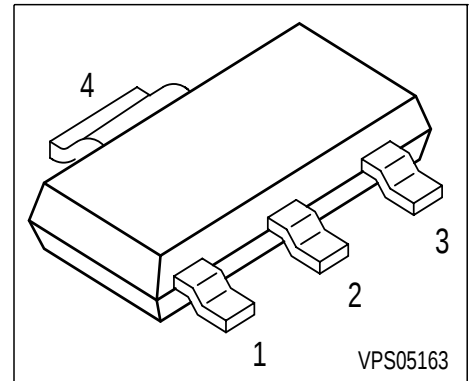


**NPN Silicon AF Power Transistor**

- For AF driver and output stages
- High collector current
- High current gain
- Low collector-emitter saturation voltage
- Complementary types: BDP952 ... BDP956 (PNP)



| Type   | Marking | Pin Configuration |       |       |       | Package |
|--------|---------|-------------------|-------|-------|-------|---------|
| BDP951 | BDP 951 | 1 = B             | 2 = C | 3 = E | 4 = C | SOT223  |
| BDP953 | BDP 953 | 1 = B             | 2 = C | 3 = E | 4 = C | SOT223  |
| BDP955 | PDP 955 | 1 = B             | 2 = C | 3 = E | 4 = C | SOT223  |

**Maximum Ratings**

| Parameter                                     | Symbol    | BDP 951     | BDP 953 | BDP 955 | Unit |
|-----------------------------------------------|-----------|-------------|---------|---------|------|
| Collector-emitter voltage                     | $V_{CEO}$ | 80          | 100     | 120     | V    |
| Collector-base voltage                        | $V_{CBO}$ | 100         | 120     | 140     |      |
| Emitter-base voltage                          | $V_{EBO}$ | 5           | 5       | 5       |      |
| DC collector current                          | $I_C$     | 3           |         |         | A    |
| Peak collector current                        | $I_{CM}$  | 5           |         |         |      |
| Base current                                  | $I_B$     | 200         |         |         | mA   |
| Peak base current                             | $I_{BM}$  | 500         |         |         |      |
| Total power dissipation, $T_S = 99\text{ °C}$ | $P_{tot}$ | 3           |         |         | W    |
| Junction temperature                          | $T_j$     | 150         |         |         | °C   |
| Storage temperature                           | $T_{sta}$ | -65 ... 150 |         |         |      |

**Thermal Resistance**

|                                          |            |     |     |
|------------------------------------------|------------|-----|-----|
| Junction - soldering point <sup>1)</sup> | $R_{thJS}$ | ≤17 | K/W |
|------------------------------------------|------------|-----|-----|

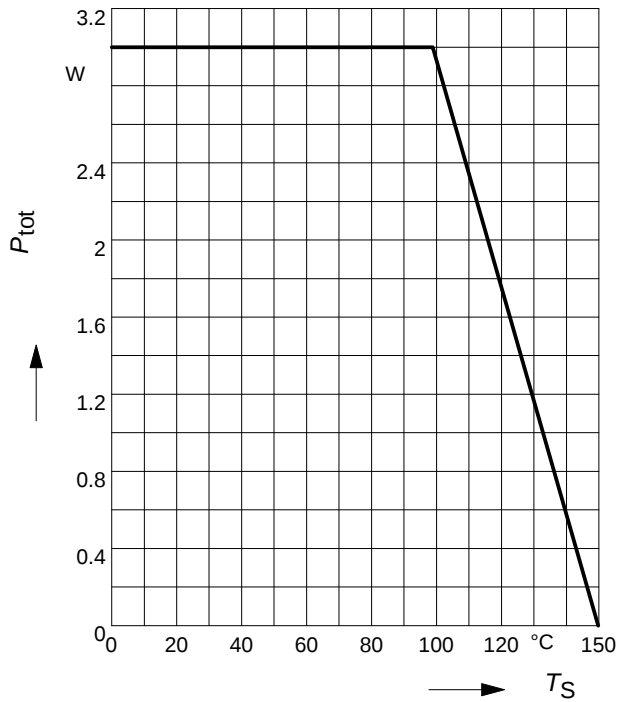
<sup>1)</sup>For calculation of  $R_{thJA}$  please refer to Application Note Thermal Resistance

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

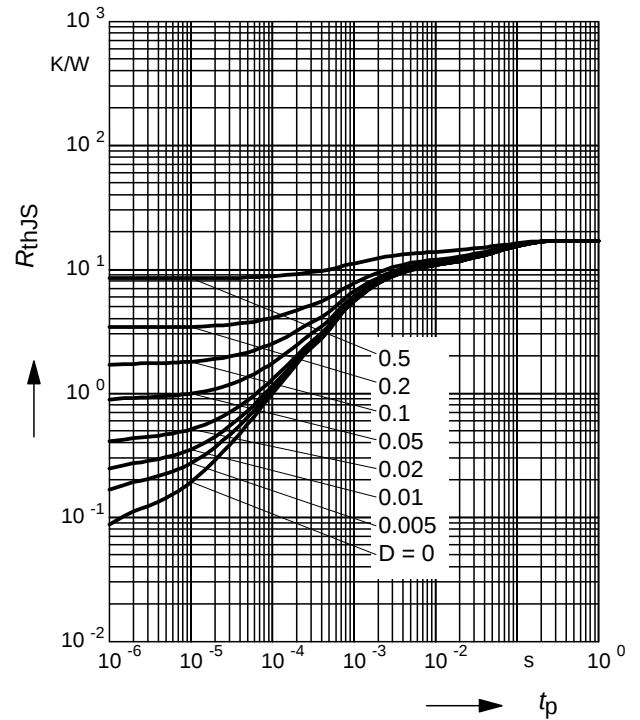
| Parameter                                                                                                                                                         | Symbol        | Values         |             |               | Unit          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------|-------------|---------------|---------------|
|                                                                                                                                                                   |               | min.           | typ.        | max.          |               |
| DC Characteristics                                                                                                                                                |               |                |             |               |               |
| Collector-emitter breakdown voltage<br>$I_C = 10\text{ mA}$ , $I_B = 0$                                                                                           | $V_{(BR)CEO}$ | 80             | -           | -             | V             |
| BDP951                                                                                                                                                            |               |                |             |               |               |
| BDP953                                                                                                                                                            |               | 100            | -           | -             |               |
| BDP955                                                                                                                                                            |               | 120            | -           | -             |               |
| Collector-base breakdown voltage<br>$I_C = 100\text{ }\mu\text{A}$ , $I_B = 0$                                                                                    | $V_{(BR)CBO}$ | 100            | -           | -             |               |
| BDP951                                                                                                                                                            |               |                |             |               |               |
| BDP953                                                                                                                                                            |               | 120            | -           | -             |               |
| BDP955                                                                                                                                                            |               | 140            | -           | -             |               |
| Emitter-base breakdown voltage<br>$I_E = 10\text{ }\mu\text{A}$ , $I_C = 0$                                                                                       | $V_{(BR)EBO}$ | 5              | -           | -             |               |
| Collector cutoff current<br>$V_{CB} = 100\text{ V}$ , $I_E = 0$                                                                                                   | $I_{CBO}$     | -              | -           | 100           | nA            |
| Collector cutoff current<br>$V_{CB} = 100\text{ V}$ , $I_E = 0$ , $T_A = 150\text{ }^\circ\text{C}$                                                               | $I_{CBO}$     | -              | -           | 20            | $\mu\text{A}$ |
| Emitter cutoff current<br>$V_{EB} = 4\text{ V}$ , $I_C = 0$                                                                                                       | $I_{EBO}$     | -              | -           | 100           | nA            |
| DC current gain 1)<br>$I_C = 10\text{ mA}$ , $V_{CE} = 5\text{ V}$<br>$I_C = 500\text{ mA}$ , $V_{CE} = 1\text{ V}$<br>$I_C = 2\text{ A}$ , $V_{CE} = 2\text{ V}$ | $h_{FE}$      | 25<br>40<br>15 | -<br>-<br>- | -<br>475<br>- | -             |
| Collector-emitter saturation voltage1)<br>$I_C = 2\text{ A}$ , $I_B = 0.2\text{ A}$                                                                               | $V_{CEsat}$   | -              | -           | 0.8           | V             |
| Base-emitter saturation voltage 1)<br>$I_C = 2\text{ A}$ , $I_B = 0.2\text{ A}$                                                                                   | $V_{BEsat}$   | -              | -           | 1.5           |               |
| AC Characteristics                                                                                                                                                |               |                |             |               |               |
| 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>$V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$                                                                                         | $C_{cb}$      | -              | 25          | -             | pF            |

1) Pulse test:  $t \leq 300\text{ }\mu\text{s}$ ,  $D = 2\%$

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

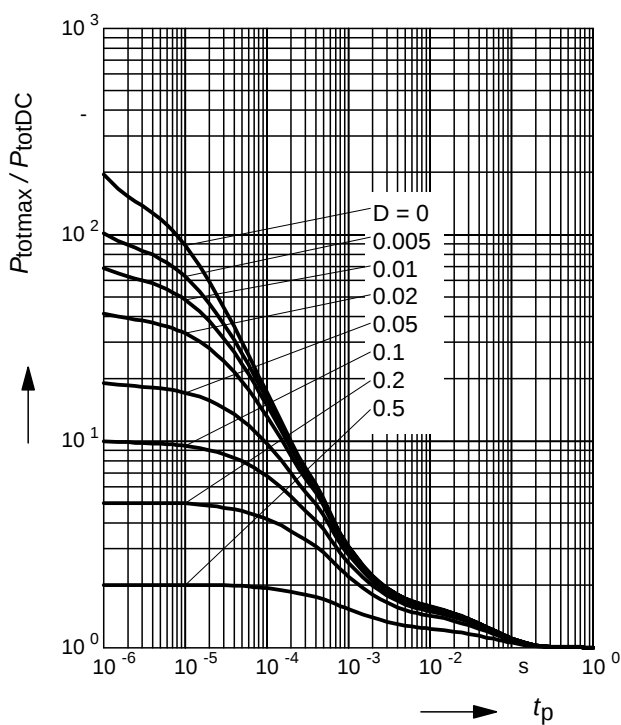


**Permissible Pulse Load  $R_{\text{thJS}} = f(t_p)$**



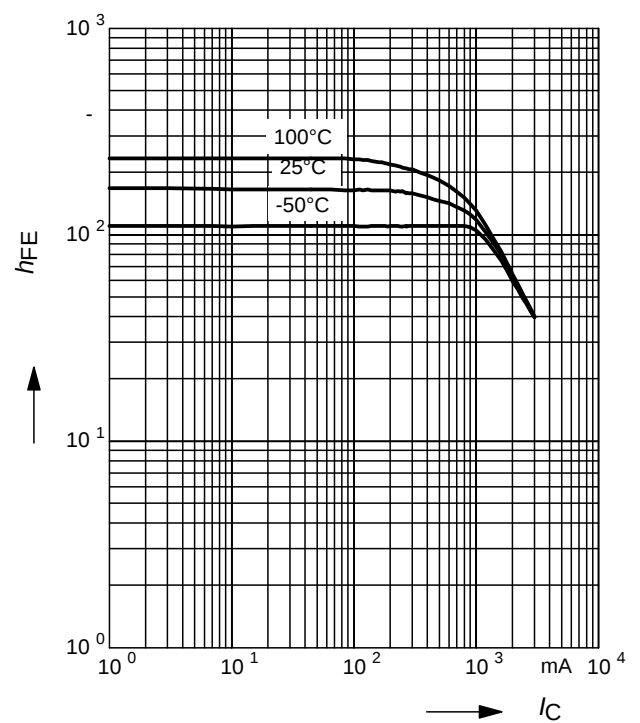
**Permissible Pulse Load**

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



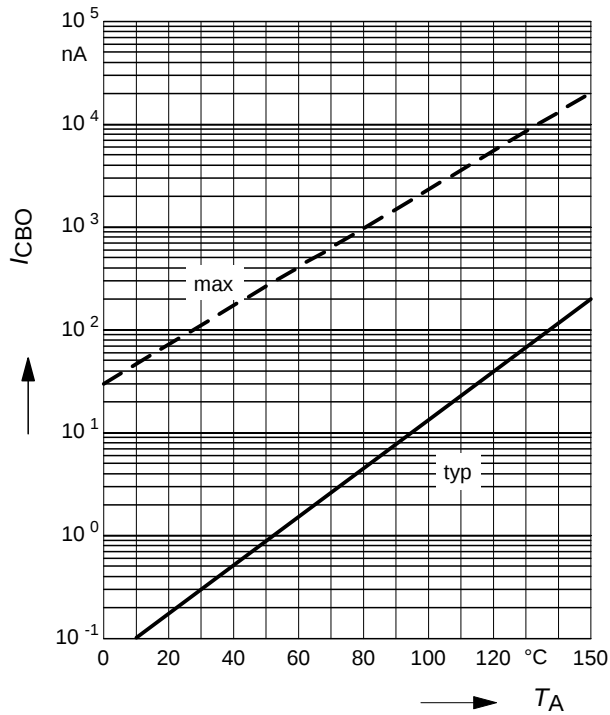
**DC current gain  $h_{\text{FE}} = f(I_C)$**

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



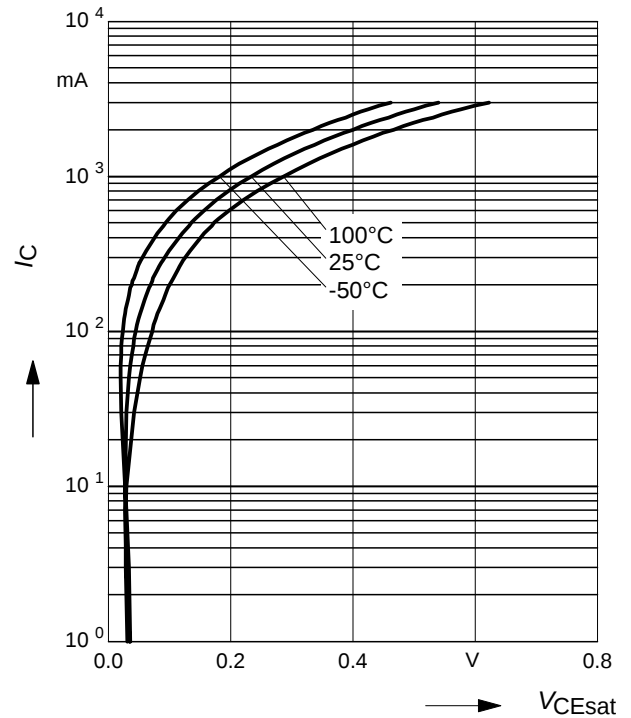
**Collector cutoff current  $I_{CBO} = f(T_A)$**

$V_{CB} = 45V$



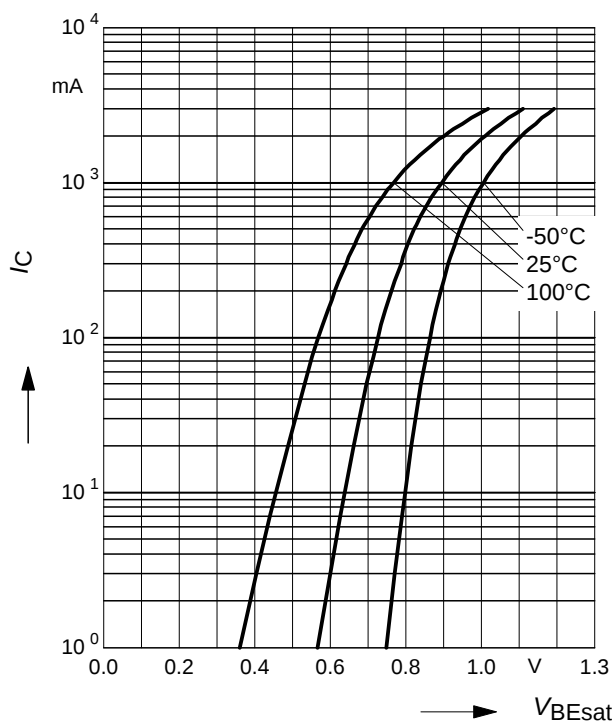
**Collector-emitter saturation voltage**

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



**Base-emitter saturation voltage**

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



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

$V_{CE} = 2V$

