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

LW 3333

Besondere Merkmale

- **Gehäusetyp:** 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

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

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)

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 Type	Emissions-farbe Color of Emission	Gehäusefarbe Color of Package	Lichtstärke Luminous Intensity I_F = 20 mA I_V (mcd)	Lichtstrom Luminous Flux I_F = 20 mA Φ_V (mlm)	Bestellnummer Ordering Code
LW 3333-S2T2-35 LW 3333-T2V1-35	white	colorless clear	224 ... 450 355 ... 900	390 (typ.) 630 (typ.)	Q62703Q5704 Q62703Q5705

*Anm.: -35 Farbselektiert nach Farbortgruppen (siehe **Seite 5**)*

Die Standardlieferform von Serientypen beinhaltet eine untere bzw. eine obere Familiengruppe, die aus nur 3 bzw. 4 Halbgruppen besteht. Einzelne Halbgruppen sind nicht erhältlich.

In einer Verpackungseinheit / Gurt ist immer nur eine Halbgruppe enthalten.

Die technologiebedingte Helligkeits-Streuung der heutigen LED-Herstellprozesse über einen längeren Fertigungszeitraum (Halbleitermaterial - Chipherstellung - Montageprozess) erlaubt keine Zusage einer einzelnen Helligkeitsgruppe.

*Note: -35 Color selection acc. to Chromaticity coordinate groups (see **page 5**)*

The standard shipping format for serial types includes a lower or upper family group of 3 or 4 individual groups. Individual half groups are not available.

No packing unit / tape ever contains more than one luminous intensity half 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.

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 $t \leq 10$ µs, $D = 0.005$	I_{FM}	200	mA
Sperrspannung[1)] Reverse voltage	V_R	5	V
Leistungsaufnahme Power consumption $T_A \leq 25$ °C	P_{tot}	80	mW
Wärmewiderstand [2)] Thermal resistance Sperrschicht/Umgebung Junction/ambient Sperrschicht/Lötpad Junction/solder point Montage auf PC-Board FR 4 (Padgröße ≥ 16 mm²) mounted on PC board FR 4 (pad size ≥ 16 mm²) 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.

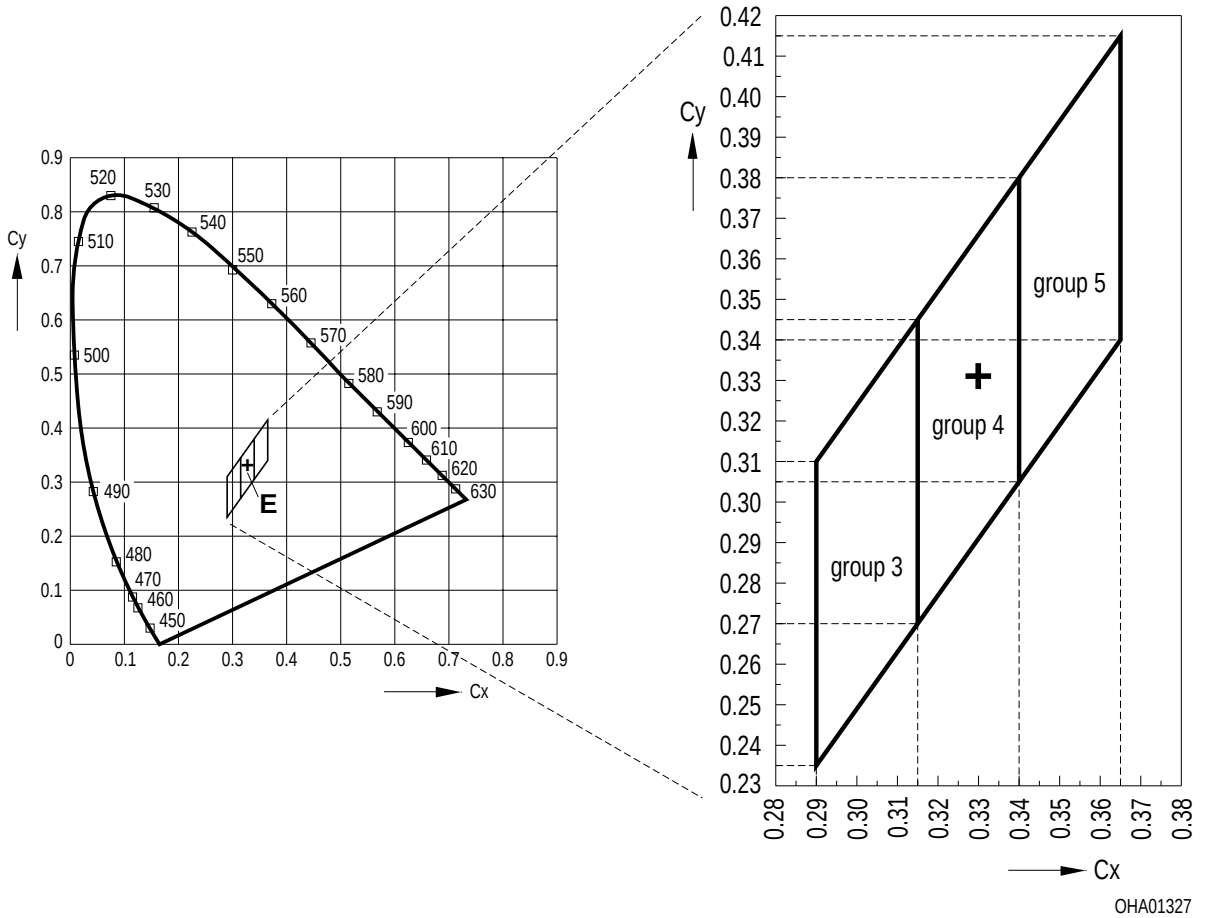
Kennwerte (T_A = 25 °C)
Characteristics

Bezeichnung **Parameter**		**Symbol** **Symbol**	**Werte** **Values**	**Einheit** **Unit**
Farbkoordinate x nach CIE 1931 [1] Chromaticity coordinate x acc. to CIE 1931 I_F = 20 mA		x	0.32	–
Farbkoordinate y nach CIE 1931 [1] Chromaticity coordinate y acc. to CIE 1931 I_F = 20 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 mA	(min.) (typ.) (max.)	V_F V_F V_F	2.9 3.5 3.9	V V V
Sperrstrom Reverse current V_R = 5 V	(typ.) (max.)	I_R I_R	0.01 10	µA µA
Temperaturkoeffizient von x Temperature coefficient of x I_F = 20 mA; –10°C ≤ T ≤ 100°C		TC_X	–0.1	10^{-3}/K
Temperaturkoeffizient von y Temperature coefficient of y I_F = 20 mA; –10°C ≤ T ≤ 100°C		TC_Y	–0.2	10^{-3}/K
Temperaturkoeffizient von V_F Temperature coefficient of V_F I_F = 20 mA; –10°C ≤ T ≤ 100°C		TC_V	–4.5	mV/K
Optischer Wirkungsgrad Optical efficiency I_F = 20 mA	(typ.)	η_{opt}	6	lm/W

[1] Farbortgruppen werden mit einer Stromeinprägedauer von 25 ms und einer Genauigkeit von ±0,01 ermittelt.
Chromaticity coordinate groups are tested at a current pulse duration of 25 ms and a tolerance of ±0.01.

[2] Durchlassspannungswerte werden mit einer Stromeinprägedauer von 1 ms und einer Genauigkeit von ±0,1 V ermittelt.
Forward voltage values are tested at a current pulse duration of 1 ms and a tolerance of ±0.1 V.

[1] Farbortgruppen
Chromaticity coordinate groups



Helligkeits-Gruppierungsschema
Luminous Intensity Groups

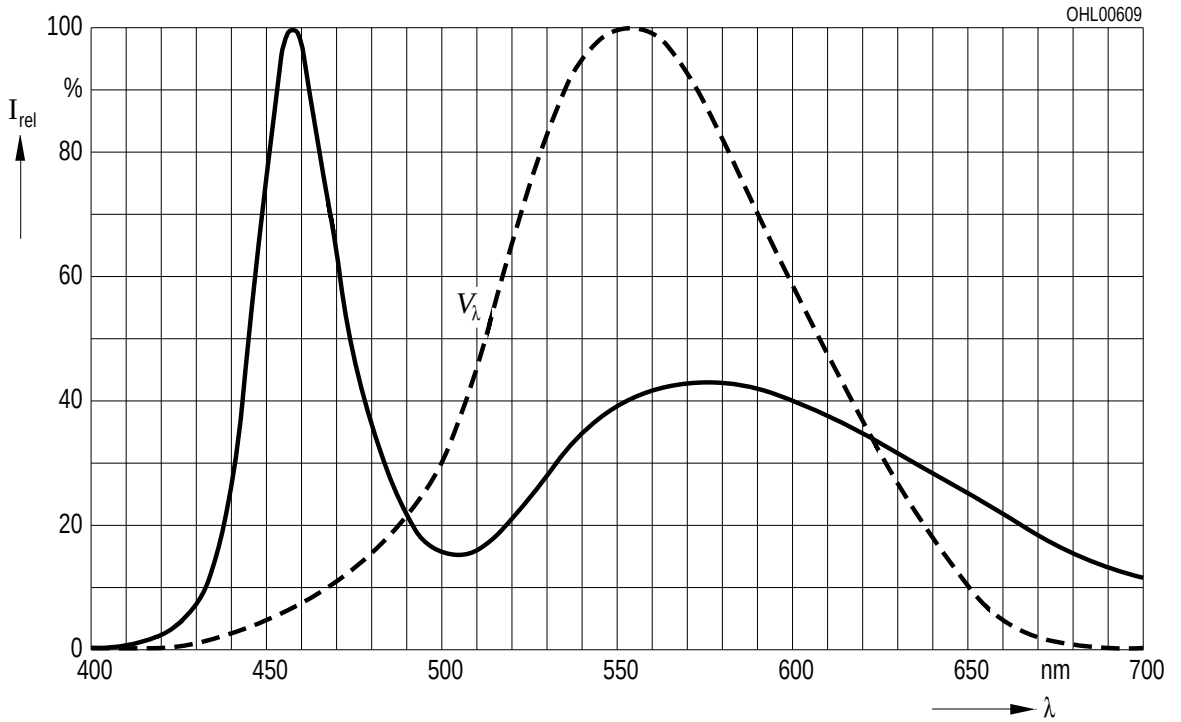
Lichtgruppe **Luminous Intensity Group**	**Lichtstärke** **Luminous Intensity** **I_V (mcd)**	**Lichtstrom** **Luminous Flux** **Φ_V (mlm)**
S2	224 ... 280	300 (typ.)
T1	280 ... 355	380 (typ.)
T2	355 ... 450	480 (typ.)
U1	450 ... 560	600 (typ.)
U2	560 ... 710	760 (typ.)
V1	710 ... 900	950 (typ.)

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

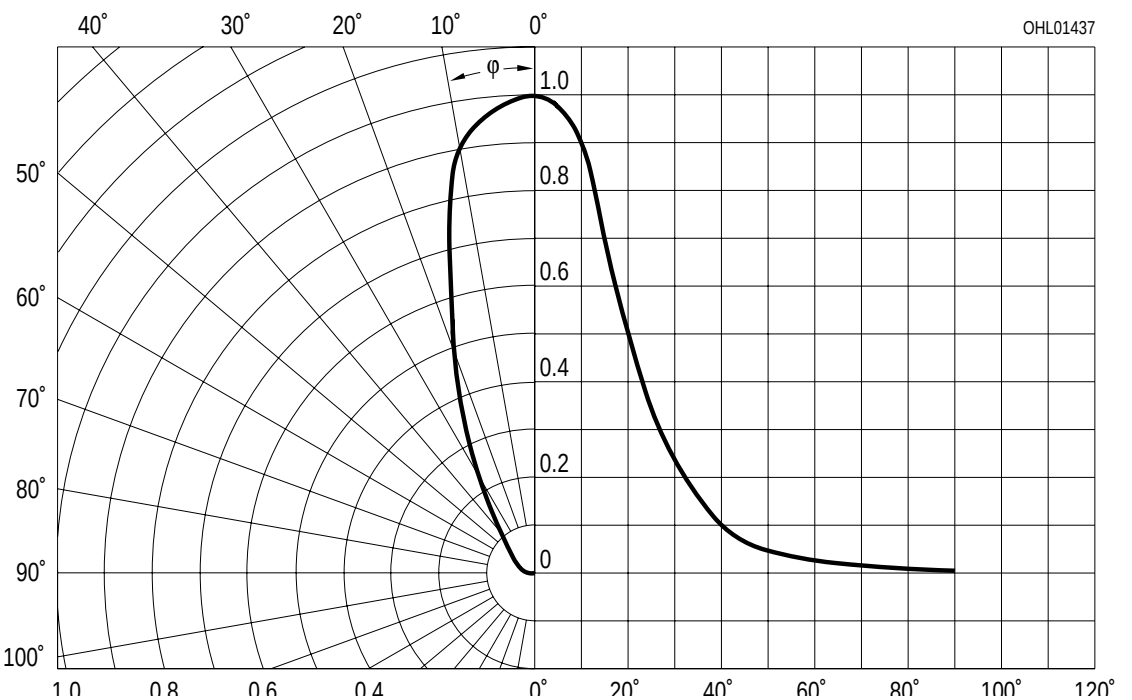
Gruppenbezeichnung auf Etikett
Group Name on Label
Beispiel: U2-3
Example: U2-3

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

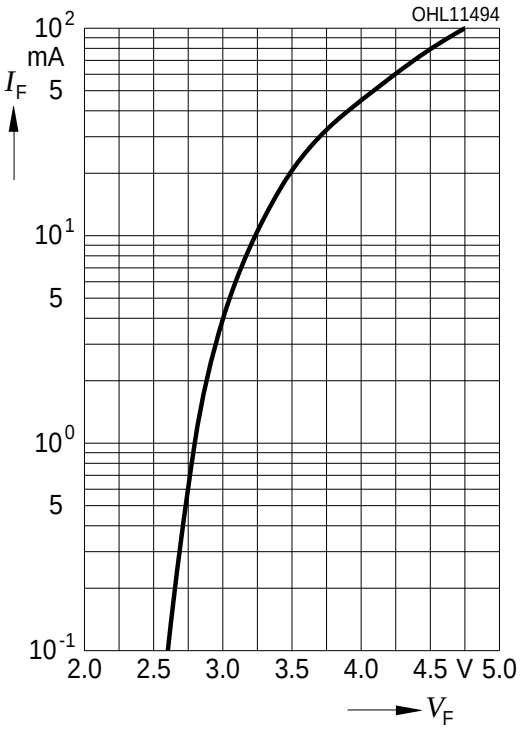
Relative spektrale Emission $I_{rel} = f(\lambda)$, T_A = 25 °C, I_F = 20 mA
Relative Spectral Emission
V(λ) = spektrale Augenempfindlichkeit
Standard eye response curve



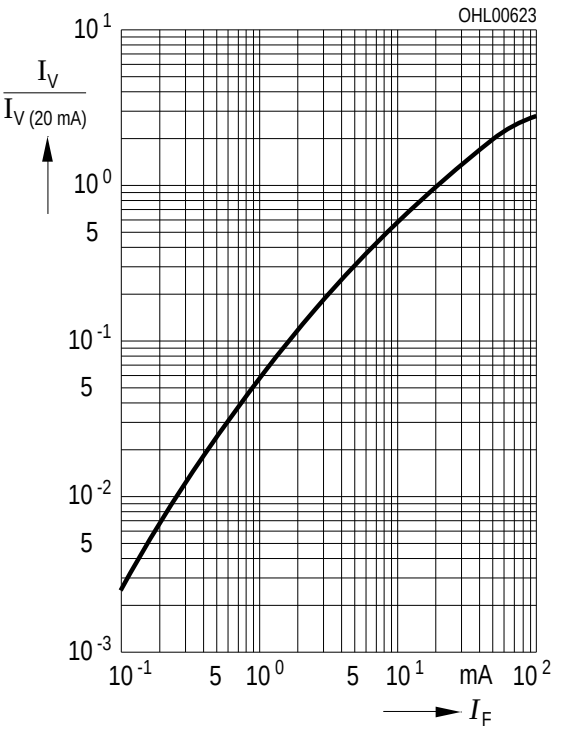
Abstrahlcharakteristik $I_{rel} = f(\varphi)$
Radiation Characteristic



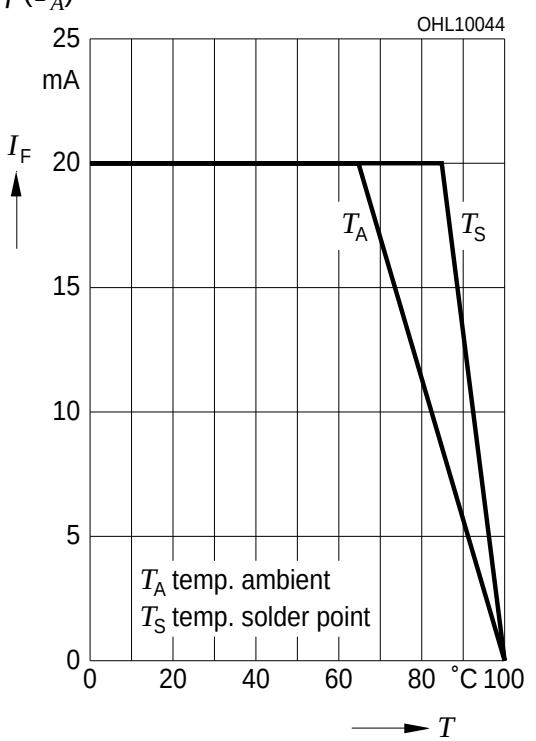
Durchlassstrom $I_F = f(V_F)$
Forward Current
T_A = 25 °C



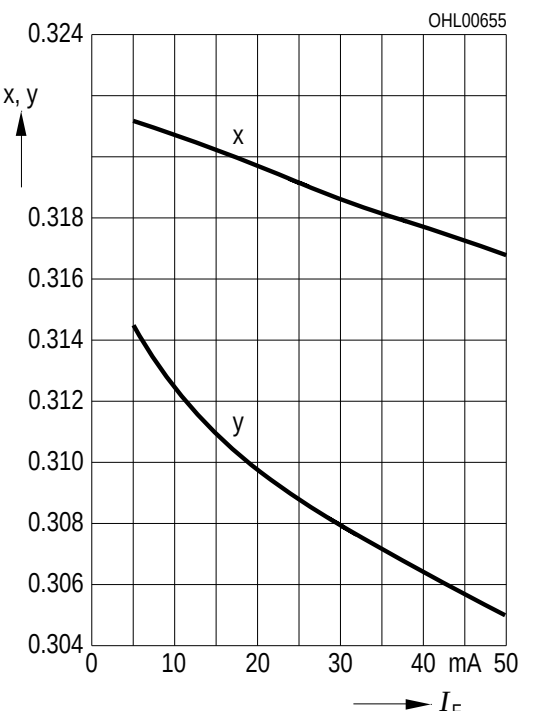
Relative Lichtstärke $I_V/I_{V(20\ mA)} = f(I_F)$
Relative Luminous Intensity
T_A = 25 °C



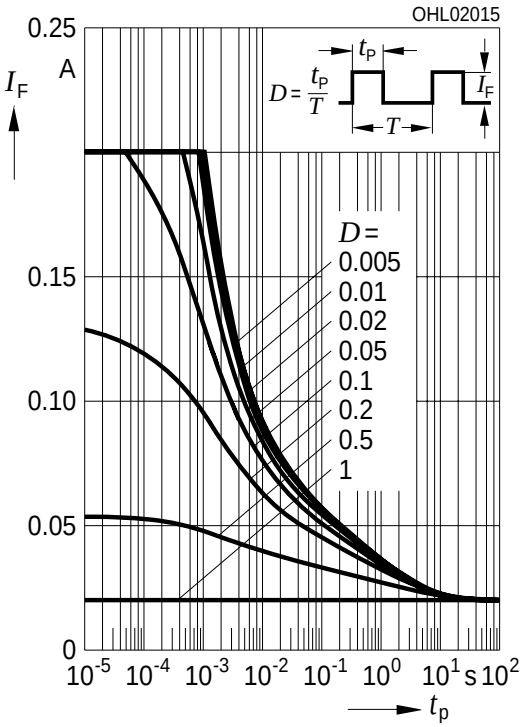
Maximal zulässiger Durchlassstrom
Max. Permissible Forward Current
$I_F = f(T_A)$



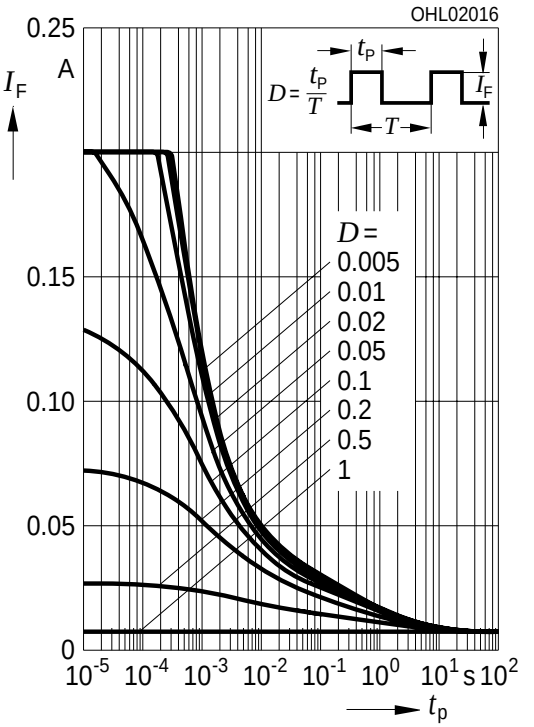
Farbortverschiebung x, y = $f(I_F)$
Chromaticity Coordinate Shift
T_A = 25 °C



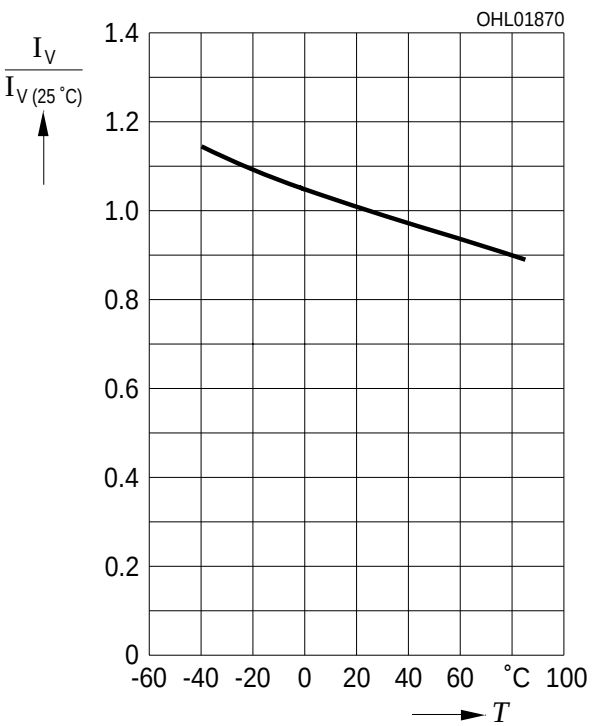
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle D = parameter, T_A= 25 °C



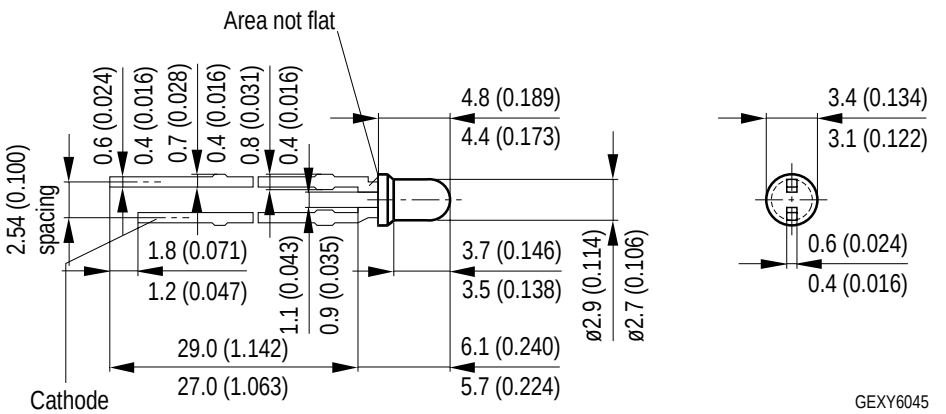
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle D = parameter, T_A= 85 °C



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



Maßzeichnung
Package Outlines

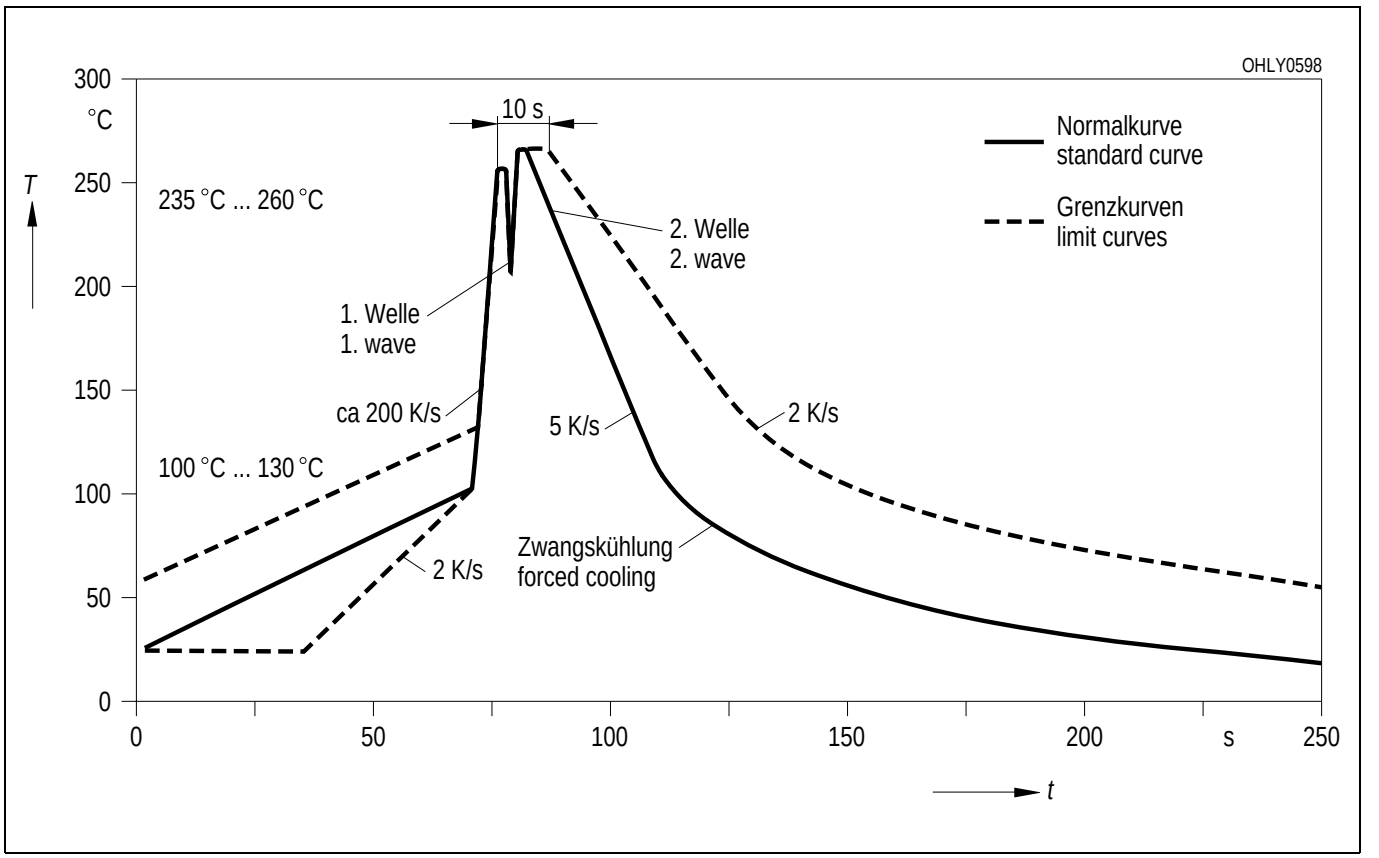


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

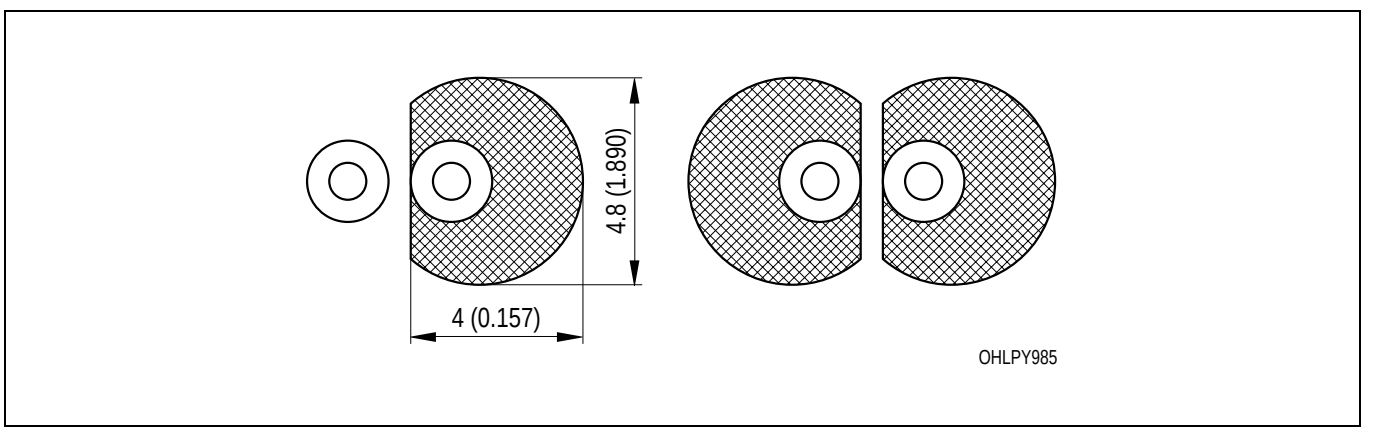
Kathodenkennung: kürzerer Lötspieß
Cathode mark: short solder lead
Gewicht / Approx. weight: 0.15 g

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: 2003-06-30		**Date of change**
Previous Version: 2003-06-02		
Page	**Subjects (major changes since last revision)**	
3	thermal resistance (footnote)	
4	value (forward voltage)	
3	power consumption from 85 mW to 80 mW	
9	diagram luminous intensity OHL00870 to OHL01870	
1	datasheet status changed form preliminary to released	
12	annotations	2002-07-25
9	diagram pulse handling (85°C) OHL00060 to OHL00813	2002-08-12
9	diagram pulse handling (25°C) OHL00064 to OHL11405	2002-08-13
3	reverse voltage (footnote)	2002-08-21
2	wavelength grouping	2002-09-16
12	new patent no.	2003-03-04
all	PCN data sheet	2003-06-02
7	new diagram permissible forward current	2003-06-02
9	new diagrams pulse derating	2003-06-30

Patent List

Patent No.
US 6 066 861, US 6 277 301, US 6 245 259

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