

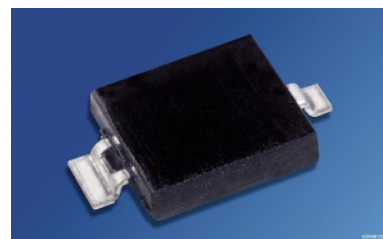
# Silizium-Pin-Fotodiode mit Tageslichtsperrfilter; in SMT

## Silicon Pin Photodiode with Daylight Filter; in SMT

**BP 104 F**  
**BP 104 FS**



BP 104 F



BP 104 FS

### Wesentliche Merkmale

- Speziell geeignet für Anwendungen bei 950 nm
- Kurze Schaltzeit (typ. 20 ns)
- DIL-Plastikbauform mit hoher Packungsdichte
- BP 104 FS: geeignet für Vapor-Phase Löten und IR-Reflow Löten

### Anwendungen

- IR-Fernsteuerung von Fernseh- und Rundfunkgeräten, Videorecordern, Lichtdimmern, Gerätefernsteuerungen
- Lichtschranken für Gleich- und Wechsellichtbetrieb

### Features

- Especially suitable for applications of 950 nm
- Short switching time (typ. 20 ns)
- DIL plastic package with high packing density
- BP 104 FS: suitable for vapor-phase and IR-reflow soldering

### Applications

- IR remote control of hi-fi and TV sets, video tape recorders, dimmers, remote controls of various equipment
- Photointerrupters

| Typ<br>Type | Bestellnummer<br>Ordering Code | Gehäuse<br>Package  |
|-------------|--------------------------------|---|
| BP 104 F    | Q62702-P84                     | DIL-Gehäuse, schwarzes Epoxy-Gießharz,<br>Kathodenkennzeichnung: Fähnchen am Anschluß<br>DIL package, black epoxy resin<br>Cathode marking: flag on lead                |
| BP 104 FS   | Q62702-P1646                   | DIL/SMT-Gehäuse, schwarzes Epoxy-Gießharz,<br>Kathodenkennzeichnung: Langer, breiter Anschluß<br>DIL/SMT package, black epoxy resin<br>Cathode marking: long broad lead |

**Grenzwerte**  
**Maximum Ratings**

| Bezeichnung<br>Parameter   | Symbol<br>Symbol  | Wert<br>Value  | Einheit<br>Unit |
|--|-------------------|----------------|-----------------|
| Betriebs- und Lagertemperatur<br>Operating and storage temperature range | $T_{op}; T_{stg}$ | - 40 ... + 100 | °C              |
| Sperrspannung<br>Reverse voltage   | $V_R$             | 20             | V               |
| Verlustleistung, $T_A = 25\text{ °C}$                                    | $P_{tot}$         | 150            | mW              |

**Kennwerte** ( $T_A = 25\text{ °C}$ ,  $\lambda = 950\text{ nm}$ )  
**Characteristics**

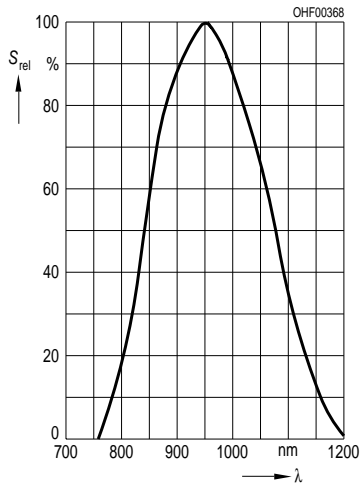
| Bezeichnung<br>Parameter   | Symbol<br>Symbol             | Wert<br>Value          | Einheit<br>Unit              |
|--|------------------------------|------------------------|------------------------------|
| Fotostrom<br>Photocurrent<br>$V_R = 5\text{ V}$ , $E_e = 1\text{ mW/cm}^2$   | $I_P$                        | 34 ( $\geq 25$ )       | $\mu\text{A}$                |
| Wellenlänge der max. Fotoempfindlichkeit<br>Wavelength of max. sensitivity   | $\lambda_{S\text{ max}}$     | 950                    | nm                           |
| Spektraler Bereich der Fotoempfindlichkeit<br>$S = 10\%$ von $S_{\text{max}}$<br>Spectral range of sensitivity<br>$S = 10\%$ of $S_{\text{max}}$ | $\lambda$                    | 800 ... 1100           | nm                           |
| Bestrahlungsempfindliche Fläche<br>Radiant sensitive area  | $A$                          | 4.84                   | $\text{mm}^2$                |
| Abmessung der bestrahlungsempfindlichen Fläche<br>Dimensions of radiant sensitive area   | $L \times B$<br>$L \times W$ | $2.20 \times 2.20$     | $\text{mm} \times \text{mm}$ |
| Abstand Chipoberfläche zu Gehäuseoberfläche<br>Distance chip front to case surface   | $H$                          | 0.5<br>0.3 (BP 104 FS) | mm                           |
| Halbwinkel<br>Half angle   | $\varphi$                    | $\pm 60$               | Grad<br>deg.                 |
| Dunkelstrom, $V_R = 10\text{ V}$<br>Dark current   | $I_R$                        | 2 ( $\leq 30$ )        | nA                           |
| Spektrale Fotoempfindlichkeit<br>Spectral sensitivity  | $S_\lambda$                  | 0.70                   | A/W                          |
| Quantenausbeute<br>Quantum yield   | $\eta$                       | 0.90                   | <u>Electrons</u><br>Photon   |

**Kennwerte** ( $T_A = 25\text{ °C}$ ,  $\lambda = 950\text{ nm}$ )  
**Characteristics** (cont'd)

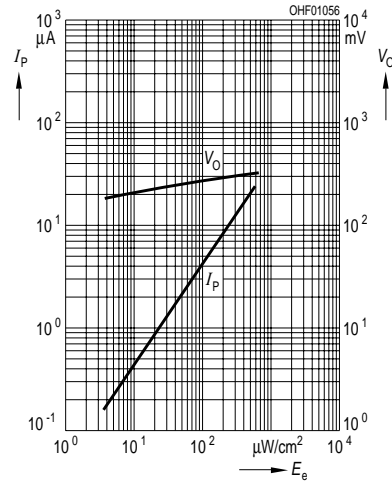
| Bezeichnung<br>Parameter   | Symbol<br>Symbol | Wert<br>Value         | Einheit<br>Unit                                      |
|--|------------------|-----------------------|--|
| Leerlaufspannung, $E_e = 0.5\text{ mW/cm}^2$<br>Open-circuit voltage   | $V_O$            | 330 ( $\geq 250$ )    | mV   |
| Kurzschlußstrom, $E_e = 0.5\text{ mW/cm}^2$<br>Short-circuit current   | $I_{SC}$         | 17                    | $\mu\text{A}$  |
| Anstiegs- und Abfallzeit des Fotostromes<br>Rise and fall time of the photocurrent<br>$R_L = 50\ \Omega$ ; $V_R = 5\text{ V}$ ; $\lambda = 850\text{ nm}$ ; $I_p = 800\ \mu\text{A}$ | $t_r, t_f$       | 20                    | ns   |
| Durchlaßspannung, $I_F = 100\text{ mA}$ , $E = 0$<br>Forward voltage   | $V_F$            | 1.3                   | V  |
| Kapazität, $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$<br>Capacitance  | $C_0$            | 48                    | pF   |
| Temperaturkoeffizient von $V_O$<br>Temperature coefficient of $V_O$  | $TC_V$           | - 2.6                 | mV/K   |
| Temperaturkoeffizient von $I_{SC}$<br>Temperature coefficient of $I_{SC}$  | $TC_I$           | 0.18                  | %/K  |
| Rauschäquivalente Strahlungsleistung<br>Noise equivalent power<br>$V_R = 10\text{ V}$  | $NEP$            | $3.6 \times 10^{-14}$ | $\frac{\text{W}}{\sqrt{\text{Hz}}}$                  |
| Nachweisgrenze, $V_R = 10\text{ V}$<br>Detection limit   | $D^*$            | $6.1 \times 10^{12}$  | $\frac{\text{cm} \times \sqrt{\text{Hz}}}{\text{W}}$ |

**Relative Spectral Sensitivity**

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

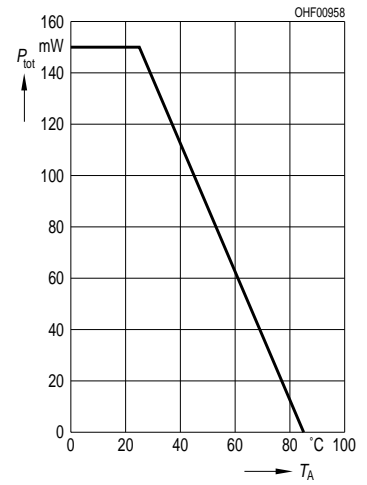


**Photocurrent  $I_P = f(E_e), V_R = 5 V$   
Open-Circuit Voltage  $V_O = f(E_e)$**



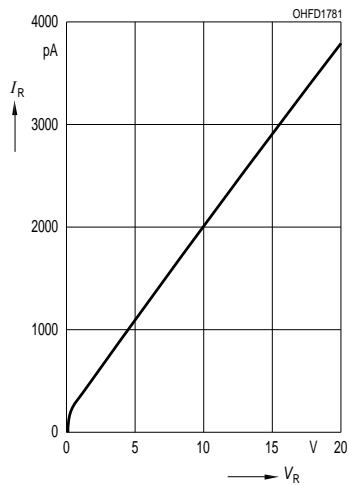
**Total Power Dissipation**

$P_{tot} = f(T_A)$



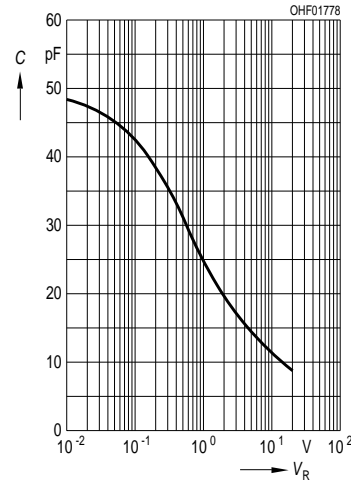
**Dark Current**

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



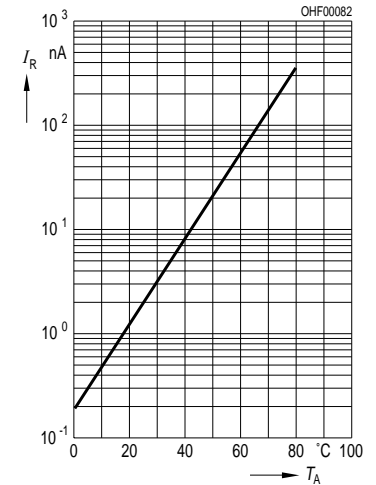
**Capacitance**

$C = f(V_R), f = 1 \text{ MHz}, E = 0$



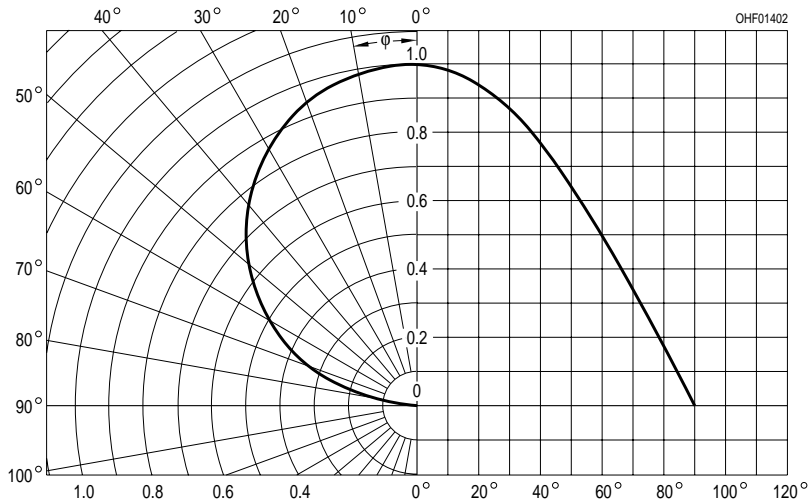
**Dark Current**

$I_R = f(T_A), V_R = 10 V, E = 0$

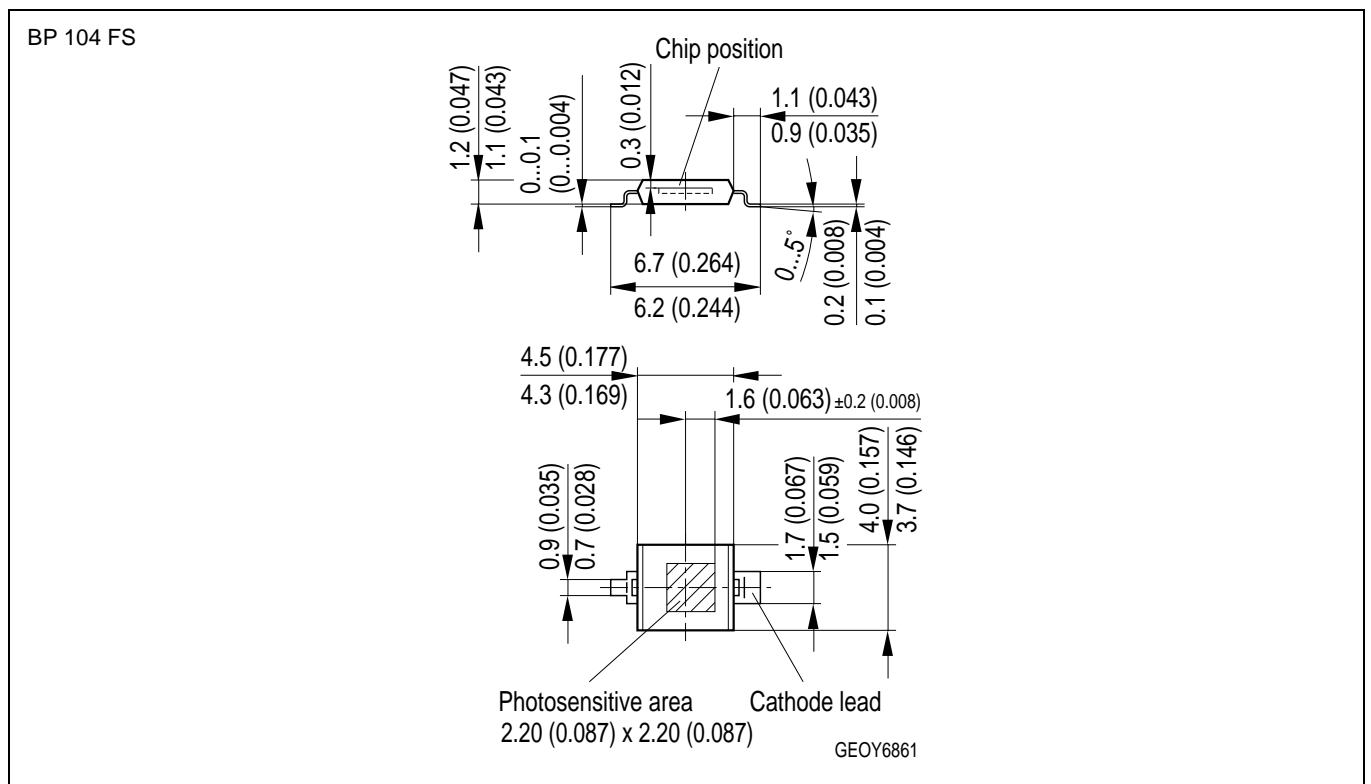
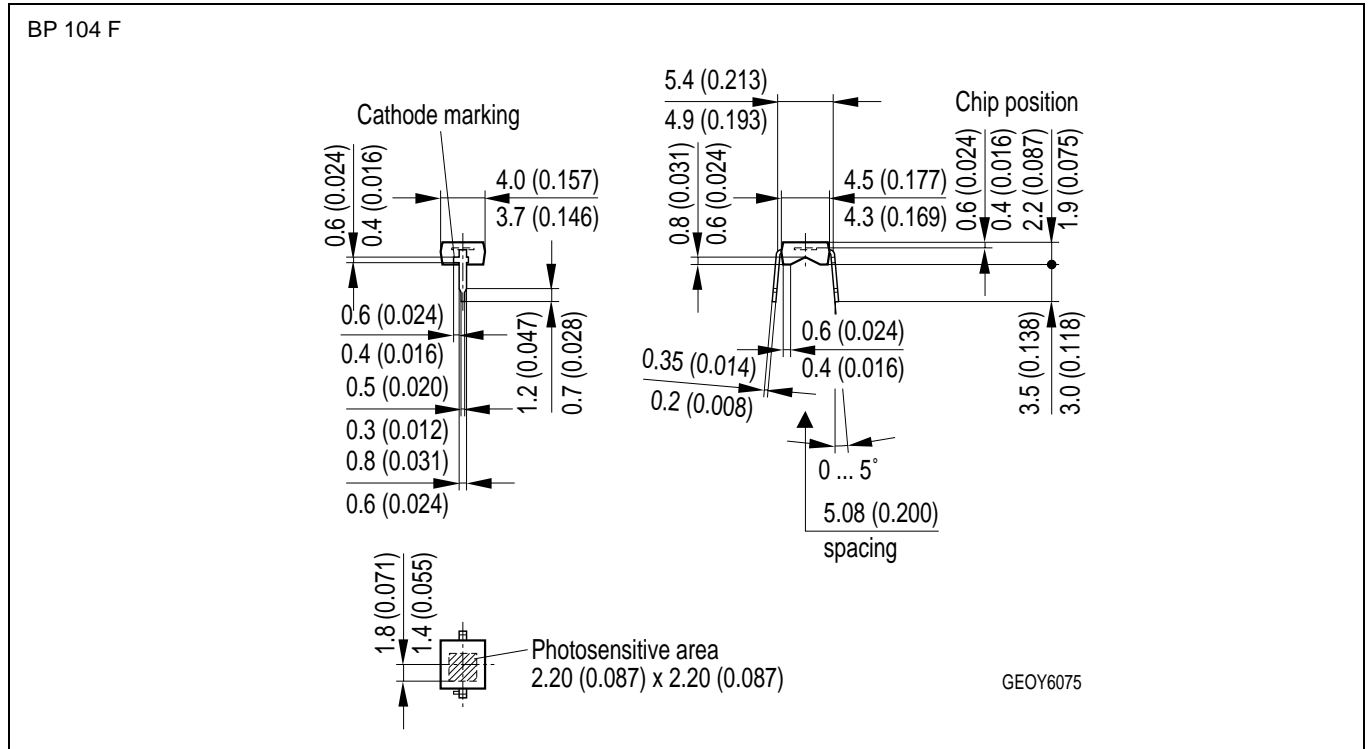


**Directional Characteristics**

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



Maßzeichnung  
Package Outlines



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

**Published by OSRAM Opto Semiconductors GmbH & Co. OHG  
Wernerwerkstrasse 2, D-93049 Regensburg**

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