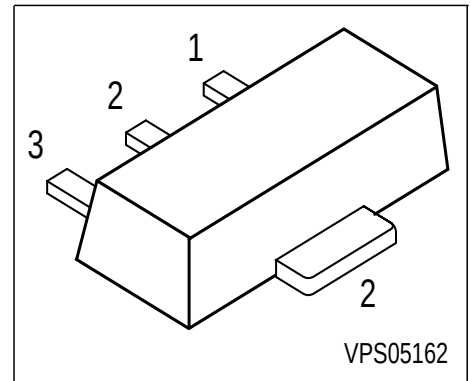


**NPN Silicon AF Transistors**

- For AF driver and output stages
- High collector current
- Low collector-emitter saturation voltage
- Complementary types: BCX51...BCX53 (PNP)



| Type     | Marking | Pin Configuration |       |       | Package |
|----------|---------|-------------------|-------|-------|---------|
| BCX54    | BA      | 1 = B             | 2 = C | 3 = E | SOT89   |
| BCX54-10 | BC      | 1 = B             | 2 = C | 3 = E | SOT89   |
| BCX54-16 | BD      | 1 = B             | 2 = C | 3 = E | SOT89   |
| BCX55    | BE      | 1 = B             | 2 = C | 3 = E | SOT89   |
| BCX55-10 | BG      | 1 = B             | 2 = C | 3 = E | SOT89   |
| BCX55-16 | BM      | 1 = B             | 2 = C | 3 = E | SOT89   |
| BCX56    | BH      | 1 = B             | 2 = C | 3 = E | SOT89   |
| BCX56-10 | BK      | 1 = B             | 2 = C | 3 = E | SOT89   |
| BCX56-16 | BL      | 1 = B             | 2 = C | 3 = E | SOT89   |

**Maximum Ratings**

| Parameter                                      | Symbol    | BCX54       | BCX55 | BCX56 | Unit |
|------------------------------------------------|-----------|-------------|-------|-------|------|
| Collector-emitter voltage                      | $V_{CEO}$ | 45          | 60    | 80    | V    |
| Collector-base voltage                         | $V_{CBO}$ | 45          | 60    | 100   |      |
| Emitter-base voltage                           | $V_{EBO}$ | 5           | 5     | 5     |      |
| DC collector current                           | $I_C$     | 1           |       |       | A    |
| Peak collector current                         | $I_{CM}$  | 1.5         |       |       |      |
| Base current                                   | $I_B$     | 100         |       |       | mA   |
| Peak base current                              | $I_{BM}$  | 200         |       |       |      |
| Total power dissipation, $T_S = 130\text{ °C}$ | $P_{tot}$ | 1           |       |       | W    |
| Junction temperature                           | $T_j$     | 150         |       |       | °C   |
| Storage temperature                            | $T_{sta}$ | -65 ... 150 |       |       |      |

**Thermal Resistance**

|                                          |            |     |     |
|------------------------------------------|------------|-----|-----|
| Junction - soldering point <sup>1)</sup> | $R_{thJS}$ | ≤20 | K/W |
|------------------------------------------|------------|-----|-----|

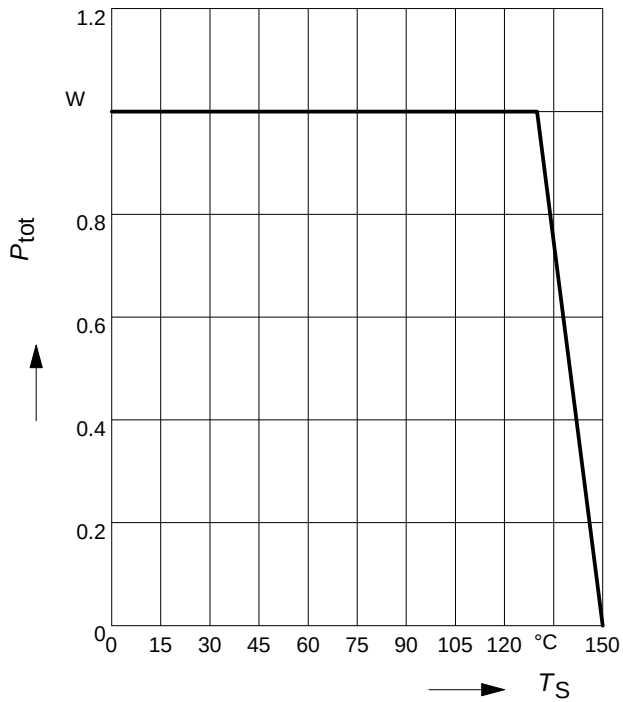
<sup>1)</sup>For calculation of  $R_{thJA}$  please refer to Application Note Thermal Resistance

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

| Parameter                                                                                          | Symbol        | Values |      |      | Unit          |
|----------------------------------------------------------------------------------------------------|---------------|--------|------|------|---------------|
|                                                                                                    |               | min.   | typ. | max. |               |
| DC Characteristics                                                                                 |               |        |      |      |               |
| Collector-emitter breakdown voltage<br>$I_C = 10\text{ mA}$ , $I_B = 0$                            | $V_{(BR)CEO}$ |        |      |      | V             |
| BCX54                                                                                              |               | 45     | -    | -    |               |
| BCX55                                                                                              |               | 60     | -    | -    |               |
| BCX56                                                                                              |               | 80     | -    | -    |               |
| Collector-base breakdown voltage<br>$I_C = 100\text{ }\mu\text{A}$ , $I_B = 0$                     | $V_{(BR)CBO}$ |        |      |      |               |
| BCX54                                                                                              |               | 45     | -    | -    |               |
| BCX55                                                                                              |               | 60     | -    | -    |               |
| BCX56                                                                                              |               | 100    | -    | -    |               |
| Emitter-base breakdown voltage<br>$I_E = 10\text{ }\mu\text{A}$ , $I_C = 0$                        | $V_{(BR)EBO}$ | 5      | -    | -    |               |
| Collector cutoff current<br>$V_{CB} = 30\text{ V}$ , $I_E = 0$                                     | $I_{CBO}$     | -      | -    | 100  | nA            |
| Collector cutoff current<br>$V_{CB} = 30\text{ V}$ , $I_E = 0$ , $T_A = 150\text{ }^\circ\text{C}$ | $I_{CBO}$     | -      | -    | 20   | $\mu\text{A}$ |
| DC current gain 1)<br>$I_C = 5\text{ mA}$ , $V_{CE} = 2\text{ V}$                                  | $h_{FE}$      | 25     | -    | -    | -             |
| DC current gain 1)<br>$I_C = 150\text{ mA}$ , $V_{CE} = 2\text{ V}$                                | $h_{FE}$      |        |      |      |               |
| BCX54...56                                                                                         |               | 40     | -    | 250  |               |
| hFE-grp.10                                                                                         |               | 63     | 100  | 160  |               |
| hFE-grp.16                                                                                         |               | 100    | 160  | 250  |               |
| DC current gain 1)<br>$I_C = 500\text{ mA}$ , $V_{CE} = 2\text{ V}$                                | $h_{FE}$      | 25     | -    | -    |               |
| Collector-emitter saturation voltage1)<br>$I_C = 500\text{ mA}$ , $I_B = 50\text{ mA}$             | $V_{CEsat}$   | -      | -    | 0.5  | V             |
| Base-emitter voltage 1)<br>$I_C = 500\text{ mA}$ , $V_{CE} = 2\text{ V}$                           | $V_{BE(ON)}$  | -      | -    | 1    |               |
| AC Characteristics                                                                                 |               |        |      |      |               |
| Transition frequency<br>$I_C = 50\text{ mA}$ , $V_{CE} = 10\text{ V}$ , $f = 20\text{ MHz}$        | $f_T$         | -      | 100  | -    | MHz           |

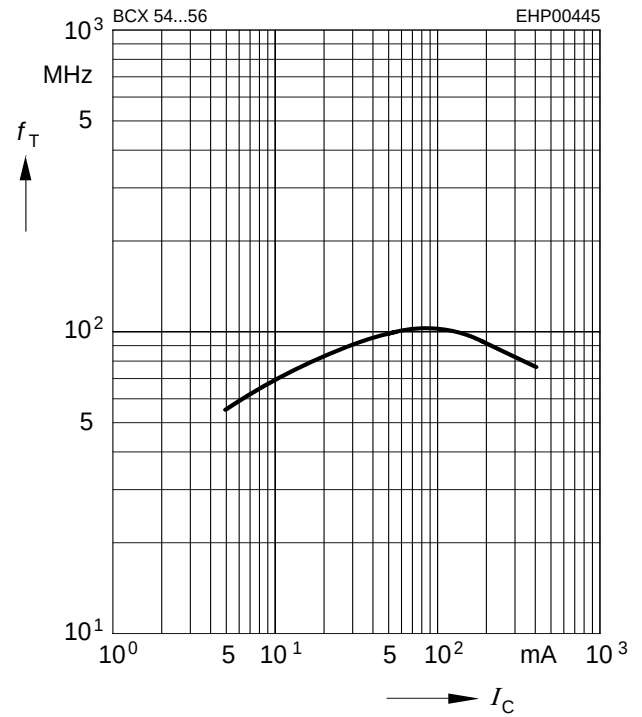
1) Pulse test:  $t \leq 300\mu\text{s}$ ,  $D = 2\%$

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



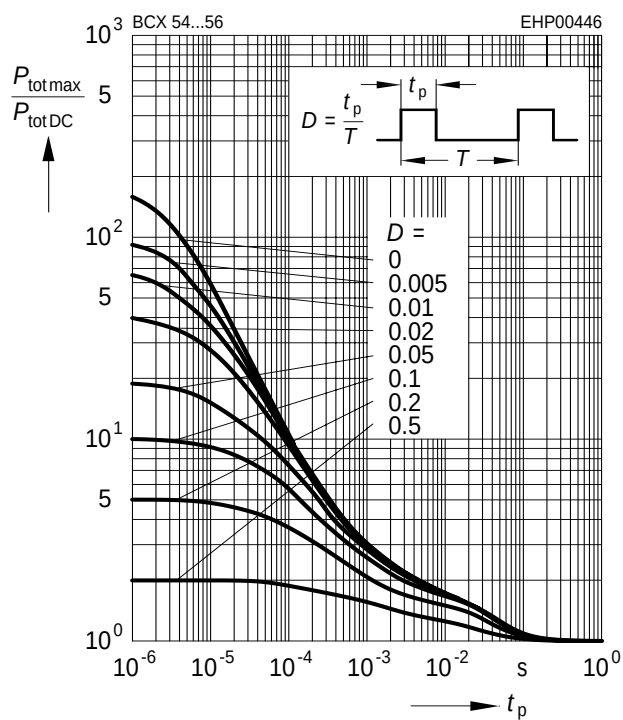
**Transition frequency**  $f_T = f(I_C)$

$V_{CE} = 10V$



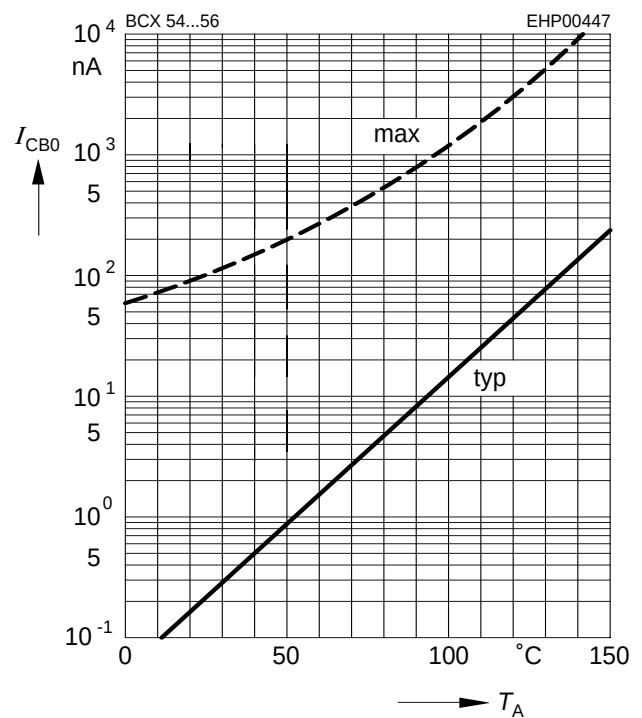
**Permissible pulse load**

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



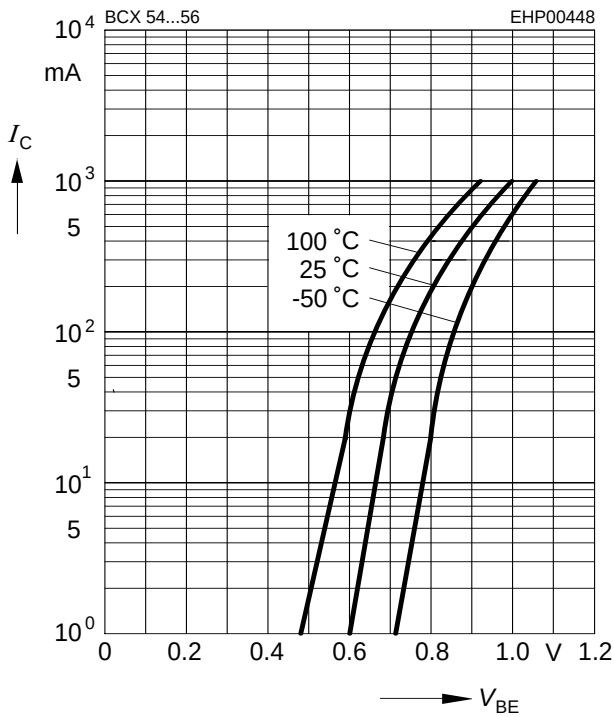
**Collector cutoff current**  $I_{CBO} = f(T_A)$

$V_{CB} = 30V$



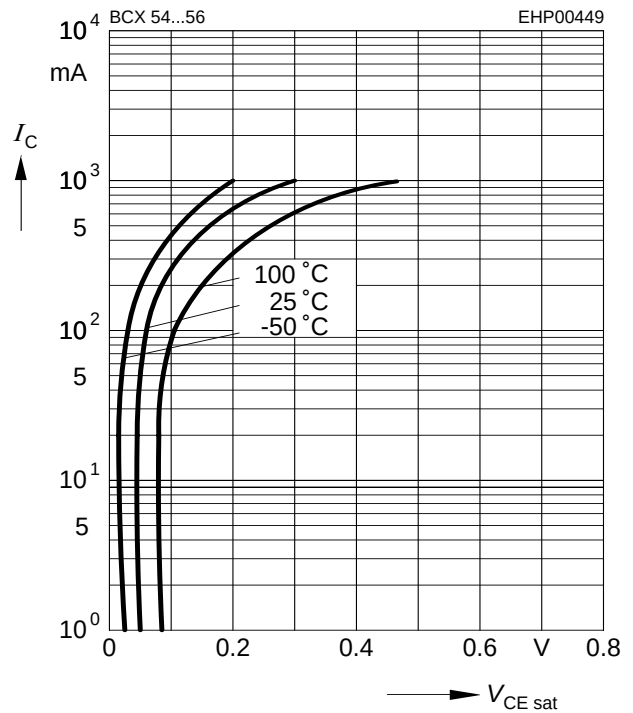
### Collector current $I_C = f(V_{BE})$

$V_{CE} = 2V$



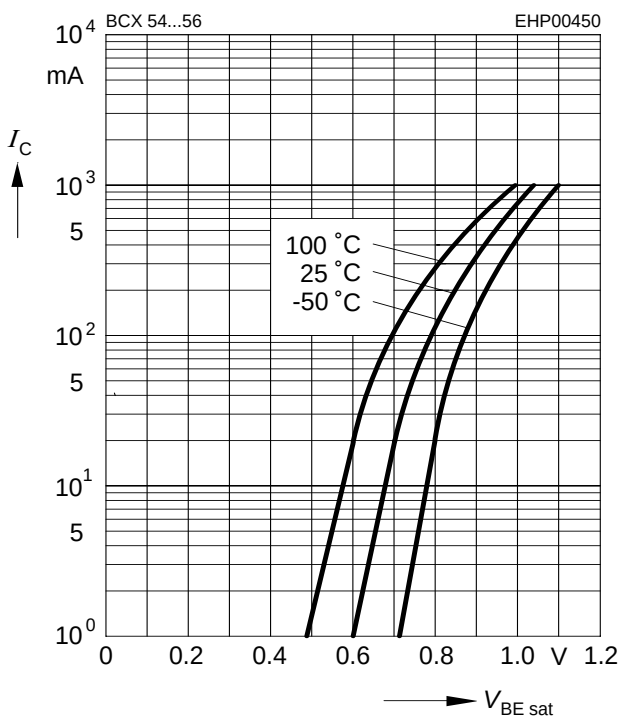
### Collector-emitter saturation voltage

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



### Base-emitter saturation voltage

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



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

$V_{CE} = 2V$

