

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

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

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 ... 1120 | 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 × mm |
| Halbwinkel Half angle | φ | ± 40 | Grad deg. |
| Fotostrom der Kollektor-Basis-Fotodiode Photocurrent of collector-base photodiode $E_e = 0.5\text{ mW/cm}^2$, $V_{\text{CB}} = 5\text{ V}$ $E_v = 1000\text{ lx}$, Normlicht/standard light A, $V_{\text{CB}} = 5\text{ V}$ | I_{PCB} I_{PCB} | 1.8 5.5 | μA μA |
| Kapazität Capacitance $V_{\text{CE}} = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ $V_{\text{CB}} = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ $V_{\text{EB}} = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ | C_{CE} C_{CB} C_{EB} | 23 39 47 | pF pF pF |
| Dunkelstrom Dark current $V_{\text{CE}} = 25\text{ V}$, $E = 0$ | I_{CEO} | 20 (≤ 100) | nA |

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

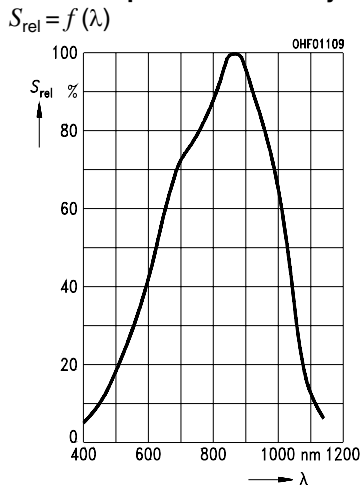
The phototransistors are grouped according to their spectral sensitivity and distinguished by arabian figures.

| Bezeichnung Parameter | Symbol Symbol | Wert Value | | | | Einh. 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} | 0.2 ... 0.4 0.95 | 0.32 ... 0.63 1.5 | 0.5 ... 1.0 2.3 | ≥ 0.8 3.6 | 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 | 200 | 200 | 200 | mV |
| Stromverstärkung Current gain $E_e = 0.5 \text{ mW/cm}^2$, $V_{CE} = 5 \text{ V}$ | $\frac{I_{PCE}}{I_{PCB}}$ | 170 | 280 | 420 | 650 | – |

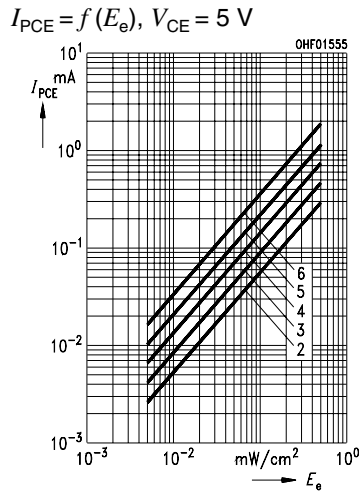
¹⁾ I_{PCEmin} ist der minimale Fotostrom der jeweiligen Gruppe.

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

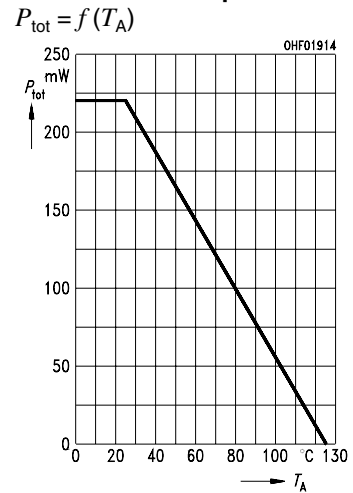
Relative Spectral Sensitivity



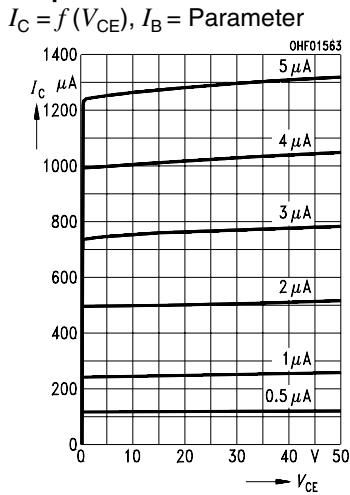
Photocurrent



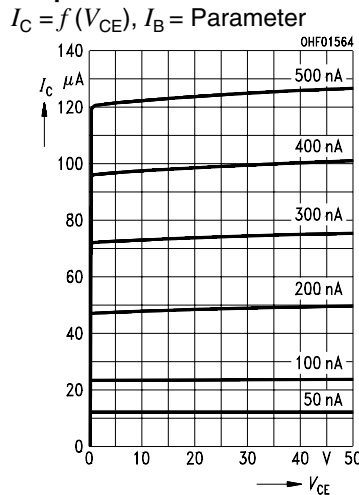
Total Power Dissipation



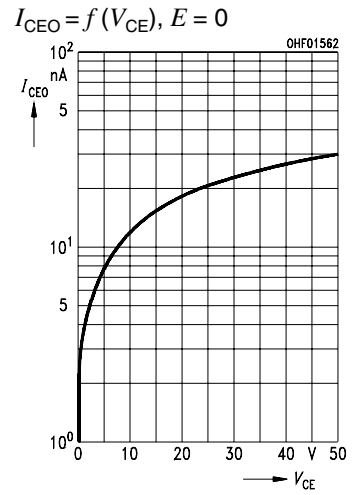
Output Characteristics



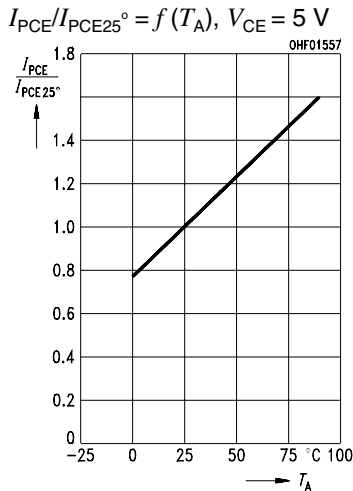
Output Characteristics



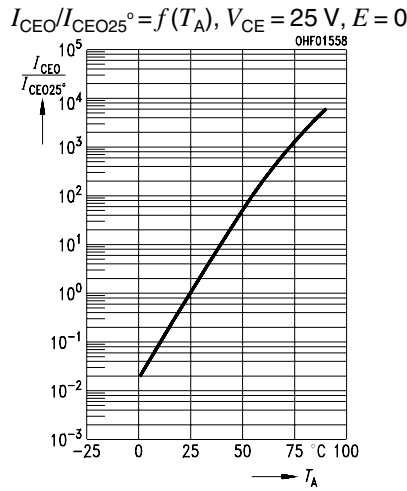
Dark Current



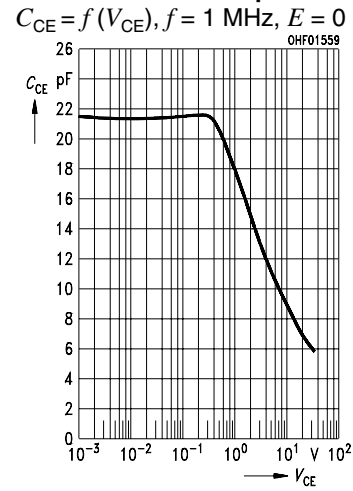
Photocurrent



Dark Current

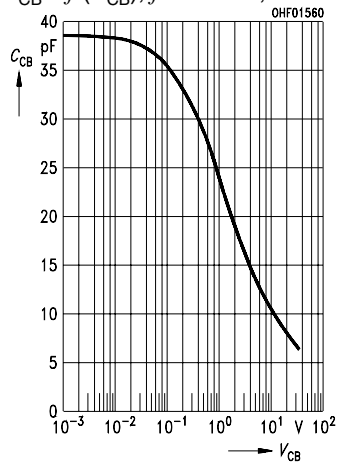


Collector-Emitter Capacitance



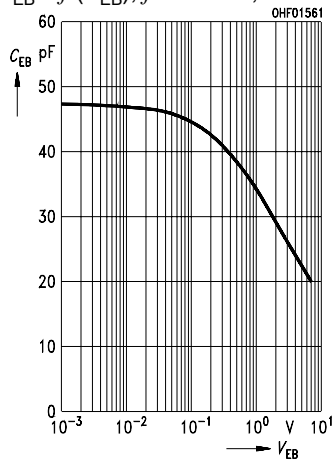
Collector-Base Capacitance

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



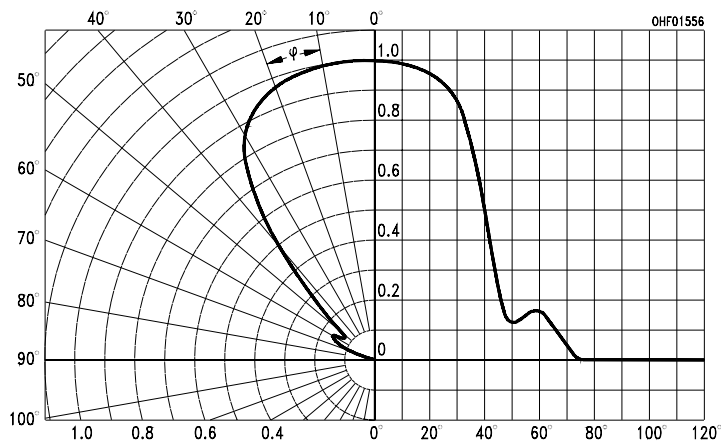
Emitter-Base Capacitance

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

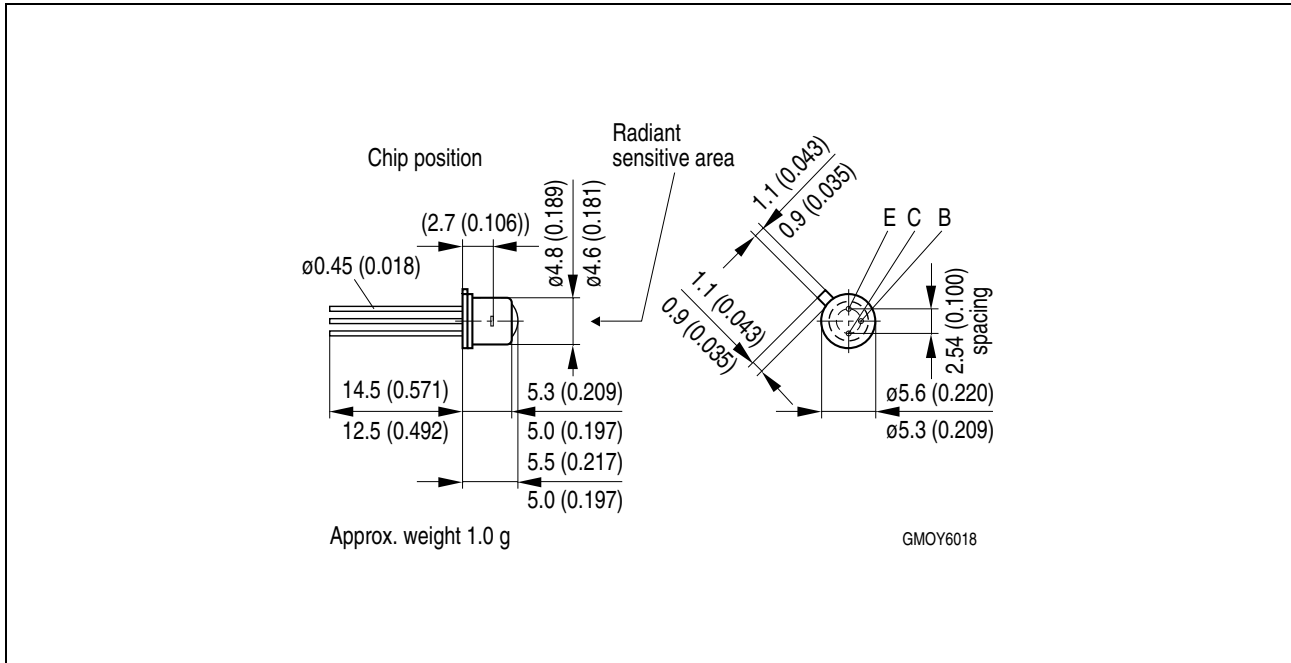


Directional Characteristics

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



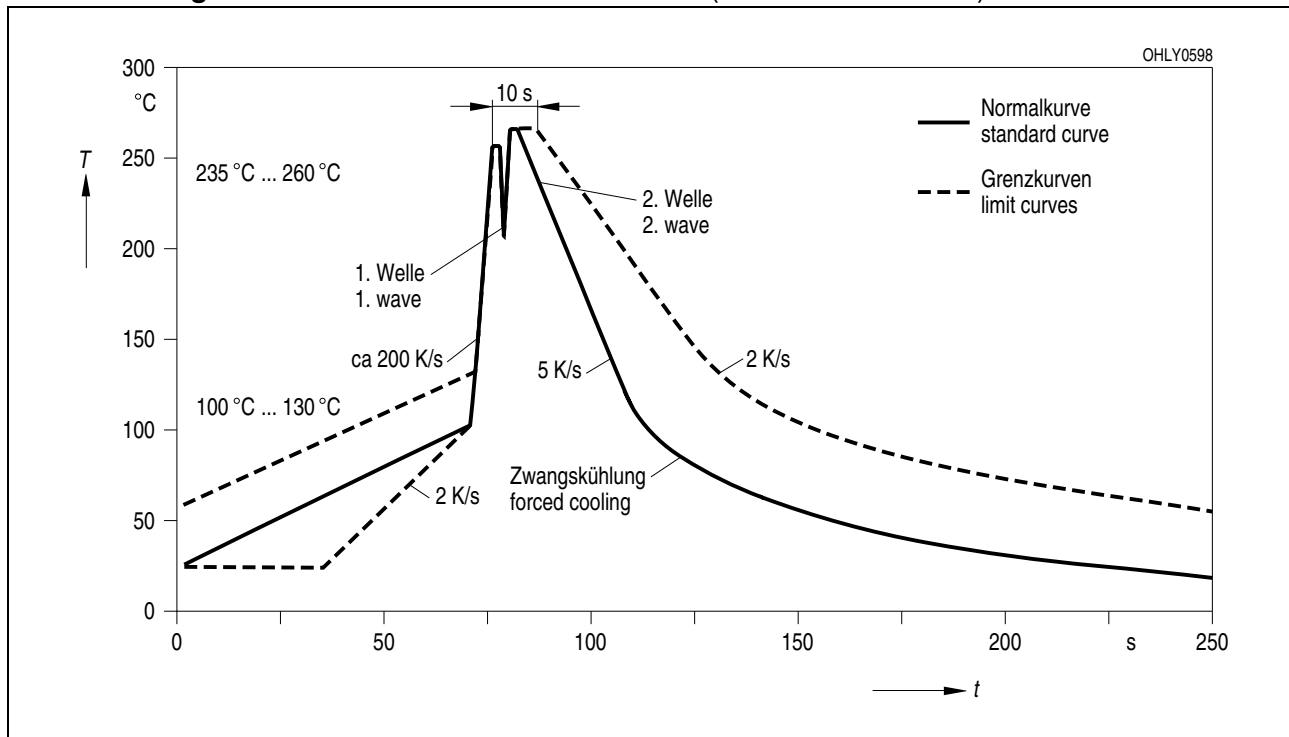
Maßzeichnung
Package Outlines



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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