

# Mini SIDELED®

## LS C870, LO C870, LY C870, LG C870, LP C870



**Nicht für Neuentwicklungen - wird durch Micro SIDELED ersetzt werden**  
**Not for new designs - will be replaced by Micro SIDELED**

### Besondere Merkmale

- **Gehäusetyp:** weißes SMT-Gehäuse
- **Besonderheit des Bauteils:** kleine Bauform mit extrem breiter Abstrahlcharakteristik; ideal für Einkopplungen in Lichtleiter
- **Wellenlänge:** 628 nm (super-rot), 606 nm (orange), 587 nm (gelb), 570 nm (grün), 560 nm (pure green)
- **Abstrahlwinkel:** Lambertischer Strahler (120°)
- **Technologie:** GaAlP (super-rot, orange, gelb, grün), GaP (pure green)
- **optischer Wirkungsgrad:** 1,5 lm/W (super-rot, orange, gelb), 2,5 lm/W (grün), 0,6 lm/W (pure green)
- **Gruppierungsparameter:** Lichtstärke, Wellenlänge
- **Verarbeitungsmethode:** für alle SMT-Bestücktechniken geeignet
- **Lötmethode:** IR Reflow Löten
- **Vorbehandlung:** nach JEDEC Level 2
- **Gurtung:** 12-mm Gurt mit 2500/Rolle, ø180 mm oder 10000/Rolle, ø330 mm

### Anwendungen

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

### Features

- **package:** white SMT package
- **feature of the device:** small package with extremely wide viewing angle; ideal for coupling in light guides
- **wavelength:** 628 nm (super-red), 606 nm (orange), 587 nm (yellow), 570 nm (green), 560 nm (pure green)
- **viewing angle:** Lambertian Emitter (120°)
- **technology:** GaAlP (super-red, orange, yellow, green), GaP (pure green)
- **optical efficiency:** 1.5 lm/W (super-red, orange, yellow), 2.5 lm/W (green), 0.6 lm/W (pure green)
- **grouping parameter:** luminous intensity, wavelength
- **assembly methods:** suitable for all SMT assembly methods
- **soldering methods:** IR reflow soldering
- **preconditioning:** acc. to JEDEC Level 2
- **taping:** 12-mm tape with 2500/reel, ø180 mm or 10000/reel, ø330 mm

### Applications

- optical indicators
- backlighting (LCD, cellular phones, switches, keys, displays, illuminated advertising, general lighting)
- marker lights (e.g. steps, exit ways, etc.)
- Interior automotive lighting (e.g. dashboard backlighting, etc.)
- coupling into light guides

## LS C870, LO C870, LY C870, LG C870, LP C870

| 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>$I_F = 10 \text{ mA}$<br>$I_V \text{ (mcd)}$ | Luminous<br>Flux<br>$I_F = 10 \text{ mA}$<br>$\Phi_V \text{ (mlm)}$ | Ordering Code |
| ■ LS C870-H2J2-1  | super-red            | colorless clear                        | 3.55 ... 7.10   | 15 (typ.)   | Q62703Q5079   |
| ■ LS C870-J2L1-1  |                      |  | 5.60 ... 14.00  | 28 (typ.)   | Q62703Q5080   |
| ■ LO C870-H2J2-24 | orange               | colorless clear                        | 3.55 ... 7.10   | 15 (typ.)   | Q62703Q5034   |
| ■ LO C870-J2L1-24 |                      |  | 5.60 ... 14.00  | 28 (typ.)   | Q62703Q5035   |
| ■ LY C870-H2J2-26 | yellow               | colorless clear                        | 3.55 ... 7.10   | 15 (typ.)   | Q62703Q5115   |
| ■ LY C870-J2L1-26 |                      |  | 5.60 ... 14.00  | 28 (typ.)   | Q62703Q5116   |
| ■ LG C870-J2K2-1  | green                | colorless clear                        | 5.60 ... 11.20  | 25 (typ.)   | Q62703Q5004   |
| ■ LG C870-K2M1-1  |                      |  | 9.00 ... 22.40  | 45 (typ.)   | Q62703Q5005   |
| ■ LP C870-F2G2-1  | pure green           | colorless clear                        | 1.40 ... 2.80   | 6.0 (typ.)  | Q62703Q5058   |
| ■ LP C870-G2J1-1  |                      |  | 2.24 ... 5.60   | 11.0 (typ.)   | Q62703Q5059   |

■ Nicht für Neuentwicklungen/ Not for new designs

*Anm.:* -1 gesamter Farbbereich (siehe **Seite 4**)

-24 gesamter Farbbereich, Lieferung in Einzelgruppen (siehe **Seite 5**)

-26 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:* -1 Total color tolerance range (please see **page 4**)

-24 Total color tolerance range, delivery in single groups (please see **page 5**)

-26 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<br>Parameter  | Symbol<br>Symbol | Wert<br>Value     |    | Einheit<br>Unit |
|---|------------------|-------------------|----|-----------------|
|   |                  | LS, LO,<br>LY, LG | LP |                 |
| Betriebstemperatur<br>Operating temperature range   | $T_{op}$         | - 40 ... + 100    |    | °C              |
| Lagertemperatur<br>Storage temperature range  | $T_{stg}$        | - 40 ... + 100    |    | °C              |
| Sperrschichttemperatur<br>Junction temperature  | $T_j$            | + 100             |    | °C              |
| Durchlassstrom<br>Forward current   | $I_F$            | 30                |    | mA              |
| Stoßstrom<br>Surge current<br>$t \leq 10 \mu s, D = 0.005$  | $I_{FM}$         | 0.5               |    | A               |
| Sperrspannung <sup>1)</sup><br>Reverse voltage  | $V_R$            | 12                |    | V               |
| Leistungsaufnahme<br>Power consumption  | $P_{tot}$        | 95                | 90 | mW              |
| Wärmewiderstand<br>Thermal resistance<br>Sperrschicht/Umgebung<br>Junction/ambient  | $R_{th JA}$      | 530               |    | K/W             |
| Sperrschicht/Löt看垫<br>Junction/soldering point<br>Montage auf PC-Board FR4 (Padgröße $\geq 5 \text{ mm}^2$ )<br>mounted on PC board FR4 (pad size $\geq 5 \text{ mm}^2$ ) | $R_{th JS}$      | 250               |    | 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                |
|--|-------------------------------------|----------------|--------------|--------------|----------------|----------------|--------------------------------|
|  |                                     | LS             | LO           | LY           | LG             | LP             |                                |
| Wellenlänge des emittierten Lichtes<br>Wavelength at peak emission<br>$I_F = 10\text{ mA}$   | (typ.) $\lambda_{\text{peak}}$      | 635            | 610          | 586          | 572            | 557            | nm                             |
| Dominantwellenlänge <sup>1)</sup><br>Dominant wavelength <sup>1)</sup><br>$I_F = 10\text{ mA}$   | (typ.) $\lambda_{\text{dom}}$       | 628<br>$\pm 6$ | 606<br>-6/+3 | 587<br>-7/+8 | 570<br>$\pm 6$ | 560<br>$\pm 6$ | nm                             |
| Spektrale Bandbreite bei 50 % $I_{\text{rel max}}$<br>Spectral bandwidth at 50 % $I_{\text{rel max}}$<br>$I_F = 10\text{ mA}$  | (typ.) $\Delta\lambda$              | 45             | 40           | 45           | 25             | 22             | nm                             |
| Abstrahlwinkel bei 50 % $I_V$ (Vollwinkel)<br>Viewing angle at 50 % $I_V$  | (typ.) $2\phi$                      | 120            | 120          | 120          | 120            | 120            | Grad<br>deg.                   |
| Durchlassspannung <sup>2)</sup><br>Forward voltage <sup>2)</sup><br>$I_F = 10\text{ mA}$   | (typ.) $V_F$<br>(max.) $V_F$        | 2.0<br>2.5     | 2.0<br>2.5   | 2.0<br>2.5   | 2.0<br>2.5     | 2.0<br>2.5     | V<br>V                         |
| Sperrstrom<br>Reverse current<br>$V_R = 12\text{ V}$   | (typ.) $I_R$<br>(max.) $I_R$        | 0.01<br>10     | 0.01<br>10   | 0.01<br>10   | 0.01<br>10     | 0.01<br>10     | $\mu\text{A}$<br>$\mu\text{A}$ |
| Temperaturkoeffizient von $\lambda_{\text{peak}}$<br>Temperature coefficient of $\lambda_{\text{peak}}$<br>$I_F = 10\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$ | (typ.) $TC_{\lambda_{\text{peak}}}$ | 0.11           | 0.12         | 0.10         | 0.11           | 0.11           | nm/K                           |
| Temperaturkoeffizient von $\lambda_{\text{dom}}$<br>Temperature coefficient of $\lambda_{\text{dom}}$<br>$I_F = 10\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$   | (typ.) $TC_{\lambda_{\text{dom}}}$  | 0.07           | 0.07         | 0.07         | 0.07           | 0.05           | nm/K                           |
| Temperaturkoeffizient von $V_F$<br>Temperature coefficient of $V_F$<br>$I_F = 10\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$                                     | (typ.) $TC_V$                       | -1.9           | -1.9         | -1.9         | -1.4           | -21            | mV/K                           |
| Optischer Wirkungsgrad<br>Optical efficiency<br>$I_F = 10\text{ mA}$   | (typ.) $\eta_{\text{opt}}$          | 1.5            | 1.5          | 1.5          | 2.5            | 0.6            | lm/W                           |

<sup>1)</sup> Wellenlängen werden mit einer Stromeinprägedauer von 25 ms und einer Genauigkeit von  $\pm 1\text{ nm}$  ermittelt.  
Wavelengths are tested at a current pulse duration of 25 ms and a tolerance of  $\pm 1\text{ nm}$ .

<sup>2)</sup> 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  $\pm 0.1\text{ V}$ .

<sup>1)</sup> Wellenlängengruppen / Wavelength groups

| Gruppe<br>Group | yellow |      | orange |      | Einheit<br>Unit |
|-----------------|--------|------|--------|------|-----------------|
|                 | min.   | max. | min.   | max. |                 |
| 2               | 580    | 583  | 600    | 603  | nm              |
| 3               | 583    | 586  | 603    | 606  | nm              |
| 4               | 586    | 589  | 606    | 609  | nm              |
| 5               | 589    | 592  |        |      | nm              |
| 6               | 592    | 595  |        |      | nm              |

**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) |
|---|--|--|
| F2                                      | 1.40 ... 1.80                                    | 60.0 (typ.)                                  |
| G1                                      | 1.80 ... 2.24                                    | 75.0 (typ.)                                  |
| G2                                      | 2.24 ... 2.80                                    | 95.0 (typ.)                                  |
| H1                                      | 2.80 ... 3.55                                    | 120.0 (typ.)                                 |
| H2                                      | 3.55 ... 4.50                                    | 150.0 (typ.)                                 |
| J1                                      | 4.50 ... 5.60                                    | 190.0 (typ.)                                 |
| J2                                      | 5.60 ... 7.10                                    | 240.0 (typ.)                                 |
| K1                                      | 7.10 ... 9.00                                    | 300.0 (typ.)                                 |
| K2                                      | 9.00 ... 11.20                                   | 380.0 (typ.)                                 |
| L1                                      | 11.20 ... 14.00                                  | 480.0 (typ.)                                 |
| L2                                      | 14.00 ... 18.00                                  | 600.0 (typ.)                                 |
| M1                                      | 18.00 ... 22.40                                  | 760.0 (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: K2-3

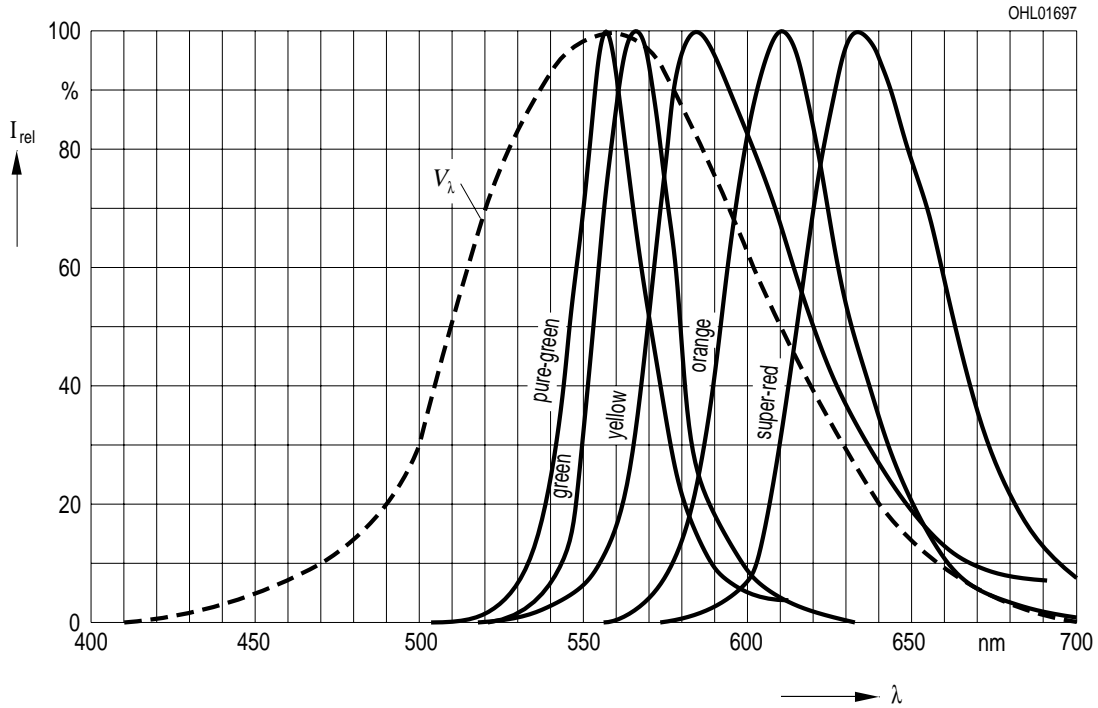
Example: K2-3

| Lichtgruppe<br>Luminous Intensity Group | Halbgruppe<br>Half Group | Wellenlänge<br>Wavelength |
|---|--------------------------|---------------------------|
| K                                       | 2                        | 3                         |

Relative spektrale Emission  $I_{rel} = f(\lambda)$ ,  $T_A = 25\text{ }^\circ\text{C}$ ,  $I_F = 10\text{ mA}$

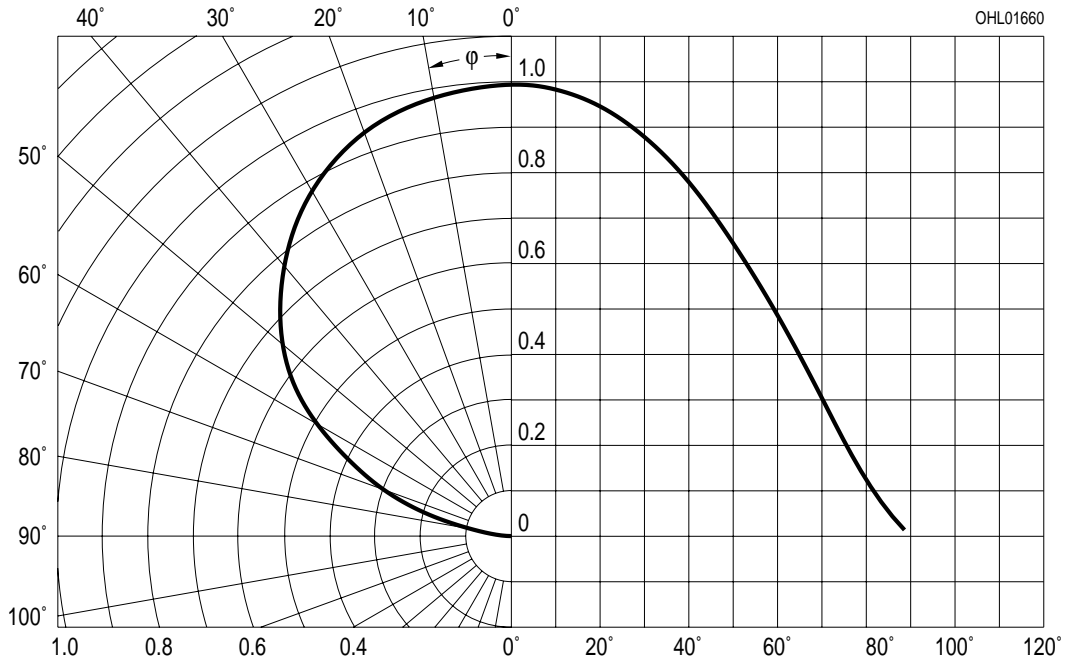
Relative Spectral Emission

$V(\lambda)$  = spektrale Augenempfindlichkeit  
Standard eye response curve

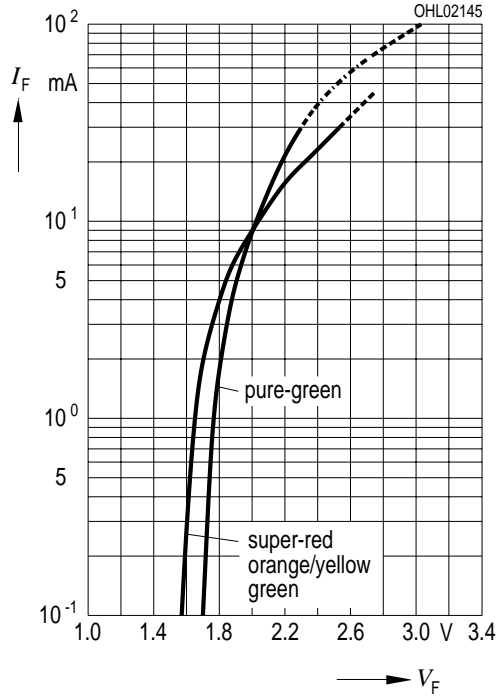


Abstrahlcharakteristik  $I_{rel} = f(\varphi)$

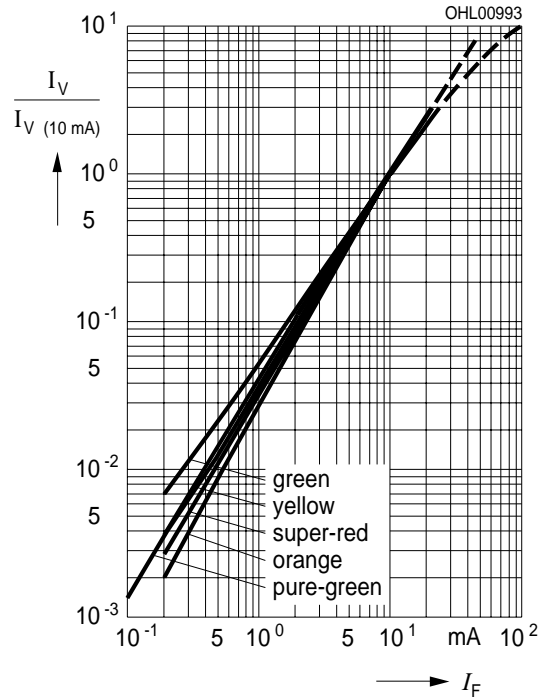
Radiation Characteristic



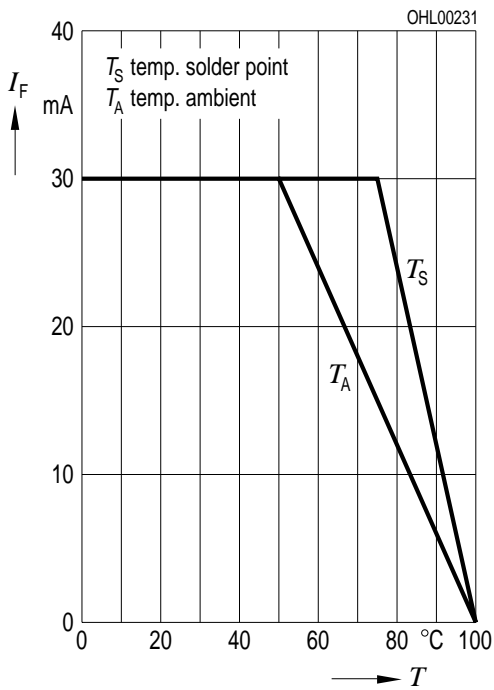
**Durchlassstrom  $I_F = f(V_F)$**   
**Forward Current**  
 $T_A = 25\text{ °C}$



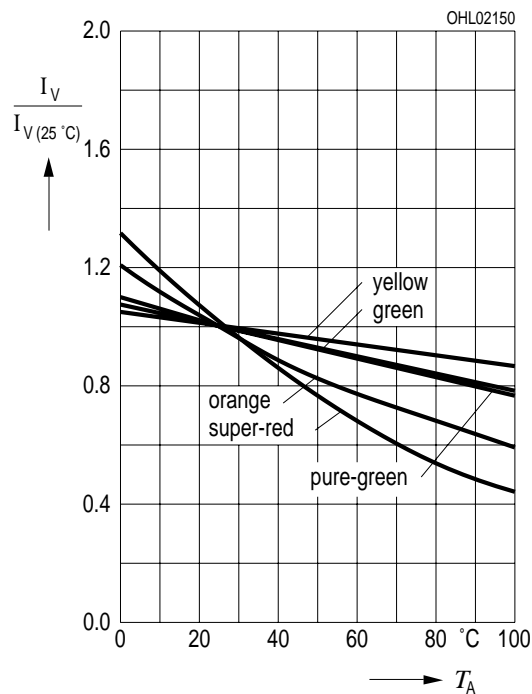
**Relative Lichtstärke  $I_V/I_{V(10\text{ mA})} = f(I_F)$**   
**Relative Luminous Intensity**  
 $T_A = 25\text{ °C}$



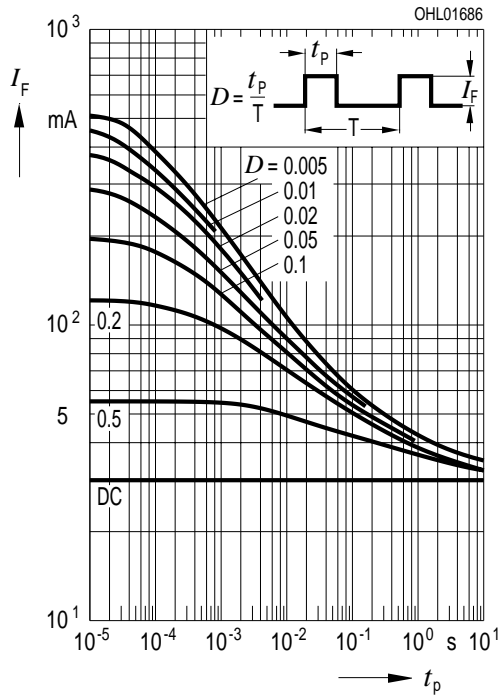
**Maximal zulässiger Durchlassstrom  $I_F = f(T)$**   
**Max. Permissible Forward Current**



**Relative Lichtstärke  $I_V / I_{V(25\text{ °C})} = f(T_A)$**   
**Relative Luminous Intensity**  
 $I_F = 10\text{ mA}$

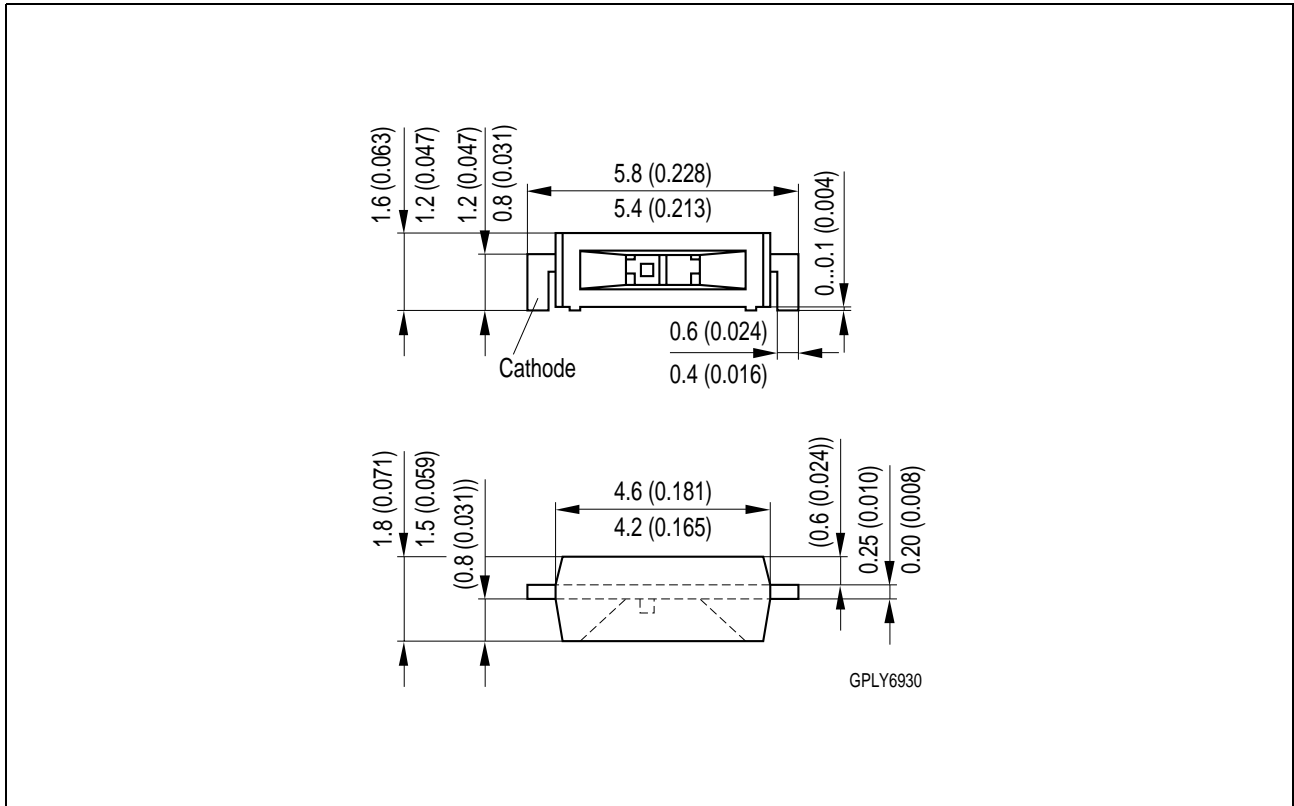


**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D = \text{parameter}$ ,  $T_A = 25\text{ °C}$





Maßzeichnung  
Package Outlines

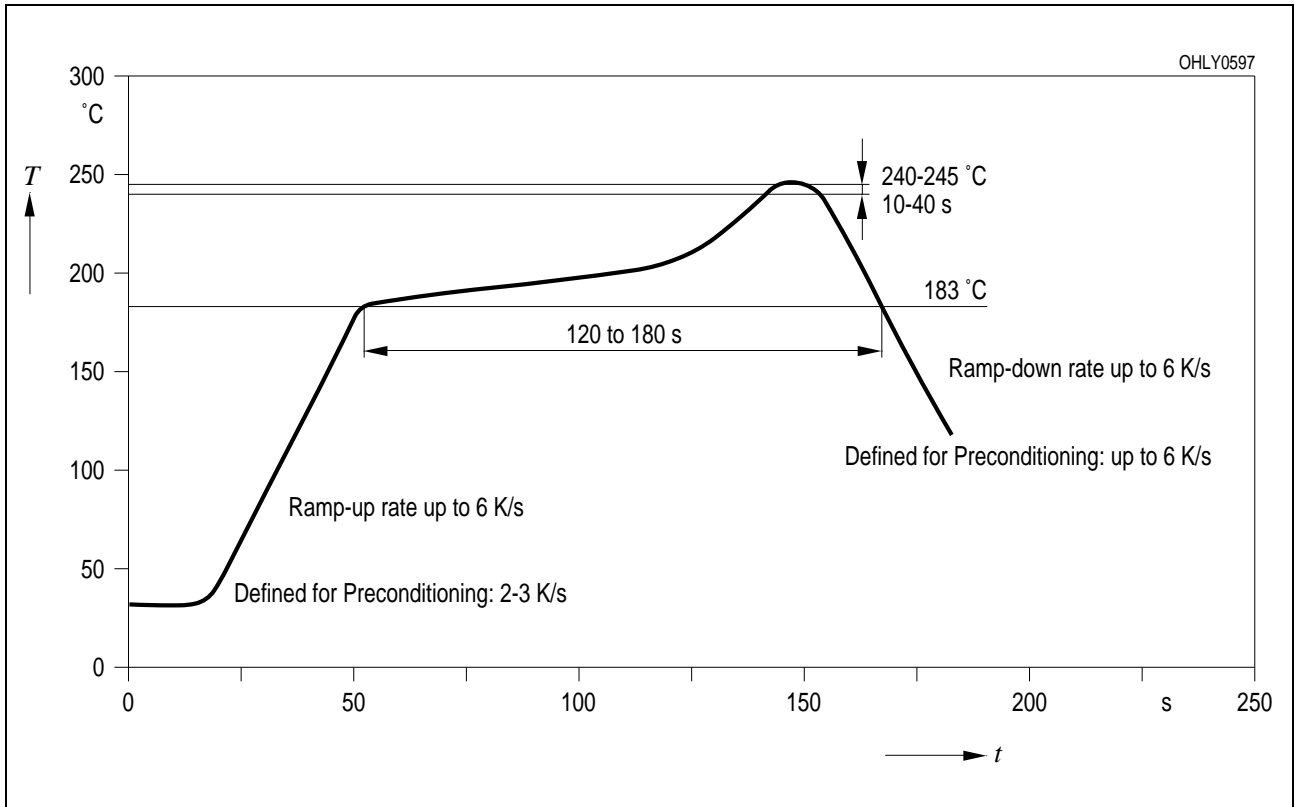


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

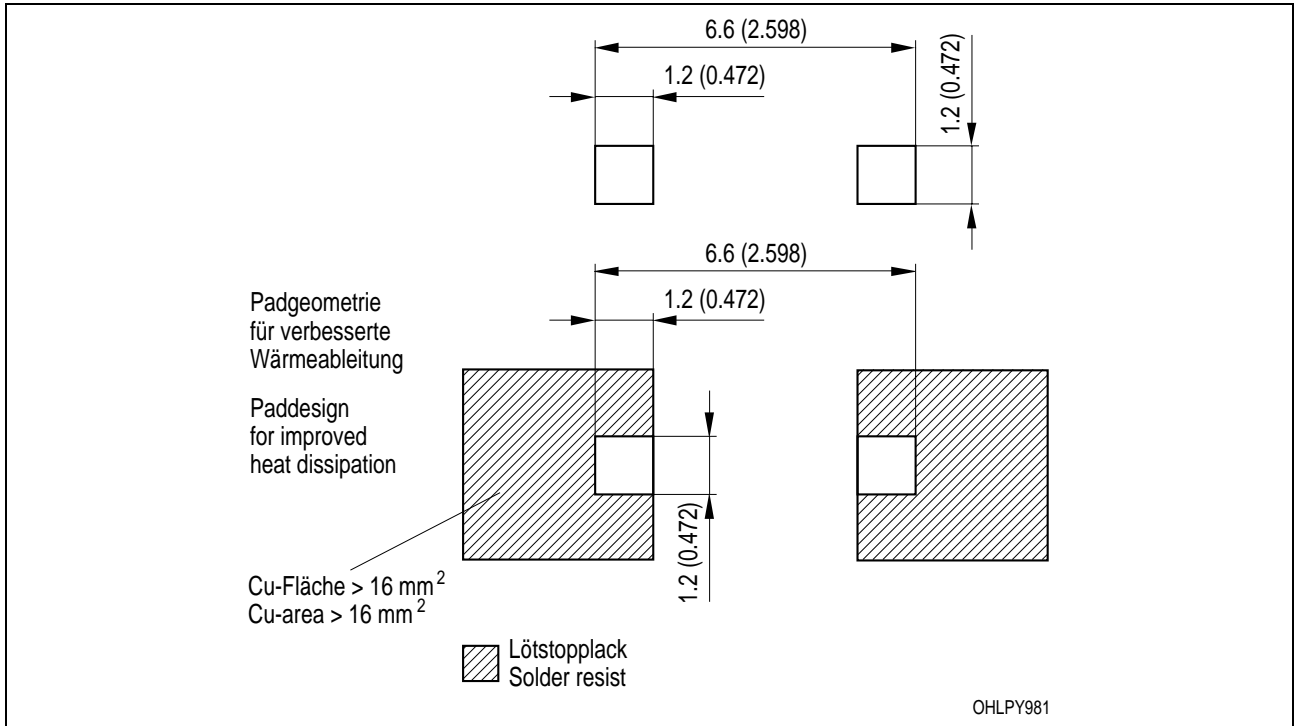
**Gewicht / Approx. weight: 20 mg**

**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 Lötten  
**Recommended Solder Pad** IR Reflow Soldering



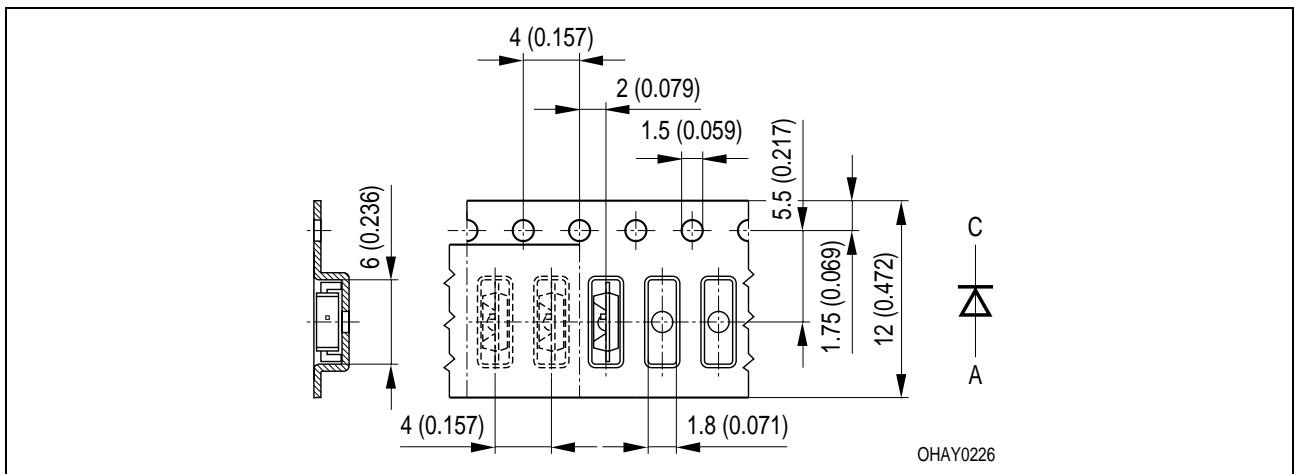
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

**Gurtung / Polarität und Lage**

Verpackungseinheit 2500/Rolle, ø180 mm oder 10000/Rolle, ø330 mm

**Method of Taping / Polarity and Orientation**

Packing unit 2500/reel, ø180 mm or 10000/reel, ø330 mm



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

| Revision History: 2003-03-13 |   | Date of change |
|------------------------------|---|----------------|
| Previous Version: 2002-09-18 |   |                |
| Page                         | Subjects (major changes since last revision)          |                |
| 5                            | wavelength groups                                     |                |
| 2                            | wavelength grouping for yellow and orange             |                |
| 3                            | pad size from 16 mm <sup>2</sup> to 5 mm <sup>2</sup> |                |
| 12                           | annotations   | 2002-07-23     |
| 3, 4                         | value (reverse voltage from 5 V to 12 V)              | 2002-09-18     |
| 7                            | diagram relative luminous intensity $f(I_F)$          | 2003-03-13     |

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**Attention please!**

The information describes the type of component and shall not be considered as assured characteristics.

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.

Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances. For information on the types in question please contact our Sales Organization.

If printed or downloaded, please find the latest version in the Internet.

**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.

**Components used in life-support devices or systems must be expressly authorized for such purpose!** Critical components <sup>1</sup> may only be used in life-support devices or systems <sup>2</sup> with the express written approval of OSRAM OS.

<sup>1</sup> 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.

<sup>2</sup> 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.