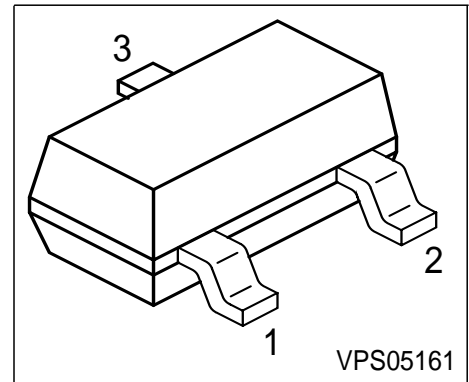


**PNP Silicon AF an Swiching Transistors**

- For general AF applications
- High breakdown voltage
- Low collector-emitter saturation voltage
- Complementary types: BCX41, BSS64 (NPN)



| Type  | Marking | Pin Configuration |       |       | Package |
|-------|---------|-------------------|-------|-------|---------|
| BCX42 | DKs     | 1 = B             | 2 = E | 3 = C | SOT23   |
| BSS63 | BMs     | 1 = B             | 2 = E | 3 = C | SOT23   |

**Maximum Ratings**

| Parameter                                     | Symbol    | BSS63       | BCX42 | Unit |
|---|-----------|-------------|-------|------|
| Collector-emitter voltage                     | $V_{CEO}$ | 100         | 125   | V    |
| Collector-base voltage                        | $V_{CBO}$ | 110         | 125   |      |
| Emitter-base voltage                          | $V_{EBO}$ | 5           | 5     |      |
| DC collector current                          | $I_C$     | 800         |       | mA   |
| Peak collector current                        | $I_{CM}$  | 1           |       | A    |
| Base current                                  | $I_B$     | 100         |       | mA   |
| Peak base current                             | $I_{BM}$  | 200         |       |      |
| Total power dissipation, $T_S = 79\text{ °C}$ | $P_{tot}$ | 330         |       | mW   |
| Junction temperature                          | $T_j$     | 150         |       | °C   |
| Storage temperature                           | $T_{stg}$ | -65 ... 150 |       |      |

**Thermal Resistance**

|  |            |      |     |
|--|------------|------|-----|
| Junction - soldering point <sup>1)</sup> | $R_{thJS}$ | ≤215 | K/W |
|--|------------|------|-----|

<sup>1)</sup>For calculation of  $R_{thJA}$  please refer to Application Note Thermal Resistance

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

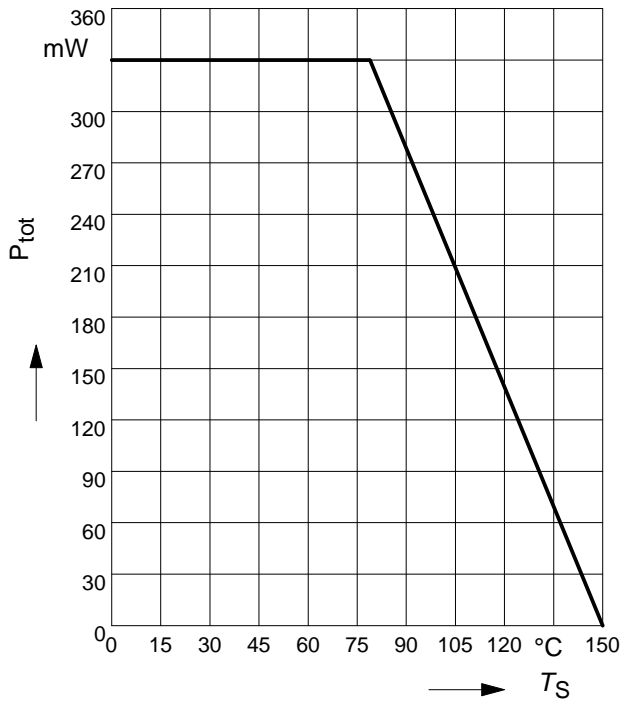
| Parameter   | Symbol                                    | Values        |                            |                       | Unit                  |               |
|---|---|---------------|----------------------------|-----------------------|-----------------------|---------------|
|   |   | min.          | typ.                       | max.                  |                       |               |
| <b>DC Characteristics</b>   |   |               |                            |                       |                       |               |
| Collector-emitter breakdown voltage<br>$I_C = 10\text{ mA}, I_B = 0$  | BSS63<br>BCX42                            | $V_{(BR)CEO}$ | 100<br>125                 | -<br>-                | -<br>-                | V             |
| Collector-base breakdown voltage<br>$I_C = 100\text{ }\mu\text{A}, I_B = 0$   | BSS63<br>BCX42                            | $V_{(BR)CBO}$ | 110<br>125                 | -<br>-                | -<br>-                |               |
| Emitter-base breakdown voltage<br>$I_E = 10\text{ }\mu\text{A}, I_C = 0$  |   | $V_{(BR)EBO}$ | 5                          | -                     | -                     |               |
| Collector cutoff current<br>$V_{CB} = 80\text{ V}, I_E = 0$<br>$V_{CB} = 100\text{ V}, I_E = 0$   | BSS63<br>BCX42                            | $I_{CBO}$     | -<br>-                     | -<br>-                | 100<br>100            | nA            |
| Collector cutoff current<br>$V_{CB} = 80\text{ V}, I_E = 0, T_A = 150\text{ }^\circ\text{C}$<br>$V_{CB} = 100\text{ V}, I_E = 0, T_A = 150\text{ }^\circ\text{C}$   | BSS63<br>BCX42                            | $I_{CBO}$     | -<br>-                     | -<br>-                | 20<br>20              | $\mu\text{A}$ |
| Emitter cutoff current<br>$V_{EB} = 4\text{ V}, I_C = 0$  |   | $I_{EBO}$     | -                          | -                     | 100                   | nA            |
| Collector cutoff current<br>$V_{CE} = 100\text{ V}, T_A = 85\text{ }^\circ\text{C}$<br>$V_{CE} = 100\text{ V}, T_A = 125\text{ }^\circ\text{C}$   | BCX42<br>BCX42                            | $I_{CEO}$     | -<br>-                     | -<br>-                | 10<br>75              | $\mu\text{A}$ |
| DC current gain 1)<br>$I_C = 100\text{ }\mu\text{A}, V_{CE} = 1\text{ V}$<br>$I_C = 10\text{ mA}, V_{CE} = 5\text{ V}$<br>$I_C = 20\text{ mA}, V_{CE} = 5\text{ V}$<br>$I_C = 100\text{ mA}, V_{CE} = 1\text{ V}$<br>$I_C = 200\text{ mA}, V_{CE} = 1\text{ V}$ | BCX42<br>BSS63<br>BSS63<br>BCX42<br>BCX42 | $h_{FE}$      | 25<br>30<br>30<br>63<br>40 | -<br>-<br>-<br>-<br>- | -<br>-<br>-<br>-<br>- | -             |

 1) Pulse test:  $t \leq 300\text{ }\mu\text{s}$ ,  $D = 2\%$

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

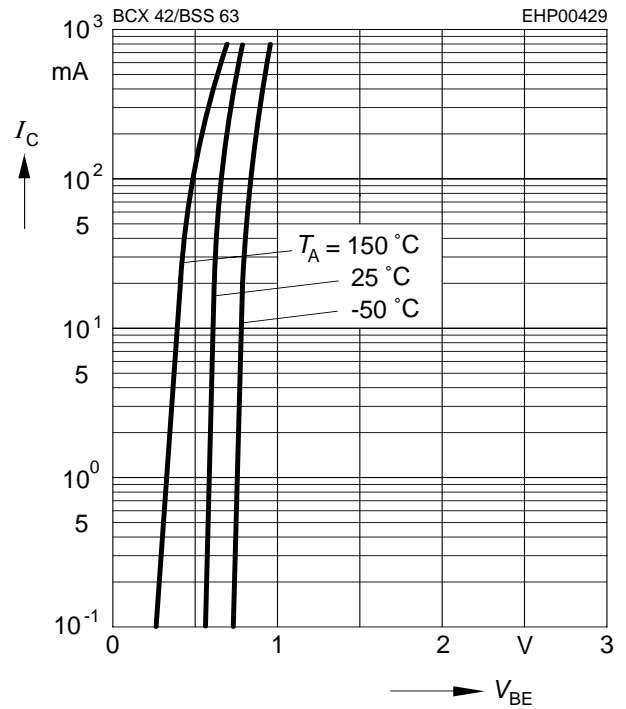
| Parameter   | Symbol      | Values |      |      | Unit |
|---|-------------|--------|------|------|------|
|   |             | min.   | typ. | max. |      |
| <b>DC Characteristics</b>   |             |        |      |      |      |
| Collector-emitter saturation voltage <sup>1)</sup><br>$I_C = 300\text{ mA}, I_B = 30\text{ mA}$ BCX42 | $V_{CEsat}$ | -      | -    | 0.9  | V    |
| $I_C = 25\text{ mA}, I_B = 2.5\text{ mA}$ BSS63   |             | -      | -    | 0.25 |      |
| $I_C = 75\text{ mA}, I_B = 7.5\text{ mA}$ BSS63   |             | -      | -    | 0.9  |      |
| Base-emitter saturation voltage 1)<br>$I_C = 300\text{ mA}, I_B = 30\text{ mA}$ BCX42                 | $V_{BEsat}$ | -      | -    | 1.4  |      |
| <b>AC Characteristics</b>   |             |        |      |      |      |
| Transition frequency<br>$I_C = 20\text{ mA}, V_{CE} = 5\text{ V}, f = 20\text{ MHz}$                  | $f_T$       | -      | 150  | -    | MHz  |
| Collector-base capacitance<br>$V_{CB} = 10\text{ V}, f = 1\text{ MHz}$                                | $C_{cb}$    | -      | 12   | -    | pF   |

**Total power dissipation  $P_{tot} = f(T_S)$**



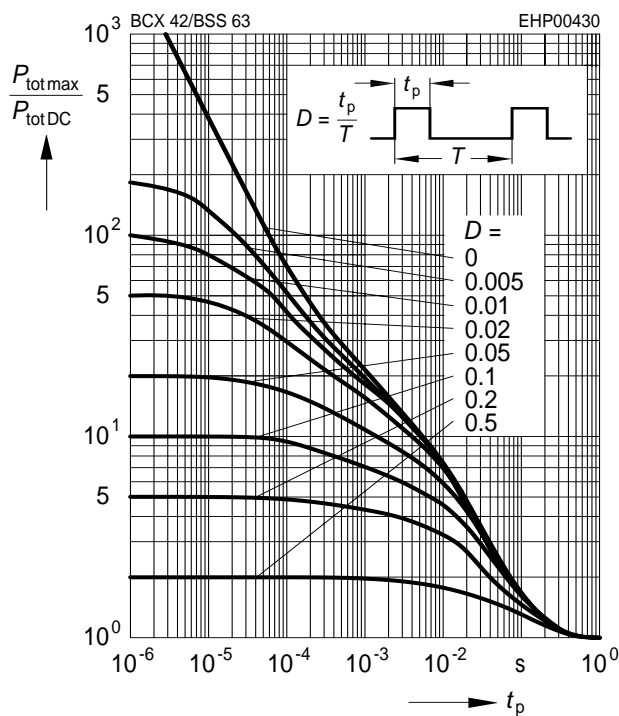
**Collector current  $I_C = f(V_{BE})$**

$V_{CE} = 1V$



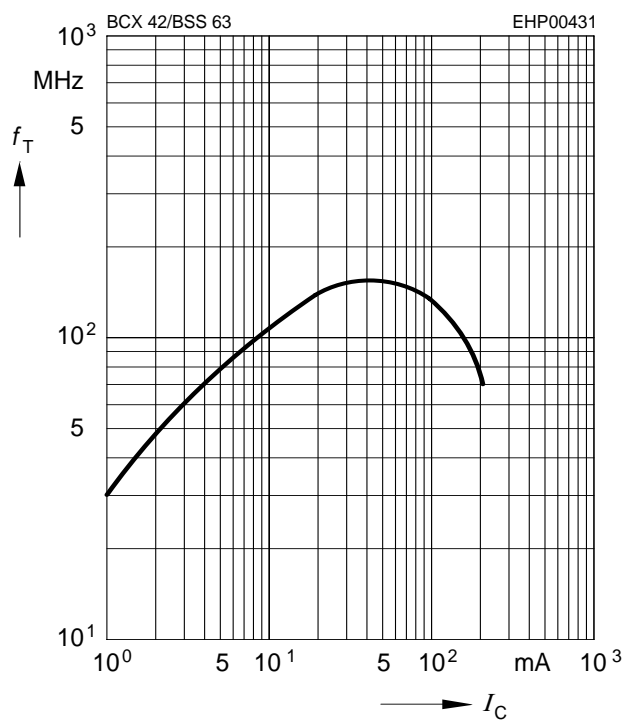
**Permissible pulse load**

$P_{totmax} / P_{totDC} = f(t_p)$



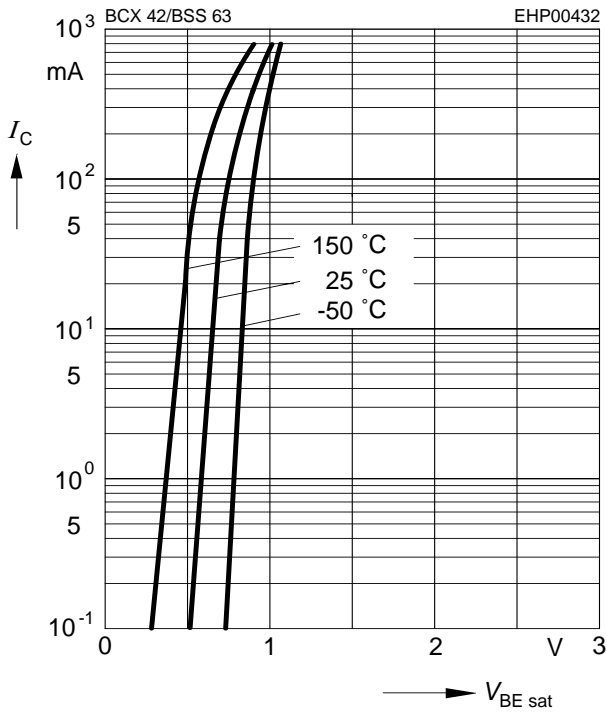
**Transition frequency  $f_T = f(I_C)$**

$V_{CE} = 5V$



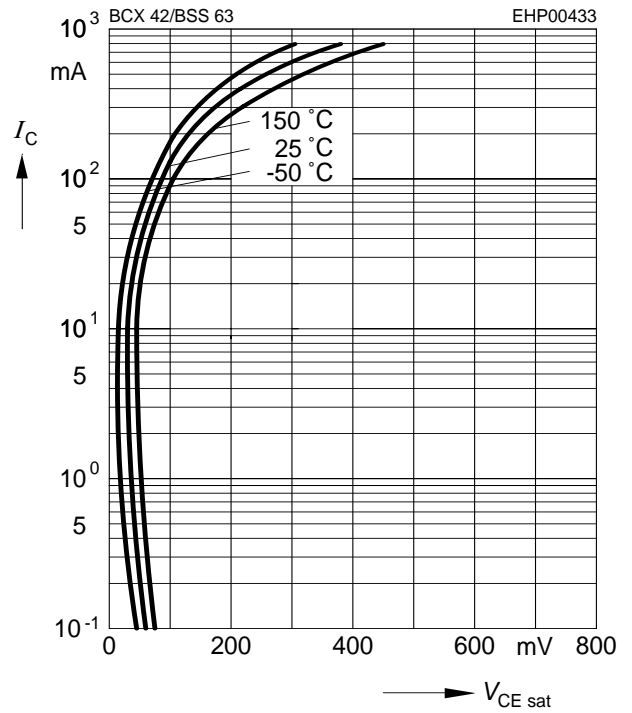
**Base-emitter saturation voltage**

$I_C = f(V_{BEsat}), h_{FE} = 10$



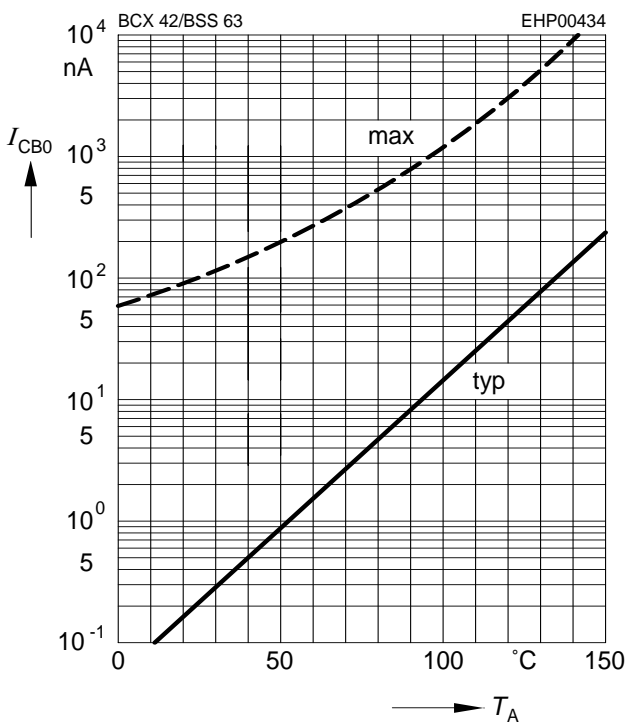
**Collector-emitter saturation voltage**

$I_C = f(V_{CEsat}), h_{FE} = 10$



**Collector cutoff current  $I_{CBO} = f(T_A)$**

$V_{CB} = 100V$



**DC current gain  $h_{FE} = f(I_C)$**

$V_{CE} = 1V$

