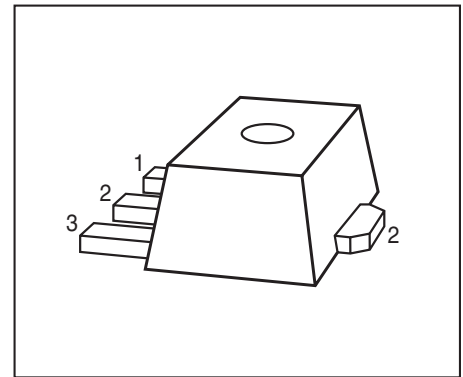


## PNP Silicon Darlington Transistors

- For general AF applications
- High collector current
- High current gain
- Complementary types: BCV29, BCV49 (NPN)
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101



| Type  | Marking | Pin Configuration |     |     | Package |
|-------|---------|-------------------|-----|-----|---------|
|       |         | 1=B               | 2=C | 3=E |         |
| BCV28 | ED      | 1=B               | 2=C | 3=E | SOT89   |
| BCV48 | EE      | 1=B               | 2=C | 3=E | SOT89   |

### Maximum Ratings

| Parameter                                     | Symbol    | Value       | Unit |
|---|-----------|-------------|------|
| Collector-emitter voltage                     | $V_{CEO}$ |             | V    |
| BCV28   |           | 30          |      |
| BCV48   |           | 60          |      |
| Collector-base voltage                        | $V_{CBO}$ |             |      |
| BCV28   |           | 40          |      |
| BCV48   |           | 80          |      |
| Emitter-base voltage                          | $V_{EBO}$ | 10          |      |
| Collector current                             | $I_C$     | 500         | mA   |
| Peak collector current, $t_p \leq 10$ ms      | $I_{CM}$  | 800         |      |
| Base current                                  | $I_B$     | 100         |      |
| Peak base current                             | $I_{BM}$  | 200         |      |
| Total power dissipation-<br>$T_S \leq 130$ °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 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**

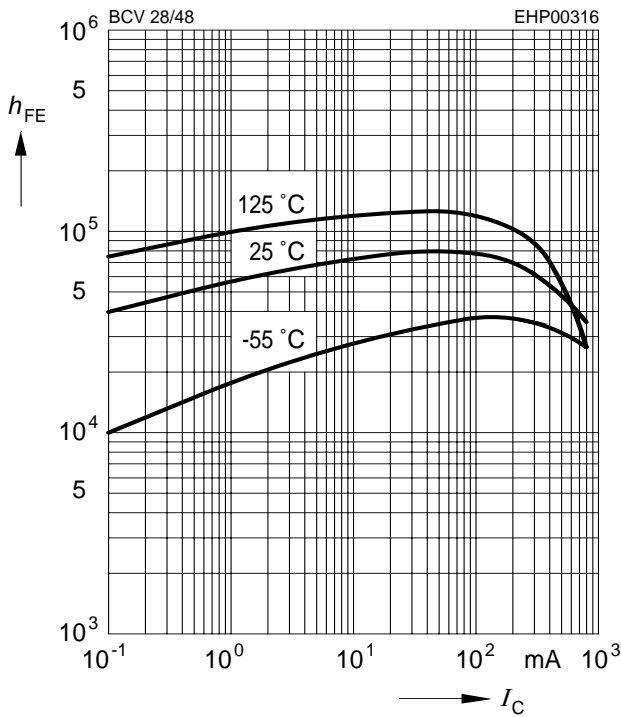
|   |               |   |                                      |                                      |               |
|---|---------------|---|--------------------------------------|--------------------------------------|---------------|
| Collector-emitter breakdown voltage<br>$I_C = 10\text{ mA}$ , $I_B = 0$ , BCV28<br>$I_C = 10\text{ mA}$ , $I_B = 0$ , BCV48   | $V_{(BR)CEO}$ | 30<br>60  | -<br>-                               | -<br>-                               | V             |
| Collector-base breakdown voltage<br>$I_C = 100\text{ }\mu\text{A}$ , $I_E = 0$ , BCV28<br>$I_C = 100\text{ }\mu\text{A}$ , $I_E = 0$ , BCV48  | $V_{(BR)CBO}$ | 40<br>80  | -<br>-                               | -<br>-                               |               |
| Emitter-base breakdown voltage<br>$I_E = 10\text{ }\mu\text{A}$ , $I_C = 0$   | $V_{(BR)EBO}$ | 10  | -                                    | -                                    |               |
| Collector-base cutoff current<br>$V_{CB} = 30\text{ V}$ , $I_E = 0$ , BCV28<br>$V_{CB} = 60\text{ V}$ , $I_E = 0$ , BCV48<br>$V_{CB} = 30\text{ V}$ , $I_E = 0$ , $T_A \leq 150^\circ\text{C}$ , BCV28<br>$V_{CB} = 60\text{ V}$ , $I_E = 0$ , $T_A \leq 150^\circ\text{C}$ , BCV48   | $I_{CBO}$     | -<br>-<br>-<br>-  | -<br>-<br>-<br>-                     | 0.1<br>0.1<br>10<br>10               | $\mu\text{A}$ |
| Emitter-base cutoff current<br>$V_{EB} = 4\text{ V}$ , $I_C = 0$  | $I_{EBO}$     | -   | -                                    | 100                                  | nA            |
| DC current gain <sup>1)</sup><br>$I_C = 10\text{ }\mu\text{A}$ , $V_{CE} = 1\text{ V}$ , BCV28<br>$I_C = 10\text{ }\mu\text{A}$ , $V_{CE} = 1\text{ V}$ , BCV48<br>$I_C = 10\text{ mA}$ , $V_{CE} = 5\text{ V}$ , BCV28<br>$I_C = 10\text{ mA}$ , $V_{CE} = 5\text{ V}$ , BCV48<br>$I_C = 100\text{ mA}$ , $V_{CE} = 5\text{ V}$ , BCV28<br>$I_C = 100\text{ mA}$ , $V_{CE} = 5\text{ V}$ , BCV48<br>$I_C = 0.5\text{ A}$ , $V_{CE} = 5\text{ V}$ , BCV28<br>$I_C = 0.5\text{ A}$ , $V_{CE} = 5\text{ V}$ , BCV48 | $h_{FE}$      | 4000<br>2000<br>10000<br>4000<br>20000<br>10000<br>4000<br>2000 | -<br>-<br>-<br>-<br>-<br>-<br>-<br>- | -<br>-<br>-<br>-<br>-<br>-<br>-<br>- | -             |
| Collector-emitter saturation voltage <sup>1)</sup><br>$I_C = 100\text{ mA}$ , $I_B = 0.1\text{ mA}$   | $V_{CEsat}$   | -   | -                                    | 1                                    | V             |
| Base emitter saturation voltage <sup>1)</sup><br>$I_C = 100\text{ mA}$ , $I_B = 0.1\text{ mA}$  | $V_{BEsat}$   | -   | -                                    | 1.5                                  |               |

<sup>1</sup>Pulse test:  $t < 300\mu\text{s}$ ;  $D < 2\%$ 
**Electrical Characteristics** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

| Parameter   | Symbol   | Values |      |      | Unit |
|---|----------|--------|------|------|------|
|   |          | min.   | typ. | max. |      |
| <b>AC Characteristics</b>   |          |        |      |      |      |
| Transition frequency<br>$I_C = 50\text{ mA}$ , $V_{CE} = 5\text{ V}$ , $f = 100\text{ MHz}$ | $f_T$    | -      | 200  | -    | MHz  |
| Collector-base capacitance<br>$V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$                   | $C_{cb}$ | -      | 4.5  | -    | pF   |

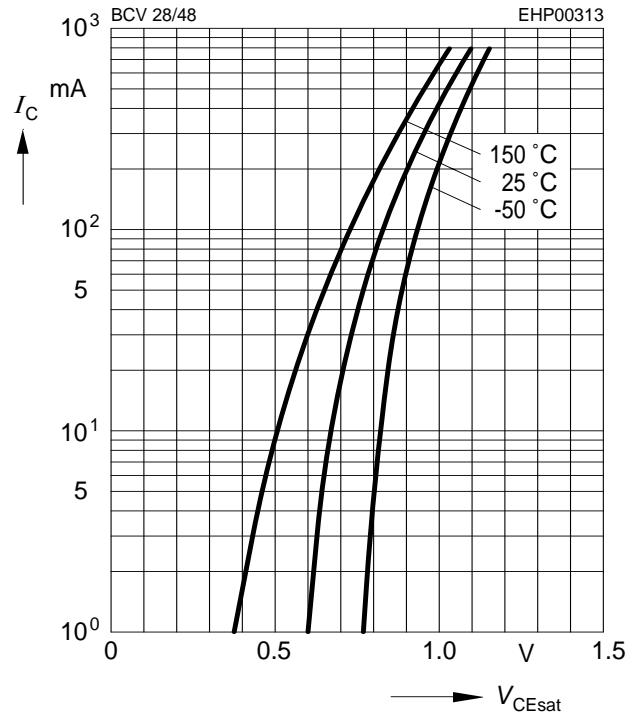
**DC current gain  $h_{FE} = f(I_C)$**

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



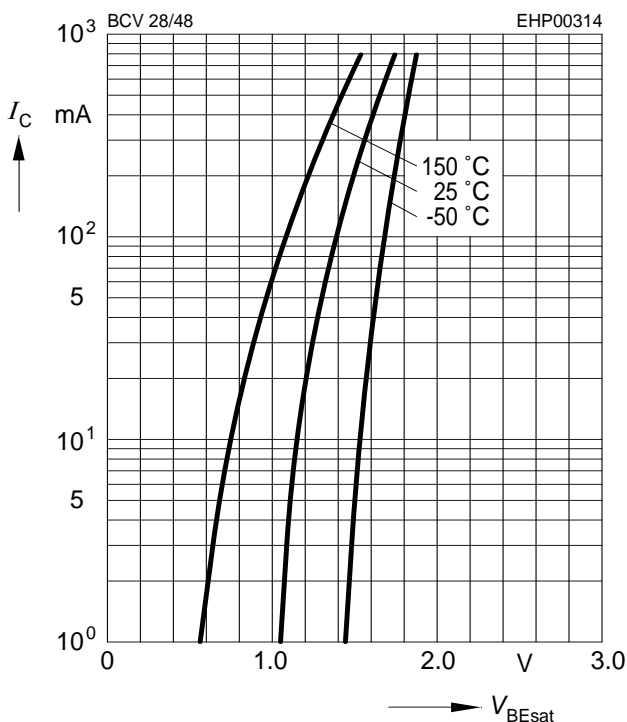
**Collector-emitter saturation voltage**

$I_C = f(V_{CEsat}), h_{FE} = 1000$



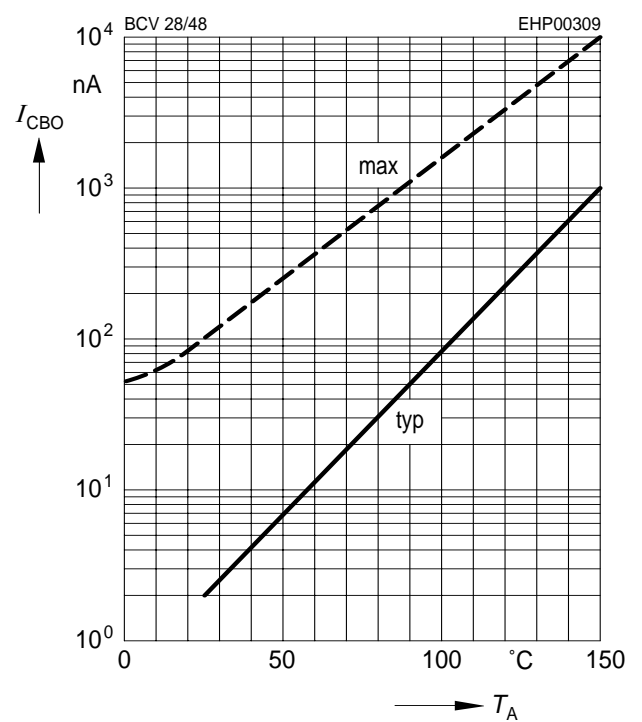
**Base-emitter saturation voltage**

$I_C = f(V_{BEsat}), h_{FE} = 1000$



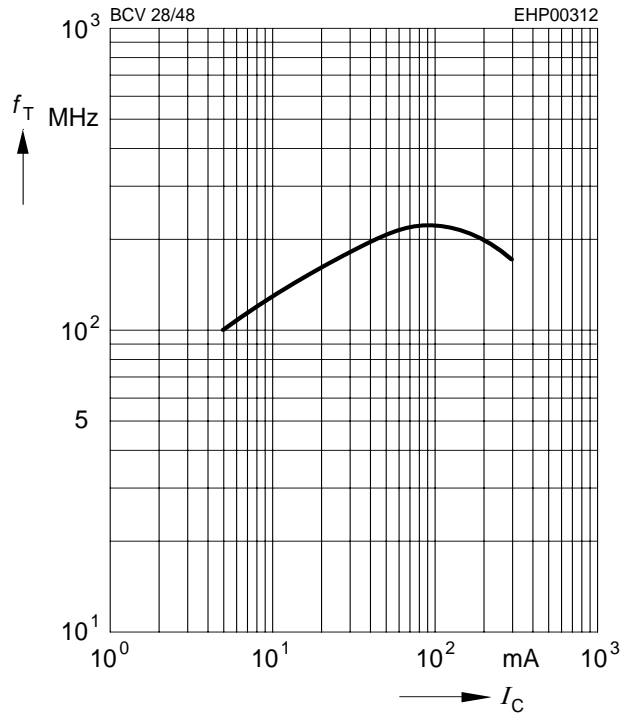
**Collector cutoff current  $I_{CBO} = f(T_A)$**

$V_{CB} = V_{CEmax}$



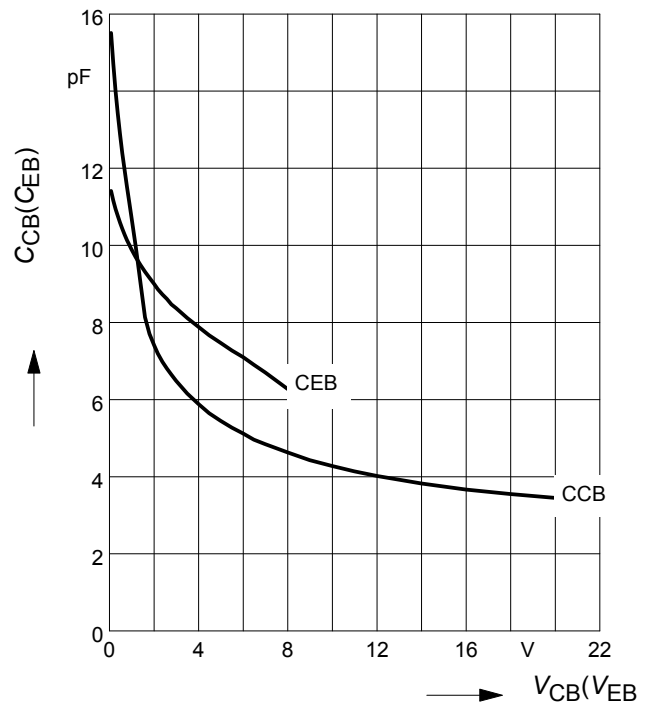
Transition frequency  $f_T = f(I_C)$

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

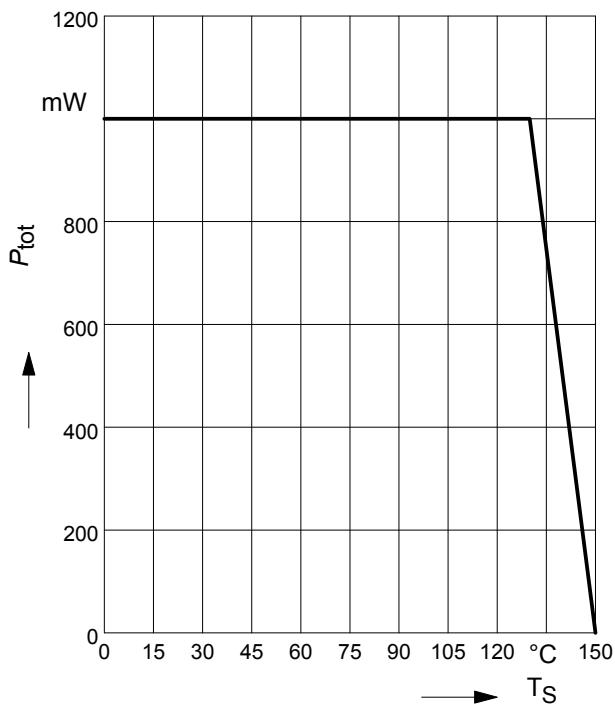


Collector-base capacitance  $C_{cb} = f(V_{CB})$

Emitter-base capacitance  $C_{eb} = f(V_{EB})$

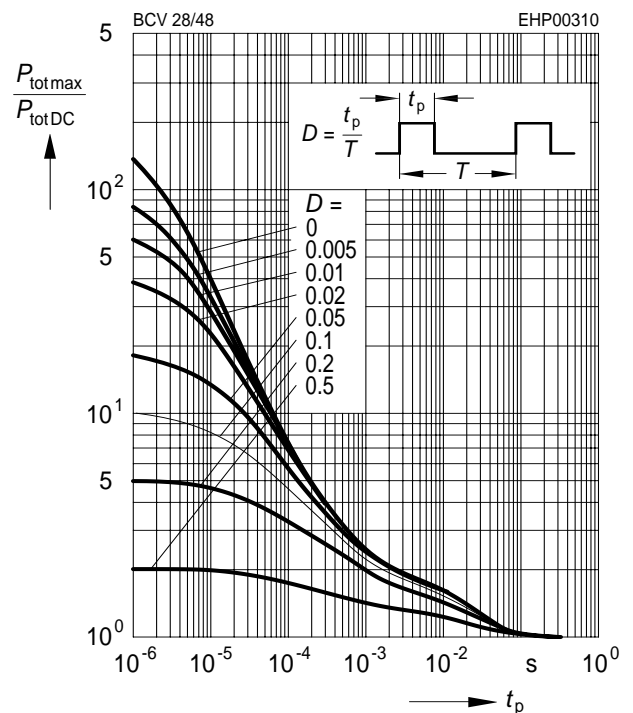


Total power dissipation  $P_{tot} = f(T_S)$

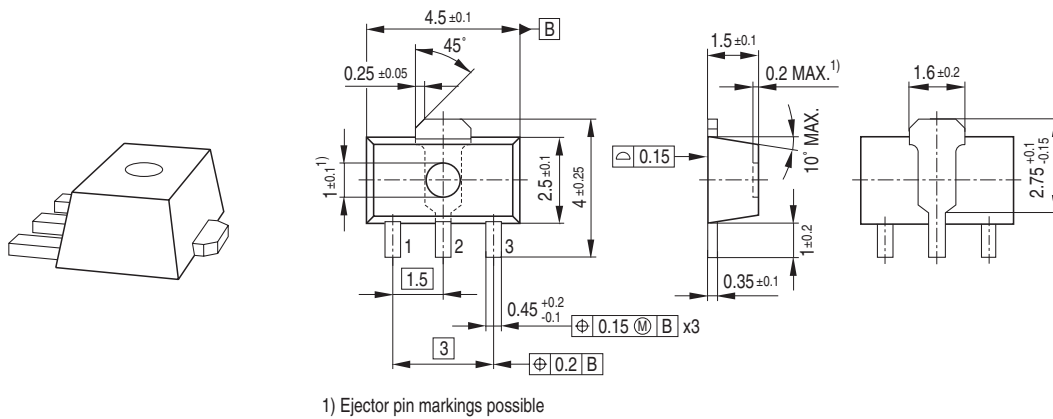


Permissible Pulse Load

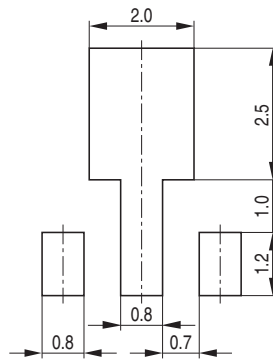
$P_{totmax}/P_{totDC} = f(t_p)$



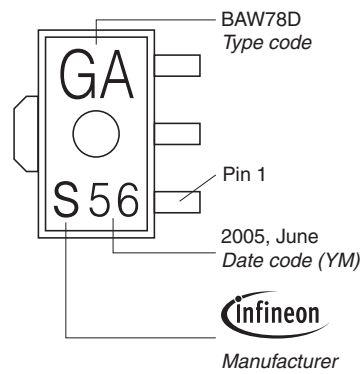
Package Outline



Foot Print

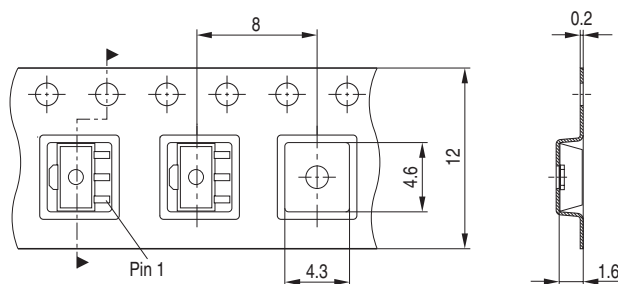


Marking Layout (Example)



Standard Packing

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



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