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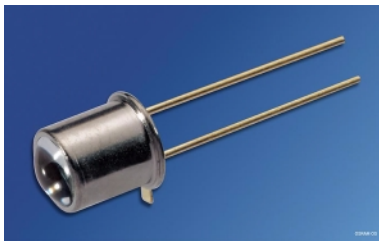
GaAs-IR-Lumineszenzdiode

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 ($\frac{1}{10}$ "") 18 A3 DIN 41876 (TO-18) glass lens, hermetically sealed package, solder tabs lead spacing 2.54 mm ($\frac{1}{10}$ "")
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, $t_p = 10\text{ }\mu\text{s}$, $D = 0$ 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

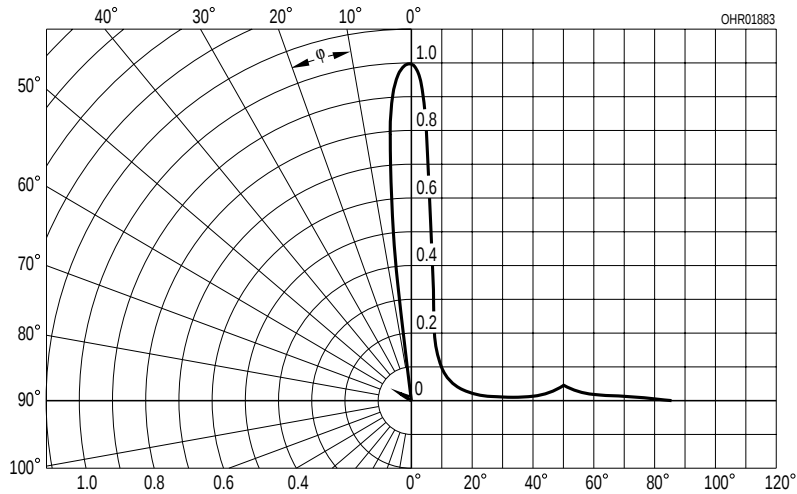
Kennwerte ($T_A = 25\text{ °C}$)**Characteristics** (cont'd)

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 $I_F = 100\text{ mA}$, $R_L = 50\text{ }\Omega$ 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	1	μs
Kapazität, Capacitance $V_R = 0\text{ V}$, $f = 1\text{ MHz}$	C_o	40	pF
Durchlaßspannung, Forward voltage $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$ $I_F = 1\text{ A}$, $t_p = 100\text{ }\mu\text{s}$	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

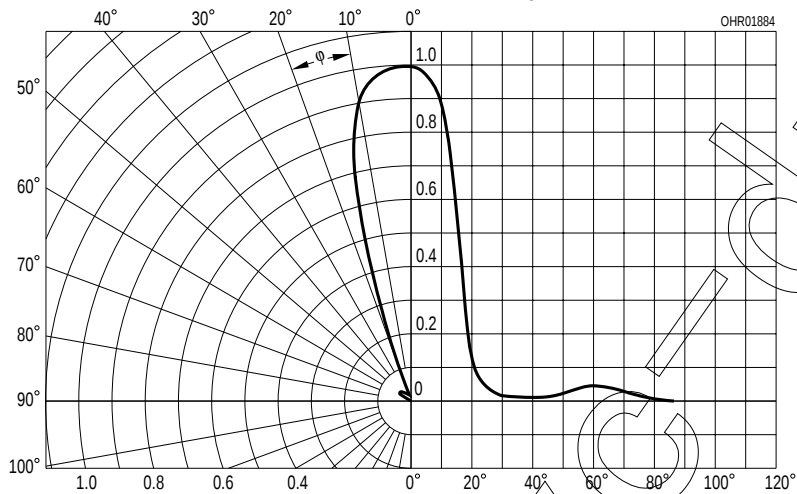
Gruppierung der Strahlstärke I_e in Achsrichtunggemessen bei einem Raumwinkel $\Omega = 0.01$ sr**Grouping of Radiant Intensity I_e in Axial Direction**at a solid angle of $\Omega = 0.01$ sr

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	$I_{e \text{ min.}}$ $I_{e \text{ max.}}$	20 –	> 32 –	> 10 –	> 16 –	2.5 –	> 4 –	mW/sr 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

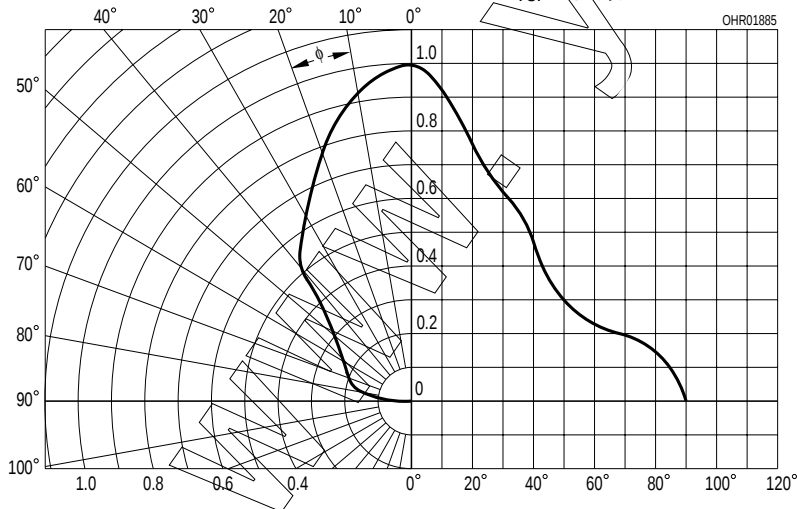
Radiation Characteristics, SFH 400 $I_{rel} = f(\varphi)$



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

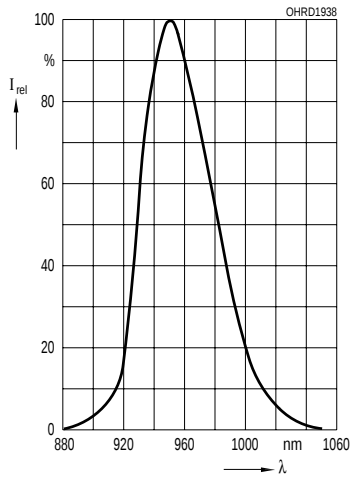


Radiation Characteristics, SFH 402 $I_{rel} = f(\varphi)$



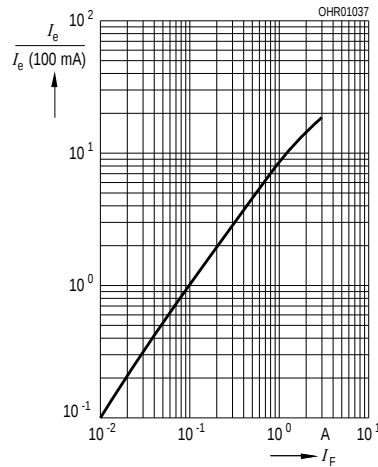
Relative Spectral Emission

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



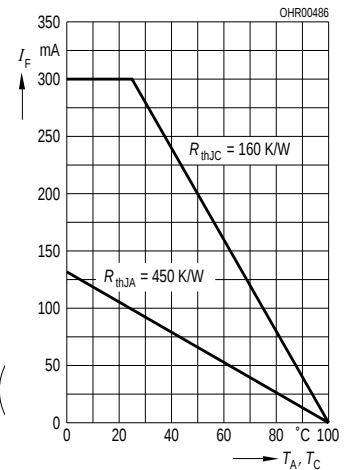
$$\text{Radiant Intensity } \frac{I_e}{I_e \text{ 100 mA}} = f(I_F)$$

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



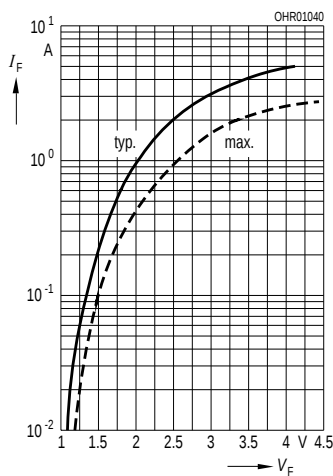
Max. Permissible Forward Current

$$\text{SFH 401, } I_F = f(T_A)$$



Forward Current

$$I_F = f(V_F)$$

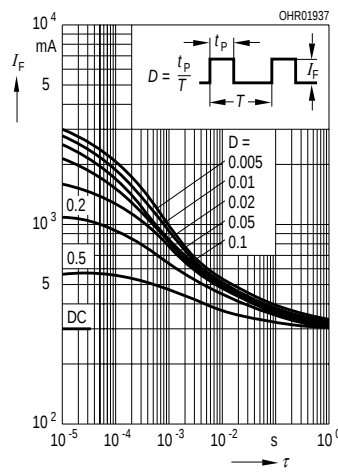


Permissible Pulse Handling

$$I_F = f(\tau), T_C = 25^\circ\text{C},$$

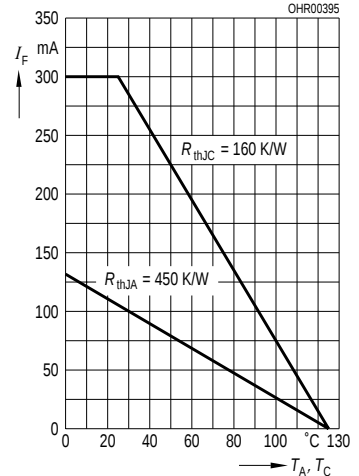
$R_{\text{thJC}} = 160 \text{ K/W}$, duty cycle

$D = \text{parameter}$

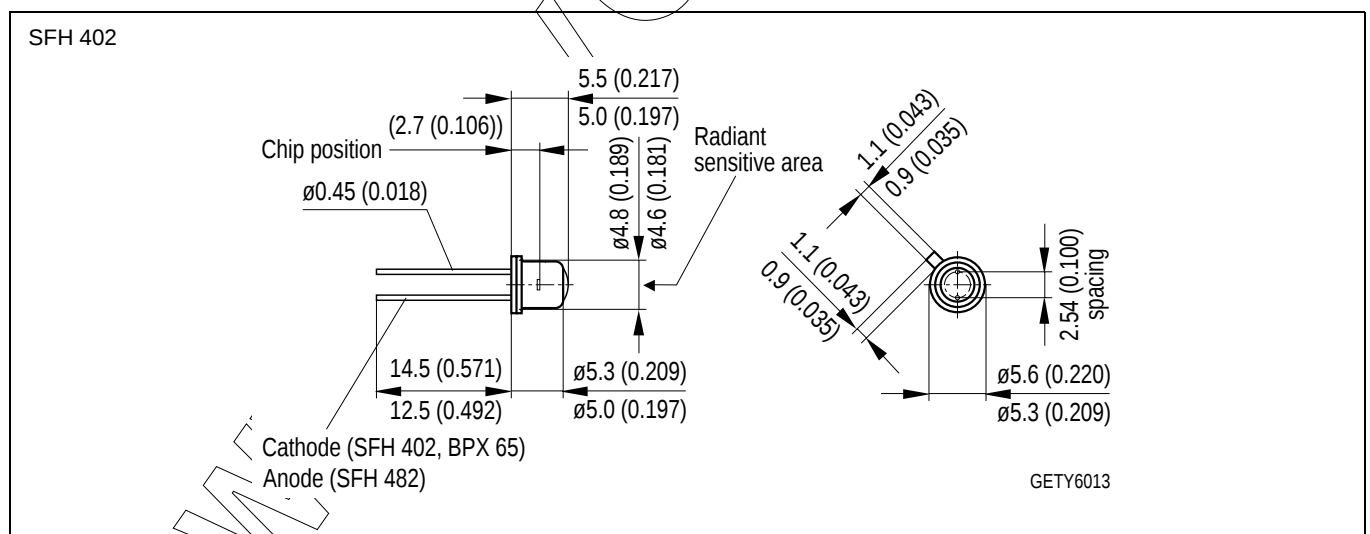
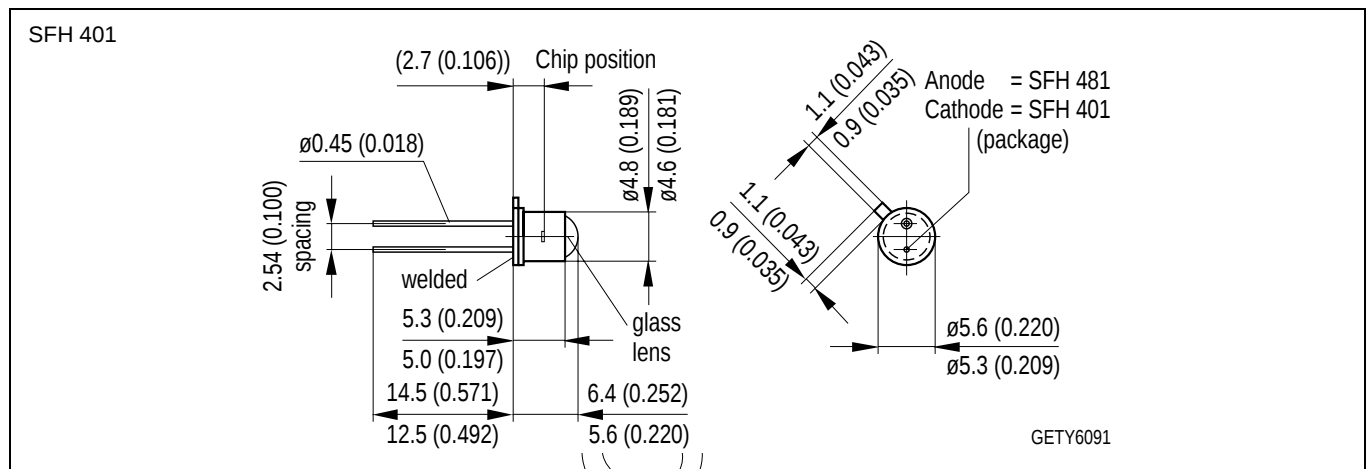
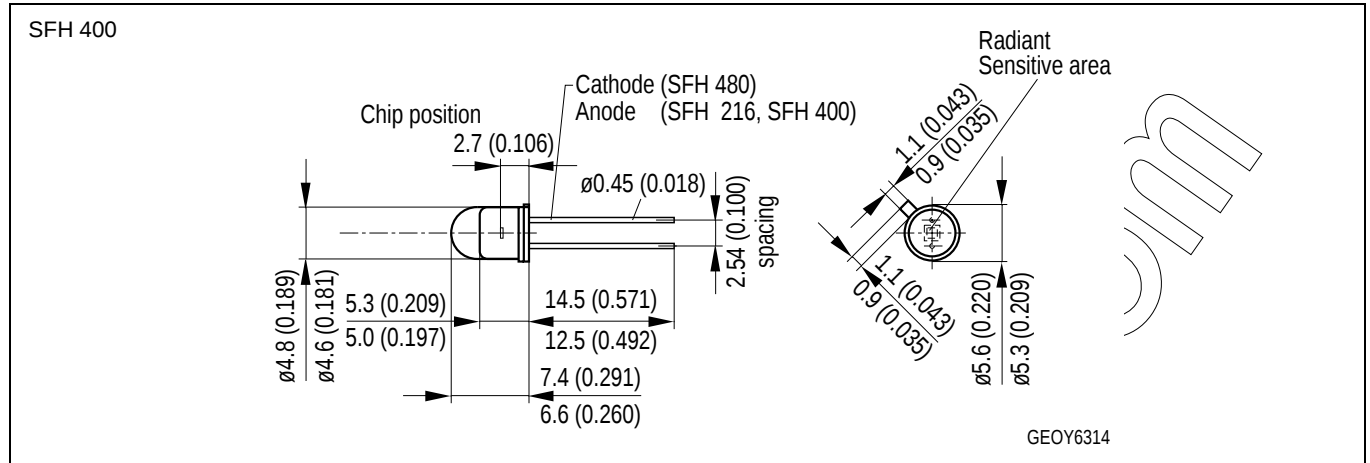


Max. Permissible Forward Current

$$\text{SFH 400, SFH 402, } I_F = f(T_A)$$



Maßzeichnung
Package Outlines



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

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