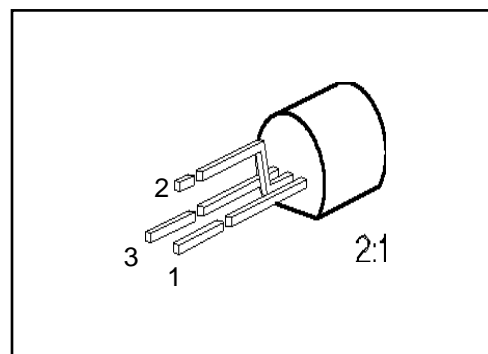


PNP Silicon Darlington Transistor

BC 516

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



| Type | Marking | Ordering Code | Pin Configuration | | | Package ¹⁾ |
|--------|---------|---------------|-------------------|---|---|-----------------------|
| | | | 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 ²⁾ | $R_{th JC}$ | ≤ 135 | |

1) For detailed information see chapter Package Outlines.

2) Mounted on Al heat sink 15 mm × 25 mm × 0.5 mm.

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

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

DC characteristics

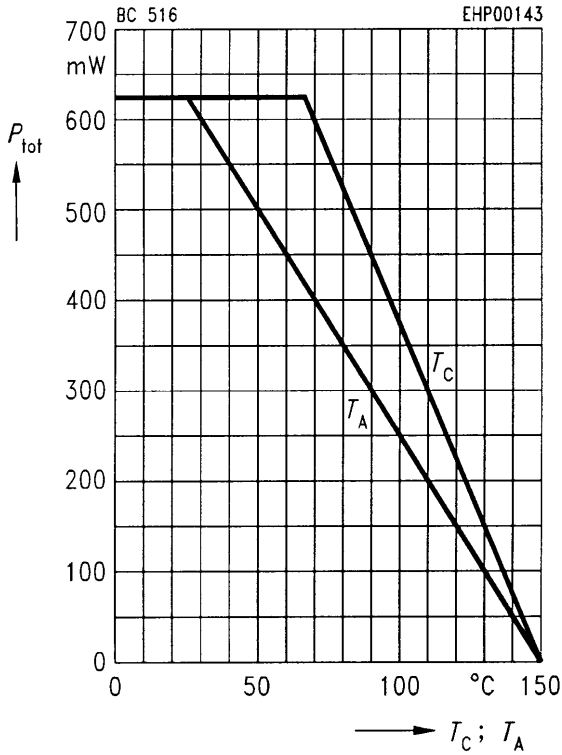
| | | | | | |
|---|---------------|--------|---|-----------|---------------------|
| Collector-emitter breakdown voltage $I_C = 10\text{ mA}$ | $V_{(BR)CE0}$ | 30 | – | – | V |
| Collector-base breakdown voltage $I_C = 100\text{ }\mu\text{A}$ | $V_{(BR)CB0}$ | 40 | – | – | |
| Emitter-base breakdown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

AC characteristics

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

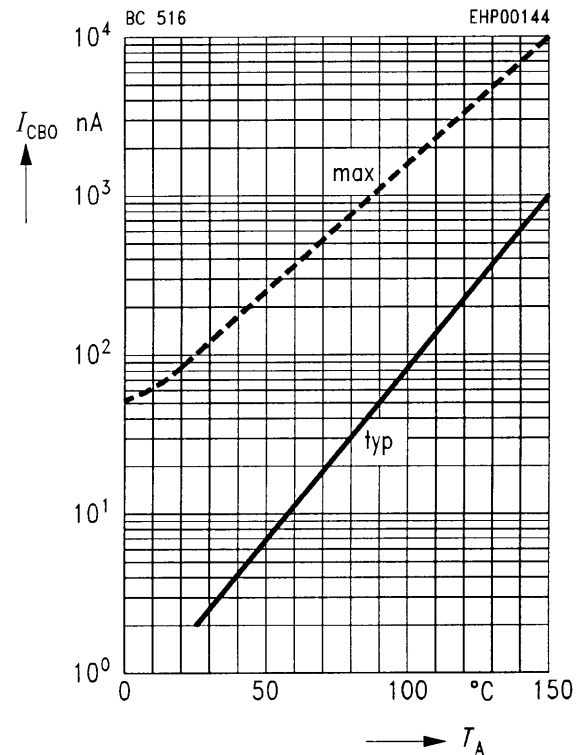
¹⁾ Pulse test: $t \leq 300\text{ }\mu\text{s}, D \leq 2\text{ %}$.

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

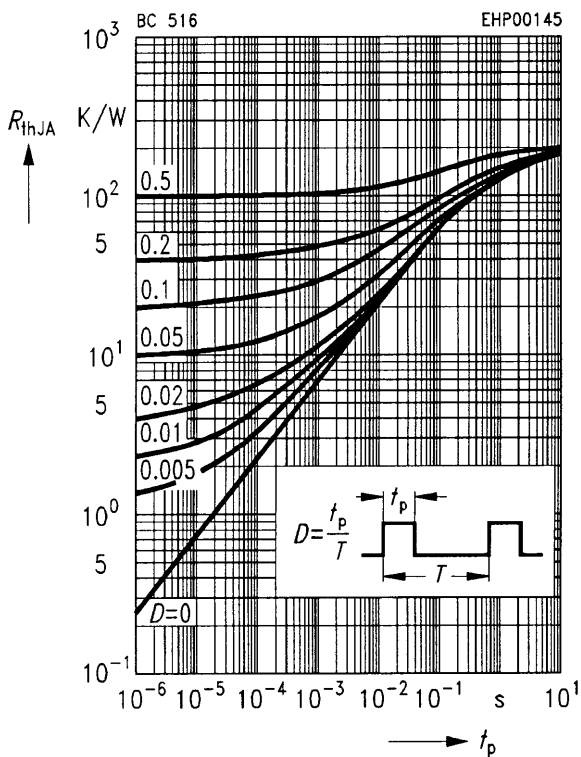


Collector cutoff current $I_{CB0} = f(T_A)$

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

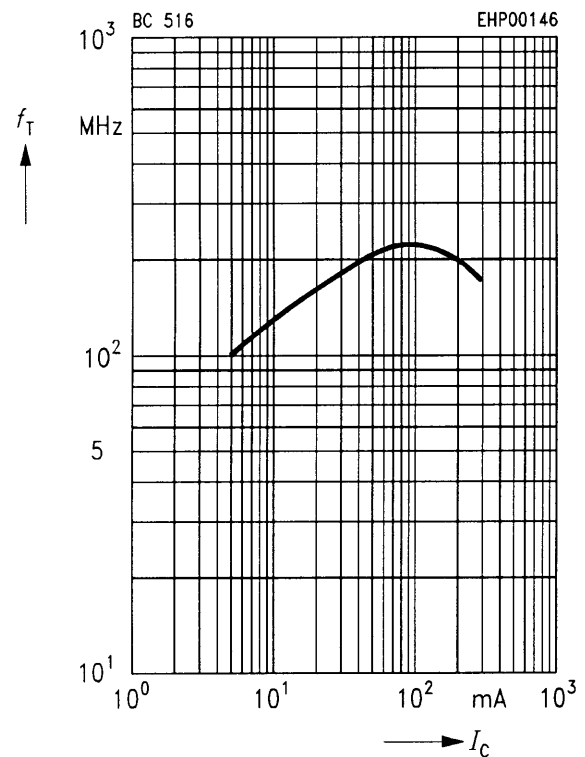


Permissible pulse load $R_{thJA} = f(t_p)$



Transition frequency $f_T = f(I_C)$

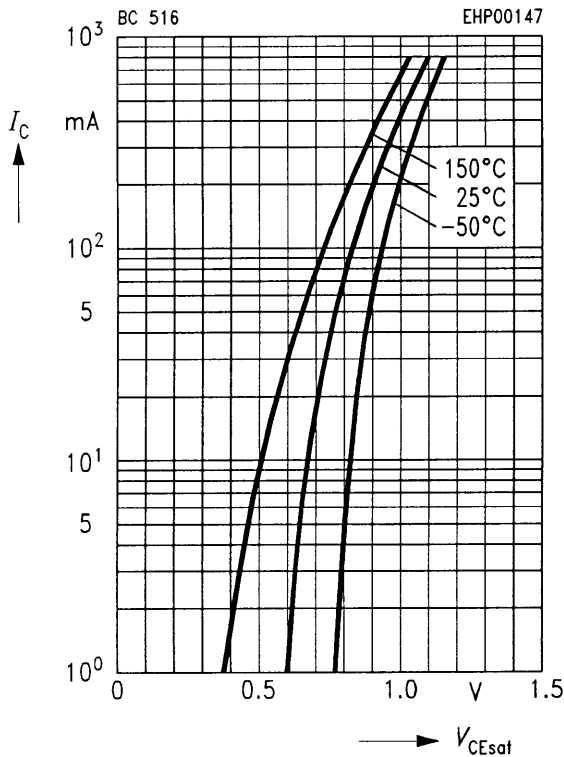
$V_{CE} = 5 \text{ V}$



Collector-emitter saturation voltage

$I_C = f(V_{CEsat})$

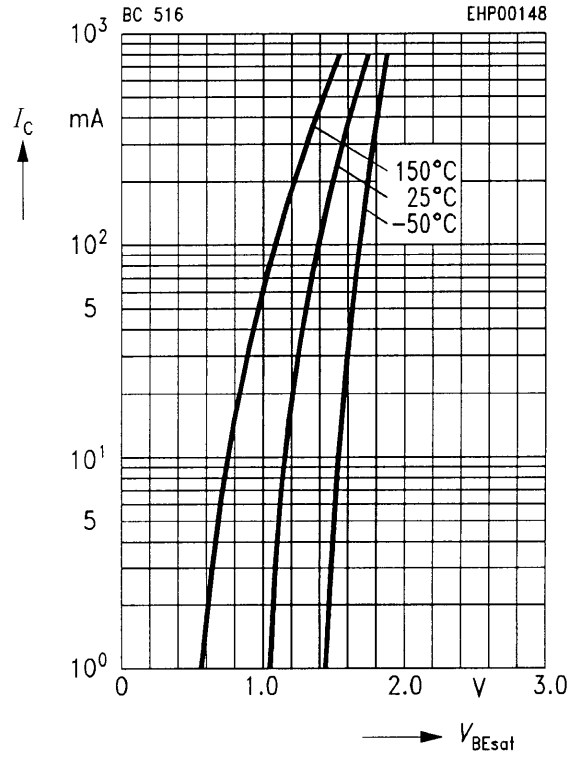
$h_{FE} = 1000$



Base-emitter saturation voltage

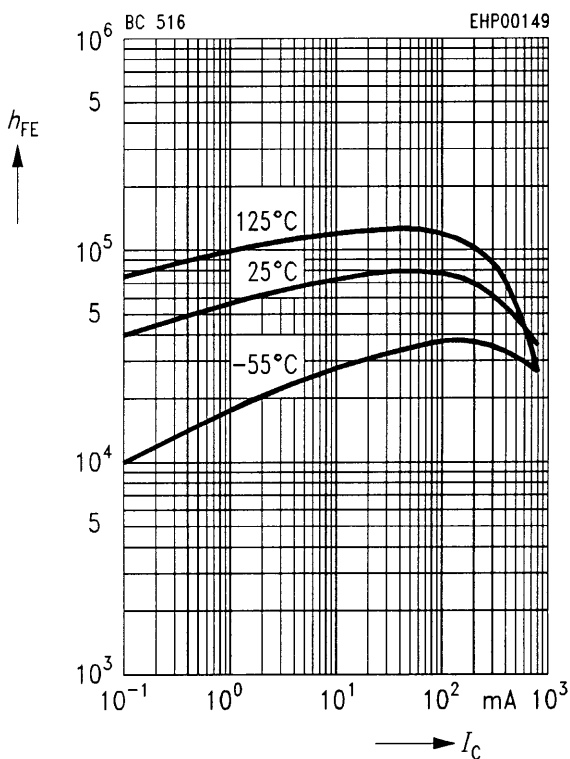
$I_C = f(V_{BEsat})$

$h_{FE} = 1000$

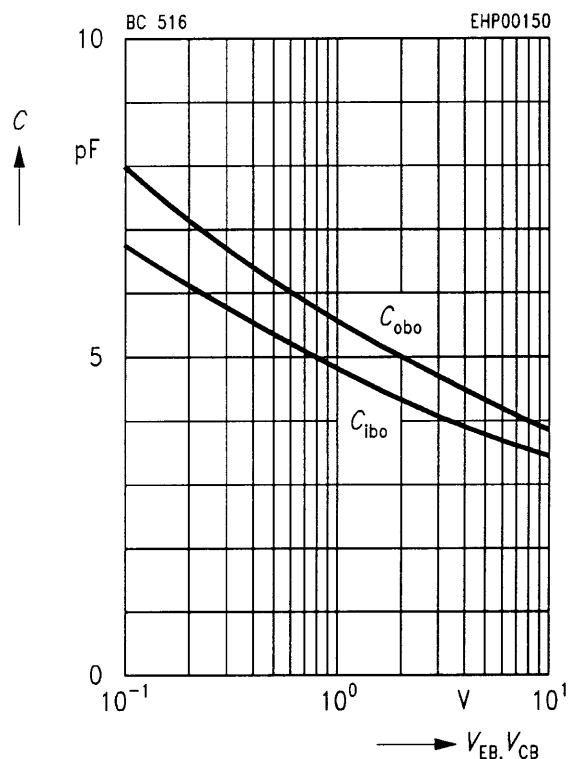


DC current gain $h_{FE} = f(I_C)$

$V_{CE} = 2 V$



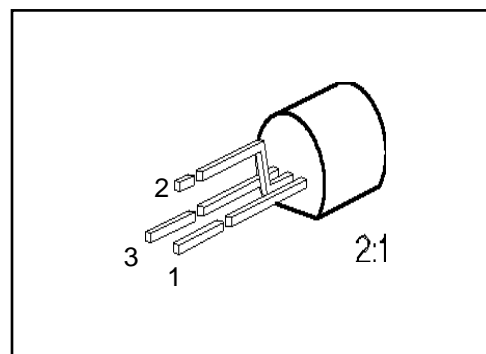
Capacitance $C = f(V_{EB}, V_{CB})$



NPN Silicon Darlington Transistor

BC 517

- High current gain
- High collector current
- Complementary type: BC 516 (PNP)



| Type | Marking | Ordering Code | Pin Configuration | | | Package ¹⁾ |
|--------|---------|---------------|-------------------|---|---|-----------------------|
| | | | 1 | 2 | 3 | |
| BC 517 | – | Q62702-C825 | 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 ²⁾ | $R_{th JC}$ | ≤ 135 | |

1) For detailed information see chapter Package Outlines.

2) Mounted on Al heat sink 15 mm × 25 mm × 0.5 mm.

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

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

DC characteristics

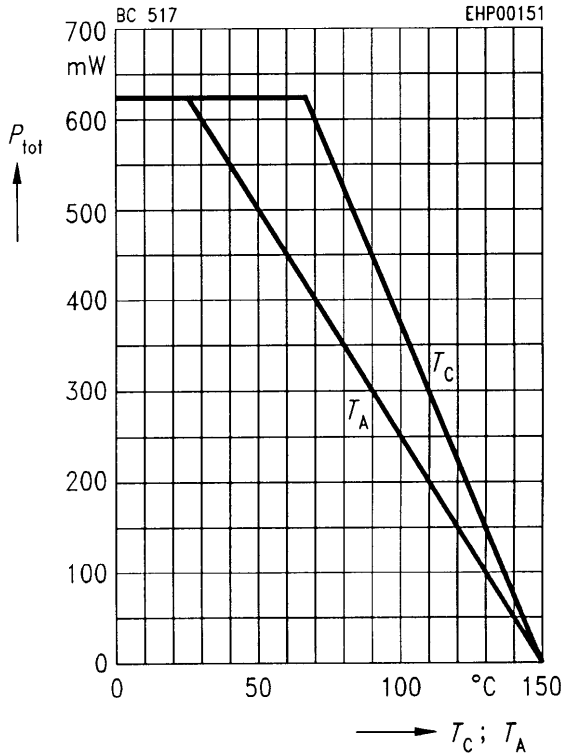
| | | | | | |
|---|---------------|--------|---|-----------|---------------------|
| Collector-emitter breakdown voltage $I_C = 10\text{ mA}$ | $V_{(BR)CE0}$ | 30 | – | – | V |
| Collector-base breakdown voltage $I_C = 100\text{ }\mu\text{A}$ | $V_{(BR)CB0}$ | 40 | – | – | |
| Emitter-base breakdown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

AC characteristics

| | | | | | |
|--|-----------|---|-----|---|-----|
| Transition frequency $I_C = 50\text{ mA}, V_{CE} = 5\text{ V}, f = 20\text{ MHz}$ | f_T | – | 150 | – | MHz |
| Output capacitance $V_{CB} = 10\text{ V}, f = 1\text{ MHz}$ | C_{obo} | – | 3.5 | – | pF |

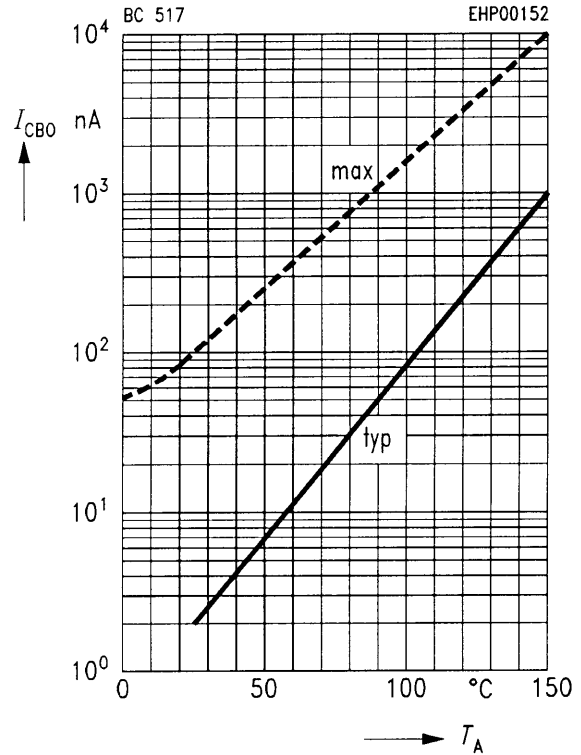
¹⁾ Pulse test: $t \leq 300\text{ }\mu\text{s}, D \leq 2\text{ %}$.

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

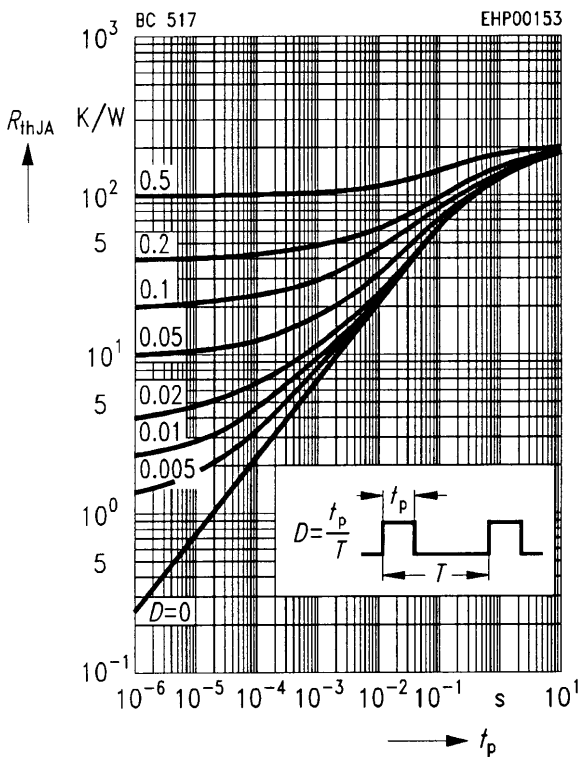


Collector cutoff current $I_{CB0} = f(T_A)$

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

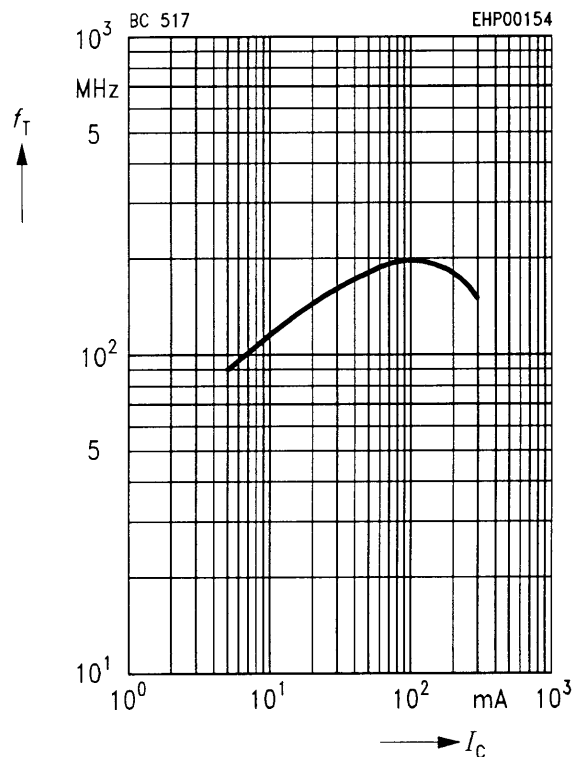


Permissible pulse load $R_{thJA} = f(t_p)$



Transition frequency $f_T = f(I_C)$

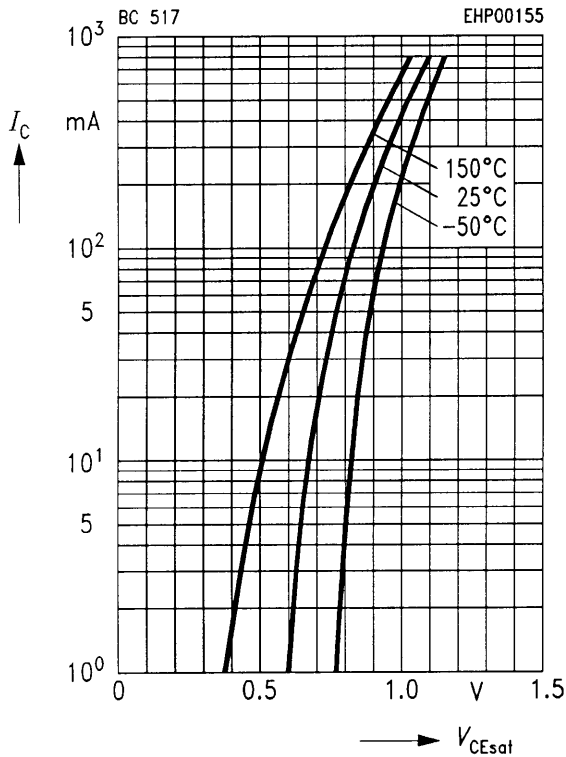
$V_{CE} = 5 \text{ V}, f = 20 \text{ MHz}$



Collector-emitter saturation voltage

$I_C = f(V_{CEsat})$

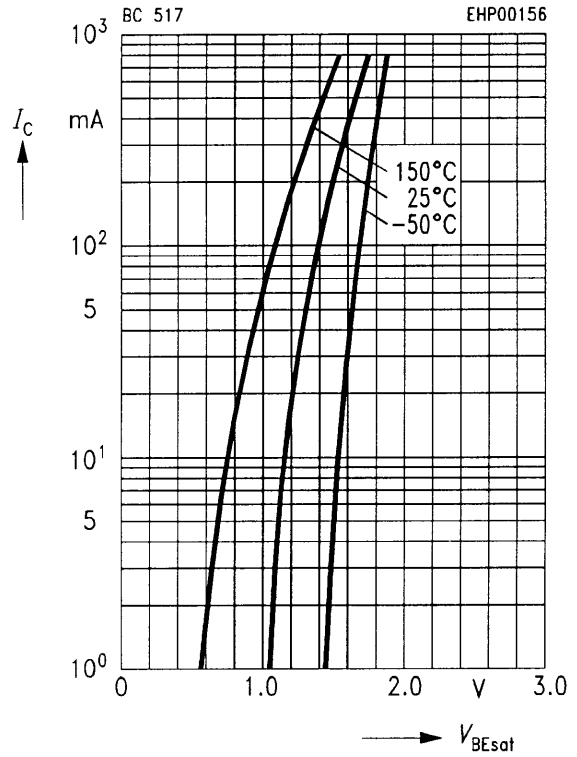
$h_{FE} = 1000$, parameter = T_A



Base-emitter saturation voltage

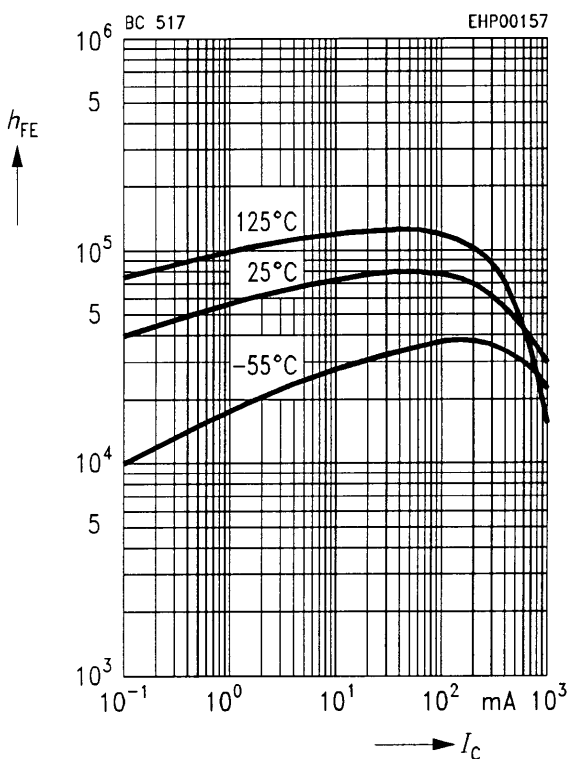
$I_C = f(V_{BEsat})$

$h_{FE} = 1000$, parameter = T_A



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

$V_{CE} = 2$ V, parameter = T_A



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

