

Schmitt-Trigger IC im Mini-Sidelooker Gehäuse mit Linse Schmitt-Trigger IC in Miniature Sidelooker Package with Lens Lead (Pb) Free Product - RoHS Compliant

SFH 5140 F
SFH 5141 F



Wesentliche Merkmale

- Integrierter Schmitt-Trigger
- SFH 5140 F: Output active low
- SFH 5141 F: Output active high
- Miniatur-Gehäuse

Anwendungen

- Optischer Schalter
- Pulsformer
- Zähler
- Empfänger in Lichtschranken

Features

- Built-in Schmitt Trigger circuit
- SFH 5140 F: Output active low
- SFH 5141 F: Output active high
- Compact package

Applications

- Optical threshold switch
- Pulseformer
- Counter
- Receiver in interrupters

Typ Type	Bestellnummer Ordering Code
SFH 5140 F	Q62702P5112
SFH 5141 F	Q62702P5113

Grenzwerte ($T_A = 25\text{ °C}$)
Maximum Ratings

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Betriebs- und Lagertemperatur Operating and storage temperature range	$T_{op}; T_{stg}$	- 40 ... + 85	°C
Versorgungsspannung Supply voltage	V_{CC}	- 0.5 ... + 20	V
Ausgangsspannung Output voltage	V_O	- 0.5 ... + 20	V
Ausgangsstrom Output current	I_O	50	mA
Verlustleistung Power dissipation	P_{tot}	175	mW

Empfohlener Arbeitsbereich
Recommended Operating Conditions

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 μ F empfohlen.

A bypass capacitor, 0.1 μ F typical, connected between V_{CC} and GND is recommended in order to stabilize power supply line.

Kennwerte ($T_A = 25\text{ °C}$, $V_{CC} = 5\text{ V}$)
Characteristics

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Ausgangsspannung „high“ Output voltage “high” $I_O = 0$	V_{OH}	$V_{CC} (> 4.0)$	V
Ausgangsspannung „low“ Output voltage “low” $I_O = 16\text{ mA}$	V_{OL}	0.15 (< 0.4)	V

Kennwerte ($T_A = 25\text{ °C}$, $V_{CC} = 5\text{ V}$)
Characteristics (cont'd)

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Stromaufnahme Supply current $V_{CC} = 5\text{ V}$ $V_{CC} = 18\text{ V}$	I_{CC}	3.3 (< 5) 5.0	mA
Hysteresis Hysteresis	$E_{e, OFF}/E_{e, ON}$	0.6 (0.5 ... 0.9)	–
Halbwinkel Half angle	φ	± 12	Grad degr.
Anstiegszeit 10% bis 90% Rise time 10% to 90% $R_L = 280\ \Omega$, $E_e = 90\ \mu\text{W}/\text{cm}^2$, $\lambda = 950\text{ nm}$	t_r	100	ns
Abfallzeit 90% bis 10% Fall time 90% to 10% $R_L = 280\ \Omega$, $E_e = 90\ \mu\text{W}/\text{cm}^2$, $\lambda = 950\text{ nm}$	t_f	100	ns
Ausgangsverzögerungszeit Propagation delay time "H" → "L" $R_L = 280\ \Omega$, $E_e = 90\ \mu\text{W}/\text{cm}^2$, $\lambda = 950\text{ nm}$	t_{PHL}	5 (< 15)	μs
Ausgangsverzögerungszeit Propagation delay time "L" → "H" $R_L = 280\ \Omega$, $E_e = 90\ \mu\text{W}/\text{cm}^2$, $\lambda = 950\text{ nm}$	t_{PLH}	5 (< 15)	μs

Die Schmitt-Trigger ICs werden nach ihrer Schaltschwelle gruppiert und mit arabischen Ziffern gekennzeichnet.

The schmitt-triggers ICs are grouped according to their threshold and distinguished by arabian figures.

Bezeichnung Parameter	Symbol Symbol	Wert Value					Einheit Unit
		1	2	3	4	5	
Schaltschwelle, $\lambda = 950\text{ nm}$ Threshold SFH 5140 F: "H" → "L" SFH 5141 F: "L" → "H"	$E_{e, ON}$	4 ... 8	6.3 ... 12.5	10 ... 20	16 ... 32	25 ... 50	$\mu\text{W}/\text{cm}^2$

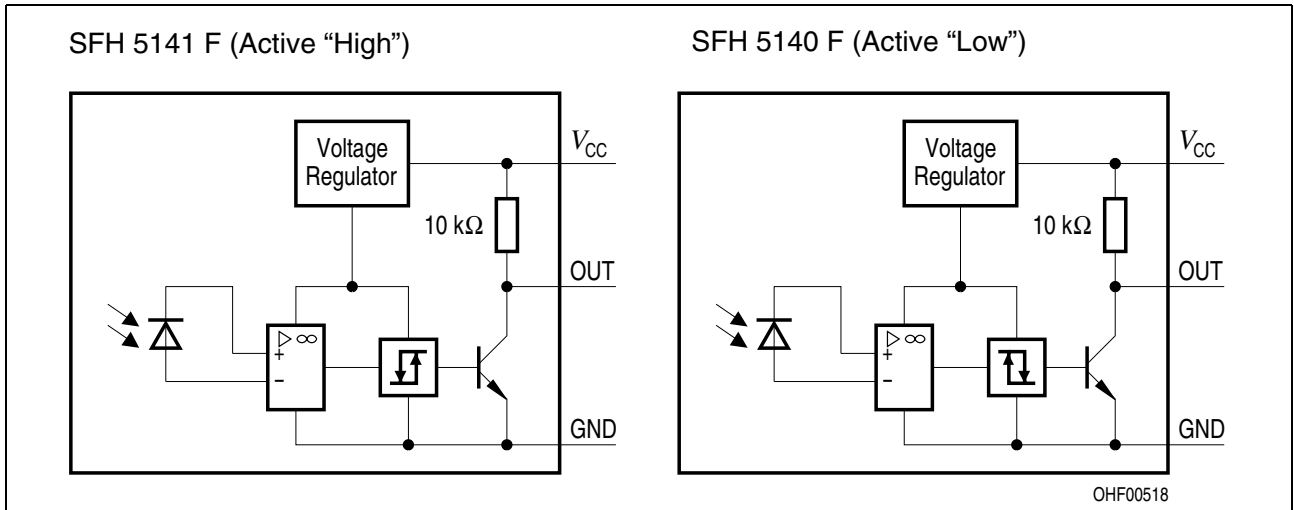


Figure 1 Block Diagram

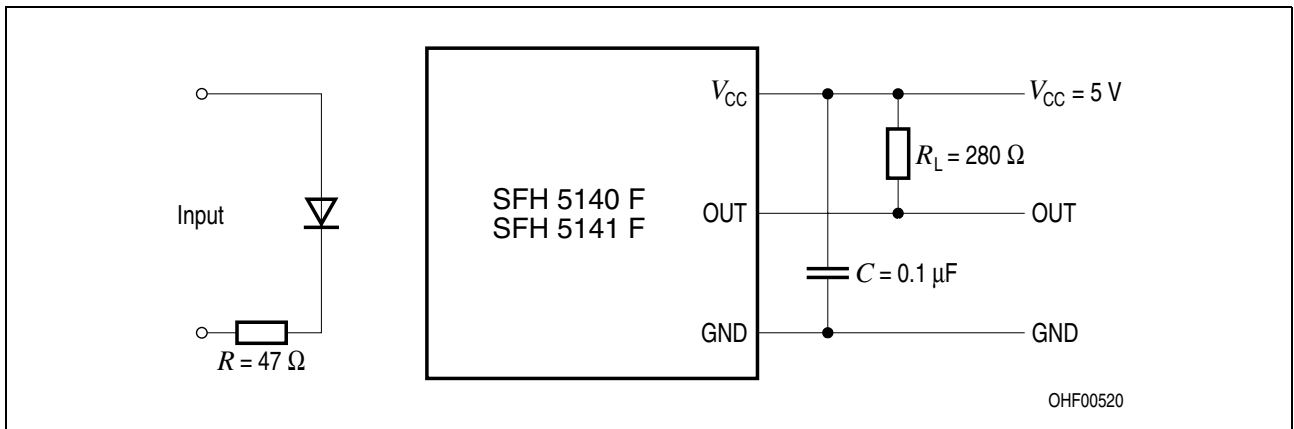


Figure 2 Test Circuit for Switching and Response Time

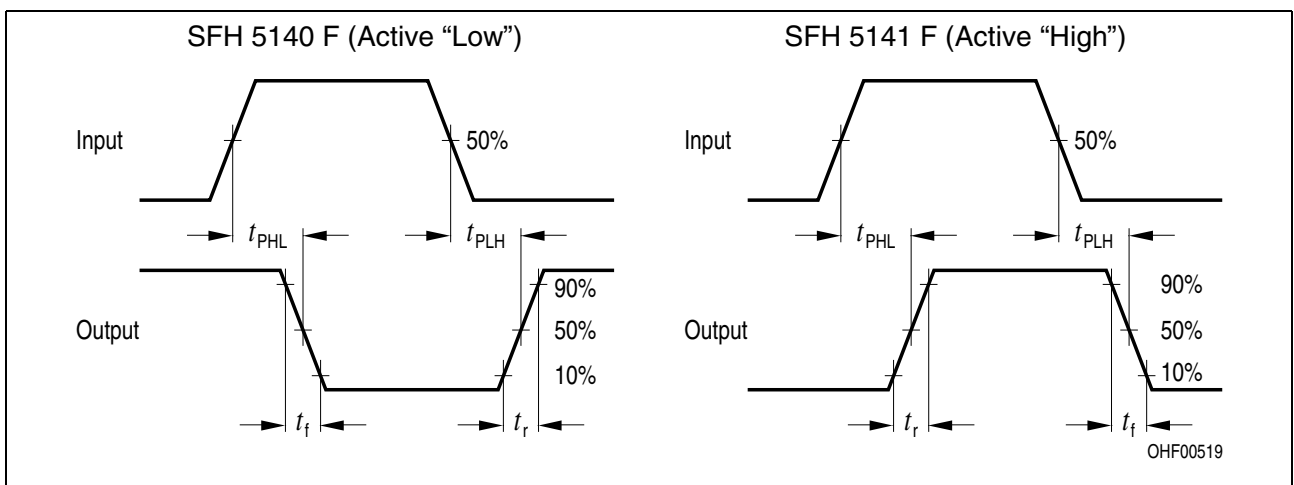
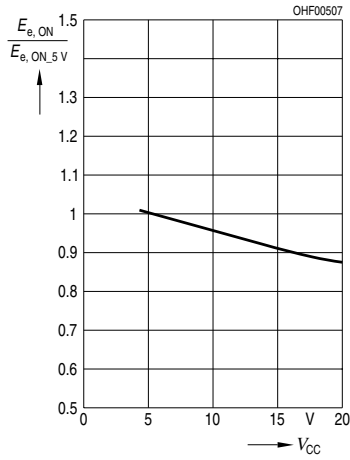


Figure 3 Switching Time Definitions

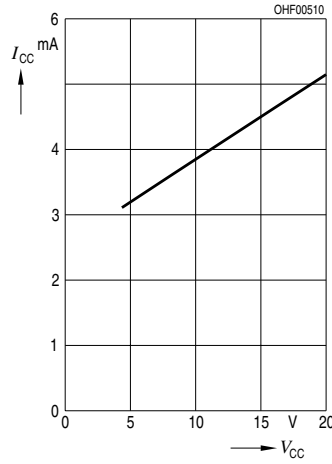
Relative Threshold

$$E_{e,ON}/E_{e,ON}(V_{CC} = 5\text{ V}) = f(V_{CC})$$



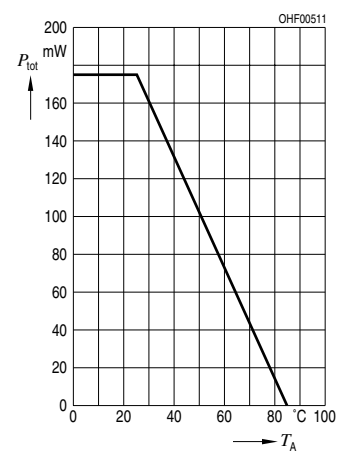
Supply Current

$$I_{CC} = f(V_{CC})$$



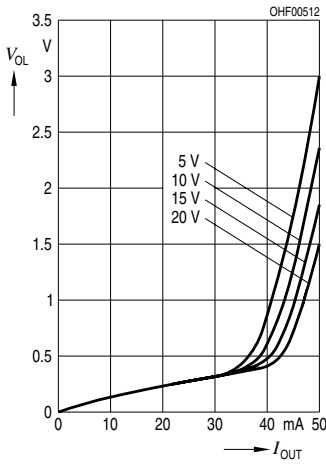
Total Power Dissipation

$$P_{tot} = f(T_A)$$



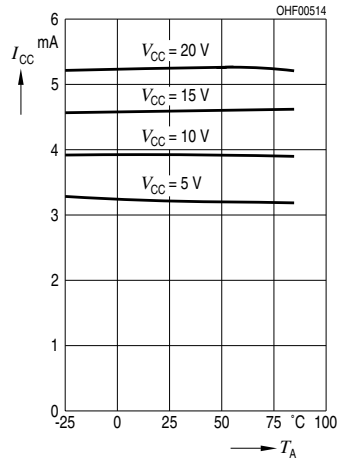
Output Voltage

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

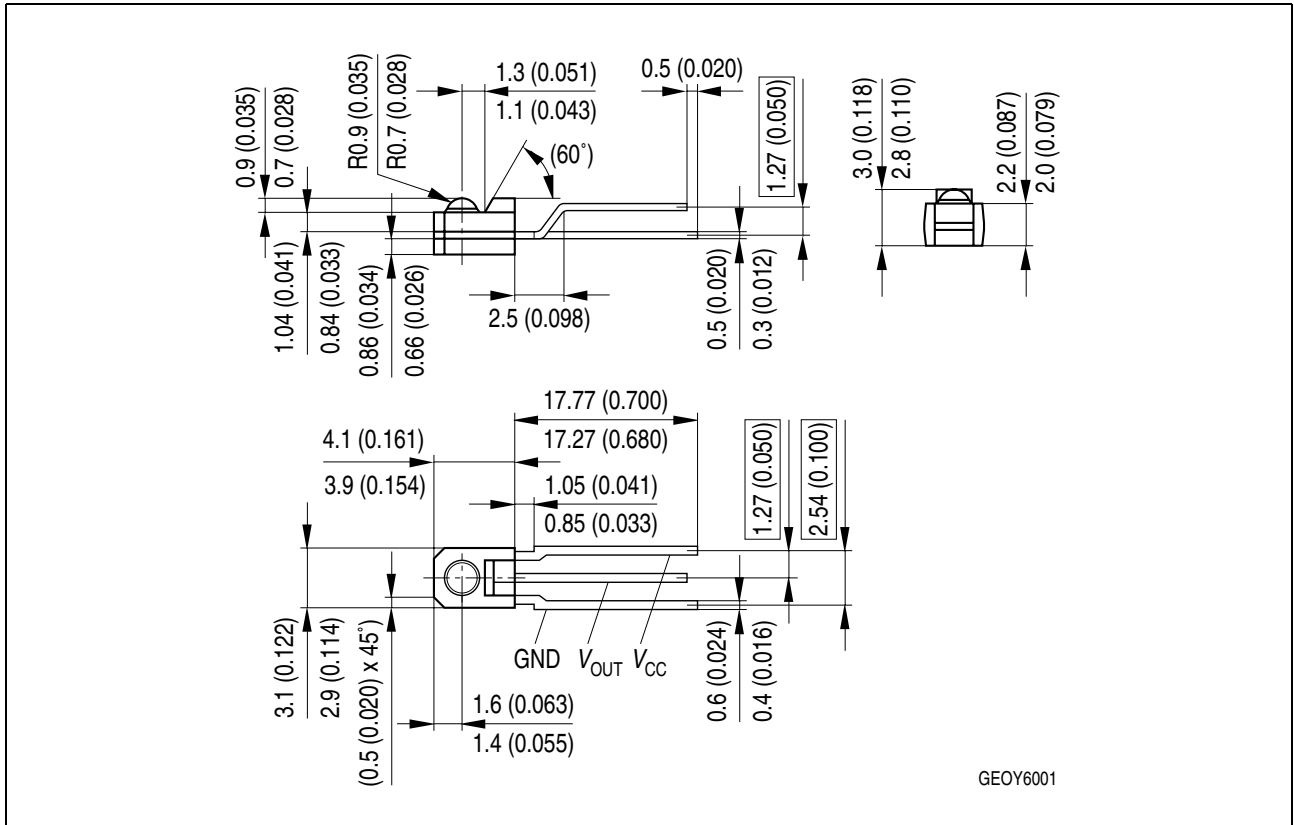


Supply Current vs. Ambient Temperature

$$I_{CC} = f(T_A, V_{CC})$$



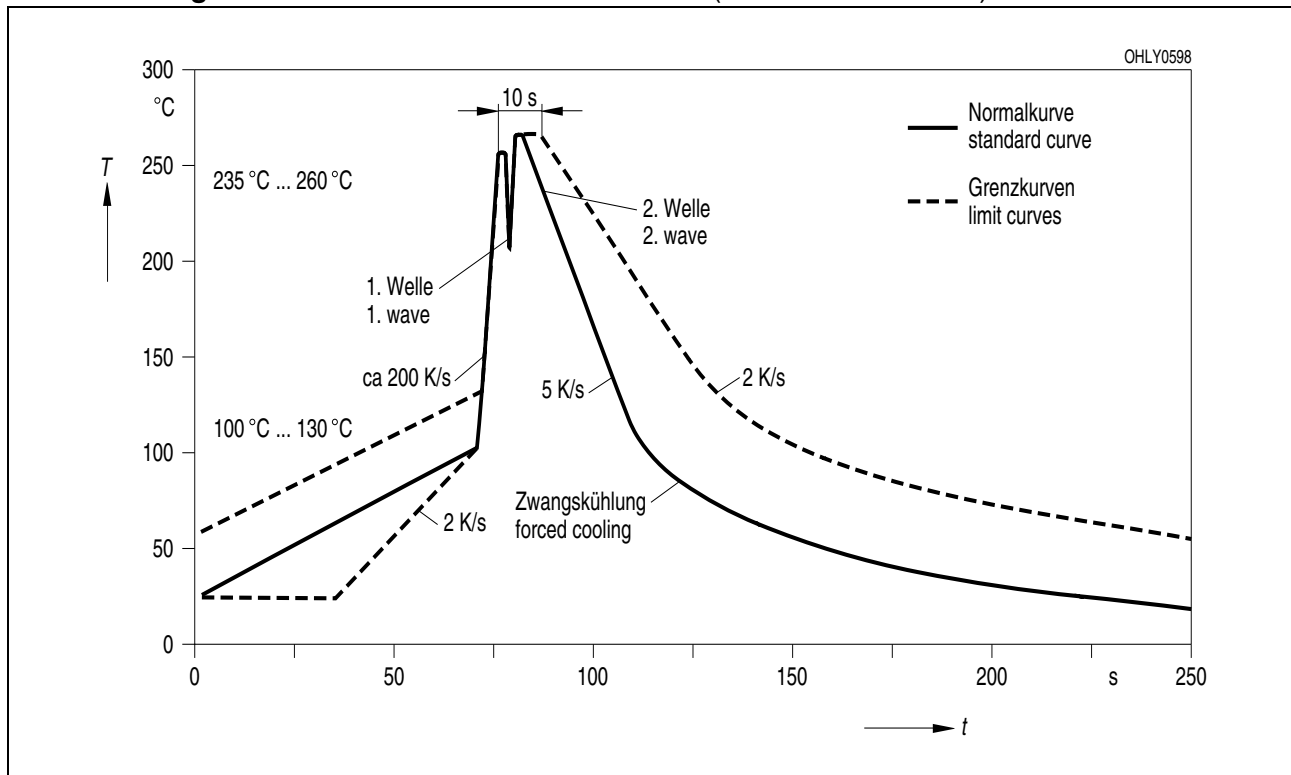
Maßzeichnung
Package Outlines



Maße in mm (inch) / Dimensions in mm (inch).

Lötbedingungen
Soldering Conditions
Wellenlöten (TTW)
TTW Soldering

(nach CECC 00802)
(acc. to CECC 00802)



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