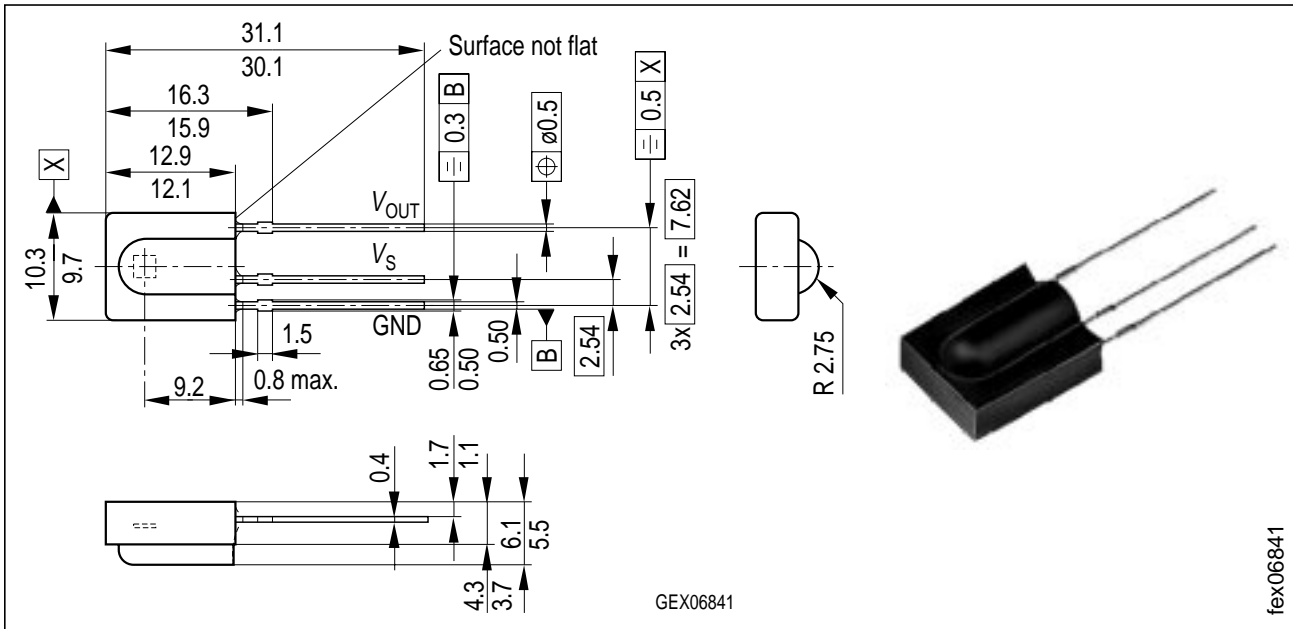


IR-Empfänger/Demodulator-Baustein IR-Receiver/Demodulator Device

SFH 506



Wesentliche Merkmale

- Fotodiode mit integriertem Verstärker
- Angepaßt an verschiedene Trägerfrequenzen
- Gehäuse schwarz eingefärbt: Verguß optimiert für eine Wellenlänge von 950 nm
- Hohe Störsicherheit
- Geringe Stromaufnahme
- 5 V Betriebsspannung
- Hohe Empfindlichkeit
- TTL und CMOS kompatibel
- Verwendbar bis zu einem Tastverhältnis $\leq 40\%$

Anwendungen

- Empfänger für IR-Fernsteuerungen

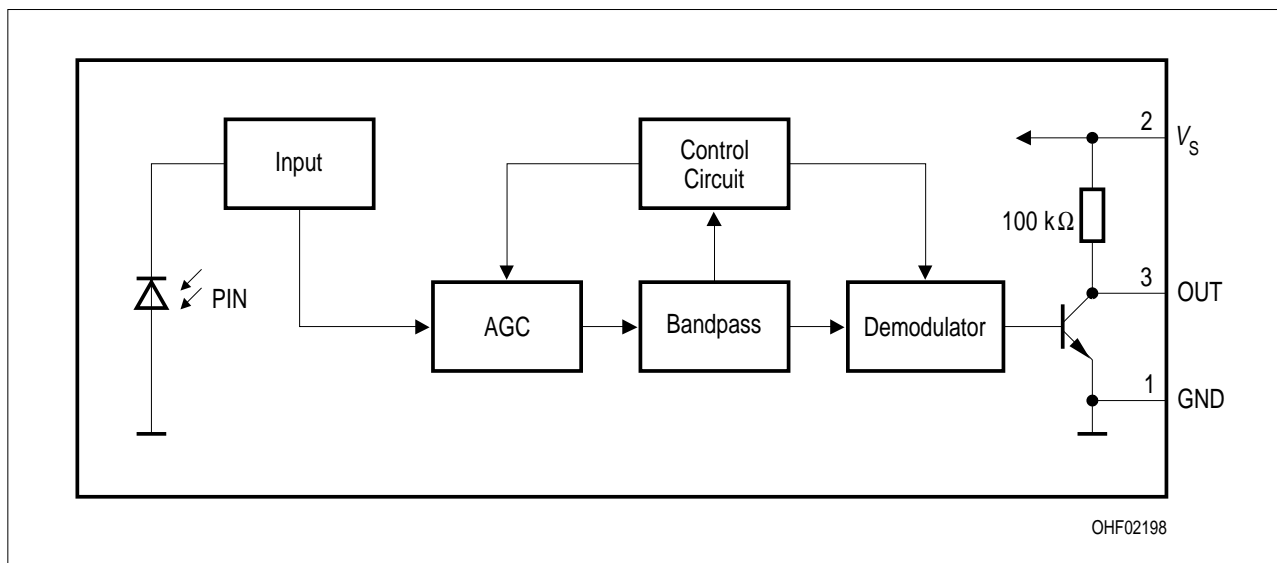
Features

- Photodiode with hybride integrated circuit
- Available for several carrier frequencies
- Black epoxy resin, daylight filter optimized for 950 nm
- High immunity against ambient light
- Low power consumption
- 5 V supply voltage
- High sensitivity (internal shield case)
- TTL and CMOS compatibility
- Continuous transmission possible ($t_{pr}/T \leq 0.4$)

Applications

- IR-remote control preamplifier modules

Typ	Trägerfrequ.	Bestellnr.	Typ	Trägerfrequ.	Bestellnr.
Type	Carrier Frequency kHz	Ordering Code	Type	Carrier Frequency kHz	Ordering Code
SFH 506-30	30	Q62702-P1196	SFH 506-38	38	Q62702-P1199
SFH 506-33	33	Q62702-P1197	SFH 506-40	40	Q62702-P1200
SFH 506-36	36	Q62702-P1198	SFH 506-56	56	Q62702-P1201



Blockschaltbild
Block Diagram

Grenzwerte
Maximum Ratings

Bezeichnung Description	Symbol Symbol	Wert Value	Einheit Unit
Betriebs- und Lagertemperatur Operation and storage temperature range	T_A, T_{stg}	- 25 ... + 85	°C
Sperrschichttemperatur Junction temperature range	T_j	100	°C
Löttemperatur Lötstelle 2 mm vom Gehäuse; Lötzeit $t \leq 5$ s Soldering temperature soldering joint ≥ 2 mm distance from package, soldering time $t \leq 5$ s	T_S	260	°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 $T_A \leq 85$ °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)	$E_{e\ min(30-40\ kHz)}^{1)}$ $E_{e\ min(56\ kHz)}^{1)}$ $E_{e\ max}^{1)}$	typ. 0.35 (< 0.5) typ. 0.4 (< 0.6) 30	mW/m ² W/m ²
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{s\ max}$	950	nm
Spektraler Bereich der Fotoempfindlichkeit Range of spectral sensitivity $S = 10\ %\ of\ S_{max}$	$\Delta\lambda$	830 ... 1100	nm
Halbwinkel Half angle	φ	± 45	deg.
Stromaufnahme Current consumption $V_s = 5\ V, E_v = 0$ $V_s = 5\ V, E_v = 40\ 000\ lx, sunlight$	Pin 2 I_{CC} I_{CC}	0.6 (< 0.8) 1.0	mA mA
Ausgangsspannung Output voltage $I_{OUT} = 0.5\ mA, E_e = 0.7\ mW/m^2, f = f_0, T_p/T = 0.4$	Pin 3 $V_{OUT\ low}$	< 250	mV

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

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

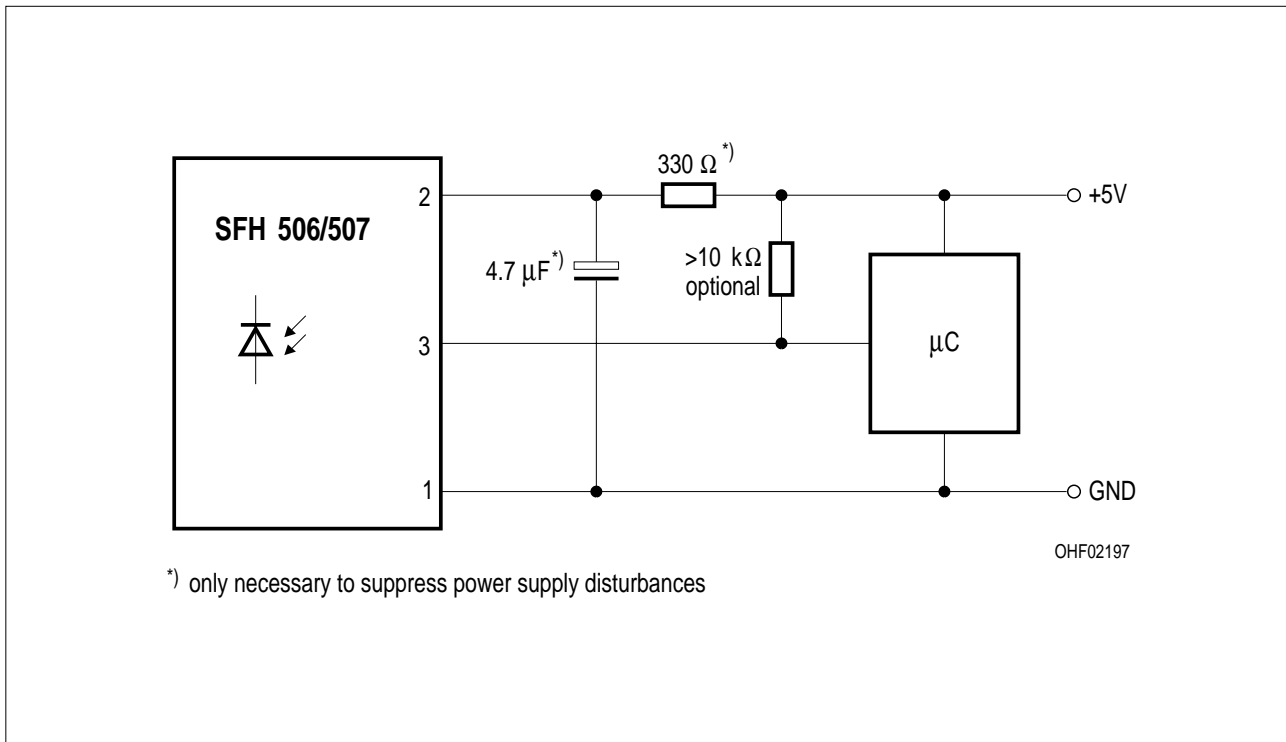


Figure 1 Externe Beschaltung
External circuit

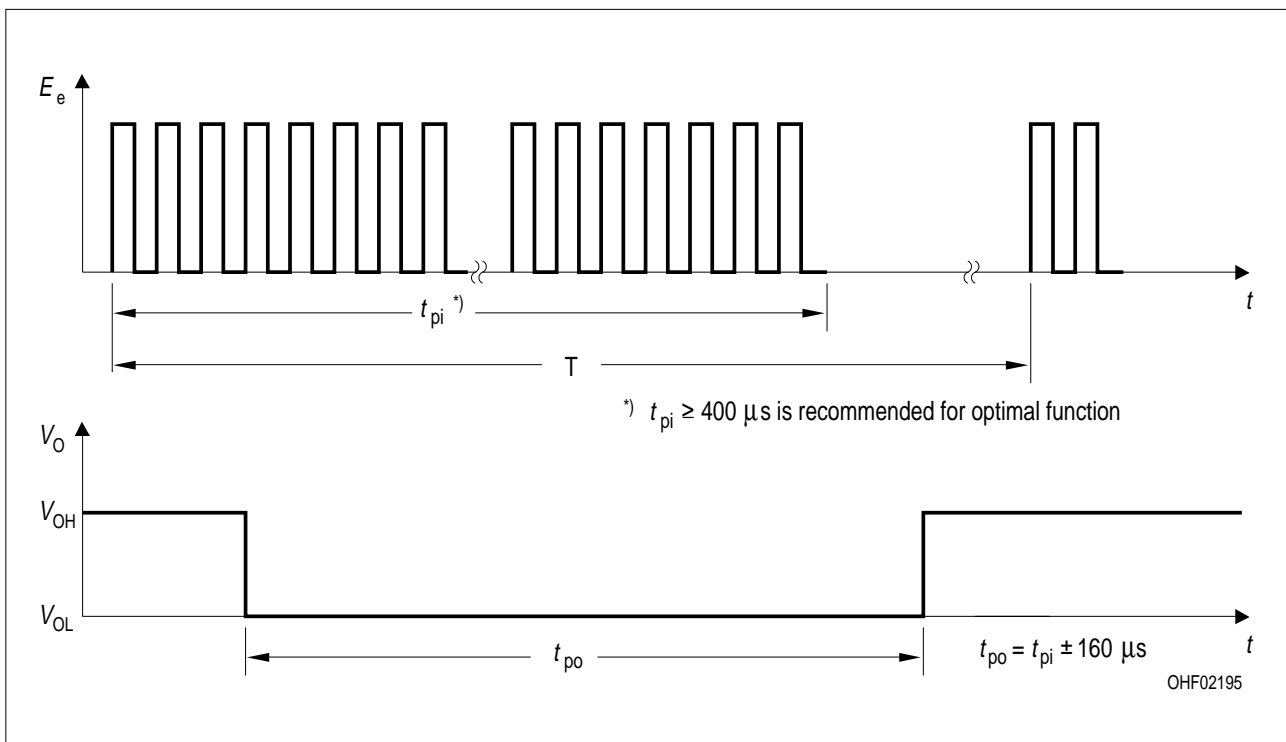
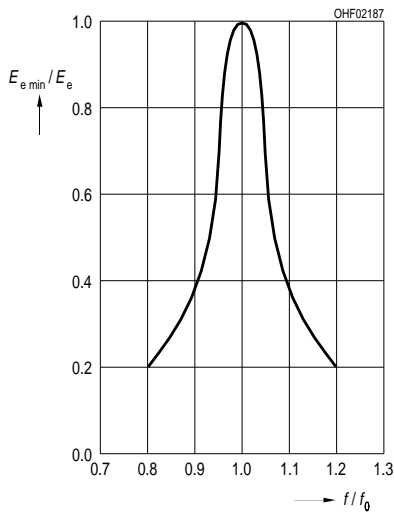


Figure 2 Testsignal
Test signal

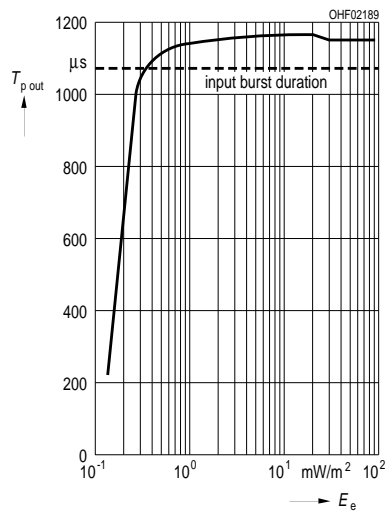
Relative sensitivity

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



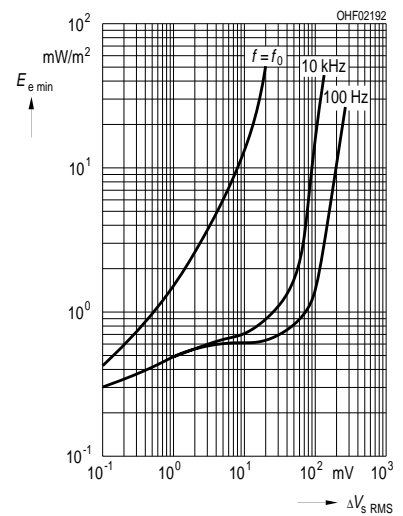
Sensitivity vs. dark ambient $T_{p \text{ out}} = f(E_e)$

$\lambda = 950 \text{ nm}$, optical test signal



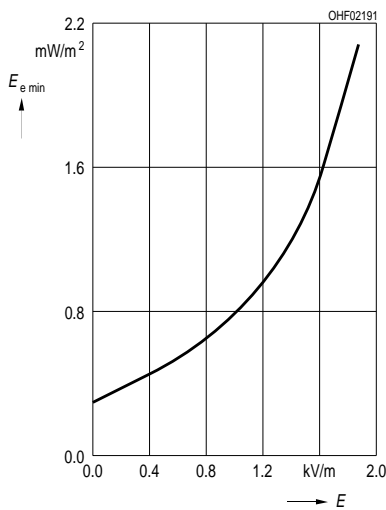
Sensitivity vs. supply voltage disturbances, $E_{e \min} = f(\Delta V_{S \text{ RMS}})$

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



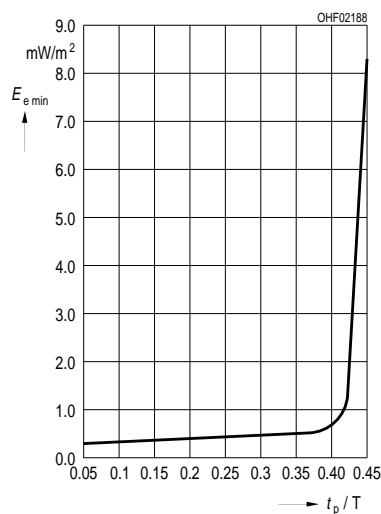
Sensitivity vs. electric field disturbance

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

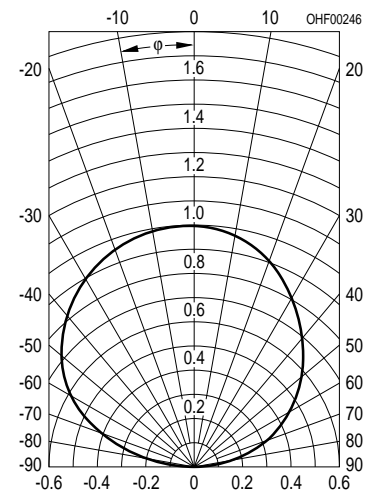


Sensitivity vs. duty cycle

$E_e = f(t_p/T)$

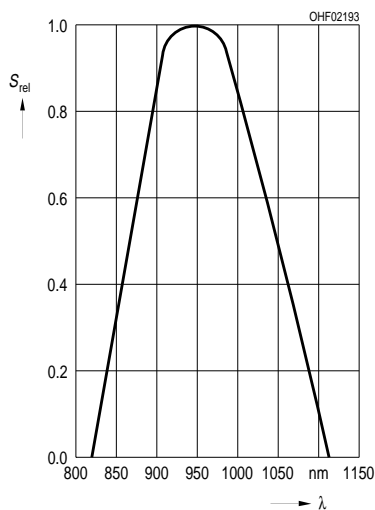


Vertical directivity ϕ_y



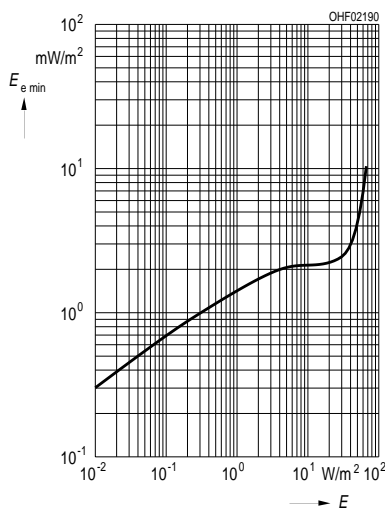
Relative luminous intensity

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

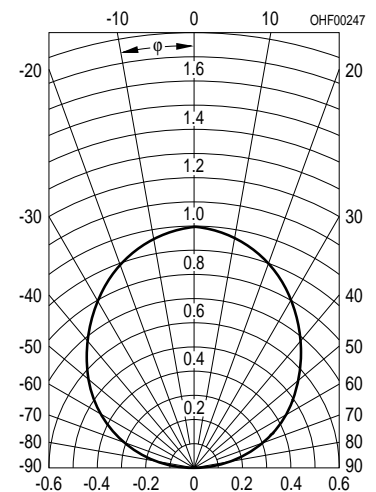


Sensitivity vs. bright ambient

$E_{e \min} = f(E)$, $\lambda = 950 \text{ nm}$, ambient



Horizontal directivity ϕ_x



Output pulse

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

