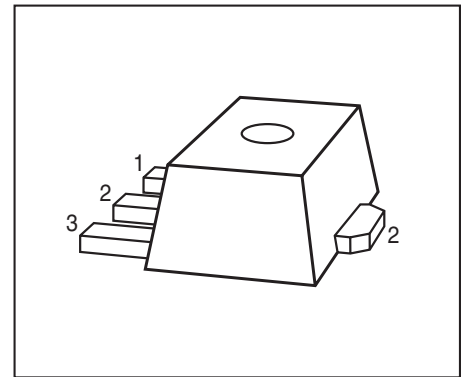


## PNP Silicon AF Transistors

- For general AF applications
- High collector current
- High current gain
- Low collector-emitter saturation voltage
- Complementary type: BCX68 (NPN)
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101



| Type     | Marking | Pin Configuration |     |     | Package |
|----------|---------|-------------------|-----|-----|---------|
| BCX69-10 | CF      | 1=B               | 2=C | 3=E | SOT89   |
| BCX69-16 | CG      | 1=B               | 2=C | 3=E | SOT89   |
| BCX69-25 | CH      | 1=B               | 2=C | 3=E | SOT89   |

### Maximum Ratings

| Parameter                                             | Symbol    | Value       | Unit             |
|-------------------------------------------------------|-----------|-------------|------------------|
| Collector-emitter voltage                             | $V_{CEO}$ | 20          | V                |
| Collector-base voltage                                | $V_{CBO}$ | 25          |                  |
| Emitter-base voltage                                  | $V_{EBO}$ | 5           |                  |
| Collector current                                     | $I_C$     | 1           | A                |
| Peak collector current, $t_p \leq 10 \text{ ms}$      | $I_{CM}$  | 2           |                  |
| Base current                                          | $I_B$     | 100         | mA               |
| Peak base current                                     | $I_{BM}$  | 200         |                  |
| Total power dissipation-<br>$T_S = 114^\circ\text{C}$ | $P_{tot}$ | 3           | W                |
| Junction temperature                                  | $T_j$     | 150         | $^\circ\text{C}$ |
| Storage temperature                                   | $T_{stg}$ | -65 ... 150 |                  |

### Thermal Resistance

| Parameter                                | Symbol     | Value     | Unit |
|------------------------------------------|------------|-----------|------|
| Junction - soldering point <sup>1)</sup> | $R_{thJS}$ | $\leq 12$ | K/W  |

<sup>1)</sup>For calculation of  $R_{thJA}$  please refer to Application Note AN077 (Thermal Resistance Calculation)

**Electrical Characteristics** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

| Parameter                                                                                                                                                                                                                                                                                                       | Symbol        | Values                       |                             |                             | Unit          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------------------|-----------------------------|-----------------------------|---------------|
|                                                                                                                                                                                                                                                                                                                 |               | min.                         | typ.                        | max.                        |               |
| DC Characteristics                                                                                                                                                                                                                                                                                              |               |                              |                             |                             |               |
| Collector-emitter breakdown voltage<br>$I_C = 30\text{ mA}$ , $I_B = 0$                                                                                                                                                                                                                                         | $V_{(BR)CEO}$ | 20                           | -                           | -                           | V             |
| Collector-base breakdown voltage<br>$I_C = 10\text{ }\mu\text{A}$ , $I_E = 0$                                                                                                                                                                                                                                   | $V_{(BR)CBO}$ | 25                           | -                           | -                           |               |
| Emitter-base breakdown voltage<br>$I_E = 1\text{ }\mu\text{A}$ , $I_C = 0$                                                                                                                                                                                                                                      | $V_{(BR)EBO}$ | 5                            | -                           | -                           |               |
| Collector-base cutoff current<br>$V_{CB} = 25\text{ V}$ , $I_E = 0$<br>$V_{CB} = 25\text{ V}$ , $I_E = 0$ , $T_A = 150$                                                                                                                                                                                         | $I_{CBO}$     | -<br>-                       | -<br>-                      | 0.1<br>100                  | $\mu\text{A}$ |
| DC current gain <sup>1)</sup><br>$I_C = 5\text{ mA}$ , $V_{CE} = 10\text{ V}$<br>$I_C = 500\text{ mA}$ , $V_{CE} = 1\text{ V}$ , BCX69-10<br>$I_C = 500\text{ mA}$ , $V_{CE} = 1\text{ V}$ , BCX69-16<br>$I_C = 500\text{ mA}$ , $V_{CE} = 1\text{ V}$ , BCX69-25<br>$I_C = 1\text{ A}$ , $V_{CE} = 1\text{ V}$ | $h_{FE}$      | 50<br>85<br>100<br>160<br>60 | -<br>100<br>160<br>250<br>- | -<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>$I_C = 1\text{ A}$ , $V_{CE} = 1\text{ V}$                                                                                                                                                                                | $V_{BE(ON)}$  | -<br>-                       | 0.6<br>-                    | -<br>1                      |               |

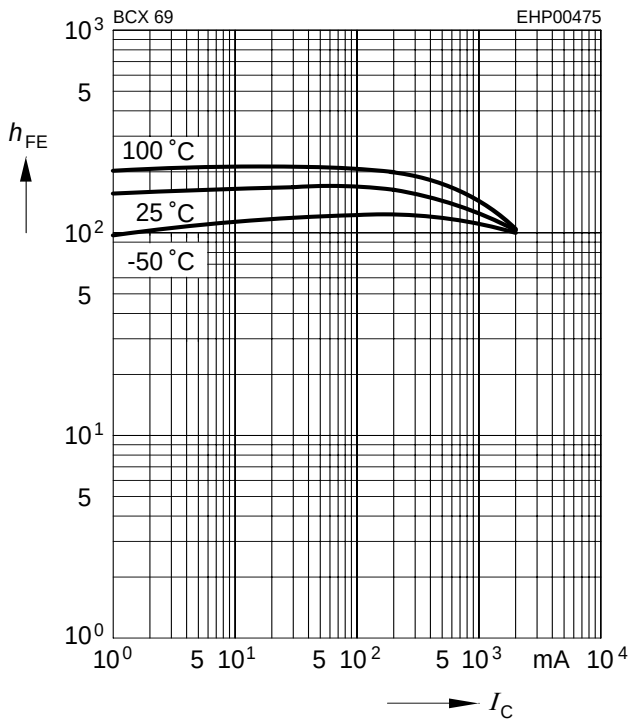
### AC Characteristics

|                                                                                             |       |   |     |   |     |
|---------------------------------------------------------------------------------------------|-------|---|-----|---|-----|
| Transition frequency<br>$I_C = 100\text{ mA}$ , $V_{CE} = 5\text{ V}$ , $f = 20\text{ MHz}$ | $f_T$ | - | 100 | - | MHz |
|---------------------------------------------------------------------------------------------|-------|---|-----|---|-----|

<sup>1)</sup>Pulse test:  $t < 300\mu\text{s}$ ;  $D < 2\%$

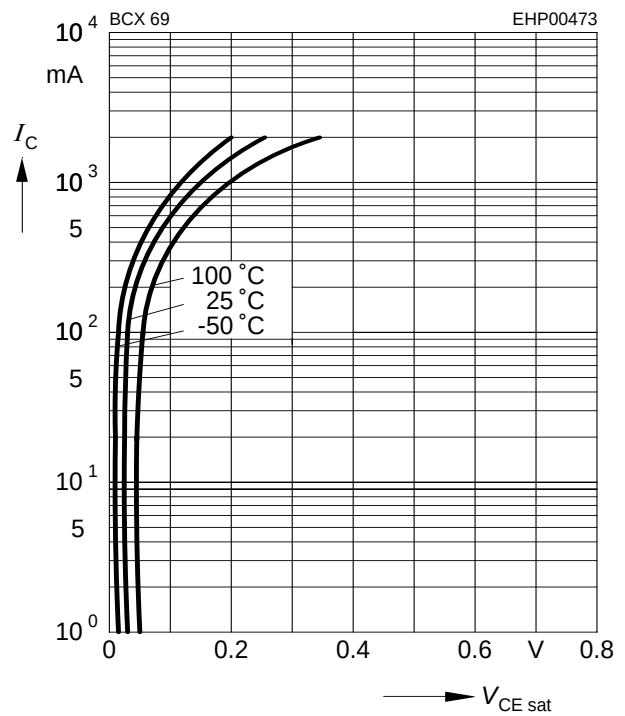
### DC current gain $h_{FE} = f(I_C)$

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



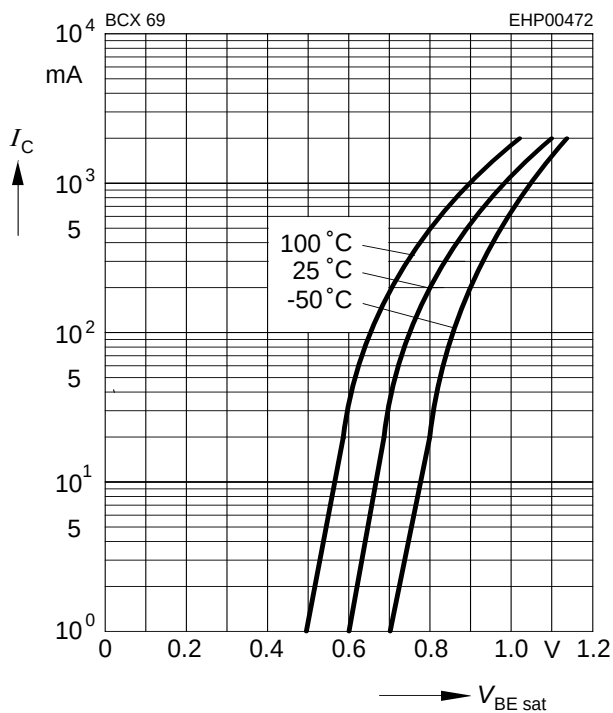
### Collector-emitter saturation voltage

$$I_C = f(V_{CEsat}), h_{FE} = 10$$



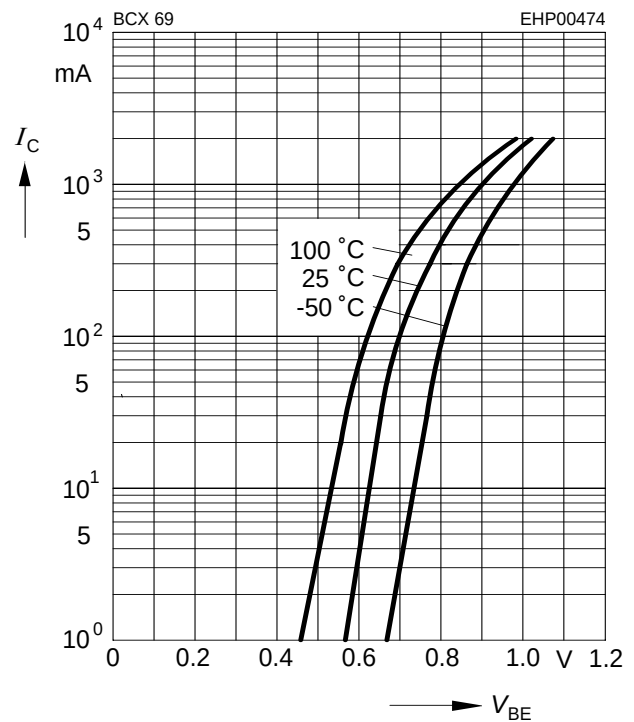
### Base-emitter saturation voltage

$$I_C = f(V_{BEsat}), h_{FE} = 10$$



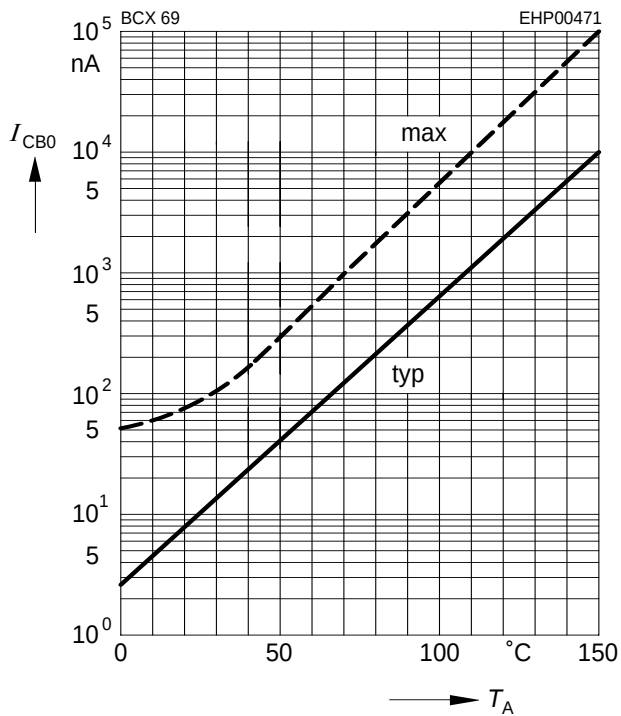
### Collector current $I_C = f(V_{BE})$

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



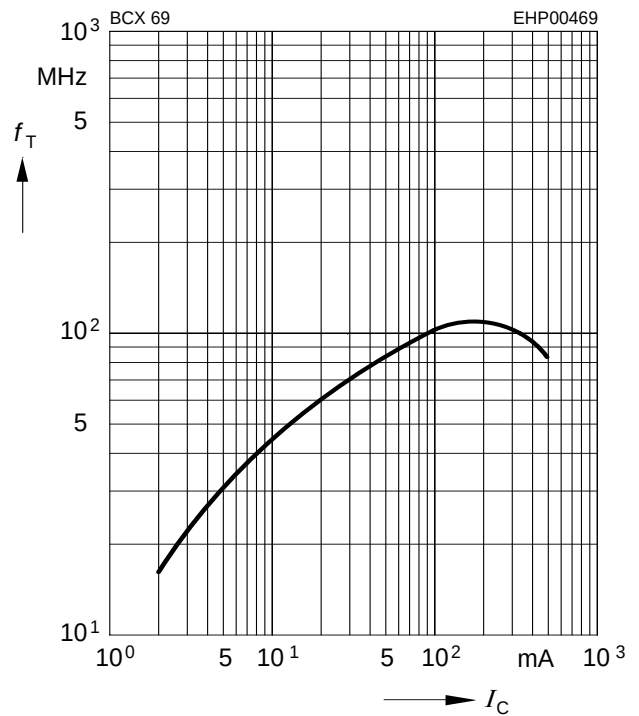
**Collector cutoff current**  $I_{CBO} = f(T_A)$

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

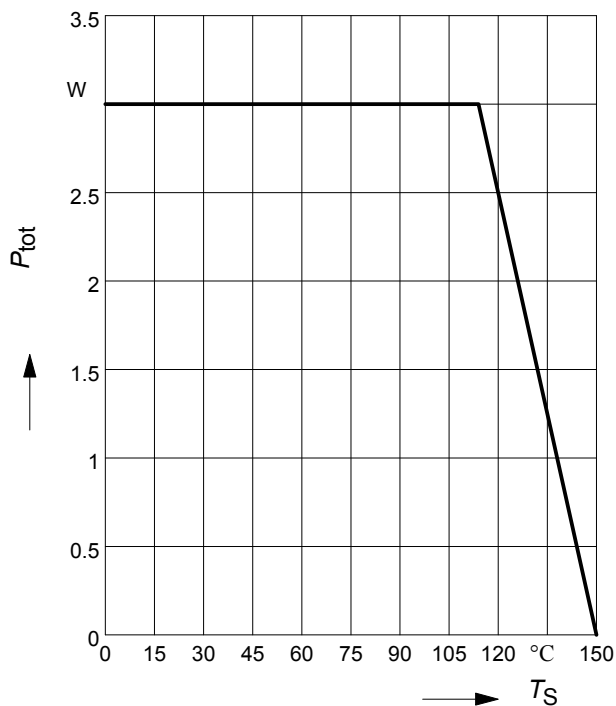


**Transition frequency**  $f_T = f(I_C)$

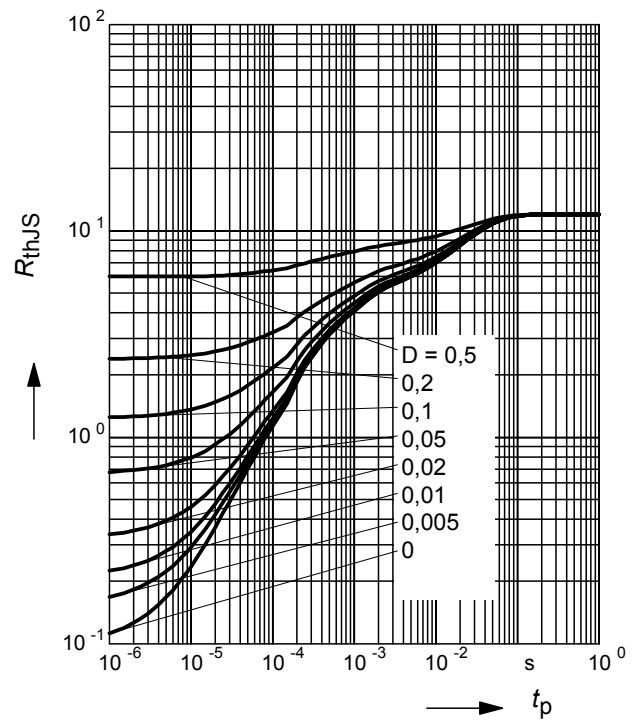
$V_{CE} = 5 \text{ V}$



**Total power dissipation**  $P_{tot} = f(T_S)$

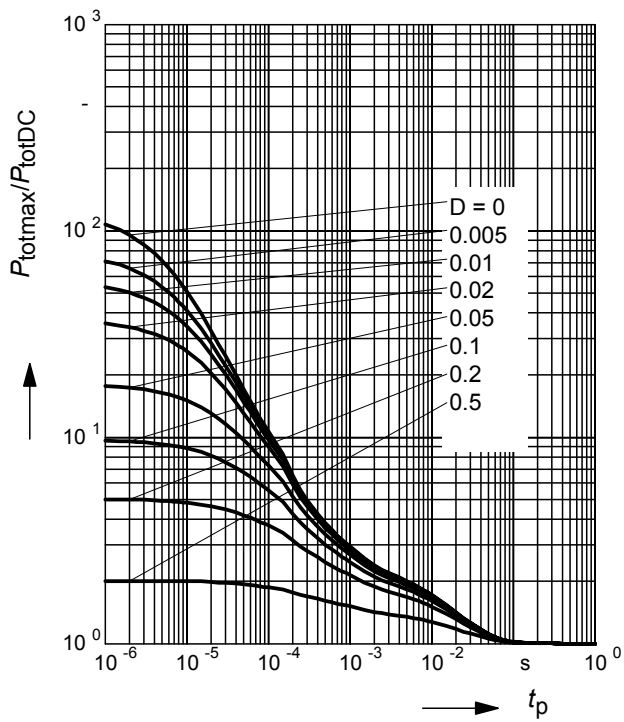


**Permissible Pulse Load**  $R_{thJS} = f(t_p)$

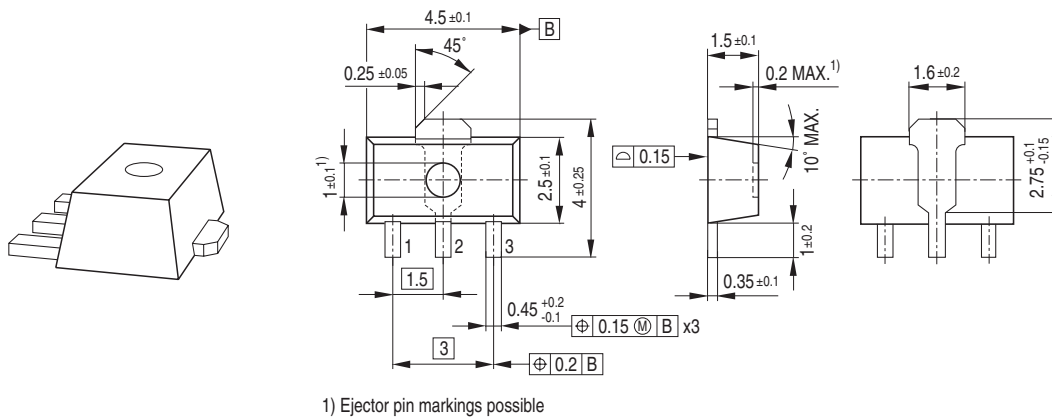


## Permissible Pulse Load

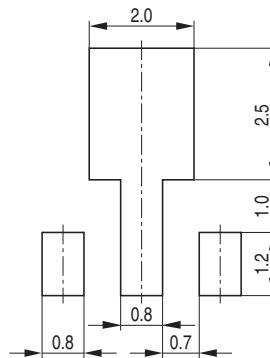
$$P_{\text{totmax}}/P_{\text{totDC}} = f(t_p)$$



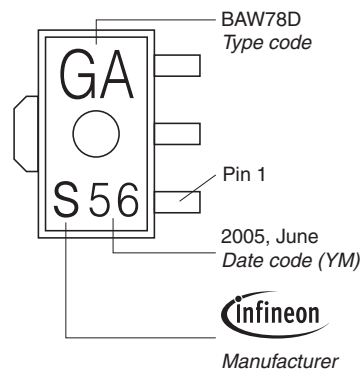
## Package Outline



## Foot Print

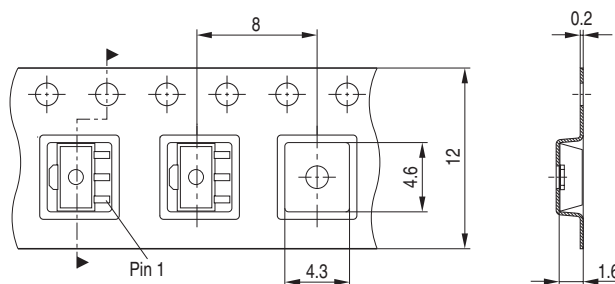


## Marking Layout (Example)



## Standard Packing

Reel ø180 mm = 1.000 Pieces/Reel  
Reel ø330 mm = 4.000 Pieces/Reel



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