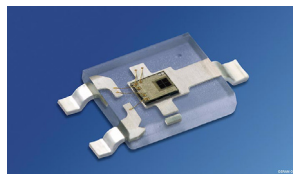


Logic Gate Detector

Lead (Pb) Free Product - RoHS Compliant

SFH 5400



Wesentliche Merkmale

- Geeignet für Anwendungen im Bereich von 500 nm bis 900 nm
- Fotodiode mit integriertem Schmitt-Trigger
- SMT-Bauform
- TTL- und CMOS-kompatibel
- Ausgang: push-pull

Anwendungen

- Optischer Schalter
- Lichtschranken
- Pulsformer
- Zähler

Features

- Suitable for applications from 500 nm to 900 nm
- Photodiode with built-in Schmitt trigger
- SMT package
- TTL and CMOS compatible
- Output: push-pull

Applications

- Optoelectronic switch
- Interrupter
- Pulse former
- Photoelectric counter

Typ Type	Bestellnummer Ordering Code
SFH 5400	Q65110A2704

Grenzwerte 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 ... 15	V
Ausgangsspannung Output voltage	V_O	- 0.5 ... 15	V
Ausgangsstrom Output current	I_q	- 25 ... 40	mA
Ausgangsleistung $T_A = 25\text{ °C}$ Total output power	P_q	100	mW

Kennwerte Characteristics

$T_A = -40 \dots 85\text{ °C}$, $V_{CC} = 4.5 \dots 15\text{ V}$, $E_e = 3.2 \dots 10\text{ mW/cm}^2$

$T_A = 25\text{ °C}$, $V_{CC} = 5\text{ V}$, $E_e = 6.5\text{ mW/cm}^2$ for typical values

Bezeichnung Parameter	Symbol Symbol	Wert Value		Einheit Unit
		typ.	Limit	
Schwelle Bestrahlungsstärke Threshold radiant intensity (Ausgang L → H) (Output L → H) $\lambda = 660\text{ nm}$	E_{eSchw}	1.3	—	mW/cm ²
Min. Bestrahlungsstärke, Ausgang H Min. radiant intensity, Output H $\lambda = 660\text{ nm}$	E_{eHmin}	—	< 3.2	mW/cm ²
Max. Bestrahlungsstärke, Ausgang L Max. radiant intensity, Output L $\lambda = 660\text{ nm}$	E_{eLmax}	—	> 0.16	mW/cm ²
Hysterese Hysteresis	ΔE_e	> 0.2	—	mW/cm ²
Ausgangsspannung L Output voltage L $I_{OL} = 6.4\text{ mA}$	V_{OL}	0.15	< 0.5	V

Kennwerte**Characteristics** (cont'd)

$T_A = -40 \dots 85 \text{ }^\circ\text{C}$, $V_{CC} = 4.5 \dots 15 \text{ V}$, $E_e = 3.2 \dots 10 \text{ mW/cm}^2$

$T_A = 25 \text{ }^\circ\text{C}$, $V_{CC} = 5 \text{ V}$, $E_e = 6.5 \text{ mW/cm}^2$ for typical values

Bezeichnung Parameter	Symbol Symbol	Wert Value		Einheit Unit
		typ.	Limit	
Ausgangsspannung H Output voltage H $I_{OH} = -2.6 \text{ mA}$	V_{OH}	$V_{CC} - 1.8$	> 2.4	V
Ausgangsleckstrom ($V_O > V_{CC} = 4.5 \text{ V}$) Output leakage current ($V_O > V_{CC} = 4.5 \text{ V}$) $V_O = 5.5 \text{ V}$ $V_O = 15 \text{ V}$	I_{OHH}	0.2 0.25	< 100 < 500	μA
Kurzschlußstrom L Short-circuit current L $t_p < 10 \text{ ms}$, $E_e = 0$; $V_{CC} = V_O = 5.5 \text{ V}$ $V_{CC} = V_O = 15 \text{ V}$	I_{OSL}	40 80	> 25 > 40	mA
Kurzschlußstrom H Short-circuit current H $t_p < 10 \text{ ms}$, $V_O = \text{GND}$; $V_{CC} = 5.5 \text{ V}$ $V_{CC} = 15 \text{ V}$	I_{OSH}	-22 -45	< -10 < -25	mA
Versorgungsstrom L Supply current L $E_e = 0$; $V_{CC} = 5.5 \text{ V}$ $V_{CC} = 15 \text{ V}$	I_{CCL}	3.5 4	< 6 < 7.5	mA
Versorgungsstrom Supply current L $V_{CC} = 5.5 \text{ V}$ $V_{CC} = 15 \text{ V}$	I_{CCH}	3.4 3.8	< 5 < 6	mA
Ausgangsverzögerungszeit ¹⁾ Ausgang H $\rightarrow$ L Output delay time ¹⁾ Output H $\rightarrow$ L	t_{PHL}	200	—	ns
Ausgangsverzögerungszeit ¹⁾ Ausgang L $\rightarrow$ H Output delay time ¹⁾ Output L $\rightarrow$ H	t_{PLH}	200	—	ns

Kennwerte

Characteristics (cont'd)

$T_A = -40 \dots 85 \text{ }^\circ\text{C}$, $V_{CC} = 4.5 \dots 15 \text{ V}$, $E_g = 3.2 \dots 10 \text{ mW/cm}^2$

$T_A = 25 \text{ }^\circ\text{C}$, $V_{CC} = 5 \text{ V}$, $E_g = 6.5 \text{ mW/cm}^2$ for typical values

Bezeichnung Parameter	Symbol Symbol	Wert Value		Einheit Unit
		typ.	Limit	
Anstiegszeit Ausgang (10% → 90%) Rise time output (10% → 90%)	t_r	30	–	ns
Abfallzeit Ausgang (90% → 10%) Fall time output (90% → 10%)	t_f	10	–	ns

1) Gemessen von 50% Punkt der ansteigenden Flanke Eingangspuls bis zu 1,3 V Punkt der ansteigenden Flanke Ausgangspuls (t_{PLH}), bzw. von 50% Punkt der abfallenden Flanke Eingangspuls bis zu 1,3 V Punkt der abfallenden Flanke Ausgangspuls (t_{PHL}).

1) Measured from 50% of the rising edge of the input pulse to 1.3 V of the rising edge of the output pulse (t_{PLH}) or from 50% of the descending edge input pulse to 1.3 V of the descending output pulse edge (t_{PHL}), respectively.

Funktionsbereich

Functional Characteristics

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Betriebs- und Lagertemperatur Operating and storage temperature range	$T_{op}; T_{stg}$	$-40 \dots +85$	$^\circ\text{C}$
Versorgungsspannung Supply voltage	V_{CC}	$4.5 \dots 15$	V

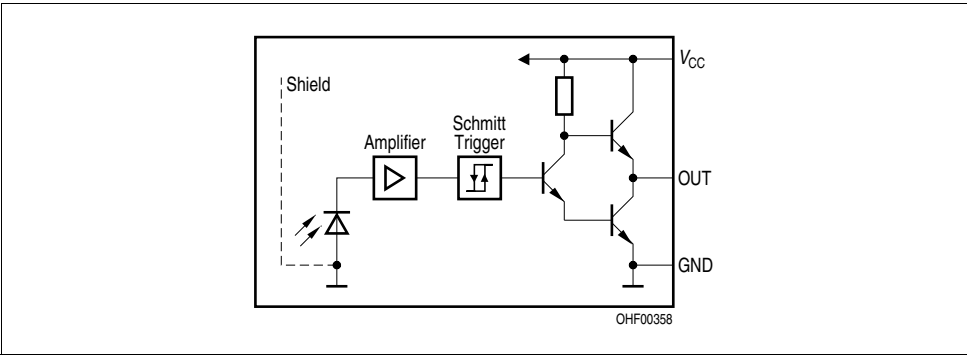
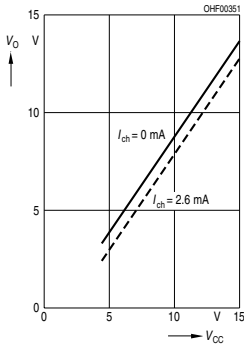


Figure 1 **Block Diagram**

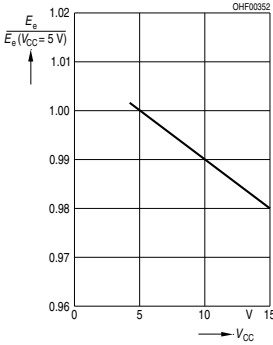
Output Voltage

$V_O = f(V_{CC}, I_C)$

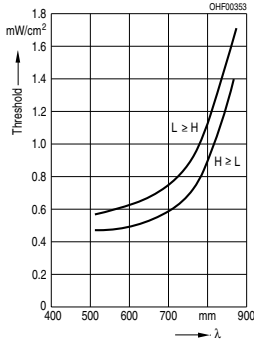


Rel. Threshold

$E_e/E_e(V_{CC} = 5 \text{ V})$

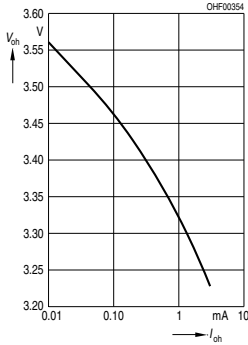


Switching Threshold

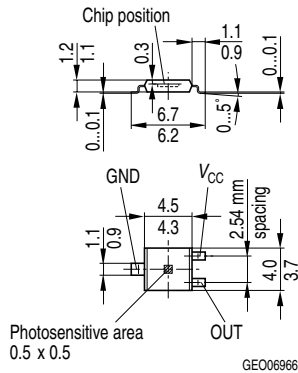


Output Characteristics

$V_{oh} = f(I_{oh}), V_{CC} = 5 \text{ V}$

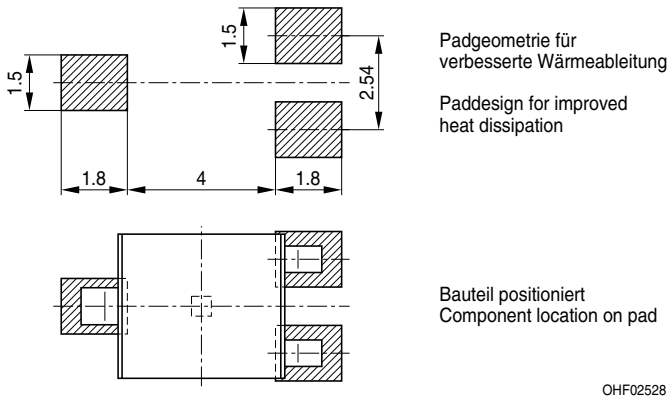


Maßzeichnung Package Outlines



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

Empfohlenes Lötpaddesign Recommended Solderpad Design



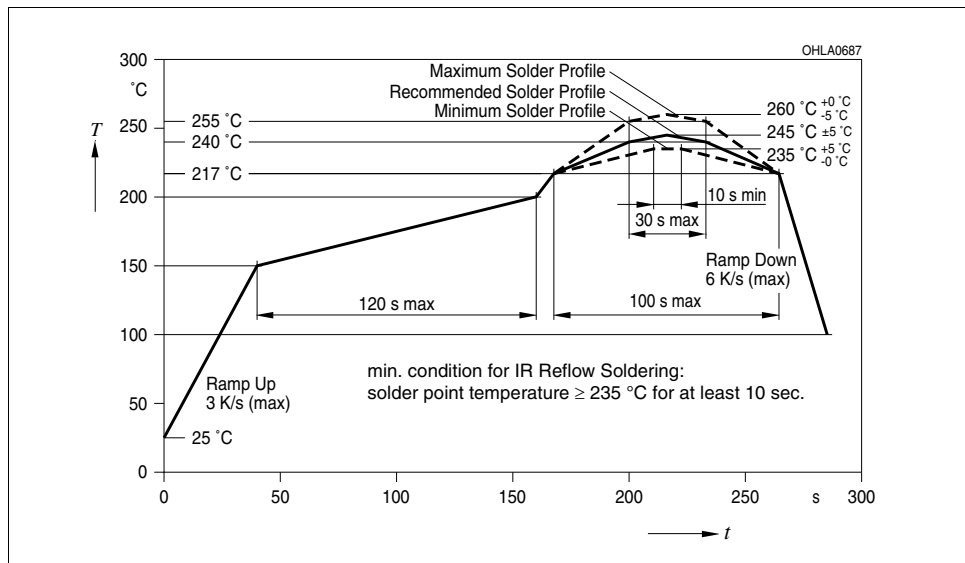
Lötbedingungen**Soldering Conditions****IR-Reflow Lötprofil für bleifreies Löten****IR Reflow Soldering Profile for lead free soldering**

Vorbehandlung nach JEDEC Level 2

Preconditioning acc. to JEDEC Level 2

(nach J-STD-020B)

(acc. to J-STD-020B)

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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.

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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.

² Life support devices or systems are intended (a) to be implanted in the human body, or (b) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health of the user may be endangered.