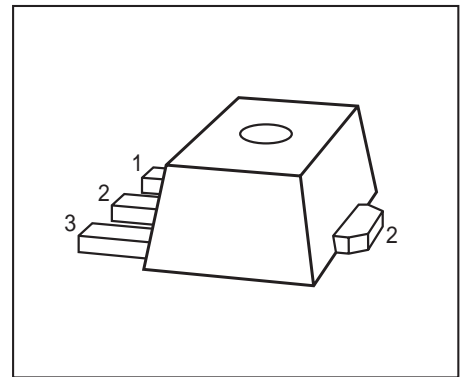


**NPN Silicon AF Transistors**

- For AF driver and output stages
- High collector current
- Low collector-emitter saturation voltage
- Complementary types: BCX51...BCX53 (PNP)
- Pb-free (RoHS compliant) package <sup>1)</sup>
- Qualified according AEC Q101



| Type     | Marking | Pin Configuration |     |     | Package |
|----------|---------|-------------------|-----|-----|---------|
|          |         | 1=B               | 2=C | 3=E |         |
| BCX54-16 | BD      | 1=B               | 2=C | 3=E | SOT89   |
| BCX55    | BE      | 1=B               | 2=C | 3=E | SOT89   |
| BCX55-16 | BM      | 1=B               | 2=C | 3=E | SOT89   |
| BCX56    | BH      | 1=B               | 2=C | 3=E | SOT89   |
| BCX56-10 | BK      | 1=B               | 2=C | 3=E | SOT89   |
| BCX56-16 | BL      | 1=B               | 2=C | 3=E | SOT89   |

<sup>1</sup>Pb-containing package may be available upon special request

**Maximum Ratings**

| Parameter  | Symbol    | Value       | Unit |
|--|-----------|-------------|------|
| Collector-emitter voltage                                | $V_{CEO}$ |             | -    |
| BCX54  |           | 45          |      |
| BCX55  |           | 60          |      |
| BCX56  |           | 80          |      |
| Collector-base voltage                                   | $V_{CBO}$ |             | V    |
| BCX54  |           | 45          |      |
| BCX55  |           | 60          |      |
| BCX56  |           | 100         |      |
| Emitter-base voltage                                     | $V_{EBO}$ | 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-<br>$T_S \leq 130^\circ\text{C}$ | $P_{tot}$ | 1           | W    |
| Junction temperature                                     | $T_j$     | 150         | °C   |
| Storage temperature                                      | $T_{stg}$ | -65 ... 150 |      |

**Thermal Resistance**

| Parameter                                | Symbol     | Value     | Unit |
|--|------------|-----------|------|
| Junction - soldering point <sup>1)</sup> | $R_{thJS}$ | $\leq 20$ | K/W  |

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

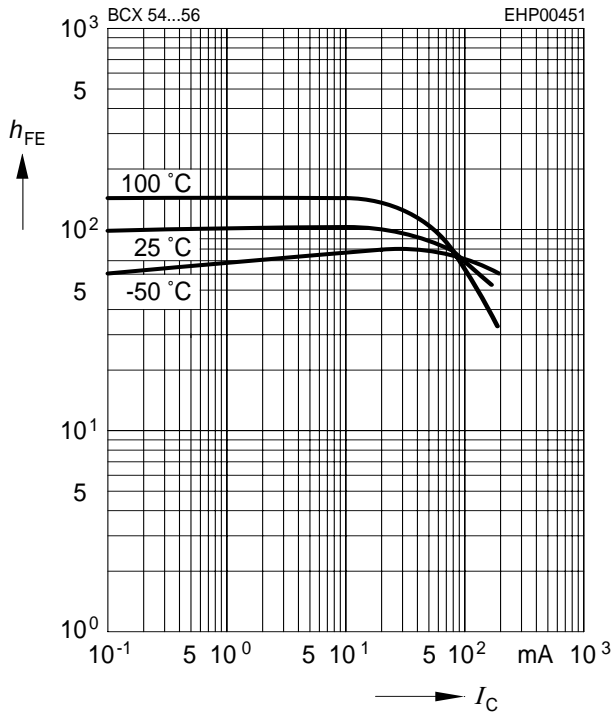
**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

| Parameter  | Symbol        | Values                      |                           |                             | Unit          |
|--|---------------|-----------------------------|---------------------------|-----------------------------|---------------|
|  |               | min.                        | typ.                      | max.                        |               |
| <b>DC Characteristics</b>  |               |                             |                           |                             |               |
| Collector-emitter breakdown voltage<br>$I_C = 10\text{ mA}$ , $I_B = 0$ , BCX54<br>$I_C = 10\text{ mA}$ , $I_B = 0$ , BCX55<br>$I_C = 10\text{ mA}$ , $I_B = 0$ , BCX56  | $V_{(BR)CEO}$ | 45<br>60<br>80              | -<br>-<br>-               | -<br>-<br>-                 | V             |
| Collector-base breakdown voltage<br>$I_C = 100\text{ }\mu\text{A}$ , $I_E = 0$ , BCX54<br>$I_C = 100\text{ }\mu\text{A}$ , $I_E = 0$ , BCX55<br>$I_C = 100\text{ }\mu\text{A}$ , $I_E = 0$ , BCX56   | $V_{(BR)CBO}$ | 45<br>60<br>100             | -<br>-<br>-               | -<br>-<br>-                 |               |
| Emitter-base breakdown voltage<br>$I_E = 10\text{ }\mu\text{A}$ , $I_C = 0$  | $V_{(BR)EBO}$ | 5                           | -                         | -                           |               |
| Collector-base cutoff current<br>$V_{CB} = 30\text{ V}$ , $I_E = 0$<br>$V_{CB} = 30\text{ V}$ , $I_E = 0$ , $T_A = 150^\circ\text{C}$  | $I_{CBO}$     | -<br>-                      | -<br>-                    | 0.1<br>20                   | $\mu\text{A}$ |
| DC current gain <sup>1)</sup><br>$I_C = 5\text{ mA}$ , $V_{CE} = 2\text{ V}$<br>$I_C = 150\text{ mA}$ , $V_{CE} = 2\text{ V}$ , BCX55/BCX56<br>$I_C = 150\text{ mA}$ , $V_{CE} = 2\text{ V}$ , BCX55-10/BCX56-10<br>$I_C = 150\text{ mA}$ , $V_{CE} = 2\text{ V}$ , BCX54-16...BCX56-16<br>$I_C = 500\text{ mA}$ , $V_{CE} = 2\text{ V}$ | $h_{FE}$      | 25<br>40<br>63<br>100<br>25 | -<br>-<br>100<br>160<br>- | -<br>250<br>160<br>250<br>- | -             |
| Collector-emitter saturation voltage <sup>1)</sup><br>$I_C = 500\text{ mA}$ , $I_B = 50\text{ mA}$   | $V_{CEsat}$   | -                           | -                         | 0.5                         | V             |
| Base-emitter voltage-<br>$I_C = 500\text{ mA}$ , $V_{CE} = 2\text{ V}$   | $V_{BE(ON)}$  | -                           | -                         | 1                           |               |
| <b>AC Characteristics</b>  |               |                             |                           |                             |               |
| Transition frequency<br>$I_C = 50\text{ mA}$ , $V_{CE} = 10\text{ V}$ , $f = 20\text{ MHz}$  | $f_T$         | -                           | 100                       | -                           | MHz           |

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

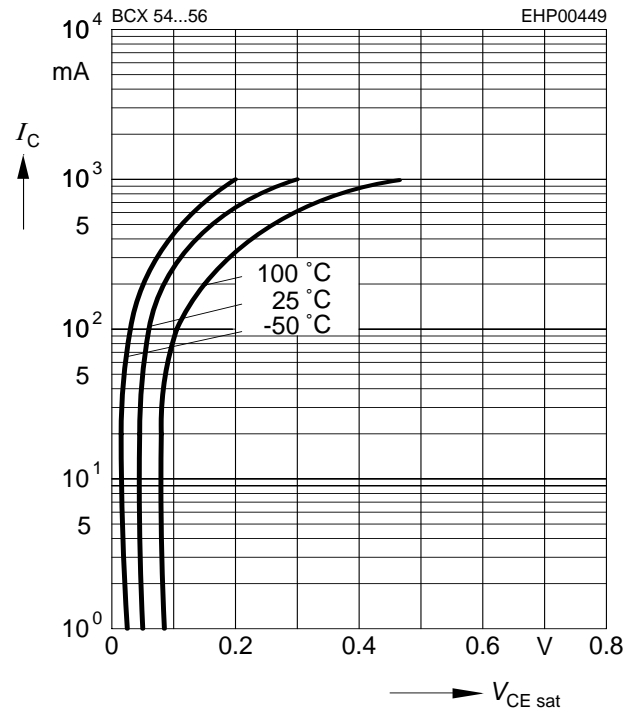
**DC current gain  $h_{FE} = f(I_C)$**

$V_{CE} = 2\text{ V}$



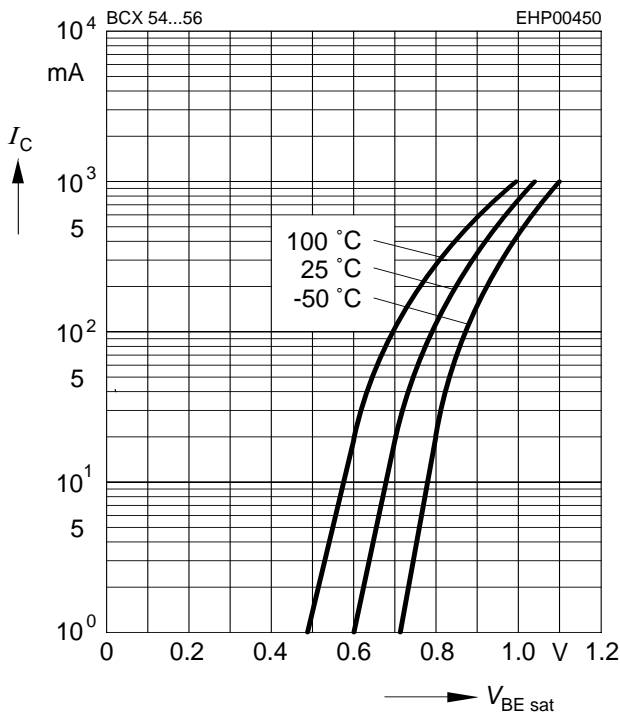
**Collector-emitter saturation voltage**

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



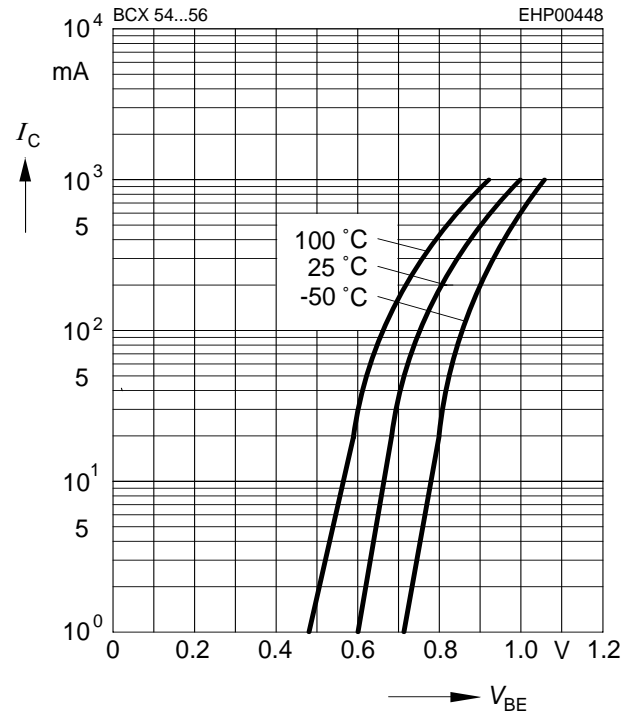
**Base-emitter saturation voltage**

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



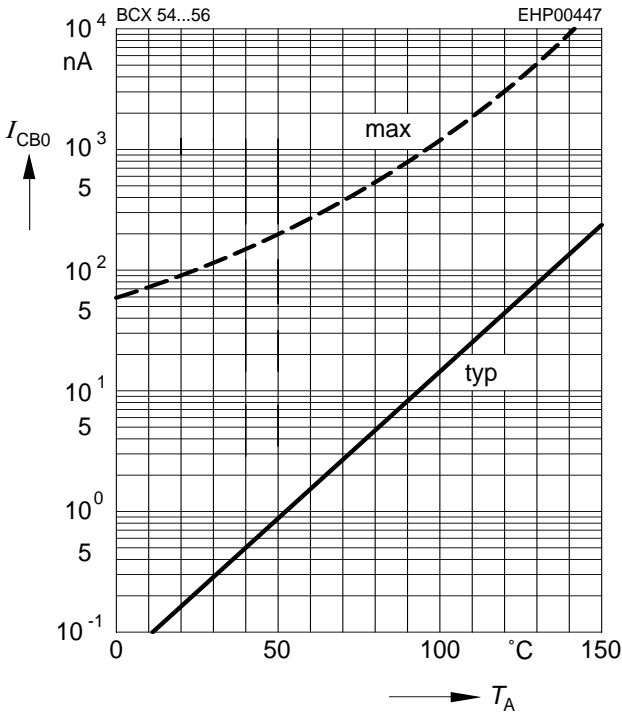
**Collector current  $I_C = f(V_{BE})$**

$V_{CE} = 2\text{ V}$



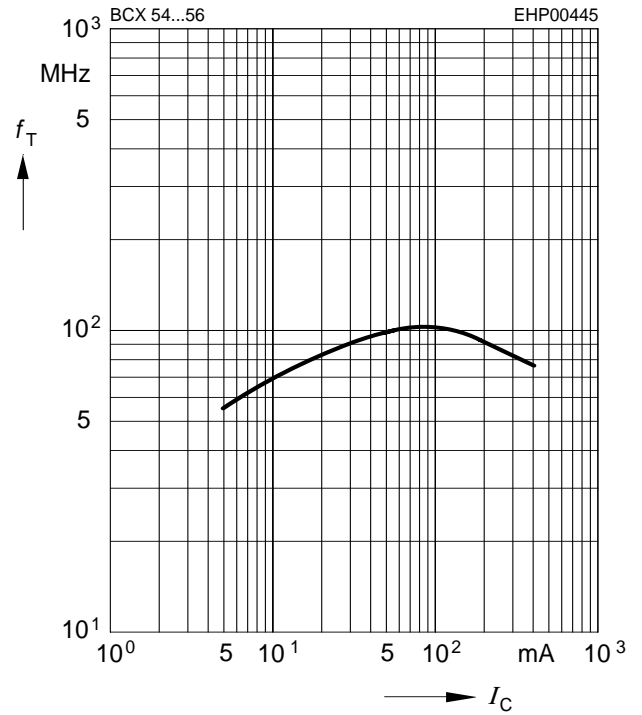
**Collector cutoff current  $I_{CBO} = f(T_A)$**

$V_{CBO} = 30\text{ V}$

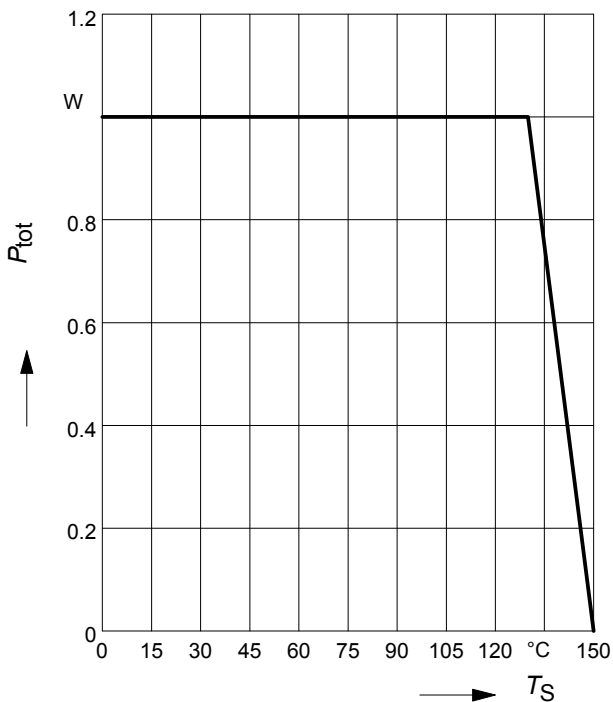


**Transition frequency  $f_T = f(I_C)$**

$V_{CE} = \text{parameter in V, } f = 2\text{ GHz}$

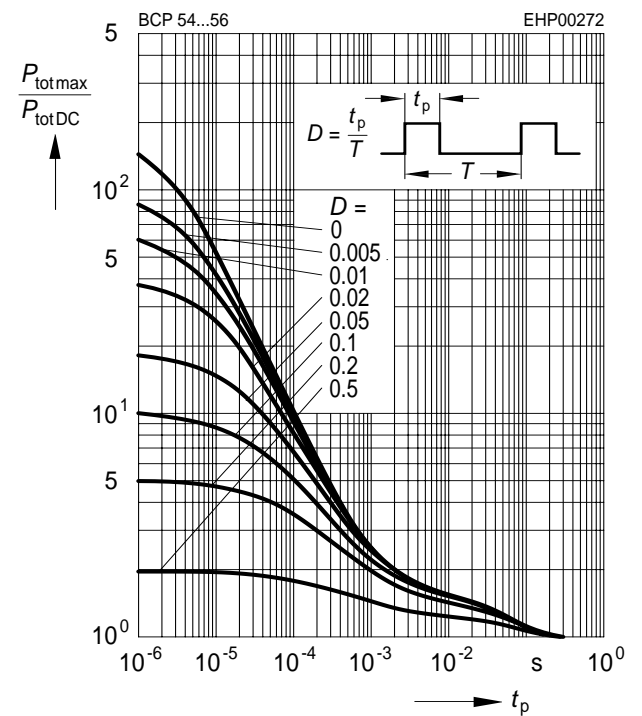


**Total power dissipation  $P_{tot} = f(T_S)$**

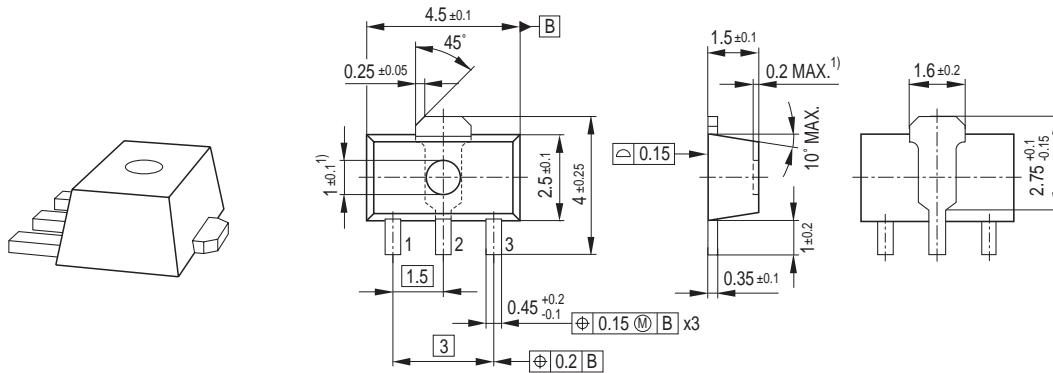


**Permissible Pulse Load**

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

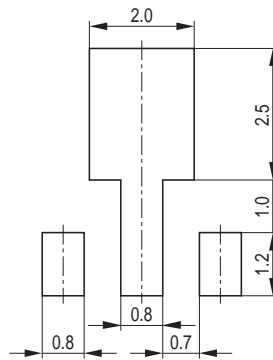


Package Outline

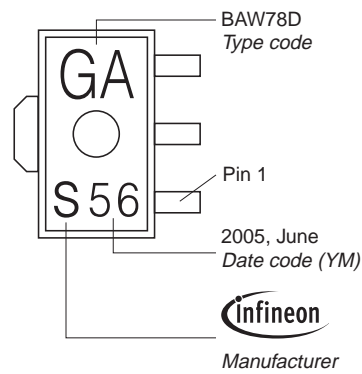


1) Ejector pin markings possible

Foot Print

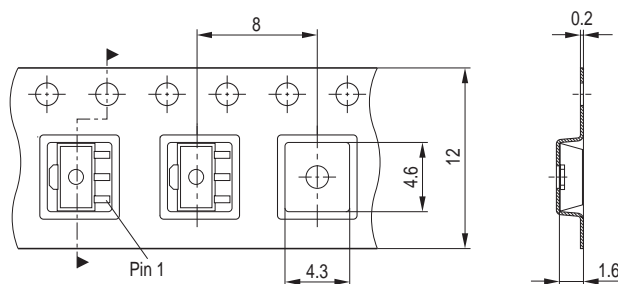


Marking Layout (Example)



Standard Packing

Reel  $\varnothing$ 180 mm = 1.000 Pieces/Reel  
 Reel  $\varnothing$ 330 mm = 4.000 Pieces/Reel



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