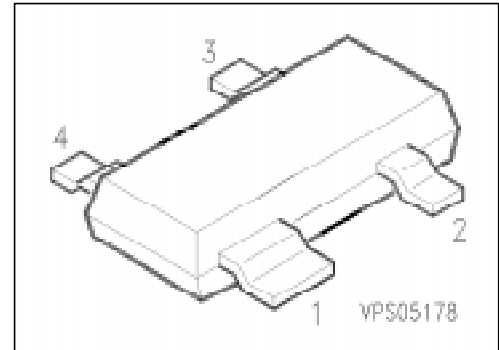


## PNP Silicon Double Transistors

BCV 62

### Preliminary Data

- To be used as a current mirror
- Good thermal coupling and  $V_{BE}$  matching
- High current gain
- Low emitter-saturation voltage



| Type                             | Marking           | Ordering Code (tape and reel)                | Pin Configuration | Package <sup>1)</sup> |
|----------------------------------|-------------------|--|-------------------|-----------------------|
| BCV 62 A<br>BCV 62 B<br>BCV 62 C | 3Js<br>3Ks<br>3Ls | Q62702-C2158<br>Q62702-C2159<br>Q62702-C2160 |                   | SOT-143               |

### Maximum Ratings

| Parameter   | Symbol    | Values         | Unit |
|---|-----------|----------------|------|
| Collector-emitter voltage (transistor T1)             | $V_{CE0}$ | 30             | V    |
| Collector-base voltage (open emitter) (transistor T1) | $V_{CB0}$ | 30             |      |
| Emitter-base voltage                                  | $V_{EBS}$ | 6              |      |
| Collector current                                     | $I_C$     | 100            | mA   |
| Collector peak current                                | $I_{CM}$  | 200            |      |
| Base peak current (transistor T1)                     | $I_{BM}$  | 200            |      |
| Total power dissipation, $T_s = 99\text{ °C}^2)$      | $P_{tot}$ | 300            | mW   |
| Junction temperature                                  | $T_j$     | 150            | °C   |
| Storage temperature range                             | $T_{stg}$ | - 65 ... + 150 |      |

### Thermal Resistance

|                                  |             |       |     |
|----------------------------------|-------------|-------|-----|
| Junction - ambient <sup>2)</sup> | $R_{th JA}$ | ≤ 240 | K/W |
| Junction - soldering point       | $R_{th JS}$ | ≤ 170 |     |

1) For detailed information see chapter Package Outlines.

2) Package mounted on epoxy pcb 40 mm × 40 mm × 1.5 mm/6 cm<sup>2</sup> Cu.

## Electrical Characteristics

at  $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise specified.

| Parameter | Symbol | Values |      |      | Unit |
|-----------|--------|--------|------|------|------|
|           |        | min.   | typ. | max. |      |

### DC characteristics for transistor T1

|   |               |     |     |     |               |
|---|---------------|-----|-----|-----|---------------|
| Collector-emitter breakdown voltage<br>$I_C = 10\text{ mA}$ , $I_B = 0$   | $V_{(BR)CE0}$ | 30  | –   | –   | V             |
| Collector-base breakdown voltage<br>$I_C = 10\text{ }\mu\text{A}$ , $I_B = 0$   | $V_{(BR)CB0}$ | 30  | –   | –   |               |
| Emitter-base breakdown voltage<br>$I_E = 10\text{ }\mu\text{A}$ , $I_C = 0$   | $V_{(BR)EBS}$ | 6   | –   | –   |               |
| Collector-base cutoff current<br>$V_{CB} = 30\text{ V}$ , $I_E = 0$<br>$V_{CB} = 30\text{ V}$ , $I_E = 0$ , $T_A = 150\text{ }^\circ\text{C}$     | $I_{CB0}$     | –   | –   | 15  | nA            |
|   |               | –   | –   | 5   | $\mu\text{A}$ |
| DC current gain <sup>1)</sup><br>$I_C = 0.1\text{ mA}$ , $V_{CE} = 5\text{ V}$<br>$I_C = 2\text{ mA}$ , $V_{CE} = 5\text{ V}$                     | $h_{FE}$      | 100 | –   | –   | –             |
| BCV 62 A  |               | 125 | 180 | 220 |               |
| BCV 62 B  |               | 220 | 290 | 475 |               |
| BCV 62 C  |               | 420 | 520 | 800 |               |
| Collector-emitter saturation voltage <sup>1)</sup><br>$I_C = 10\text{ mA}$ , $I_B = 0.5\text{ mA}$<br>$I_C = 100\text{ mA}$ , $I_B = 5\text{ mA}$ | $V_{CEsat}$   | –   | 75  | 300 | mV            |
|   |               | –   | 250 | 650 |               |
| Base-emitter saturation voltage <sup>1)</sup><br>$I_C = 10\text{ mA}$ , $I_C = 0.5\text{ mA}$<br>$I_C = 100\text{ mA}$ , $I_C = 5\text{ mA}$      | $V_{BEsat}$   | –   | 700 | –   |               |
|   |               | –   | 850 | –   |               |
| Base-emitter voltage<br>$I_C = 2\text{ mA}$ , $V_{CE} = 5\text{ V}$<br>$I_C = 10\text{ mA}$ , $V_{CE} = 5\text{ V}$                               | $V_{BE}$      | 600 | 650 | 750 |               |
|   |               | –   | –   | 820 |               |

<sup>1)</sup> Pulse test conditions:  $t \leq 300\text{ }\mu\text{s}$ ,  $D = 2\text{ }\%$ .

## Electrical Characteristics

at  $T_A = 25\text{ °C}$ , unless otherwise specified.

| Parameter | Symbol | Values |      |      | Unit |
|-----------|--------|--------|------|------|------|
|           |        | min.   | typ. | max. |      |

### DC characteristics for transistor T2

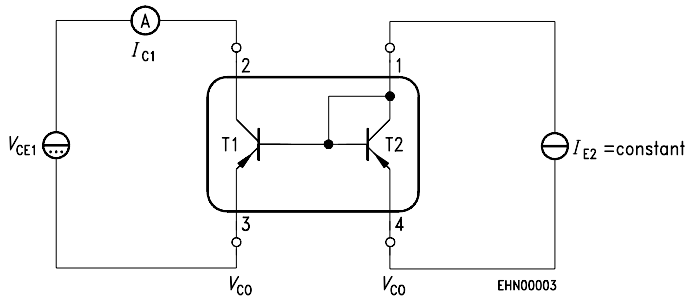
|  |  |            |        |            |    |
|--|--|------------|--------|------------|----|
| Base-emitter forward voltage<br>$I_E = 10\text{ }\mu\text{A}$<br>$I_E = 250\text{ mA}$   | $V_{BES}$                              | 0.4<br>—   | —<br>— | —<br>1.8   | V  |
| Matching of transistor T1 and transistor T2<br>at $I_{E2} = 0.5\text{ mA}$ and $V_{CE1} = 5\text{ V}$<br>$T_A = 25\text{ °C}$<br>$T_A = 150\text{ °C}$ | $I_{C1} / I_{C2}$<br>$I_{C1} / I_{C2}$ | 0.7<br>0.7 | —<br>— | 1.3<br>1.3 |    |
| Thermal coupling of transistor T1 and transistor T2 <sup>1)</sup> T1: $V_{CE} = 5\text{ V}$<br>Maximum current for thermal stability of $I_{C1}$       | $I_{E2}$                               | —          | 5      | —          | mA |

### AC characteristics for transistor T1

|   |           |     |     |     |               |
|---|-----------|-----|-----|-----|---------------|
| Transition frequency<br>$I_C = 10\text{ mA}$ , $V_{CE} = 5\text{ V}$ , $f = 100\text{ MHz}$   | $f_T$     | —   | 250 | —   | MHz           |
| Collector-base capacitance<br>$V_{CB} = 10\text{ V}$ , $I_C = i_C = 0$ , $f = 1\text{ MHz}$   | $C_{cb}$  | —   | 3   | —   | pF            |
| Input capacitance<br>$V_{EB} = 0.5\text{ V}$ , $I_C = i_C = 0$ , $f = 1\text{ MHz}$   | $C_{ibo}$ | —   | 8   | —   |               |
| Noise figure<br>$I_C = 200\text{ }\mu\text{A}$ , $V_{CE} = 5\text{ V}$ , $R_S = 2\text{ k}\Omega$<br>$f = 1\text{ kHz}$ , $B = 200\text{ Hz}$ | $F$       | —   | 2   | —   | dB            |
| Input impedance<br>$I_C = 1\text{ mA}$ , $V_{CE} = 10\text{ V}$ , $f = 1\text{ kHz}$  | $h_{11e}$ | —   | 4.5 | —   | k $\Omega$    |
| Open-circuit reverse voltage transfer ratio<br>$I_C = 1\text{ mA}$ , $V_{CE} = 10\text{ V}$ , $f = 1\text{ kHz}$                              | $h_{12e}$ | —   | 2   | —   | $10^{-4}$     |
| Short-circuit forward current transfer ratio<br>$I_C = 1\text{ mA}$ , $V_{CE} = 10\text{ V}$ , $f = 1\text{ kHz}$                             | $h_{21e}$ | 100 | —   | 900 | —             |
| Open-circuit output admittance<br>$I_C = 1\text{ mA}$ , $V_{CE} = 10\text{ V}$ , $f = 1\text{ kHz}$   | $h_{22e}$ | —   | 30  | —   | $\mu\text{S}$ |

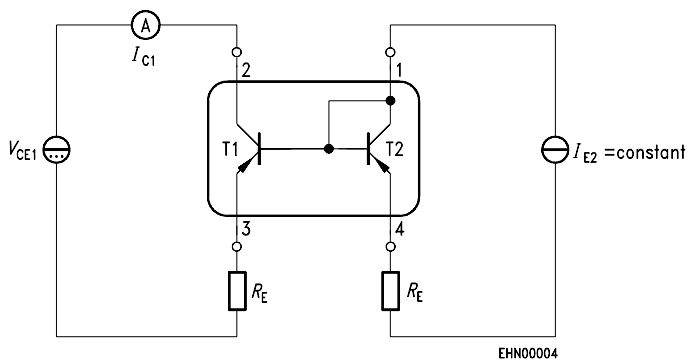
<sup>1)</sup> Without emitter resistor. Device mounted on alumina  $15\text{ mm} \times 16.5\text{ mm} \times 0.7\text{ mm}$ .

**Test circuit for current matching**



Note: Voltage drop at contacts:  $V_{CO} < \frac{2}{3} V_T = 16 \text{ mV}$

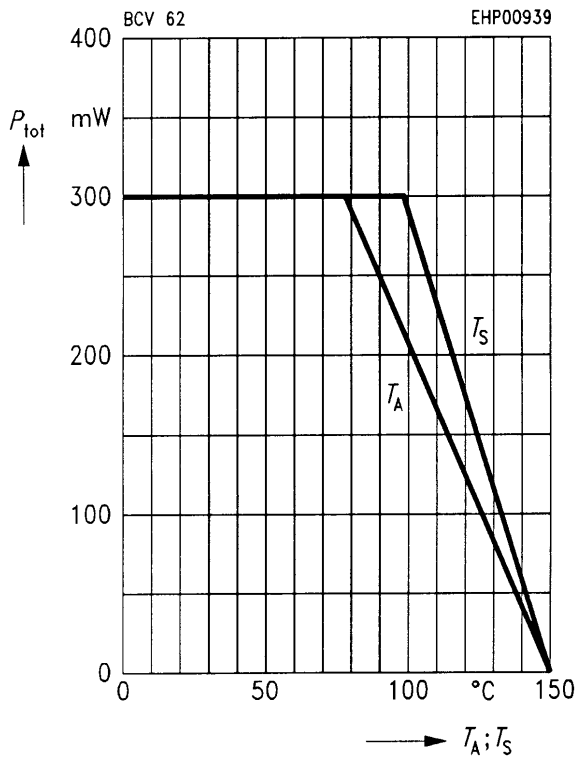
**Characteristic for determination of  $V_{CE1}$  at specified  $R_E$  range with  $I_{E2}$  as parameter under condition of  $I_{C1} / I_{E2} = 1.3$**



Note: BCV 62 with emitter resistors

### Total power dissipation $P_{tot} = f(T_A^*; T_S)$

\* Package mounted on epoxy



### Permissible pulse load $P_{tot max}/P_{tot DC} = f(t_p)$

