

## 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>$\Phi_V \text{ (mlm)}$ | Ordering Code |
| LW Y87C-S1T1-3C5D | white                | colored                                | 180 ... 355                                                           | 800 (typ.)                                                          | Q65110A0573   |
| LW Y87C-T1U1-3C5D |                      | diffused                               | 280 ... 560                                                           | 1250 (typ.)                                                         | Q65110A0574   |
| LW Y87C-S1T1-2C5D | white                | colored                                | 180 ... 355                                                           | 800 (typ.)                                                          | on request    |
| LW Y87C-T1U1-2C5D |                      | diffused                               | 280 ... 560                                                           | 1250 (typ.)                                                         | on request    |

Anm.: -2C5D 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: -2C5D 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 <sup>1)</sup><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<br>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 $\geq 5 \text{ mm}^2$ ) | $R_{th JA}$<br><br>$R_{th JS}$ | 600<br><br>350 | K/W<br><br>K/W  |

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

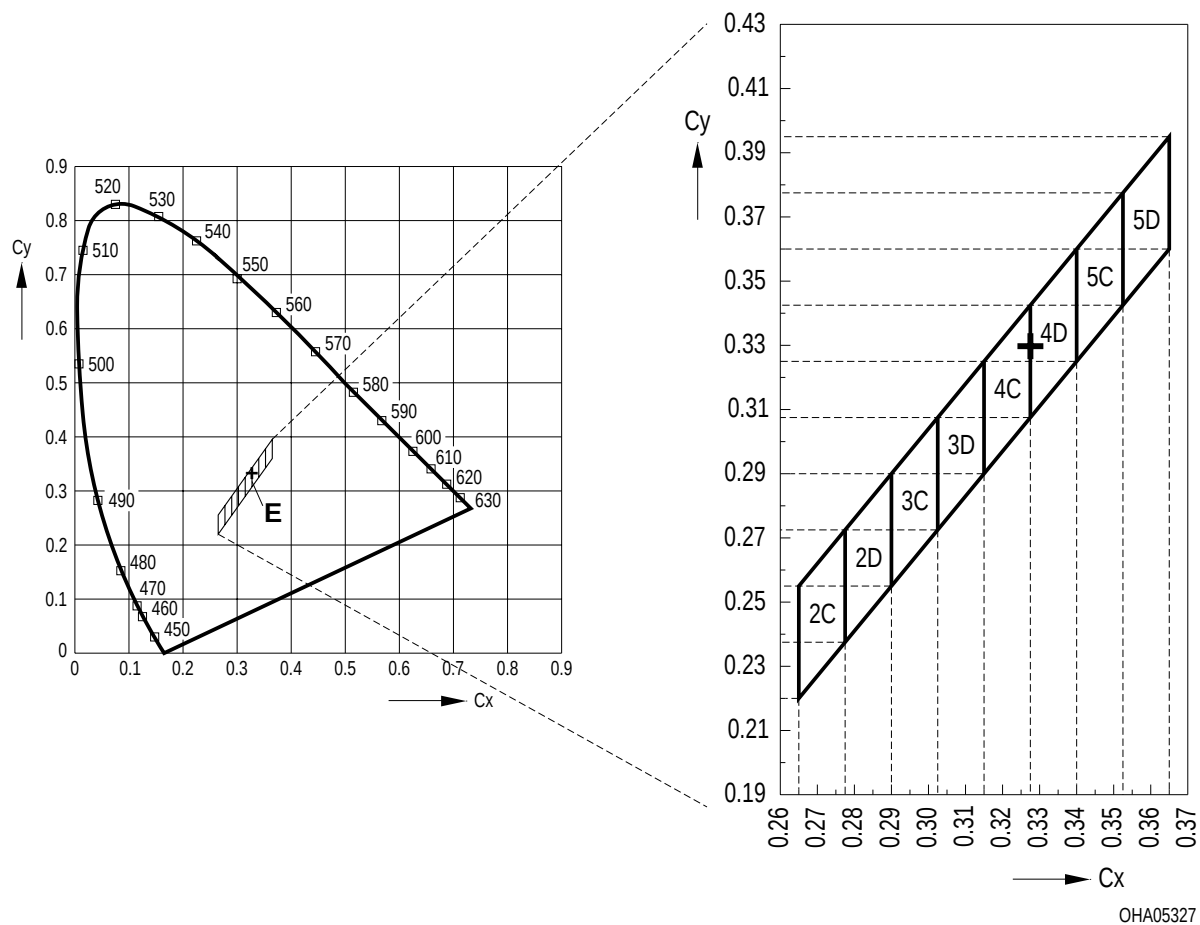
**Kennwerte** ( $T_A = 25\text{ °C}$ )**Characteristics**

| 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 Stromeinprägungsdauer 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 Stromeinprägungsdauer 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) |
|-----------------------------------------|--------------------------------------------------|----------------------------------------------|
| S1                                      | 180 ... 224                                      | 600 (typ.)                                   |
| S2                                      | 224 ... 280                                      | 760 (typ.)                                   |
| T1                                      | 280 ... 355                                      | 950 (typ.)                                   |
| T2                                      | 355 ... 450                                      | 1200 (typ.)                                  |
| U1                                      | 450 ... 560                                      | 1500 (typ.)                                  |
| U2                                      | 560 ... 710                                      | 1900 (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: S2-4D

Example: S2-4D

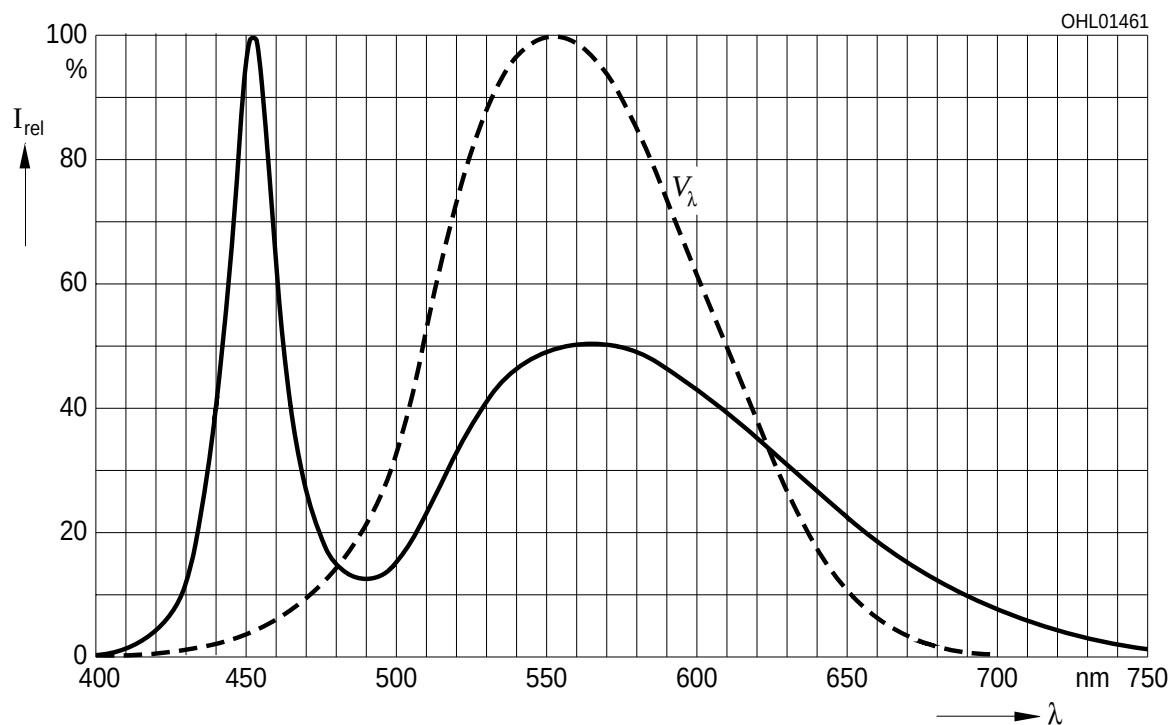
| Lichtgruppe<br>Luminous Intensity Group | Halbgruppe<br>Half Group | Farbortgruppe<br>Chromaticity Coordinate Group |
|-----------------------------------------|--------------------------|------------------------------------------------|
| S                                       | 2               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

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

### Relative Spectral Emission

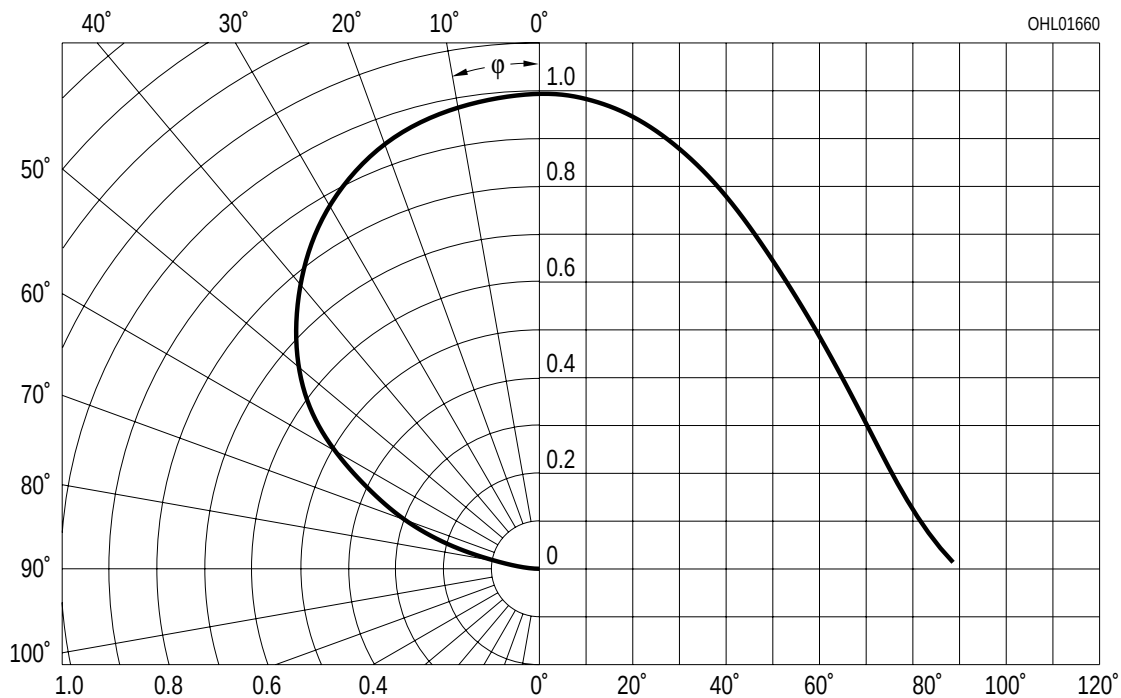
$V(\lambda)$  = spektrale Augenempfindlichkeit

Standard eye response curve



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

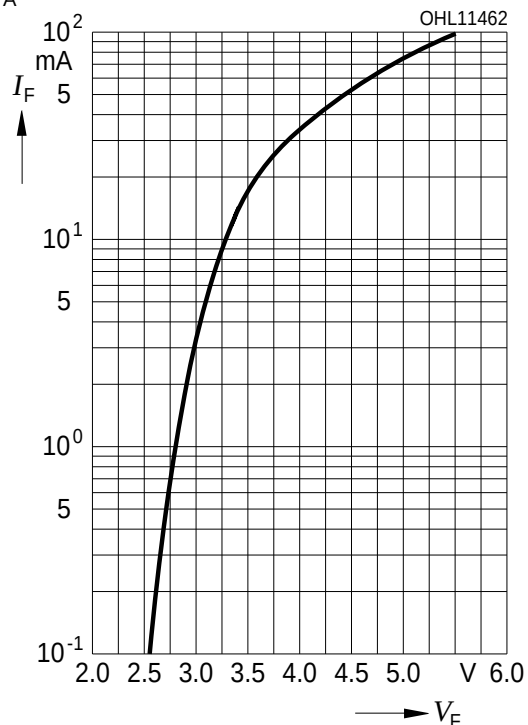
### Radiation Characteristic



Durchlassstrom  $I_F = f(V_F)$

Forward Current

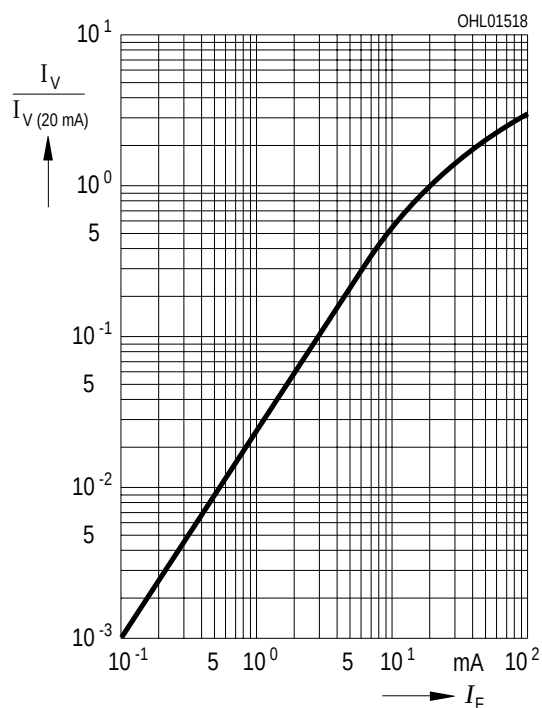
$T_A = 25\text{ °C}$



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

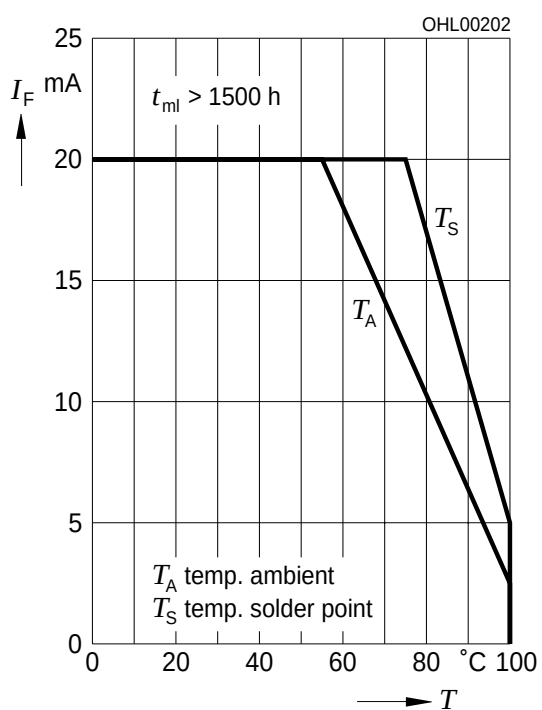
Relative Luminous Intensity

$T_A = 25\text{ °C}$



Maximal zulässiger Durchlassstrom  $I_F = f(T)$

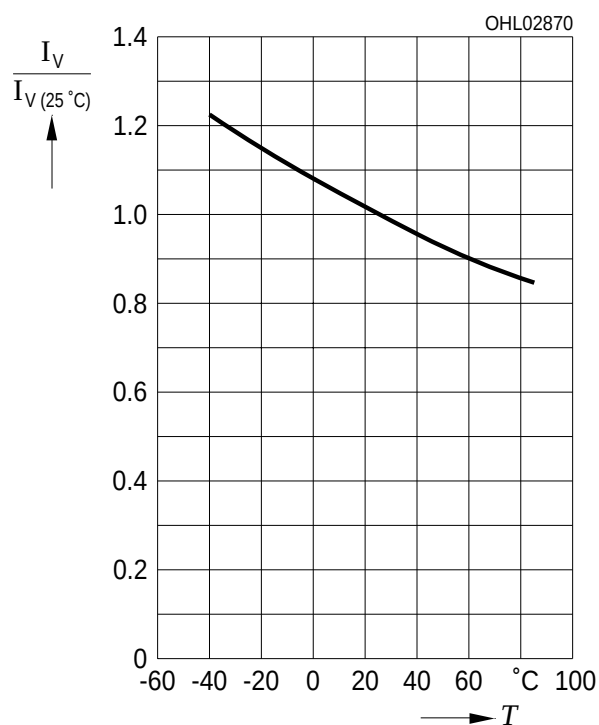
Max. Permissible Forward Current



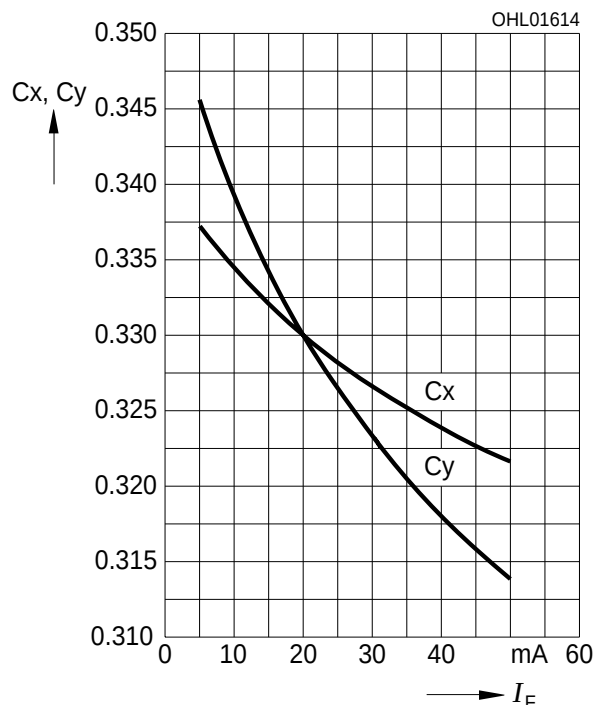
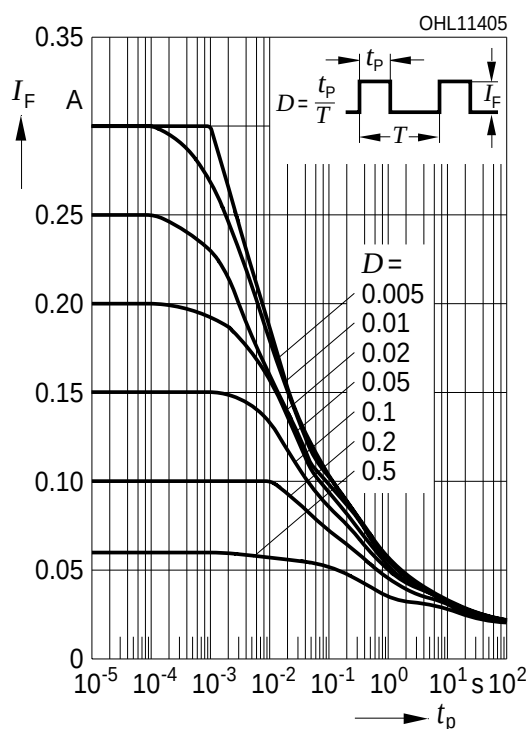
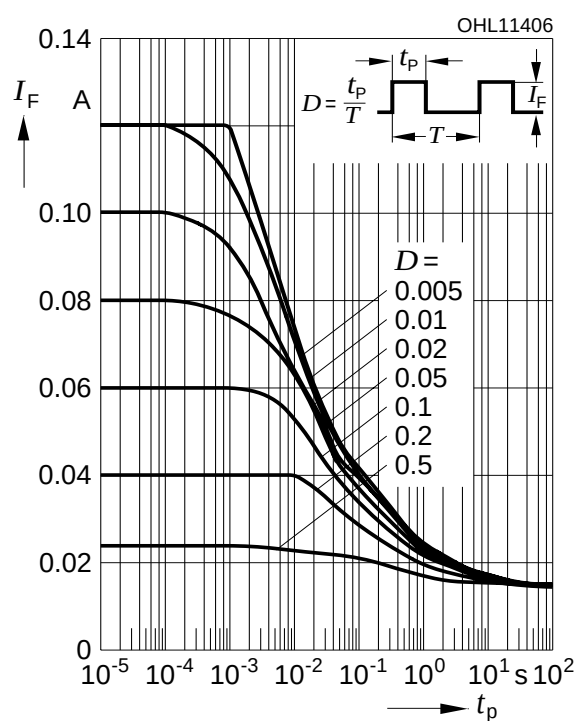
Relative Lichtstärke  $I_V/I_{V(25\text{ °C})} = f(T_A)$

Relative Luminous Intensity

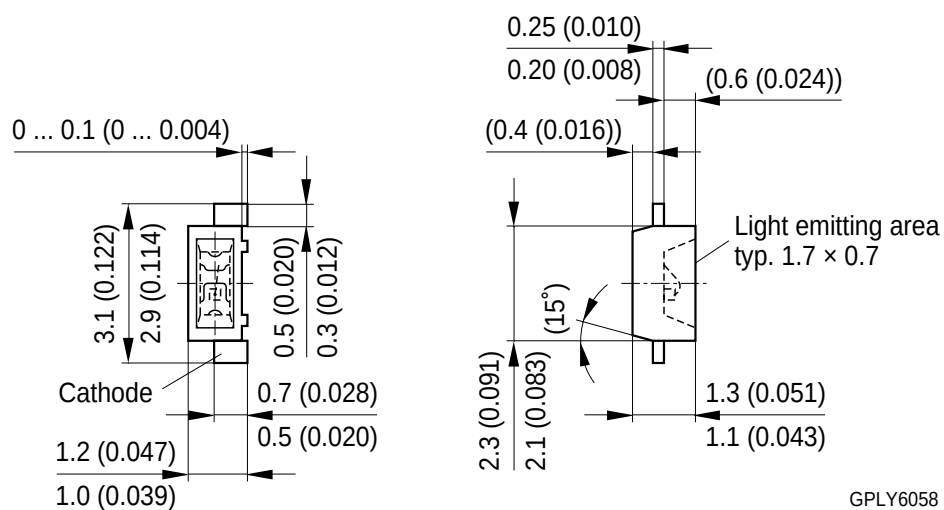
$I_F = 20\text{ mA}$





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

## Maßzeichnung Package Outlines

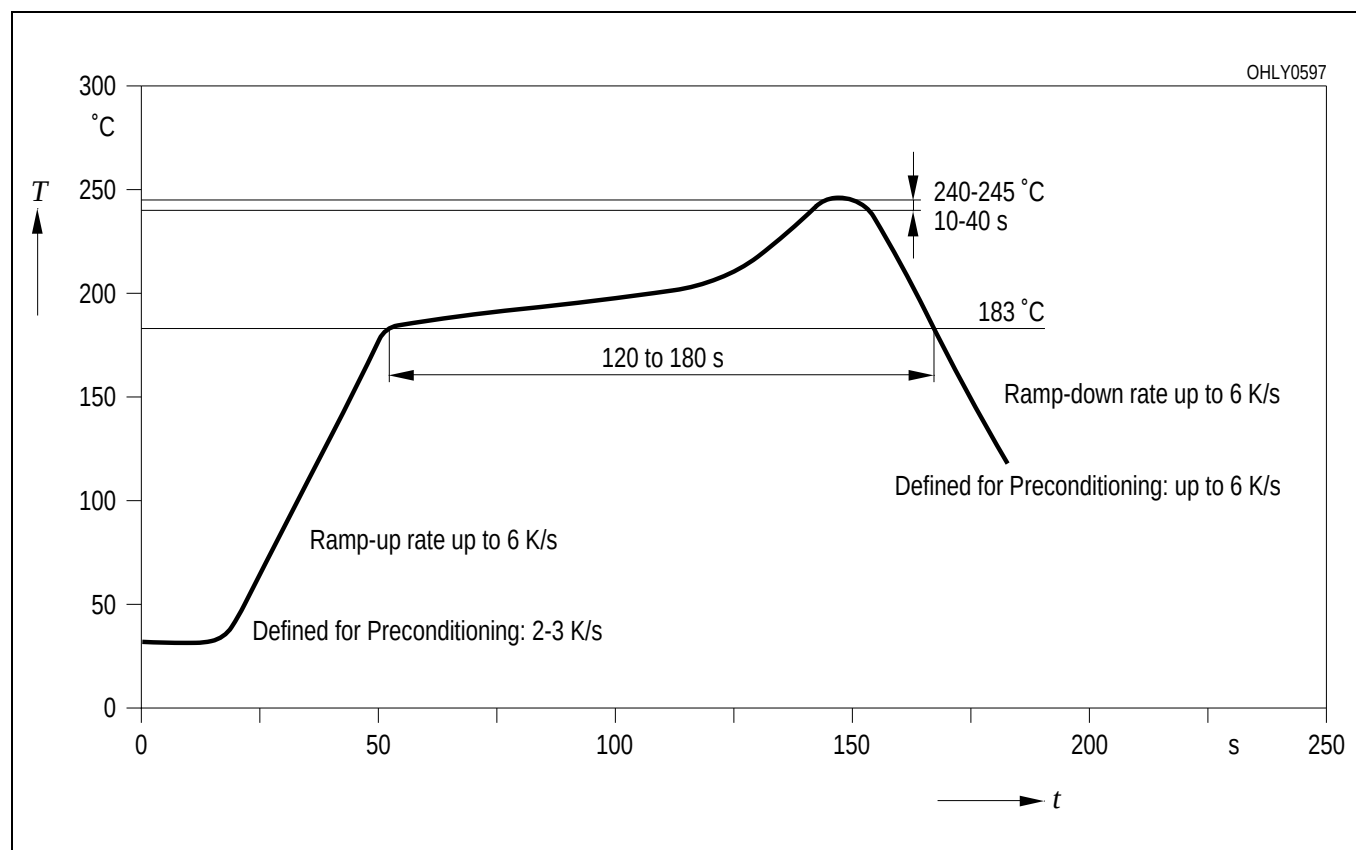


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

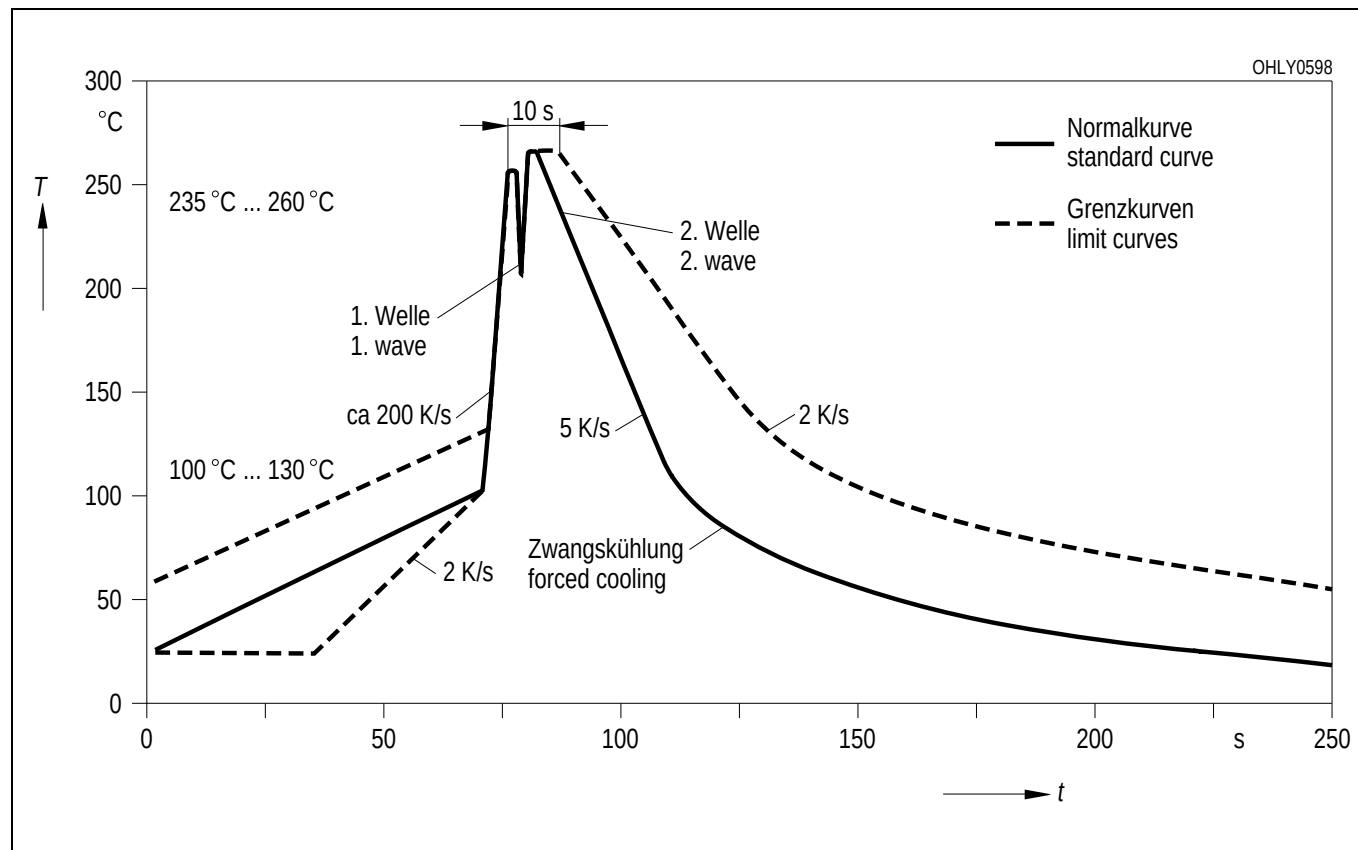
**Gewicht / Approx. weight:** 6 mg

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

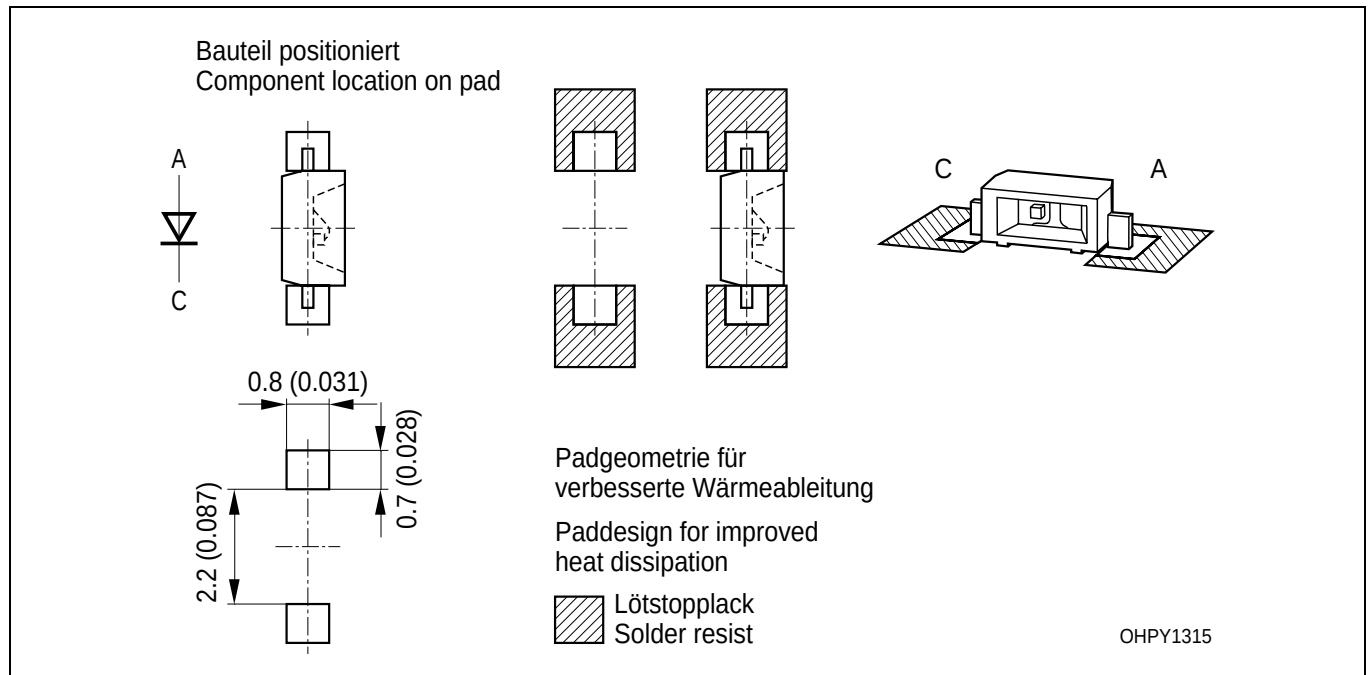
**IR-Reflow Lötprofil** (nach IPC 9501)  
**IR Reflow Soldering Profile** (acc. to IPC 9501)



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



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



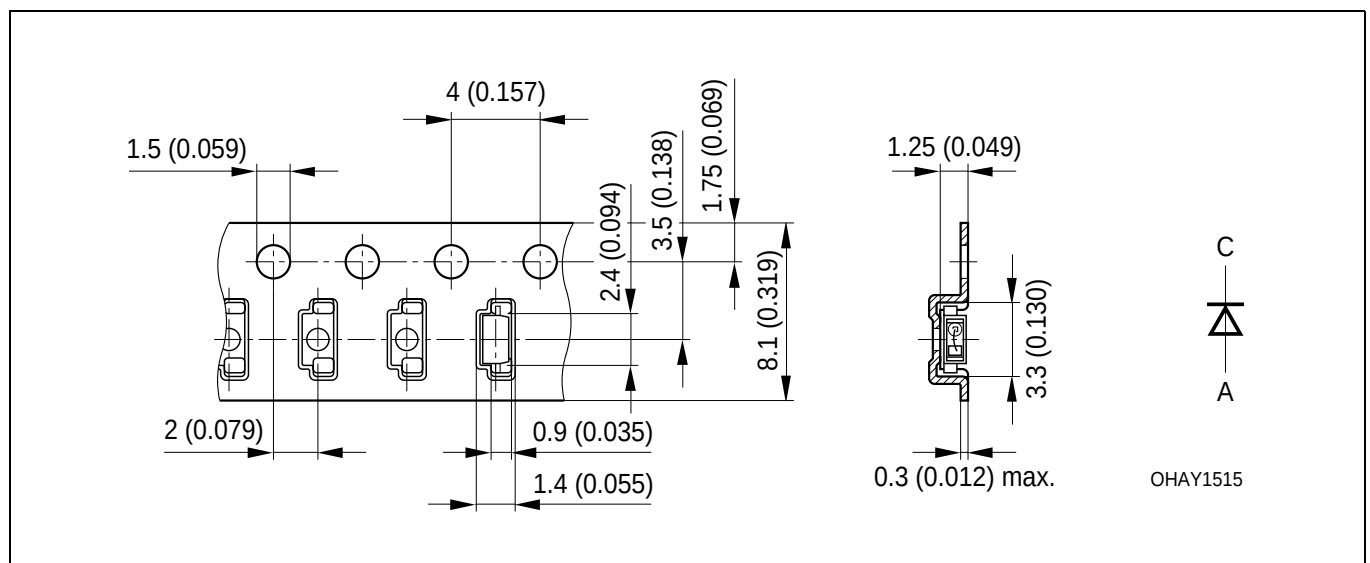
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).  
 Gehäuse hält TTW-Löthitze aus / Package able to withstand TTW-soldering heat

### 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: 2003-03-04 |                                                                            | Date of change |
|------------------------------|----------------------------------------------------------------------------|----------------|
| Previous Version: 2002-11-18 |                                                                            |                |
| 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>                      |                |
| 14                           | annotations                                                                | 2002-07-25     |
| 3                            | reverse voltage (footnote)                                                 | 2002-08-21     |
| 2, 5                         | new luminous intensity groups and new ordering codes                       | 2002-10-25     |
| 2, 5                         | Chromaticity coordinate groups                                             | 2002-11-18     |
| 14                           | new patent no.                                                             | 2003-03-04     |

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**Patent List**

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**Patent No.**

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US 6 066 861, US 6 277 301, US 6 245 259

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All typical data and graphs are basing on representative samples, but don't represent the production range. If requested, e.g. because of technical improvements, these typ. data will be changed without any further notice.

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