

Silicon NPN Phototransistor

Version 1.3

BPX 81



Features:

- **Spectral range of sensitivity:** (typ) 450 ... 1100 nm
- **Package:** Miniature Array, Epoxy
- **Special:** One-digit array package
- High linearity
- Available in groups

Applications

- Computer-controlled flashes
- Miniature photointerrupters
- Industrial electronics
- For control and drive circuits

Ordering Information

Type:	Photocurrent I_{PCE} [μ A] $\lambda = 950 \text{ nm}$, $E_e = 0.5 \text{ mW/cm}^2$, $V_{CE} = 5 \text{ V}$	Ordering Code
BPX 81	> 250	Q62702P0020
BPX 81-2/3	250 ... 800	Q62702P3583
BPX 81-3	400 ... 800	Q62702P0043S003
BPX 81-3/4	> 400	Q62702P3584
BPX 81-4	> 630	Q62702P0043S004

Note: Only one bin within one packing unit (variation less than 2:1)

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

Parameter	Symbol	Values	Unit
Operating and storage temperature range	$T_{op}; T_{stg}$	-40 ... 80	°C
Collector-emitter voltage	V_{CE}	35	V
Collector current	I_C	50	mA
Collector surge current ($\tau < 10\ \mu\text{s}$)	I_{CS}	200	mA
Emitter-collector voltage	V_{EC}	7	V
Total Power dissipation	P_{tot}	90	mW
Thermal resistance	R_{thJA}	750	K / W
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
Wavelength of max. sensitivity	(typ)	$\lambda_{S\ max}$	850	nm
Spectral range of sensitivity	(typ)	$\lambda_{10\%}$	(typ) 450 ... 1100	nm
Radiant sensitive area	(typ)	A	0.11	mm ²
Dimensions of chip area	(typ)	L x W	(typ) 0.55 x 0.55	mm x mm
Half angle	(typ)	φ	± 18	°
Capacitance ($V_{CE} = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$)	(typ)	C_{CE}	7.5	pF
Dark current ($V_{CE} = 20\text{ V}$, $E = 0$)	(typ (max))	I_{CE0}	1 (≤ 50)	nA
Rise and fall time	(typ)	t_r, t_f	7	μs

Grouping ($T_A = 25\text{ }^\circ\text{C}$, $\lambda = 950\text{ nm}$)

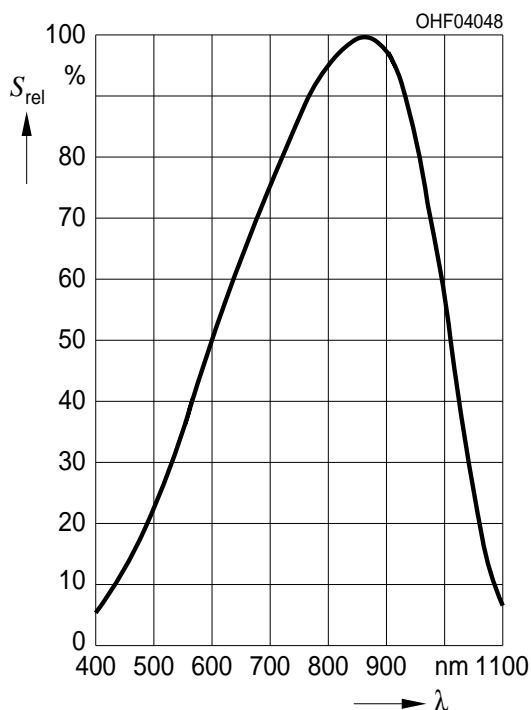
Group	Min Photocurrent $E_e = 0.5\text{ mW/cm}^2$, $V_{CE} = 5\text{ V}$ $I_{PCE, min}$ [μA]	Max Photocurrent $E_e = 0.5\text{ mW/cm}^2$, $V_{CE} = 5\text{ V}$ $I_{PCE, max}$ [μA]	Typ Photocurrent $E_V = 1000\text{ lx, Std. Light A}$, $V_{CE} = 5\text{ V}$ I_{PCE} [μA]	Rise and fall time t_r, t_f [μs]
BPX 81-2	250	500	1200	5.5
BPX 81-3	400	800	1900	6
BPX 81-4	630		2900	8

Group	Collector-emitter saturation voltage $I_C = I_{PCEmin} \times 0.3$, $E_e = 0.5\text{ mW/cm}^2$ V_{CEsat} [mV]
BPX 81-2	150
BPX 81-3	150
BPX 81-4	150

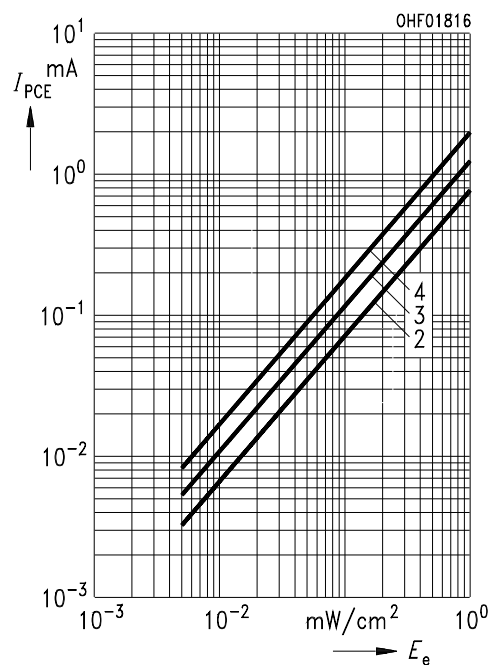
Note.: I_{PCEmin} is the min. photocurrent of the specified group.

Relative Spectral Sensitivity ^{1) page 9}

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

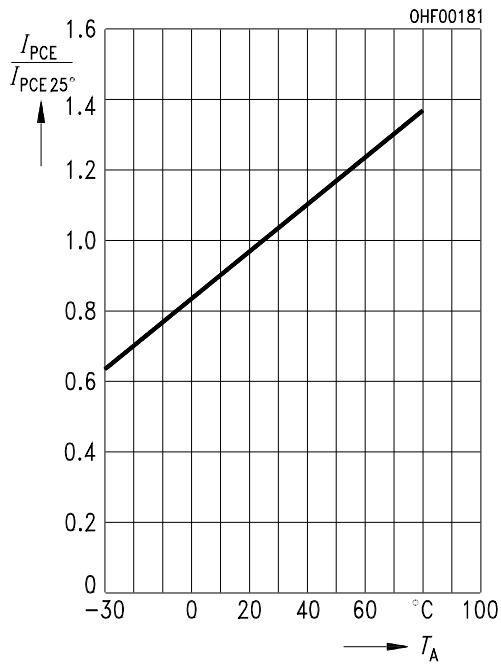
Photocurrent ^{1) page 9}

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



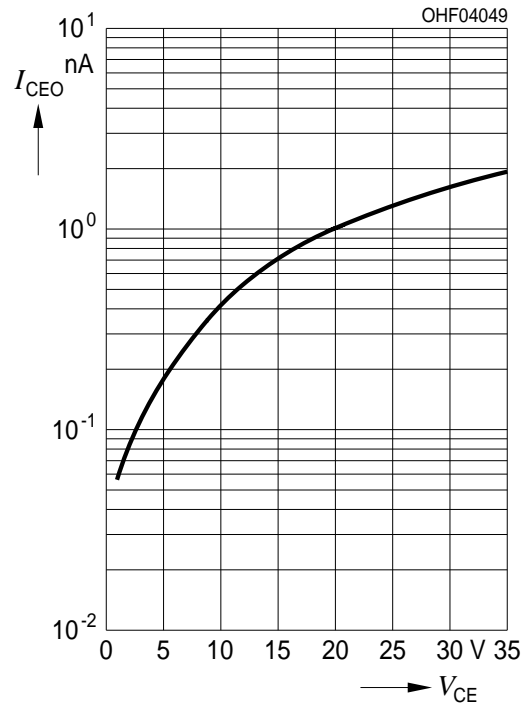
Photocurrent ^{1) page 9}

$I_{PCE} / I_{PCE(25^\circ C)} = f(T_A), V_{CE} = 5 V$



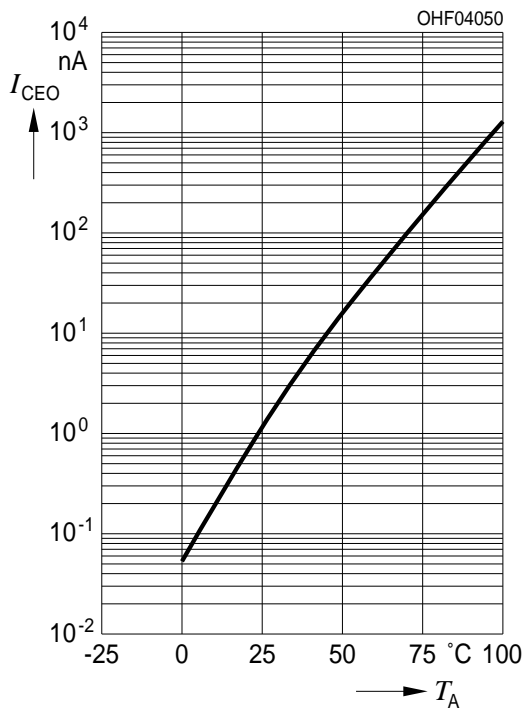
Dark Current ^{1) page 9}

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



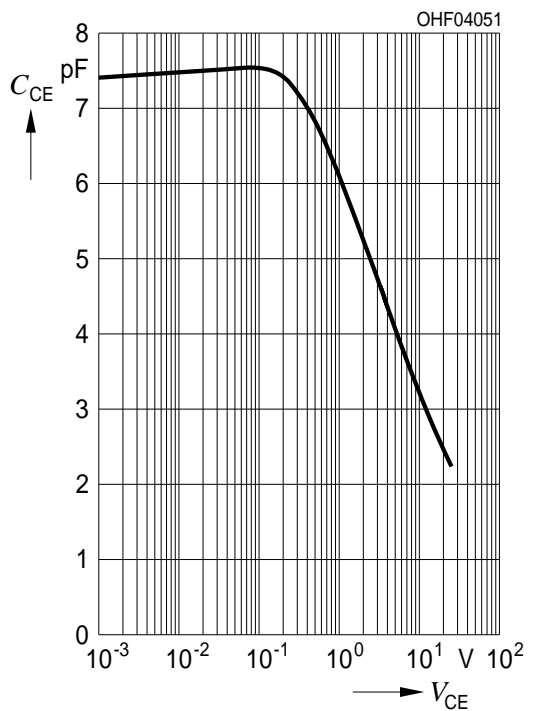
Dark Current ^{1) page 9}

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



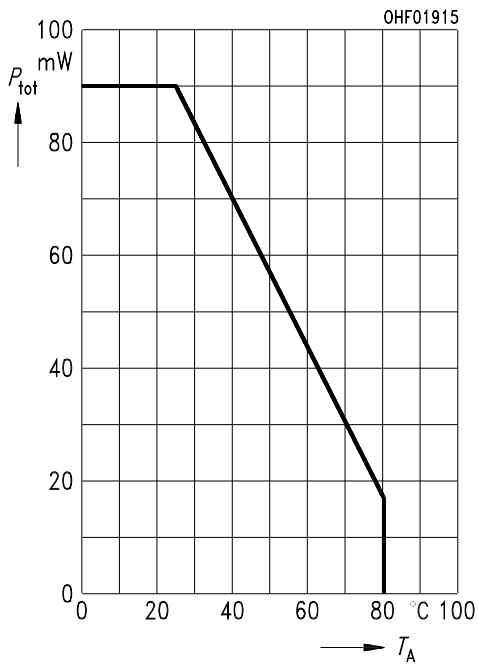
Collector-Emitter Capacitance ^{1) page 9}

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



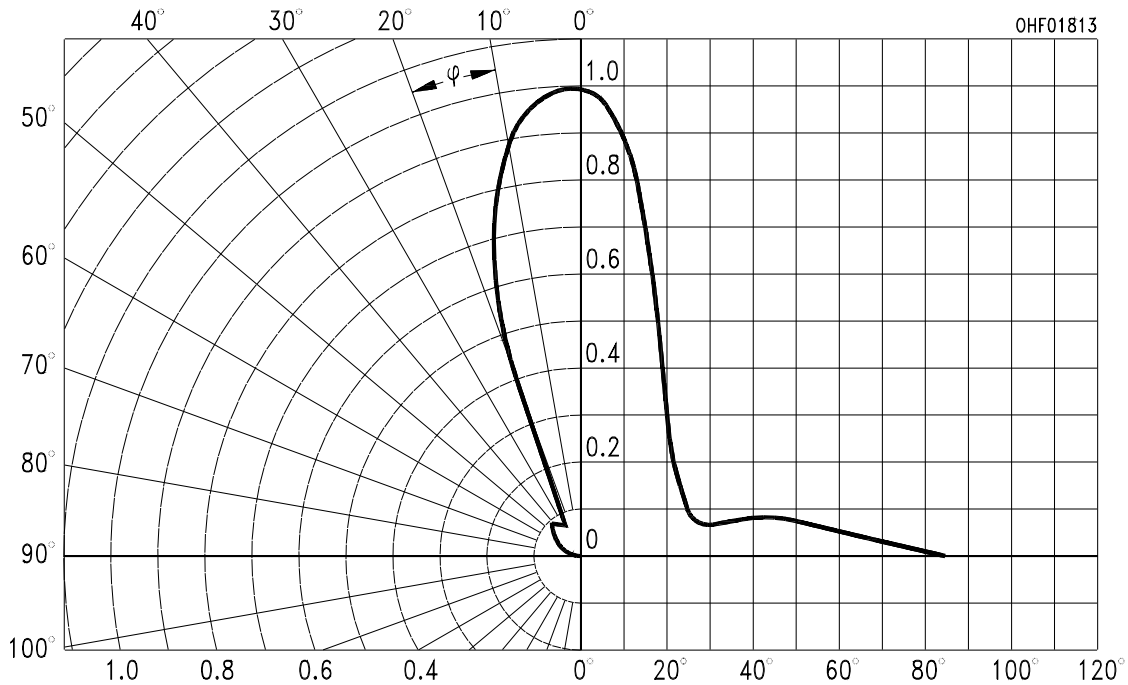
Power Consumption

$P_{tot} = f(T_A)$

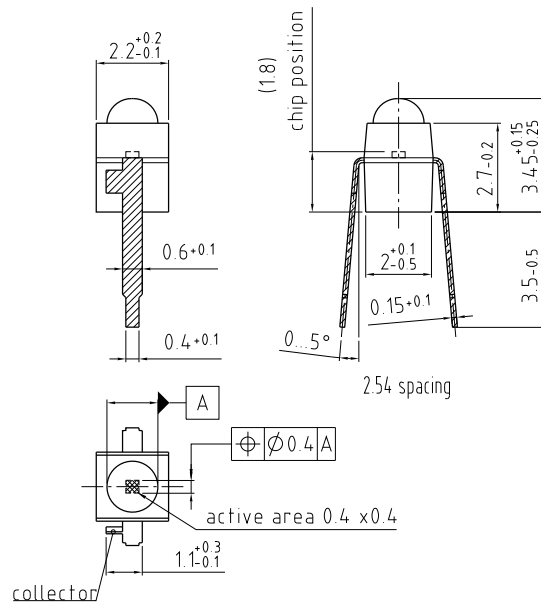


Directional Characteristics ^{1) page 9}

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



Package Outline



general tolerance ± 0.1
lead finish Sn 

C63062-A257-A31-05

Dimensions in mm (inch).

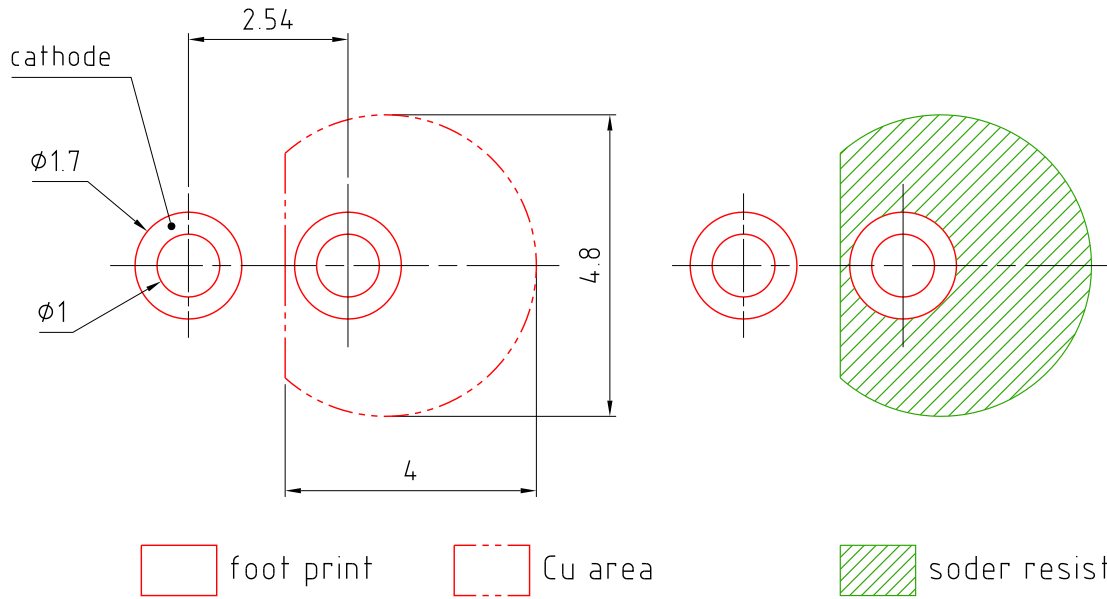
Package

Miniature Array, Epoxy

Approximate Weight:

24 mg

Recommended Solder Pad

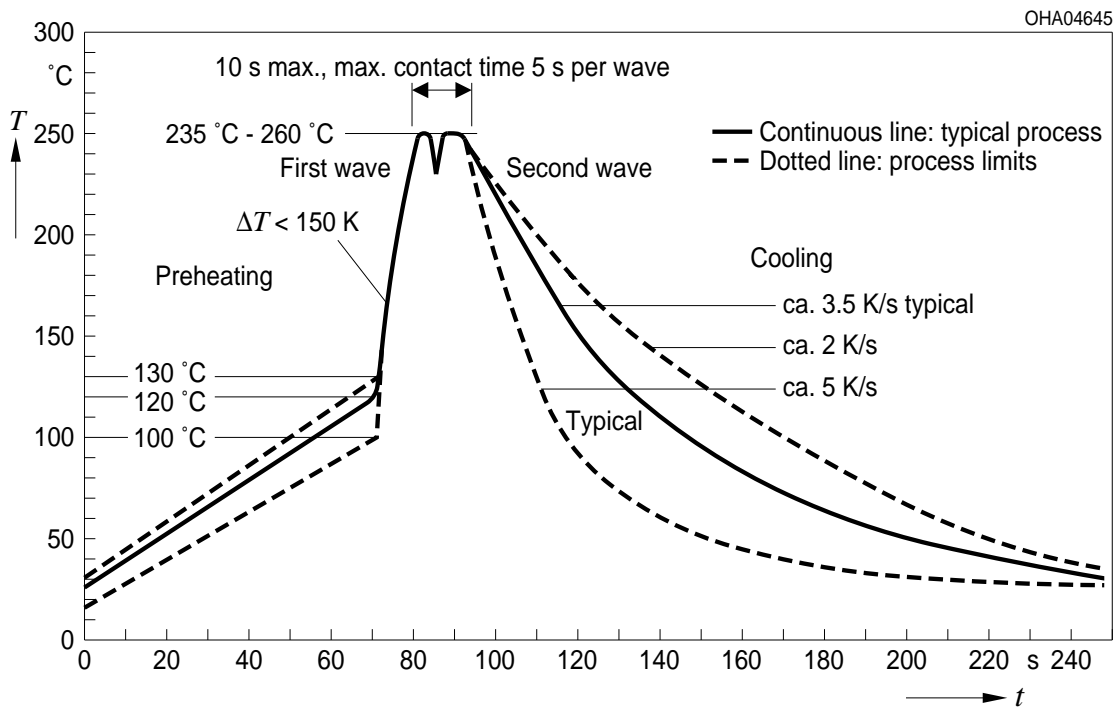


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Dimensions in mm.

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.

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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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