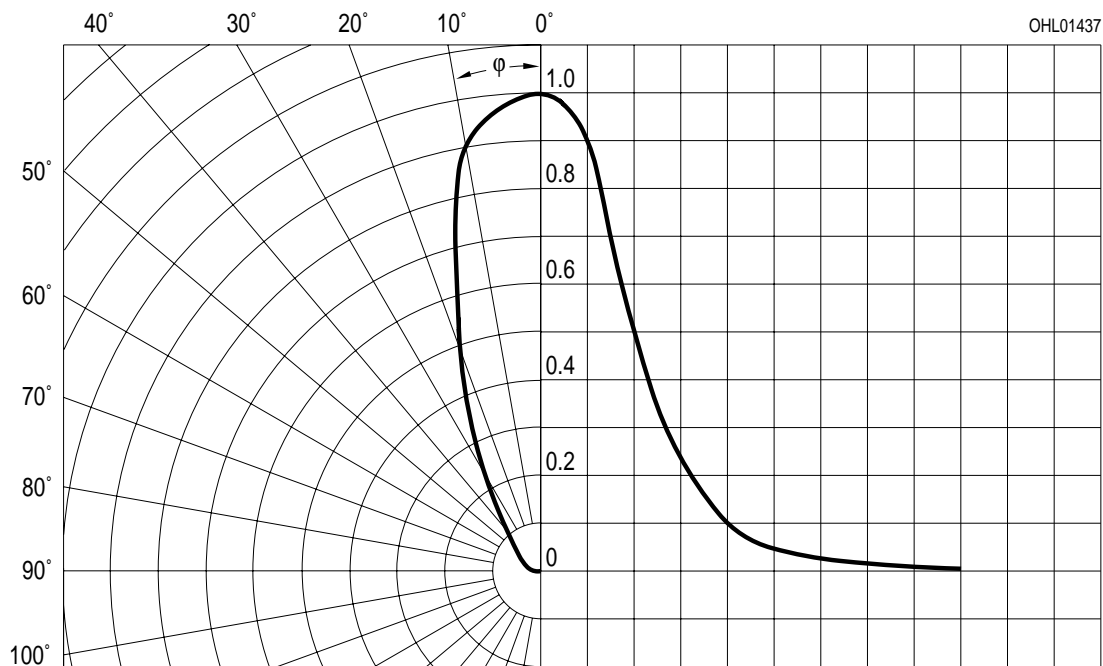
$V(\lambda)$ = spektrale Augenempfindlichkeit

Standard eye response curve



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

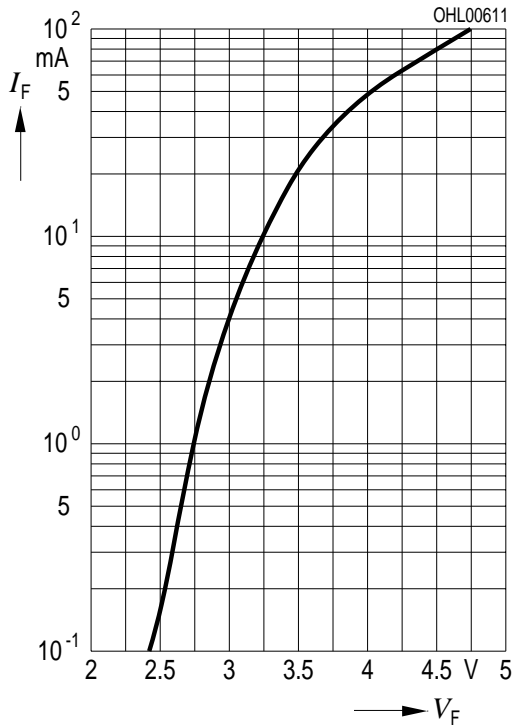
Radiation Characteristic



Durchlassstrom $I_F = f(V_F)$

Forward Current

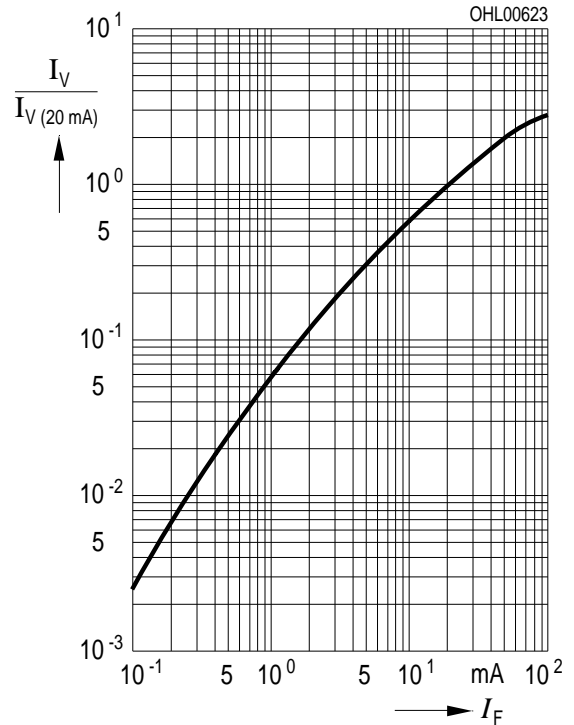
$T_A = 25\text{ °C}$



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

Relative Luminous Intensity

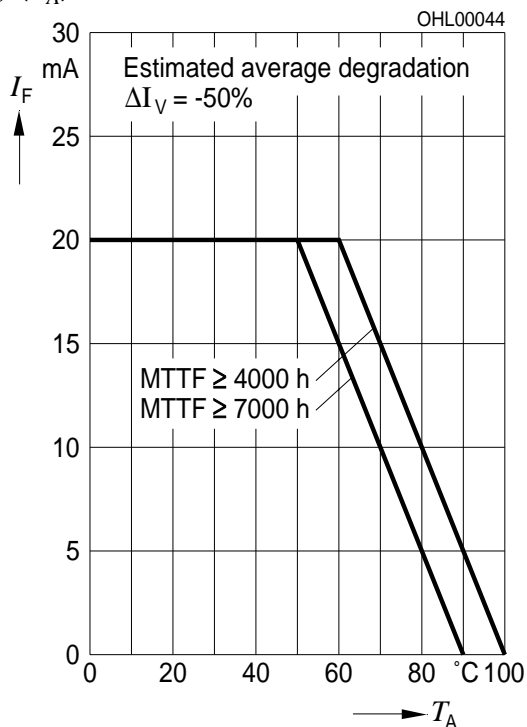
$T_A = 25\text{ °C}$



Maximal zulässiger Durchlassstrom

Max. Permissible Forward Current

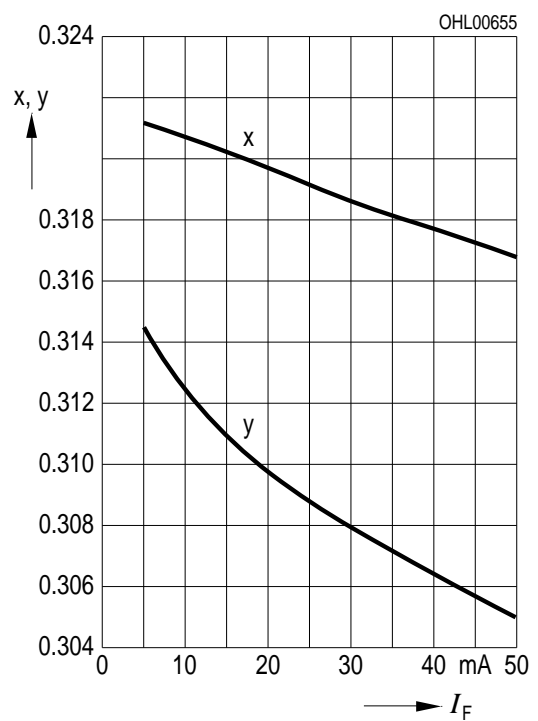
$I_F = f(T_A)$



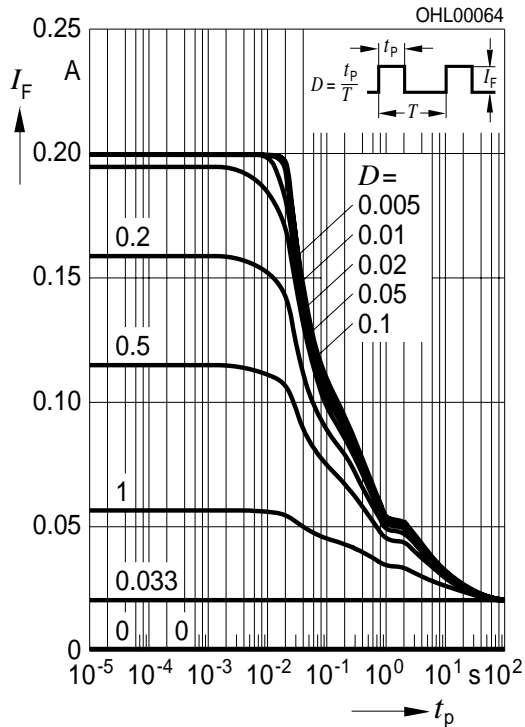
Farbortverschiebung $x, y = f(I_F)$

Chromaticity Coordinate Shift

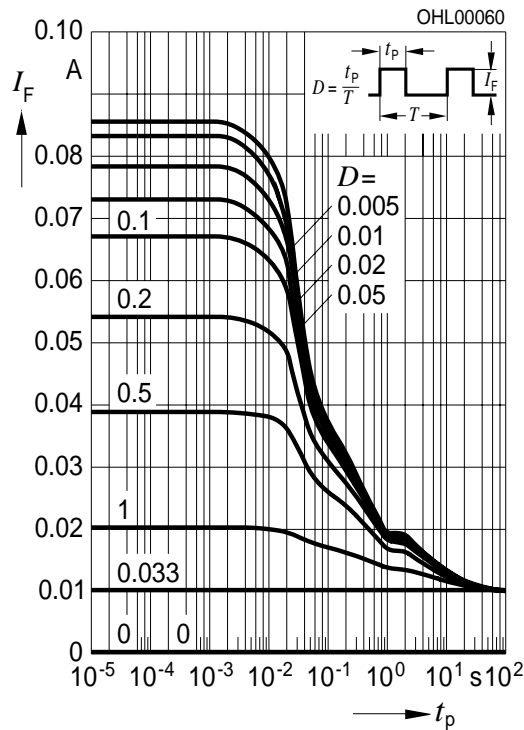
$T_A = 25\text{ °C}$



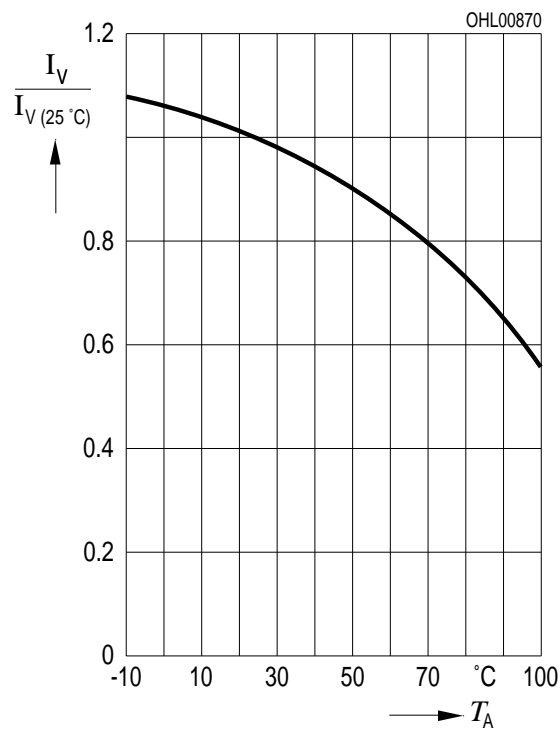
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle $D = \text{parameter}$, $T_A = 25\text{ °C}$



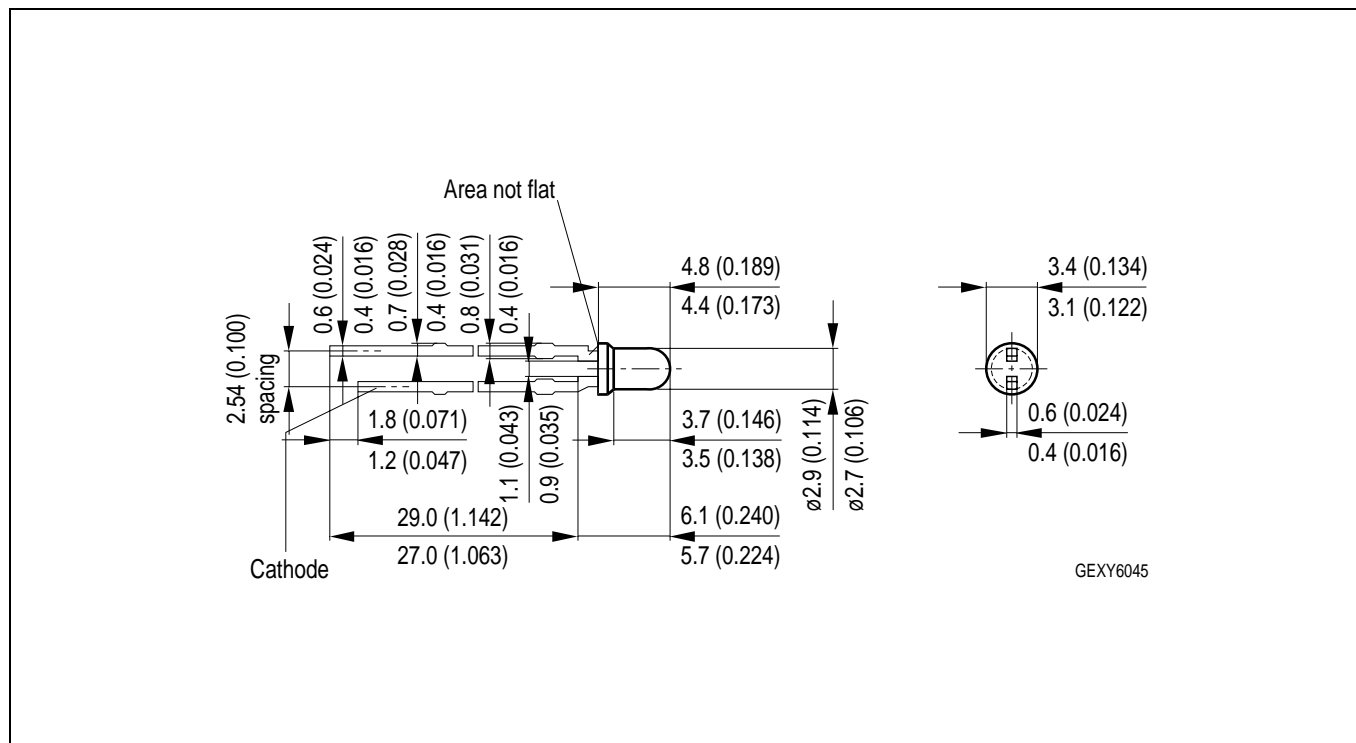
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle $D = \text{parameter}$, $T_A = 85\text{ °C}$



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



Maßzeichnung Package Outlines

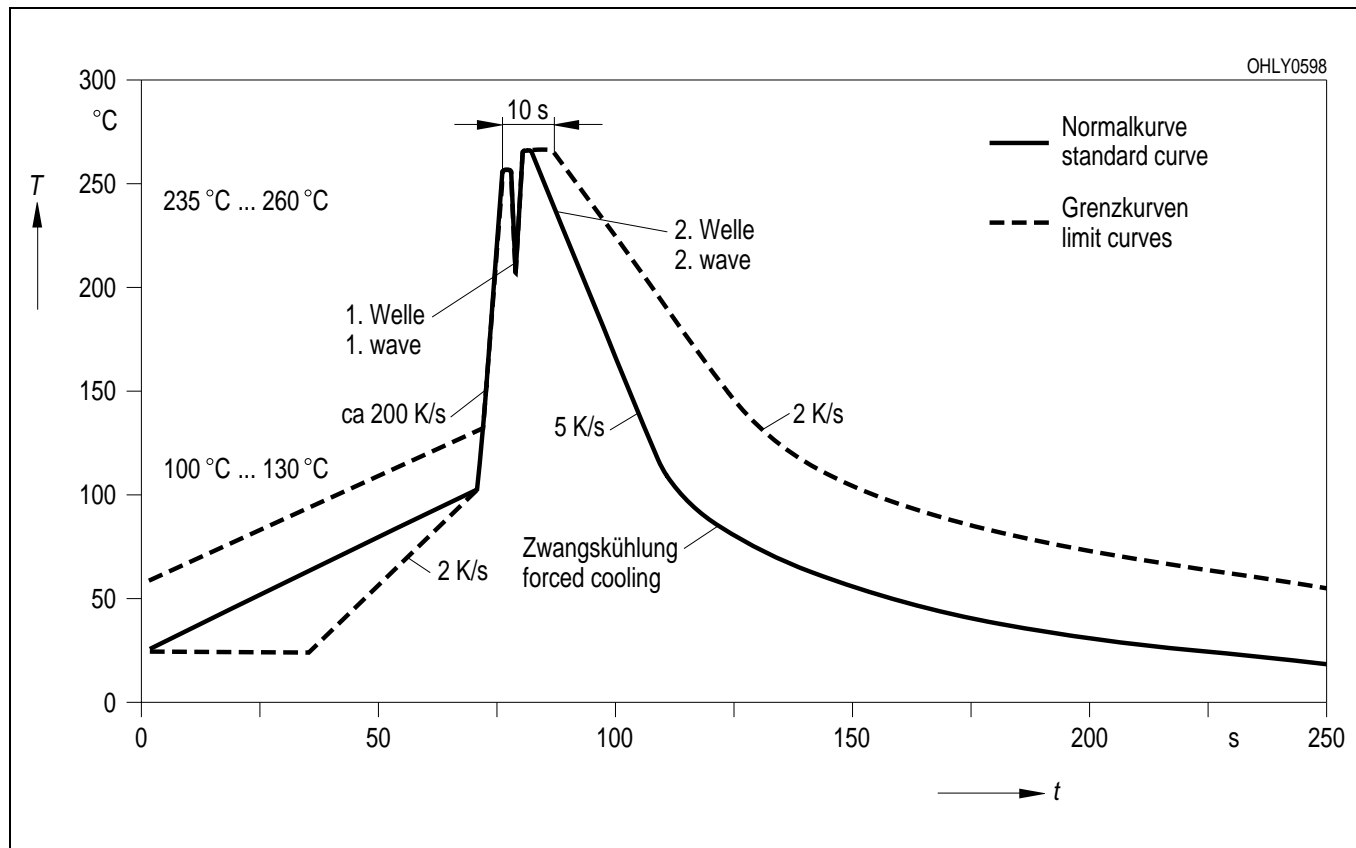


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

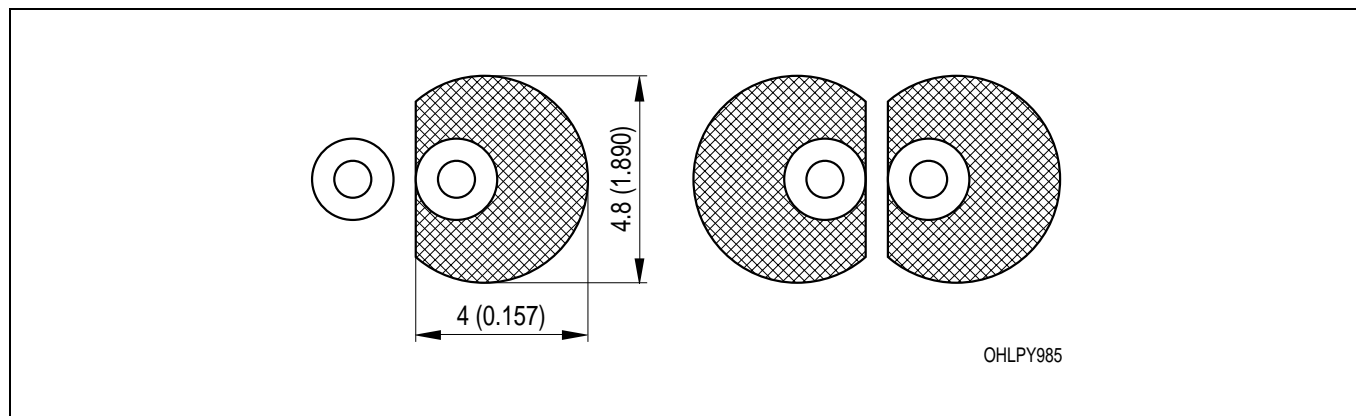
Kathodenkennung: kürzerer Lötspieß
Cathode mark: short solder lead
Gewicht / Approx. weight: 0.15 g

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: 2001-10-02

Previous Version: 2001-03-01

| Page | Subjects (major changes since last revision) |
|------|--|
| 3 | thermal resistance (footnote) |
| 4 | value (forward voltage) |

Patent List

Patent No.

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