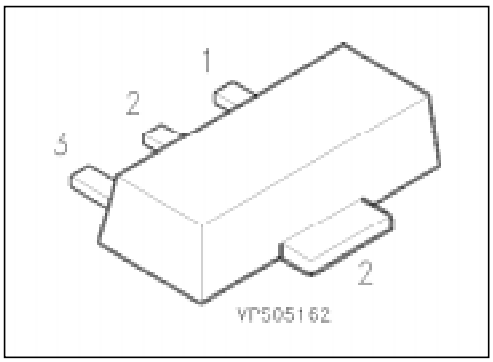
SIEMENS

## NPN Silicon High-Voltage Transistor — BFN 20

- Suitable for video output stages in TV sets and switching power supplies
- High breakdown voltage
- Low collector-emitter saturation voltage
- Low capacitance
- Complementary type: BFN 21 (PNP)




| Type | Marking | Ordering Code (tape and reel) | Pin Configuration 1 | 2 | 3 | Package[1] |
|---|---|---|---|---|---|---|
| BFN 20 | DC | Q62702-F1058 | B | C | E | SOT-89 |

### Maximum Ratings

| Parameter | Symbol | Values | Unit |
|---|---|---|---|
| Collector-emitter voltage | $V_{CE0}$ | 300 | V |
| Collector-base voltage | $V_{CB0}$ | 300 | |
| Collector-emitter voltage, $R_{BE}$ = 2.7 kΩ | $V_{CER}$ | 300 | |
| Emitter-base voltage | $V_{EB0}$ | 5 | |
| Collector current | $I_C$ | 50 | mA |
| Peak collector current | $I_{CM}$ | 100 | |
| Total power dissipation, $T_S$ = 120 °C | $P_{tot}$ | 1 | W |
| Junction temperature | $T_j$ | 150 | °C |
| Storage temperature range | $T_{stg}$ | – 65 … + 150 | |

### Thermal Resistance

| | | | |
|---|---|---|---|
| Junction - ambient[2] | $R_{th\ JA}$ | ≤ 90 | K/W |
| Junction - soldering point | $R_{th\ JS}$ | ≤ 30 | |

1) For detailed information see chapter Package Outlines.

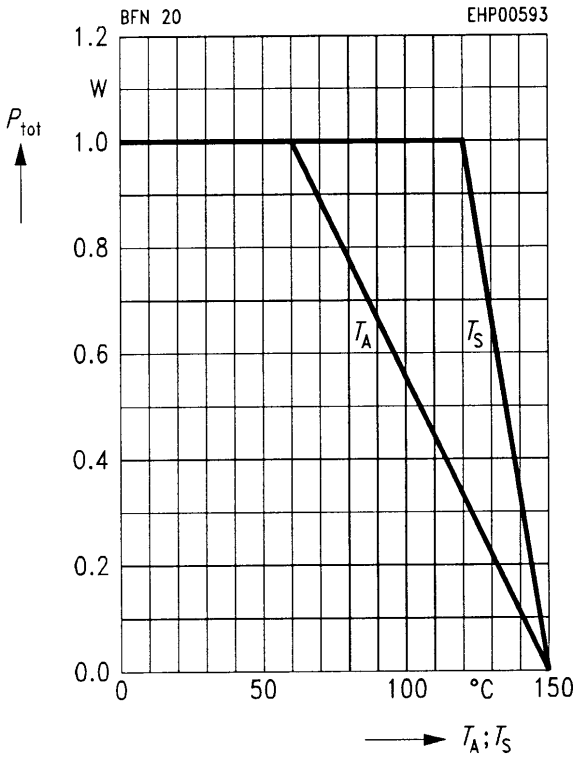
2) Package mounted on epoxy pcb 40 mm × 40 mm × 1.5 mm/6 cm² Cu.

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

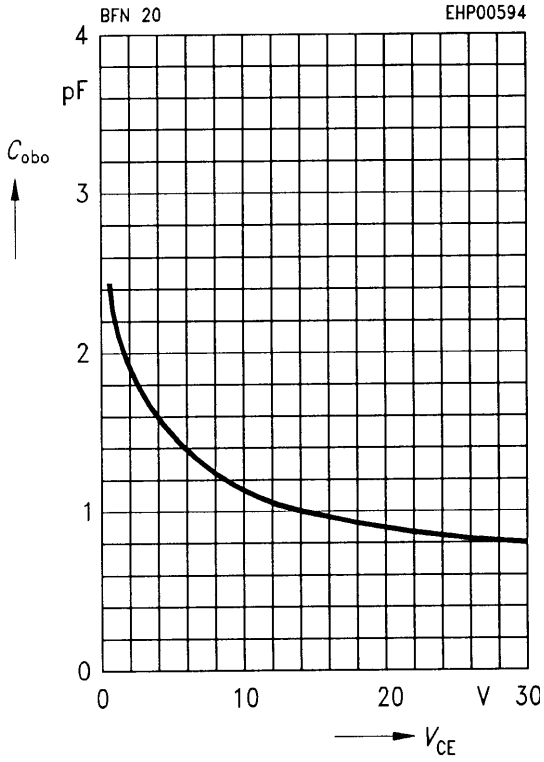
| Parameter | Symbol | Values | | | Unit |
|---|---|---|---|---|---|
| | | min. | typ. | max. | |
| **DC characteristics** | | | | | |
| Collector-emitter breakdown voltage<br>$I_C$ = 1 mA | $V_{(BR)CE0}$ | 300 | – | – | V |
| Collector-base breakdown voltage<br>$I_C$ = 10 µA | $V_{(BR)CB0}$ | 300 | – | – | |
| Collector-emitter breakdown voltage<br>$I_C$ = 10 µA, $R_{BE}$ = 2.7 kΩ | $V_{(BR)CER}$ | 300 | – | – | |
| Emitter-base breakdown voltage<br>$I_E$ = 10 µA | $V_{(BR)EB0}$ | 5 | – | – | |
| Collector-base cutoff current<br>$V_{CB}$ = 250 V<br>$V_{CB}$ = 250 V, $T_A$ = 150 ˚C | $I_{CB0}$ | <br>–<br>– | <br>–<br>– | <br>100<br>20 | <br>nA<br>µA |
| Collector cutoff current<br>$V_{CE}$ = 300 V, $R_{BE}$ = 2.7 kΩ<br>$V_{CE}$ = 300 V, $T_A$ = 150 ˚C, $R_{BE}$ = 2.7 kΩ | $I_{CER}$ | <br>–<br>– | <br>–<br>– | <br>1<br>50 | µA |
| Emitter-base cutoff current<br>$V_{EB}$ = 5 V | $I_{EB0}$ | – | – | 10 | |
| DC current gain[1)]<br>$I_C$ = 25 mA, $V_{CE}$ = 20 V | $h_{FE}$ | 40 | – | – | – |
| Collector-emitter saturation voltage[1)]<br>$I_C$ = 10 mA, $I_B$ = 1 mA | $V_{CEsat}$ | – | – | 0.5 | V |
| Base-emitter saturation voltage[1)]<br>$I_C$ = 10 mA, $I_B$ = 1 mA | $V_{BEsat}$ | – | – | 1 | |
| **AC characteristics** | | | | | |
| Transition frequency<br>$I_C$ = 10 mA, $V_{CE}$ = 10 V, $f$ = 20 MHz | $f_T$ | – | 100 | – | MHz |
| Output capacitance<br>$V_{CB}$ = 30 V, $f$ = 1 MHz | $C_{obo}$ | – | 0.8 | – | pF |

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

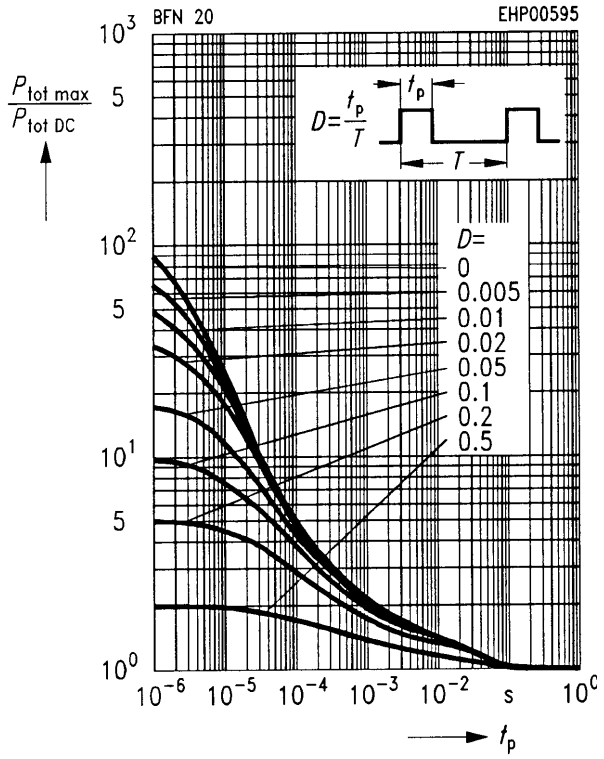
**Total power dissipation** $P_{tot} = f(T_A^*; T_S)$
* Package mounted on epoxy



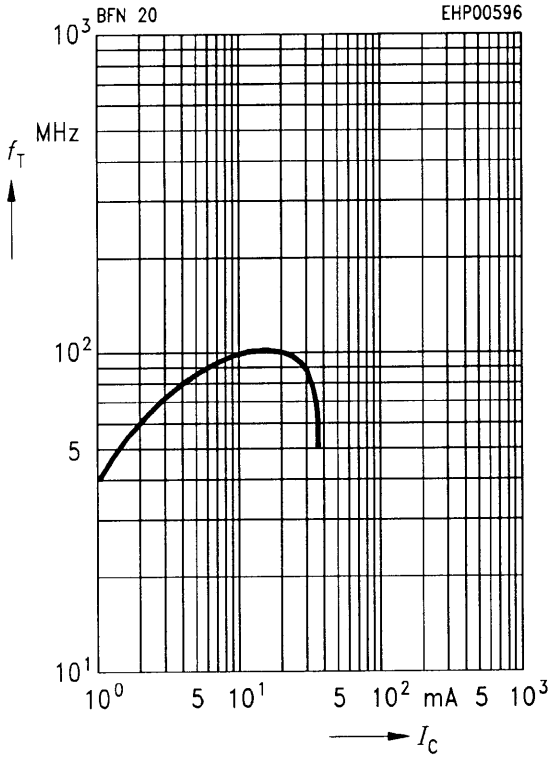

**Output capacitance** $C_{obo} = f(V_{CE})$
$f$= 1 MHz



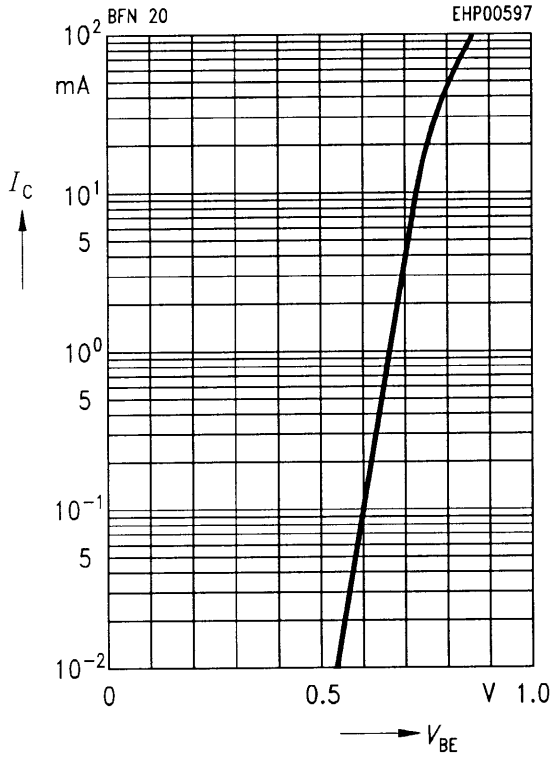

**Permissible pulse load** $P_{tot\,max} / P_{tot\,DC} = f(t_p)$



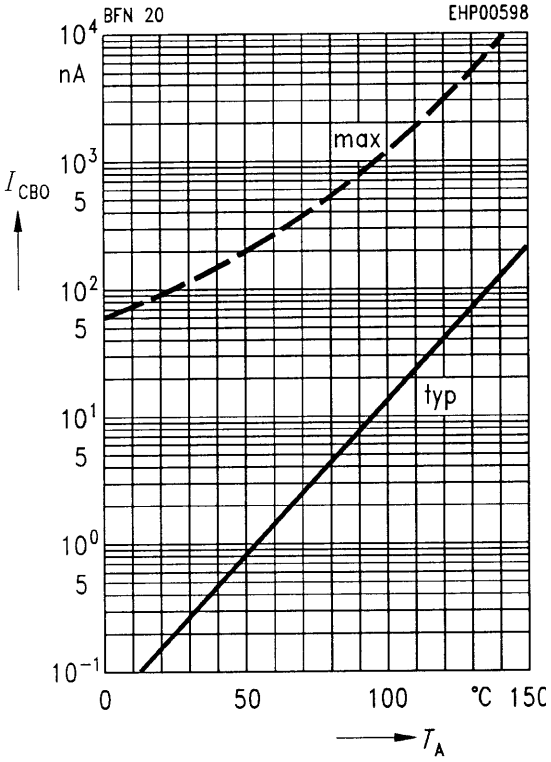

**Transition frequency** $f_T = f(I_C)$
$V_{CE}$ = 10 V



**Collector current** $I_C = f(V_{BE})$
$V_{CE}$ = 20 V




**Collector cutoff current** $I_{CB0} = f(T_A)$
$V_{CB}$ = 250 V




**DC current gain** $h_{FE} = f(I_C)$
$V_{CE}$ = 20 V