

IR-Empfänger für Fernbedienungen

IR-Receiver for Remote Control Systems

SFH 5110
SFH 5111



Beschreibung

SFH 5110 und SFH 5111 sind Infrarot-Empfänger für die Erkennung von Signalen aus Infrarot-Fernbedienungssystemen und bestehen aus Fotodiode, Vorverstärker, automatischer Verstärkungsregelung, Bandpaß-Filter und Demodulator. Das schwarz eingefärbte Gehäuse dient zur Unterdrückung des Tageslichteinflusses.

Wesentliche Merkmale

- IC mit monolithisch integrierter Fotodiode (Ein-Chip Lösung)
- Speziell geeignet für Anwendungen von 940 nm
- Hohe Empfindlichkeit
- Variable Bandpaß-Filterfrequenz
- TTL und CMOS kompatibel
- Ausgang: aktiv „Low“
- Keine externe Beschaltung nötig

Anwendungen

- Empfänger in Fernbedienungen für TV, Videorekorder, HiFi, Satellitenempfänger und CD-Spieler
- Optischer Schalter

Description

SFH 5110 and SFH 5111 are IR receivers to detect light from infrared remote control systems. The IC includes photodiode, preamplifier, automatic gain control, bandpass and demodulator. The black-colored package is designed as day-light-cutoff filter.

Features

- IC with monolithic integrated photodiode (single chip solution)
- Especially suitable for applications of 940 nm
- High sensitivity
- Various bandpass filter frequency
- TTL and CMOS compatibility
- Output: active Low
- No external components necessary

Applications

- Remote control module for TV sets, VCRs, hi-fi audio receivers, SAT receivers and compact disk players
- Optical Switch

| Typ | Trägerfrequ. | Bestellnr. | Typ | Trägerfrequ. | Bestellnr. |
|-------------|-----------------------|---------------|-------------|-----------------------|---------------|
| Type | Carrier Frequency kHz | Ordering Code | Type | Carrier Frequency kHz | Ordering Code |
| SFH 5110-30 | 30 | Q62702-P5088 | SFH 5111-30 | 30 | Q62702-P5257 |
| SFH 5110-33 | 33 | Q62702-P5089 | SFH 5111-33 | 33 | Q62702-P5258 |
| SFH 5110-36 | 36 | Q62702-P5090 | SFH 5111-36 | 36 | Q62702-P5259 |
| SFH 5110-38 | 38 | Q62702-P5091 | SFH 5111-38 | 38 | Q62702-P5260 |
| SFH 5110-40 | 40 | Q62702-P5092 | SFH 5111-40 | 40 | Q62702-P5261 |

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

| Bezeichnung Parameter | Symbol Symbol | Wert Value | Einheit Unit |
|--|-----------------------|---------------------------------|-----------------|
| Betriebs- und Lagertemperatur Operation and storage temperature range | T_{op} T_{stg} | - 10 ... + 75 - 30 ... + 100 | °C |
| Betriebsspannung Supply voltage | V_{CC} | 6.3 | V |
| Betriebsstrom Supply current | I_{CC} | 5 | mA |
| Ausgangsspannung Output voltage | V_{OUT} | 6.3 | V |
| Ausgangsstrom Output current | I_{OUT} | 3 | mA |
| Verlustleistung Total power dissipation, $T_A \leq 85\text{ °C}$ | P_{tot} | 50 | mW |

Empfohlener Arbeitsbereich**Recommended Operating Conditions**

| Bezeichnung Parameter | Symbol Symbol | Wert Value | | | Einheit Unit |
|---|------------------|---------------|------|------|-----------------|
| | | min. | typ. | max. | |
| Betriebstemperatur Operating temperature | T_{op} | - 10 | - | 75 | °C |
| Betriebsspannung Supply Voltage | V_{cc} | 4.5 | 5.0 | 5.5 | V |

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

| Bezeichnung Parameter | Symbol Symbol | Wert Value | | | Einheit Unit |
|--|---|-------------------|----------------------------|-------------------|-------------------|
| | | min. | typ. | max. | |
| Stromaufnahme, $V_{CC} = 5\text{ V}$, $E = 0$ Current consumption | I_{CC} | – | 1.3 | – | mA |
| Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity | $\lambda_{s\text{ max}}$ | – | 940 | – | nm |
| Spektraler Bereich der Fotoempfindlichkeit Spectral range of sensitivity | λ | 830 | – | 1100 | nm |
| Ausgangsspannung Output voltage Output "High" - ($I_q = 10\text{ }\mu\text{A}$) Output "Low" - ($I_q = 500\text{ }\mu\text{A}$) | $V_{OUT\text{ high}}$ $V_{OUT\text{ low}}$ | $V_S - 0.5$ – | – – | – 0.5 | V |
| Trägerfrequenz Carrier frequency | f_0 | – | 30 33 36 38 40 | – | kHz |
| Min. Bestrahlungsstärke (Testsignal, s. Fig. 3) Min. Threshold irradiance (test signal, see Fig. 3) $f = f_0$, $t_{p,I} = 600\text{ }\mu\text{s}$ | $E_{e\text{ min}}$ | – | 0.35 | 0.5 | mW/m ² |
| Min. Eingangspulsbreite „ON“ (Testsignal, s. Fig. 3) ¹⁾ Min. Input pulse width "ON" (test signal, see Fig. 3) ¹⁾ | $t_{p,I}$ | $6/f_0$ | – | – | μs |
| Ausgangspulsbreite „ON“ (Testsignal, s. Fig. 3) Output pulse width "ON" (test signal, see Fig. 3 , $E_e = 1\text{ mW/m}^2$) | $t_{p,O}$ | $t_{p,I} - 6/f_0$ | – | $t_{p,I} + 6/f_0$ | μs |
| 50%-Filterbandbreite, $f = f_0$, $E_V = 0$, $V_{CC} = 5\text{ V}$ 50%-Filter bandwidth | $\Delta f_{50\%}$ | 3 | – | 6 | kHz |

¹⁾ Die volle Empfindlichkeit wird bei einer Burstlänge von mindestens 6 Pulsen erreicht. Die Reichweite bei Verwendung eines typischen Senders (SFH 4510/SFH 4515, $I_F = 500\text{ mA}$) beträgt etwa 30 m.

¹⁾ A minimum burst length of 6 pulses is necessary for full sensitivity. The transmission distance with a typical transmitter (SFH 4510/SFH 4515, $I_F = 500\text{ mA}$) is about 30 m.

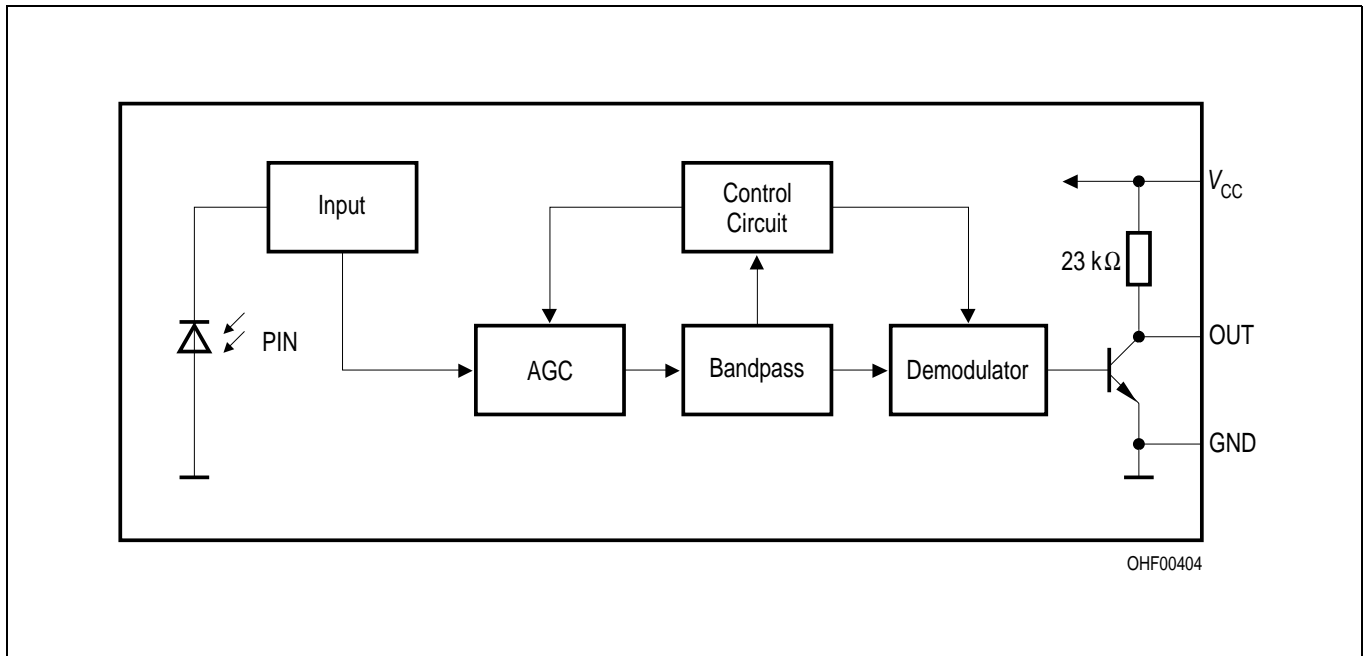


Figure 1 **Blockschaltbild**
Block Diagram

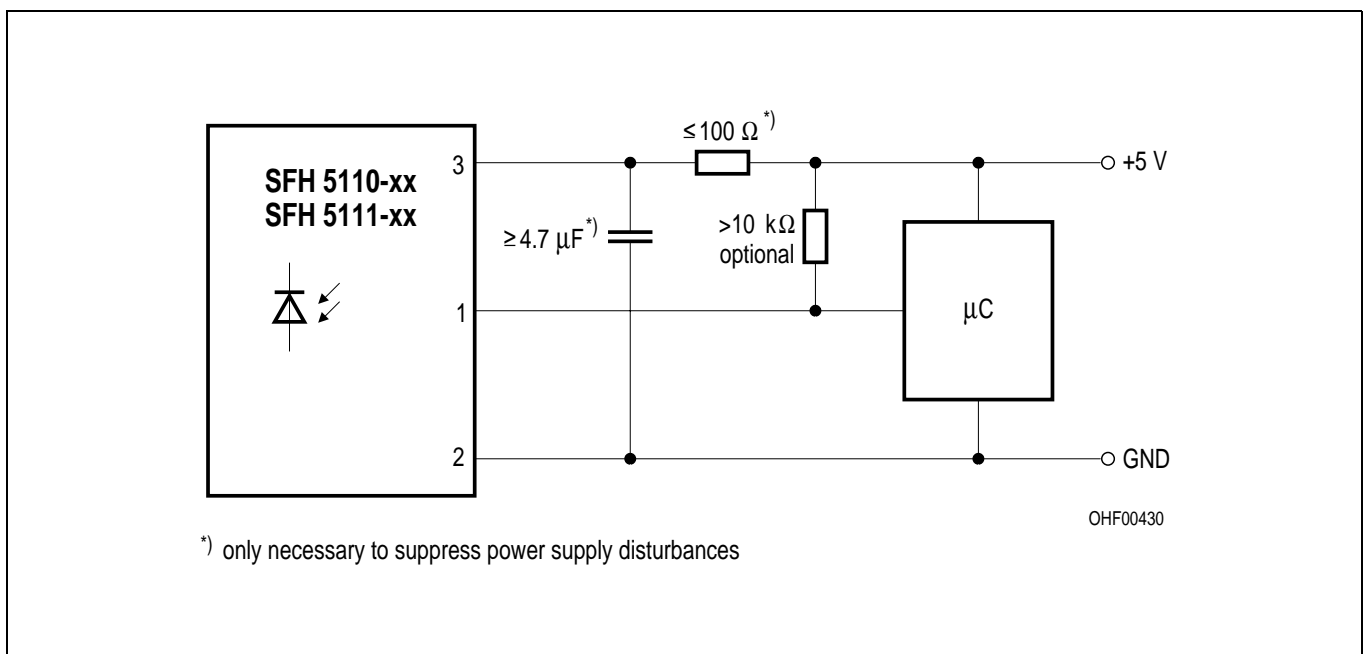


Figure 2 **Externe Beschaltung**
External Circuit

*) only necessary to suppress power supply disturbances

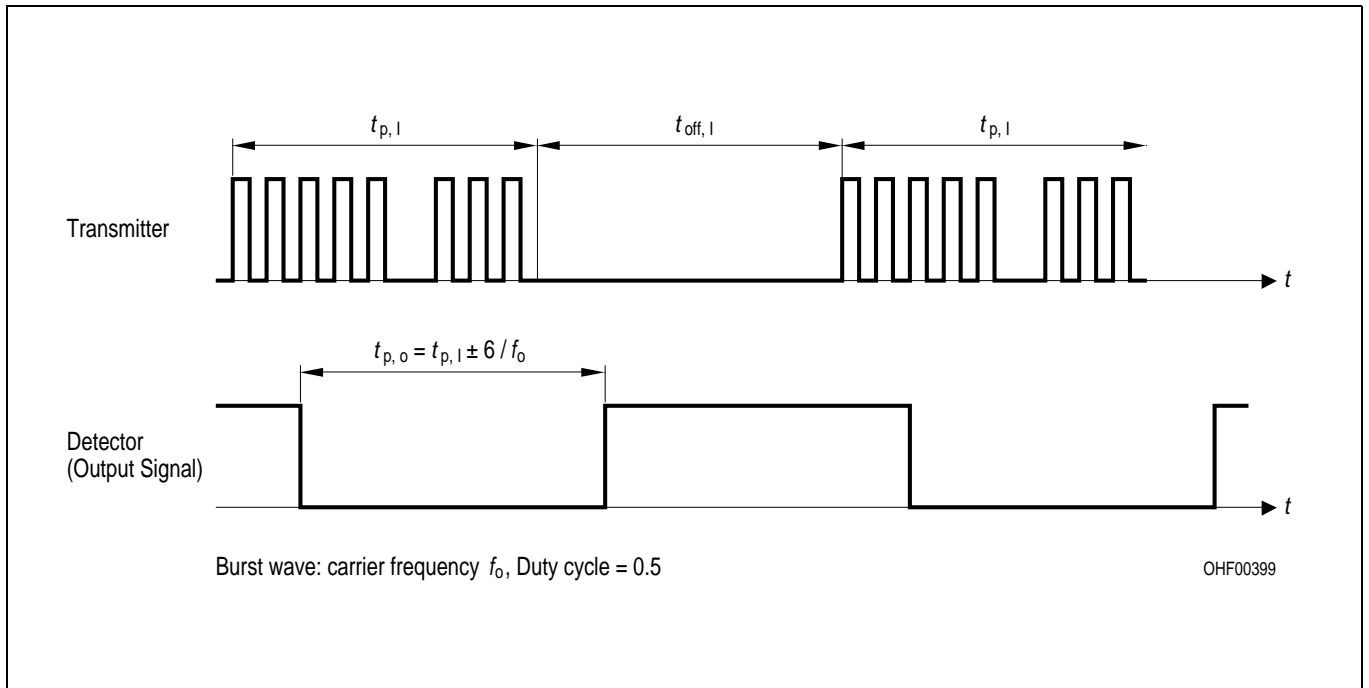
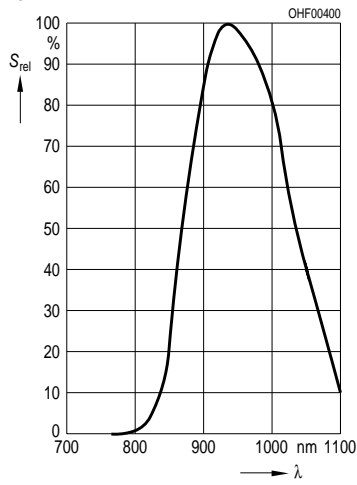


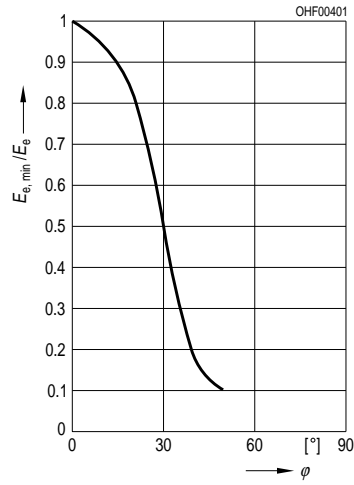
Figure 3 **Optisches Testsignal**
Optical Test Signal

Relative Luminous Sensitivity

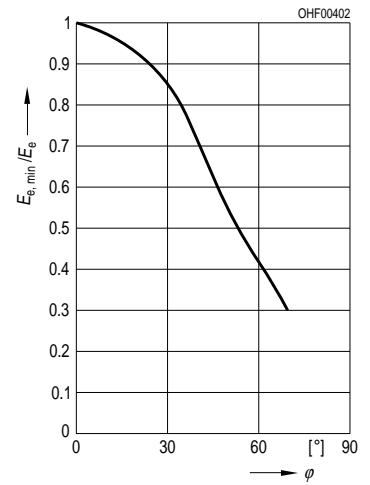
$S_{rel} = f(\lambda)$



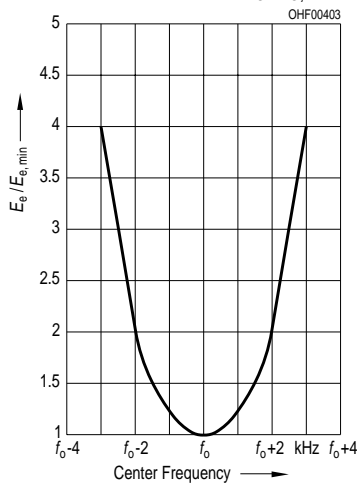
Vertical Directivity ϕ_y



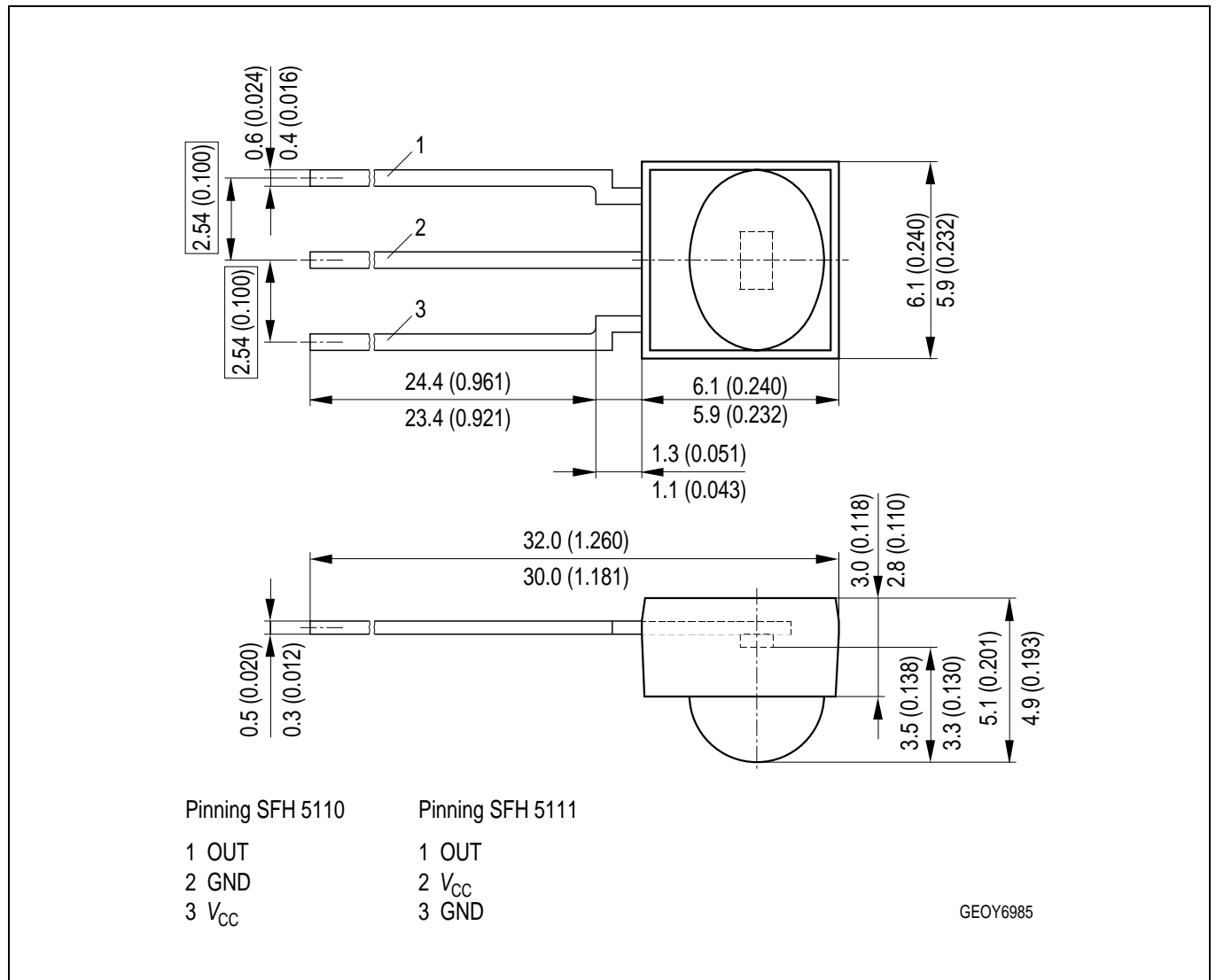
Horizontal Directivity ϕ_x



Relative Sensitivity $E_e/E_{e,min} = f(f_0)$



Maßzeichnung
Package Outlines



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

**Published by OSRAM Opto Semiconductors GmbH & Co. OHG
Wernerwerkstrasse 2, D-93049 Regensburg**

© All Rights Reserved.

Attention please!

The information describes the type of component and shall not be considered as assured characteristics. Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances. For information on the types in question please contact our Sales Organization.

Packing

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.

Components used in life-support devices or systems must be expressly authorized for such purpose! Critical components ¹, may only be used in life-support devices or systems ² with the express written approval of OSRAM OS.

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.