

# Leistungsstarke IR-Lumineszenzdiode High Power Infrared Emitter

SFH 4500  
SFH 4505



SFH 4500



SFH 4505

## Vorläufige Daten / Preliminary Data

### Wesentliche Merkmale

- Leistungsstarke GaAs-LED (40mW)
- Hoher Wirkungsgrad bei kleinen Strömen
- Typische Peakwellenlänge 950nm
- Engwinkliger SMT-Sidelooker
- IR Reflow Löten geeignet
- Feuchte-Empfindlichkeitsstufe 3 nach JEDEC Standard J-STD-020A

### Features

- High Power GaAs-LED (40mW)
- High Efficiency at low currents
- Typical peak wavelength 950nm
- Narrow angle SMT-Sidelooker
- Suitable for IR reflow soldering
- Moisture Sensitivity Level 3 according to JEDEC Standard J-STD-020A

### Anwendungen

- Bauteil mit hoher Strahlstärke zur Oberflächenmontage (SMT)
- Schnelle Datenübertragung mit Übertragungsraten bis 100 Mbaud (IR Tastatur, Joystick, Multimedia)
- Analoge und digitale Hi-Fi Audio- und Videosignalübertragung
- Alarm- und Sicherungssysteme
- IR Freiraumübertragung
- IR-Scheinwerfer für Kameras

### Applications

- Device with high radiant intensity suitable for surface mounting (SMT)
- High data transmission rate up to 100 Mbaud (IR keyboard, Joystick, Multimedia)
- Analog and digital Hi-Fi audio and video signal transmission
- Alarm and safety equipment
- IR free air transmission
- IR spotlight for cameras

Typ Type	Bestellnummer Ordering Code	Strahlstärkegruppierung <sup>1)</sup> ( $I_F = 100\text{mA}$ , $t_p = 20\text{ ms}$ ) Radiant intensity grouping <sup>1)</sup> $I_e$ (mW/sr)
SFH 4500	Q62702-P5163	85 (>25)
SFH 4505	Q62702-P5164	85 (>25)

<sup>1)</sup> 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	$V_R$	3	V
Durchlaßstrom Forward current	$I_F$ (DC)	100	mA
Stoßstrom Surge current $t_p = 10\text{ }\mu\text{s}, D = 0$	$I_{FSM}$	2.2	A
Verlustleistung Power dissipation	$P_{tot}$	180	mW
Wärmewiderstand Sperrschicht - Umgebung, freie Beinchenlänge max. 10 mm Thermal resistance junction - ambient, lead length between package bottom and PCB max. 10 mm	$R_{thJA}$	375	K/W

Kennwerte ( $T_A = 25\text{ °C}$ )

## Characteristics

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Wellenlänge der Strahlung Wavelength of peak emission $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\lambda_{\text{peak}}$	950	nm
Spektrale Bandbreite bei 50% von $I_{\text{max}}$ Spectral bandwidth at 50% of $I_{\text{max}}$ $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\Delta\lambda$	40	nm
Abstrahlwinkel Half angle	$\varphi$	$\pm 10$	Grad deg.
Aktive Chipfläche Active chip area	$A$	0.09	mm <sup>2</sup>
Abmessungen der aktiven Chipfläche Dimension of the active chip area	$L \times B$ $L \times W$	$0.3 \times 0.3$	mm
Schaltzeiten, $I_e$ von 10% auf 90% und von 90% auf 10% Switching times, $I_e$ from 10% to 90% and from 90% to 10% $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$ , $R_L = 50\ \Omega$	$t_r$ , $t_f$	10	ns
Kapazität Capacitance $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$	$C_o$	35	pF
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 ( $\leq 1.8$ ) 3.2 ( $\leq 4.3$ )	V V
Sperrstrom Reverse current $V_R = 3\text{ V}$	$I_R$	0.01 ( $\leq 10$ )	$\mu\text{A}$
Gesamtstrahlungsfluß Total radiant flux $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\Phi_e$	40	mW
Temperaturkoeffizient von $I_e$ bzw. $\Phi_e$ Temperature coefficient of $I_e$ or $\Phi_e$ $I_F = 100\text{ mA}$	$TC_1$	- 0.44	%/K

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

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Temperaturkoeffizient von $V_F$ Temperature coefficient of $V_F$ $I_F = 100\text{ mA}$	$TC_V$	- 1.5	mV/K
Temperaturkoeffizient von $\lambda$ Temperature coefficient of $\lambda$ $I_F = 100\text{ mA}$	$TC_\lambda$	+ 0.2	nm/K

**Strahlstärke  $I_e$  in Achsrichtung**gemessen bei einem Raumwinkel von  $\Omega = 0.01\text{ sr}$ **Radiant Intensity  $I_e$  in Axial Direction**measured at a solid angle of  $\Omega = 0.01\text{ sr}$ 

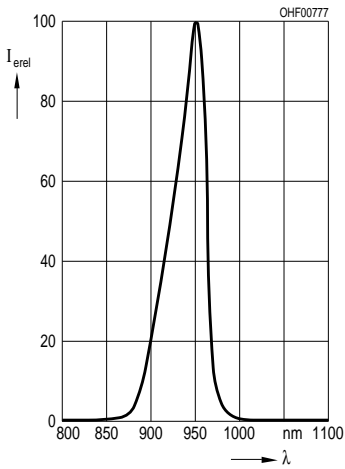
Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Strahlstärke Radiant intensity $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$I_{e\text{ min}}$ $I_{e\text{ typ}}$	25 85	mW/sr mW/sr
Strahlstärke Radiant intensity $I_F = 1\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$	$I_{e\text{ typ}}$	550	mW/sr

**Lötbedingungen****Soldering Conditions**

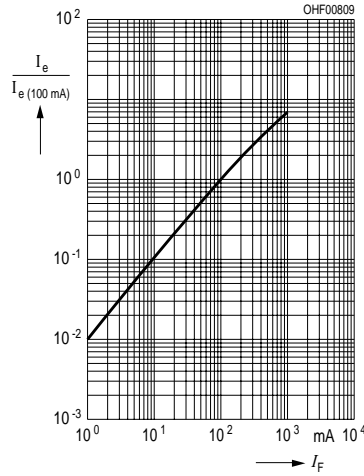
Reflowlötung Reflow Soldering		Kolbenlötung (mit 1,5-mm-Kolbenspitze) Iron Soldering (with 1.5-mm-bit)		
Lötzonen- temperatur  Temperature of Soldering Zone	Maximale Durchlaufzeit  Max. Transit Time	Temperatur des Kolbens  Temperature of the Solder- ing Iron	Maximale zulässige Lötzeit  Max. Permis- sible Solder- ing Time	Abstand Lötstelle – Gehäuse  Distance between Solder Joint and Case
245 °C	10 s	300 °C	3 s	$\geq 1.5\text{ mm}$

**Relative Spectral Emission**

$I_{\text{erel}} = f(\lambda)$

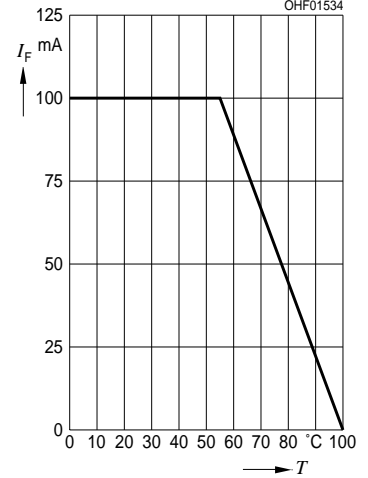


**Radiant Intensity  $I_e/I_{e(100 \text{ mA})} = f(I_F)$**   
Single pulse,  $t_p = 20 \mu\text{s}$

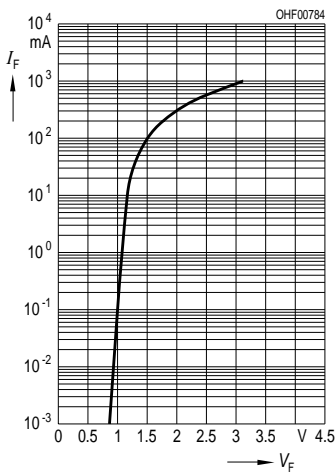


**Max. Permissible Forward Current**

$I_F = f(T_A)$

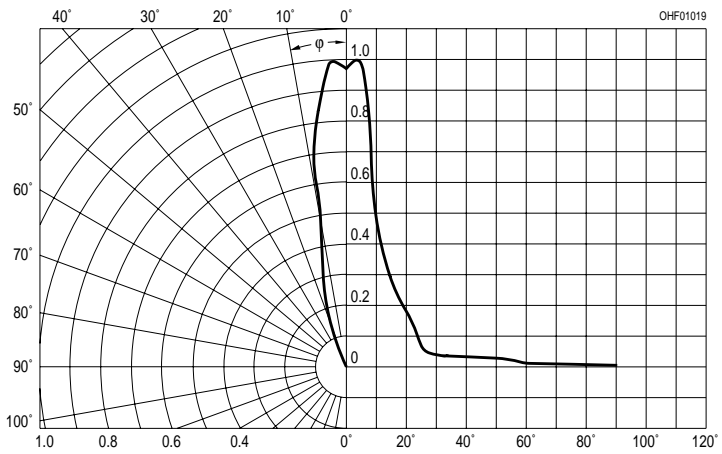


**Forward Current  $I_F = f(V_F)$**   
single pulse,  $t_p = 20 \mu\text{s}$

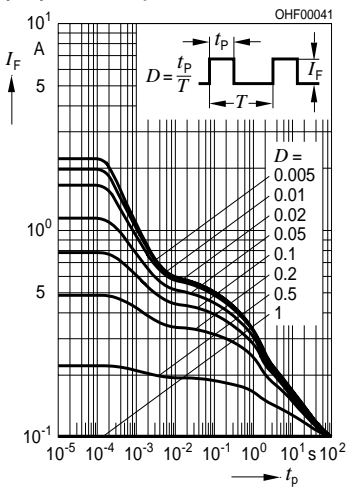


**Radiation Characteristic**

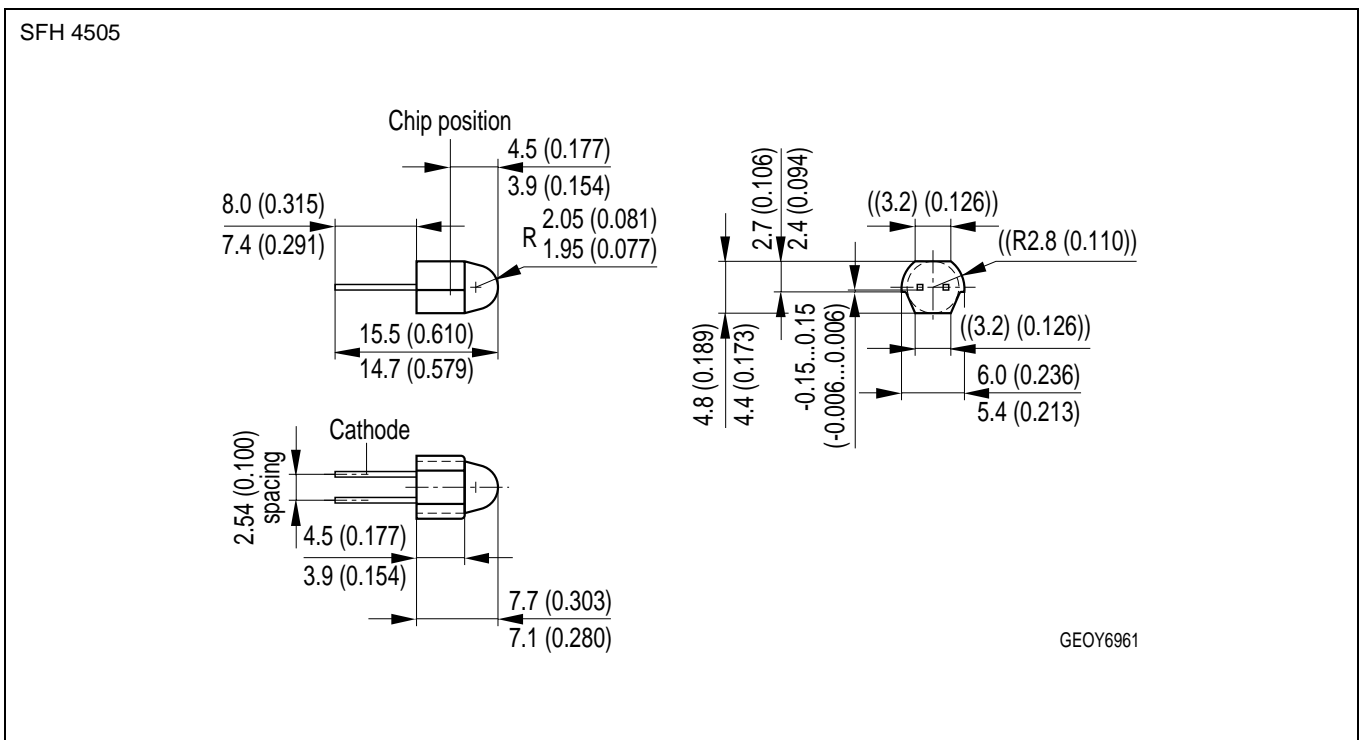
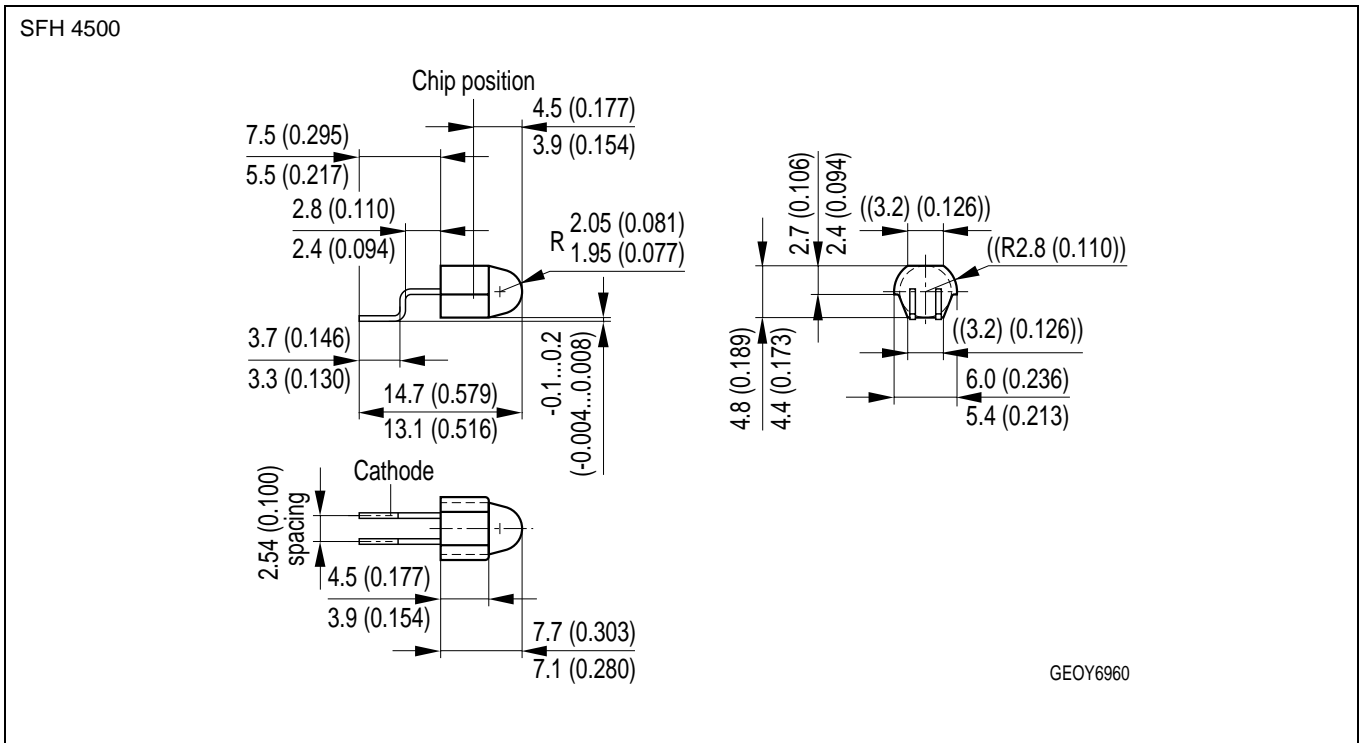
$I_{\text{erel}} = f(\varphi)$



**Permissible Pulse Handling Capability  $I_F = f(\tau)$ ,  $T_A = 25 \text{ }^\circ\text{C}$ ,**  
duty cycle  $D = \text{parameter}$



Maßzeichnungen  
Package Outlines



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

**Published by OSRAM Opto Semiconductors GmbH & Co. OHG**  
**Wernerwerkstrasse 2, D-93049 Regensburg**

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