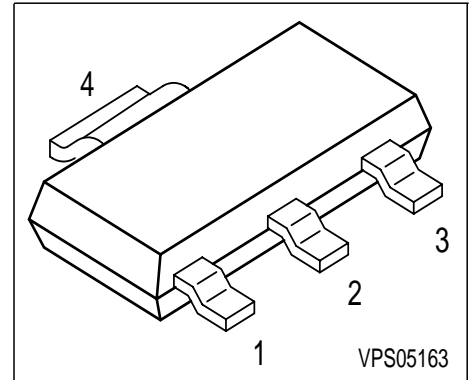
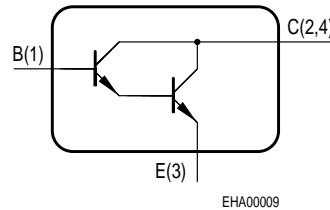


NPN Silicon Darlington Transistors

- For general AF applications
- High collector current
- High current gain
- Complementary types: BCP28/48 (PNP)



| Type | Marking | Pin Configuration | | | | Package |
|-------|---------|-------------------|-------|-------|-------|---------|
| BCP29 | BCP 29 | 1 = B | 2 = C | 3 = E | 4 = C | SOT223 |
| BCP49 | BCP 49 | 1 = B | 2 = C | 3 = E | 4 = C | SOT223 |

Maximum Ratings

| Parameter | Symbol | BCP29 | BCP49 | Unit |
|--|-----------|-------------|-------|------|
| Collector-emitter voltage | V_{CEO} | 30 | 60 | V |
| Collector-base voltage | V_{CBO} | 40 | 80 | |
| Emitter-base voltage | V_{EBO} | 10 | 10 | |
| DC collector current | I_C | 500 | | mA |
| Peak collector current | I_{CM} | 800 | | mA |
| Base current | I_B | 100 | | |
| Peak base current | I_{BM} | 200 | | |
| Total power dissipation, $T_S = 124\text{ °C}$ | P_{tot} | 1.5 | | W |
| Junction temperature | T_j | 150 | | °C |
| Storage temperature | T_{stg} | -65 ... 150 | | |

Thermal Resistance

| | | | |
|--|------------|-----|-----|
| Junction - soldering point ¹⁾ | R_{thJS} | ≤17 | K/W |
|--|------------|-----|-----|

¹⁾For calculation of R_{thJA} please refer to Application Note Thermal Resistance

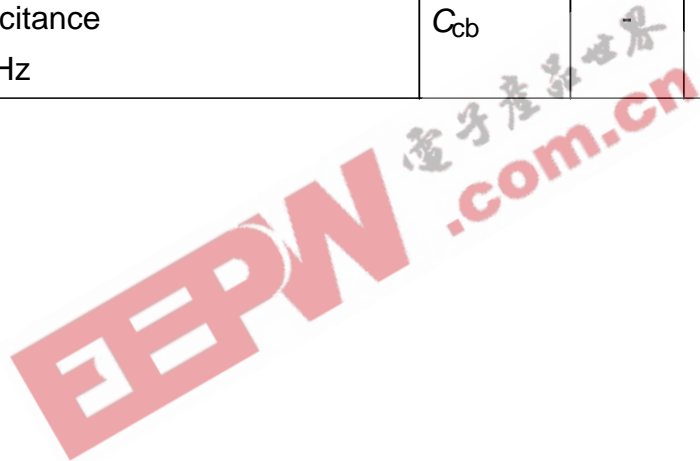
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified.

| Parameter | Symbol | Values | | | Unit |
|---|---------------|--------|------|------|---------------|
| | | min. | typ. | max. | |
| DC Characteristics | | | | | |
| Collector-emitter breakdown voltage $I_C = 1 \text{ mA}, I_B = 0$ | $V_{(BR)CEO}$ | | | | V |
| BCP29 | | 30 | - | - | |
| BCP49 | | 60 | - | - | |
| Collector-base breakdown voltage $I_C = 100 \mu\text{A}, I_E = 0$ | $V_{(BR)CBO}$ | | | | |
| BCP29 | | 40 | - | - | |
| BCP49 | | 80 | - | - | |
| Emitter-base breakdown voltage $I_E = 10 \mu\text{A}, I_C = 0$ | $V_{(BR)EBO}$ | 10 | - | - | |
| Collector cutoff current $V_{CB} = 30 \text{ V}, I_E = 0$ | I_{CBO} | | | | nA |
| BCP29 | | - | - | 100 | |
| $V_{CB} = 60 \text{ V}, I_E = 0$ | | | | | |
| BCP49 | | - | - | 100 | |
| Collector cutoff current $V_{CB} = 30 \text{ V}, I_E = 0, T_A = 150^\circ\text{C}$ | I_{CBO} | | | | μA |
| BCP29 | | - | - | 10 | |
| $V_{CB} = 60 \text{ V}, I_E = 0, T_A = 150^\circ\text{C}$ | | | | | |
| BCP49 | | - | - | 10 | |
| Emitter cutoff current $V_{EB} = 5 \text{ V}, I_C = 0$ | I_{EBO} | - | - | 100 | nA |
| DC current gain 1) $I_C = 100 \mu\text{A}, V_{CE} = 1 \text{ V}$ | h_{FE} | | | | - |
| BCP29 | | 4000 | - | - | |
| BCP49 | | 2000 | - | - | |
| DC current gain 1) $I_C = 10 \text{ mA}, V_{CE} = 5 \text{ V}$ | h_{FE} | | | | |
| BCP29 | | 10000 | - | - | |
| BCP49 | | 4000 | - | - | |
| DC current gain 1) $I_C = 100 \text{ mA}, V_{CE} = 5 \text{ V}$ | h_{FE} | | | | |
| BCP29 | | 20000 | - | - | |
| BCP49 | | 10000 | - | - | |
| DC current gain 1) $I_C = 500 \text{ mA}, V_{CE} = 5 \text{ V}$ | h_{FE} | | | | |
| BCP29 | | 4000 | - | - | |
| BCP49 | | 2000 | - | - | |

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

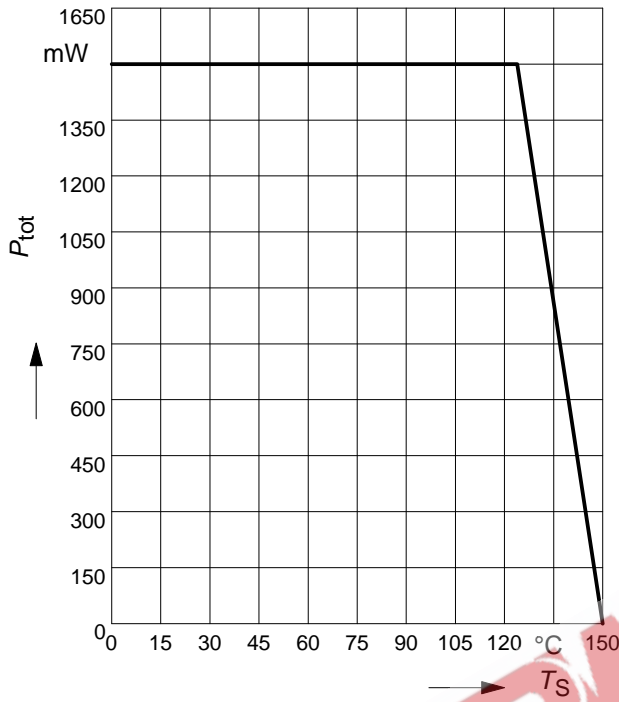
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified.

| Parameter | Symbol | Values | | | Unit |
|--|-------------|--------|------|------|------|
| | | min. | typ. | max. | |
| DC Characteristics | | | | | |
| Collector-emitter saturation voltage ¹⁾ $I_C = 100\text{ mA}, I_B = 0.1\text{ mA}$ | V_{CEsat} | - | - | 1 | V |
| Base-emitter saturation voltage 1) $I_C = 100\text{ mA}, I_B = 0.1\text{ mA}$ | V_{BEsat} | - | - | 1.5 | |
| AC Characteristics | | | | | |
| Transition frequency $I_C = 50\text{ mA}, V_{CE} = 5\text{ V}, f = 100\text{ MHz}$ | f_T | - | 200 | - | MHz |
| Collector-base capacitance $V_{CB} = 10\text{ V}, f = 1\text{ MHz}$ | C_{cb} | - | 6.5 | - | pF |



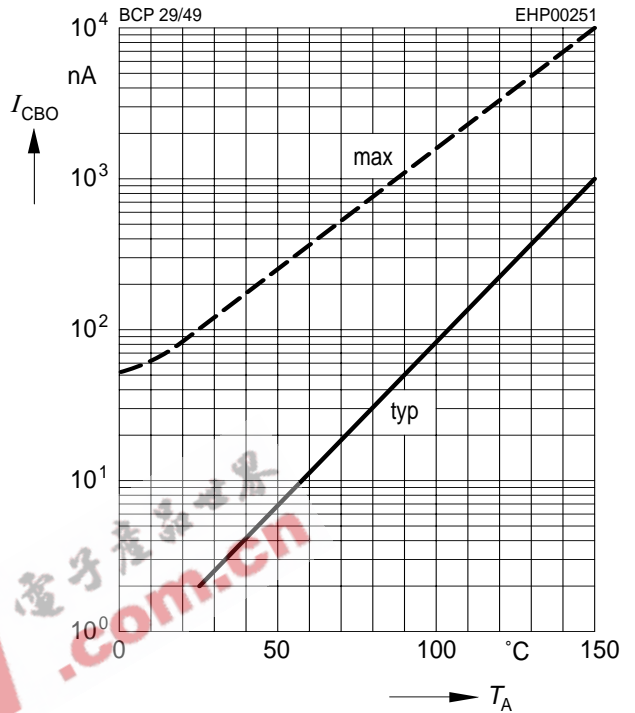
1) Pulse test: $t \leq 300\mu\text{s}$, $D = 2\%$

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



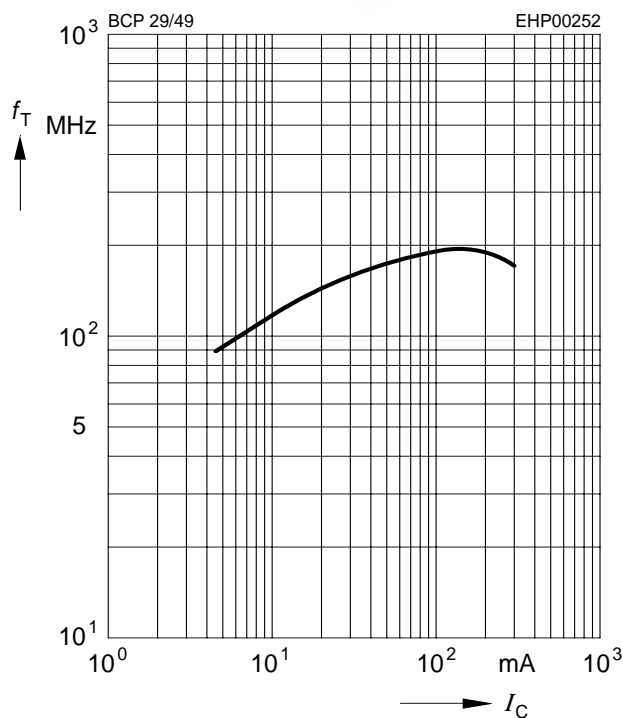
Collector cutoff current $I_{CBO} = f(T_A)$

$V_{CB} = V_{CEmax}$



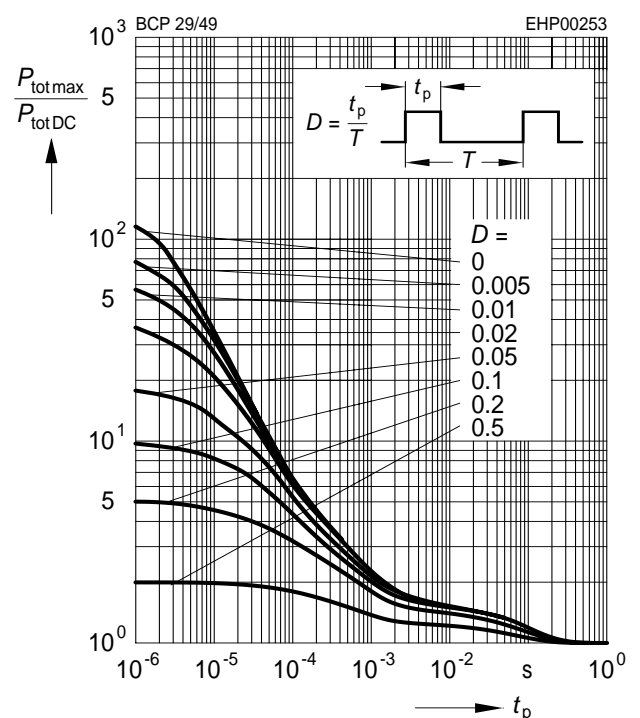
Transition frequency $f_T = f(I_C)$

$V_{CE} = 5V$



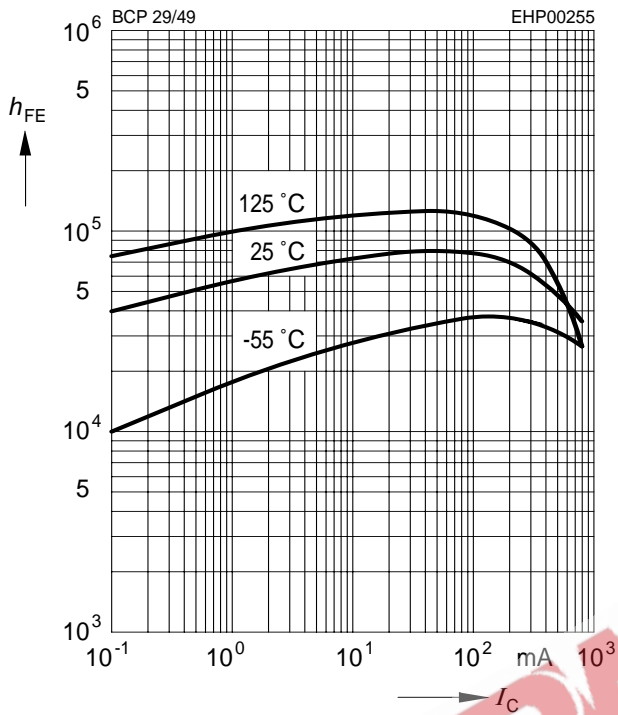
Permissible pulse load

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



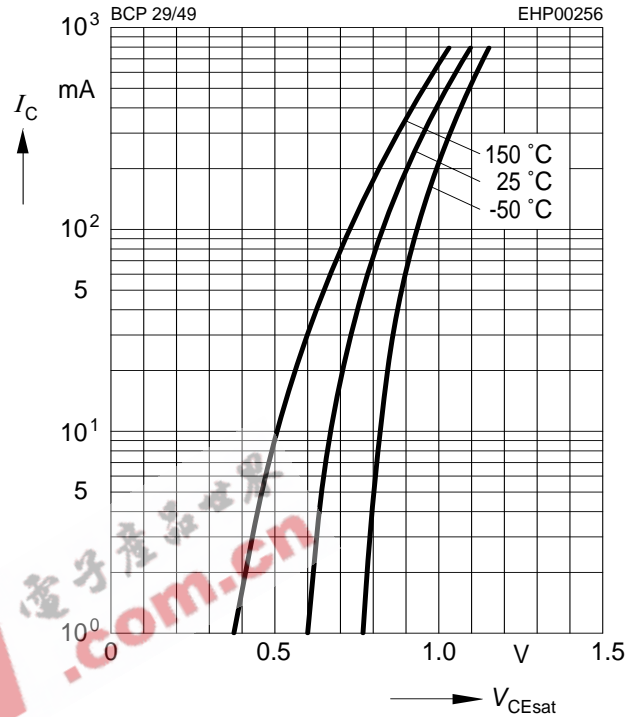
DC current gain $h_{FE} = f(I_C)$

$V_{CE} = 5V$



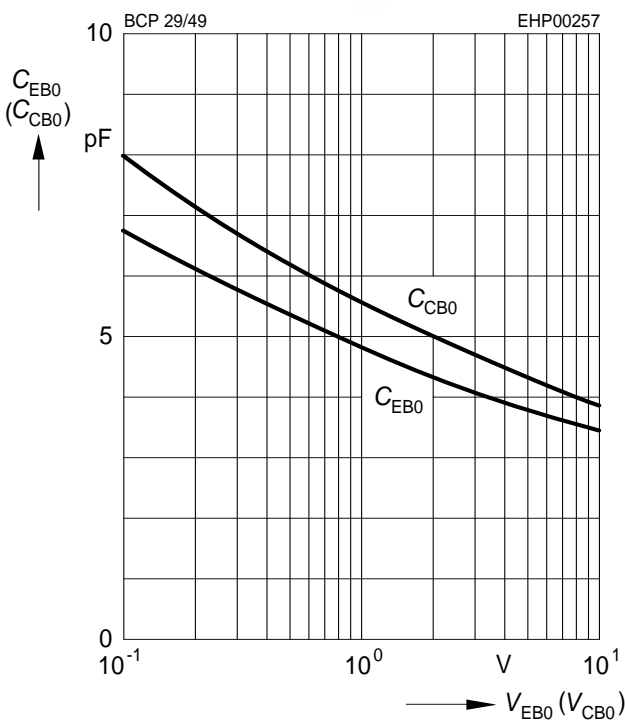
Collector-emitter saturation voltage

$I_C = f(V_{CEsat}), h_{FE} = 1000$



Collector-base capacitance $C_{CB} = f(V_{CB0})$

Emitter-base capacitance $C_{EB} = f(V_{EB0})$



Base-emitter saturation voltage

$I_C = f(V_{BEsat}), h_{FE} = 1000$

