

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

**SFH 400**  
**SFH 401**



SFH 400



SFH 401

**Wesentliche Merkmale**

- Kathode galvanisch mit dem Gehäuseboden verbunden
- Hohe Zuverlässigkeit
- Gute spektrale Anpassung an Si-Fotoempfänger
- Hermetisch dichtes Metallgehäuse
- SFH 401: Gehäusegleich mit BPX 43, BPY 62

**Features**

- Cathode is electrically connected to the case
- High reliability
- Matches all Si-Photodetectors
- Hermetically sealed package
- SFH 401: Same package as BPX 43, BPY 62

**Anwendungen**

- Lichtschranken für Gleich- und Wechsellichtbetrieb
- IR-Gerätefernsteuerungen
- Sensorik
- Lichtgitter

**Applications**

- Photointerrupters
- IR remote control
- Sensor technology
- Light curtains

Typ Type	Bestellnummer Ordering Code	Gehäuse Package
SFH 400	Q62702P0096	18 A3 DIN 41876 (TO-18), Glaslinse, hermetisch dichtes Gehäuse, Anschlüsse im 2.54-mm-Raster ( $\frac{1}{10}$ " )
SFH 401	Q62702P0097	18 A3 DIN 41876 (TO-18) glass lens, hermetically sealed package, solder tabs lead spacing 2.54 mm ( $\frac{1}{10}$ " )

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

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Betriebs- und Lagertemperatur Operating and storage temperature range SFH 400	$T_{op}; T_{stg}$	- 40 ... + 125	°C
Betriebs- und Lagertemperatur Operating and storage temperature range SFH 401	$T_{op}; T_{stg}$	- 40 ... + 100	°C
Sperrspannung Reverse voltage	$V_R$	5	V
Durchlassstrom Forward current	$I_F$	300	mA
Stoßstrom, $t_p = 10\ \mu\text{s}$ , $D = 0$ Surge current	$I_{FSM}$	3	A
Verlustleistung Power dissipation	$P_{tot}$	470	mW
Wärmewiderstand Thermal resistance	$R_{thJA}$ $R_{thJC}$	450 160	K/W 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 $I_{max}$ $I_F = 100\ \text{mA}$ , $t_p = 20\text{ms}$	$\Delta\lambda$	55	nm
Abstrahlwinkel Half angle SFH 400 SFH 401	$\varphi$ $\varphi$	$\pm 6$ $\pm 15$	Grad deg.
Aktive Chipfläche Active chip area	$A$	0.25	mm <sup>2</sup>
Abmessungen der aktiven Chipfläche Dimension of the active chip area	$L \times B$ $L \times W$	$0.5 \times 0.5$	mm <sup>2</sup>

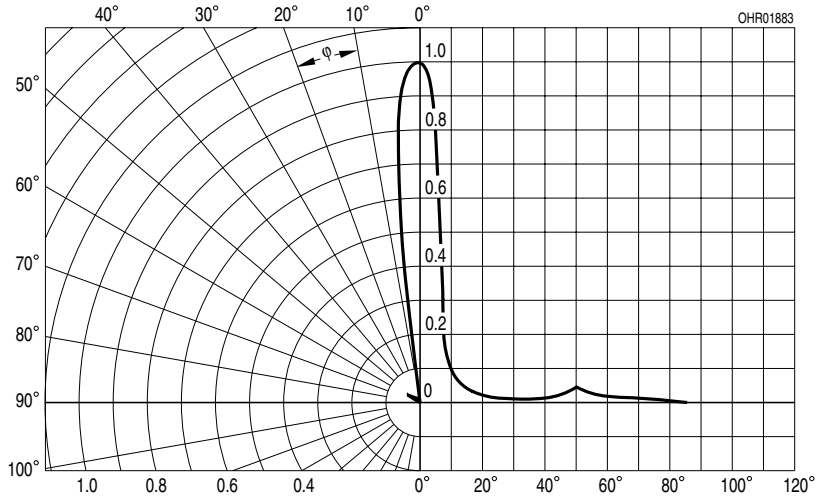
**Kennwerte** ( $T_A = 25\text{ °C}$ )  
**Characteristics** (cont'd)

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Abstand Chipoberfläche bis Linsenscheitel Distance chip front to lens top SFH 400 SFH 401	$H$ $H$	4.0 ... 4.8 2.8 ... 3.7	mm mm
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%, $I_F = 100\text{ mA}$ , $R_L = 50\ \Omega$	$t_r$ , $t_f$	1	$\mu\text{s}$
Kapazität Capacitance $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$	$C_o$	40	pF
Durchlassspannung Forward voltage $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$ $I_F = 1\text{ A}$ , $t_p = 100\ \mu\text{s}$	$V_F$ $V_F$	1.30 ( $\leq 1.5$ ) 1.90 ( $\leq 2.5$ )	V V
Sperrstrom Reverse current $V_R = 5\text{ V}$	$I_R$	0.01 ( $\leq 1$ )	$\mu\text{A}$
Gesamtstrahlungsfluss Total radiant flux $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\Phi_e$	8	mW
Temperaturkoeffizient von $I_e$ bzw. $\Phi_e$ , $I_F = 100\text{ mA}$ Temperature coefficient of $I_e$ or $\Phi_e$ , $I_F = 100\text{ mA}$	$TC_I$	- 0.55	%/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 $\lambda$ , $I_F = 100\text{ mA}$ Temperature coefficient of $\lambda$ , $I_F = 100\text{ mA}$	$TC_\lambda$	+ 0.3	nm/K

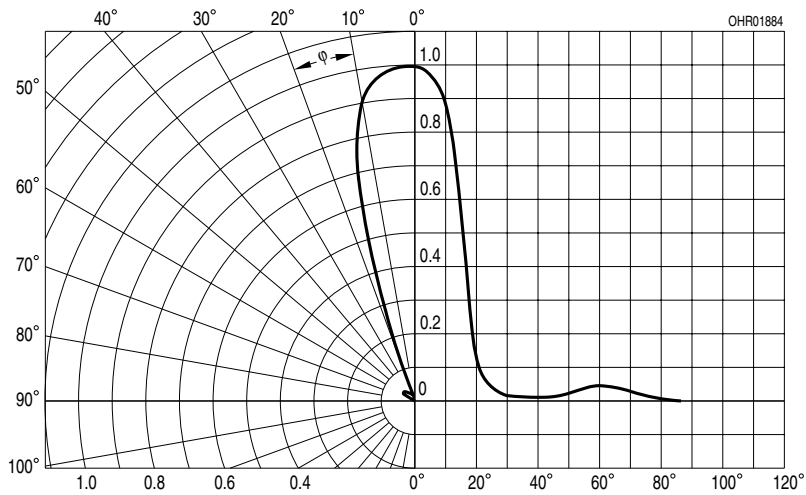
**Gruppierung der Strahlstärke  $I_e$  in Achsrichtung**gemessen bei einem Raumwinkel  $\Omega = 0.01$  sr**Grouping of Radiant Intensity  $I_e$  in Axial Direction**at a solid angle of  $\Omega = 0.01$  sr

Bezeichnung Parameter	Symbol Symbol	Wert Value				Einheit Unit
		SFH 400-2	SFH 400-3	SFH 401-2	SFH 401-3	
Strahlstärke Radiant intensity $I_F = 100$ mA, $t_p = 20$ ms	$I_{e \text{ min}}$	20	> 32	10	>16	mW/sr
	$I_{e \text{ max}}$	40	–	20	–	mW/sr
Strahlstärke Radiant intensity $I_F = 1$ A, $t_p = 100$ $\mu$ s	$I_{e \text{ typ.}}$	300	320	120	190	mW/sr

Radiation Characteristics, SFH 400,  $I_{rel} = f(\varphi)$

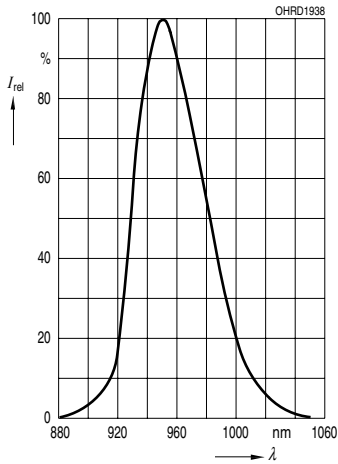


Radiation Characteristics, SFH 401,  $I_{rel} = f(\varphi)$



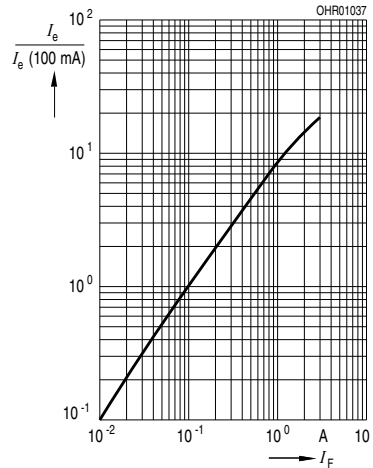
**Relative Spectral Emission**

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

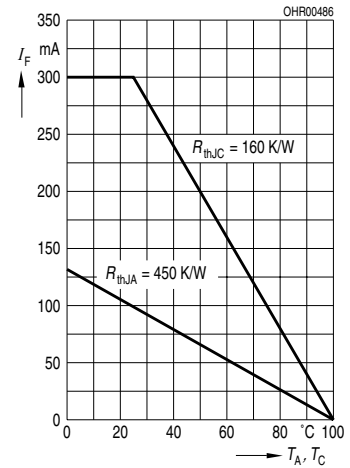


**Radiant Intensity**  $\frac{I_e}{I_e 100 \text{ mA}} = f(I_F)$

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

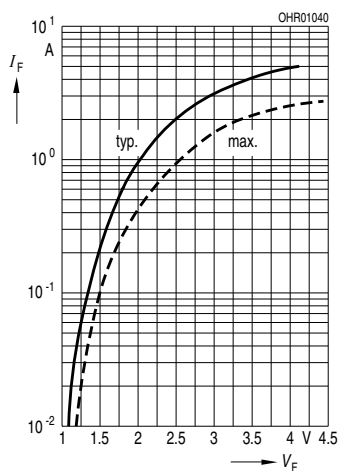


**Max. Permissible Forward Current SFH 401,  $I_F = f(T_A)$**



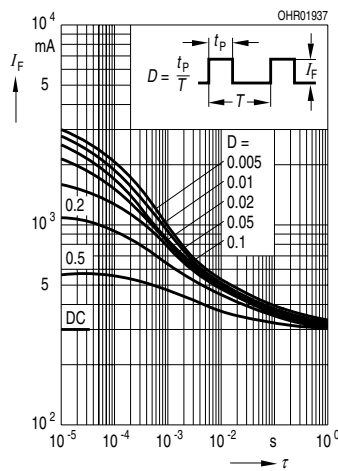
**Forward Current**

$I_F = f(V_F)$

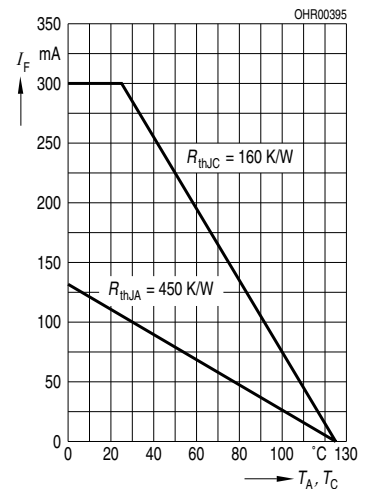


**Permissible Pulse Handling Capability**

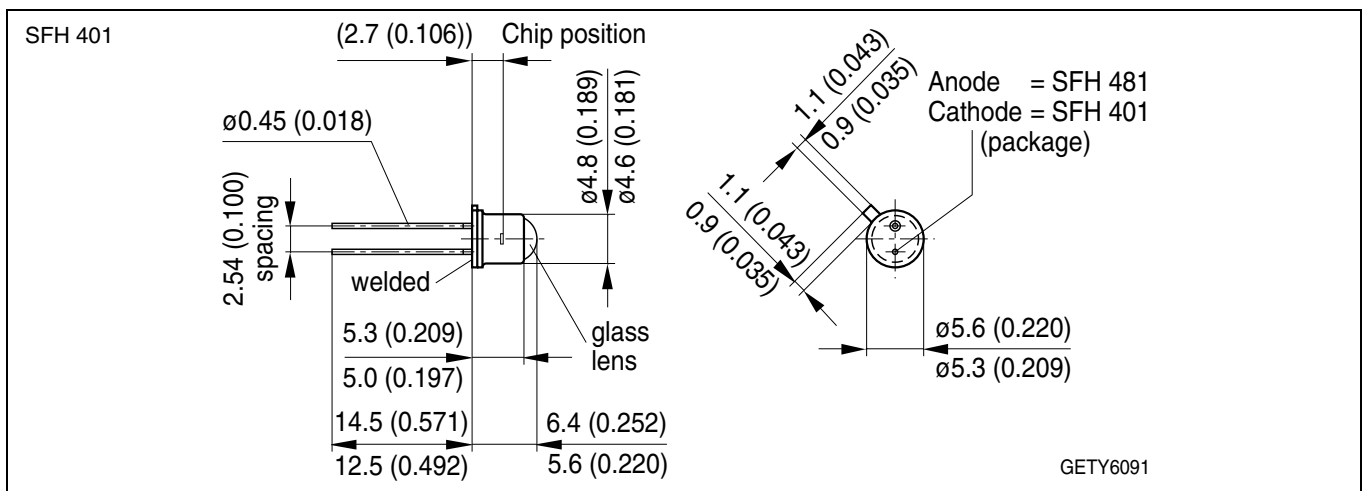
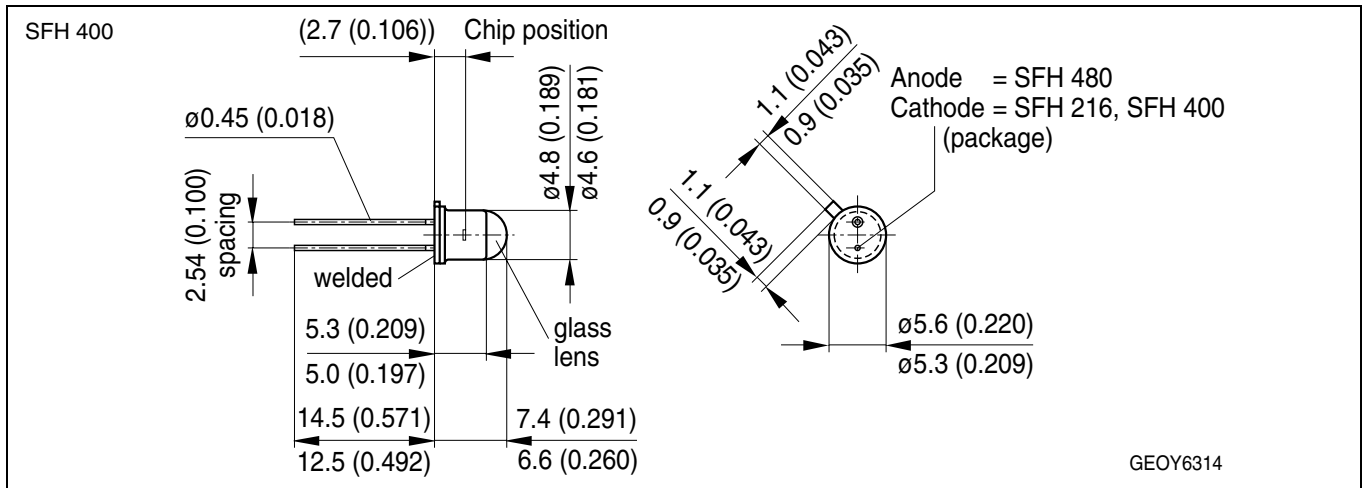
$I_F = f(\tau)$ ,  $T_C = 25^\circ\text{C}$ ,  $R_{thJC} = 160 \text{ K/W}$ , duty cycle  $D =$  parameter



**Max. Permissible Forward Current SFH 400,  $I_F = f(T_A)$**



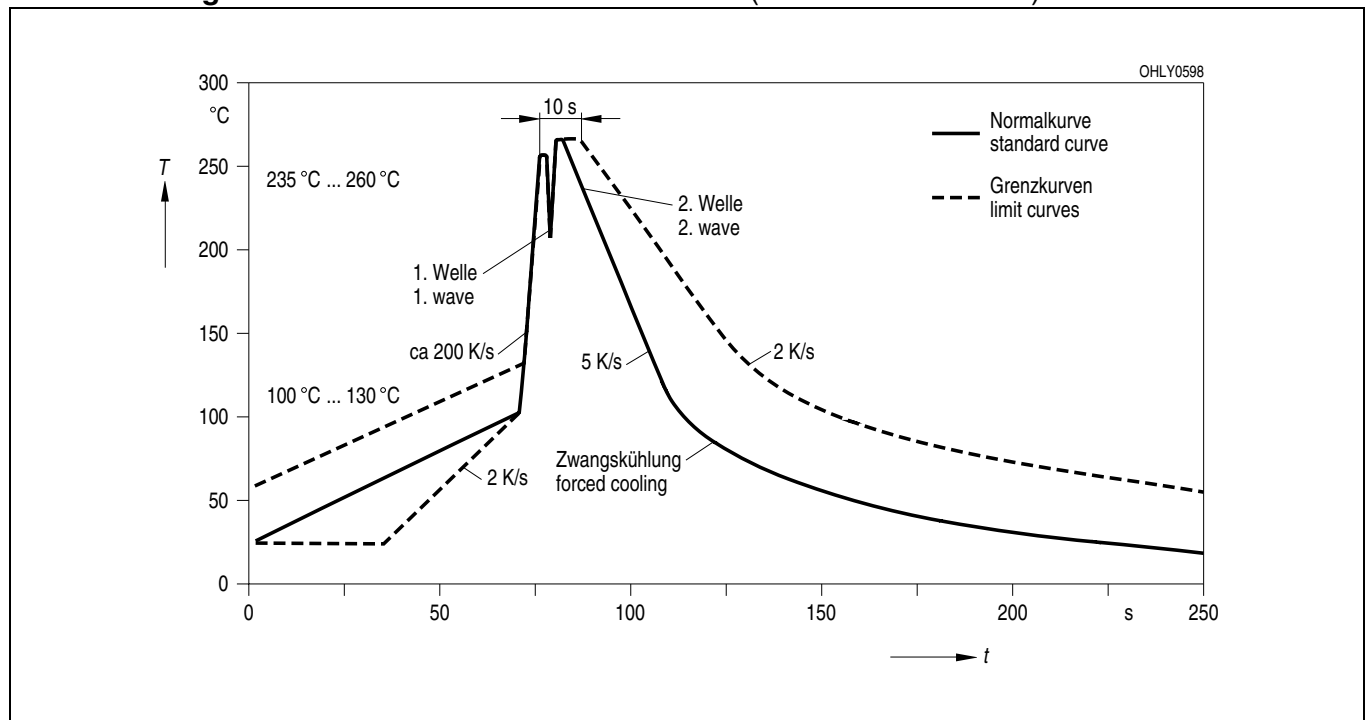
Maßzeichnung  
Package Outlines



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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