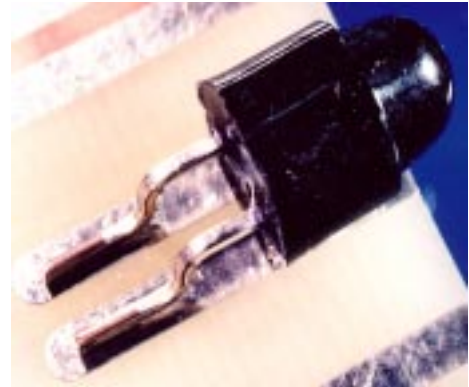
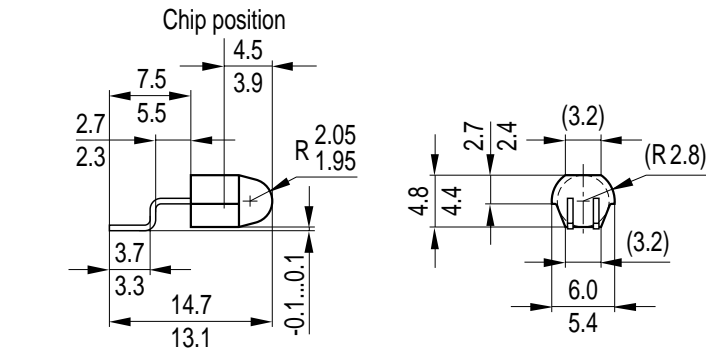


Silizium-PIN-Fotodiode mit sehr kurzer Schaltzeit
Silicon PIN Photodiode with Very Short Switching Time

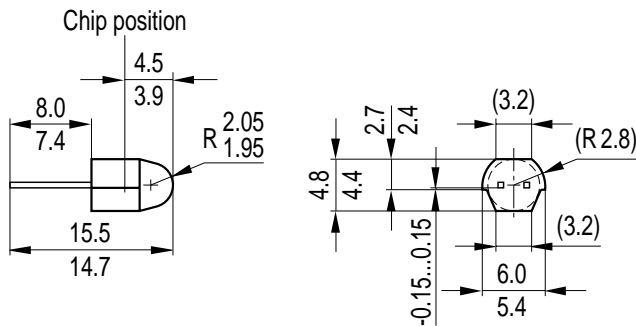
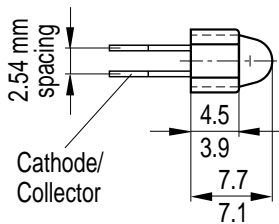
SFH 2500/FA
SFH 2505/FA

Vorläufige Daten / Preliminary Data



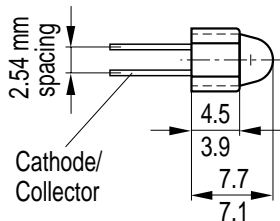
GEO06968

SFH 2500/FA



GEO06969

SFH 2505/FA



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

Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 400 nm bis 1100 nm (SFH 2500/2505) und bei 880 nm (SFH 2500 FA/2505 FA)
- Kurze Schaltzeit (typ. 5 ns)
- Passend zu IRED SFH 451x, SFH 458x
- Für Oberflächenmontage (SMT) geeignet
- Gegurtet lieferbar

Anwendungen

- Industrieelektronik
- "Messen/Steuern/Regeln"
- Schnelle Lichtschranken für Gleich- und Wechselbetrieb
- Datenübertragung

Features

- Especially suitable for applications from 400 nm to 1100 nm (SFH 2500/2505) and of 880 nm (SFH 2500 FA/2505 FA)
- Short switching time (typ. 5 ns)
- Matches IRED SFH 451x, SFH 458x
- Suitable for surface mounting (SMT)
- Available on tape and reel

Applications

- Industrial electronics
- For control and drive circuits
- Photointerrupters
- Data transmission

| Typ Type | Bestellnummer Ordering Code | Gehäuse Package |
|-------------|--------------------------------|---|
| SFH 2500 | Q62702-P5034 | 5-mm-LED-Gehäuse (T 1 ^{3/4}), klares (SFH 2500/2505) und schwarz eingefärbtes (SFH 2500 FA/2505 FA) Epoxy-Gießharz, Anschlüsse (SFH 2500/2500 FA gebogen, SFH 2505/2505 FA gerade) im 2.54-mm-Raster (1/10"), Kathodenkennzeichnung: siehe Maßzeichnung. 5 mm LED package (T 1 ^{3/4}), clear (SFH 2500/2505) and black-colored (SFH 2500 FA/2505 FA) epoxy resin, solder tabs (SFH 2500/2500 FA bent, SFH 2505/2505 FA straight) lead spacing 2.54 mm (1/10"), cathode marking: see package outline. |
| SFH 2505 | Q62701-P5029 | |
| SFH 2500 FA | Q62702-P1795 | |
| SFH 2505 FA | Q62701-P5030 | |

Grenzwerte Maximum Ratings

| Bezeichnung Description | Symbol Symbol | Wert Value | Einheit Unit |
|--|-------------------|---------------|-----------------|
| Betriebs- und Lagertemperatur Operating and storage temperature range | $T_{op}; T_{stg}$ | - 40 ... + 85 | °C |
| Sperrspannung Reverse voltage | V_R | 50 | V |
| Verlustleistung Total power dissipation | P_{tot} | 100 | mW |

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

| Bezeichnung Description | Symbol Symbol | Wert Value | | Einheit Unit |
|---|------------------------------|----------------------|----------------------------|------------------------------------|
| | | SFH 2500 SFH 2505 | SFH 2500 FA SFH 2505 FA | |
| Fotoempfindlichkeit Spectral sensitivity $V_R = 5\text{ V}$, Normlicht/standard light A, $T = 2856\text{ K}$, $V_R = 5\text{ V}$, $\lambda = 870\text{ nm}$, $E_e = 1\text{ mW/cm}^2$ | S | 100 (> 75) | – | nA/lx |
| | S | – | 70 (> 50) | μA |
| Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity | $\lambda_{S\text{max}}$ | 850 | 900 | nm |
| Spektraler Bereich der Fotoempfindlichkeit $S = 10\%$ von S_{max} Spectral range of sensitivity $S = 10\%$ of S_{max} | λ | 400 ... 1100 | 750 ... 1100 | nm |
| Bestrahlungsempfindliche Fläche Radiant sensitive area | A | 1 | 1 | mm^2 |
| Abmessung der bestrahlungsempfindlichen Fläche Dimensions of radiant sensitive area | $L \times B$ $L \times W$ | 1×1 | 1×1 | mm×mm |
| Halbwinkel Half angle | φ | ± 15 | ± 15 | Grad deg. |
| Dunkelstrom, $V_R = 20\text{ V}$ Dark current | I_R | $1 (\leq 5)$ | $1 (\leq 5)$ | nA |
| Spektrale Fotoempfindlichkeit, $\lambda = 850\text{ nm}$ Spectral sensitivity | S_λ | 0.62 | 0.59 | A/W |
| Quantenausbeute, $\lambda = 850\text{ nm}$ Quantum yield | η | 0.89 | 0.86 | <u>Electrons</u> <u>Photons</u> |
| Leerlaufspannung Open-circuit voltage $E_v = 1000\text{ lx}$, Normlicht/standard light A, $T = 2856\text{ K}$ $E_e = 0.5\text{ mW/cm}^2$, $\lambda = 870\text{ nm}$ | V_O V_O | 430 (> 360) – | – 390 (> 320) | mV mV |
| Kurzschlußstrom Short-circuit current $E_v = 1000\text{ lx}$, Normlicht/standard light A, $T = 2856\text{ K}$ $E_e = 0.5\text{ mW/cm}^2$, $\lambda = 870\text{ nm}$ | I_{SC} I_{SC} | 100 – | – 35 | μA μA |

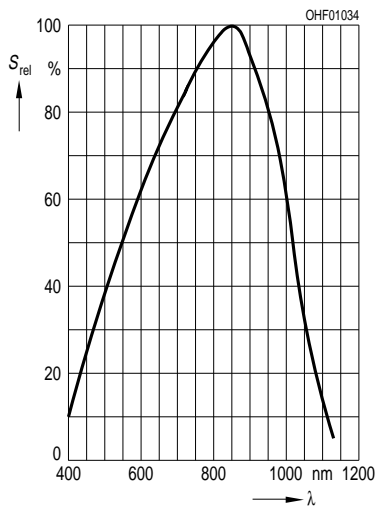
Kennwerte ($T_A = 25\text{ °C}$)
Characteristics (cont'd)

| Bezeichnung Description | Symbol Symbol | Wert Value | | Einheit Unit |
|--|------------------|-----------------------|----------------------------|---|
| | | SFH 2500 SFH 2505 | SFH 2500 FA SFH 2505 FA | |
| Anstiegs- und Abfallzeit des Fotostromes Rise and fall time of the photocurrent $R_L = 50\ \Omega$; $V_R = 5\text{ V}$; $\lambda = 850\text{ nm}$; $I_p = 800\ \mu\text{A}$ | t_r, t_f | 5 | 5 | ns |
| Kapazität, $V_R = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ Capacitance | C_0 | 11 | 11 | pF |
| Temperaturkoeffizient von V_O Temperature coefficient of V_O | TC_V | - 2.6 | - 2.6 | mV/K |
| Temperaturkoeffizient von I_{SC} Temperature coefficient of I_{SC} Normlicht/standard light A $\lambda = 870\text{ nm}$ | TC_I | 0.18 - | - 0.1 | %/K |
| Rauschäquivalente Strahlungsleistung Noise equivalent power $V_R = 20\text{ V}$, $\lambda = 850\text{ nm}$ | NEP | 2.9×10^{-14} | 2.9×10^{-14} | $\frac{\text{W}}{\sqrt{\text{Hz}}}$ |
| Nachweisgrenze, $V_R = 20\text{ V}$, $\lambda = 850\text{ nm}$ Detection limit | D^* | 3.5×10^{12} | 3.5×10^{12} | $\frac{\text{cm} \cdot \sqrt{\text{Hz}}}{\text{W}}$ |

Relative spectral sensitivity

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

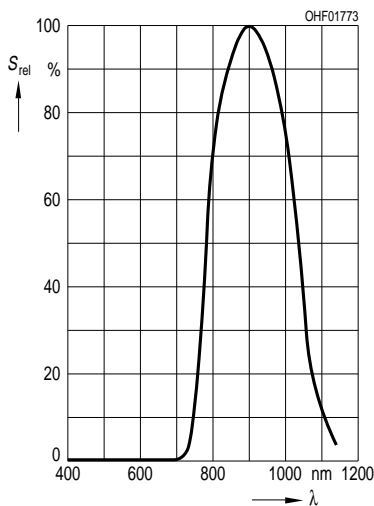
SFH 2500/2505



Relative spectral sensitivity

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

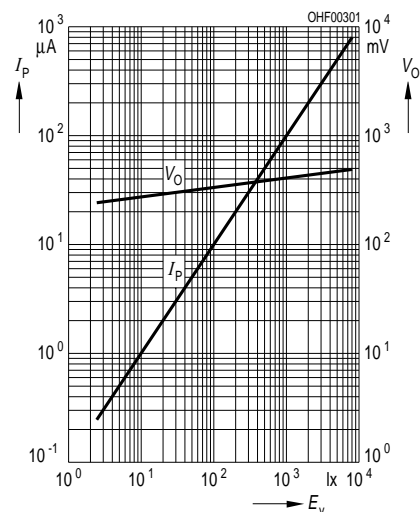
SFH 2500 FA/2505 FA



Photocurrent $I_P = f(E_V), V_R = 5 V$

Open-circuit voltage $V_O = f(E_V)$

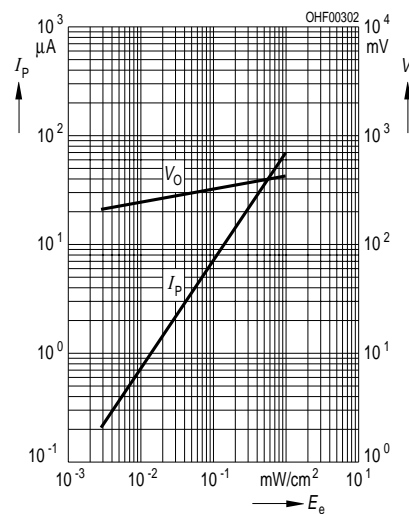
SFH 2500/2505



Photocurrent $I_P = f(E_e), V_R = 5 V$

Open-circuit-voltage $V_O = f(E_e)$

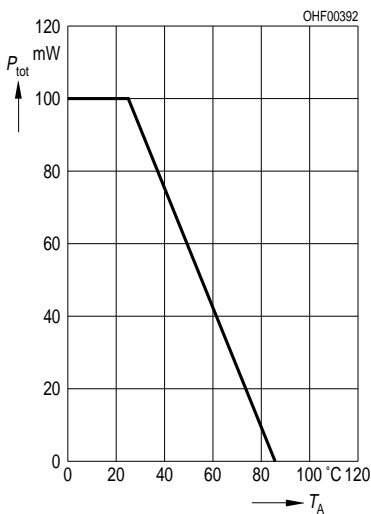
SFH 2500 FA/2505 FA



Total power dissipation

$$P_{tot} = f(T_A)$$

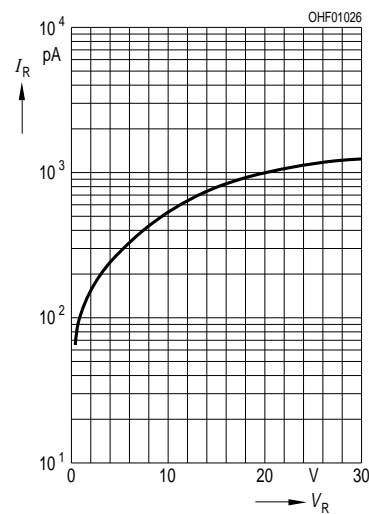
SFH 2500 FA/2505 FA



Dark current

$$I_R = f(V_R), E = 0$$

SFH 2500 FA/2505 FA



Directional characteristics $S_{rel} = f(\varphi)$

SFH 2500 FA/2505 FA

