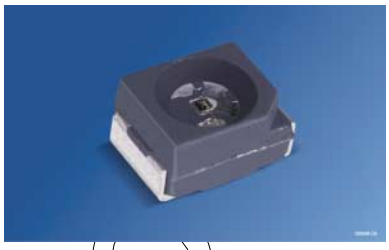
# Infrarot-LED mit hoher Ausgangsleistung
# High Power Infrared LED
## Lead (Pb) Free Product - RoHS Compliant

## SFH 4257



**preliminary data / vorläufige Daten**

### Wesentliche Merkmale

- Infrarot LED mit hoher Ausgangsleistung
- Emissionswellenlänge typ. 850nm
- Schwarz eingefärbtes TOPLED-Gehäuse
- Verbesserte Abbildungseigenschaften durch Absorption der Seitenstrahlung

### Features

- High Power Infrared LED
- Peak wavelength typ. 850nm
- Black coloured TOPLED-package
- Improved imaging characteristics due to absorption of side emission

### Anwendungen

- Miniaturlichtschranken und Lichtschranken über große Entfernungen

### Applications

- Miniature and long distance photointerrupters

### Sicherheitshinweise

Je nach Betriebsart emittieren diese Bauteile hochkonzentrierte, nicht sichtbare Infrarot-Strahlung, die gefährlich für das menschliche Auge sein kann. Produkte, die diese Bauteile enthalten, müssen gemäß den Sicherheits-richtlinien der IEC-Norm 60825-1 behandelt werden.

### Safety Advices

Depending on the mode of operation, these devices emit highly concentrated non visible infrared light which can be hazardous to the human eye. Products which incorporate these devices have to follow the safety precautions given in IEC 60825-1 “Safety of laser products”.

| **Typ**<br>**Type** | **Bestellnummer**<br>**Ordering Code** | **Strahlstärkegruppierung** [1] ($I_F$ = 100mA, $t_p$ = 20 ms)<br>**Radiant intensity grouping** [1]<br>$I_e$ (mW/sr) |
|---|---|---|
| SFH 4257 | Q65110A2090 | > 4 (typ. 7) |

[1] gemessen bei einem Raumwinkel Ω = 0.01 sr
measured at2004-12-09 a solid angle of Ω = 0.01 sr

**ATTENTION - Observe Precautions For Handling - Electrostatic Sensitive Device**

**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 |
| Sperrspannung<br>Reverse voltage | $V_R$ | 3 | V |
| Vorwärtsgleichstrom, $T_A \leq 65$ °C<br>Forward current | $I_F$ | 100 | mA |
| Stoßstrom, $t_p = 10$ µs, $D = 0$, $T_A = 25$ °C<br>Surge current | $I_{FSM}$ | 1 | A |
| Verlustleistung $T_A = 25$ °C<br>Power dissipation | $P_{tot}$ | 180 | mW |
| Wärmewiderstand<br>Thermal resistance<br>Sperrschicht/Umgebung<br>Junction/ambient<br>Sperrschicht/Lötpad<br>Junction/soldering point<br>Montage auf PC-Board FR 4 (Padgröße ≥ 16 mm²)<br>mounted on PC board FR 4 (pad size ≥ 16 mm²) | <br><br>$R_{thJA}$<br><br>$R_{thJS}$ | <br><br>450<br><br>200 | <br><br>K/W<br><br>K/W |

**Kennwerte** ($T_A = 25$ °C)
**Characteristics**

| Bezeichnung<br>Parameter | Symbol<br>Symbol | Wert<br>Value | Einheit<br>Unit |
|---|---|---|---|
| Wellenlänge der Strahlung<br>Wavelength at peak emission<br>$I_F = 100$ mA | $\lambda_{peak}$ | 850 | nm |
| Spektrale Bandbreite bei 50% von $I_{max}$<br>Spectral bandwidth at 50% of $I_{max}$<br>$I_F = 100$ mA | $\Delta\lambda$ | 35 | nm |
| Abstrahlwinkel<br>Half angle | $\varphi$ | ± 60 | Grad<br>deg. |
| Aktive Chipfläche<br>Active chip area | $A$ | 0.09 | mm² |

**Kennwerte** ($T_A$ = 25 °C)
**Characteristics** (cont'd)

| **Bezeichnung**<br>**Parameter** | **Symbol**<br>**Symbol** | **Wert**<br>**Value** | **Einheit**<br>**Unit** |
|---|---|---|---|
| Abmessungen der aktiven Chipfläche<br>Dimension of the active chip area | $L \times B$<br>$L \times W$ | 0.3 × 0.3 | mm |
| Schaltzeiten, $I_e$ von 10% auf 90% und von 90% auf 10%, bei $I_F$ = 100 mA, $R_L$ = 50 Ω<br>Switching times, $I_e$ from 10% to 90% and from 90% to 10%, $I_F$ = 100 mA, $R_L$ = 50 Ω | $t_r$, $t_f$ | 12 | ns |
| Durchlaßspannung<br>Forward voltage<br>$I_F$ = 100 mA, $t_p$ = 20 ms<br>$I_F$ = 1 A, $t_p$ = 100 µs | <br><br>$V_F$<br>$V_F$ | <br><br>1.5 (< 1.8)<br>2.4 (< 3.0) | <br><br>V<br>V |
| Sperrstrom<br>Reverse current<br>$V_R$ = 3 V | $I_R$ | 0.01 (≤ 10) | µA |
| Gesamtstrahlungsfluß<br>Total radiant flux<br>$I_F$ = 100 mA, $t_p$ = 20 ms | $\Phi_e$ | 18 | mW |
| Temperaturkoeffizient von $I_e$ bzw. $\Phi_e$, $I_F$ = 100 mA<br>Temperature coefficient of $I_e$ or $\Phi_e$, $I_F$ = 100 mA | $TC_I$ | – 0.5 | %/K |
| Temperaturkoeffizient von $V_F$, $I_F$ = 100 mA<br>Temperature coefficient of $V_F$, $I_F$ = 100 mA | $TC_V$ | – 0.7 | mV/K |
| Temperaturkoeffizient von λ, $I_F$ = 100 mA<br>Temperature coefficient of λ, $I_F$ = 100 mA | $TC_\lambda$ | + 0.2 | nm/K |

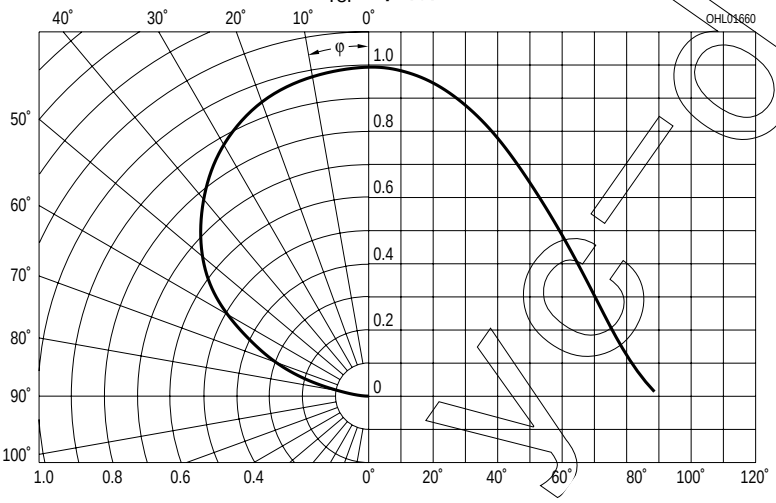
**Strahlstärke $I_e$ in Achsrichtung** [1)]
gemessen bei einem Raumwinkel $\Omega$ = 0.01 sr
**Radiant Intensity $I_e$ in Axial Direction**
at a solid angle of $\Omega$ = 0.01 sr

| Bezeichnung<br>Parameter | Symbol | Werte<br>Values | | Einheit<br>Unit |
|---|---|---|---|---|
| | | SFH 4257-P | SFH 4257-Q | |
| Strahlstärke<br>Radiant intensity<br>$I_F$ = 100 mA, $t_p$ = 20 ms | $I_{e\ min}$<br>$I_{e\ max}$ | 4<br>8 | 6.3<br>12.5 | mW/sr<br>mW/sr |
| Strahlstärke<br>Radiant intensity<br>$I_F$ = 1A, $t_p$ = 100 µs | $I_{e\ typ}$ | 50 | 60 | mW/sr |

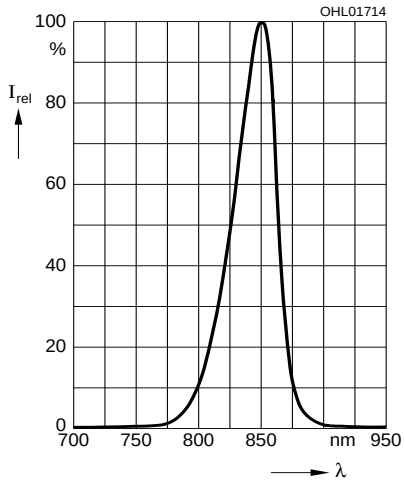
1) Nur eine Gruppe in einer Verpackungseinheit (Streuung kleiner2:1)

1) Only one group in one packing unit, (variation lower 2:1)

**Radiation Characteristics $I_{rel} = f(\varphi)$**

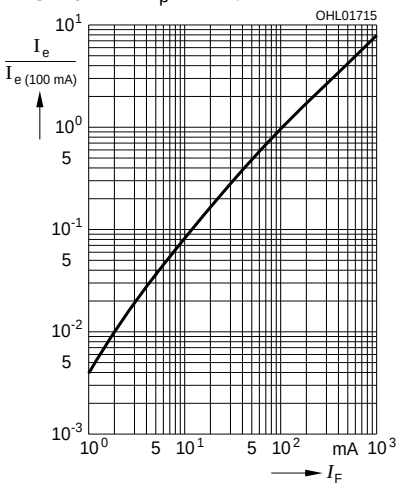


**Relative Spectral Emission**
$I_{rel} = f(\lambda)$

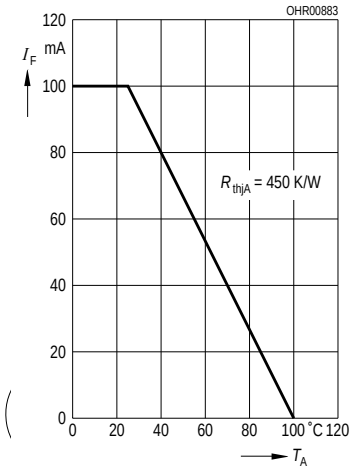



**Radiant Intensity** $\frac{I_e}{I_e\,100\ mA} = f(I_F)$

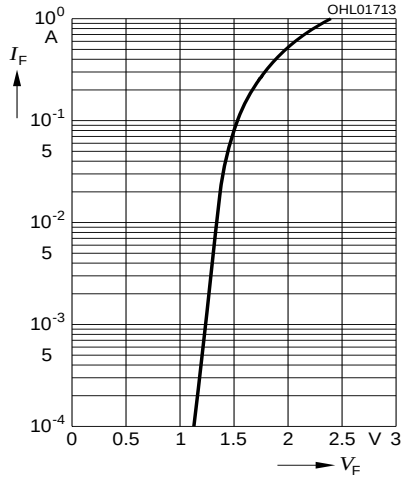
Single pulse, $t_p$ = 20 µs



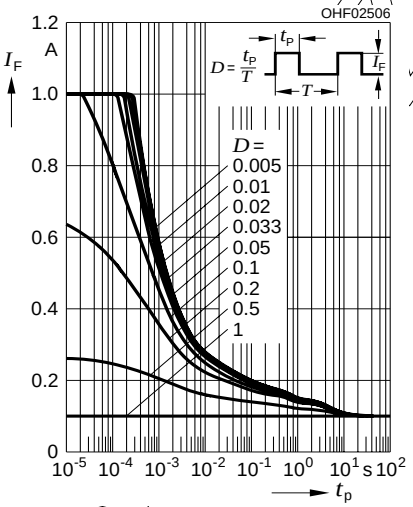

**Max. Permissible Forward Current**
$I_F = f(T_A)$, $R_{thJA}$ = 300 K/W



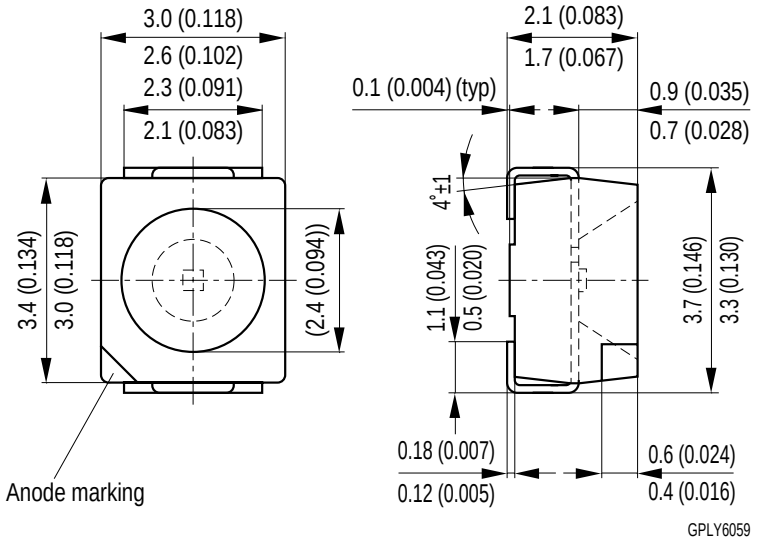

**Forward Current** $I_F = f(V_F)$
Single pulse, $t_p$ = 20 µs




**Permissible Pulse Handling Capability** $I_F = f(\tau)$, $T_A$ = 25 °C, duty cycle $D$ = parameter



## Maßzeichnung
## Package Outlines

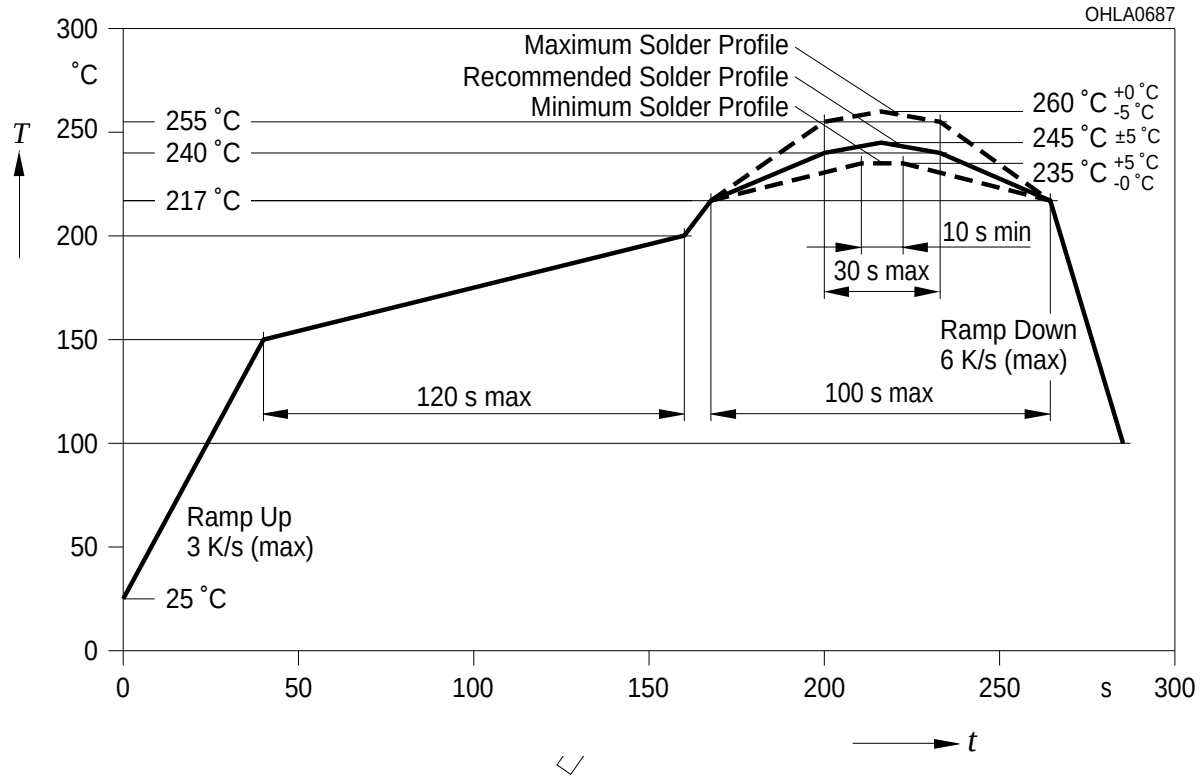



Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

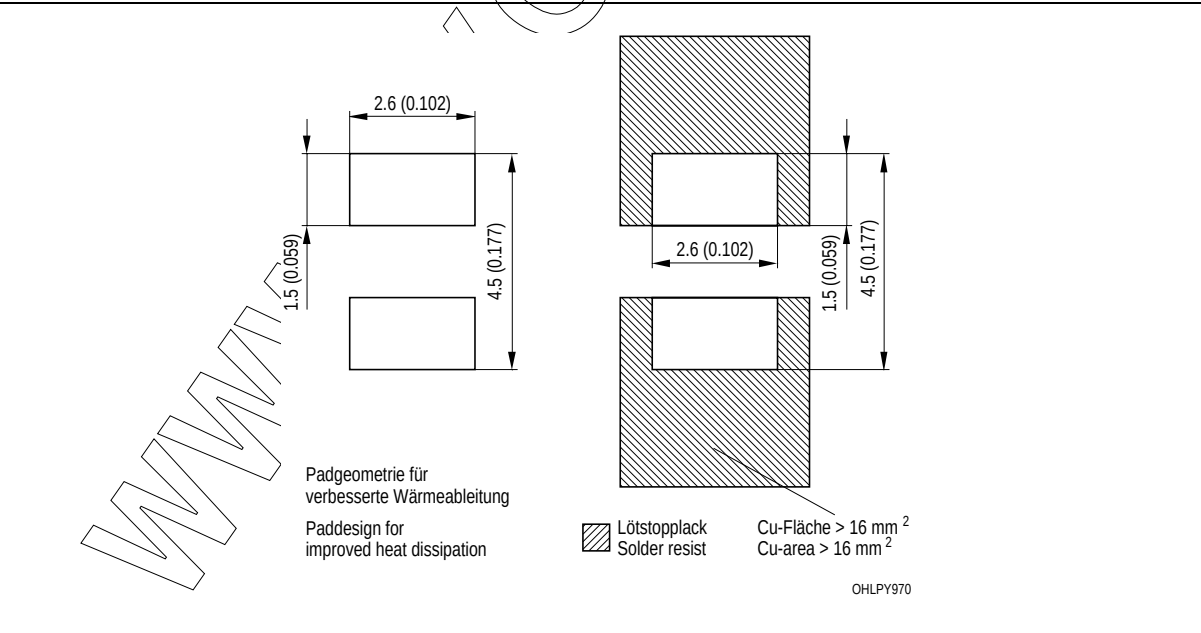
| | |
|---|---|
| Gehäuse | schwarz, Verguss klar<br>Brechungsindex Verguss: 1.53 |
| Package | black, resin colourless clear<br>Refractive index resin: 1.53 |

**Lötbedingungen**
**Soldering Conditions**
**IR-Reflow Lötprofil für bleifreies Löten**
**IR Reflow Soldering Profile for lead free soldering**

Vorbehandlung nach JEDEC Level 2
Preconditioning acc. to JEDEC Level 2
(nach J-STD-020B)
(acc. to J-STD-020B)




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



**Published by**
**OSRAM Opto Semiconductors GmbH**
**Wernerwerkstrasse 2, D-93049 Regensburg**
**www.osram-os.com**

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