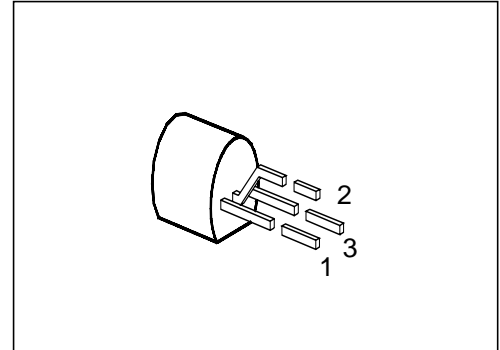


## PNP Silicon Darlington Transistor

**BC 516**

- High current gain
- High collector current
- Complementary type: BC 517 (NPN)



| Type   | Marking | Ordering Code | Pin Configuration |   |   | Package <sup>1)</sup> |
|--------|---------|---------------|-------------------|---|---|-----------------------|
|        |         |               | 1                 | 2 | 3 |                       |
| BC 516 | –       | Q62702-C944   | C                 | B | E | TO-92                 |

### Maximum Ratings

| Parameter                                     | Symbol    | Values         | Unit |
|---|-----------|----------------|------|
| Collector-emitter voltage                     | $V_{CE0}$ | 30             | V    |
| Collector-base voltage                        | $V_{CB0}$ | 40             |      |
| Emitter-base voltage                          | $V_{EB0}$ | 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, $T_c = 66\text{ °C}$ | $P_{tot}$ | 625            | mW   |
| Junction temperature                          | $T_j$     | 150            | °C   |
| Storage temperature range                     | $T_{stg}$ | – 65 ... + 150 |      |

### Thermal Resistance

|                               |              |       |     |
|-------------------------------|--------------|-------|-----|
| Junction - ambient            | $R_{th\ JA}$ | ≤ 200 | K/W |
| Junction - case <sup>2)</sup> | $R_{th\ JC}$ | ≤ 135 |     |

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

<sup>2)</sup> Mounted on Al heat sink 15 mm × 25 mm × 0.5 mm.

## Electrical Characteristics

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

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

### DC characteristics

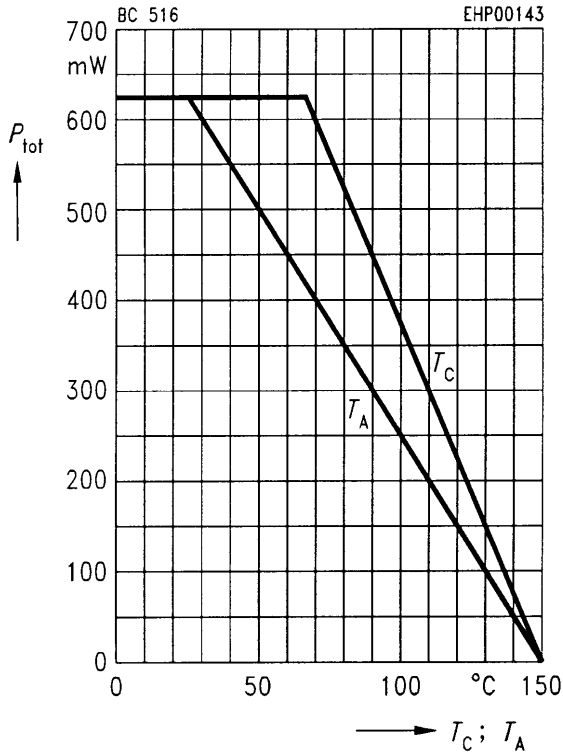
|   |               |        |   |           |                     |
|---|---------------|--------|---|-----------|---------------------|
| Collector-emitter breakdown voltage<br>$I_C = 10\text{ mA}$                                       | $V_{(BR)CE0}$ | 30     | – | –         | V                   |
| Collector-base breakdown voltage<br>$I_C = 100\text{ }\mu\text{A}$                                | $V_{(BR)CB0}$ | 40     | – | –         |                     |
| Emitter-base breakdown voltage<br>$I_E = 10\text{ }\mu\text{A}$                                   | $V_{(BR)EB0}$ | 10     | – | –         |                     |
| Collector cutoff current<br>$V_{CB} = 30\text{ V}$<br>$V_{CB} = 30\text{ V}, T_A = 150\text{ °C}$ | $I_{CB0}$     | –      | – | 100<br>10 | nA<br>$\mu\text{A}$ |
| Emitter cutoff current<br>$V_{EB} = 4\text{ V}$   | $I_{EB0}$     | –      | – | 100       | $\mu\text{A}$       |
| DC current gain<br>$I_C = 20\text{ mA}; V_{CE} = 2\text{ V}$                                      | $h_{FE}$      | 30 000 | – | –         | –                   |
| Collector-emitter saturation voltage <sup>1)</sup><br>$I_C = 100\text{ mA}; I_B = 0.1\text{ mA}$  | $V_{CEsat}$   | –      | – | 1         | V                   |
| Base-emitter voltage <sup>1)</sup><br>$I_C = 10\text{ mA}; V_{CE} = 5\text{ V}$                   | $V_{BE}$      | –      | – | 1.4       |                     |

### AC characteristics

|  |           |   |     |   |     |
|--|-----------|---|-----|---|-----|
| Transition frequency<br>$I_C = 50\text{ mA}, V_{CE} = 5\text{ V}, f = 20\text{ MHz}$ | $f_T$     | – | 200 | – | MHz |
| Output capacitance<br>$V_{CB} = 10\text{ V}, f = 1\text{ MHz}$                       | $C_{obo}$ | – | 3.5 | – | pF  |

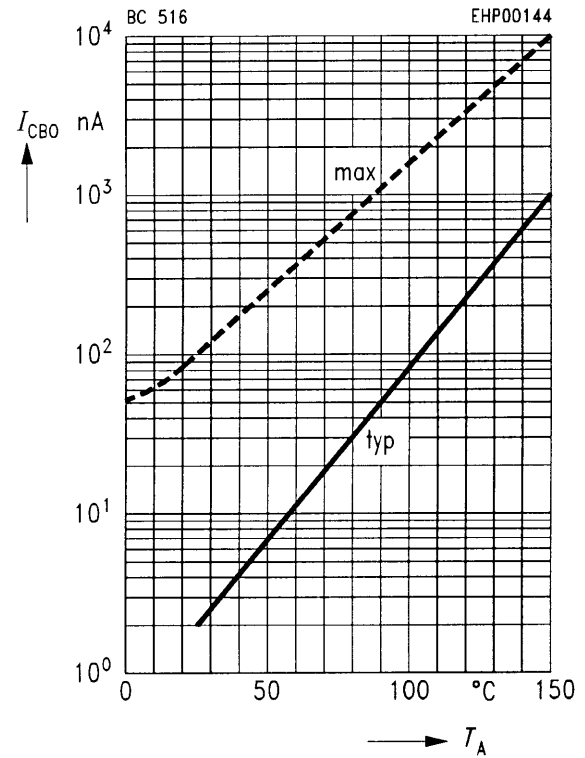
<sup>1)</sup> Pulse test:  $t \leq 300\text{ }\mu\text{s}, D \leq 2\text{ %}$ .

**Total power dissipation  $P_{tot} = f(T_A; T_C)$**

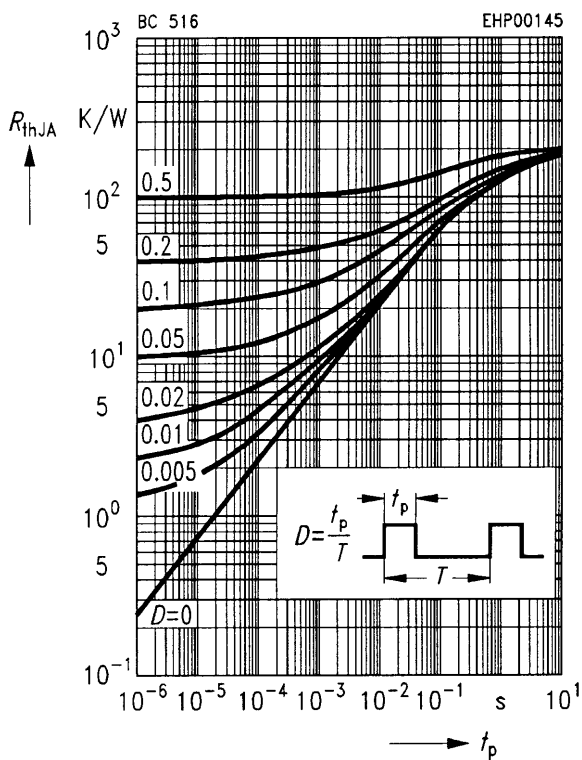


**Collector cutoff current  $I_{CB0} = f(T_A)$**

$V_{CB} = 30 \text{ V}$

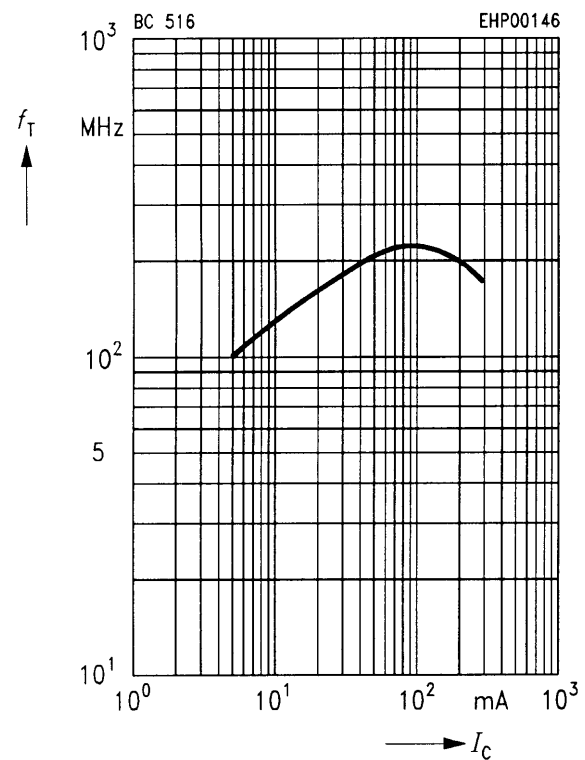


**Permissible pulse load  $R_{thJA} = f(t_p)$**



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

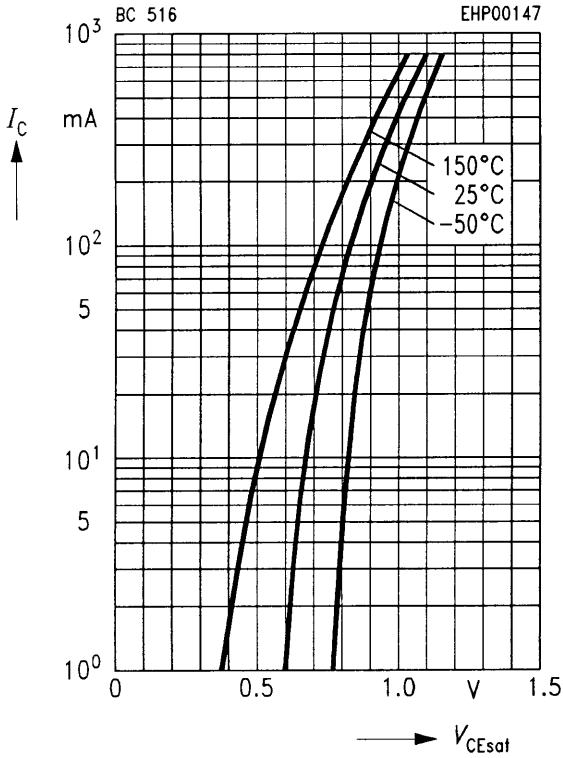
$V_{CE} = 5 \text{ V}$



**Collector-emitter saturation voltage**

$I_C = f(V_{CEsat})$

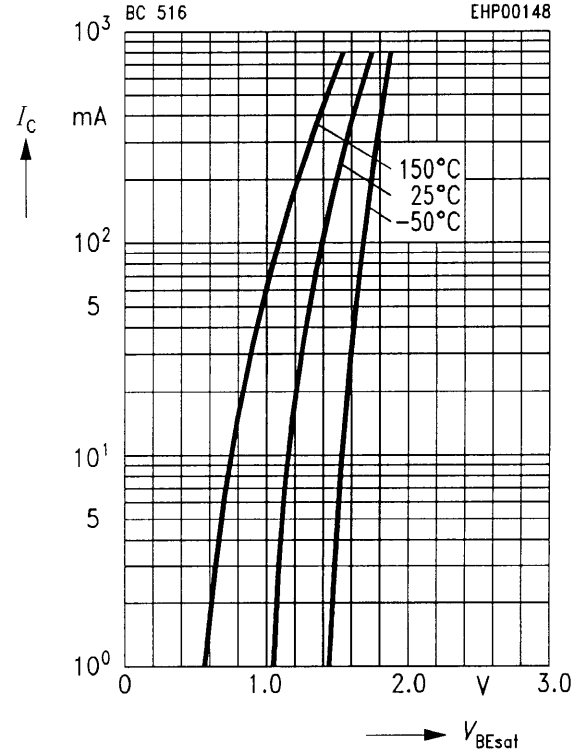
$h_{FE} = 1000$



**Base-emitter saturation voltage**

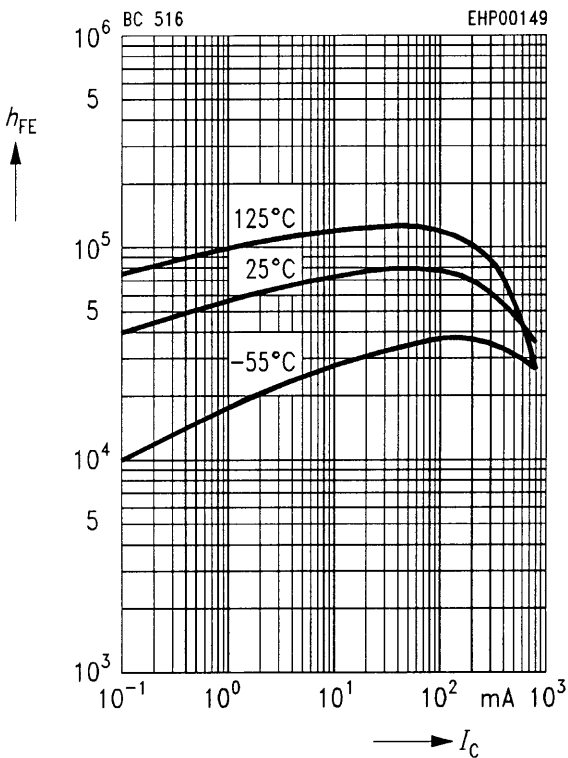
$I_C = f(V_{BEsat})$

$h_{FE} = 1000$



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

$V_{CE} = 2\text{ V}$



**Capacitance  $C = f(V_{EB}, V_{CB})$**

