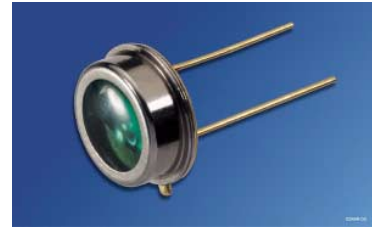


# Silicon Photodiode for the Visible Spectral Range

## Silicon Photodiode for the Visible Spectral Range

### Lead (Pb) Free Product - RoHS Compliant

#### BPW 21



#### Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 350nm bis 820nm
- Angepaßt an die Augenempfindlichkeit ( $V_{\lambda}$ )
- Hermetisch dichte Metallbauform (ähnlich TO-5)

#### Anwendungen

- Belichtungsmesser für Tageslicht
- Für Kunstlicht mit hoher Farbtemperatur in der Fotografie und Farbanalyse

#### Features

- Especially suitable for applications from 350nm to 820nm
- Adapted to human eye sensitivity ( $V_{\lambda}$ )
- Hermetically sealed metal package (similar to TO-5)

#### Application

- Exposure meter for daylight
- For artificial light of high color temperature in photographic fields and color analysis

Typ Type	Bestellnummer Ordering Code
BPW 21	Q62702P0885

**Grenzwerte**  
**Maximum Ratings**

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Betriebs- und Lagertemperatur Operating and storage temperature range	$T_{op}; T_{stg}$	- 40 ... + 80	°C
Sperrspannung Reverse voltage	$V_R$	10	V
Verlustleistung, $T_A = 25\text{ °C}$ Total power dissipation	$P_{tot}$	250	mW

**Kennwerte** ( $T_A = 25\text{ °C}$ , Normlicht A,  $T = 2856\text{ K}$ )  
**Characteristics** ( $T_A = 25\text{ °C}$ , standard light A,  $T = 2856\text{ K}$ )

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Fotoempfindlichkeit, $V_R = 5\text{ V}$ Spectral sensitivity	$S$	10 ( $\geq 5.5$ )	nA/lx
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S\max}$	550	nm
Spektraler Bereich der Fotoempfindlichkeit $S = 10\%$ von $S_{\max}$ Spectral range of sensitivity $S = 10\%$ of $S_{\max}$	$\lambda$	350 ... 820	nm
Bestrahlungsempfindliche Fläche Radiant sensitive area	$A$	7.34	mm <sup>2</sup>
Abmessung der bestrahlungsempfindlichen Fläche Dimensions of radiant sensitive area	$L \times B$ $L \times W$	$2.73 \times 2.73$	mm × mm
Halbwinkel Half angle	$\varphi$	$\pm 55$	Grad deg.
Dunkelstrom $V_R = 10\text{ V}$ Dark current $V_R = 5\text{ V}$ $V_R = 10\text{ mV}$	$I_R$ $I_R$	2 ( $\leq 30$ ) 8 ( $\leq 200$ )	nA pA
Spektrale Fotoempfindlichkeit, $\lambda = 550\text{ nm}$ Spectral sensitivity	$S_\lambda$	0.34	A/W
Quantenausbeute, $\lambda = 550\text{ nm}$ Quantum yield	$\eta$	0.80	<u>Electrons</u> Photon
Leerlaufspannung, $E_V = 1000\text{ lx}$ Open-circuit voltage	$V_O$	400 ( $\geq 320$ )	mV

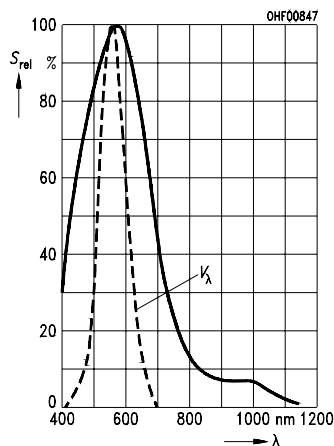
**Kennwerte** ( $T_A = 25\text{ °C}$ , Normlicht A,  $T = 2856\text{ K}$ )

**Characteristics** ( $T_A = 25\text{ °C}$ , standard light A,  $T = 2856\text{ K}$ ) (cont'd)

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Kurzschlußstrom, $E_V = 1000\text{ lx}$ Short-circuit current	$I_{SC}$	10	$\mu\text{A}$
Anstiegs- und Abfallzeit des Fotostromes Rise and fall time of the photocurrent $R_L = 1\text{ k}\Omega$ ; $V_R = 5\text{ V}$ ; $\lambda = 550\text{ nm}$ ; $I_p = 10\text{ }\mu\text{A}$	$t_r, t_f$	1.5	$\mu\text{s}$
Durchlaßspannung, $I_F = 100\text{ mA}$ , $E = 0$ Forward voltage	$V_F$	1.2	V
Kapazität, $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$ Capacitance	$C_0$	580	pF
Temperaturkoeffizient von $V_O$ Temperature coefficient of $V_O$	$TC_V$	- 2.6	mV/K
Temperaturkoeffizient von $I_{SC}$ Temperature coefficient of $I_{SC}$	$TC_I$	- 0.05	%/K
Rauschäquivalente Strahlungsleistung Noise equivalent power $V_R = 5\text{ V}$ , $\lambda = 550\text{ nm}$	$NEP$	$7.2 \times 10^{-14}$	$\frac{\text{W}}{\sqrt{\text{Hz}}}$
Nachweisgrenze, $V_R = 5\text{ V}$ , $\lambda = 550\text{ nm}$ Detection limit	$D^*$	$1 \times 10^{12}$	$\frac{\text{cm} \times \sqrt{\text{Hz}}}{\text{W}}$

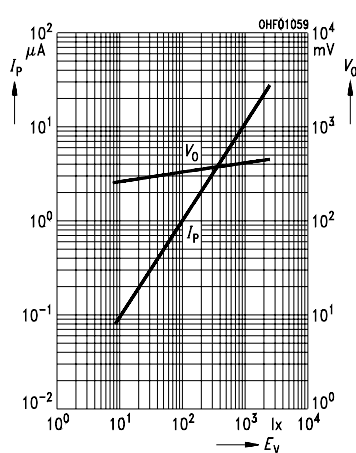
**Relative Spectral Sensitivity**

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



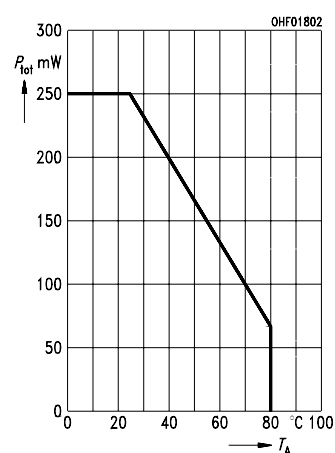
**Photocurrent  $I_P = f(E_V), V_R = 5 V$**

**Open-Circuit Voltage  $V_O = f(E_V)$**



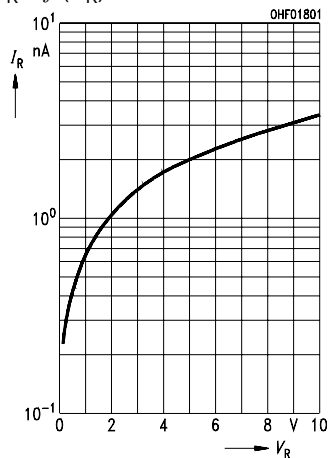
**Total Power Dissipation**

$P_{tot} = f(T_A)$



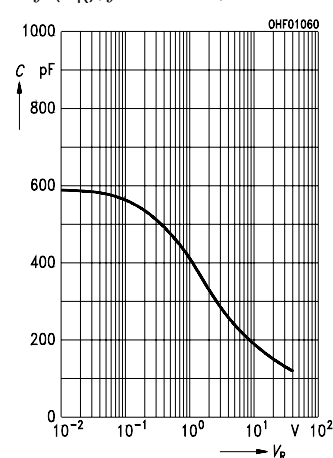
**Dark Current**

$I_R = f(V_R)$



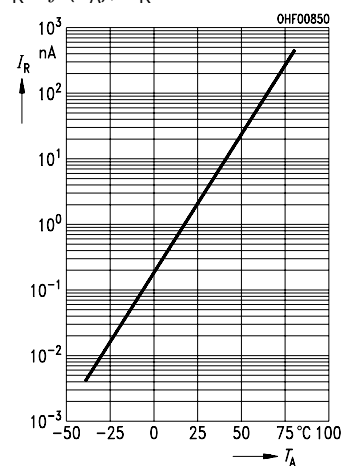
**Capacitance**

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



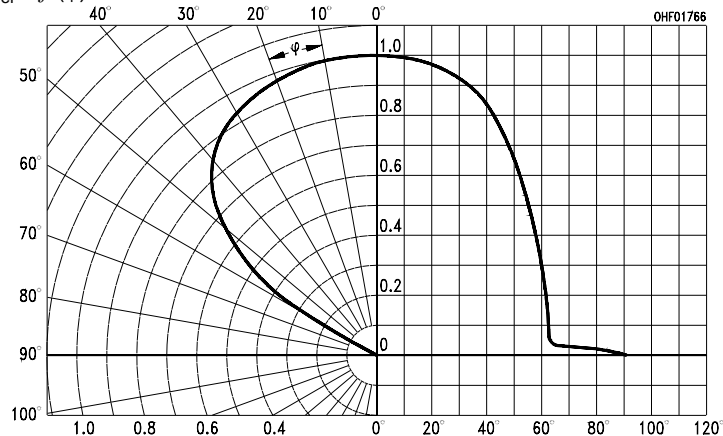
**Dark Current**

$I_R = f(T_A), V_R = 5 V$

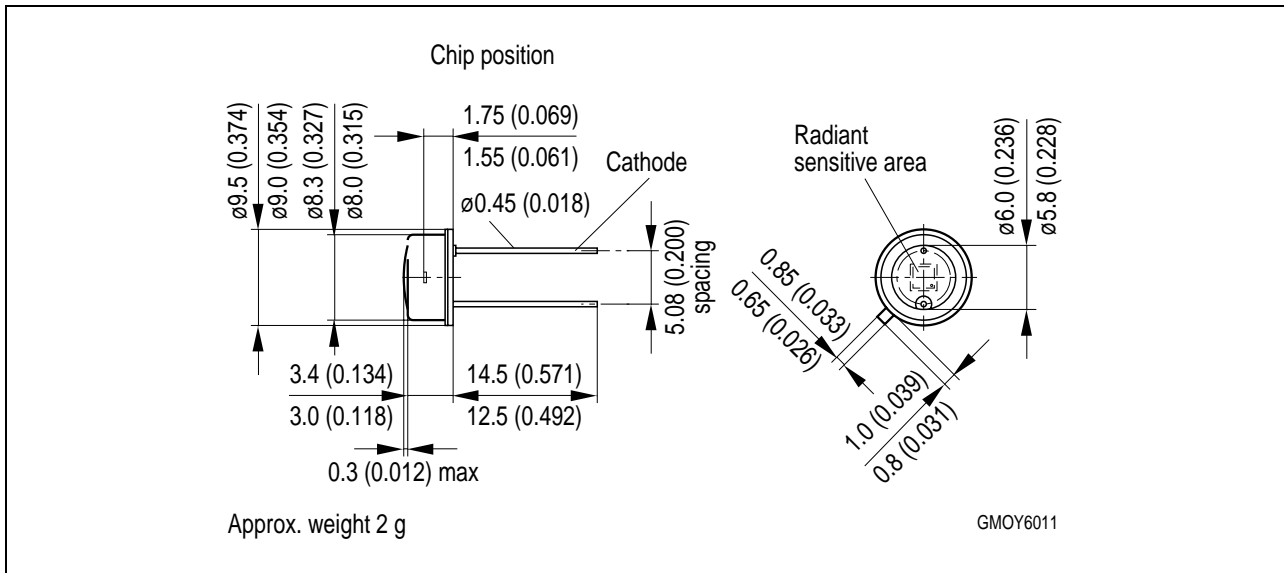


**Directional Characteristics**

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



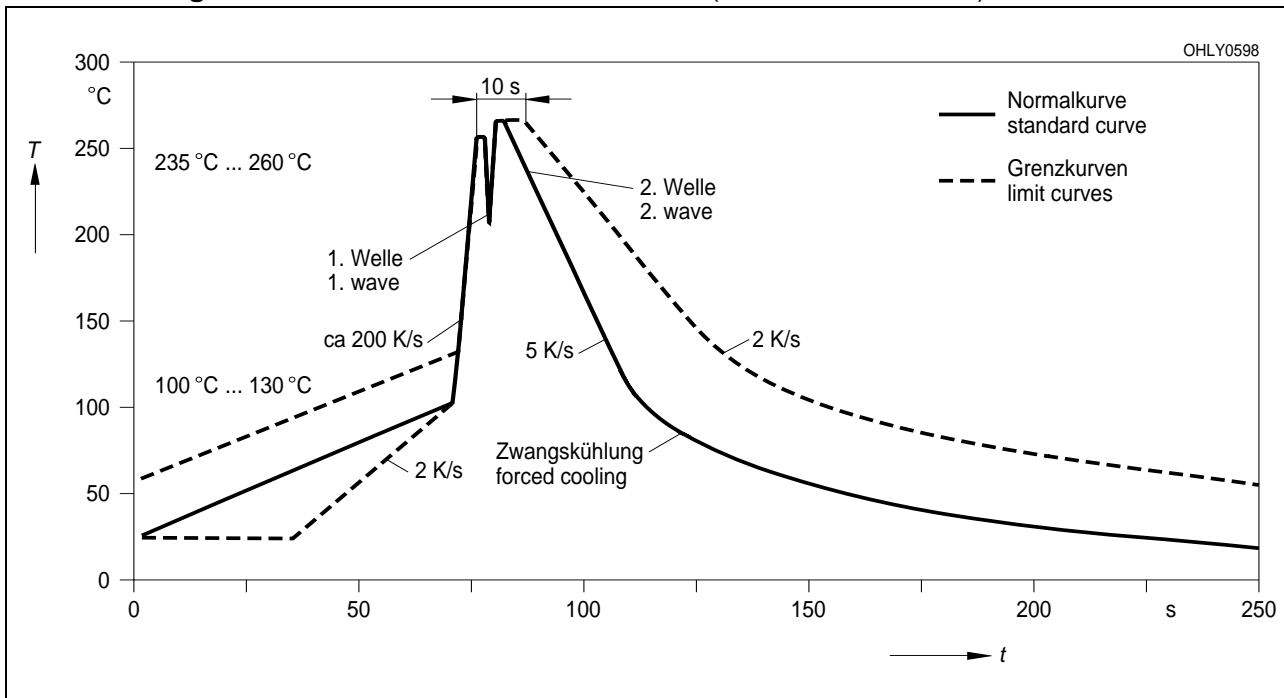
**Maßzeichnung  
Package Outlines**



Maße in mm (inch) / Dimensions in mm (inch).

**Lötbedingungen  
Soldering Conditions  
Wellenlöten (TTW)  
TTW Soldering**

(nach CECC 00802)  
(acc. to CECC 00802)



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