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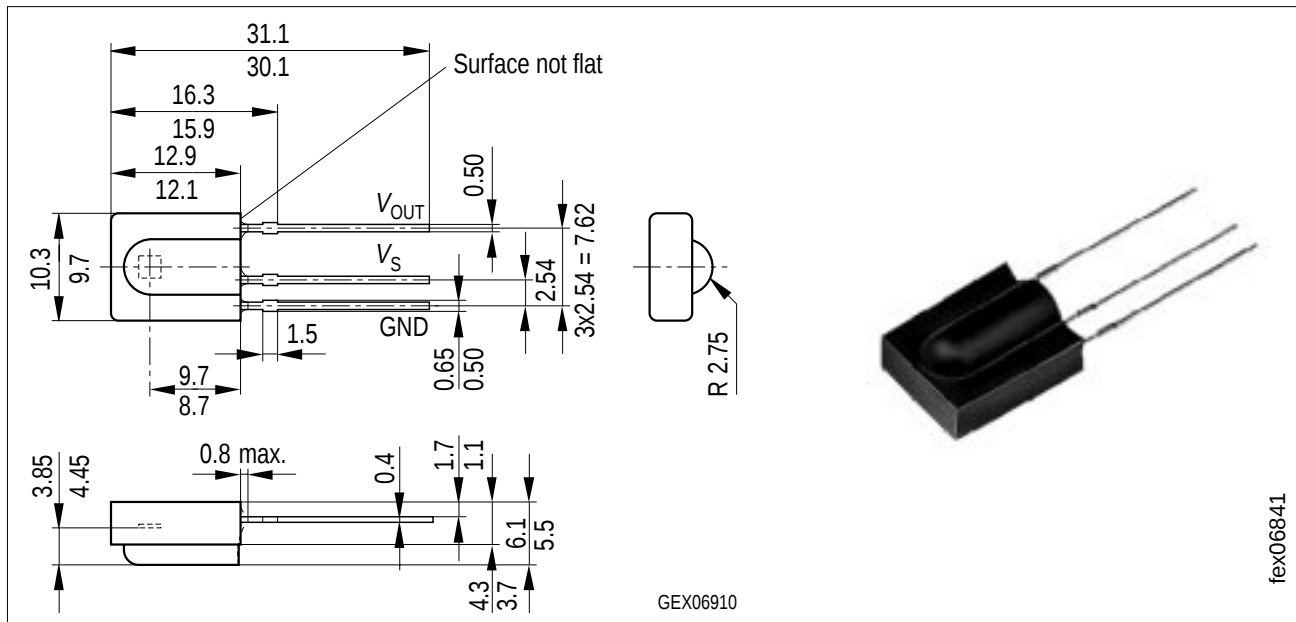
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IR-Empfänger für Fernbedienungen (für kurze Burst) IR-Receiver for Remote Control Systems (for Short Burst)

SFH 507



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

Wesentliche Merkmale

- Empfängermodul für Übertragungsprotokolle mit kurzen Pulspaketen ($N \geq 6$ Pulse pro Bit)
- Fotodiode mit integriertem Verstärker
- Gehäuse schwarz eingefärbt: Verguß optimiert für eine Wellenlänge von 950 nm
- Hohe Störsicherheit
- Geringe Stromaufnahme (0.5 mA typ.)
- 5 V Betriebsspannung
- Hohe Empfindlichkeit
- TTL und CMOS kompatibel
- Mögliche Datenübertragungsrate 2.4 kbit/s ($N = 6, f_0 = 56$ kHz)

Anwendungen

- Empfänger für IR-Fernsteuerungen

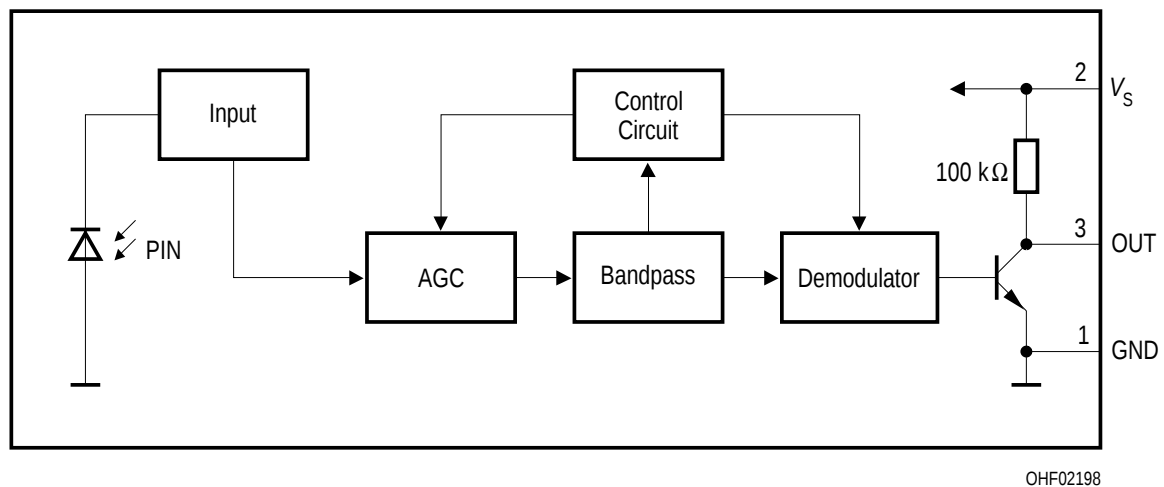
Features

- Receiver module for transmission codes with short bursts ($N \geq 6$ pulses per bit)
- Photodiode with hybride integrated circuit
- Black epoxy resin: daylight filter optimized for 950 nm
- High immunity against ambient light
- Low power consumption (0.5 mA typ.)
- 5 V supply voltage
- High sensitivity (internal shield case)
- TTL and CMOS compatibility
- 2.4 kbit/s data transmission possible ($N = 6, f_0 = 56$ kHz)

Applications

- IR-remote control preamplifier module

Typ	Trägerfrequ.	Bestellnr.	Typ	Trägerfrequ.	Bestellnr.
Type	Carrier Frequency kHz	Ordering Code	Type	Carrier Frequency kHz	Ordering Code
SFH 507-30	30	Q62702-P1701	SFH 507-38	38	Q62702-P1704
SFH 507-33	33	Q62702-P1702	SFH 507-40	40	Q62702-P1705
SFH 507-36	36	Q62702-P1703	SFH 507-56	56	Q62702-P1822



Blockschaltbild
Block Diagram

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

Bezeichnung Description	Symbol Symbol	Wert Value	Einheit Unit
Betriebs- und Lagertemperatur Operation and storage temperature range	T_A, T_{stg}	– 25 ... + 85	$^\circ\text{C}$
Sperrschichttemperatur Junction temperature range	T_j	100	$^\circ\text{C}$
Löttemperatur Lötstelle 1 mm vom Gehäuse; Lötzeit $t \leq 10$ s Soldering temperature soldering joint ≥ 1 mm distance from package, soldering time $t \leq 10$ s	T_s	260	$^\circ\text{C}$
Betriebsspannung Supply voltage	Pin 2 V_S	– 0.3 ... + 6.0	V
Betriebsstrom Supply current	Pin 2 I_{CC}	5	mA
Ausgangsspannung Output voltage	Pin 3 V_{OUT}	– 0.3 ... + 6.0	V
Ausgangsstrom Output current	Pin 3 I_{OUT}	5	mA
Verlustleistung Total power dissipation $T_A \leq 85^\circ\text{C}$	P_{tot}	50	mW

Kennwerte ($T_A = 25\text{ °C}$)

Characteristics

Bezeichnung Description	Symbol Symbol	Wert Value	Einheit Unit
Betriebsspannung Supply voltage	V_s	typ. 5.0 (4.5 ... 5.5)	V
Bestrahlungsstärke (Testsignal, s. Figure 2) Threshold irradiance (test signal, see Fig. 2)	$E_{e\text{ min}(30-40\text{ kHz})}^{1)}$ $E_{e\text{ min}(56\text{ kHz})}^{1)}$ $E_{e\text{ max}}^{1)}$	typ. 0.4 (< 0.6) typ. 0.45 (< 0.7) 30	mW/m^2 mW/m^2 W/m^2
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{s\text{ max}}$	950	nm
Halbwinkel Half angle	φ	± 45	deg.
Stromaufnahme Current consumption	Pin 2		
$V_s = 5\text{ V}$, $E_v = 0$	I_{CC}	0.5 (< 0.8)	mA
$V_s = 5\text{ V}$, $E_v = 40\text{ klx}$, sunlight	I_{CC}	1.0	mA
Ausgangsspannung Output voltage	Pin 3		
$I_{OUT} = 0.5\text{ mA}$, $E_e = 0.7\text{ mW/m}^2$ (Testsignal, s. Figure 2) (test signal, see Fig. 2)	$V_{OUT\text{ low}}$	≤ 250	mV

¹⁾ In Verbindung mit einer typ. SFH 415 bei Betrieb mit $I_F = 0.5\text{ A}$ wird eine Reichweite von ca. 35 m erreicht.

¹⁾ Together with an IRED SFH 415 under operation conditions of $I_F = 0.5\text{ A}$ a distance of 35 m is possible.

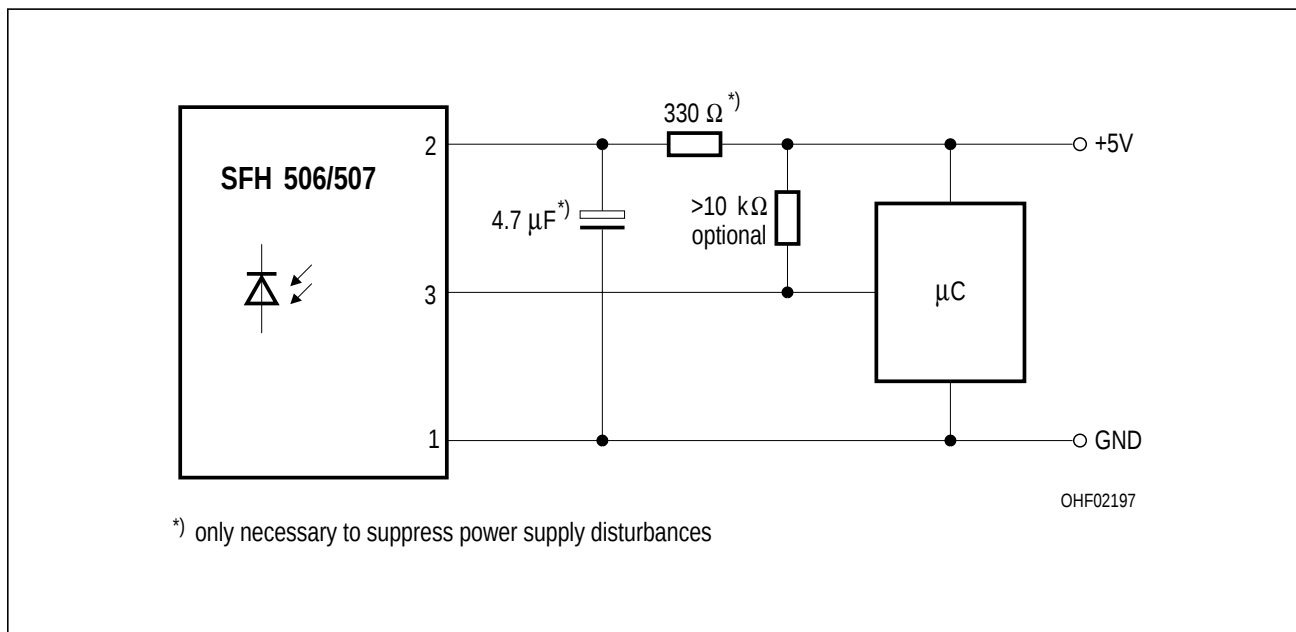


Figure 1 Externe Beschaltung
External circuit

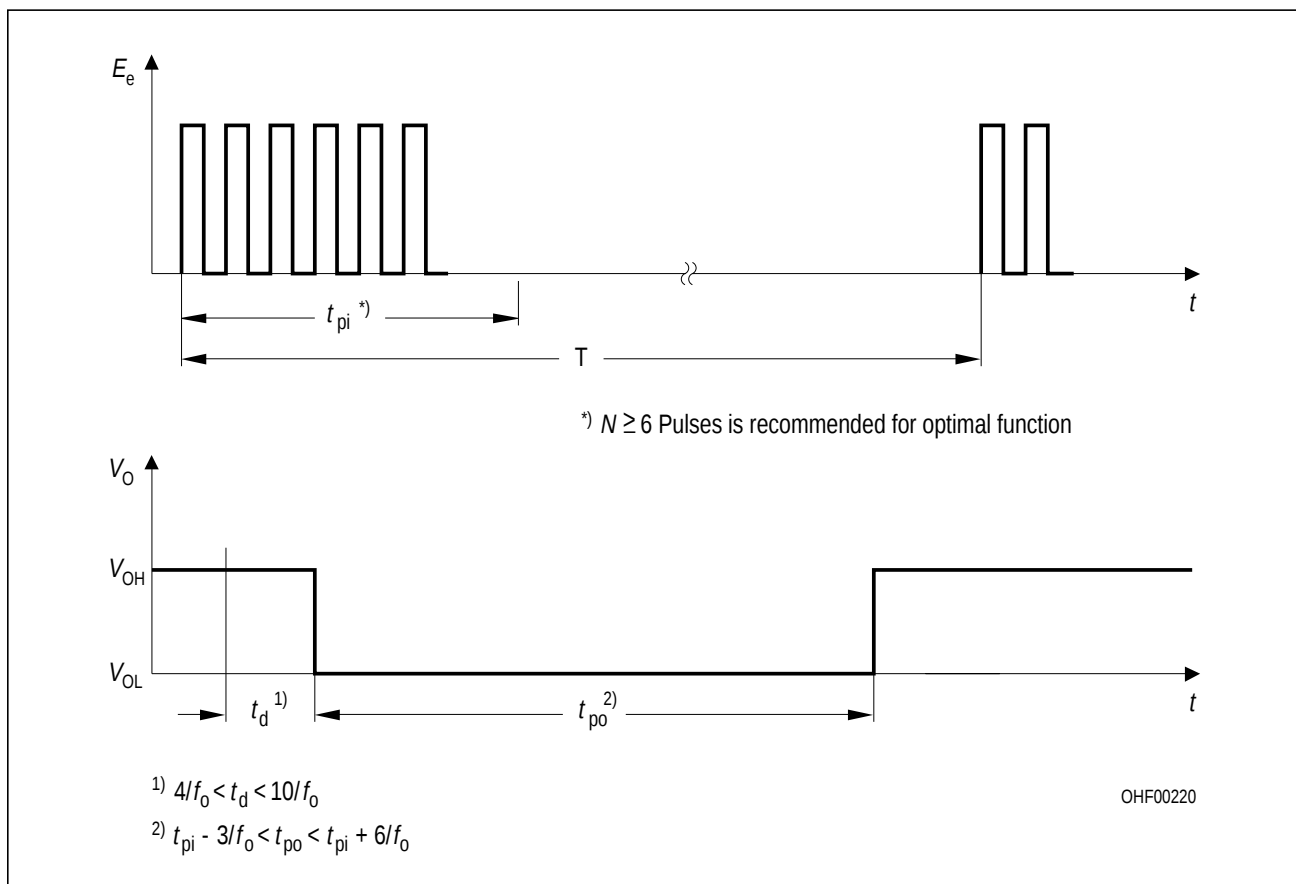
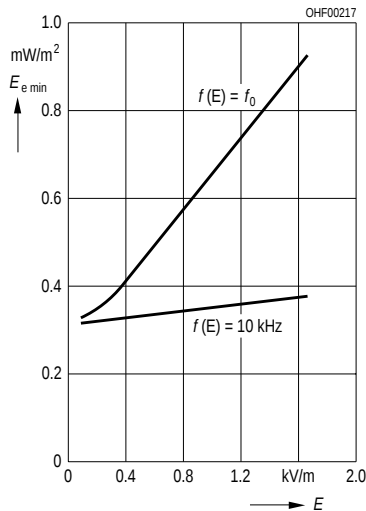


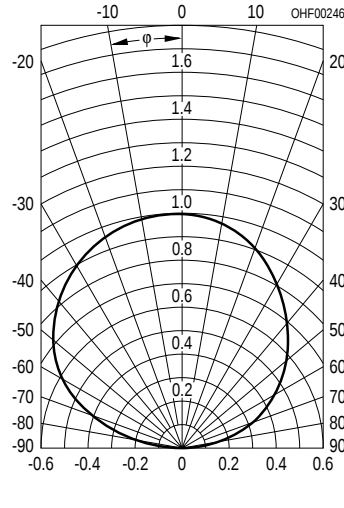
Figure 2 Optisches Testsignal (IR-Diode SFH 415, $I_F = 0.5$ A, $N = 6$ pulses, $f = f_0$, $T = 10$ ms)
Optical test signal

Sensitivity vs. electric field disturbance

$E_{e \min} = f(E)$, field strength of disturbance,
 $f = f_0$

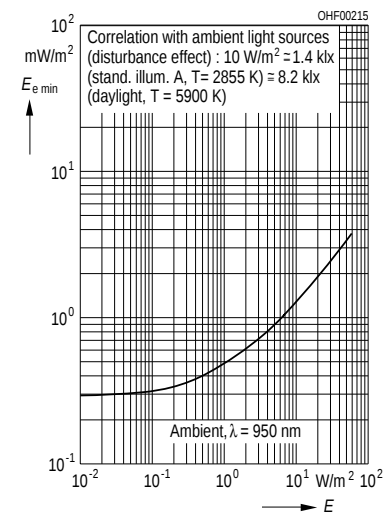


Vertical directivity ϕ_y



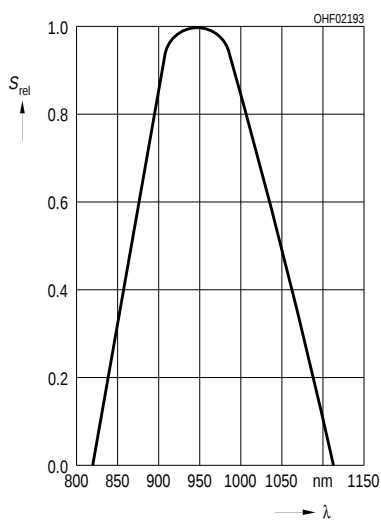
Sensitivity vs. bright ambient

$E_{e \min} = f(E)$

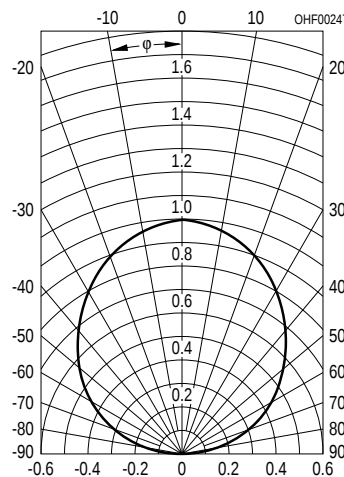


Relative luminous sensitivity

$S_{rel} = f(\lambda)$, $T_A = 25^\circ C$

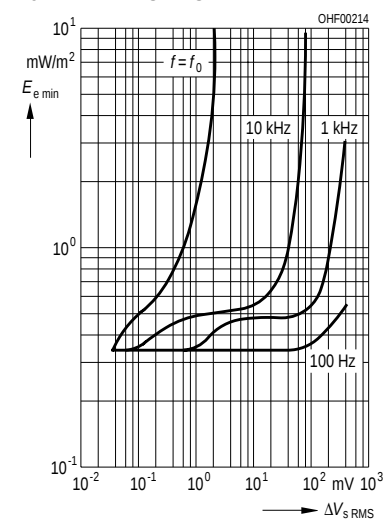


Horizontal directivity ϕ_x



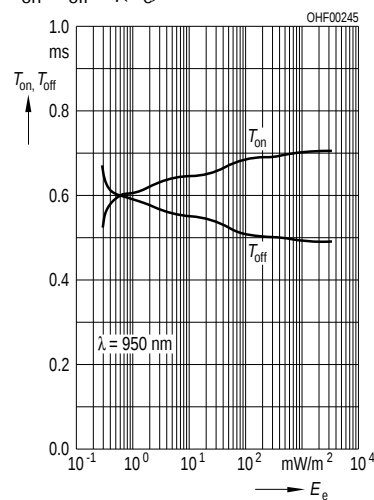
Sensitivity vs. supply volt. disturbances,

$E_{e \min} = f(\Delta V_{s \text{ RMS}})$



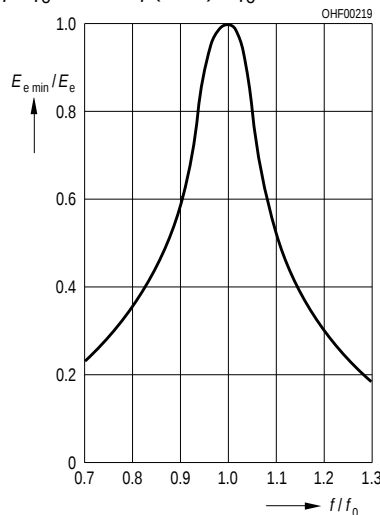
Output pulse

$T_{on}, T_{off} = f(E_e)$



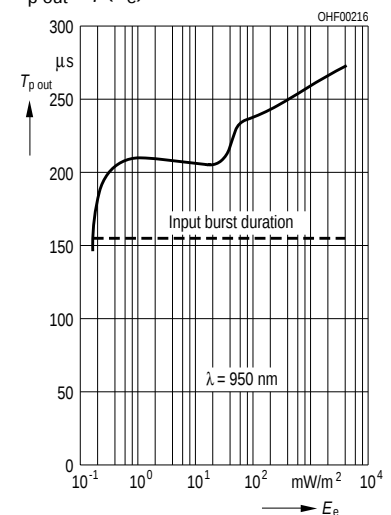
Relative sensitivity $E_{e \min}/E_e = f(f/f_0)$

$f = f_0 \pm 5\%$, Δf (3 dB) = $f_0/7$



Sensitivity vs. dark ambient

$T_{p \text{ out}} = f(E_e)$



Sensitivity vs. duty cycle

$$E_e = f(t_p / T)$$

