

IR-Lumineszenzdiode (940 nm) mit hoher Ausgangsleistung
High Power Infrared Emitter (940 nm)
Lead (Pb) Free Product - RoHS Compliant
SFH 4231



Vorläufige Daten / Preliminary Data

Wesentliche Merkmale

- Punktlichtquelle mit hohem Wirkungsgrad bei geringer Baugröße
- Chipgröße (emittierende Fläche) 1 x 1 mm²
- max. Gleichstrom 1 A
- niedriger Wärmewiderstand (15 K/W)
- Emissionswellenlänge 940 nm
- ESD-sicher bis 2 kV nach JESD22-A114-B

Anwendungen

- Infrarotbeleuchtung für CMOS Kameras
- Überwachungssysteme
- IR-Datenübertragung
- Fahrer-Assistenz Systeme
- Maschinensicherheit

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

- Point lightsource with high efficiency and small package
- die-size (emitting area) 1 x 1 mm²
- max. DC-current 1 A
- Low thermal resistance (15 K/W)
- Maximum of spectral emission at 940 nm
- ESD safe up to 2 kV acc. to JESD22-A114-B

Applications

- Infrared Illumination for CMOS cameras
- Surveillance systems
- IR Data Transmission
- Driver assistance systems
- Machine security

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 | Gesamtstrahlungsfluss ¹⁾ ($I_F = 1A, t_p = 100 \mu s$) Total Radiant Flux ¹⁾ Φ_e (mW) |
|-------------|--------------------------------|--|
| SFH 4231 | Q65110A4808 | typ. 500 |

¹⁾ gemessen mit Ulbrichtkugel / measured with integrating sphere

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 |
| Sperrschichttemperatur Junction temperature | T_J | + 125 | °C |
| Sperrspannung Reverse voltage | V_R | 1 | V |
| Vorwärtsgleichstrom Forward current | I_F | 1 | A |
| Stoßstrom, $t_p < 1\text{ ms}$, $D = 0.2$ Surge current | I_{FSM} | 2 | A |
| Leistungsaufnahme Power consumption | P_{tot} | 2.4 | W |
| Wärmewiderstand Sperrschicht - Lötstelle bei Montage auf Metall-Block Thermal resistance junction - soldering point, mounted on metal block | R_{thJS} | 15 | K/W |

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

| Bezeichnung Parameter | Symbol Symbol | Wert Value | Einheit Unit |
|---|------------------------------|---------------|-----------------|
| Wellenlänge der Strahlung Wavelength at peak emission $I_F = 1\text{ A}$, $t_p = 10\text{ ms}$ | λ_{peak} | 940 | nm |
| Centroid-Wellenlänge der Strahlung Centroid wavelength $I_F = 1\text{ A}$, $t_p = 10\text{ ms}$ | $\lambda_{centroid}$ | 935 | nm |
| Spektrale Bandbreite bei 50% von I_{max} Spectral bandwidth at 50% of I_{max} $I_F = 1\text{ A}$, $t_p = 10\text{ ms}$ | $\Delta\lambda$ | 45 | nm |
| Abstrahlwinkel Half angle | φ | ± 60 | Grad deg. |
| Aktive Chipfläche Active chip area | A | 1 | mm ² |
| Abmessungen der aktiven Chipfläche Dimension of the active chip area | $L \times B$ $L \times W$ | 1 × 1 | mm ² |

Kennwerte ($T_A = 25\text{ °C}$)
Characteristics (cont'd)

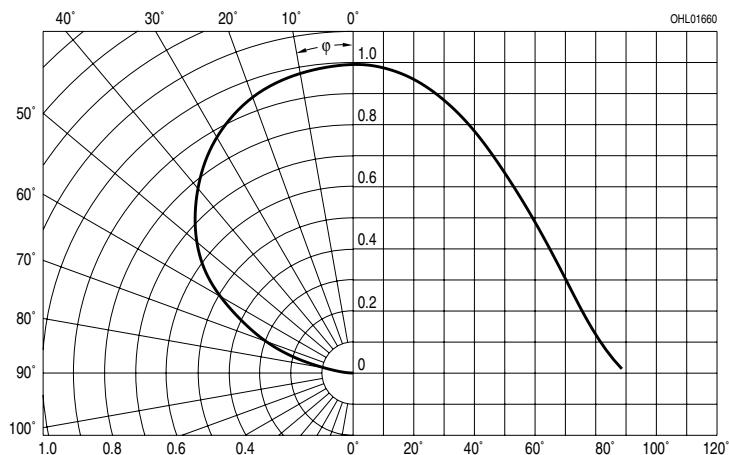
| Bezeichnung Parameter | Symbol Symbol | Wert Value | Einheit Unit |
|---|---------------------------------|---------------|-----------------|
| Schaltzeiten, I_e von 10% auf 90% und von 90% auf 10%, $I_F = 1\text{ A}$, $R_L = 50\ \Omega$ Switching times, I_e from 10% to 90% and from 90% to 10%, $I_F = 1\text{ A}$, $R_L = 50\ \Omega$ | t_r, t_f | 20 | ns |
| Durchlassspannung Forward voltage $I_F = 1\text{ A}$, $t_p = 100\ \mu\text{s}$ | V_F | 1.8 (< 2.4) | V |
| Strahlstärke Radiant intensity $I_F = 1\text{ A}$, $t_p = 100\ \mu\text{s}$ | $I_{e\text{ typ}}$ | 200 | mW/sr |
| Temperaturkoeffizient von I_e bzw. Φ_e Temperature coefficient of I_e or Φ_e $I_F = 1\text{ A}$, $t_p = 10\text{ ms}$ | TC_I | - 0.5 | %/K |
| Temperaturkoeffizient von V_F Temperature coefficient of V_F $I_F = 1\text{ A}$, $t_p = 10\text{ ms}$ | TC_V | - 1 | mV/K |
| Temperaturkoeffizient von λ Temperature coefficient of λ $I_F = 1\text{ A}$, $t_p = 10\text{ ms}$ | $TC_{\lambda, \text{centroid}}$ | + 0.2 | nm/K |

Gesamtstrahlungsfluss¹⁾ Φ_e
Total Radiant Flux¹⁾ Φ_e

| Bezeichnung Parameter | Symbol | Werte Values | | Einheit Unit |
|---|--|-----------------|-------------|-----------------|
| | | SFH 4231-CX | SFH 4231-DX | |
| Gesamtstrahlungsfluss Total Radiant Flux $I_F = 1 \text{ A}, t_p = 100 \mu\text{s}$ | $\Phi_{e \text{ min}}$ $\Phi_{e \text{ max}}$ | 320 630 | 500 1000 | mW mW |

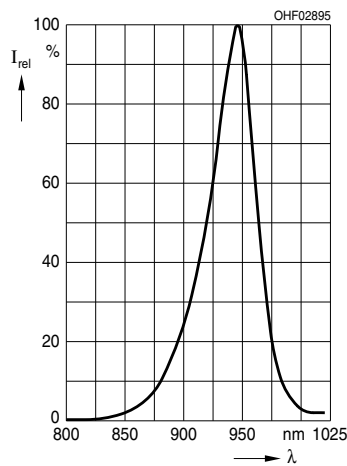
¹⁾ Nur eine Gruppe in einer Verpackungseinheit (Streuung kleiner 2:1) /
 Only one group in one packing unit (variation lower 2:1)

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



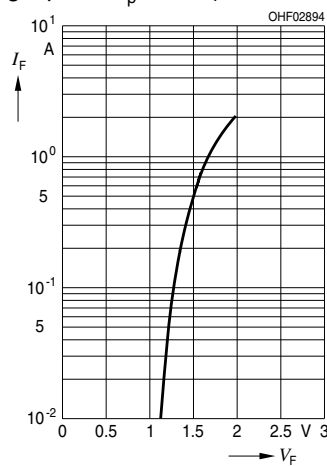
**Relative spektrale Emission
Relative Spectral Emission**

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



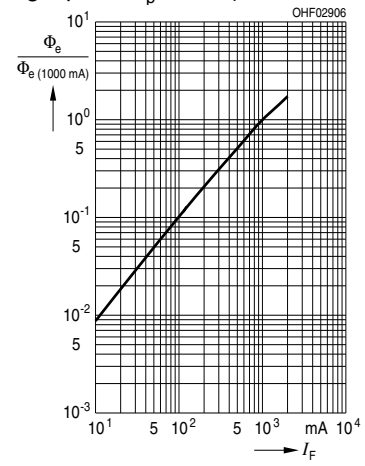
**Durchlassstrom
Forward Current**

$I_F = f(V_F)$
Single pulse, $t_p = 100 \mu s$



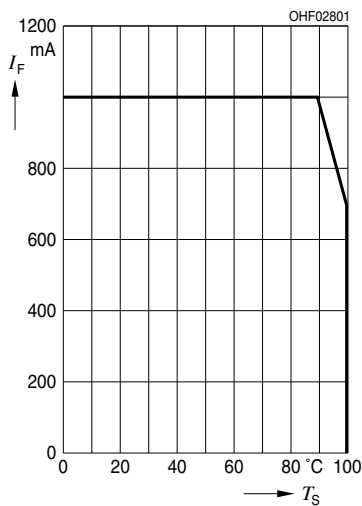
**Relativer Gesamtstrahlungsfluss
Relative Total Radiant Flux**

$\Phi_e / \Phi_e(1000mA) = f(I_F)$
Single pulse, $t_p = 100 \mu s$



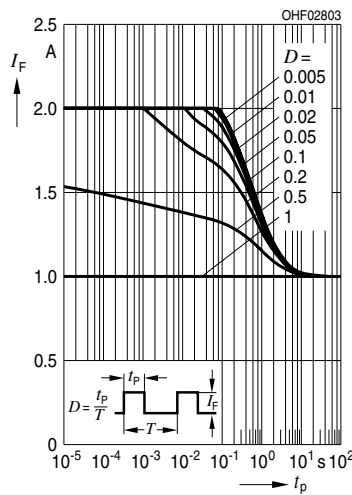
**Max. zulässiger Durchlassstrom
Max. Permissible Forward Current**

$I_F = f(T_A), R_{thJS} = 15 K/W$

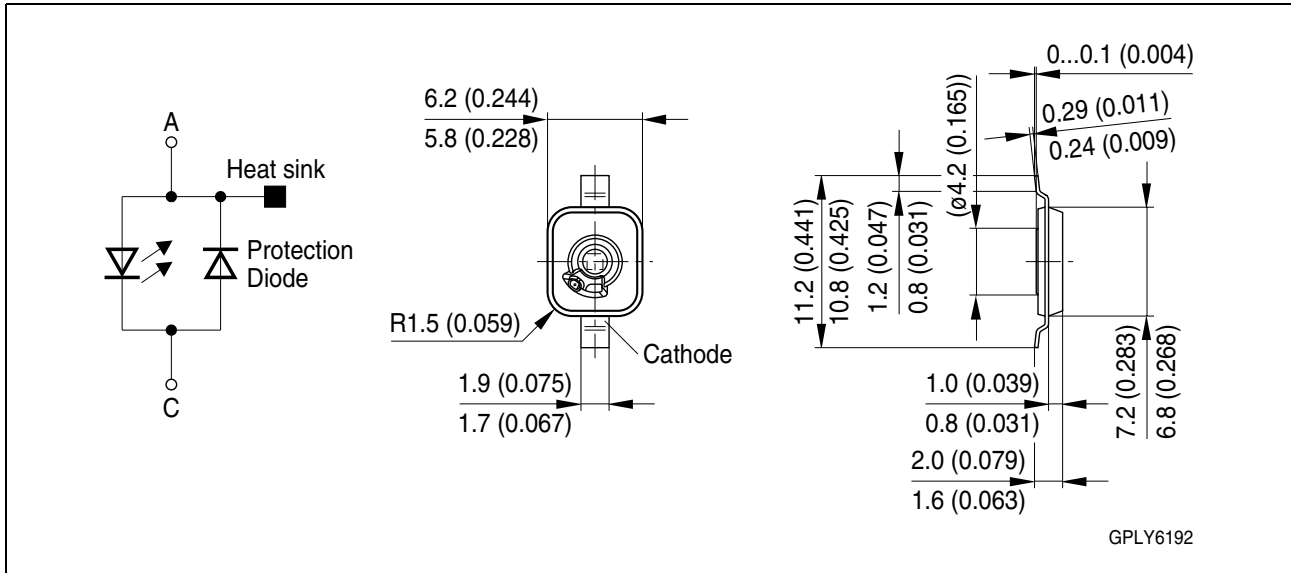


**Zulässige Impulsbelastbarkeit
Permissible Pulse Handling Capability**

$I_F = f(t_p), T_A \leq 85 \text{ } ^\circ\text{C}$,
Duty cycle $D = \text{parameter}$



Maßzeichnung¹⁾
Package Outlines

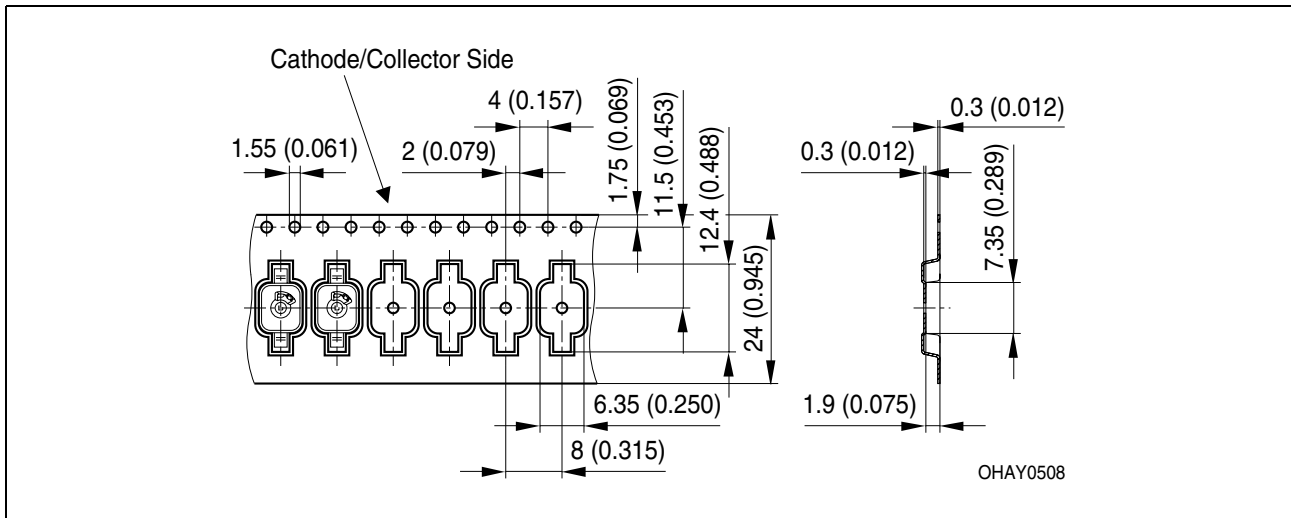


Kathodenkennung:
Cathode mark:
Gewicht / Approx. weight:

Markierung
mark
0.2 g

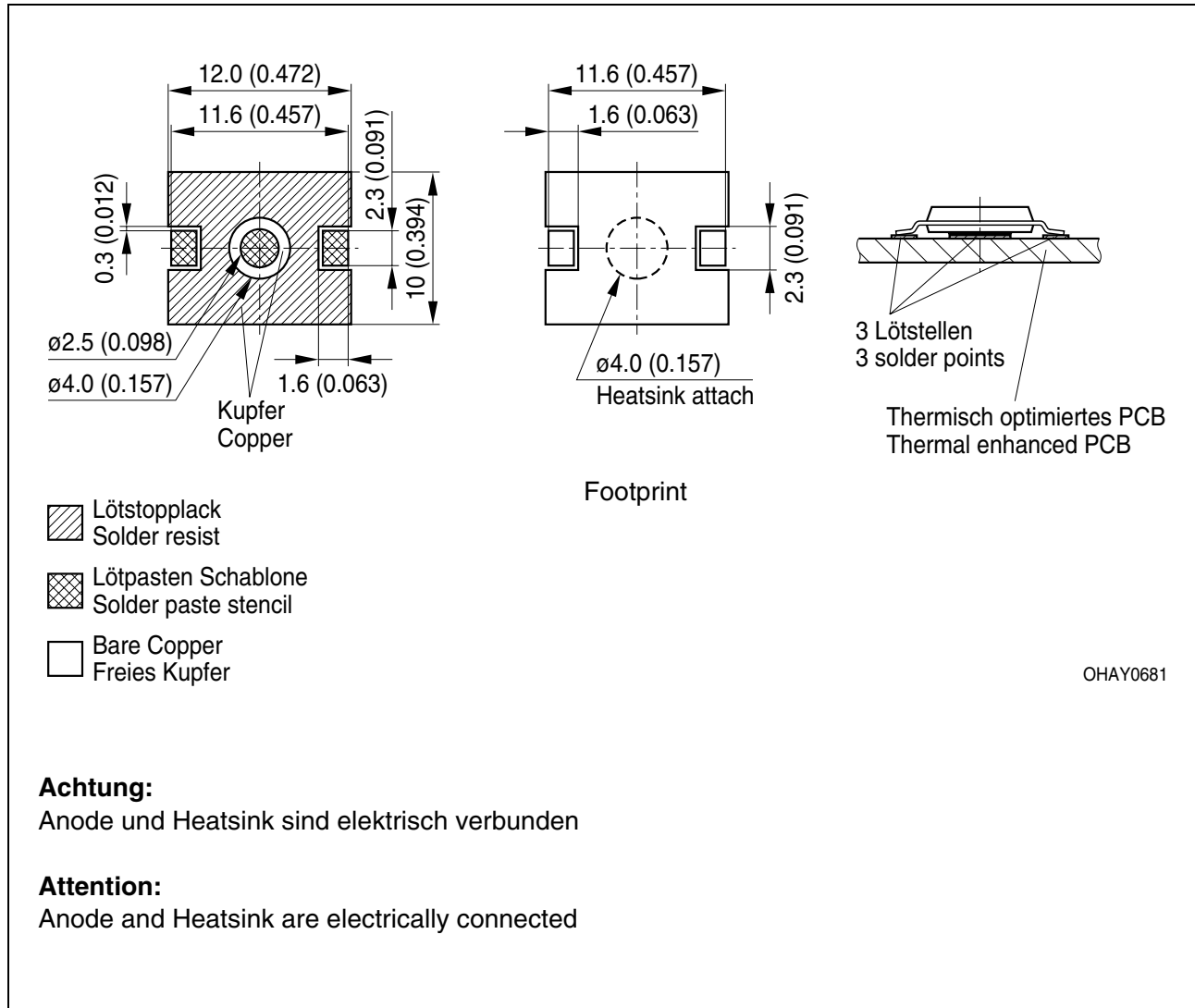
Gurtung / Polarität und Lage
Method of Taping / Polarity and Orientation

Verpackungseinheit 800/Rolle, ø180 mm
Packing unit 800/reel, ø180 mm



¹⁾ Maße in mm (inch) / Dimensions in mm (inch)

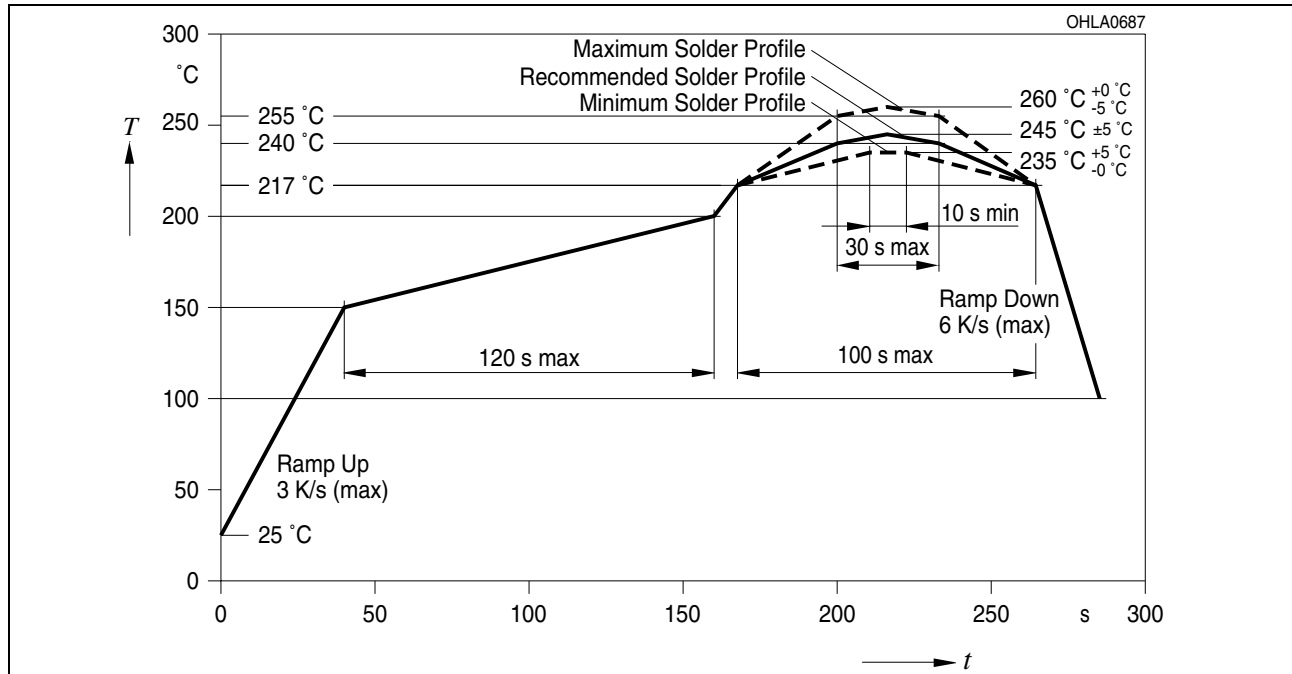
Empfohlenes Lötpad Design Recommended Solder Pad Design



Lötbedingungen
Soldering Conditions

Reflow Lötprofil für bleifreies Löten
Reflow Soldering Profile for lead free soldering

Vorbehandlung nach JEDEC Level 4
Preconditioning acc. to JEDEC Level 4
(nach J-STD-020C)
(acc. to J-STD-020C)



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