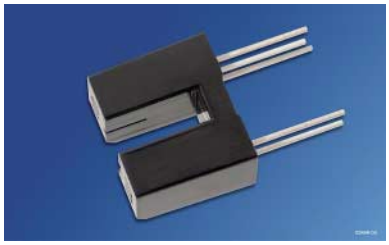
Gabellichtschranke mit Schmitt-Trigger IC
Slotted Interrupter with Schmitt-Trigger-IC
Lead (Pb) Free Product - RoHS Compliant

SFH 9340
SFH 9341



Wesentliche Merkmale

- IR-Sender: GaAs (950 nm)
- Empfänger: Schmitt-Trigger IC
- Empfänger: Tageslichtsperrfilter
- SFH 9340: Ausgang active low
- SFH 9341: Ausgang active high
- Einschaltstrom: typ. 0.6 mA

Features

- IR-emitter: GaAs (950 nm)
- Detector: Schmitt-Trigger IC
- Detector: Daylight-Cutoff Filter
- SFH 9340: Output active low
- SFH 9341: Output active high
- Threshold current: typ. 0.6 mA

Anwendungen

- Optischer Schalter
- Pulsformer
- Zähler

Applications

- Optical threshold switch
- Pulseformer
- Counter

Typ Type	Bestellnummer Ordering Code	$I_{F,ON}$ [mA] (V_{CC} = 5 V, d = 1 mm Kodak neutral white test card with 90% reflection)
SFH 9340	Q62702P5120	0.6 (< 2)
SFH 9341	Q62702P5121	0.6 (< 2)

Grenzwerte (T_A = 25 °C)
Maximum Ratings

Bezeichnung **Parameter**	**Symbol** **Symbol**	**Wert** **Value**	**Einheit** **Unit**
Sender (GaAs-Diode) **Emitter** (GaAs diode)			
Sperrspannung Reverse voltage	V_R	5	V
Durchlassstrom Forward current	I_F (DC)	60	mA
Stoßstrom ($t_P \leq 10$ µs, D = 0) Surge current	I_{FSM}	1	A
Verlustleistung Power dissipation	P_{tot}	100	mW
Wärmewiderstand Thermal resistance	R_{thJA}	280	K/W
Empfänger (Schmitt-Trigger IC) **Detector** (Schmitt-Trigger IC)			
Versorgungsspannung Supply voltage	V_{CC}	– 0.5 … + 20	V
Ausgangsspannung Output voltage	V_{OUT}	– 0.5 … + 20	V
Ausgangsstrom (T_A = 25 °C) Output current	I_O	50	mA
Verlustleistung Power dissipation	P_{tot}	175	mW
Gabellichtschranke **Slotted Interrupter**			
Lagertemperatur Storage temperature range	T_{stg}	– 40 … + 85	°C
Betriebstemperatur Operating temperature range	T_{op}	– 40 … + 85	°C
Elektrostatische Entladung Electrostatic discharge	ESD	2	kV

Kennwerte (T_A = 25 °C)
Characteristics

Bezeichnung **Parameter**	**Symbol** **Symbol**	**Wert** **Value**	**Einheit** **Unit**
Sender (GaAs-Diode) **Emitter** (GaAs diode)			
Wellenlänge der Strahlung Wavelength of peak emission	λ_{peak}	950	nm
Durchlassspannung (I_F = 20 mA, t_p = 20 ms) Forward voltage	V_F	1.2 (< 1.4)	V
Sperrstrom (V_R = 3 V) Reverse current	I_R	0.01 (< 1)	µA
Kapazität (V_R = 0 V, f = 1 MHz) Capacitance	C_0	16	pF
Empfänger (Schmitt-Trigger IC) (wenn nicht anders angegeben, V_{CC} = 5 V) **Detector** (Schmitt-Trigger IC) (unless otherwise specified, V_{CC} = 5 V)			
Ausgangsspannung „High“ Output voltage “High” I_O = 0, V_{CC} = 4.5 - 18 V	V_{OH}	V_{CC} (> 4.0)	V
Ausgangsspannung „Low“ Output voltage “Low” I_O = 16 mA	V_{OL}	0.15 (< 0.4)	V
Stromaufnahme Supply current V_{CC} = 5 V V_{CC} = 18 V	I_{CC}	 3.5 (< 5) 5.0	mA
Anstiegszeit 10% bis 90% Rise time 10% to 90% R_L = 280 Ω, I_F = 4 mA, λ = 950 nm	t_r	**SFH 9340**: 20 **SFH 9341**: 30	ns
Abfallzeit 90% bis 10% Fall time 90% to 10% R_L = 280 Ω, I_F = 4 mA, λ = 950 nm	t_f	**SFH 9340**: 10 **SFH 9341**: 20	ns
Ausgangsverzögerungszeit Propagation delay time “ON” R_L = 280 Ω, I_F = 4 mA, λ = 950 nm	t_{ON}	1	µs
Ausgangsverzögerungszeit Propagation delay time “OFF” R_L = 280 Ω, I_F = 4 mA, λ = 950 nm	t_{OFF}	2	µs

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

Bezeichnung **Parameter**	**Symbol** **Symbol**	**Wert** **Value**	**Einheit** **Unit**

Gabellichtschranke (wenn nicht anders angegeben, V_{CC} = 5 V)
Slotted Interrupter (unless otherwise specified: V_{CC} = 5 V)

Schaltschwelle Threshold current "ON"	$I_{F, ON}$	typ. 0.6 (< 2.0)	mA
Schaltschwelle Threshold current "OFF"	$I_{F, OFF}$	0.36 (> 0.05)	mA
Hysterese Hysteresis	$I_{F, OFF}$ / $I_{F, ON}$	0.6 (0.5 … 0.9)	–

Zulässiger Arbeitsbereich Detektor (Schmitt-Trigger IC)
Operating Conditions Detector (Schmitt-Trigger IC)

Bezeichnung **Parameter**	**Symbol** **Symbol**	**Wert** **Value**	**Einheit** **Unit**
Versorgungsspannung Supply voltage	V_{CC}	4 … 18	V
Ausgangsstrom Output current	I_O	< 16	mA

Zur Stabilisierung der Versorgung wird ein Stützkondensator (angeschlossen zwischen V_{CC} und GND) von typ. 0,1 µF empfohlen.
A bypass capacitor, 0.1 µF typical, connected between V_{CC} and GND is recommended in order to stabilize power supply line.

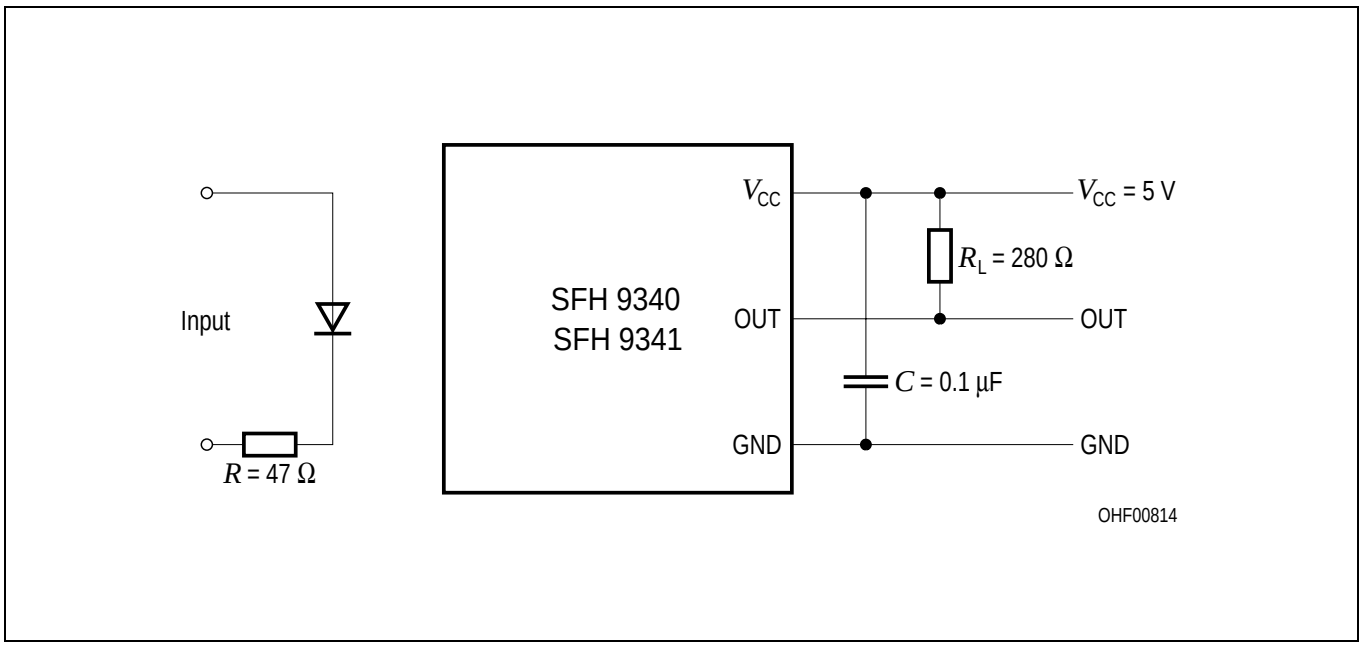


Figure 1 Test Circuit for Switching and Response Time

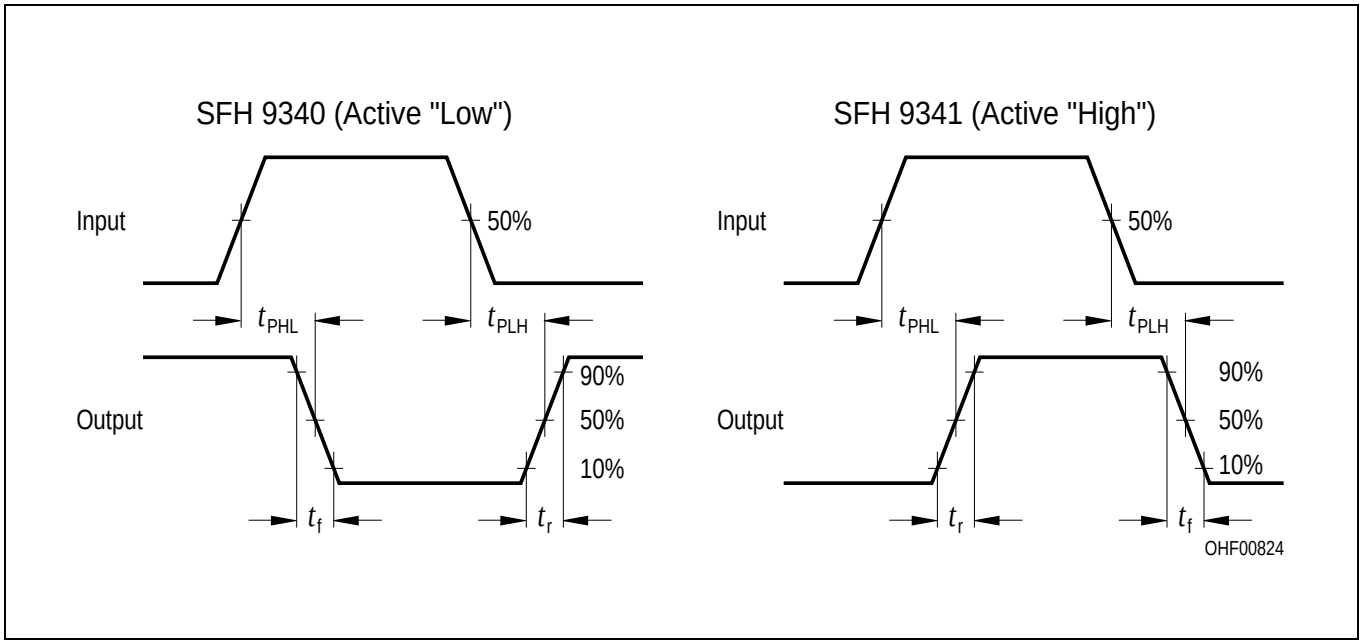
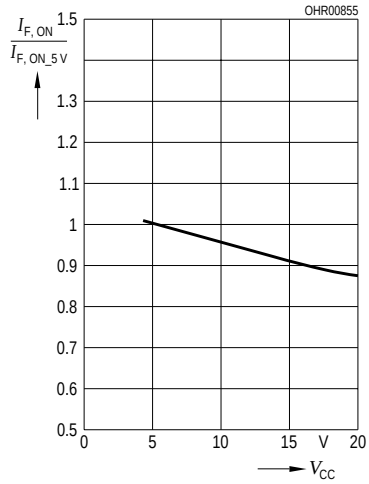
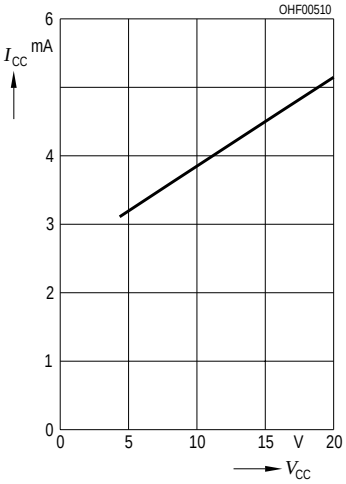


Figure 2 Switching Time Definitions

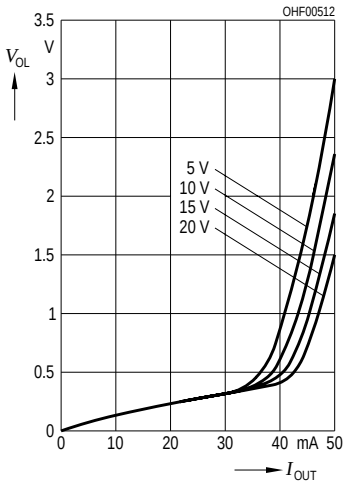
Relative Threshold
$I_{F,\,ON}/I_{F,\,ON\,(Vcc\,=\,5\,V)} = f\,(V_{CC})$



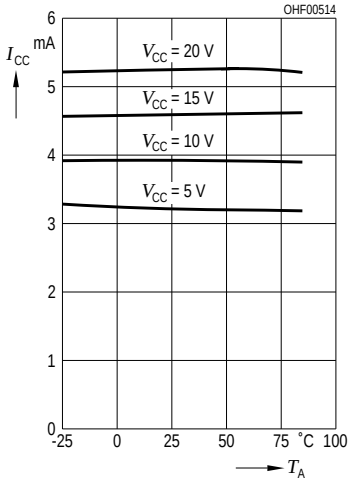
Supply Current
$I_{CC} = f\,(V_{CC})$



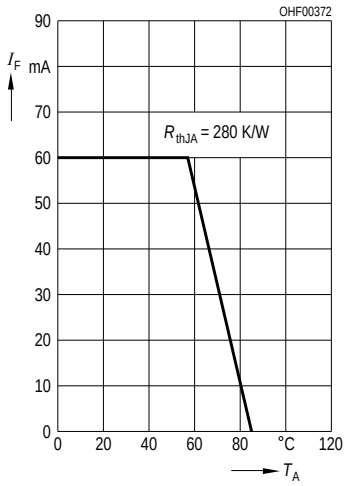
Output Voltage
$V_{OL} = f(I_{OUT},\, V_{CC})$



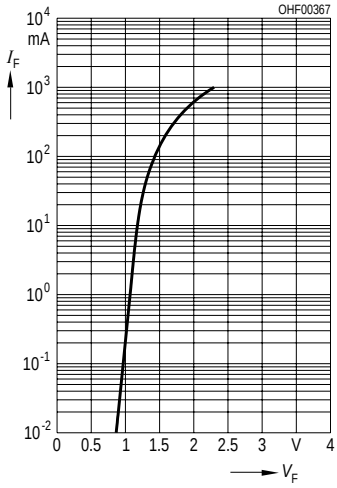
Supply Current vs. Ambient Temperature $I_{CC} = f\,(T_A,\, V_{CC})$



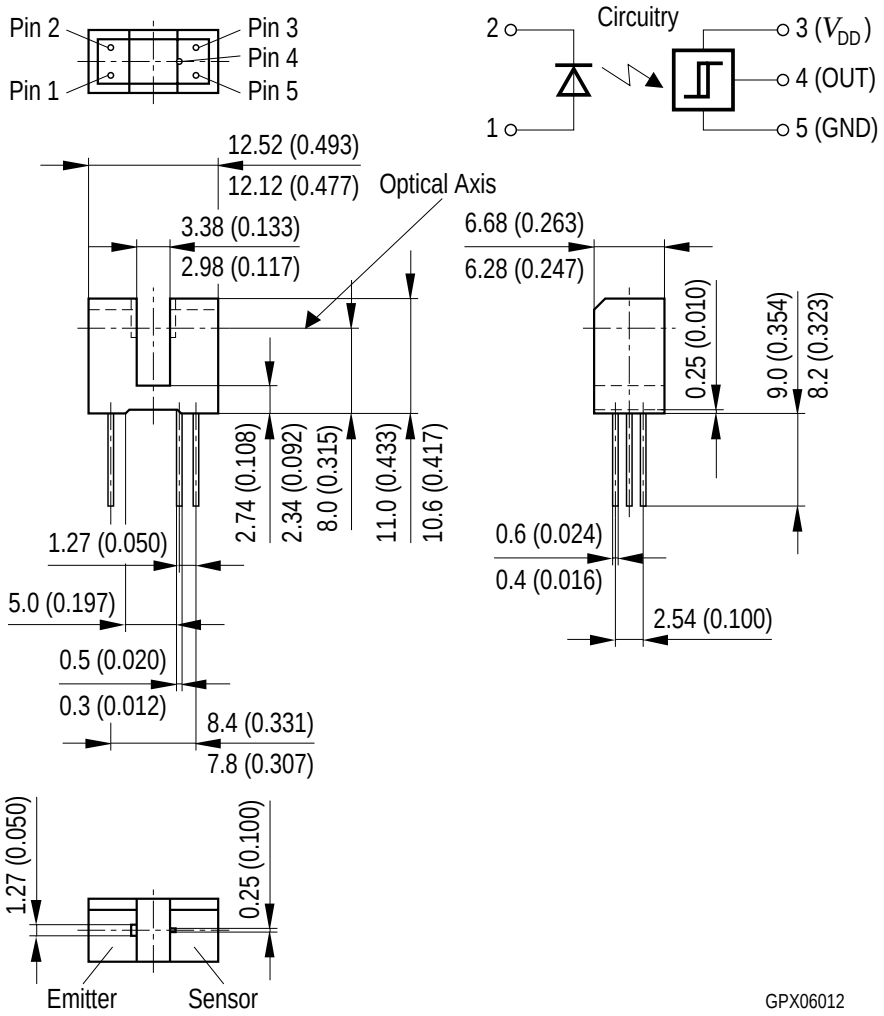
Max. Permissible Forward Current
$I_F = f\,(T_A)$



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



Maßzeichnung
Package Outlines

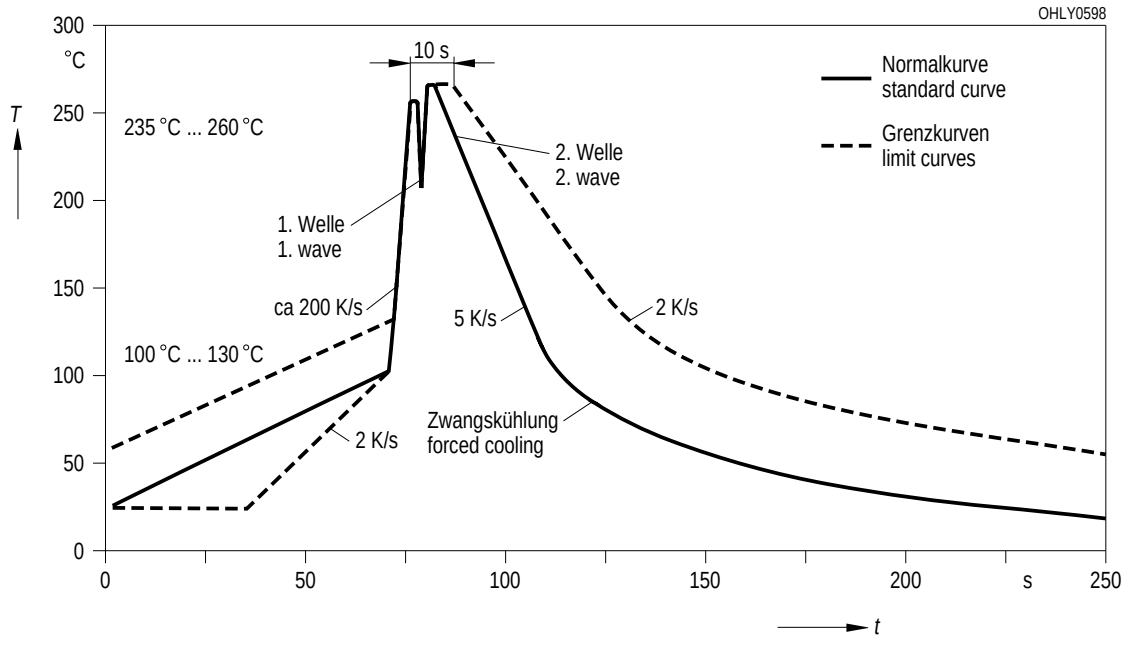


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

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.)	Max. Time
SFH 9340 SFH 9341	260 °C	10 s	n.a.	–	300 °C	5 s

Lötbedingungen
Soldering Conditions
Wellenlöten (TTW) (nach CECC 00802)
TTW Soldering (acc. to CECC 00802)



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