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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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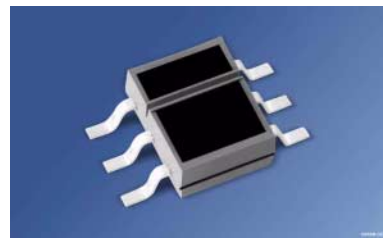
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Reflexlichtschranke Reflective Interrupter

SFH 9201



Wesentliche Merkmale

- Optimaler Arbeitsabstand 1 mm bis 5 mm
- IR-GaAs-Lumineszenzdiode in Kombination mit einem Si-NPN-Fototransistor
- Tageslichtsperrfilter
- Hoher Kollektor-Emitter-Strom typ. 0.7 mA
- Geringe Sättigungsspannung
- Sender und Empfänger galvanisch getrennt

Anwendungen

- Positionsmelder
- Drehzahlüberwachung, -regelung
- Bewegungssensor

Features

- Optimal operating distance 1 mm to 5 mm
- IR-GaAs-emitter in combination with a Silicon NPN phototransistor
- Daylight cut-off filter
- High collector-emitter current typ. 0.7 mA
- Low saturation voltage
- Emitter and detector electrically isolated

Applications

- Position reporting
- End position switch
- Speed monitoring and regulating
- Motion transmitter

| Typ Type | Bestellnummer Ordering Code | I_{CE} $I_F = 10 \text{ mA}, V_{CE} = 5 \text{ V}, d = 1 \text{ mm}$ mA |
|--------------|--------------------------------|---|
| SFH 9201 | Q62702-P5038 | 0.25 ... 2.00 |
| SFH 9201-2/3 | Q62702-P5056 | 0.40 ... 1.25 |
| SFH 9201-3/4 | Q62702-P5057 | 0.63 ... 2.00 |

Grenzwerte
Maximum Ratings

| Bezeichnung Parameter | Symbol Symbol | Wert Value | Einheit Unit |
|--------------------------|------------------|---------------|-----------------|
|--------------------------|------------------|---------------|-----------------|

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

| | | | |
|--------------------------------------|-----------|----|----|
| Sperrspannung Reverse voltage | V_R | 5 | V |
| Vorwärtsstrom Forward current | I_F | 50 | mA |
| Verlustleistung Power dissipation | P_{tot} | 80 | mW |

Empfänger (Si-Fototransistor)**Detector** (silicon phototransistor)

| | | | |
|--|-----------|-----|----|
| Dauer-Kollektor-Emitter-Sperrspannung Continuous collector-emitter voltage | V_{CE} | 16 | V |
| Kollektor-Emitter-Sperrspannung, ($t \leq 2$ min) Collector-emitter voltage, ($t \leq 2$ min) | V_{CE} | 30 | |
| Emitter-Kollektor-Sperrspannung Emitter-collector voltage | V_{EC} | 7 | |
| Kollektorstrom Collector current | I_C | 10 | mA |
| Verlustleistung Total power dissipation | P_{tot} | 100 | mW |

Reflexlichtschranke**Light Reflection Switch**

| | | | |
|--|---|----------------|----|
| Lagertemperatur Storage temperature range | T_{stg} | - 40 ... + 100 | °C |
| Umgebungstemperatur Ambient temperature range | T_A | - 40 ... + 100 | |
| Elektrostatistische Entladung Electrostatic discharge | ESD | 2 | KV |
| Umweltbedingungen / Environment conditions | 3 K3 acc. to EN 60721-3-3 (IEC 721-3-3) | | |

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

| Bezeichnung Parameter | Symbol Symbol | Wert Value | Einheit Unit |
|---|------------------|----------------------|-----------------|
| Sender (IR-GaAs-Diode) | | | |
| Emitter (IR-GaAs diode) | | | |
| Durchlaßspannung Forward voltage $I_F = 50\text{ mA}$ | V_F | 1.25 (≤ 1.65) | V |
| Sperrstrom Reverse current $V_R = 5\text{ V}$ | I_R | 0.01 (≤ 1) | μA |
| Kapazität Capacitance $V_R = 0\text{ V}, f = 1\text{ MHz}$ | C_O | 25 | pF |
| Wärmewiderstand ¹⁾ Thermal resistance ¹⁾ | R_{thJA} | 400 | K/W |

Empfänger (Si-Fototransistor)**Detector** (silicon phototransistor)

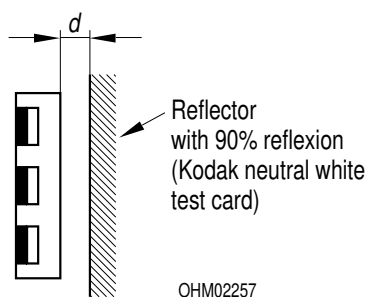
| | | | |
|--|------------|------------------|-----|
| Kapazität Capacitance $V_{CE} = 5\text{ V}, f = 1\text{ MHz}$ | C_{CE} | 10 | pF |
| Kollektor-Emitter-Reststrom Collector-emitter leakage current $V_{CE} = 20\text{ V}$ | I_{CEO} | 3 (≤ 200) | nA |
| Fotostrom (Fremdlichtempfindlichkeit) Photocurrent (outside light density) $V_{CE} = 5\text{ V}, E_V = 1000\text{ Lx}$ | I_P | 3.5 | mA |
| Wärmewiderstand ¹⁾ Thermal resistance ¹⁾ | R_{thJA} | 400 | K/W |

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

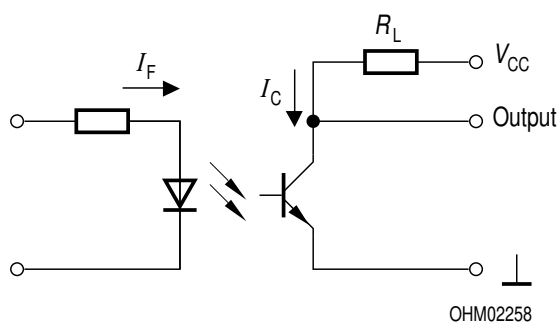
| Bezeichnung Parameter | Symbol Symbol | Wert Value | Einheit Unit |
|--|--|---------------------|-----------------|
| Reflexlichtschranke Light Reflection Switch | | | |
| Kollektor-Emitterstrom Collector-emitter current Kodak neutral white test card, 90% Reflexion $I_F = 10\text{ mA}$; $V_{CE} = 5\text{ V}$; $d = 1\text{ mm}$ | $I_{CE\text{ min.}}$ $I_{CE\text{ typ.}}$ | 0.25 0.70 | mA mA |
| Kollektor-Emitter-Sättigungsspannung Collector-emitter-saturation voltage Kodak neutral white test card, 90% Reflexion $I_F = 10\text{ mA}$; $d = 1\text{ mm}$; $I_C = 85\text{ }\mu\text{A}$ | $V_{CE\text{ sat}}$ | 0.15 (≤ 0.6) | V |

1) Montage auf PC-Board mit $> 5\text{ mm}^2$ Padgröße

1) Mounting on pcb with $> 5\text{ mm}^2$ pad size



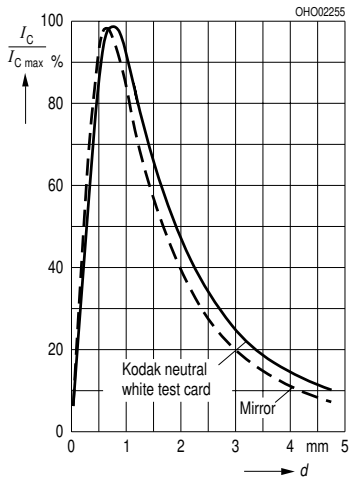
Schaltzeiten ($T_A = 25\text{ °C}$, $V_{CC} = 5\text{ V}$, $I_C = 1\text{ mA}^1$), $R_L = 1\text{ k}\Omega$)
Switching Times



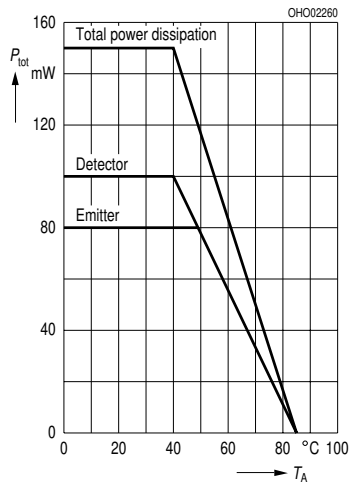
| Bezeichnung Parameter | Symbol Symbol | Wert Value | Einheit Unit |
|--------------------------------|--------------------------------------|---------------|-----------------|
| Einschaltzeit Turn-on time | t_{ein} t_{on} | 65 | μs |
| Anstiegszeit Rise time | t_r | 50 | μs |
| Ausschaltzeit Turn-off time | t_{aus} t_{off} | 55 | μs |
| Abfallzeit Fall time | t_f | 50 | μs |

- ¹⁾ I_C eingestellt über den Durchlaßstrom der Sendediode, den Reflexionsgrad und den Abstand des Reflektors vom Bauteil (d)
- ¹⁾ I_C as a function of the forward current of the emitting diode, the degree of reflection and the distance between reflector and component (d)

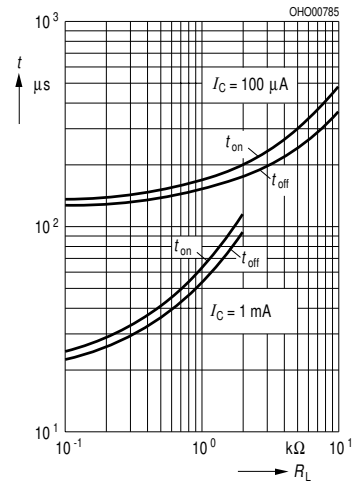
Collector Current $\frac{I_C}{I_{Cmax}} = f(d)$



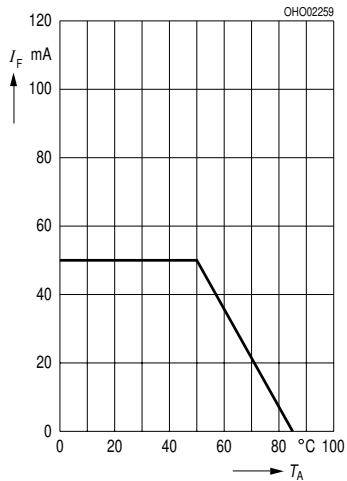
Permissible Power Dissipation for Diode and Transistor $P_{tot} = f(T_A)$



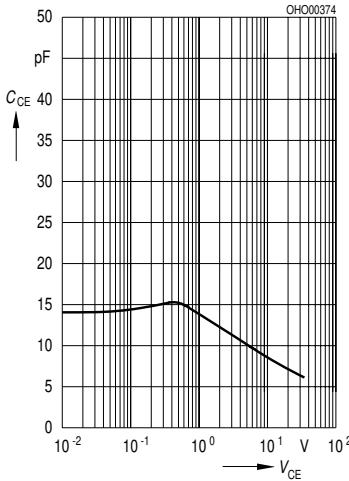
Switching Characteristics $t = f(R_L)$
 $T_A = 25^\circ\text{C}, I_F = 10\text{ mA}$



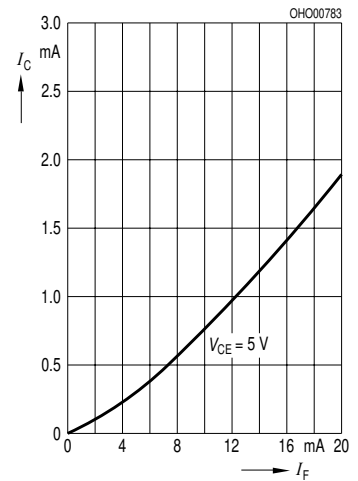
Max. Permissible Forward Current
 $I_F = f(T_A)$



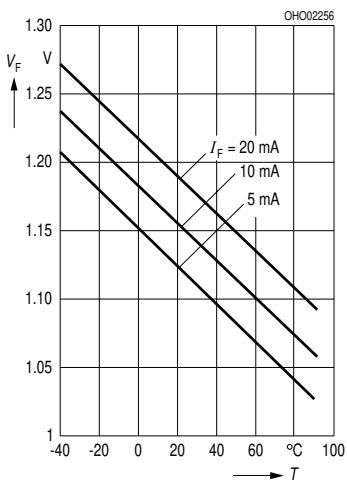
Transistor Capacitance (typ.)
 $C_{CE} = f(V_{CE}), T_A = 25^\circ\text{C}, f = 1\text{ MHz}$



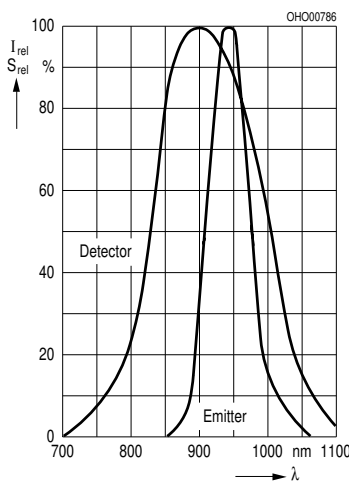
Collector Current $I_C = f(I_F)$, spacing d to reflector = 1 mm, 90% reflection



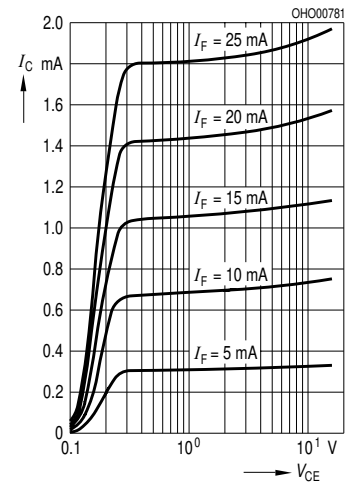
Forward Voltage (typ.) of the Diode $V_F = f(T)$



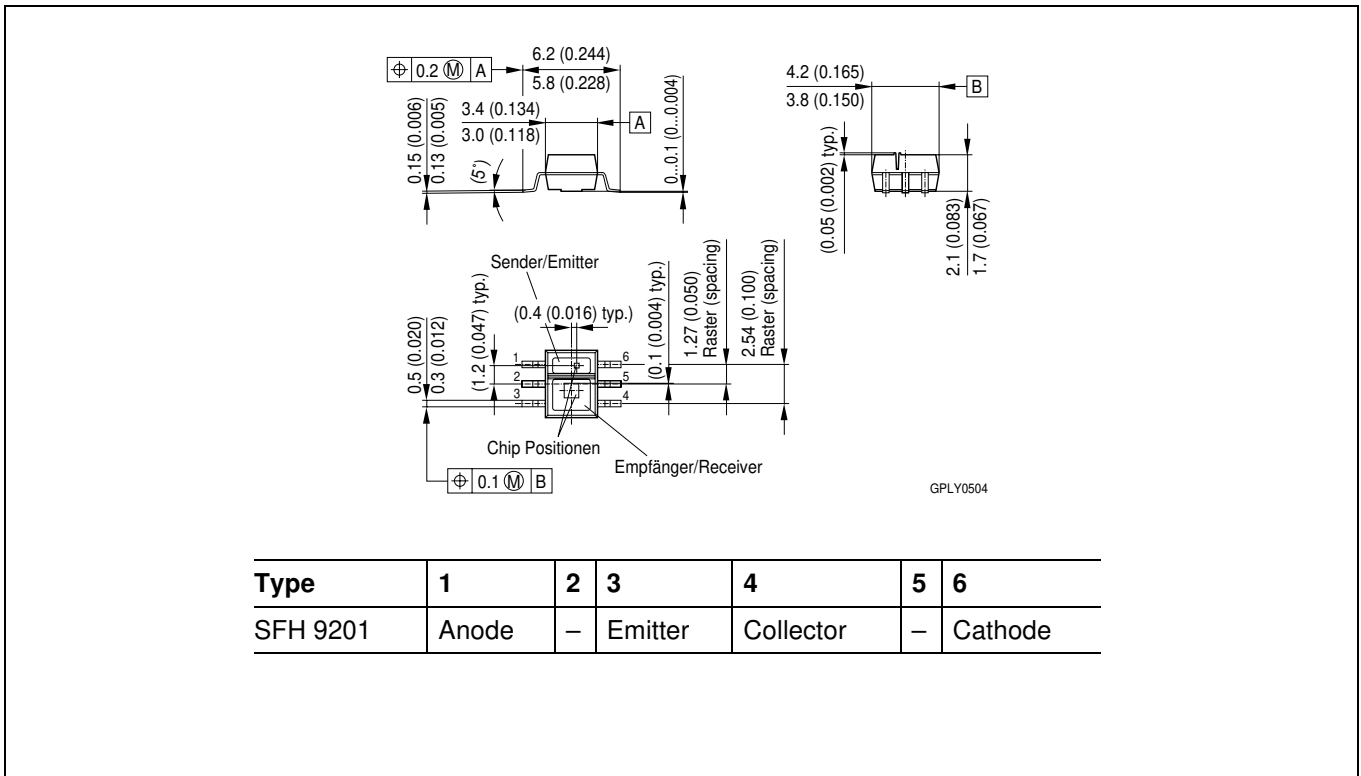
Relative Spectral Emission of Emitter (GaAs) $I_{rel} = f(\lambda)$ and Detector (Si) $S_{rel} = f(\lambda)$



Output Characteristics (typ.)
 $I_C = f(V_{CE})$, spacing to reflector: $d = 1\text{ mm}, 90\%$ reflection, $T_A = 25^\circ\text{C}$



Maßzeichnung
Package Outlines



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

Löthinweise Soldering Conditions

| Bauform Type | Drypack Level acc. to IPS-stand. 020 | Tauch-, Schwallötung Dip, Wave Soldering | | Reflowlötung Reflow Soldering | | Kolbenlötung Iron Soldering (Iron temp.) |
|-----------------|--|---|---------------------------|----------------------------------|------------------------------|--|
| | | Peak Temp. (solderbath) | Max. Time in Peak Zone | Peak Temp. (package temp.) | Max. Time in Peak Zone | |
| SFH 9201 | 4 | n. a. | – | 245 °C | 10 sec. | n.a. |

Bitte Verarbeitungshinweise für SMT-Bauelemente beachten!

Please observe the handling guidelines for SMT devices!

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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 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.

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