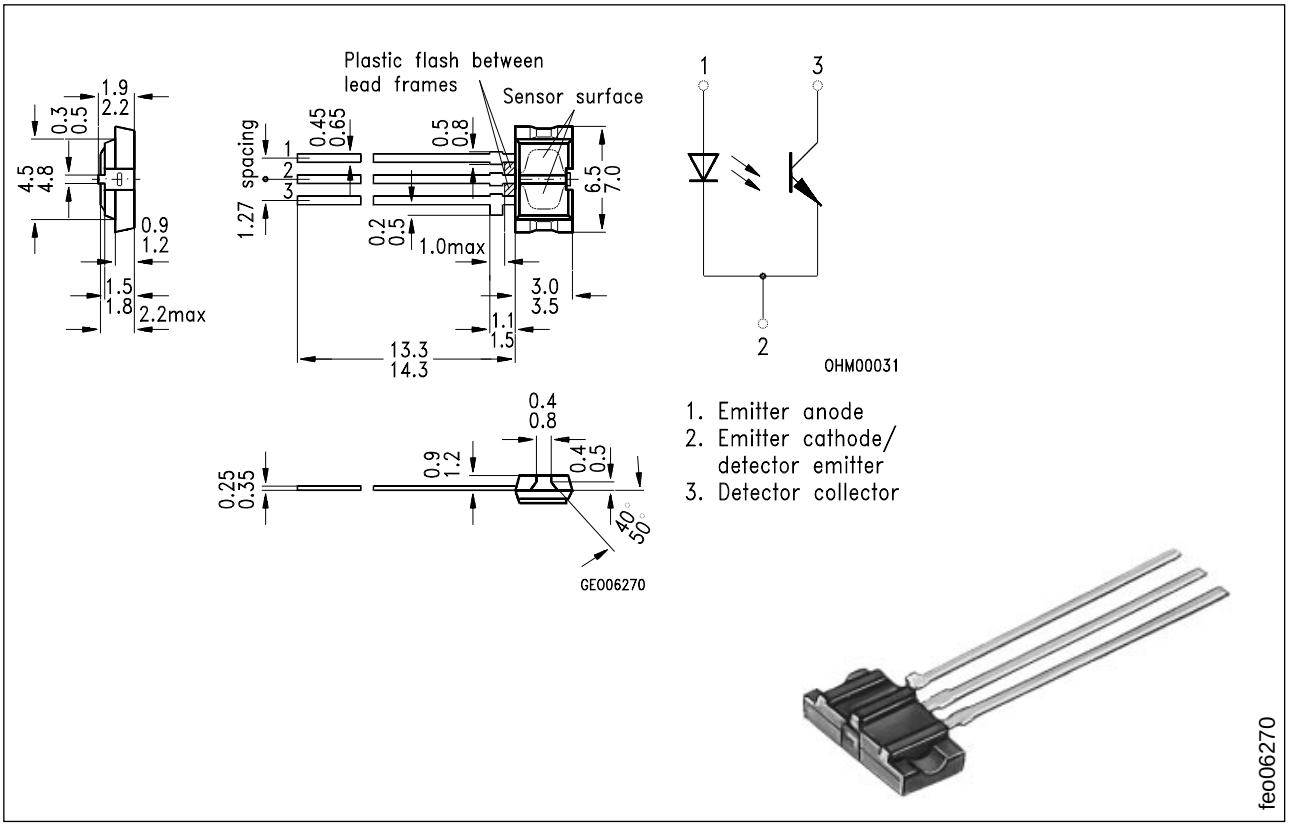
SIEMENS

Miniatur-Reflexlichtschranken
Miniature Light Reflection Switches

SFH 900



Maβe 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 o.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	Q62702-P1187
SFH 900-1[1)]	Q62702-P935
SFH 900-2	Q62703-P141
SFH 900-3	Q62703-P1088
SFH 900-4[1)]	Q62703-P1087

1) Nur auf Anfrage lieferbar.
1) Available only on request.

Grenzwerte (T_A = 40 °C)
Maximum Ratings

Bezeichnung Description	Symbol Symbol	Wert Value	Einheit Unit
Sender (IR-GaAs-Lumineszenzdiode) **Emitter** (GaAs infrared diode)			
Sperrspannung Reverse voltage	V_R	6	V
Vorwärtsgleichstrom Forward current	I_F	50	mA
Vorwärtsstoβstrom, $t_p \leq 10$ µs 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
Verlustleistung Total power dissipation	P_{tot}	100	mW

Bezeichnung Description	Symbol Symbol	Wert Value	Einheit Unit
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_A = 25 °C)
Characteristics

Bezeichnung Description	Symbol Symbol	Wert Value	Einheit Unit
Sender (IR-GaAs-Lumineszenzdiode) **Emitter** (GaAs infrared diode)			
Durchlaβspannung Forward voltage I_F = 50 mA	V_F	1.25 (≤1.65)	V
Durchbruchspannung Breakdown voltage I_R = 10 µA	V_{BR}	≥6	V
Sperrstrom Reverse current V_R = 6 V	I_R	0.01 (≤10)	µA
Kapazität Capacitance V_R = 0 V, f = 1 MHz	C_O	40	pF
Wärmewiderstand Thermal resistance	R_{thJA}	750	K/W

Kennwerte (T_A = 25 °C)
Characteristics

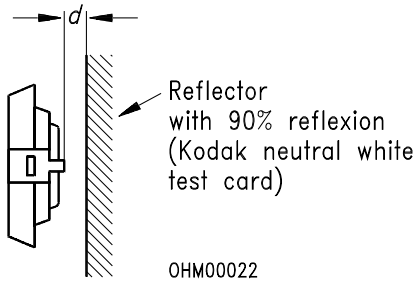
Bezeichnung **Description**	**Symbol** **Symbol**	**Wert** **Value**	**Einheit** **Unit**
Empfänger (Si-Fototransistor) **Detector** (silicon phototransistor)			
Kapazität Capacitance V_{CE} = 5 V, f = 1 MHz	C_{CE}	11	pF
Kollektor-Emitter-Reststrom Collector-emitter leakage current V_{CE} = 10 V	I_{CEO}	20 (≤ 200)	nA
Fotostrom (Fremdlichtempfindlichkeit) Photocurrent (outside light density) V_{CE} = 5 V, E_V = 1000 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 mA; V_{CE} = 5 V; d = 1 mm			
SFH 900	I_{CE}	> 0.25	mA
SFH 900-1[1)]	I_{CE}	0.25 ... 0.50	mA
SFH 900-2	I_{CE}	0.40 ... 0.80	mA
SFH 900-3	I_{CE}	0.63 ... 1.25	mA
SFH 900-4[1)]	I_{CE}	≥ 1.0	mA
Kollektor-Emitter-Sättigungsspannung Collector-emitter saturation voltage Kodak neutral white test card, 90% reflexion I_F = 10 mA; d = 1 mm;			
SFH 900, I_C = 85 µA	$V_{CE\,sat}$	0.2 (≤ 0.6)	V
SFH 900-1[1)], I_C = 85 µA	$V_{CE\,sat}$	0.2 (≤ 0.6)	V
SFH 900-2, I_C = 135 µA	$V_{CE\,sat}$	0.2 (≤ 0.6)	V
SFH 900-3, I_C = 215 µA	$V_{CE\,sat}$	0.2 (≤ 0.6)	V
SFH 900-4[1)], I_C = 335 µA	$V_{CE\,sat}$	0.2 (≤ 0.6)	V

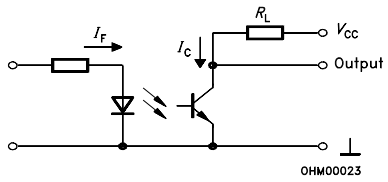
[1)] Nur auf Anfrage lieferbar.
[1)] Available only on request.

Schaltzeiten (T_A = 25 °C, V_{CC} = 5 V, I_C = 1 mA[1)], R_L = 1 kΩ)
Switching Times

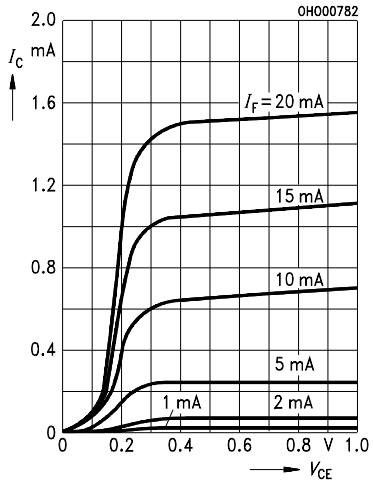
Bezeichnung Description	Symbol Symbol	Wert Value	Einheit Unit
Einschaltzeit Turn-on time	t_{ein} t_{on}	65	µs
Anstiegzeit Rise time	t_r	50	µs
Ausschaltzeit Turn-off time	t_{aus} t_{off}	55	µs
Abfallzeit Fall time	t_f	50	µs

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)

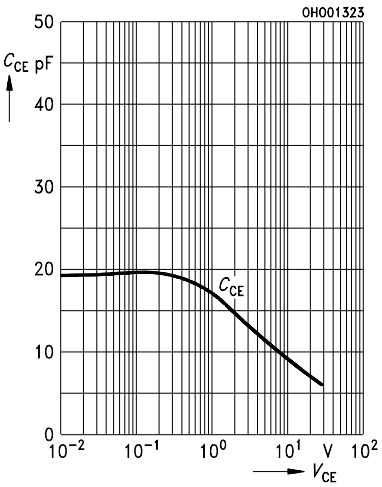




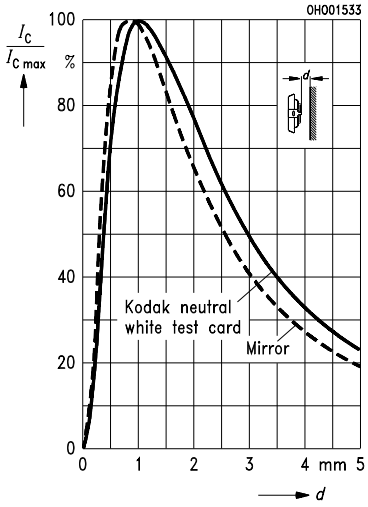
Output characteristics (typ.) $I_C = f\ (V_{CE})$
spacing to reflector: d = 1 mm,
90% reflection, T_A = 25 °C



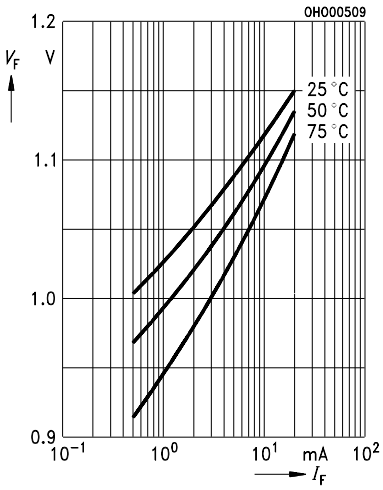
Transistor capacitance (typ.)
$C_{CE} = f\ (V_{CE})$, T_A = 25 °C, f = 1 MHz



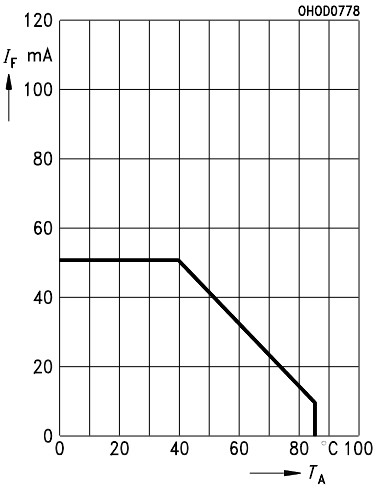
Collector current $\frac{I_C}{I_{Cmax}} = f(d)$



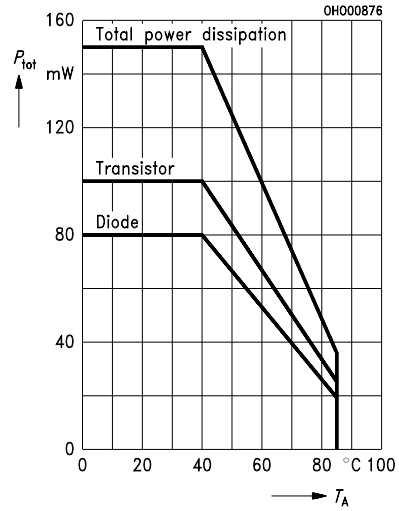
Forward voltage (typ.) of the diode
$V_F = f(I_F)$



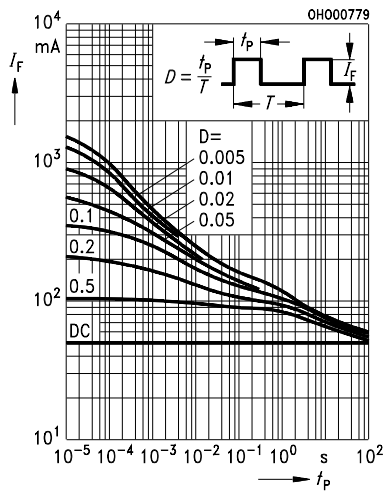
Max. permissible forward current
$I_F = f(T_A)$



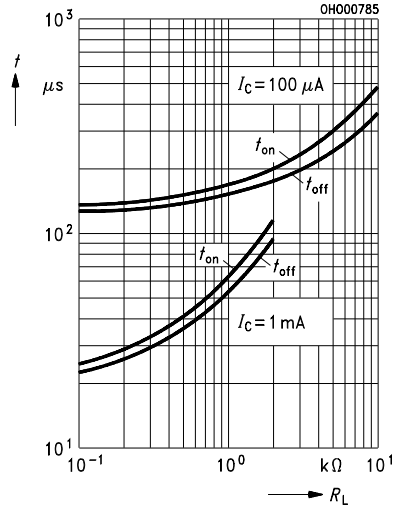
Permissible power dissipation for diode and transistor
$P_{tot} = f(T_A)$



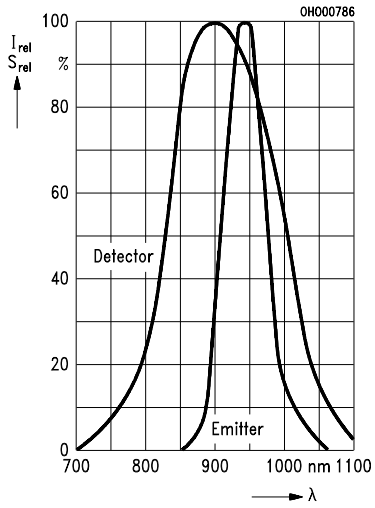
Permissible pulse handling capability
$I_F = f(t_p)$, D = parameter, T_A = 25 °C



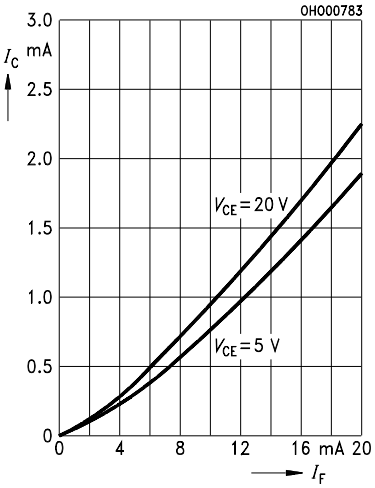
Switching characteristics
$t = f(R_L)$, T_A = 25 °C, I_F = 10 mA



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 mm,
90% reflection, T_A = 25 °C