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

SFH 4045



## Vorläufige Daten / Preliminary Data

### Wesentliche Merkmale

- Infrarot LED mit hoher Ausgangsleistung
- Kurze Schaltzeiten

### Anwendungen

- Lichtschranken, Lichtvorhänge
- Sensorik
- Näherungssensor
- berührungsempfindliche Bildschirme

### 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

- Interrupters, Lightcurtains
- Sensors
- proximity sensor
- Touchscreen

### 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 <sup>1)</sup> ( $I_F = 70 \text{ mA}$ , $t_p = 20 \text{ ms}$ ) Radiant Intensity Grouping <sup>1)</sup> $I_e$ (mW/sr)
SFH 4045	Q65110A9731	$\geq 40$ (typ. 90)

<sup>1)</sup> gemessen bei einem Raumwinkel  $\Omega = 0.01$  / measured at a solid angle of  $\Omega = 0.01$  sr

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

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Betriebstemperatur Operating temperature range	$T_{op}$	- 25 ... + 85	°C
Lagertemperatur Storage temperature range	$T_{stg}$	- 40 ... + 85	°C
Sperrspannung Reverse voltage	$V_R$	5	V
Vorwärtsgleichstrom Forward current	$I_F$	70	mA
Stoßstrom, $t_p = 100\ \mu\text{s}$ , $D = 0$ Surge current	$I_{FSM}$	700	mA
Verlustleistung Power dissipation	$P_{tot}$	140	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	$R_{thJA}$	540	K/W
Wärmewiderstand Sperrschicht - Lötstelle bei Montage auf Metall-Block Thermal resistance junction - soldering point, mounted on metal block	$R_{thJS}$	360	K/W

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

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Wellenlänge der Strahlung Wavelength at peak emission $I_F = 70\ \text{mA}$	$\lambda_{peak}$	950	nm
Centroid-Wellenlänge der Strahlung Centroid wavelength $I_F = 70\ \text{mA}$	$\lambda_{centroid}$	940	nm
Spektrale Bandbreite bei 50% von $I_{max}$ Spectral bandwidth at 50% of $I_{max}$ $I_F = 70\ \text{mA}$	$\Delta\lambda$	42	nm
Abstrahlwinkel Half angle	$\varphi$	$\pm 9$	Grad deg.

Kennwerte ( $T_A = 25\text{ °C}$ )

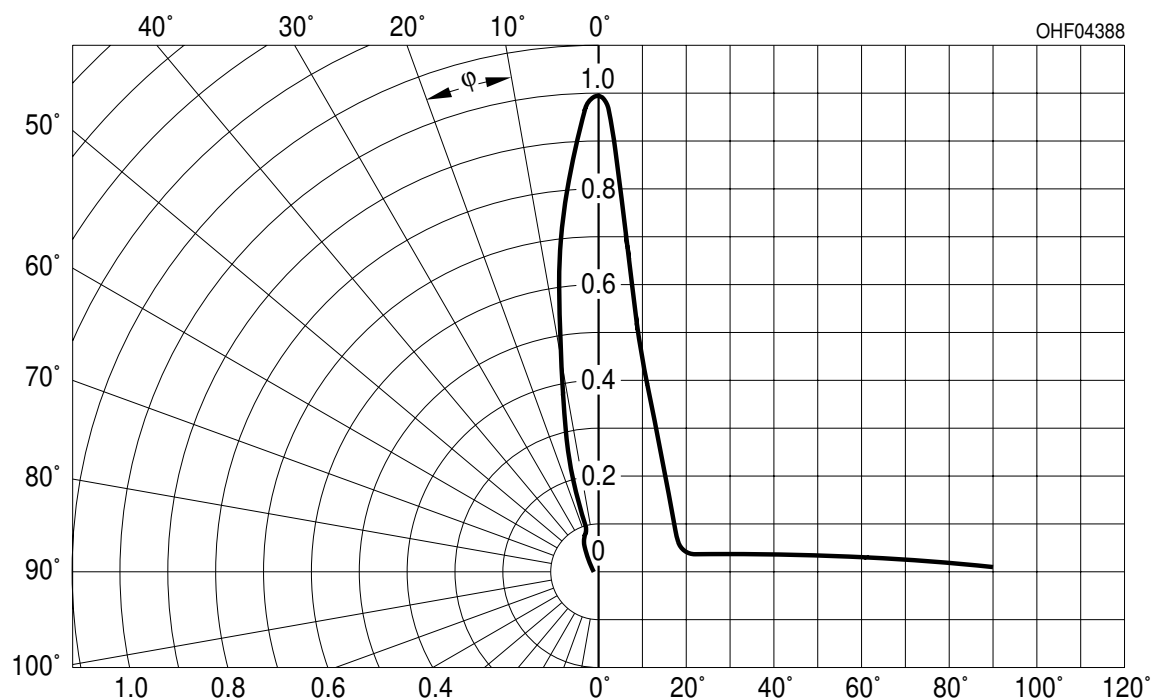
Characteristics (cont'd)

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Aktive Chipfläche Active chip area	$A$	0.04	mm <sup>2</sup>
Abmessungen der aktiven Chipfläche Dimension of the active chip area	$L \times B$ $L \times W$	$0.2 \times 0.2$	mm <sup>2</sup>
Schaltzeiten, $I_e$ von 10% auf 90% und von 90% auf 10%, bei $I_F = 70\text{ mA}$ , $R_L = 50\ \Omega$ Switching times, $I_e$ from 10% to 90% and from 90% to 10%, $I_F = 70\text{ mA}$ , $R_L = 50\ \Omega$	$t_r, t_f$	12	ns
Durchlassspannung Forward voltage $I_F = 70\text{ mA}$ , $t_p = 20\text{ ms}$	$V_F$	1.6 (< 2.0)	V
Sperrstrom Reverse current	$I_R$	not designed for reverse operation	$\mu\text{A}$
Gesamtstrahlungsfluss Total radiant flux $I_F = 70\text{ mA}$ , $t_p = 20\text{ ms}$	$\Phi_{e\text{ typ}}$	40	mW
Temperaturkoeffizient von $I_e$ bzw. $\Phi_e$ , $I_F = 70\text{ mA}$ Temperature coefficient of $I_e$ or $\Phi_e$ , $I_F = 70\text{ mA}$	$TC_I$	- 0.5	%/K
Temperaturkoeffizient von $V_F$ , $I_F = 70\text{ mA}$ Temperature coefficient of $V_F$ , $I_F = 70\text{ mA}$	$TC_V$	- 3.5	mV/K
Temperaturkoeffizient von $\lambda$ , $I_F = 70\text{ mA}$ Temperature coefficient of $\lambda$ , $I_F = 70\text{ mA}$	$TC_\lambda$	+ 0.3	nm/K

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

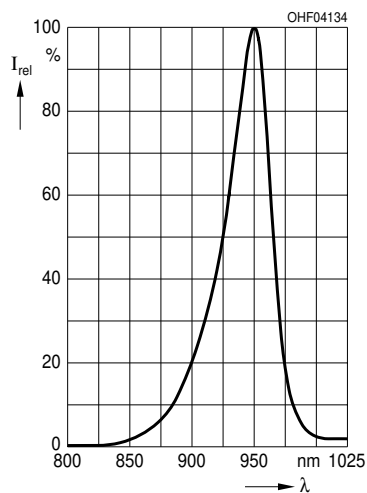
Bezeichnung Parameter	Symbol	Werte Values			Einheit Unit
		SFH 4045 - U	SFH 4045 - V	SFH 4045 - AW	
Strahlstärke Radiant intensity $I_F = 70$ mA, $t_p = 20$ ms	$I_{e \text{ min}}$ $I_{e \text{ max}}$	40 80	63 125	100 200	mW/sr mW/sr
Strahlstärke Radiant intensity $I_F = 500$ mA, $t_p = 25$ $\mu$ s	$I_{e \text{ typ}}$	225	360	550	mW/sr

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

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

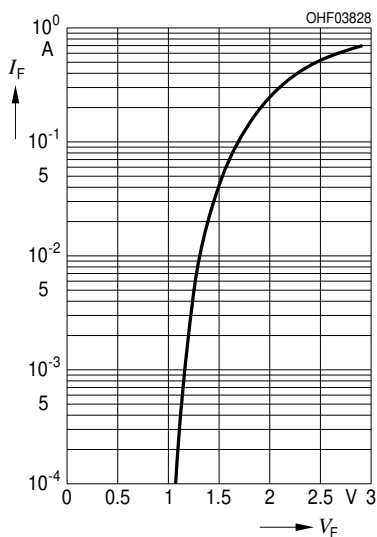
**Relative Spectral Emission**

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



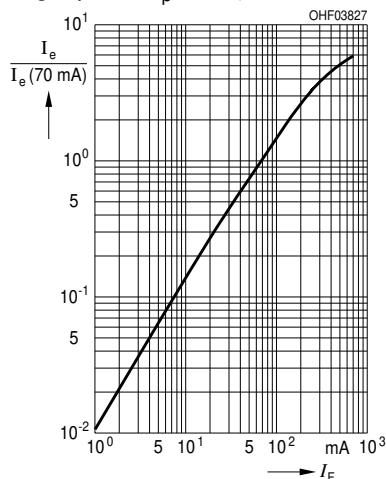
**Forward Current  $I_F = f(V_F)$**

Single pulse,  $t_p = 100 \mu s$



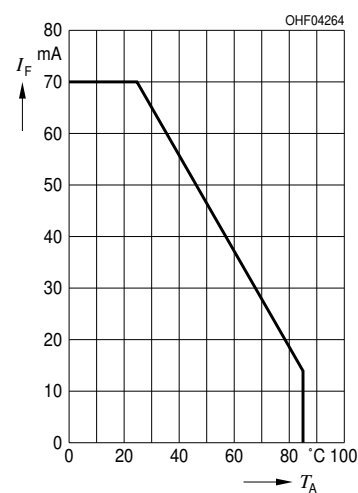
**Radiant Intensity  $\frac{I_e}{I_e(70 \text{ mA})} = f(I_F)$**

Single pulse,  $t_p = 25 \mu s$



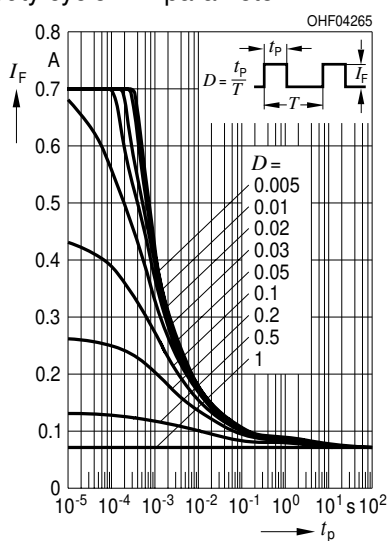
**Max. Permissible Forward Current**

$I_F = f(T_A), R_{thJA} = 540 \text{ K/W}$



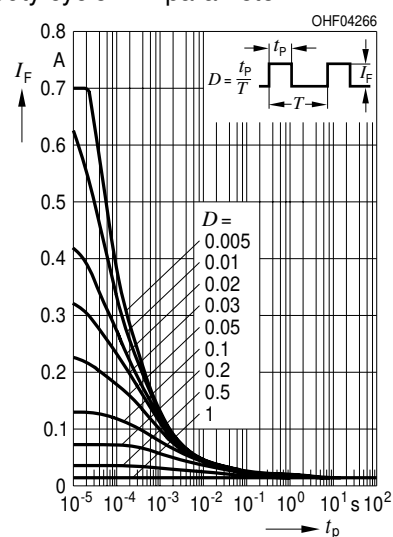
**Permissible Pulse Handling Capability  $I_F = f(\tau), T_A = 25 \text{ °C}$**

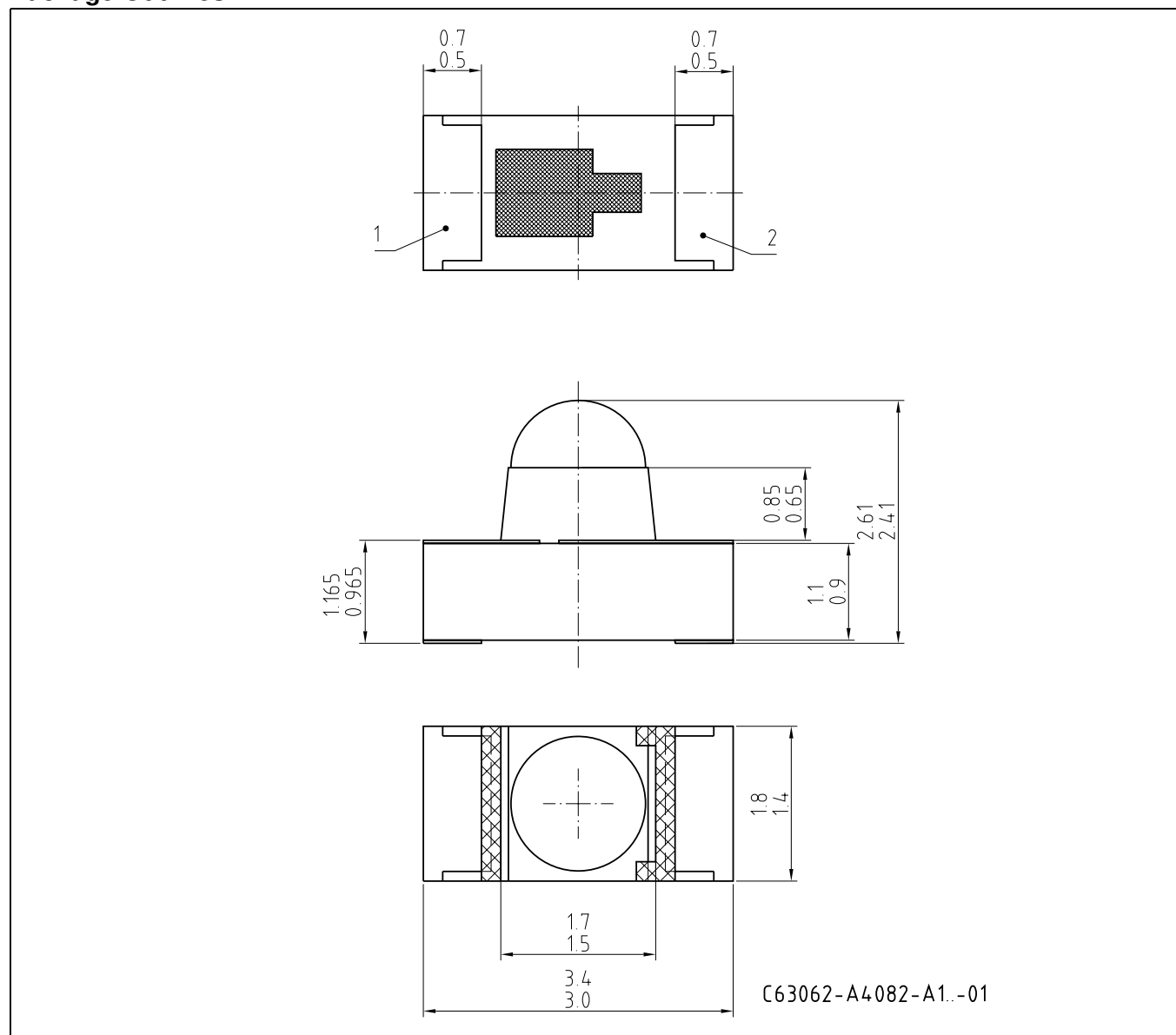
Single pulse,  $t_p = 100 \mu s$   
 duty cycle  $D = \text{parameter}$



**Permissible Pulse Handling Capability  $I_F = f(\tau), T_A = 85 \text{ °C}$**

Single pulse,  $t_p = 100 \mu s$   
 duty cycle  $D = \text{parameter}$



**Maßzeichnung**  
**Package Outlines**


Maße in mm / Dimensions in mm.

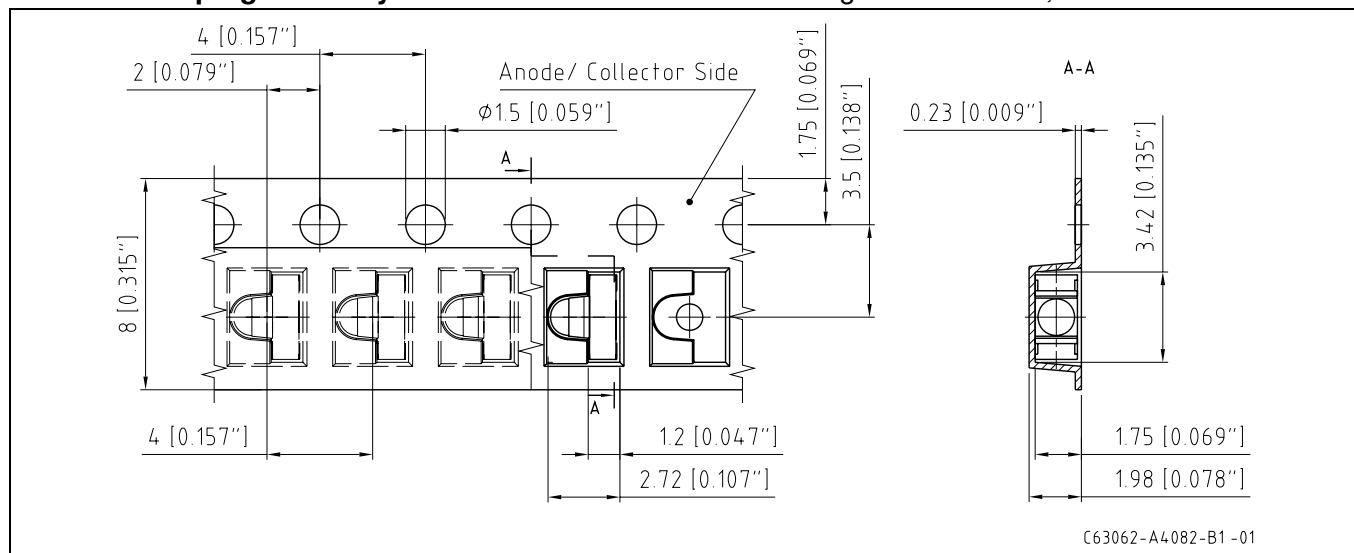
Gehäuse / Package	Sidelooker mit Linse / Sidelooker with Lens
Anschlussbelegung pin configuration	1 = Kathode / cathode 2 = Anode / anode
Farbe Color	farblos klar colorless clear

**Gurtung / Polarität und Lage**

Verpackungseinheit 1500/Rolle, ø180 mm

**Method of Taping / Polarity and Orientation**

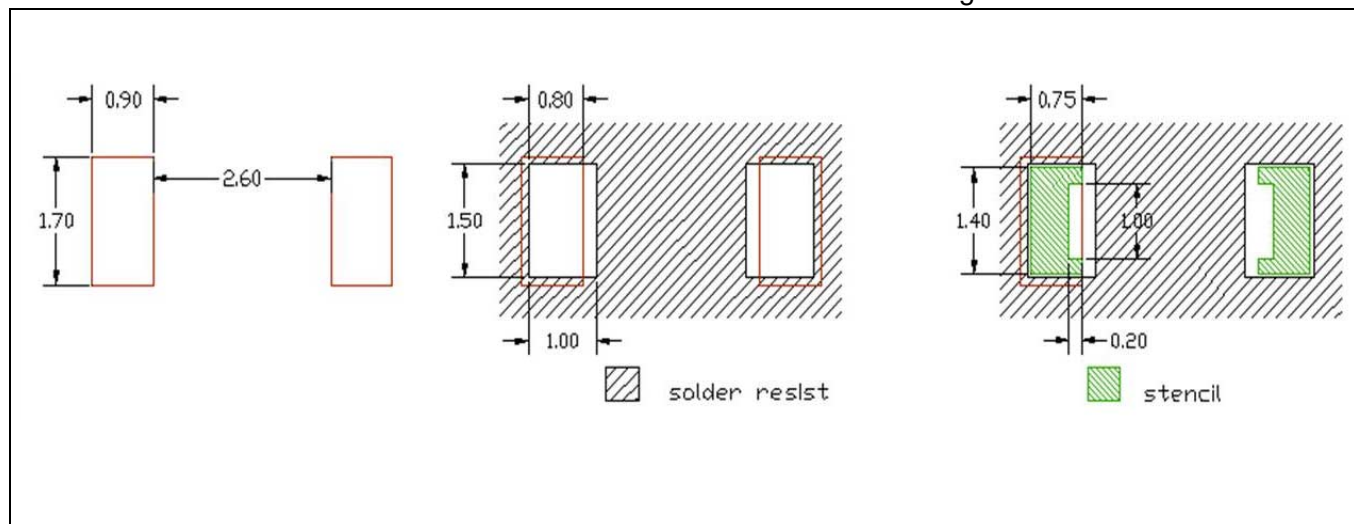
Packing unit 1500/reel, ø180 mm



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

**Empfohlenes Lötpaddesign  
Recommended Solder Pad**

Reflow Löten  
Reflow Soldering



Maße in mm / Dimensions in mm.



