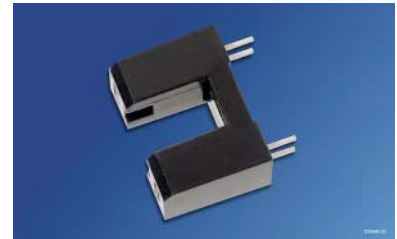


# Gabellichtschranke Slotted Interrupter

## SFH 9310



### Wesentliche Merkmale

- Kompaktes Gehäuse
- GaAs-IR-Sendediode (950 nm)
- Si-Fototransistor mit Tageslichtsperrfilter

### Features

- Compact type
- GaAs infrared emitter (950 nm)
- Silicon phototransistor detector with daylight-cutoff filter

### Anwendungen

- Geschwindigkeitsüberwachung
- Motorsteuerung
- Überwachung des Papiervorschubs in Druckern, Kopier- und Faxgeräten
- Speicherlaufwerke
- Steuerung des Druckkopfes in Druckern
- Münzdetektion
- Optoelektronische Schalter

### Applications

- Speed control
- Motor control
- Monitoring of paper feed in printers, copiers, facsimiles
- Disk drives
- Control of print head in printers
- Coin detection
- Optoelectronic switches

| Typ<br>Type | Bestellnummer<br>Ordering Code | Gehäuse<br>Package                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SFH 9310    | Q62702-P5214                   | Schwarzes Polykarbonat Plastikgehäuse, Anschlüsse im 2.54-mm Raster, Senderseite durch Buchstaben „E“, Empfängerseite durch Buchstaben „S“ gekennzeichnet, Kathode / Transistoremitter durch schräge Kante gekennzeichnet.<br>Black polycarbonate plastic material housing, solder tabs 2.54-mm (1/10") spacing, emitter side marked with letter "E", sensor side marked with letter "S", cathode / emitter of transistor marked with edge at an angle. |

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

| Bezeichnung<br>Parameter                                  | Symbol<br>Symbol | Wert<br>Value | Einheit<br>Unit |
|-----------------------------------------------------------|------------------|---------------|-----------------|
| <b>Sender</b> (GaAs-Diode)<br><b>Emitter</b> (GaAs Diode) |                  |               |                 |
| Sperrspannung<br>Reverse voltage                          | $V_R$            | 5             | V               |
| Durchlaßstrom<br>Forward current                          | $I_{F(DC)}$      | 60            | mA              |
| Verlustleistung<br>Power dissipation                      | $P_{tot}$        | 100           | mW              |
| Wärmewiderstand<br>Thermal resistance                     | $R_{thJA}$       | 280           | K/W             |

**Empfänger** (Si-Fototransistor)**Detector** (Silicon Phototransistor)

|                                                                                                               |            |     |     |
|---------------------------------------------------------------------------------------------------------------|------------|-----|-----|
| Kollektor-Emitter-Spannung<br>Collector-emitter voltage                                                       | $V_{CE}$   | 30  | V   |
| Kollektor-Emitter-Spannung, ( $t \leq 2\text{ min}$ )<br>Collector-emitter voltage, ( $t \leq 2\text{ min}$ ) | $V_{CE}$   | 70  |     |
| Emitter-Kollektor-Spannung<br>Emitter-collector voltage                                                       | $V_{EC}$   | 7   |     |
| Kollektorstrom<br>Collector current                                                                           | $I_C$      | 50  | mA  |
| Verlustleistung<br>Total power dissipation                                                                    | $P_{tot}$  | 150 | mW  |
| Wärmewiderstand<br>Thermal resistance                                                                         | $R_{thJA}$ | 280 | K/W |

**Gabellichtschranke****Slotted Interrupter**

|                                                       |           |               |    |
|-------------------------------------------------------|-----------|---------------|----|
| Lagertemperatur<br>Storage temperature range          | $T_{stg}$ | - 40 ... + 85 | °C |
| Betriebstemperatur<br>Operating temperature range     | $T_{op}$  | - 40 ... + 85 |    |
| Elektrostatische Entladung<br>Electrostatic discharge | ESD       | 2             | kV |

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

| Bezeichnung<br>Parameter | Symbol<br>Symbol | Wert<br>Value | Einheit<br>Unit |
|--------------------------|------------------|---------------|-----------------|
|--------------------------|------------------|---------------|-----------------|

**Sender** (GaAs-Diode)**Emitter** (GaAs Diode)

|                                                                                    |                         |                    |               |
|------------------------------------------------------------------------------------|-------------------------|--------------------|---------------|
| Wellenlänge der Strahlung<br>Wavelength of peak emission                           | $\lambda_{\text{peak}}$ | 950                | nm            |
| Durchlaßspannung<br>Forward voltage<br>$I_F = 20\text{ mA}$ , $t_p = 20\text{ ms}$ | $V_F$                   | 1.2 ( $\leq 1.4$ ) | V             |
| Sperrstrom<br>Reverse current<br>$V_R = 5\text{ V}$                                | $I_R$                   | 0.01 ( $\leq 1$ )  | $\mu\text{A}$ |
| Kapazität<br>Capacitance<br>$V_R = 0\text{ V}$ , $f = 1\text{ MHz}$                | $C_0$                   | 16                 | pF            |

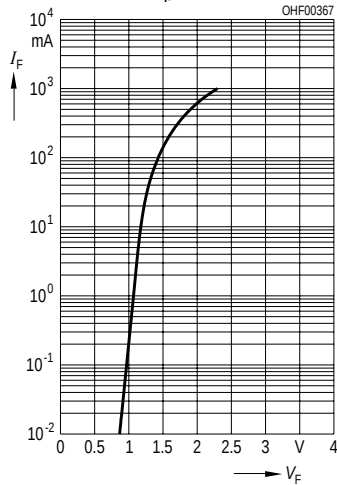
**Empfänger** (Si-Fototransistor)**Detector** (Silicon Phototransistor)

|                                                                                                            |                          |                 |    |
|------------------------------------------------------------------------------------------------------------|--------------------------|-----------------|----|
| Wellenlänge der max. Fotoempfindlichkeit<br>Wavelength of max. sensitivity                                 | $\lambda_{S\text{ max}}$ | 920             | nm |
| Spectr. Bereich der Fotoempfindlichkeit<br>Spectral range of sensitivity<br>$S = 10\%$ of $S_{\text{max}}$ | $\lambda$                | 840 ... 1080    | nm |
| Kapazität<br>Capacitance<br>$V_{CE} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$                           | $C_{CE}$                 | 6.5             | pF |
| Dunkelstrom<br>Dark current<br>$V_{CE} = 20\text{ V}$                                                      | $I_{CEO}$                | 2 ( $\leq 50$ ) | nA |

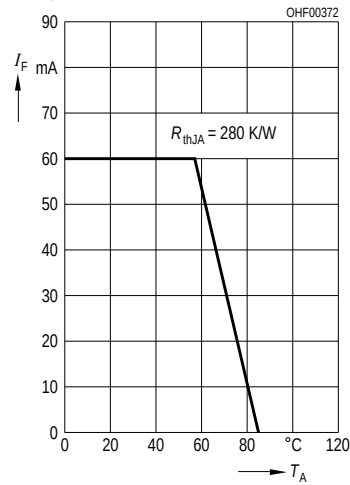
Kennwerte  $T_A = 25\text{ °C}$   
 Characteristics (cont'd)

| Bezeichnung<br>Parameter                                                                                                     | Symbol<br>Symbol                             | Wert<br>Value | Einheit<br>Unit                |
|------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|---------------|--------------------------------|
| <b>Gabellichtschranke<br/>Slotted interrupter</b>                                                                            |                                              |               |                                |
| Kollektor-Emitterstrom<br>Collector-emitter current<br>$I_F = 20\text{ mA}$ ; $V_{CE} = 5\text{ V}$                          | $I_{CE\text{ min.}}$<br>$I_{CE\text{ typ.}}$ | $> 0.7$       | mA                             |
| Kollektor-Emitter-Sättigungsspannung<br>Collector-emitter-saturation voltage<br>$I_F = 20\text{ mA}$ ; $I_C = 0.2\text{ mA}$ | $V_{CE\text{ sat}}$                          | $\leq 0.4$    | V                              |
| Anstiegs- und Abfallzeit<br>Rise and fall time<br>$V_{CC} = 5\text{ V}$ , $I_C = 1\text{ mA}$ , $R_L = 1\text{ k}\Omega$     | $t_r$<br>$t_f$                               | 13<br>17      | $\mu\text{s}$<br>$\mu\text{s}$ |

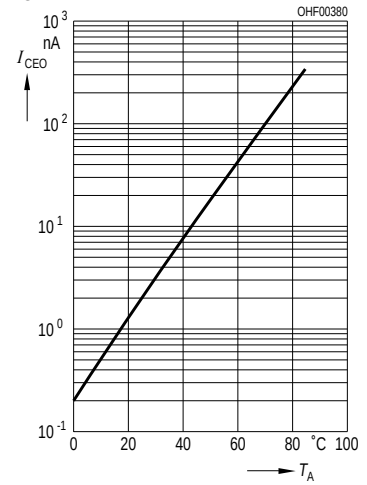
**Forward Current  $I_F = f(V_F)$**   
Single pulse,  $t_p = 20 \mu s$



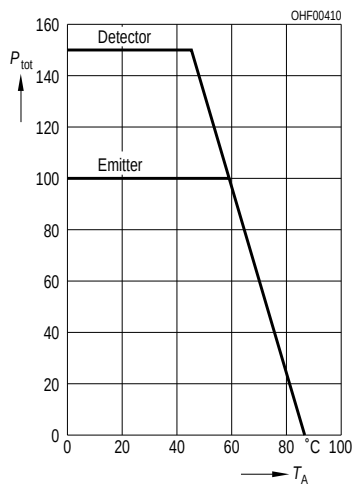
**Max. Permissible Forward Current  $I_F = f(T_A)$**



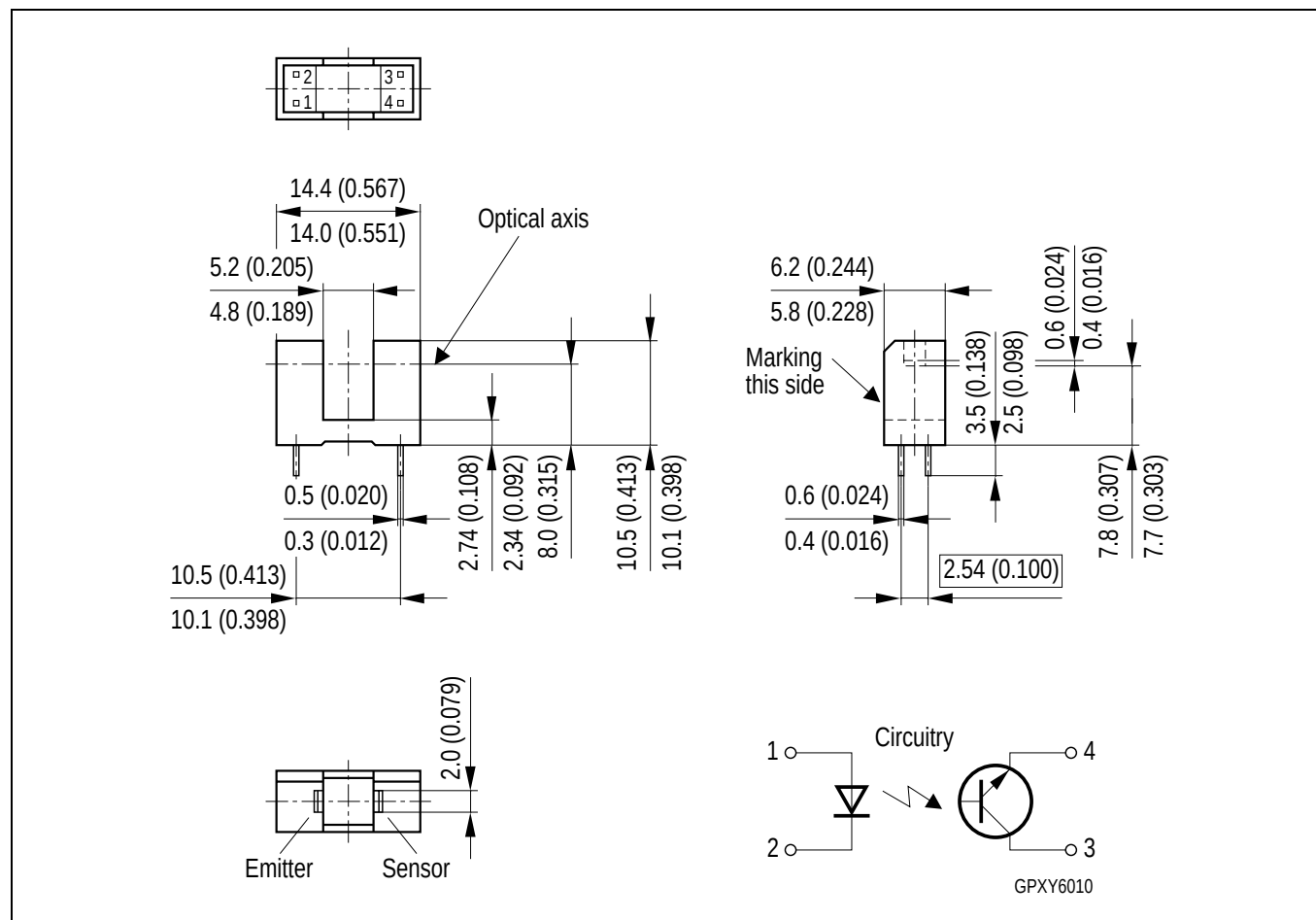
**Dark Current  $I_{CEO} = f(T_A)$**   
 $V_{CE} = 20 V, E = 0$



**Total Power Dissipation for Emitter and Detector  $P_{tot} = f(T_A)$**



## Maßzeichnung Package Outlines



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

**Löthinweise**  
**Soldering Conditions**

| Bauform<br>Type | Tauch-, Schwalllötung<br>Dip, Wave Soldering |                           | Reflowlötung<br>Reflow Soldering |                           | Kolbenlötung<br>Iron Soldering |
|-----------------|----------------------------------------------|---------------------------|----------------------------------|---------------------------|--------------------------------|
|                 | Peak Temp.<br>(solderbath)                   | Max. Time in<br>Peak Zone | Peak Temp.<br>(package<br>temp.) | Max. Time in<br>Peak Zone | (Iron temp.)                   |
| SFH 9310        | 260 °C                                       | 10 s                      | n. a.                            | –                         | 300 °C < 5 s                   |

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**Attention please!**

The information describes the type of component and shall not be considered as assured characteristics.  
Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances. For information on the types in question please contact our Sales Organization.

**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<sup>1</sup>, may only be used in life-support devices or systems<sup>2</sup> with the express written approval of OSRAM OS.

<sup>1</sup> A critical component is a component used in 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.

<sup>2</sup> 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.