# SIEMENS

## NPN Silicon Darlington Transistors

**BC 875**
**… BC 879**

● High current gain
● Low collector-emitter saturation voltage
● Complementary types: BC 876, BC 878
BC 880 (PNP)
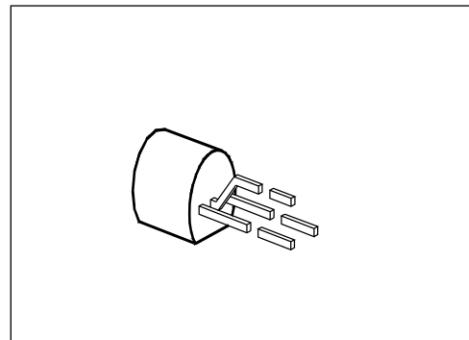
| Type | Marking | Ordering Code | Pin Configuration | | | Package[1] |
|------|---------|---------------|---|---|---|---------|
| | | | **1** | **2** | **3** | |
| BC 875 | – | C62702-C853 | E | C | B | TO-92 |
| BC 877 | | C62702-C854 | | | | |
| BC 879 | | C62702-C855 | | | | |

**Maximum Ratings**

| Parameter | Symbol | Values | | | Unit |
|-----------|--------|--------|---|---|------|
| | | **BC 875** | **BC 877** | **BC 879** | |
| Collector-emitter voltage | $V_{CE0}$ | 45 | 60 | 80 | V |
| Collector-base voltage | $V_{CB0}$ | 60 | 80 | 100 | |
| Emitter-base voltage | $V_{EB0}$ | 5 | | | |
| Collector current | $I_C$ | 1 | | | A |
| Peak collector current | $I_{CM}$ | 2 | | | |
| Base current | $I_B$ | 100 | | | mA |
| Peak base current | $I_{BM}$ | 200 | | | |
| Total power dissipation, $T_C = 90\ °C$[2] | $P_{tot}$ | 0.8 (1) | | | W |
| Junction temperature | $T_j$ | 150 | | | °C |
| Storage temperature range | $T_{stg}$ | – 65 … + 150 | | | |

**Thermal Resistance**

| | | | |
|---|---|---|---|
| Junction - ambient[2] | $R_{th\ JA}$ | ≤ 156 | K/W |
| Junction - case[3] | $R_{th\ JC}$ | ≤ 75 | |

[1] For detailed information see chapter Package Outlines.
[2] If 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, $R_{thJA}$ = 125 K/W and thus $P_{tot\ max}$ = 1 W at $T_A$ = 25 °C.
[3] 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

| Parameter | Symbol | min. | typ. | max. | Unit |
|---|---|---|---|---|---|
| Collector-emitter breakdown voltage $I_C$ = 50 mA | $V_{(BR)CE0}$ | | | | V |
| BC 875 | | 45 | – | – | |
| BC 877 | | 60 | – | – | |
| BC 879 | | 80 | – | – | |
| Collector-base breakdown voltage $I_C$ = 100 µA | $V_{(BR)CB0}$ | | | | |
| BC 875 | | 60 | – | – | |
| BC 877 | | 80 | – | – | |
| BC 879 | | 100 | – | – | |
| Emitter-base breakdown voltage, $I_E$ = 100 µA | $V_{(BR)EB0}$ | 5 | – | – | |
| Collector cutoff current $V_{CE}$ = 0.5 × $V_{CEmax}$ | $I_{CE0}$ | – | – | 500 | nA |
| Collector cutoff current | $I_{CB0}$ | | | | |
| $V_{CB}$ = $V_{CBmax}$ | | – | – | 100 | nA |
| $V_{CB}$ = $V_{CBmax}$, $T_A$ = 150 ˚C | | – | – | 20 | µA |
| Emitter cutoff current, $V_{EB}$ = 4 V | $I_{EB0}$ | – | – | 100 | nA |
| DC current gain | $h_{FE}$ | | | | – |
| $I_C$ = 150 mA; $V_{CE}$ = 10 V[1] | | 1000 | – | – | |
| $I_C$ = 500 mA; $V_{CE}$ = 10 V[1] | | 2000 | – | – | |
| Collector-emitter saturation voltage[1] | $V_{CEsat}$ | | | | V |
| $I_C$ = 500 mA, $I_B$ = 0.5 mA | | – | – | 1.3 | |
| $I_C$ = 1 A, $I_B$ = 1 mA | | – | – | 1.8 | |
| Base-emitter saturation voltage[1] $I_C$ = 1 A; $I_B$ = 1 mA | $V_{BEsat}$ | – | – | 2.2 | |

### AC characteristics

| Parameter | Symbol | min. | typ. | max. | Unit |
|---|---|---|---|---|---|
| Transition frequency $I_C$ = 200 mA, $V_{CE}$ = 5 V, $f$ = 20 MHz | $f_T$ | – | 150 | – | MHz |

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

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

BC 875...879                    EHP00225
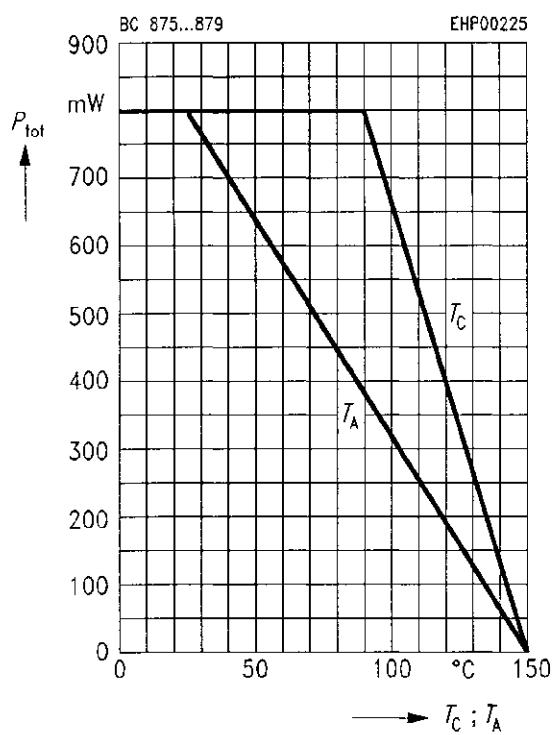


**Collector cutoff current** $I_{CB0} = f (T_A)$
$V_{CB} = 100$ V

BC 875...879                    EHP00226
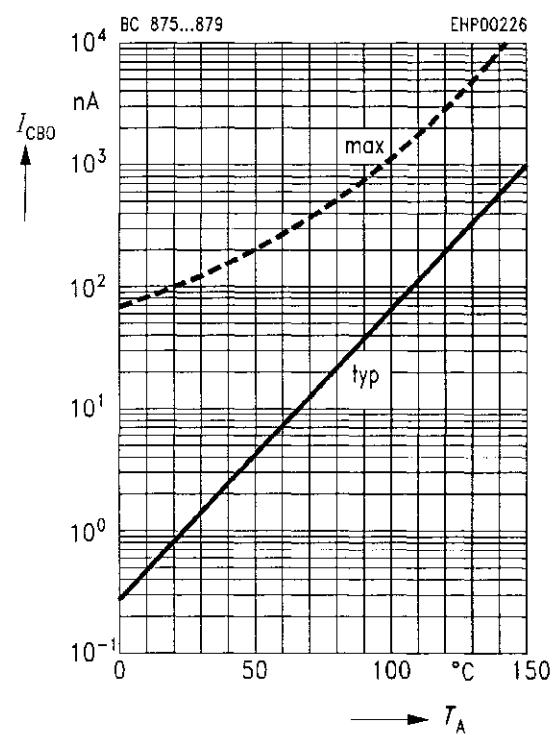


**Permissible pulse load** $R_{thJA} = f (t_p)$

BC 875...879                    EHP00227
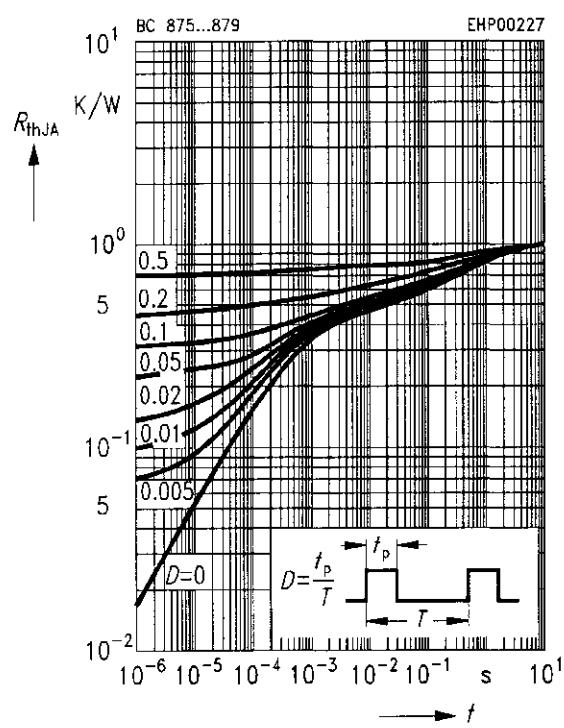


**DC current gain** $h_{FE} = f (T_A)$
$V_{CE} = 10$ V

BC 875...879                    EHP00228
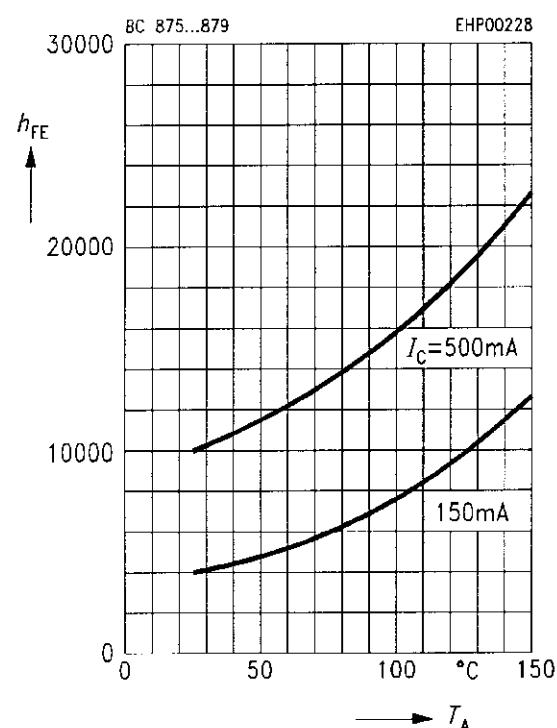
**DC current gain** $h_{FE} = f(I_C)$
$V_{CE} = 10$ V, $T_A = 25$ °C

BC 875...879         EHP00229

$h_{FE}$

$I_C$
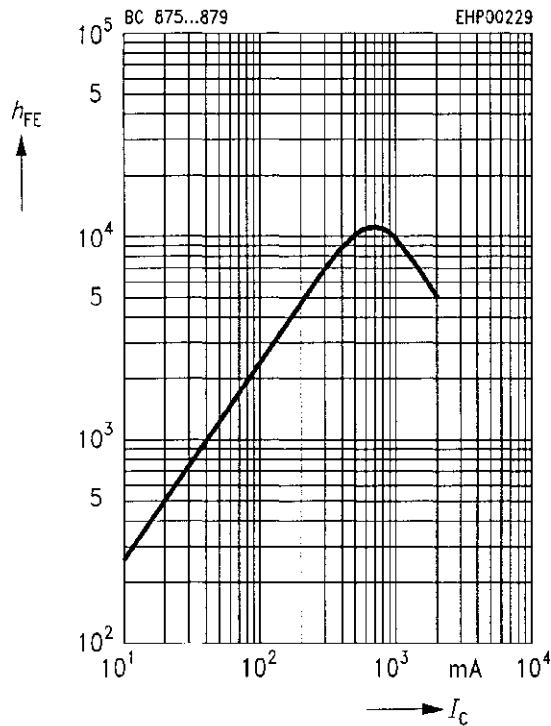
**Transition frequency** $f_T = f(I_C)$
$V_{CE} = 5$ V, $f = 20$ MHz

BC 875...879         EHP00230

$f_T$

$I_C$
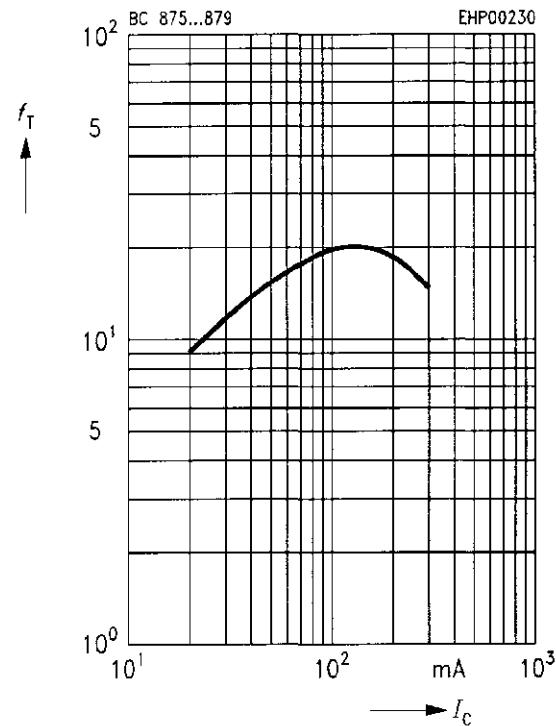
**Collector-emitter saturation voltage**
$V_{CEsat} = f(I_C)$
Parameter = $I_B$, $T_A = 25$ °C

BC 875...879         EHP00231

$I_C$   mA

$I_B = 0.5$mA
4mA

$V_{CEsat}$
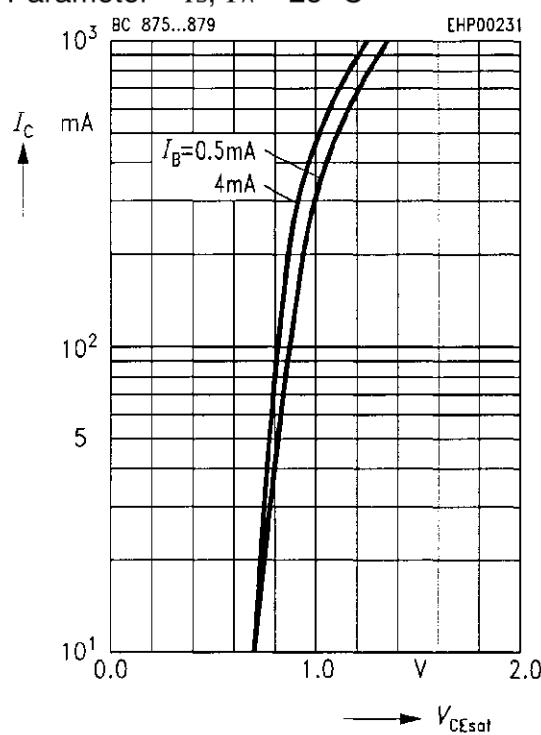
**Base-emitter saturation voltage**
$V_{BEsat} = f(I_C)$
Parameter = $I_B$, $T_A = 25$ °C

BC 875...879         EHP00232

$I_C$   mA

$I_B = 0.5$mA
4mA

$V_{BEsat}$