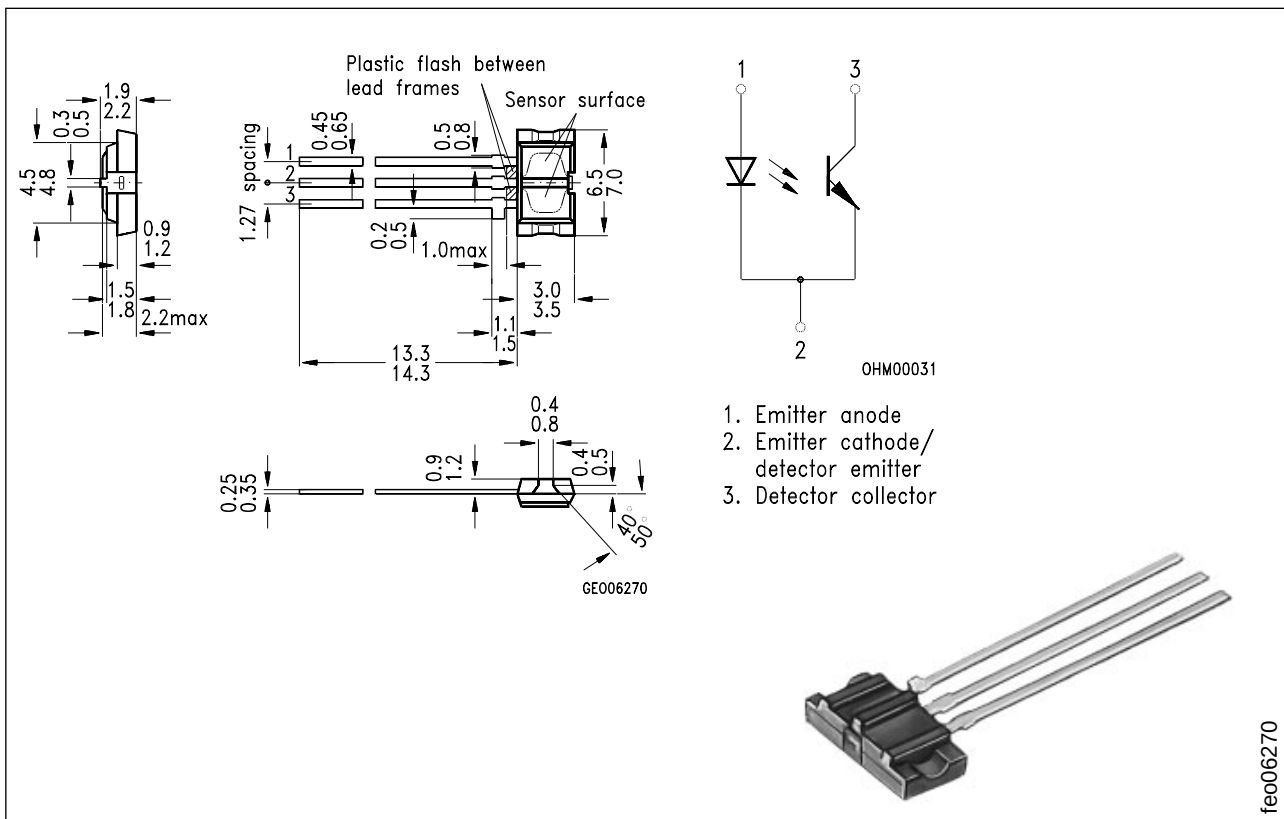


Miniatur-Reflexlichtschranken Miniature Light Reflection Switches

SFH 900



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

Wesentliche Merkmale

- Reflexlichtschranken für den Nahbereich (bis 5 mm Abstand)
- IR-GaAs-Lumineszenzdiode
- Si-NPN-Fototransistor
- Flaches Kunststoffgehäuse
- Tageslichtsperrfilter
- Hoher Kollektor-Emitter-Strom
0.25 ... ≥ 1.0 mA
- Geringe Sättigungsspannung
- Kein Übersprechen

Anwendungen

- Positionsmelder
- Endabschalter
- Drehzahlüberwachung
- Bewegungssensor

Features

- Designed for short distances up to 5 mm
- GaAs infrared emitter
- Silicon NPN phototransistor detector
- Flat plastic package
- Daylight filter against undesired light effects
- High collector-emitter current
0.25 ... ≥ 1.0 mA
- Low saturation voltage
- No cross talk

Applications

- Position reporting
- Devices and end position switches
- Speed monitoring
- Various types of motion transmitters

Typ Type	Bestellnummer Ordering Code
SFH 900-1	Q62702-P1187
SFH 900-2	Q62702-P935
SFH 900-1/2 ¹⁾	Q62703-P1783
SFH 900-3	Q62703-P1088
SFH 900-4	Q62703-P1087
SFH 900-3/4 ²⁾	Q62703-P1784

1) Geliefert werden die einzelnen Gruppen 1 bzw. 2.

1) We supply the bins 1 and/or 2.

2) Geliefert werden die einzelnen Gruppen 3 bzw. 4.

2) We supply the bins 3 and/or 4.

Grenzwerte ($T_A = 40\text{ °C}$)

Maximum Ratings

Bezeichnung Description	Symbol Symbol	Wert Value	Einheit Unit
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Sender (IR-GaAs-Lumineszenzdiode)

Emitter (GaAs infrared diode)

Sperrspannung Reverse voltage	V_R	6	V
Vorwärtsgleichstrom Forward current	I_F	50	mA
Vorwärtsstoßstrom, $t_p \leq 10\text{ }\mu\text{s}$ Surge current	I_{FSM}	1.5	A
Verlustleistung Power dissipation	P_{tot}	80	mW

Empfänger (Si-Fototransistor)

Detector (silicon phototransistor)

Kollektor-Emitter-Sperrspannung Collector-emitter voltage	V_{CEO}	30	V
Emitter-Kollektor-Sperrspannung Emitter-collector voltage	V_{ECO}	7	V
Kollektorstrom Collector current	I_C	10	mA

Bezeichnung Description	Symbol Symbol	Wert Value	Einheit Unit
Verlustleistung Total power dissipation	P_{tot}	100	mW

Reflexlichtschranke Light reflection switch

Lagertemperatur Storage temperature range	T_{stg}	– 40 ... + 85	°C
Umgebungstemperatur Ambient temperature range	T_{A}	– 40 ... + 85	°C
Sperrschichttemperatur Junction temperature range	T_{j}	100	°C
Löttemperatur (Lötstelle ≥ 3 mm vom Gehäuse entfernt bei Lötzeit $t \leq 3$ s) Soldering temperature (Dip soldering time $t \leq 3$ s at ≥ 3 mm from package) mit Wärmeabführung vom Gehäuse with heat sink between case and soldering	T_{S} T_{S}	235 260	°C °C
Verlustleistung Total power dissipation	P_{tot}	150	mW

Kennwerte ($T_{\text{A}} = 25$ °C) Characteristics

Bezeichnung Description	Symbol Symbol	Wert Value	Einheit Unit
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Sender (IR-GaAs-Lumineszenzdiode) Emitter (GaAs infrared diode)

Durchlaßspannung Forward voltage $I_{\text{F}} = 50$ mA	V_{F}	1.25 (≤ 1.65)	V
Durchbruchspannung Breakdown voltage $I_{\text{R}} = 10$ μ A	V_{BR}	≥ 6	V
Sperrstrom Reverse current $V_{\text{R}} = 6$ V	I_{R}	0.01 (≤ 10)	μ A
Kapazität Capacitance $V_{\text{R}} = 0$ V, $f = 1$ MHz	C_{O}	40	pF

Kennwerte ($T_A = 25\text{ °C}$)

Characteristics

Bezeichnung Description	Symbol Symbol	Wert Value	Einheit Unit
Wärmewiderstand Thermal resistance	R_{thJA}	750	K/W

Empfänger (Si-Fototransistor)

Detector (silicon phototransistor)

Kapazität Capacitance $V_{CE} = 5\text{ V}$, $f = 1\text{ MHz}$	C_{CE}	11	pF
Kollektor-Emitter-Reststrom Collector-emitter leakage current $V_{CE} = 10\text{ V}$	I_{CEO}	20 (≤ 200)	nA
Fotostrom (Fremdlichtempfindlichkeit) Photocurrent (outside light density) $V_{CE} = 5\text{ V}$, $E_V = 1000\text{ Lx}$	I_P	3.5	mA
Wärmewiderstand Thermal resistance	R_{thJA}	600	mW

Reflexlichtschranke

Light Reflection Switch

Kollektor-Emitterstrom Collector-emitter current Kodak neutral white test card, 90% reflexion $I_F = 10\text{ mA}$; $V_{CE} = 5\text{ V}$; $d = 1\text{ mm}$ SFH 900 SFH 900-1 ¹⁾ SFH 900-2 SFH 900-3 SFH 900-4 ¹⁾	I_{CE} I_{CE} I_{CE} I_{CE} I_{CE}	> 0.25 0.25 ... 0.50 0.40 ... 0.80 0.63 ... 1.25 ≥ 1.0	mA mA mA mA mA
Kollektor-Emitter-Sättigungsspannung Collector-emitter saturation voltage Kodak neutral white test card, 90% reflexion $I_F = 10\text{ mA}$; $d = 1\text{ mm}$; SFH 900, $I_C = 85\text{ }\mu\text{A}$ SFH 900-1 ¹⁾ , $I_C = 85\text{ }\mu\text{A}$ SFH 900-2, $I_C = 135\text{ }\mu\text{A}$ SFH 900-3, $I_C = 215\text{ }\mu\text{A}$ SFH 900-4 ¹⁾ , $I_C = 335\text{ }\mu\text{A}$	$V_{CE\text{ sat}}$ $V_{CE\text{ sat}}$ $V_{CE\text{ sat}}$ $V_{CE\text{ sat}}$ $V_{CE\text{ sat}}$	0.2 (≤ 0.6) 0.2 (≤ 0.6) 0.2 (≤ 0.6) 0.2 (≤ 0.6) 0.2 (≤ 0.6)	V V V V V

¹⁾ Nur auf Anfrage lieferbar.

¹⁾ Available only on request.

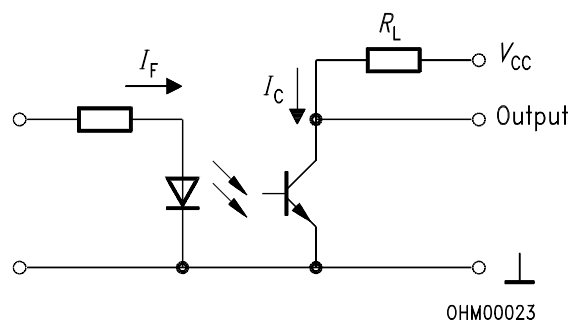
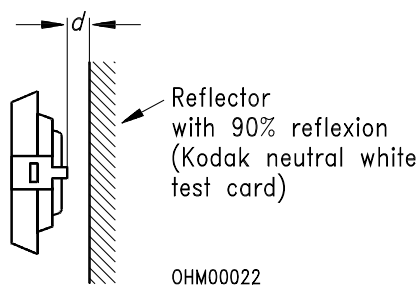
Schaltzeiten ($T_A = 25^\circ\text{C}$, $V_{CC} = 5\text{ V}$, $I_C = 1\text{ mA}^{1)}$, $R_L = 1\text{ k}\Omega$)

Switching Times

Bezeichnung Description	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

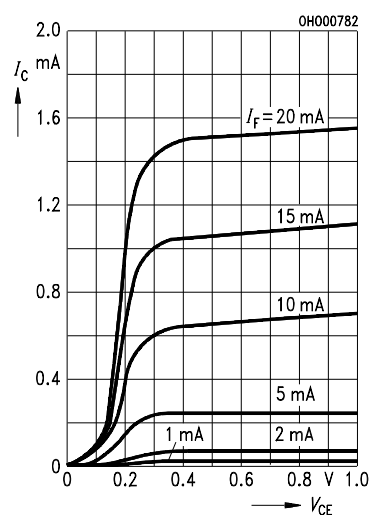
1) I_C eingestellt über den Durchlaßstrom der Sendediode, den Reflexionsgrad und den Abstand des Reflektors vom Bauteil (d)

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)



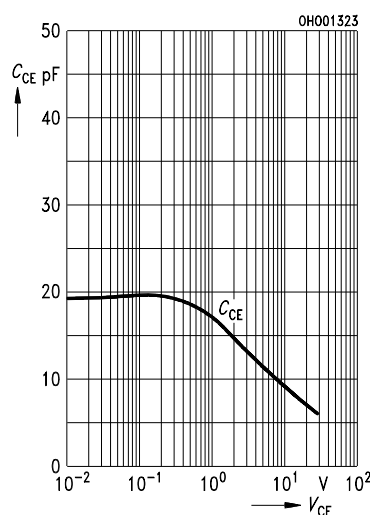
Output characteristics (typ.) $I_C = f(V_{CE})$

spacing to reflector: $d = 1\text{ mm}$,
90% reflection, $T_A = 25^\circ\text{C}$

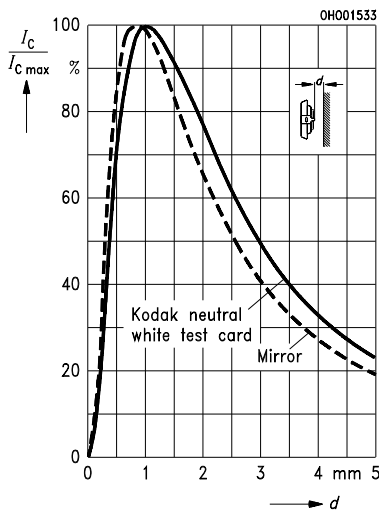


Transistor capacitance (typ.)

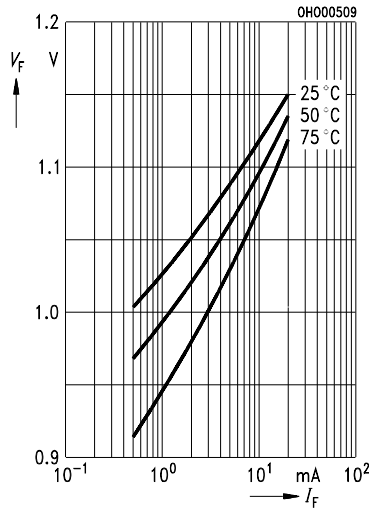
$C_{CE} = f(V_{CE})$, $T_A = 25^\circ\text{C}$, $f = 1\text{ MHz}$



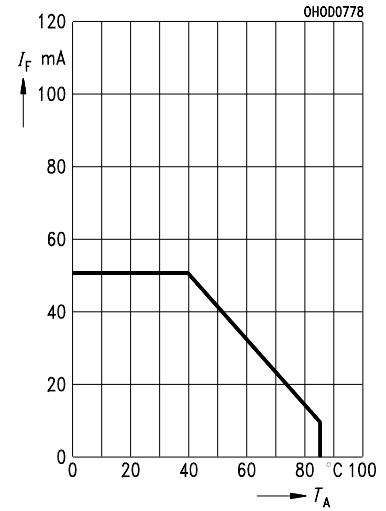
Collector current $\frac{I_C}{I_{Cmax}} = f(d)$



Forward voltage (typ.) of the diode $V_F = f(I_F)$

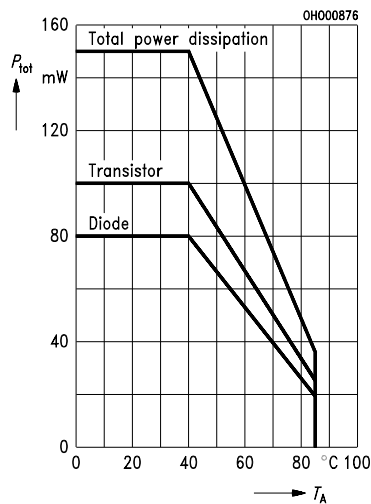


Max. permissible forward current $I_F = f(T_A)$



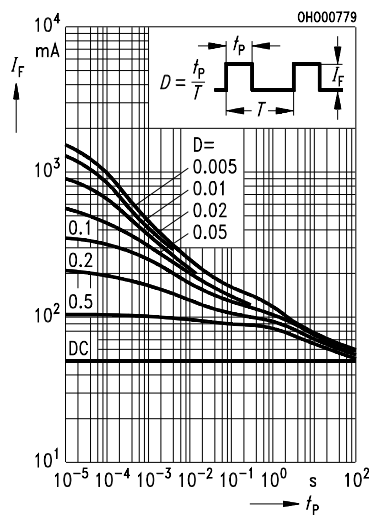
Permissible power dissipation for diode and transistor

$P_{tot} = f(T_A)$



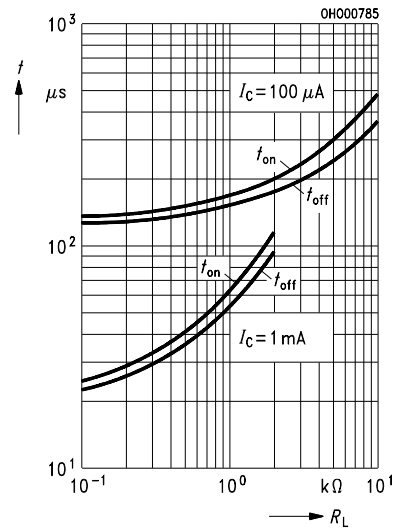
Permissible pulse handling capability

$I_F = f(t_p)$, $D = \text{parameter}$, $T_A = 25\text{ °C}$



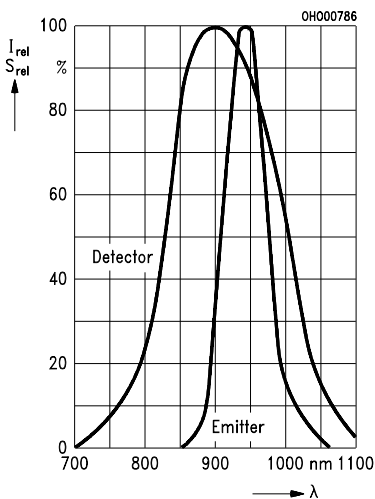
Switching characteristics

$t = f(R_L)$, $T_A = 25\text{ °C}$, $I_F = 10\text{ mA}$

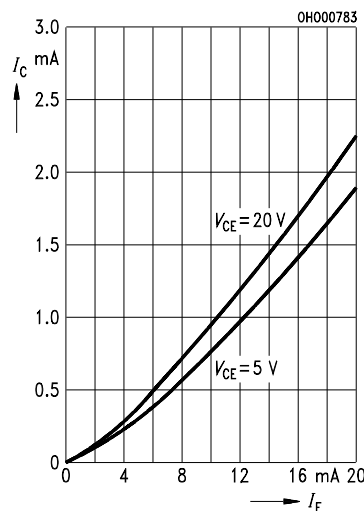


Relative spectral emission of emitter (GaAs) and detector (Si)

Emitter: $I_{rel} = f(\lambda)$, Detector: $S_{rel} = f(\lambda)$



Collector current, spacing d to reflector = 1 mm, 90% reflection



Output characteristics, $I_C = f(V_{CE})$

spacing to reflector: $d = 1\text{ mm}$, 90% reflection, $T_A = 25\text{ °C}$

