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IR-Empfänger für Fernbedienungen

IR-Receiver for Remote Control Systems

SFH 5110



Beschreibung

SFH 5110 ist ein 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 is a IR receiver 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 daylight-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 Type	Trägerfrequ. Carrier Frequency kHz	Bestellnr. Ordering Code
SFH 5110-30 ¹⁾	30	Q62702-P5088
SFH 5110-33 ¹⁾	33	Q62702-P5089
SFH 5110-36 ¹⁾	36	Q62702-P5090
SFH 5110-38	38	Q62702-P5091
SFH 5110-40 ¹⁾	40	Q62702-P5092

¹⁾ Mindestbestellmenge 80000 Stück / Minimum order quantity 80000 pieces

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					V
Output "High" - ($I_q = 10\text{ }\mu\text{A}$)	$V_{OUT\text{ high}}$	$V_S - 0.5$	–	–	
Output "Low" - ($I_q = 500\text{ }\mu\text{A}$)	$V_{OUT\text{ low}}$	–	–	0.5	
Trägerfrequenz Carrier frequency	f_0	–	38	–	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.

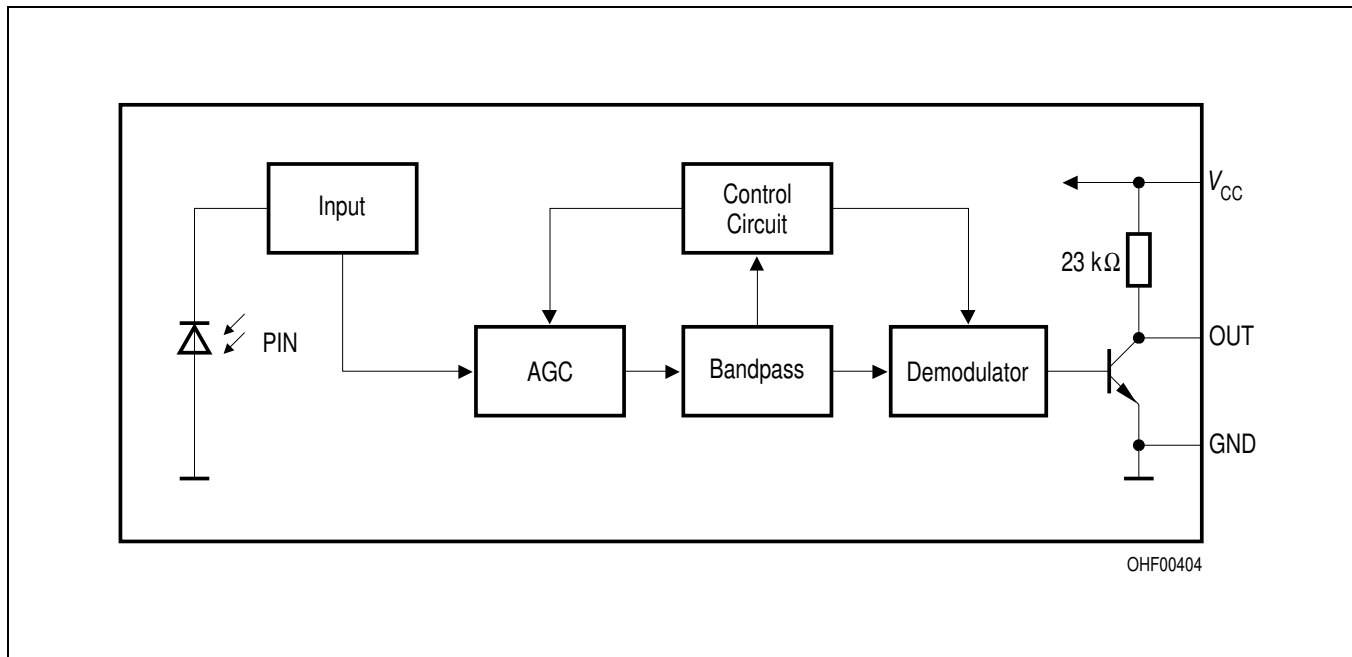


Figure 1 **Blockschaltbild**
Block Diagram

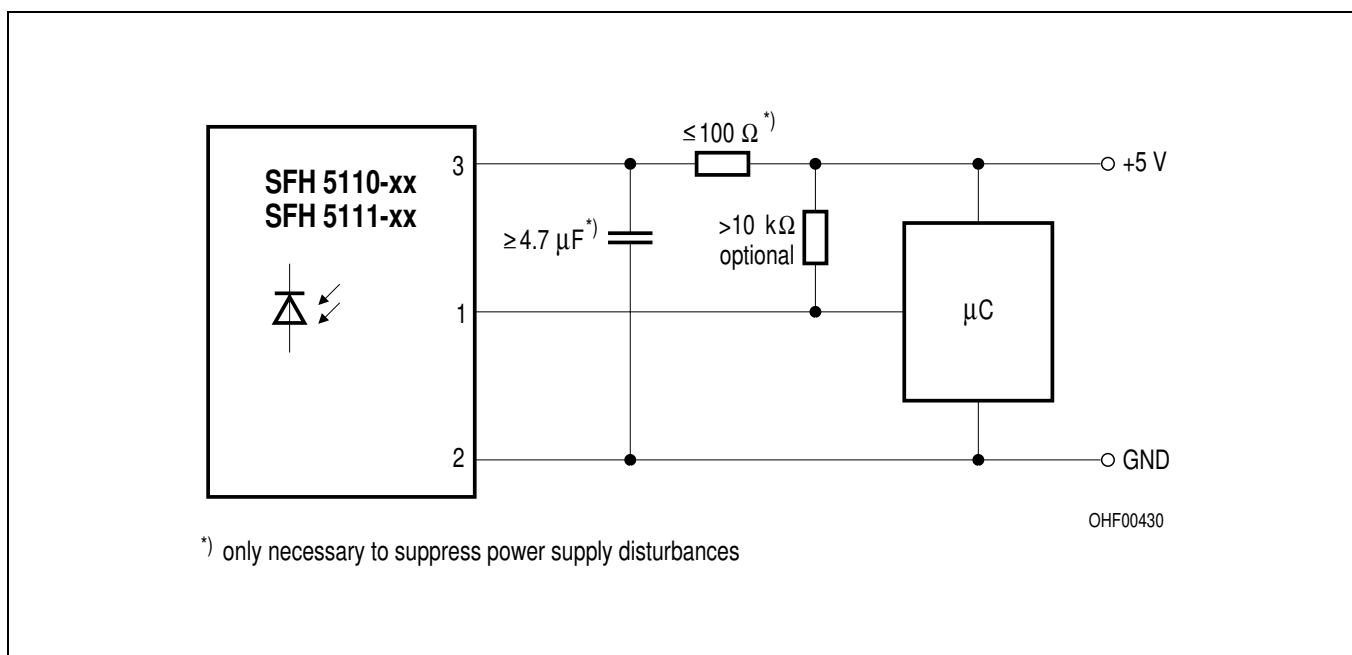


Figure 2 **Externe Beschaltung**
External Circuit

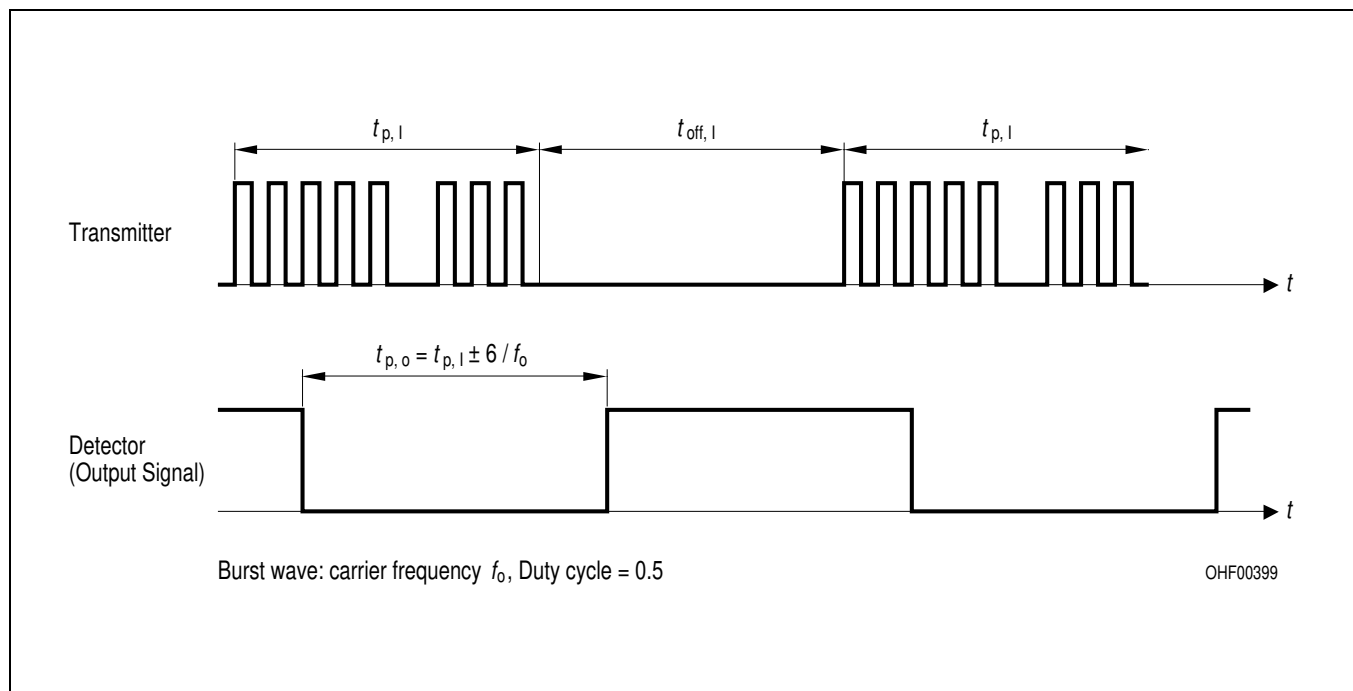
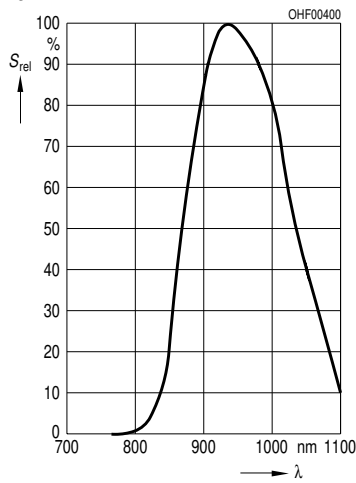


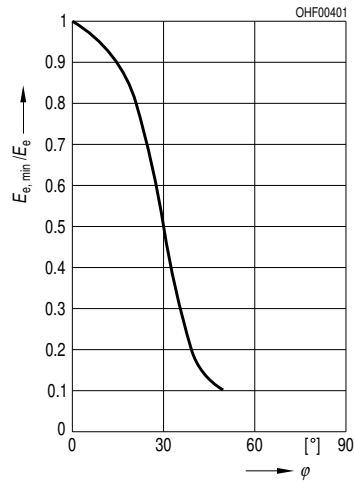
Figure 3 **Optisches Testsignal**
Optical Test Signal

Relative Spectral Sensitivity

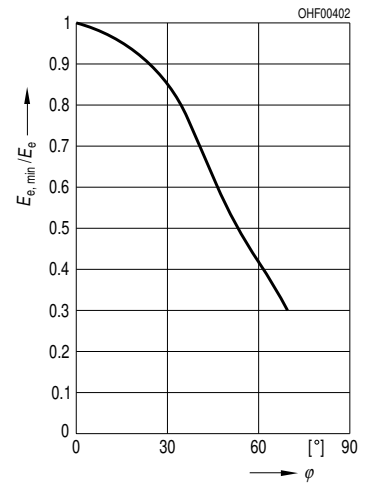
$$S_{rel} = f(\lambda)$$



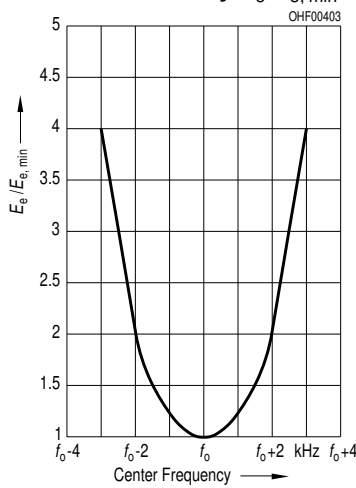
Vertical Directivity φ_y



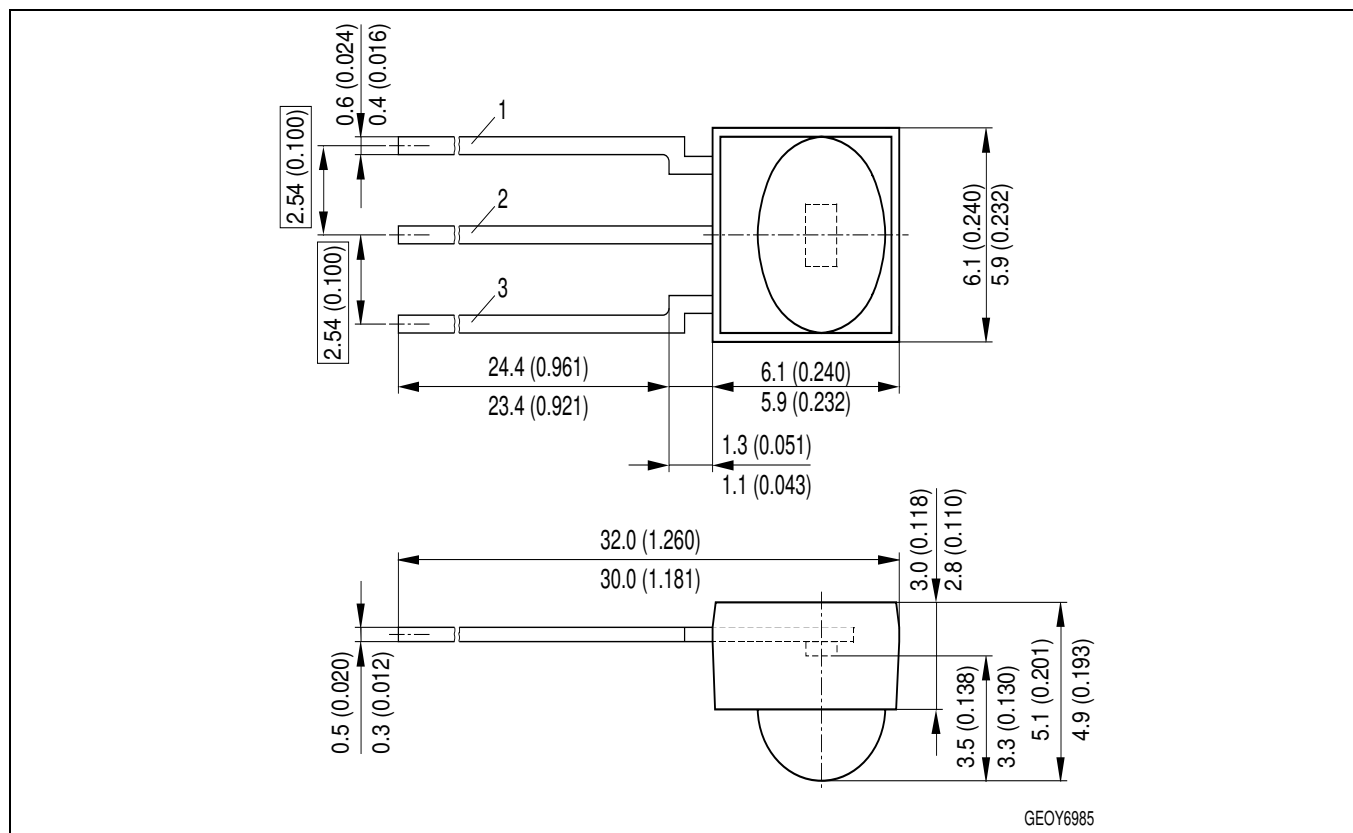
Horizontal Directivity φ_x



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).

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