

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 Gehäuse ist zur Unterdrückung des Tageslichteinflusses schwarz eingefärbt.

Wesentliche Merkmale

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

Anwendungen

- Empfänger in Fernbedienungen für TV, Videorecorder, 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 carrier frequencies available
- 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
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.

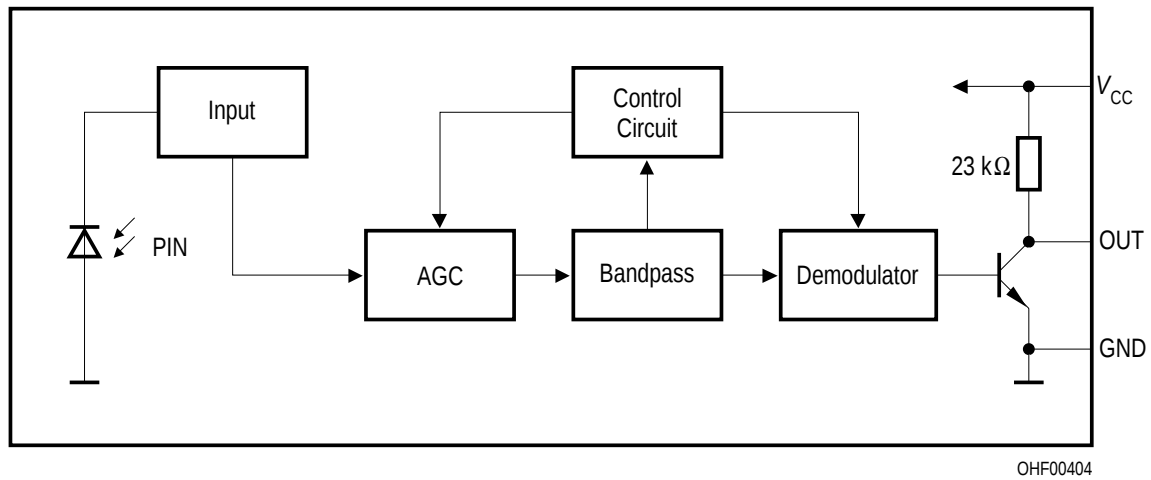
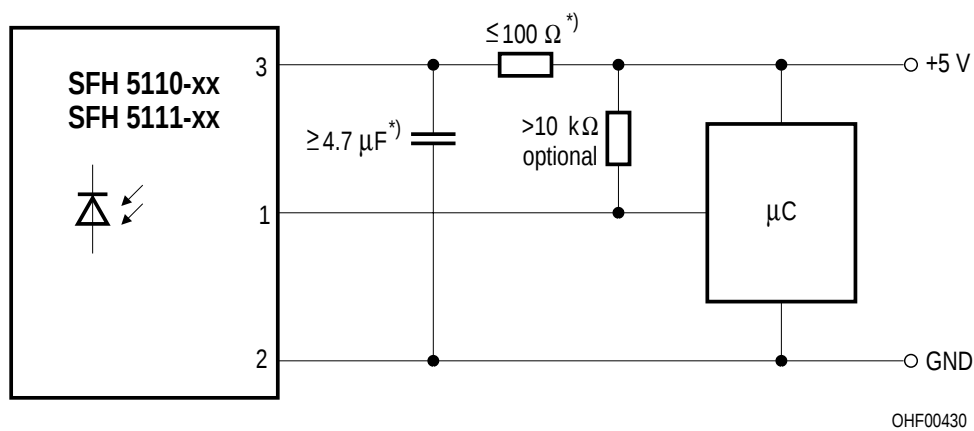


Figure 1 **Blockschaltbild**
Block Diagram



^{*)} only necessary to suppress power supply disturbances

Figure 2 **Externe Beschaltung**
External Circuit

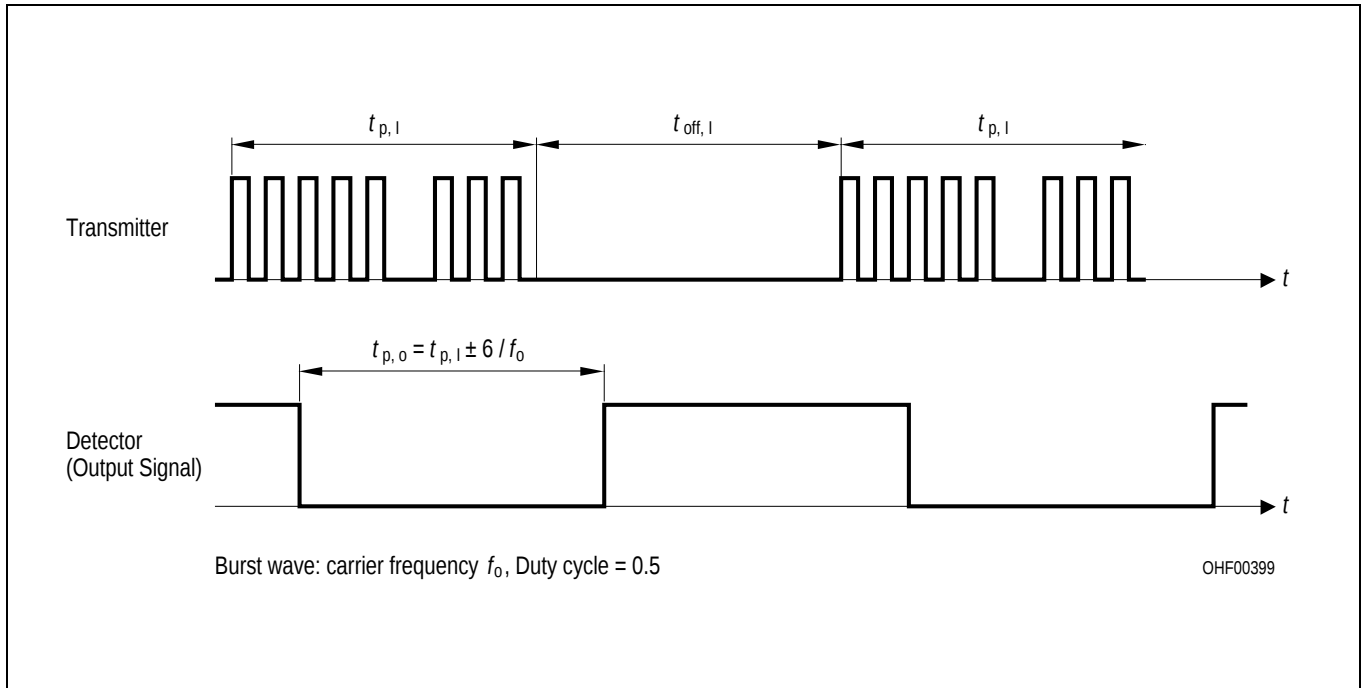
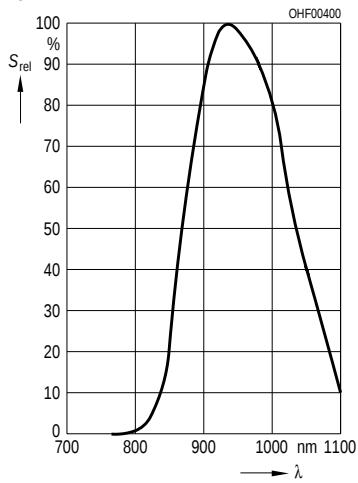
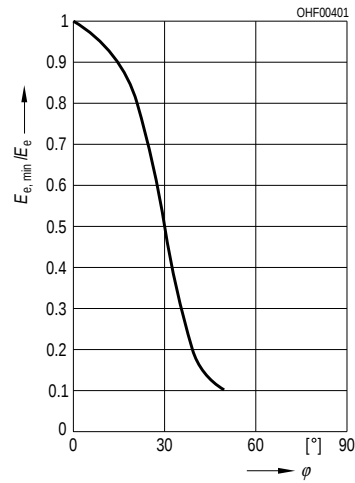


Figure 3 **Optisches Testsignal**
Optical Test Signal

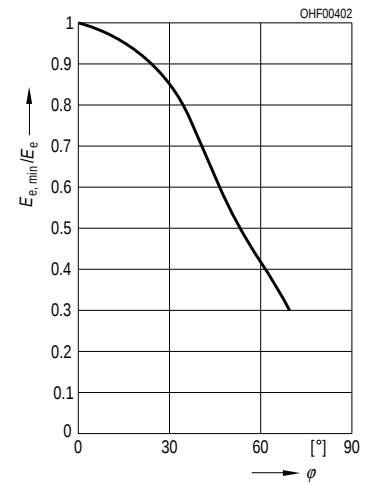
Relative Spectral Sensitivity
 $S_{\text{rel}} = f(\lambda)$



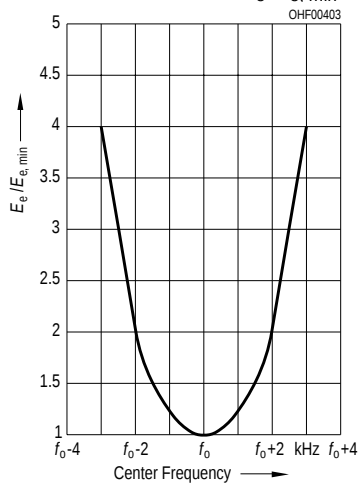
Vertical Directivity φ_y



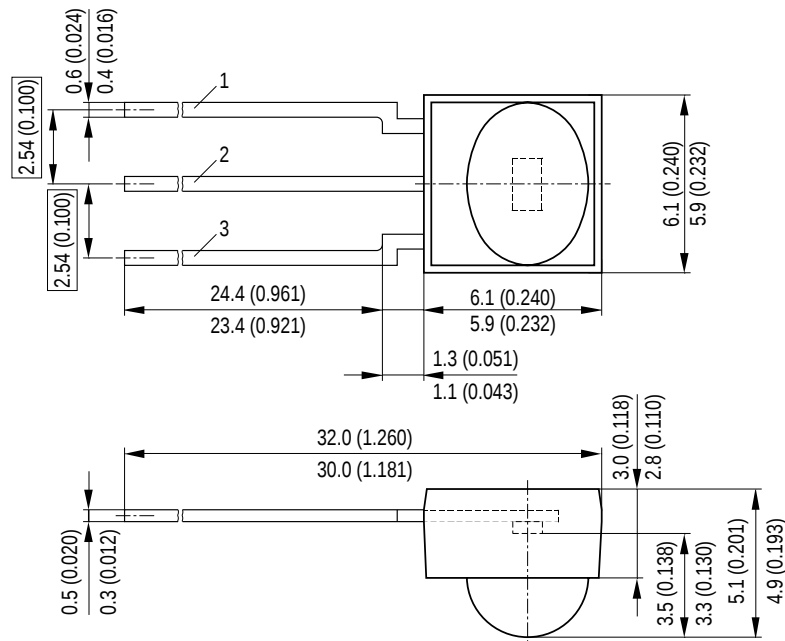
Horizontal Directivity φ_x



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



Maßzeichnung Package Outlines



Pinning SFH 5110

1 OUT
2 GND
3 V_{CC}

Pinning SFH 5111

1 OUT
2 V_{CC}
3 GND

GEOY6985

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

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