

IR-Lumineszenzdiode (940 nm) mit hoher Ausgangsleistung
High Power Infrared Emitter (940 nm)
Lead (Pb) Free Product - RoHS Compliant
SFH 4546



Wesentliche Merkmale

- Infrarot LED mit hoher Ausgangsleistung
- Kurze Schaltzeiten

Anwendungen

- Infrarotbeleuchtung für Kameras
- Sensorik
- Datenübertragung

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 Sicherheitsrichtlinien der IEC-Normen 60825-1 und 62471 behandelt werden.

Features

- High Power Infrared LED
- Short switching times

Applications

- Infrared Illumination for cameras
- Sensor technology
- Data transmission

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 and IEC 62471.

| Typ Type | Bestellnummer Ordering Code | Strahlstärkegruppierung ¹⁾ ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) Radiant Intensity Grouping ¹⁾ $I_e \text{ (mW/sr)}$ |
|-------------|--------------------------------|---|
| SFH 4546 | Q65110A8096 | ≥ 40 (typ. 130) |

¹⁾ gemessen bei einem Raumwinkel $\Omega = 0.01 \text{ sr}$ / measured at a solid angle of $\Omega = 0.01 \text{ sr}$

Grenzwerte ($T_A = 25\text{ °C}$)**Maximum Ratings**

| Bezeichnung Parameter | Symbol Symbol | Wert Value | Einheit Unit |
|--|-------------------|----------------|-----------------|
| Betriebs- und Lagertemperatur Operating and storage temperature range | T_{op}, T_{stg} | - 40 ... + 100 | °C |
| Sperrspannung Reverse voltage | V_R | 5 | V |
| Vorwärtsgleichstrom Forward current | I_F | 100 | mA |
| Stoßstrom, $t_p = 100\ \mu\text{s}$, $D = 0$ Surge current | I_{FSM} | 1.5 | A |
| Verlustleistung Power dissipation | P_{tot} | 180 | mW |
| Wärmewiderstand Sperrschicht - Umgebung bei Montage auf FR4 Platine, Padgröße je $16\ \text{mm}^2$ Thermal resistance junction - ambient mounted on PC-board (FR4), padsizes $16\ \text{mm}^2$ each | R_{thJA} | 450 | K/W |

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

| Bezeichnung Parameter | Symbol Symbol | Wert Value | Einheit Unit |
|--|------------------------------|------------------|-----------------|
| Wellenlänge der Strahlung Wavelength at peak emission $I_F = 100\ \text{mA}$ | λ_{peak} | 950 | nm |
| Centroid-Wellenlänge der Strahlung Centroid wavelength $I_F = 100\ \text{mA}$ | $\lambda_{centroid}$ | 940 | nm |
| Spektrale Bandbreite bei 50% von I_{max} Spectral bandwidth at 50% of I_{max} $I_F = 100\ \text{mA}$ | $\Delta\lambda$ | 42 | nm |
| Abstrahlwinkel Half angle | φ | ± 20 | Grad deg. |
| Aktive Chipfläche Active chip area | A | 0.09 | mm^2 |
| Abmessungen der aktiven Chipfläche Dimension of the active chip area | $L \times B$ $L \times W$ | 0.3×0.3 | mm^2 |

Kennwerte ($T_A = 25\text{ °C}$)

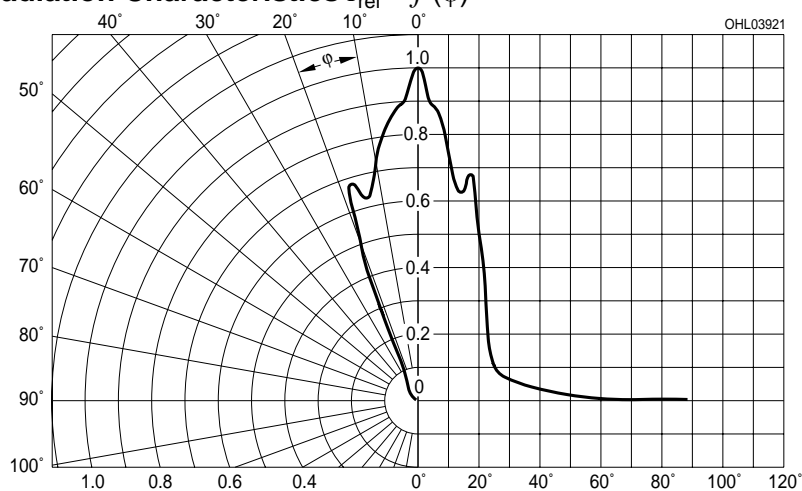
Characteristics (cont'd)

| Bezeichnung Parameter | Symbol Symbol | Wert Value | Einheit Unit |
|---|-----------------------|------------------------------------|-----------------|
| Schaltzeiten, I_e von 10% auf 90% und von 90% auf 10%, bei $I_F = 100\text{ mA}$, $R_L = 50\ \Omega$ Switching times, I_e from 10% to 90% and from 90% to 10%, $I_F = 100\text{ mA}$, $R_L = 50\ \Omega$ | t_r, t_f | 11 | ns |
| Durchlassspannung Forward voltage $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$ $I_F = 1\text{ A}$, $t_p = 100\ \mu\text{s}$ | V_F V_F | 1.5 (< 1.8) 2.4 (< 3.0) | V V |
| Sperrstrom Reverse current | I_R | not designed for reverse operation | μA |
| Gesamtstrahlungsfluss Total radiant flux $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$ | $\Phi_{e\text{ typ}}$ | 50 | mW |
| Temperaturkoeffizient von I_e bzw. Φ_e , $I_F = 100\text{ mA}$ Temperature coefficient of I_e or Φ_e , $I_F = 100\text{ mA}$ | TC_I | - 0.5 | %/K |
| Temperaturkoeffizient von V_F , $I_F = 100\text{ mA}$ Temperature coefficient of V_F , $I_F = 100\text{ mA}$ | TC_V | - 3 | mV/K |
| Temperaturkoeffizient von λ , $I_F = 100\text{ mA}$ Temperature coefficient of λ , $I_F = 100\text{ mA}$ | TC_λ | + 0.3 | nm/K |

Strahlstärke I_e in Achsrichtung¹⁾gemessen bei einem Raumwinkel $\Omega = 0.01$ sr**Radiant Intensity I_e in Axial Direction**at a solid angle of $\Omega = 0.01$ sr

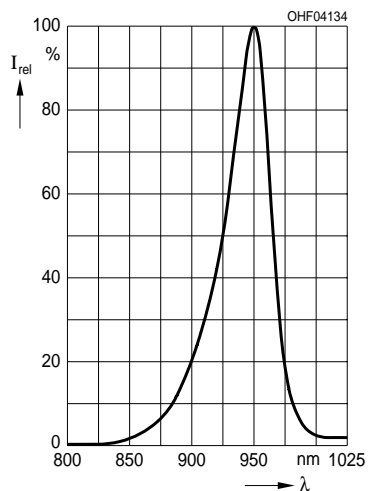
| Bezeichnung Parameter | Symbol | Werte Values | | | Einheit Unit |
|--|--|-----------------|----------------|-----------------|-----------------|
| | | SFH 4546 -U | SFH 4546 -V | SFH 4546 -AW | |
| Strahlstärke Radiant intensity $I_F = 100$ mA, $t_p = 20$ ms | $I_{e \text{ min}}$ $I_{e \text{ max}}$ | 40 80 | 63 125 | 100 200 | mW/sr mW/sr |
| Strahlstärke Radiant intensity $I_F = 1$ A, $t_p = 25$ μ s | $I_{e \text{ typ}}$ | 435 | 690 | 1090 | mW/sr |

¹⁾ Nur eine Gruppe in einer Verpackungseinheit (Streuung kleiner 2:1) /
Only one bin in one packing unit (variation lower 2:1)

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

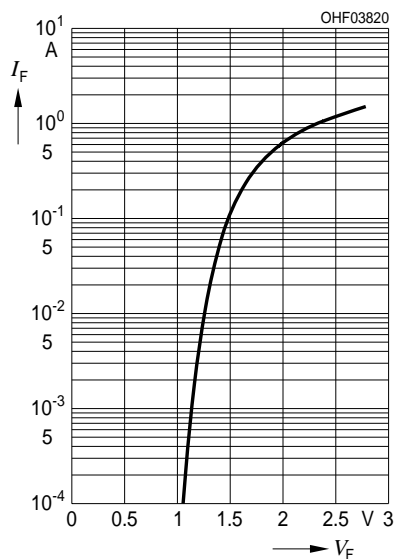
Relative Spectral Emission

$I_{rel} = f(\lambda)$



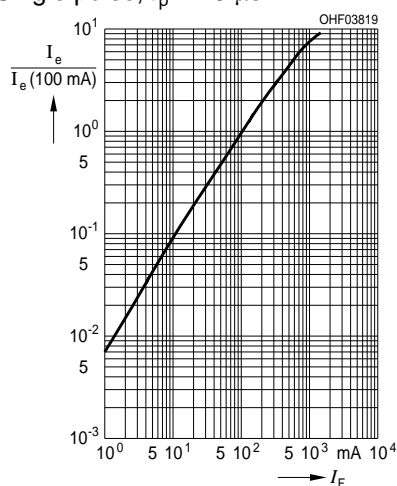
Forward Current $I_F = f(V_F)$

Single pulse, $t_p = 100 \mu s$



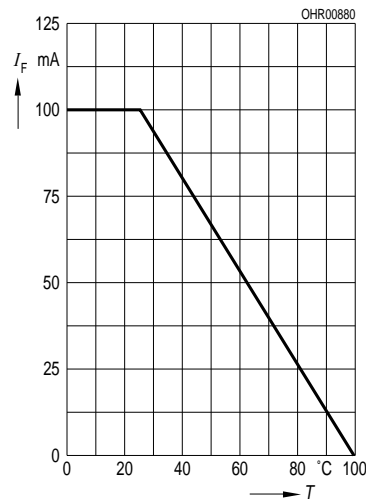
Radiant Intensity $\frac{I_e}{I_e 100 \text{ mA}} = f(I_F)$

Single pulse, $t_p = 25 \mu s$



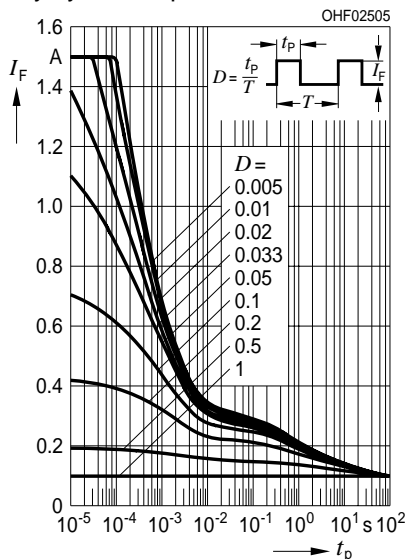
Max. Permissible Forward Current

$I_F = f(T_A), R_{thJA} = 450 \text{ K/W}$

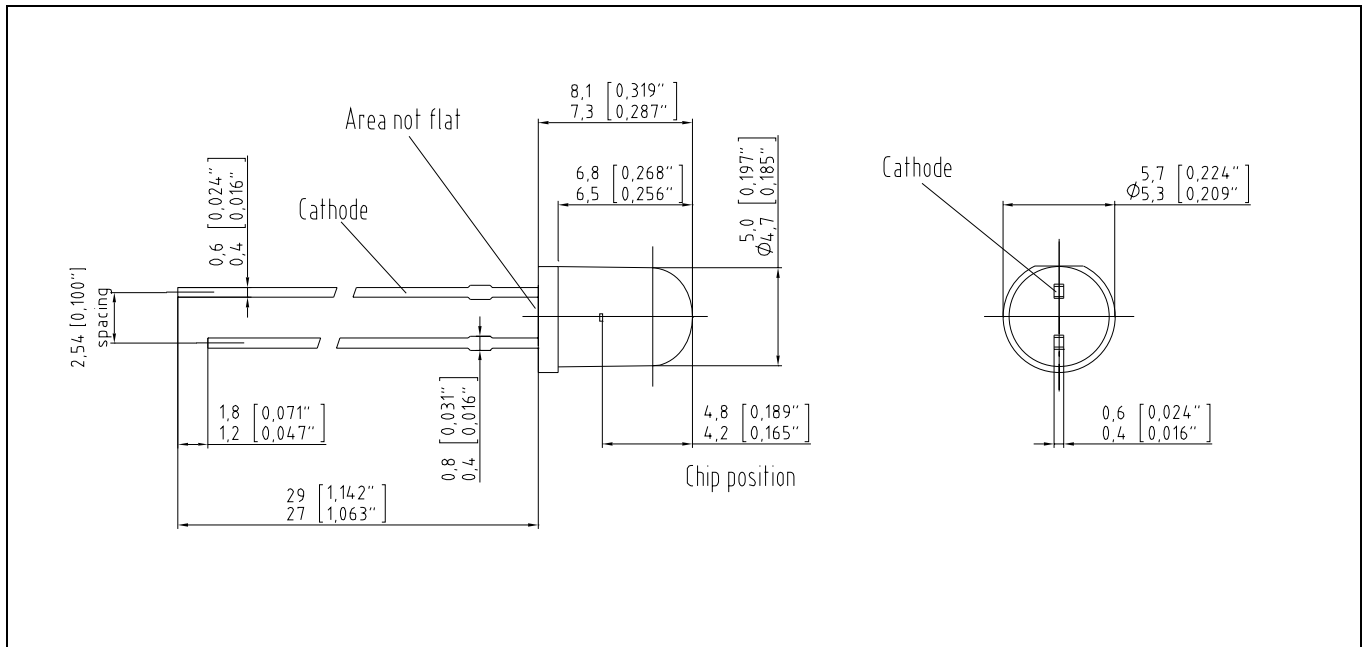


Permissible Pulse Handling Capability $I_F = f(\tau), T_A = 25 \text{ °C}$

duty cycle $D = \text{parameter}$



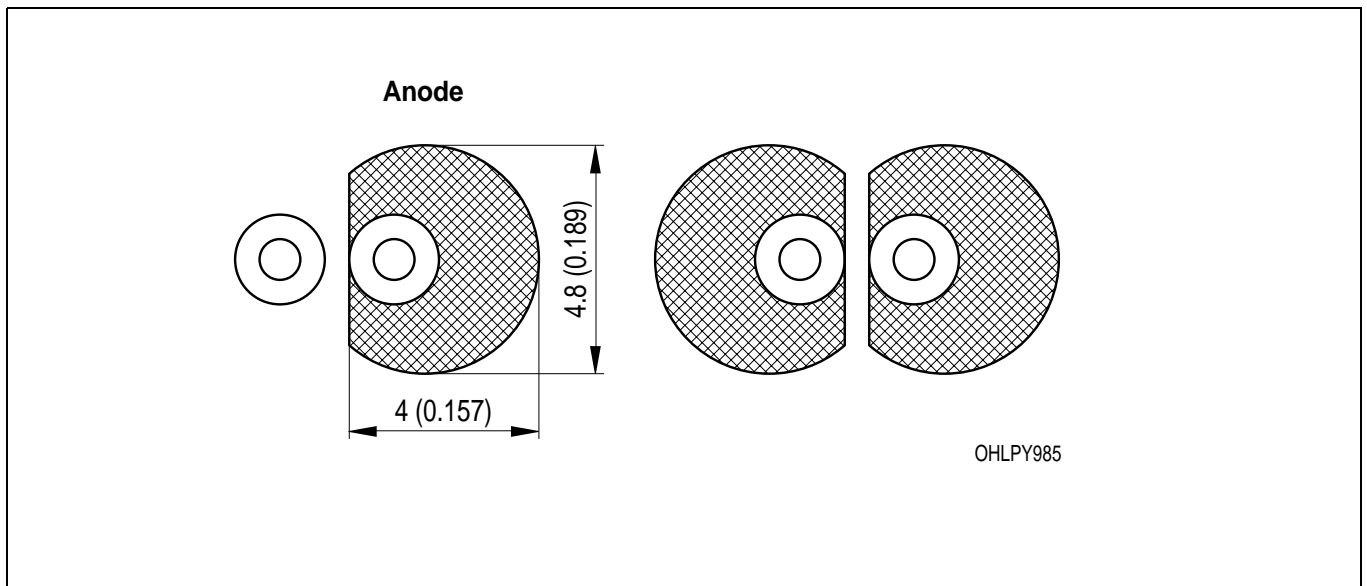
**Maßzeichnung
Package Outlines**



Maße in mm (inch) / Dimensions in mm (inch).

**Empfohlenes Lötpaddesign
Recommended Solder Pad Design**

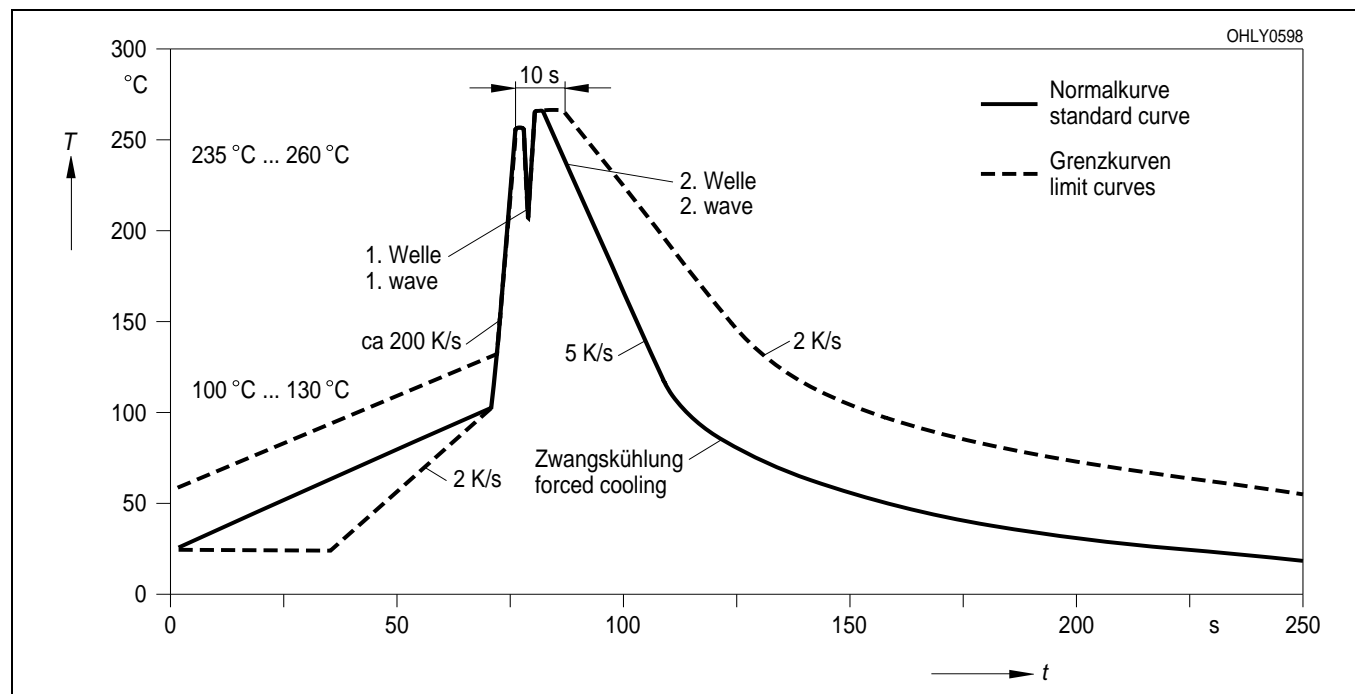
**Wellenlöten TTW
TTW Soldering**



Maße in mm (inch) / Dimensions in mm (inch).

Lötbedingungen
Soldering Conditions
Wellenlöten (TTW)
TTW Soldering

(nach CECC 00802)
(acc. to CECC 00802)



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