

# Schnelle IR-Lumineszenzdiode (950 nm) im 3 mm Radial-Gehäuse High-Speed Infrared Emitter (950 nm) in 3 mm Radial Package

## SFH 4301



### Wesentliche Merkmale

- Hohe Pulsleistung und hoher Gesamtstrahlungsfluß  $\Phi_e$
- Sehr kurze Schaltzeiten (10 ns)
- Sehr hohe Langzeitstabilität
- Hohe Zuverlässigkeit

### Features

- High pulse power and high radiant flux  $\Phi_e$
- Very short switching times (10 ns)
- Very high long-time stability
- High reliability

### Anwendungen

- Schnelle Datenübertragung mit Übertragungsraten bis 100 Mbaud (IR Tastatur, Joystick, Multimedia)
- Analoge und digitale Hi-Fi Audio- und Videosignalübertragung
- Batteriebetriebene Geräte (geringe Stromaufnahme)
- Anwendungen mit hohen Zuverlässigkeitsansprüchen bzw. erhöhten Anforderungen
- Alarm- und Sicherungssysteme
- IR Freiraumübertragung

### Applications

- High data transmission rate up to 100 Mbaud (IR keyboard, Joystick, Multimedia)
- Analog and digital Hi-Fi audio and video signal transmission
- Low power consumption (battery) equipment
- Suitable for professional and high-reliability applications
- Alarm and safety equipment
- IR free air transmission

Typ Type	Bestellnummer Ordering Code	Gehäuse Package
SFH 4301	Q62702-P5166	3-mm-LED-Gehäuse (T1), schwarz eingefärbt, Anschlüsse im 2.54-mm-Raster ( $\frac{1}{10}$ "), Kathodenkennung: längerer Anschluß 3 mm LED package (T1), black-colored epoxy resin, solder tabs lead spacing 2.54 mm ( $\frac{1}{10}$ "), cathode marking: long lead

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

<b>Bezeichnung Parameter</b>	<b>Symbol Symbol</b>	<b>Wert Value</b>	<b>Einheit Unit</b>
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 Surge current $t_p = 10\ \mu\text{s}, D = 0$	$I_{FSM}$	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**

<b>Bezeichnung Parameter</b>	<b>Symbol Symbol</b>	<b>Wert Value</b>	<b>Einheit Unit</b>
Wellenlänge der Strahlung Wavelength of peak emission $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\lambda_{\text{peak}}$	950	nm
Spektrale Bandbreite bei 50% von $I_{\text{max}}$ Spectral bandwidth at 50% of $I_{\text{max}}$ $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\Delta\lambda$	40	nm
Abstrahlwinkel Half angle	$\varphi$	$\pm 10$	Grad deg.
Aktive Chipfläche Active chip area	$A$	0.09	mm <sup>2</sup>
Abmessungen der aktiven Chipfläche Dimension of the active chip area	$L \times B$ $L \times W$	$0.3 \times 0.3$	mm
Schaltzeiten, $I_e$ von 10% auf 90% und von 90% auf 10% Switching times, $I_e$ from 10% to 90% and from 90% to 10%, $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$ , $R_L = 50\ \Omega$	$t_r$ , $t_f$	10	ns
Kapazität Capacitance $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$	$C_o$	35	pF
Durchlaßspannung Forward voltage $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$ $I_F = 1\text{ A}$ , $t_p = 100\ \mu\text{s}$	$V_F$ $V_F$	1.5 ( $\leq 1.8$ ) 3.2 ( $\leq 4.0$ )	V V
Sperrstrom Reverse current $V_R = 3\text{ V}$	$I_R$	0.01 ( $\leq 10$ )	$\mu\text{A}$
Gesamtstrahlungsfluß Total radiant flux $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\Phi_e$	32	mW
Temperaturkoeffizient von $I_e$ bzw. $\Phi_e$ Temperature coefficient of $I_e$ or $\Phi_e$ $I_F = 100\text{ mA}$	$TC_1$	- 0.44	%/K

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

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Temperaturkoeffizient von $V_F$ Temperature coefficient of $V_F$ $I_F = 100\text{ mA}$	$TC_V$	- 1.5	mV/K
Temperaturkoeffizient von $\lambda$ Temperature coefficient of $\lambda$ $I_F = 100\text{ mA}$	$TC_\lambda$	+ 0.2	nm/K

**Strahlstärke  $I_e$  in Achsrichtung**gemessen bei einem Raumwinkel von  $\Omega = 0.01\text{ sr}$ **Radiant Intensity  $I_e$  in Axial Direction**measured at a solid angle of  $\Omega = 0.01\text{ sr}$ 

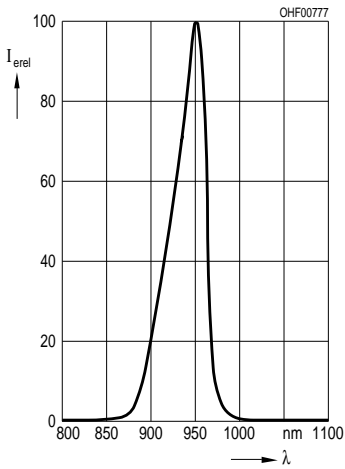
Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Strahlstärke Radiant intensity $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$I_{e\text{ min}}$ $I_{e\text{ typ}}$	16 60	mW/sr mW/sr
Strahlstärke Radiant intensity $I_F = 1\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$	$I_{e\text{ typ}}$	400	mW/sr

**Lötbedingungen****Soldering Conditions**

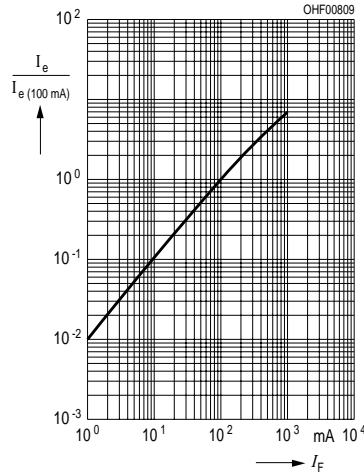
Tauch-, Schwall- und Schleplötung Dip, Wave and Drag Soldering			Kolbenlötung (mit 1,5-mm-Kolbenspitze) Iron Soldering (with 1.5-mm-bit)		
Lötbad- temperatur	Maximal zulässige Lötzeit	Abstand Lötstelle – Gehäuse	Temperatur des Kolbens	Maximale zulässige Lötzeit	Abstand Lötstelle – Gehäuse
Temperature of the Soldering Bath	Max. Perm. Soldering Time	Distance between Solder Joint and Case	Temperature of the Solder- ing Iron	Max. Permis- sible Solder- ing Time	Distance between Solder Joint and Case
260 °C	10 s	$\geq 1.5\text{ mm}$	300 °C	3 s	$\geq 1.5\text{ mm}$

**Relative Spectral Emission**

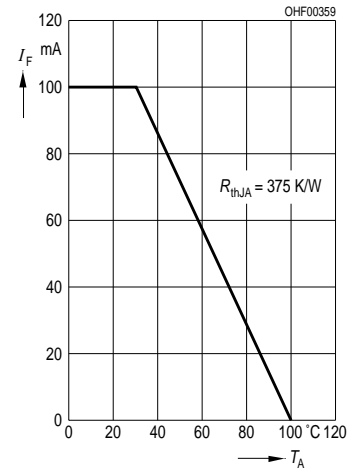
$I_{\text{erel}} = f(\lambda)$



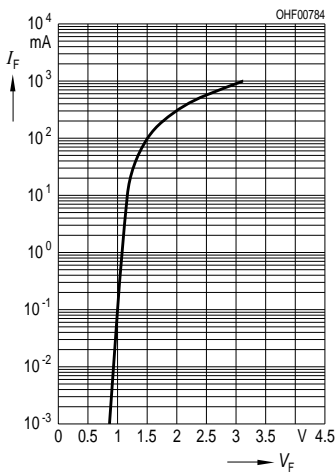
**Radiant Intensity  $I_e/I_e(100 \text{ mA}) = f(I_F)$**   
Single pulse,  $t_p = 20 \mu\text{s}$



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

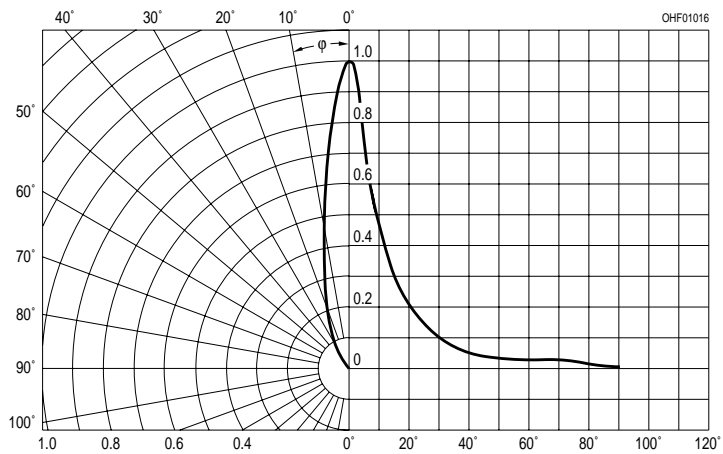


**Forward Current  $I_F = f(V_F)$**   
single pulse,  $t_p = 20 \mu\text{s}$

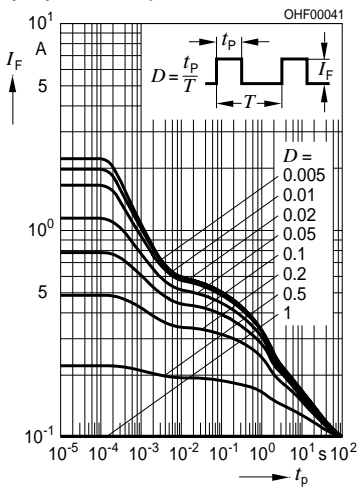


**Radiation Characteristic**

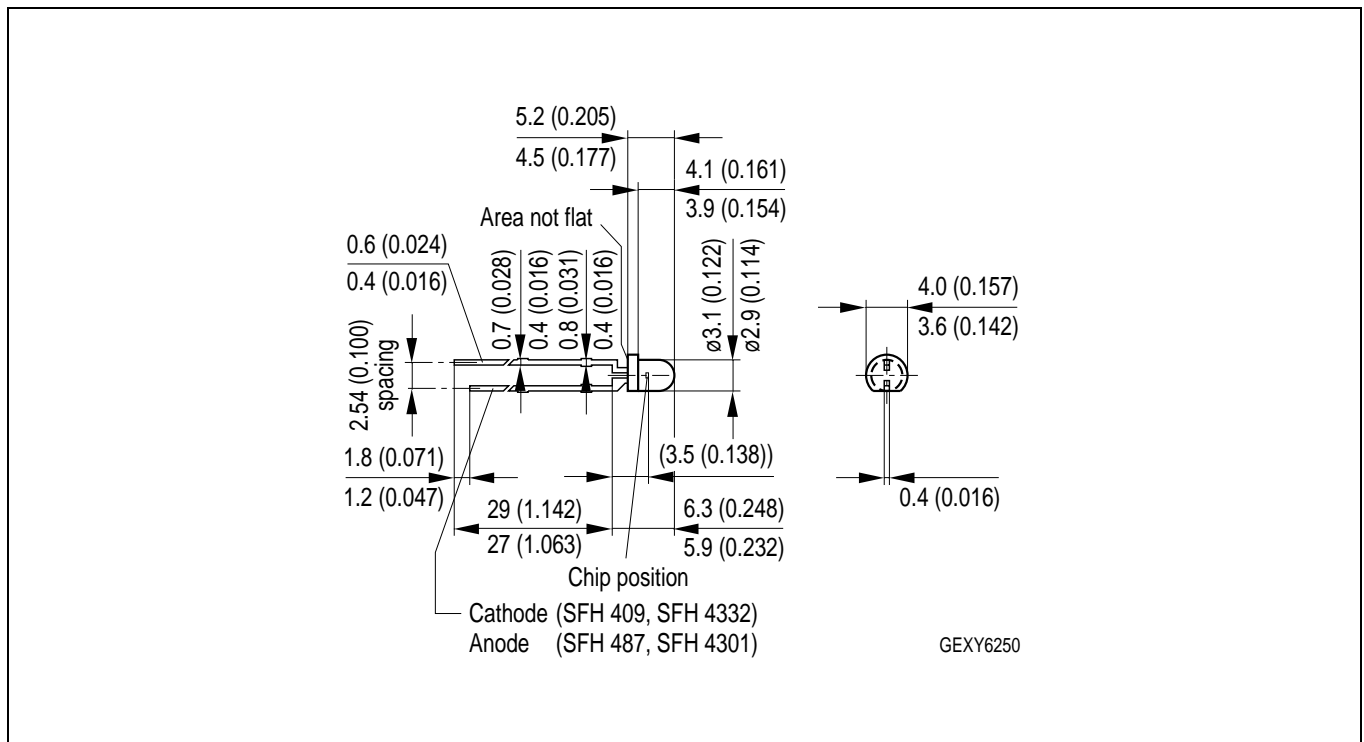
$I_{\text{erel}} = f(\phi)$



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



## Maßzeichnung Package Outlines



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

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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.

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