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# Gabellichtschanke mit Fotodarlington Transistor Slotted Interrupter with Photodarlington Transistor

## SFH 9330



### Wesentliche Merkmale

- Kompaktes Gehäuse
- GaAs-IR-Sendediode
- Si-Foto Darlington-Transistor mit Tageslichtsperrfilter
- Hoher Koppelfaktor

### Features

- Compact type
- GaAs infrared emitter
- Silicon photo darlington-transistor detector with daylight-cutoff filter
- High coupling factor

### Anwendungen

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

### 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
- Counter

| Typ<br>Type | Bestellnummer<br>Ordering Code | Gehäuse<br>Package                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SFH 9330    | Q62702-P5263                   | Schwarzes Polycarbonat Plastikgehäuse, Anschlüsse im 2.54-mm Raster, Senderseite durch Buchstaben „E“, Empfängerseite durch Buchstaben „S“ gekennzeichnet, Kathode/Transistoremmitter 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                                                       | $V_{CE}$   | 75  | V   |
| Kollektor-Emitter-Spannung, ( $t \leq 2\text{ min}$ )<br>Collector-emitter voltage, ( $t \leq 2\text{ min}$ ) | $V_{CE}$   | 30  |     |
| Emitter-Kollektor-Spannung<br>Emitter-collector voltage                                                       | $V_{EC}$   | 7   |     |
| Kollektorstrom<br>Collector current                                                                           | $I_C$      | 100 | 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, $I_F = 20\text{ mA}$ , $t_p = 20\text{ ms}$<br>Forward voltage | $V_F$                   | 1.2 ( $\leq 1.4$ ) | V             |
| Sperrstrom, $V_R = 5\text{ V}$<br>Reverse current                                | $I_R$                   | 0.01 ( $\leq 1$ )  | $\mu\text{A}$ |
| Kapazität, $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$<br>Capacitance                | $C_0$                   | 16                 | pF            |

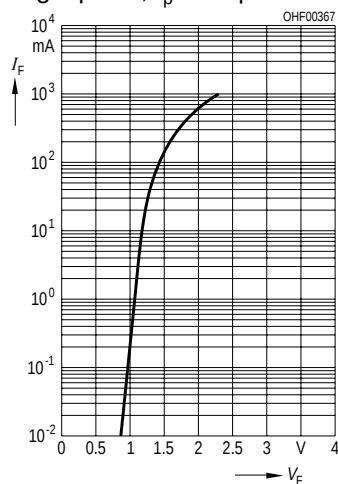
**Empfänger** (Si-Fototransistor)**Detector** (Silicon Phototransistor)

|                                                                                                            |                          |                 |    |
|------------------------------------------------------------------------------------------------------------|--------------------------|-----------------|----|
| Wellenlänge der max. Fotoempfindlichkeit<br>Wavelength of max. sensitivity                                 | $\lambda_{S\text{ max}}$ | 900             | nm |
| Spektr. Bereich der Fotoempfindlichkeit<br>Spectral range of sensitivity<br>$S = 10\%$ of $S_{\text{max}}$ | $\lambda$                | 840 ... 1060    | nm |
| Kapazität, $V_{CE} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$<br>Capacitance                             | $C_{CE}$                 | 14              | pF |
| Dunkelstrom, $V_{CE} = 20\text{ V}$<br>Dark current                                                        | $I_{CEO}$                | 1 ( $\leq 50$ ) | nA |

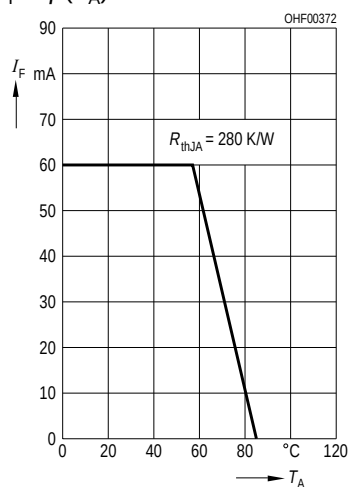
**Gabellichtschranke****Slotted Interrupter**

|                                                                                                                             |                                            |                 |          |
|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-----------------|----------|
| Kollektor-Emitterstrom<br>Collector-emitter current<br>$I_F = 1\text{ mA}$<br>$I_F = 10\text{ mA}$                          | $I_{CE\text{ min}}$<br>$I_{CE\text{ min}}$ | $> 1$<br>$> 20$ | mA<br>mA |
| Kollektor-Emitter-Sättigungsspannung<br>Collector-emitter-saturation voltage<br>$I_F = 1\text{ mA}$ ; $I_C = 0.3\text{ mA}$ | $V_{CE\text{ sat}}$                        | $\leq 0.9$      | V        |

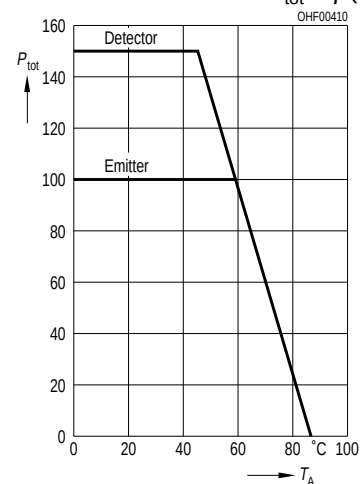
**Forward Current  $I_F = f(V_F)$**   
Single pulse,  $t_p = 20 \mu s$



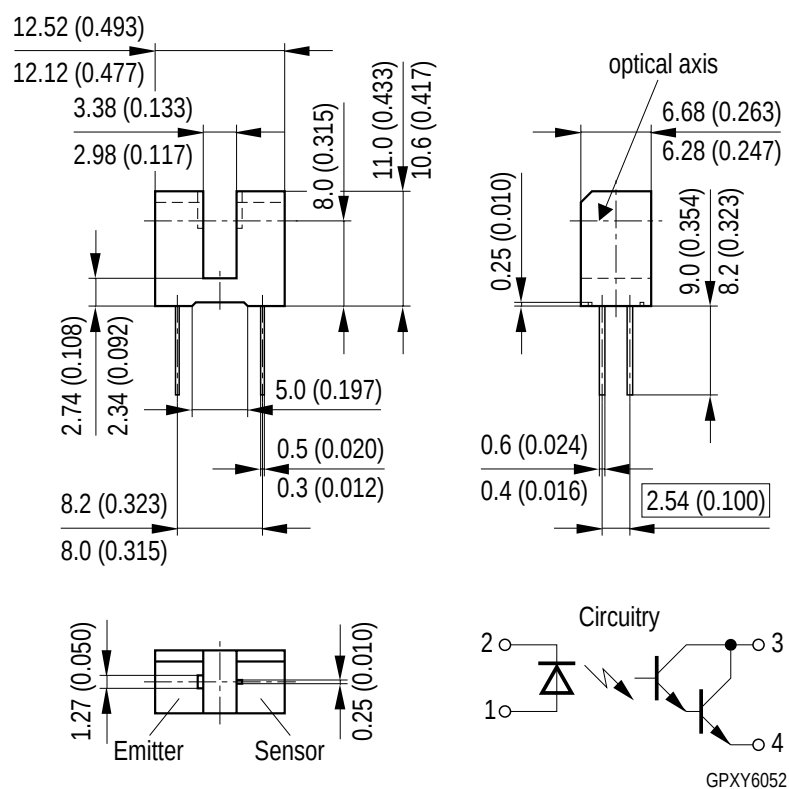
**Max. Permissible Forward Current  $I_F = f(T_A)$**



**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**

| <b>Bauform<br/>Type</b> | <b>Tauch-, Schwalllötung<br/>Dip, Wave Soldering</b> |                                   | <b>Reflowlötung<br/>Reflow Soldering</b>  |                                   | <b>Kolbenlötung<br/>Iron Soldering</b> |
|-------------------------|------------------------------------------------------|-----------------------------------|-------------------------------------------|-----------------------------------|----------------------------------------|
|                         | <b>Peak Temp.<br/>(solderbath)</b>                   | <b>Max. Time in<br/>Peak Zone</b> | <b>Peak Temp.<br/>(package<br/>temp.)</b> | <b>Max. Time in<br/>Peak Zone</b> | <b>(Iron temp.)</b>                    |
| SFH 9330                | 260 °C                                               | 10 s                              | n. a.                                     | –                                 | 300 °C < 5 s                           |