

**GaAs-IR-Lumineszenzdiode mit 3/4 Linse (950nm)**  
**GaAs Infrared Emitter with 3/4 lens (950nm)**  
**Lead (Pb) Free Product - RoHS Compliant**

**SFH 4113**



**Wesentliche Merkmale**

- Wellenlänge der Strahlung 950 nm
- Hohe Strahlstärke
- Geringe Außenabmessungen

**Anwendungen**

- Bandende Erkennung (z.B. Videorecorder)
- Datenübertragung
- Positionsüberwachung
- Barcode-Leser
- „Messen/Steuern/Regeln“
- Münzzähler

**Features**

- Peak wavelength of 950 nm
- High radiant intensity
- Small outline dimensions

**Applications**

- Tape end detection (VCR e.g.)
- Data transmission
- Position sensing
- Barcode reader
- For control and drive circuits
- Coin counters

Typ Type	Bestellnummer Ordering Code	Ee <sup>1)</sup> [mW/cm <sup>2</sup> ] at d <sup>2)</sup> =6mm, If=4mA
SFH 4113	Q62702P5299	0.25 - 1.25

<sup>1)</sup> Auf einem Detektor erzeugte Bestrahlungsstärke.

Irradiance generated on a detector.

<sup>2)</sup> Entfernung zwischen Vorderseite Beinchen und Detektorebene.

Distance between leadframe front side and detection area.

**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 ... + 85	°C
Sperrspannung Reverse voltage	$V_R$	5	V
Durchlaßstrom Forward current	$I_F$ (DC)	50	mA
Stoßstrom, $t_p = 10\text{ }\mu\text{s}$ , $D = 0$ Surge current	$I_{FSM}$	1	A
Verlustleistung Power dissipation	$P_{tot}$	75	mW
Wärmewiderstand Sperrschicht - Umgebung Thermal resistance junction - ambient	$R_{thJA}$	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	$\lambda_{peak}$	950	nm
Spektrale Bandbreite bei 50% von $I_{max}$ Spectral bandwidth at 50% of $I_{max}$	$\Delta\lambda$	55	nm
Abstrahlwinkel horizontal/ vertikal Half angle horizontal/ vertical	$\varphi$	$\pm 33/ 43$	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 <sup>2</sup>
Schaltzeiten, $I_e$ von 10% auf 90% und von 90% auf 10%, bei $I_F = 50\text{ mA}$ , $R_L = 50\text{ }\Omega$ Switching times, $I_e$ from 10% to 90% and from 90% to 10%, $I_F = 50\text{ mA}$ , $R_L = 50\text{ }\Omega$	$t_r, t_f$	0.5	$\mu\text{s}$
Kapazität, Capacitance $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$	$C_o$	40	pF

Kennwerte ( $T_A = 25\text{ °C}$ )

Characteristics (cont'd)

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Durchlaßspannung, Forward voltage $I_F = 20\text{ mA}$ , $t_p = 20\text{ ms}$	$V_F$	1.25 ( $\leq 1.6$ )	V
Sperrstrom, Reverse current $V_R = 5\text{ V}$	$I_R$	0.01 ( $\leq 1.0$ )	$\mu\text{A}$
Gesamtstrahlungsfluß, Total radiant flux $I_F = 20\text{ mA}$ , $t_p = 20\text{ ms}$	$\Phi_e$	3.5	mW
Temperaturkoeffizient von $I_e$ bzw. $\Phi_e$ , $I_F = 20\text{ mA}$ Temperature coefficient of $I_e$ or $\Phi_e$ , $I_F = 20\text{ mA}$	$TC_I$	- 1.1	%/K
Temperaturkoeffizient von $V_F$ , $I_F = 20\text{ mA}$ Temperature coefficient of $V_F$ , $I_F = 20\text{ mA}$	$TC_V$	- 1.3	mV/K
Temperaturkoeffizient von $\lambda$ , $I_F = 20\text{ mA}$ Temperature coefficient of $\lambda$ , $I_F = 20\text{ mA}$	$TC_\lambda$	+ 0.3	nm/K

Bezeichnung Parameter	Symbol Symbol	Werte Values	Einheit Unit
Bestrahlungsstärke <sup>1)</sup> Irradiance <sup>1)</sup> $d^2) = 6\text{ mm}$ , $I_F = 4\text{ mA}$ , $t_p = 20\text{ ms}$	$E_e$ <sup>1)</sup>	0.25 ... 1.25	mW/cm <sup>2</sup>

<sup>1)</sup> Auf einem Detektor erzeugte Bestrahlungsstärke.

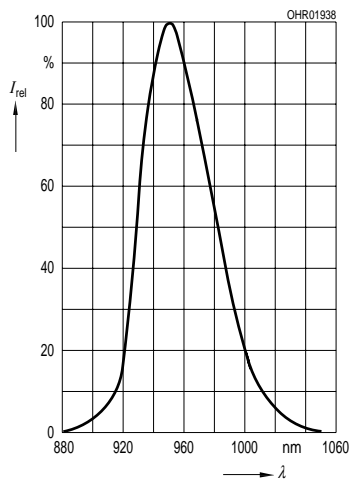
Irradiance generated on a detector.

<sup>2)</sup> Entfernung zwischen Vorderseite Beinchen und Detektorebene.

Distance between leadframe front side and detection area.

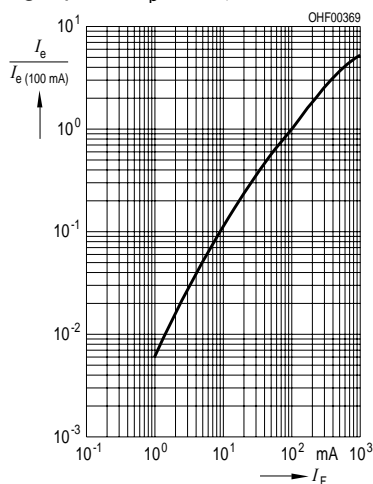
**Relative Spectral Emission**

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



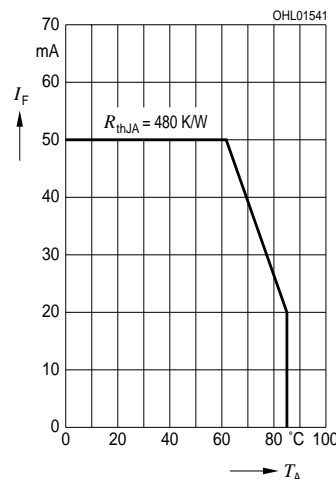
**Radiant Intensity**  $\frac{I_e}{I_e 100 \text{ mA}} = f(I_F)$

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



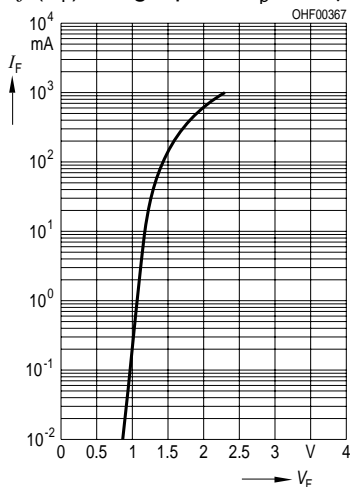
**Max. Permissible Forward Current**

$I_F = f(T_A)$



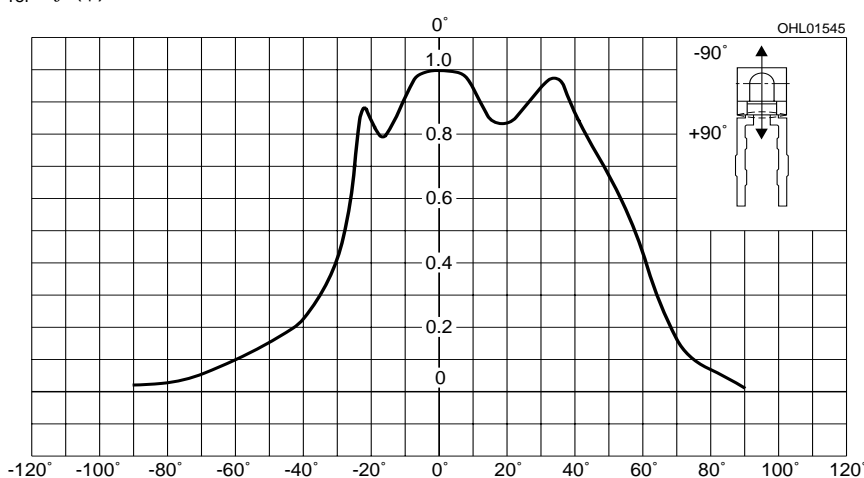
**Forward Current**

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



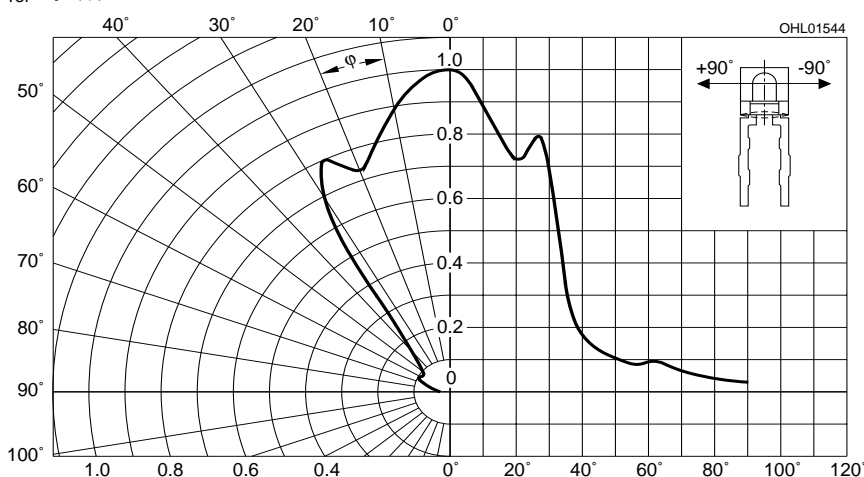
**Radiation Characteristics/ vertical**

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

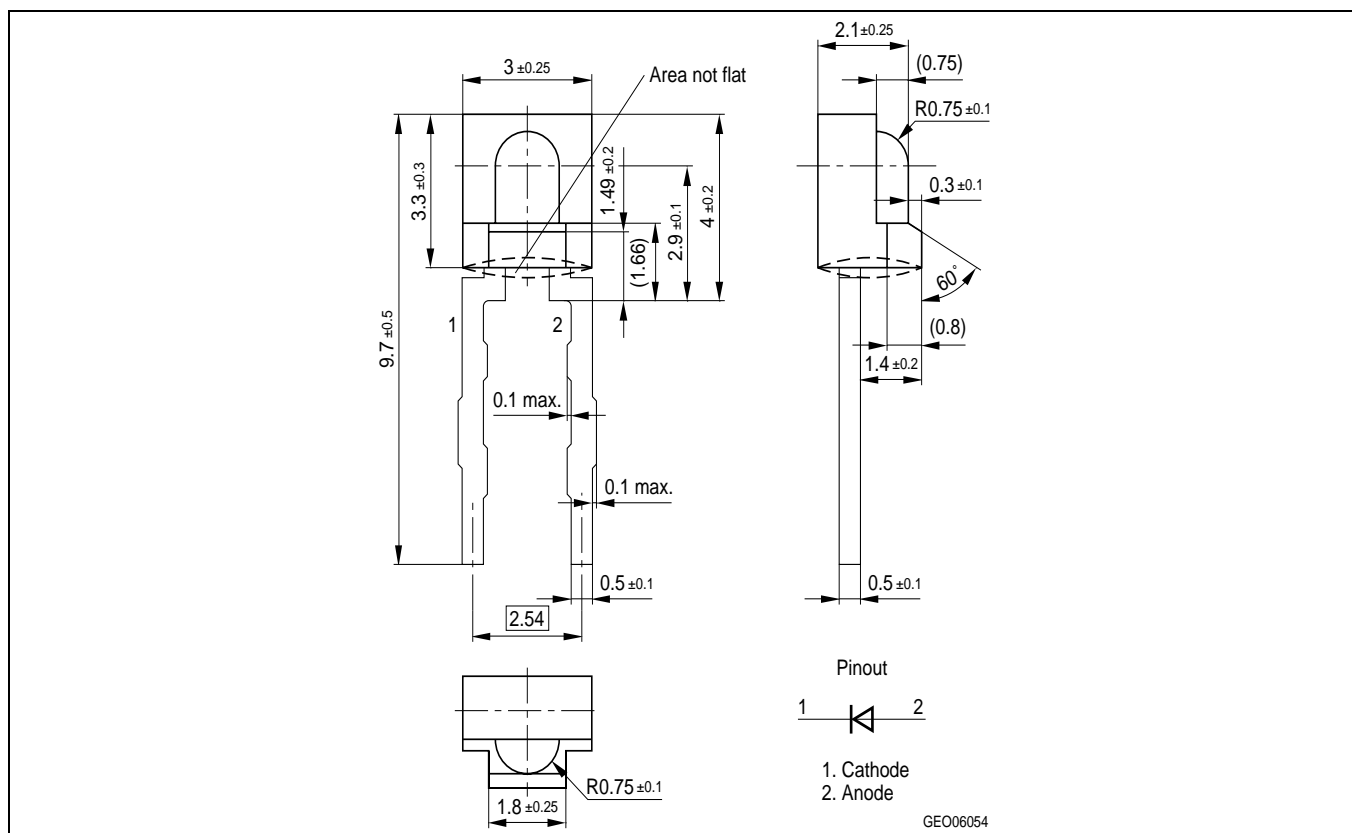


**Radiation Characteristics/ horiz**

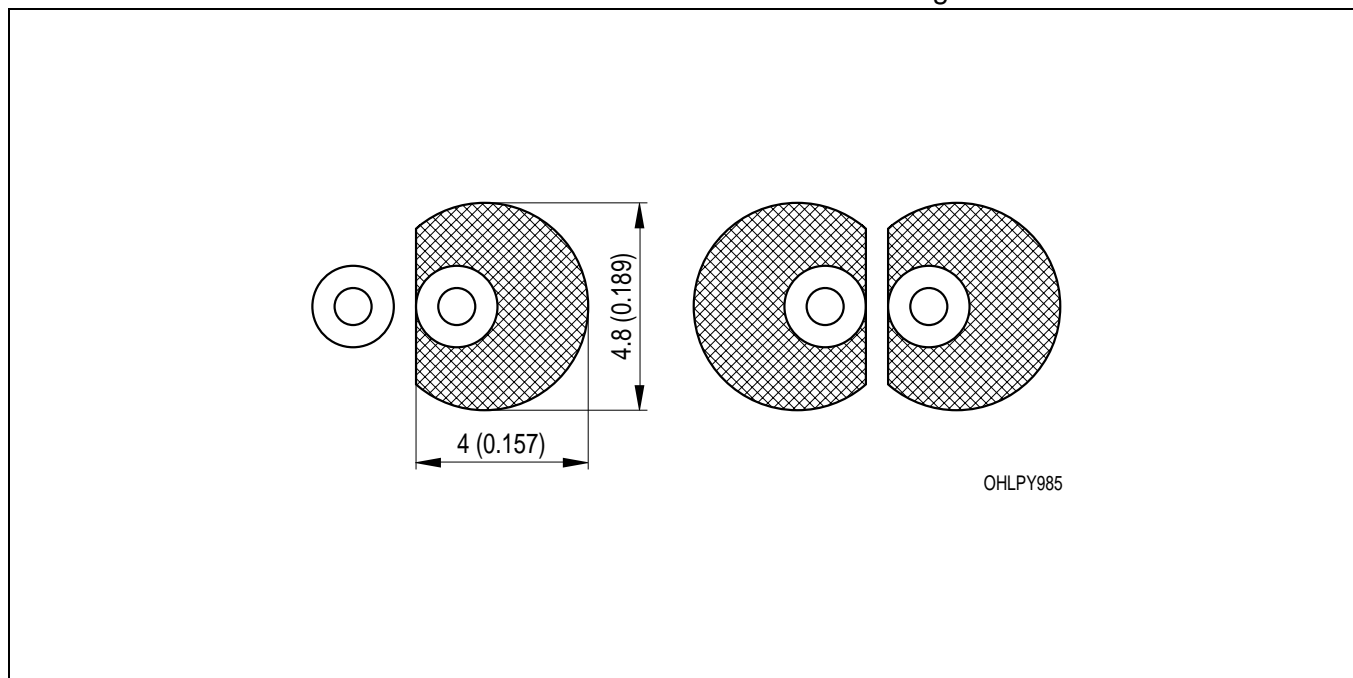
$I_{rel} = f(\varphi)$



## Maßzeichnung Package Outlines



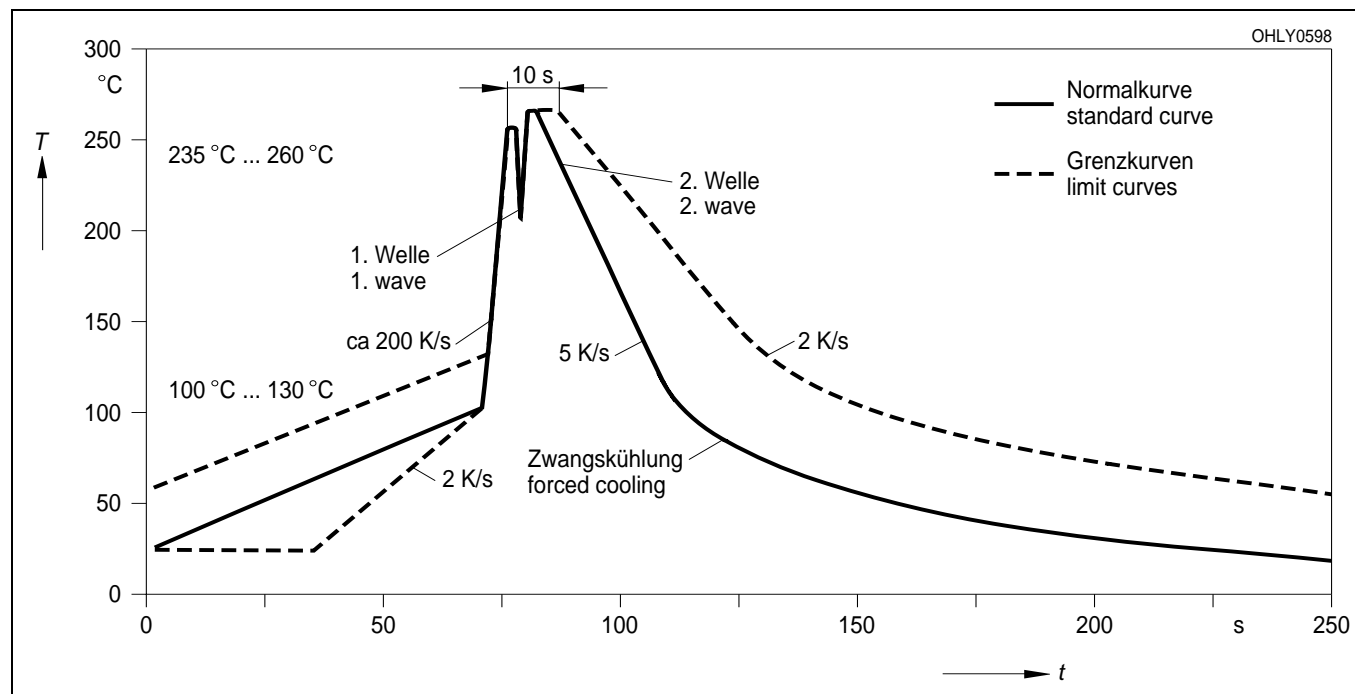
Maße in mm (inch) / Dimensions in mm (inch).

**Empfohlenes Lötpaddesign**  
**Recommended Solder Pad**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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