

GaAs-IR-Lumineszenzdiode
GaAs Infrared Emitter
Lead (Pb) Free Product - RoHS Compliant

SFH 409



Wesentliche Merkmale

- GaAs-LED mit sehr hohem Wirkungsgrad
- Hohe Zuverlässigkeit
- Hohe Impulsbelastbarkeit
- Gute spektrale Anpassung an Si-Fotoempfänger
- Gehäusegleich mit SFH 309, SFH 487

Features

- Very highly efficient GaAs-LED
- High reliability
- High pulse handling capability
- Good spectral match to silicon photodetectors
- Same package as SFH 309, SFH 487

Anwendungen

- IR-Fernsteuerungen von Fernseh-, Rundfunk- und Videogeräten, Lichtdimmern
- Lichtschranken bis 500 kHz
- Münzzähler
- Sensorik
- Diskrete Optokoppler

Applications

- IR remote control for hifi and TV sets, video tape recorders, dimmers
- Light-reflection switches (max. 500 kHz)
- Coin counters
- Sensor technology
- Discrete optocouplers

Typ Type	Bestellnummer Ordering Code	Gehäuse Package
SFH 409	Q62702P0860	3-mm-LED-Gehäuse (T 1), grau eingefärbt, Anschlüsse im 2.54-mm-Raster ($1/10''$), Kathodenkennzeichnung: kürzerer Anschluß 3 mm LED package (T 1), grey-colored epoxy resin, solder tabs lead spacing 2.54 mm ($1/10''$), cathode marking: short lead
SFH 409-2	Q62702P1002	

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, $\tau \leq 10\ \mu\text{s}$, $D = 0$ 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 $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	λ_{peak}	950	nm
Spektrale Bandbreite bei 50% von I_{max} Spectral bandwidth at 50% of I_{max} $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	$\Delta\lambda$	55	nm
Abstrahlwinkel Half angle	φ	± 20	Grad deg.
Aktive Chipfläche Active chip area	A	0.09	mm ²
Abmessungen der aktiven Chipfläche Dimensions of the active chip area	$L \times B$ $L \times W$	0.3×0.3	mm
Abstand Chipoberfläche bis Linsenscheitel Distance chip surface to lens top	H	2.6	mm
Kapazität, $V_R = 0\text{ V}$ Capacitance	C_o	25	pF

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%, bei $I_F = 100\text{ mA}$, $R_L = 50\ \Omega$ Switching times, I_e from 10% to 90% and from 90% to 10%, $I_F = 100\text{ mA}$, $R_L = 50\ \Omega$	t_r, t_f	0.5	μs
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	1.30 (≤ 1.5) 1.9 (≤ 2.5)	V V
Sperrstrom, Reverse current, $V_R = 5\text{ V}$	I_R	0.01 (≤ 1)	μA
Gesamtstrahlungsfluß, Total radiant flux $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	Φ_e	15	mW
Temperaturkoeffizient von I_e bzw. Φ_e , $I_F = 100\text{ mA}$ Temperature coefficient of I_e or Φ_e , $I_F = 100\text{ mA}$	TC_I	- 0.55	%/K
Temperaturkoeffizient von V_F , $I_F = 100\text{ mA}$ Temperature coefficient of V_F , $I_F = 100\text{ mA}$	TC_V	- 1.5	mV/K
Temperaturkoeffizient von λ_{peak} , $I_F = 100\text{ mA}$ Temperature coefficient of λ_{peak} , $I_F = 100\text{ mA}$	TC_λ	+ 0.3	nm/K

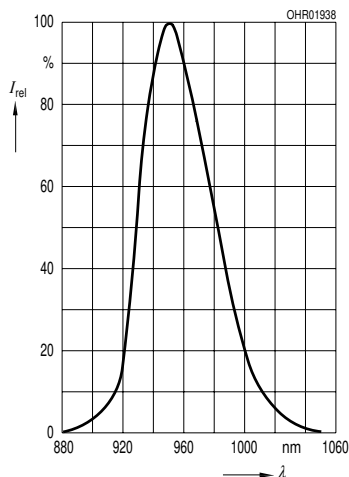
Gruppierung der Strahlstärke I_e in Achsrichtunggemessen bei einem Raumwinkel $\Omega = 0.01\text{ sr}$ **Grouping of Radiant Intensity I_e in Axial Direction**at a solid angle of $\Omega = 0.01\text{ sr}$

Bezeichnung Parameter	Symbol	Werte Values				Einheit Unit
		SFH 409	SFH 409-1 ¹⁾	SFH 409-2	SFH 409-3 ¹⁾	
Strahlstärke Radiant intensity $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$ $I_F = 1\text{ A}$, $t_p = 100\ \mu\text{s}$	I_e $I_{e\text{ typ.}}$	≥ 6.3 -	6.3 ... 12.5 75	> 10 120	16 ... 32 -	mW/sr mW/sr

¹⁾ Nicht bestellbar als Einzelgruppe.¹⁾ Can not be ordered as single group.

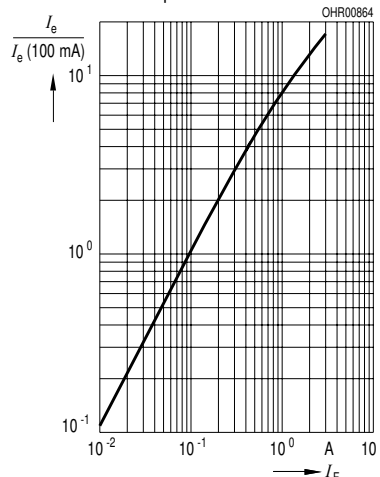
Relative Spectral Emission

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



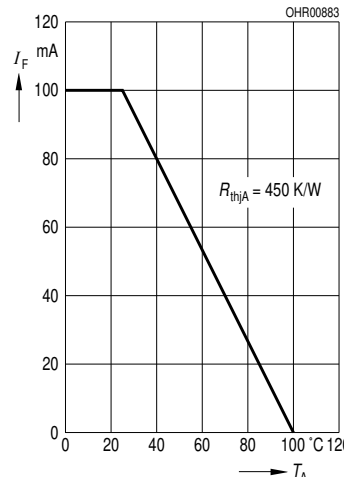
Radiant Intensity $\frac{I_e}{I_e 100 \text{ mA}} = f(I_F)$

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



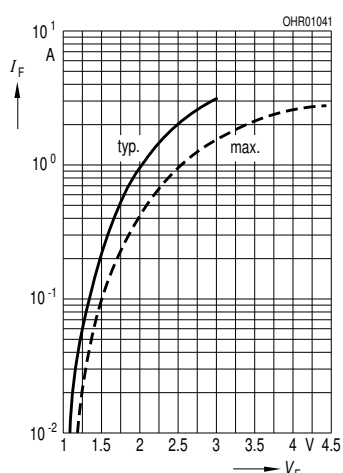
Max. Permissible Forward Current

$I_F = f(T_A)$



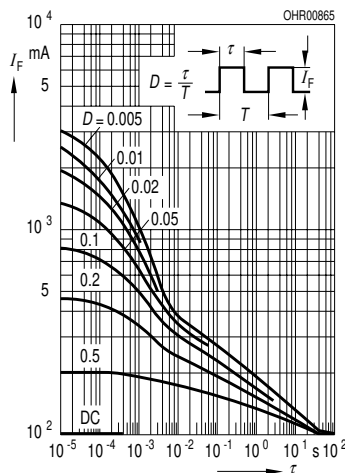
Forward Current

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

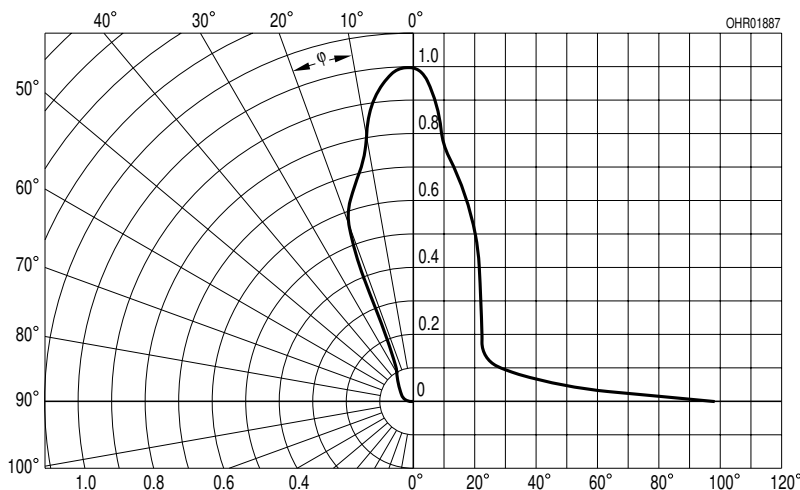


Permissible Pulse Handling Capability

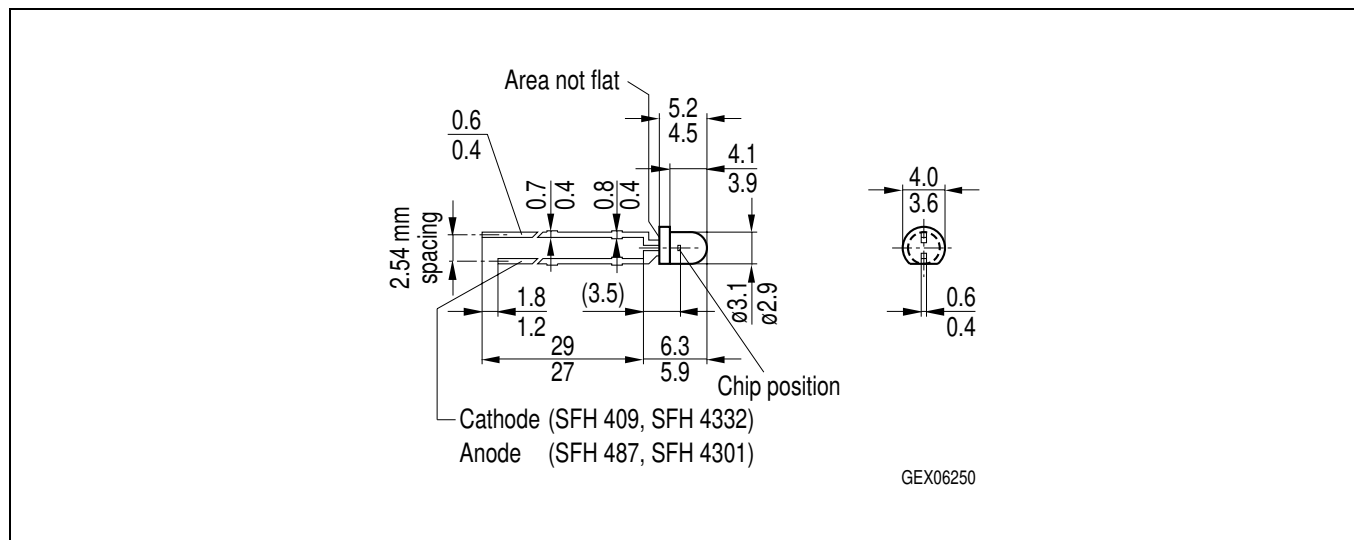
$I_F = f(\tau)$, $T_A = 25^\circ\text{C}$
duty cycle $D = \text{parameter}$



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



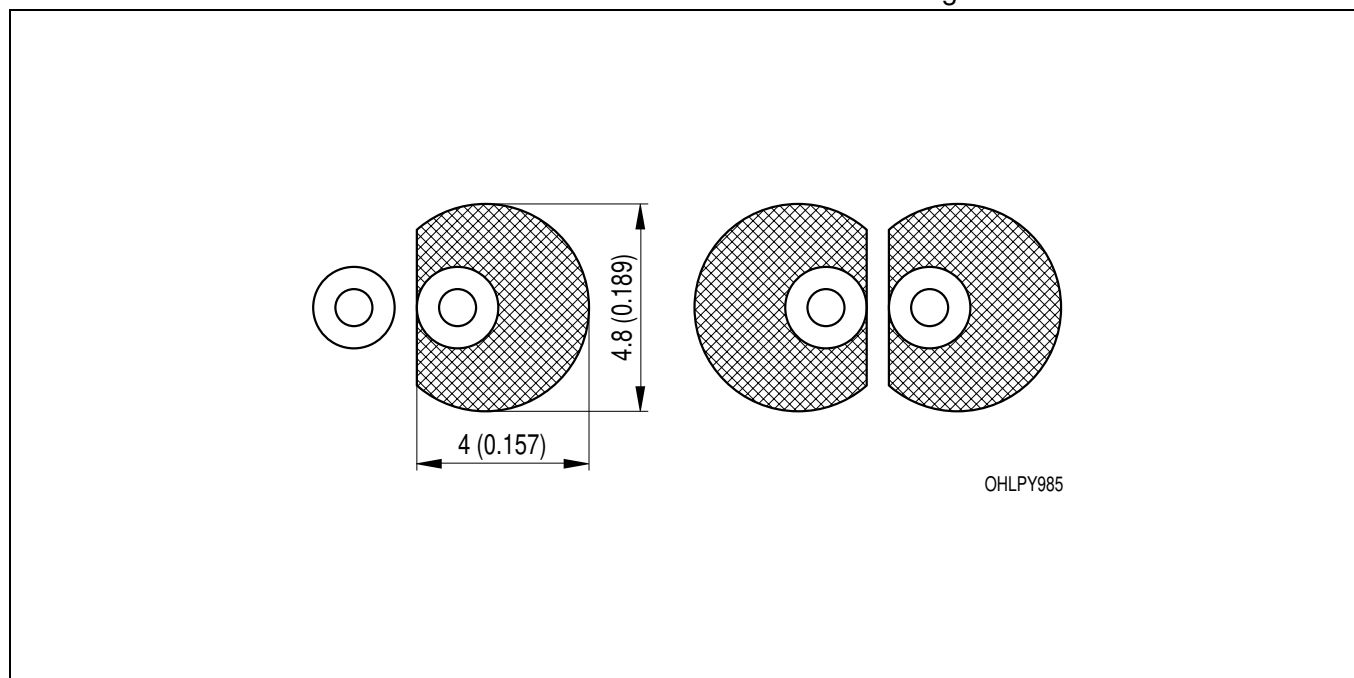
**Maßzeichnung
Package Outlines**



Maße in mm, wenn nicht anders angegeben / Dimensions in mm, unless otherwise specified.

**Empfohlenes Lötpaddesign
Recommended Solder Pad**

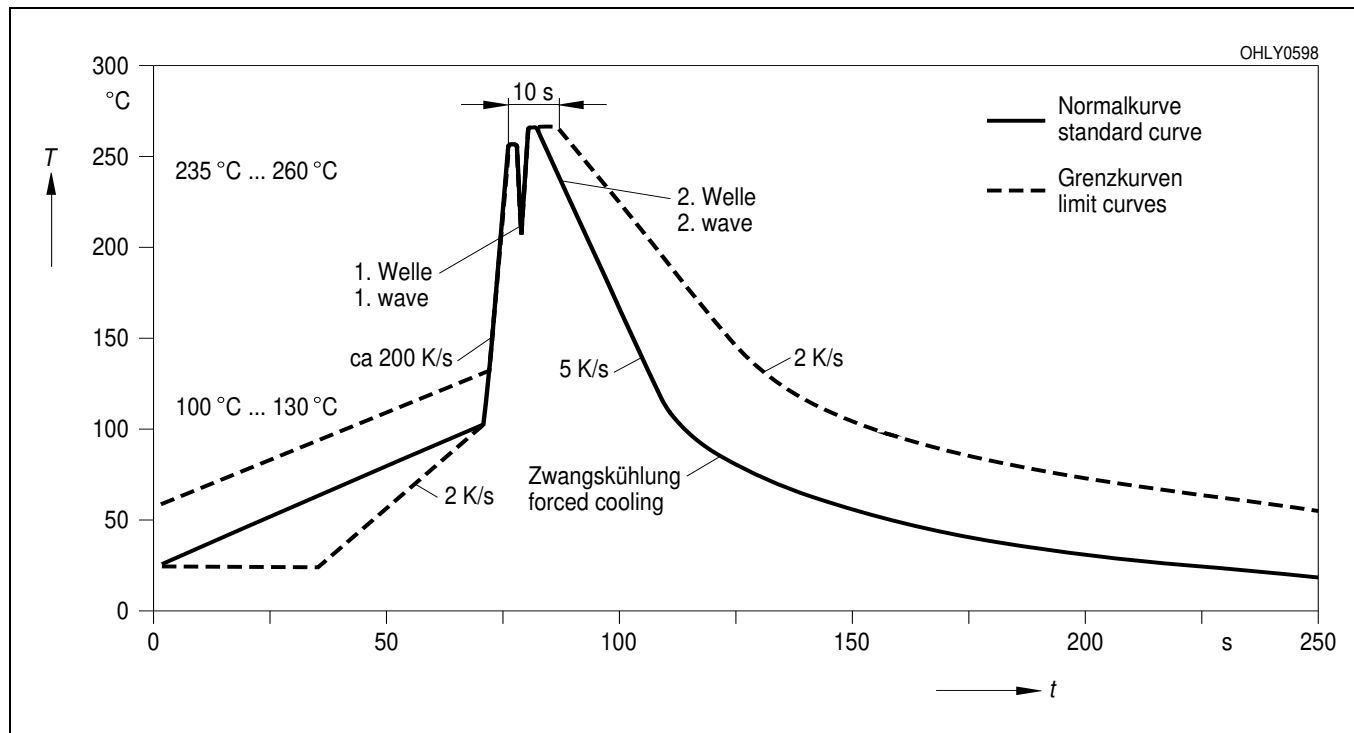
**Wellenlöten (TTW)
TTW Soldering**



Maße in mm, wenn nicht anders angegeben / Dimensions in mm, unless otherwise specified.

Lötbedingungen
Soldering Conditions
Wellenlöten (TTW)
TTW Soldering

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



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