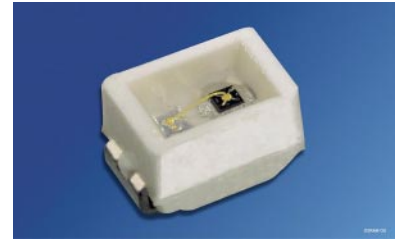


# Hyper Mini TOPLED® Hyper-Bright LED

LS M676, LA M676, LO M676, LY M676



## Besondere Merkmale

- **Gehäusotyp:** weißes SMT-Gehäuse
- **Besonderheit des Bauteils:** kleine Bauform  
2,3 mm x 1,3 mm x 1,4 mm
- **Wellenlänge:** 632 nm (super-rot),  
615 nm (amber), 605 nm (orange),  
587 nm (gelb)
- **Abstrahlwinkel:** Lambertscher Strahler (120°)
- **Technologie:** InGaAlP
- **optischer Wirkungsgrad:** 11 lm/W (gelb,  
orange, amber), 7 lm/W (super-rot)
- **Gruppierungsparameter:** Lichtstärke
- **Verarbeitungsmethode:** für alle  
SMT-Bestücktechniken geeignet
- **Lötmethode:** IR Reflow Löten
- **Vorbehandlung:** nach JEDEC Level 2
- **Gurtung:** 8 mm Gurt mit 3000/Rolle, ø180 mm  
oder 12000/Rolle, ø330 mm

## Anwendungen

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

## Features

- **package:** white SMT package
- **feature of the device:** small package  
2.3 mm x 1.3 mm x 1.4 mm
- **wavelength:** 632 nm (super-red),  
615 nm (amber), 605 nm (orange),  
587 nm (yellow)
- **viewing angle:** Lambertian Emitter (120°)
- **technology:** InGaAlP
- **optical efficiency:** 11 lm/W (yellow, orange,  
amber), 7 lm/W (super-red)
- **grouping parameter:** luminous intensity
- **assembly methods:** suitable for all  
SMT assembly methods
- **soldering methods:** IR reflow soldering
- **preconditioning:** acc. to JEDEC Level 2
- **taping:** 8 mm tape with 3000/reel, ø180 mm or  
12000/reel, ø330 mm

## Applications

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

LS M676, LA M676, LO M676, LY M676

Typ	Emissions- farbe	Farbe der Lichtaustritts- fläche	Lichtstärke	Lichtstrom	Bestellnummer
Type	Color of Emission	Color of the Light Emitting Area	Luminous Intensity $I_F = 20 \text{ mA}$ $I_V \text{ (mcd)}$	Luminous Flux $I_F = 20 \text{ mA}$ $\Phi_V \text{ (lm)}$	Ordering Code
LS M676-N2P2-1 LS M676-P2R1-1 LS M676-N2 LS M676-P1 LS M676-P2 LS M676-Q1 LS M676-Q2 LS M676-R1	super-red	colorless clear	35.5 ... 71.0 56.0 ... 140.0 35.5 ... 45.0 45.0 ... 56.0 56.0 ... 71.0 71.0 ... 90.0 90.0 ... 112.0 112.0 ... 140.0	150 (typ.) 280 (typ.) 120 (typ.) 150 (typ.) 190 (typ.) 240 (typ.) 300 (typ.) 380 (typ.)	Q62703-Q5085 Q62703-Q5086
LA M676-P2Q2-1 LA M676-Q2S1-1 LA M676-P2 LA M676-Q1 LA M676-Q2 LA M676-R1 LA M676-R2 LA M676-S1	amber	colorless clear	56.0 ... 112.0 90.0 ... 224.0 56.0 ... 71.0 71.0 ... 90.0 90.0 ... 112.0 112.0 ... 140.0 140.0 ... 180.0 180.0 ... 224.0	240 (typ.) 440 (typ.) 190 (typ.) 240 (typ.) 300 (typ.) 380 (typ.) 480 (typ.) 600 (typ.)	Q62703-Q4978 Q62703-Q4979
LO M676-Q1R1-1 LO M676-R1S2-1 LO M676-Q1 LO M676-Q2 LO M676-R1 LO M676-R2 LO M676-S1 LO M676-S2	orange	colorless clear	71.0 ... 140.0 112.0 ... 280.0 71.0 ... 90.0 90.0 ... 112.0 112.0 ... 140.0 140.0 ... 180.0 180.0 ... 224.0 224.0 ... 280.0	310 (typ.) 560 (typ.) 240 (typ.) 300 (typ.) 380 (typ.) 480 (typ.) 600 (typ.) 760 (typ.)	Q62703-Q5040 Q62703-Q5041
LY M676-P2Q2-1 LY M676-Q2S1-1 LY M676-P2 LY M676-Q1 LY M676-Q2 LY M676-R1 LY M676-R2 LY M676-S1	yellow	colorless clear	56.0 ... 112.0 90.0 ... 224.0 56.0 ... 71.0 71.0 ... 90.0 90.0 ... 112.0 112.0 ... 140.0 140.0 ... 180.0 180.0 ... 224.0	240 (typ.) 440 (typ.) 190 (typ.) 240 (typ.) 300 (typ.) 380 (typ.) 480 (typ.) 600 (typ.)	Q62703-Q5123 Q62703-Q5124

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 an accuracy of  $\pm 11 \%$ .

**Grenzwerte  
Maximum Ratings**

Bezeichnung Parameter	Symbol Symbol	Werte Values		Einheit Unit
		LS, LO, LA	LY	
Betriebstemperatur Operating temperature range	$T_{op}$	- 40 ... + 100		°C
Lagertemperatur Storage temperature range	$T_{stg}$	- 40 ... + 100		°C
Sperrschichttemperatur Junction temperature	$T_j$	+ 125		°C
Durchlassstrom Forward current	$I_F$	30		mA
Stoßstrom Surge current $t \leq 10 \mu s, D = 0.005$	$I_{FM}$	0.8	0.2	A
Sperrspannung Reverse voltage	$V_R$	3		V
Leistungsaufnahme Power dissipation	$P_{tot}$	80		mW
Wärmewiderstand Thermal resistance Sperrschicht/Umgebung Junction/ambient	$R_{th JA}$	580		K/W
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 $\geq 16 \text{ mm}^2$ )	$R_{th JS}$	330		K/W

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

**Characteristics**

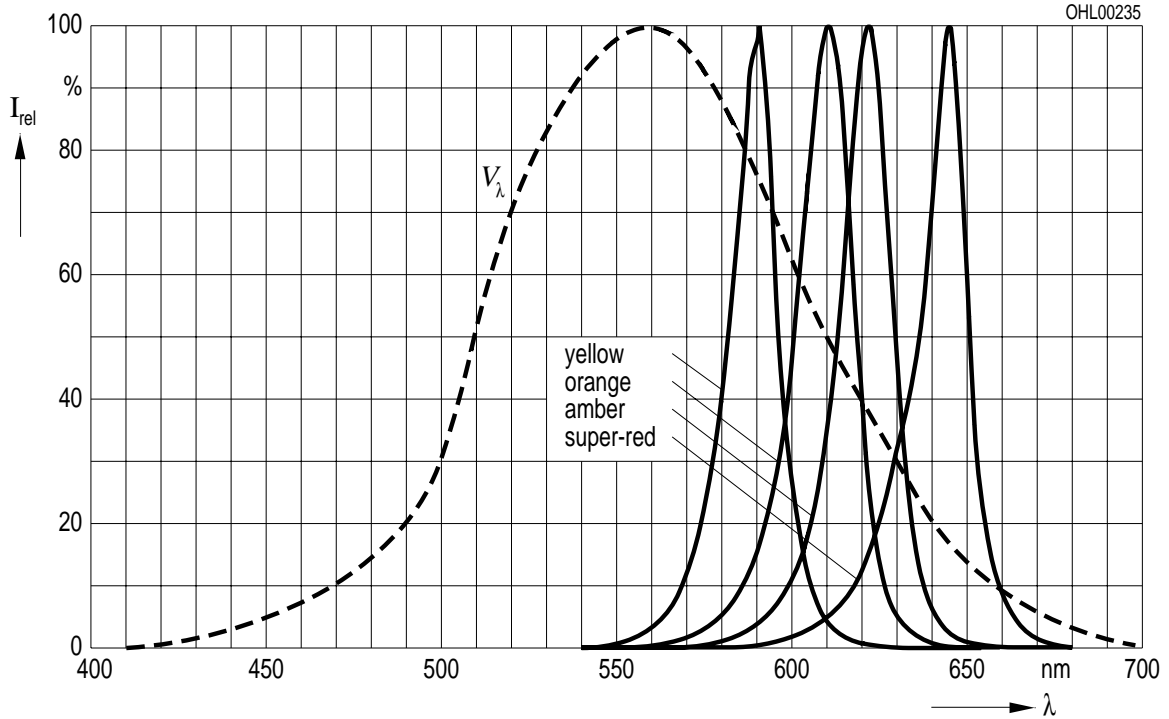
Bezeichnung Parameter	Symbol Symbol	Werte Values				Einheit Unit
		LS	LA	LO	LY	
Wellenlänge des emittierten Lichtes Wavelength at peak emission $I_F = 20\text{ mA}$	(typ.) $\lambda_{\text{peak}}$	645	622	610	591	nm
Dominantwellenlänge Dominant wavelength $I_F = 20\text{ mA}$	(typ.) $\lambda_{\text{dom}}$	632	615	605	587	nm
Spektrale Bandbreite bei 50 % $I_{\text{rel max}}$ Spectral bandwidth at 50 % $I_{\text{rel max}}$ $I_F = 20\text{ mA}$	(typ.) $\Delta\lambda$	16	16	16	15	nm
Abstrahlwinkel bei 50 % $I_V$ (Vollwinkel) Viewing angle at 50 % $I_V$	(typ.) $2\phi$	120	120	120	120	Grad deg.
Durchlassspannung Forward voltage $I_F = 20\text{ mA}$	(typ.) $V_F$ (max.) $V_F$	2.0 2.5	2.0 2.5	2.0 2.5	2.0 2.5	V V
Sperrstrom Reverse current $V_R = 3\text{ V}$	(typ.) $I_R$ (max.) $I_R$	0.01 10	0.01 10	0.01 10	0.01 10	$\mu\text{A}$ $\mu\text{A}$
Temperaturkoeffizient von $\lambda_{\text{peak}}$ Temperature coefficient of $\lambda_{\text{peak}}$ $I_F = 20\text{ mA}$	(typ.) $TC_{\lambda_{\text{peak}}}$	0.14	0.13	0.13	0.13	nm/K
Temperaturkoeffizient von $\lambda_{\text{dom}}$ Temperature coefficient of $\lambda_{\text{dom}}$ $I_F = 20\text{ mA}$	(typ.) $TC_{\lambda_{\text{dom}}}$	0.01	0.06	0.07	0.10	nm/K
Temperaturkoeffizient von $V_F$ Temperature coefficient of $V_F$ $I_F = 20\text{ mA}$	(typ.) $TC_V$	-2.0	-1.8	-1.7	-2.5	mV/K
Optischer Wirkungsgrad Optical efficiency $I_F = 20\text{ mA}$	(typ.) $\eta_{\text{opt}}$	7	11	11	11	lm/W

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

**Relative Spectral Emission**

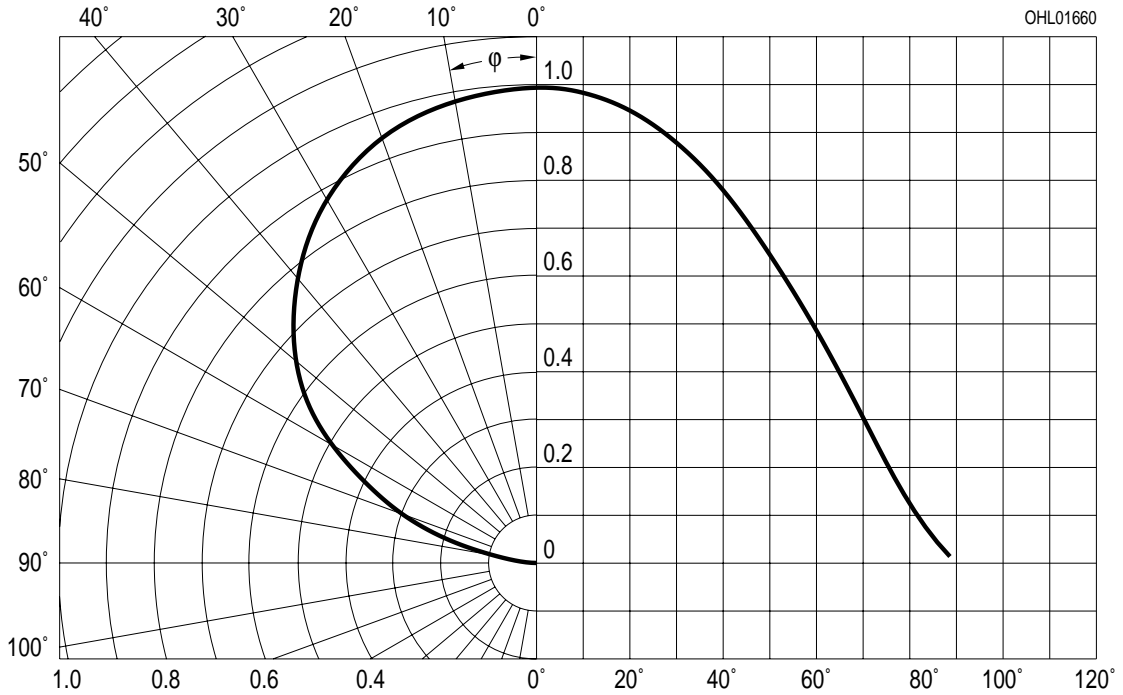
$V(\lambda)$  = spektrale Augenempfindlichkeit

Standard eye response curve



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

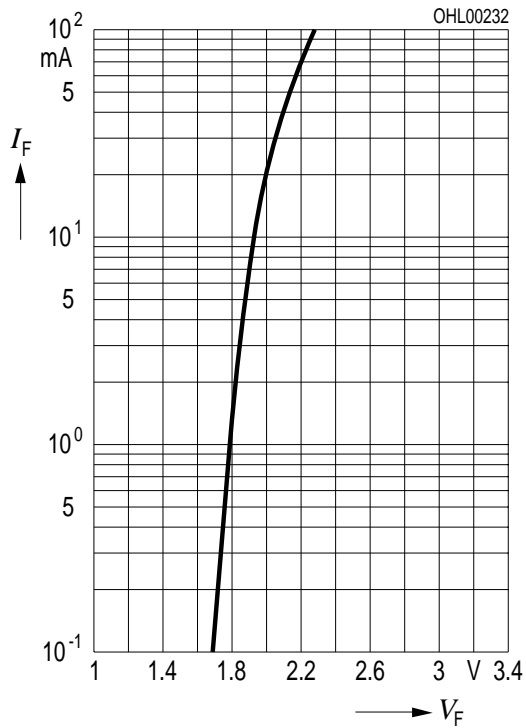
**Radiation Characteristic**



**Durchlassstrom  $I_F = f(V_F)$**

**Forward Current**

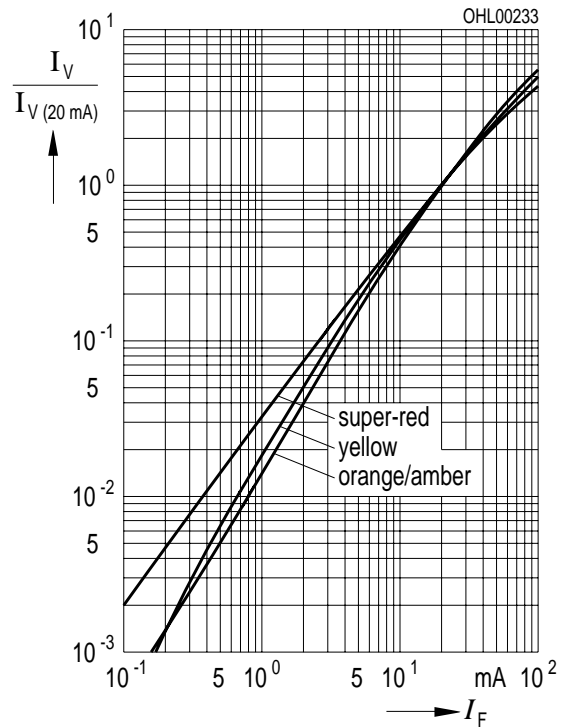
$T_A = 25\text{ °C}$



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

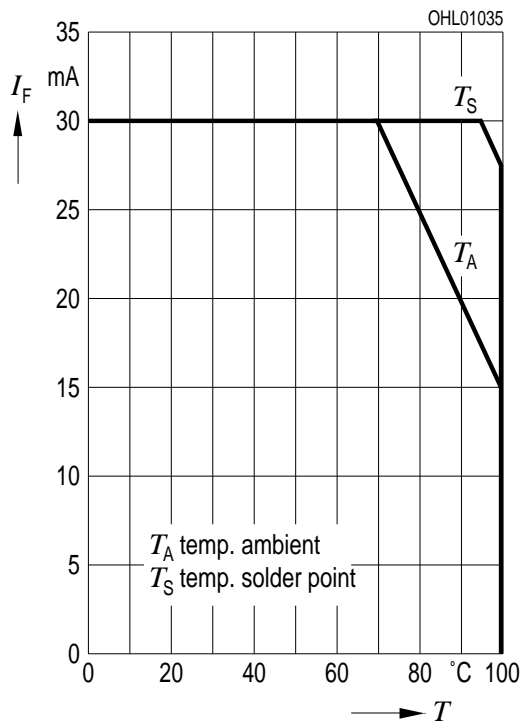
**Relative Luminous Intensity**

$T_A = 25\text{ °C}$



**Maximal zulässiger Durchlassstrom  $I_F = f(T)$**

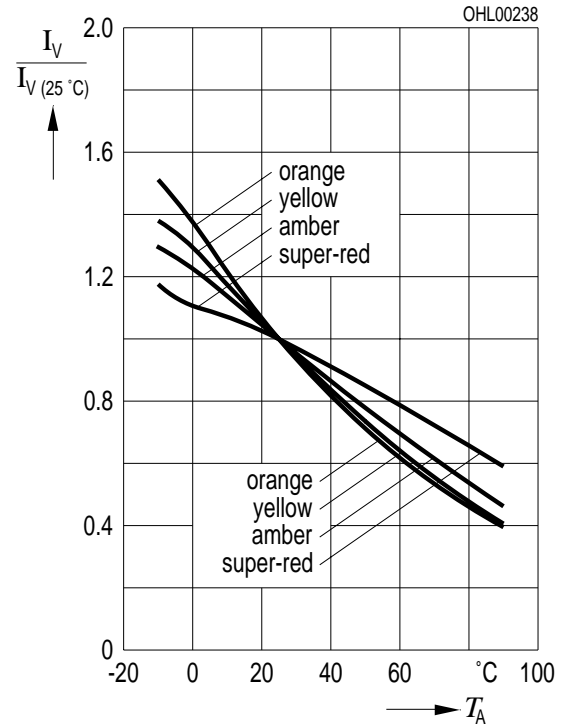
**Max. Permissible Forward Current**



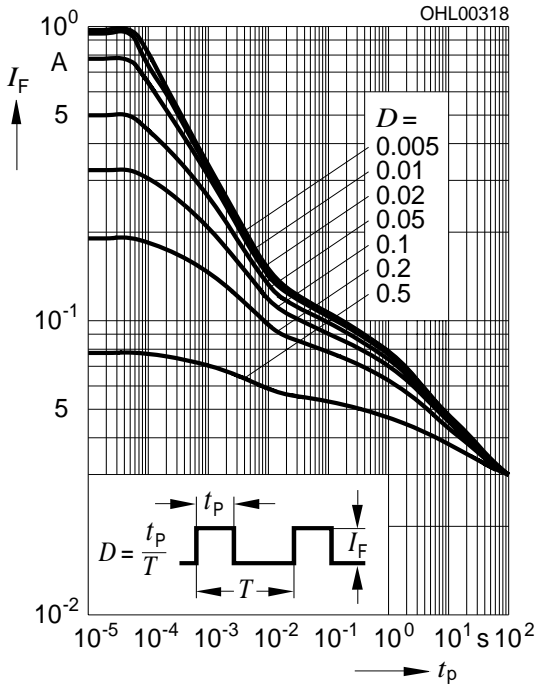
**Relative Lichtstärke  $I_V/I_{V(25\text{ °C})} = f(T_A)$**

**Relative Luminous Intensity**

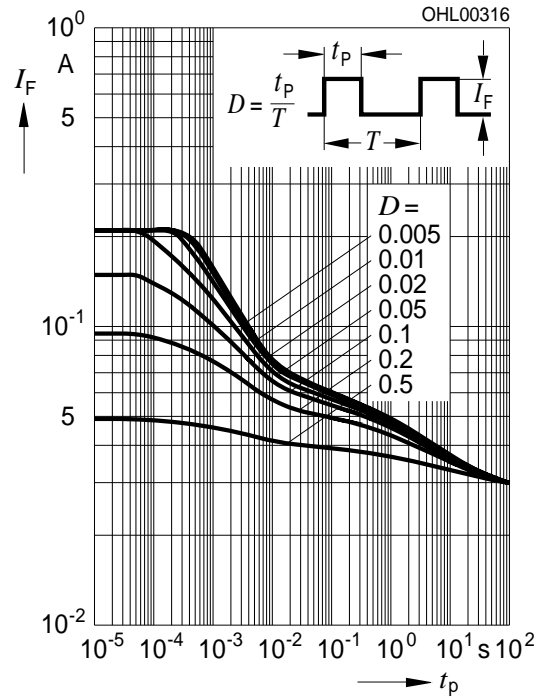
$I_F = 20\text{ mA}$



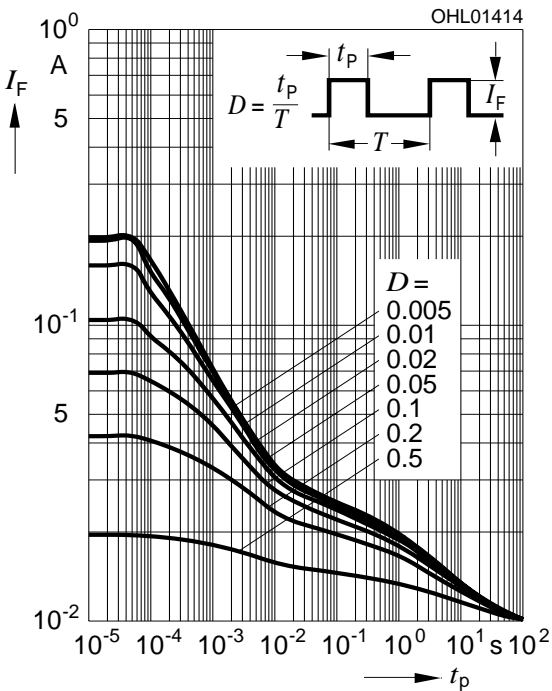
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 25\text{ °C}$   
**LS, LA, LO**



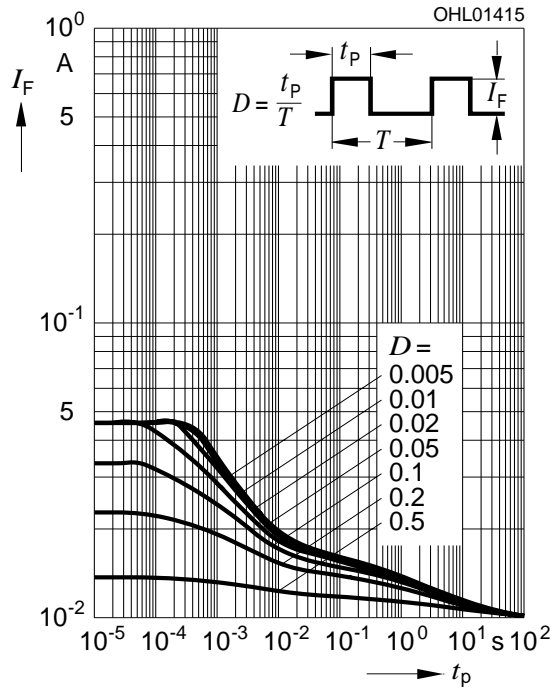
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 25\text{ °C}$   
**LY**



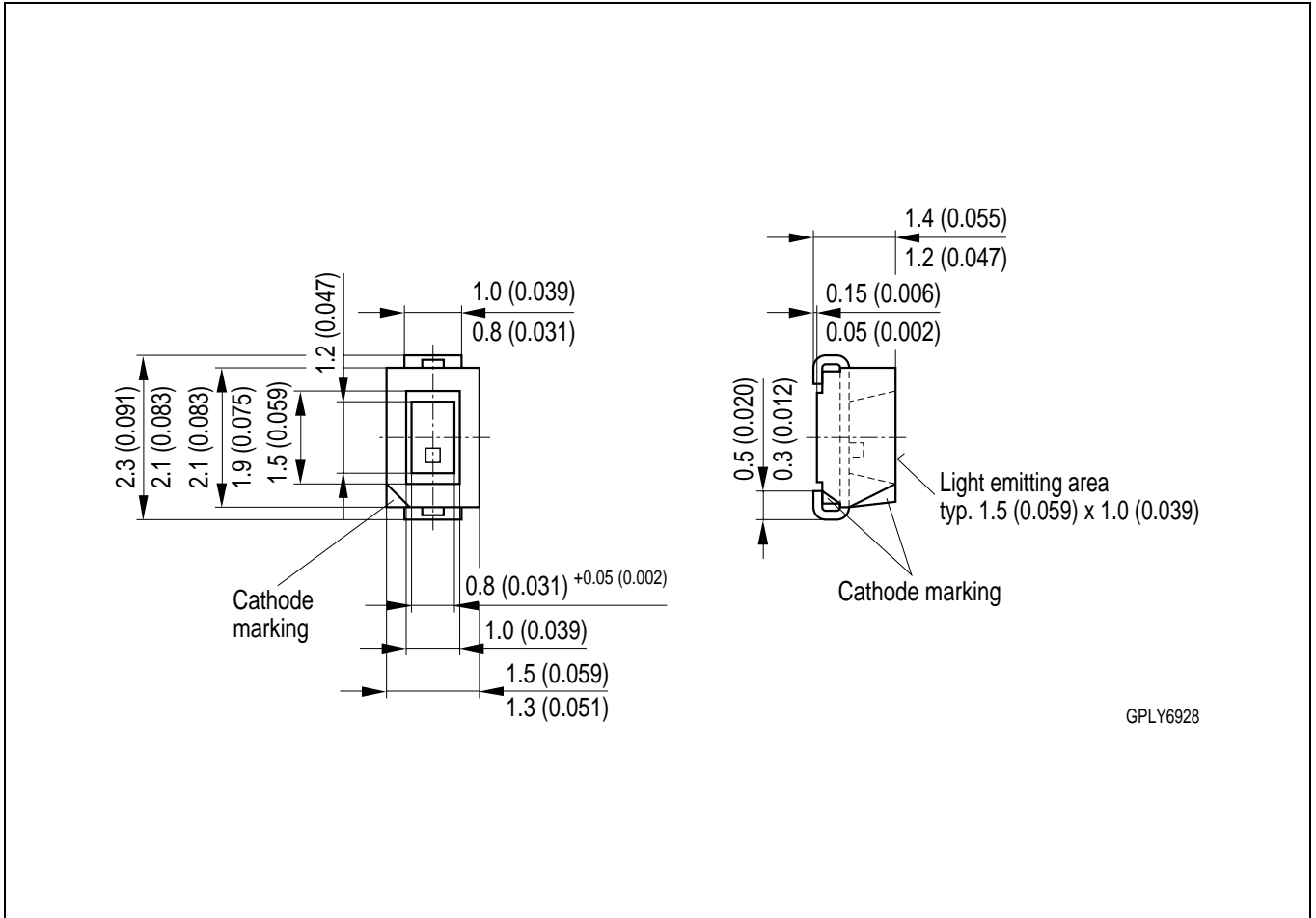
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 85\text{ °C}$   
**LS, LA, LO**



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



Maßzeichnung  
Package Outlines



GPLY6928

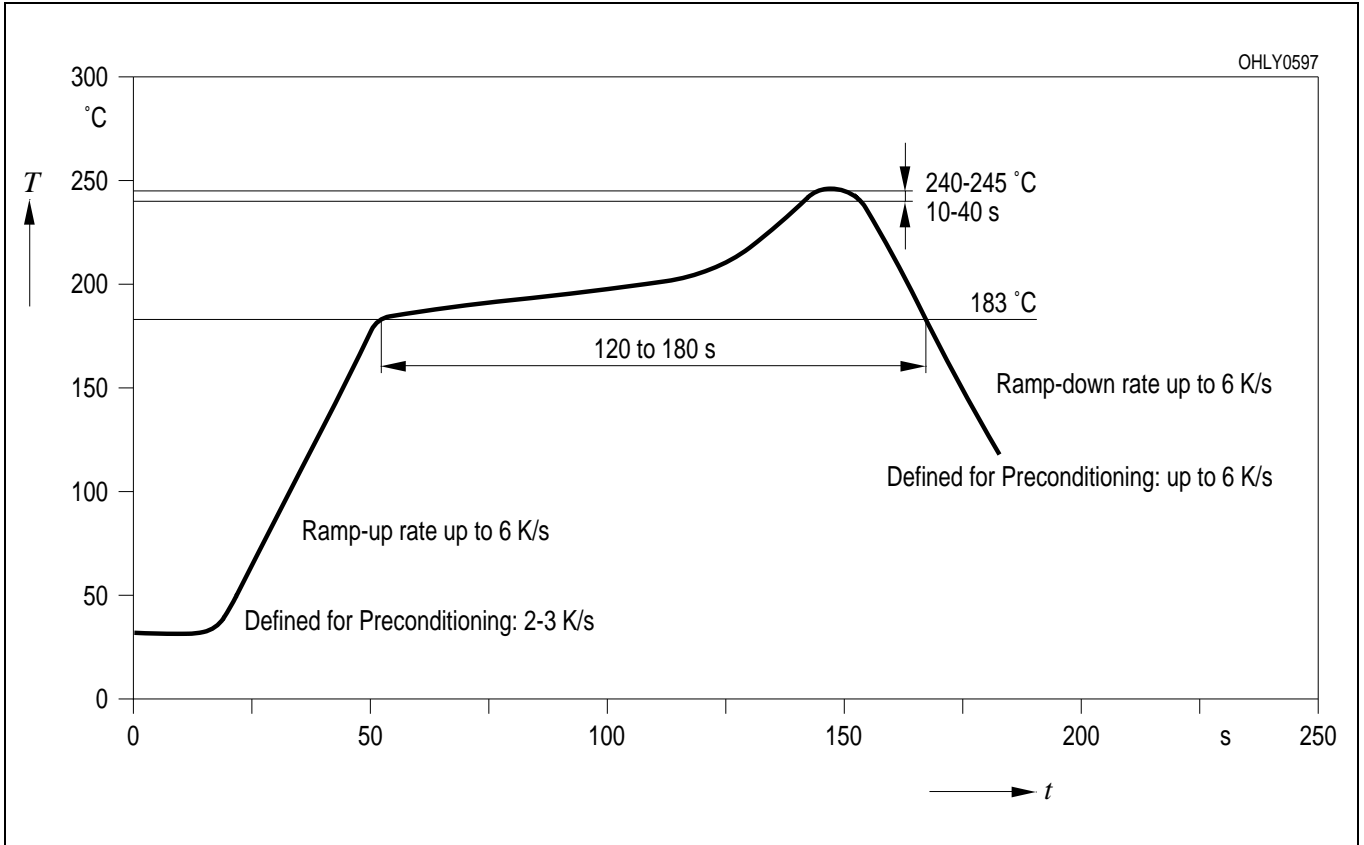
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

**Kathodenkennung:** abgeschrägte Ecke  
**Cathode mark:** bevelled edge

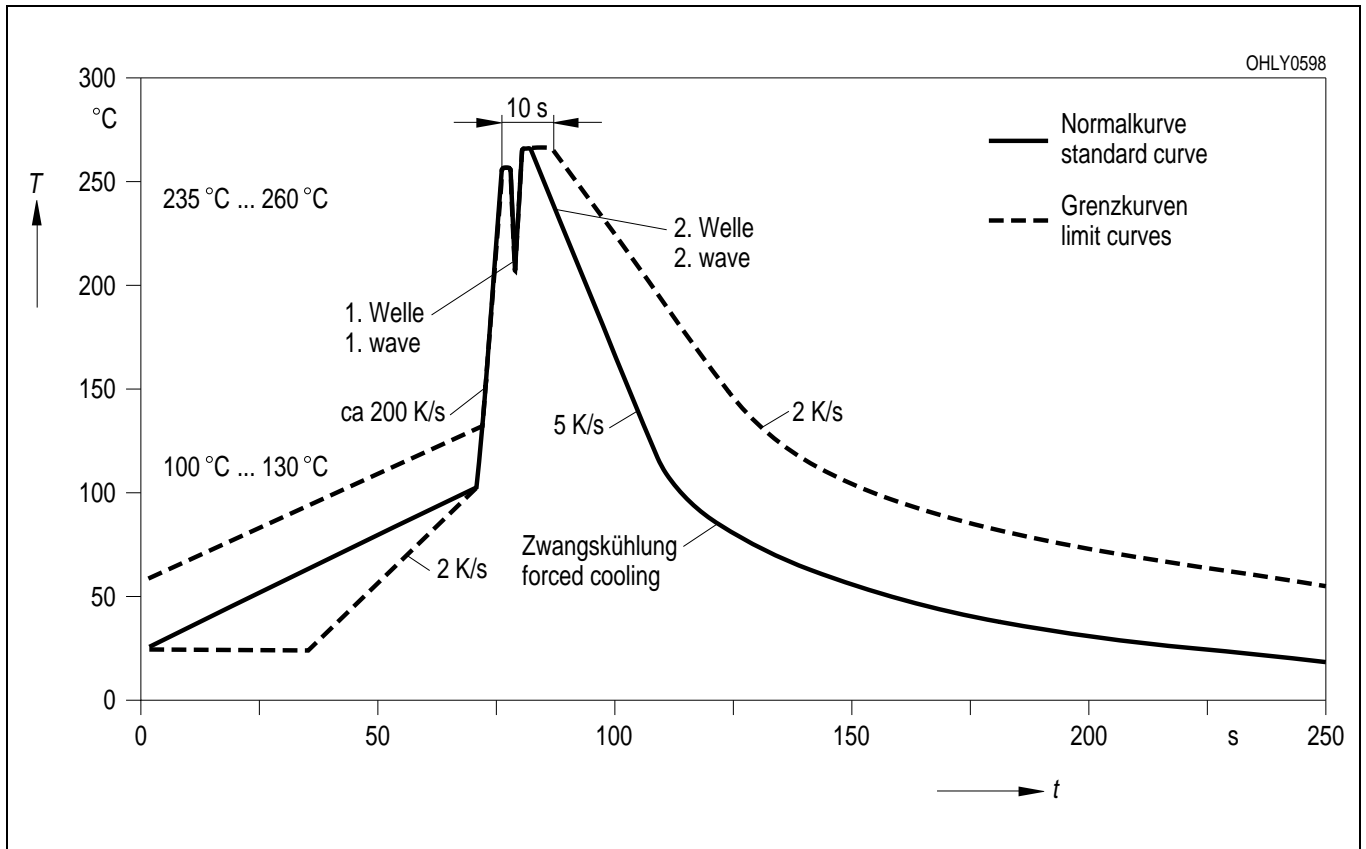


**Lötbedingungen** Vorbehandlung nach JEDEC Level 2  
**Soldering Conditions** Preconditioning acc. to JEDEC Level 2

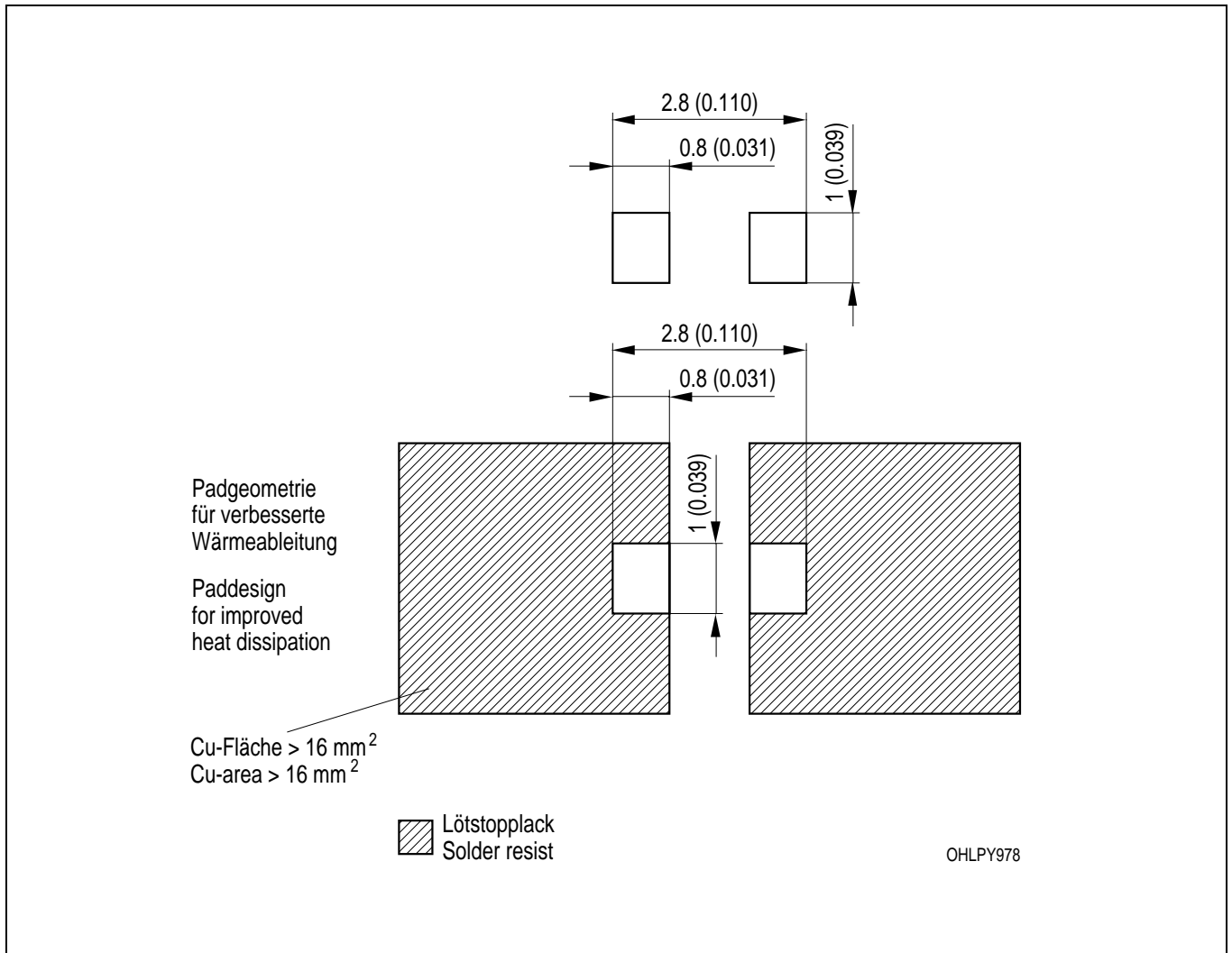
**IR-Reflow Lötprofil** (nach IPC 9501)  
**IR Reflow Soldering Profile** (acc. to IPC 9501)



**Wellenlötten (TTW)** (nach CECC 00802)  
**TTW Soldering** (acc. to CECC 00802)



**Empfohlenes Lötpad Design** IR Reflow Löten  
**Recommended Solder Pad** IR Reflow Soldering



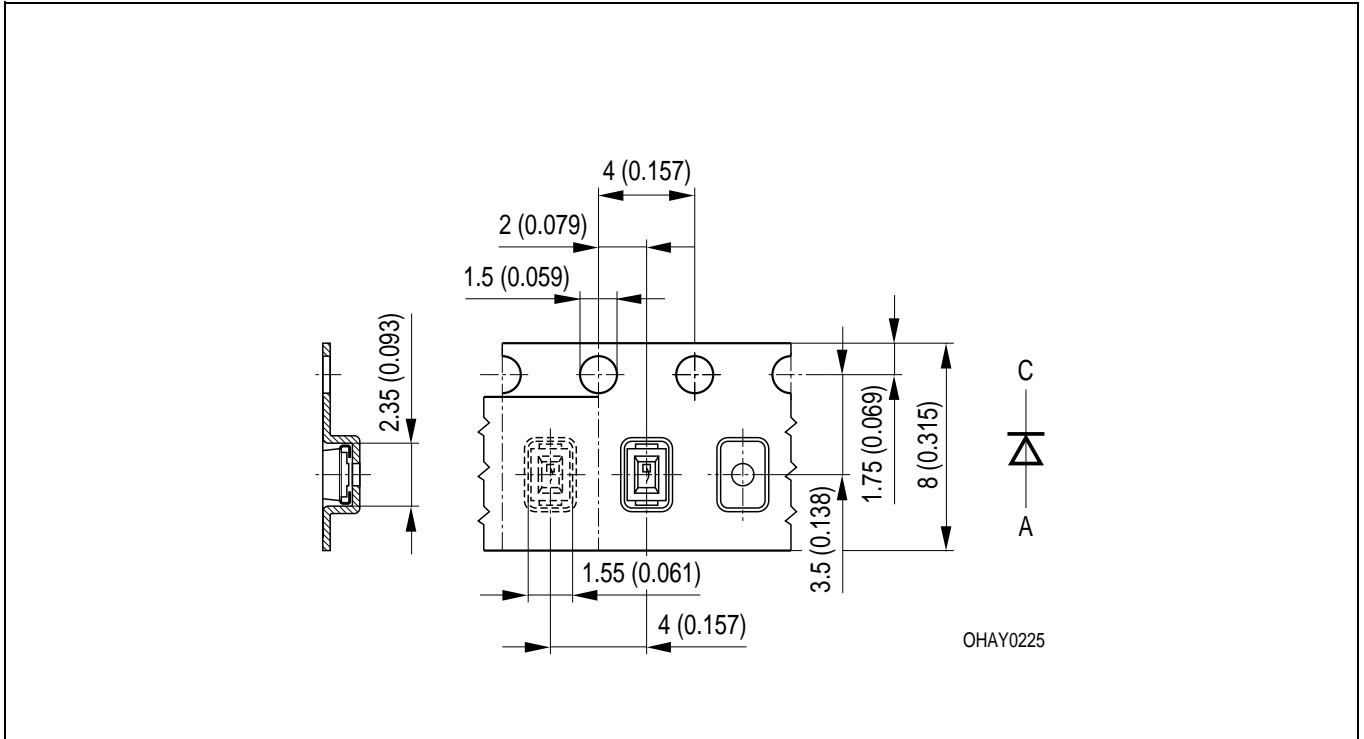
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch)

**Gurtung / Polarität und Lage**

Verpackungseinheit 3000/Rolle,  $\varnothing$ 180 mm  
oder 12000/Rolle,  $\varnothing$ 330 mm

**Method of Taping / Polarity and Orientation**

Packing unit 3000/reel,  $\varnothing$ 180 mm  
or 12000/reel,  $\varnothing$ 330 mm



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