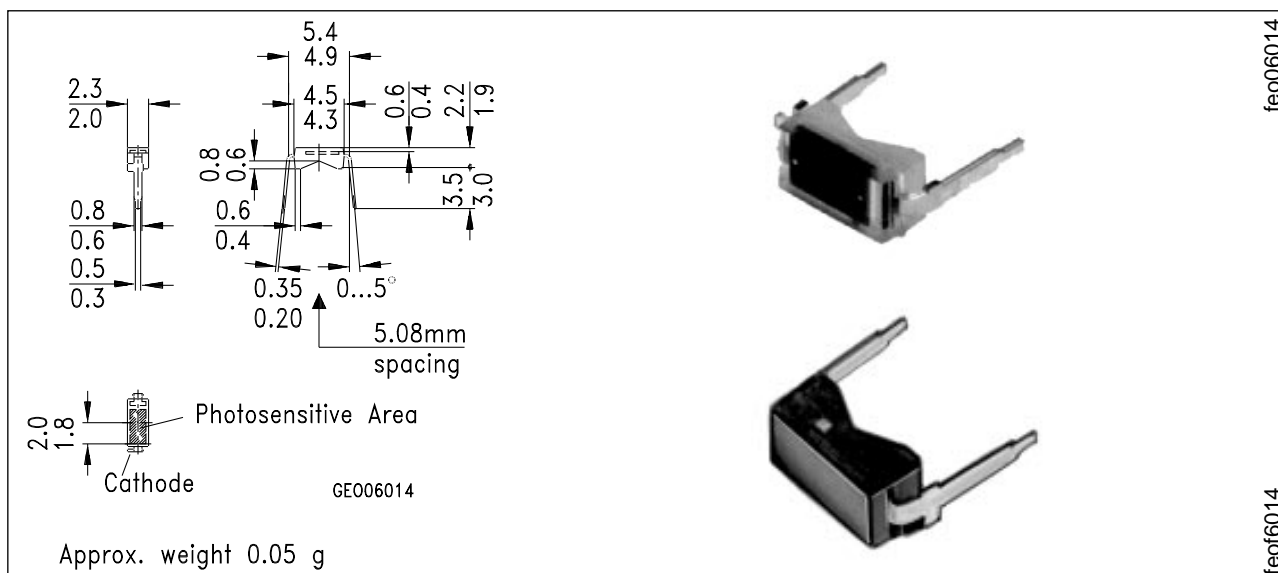


## Silizium-Fotodiode Silicon Photodiode

**BPX 90**  
**BPX 90 F**



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 (BPX 90) und bei 950 nm (BPX 90 F)
- Hohe Fotoempfindlichkeit
- DIL-Plastikbauform mit hoher Packungsdichte

### Anwendungen

- Industrieelektronik
- "Messen/Steuern/Regeln"

### Features

- Especially suitable for applications from 400 nm to 1100 nm (BPX 90) and of 950 nm (BPX 90 F)
- High photosensitivity
- DIL plastic package with high packing density

### Applications

- Industrial electronics
- For control and drive circuits

Typ Type	Bestellnummer Ordering Code
BPX 90	Q62702-P47
BPX 90 F	Q62702-P928

## Grenzwerte Maximum Ratings

Bezeichnung Description	Symbol Symbol	Wert Value	Einheit Unit
Betriebs- und Lagertemperatur Operating and storage temperature range	$T_{op}; T_{stg}$	- 40 ... + 80	°C
Löttemperatur (Lötstelle 2 mm vom Gehäuse entfernt bei Lötzeit $t \leq 3$ s) Soldering temperature in 2 mm distance from case bottom ( $t \leq 3$ s)	$T_S$	230	°C
Sperrspannung Reverse voltage	$V_R$	32	V
Verlustleistung, $T_A = 25$ °C Total power dissipation	$P_{tot}$	100	mW

## Kennwerte $T_A = 25$ °C Characteristics

Bezeichnung Description	Symbol Symbol	Wert Value		Einheit Unit
		BPX 90	BPX 90 F	
Fotoempfindlichkeit Spectral sensitivity $V_R = 5$ V, Normlicht/standard light A, $T = 2856$ K, $V_R = 5$ V, $\lambda = 950$ nm, $E_e = 1$ mW/cm <sup>2</sup>	$S$	45 ( $\geq 32$ )	–	nA/lx
	$S$	–	26 ( $\geq 16$ )	$\mu$ A
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S_{max}}$	830	950	nm
Spektraler Bereich der Fotoempfindlichkeit $S = 10$ % von $S_{max}$ Spectral range of sensitivity $S = 10$ % of $S_{max}$	$\lambda$	400 ... 1150	800 ... 1150	nm
Bestrahlungsempfindliche Fläche Radiant sensitive area	$A$	5.5	5.5	mm <sup>2</sup>
Abmessung der bestrahlungsempfindlichen Fläche Dimensions of radiant sensitive area	$L \times B$ $L \times W$	1.75 × 3.15	1.75 × 3.15	mm × mm
Abstand Chipoberfläche zu Gehäuseoberfläche Distance chip front to case surface	$H$	0.5	0.5	mm

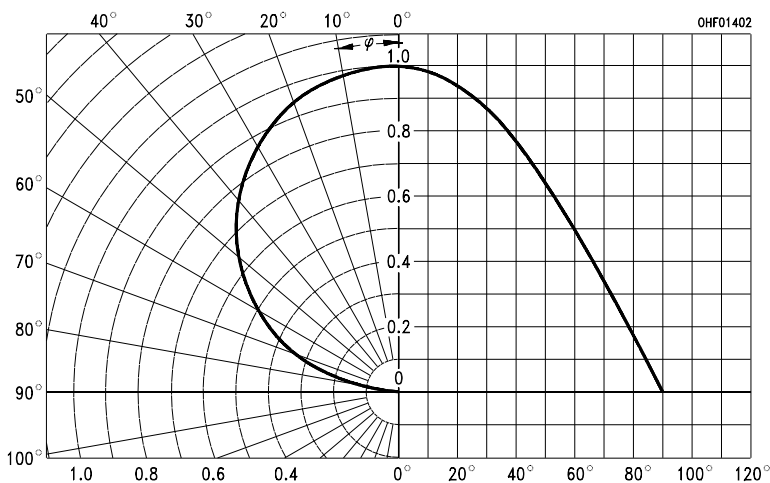
**Kennwerte**  $T_A = 25\text{ °C}$   
**Characteristics** (cont'd)

Bezeichnung Description	Symbol Symbol	Wert Value		Einheit Unit
		BPX 90	BPX 90 F	
Halbwinkel Half angle	$\varphi$	$\pm 60$	$\pm 60$	Grad deg.
Dunkelstrom, $V_R = 10\text{ V}$ Dark current	$I_R$	5 ( $\leq 180$ )	5 ( $\leq 180$ )	nA
Spektrale Fotoempfindlichkeit, $\lambda = 950\text{ nm}$ Spectral sensitivity	$S_\lambda$	0.48	0.48	A/W
Quantenausbeute, $\lambda = 950\text{ nm}$ Quantum yield	$\eta$	0.62	0.62	<u>Electrons</u> Photon
Leerlaufspannung Open-circuit voltage $E_v = 1000\text{ lx}$ , Normlicht/standard light A, $T = 2856\text{ K}$ $E_e = 0.5\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$	$V_O$  $V_O$	450 ( $\geq 380$ ) –	– 400 ( $\geq 340$ )	mV mV
Kurzschlußstrom Short-circuit current $E_v = 1000\text{ lx}$ , Normlicht/standard light A, $T = 2856\text{ K}$ $E_e = 0.5\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$	$I_{SC}$  $I_{SC}$	45 –	– 13	$\mu\text{A}$ $\mu\text{A}$
Anstiegs- und Abfallzeit des Fotostromes Rise and fall time of the photocurrent $R_L = 1\text{ k}\Omega$ ; $V_R = 5\text{ V}$ ; $\lambda = 850\text{ nm}$ ; $I_p = 30\text{ }\mu\text{A}$	$t_r, t_f$	1.3	1.3	$\mu\text{s}$
Durchlaßspannung, $I_F = 80\text{ mA}$ , $E = 0$ Forward voltage	$V_F$	1.3	1.3	V
Kapazität, $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$ Capacitance	$C_0$	430	430	pF

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

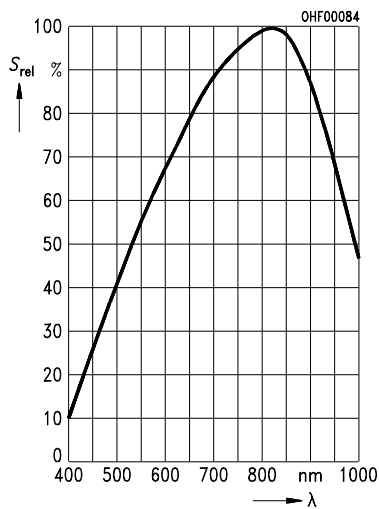
Bezeichnung Description	Symbol Symbol	Wert Value		Einheit Unit
		BPX 90	BPX 90 F	
Temperaturkoeffizient von $V_O$ Temperature coefficient of $V_O$	$TC_V$	-2.6	-2.6	mV/K
Temperaturkoeffizient von $I_{SC}$ Temperature coefficient of $I_{SC}$ Normlicht/standard light A $\lambda = 950\text{ nm}$	$TC_I$ $TC_I$	0.18 -	- 0.2	%/K %/K
Rauschäquivalente Strahlungsleistung Noise equivalent power $V_R = 10\text{ V}, \lambda = 950\text{ nm}$	$NEP$	$8 \times 10^{-14}$	$8 \times 10^{-14}$	$\frac{W}{\sqrt{Hz}}$
Nachweisgrenze, $V_R = 10\text{ V}, \lambda = 950\text{ nm}$ Detection limit	$D^*$	$2.9 \times 10^{12}$	$2.9 \times 10^{12}$	$\frac{cm \cdot \sqrt{Hz}}{W}$

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



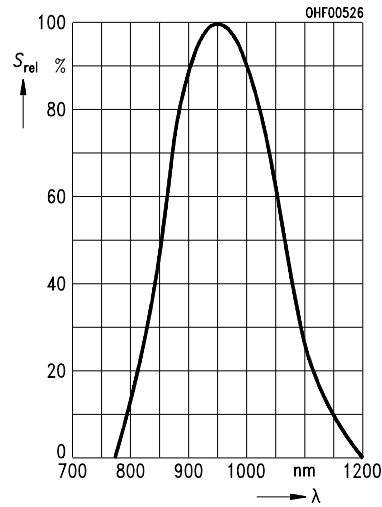
### Relative spectral sensitivity BPX 90

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



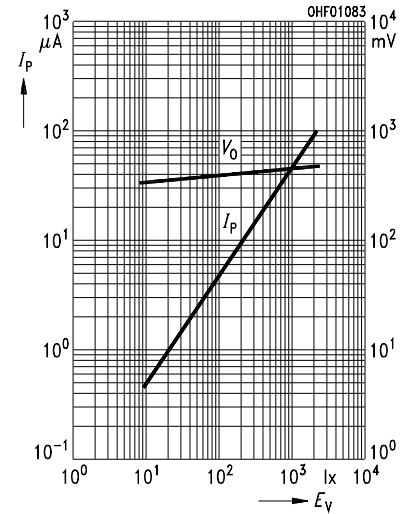
### Relative spectral sensitivity BPX 90 F

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



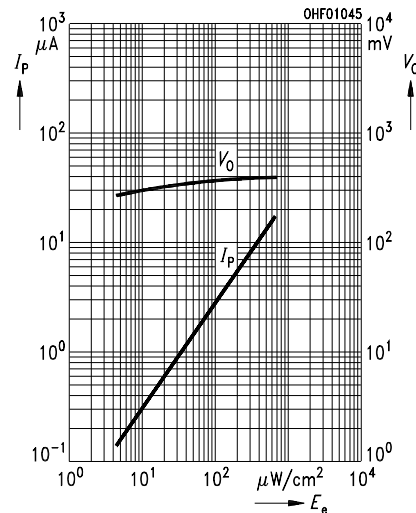
### Photocurrent $I_P = f(E_V)$ , $V_R = 5 V$

Open-circuit volt. BPX 90  $V_O = f(E_V)$



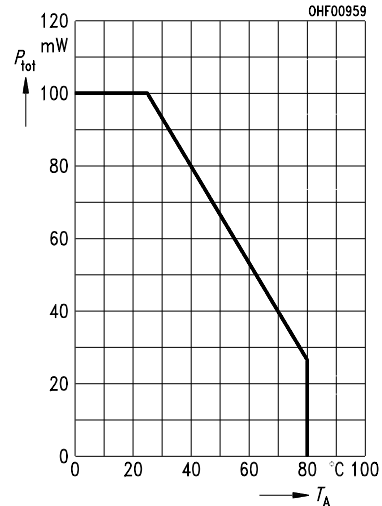
### Photocurrent $I_P = f(E_e)$ , $V_R = 5 V$

Open-circuit-volt. BPX 90 F  $V_O = f(E_e)$



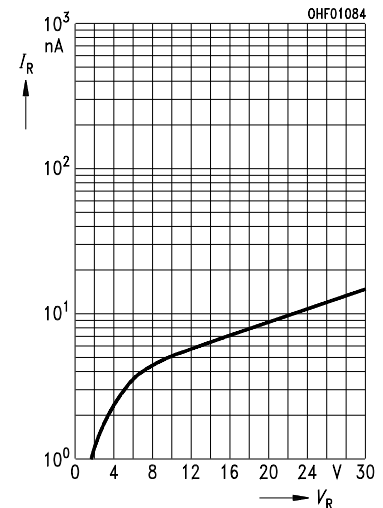
### Total power dissipation

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



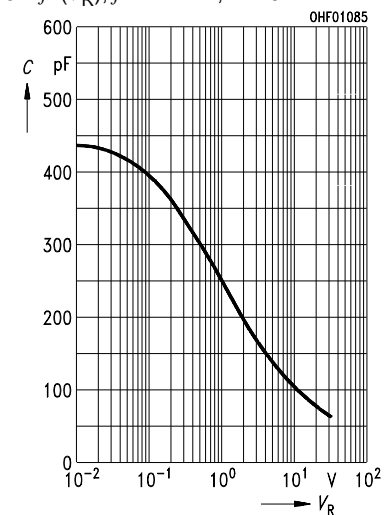
### Dark current

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



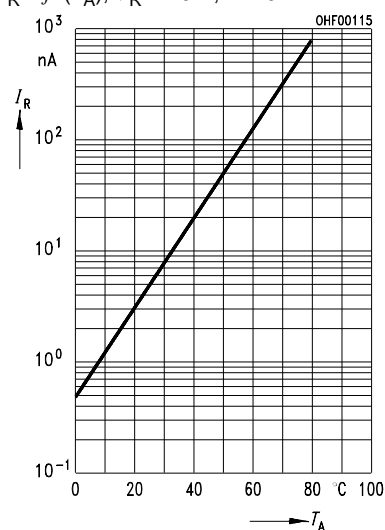
### Capacitance

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



### Dark current

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





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