

# Micro SIDELED® Enhanced optical Power LED (ATON®)

LW Y87C



## Besondere Merkmale

- **Gehäusotyp:** weißes SMT Gehäuse
- **Besonderheit des Bauteils:** kleine Bauform mit extrem breiter Abstrahlcharakteristik; ideal für Hinterleuchtungen und Einkopplungen in Lichtleiter
- **Farbort:**  $x = 0,33$ ,  $y = 0,33$  nach CIE 1931 (weiß)
- **typische Farbtemperatur:** 5600 K
- **Farbwiedergabeindex:** 80
- **Abstrahlwinkel:** Lambertischer Strahler ( $120^\circ$ )
- **Technologie:** InGaN
- **optischer Wirkungsgrad:** 10 lm/W
- **Gruppierungsparameter:** Lichtstärke, Farbort
- **Verarbeitungsmethode:** für alle SMT-Bestücktechniken geeignet
- **Lötmethode:** IR Reflow Löten und Wellenlöten (TTW)
- **Vorbehandlung:** nach JEDEC Level 2
- **Gurtung:** 8 mm Gurt mit 3000/Rolle,  $\varnothing 180$  mm oder 10000/Rolle,  $\varnothing 330$  mm
- **ESD-Festigkeit:** ESD-sicher bis 2 kV nach EOS/ESD-5.1-1993

## Anwendungen

- Hinterleuchtung (LCD, Mobiltelefone, Schalter, Tasten, Displays, Werbebeleuchtung)
- optimierte Einkopplung in Lichtleiter
- Signal- und Symbolleuchten

## Features

- **package:** white SMT package
- **feature of the device:** small package with extremely wide viewing angle; ideal for backlighting and coupling in light guides
- **color coordinates:**  $x = 0.33$ ,  $y = 0.33$  acc. to CIE 1931 (white)
- **typ. color temperature:** 5600 K
- **color reproduction index:** 80
- **viewing angle:** Lambertian Emitter ( $120^\circ$ )
- **technology:** InGaN
- **optical efficiency:** 10 lm/W
- **grouping parameter:** luminous intensity, color coordinates
- **assembly methods:** suitable for all SMT assembly methods
- **soldering methods:** IR reflow soldering and TTW soldering
- **preconditioning:** acc. to JEDEC Level 2
- **taping:** 8 mm tape with 3000/reel,  $\varnothing 180$  mm or 10000/reel,  $\varnothing 330$  mm
- **ESD-withstand voltage:** up to 2 kV acc. to EOS/ESD-5.1-1993

## Applications

- backlighting (LCD, mobile phones, switches, keys, displays, illuminated advertising)
- optimized coupling into light guides
- signal and symbol luminaire

| Typ             | Emissions-<br>farbe  | Farbe der<br>Lichtaustritts-<br>fläche | Lichtstärke                                                           | Lichtstrom                                                         | Bestellnummer |
|-----------------|----------------------|----------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------|---------------|
| Type            | Color of<br>Emission | Color of the<br>Light Emitting<br>Area | Luminous<br>Intensity<br>$I_F = 20 \text{ mA}$<br>$I_V \text{ (mcd)}$ | Luminous<br>Flux<br>$I_F = 20 \text{ mA}$<br>$\Phi_V \text{ (lm)}$ | Ordering Code |
| LW Y87C-R2S1-35 | white                | colored                                | 140 ... 224                                                           | 550 (typ.)                                                         | Q62703-Q6393  |
| LW Y87C-S2T2-35 |                      | diffused                               | 224 ... 450                                                           | 1000 (typ.)                                                        | Q62703-Q6394  |

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

*Die Standardlieferform von Serientypen beinhaltet eine untere bzw. eine obere Familiengruppe, die aus nur 2 bzw. 3 Halbgruppen besteht. Einzelne Halbgruppen sind nicht erhältlich.  
In einer Verpackungseinheit / Gurt ist immer nur eine Halbgruppe enthalten.*

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 2 or 3 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<br>Parameter                                                                                                                                                  | Symbol<br>Symbol | Wert<br>Value  | Einheit<br>Unit |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------|-----------------|
| Betriebstemperatur<br>Operating temperature range                                                                                                                         | $T_{op}$         | – 40 ... + 100 | °C              |
| Lagertemperatur<br>Storage temperature range                                                                                                                              | $T_{stg}$        | – 40 ... + 100 | °C              |
| Sperrschichttemperatur<br>Junction temperature                                                                                                                            | $T_j$            | + 110          | °C              |
| Durchlassstrom<br>Forward current                                                                                                                                         | $I_F$            | 20             | mA              |
| Stoßstrom<br>Surge current<br>$t \leq 10 \mu s, D = 0.005$                                                                                                                | $I_{FM}$         | 300            | mA              |
| Sperrspannung<br>Reverse voltage                                                                                                                                          | $V_R$            | 5              | V               |
| Leistungsaufnahme<br>Power consumption<br>$T_A \leq 25 \text{ °C}$                                                                                                        | $P_{tot}$        | 85             | mW              |
| Wärmewiderstand<br>Thermal resistance<br>Sperrschicht/Umgebung<br>Junction/ambient                                                                                        | $R_{th JA}$      | 600            | K/W             |
| Sperrschicht/Lötpad<br>Junction/solder point<br>Montage auf PC-Board FR 4 (Padgröße $\geq 5 \text{ mm}^2$ )<br>mounted on PC board FR 4 (pad size $\geq 5 \text{ mm}^2$ ) | $R_{th JS}$      | 350            | K/W             |

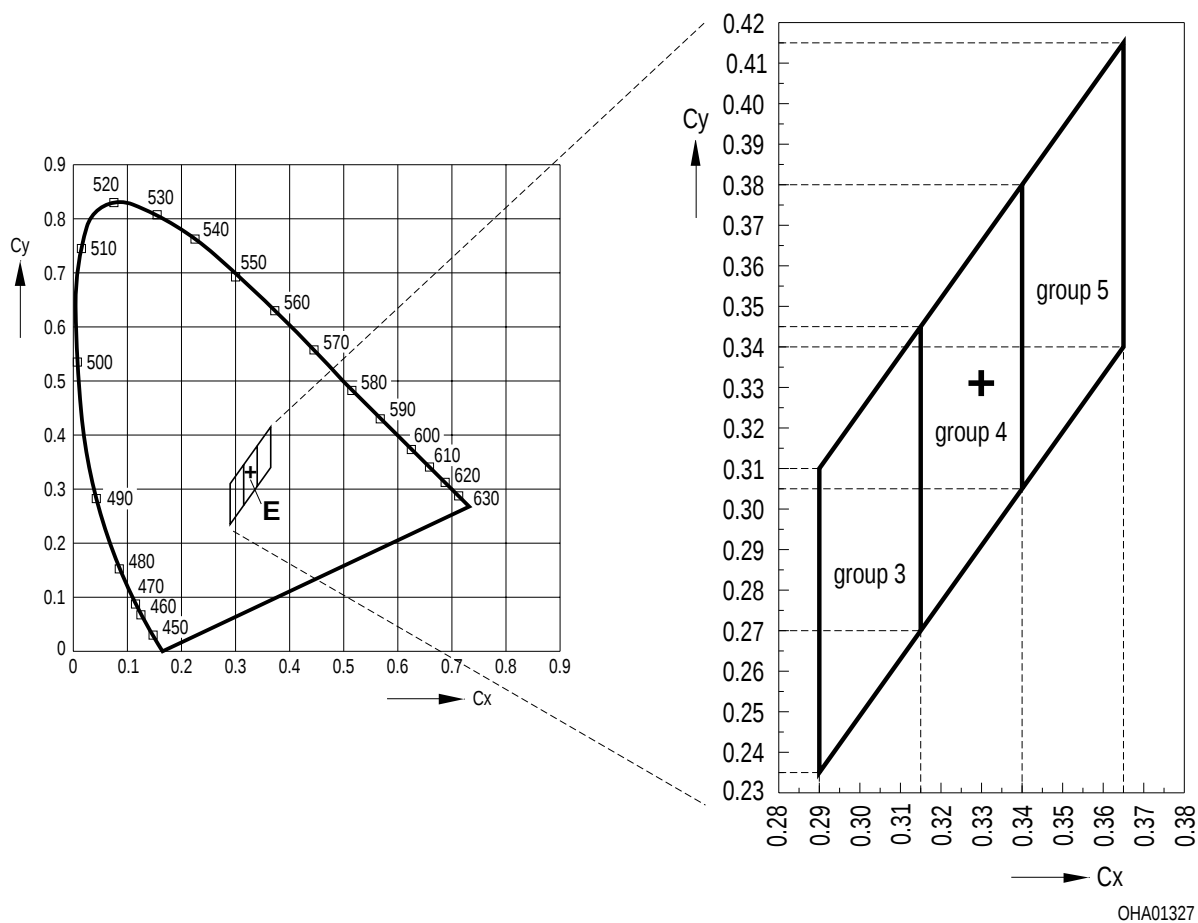
**Kennwerte** ( $T_A = 25\text{ °C}$ )**Characteristics**

| Bezeichnung<br>Parameter                                                                                                                    | Symbol<br>Symbol        | Wert<br>Value     | Einheit<br>Unit    |
|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------|--------------------|
| Farbkoordinate x nach CIE 1931 <sup>1)</sup> (typ.)<br>Chromaticity coordinate x acc. to CIE 1931<br>$I_F = 20\text{ mA}$                   | x                       | 0.33              | –                  |
| Farbkoordinate y nach CIE 1931 <sup>1)</sup> (typ.)<br>Chromaticity coordinate y acc. to CIE 1931<br>$I_F = 20\text{ mA}$                   | y                       | 0.33              | –                  |
| Abstrahlwinkel bei 50 % $I_V$ (Vollwinkel) (typ.)<br>Viewing angle at 50 % $I_V$                                                            | 2φ                      | 120               | Grad<br>deg.       |
| Durchlassspannung <sup>2)</sup> (min.)<br>Forward voltage (typ.)<br>$I_F = 20\text{ mA}$ (max.)                                             | $V_F$<br>$V_F$<br>$V_F$ | 3.0<br>3.6<br>4.1 | V<br>V<br>V        |
| Sperrstrom (typ.)<br>Reverse current (max.)<br>$V_R = 5\text{ V}$                                                                           | $I_R$<br>$I_R$          | 0.01<br>10        | μA<br>μA           |
| Temperaturkoeffizient von x (typ.)<br>Temperature coefficient of x<br>$I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$         | $TC_x$                  | – 0.1             | $10^{-3}/\text{K}$ |
| Temperaturkoeffizient von y (typ.)<br>Temperature coefficient of y<br>$I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$         | $TC_y$                  | – 0.2             | $10^{-3}/\text{K}$ |
| Temperaturkoeffizient von $V_F$ (typ.)<br>Temperature coefficient of $V_F$<br>$I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$ | $TC_V$                  | – 3.0             | mV/K               |
| Optischer Wirkungsgrad (typ.)<br>Optical efficiency<br>$I_F = 20\text{ mA}$                                                                 | $\eta_{\text{opt}}$     | 10                | lm/W               |

<sup>1)</sup> Farbortgruppen werden mit einer Stromeinprägedauer von 25 ms und einer Genauigkeit von  $\pm 0,01$  ermittelt.  
Chromaticity coordinate groups are tested at a current pulse duration of 25 ms and a tolerance of  $\pm 0.01$ .

<sup>2)</sup> Durchlassspannungsgruppen werden mit einer Stromeinprägedauer von 1 ms und einer Genauigkeit von  $\pm 0,05\text{ V}$  ermittelt.  
Forward voltage groups are tested at a current pulse duration of 1 ms and a tolerance of  $\pm 0.05\text{ V}$ .

1) **Farbortgruppen**  
**Chromaticity coordinate groups**



### Helligkeits-Gruppierungsschema Luminous Intensity Groups

| Lichtgruppe<br>Luminous Intensity Group | Lichtstärke<br>Luminous Intensity<br>$I_v$ (mcd) | Lichtstrom<br>Luminous Flux<br>$\Phi_v$ (lm) |
|-----------------------------------------|--------------------------------------------------|----------------------------------------------|
| R2                                      | 140 ... 180                                      | 480 (typ.)                                   |
| S1                                      | 180 ... 224                                      | 600 (typ.)                                   |
| S2                                      | 224 ... 280                                      | 760 (typ.)                                   |
| T1                                      | 280 ... 355                                      | 950 (typ.)                                   |
| T2                                      | 355 ... 450                                      | 1200 (typ.)                                  |

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  $\pm 11\%$ .

### Gruppenbezeichnung auf Etikett Group Name on Label

Beispiel: S2-4

Example: S2-4

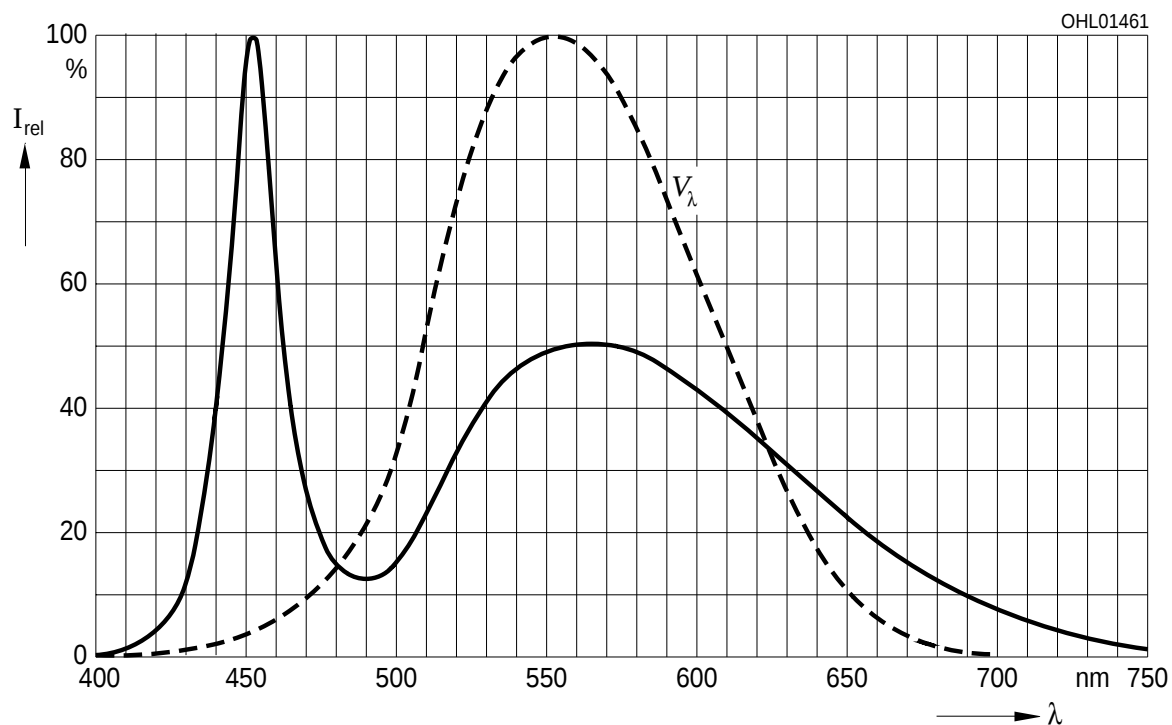
| Lichtgruppe<br>Luminous Intensity Group | Halbgruppe<br>Half Group | Farbortgruppe<br>Chromaticity Coordinate Group |
|-----------------------------------------|--------------------------|------------------------------------------------|
| S                                       | 2                        | 4                                              |

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

### Relative Spectral Emission

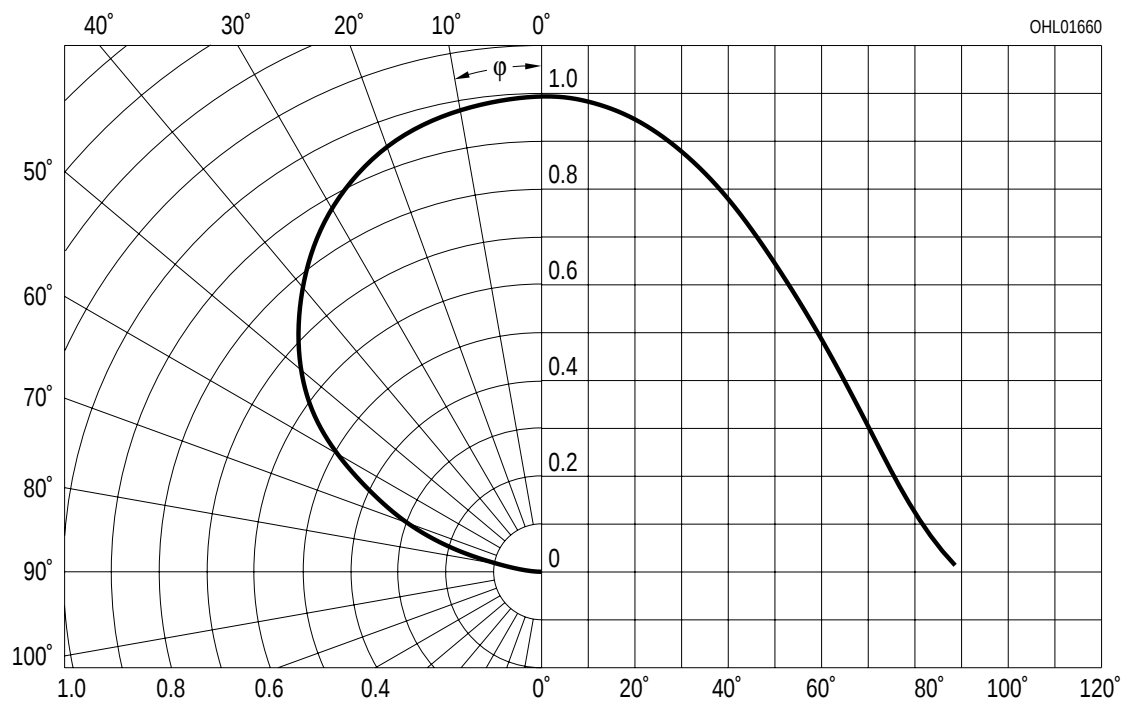
$V(\lambda)$  = spektrale Augenempfindlichkeit

Standard eye response curve



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

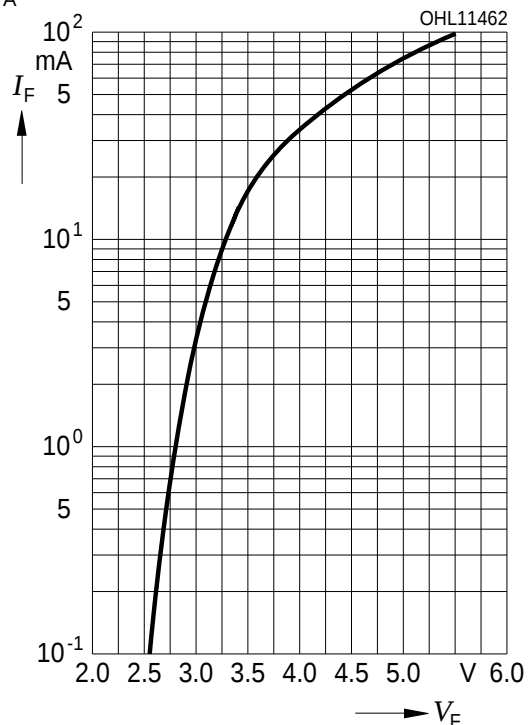
### Radiation Characteristic



Durchlassstrom  $I_F = f(V_F)$

Forward Current

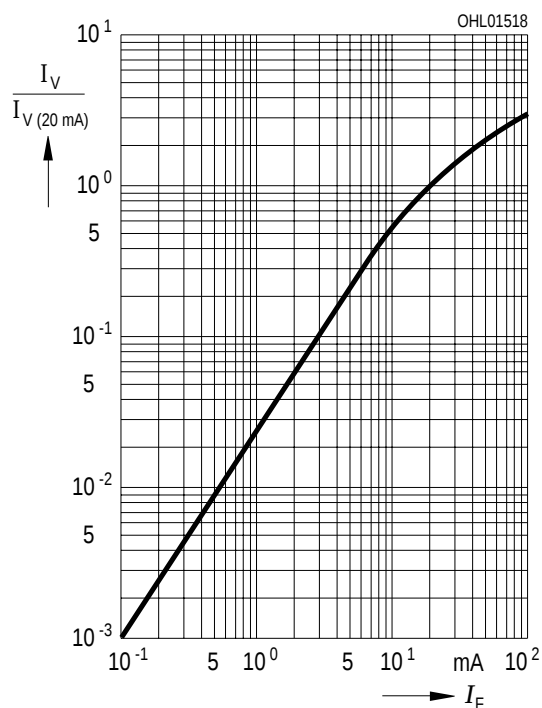
$T_A = 25\text{ °C}$



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

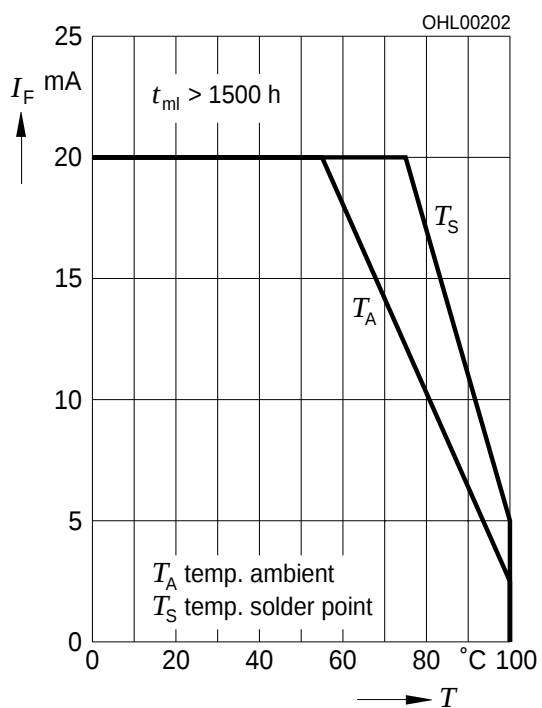
Relative Luminous Intensity

$T_A = 25\text{ °C}$



Maximal zulässiger Durchlassstrom  $I_F = f(T)$

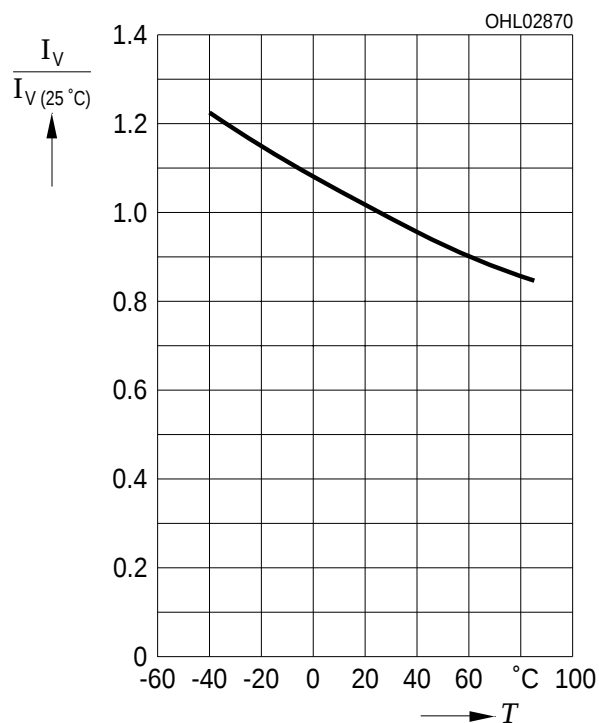
Max. Permissible Forward Current

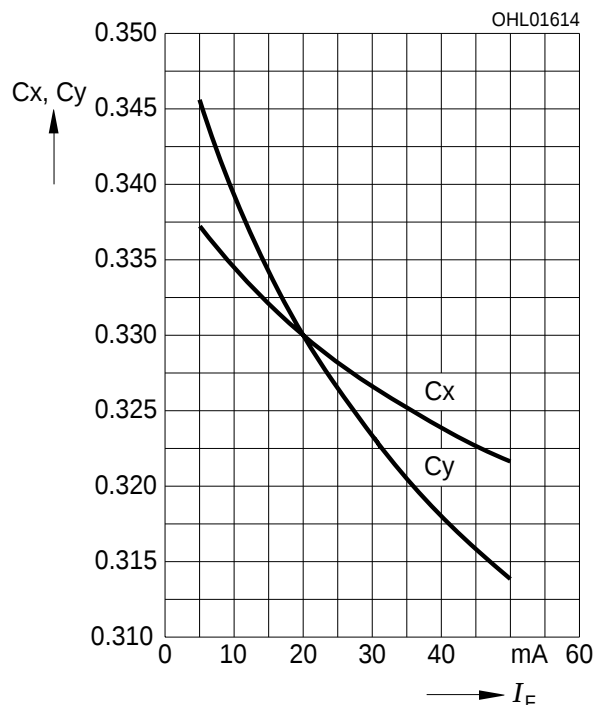
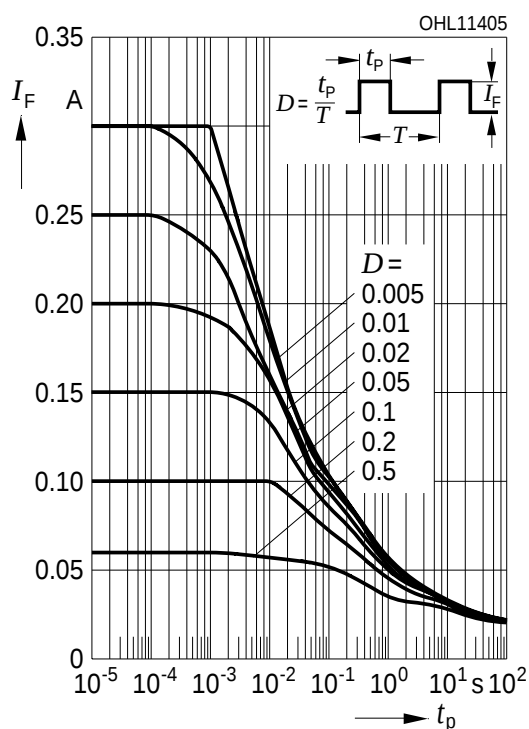
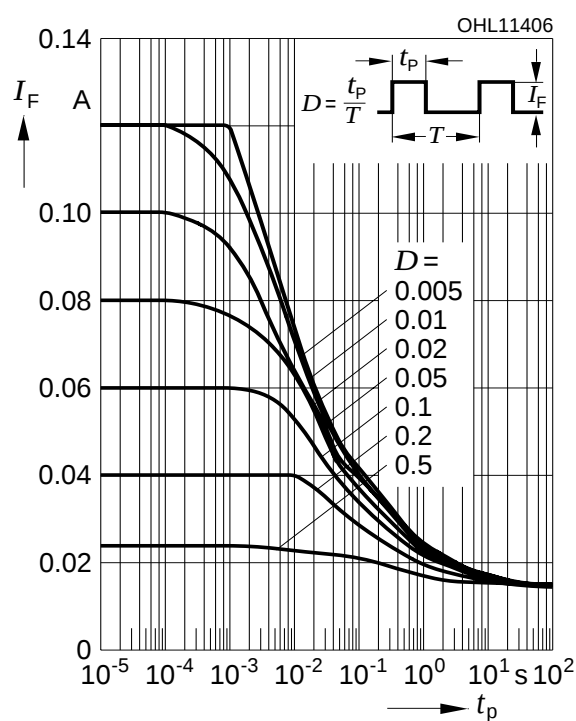


Relative Lichtstärke  $I_V/I_{V(25\text{ °C})} = f(T_A)$

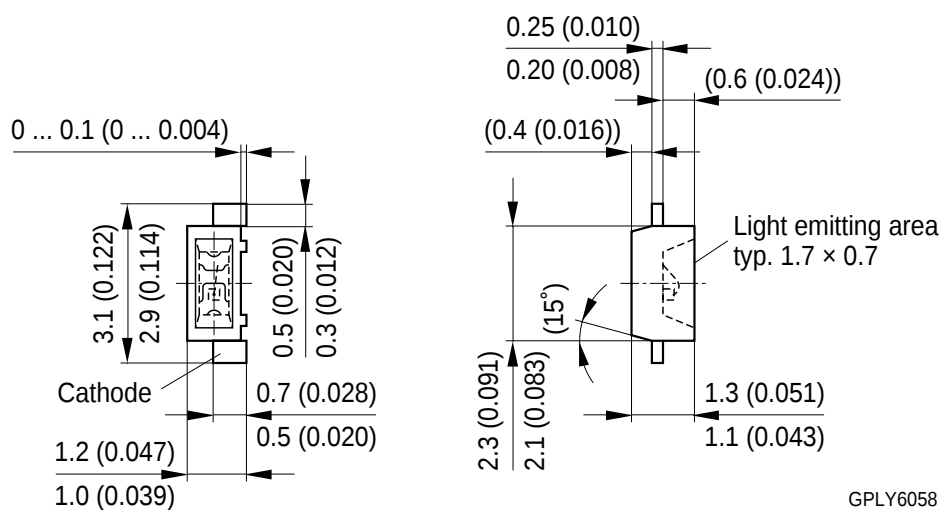
Relative Luminous Intensity

$I_F = 20\text{ mA}$



**Farbortverschiebung  $x, y = f(I_F)$** **Chromaticity Coordinate Shift** $T_A = 25\text{ °C}$ **Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$** **Permissible Pulse Handling Capability**Duty cycle  $D =$  parameter,  $T_A = 25\text{ °C}$ **Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$** **Permissible Pulse Handling Capability**Duty cycle  $D =$  parameter,  $T_A = 85\text{ °C}$ 

## Maßzeichnung Package Outlines

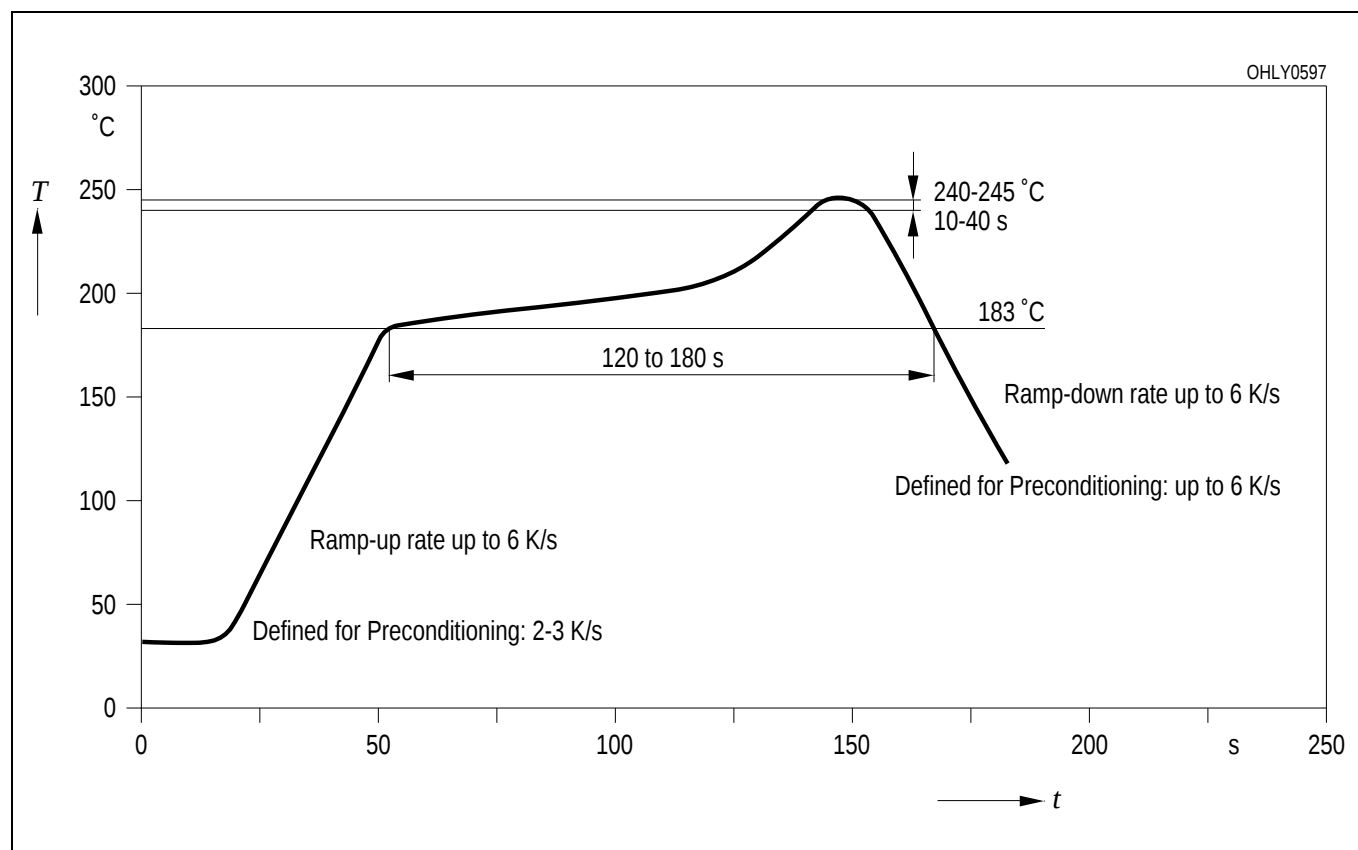


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

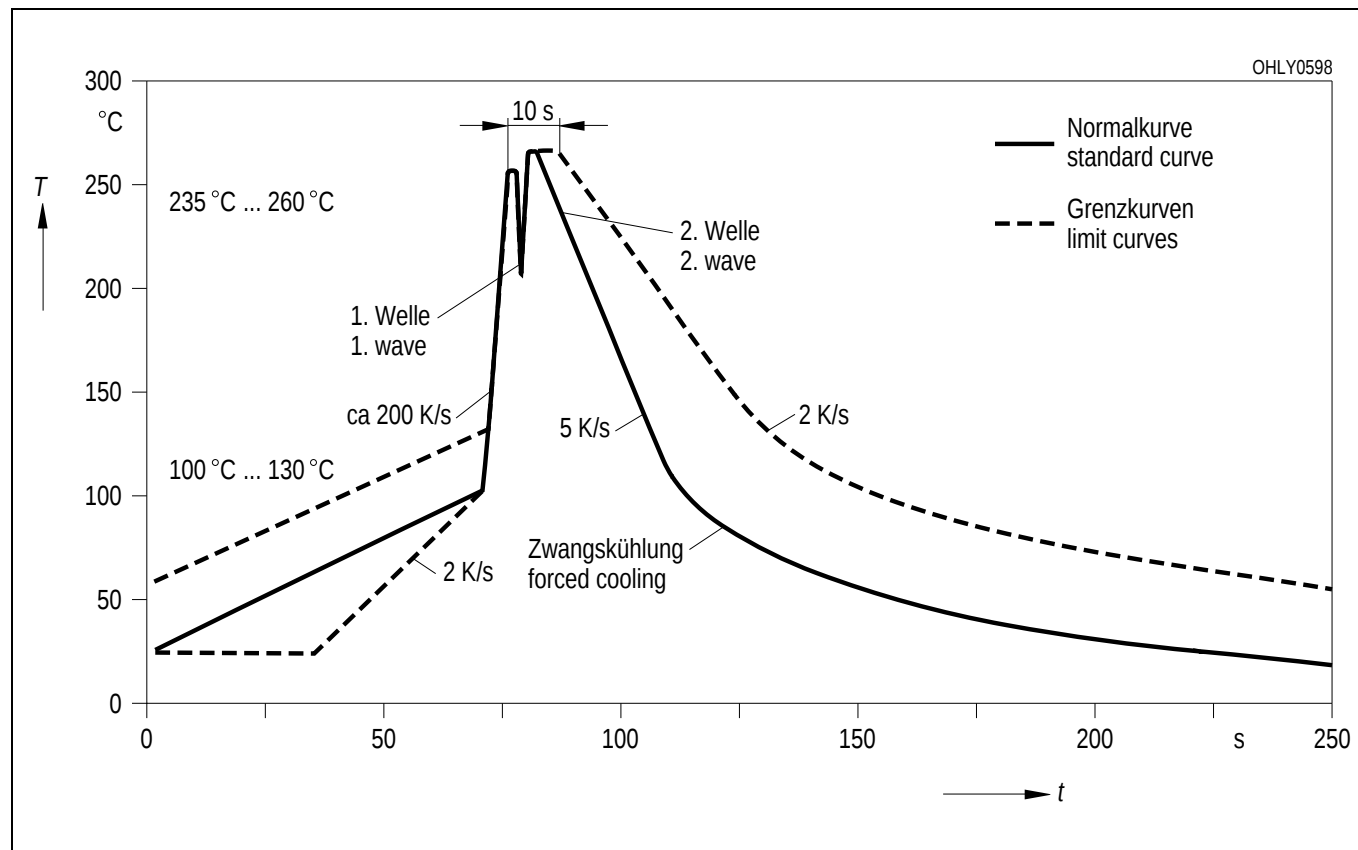
**Gewicht / Approx. weight:** 6 mg

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

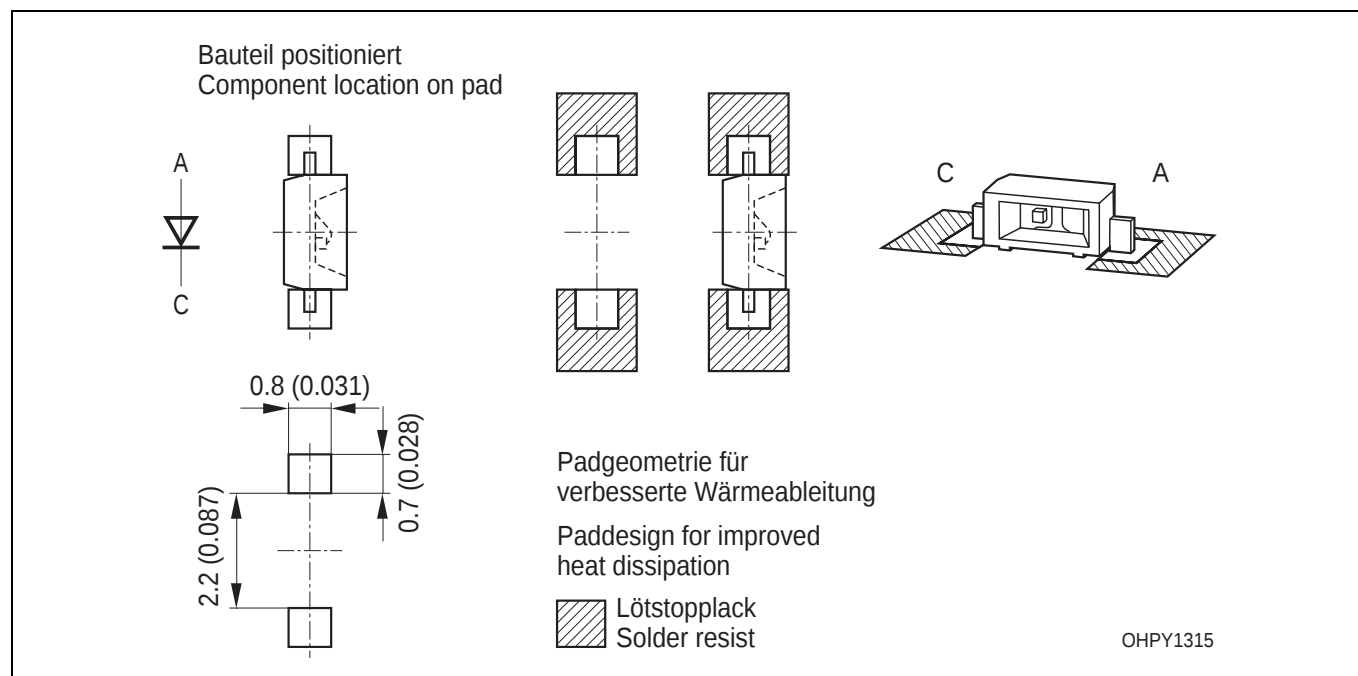
**IR-Reflow Lötprofil** (nach IPC 9501)  
**IR Reflow Soldering Profile** (acc. to IPC 9501)



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



**Empfohlenes Lötpaddesign** IR Reflow Löten  
**Recommended Solder Pad** IR Reflow Soldering



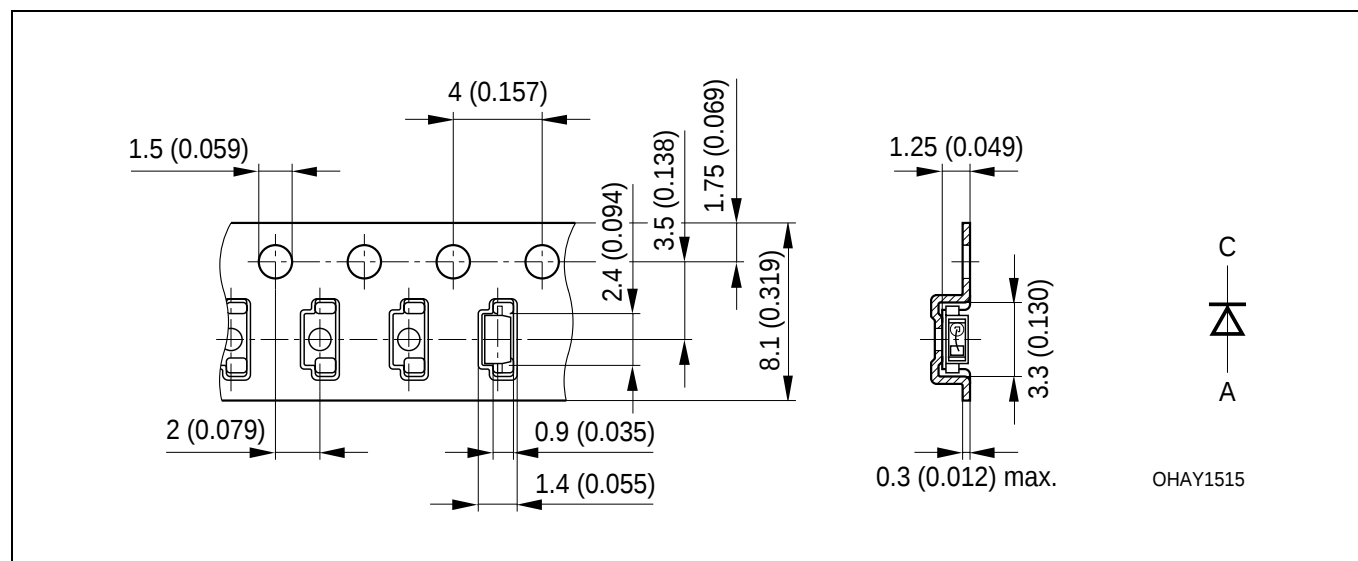
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).  
 Gehäuse für Wellenlöten (TTW) geeignet / Package suitable for TTW-soldering

### Gurtung / Polarität und Lage

Verpackungseinheit 3000/Rolle, ø180 mm  
 oder 10000/Rolle, ø330 mm

### Method of Taping / Polarity and Orientation

Packing unit 3000/reel, ø180 mm  
 or 10000/reel, ø330 mm



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

**Revision History: 2002-04-05**

Previous Version: 2002-04-03

| Page | Subjects (major changes since last revision)                               |
|------|----------------------------------------------------------------------------|
| 2    | luminous intensity grouping                                                |
| 4    | optical efficiency                                                         |
| 4    | forward voltage                                                            |
| 8    | max. permissible forward current                                           |
| 3    | power consumption from 90 mW to 85 mW                                      |
| 8    | diagram luminous intensity from OHL01462 to OHL11462                       |
| 8    | diagram relative luminous intensity OHL01637 to OHL02870                   |
| 9    | new diagrams OHL11405 and OHL11406 (permissible pulse handling capability) |
| 2    | wavelength grouping for white                                              |
| 3    | surge current from t.b.d. to 300mA                                         |
| 3    | pad size from 16 mm <sup>2</sup> to 5 mm <sup>2</sup>                      |
|      |                                                                            |
|      |                                                                            |

**Patent List****Patent No.**

US 6 066 861, US 6 277 301

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