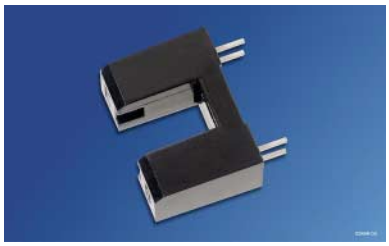
# Gabellichtschranke
# Slotted Interrupter

## 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 °C
**Maximum Ratings**

| **Bezeichnung**<br>**Parameter** | **Symbol**<br>**Symbol** | **Wert**<br>**Value** | **Einheit**<br>**Unit** |
|---|---|---|---|
| **Sender** (GaAs-Diode)<br>**Emitter** (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)<br>**Detector** (Silicon Phototransistor) | | | |
| Kollektor-Emitter-Spannung<br>Collector-emitter voltage | $V_{CE}$ | 30 | V |
| Kollektor-Emitter-Spannung, ($t \leq 2$ min)<br>Collector-emitter voltage, ($t \leq 2$ 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**<br>**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 |

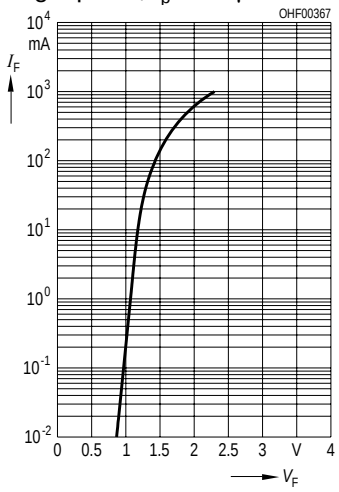
**Kennwerte** $T_A$ = 25 °C
**Characteristics**

| **Bezeichnung**<br>**Parameter** | **Symbol**<br>**Symbol** | **Wert**<br>**Value** | **Einheit**<br>**Unit** |
|---|---|---|---|
| **Sender** (GaAs-Diode)<br>**Emitter** (GaAs Diode) | | | |
| Wellenlänge der Strahlung<br>Wavelength of peak emission | $\lambda_{peak}$ | 950 | nm |
| Durchlaβspannung<br>Forward voltage<br>$I_F$ = 20 mA, $t_p$ = 20 ms | $V_F$ | 1.2 (≤ 1.4) | V |
| Sperrstrom<br>Reverse current<br>$V_R$ = 5 V | $I_R$ | 0.01 (≤ 1) | µA |
| Kapazität<br>Capacitance<br>$V_R$ = 0 V, $f$ = 1 MHz | $C_0$ | 16 | pF |
| **Empfänger** (Si-Fototransistor)<br>**Detector** (Silicon Phototransistor) | | | |
| Wellenlänge der max. Fotoempfindlichkeit<br>Wavelength of max. sensitivity | $\lambda_{S\ max}$ | 920 | nm |
| Spectr. Bereich der Fotoempfindlichkeit<br>Spectral range of sensitivity<br>$S$ = 10% of $S_{max}$ | $\lambda$ | 840 … 1080 | nm |
| Kapazität<br>Capacitance<br>$V_{CE}$ = 0 V, $f$ = 1 MHz, $E$ = 0 | $C_{CE}$ | 6.5 | pF |
| Dunkelstrom<br>Dark current<br>$V_{CE}$ = 20 V | $I_{CEO}$ | 2 (≤ 50) | nA |

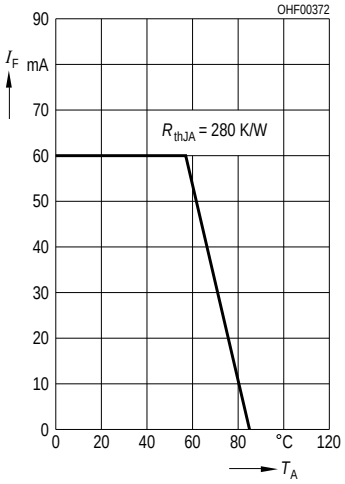
**Kennwerte** $T_A$ = 25 °C
**Characteristics** (cont'd)

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

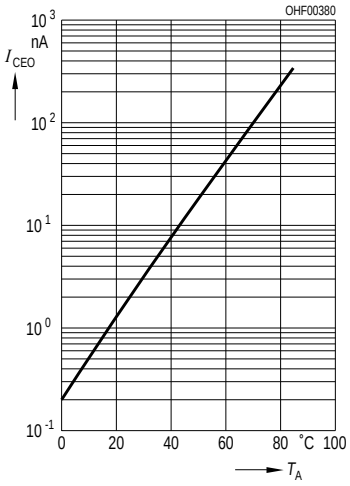
**Forward Current $I_F = f(V_F)$**
Single pulse, $t_p$ = 20 µs



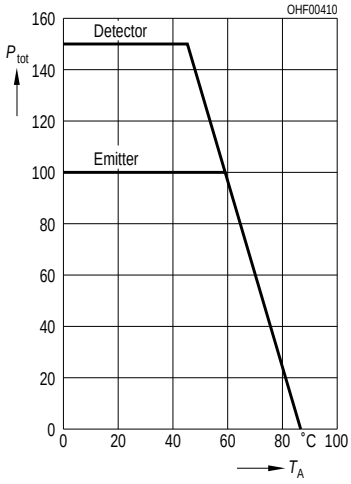

**Max. Permissible Forward Current $I_F = f(T_A)$**



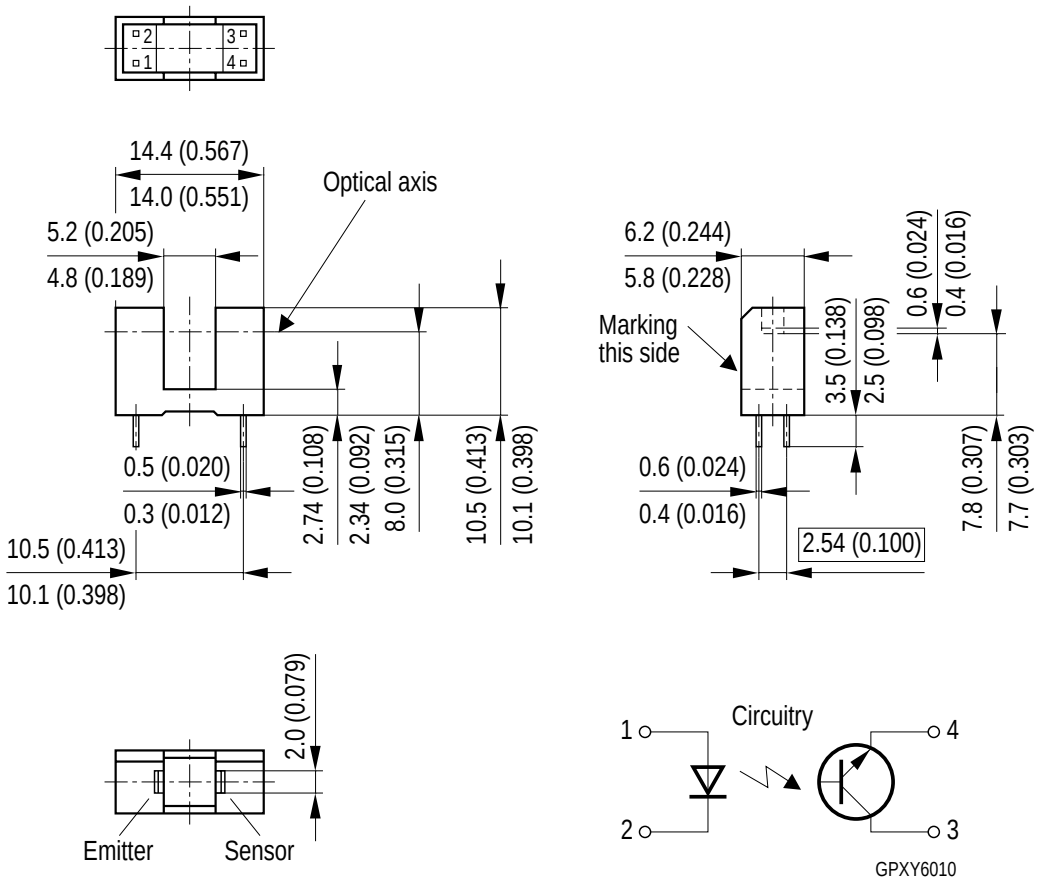

**Dark Current $I_{CEO} = f(T_A)$**
$V_{CE}$ = 20 V, $E$ = 0




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

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