BPX 43

TO18

Silicon NPN Phototransistor

Applications

- Industrial Automation (Machine controls, Light barriers, Vision controls)

Features:

- Package: hermetically sealed
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)
- Spectral range of sensitivity: (typ) 450 ... 1100 nm
- Hermetically sealed metal can package (TO-18), suitable up to 125 °C
- Base connection
- High linearity
- Available in groups
- Suitable up to 125 °C

Ordering Information

Type	Photocurrent V_{CE} = 5 V; λ = 950 nm; E_e = 0.5 mW/cm² I_{PCE}	Ordering Code
BPX 43	1250 ... 4000 µA	Q62702P0016
BPX 43-4	2000 ... 4000 µA	Q62702P0016S004
BPX 43-5	3200 ... 6400 µA	Q62702P0016S005
BPX 43-3/4	1250 ... 4000 µA	Q62702P3581
BPX 43-4/5	2000 ... 4000 µA	Q62702P3582

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

Maximum Ratings

T_A = 25 °C

Parameter	Symbol		Values
Operating temperature	T_{op}	min. max.	-40 °C 125 °C
Storage temperature	T_{stg}	min. max.	-40 °C 125 °C
Collector-emitter voltage	V_{CE}	max.	50 V
Collector current	I_C	max.	50 mA
Collector surge current τ ≤ 10 µs	I_{CS}	max.	200 mA
Emitter-basis voltage	V_{EB}	max.	7 V
Total power dissipation	P_{tot}	max.	220 mW
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	V_{ESD}	max.	2 kV

Characteristics

T_A = 25 °C

Parameter	Symbol		Values
Wavelength of max sensitivity	$\lambda_{S\ max}$	typ.	880 nm
Spectral range of sensitivity	$\lambda_{10\%}$	typ.	450 ... 1100 nm
Chip dimensions	L x W	typ.	1.02 x 1.02 mm x mm
Radiant sensitive area	A	typ.	0.675 mm²
Half angle	φ	typ.	15 °
Photocurrent V_{CE} = 5 V; Std. Light A; E_v = 1000 lx	I_{PCE}	typ.	7750 µA
Photocurrent of collector-base photodiode E_e = 0.5 mW/cm²; λ = 950 nm; V_{CB} = 5 V	I_{PCB}	typ.	11 µA
Photocurrent of collector-base photodiode E_v = 1000 lx; Std. Light A ; V_{CB} = 5 V	I_{PCB}	typ.	35 µA
Dark current V_{CE} = 20 V	I_{CE0}	typ. max.	20 nA 100 nA
Rise time I_C = 1 mA; V_{CC} = 5 V; R_L = 1 kΩ	t_r	typ.	12 µs
Fall time I_C = 1 mA; V_{CC} = 5 V; R_L = 1 kΩ	t_f	typ.	12 µs
Collector-emitter saturation voltage [1)] I_C = $I_{PCE,min}$ X 0.3; E_e = 0.5 mW/cm²	V_{CEsat}	typ.	230 mV
Capacitance V_{CE} = 0 V; f = 1 MHz; E = 0	C_{CE}	typ.	23 pF
Capacitance V_{CB} = 0 V; f = 1 MHz; E = 0	C_{CB}	typ.	39 pF
Capacitance V_{EB} = 0 V; f = 1 MHz; E = 0	C_{EB}	typ.	47 pF
Thermal resistance junction ambient real	R_{thJA}	max.	450 K / W

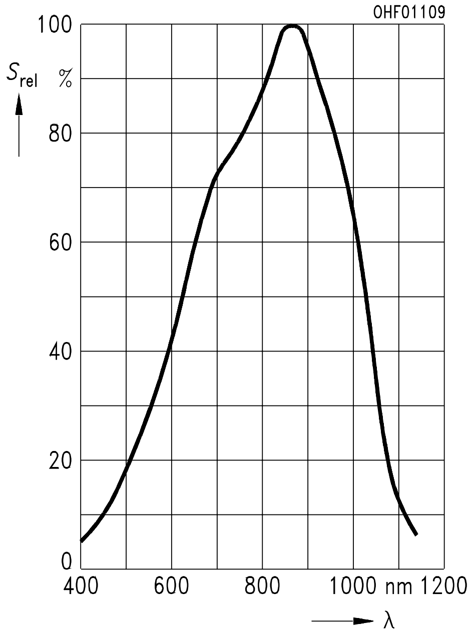
Grouping

T_A = 25 °C

Group	Photocurrent V_{CE} = 5 V; λ = 950 nm; E_e = 0.5 mW/cm² min. I_{PCE}	Photocurrent V_{CE} = 5 V; λ = 950 nm; E_e = 0.5 mW/cm² max. I_{PCE}
3	1250 µA	2500 µA
4	2000 µA	4000 µA
5	3200 µA	6400 µA

Relative Spectral Sensitivity [2), 3)]

S_{rel} = f (λ)



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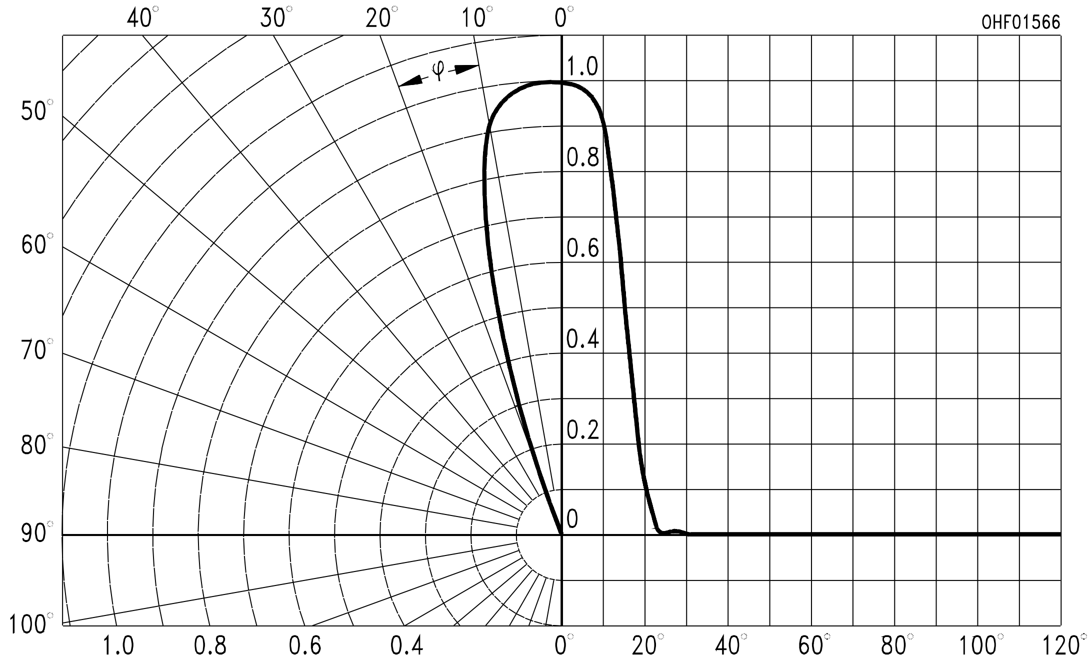
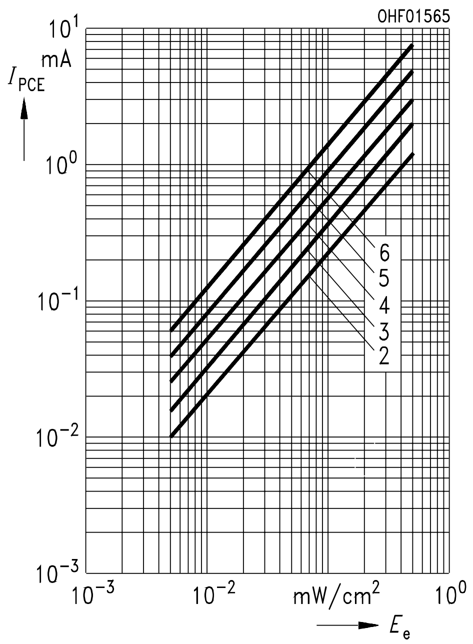
Directional Characteristics 2), 3)

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



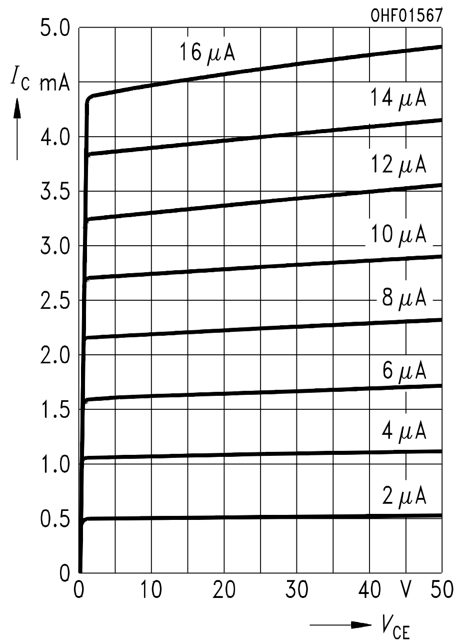
Photocurrent 2), 3)

$I_{PCE} = f(E_e)$; $V_{CE} = 5$ V



Collector Current 2), 3)

$I_{CE} = f(V_{CE})$; I_B = Parameter



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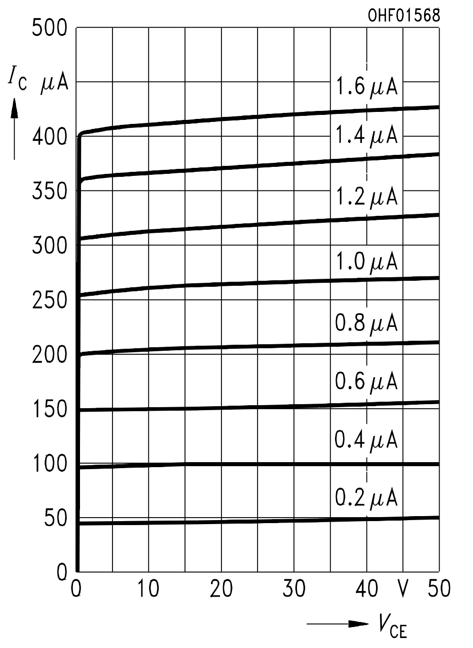
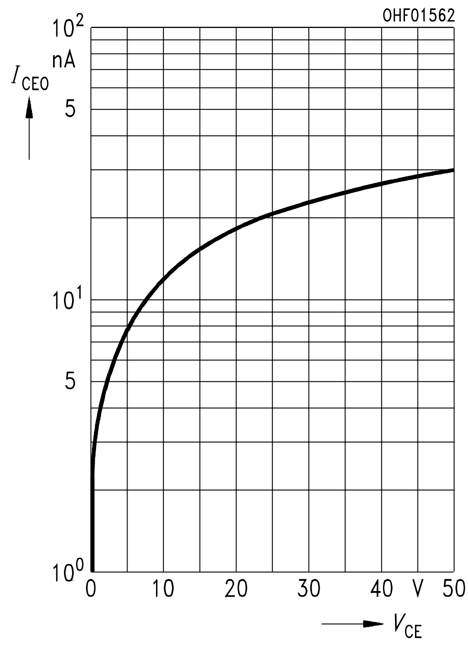
Collector Current [2), 3)]

$I_{CE} = f(V_{CE})$; I_B = Parameter



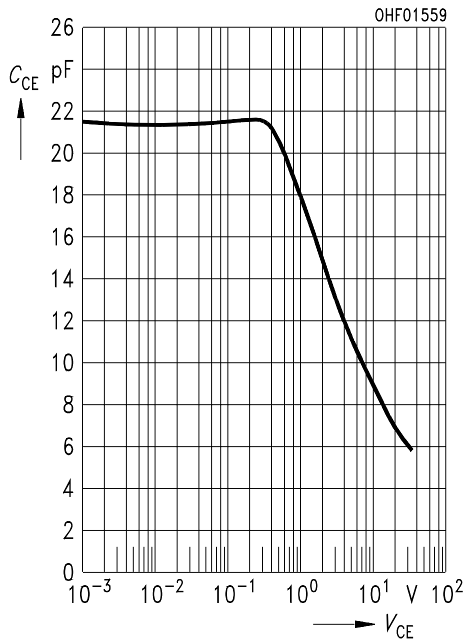
Dark Current [2), 3)]

$I_{CE0} = f(V_{CE})$; E = 0 ;



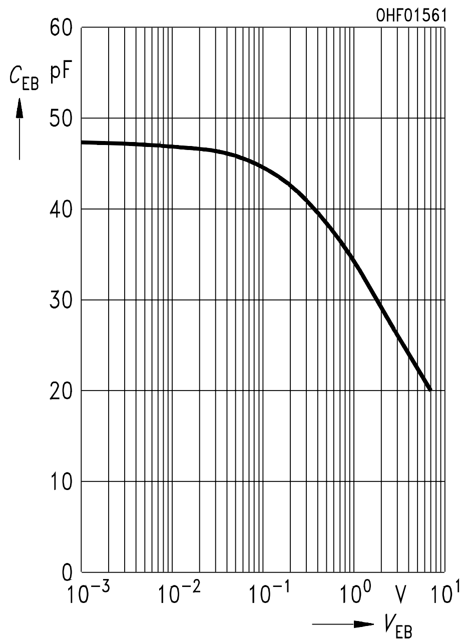
Collector-Emitter Capacitance [2), 3)]

$C_{CE} = f(V_{CE})$; f = 1 MHz; E = 0 ;



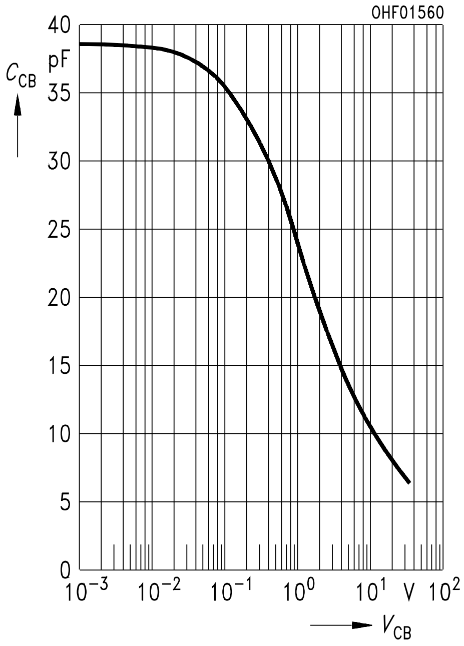
Emitter-Base Capacitance [2), 3)]

$C_{EB} = f(V_{EB})$; f = 1 MHz; E = 0 ;



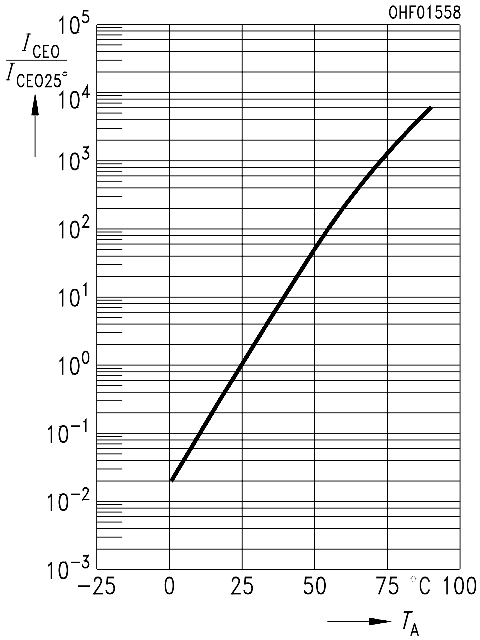
Collector-Base Capacitance 2), 3)

$C_{CB} = f(V_{CB})$; f = 1 MHz; E = 0 ;



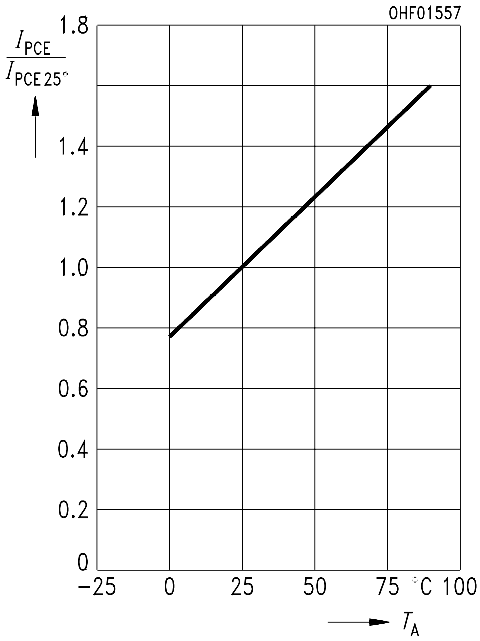
Dark Current 2)

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



Photocurrent 2)

$I_{PCE,rel} = f(T_A)$; V_{CE} = 5 V



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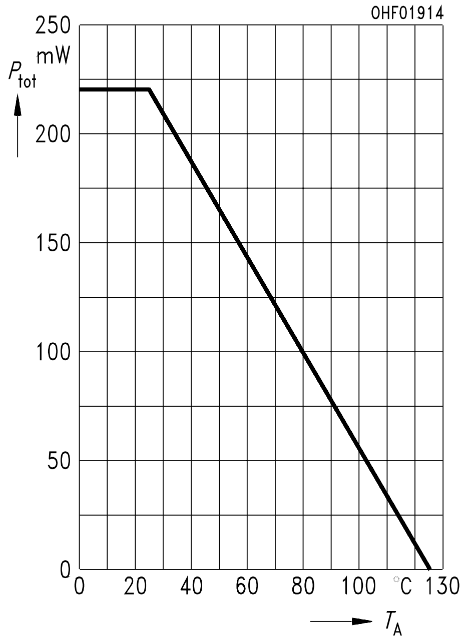
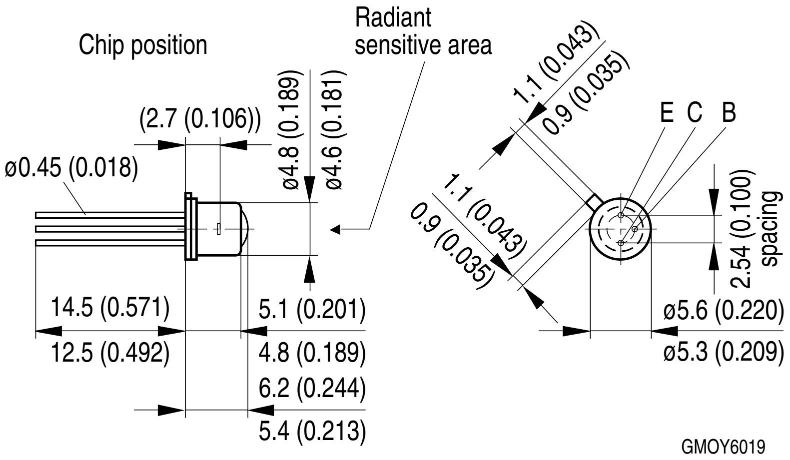
Power Consumption

$P_{tot} = f(T_A)$; $R_{thJA} = 450$ K / W



Dimensional Drawing [4)]

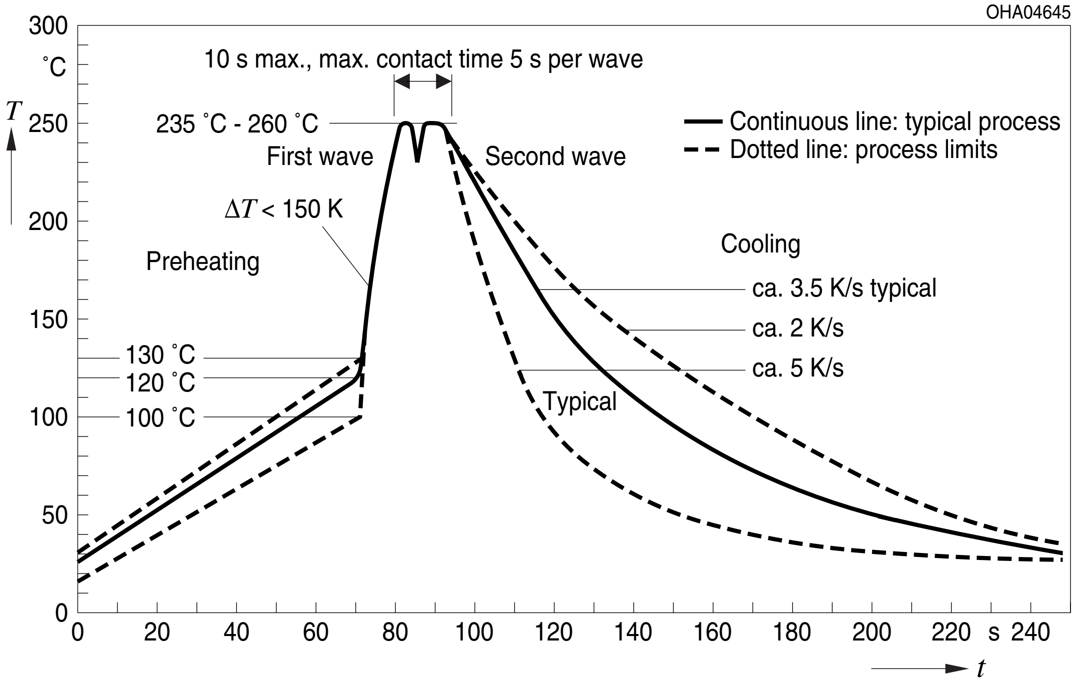


Approximate Weight: 332.0 mg

Package marking: Emitter

TTW Soldering

IEC-61760-1 TTW



Notes

The evaluation of eye safety occurs according to the standard IEC 62471:2006 (photo biological safety of lamps and lamp systems). Within the risk grouping system of this IEC standard, the LED specified in this data sheet fall into the class **exempt group (exposure time 10000 s)**. Under real circumstances (for exposure time, conditions of the eye pupils, observation distance), it is assumed that no endangerment to the eye exists from these devices. As a matter of principle, however, it should be mentioned that intense light sources have a high secondary exposure potential due to their blinding effect. When looking at bright light sources (e.g. headlights), temporary reduction in visual acuity and afterimages can occur, leading to irritation, annoyance, visual impairment, and even accidents, depending on the situation.

Subcomponents of this LED contain, in addition to other substances, metal filled materials including silver. Metal filled materials can be affected by environments that contain traces of aggressive substances. Therefore, we recommend that customers minimize LED exposure to aggressive substances during storage, production, and use. LEDs that showed visible discoloration when tested using the described tests above did show no performance deviations within failure limits during the stated test duration. Respective failure limits are described in the IEC60810.

For further application related informations please visit www.osram-os.com/appnotes

Disclaimer

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

Attention please!
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Packing
Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office.
By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

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Glossary

[1] **IPCEmin**: I_{PCEmin} is the min. photocurrent of the specified group.

[2] **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.

[3] **Testing temperature**: T_A = 25°C

[4] **Tolerance of Measure**: Unless otherwise noted in drawing, tolerances are specified with ±0.1 and dimensions are specified in mm.

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