

# GaAs-IR-Lumineszenzdiode

## GaAs Infrared Emitter

### Lead (Pb) Free Product - RoHS Compliant

#### SFH 4511



#### Wesentliche Merkmale

- GaAs-LED mit sehr hohem Wirkungsgrad
- 5mm Kunststoffgehäuse
- Peakwellenlänge 950 nm
- Sehr enger Abstrahlwinkel ( $\pm 4^\circ$ )
- Hohe Strahlstärke
- Hohe Zuverlässigkeit

#### Features

- Very highly efficient GaAs-LED
- 5mm plastic package
- Peak Wavelength 950 nm
- Very narrow radiation Angle ( $\pm 4$  Deg.)
- High radiant intensity
- High reliability

#### Anwendungen

- IR-Fernsteuerung von Fernseh- und Rundfunkgeräten, Videorecordern, Lichtdimmern
- Gerätefernsteuerungen für Gleich- und Wechsellichtbetrieb
- Sensorik
- Diskrete Lichtschranken

#### Applications

- IR remote control of hi-fi and TV-sets, video tape recorders, dimmers
- Remote control for steady and varying intensity
- Sensor technology
- Discrete interrupters

Typ Type	Bestellnummer Ordering Code	Strahlstärkegruppierung <sup>1)</sup> ( $I_F = 100$ mA, $t_p = 20$ ms) Radiant Intensity Grouping <sup>1)</sup> $I_e$ (mW/sr)
SFH 4511	Q62703Q5557	> 63 (typ. 150)

<sup>1)</sup> gemessen bei einem Raumwinkel  $\Omega = 0.001$  sr / measured at a solid angle of  $\Omega = 0.001$  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
Durchlassstrom Forward current	$I_F$	100	mA
Stoßstrom, $t_p = 10\text{ }\mu\text{s}$ , $D = 0$ Surge current	$I_{FSM}$	3	A
Verlustleistung Power dissipation	$P_{tot}$	165	mW
Wärmewiderstand Thermal resistance	$R_{thJA}$	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 $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\lambda_{peak}$	950	nm
Spektrale Bandbreite bei 50% von $I_{max}$ Spectral bandwidth at 50% of $I_{max}$ $I_F = 100\text{ mA}$	$\Delta\lambda$	55	nm
Abstrahlwinkel Half angle	$\varphi$	$\pm 4$	Grad deg.
Aktive Chipfläche Active chip area	$A$	0.09	mm <sup>2</sup>
Abmessungen der aktiven Chipfläche Dimensions 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%, bei $I_F = 100\text{ mA}$ , $R_L = 50\text{ }\Omega$ Switching times, $I_e$ from 10% to 90% and from 90% to 10%, $I_F = 100\text{ mA}$ , $R_L = 50\text{ }\Omega$	$t_r, t_f$	0.5	$\mu\text{s}$

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

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Kapazität, Capacitance $V_R = 0\text{ V}, f = 1\text{ MHz}$	$C_o$	25	pF
Durchlassspannung Forward voltage $I_F = 100\text{ mA}, t_p = 20\text{ ms}$ $I_F = 1\text{ A}, t_p = 100\text{ }\mu\text{s}$	$V_F$ $V_F$	1.3 ( $\leq 1.5$ ) 2.3 ( $\leq 2.8$ )	V V
Sperrstrom Reverse current $V_R = 5\text{ V}$	$I_R$	0.01 ( $\leq 1$ )	$\mu\text{A}$
Gesamtstrahlungsfluss Total radiant flux $I_F = 100\text{ mA}, t_p = 20\text{ ms}$	$\Phi_e$	22	mW
Strahlstärke Radiant intensity $I_F = 1\text{ A}, t_p = 100\text{ }\mu\text{s}$	$I_{e\text{ typ.}}$	1200	mW/sr
Temperaturkoeffizient von $I_e$ bzw. $\Phi_e$ , $I_F = 100\text{ mA}$ Temperature coefficient of $I_e$ or $\Phi_e$ , $I_F = 100\text{ mA}$	$TC_I$	- 0.5	%/K
Temperaturkoeffizient von $V_F$ , $I_F = 100\text{ mA}$ Temperature coefficient of $V_F$ , $I_F = 100\text{ mA}$	$TC_V$	- 2	mV/K
Temperaturkoeffizient von $\lambda$ , $I_F = 100\text{ mA}$ Temperature coefficient of $\lambda$ , $I_F = 100\text{ mA}$	$TC_\lambda$	+ 0.3	nm/K

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### Strahlstärke $I_e$ in Achsrichtung

gemessen bei einem Raumwinkel  $\Omega = 0.001$  sr

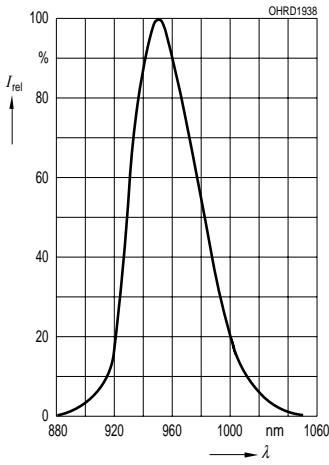
### Grouping of Radiant Intensity $I_e$ in Axial Direction

at a solid angle of  $\Omega = 0.001$  sr

Bezeichnung Parameter	Symbol	Wert Value	Einheit Unit
Strahlstärke Radiant intensity $I_F = 100$ mA, $t_p = 20$ ms	$I_{e \text{ min.}}$ $I_{e \text{ typ.}}$	63 150	mW/sr mW/sr
Strahlstärke Radiant intensity $I_F = 1$ A, $t_p = 100$ $\mu$ s	$I_{e \text{ typ.}}$	1200	mW/sr

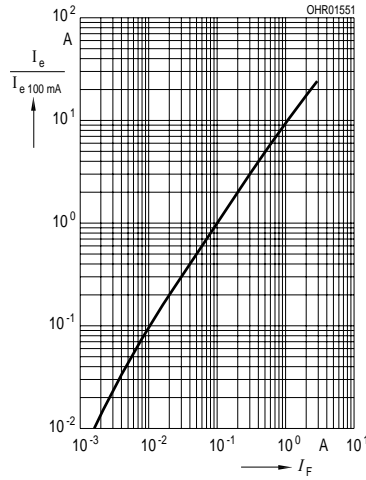
**Relative Spectral Emission**

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



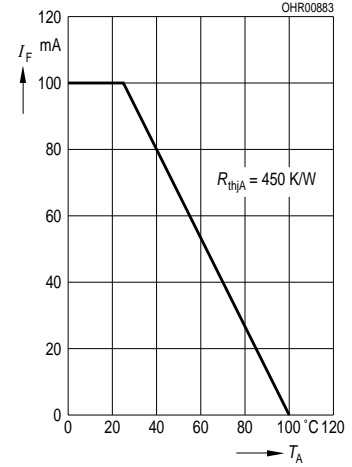
**Radiant Intensity**  $\frac{I_e}{I_e 100 \text{ mA}} = f(I_F)$

Single pulse,  $t_p = 20 \mu\text{s}$



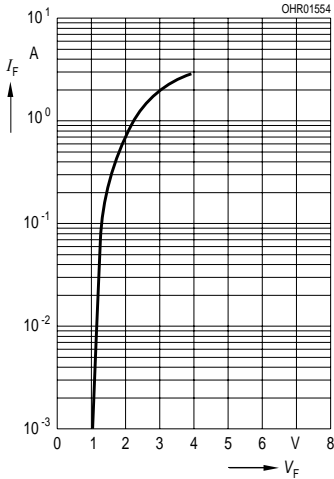
**Max. Permissible Forward Current**

$I_F = f(T_A)$



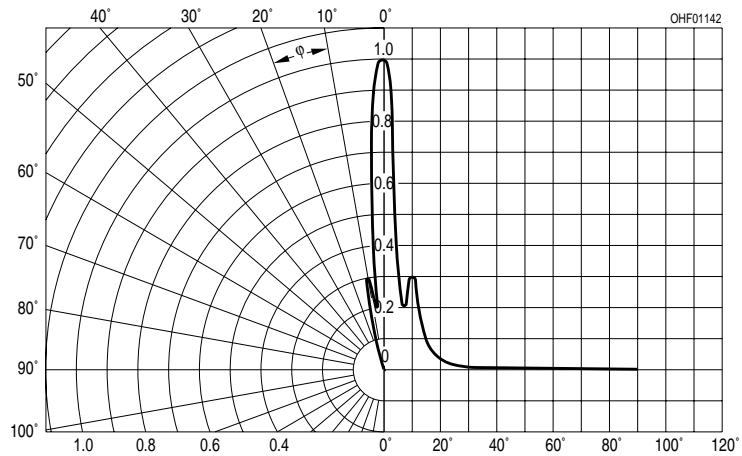
**Forward Current**

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



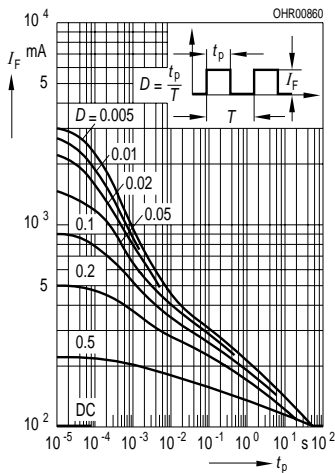
**Radiation Characteristics,**

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



**Permissible Pulse Handling Capability**

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

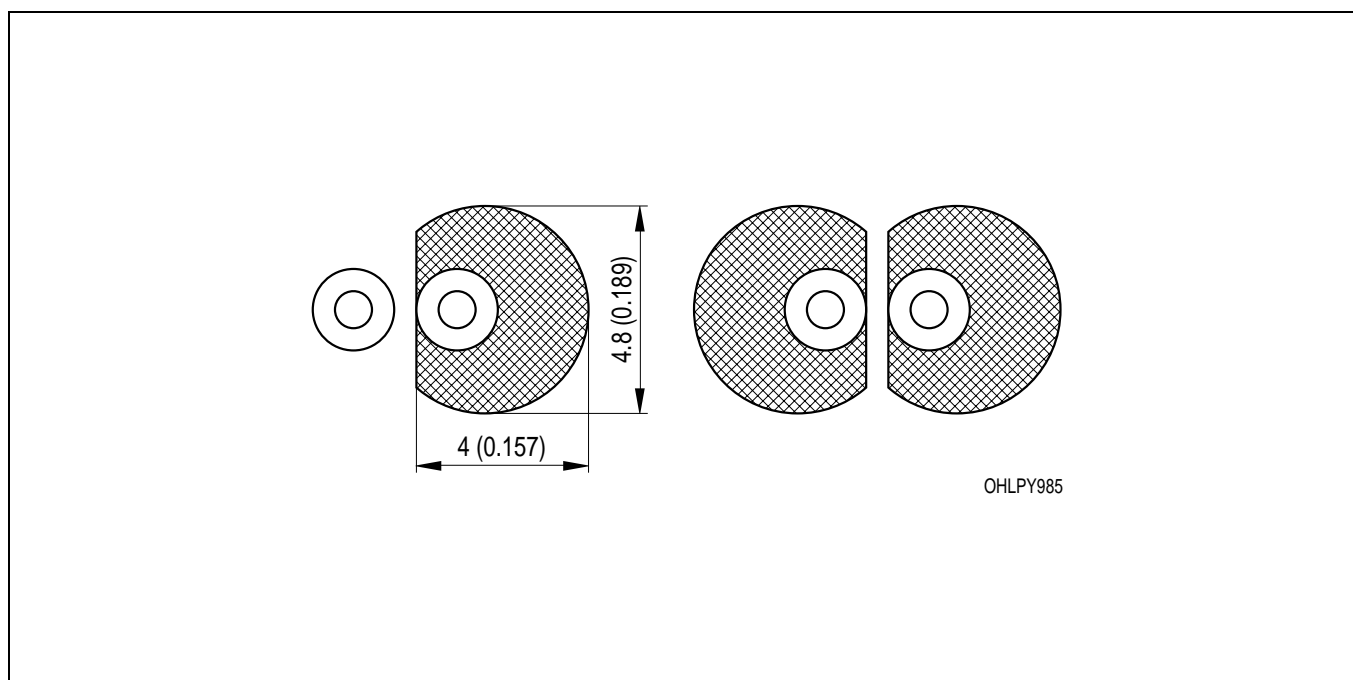




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Empfohlenes Lötpad design  
Recommended Solder Pad

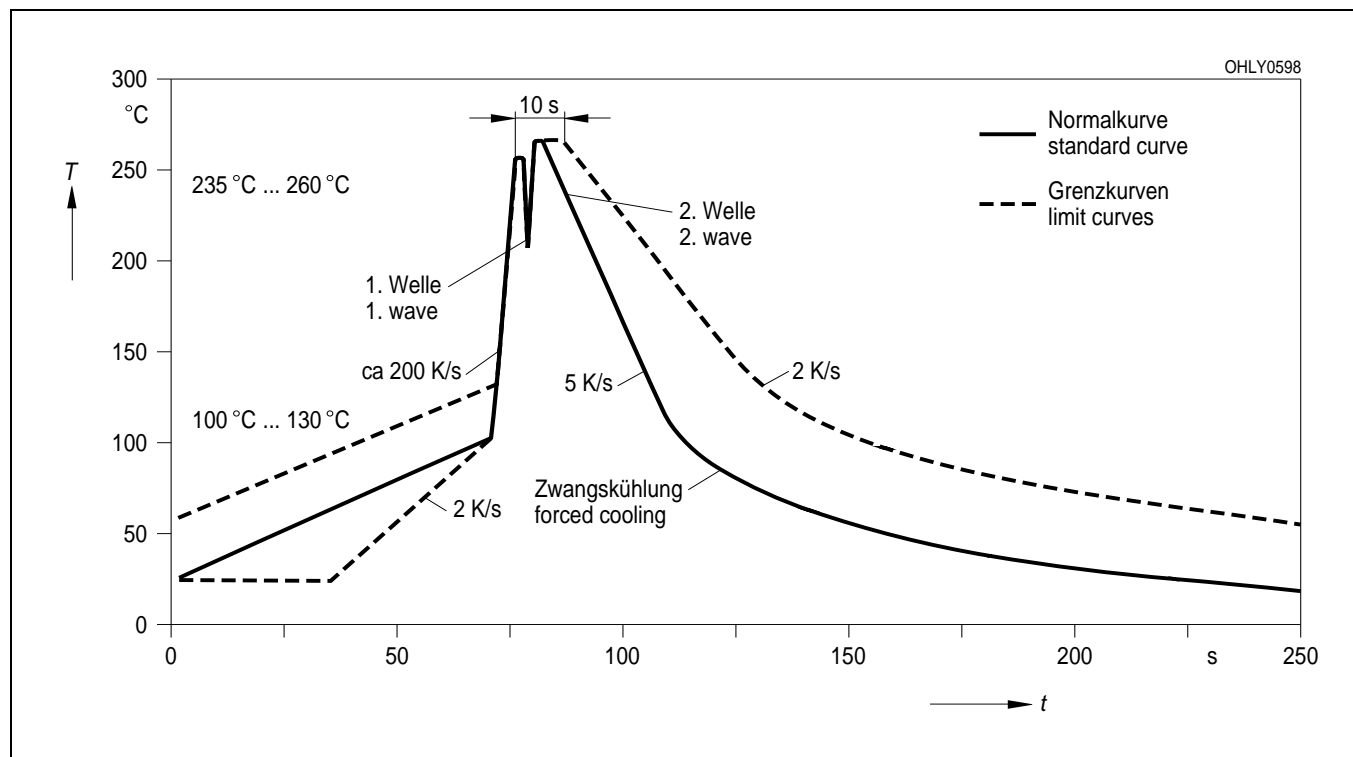
Wellenlöten (TTW)  
TTW Soldering



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

**Lötbedingungen**  
**Soldering Conditions**  
**Wellenlöten (TTW)**  
**TTW Soldering**

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



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