

## PNP Silicon Darlington Transistors

**BCP 28**  
**BCP 48**

- For general AF applications
- High collector current
- High current gain
- Complementary types: BCP 29/49 (NPN)



| Type             | Marking          | Ordering Code (tape and reel) | Pin Configuration | Package <sup>1)</sup> |
|------------------|------------------|-------------------------------|-------------------|-----------------------|
| BCP 28<br>BCP 48 | BCP 28<br>BCP 48 | Q62702-C2134<br>Q62702-C2135  |                   | SOT-223               |

### Maximum Ratings

| Parameter   | Symbol    | Values         |        | Unit |
|---|-----------|----------------|--------|------|
|   |           | BCP 28         | BCP 48 |      |
| Collector-emitter voltage                         | $V_{CE0}$ | 30             | 60     | V    |
| Collector-base voltage                            | $V_{CB0}$ | 40             | 80     |      |
| Emitter-base voltage                              | $V_{EB0}$ | 10             | 10     |      |
| Collector current                                 | $I_C$     | 500            |        | mA   |
| Peak collector current                            | $I_{CM}$  | 800            |        |      |
| Base current                                      | $I_B$     | 100            |        |      |
| Peak base current                                 | $I_{BM}$  | 200            |        |      |
| Total power dissipation, $T_s = 124\text{ °C}^2)$ | $P_{tot}$ | 1.5            |        | W    |
| Junction temperature                              | $T_j$     | 150            |        | °C   |
| Storage temperature range                         | $T_{stg}$ | - 65 ... + 150 |        |      |

### Thermal Resistance

|                                  |              |      |     |
|----------------------------------|--------------|------|-----|
| Junction - ambient <sup>2)</sup> | $R_{th\ JA}$ | ≤ 75 | K/W |
| Junction - soldering point       | $R_{th\ JS}$ | ≤ 17 |     |

<sup>1)</sup> For detailed information see chapter Package Outlines.

<sup>2)</sup> 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

|   |               |       |   |     |               |
|---|---------------|-------|---|-----|---------------|
| Collector-emitter breakdown voltage<br>$I_C = 1\text{ mA}, I_B = 0$                       | $V_{(BR)CE0}$ |       |   |     | V             |
| BCP 28  |               | 30    | – | –   |               |
| BCP 48  |               | 60    | – | –   |               |
| Collector-base breakdown voltage <sup>1)</sup><br>$I_C = 100\text{ }\mu\text{A}, I_B = 0$ | $V_{(BR)CB0}$ |       |   |     |               |
| BCP 28  |               | 40    | – | –   |               |
| BCP 48  |               | 80    | – | –   |               |
| Emitter-base breakdown voltage<br>$I_E = 10\text{ }\mu\text{A}, I_C = 0$                  | $V_{(BR)EB0}$ | 10    | – | –   |               |
| Collector-base cutoff current<br>$V_{CB} = 30\text{ V}, I_E = 0$                          | $I_{CB0}$     |       |   |     | nA            |
| BCP 28  |               | –     | – | 100 | nA            |
| $V_{CB} = 60\text{ V}, I_E = 0$   |               |       |   |     | nA            |
| BCP 48  |               | –     | – | 100 | nA            |
| $V_{CB} = 30\text{ V}, I_E = 0, T_A = 150\text{ }^\circ\text{C}$                          |               |       |   |     | $\mu\text{A}$ |
| BCP 28  |               | –     | – | 10  | $\mu\text{A}$ |
| $V_{CB} = 60\text{ V}, I_E = 0, T_A = 150\text{ }^\circ\text{C}$                          |               |       |   |     | $\mu\text{A}$ |
| BCP 48  |               | –     | – | 10  | $\mu\text{A}$ |
| Emitter-base cutoff current<br>$V_{EB} = 4\text{ V}, I_C = 0$                             | $I_{EB0}$     | –     | – | 100 | nA            |
| DC current gain <sup>1)</sup><br>$I_C = 100\text{ }\mu\text{A}, V_{CE} = 1\text{ V}$      | $h_{FE}$      |       |   |     | –             |
| BCP 28  |               | 4000  | – | –   |               |
| BCP 48  |               | 2000  | – | –   |               |
| $I_C = 10\text{ mA}, V_{CE} = 5\text{ V}$   |               |       |   |     |               |
| BCP 28  |               | 10000 | – | –   |               |
| BCP 48  |               | 4000  | – | –   |               |
| $I_C = 100\text{ mA}, V_{CE} = 5\text{ V}$  |               |       |   |     |               |
| BCP 28  |               | 20000 | – | –   |               |
| BCP 48  |               | 10000 | – | –   |               |
| $I_C = 500\text{ mA}, V_{CE} = 5\text{ V}$  |               |       |   |     |               |
| BCP 28  |               | 4000  | – | –   |               |
| BCP 48  |               | 2000  | – | –   |               |
| Collector-emitter saturation voltage<br>$I_C = 100\text{ mA}, I_B = 0.1\text{ mA}$        | $V_{CEsat}$   | –     | – | 1.0 | V             |
| Base-emitter saturation voltage<br>$I_C = 100\text{ mA}, I_B = 0.1\text{ mA}$             | $V_{BEsat}$   | –     | – | 1.5 |               |

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

## Electrical Characteristics

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

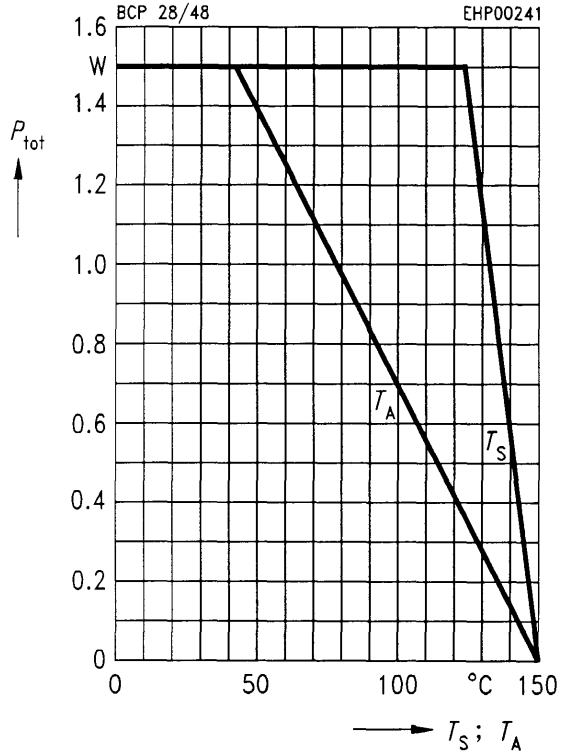
| Parameter | Symbol | Values |      |      | Unit |
|-----------|--------|--------|------|------|------|
|           |        | min.   | typ. | max. |      |

### AC characteristics

|   |           |   |     |   |     |
|---|-----------|---|-----|---|-----|
| Transition frequency<br>$I_C = 50\text{ mA}$ , $V_{CE} = 5\text{ V}$ , $f = 100\text{ MHz}$ | $f_t$     | – | 200 | – | MHz |
| Output capacitance<br>$V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$                           | $C_{obo}$ | – | 8   | – | pF  |

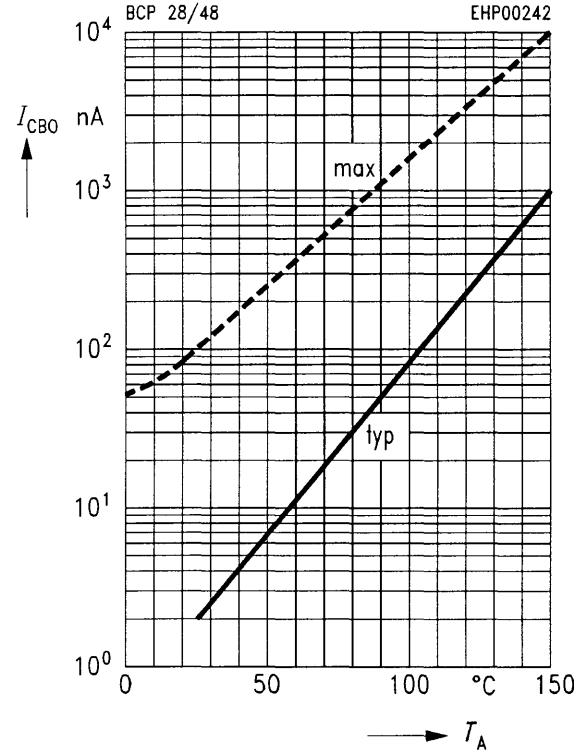
### Total power dissipation $P_{tot} = f(T_A^*; T_S)$

\* Package mounted on epoxy



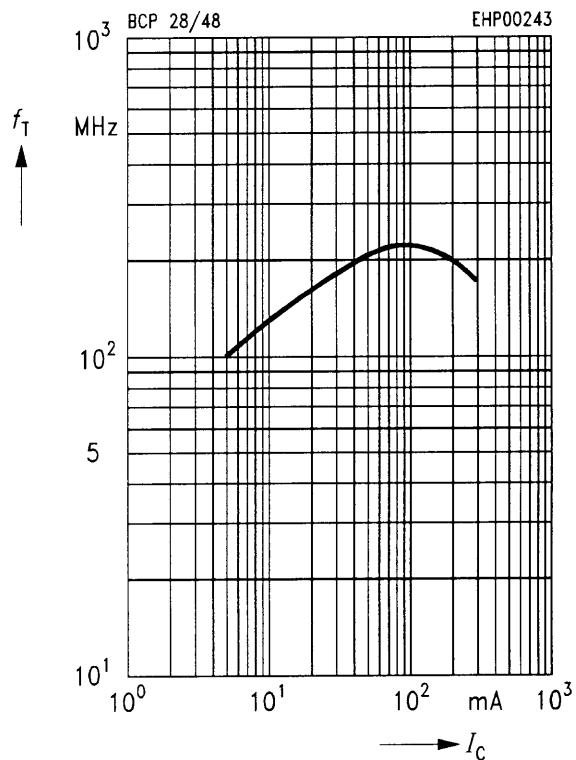
### Collector cutoff current $I_{CBO} = f(T_A)$

$V_{CB} = V_{CE\ max}$

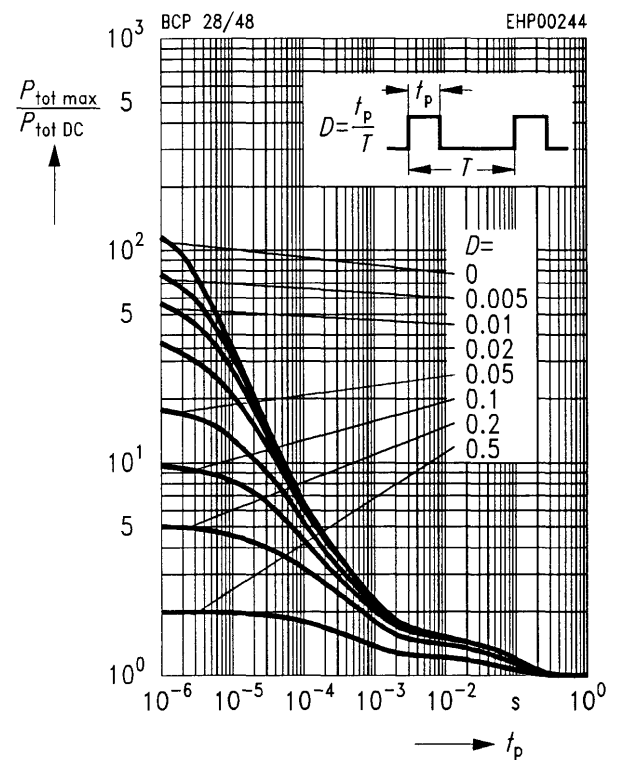


### Transition frequency $f_T = f(I_C)$

$V_{CE} = 5\ V$

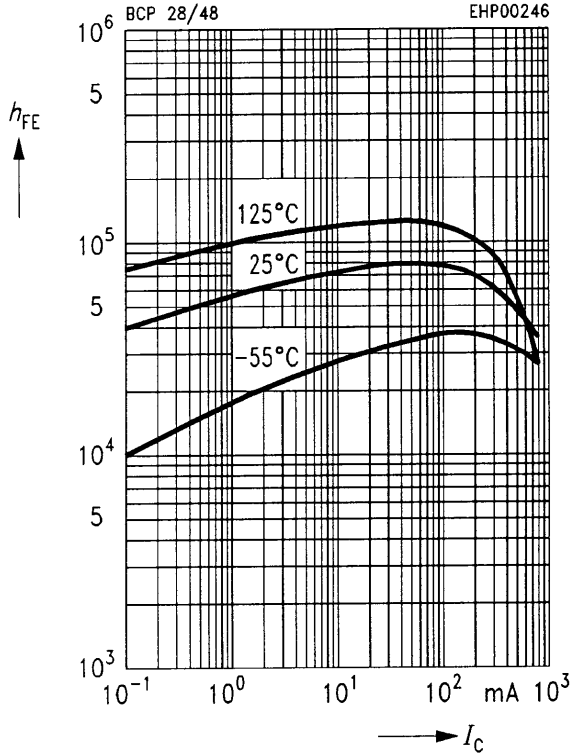


### Permissible pulse load $P_{tot\ max}/P_{tot\ DC} = f(t_p)$



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

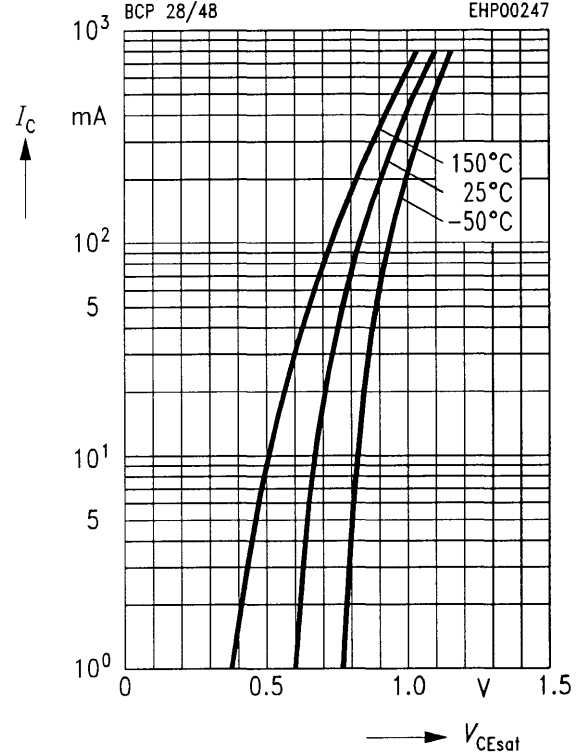
$V_{CE} = 5\text{ V}$



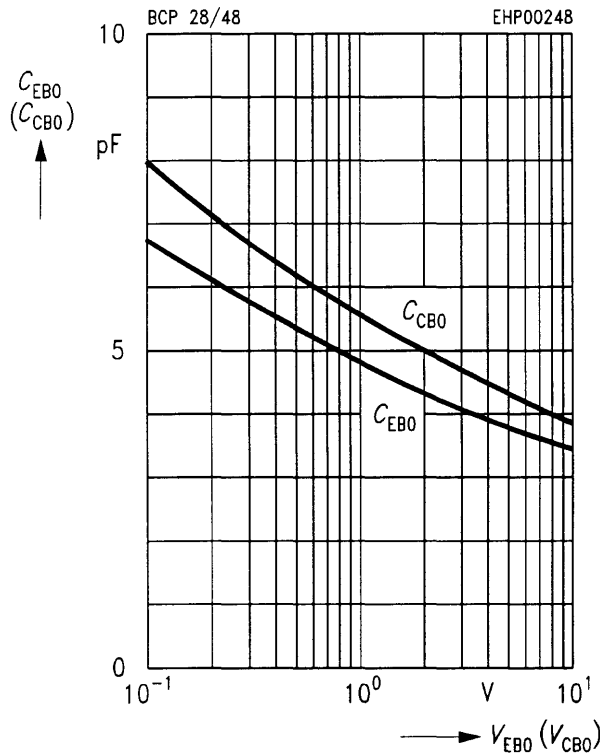
**Collector-emitter saturation voltage**

$I_C = f(V_{CEsat})$

$h_{FE} = 1000$



**Collector-base capacitance  $C_{CB0} = f(V_{CB0})$**   
**Emitter-base capacitance  $C_{EB0} = f(V_{EB0})$**



**Base-emitter saturation voltage**

$I_C = f(V_{BEsat})$

$h_{FE} = 1000$

