

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:** 632 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:** 632 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 Type	Emissionsfarbe Color of Emission	Farbe der Lichtaustrittsfläche Color of the Light Emitting Area	Lichtstärke Luminous Intensity $I_F = 20 \text{ mA}$ $I_V \text{ (mcd)}$		Bestellnummer Ordering Code
			min.	typ.	
LS Q976	super-red	colored diffused	18	50	Q62702-P5187
LO Q976	orange	colored diffused	28	70	Q62702-P5188
LY Q976	yellow	colored diffused	28	60	Q62702-P5186

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 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.*

Note: Total color tolerance range, delivery in single groups (please 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.*

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 Reverse voltage	V_R	5	V
Leistungsaufnahme Power consumption	P_{tot}	65	mW
Wärmewiderstand Thermal resistance Sperrschicht/Umgebung Junction/ambient	$R_{th JA}$	900	K/W
Sperrschicht/Löt看垫 Junction/solder point Montage auf PC-Board FR 4 (Padgröße $\geq 16 \text{ mm}^2$) mounted on PC board FR 4 (pad size $\geq 16 \text{ mm}^2$)	$R_{th JS}$	510	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 ¹⁾ (typ.) Dominant wavelength $I_F = 20\text{ mA}$	λ_{dom}	633 ± 6	606 ± 6	587 +5/-7	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 $I_F = 20\text{ mA}$	V_F V_F	2.0 2.4	2.0 2.4	2.0 2.4	V V
Sperrstrom (typ.) Reverse current $V_R = 5\text{ V}$	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} $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	$TC_{\lambda_{\text{peak}}}$	0.14	0.13	0.13	nm/K
Temperaturkoeffizient von λ_{dom} (typ.) Temperature coefficient of λ_{dom} $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	$TC_{\lambda_{\text{dom}}}$	0.01	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⁾ 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

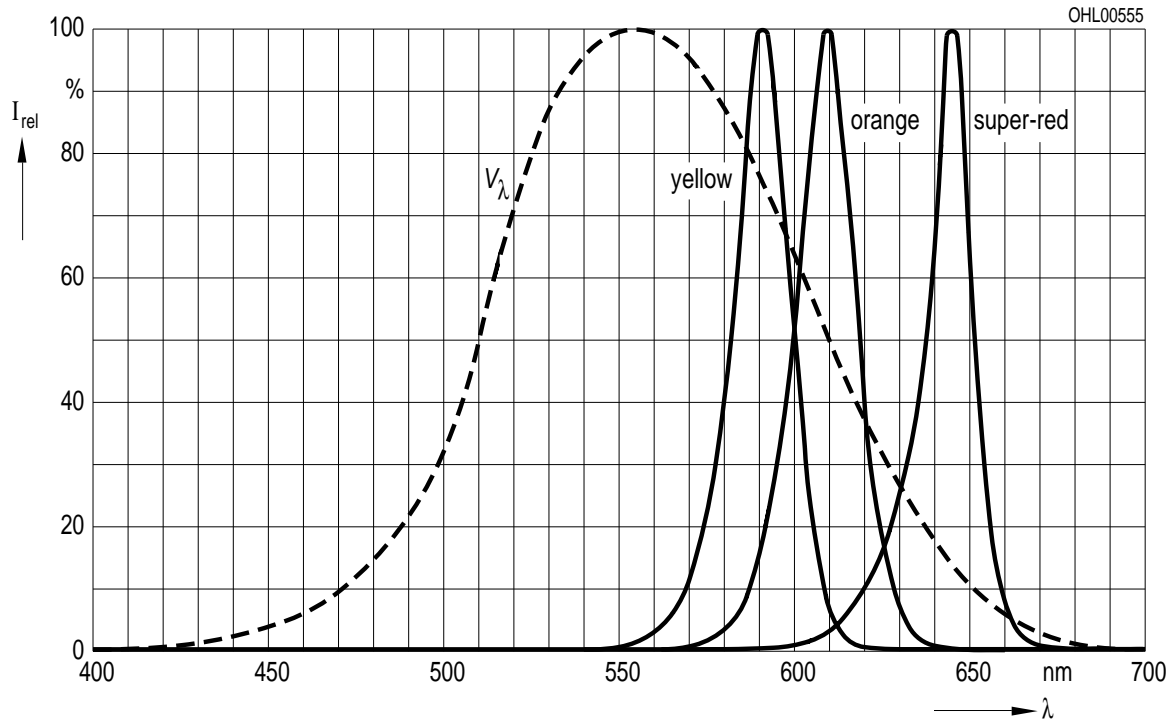
Gruppe Group	Wellenlänge Wavelength		Einheit Unit
	min.	max.	
2	580	583	nm
3	583	586	nm
4	586	589	nm
5	589	592	nm

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

Relative Spectral Emission

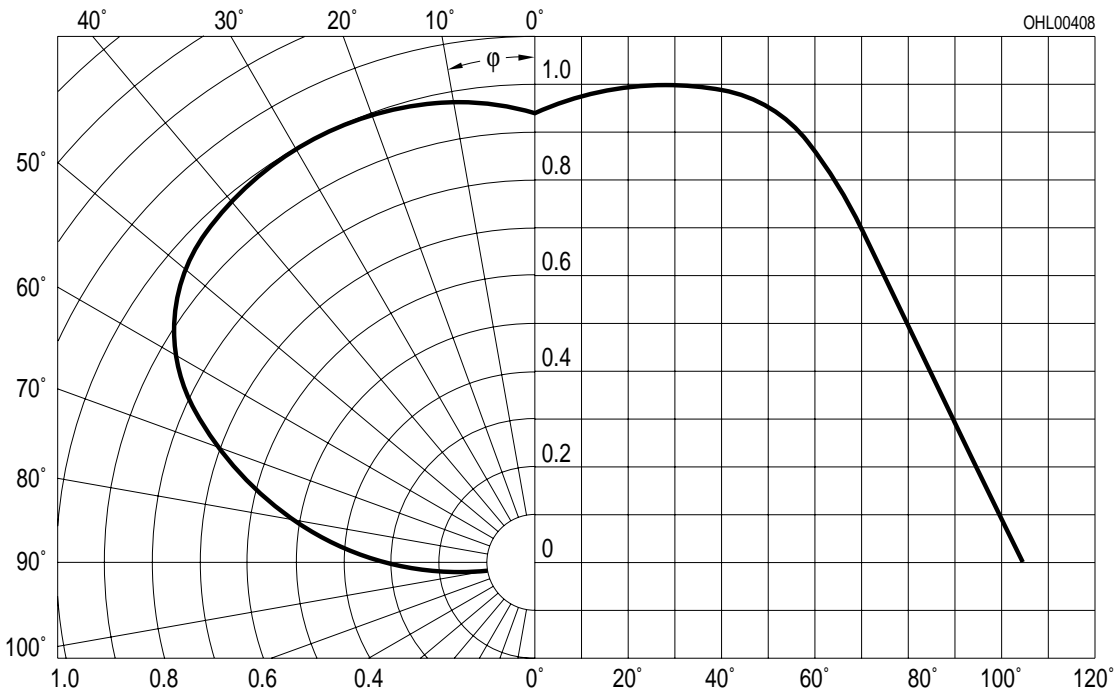
$V(\lambda)$ = spektrale Augenempfindlichkeit

Standard eye response curve



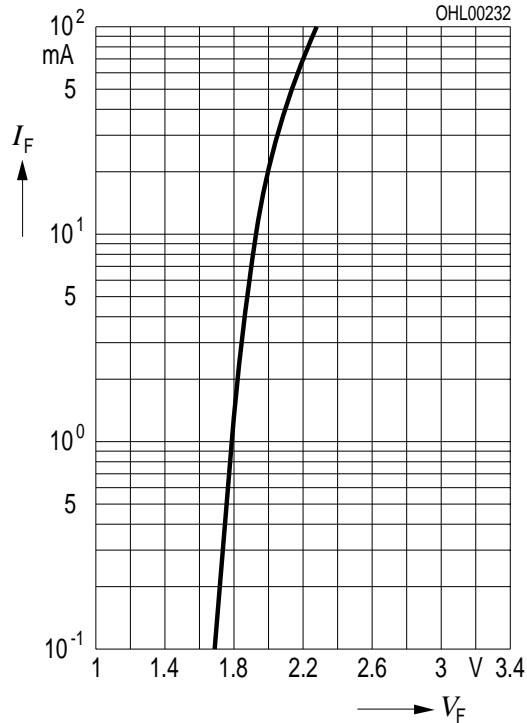
Abstrahlcharakteristik $I_{rel} = f(\varphi)$

Radiation Characteristic



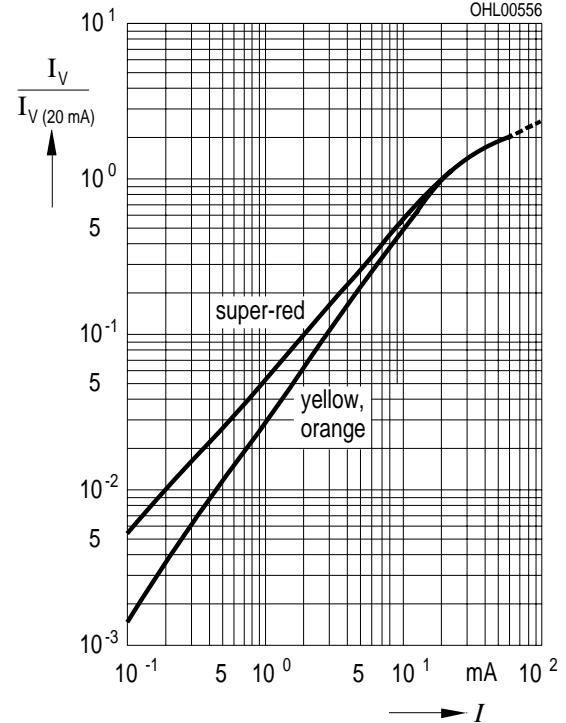
Durchlassstrom $I_F = f(V_F)$
Forward Current

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

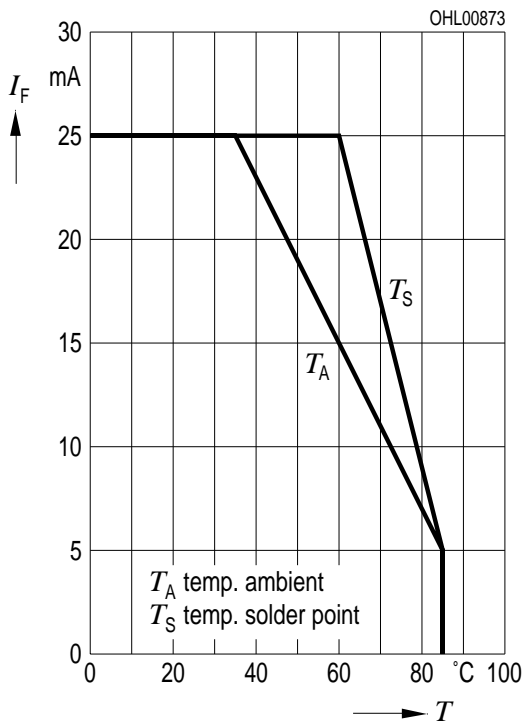


Relative Lichtstärke $I_V/I_{V(20\text{ mA})} = f(I_F)$
Relative Luminous Intensity

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

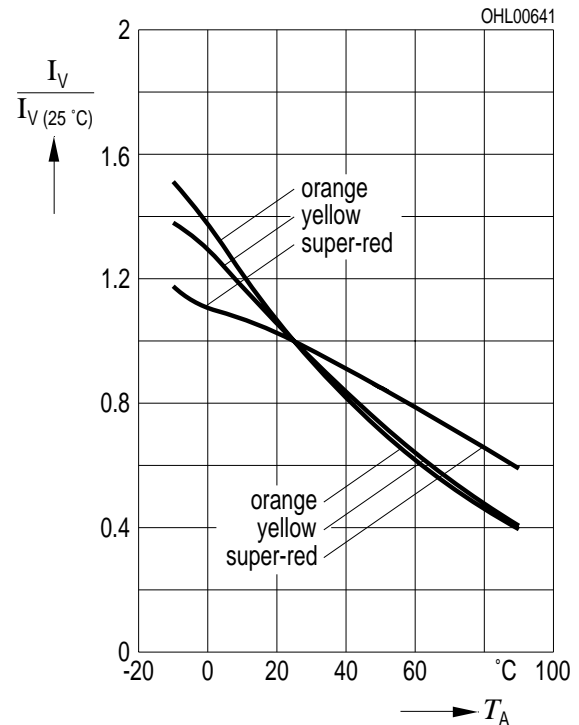


Maximal zulässiger Durchlassstrom $I_F = f(T)$
Max. Permissible Forward Current

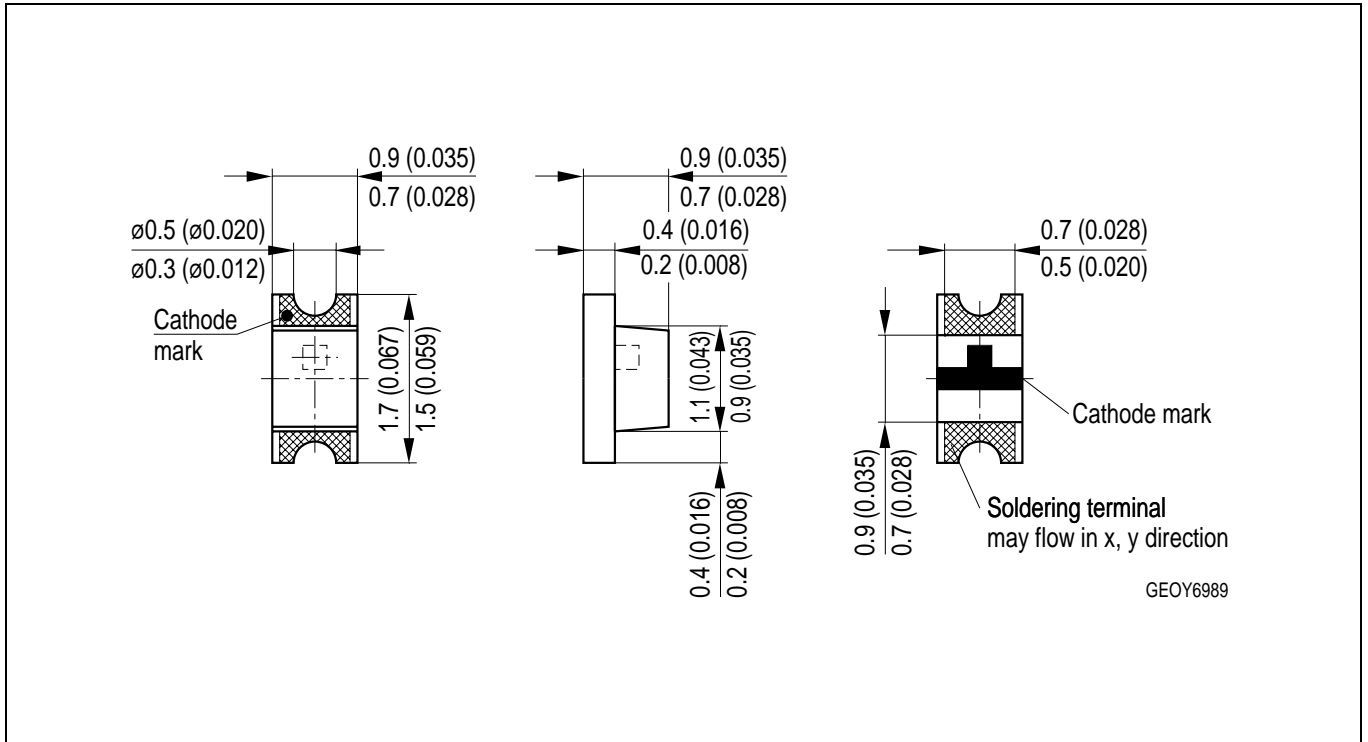


Relative Lichtstärke $I_V/I_{V(25\text{ }^\circ\text{C})} = f(T_A)$
Relative Luminous Intensity

$I_F = 20\text{ mA}$



**Maßzeichnung
Package Outlines**

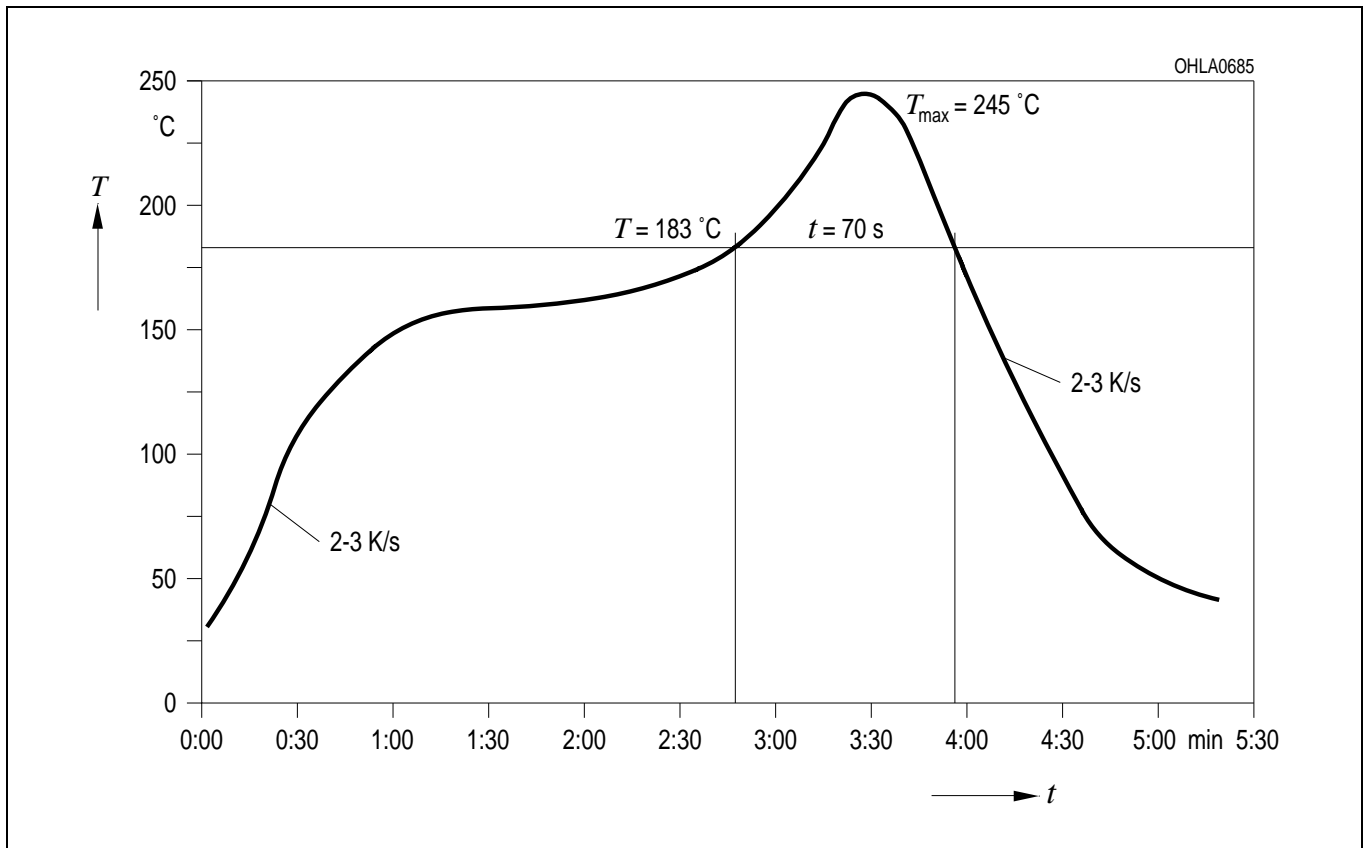


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

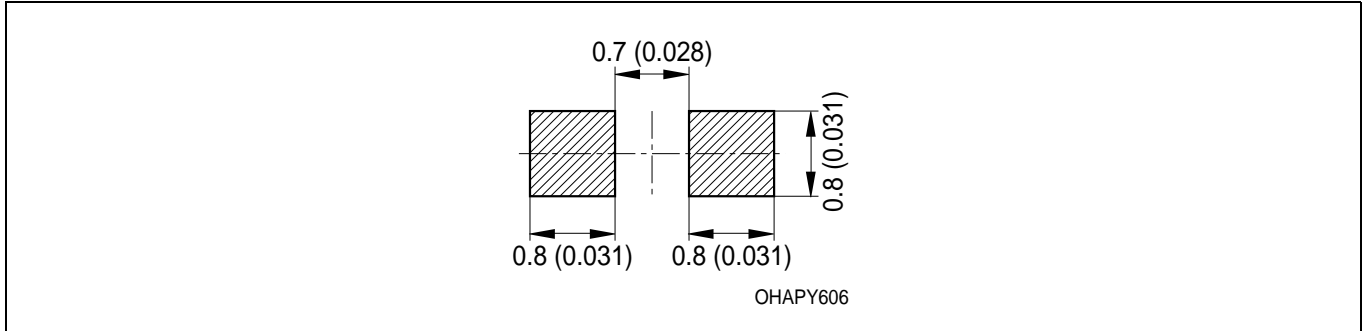
Gewicht / Approx. weight: 1.4 mg

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 Lötpad design IR Reflow Löten
Recommended Solder Pad IR Reflow Soldering



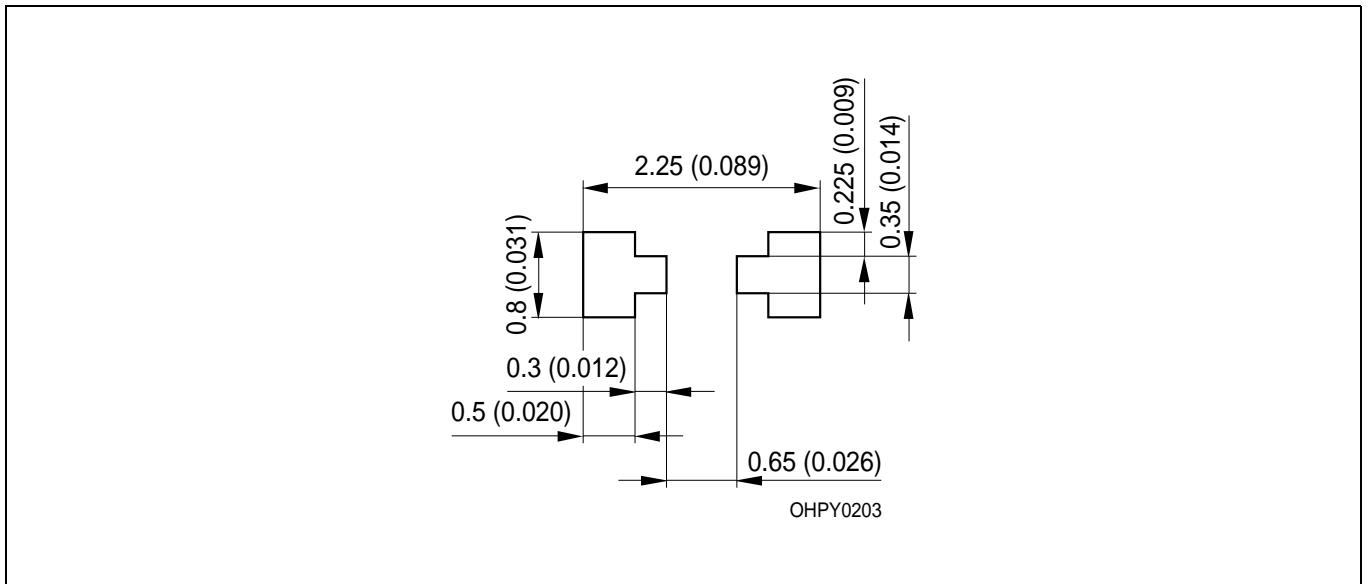
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

Empfohlenes Lötpad design verwendbar für Hyper CHIPLED und Chiplid - Bauform 0603

IR Reflow Löten

Recommended Solder Pad useable for Hyper CHIPLED and Chiplid - Package 0603

IR Reflow Soldering



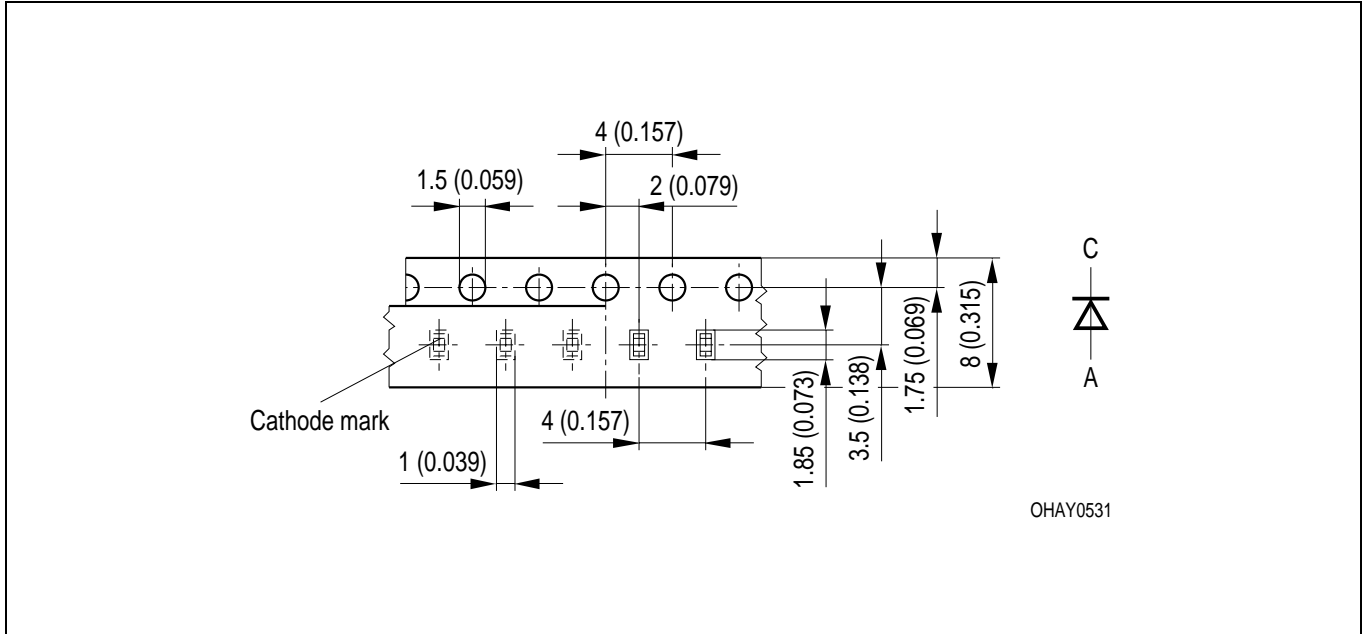
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).
 Empfohlene Lötpastendicke: 120 µm/ recommended thickness of solder paste: 120 µm

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: 2001-11-30

Previous Version: 2001-02-12

Page	Subjects (major changes since last revision)
4	value (wavelength yellow)
10	recommended solder pad

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