Hyper 3 mm (T1) LED, Diffused
Hyper-Bright Low Current LED

LS 336K, LY 336K

Vorläufige Daten / Preliminary Data

Besondere Merkmale

- **Gehäusetyp:** eingefärbtes, diffuses 3 mm (T1) Gehäuse
- **Besonderheit des Bauteils:** hohe Lichtstärke bei kleinen Strömen; Lötspieße mit Aufsetzebene
- **Wellenlänge:** 630 nm (super-rot), 587 nm (gelb)
- **Abstrahlwinkel:** 60°
- **Technologie:** InGaAlP
- **optischer Wirkungsgrad:** 6 lm/W (gelb) 5 lm/W (super-rot)
- **Gruppierungsparameter:** Lichtstärke / Wellenlänge
- **Lötmethode:** Wellenlöten (TTW)
- **Verpackung:** Schüttgut, gegurtet lieferbar
- **ESD-Festigkeit:** ESD-sicher bis 2 kV nach EOS/ESD-5.1-1993

Features

- **package:** colored, diffused 3 mm (T1) package
- **feature of the device:** high luminous intensity at low currents; solder leads with stand-off
- **wavelength:** 630 nm (super-red), 587 nm (yellow)
- **viewing angle:** 60°
- **technology:** InGaAlP
- **optical efficiency:** 6 lm/W (yellow) 5 lm/W (super-red)
- **grouping parameter:** luminous intensity / wavelength
- **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

- optischer Indikator
- Hinterleuchtung (LCD, Schalter, Tasten, Displays, Werbebeleuchtung, Allgemeinbeleuchtung)
- Innenbeleuchtung im Automobilbereich (z.B. Instrumentenbeleuchtung, u.ä.)

Applications

- optical indicators
- backlighting (LCD, switches, keys, displays, illuminated advertising, general lighting)
- interior automotive lighting (e.g. dashboard backlighting, etc.)

Typ Type	Emissions-farbe Color of Emission	Farbe der Lichtaustritts-fläche Color of the Light Emitting Area	Lichtstärke Luminous Intensity I_F = 2 mA I_V (mcd)	Lichtstrom Luminous Flux I_F = 2 mA Φ_V (mlm)	Bestellnummer Ordering Code
LS 336K-J2K2-1 LS 336K-K2M1-1	super-red	red diffused	5.6 ... 11.2 9.0 ... 22.4	15 (typ.) 30 (typ.	on request on request
LY 336K-J2K2-26 LY 336K-K2M1-26	yellow	yellow diffused	5.6 ... 11.2 9.0 ... 22.4	15 (typ.) 30 (typ.)	on request on request

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!

Vergleichstabelle für 10 mA
Correllation Table for 10 mA

Typ Type I_F = 2 mA	Emissions-farbe Color of Emission	Lichtstärke Luminous Intensity I_F = 2 mA I_V (mcd)		Lichtstärke Luminous Intensity I_F = 10 mA I_V (mcd)	Lichtstrom Luminous Flux I_F = 10 mA Φ_V (mlm)
LS 336K-J1K1-1 LS 336K-K1L2-1	super-red	4.5 ... 9.0 7.1 ... 18.0	 ⇒	35 (typ.) 60 (typ.)	70 (typ.) 120 (typ.
LY 336K-J2K2-26 LY 336K-K2M1-26	yellow	5.6 ... 11.2 9.0 ... 22.4	 ⇒	40 (typ.) 75 (typ.)	80 (typ.) 150 (typ.)

*Siehe auch Grafik auch **Seite 7** / Please see also graph on **page 7***

Grenzwerte
Maximum Ratings

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
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	15	mA
Stoßstrom Surge current $t \leq 10$ µs, $D = 0.005$	I_{FM}	100	mA
Sperrspannung[1)] Reverse voltage	V_R	12	V
Leistungsaufnahme Power consumption $T_A \leq 25$ °C	P_{tot}	40	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	 $R_{th\ JA}$ $R_{th\ JS}$	 450 230	 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**
			LS	**LY**	
Wellenlänge des emittierten Lichtes Wavelength at peak emission I_F = 2 mA	(typ.)	λ_{peak}	643	591	nm
Dominantwellenlänge [1] Dominant wavelength I_F = 2 mA	(typ.)	λ_{dom}	630 ± 6	587 –7/+8	nm
Spektrale Bandbreite bei 50 % $I_{rel\ max}$ Spectral bandwidth at 50 % $I_{rel\ max}$ I_F = 2 mA	(typ.)	$\Delta\lambda$	16	15	nm
Abstrahlwinkel bei 50 % I_V (Vollwinkel) Viewing angle at 50 % I_V	(typ.)	2φ	60	60	Grad deg.
Durchlassspannung [2] Forward voltage I_F = 2 mA	(typ.) (max.)	V_F V_F	1.8 2.2	1.8 2.2	V V
Sperrstrom Reverse current V_R = 12 V	(typ.) (max.)	I_R I_R	0.01 10	0.01 10	µA µA
Temperaturkoeffizient von λ_{peak} Temperature coefficient of λ_{peak} I_F = 2 mA; –10°C ≤ T ≤ 100°C	(typ.)	$TC_{\lambda peak}$	0.14	0.12	nm/K
Temperaturkoeffizient von λ_{dom} Temperature coefficient of λ_{dom} I_F = 2 mA; –10°C ≤ T ≤ 100°C	(typ.)	$TC_{\lambda dom}$	0.05	0.09	nm/K
Temperaturkoeffizient von V_F Temperature coefficient of V_F I_F = 2 mA; –10°C ≤ T ≤ 100°C	(typ.)	TC_V	– 1.8	– 2.1	mV/K
Optischer Wirkungsgrad Optical efficiency I_F = 2 mA	(typ.)	η_{opt}	5	6	lm/W

[1] Wellenlängen werden mit einer Stromeinprägedauer von 25 ms und einer Genauigkeit von ±1 nm ermittelt.
Wavelengths are tested at a current pulse duration of 25 ms and a toleranceof ±1 nm.

[2] 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.

[1] Wellenlängengruppen
Wavelength groups

Gruppe Group	yellow		Einheit Unit
	min.	max.	
2	580	583	nm
3	583	586	nm
4	586	589	nm
5	589	592	nm
6	592	595	nm

Helligkeits-Gruppierungsschema
Luminous Intensity Groups

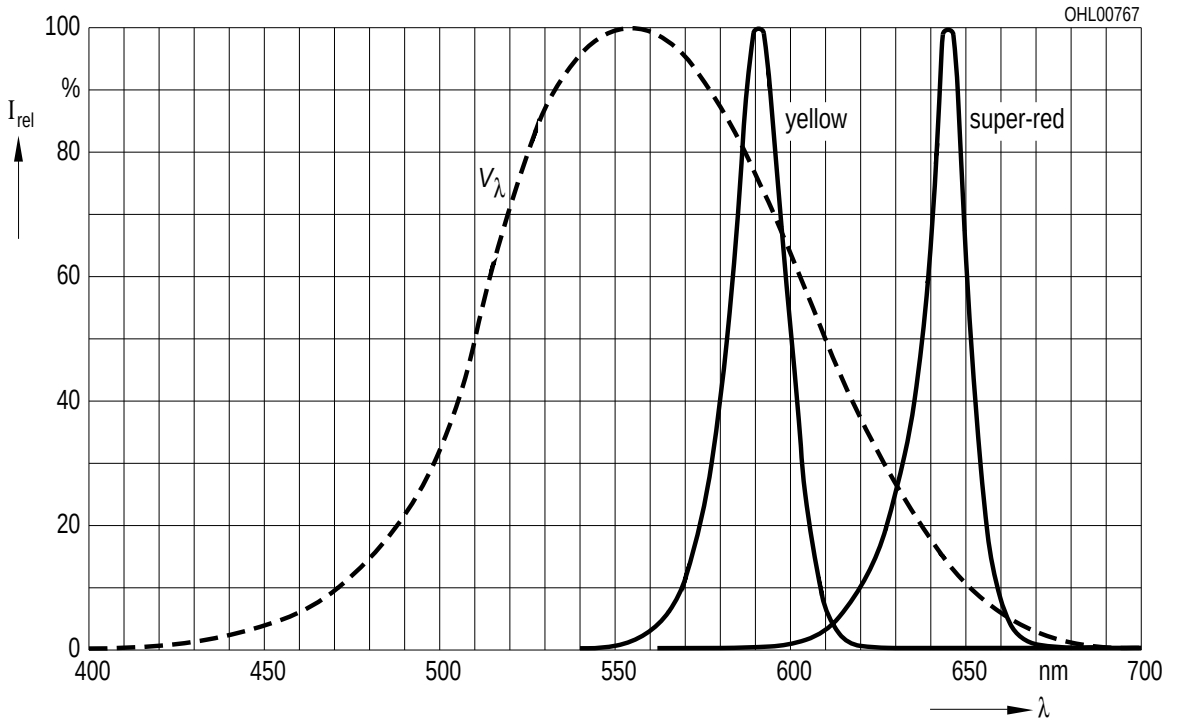
Lichtgruppe Luminous Intensity Group	Lichtstärke Luminous Intensity I_V (mcd)	Lichtstrom Luminous Flux Φ_V (mlm)
J1	4.50 … 5.60	10 (typ.)
J2	5.60 … 7.10	12 (typ.)
K1	7.10 … 9.00	16 (typ.)
K2	9.00 …11.20	20 (typ.)
L1	11.20 …14.00	25 (typ.)
L2	14.00 …18.00	32 (typ.)
M1	18.00 …22.40	40 (typ.)

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%.

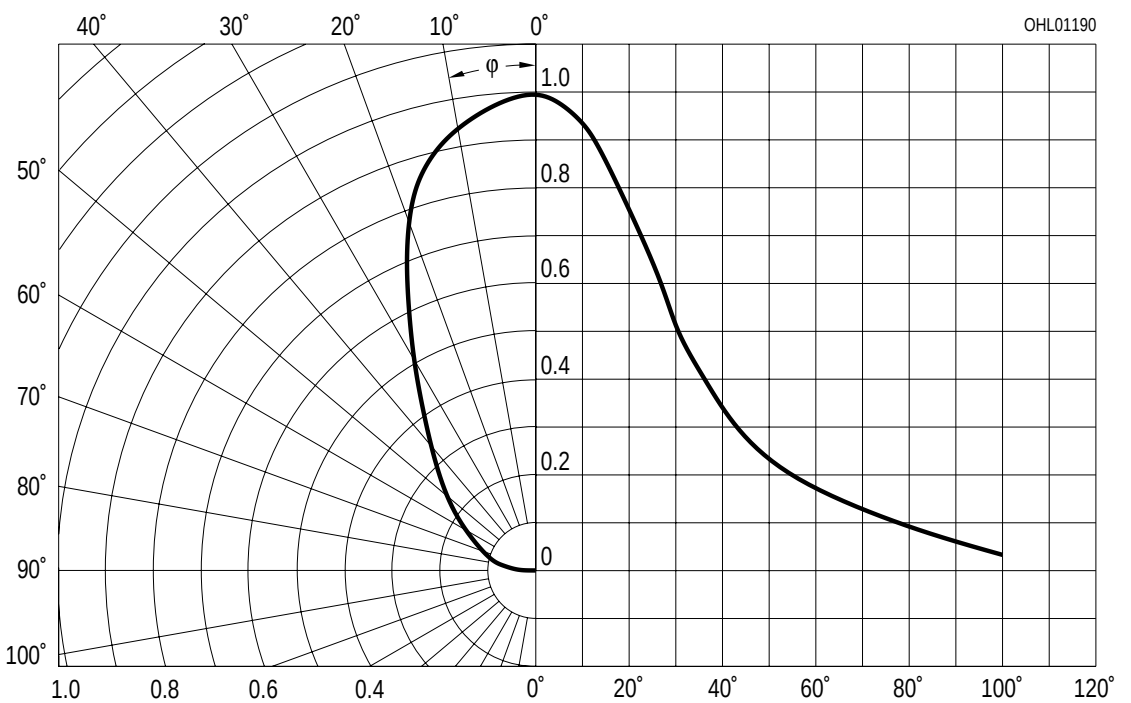
Gruppenbezeichnung auf Etikett
Group Name on Label
Beispiel: K2-3
Example: K2-3

Lichtgruppe Luminous Intensity Group	Halbgruppe Half Group	Wellenlänge Wavelength
K	2	3

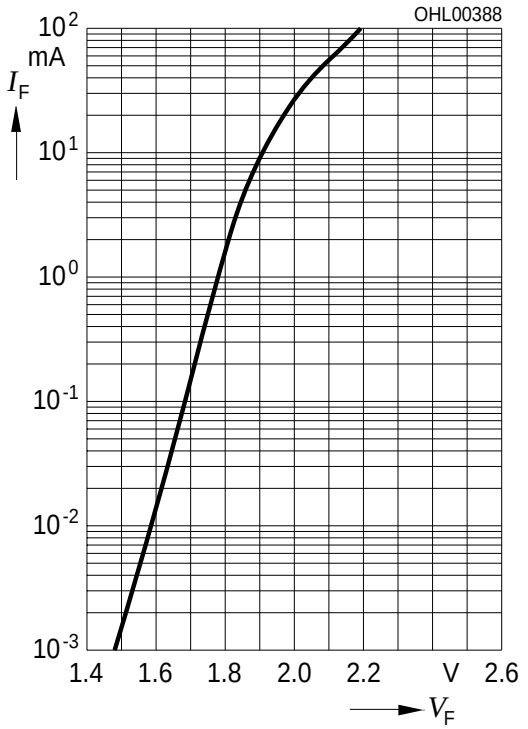
Relative spektrale Emission $I_{rel} = f(\lambda)$, T_A = 25 °C, I_F = 2 mA
Relative Spectral Emission
V(λ) = spektrale Augenempfindlichkeit
Standard eye response curve



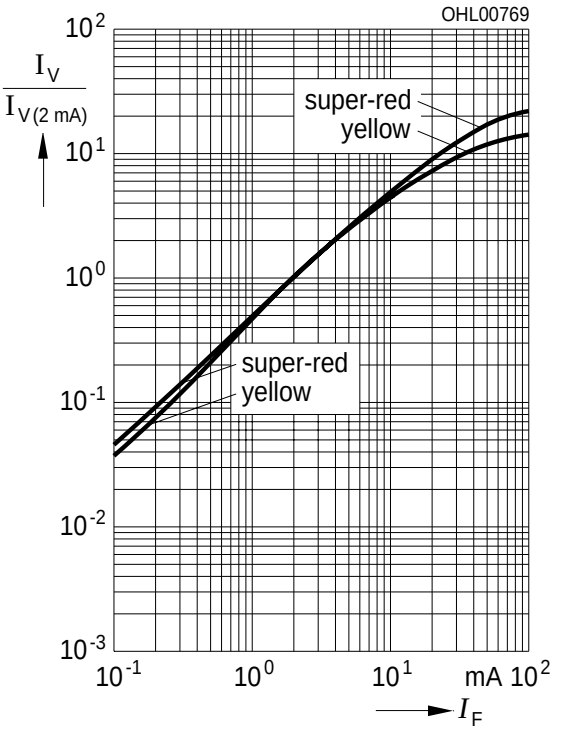
Abstrahlcharakteristik $I_{rel} = f(\varphi)$
Radiation Characteristic



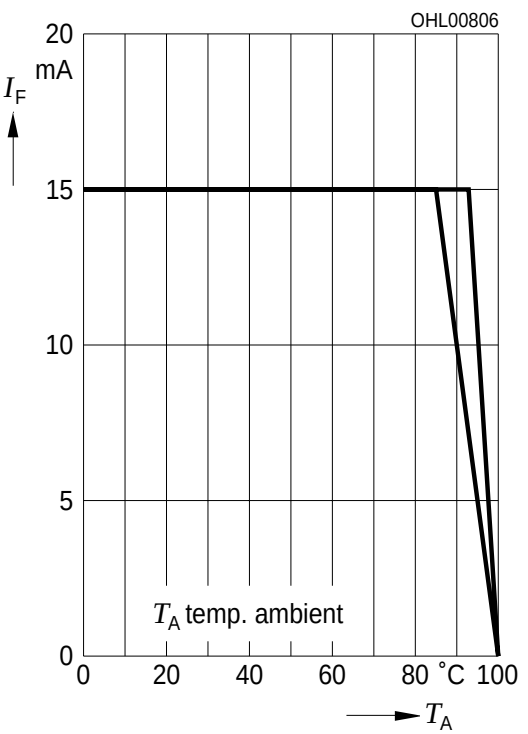
Durchlassstrom $I_F = f(V_F)$
Forward Current
T_A = 25 °C



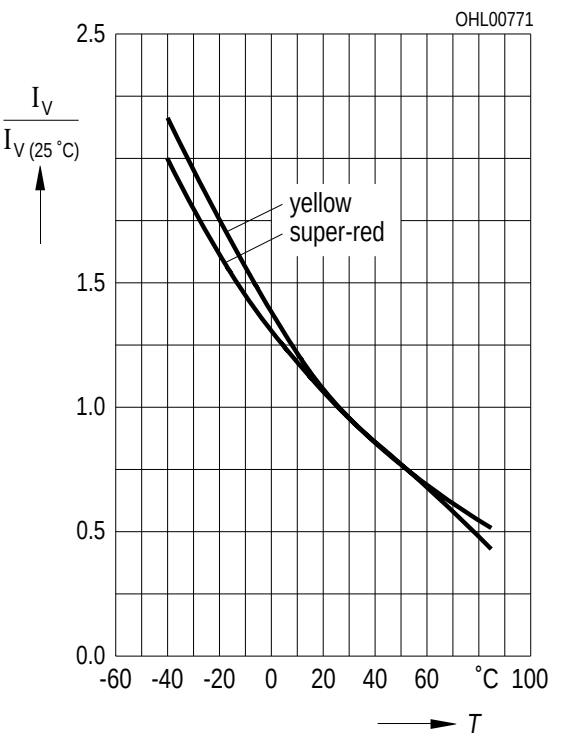
Relative Lichtstärke $I_V/I_{V(2\ mA)} = f(I_F)$
Relative Luminous Intensity
T_A = 25 °C



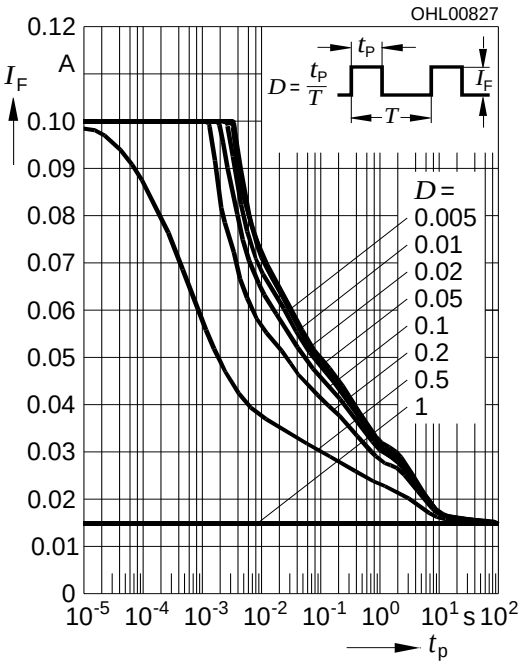
Maximal zulässiger Durchlassstrom $I_F = f(T)$
Max. Permissible Forward Current



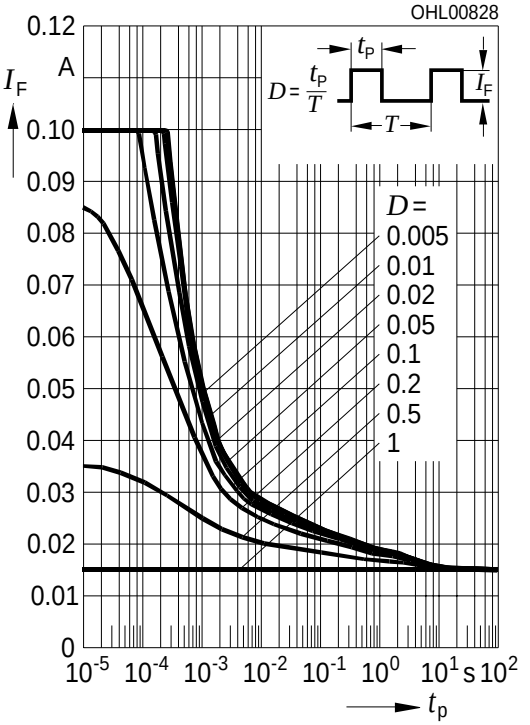
Relative Lichtstärke $I_V/I_{V(25\ °C)} = f(T_A)$
Relative Luminous Intensity
I_F = 2 mA



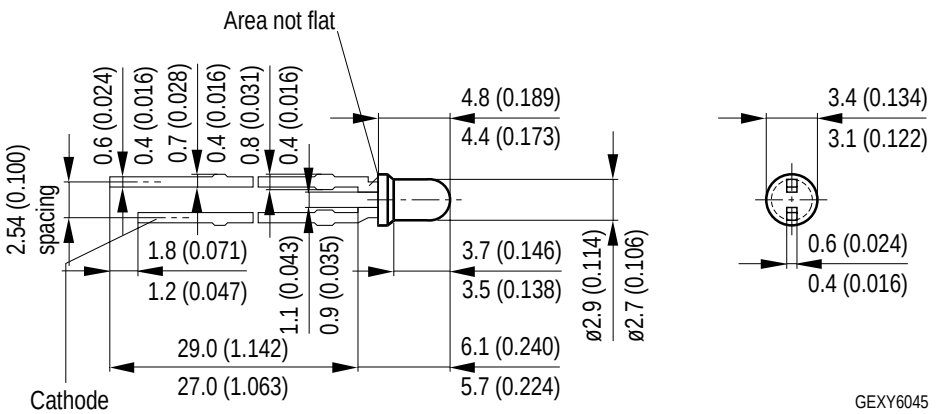
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle D = parameter, T_A = 25 °C



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



Maßzeichnung
Package Outlines

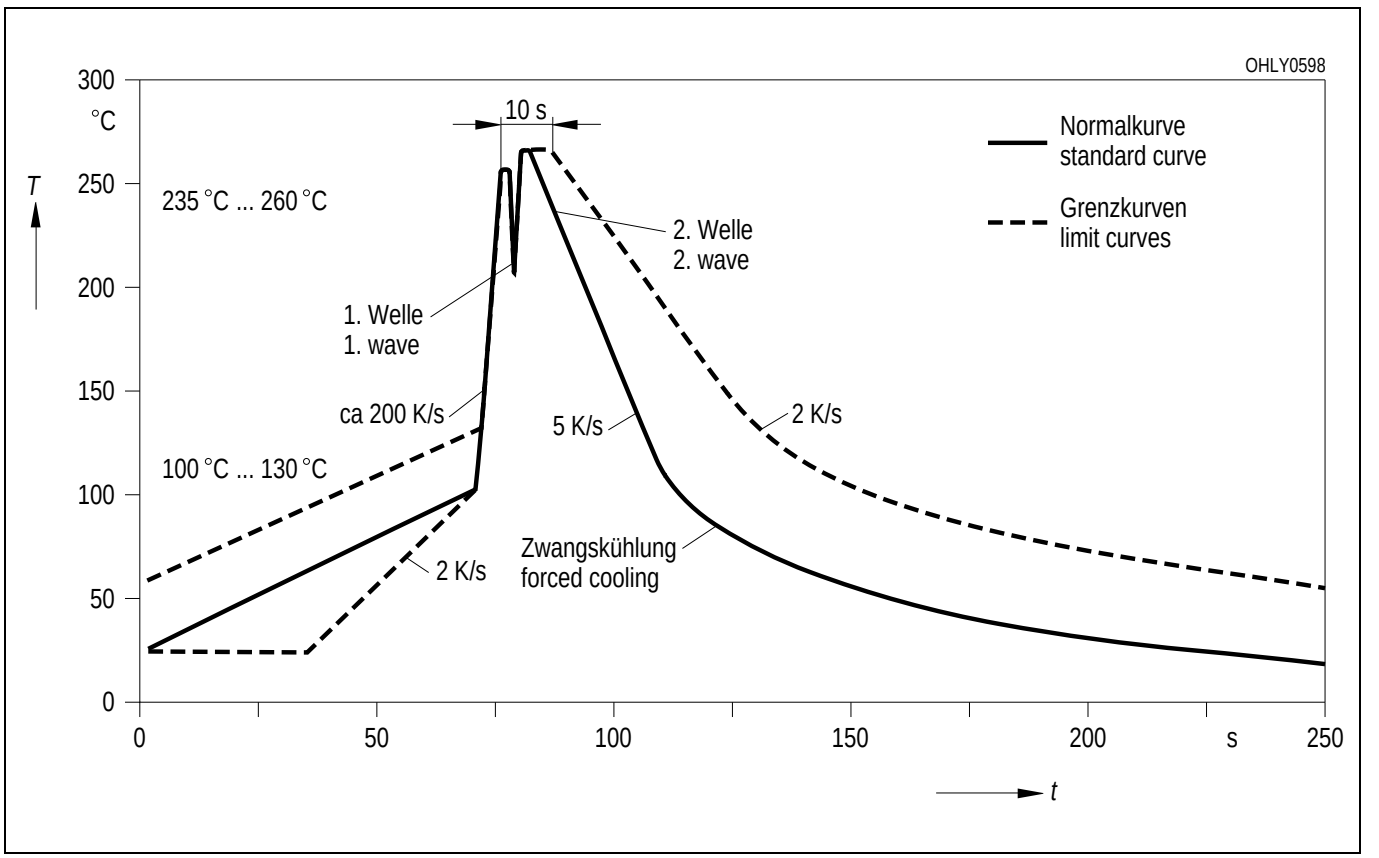


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

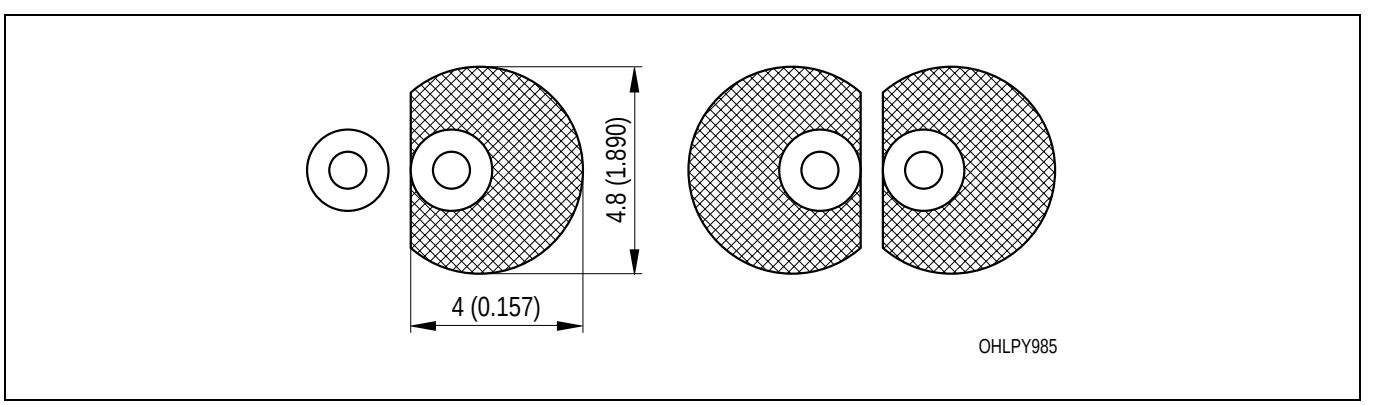
Kathodenkennung: kürzerer Lötspieß
Cathode mark: short solder lead
Gewicht / Approx. weight: 0.15 g

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: 2003-04-28		Date of change
Previous Version: 2002-09-18		
Page	**Subjects (major changes since last revision)**	
11	annotations	2002-07-25
1	ESD-withstand voltage	2002-08-01
8	Permissible Pulse Handling Capability	2002-08-21
3, 4	value (reverse voltage from 5 V to 12 V)	2002-09-18
7	Max. Permissible Forward Current	2002-09-17
2	luminous intensity groups	2003-04-28

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The information describes the type of component and shall not be considered as assured characteristics.
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Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office. By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.
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[2] Life support devices or systems are intended (a) to be implanted in the human body, or (b) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health of the user may be endangered.