

# OSRAM BPX 89

## Datasheet

Discontinued

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Tobelbader Strasse 30, 8141 Premstaetten, Austria

Phone +43 3136 500-0

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## Array Linear

# BPX 89

Silicon NPN Phototransistor Arrays



## Applications

- Factory Automation

## Features

- Package: clear epoxy
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)
- Spectral range of sensitivity: (typ) 450 ... 1100 nm
- Multiple-digit array package
- High linearity
- Available in groups

## Ordering Information

Type	Photocurrent <sup>1)</sup> $V_{CE} = 5\text{ V}; \lambda = 950\text{ nm}; E_e = 0.5\text{ mW/cm}^2$ $I_{PCE}$	Photocurrent <sup>2)</sup> typ. $V_{CE} = 5\text{ V}; \lambda = 950\text{ nm}; E_e = 0.5\text{ mW/cm}^2$ $I_{PCE}$	Ordering Code
BPX 89	360 ... 900 $\mu\text{A}$	660 $\mu\text{A}$	Q62702P0026

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

## Maximum Ratings

$T_A = 25\text{ °C}$

Parameter	Symbol		Values
Operating temperature	$T_{op}$	min.	-40 °C
		max.	80 °C
Storage temperature	$T_{stg}$	min.	-40 °C
		max.	80 °C
Collector-emitter voltage	$V_{CE}$	max.	35 V
Collector current	$I_C$	max.	50 mA
Collector surge current $\tau \leq 10\ \mu\text{s}$	$I_{CS}$	max.	200 mA
Emitter-collector voltage	$V_{EC}$	max.	7 V
Total power dissipation	$P_{tot}$	max.	90 mW
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	$V_{ESD}$	max.	2 kV

## Characteristics

$T_A = 25\text{ °C}$

Parameter	Symbol		Values
Number of detectors	n		9
Dimension "B" (see drawing)	l	max. min.	22.7 mm 22.3 mm
Wavelength of max sensitivity	$\lambda_{S\max}$	typ.	850 nm
Spectral range of sensitivity	$\lambda_{10\%}$	typ.	450 ... 1100 nm
Dimensions of chip area	L x W	typ.	0.55 x 0.55 mm x mm
Radiant sensitive area	A	typ.	0.11 mm <sup>2</sup>
Half angle	$\varphi$	typ.	18 °
Photocurrent $V_{CE} = 5\text{ V}$ ; Std. Light A; $E_v = 1000\text{ lx}$	$I_{PCE}$	typ.	1900 $\mu\text{A}$
Dark current $V_{CE} = 5\text{ V}$	$I_{CE0}$	typ. max.	1 nA 50 nA
Rise time $I_C = 1\text{ mA}$ ; $\lambda = 0\text{ nm}$ ; $V_{CC} = 5\text{ V}$ ; $R_L = 1\text{ k}\Omega$	$t_r$	typ.	6 $\mu\text{s}$
Fall time $I_C = 1\text{ mA}$ ; $\lambda = 0\text{ nm}$ ; $V_{CC} = 5\text{ V}$ ; $R_L = 1\text{ k}\Omega$	$t_f$	typ.	6 $\mu\text{s}$
Collector-emitter saturation voltage <sup>3)</sup> $I_C = I_{PCE,\min} \times 0.3$ ; $\lambda = 950\text{ nm}$ ; $E_e = 0.5\text{ mW/cm}^2$ ; $E_v = 0\text{ lx}$ ; 0	$V_{CEsat}$	typ.	150 mV
Capacitance $V_{CE} = 0\text{ V}$ ; $f = 1\text{ MHz}$ ; $E = 0$	$C_{CE}$	typ.	7.5 pF

## Photocurrent Groups

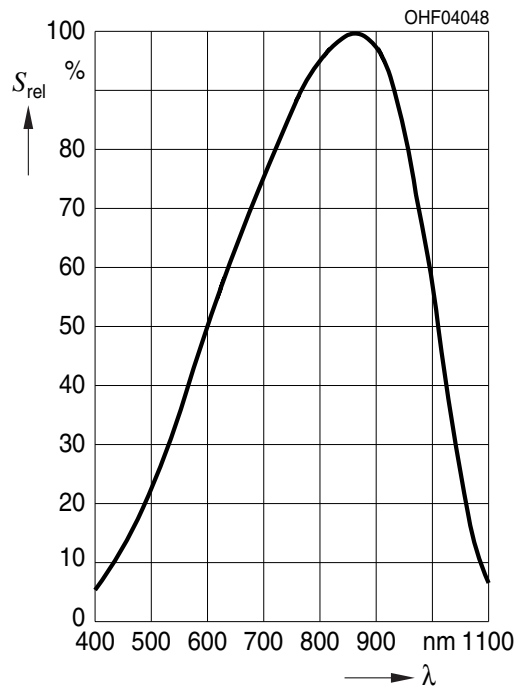
$T_A = 25\text{ °C}$

Group	Photocurrent <sup>1)</sup> $V_{CE} = 5\text{ V}; \lambda = 950\text{ nm}; E_e = 0.5\text{ mW/cm}^2$ min. $I_{PCE}$	Photocurrent <sup>1)</sup> $V_{CE} = 5\text{ V}; \lambda = 950\text{ nm}; E_e = 0.5\text{ mW/cm}^2$ max. $I_{PCE}$
A	360 $\mu\text{A}$	560 $\mu\text{A}$
B	450 $\mu\text{A}$	710 $\mu\text{A}$
C	560 $\mu\text{A}$	900 $\mu\text{A}$

For delivery the components are marked -A, -B, -C. Due to differing yields it is not possible to order a definite group.

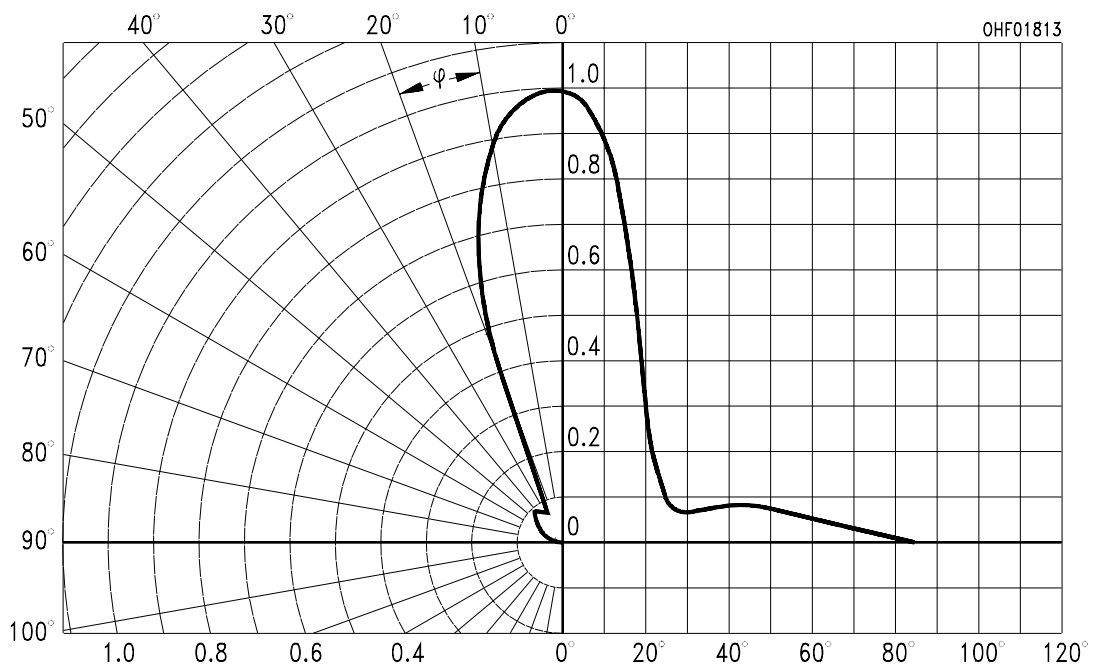
### Relative Spectral Sensitivity <sup>4), 5)</sup>

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



### Directional Characteristics <sup>4), 5)</sup>

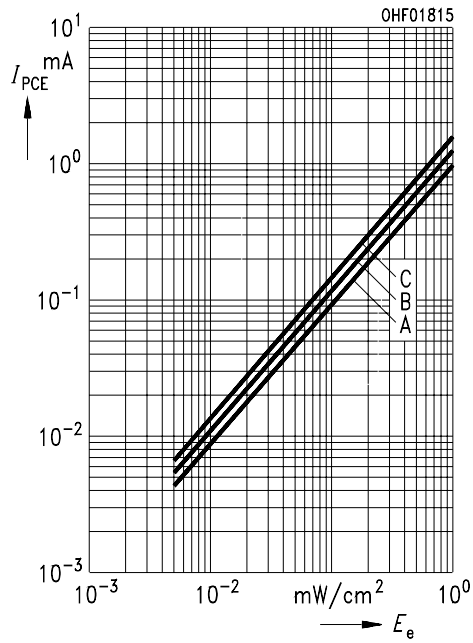
$$S_{rel} = f(\varphi)$$



Discontinued

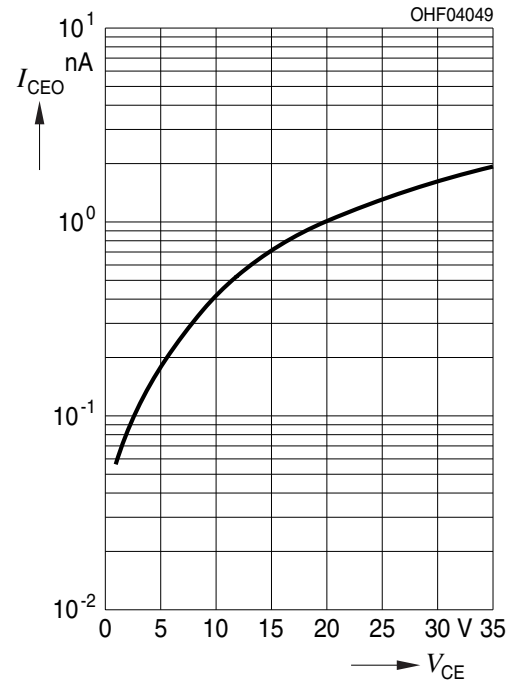
**Photocurrent** 4), 5)

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



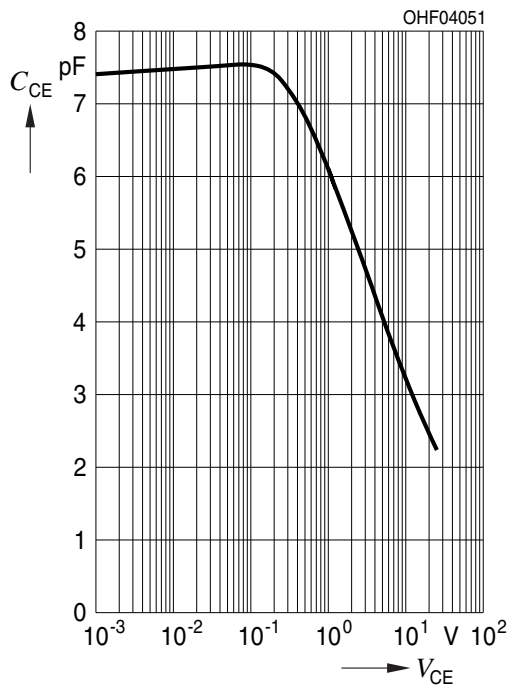
**Dark Current** 4), 5)

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



**Collector-Emitter Capacitance** 4), 5)

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

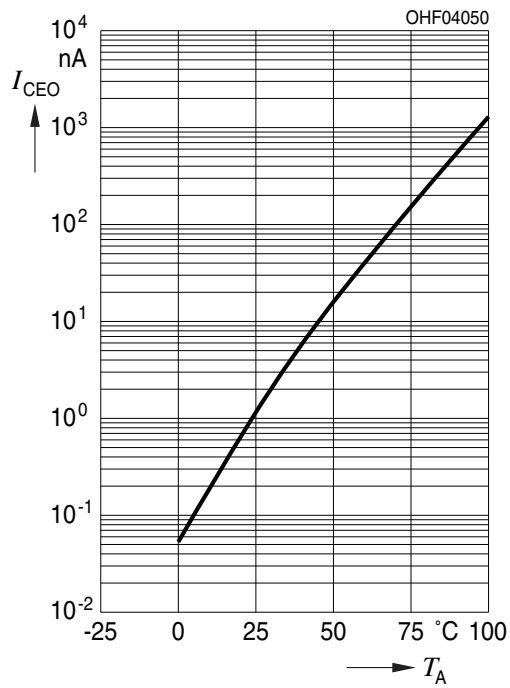


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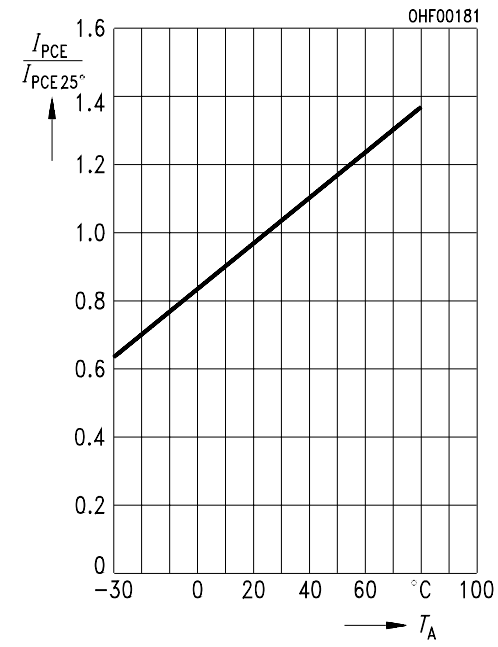
**Dark Current** 4)

$I_{CE0} = f(T_A); V_{CE} = 0 \text{ V}; E = 0; E_e = 0 \text{ mW/cm}^2; 0$

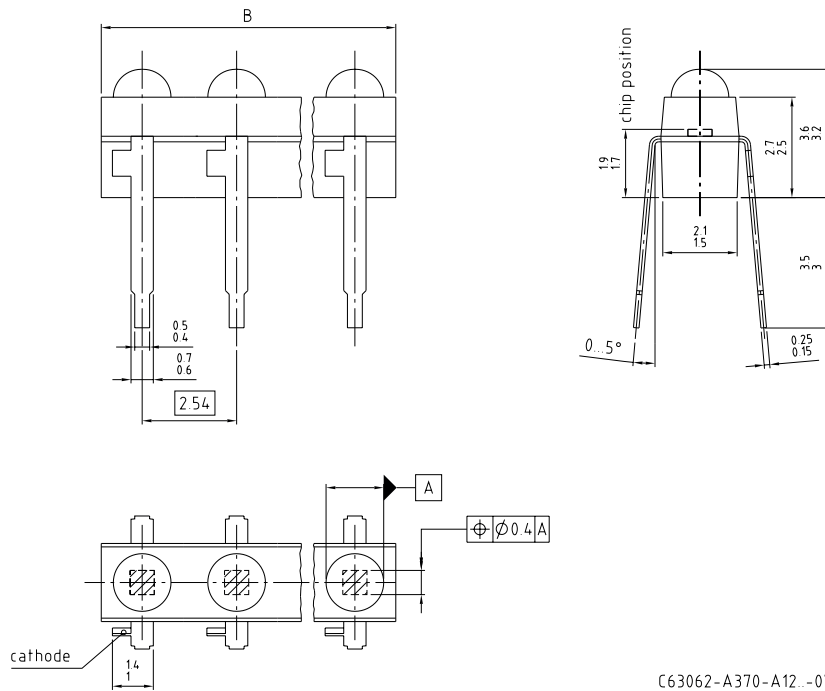


**Photocurrent** 4)

$I_{PCE,rel} = f(T_A); V_{CE} = 5 \text{ V}; E_v = 0 \text{ lx}; \text{Std. Light A}$



Dimensional Drawing <sup>6)</sup>



C63062-A370-A12.-07

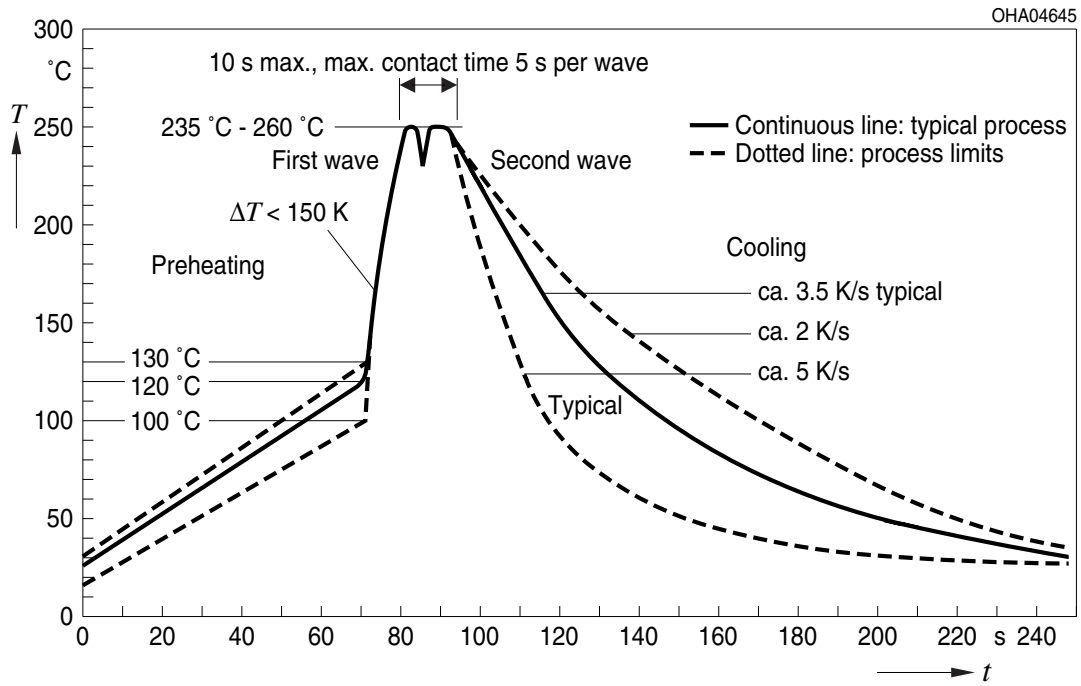
Further Information:

Approximate Weight: 216.0 mg

Package marking: Cathode

### TTW Soldering

IEC-61760-1 TTW



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## Disclaimer

### Attention please!

The information describes the type of component and shall not be considered as assured characteristics. Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances.

For information on the types in question please contact our Sales Organization.

If printed or downloaded, please find the latest version on our website.

### 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.

### Product and functional safety devices/applications or medical devices/applications

Our components are not developed, constructed or tested for the application as safety relevant component or for the application in medical devices.

Our products are not qualified at module and system level for such application.

In case buyer – or customer supplied by buyer – considers using our components in product safety devices/ applications or medical devices/applications, buyer and/or customer has to inform our local sales partner immediately and we and buyer and /or customer will analyze and coordinate the customer-specific request between us and buyer and/or customer.

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## Glossary

- 1) **Photocurrent:** The photocurrent values are measured (by irradiating the devices with a homogenous light source and applying a voltage to the device) with a tolerance of  $\pm 11\%$ .
- 2) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with  $\pm 0.1$  and dimensions are specified in mm.
- 3) **IPCEmin:** IPCEmin is the min. photocurrent of the specified group.
- 4) **Typical Values:** Due to the special conditions of the manufacturing processes of semiconductor devices, 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.
- 5) **Testing temperature:** TA = 25°C (unless otherwise specified)
- 6) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with  $\pm 0.1$  and dimensions are specified in mm.

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## Revision History

Version	Date	Change
1.4	2023-06-06	New Layout Applications Discontinued

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Tobelbader Strasse 30, 8141 Premstaetten, Austria

Phone +43 3136 500-0

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