

# GaAs-IR-Lumineszenzdiode in SMT-Gehäuse mit Linse

## GaAs Infrared Emitter in SMT Package with lens

SFH 4219



### Wesentliche Merkmale

- TOPLED mit Linse
- GaAs-LED mit sehr hohem Wirkungsgrad
- Gute Linearität ( $I_e = f[I_F]$ ) bei hohen Strömen
- Gleichstrom- (mit Modulation) oder Impulsbetrieb möglich
- Hohe Zuverlässigkeit
- Hohe Impulsbelastbarkeit
- Oberflächenmontage geeignet
- Gegurtet lieferbar
- SFH 4219 Gehäusegleich mit SFH 3219

### Anwendungen

- Miniaturlichtschranken für Gleich- und Wechsellichtbetrieb, Lochstreifenleser
- Industrieelektronik
- „Messen/Steuern/Regeln“
- Automobiltechnik
- Sensorik
- Alarm- und Sicherungssysteme
- IR-Freiraumübertragung

### Features

- TOPLED with lens
- Very highly efficient GaAs-LED
- Good Linearity ( $I_e = f[I_F]$ ) at high currents
- DC (with modulation) or pulsed operations are possible
- High reliability
- High pulse handling capability
- Suitable for surface mounting (SMT)
- Available on tape and reel
- SFH 4219 same package as SFH 3219

### Applications

- Miniature photointerrupters
- Industrial electronics
- For drive and control circuits
- Automotive technology
- Sensor technology
- Alarm and safety equipment
- IR free air transmission

| Typ<br>Type | Bestellnummer<br>Ordering Code | Gehäuse<br>Package                                                                 |
|-------------|--------------------------------|------------------------------------------------------------------------------------|
| SFH 4219    | Q62702 P5410                   | Kathodenkennzeichnung: abgesetzte Ecke<br>cathode marking: bevelled edge<br>TOPLED |

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

| Bezeichnung<br>Parameter                                                                                                                                                                                    | Symbol<br>Symbol  | Wert<br>Value  | Einheit<br>Unit |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------|-----------------|
| Betriebs- und Lagertemperatur<br>Operating and storage temperature range                                                                                                                                    | $T_{op}; T_{stg}$ | - 40 ... + 100 | °C              |
| Sperrspannung<br>Reverse voltage                                                                                                                                                                            | $V_R$             | 5              | V               |
| Durchlaßstrom<br>Forward current                                                                                                                                                                            | $I_F$             | 100            | mA              |
| Stoßstrom, $\tau = 10\ \mu\text{s}$ , $D = 0$<br>Surge current                                                                                                                                              | $I_{FSM}$         | 3              | A               |
| Verlustleistung<br>Power dissipation                                                                                                                                                                        | $P_{tot}$         | 160            | mW              |
| Wärmewiderstand Sperrschicht - Umgebung bei<br>Montage auf FR4 Platine, Padgröße je $16\ \text{mm}^2$<br>Thermal resistance junction - ambient mounted<br>on PC-board (FR4), padsize $16\ \text{mm}^2$ each | $R_{thJA}$        | 450            | K/W             |
| Wärmewiderstand Sperrschicht - Lötstelle bei<br>Montage auf Metall-Block<br>Thermal resistance junction - soldering point,<br>mounted on metal block                                                        | $R_{thJS}$        | 200            | K/W             |

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

| Bezeichnung<br>Parameter                                                                                       | Symbol<br>Symbol             | Wert<br>Value    | Einheit<br>Unit |
|----------------------------------------------------------------------------------------------------------------|------------------------------|------------------|-----------------|
| Wellenlänge der Strahlung<br>Wavelength at peak emission<br>$I_F = 100\ \text{mA}$ , $t_p = 20\ \text{ms}$     | $\lambda_{peak}$             | 950              | nm              |
| Spektrale Bandbreite bei 50% von $I_{max}$<br>Spectral bandwidth at 50% of $I_{max}$<br>$I_F = 100\ \text{mA}$ | $\Delta\lambda$              | 55               | nm              |
| Abstrahlwinkel<br>Half angle                                                                                   | $\varphi$                    | $\pm 25$         | Grad<br>deg.    |
| Aktive Chipfläche<br>Active chip area                                                                          | $A$                          | 0.09             | $\text{mm}^2$   |
| Abmessungen der aktiven Chipfläche<br>Dimensions of the active chip area                                       | $L \times B$<br>$L \times W$ | $0.3 \times 0.3$ | mm              |

Kennwerte ( $T_A = 25\text{ °C}$ )

## Characteristics (cont'd)

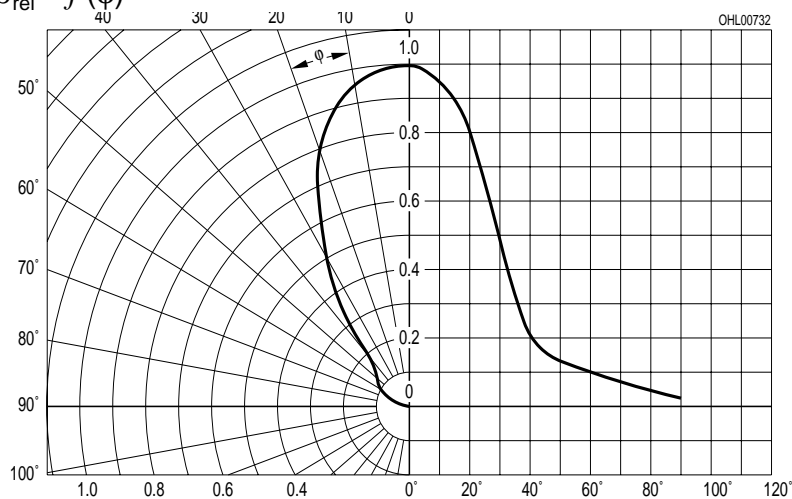
| Bezeichnung<br>Parameter                                                                                                                                                                                          | Symbol<br>Symbol | Wert<br>Value                            | Einheit<br>Unit |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------------------------------|-----------------|
| Schaltzeiten, $I_e$ von 10% auf 90% und von 90% auf 10%, bei $I_F = 100\text{ mA}$ , $R_L = 50\ \Omega$<br>Switching times, $I_e$ from 10% to 90% and from 90% to 10%, $I_F = 100\text{ mA}$ , $R_L = 50\ \Omega$ | $t_r$ , $t_f$    | 0.5                                      | $\mu\text{s}$   |
| Kapazität,<br>Capacitance<br>$V_R = 0\text{ V}$ , $f = 1\text{ MHz}$                                                                                                                                              | $C_o$            | 25                                       | $\text{pF}$     |
| Durchlaßspannung,<br>Forward voltage<br>$I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$<br>$I_F = 1\text{ A}$ , $t_p = 100\ \mu\text{s}$                                                                             | $V_F$<br>$V_F$   | 1.3 ( $\leq 1.5$ )<br>1.9 ( $\leq 2.5$ ) | V<br>V          |
| Sperrstrom,<br>Reverse current<br>$V_R = 5\text{ V}$                                                                                                                                                              | $I_R$            | 0.01 ( $\leq 1$ )                        | $\mu\text{A}$   |
| Gesamtstrahlungsfluß,<br>Total radiant flux<br>$I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$                                                                                                                       | $\Phi_e$         | 14                                       | mW              |
| Temperaturkoeffizient von $I_e$ bzw. $\Phi_e$ ,<br>$I_F = 100\text{ mA}$<br>Temperature coefficient of $I_e$ or $\Phi_e$ ,<br>$I_F = 100\text{ mA}$                                                               | $TC_I$           | - 0.55                                   | %/K             |
| Temperaturkoeffizient von $V_F$ , $I_F = 100\text{ mA}$<br>Temperature coefficient of $V_F$ , $I_F = 100\text{ mA}$                                                                                               | $TC_V$           | - 1.5                                    | mV/K            |
| Temperaturkoeffizient von $\lambda$ , $I_F = 100\text{ mA}$<br>Temperature coefficient of $\lambda$ , $I_F = 100\text{ mA}$                                                                                       | $TC_\lambda$     | + 0.3                                    | 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<br>Parameter                                              | Symbol                                 | Werte<br>Values | Einheit<br>Unit |
|-----------------------------------------------------------------------|----------------------------------------|-----------------|-----------------|
| Strahlstärke<br>Radiant intensity<br>$I_F = 100$ mA, $t_p = 20$ ms    | $I_{e\text{min}}$<br>$I_{e\text{typ}}$ | 4<br>13         | mW/sr<br>mW/sr  |
| Strahlstärke<br>Radiant intensity<br>$I_F = 1$ A, $t_p = 100$ $\mu$ s | $I_{e\text{typ}}$                      | 90              | mW/sr           |

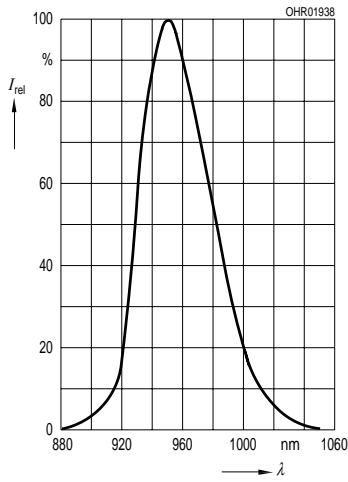
**Radiation Characteristics**

$$S_{\text{rel}} = f(\varphi)$$



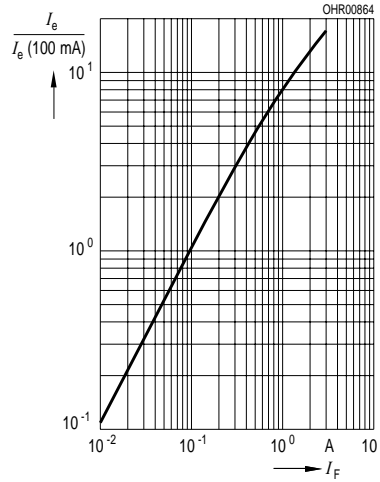
**Relative Spectral Emission**

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

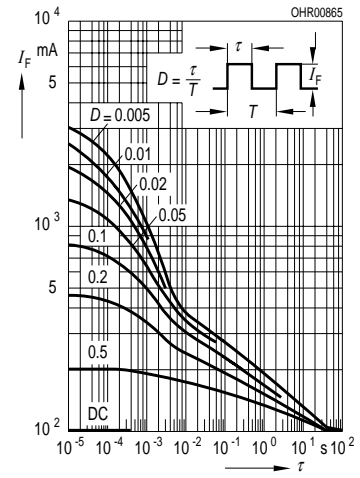


**Radiant Intensity**  $\frac{I_e}{I_e 100 \text{ mA}} = f(I_F)$

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

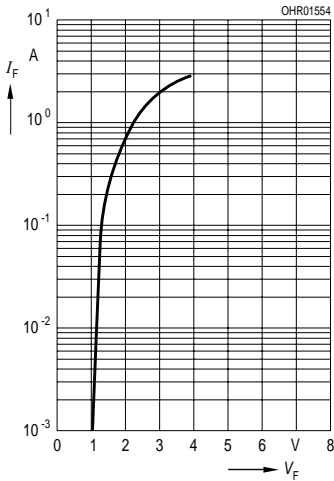


**Permissible Pulse Handling Capability**  $I_F = f(t_p)$ , duty cycle  $D =$  parameter,  $T_A = 20 \text{ }^\circ\text{C}$



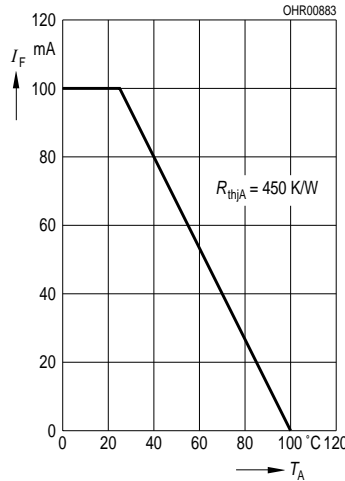
**Forward Current**

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



**Max. Permissible Forward Current**

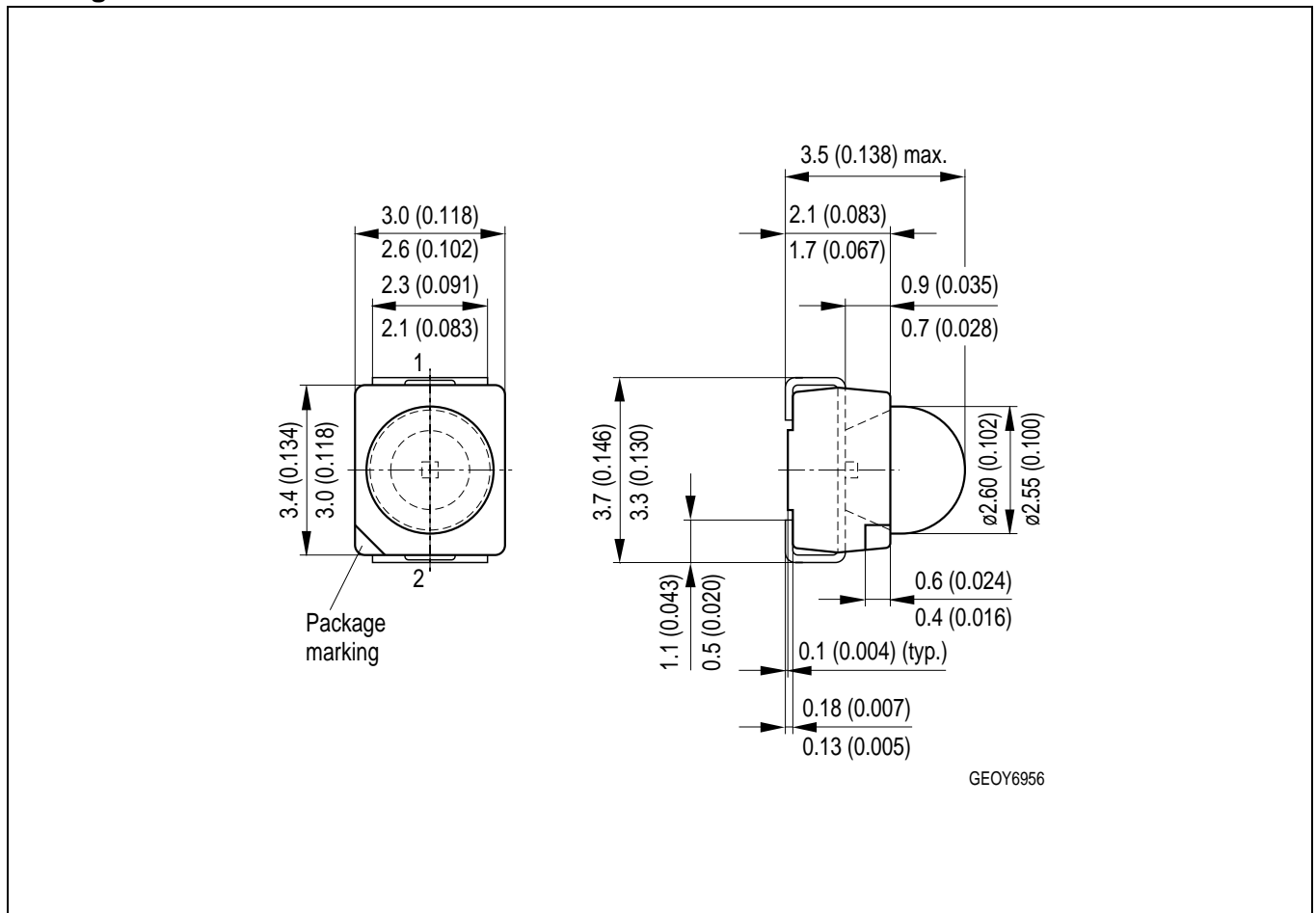
$I_F = f(T_A)$



Zusätzliche Informationen über allgemeine Lötbedingungen erhalten Sie auf Anfrage.

For additional information on general soldering conditions please contact us.

## Maßzeichnung Package Outlines



Maße in mm, wenn nicht anders angegeben / Dimensions in mm, unless otherwise specified.

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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.

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