

NPN-Silizium-Fototransistor

Silicon NPN Phototransistor

Lead (Pb) Free Product - RoHS Compliant

BPX 43



Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 450 nm bis 1100 nm
- Hohe Linearität
- Hermetisch dichte Metallbauform (TO-18) mit Basisanschluss, geeignet bis 125 °C
- Gruppiert lieferbar

Features

- Especially suitable for applications from 450 nm to 1100 nm
- High linearity
- Hermetically sealed metal package (TO-18) with base connection suitable up to 125 °C
- Available in groups

Anwendungen

- Lichtschranken für Gleich- und Wechsellichtbetrieb
- Industrieelektronik
- „Messen/Steuern/Regeln“

Applications

- Photointerrupters
- Industrial electronics
- For control and drive circuits

Typ Type	Bestellnummer Ordering Code	Fotostrom , $E_e = 0.5 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$, $V_{CE} = 5 \text{ V}$ Photocurrent $I_{pce} \text{ (mA)}$
BPX 43	Q62702P0016	> 0.8
BPX 43-3/4 ¹⁾	Q62702P3581	1.25...4.0
BPX 43-4	Q62702P0016S004	2.0...4.0
BPX 43-4/5 ¹⁾	Q62702P3582	> 2.0
BPX 43-5	Q 62702P0016S005	> 3.2

¹⁾ nur eine Gruppe in einer Verpackungseinheit (siehe "Kennwerte") / only one bin within one packing unit (see "Characteristics")

Grenzwerte
Maximum Ratings

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Betriebs- und Lagertemperatur Operating and storage temperature range	$T_{op}; T_{stg}$	– 40 ... + 125	°C
Kollektor-Emitterspannung Collector-emitter voltage	V_{CE}	50	V
Kollektorstrom Collector current	I_C	50	mA
Kollektorspitzenstrom, $\tau < 10 \mu s$ Collector surge current	I_{CS}	200	mA
Emitter-Basisspannung Emitter-base voltage	V_{EB}	7	V
Verlustleistung, $T_A = 25 \text{ °C}$ Total power dissipation	P_{tot}	220	mW
Wärmewiderstand Thermal resistance	R_{thJA}	450	K/W

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

Characteristics

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S\text{ max}}$	880	nm
Spektraler Bereich der Fotoempfindlichkeit $S = 10\%$ von S_{max} Spectral range of sensitivity $S = 10\%$ of S_{max}	λ	450 ... 1100	nm
Bestrahlungsempfindliche Fläche Radiant sensitive area	A	0.675	mm ²
Abmessung der Chipfläche Dimensions of chip area	$L \times B$ $L \times W$	1×1	mm $\times$ mm
Halbwinkel Half angle	φ	± 15	Grad deg.
Fotostrom der Kollektor-Basis-Fotodiode Photocurrent of collector-base photodiode $E_e = 0.5\text{ mW/cm}^2$, $V_{CB} = 5\text{ V}$ $E_v = 1000\text{ lx}$, Normlicht/standard light A, $V_{CB} = 5\text{ V}$	I_{PCB} I_{PCB}	11 35	μA μA
Kapazität Capacitance $V_{CE} = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ $V_{CB} = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ $V_{EB} = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$	C_{CE} C_{CB} C_{EB}	23 39 47	pF pF pF
Dunkelstrom Dark current $V_{CE} = 25\text{ V}$, $E = 0$	I_{CEO}	20 (≤ 100)	nA

Die Fototransistoren werden nach ihrer Fotoempfindlichkeit gruppiert und mit arabischen Ziffern gekennzeichnet.

The phototransistors are grouped according to their spectral sensitivity and distinguished by arabian figures.

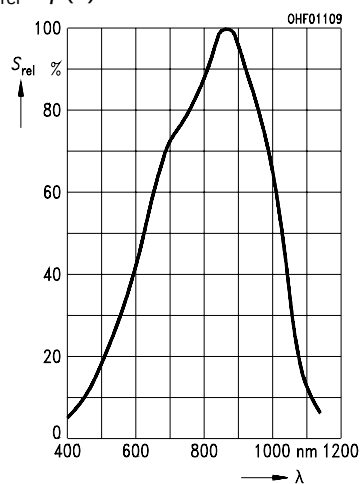
Bezeichnung Parameter	Symbol Symbol	Wert Value				Einheit Unit
		-2	-3	-4	-5	
Fotostrom, $\lambda = 950 \text{ nm}$ Photocurrent $E_e = 0.5 \text{ mW/cm}^2$, $V_{CE} = 5 \text{ V}$ $E_v = 1000 \text{ lx}$, Normlicht/standard light A, $V_{CE} = 5 \text{ V}$	I_{PCE} I_{PCE}	0.8 ...1.6 3.8	1.25 ...2.5 6.0	2.0...4.0 9.5	≥ 3.2 15.0	mA mA
Anstiegszeit/Abfallzeit Rise and fall time $I_C = 1 \text{ mA}$, $V_{CC} = 5 \text{ V}$, $R_L = 1 \text{ k}\Omega$	t_r , t_f	9	12	15	18	μs
Kollektor-Emitter-Sättigungsspannung Collector-emitter saturation voltage $I_C = I_{PCEmin}^{1)} \times 0.3$ $E_e = 0.5 \text{ mW/cm}^2$	V_{CEsat}	200	220	240	260	mV
Stromverstärkung Current gain $E_e = 0.5 \text{ mW/cm}^2$, $V_{CE} = 5 \text{ V}$	$\frac{I_{PCE}}{I_{PCB}}$	110	170	270	430	–

¹⁾ I_{PCEmin} ist der minimale Fotostrom der jeweiligen Gruppe.

¹⁾ I_{PCEmin} is the min. photocurrent of the specified group.

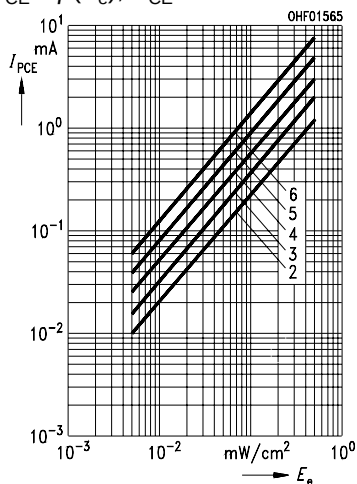
Relative Spectral Sensitivity

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



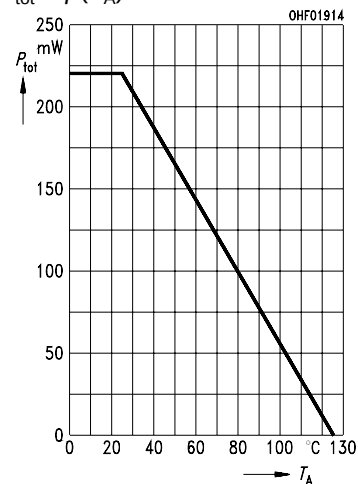
Photocurrent

$$I_{PCE} = f(E_e), V_{CE} = 5 \text{ V}$$



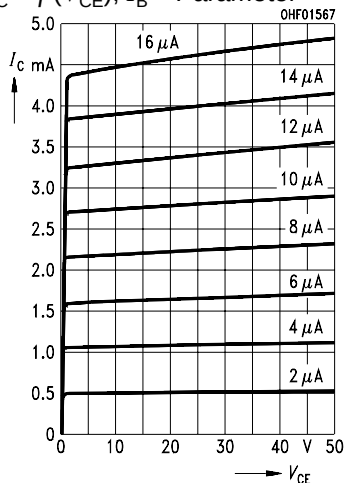
Total Power Dissipation

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



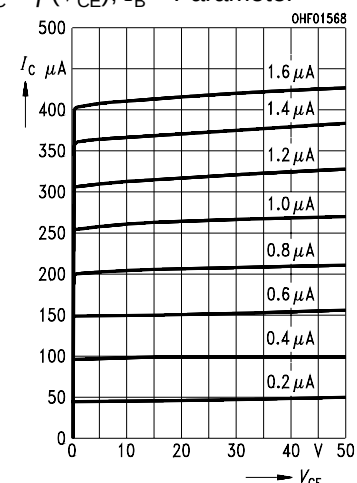
Output Characteristics

$$I_C = f(V_{CE}), I_B = \text{Parameter}$$



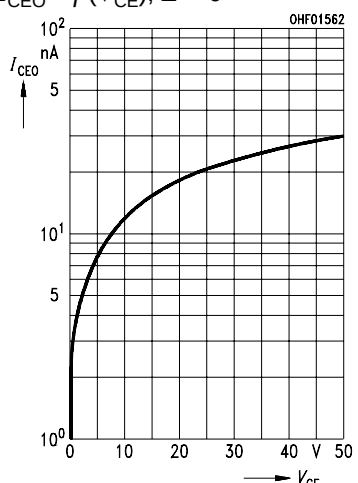
Output Characteristics

$$I_C = f(V_{CE}), I_B = \text{Parameter}$$



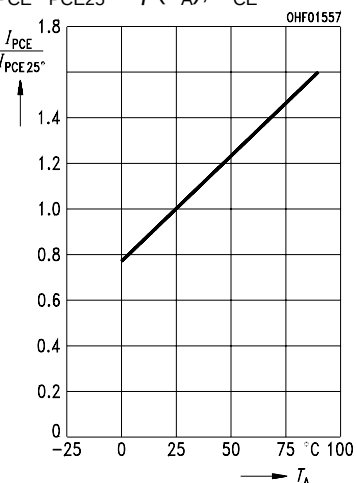
Dark Current

$$I_{CEO} = f(V_{CE}), E = 0$$



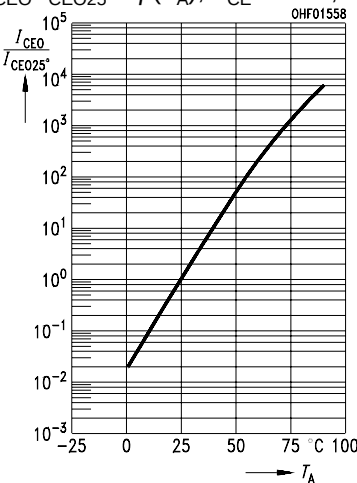
Photocurrent

$$I_{PCE}/I_{PCE25^{\circ}} = f(T_A), V_{CE} = 5 \text{ V}$$



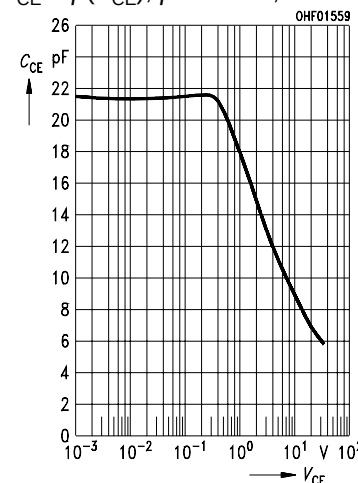
Dark Current

$$I_{CEO}/I_{CEO25^{\circ}} = f(T_A), V_{CE} = 25 \text{ V}, E = 0$$



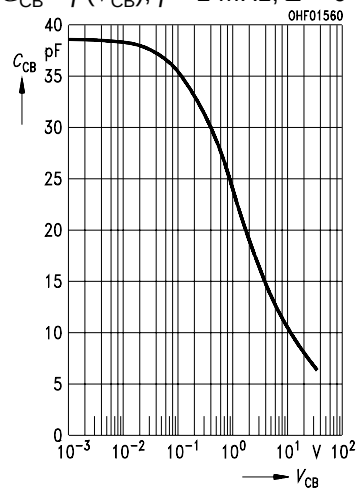
Collector-Emitter Capacitance

$$C_{CE} = f(V_{CE}), f = 1 \text{ MHz}, E = 0$$

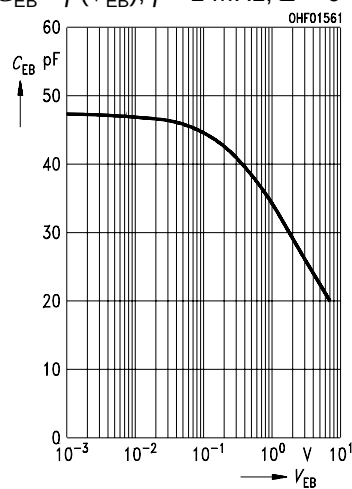


Collector-Base Capacitance

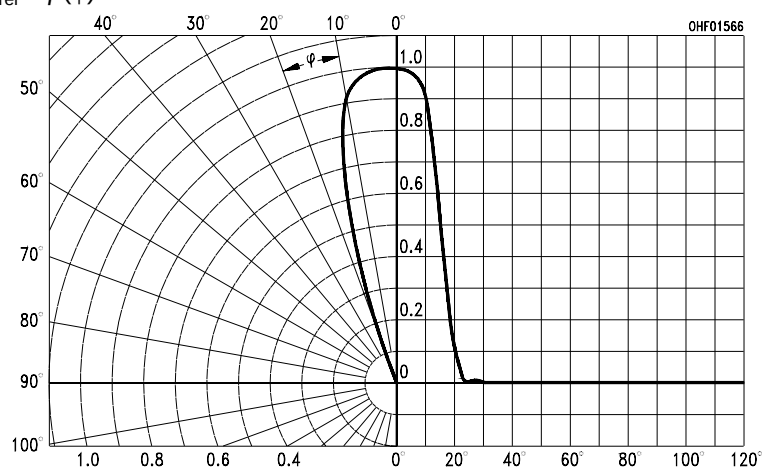
$$C_{CB} = f(V_{CB}), f = 1 \text{ MHz}, E = 0$$

**Emitter-Base Capacitance**

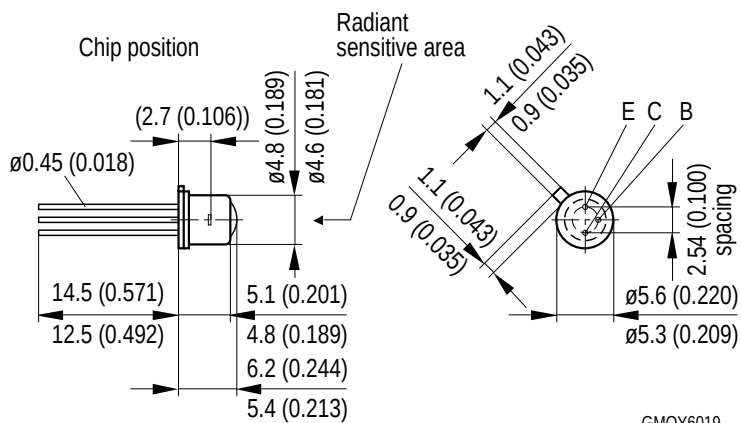
$$C_{EB} = f(V_{EB}), f = 1 \text{ MHz}, E = 0$$

**Directional Characteristics**

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



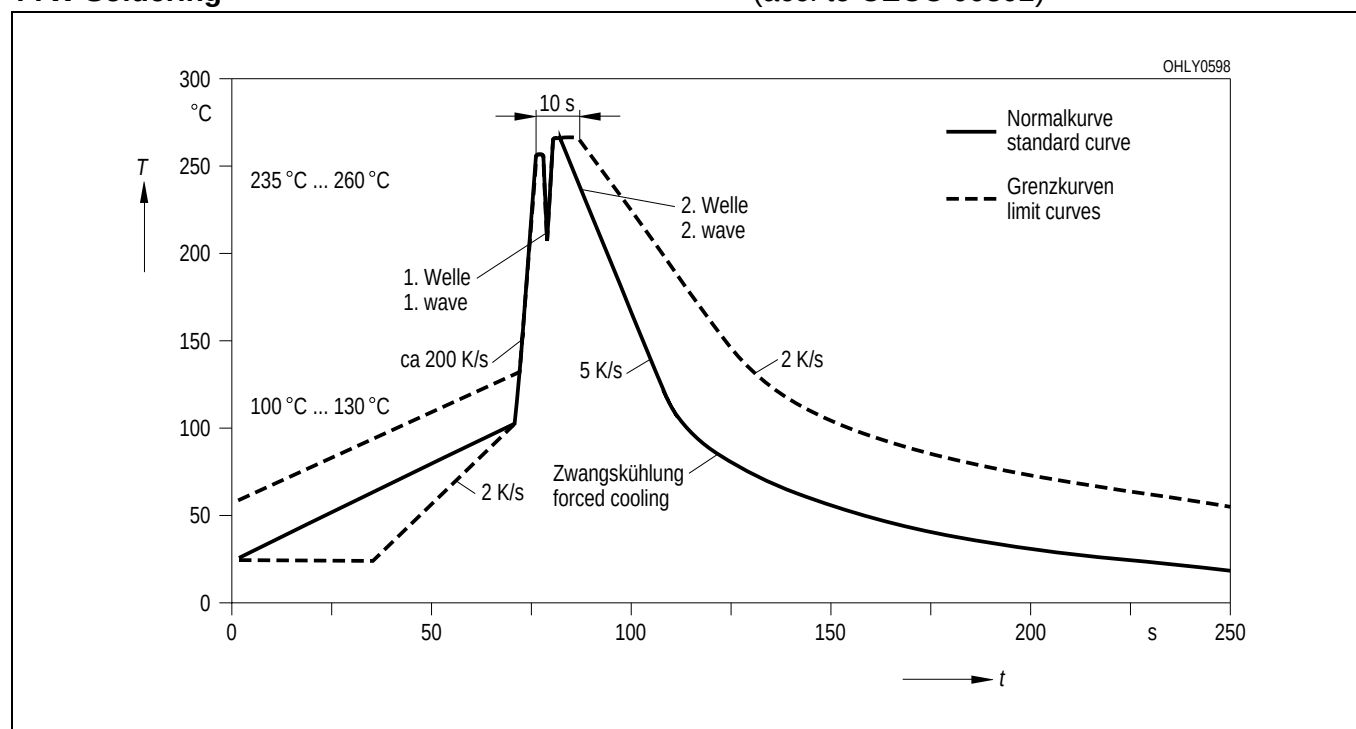
Maßzeichnung Package Outlines



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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