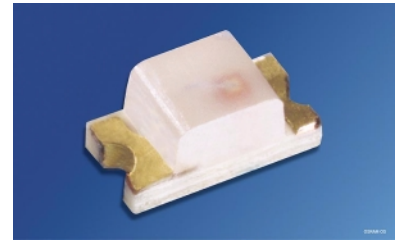


Hyper CHIPLED Hyper-Bright LED

LS Q976, LO Q976, LY Q976



Besondere Merkmale

- **Gehäusotyp:** 0603
- **Besonderheit des Bauteils:** kleinste Bauform 1,6 mm x 0,8 mm x 0,8 mm
- **Wellenlänge:** 633 nm (super-rot), 605 nm (orange), 587 nm (gelb)
- **Abstrahlwinkel:** extrem breite Abstrahlcharakteristik (160°)
- **Technologie:** InGaAlP
- **optischer Wirkungsgrad:** 7 lm/W (super-rot), 11 lm/W (orange, gelb)
- **Verarbeitungsmethode:** für alle SMT-Bestücktechniken geeignet
- **Lötmethode:** IR Reflow Löten
- **Vorbehandlung:** nach JEDEC Level 2
- **Gurtung:** 8 mm Gurt mit 4000/Rolle, ø180 mm

Anwendungen

- Informationsanzeigen im Außenbereich
- Flache Hinterleuchtung (LCD, Handy, Schalter, Display)
- Signal- und Symbolleuchten
- Markierungsbeleuchtung (z.B. Stufen, Fluchtwege, u.ä.)

Features

- **package:** 0603
- **feature of the device:** smallest package 1.6 mm x 0.8 mm x 0.8 mm
- **wavelength:** 633 nm (super-red), 605 nm (orange), 587 nm (yellow)
- **viewing angle:** extremely wide (160°)
- **technology:** InGaAlP
- **optical efficiency:** 7 lm/W (super-red), 11 lm/W (orange, yellow)
- **assembly methods:** suitable for all SMT assembly methods
- **soldering methods:** IR reflow soldering
- **preconditioning:** acc. to JEDEC Level 2
- **taping:** 8 mm tape with 4000/reel, ø180

Applications

- outdoor displays
- flat backlighting (LCD, cellular phones, switches, displays)
- signal and symbol luminaire
- marker lights (e.g. steps, exit ways, etc.)

Typ	Emissionsfarbe	Farbe der Lichtaustrittsfläche	Lichtstärke		Bestellnummer
Type	Color of Emission	Color of the Light Emitting Area	Luminous Intensity $I_F = 20 \text{ mA}$ $I_V \text{ (mcd)}$		Ordering Code
			min.	typ.	
LS Q976	super-red	colorless diffused	18	50	Q62702P5187
LO Q976	orange	colorless diffused	28	70	Q62702P5188
LY Q976	yellow	colorless diffused	28	60	Q62702P5276

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 $\pm 11\%$.

*Anm.: gesamter Farbbereich, Lieferung in Einzelgruppen (siehe **Seite 5**)*

Die Standardlieferform von Serientypen beinhaltet alle Gruppen. Einzelne Gruppen sind nicht erhältlich.

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

*Note: Total color tolerance range, delivery in single groups (please see **page 5**)*

The standard shipping format for serial types includes all groups. Individual groups are not available.

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

Grenzwerte
Maximum Ratings

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Betriebstemperatur Operating temperature range	T_{op}	– 30 ... + 85	°C
Lagertemperatur Storage temperature range	T_{stg}	– 40 ... + 85	°C
Sperrschichttemperatur Junction temperature	T_j	+ 95	°C
Durchlassstrom Forward current	I_F	25	mA
Stoßstrom Surge current $t \leq 10 \mu s, D = 0.1$	I_{FM}	0.1	A
Sperrspannung ¹⁾ Reverse voltage	V_R	12	V
Leistungsaufnahme Power consumption	P_{tot}	65	mW
Wärmewiderstand Thermal resistance Sperrschicht/Umgebung Junction/ambient Sperrschicht/Lötpad Junction/solder point Montage auf PC-Board FR 4 (Padgröße $\geq 5 \text{ mm}^2$) mounted on PC board FR 4 (pad size $\geq 5 \text{ mm}^2$)	$R_{th JA}$ $R_{th JS}$	900 510	K/W K/W

¹⁾ für kurzzeitigen Betrieb geeignet / suitable for short term application

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 ¹⁾ (typ.) Dominant wavelength $I_F = 20\text{ mA}$	λ_{dom}	633 ± 6	605 ± 6	587 -7/+5	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	160	160	160	Grad deg.
Durchlassspannung ²⁾ (typ.) Forward voltage (max.) $I_F = 20\text{ mA}$	V_F V_F	2.0 2.5	2.0 2.5	2.0 2.5	V V
Sperrstrom (typ.) Reverse current (max.) $V_R = 12\text{ V}$	I_R I_R	0.01 100	0.01 100	0.01 100	μA μA
Temperaturkoeffizient von λ_{peak} (typ.) Temperature coefficient of λ_{peak} $I_F = 20\text{ mA}; -10^\circ\text{C} \leq T \leq 100^\circ\text{C}$	$TC_{\lambda_{\text{peak}}}$	0.14	0.13	0.13	nm/K
Temperaturkoeffizient von λ_{dom} (typ.) Temperature coefficient of λ_{dom} $I_F = 20\text{ mA}; -10^\circ\text{C} \leq T \leq 100^\circ\text{C}$	$TC_{\lambda_{\text{dom}}}$	0.05	0.07	0.10	nm/K
Temperaturkoeffizient von V_F (typ.) Temperature coefficient of V_F $I_F = 20\text{ mA}; -10^\circ\text{C} \leq T \leq 100^\circ\text{C}$	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⁾ Wellenlängengruppen werden mit einer Stromeinprägedauer von 25 ms und einer Genauigkeit von $\pm 1\text{ nm}$ ermittelt.
Wavelength groups are tested at a current pulse duration of 25 ms and a tolerance of $\pm 1\text{ nm}$.

²⁾ 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 $\pm 0.1\text{ V}$.

¹⁾ Wellenlängengruppen für LY Q976
Wavelength groups for LY Q976

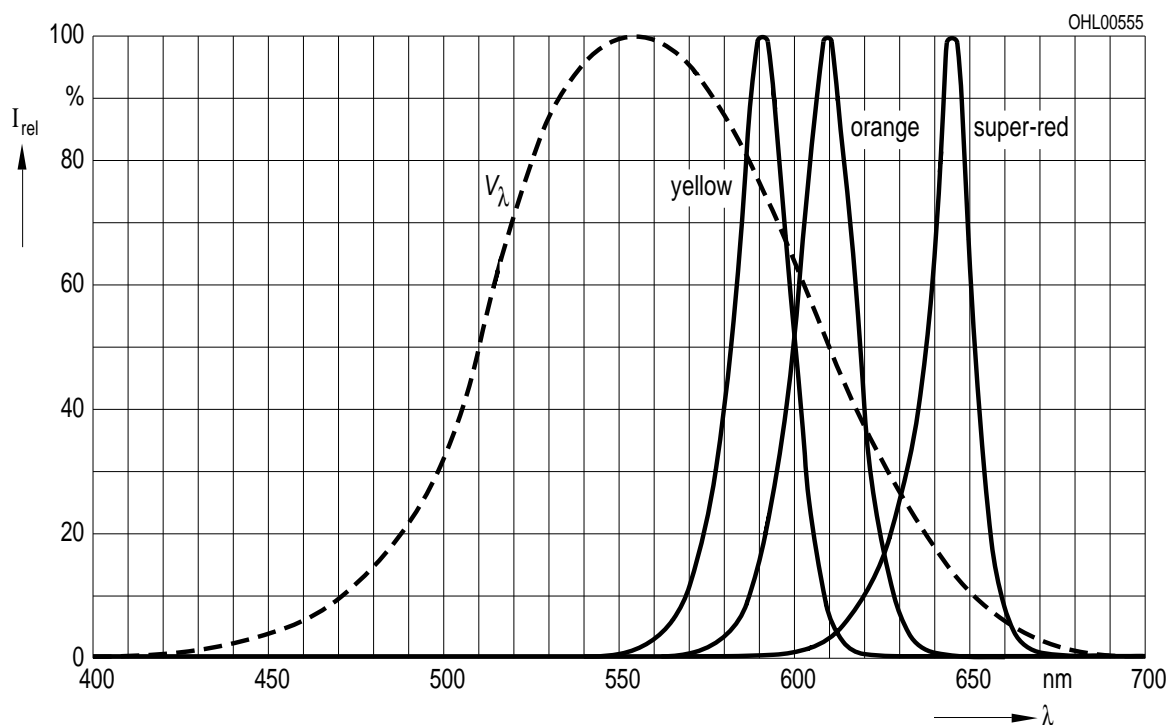
Gruppe Group	Wellenlänge Wavelength		Einheit Unit
	min.	max.	
2	580	583	nm
3	583	586	nm
4	586	589	nm
5	589	592	nm

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

Relative Spectral Emission

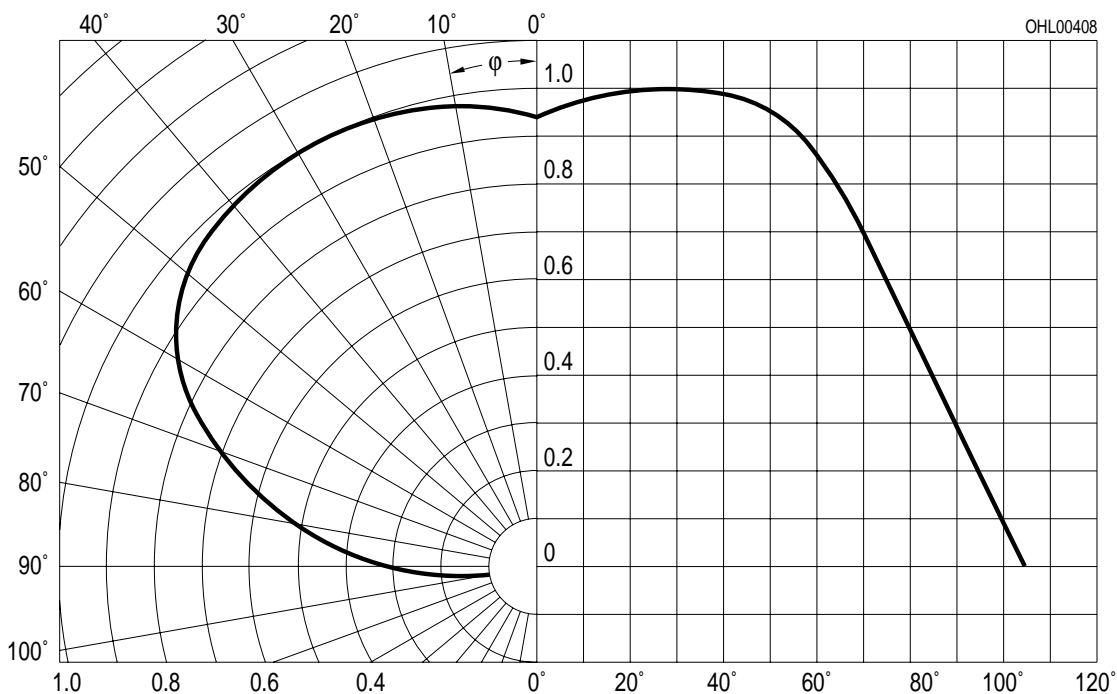
$V(\lambda)$ = spektrale Augenempfindlichkeit

Standard eye response curve



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

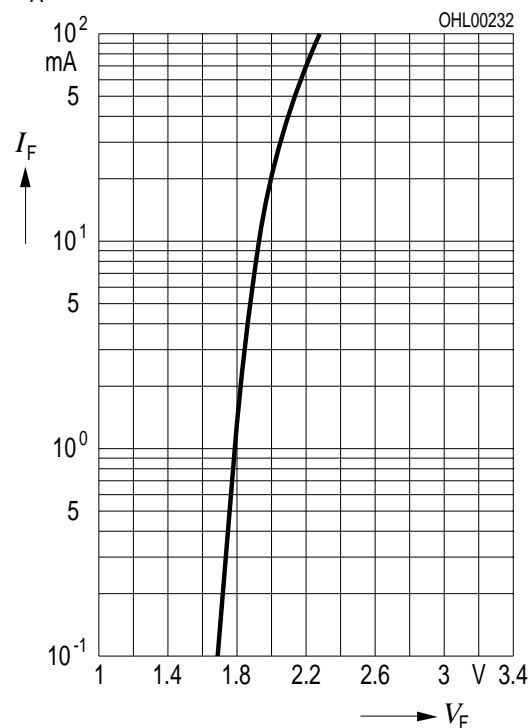
Radiation Characteristic



Durchlassstrom $I_F = f(V_F)$

Forward Current

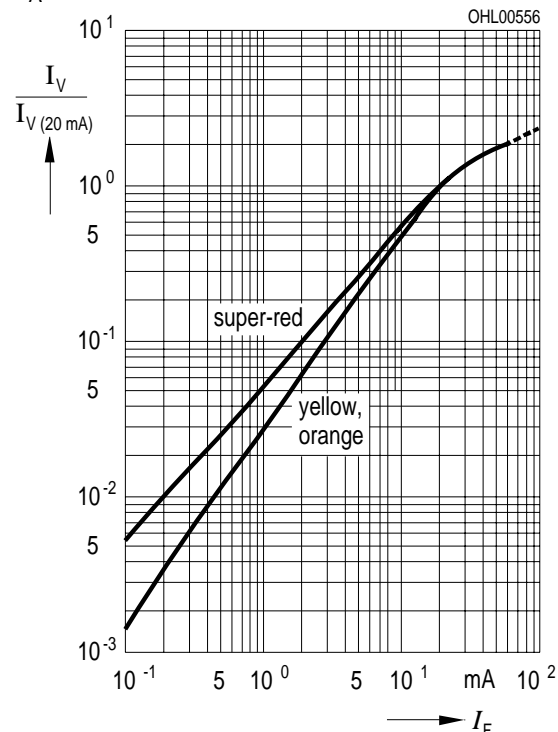
$T_A = 25\text{ °C}$



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

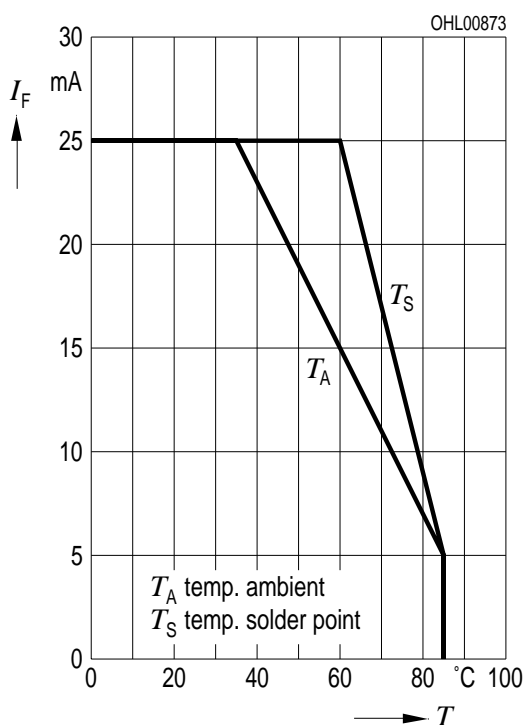
Relative Luminous Intensity

$T_A = 25\text{ °C}$



Maximal zulässiger Durchlassstrom $I_F = f(T)$

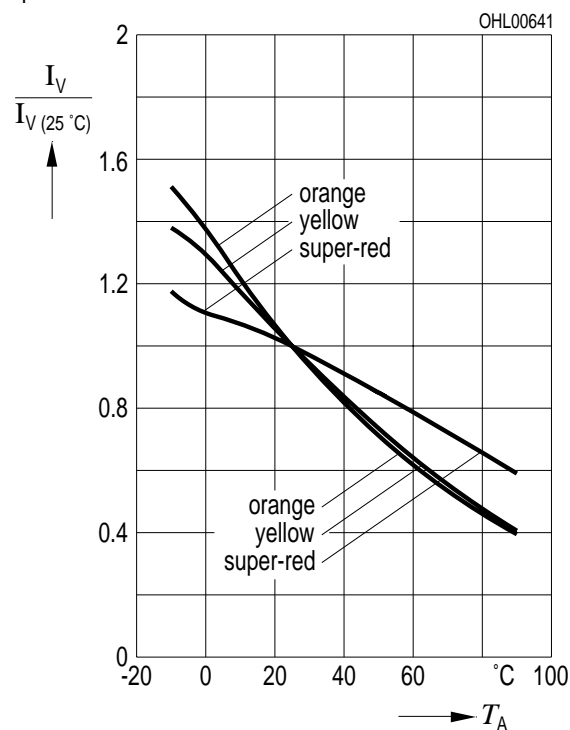
Max. Permissible Forward Current



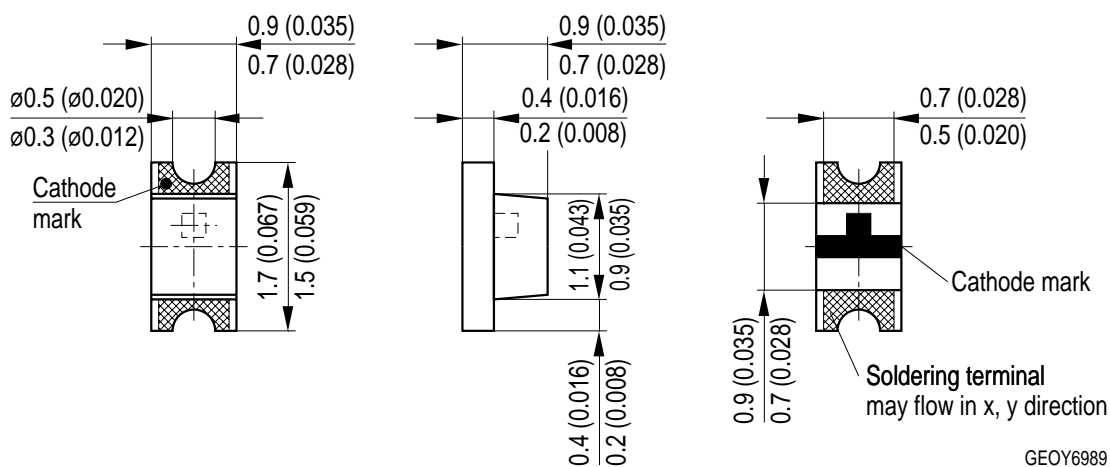
Relative Lichtstärke $I_V/I_{V(25\text{ °C})} = f(T_A)$

Relative Luminous Intensity

$I_F = 20\text{ mA}$



Maßzeichnung Package Outlines

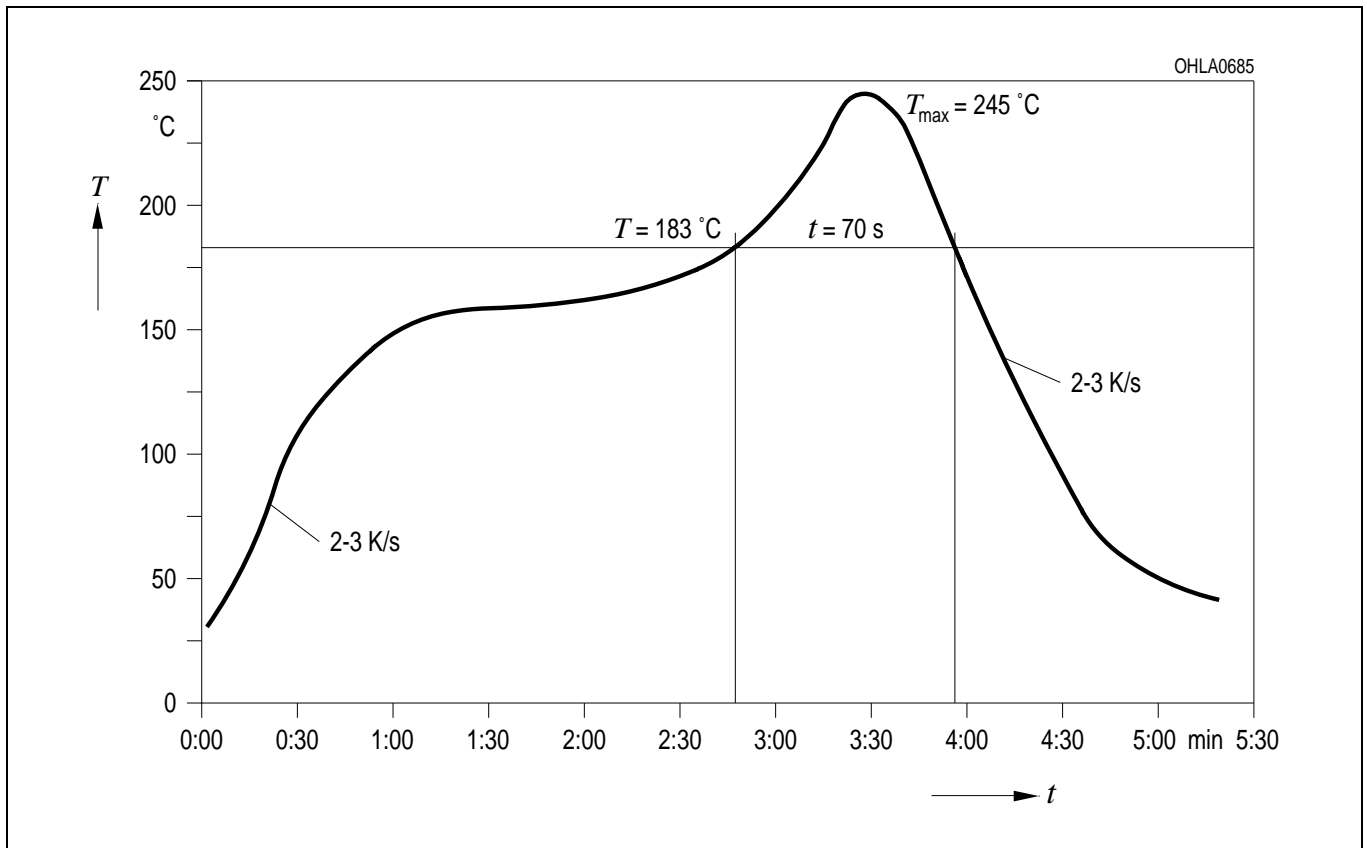


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

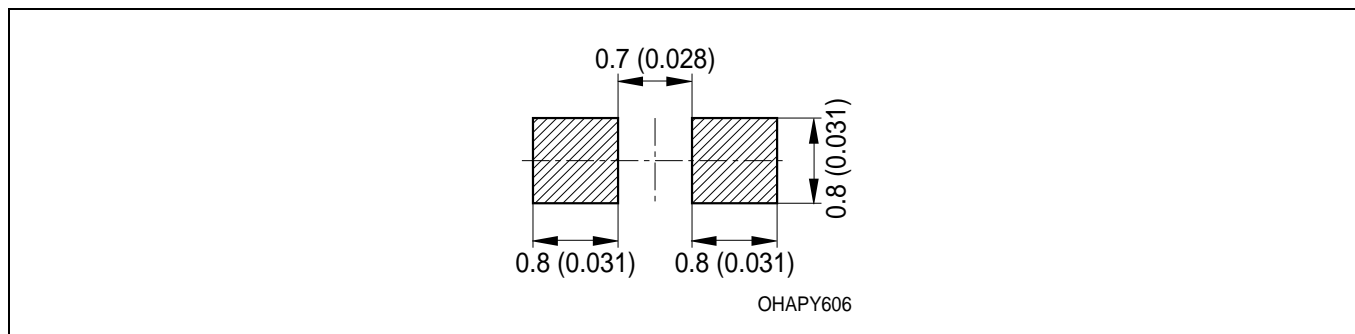
Gewicht / Approx. weight: 1.4 mg

Lötbedingungen Vorbehandlung nach JEDEC Level 2
Soldering Conditions Preconditioning acc. to JEDEC Level 2

IR-Reflow Lötprofil (nach IPC 9501)
IR Reflow Soldering Profile (acc. to IPC 9501)



Empfohlenes Lötpaddesign IR Reflow Lötén
Recommended Solder Pad IR Reflow Soldering



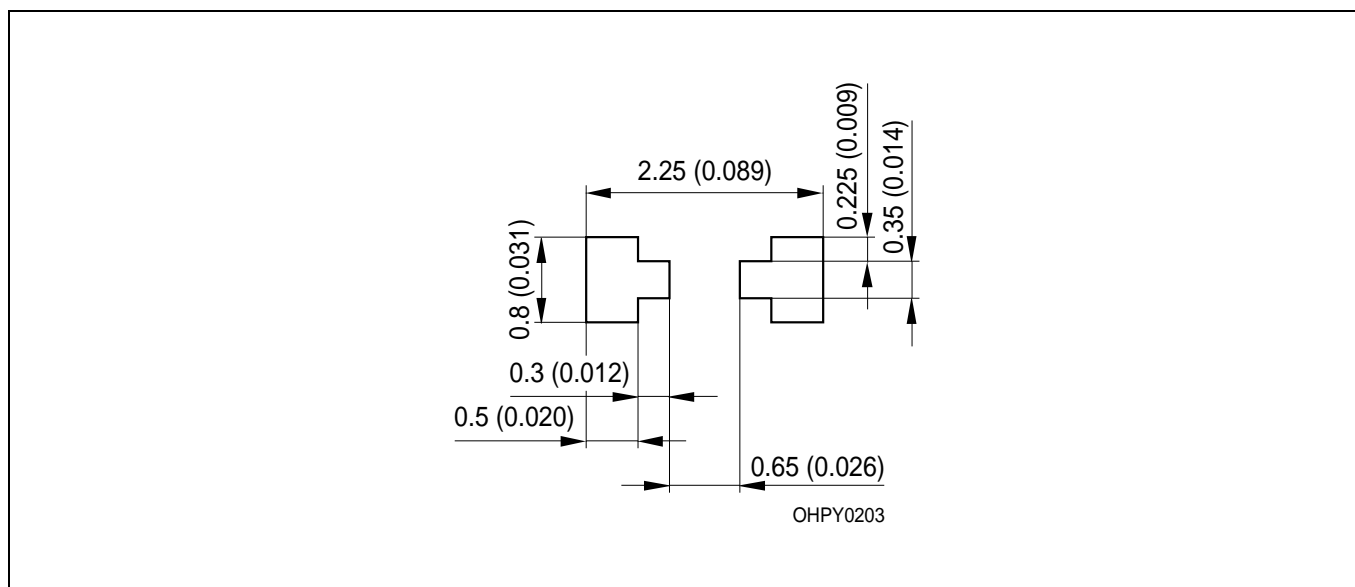
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

Empfohlenes Lötpaddesign verwendbar für Hyper CHIPLÉD und Chipléd - Bauform 0603

IR Reflow Lötén

Recommended Solder Pad useable for Hyper CHIPLÉD and Chipléd - Package 0603

IR Reflow Soldering



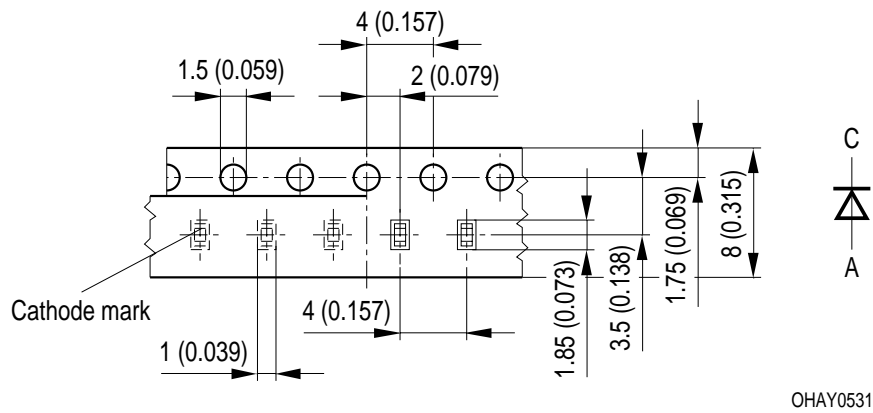
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).
 Empfohlene Lötpastendicke: 120 µm/ recommended thickness of solder paste: 120 µm

Gurtung / Polarität und Lage

Verpackungseinheit 4000/Rolle, ø180 mm

Method of Taping / Polarity and Orientation

Packing unit 4000/reel, ø180 mm



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

Revision History: 2002-09-19		Date of change
Previous Version: 2002-08-19		
Page	Subjects (major changes since last revision)	
4	value (wavelength yellow)	
10	recommended solder pad	
2	color of the light emitting area	
3	pad size from 16 mm ² to 5 mm ²	
12	annotations	2002-07-25
4	value ($TC_{\lambda_{\text{dom}}}$ from 0.01 to 0.05 nm/K)	2002-07-25
3, 4	value (reverse voltage from 5 V to 12 V)	2002-09-18
2	ordering code	2002-09-19

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Packing

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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¹ A critical component is a component used in a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or the effectiveness of that device or system.

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.