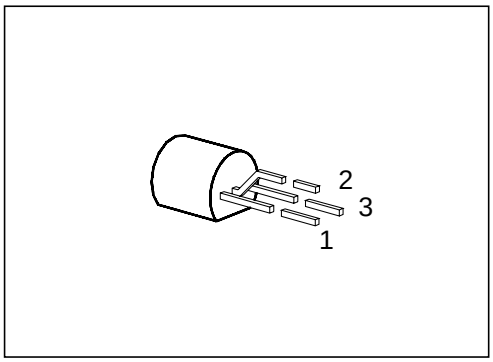
SIEMENS

## NPN Silicon AF Transistors

**BC 635**
**… BC 639**

- High current gain
- High collector current
- Low collector-emitter saturation voltage
- Complementary types: BC 636, BC 638, BC 640 (PNP)




| Type | Marking | Ordering Code | Pin Configuration 1 | 2 | 3 | Package[1)] |
|---|---|---|---|---|---|---|
| BC 635<br>BC 637<br>BC 639 | – | Q68000-A3360<br>Q68000-A2285<br>Q68000-A3361 | E | C | B | TO-92 |

If desired, selected transistors, type BC 63 ★ –10 ($h_{FE}$ = 63 … 160), or BC 63 ★ –16 ($h_{FE}$ = 100 … 250) are available. Ordering codes upon request.

1) For detailed information see chapter Package Outlines.

## Maximum Ratings

| Parameter | Symbol | Values | | | Unit |
|---|---|---|---|---|---|
| | | BC 635 | BC 637 | BC 639 | |
| Collector-emitter voltage | $V_{CE0}$ | 45 | 60 | 80 | V |
| Collector-base voltage | $V_{CB0}$ | 45 | 60 | 100 | |
| Emitter-base voltage | $V_{EB0}$ | 5 | | | |
| Collector current | $I_C$ | 1 | | | A |
| Peak collector current | $I_{CM}$ | 1.5 | | | |
| Base current | $I_B$ | 100 | | | mA |
| Peak base current | $I_{BM}$ | 200 | | | |
| Total power dissipation, $T_C$ = 90 °C[1)] | $P_{tot}$ | 0.8 (1) | | | W |
| Junction temperature | $T_j$ | 150 | | | °C |
| Storage temperature range | $T_{stg}$ | – 65 … + 150 | | | |

## Thermal Resistance

| | | | |
|---|---|---|---|
| Junction - ambient[1)] | $R_{th\ JA}$ | ≤ 156 | K/W |
| Junction - case[2)] | $R_{th\ JC}$ | ≤ 75 | |

1) If the transistors with max. 4 mm lead length are fixed on PCBs with a min. 10 mm × 10 mm large copper area for the collector terminal, $R_{th\ JA}$ = 125 K/W and thus $P_{tot\ max}$ = 1 W at $T_A$ = 25 °C.

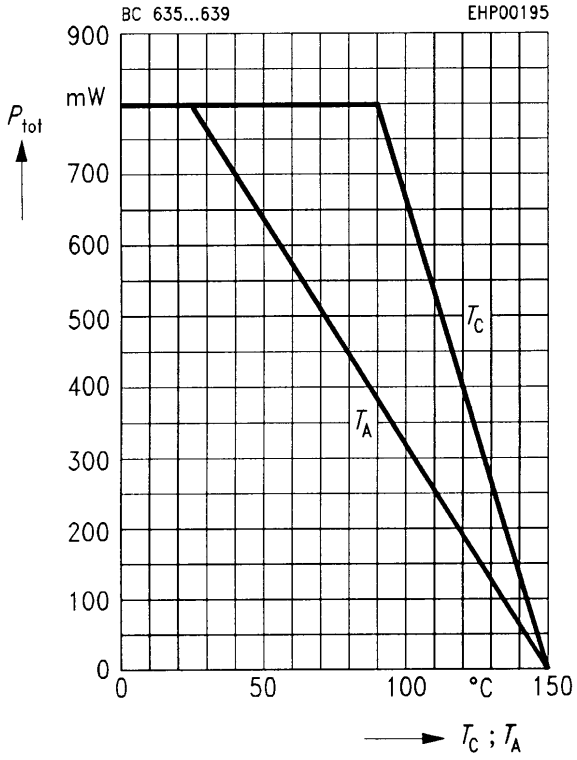
2) Mounted on Al heat sink 15 mm × 25 mm × 0.5 mm.

**Electrical Characteristics**
at $T_A$ = 25 ˚C, unless otherwise specified.

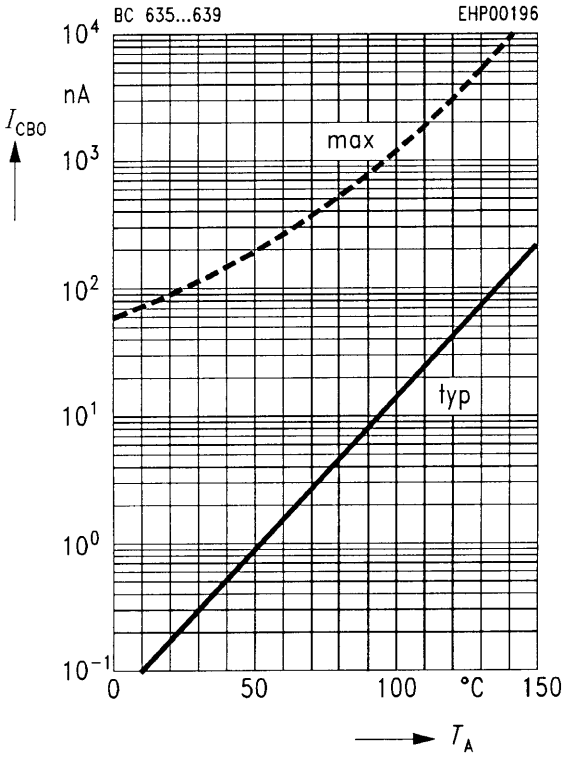
| Parameter | Symbol | Values | | | Unit |
|---|---|---|---|---|---|
| | | min. | typ. | max. | |
| **DC characteristics** | | | | | |
| Collector-emitter breakdown voltage<br>$I_C$ = 10 mA | $V_{(BR)CE0}$ | | | | V |
| BC 635 | | 45 | – | – | |
| BC 637 | | 60 | – | – | |
| BC 639 | | 80 | – | – | |
| Collector-base breakdown voltage<br>$I_C$ = 100 µA | $V_{(BR)CB0}$ | | | | |
| BC 635 | | 45 | – | – | |
| BC 637 | | 60 | – | – | |
| BC 639 | | 100 | – | – | |
| Emitter-base breakdown voltage<br>$I_E$ = 10 µA | $V_{(BR)EB0}$ | 5 | – | – | |
| Collector cutoff current<br>$V_{CB}$ = 30 V<br>$V_{CB}$ = 30 V, $T_A$ = 150 ˚C | $I_{CB0}$ | –<br>– | –<br>– | 100<br>20 | nA<br>µA |
| Emitter cutoff current<br>$V_{EB}$ = 4 V | $I_{EB0}$ | – | – | 100 | nA |
| DC current gain<br>$I_C$ = 5 mA; $V_{CE}$ = 2 V<br>$I_C$ = 150 mA; $V_{CE}$ = 2 V[1)]<br>$I_C$ = 500 mA; $V_{CE}$ = 2 V[1)] | $h_{FE}$ | <br>25<br>40<br>25 | <br>–<br>–<br>– | <br>–<br>250<br>– | – |
| Collector-emitter saturation voltage[1)]<br>$I_C$ = 500 mA; $I_B$ = 50 mA | $V_{CEsat}$ | – | – | 500 | mV |
| Base-emitter voltage[1)]<br>$I_C$ = 500 mA; $V_{CE}$ = 2 V | $V_{BE)}$ | – | – | 1 | V |
| **AC characteristics** | | | | | |
| Transition frequency<br>$I_C$ = 50 mA, $V_{CE}$ = 10 V, $f$ = 20 MHz | $f_T$ | – | 100 | – | MHz |

1) Pulse test: $t \leq 300$ µs, $D \leq 2$ %.

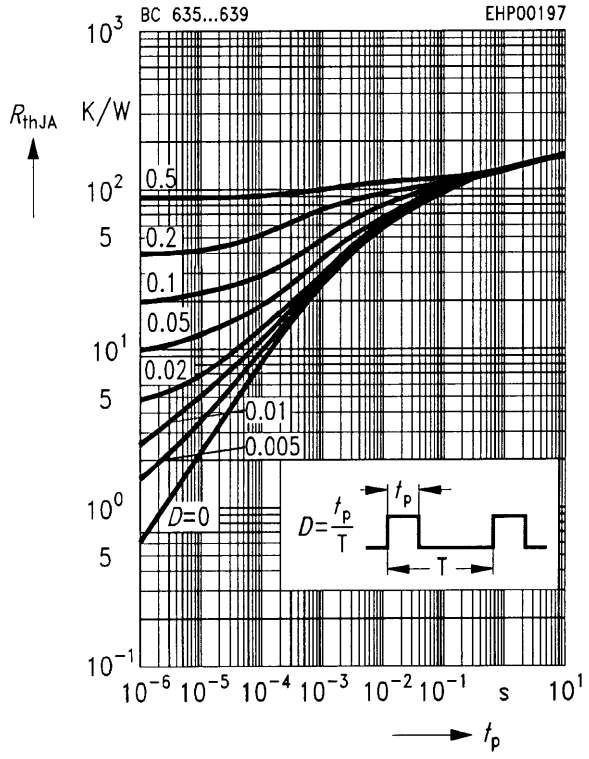
**Total power dissipation** $P_{tot} = f(T_A; T_C)$



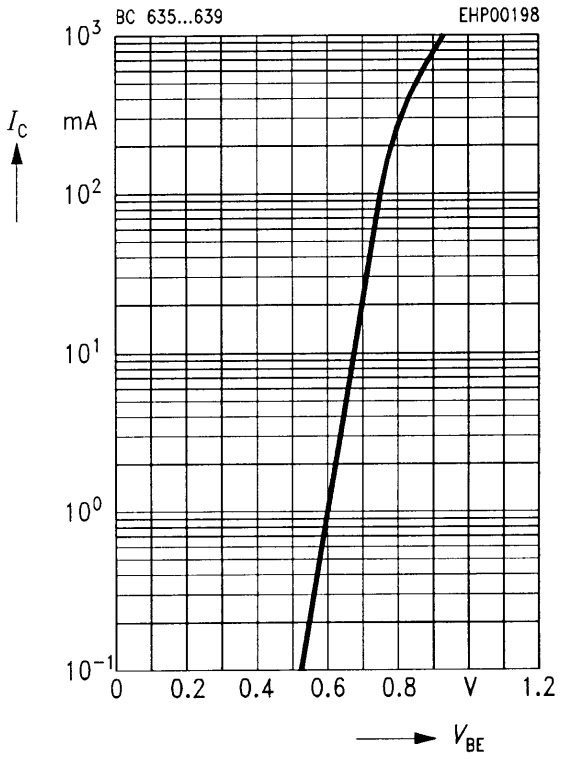

**Collector cutoff current** $I_{CB0} = f(T_A)$
$V_{CB}$ = 30 V



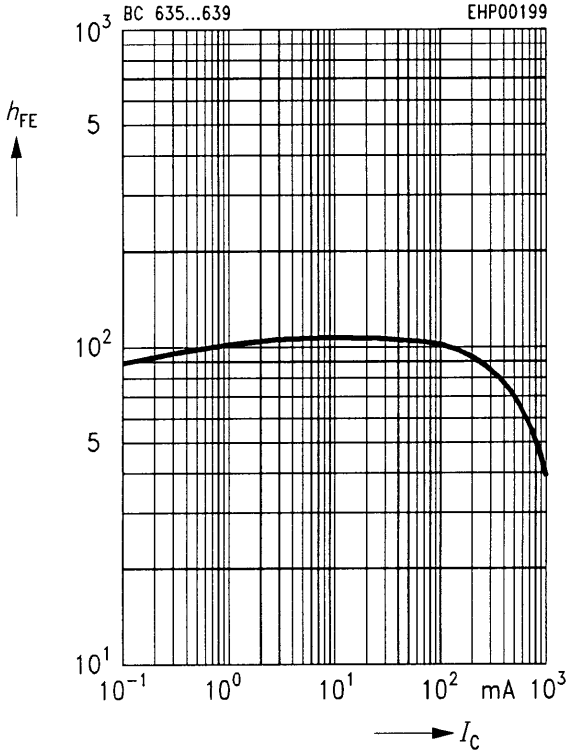

**Permissible pulse load** $R_{thJA} = f(t_p)$
$V_{CE}$ = 2 V



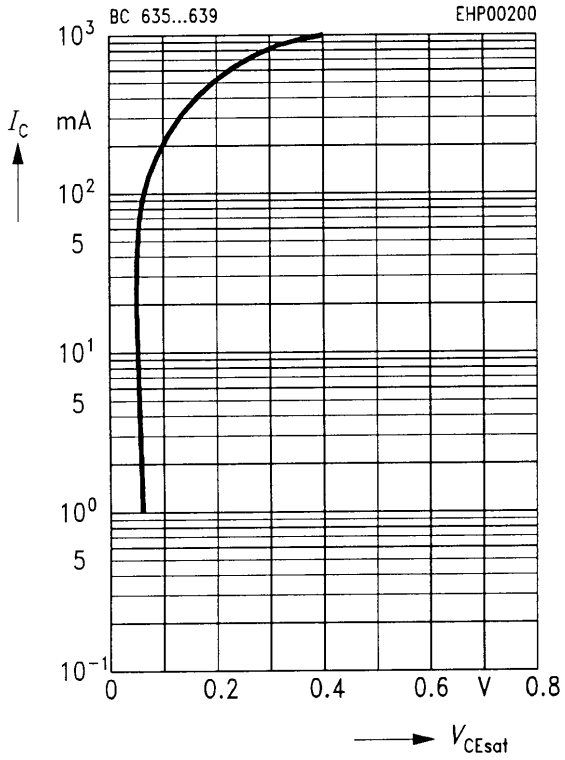

**Collector current** $I_C = f(V_{BE})$



**DC current gain** $h_{FE} = f(I_C)$
$V_{CE}$ = 2 V




**Collector-emitter saturation voltage**
$V_{CEsat} = f(I_C)$
$h_{FE}$ = 10




**Transition frequency** $f_T = f(I_C)$
$V_{CE}$ = 10 V, $f$ = 20 MHz