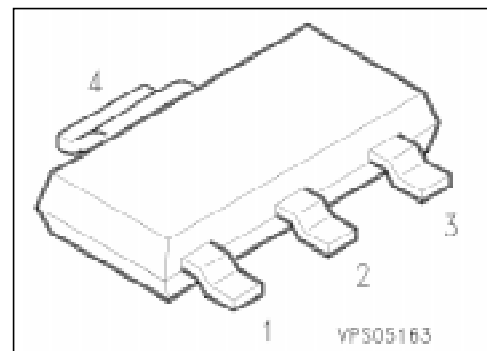


## PNP Silicon AF Transistor

## BCP 69

- For general AF application
- High collector current
- High current gain
- Low collector-emitter saturation voltage
- Complementary type: BCP 68 (NPN)



| Type      | Marking   | Ordering Code<br>(tape and reel) | Pin Configuration |   |   |   | Package <sup>1)</sup> |
|-----------|-----------|----------------------------------|-------------------|---|---|---|-----------------------|
|           |           |                                  | 1                 | 2 | 3 | 4 |                       |
| BCP 69    | BCP 69    | Q62702-C2130                     | B                 | C | E | C | SOT-223               |
| BCP 69-10 | BCP 69-10 | Q62702-C2131                     |                   |   |   |   |                       |
| BCP 69-16 | BCP 69-16 | Q62702-C2132                     |                   |   |   |   |                       |
| BCP 69-25 | BCP 69-25 | Q62702-C2133                     |                   |   |   |   |                       |

### Maximum Ratings

| Parameter                                           | Symbol    | Values         | Unit |
|-----------------------------------------------------|-----------|----------------|------|
| Collector-emitter voltage                           | $V_{CE0}$ | 20             | V    |
|                                                     | $V_{CES}$ | 25             |      |
|                                                     | $V_{CB0}$ | 25             |      |
| Collector-base voltage                              | $V_{CB0}$ | 25             |      |
| 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, $T_s = 124\text{ °C}^{2)}$ | $P_{tot}$ | 1.5            | W    |
| Junction temperature                                | $T_j$     | 150            | °C   |
| Storage temperature range                           | $T_{stg}$ | - 65 ... + 150 |      |

### Thermal Resistance

|                                  |             |      |     |
|----------------------------------|-------------|------|-----|
| Junction - ambient <sup>2)</sup> | $R_{th JA}$ | ≤ 72 | K/W |
| Junction - soldering point       | $R_{th JS}$ | ≤ 17 |     |

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

<sup>2)</sup> Package mounted on epoxy pcb 40 mm × 40 mm × 1.5 mm/6 cm<sup>2</sup> Cu.

## 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>$I_C = 30\text{ mA}$ , $I_B = 0$                                                                                                                                                               | $V_{(BR)CE0}$ | 20                                 | —                                | —                                  | V                   |
| Collector-emitter breakdown voltage<br>$I_C = 10\text{ }\mu\text{A}$ , $V_{BE} = 0$                                                                                                                                                   | $V_{(BR)CES}$ | 25                                 | —                                | —                                  |                     |
| Collector-base breakdown voltage<br>$I_C = 10\text{ }\mu\text{A}$ , $I_B = 0$                                                                                                                                                         | $V_{(BR)CB0}$ | 25                                 | —                                | —                                  |                     |
| Emitter-base breakdown voltage<br>$I_E = 10\text{ }\mu\text{A}$ , $I_B = 0$                                                                                                                                                           | $V_{(BR)EB0}$ | 5                                  | —                                | —                                  |                     |
| Collector-base cutoff current<br>$V_{CB} = 25\text{ V}$<br>$V_{CB} = 25\text{ V}$ , $T_A = 150\text{ °C}$                                                                                                                             | $I_{CB0}$     | —<br>—                             | —<br>—                           | 100<br>100                         | nA<br>$\mu\text{A}$ |
| Emitter-base cutoff current<br>$V_{EB} = 5\text{ V}$ , $I_C = 0$                                                                                                                                                                      | $I_{EB0}$     | —                                  | —                                | 100                                | nA                  |
| DC current gain <sup>1)</sup><br>$I_C = 5\text{ mA}$ , $V_{CE} = 10\text{ V}$<br>$I_C = 500\text{ mA}$ , $V_{CE} = 1\text{ V}$<br><br>BCP 69<br>BCP 69-10<br>BCP 69-16<br>BCP 69-25<br><br>$I_C = 1\text{ A}$ , $V_{CE} = 1\text{ V}$ | $h_{FE}$      | 50<br>85<br>85<br>100<br>160<br>60 | —<br>—<br>100<br>160<br>250<br>— | —<br>375<br>160<br>250<br>375<br>— | —                   |
| Collector-emitter saturation voltage <sup>1)</sup><br>$I_C = 1\text{ A}$ , $I_B = 100\text{ mA}$                                                                                                                                      | $V_{CEsat}$   | —                                  | —                                | 0.5                                | V                   |
| Base-emitter voltage <sup>1)</sup><br>$I_C = 5\text{ mA}$ , $V_{CE} = 10\text{ V}$<br>$I_C = 1\text{ A}$ , $V_{CE} = 1\text{ V}$                                                                                                      | $V_{BE}$      | —<br>—                             | 0.6<br>—                         | —<br>1                             |                     |

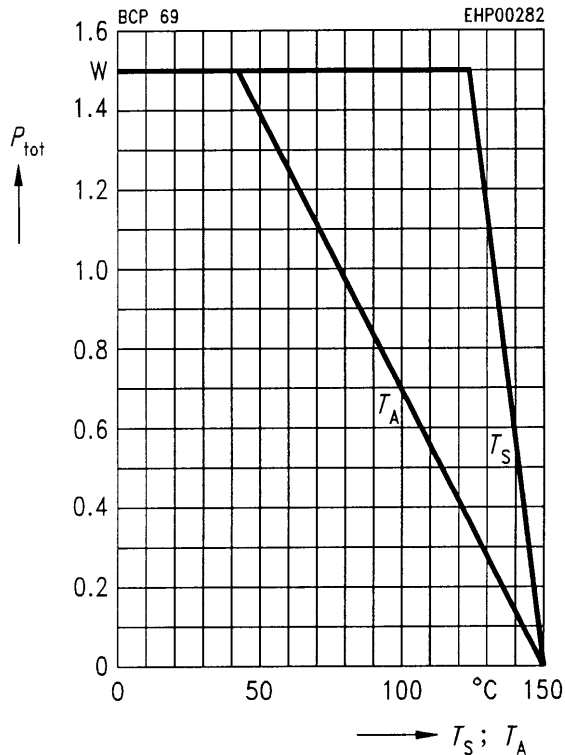
### AC characteristics

|                                                                                              |       |   |     |   |     |
|----------------------------------------------------------------------------------------------|-------|---|-----|---|-----|
| Transition frequency<br>$I_C = 100\text{ mA}$ , $V_{CE} = 5\text{ V}$ , $f = 100\text{ MHz}$ | $f_T$ | — | 100 | — | MHz |
|----------------------------------------------------------------------------------------------|-------|---|-----|---|-----|

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

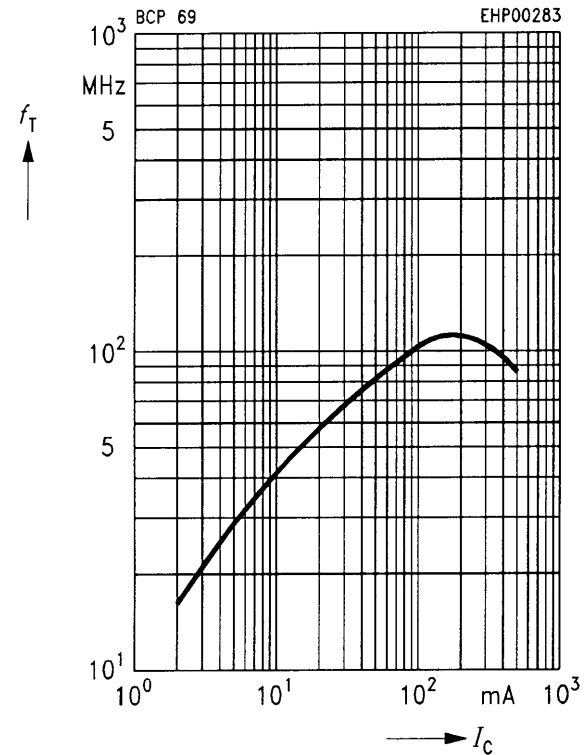
## Total power dissipation $P_{\text{tot}} = f(T_A^*; T_S)$

\* Package mounted on epoxy



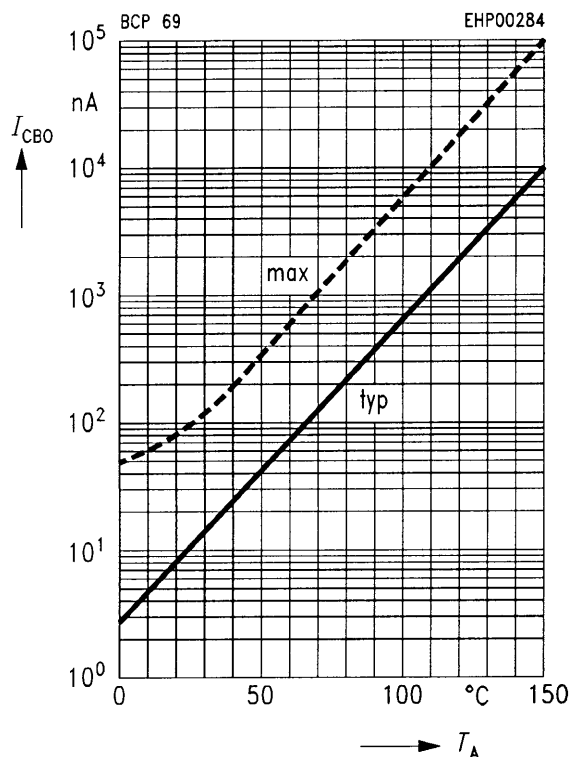
## Transition frequency $f_T = f(I_C)$

$V_{CE} = 5 \text{ V}, f = 100 \text{ MHz}$



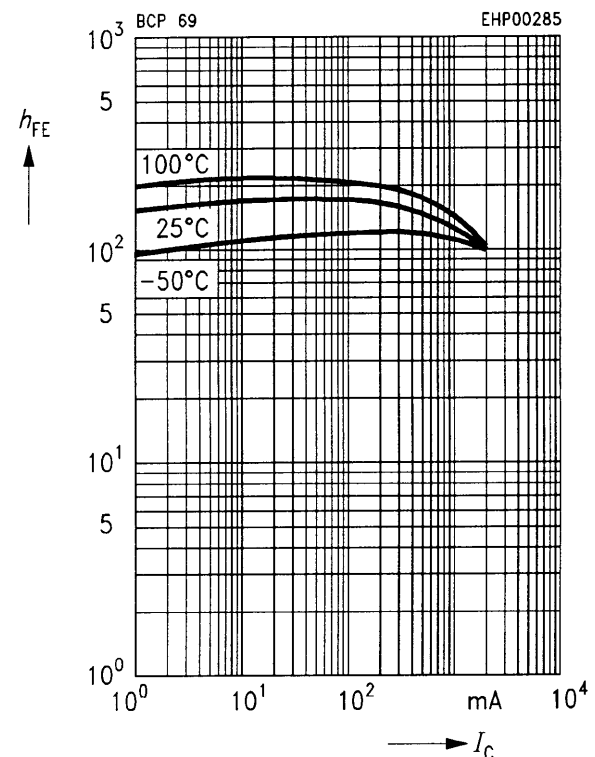
## Collector cutoff current $I_{CB0} = f(T_A)$

$V_{CB} = 25 \text{ V}$



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

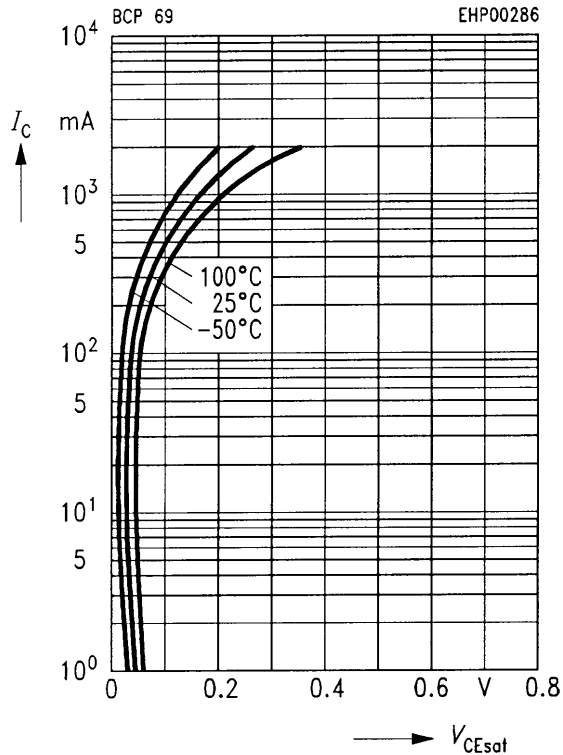
$V_{CB} = 1 \text{ V}$



### Collector-emitter saturation voltage

$$I_C = f(V_{CEsat})$$

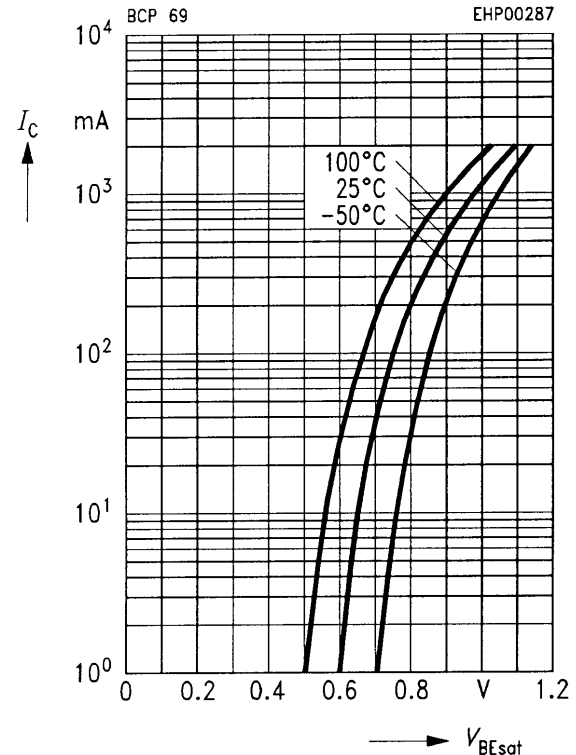
$$h_{FE} = 10$$



### Base-emitter saturation voltage

$$I_C = f(V_{BEsat})$$

$$h_{FE} = 10$$



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

