Leistungsstarke IR-Lumineszenzdiode
High Power Infrared Emitter
Lead (Pb) Free Product - RoHS Compliant

SFH 4209

Wesentliche Merkmale

- Leistungsstarke GaAs-LED (40mW)
- Hoher Wirkunsgrad bei kleinen Strömen
- Typische Peakwellenlänge 950nm

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

Features

- High Power GaAs-LED (40mW)
- High Efficiency at low currents
- Typical peak wavelength 950nm

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**	**Strahlstärkegruppierung**[1] (I_F = 100mA, t_p = 20 ms) **Radiant Intensity Grouping**[1] I_e (mW/sr)
SFH 4209	Q65110A2501	24 (> 10)

[1] gemessen bei einem Raumwinkel $\Omega = 0.01$ / measured at a solid angle of $\Omega = 0.01$ sr

Grenzwerte (T_A = 25 °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 µs, D = 0 Surge current	I_{FSM}	2.2	A
Verlustleistung Power dissipation	P_{tot}	180	mW
Wärmewiderstand Sperrschicht - Umgebung bei Montage auf FR4 Platine, Padgröße je 16 mm^2 Thermal resistance junction - ambient mounted on PC-board (FR4), padsize 16 mm^2 each	R_{thJA}	450	K/W
Wärmewiderstand Sperrschicht - Lötstelle bei Montage auf Metall-Block Thermal resistance junction - soldering point, mounted on metal block	R_{thJS}	200	K/W

Kennwerte (T_A = 25 °C)
Characteristics

Bezeichnung **Parameter**	**Symbol** **Symbol**	**Wert** **Value**	**Einheit** **Unit**
Wellenlänge der Strahlung Wavelength at peak emission I_F = 100 mA, t_p = 20 ms	λ_{peak}	950	nm
Spektrale Bandbreite bei 50% von I_{max} Spectral bandwidth at 50% of I_{max} I_F = 100 mA, t_p = 20 ms	$\Delta\lambda$	40	nm
Abstrahlwinkel Half angle	φ	± 25	Grad deg.
Aktive Chipfläche Active chip area	A	0.09	mm^2
Abmessungen der aktiven Chipfläche Dimensions 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%, bei I_F = 100 mA, t_p = 20 ms, R_L = 50 Ω Switching times, I_e from 10% to 90% and from 90% to10%, I_F = 100 mA, t_p = 20 ms, R_L = 50 Ω	t_r, t_f	10	ns
Durchlassspannung, Forward voltage I_F = 100 mA, t_p = 20 ms I_F = 1 A, t_p = 100 µs	V_F V_F	1.5 (≤ 1.8) 3.2 (≤ 4.3)	V V
Sperrstrom Reverse current V_R = 3 V	I_R	0.01 (≤ 10)	µA
Gesamtstrahlungsfluss Total radiant flux I_F = 100 mA, t_p = 20 ms	Φ_e	40	mW
Temperaturkoeffizient von I_e bzw. Φ_e, I_F = 100 mA Temperature coefficient of I_e or Φ_e, I_F = 100 mA	TC_I	– 0.44	%/K
Temperaturkoeffizient von V_F, I_F = 100 mA Temperature coefficient of V_F, I_F = 100 mA	TC_V	– 1.5	mV/K
Temperaturkoeffizient von λ, I_F = 100 mA Temperature coefficient of λ, I_F = 100 mA	TC_λ	+ 0.2	nm/K

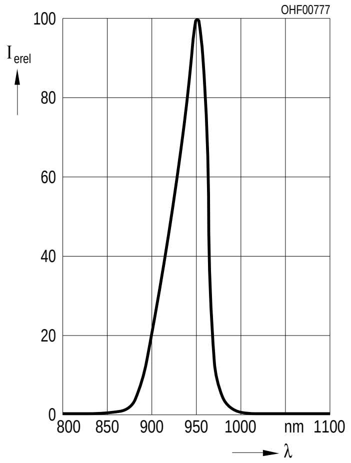
Strahlstärke I_e in Achsrichtung[1]
gemessen bei einem Raumwinkel $\Omega = 0.01$ sr
Radiant Intensity I_e in Axial Direction
at a solid angle of $\Omega = 0.01$ sr

Bezeichnung **Parameter**	**Symbol**	**Werte** **Values**			**Einheit** **Unit**
		SFH 4209-R	**SFH 4209-S**	**SFH 4209-T**	
Strahlstärke Radiant intensity $I_F = 100$ mA, $t_p = 20$ ms	$I_{e\ min}$ $I_{e\ max}$	10 20	16 32	25 50	mW/sr mW/sr
Strahlstärke Radiant intensity $I_F = 1$A, $t_p = 100$ µs	$I_{e\ typ.}$	100	140	180	mW/sr

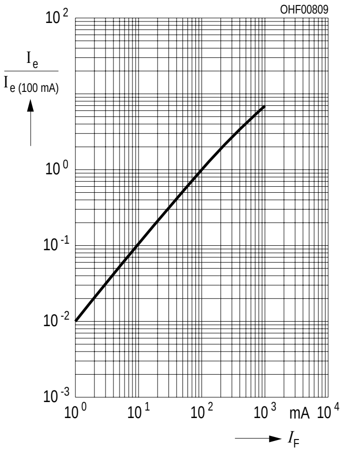
[1] Nur eine Gruppe in einer Verpackungseinheit (Streuung kleiner 2:1)

[1] Only one group in one packing unit, (variation lower 2:1)

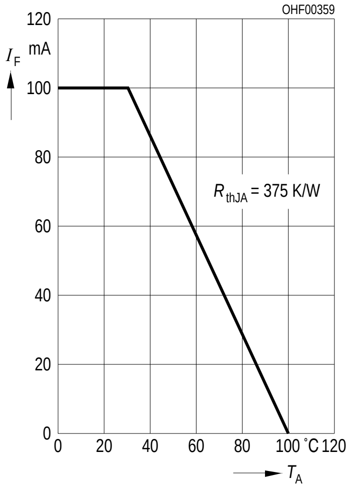
Relative Spectral Emission
$I_{rel} = f(\lambda)$



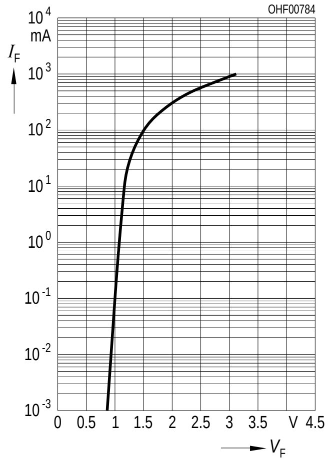
Radiant Intensity $\frac{I_e}{I_e\ 100\ mA} = f(I_F)$
Single pulse, t_p = 20 µs



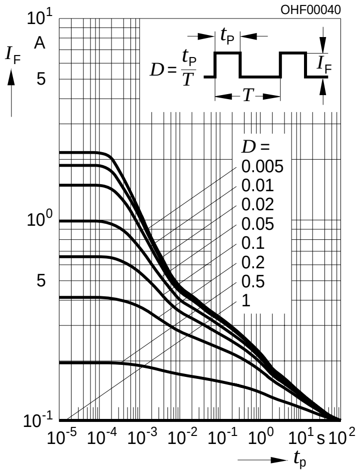
Max. Permissible Forward Current
$I_F = f(T_A)$, R_{thJA}[1]



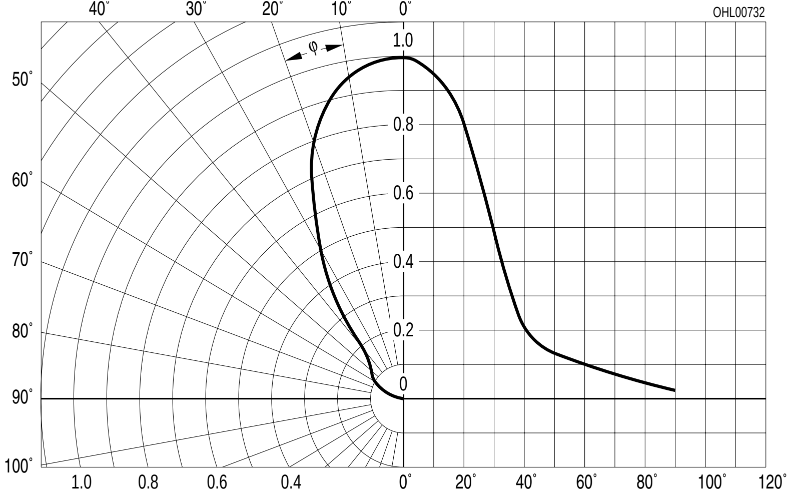
Forward Current $I_F = f(V_F)$
single pulse, t_p = 20 µs



Permissible Pulse Handling Capability $I_F = f(\tau)$, T_A = 25 °C, duty cycle D = parameter



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



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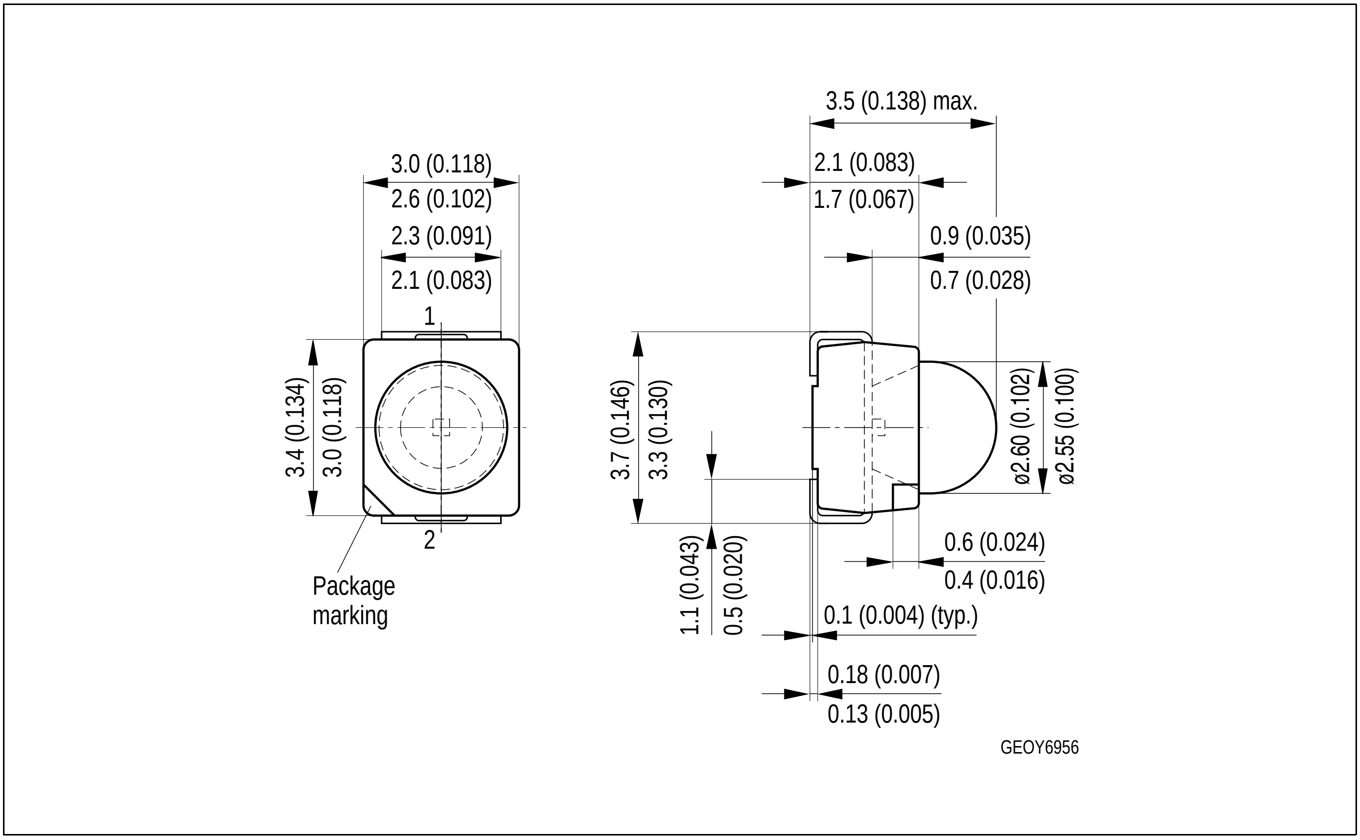
[1] Thermal resistance junction - ambient mounted on PC-board (FR4), pad size 16 mm^2 (each).

Maßzeichnung
Package Outlines

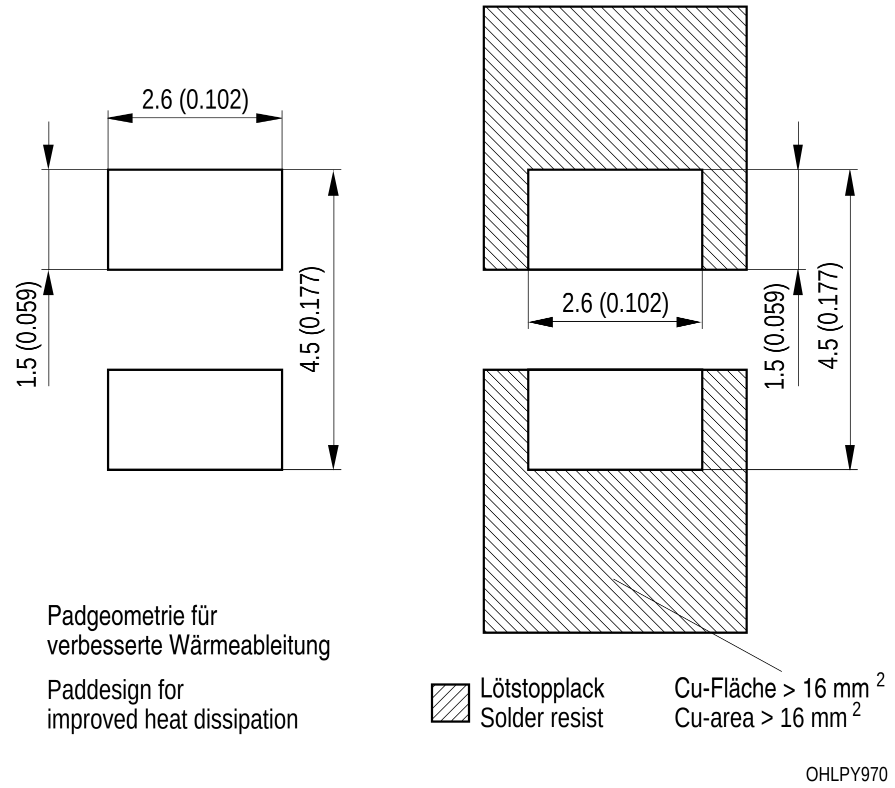


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

Gehäuse / Package	TOPLED® mit Linse (P-LCC-2) / TOPLED® with lens (P-LCC-2)
Anschlussbelegung pin configuration	1 = Anode / anode 2 = Kathode / cathode
Farbe Color	weiß white

Empfohlenes Lötpaddesign
Recommended Solder Pad

IR-Reflow Löten
IR Reflow Soldering



Padgeometrie für
verbesserte Wärmeableitung

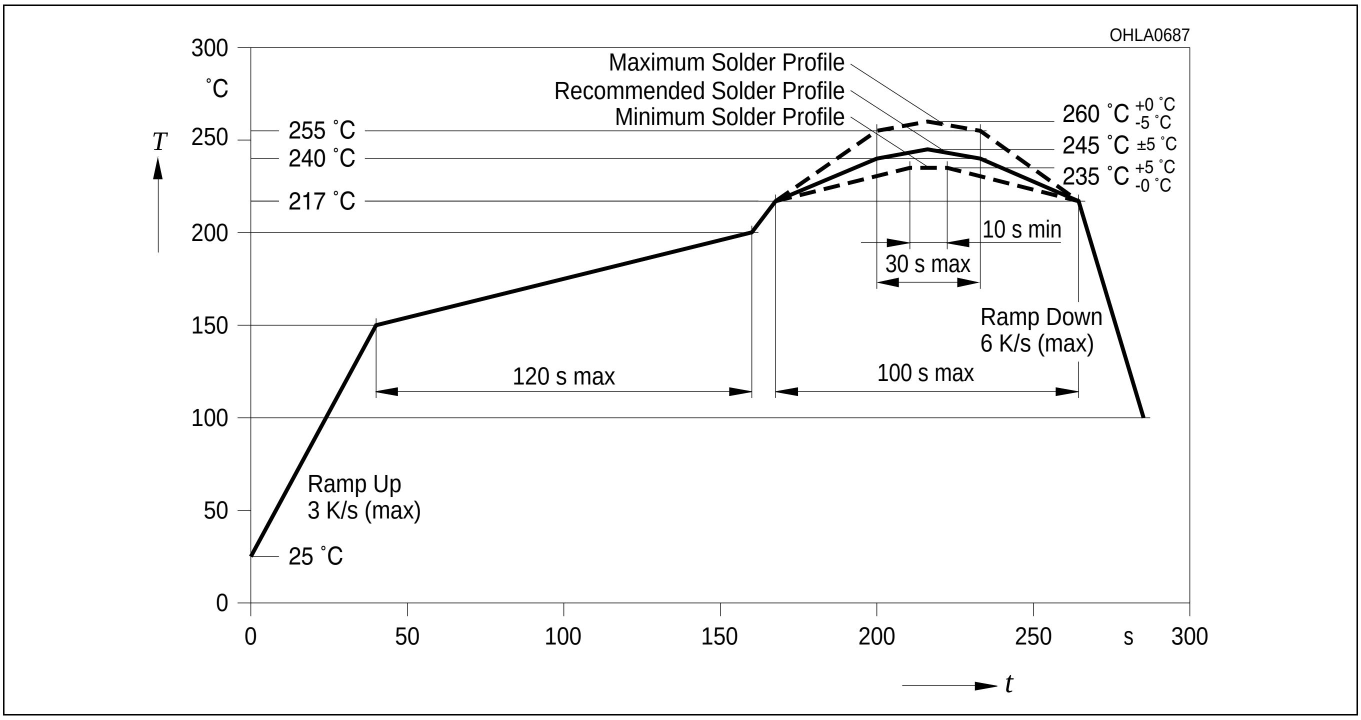
Paddesign for
improved heat dissipation

▨ Lötstopplack
Solder resist

Cu-Fläche > 16 mm ^{2}
Cu-area > 16 mm ^{2}

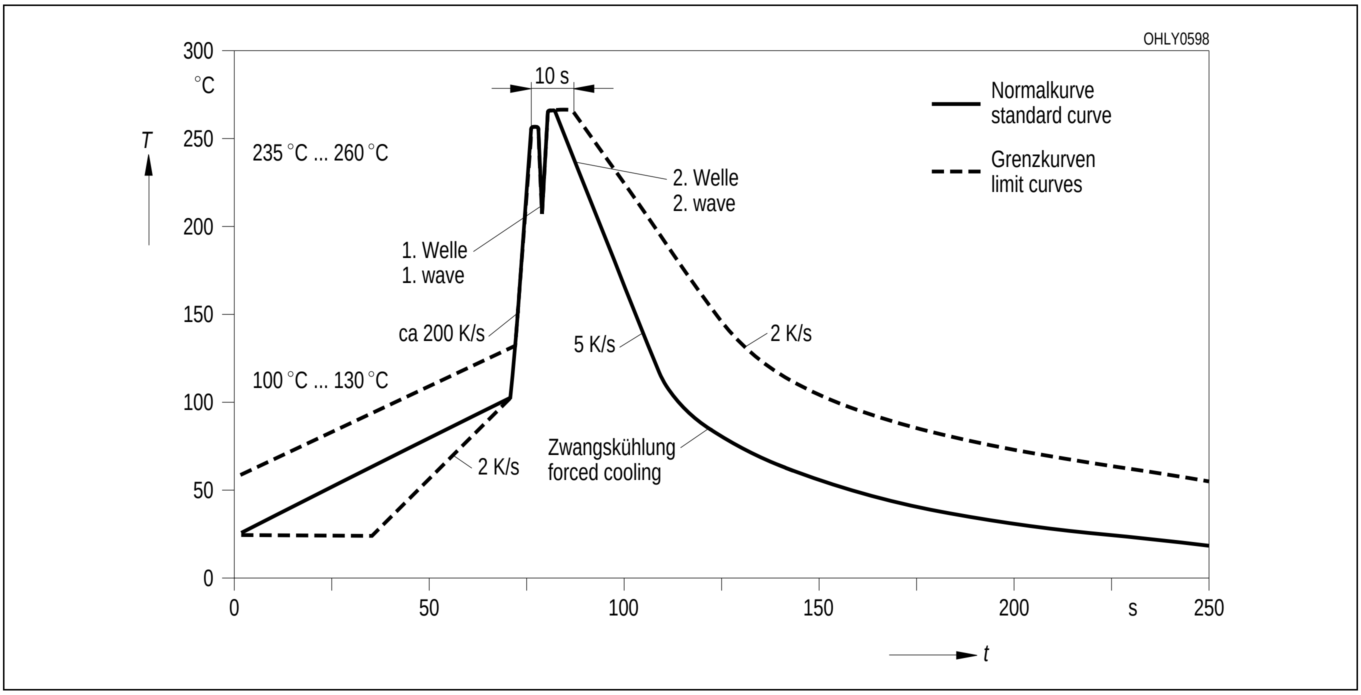
Lötbedingungen
Soldering Conditions
IR-Reflow Lötprofil für bleifreies Löten
IR Reflow Soldering Profile for lead free soldering

Vorbehandlung nach JEDEC Level 2
Preconditioning acc. to JEDEC Level 2
(nach J-STD-020B)
(acc. to J-STD-020B)



Wellenlöten (TTW)
TTW Soldering

(nach CECC 00802)
(acc. to CECC 00802)



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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 usedin 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.