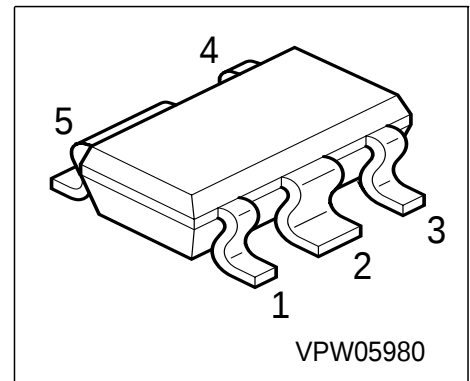


### NPN Silicon AF Transistors

- For AF driver and output stages
- High collector current
- Low collector-emitter saturation voltage
- Complementary types: BCP 51M...BCP 53M(PNP)



| Type    | Marking | Ordering Code | Pin Configuration |       |       |        |       | Package |
|---------|---------|---------------|-------------------|-------|-------|--------|-------|---------|
| BCP 54M | BAs     | Q62702-C2595  | 1 = B             | 2 = C | 3 = E | 4 n.c. | 5 = C | SCT-595 |
| BCP 55M | BEs     | Q62702-C2606  |                   |       |       |        |       |         |
| BCP 56M | BHs     | Q62702-C2607  |                   |       |       |        |       |         |

### Maximum Ratings

| Parameter                                                      | Symbol    | BCP 54M    | BCP 55M | BCP 56M | 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          |         |         | mA                 |
| Peak collector current                                         | $I_{CM}$  | 1.5        |         |         | A                  |
| Base current                                                   | $I_B$     | 100        |         |         | mA                 |
| Peak base current                                              | $I_{BM}$  | 200        |         |         |                    |
| Total power dissipation, $T_S \leq 77\text{ }^{\circ}\text{C}$ | $P_{tot}$ | 1.7        |         |         | W                  |
| Junction temperature                                           | $T_j$     | 150        |         |         | $^{\circ}\text{C}$ |
| Storage temperature                                            | $T_{stg}$ | -65...+150 |         |         |                    |

### Thermal Resistance

|                                |            |           |     |
|--------------------------------|------------|-----------|-----|
| Junction ambient <sup>1)</sup> | $R_{thJA}$ | $\leq 98$ | K/W |
| Junction - soldering point     | $R_{thJS}$ | $\leq 43$ |     |

1) Package mounted on pcb 40mm x 40mm x 1.5mm / 6cm<sup>2</sup> Cu

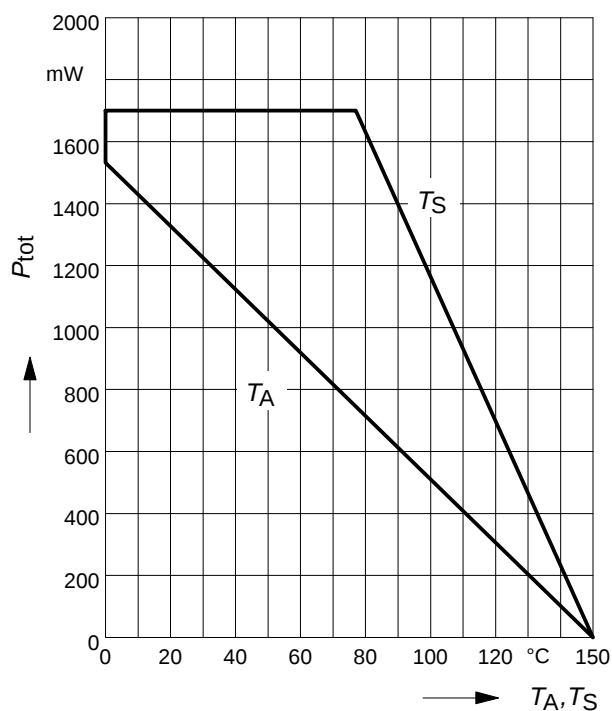
**Electrical Characteristics** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified.

| Parameter                                                                                                       | Symbol        | Values          |             |             | Unit |               |
|-----------------------------------------------------------------------------------------------------------------|---------------|-----------------|-------------|-------------|------|---------------|
|                                                                                                                 |               | min.            | typ.        | max.        |      |               |
| DC Characteristics                                                                                              |               |                 |             |             |      |               |
| Collector-emitter breakdown voltage<br>$I_C = 10\text{ mA}$ , $I_B = 0$<br>BCP 54M<br>BCP 55M<br>BCP 56M        | $V_{(BR)CEO}$ | 45<br>60<br>80  | -<br>-<br>- | -<br>-<br>- | V    |               |
| Collector-base breakdown voltage<br>$I_C = 100\text{ }\mu\text{A}$ , $I_B = 0$<br>BCP 54M<br>BCP 55M<br>BCP 56M | $V_{(BR)CBO}$ | 45<br>60<br>100 | -<br>-<br>- | -<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>$V_{CB} = 30\text{ V}$ , $I_E = 0$                                                  | $I_{CBO}$     | -               | -           | 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>$I_C = 150\text{ mA}$ , $V_{CE} = 2\text{ V}$                                             | $h_{FE}$      | 40              | -           | 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>$I_C = 50\text{ mA}$ , $V_{CE} = 10\text{ V}$ , $f = 100\text{ MHz}$                    | $f_T$         | -               | 100         | -           | MHz  |               |

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

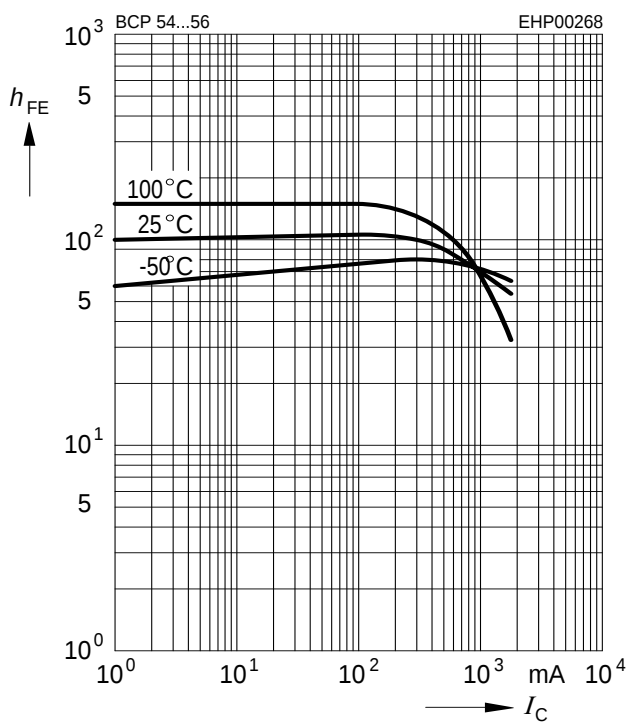
### Total power dissipation $P_{\text{tot}} = f(T_A^*; T_S)$

\* Package mounted on epoxy

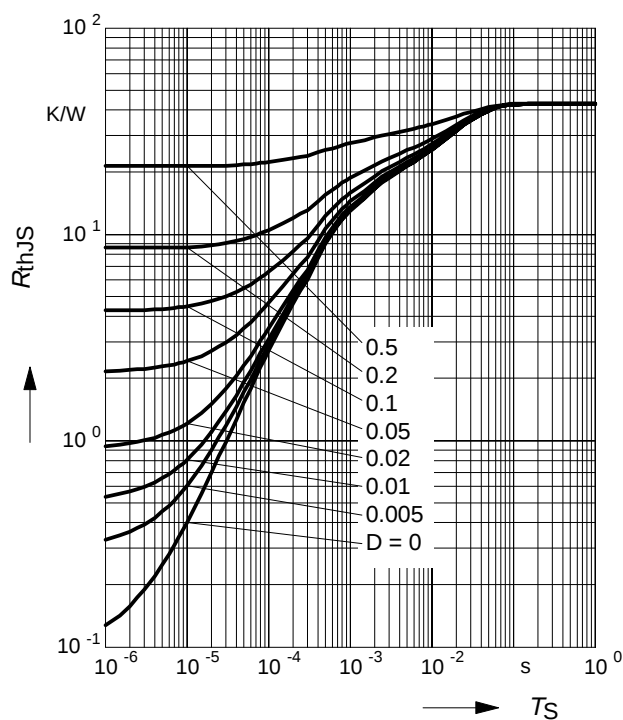


### DC current gain $h_{FE} = f(I_C)$

$V_{CE} = 2V$

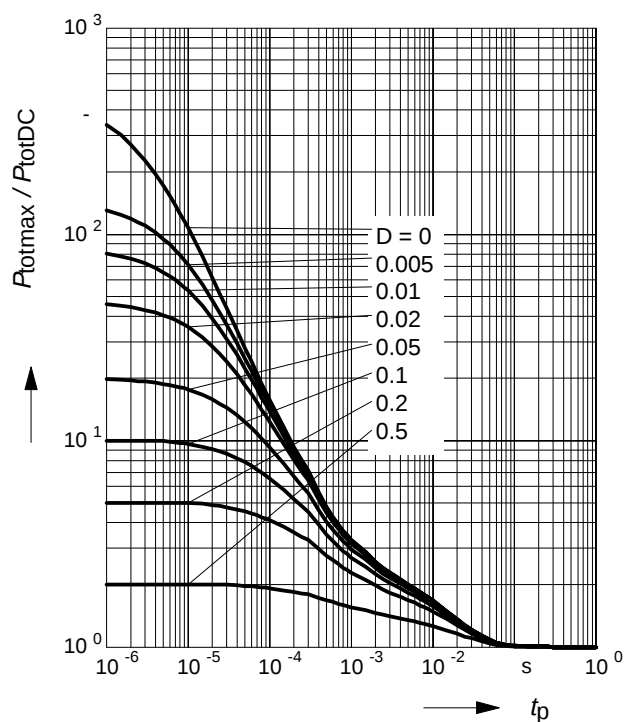


### Permissible Pulse Load $R_{thJS} = f(t_p)$



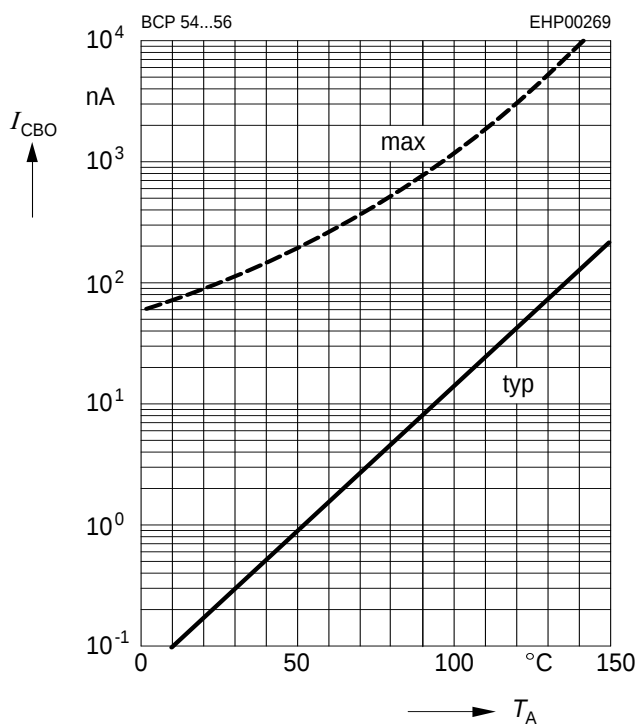
### Permissible Pulse Load

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



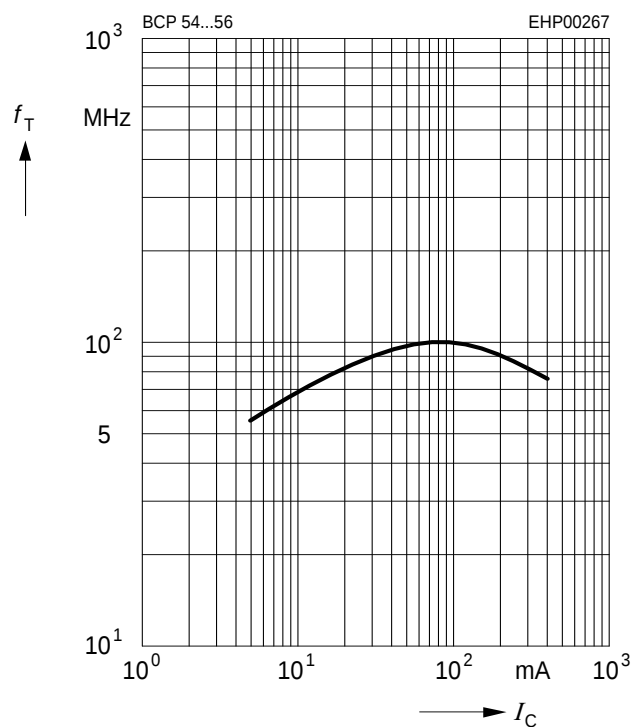
### Collector cutoff current $I_{CBO} = f(T_A)$

$V_{CB} = 30V$



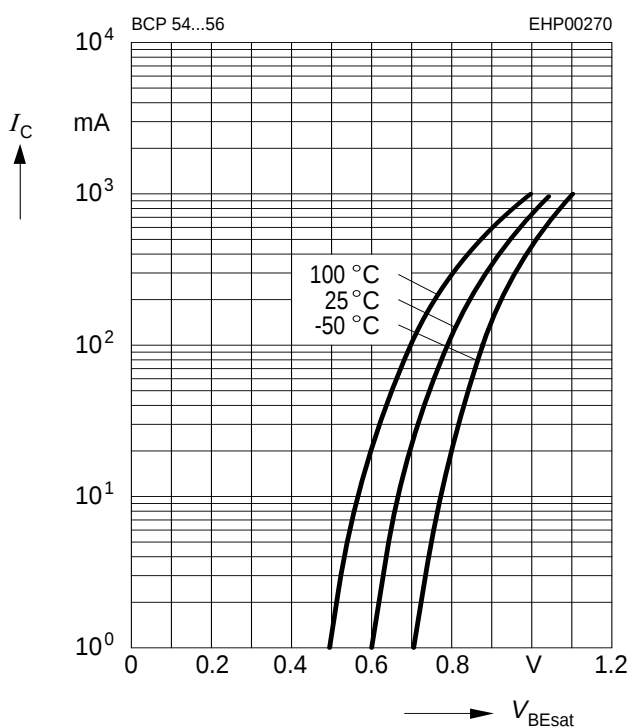
### Transition frequency $f_T = f(I_C)$

$V_{CE} = 10V$



### Base-emitter saturation voltage

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



### Collector-emitter saturation voltage

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

