

GaAs-IR-Lumineszenzdiode

GaAs Infrared Emitter

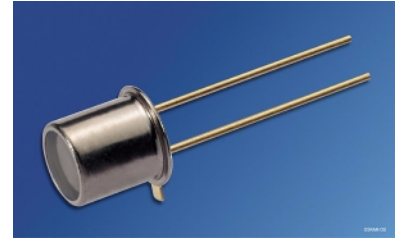
SFH 400, SFH 401, SFH 402



SFH 400



SFH 401



SFH 402

Wesentliche Merkmale

- Hergestellt im Schmelzepitaxieverfahren
- Kathode galvanisch mit dem Gehäuseboden verbunden
- Hohe Zuverlässigkeit
- Gute spektrale Anpassung an Si-Fotoempfänger
- Hermetisch dichtes Metallgehäuse
- SFH 400: Gehäusegleich mit SFH 216
- SFH 401: Gehäusegleich mit BPX 43, BPY 62
- SFH 402: Gehäusegleich mit BPX 38, BPX 65

Anwendungen

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

Features

- Fabricated in a liquid phase epitaxy process
- Cathode is electrically connected to the case
- High reliability
- Matches all Si-Photodetectors
- Hermetically sealed package
- SFH 400: Same package as SFH 216
- SFH 401: Same package as BPX 43, BPY 62
- SFH 402: Same package as BPX 38, BPX 65

Applications

- Photointerrupters
- IR remote control of various equipment
- Sensor technology
- Light-grille barrier

Typ Type	Bestellnummer Ordering Code	Gehäuse Package
SFH 400	Q62702-P96	18 A3 DIN 41876 (TO-18), Glaslinse, hermetisch dichtes Gehäuse, Anschlüsse im 2.54-mm-Raster (1/10") 18 A3 DIN 41876 (TO-18) glass lens, hermetically sealed package, solder tabs lead spacing 2.54 mm (1/10")
SFH 400-3	Q62702-P784	
SFH 401	Q62702-P97	
SFH 401-3	Q62702-P787	
SFH 402	Q62702-P98	
SFH 402-3	Q62702-P790	

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, SFH 402	$T_{op}; T_{stg}$	- 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 $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	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 SFH 400 SFH 401 SFH 402	φ φ φ	± 6 ± 15 ± 40	Grad deg.
Aktive Chipfläche Active chip area	A	0.25	mm ²

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

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Abmessungen der aktiven Chipfläche Dimensions of the active chip area	$L \times B$ $L \times W$	0.5×0.5	mm
Abstand Chipoberfläche bis Linsenscheitel Distance chip front to lens top			
SFH 400	H	4.0 ... 4.8	mm
SFH 401	H	2.8 ... 3.7	mm
SFH 402	H	2.1 ... 2.7	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	μs
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 (≤ 1.5) 1.90 (≤ 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	8	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 , $I_F = 100\text{ mA}$ Temperature coefficient of λ , $I_F = 100\text{ mA}$	TC_λ	+ 0.3	nm/K

Gruppierung der Strahlstärke I_e in Achsrichtung

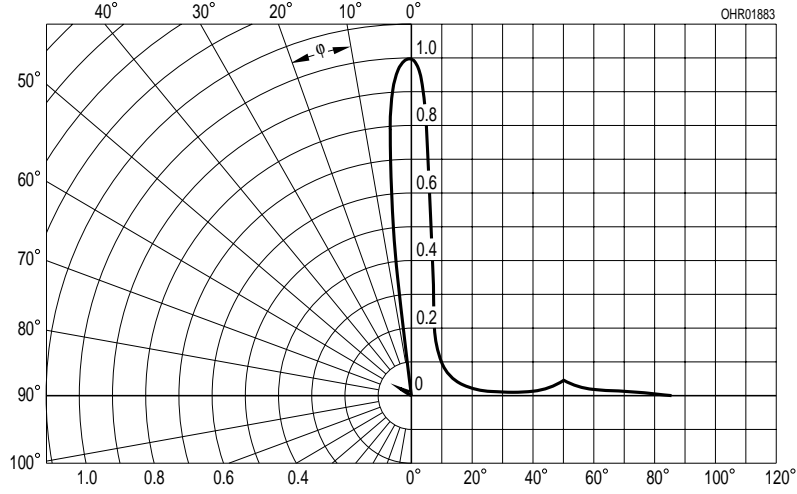
gemessen bei einem Raumwinkel $\Omega = 0.01$ sr

Grouping of Radiant Intensity I_e in Axial Direction

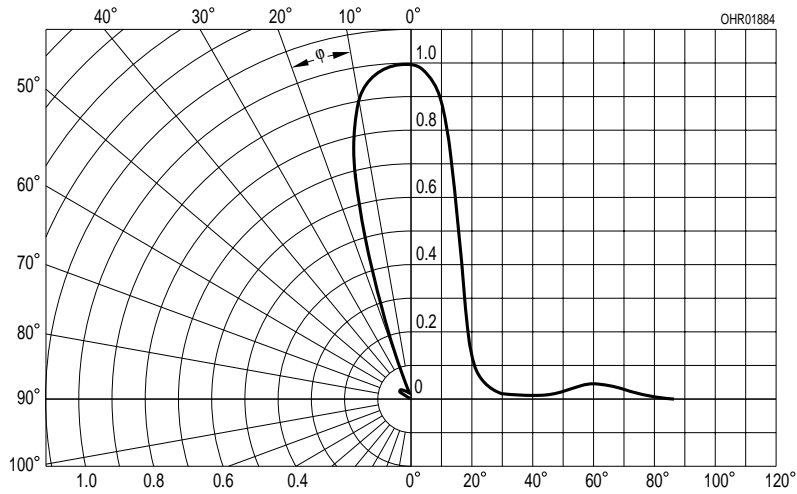
at a solid angle of $\Omega = 0.01$ sr

Bezeichnung Parameter	Symbol Symbol	Wert Value						Einheit Unit
		SFH 400	SFH 400-3	SFH 401	SFH 401-3	SFH 402	SFH 402-3	
Strahlstärke Radiant intensity $I_F = 100$ mA, $t_p = 20$ ms	$I_{e \text{ min.}}$	20	> 32	> 10	> 16	2.5	> 4	mW/sr
	$I_{e \text{ max.}}$	–	–	–	–	–	–	mW/sr
Strahlstärke Radiant intensity $I_F = 1$ A, $t_p = 100$ μ s	$I_{e \text{ typ.}}$	300	320	120	190	40	40	mW/sr

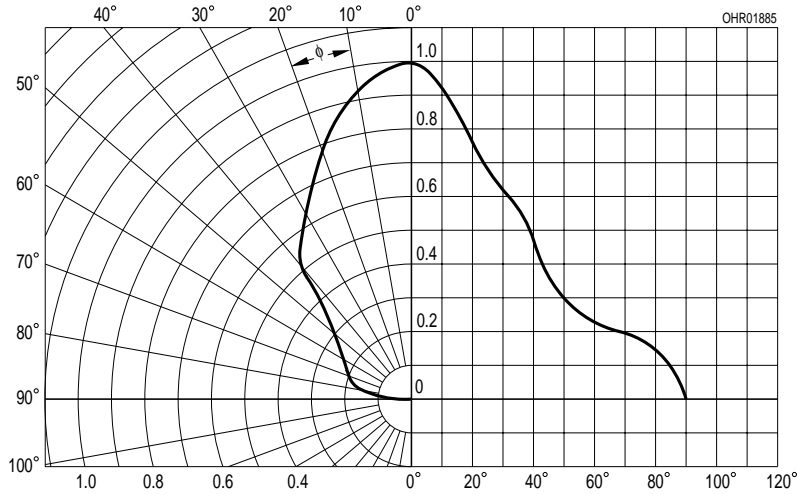
Radiation Characteristics, SFH 400 $I_{rel} = f(\varphi)$



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

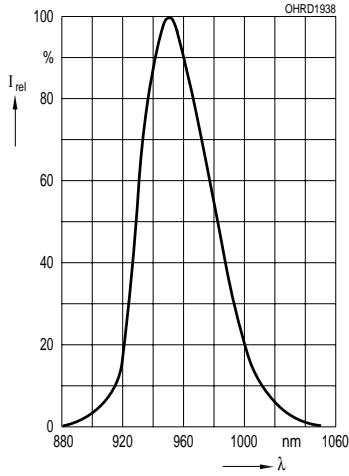


Radiation Characteristics, SFH 402 $I_{rel} = f(\varphi)$



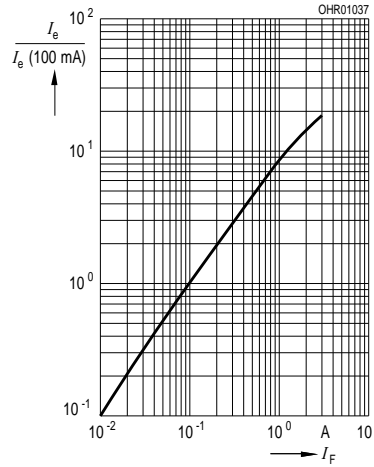
Relative Spectral Emission

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

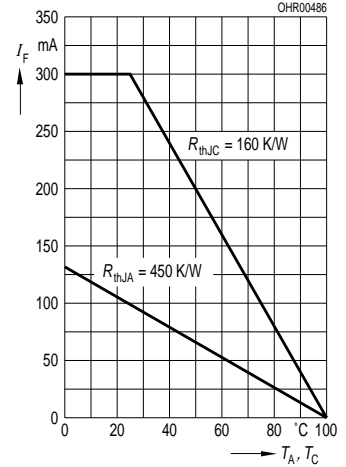


Radiant Intensity $\frac{I_e}{I_e \text{ 100 mA}} = f(I_F)$

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

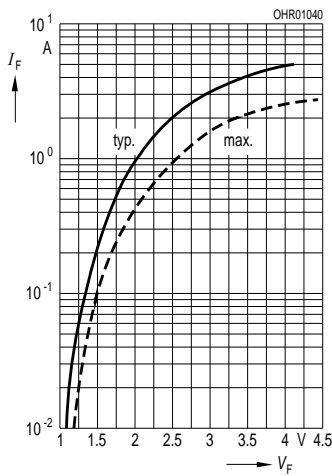


Max. Permissible Forward Current SFH 401, $I_F = f(T_A)$



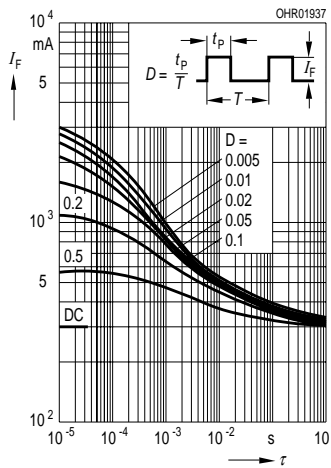
Forward Current $I_F = f(V_F)$

$I_F = f(V_F)$



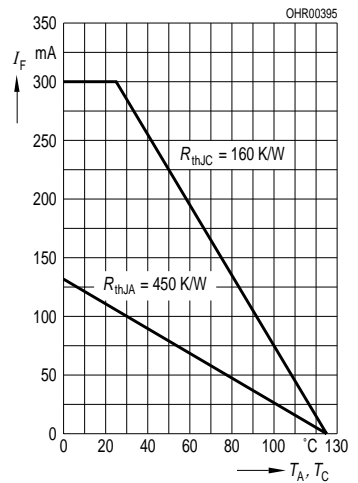
Permissible Pulse Handling Capability $I_F = f(\tau)$, $T_C = 25^\circ\text{C}$, $R_{thJC} = 160 \text{ K/W}$, duty cycle $D = \text{parameter}$

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

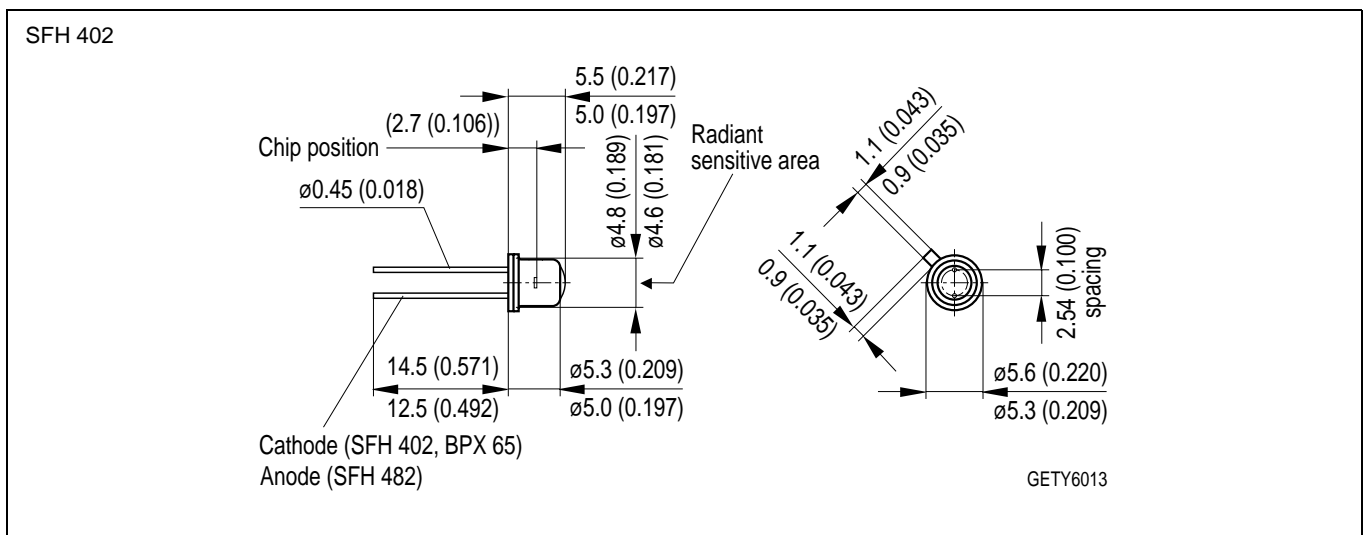
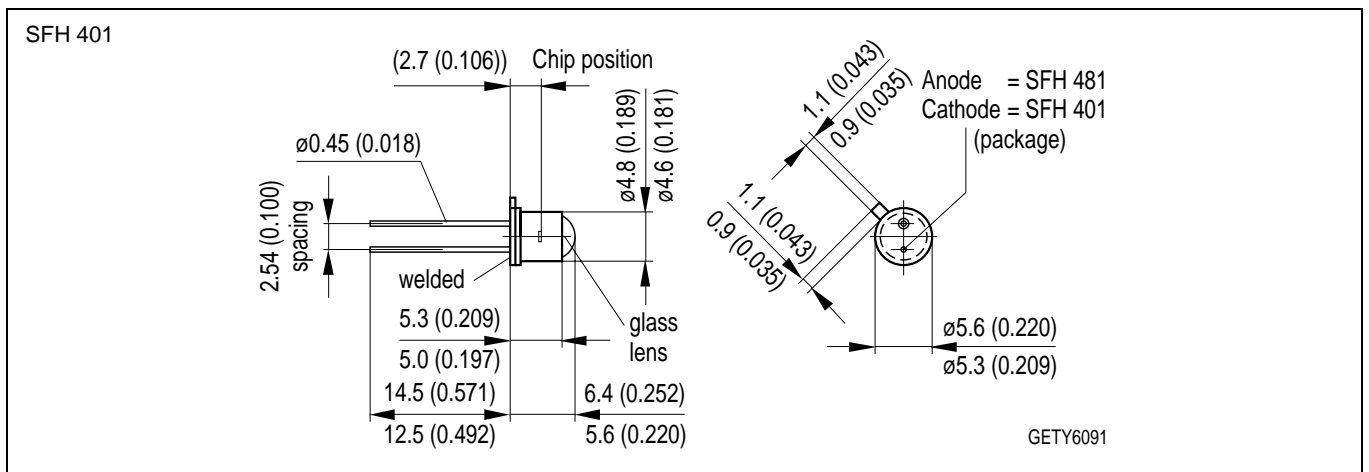
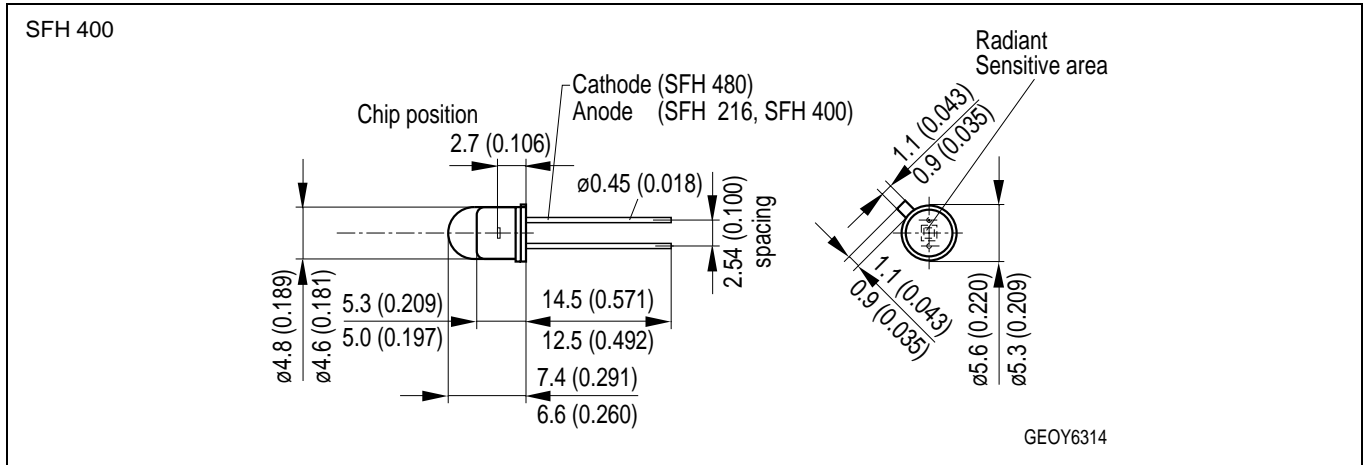


Max. Permissible Forward Current SFH 400, SFH 402, $I_F = f(T_A)$

$I_F = f(T_A)$



Maßzeichnung
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**

© All Rights Reserved.

Attention please!

The information describes the type of component and shall not be considered as assured characteristics. Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances. For information on the types in question please contact our Sales Organization.

Packing

Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office. By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

Components used in life-support devices or systems must be expressly authorized for such purpose! Critical components ¹, may only be used in life-support devices or systems ² with the express written approval of OSRAM OS.

¹ A critical component is a component used in a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or effectiveness of that device or system.

² Life support devices or systems are intended (a) to be implanted in the human body, or (b) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health of the user may be endangered.