

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 Φ_e
- Sehr kurze Schaltzeiten (10 ns)
- Sehr hohe Langzeitstabilität
- Hohe Zuverlässigkeit

Features

- High pulse power and high radiant flux Φ_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**

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 Surge current $t_p = 10\text{ }\mu\text{s}, D = 0$	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**

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Wellenlänge der Strahlung Wavelength of 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	φ	± 10	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
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 (≤ 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 Temperature coefficient of I_e or Φ_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 λ Temperature coefficient of λ $I_F = 100\text{ mA}$	TC_λ	+ 0.2	nm/K

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

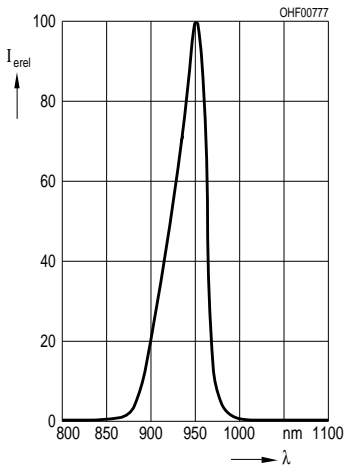
Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Strahlstärke Radiant intensity $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	$I_{e\text{ min}}$ $I_{e\text{ typ}}$	16 60	mW/sr mW/sr
Strahlstärke Radiant intensity $I_F = 1\text{ A}$, $t_p = 100\text{ }\mu\text{s}$	$I_{e\text{ typ}}$	400	mW/sr

Lötbedingungen**Soldering Conditions**

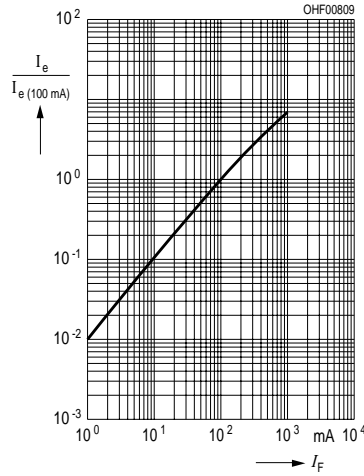
Tauch-, Schwall- und Schleplötung Dip, Wave and Drag Soldering			Kolbenlötung (mit 1,5-mm-Kolbenspitze) Iron Soldering (with 1.5-mm-bit)		
Lötbad- temperatur	Maximal zulässige Lötzeit	Abstand Lötstelle – Gehäuse	Temperatur des Kolbens	Maximale zulässige Lötzeit	Abstand Lötstelle – Gehäuse
Temperature 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

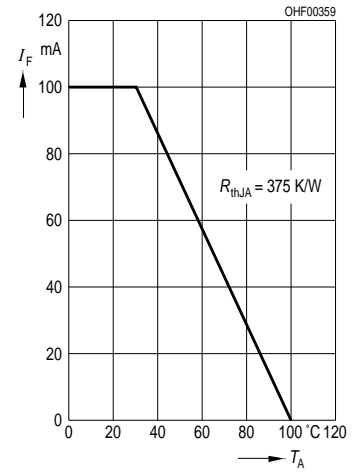
$I_{\text{erel}} = f(\lambda)$



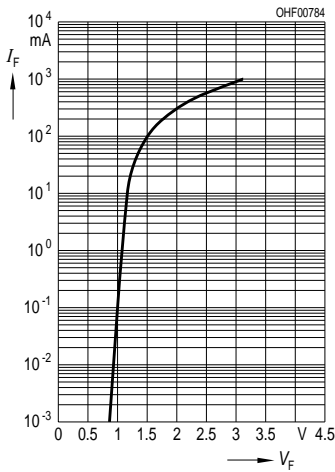
Radiant Intensity $I_e/I_e(100 \text{ mA}) = f(I_F)$
Single pulse, $t_p = 20 \mu\text{s}$



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

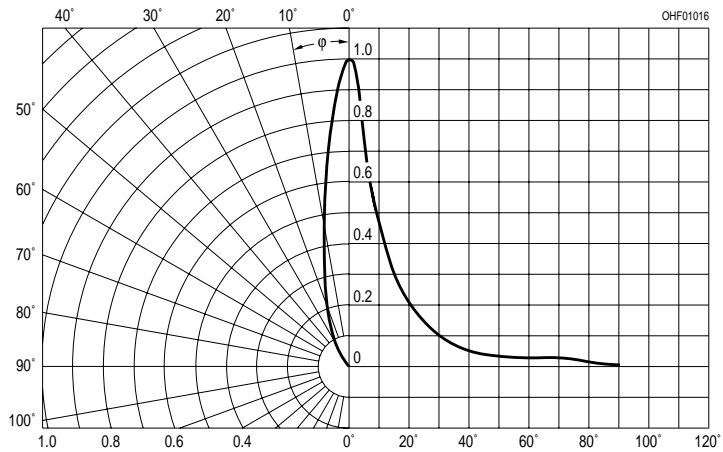


Forward Current $I_F = f(V_F)$
single pulse, $t_p = 20 \mu\text{s}$

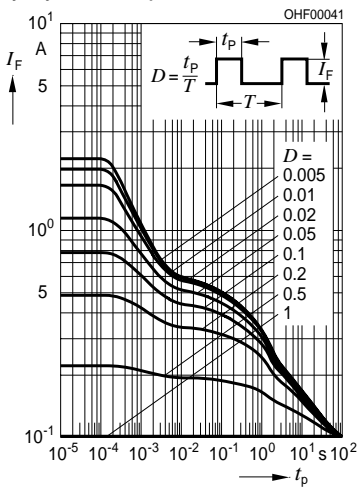


Radiation Characteristic

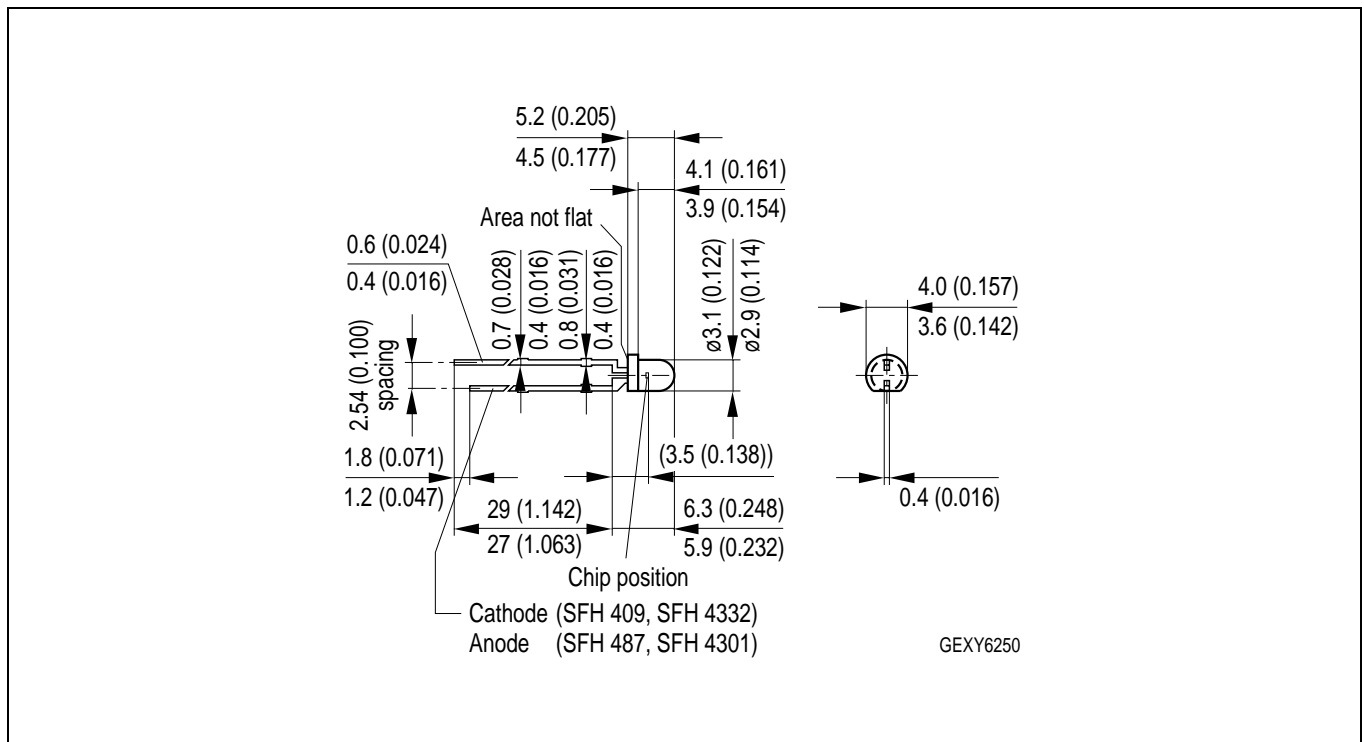
$I_{\text{erel}} = f(\phi)$



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



Maßzeichnung Package Outlines



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