

Silicon PIN Photodiode with Daylight Blocking Filter

Version 1.4

BP 104 F



Features:

- Especially suitable for applications of 950 nm
- Short switching time (typ. 20 ns)
- DIL plastic package with high packing density
- The product qualification test plan is based on the guidelines of AEC-Q101-REV-C, Stress Test Qualification for Automotive Grade Discrete Semiconductors.

Applications

- Photointerrupters
- Remote control

Ordering Information

| Type: | Photocurrent I_P [μ A] $\lambda = 950 \text{ nm}$, $E_e = 1 \text{ mW/cm}^2$, $V_R = 5 \text{ V}$ | Ordering Code |
|----------|---|---------------|
| BP 104 F | 34 (≥ 25) | Q62702P0084 |

Maximum Ratings ($T_A = 25\text{ °C}$)

| Parameter | Symbol | Values | Unit |
|---|-------------------|-------------|------|
| Operating and storage temperature range | $T_{op}; T_{stg}$ | -40 ... 100 | °C |
| Reverse voltage | V_R | 20 | V |
| Total Power dissipation | P_{tot} | 150 | mW |
| ESD withstand voltage (acc. to ANSI/ ESDA/ JEDEC JS-001 - HBM) | V_{ESD} | 2000 | V |

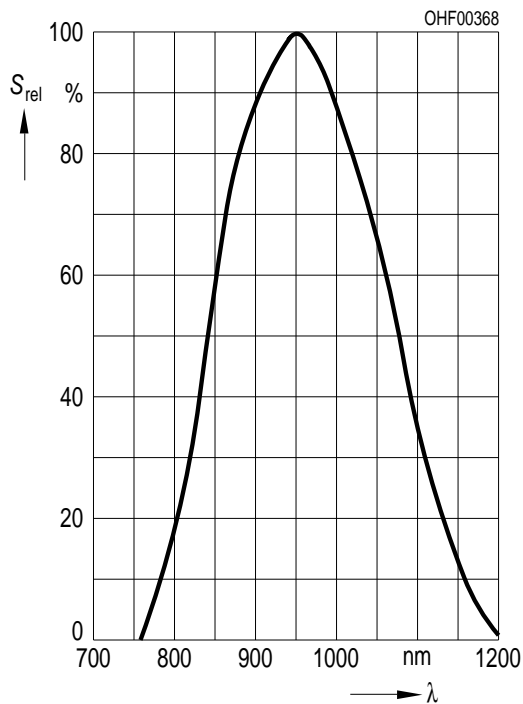
Characteristics ($T_A = 25\text{ °C}$)

| Parameter | Symbol | Values | Unit |
|--|--------------------------------|-----------------------|--------------------|
| Photocurrent ($V_R = 5\text{ V}$, $E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$) | (typ (min)) I_p | 34 (≥ 25) | μA |
| Wavelength of max. sensitivity | (typ) $\lambda_{S\max}$ | 950 | nm |
| Spectral range of sensitivity | (typ) $\lambda_{10\%}$ | (typ) 800 ... 1100 | nm |
| Radiant sensitive area | (typ) A | 4.84 | mm^2 |
| Dimensions of radiant sensitive area | (typ) $L \times W$ | 2.2 x 2.2 | mm x mm |
| Half angle | (typ) φ | ± 60 | ° |
| Dark current ($V_R = 10\text{ V}$) | (typ (max)) I_R | 2 (≤ 30) | nA |
| Spectral sensitivity of the chip ($\lambda = 950\text{ nm}$) | (typ) $S_{\lambda\text{ typ}}$ | 0.7 | A / W |
| Quantum yield of the chip ($\lambda = 950\text{ nm}$) | (typ) η | 0.91 | Electrons / Photon |
| Open-circuit voltage ($E_e = 0.5\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$) | (typ (min)) V_O | 330 (≥ 250) | mV |
| Short-circuit current ($E_e = 0.5\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$) | (typ) I_{SC} | 17 | μA |
| Rise and fall time ($V_R = 5\text{ V}$, $R_L = 50\ \Omega$, $\lambda = 850\text{ nm}$, $I_p = 800\ \mu\text{A}$) | (typ) t_r, t_f | 0.02 | μs |
| Forward voltage ($I_F = 100\text{mA}$, $E_e = 0$) | (typ) V_F | 1.3 | V |
| Capacitance ($V_R = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$) | (typ) C_0 | 48 | pF |
| Temperature coefficient of V_O | (typ) TC_V | -2.6 | mV / K |

| Parameter | | Symbol | Values | Unit |
|---|-------|--------|----------------------|---|
| Temperature coefficient of I_{SC} ($\lambda = 950 \text{ nm}$) | (typ) | TC_1 | 0.18 | % / K |
| Noise equivalent power ($V_R = 10 \text{ V}$, $\lambda = 950 \text{ nm}$) | (typ) | NEP | 0.036 | $\text{pW} / \text{Hz}^{1/2}$ |
| Detection limit | (typ) | D^* | 6.1×10^{12} | $\text{cm} \times \text{Hz}^{1/2} / \text{W}$ |

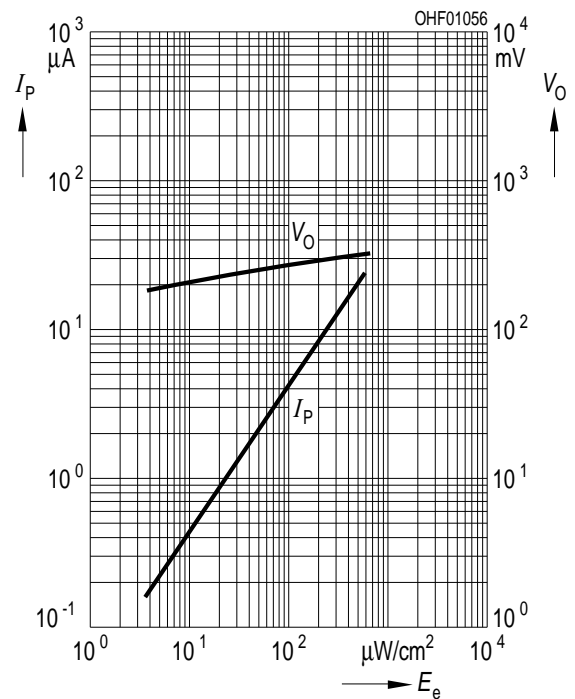
Relative Spectral Sensitivity ^{1) page 8}

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



Photocurrent / Open-Circuit Voltage ^{1) page 8}

$I_P (V_R = 5 \text{ V}) / V_O = f(E_e)$



Power Consumption

$P_{tot} = f(T_A)$



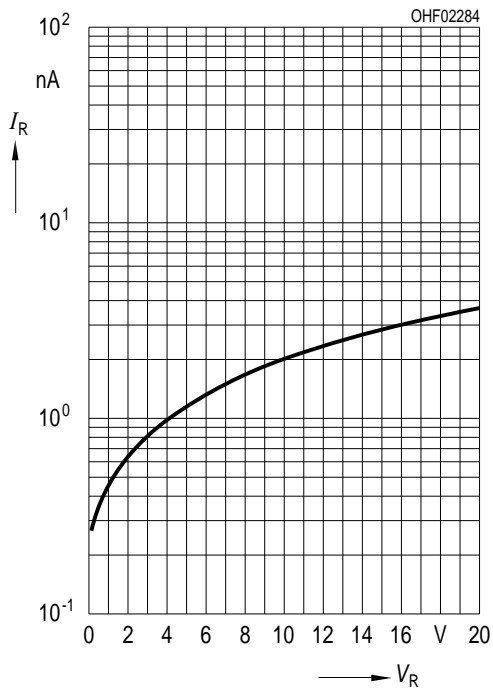
Dark Current ^{1) page 8}

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



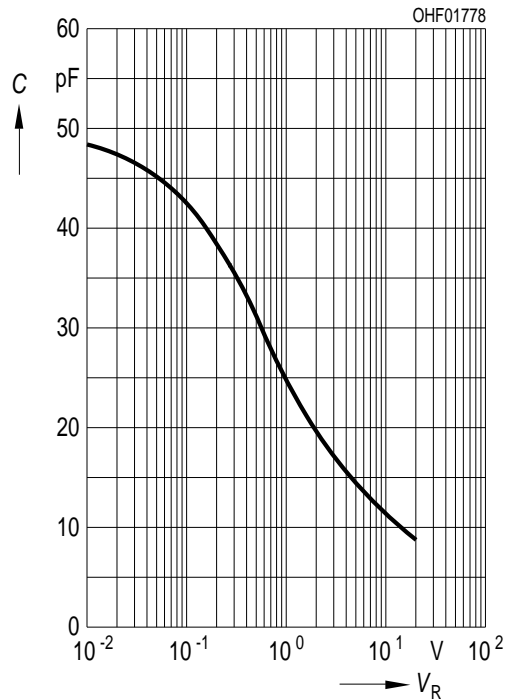
Dark Current ^{1) page 8}

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



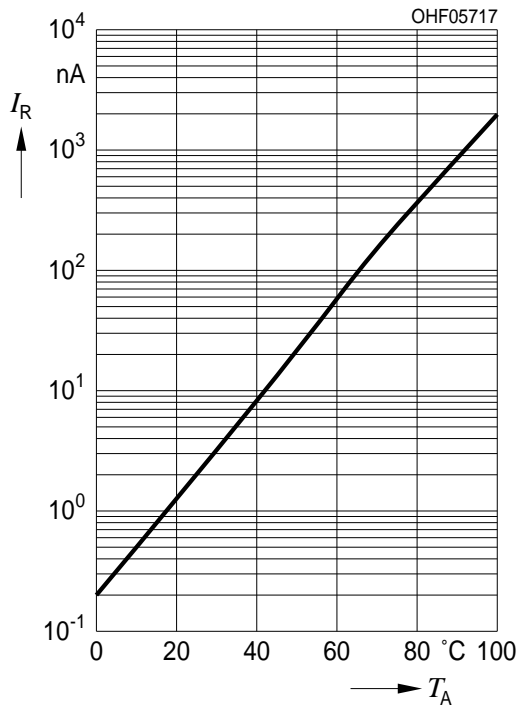
Capacitance ^{1) page 8}

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



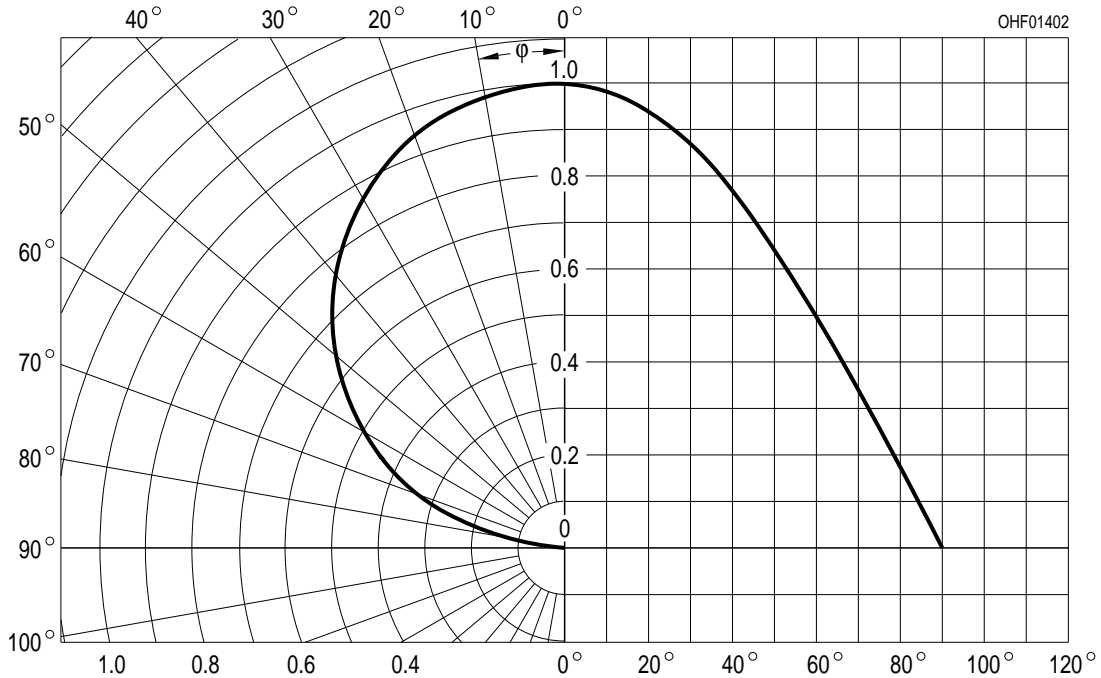
Dark Current ^{1) page 8}

$I_R = f(T_A), V_R = 10 \text{ V}, E = 0$

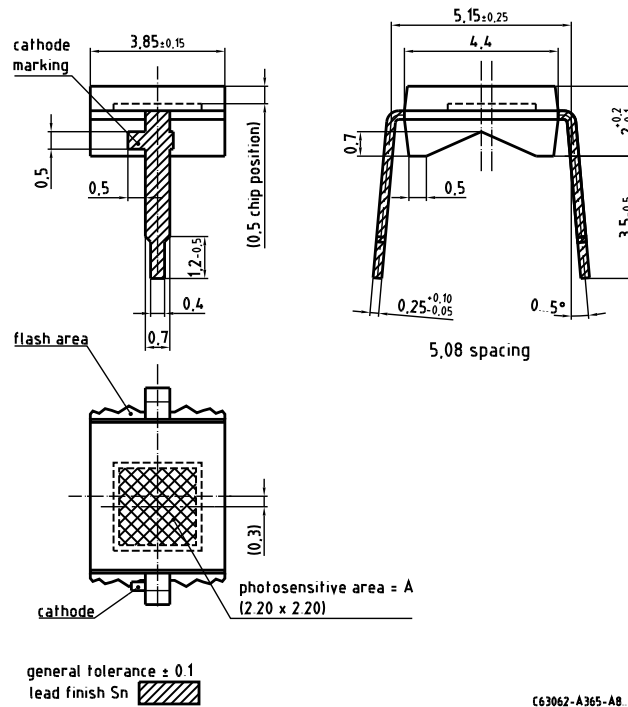


Directional Characteristics ^{1) page 8}

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



Package Outline



Dimensions in mm (inch).

Package

DIL, Epoxy

Approximate Weight:

72 mg

C63062-A365-AB -01

TTW Soldering

IEC-61760-1 TTW

**Disclaimer**

Language english will prevail in case of any discrepancies or deviations between the two language wordings.

Attention please!

The information describes the type of component and shall not be considered as assured characteristics.

Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances.

For information on the types in question please contact our Sales Organization.

If printed or downloaded, please find the latest version in the Internet.

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Critical components* may only be used in life-support devices** or systems with the express written approval of OSRAM OS.

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**) Life support devices or systems are intended (a) to be implanted in the human body, or (b) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health and the life of the user may be endangered.

Glossary

- ¹⁾ **Typical Values:** Due to the special conditions of the manufacturing processes of LED, the typical data or calculated correlations of technical parameters can only reflect statistical figures. These do not necessarily correspond to the actual parameters of each single product, which could differ from the typical data and calculated correlations or the typical characteristic line. If requested, e.g. because of technical improvements, these typ. data will be changed without any further notice.

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- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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