

Schnelle IR-Lumineszenzdiode (950 nm) im 5 mm Radial-Gehäuse High-Speed Infrared Emitter (950 nm) in 5 mm Radial Package

SFH 4501, SFH 4502, SFH 4503



SFH 4501



SFH 4502



SFH 4503

Wesentliche Merkmale

- GaAs-LED mit sehr hohem Wirkungsgrad
- Hohe Zuverlässigkeit
- Gute spektrale Anpassung an Si-Fotoempfänger

Anwendungen

- IR-Fernsteuerung von Fernseh- und Rundfunkgeräten, Videorecordern, Lichtdimmern
- Gerätefernsteuerungen für Gleich- und Wechsellichtbetrieb
- Sensorik
- Diskrete Lichtschranken

Features

- Very highly efficient GaAs-LED
- High reliability
- Spectral match with silicon photodetectors

Applications

- IR remote control of hi-fi and TV-sets, video tape recorders, dimmers
- Remote control for steady and varying intensity
- Sensor technology
- Discrete interrupters

Typ Type	Bestellnummer Ordering Code	Gehäuse Package
SFH 4501	Q62702-P5061	5-mm-LED-Gehäuse (T 1 ³ / ₄), schwarz eingefärbt, Anschluß im 2.54-mm-Raster (1 ¹ / ₁₀ "), Anodenkennzeichnung: kürzerer Anschluß
SFH 4502	Q62702-P5062	
SFH 4503	Q62702-P5305	5 mm LED package (T 1 ³ / ₄), black-colored epoxy resin lens, solder tabs lead spacing 2.54 mm (1 ¹ / ₁₀ "), anode marking: short lead

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	3	V
Durchlaßstrom Forward current	I_F (DC)	100	mA
Stoßstrom, $t_p = 10\text{ }\mu\text{s}$, $D = 0$ Surge current	I_{FSM}	2.2	A
Verlustleistung Power dissipation	P_{tot}	180	mW
Wärmewiderstand Sperrschicht - Umgebung, freie Beinchenlänge max. 10 mm Thermal resistance junction - ambient, lead length between package bottom and PCB max. 10 mm	R_{thJA}	375	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} $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	$\Delta\lambda$	40	nm
Abstrahlwinkel Half angle SFH 4501 SFH 4502 SFH 4503	φ	± 7 ± 18 ± 4	Grad deg.
Aktive Chipfläche Active chip area	A	0.09	mm ²
Abmessungen der aktiven Chipfläche Dimension of the active chip area	$L \times B$ $L \times W$	0.3×0.3	mm

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 $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$, $R_L = 50\text{ }\Omega$ Switching times, I_e from 10% to 90% and from 90% to 10%, $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$, $R_L = 50\text{ }\Omega$	t_r , t_f	10	ns
Kapazität Capacitance $V_R = 0\text{ V}$, $f = 1\text{ MHz}$	C_o	35	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	1.5 (≤ 1.8) 3.2 (≤ 4.0)	V V
Sperrstrom, Reverse current $V_R = 3\text{ V}$	I_R	0.01 (≤ 10)	μA
Gesamtstrahlungsfluß, Total radiant flux $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	Φ_e	32	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	- 0.44	%/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	+ 0.2	nm/K

Strahlstärke I_e in Achsrichtung

gemessen bei einem Raumwinkel $\Omega = 0.01$ sr

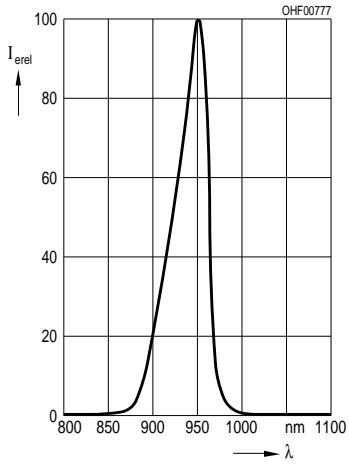
Radiant Intensity I_e in Axial Direction

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

Bezeichnung Description	Symbol	Werte Values			Einheit Unit
		SFH 4501	SFH 4502	SFH 4503	
Strahlstärke Radiant intensity $I_F = 100$ mA, $t_p = 20$ ms	$I_{e \text{ min}}$	63	25	63	mW/sr
	$I_{e \text{ typ}}$	90	50	200	
Strahlstärke Radiant intensity $I_F = 1$ A, $t_p = 100$ μ s	$I_{e \text{ typ}}$	550	310	1200	mW/sr

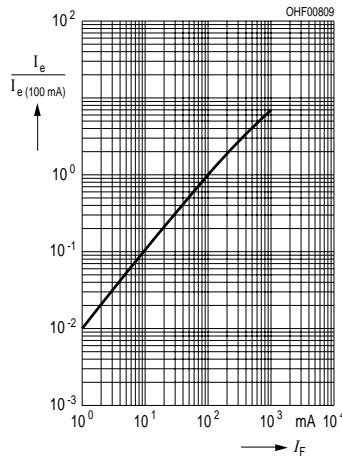
Relative Spectral Emission

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



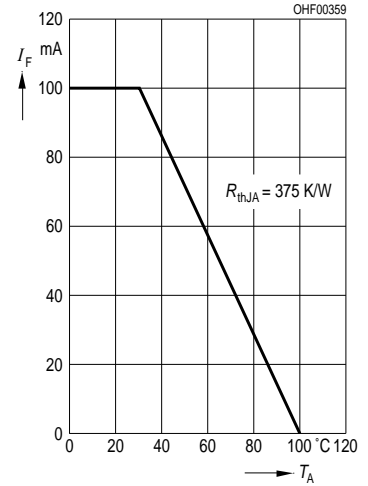
Radiant Intensity $\frac{I_e}{I_e(100 \text{ mA})} = f(I_F)$

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



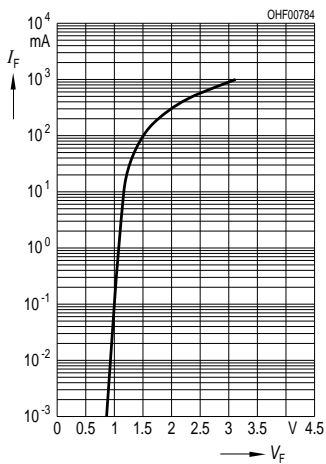
Max. Permissible Forward Current

$I_F = f(T_A)$



Forward Current $I_F = f(V_F)$

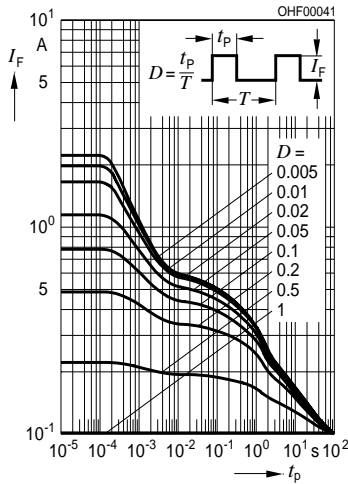
single pulse, $t_p = 20 \mu\text{s}$



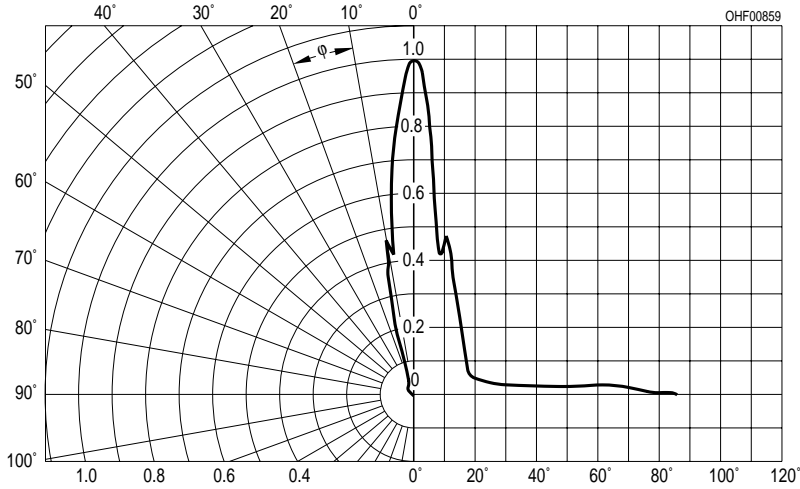
Permissible Pulse Handling

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

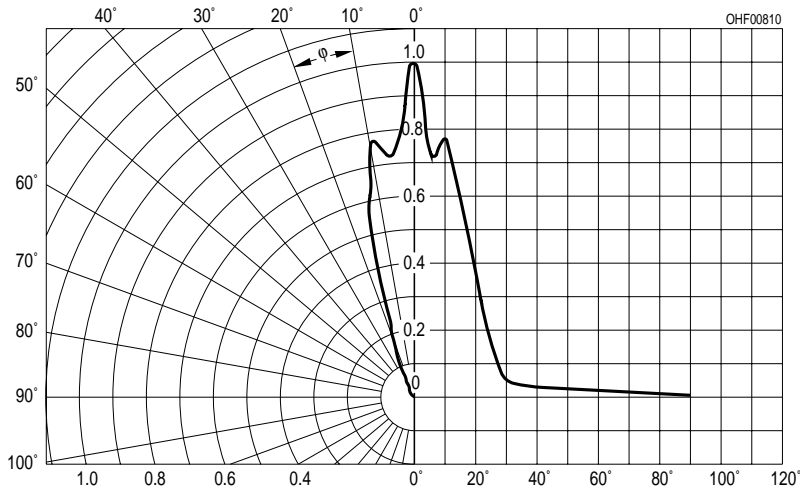
duty cycle $D =$ parameter



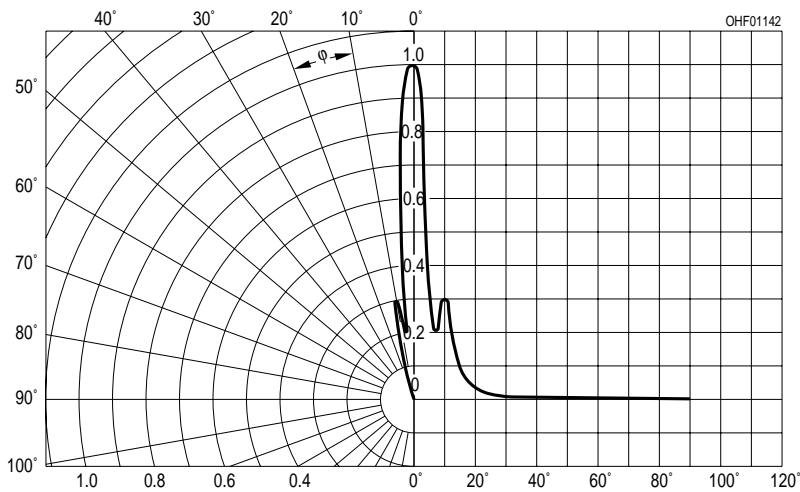
Radiation Characteristics $I_{rel} = f(\varphi)$
SFH 4501



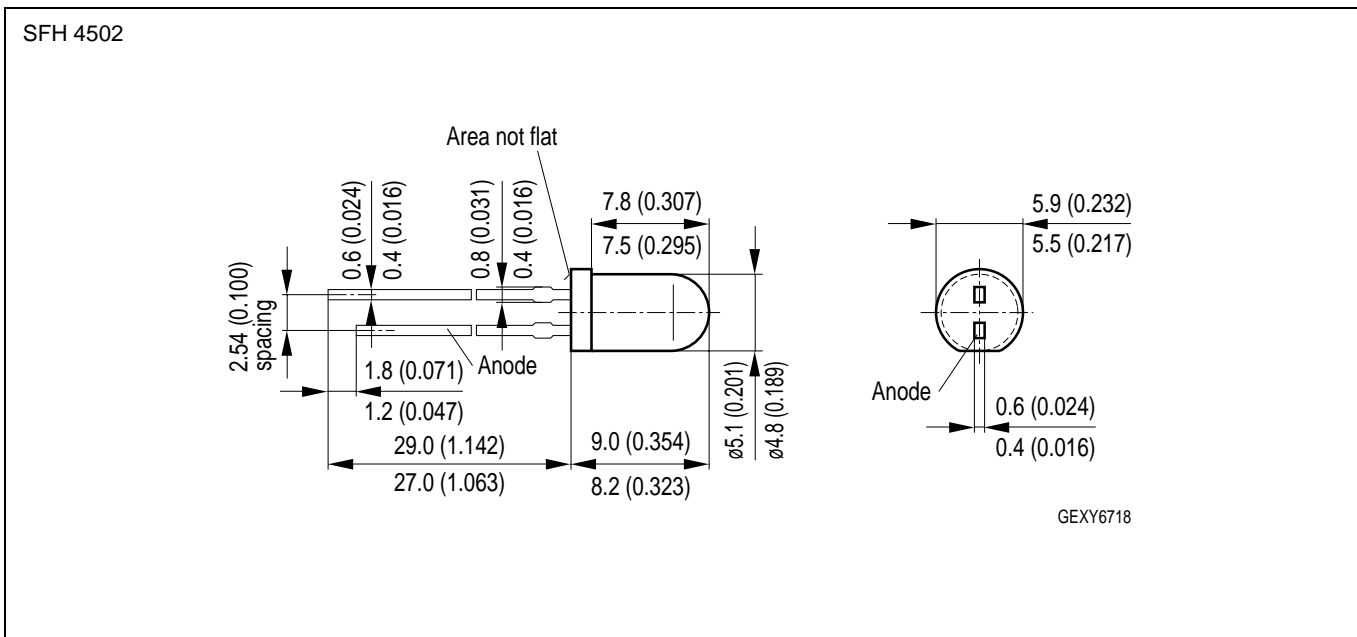
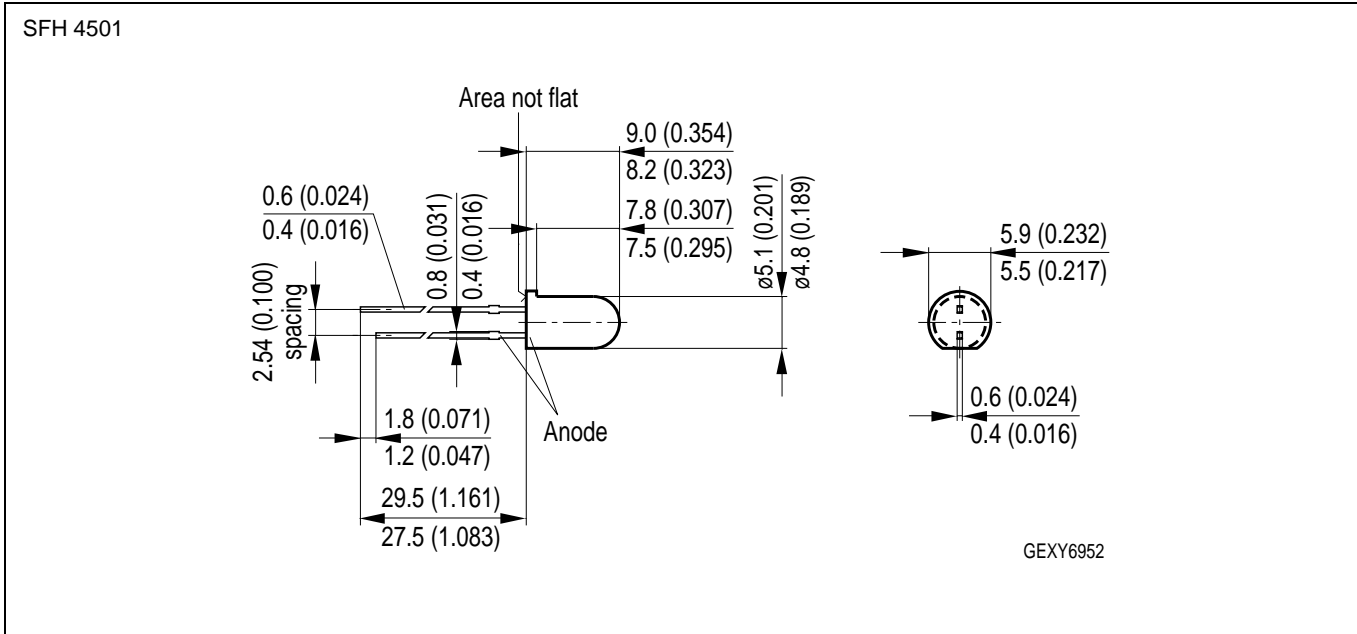
Radiation Characteristics $I_{rel} = f(\varphi)$
SFH 4502



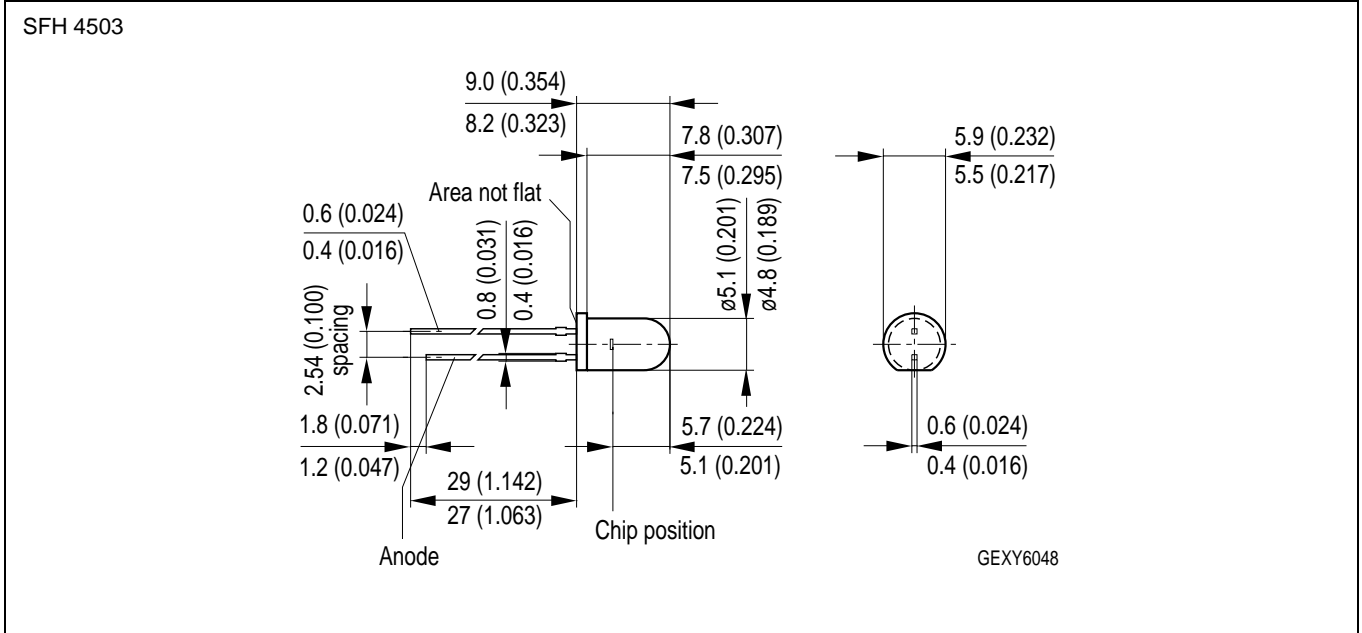
Radiation Characteristics $I_{rel} = f(\varphi)$
SFH 4503



Maßzeichnung
Package Outlines



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



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Lötbedingungen
Soldering Conditions

Tauch-, Schwall- und Schlepplötlung Dip, Wave and Drag Soldering			Kolbenlötlung (mit 1,5-mm-Kolbenspitze) Iron Soldering (with 1.5-mm-bit)		
Lötlad- temperatur	Maximal zulässige Lötzeit	Abstand Lötstelle – Gehäuse	Temperatur des Kolbens	Maximale zulässige Lötzeit	Abstand Lötstelle – Gehäuse
Temperature of the Soldering Bath	Max. Perm. Soldering Time	Distance between Solder Joint and Case	Temperature of the Soldering Iron	Max. Permissible Soldering Time	Distance between Solder Joint and Case
260 °C	10 s	≥ 1.5 mm	300 °C	3 s	≥ 1.5 mm

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