

**NPN-Silizium-Fototransistor**  
**Silicon NPN Phototransistor**  
**Lead (Pb) Free Product - RoHS Compliant**

**BPX 38**



**Wesentliche Merkmale**

- Speziell geeignet für Anwendungen im Bereich von 450 nm bis 1120 nm
- Hohe Linearität
- Hermetisch dichte Metallbauform (TO-18) mit Basisanschluß, geeignet bis 125 °C
- Gruppiert lieferbar

**Anwendungen**

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

**Features**

- Especially suitable for applications from 450 nm to 1120 nm
- High linearity
- Hermetically sealed metal package (TO-18) with base connection, suitable up to 125 °C
- Available in groups

**Applications**

- Photointerrupters
- Industrial electronics
- For control and drive circuits

| <b>Typ<br/>Type</b> | <b>Bestellnummer<br/>Ordering Code</b> |
|---------------------|--|
| BPX 38              | Q62702P0015                            |
| BPX 38-2/3          | Q62702P3578                            |
| BPX 38-3            | Q62702P0015S003                        |
| BPX 38-4            | Q62702P0015S004                        |

**Grenzwerte**  
**Maximum Ratings**

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

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

**Characteristics**

| Bezeichnung<br>Parameter  | Symbol<br>Symbol                                      | Wert<br>Value  | Einheit<br>Unit |
|---|---|----------------|-----------------|
| Wellenlänge der max. Fotoempfindlichkeit<br>Wavelength of max. sensitivity  | $\lambda_{S\text{ max}}$                              | 880            | nm              |
| Spektraler Bereich der Fotoempfindlichkeit<br>$S = 10\%$ von $S_{\text{max}}$<br>Spectral range of sensitivity<br>$S = 10\%$ of $S_{\text{max}}$  | $\lambda$   | 450 ... 1120   | nm              |
| Bestrahlungsempfindliche Fläche<br>Radiant sensitive area   | $A$   | 0.675          | mm <sup>2</sup> |
| Abmessung der Chipfläche<br>Dimensions of chip area   | $L \times B$<br>$L \times W$                          | 1 × 1          | mm × mm         |
| Halbwinkel<br>Half angle  | $\varphi$   | ± 40           | Grad<br>deg.    |
| Fotostrom der Kollektor-Basis-Fotodiode<br>Photocurrent of collector-base photodiode<br>$E_e = 0.5\text{ mW/cm}^2$ , $V_{\text{CB}} = 5\text{ V}$<br>$E_v = 1000\text{ lx}$ , Normlicht/standard light A,<br>$V_{\text{CB}} = 5\text{ V}$ | $I_{\text{PCB}}$<br>$I_{\text{PCB}}$                  | 1.8<br>5.5     | μA<br>μA        |
| Kapazität<br>Capacitance<br>$V_{\text{CE}} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$<br>$V_{\text{CB}} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$<br>$V_{\text{EB}} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$                     | $C_{\text{CE}}$<br>$C_{\text{CB}}$<br>$C_{\text{EB}}$ | 23<br>39<br>47 | pF<br>pF<br>pF  |
| Dunkelstrom<br>Dark current<br>$V_{\text{CE}} = 25\text{ V}$ , $E = 0$  | $I_{\text{CEO}}$                                      | 20 (≤ 100)     | nA              |

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

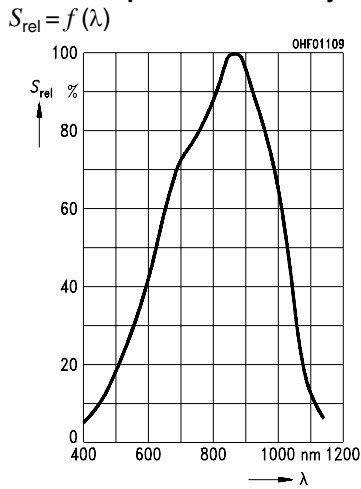
The phototransistors are grouped according to their spectral sensitivity and distinguished by arabian figures.

| Bezeichnung<br>Parameter   | Symbol<br>Symbol          | Wert<br>Value       |                      |                    |                   | Einh.<br>Unit |
|--|---------------------------|---------------------|----------------------|--------------------|-------------------|---------------|
|  |                           | -2                  | -3                   | -4                 | -5                |               |
| Fotostrom, $\lambda = 950 \text{ nm}$<br>Photocurrent<br>$E_e = 0.5 \text{ mW/cm}^2$ , $V_{CE} = 5 \text{ V}$<br>$E_v = 1000 \text{ lx}$ , Normlicht/standard light A,<br>$V_{CE} = 5 \text{ V}$ | $I_{PCE}$<br>$I_{PCE}$    | 0.2 ... 0.4<br>0.95 | 0.32 ... 0.63<br>1.5 | 0.5 ... 1.0<br>2.3 | $\geq 0.8$<br>3.6 | mA<br>mA      |
| Anstiegszeit/Abfallzeit<br>Rise and fall time<br>$I_C = 1 \text{ mA}$ , $V_{CC} = 5 \text{ V}$ , $R_L = 1 \text{ k}\Omega$   | $t_r$ , $t_f$             | 9                   | 12                   | 15                 | 18                | $\mu\text{s}$ |
| Kollektor-Emitter-Sättigungsspannung<br>Collector-emitter saturation voltage<br>$I_C = I_{PCEmin}^{1)} \times 0.3$<br>$E_e = 0.5 \text{ mW/cm}^2$  | $V_{CEsat}$               | 200                 | 200                  | 200                | 200               | mV            |
| Stromverstärkung<br>Current gain<br>$E_e = 0.5 \text{ mW/cm}^2$ , $V_{CE} = 5 \text{ V}$   | $\frac{I_{PCE}}{I_{PCB}}$ | 170                 | 280                  | 420                | 650               | –             |

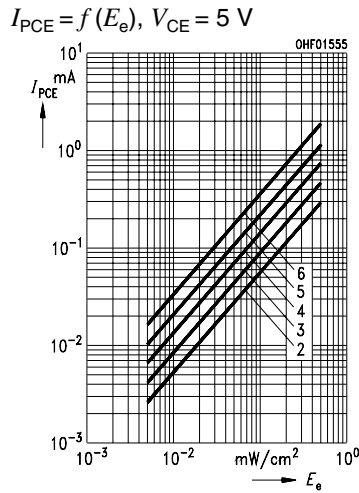
<sup>1)</sup>  $I_{PCEmin}$  ist der minimale Fotostrom der jeweiligen Gruppe.

<sup>1)</sup>  $I_{PCEmin}$  is the min. photocurrent of the specified group.

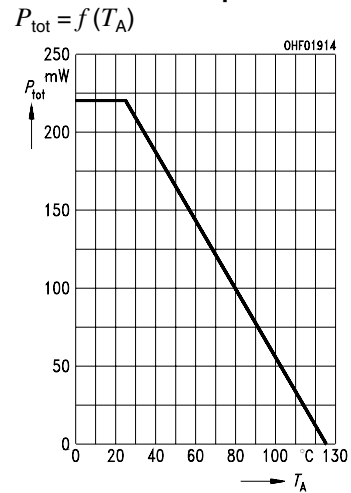
**Relative Spectral Sensitivity**



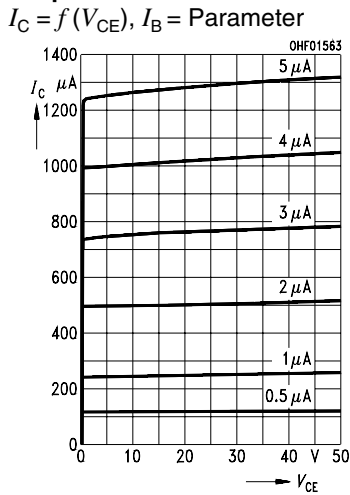
**Photocurrent**



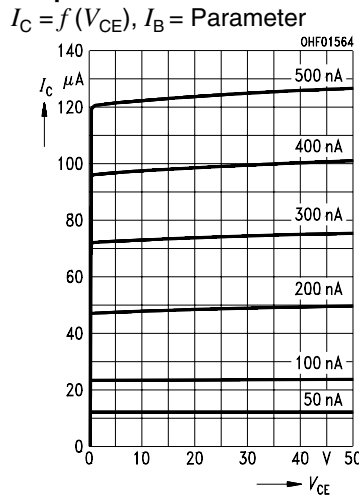
**Total Power Dissipation**



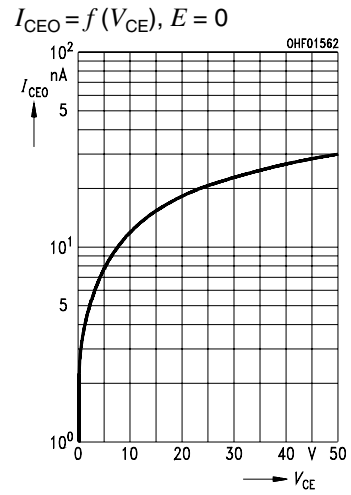
**Output Characteristics**



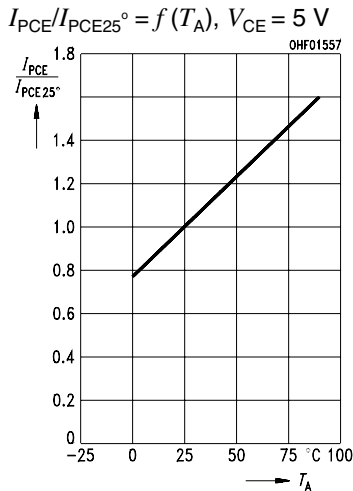
**Output Characteristics**



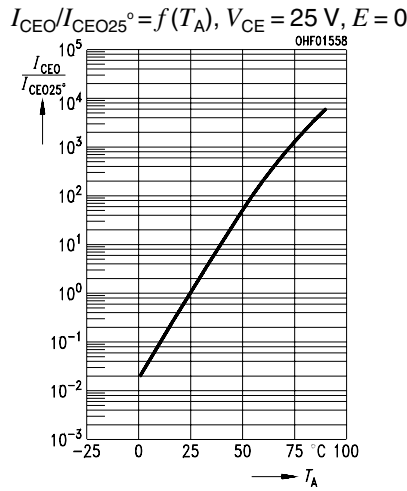
**Dark Current**



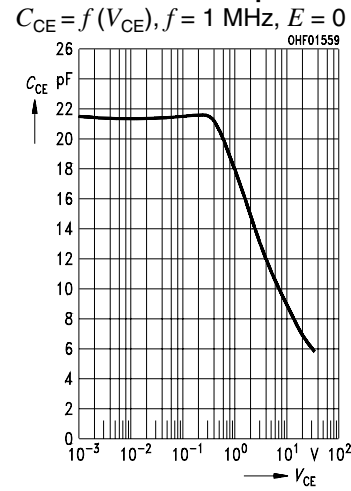
**Photocurrent**



**Dark Current**

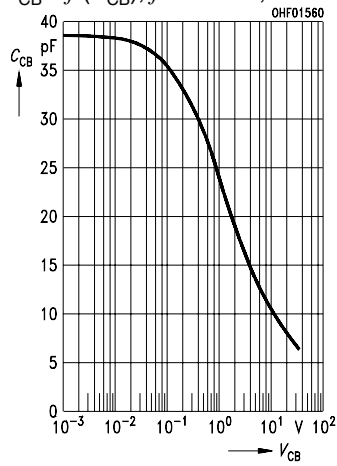


**Collector-Emitter Capacitance**



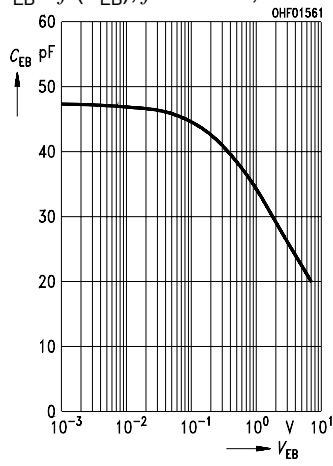
**Collector-Base Capacitance**

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



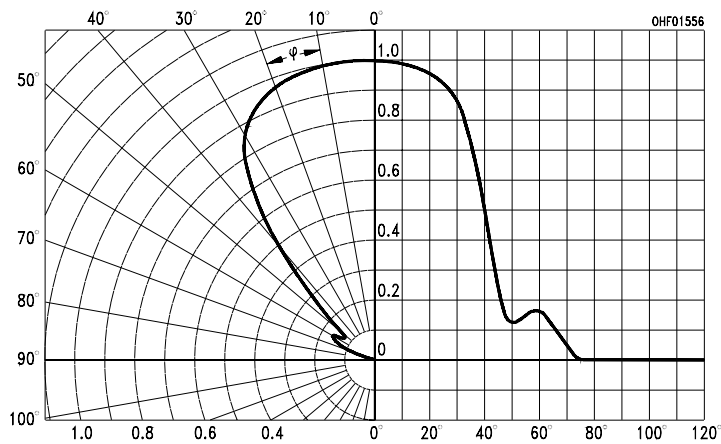
**Emitter-Base Capacitance**

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



**Directional Characteristics**

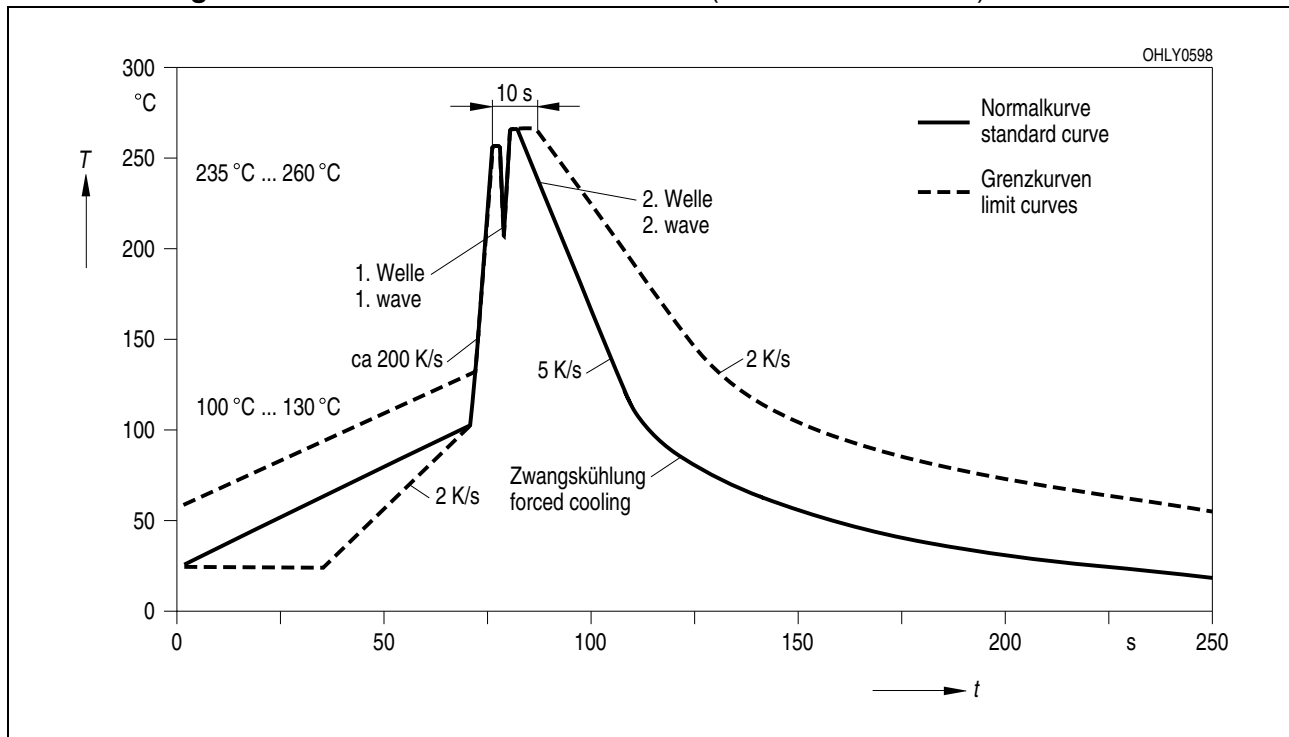
$S_{rel} = f(\varphi)$





**Lötbedingungen**  
**Soldering Conditions**  
**Wellenlöt (TTW)**  
**TTW Soldering**

(nach CECC 00802)  
(acc. to CECC 00802)



Published by  
**OSRAM Opto Semiconductors GmbH**  
Wernerwerkstrasse 2, D-93049 Regensburg  
[www.osram-os.com](http://www.osram-os.com)  
© All Rights Reserved.

EU RoHS and China RoHS compliant product



此产品符合欧盟 RoHS 指令的要求；

按照中国的相关法规和标准，不含有毒有害物质或元素。

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.

**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.

**Components used in life-support devices or systems must be expressly authorized for such purpose!** Critical components<sup>1</sup>, may only be used in life-support devices or systems<sup>2</sup> with the express written approval of OSRAM OS.

<sup>1</sup> A critical component is a component used in a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or effectiveness of that device or system.

<sup>2</sup> 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 of the user may be endangered.

2007-03-29

8