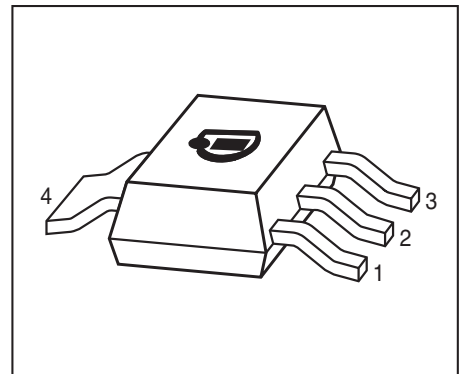


**PNP Silicon AF Power Transistors**

- For AF driver and output stages
- High collector current
- High current gain
- Low collector-emitter saturation voltage
- Complementary types: BDP947, BDP949  
BDP953 (NPN)
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101



| Type   | Marking | Pin Configuration |     |     |     |   |   | Package |
|--------|---------|-------------------|-----|-----|-----|---|---|---------|
|        |         | 1=B               | 2=C | 3=E | 4=C | - | - |         |
| BDP948 | BDP948  | 1=B               | 2=C | 3=E | 4=C | - | - | SOT223  |
| BDP950 | BDP950  | 1=B               | 2=C | 3=E | 4=C | - | - | SOT223  |
| BDP954 | BCP954  | 1=B               | 2=C | 3=E | 4=C | - | - | SOT223  |

**Maximum Ratings**

| Parameter                                     | Symbol    | Value       | Unit |
|---|-----------|-------------|------|
| Collector-emitter voltage                     | $V_{CEO}$ |             | V    |
| BDP948  |           | 45          |      |
| BDP950  |           | 60          |      |
| BDP954  |           | 100         |      |
| Collector-base voltage                        | $V_{CBO}$ |             |      |
| BDP948  |           | 45          |      |
| BDP950  |           | 60          |      |
| BDP954  |           | 120         |      |
| Emitter-base voltage                          | $V_{EBO}$ | 5           |      |
| Collector current                             | $I_C$     | 3           | A    |
| Peak collector current, $t_p \leq 10$ ms      | $I_{CM}$  | 5           |      |
| Base current                                  | $I_B$     | 200         | mA   |
| Peak base current                             | $I_{BM}$  | 500         |      |
| Total power dissipation-<br>$T_S \leq 100$ °C | $P_{tot}$ | 5           | 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> | $R_{thJS}$ | $\leq 10$ | K/W  |

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

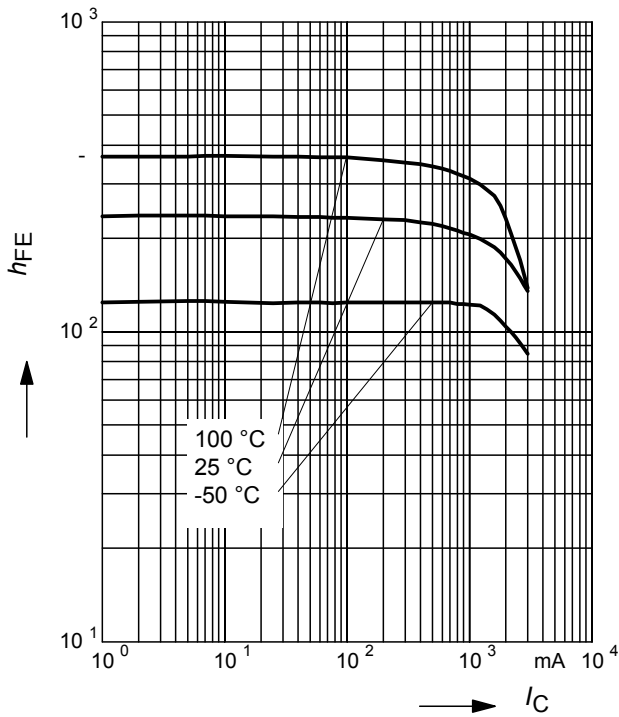
**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

| Parameter   | Symbol        | Values               |                  |                    | Unit          |
|---|---------------|----------------------|------------------|--------------------|---------------|
|   |               | min.                 | typ.             | max.               |               |
| <b>DC Characteristics</b>   |               |                      |                  |                    |               |
| Collector-emitter breakdown voltage<br>$I_C = 10\text{ mA}$ , $I_B = 0$ , BDP948<br>$I_C = 10\text{ mA}$ , $I_B = 0$ , BDP950<br>$I_C = 10\text{ mA}$ , $I_B = 0$ , BDP954  | $V_{(BR)CEO}$ | 45<br>60<br>100      | -<br>-<br>-      | -<br>-<br>-        | V             |
| Collector-base breakdown voltage<br>$I_C = 100\text{ }\mu\text{A}$ , $I_E = 0$ , BDP948<br>$I_C = 100\text{ }\mu\text{A}$ , $I_E = 0$ , BDP950<br>$I_C = 100\text{ }\mu\text{A}$ , $I_E = 0$ , BDP954   | $V_{(BR)CBO}$ | 45<br>60<br>120      | -<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>$V_{CB} = 45\text{ V}$ , $I_E = 0$<br>$V_{CB} = 45\text{ V}$ , $I_E = 0$ , $T_A = 150^\circ\text{C}$   | $I_{CBO}$     | -<br>-               | -<br>-           | 0.1<br>20          | $\mu\text{A}$ |
| Emitter-base cutoff current<br>$V_{EB} = 4\text{ V}$ , $I_C = 0$  | $I_{EBO}$     | -                    | -                | 100                | nA            |
| DC current gain <sup>1)</sup><br>$I_C = 10\text{ mA}$ , $V_{CE} = 5\text{ V}$<br>$I_C = 500\text{ mA}$ , $V_{CE} = 1\text{ V}$<br>$I_C = 1\text{ A}$ , $V_{CE} = 2\text{ V}$ BDP948, BDP950<br>BDP954<br>$I_C = 1\text{ A}$ , $V_{CE} = 2\text{ V}$ | $h_{FE}$      | 25<br>85<br>50<br>15 | -<br>-<br>-<br>- | -<br>475<br>-<br>- | -             |
| Collector-emitter saturation voltage <sup>1)</sup><br>$I_C = 2\text{ A}$ , $I_B = 0.2\text{ A}$   | $V_{CEsat}$   | -                    | -                | 0.5                | V             |
| Base emitter saturation voltage <sup>1)</sup><br>$I_C = 2\text{ A}$ , $I_B = 0.2\text{ A}$  | $V_{BEsat}$   | -                    | -                | 1.3                |               |
| <b>AC Characteristics</b>   |               |                      |                  |                    |               |
| Transition frequency<br>$I_C = 50\text{ mA}$ , $V_{CE} = 10\text{ V}$ , $f = 100\text{ MHz}$  | $f_T$         | -                    | 100              | -                  | MHz           |
| Collector-base capacitance<br>$V_{CB} = 10\text{ V}$ , $f = 100\text{ MHz}$   | $C_{cb}$      | -                    | 40               | -                  | pF            |

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

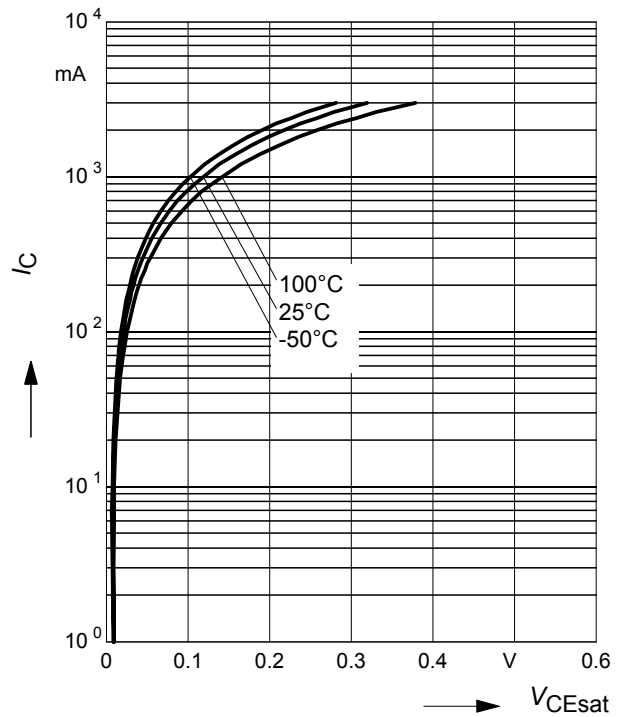
**DC current gain  $h_{FE} = f(I_C)$**

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



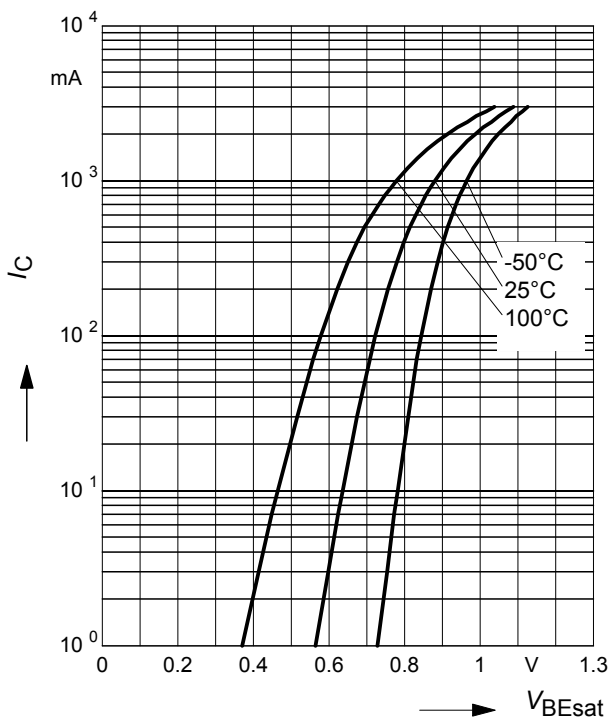
**Collector-emitter saturation voltage**

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



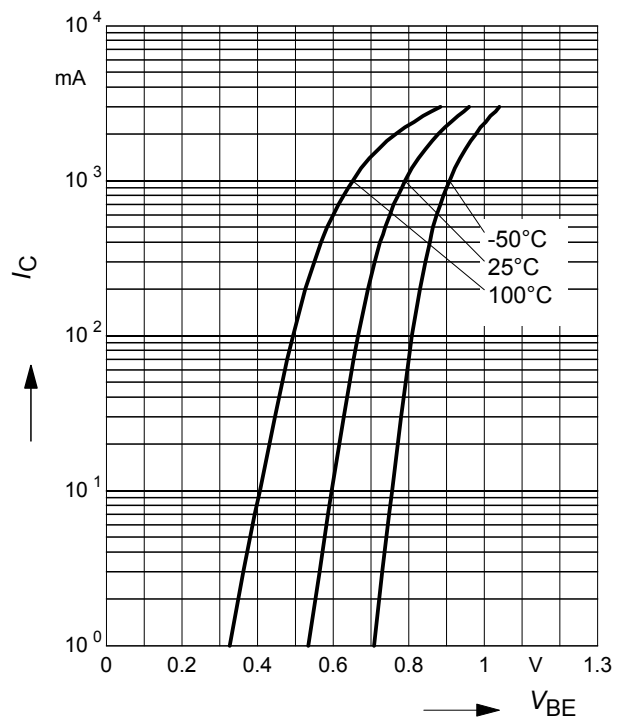
**Base-emitter saturation voltage**

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



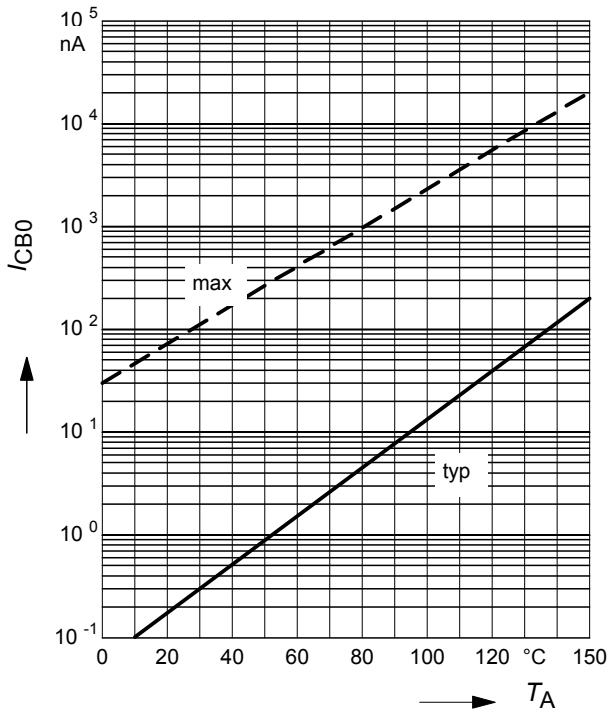
**Collector current  $I_C = f(V_{BE})$**

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



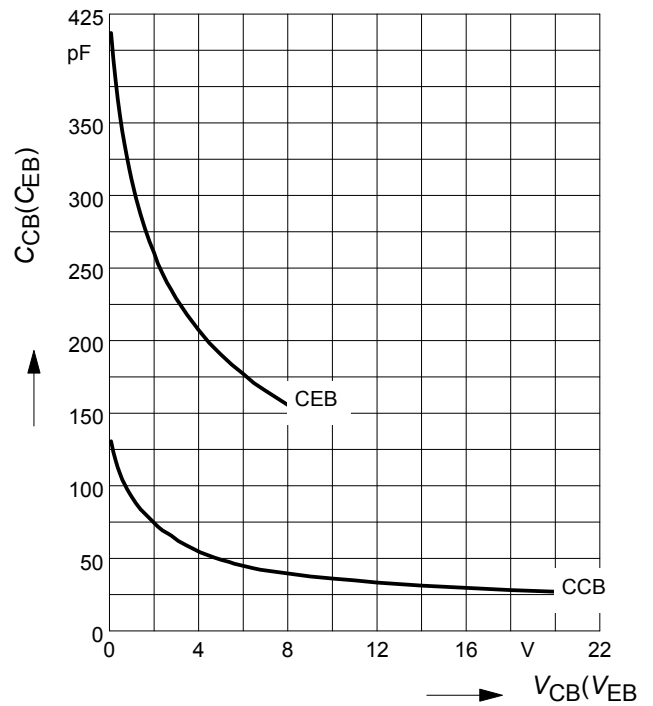
Collector cutoff current  $I_{CBO} = f(T_A)$

$V_{CB} = 45\text{ V}$

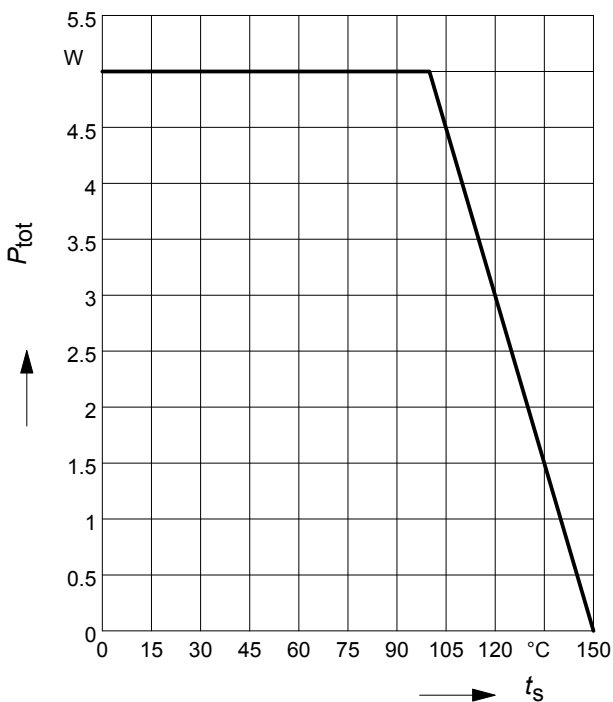


Collector-base capacitance  $C_{cb} = f(V_{CB})$

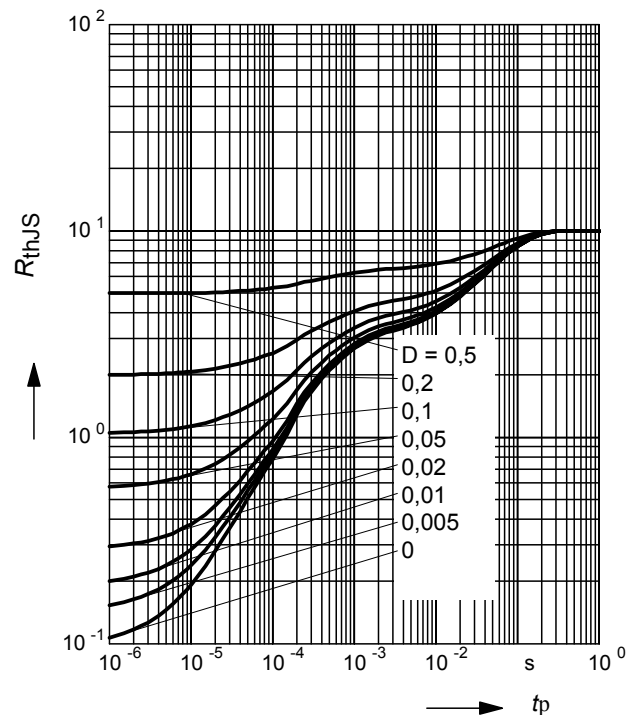
Emitter-base capacitance  $C_{eb} = f(V_{EB})$



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



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

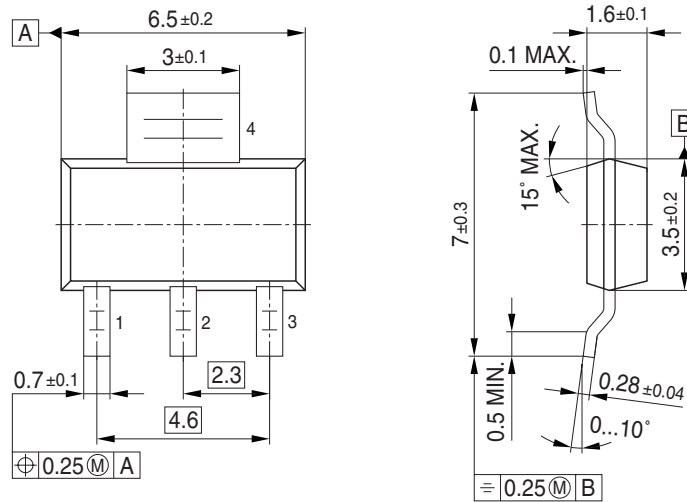


**Permissible Pulse Load**

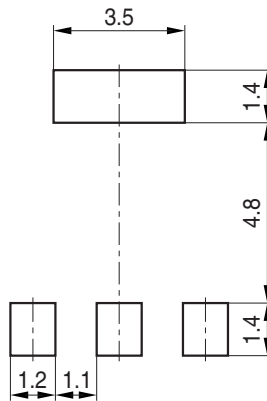
$$P_{\text{totmax}}/P_{\text{totDC}} = f(t_p)$$



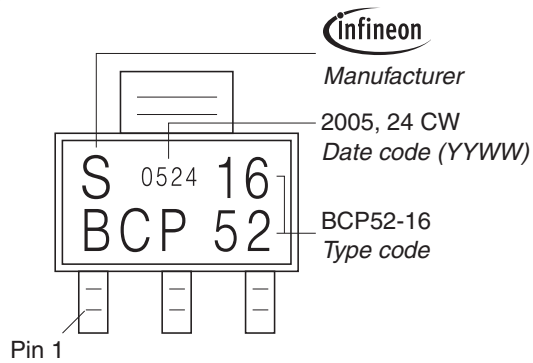
### Package Outline



### Foot Print

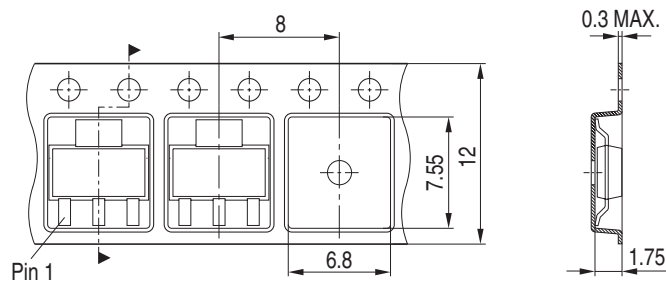


### Marking Layout (Example)



### Packing

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



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