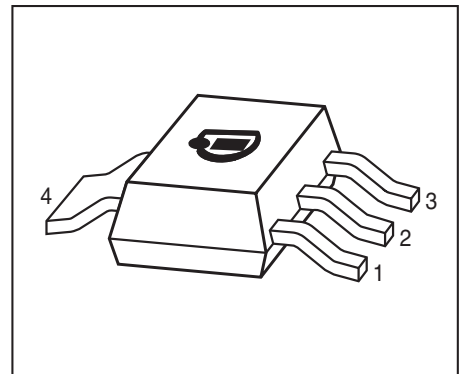


Silicon NPN Transistors

- For AF driver and output stages
- High collector current
- High current gain
- Low collector-emitter saturation voltage
- Complementary types: BDP948, BDP950, BDP954 (PNP)
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101



| Type | Marking | Pin Configuration | | | | | | Package |
|--------|---------|-------------------|-----|-----|-----|---|---|---------|
| | | 1=B | 2=C | 3=E | 4=C | - | - | |
| BDP947 | BDP947 | 1=B | 2=C | 3=E | 4=C | - | - | SOT223 |
| BDP949 | BDP949 | 1=B | 2=C | 3=E | 4=C | - | - | SOT223 |
| BDP953 | BDP953 | 1=B | 2=C | 3=E | 4=C | - | - | SOT223 |

Maximum Ratings

| Parameter | Symbol | Value | Unit |
|---|-----------|-------------|------|
| Collector-emitter voltage | V_{CEO} | | V |
| BDP947 | | 45 | |
| BDP949 | | 60 | |
| BDP953 | | 100 | |
| Collector-base voltage | V_{CBO} | | |
| BDP947 | | 45 | |
| BDP949 | | 60 | |
| BDP953 | | 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, $t_p \leq 10$ ms | I_{BM} | 500 | |
| Total power dissipation- $T_S \leq 100$ °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 ¹⁾ | R_{thJS} | ≤ 10 | K/W |

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 $I_C = 10\text{ mA}$, $I_B = 0$, BDP947 $I_C = 10\text{ mA}$, $I_B = 0$, BDP949 $I_C = 10\text{ mA}$, $I_B = 0$, BDP953 | $V_{(BR)CEO}$ | 45 60 100 | - - - | - - - | V |
| Collector-base breakdown voltage $I_C = 100\text{ }\mu\text{A}$, $I_E = 0$, BDP947 $I_C = 100\text{ }\mu\text{A}$, $I_E = 0$, BDP949 $I_C = 0$, $I_E = 100\text{ }\mu\text{A}$, BDP953 | $V_{(BR)CBO}$ | 45 60 120 | - - - | - - - | |
| Emitter-base breakdown voltage $I_E = 10\text{ }\mu\text{A}$, $I_C = 0$ | $V_{(BR)EBO}$ | 5 | - | - | |
| Collector-base cutoff current $V_{CB} = 45\text{ V}$, $I_E = 0$ $V_{CB} = 45\text{ V}$, $I_E = 0$, $T_A = 150^\circ\text{C}$ | I_{CBO} | - - | - - | 0.1 20 | μA |
| Emitter-base cutoff current $V_{EB} = 4\text{ V}$, $I_C = 0$ | I_{EBO} | - | - | 100 | nA |
| DC current gain ²⁾ $I_C = 10\text{ mA}$, $V_{CE} = 5\text{ V}$ $I_C = 500\text{ mA}$, $V_{CE} = 1\text{ V}$ $I_C = 2\text{ A}$, $V_{CE} = 2\text{ V}$, BDP947, BDP949 $I_C = 2\text{ A}$, $V_{CE} = 2\text{ V}$, BDP953 | h_{FE} | 25 100 50 15 | - - - - | - 475 - - | - |
| Collector-emitter saturation voltage ²⁾ $I_C = 2\text{ A}$, $I_B = 0.2\text{ A}$ | V_{CEsat} | - | - | 0.5 | V |
| Base emitter saturation voltage ²⁾ $I_C = 2\text{ A}$, $I_B = 0.2\text{ A}$ | V_{BEsat} | - | - | 1.3 | |

AC Characteristics

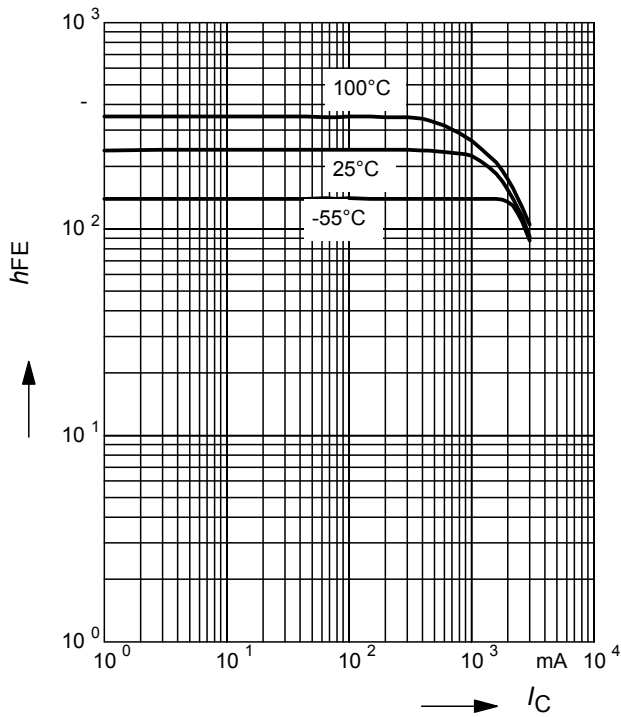
| | | | | | |
|--|----------|---|-----|---|-----|
| Transition frequency $I_C = 50\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 100\text{ MHz}$ | f_T | - | 100 | - | MHz |
| Collector-base capacitance $V_{CB} = 10\text{ V}$, $f = 1\text{ MHz}$ | C_{cb} | - | 25 | - | pF |

¹For calculation of R_{thJA} please refer to Application Note AN077 (Thermal Resistance Calculation)

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

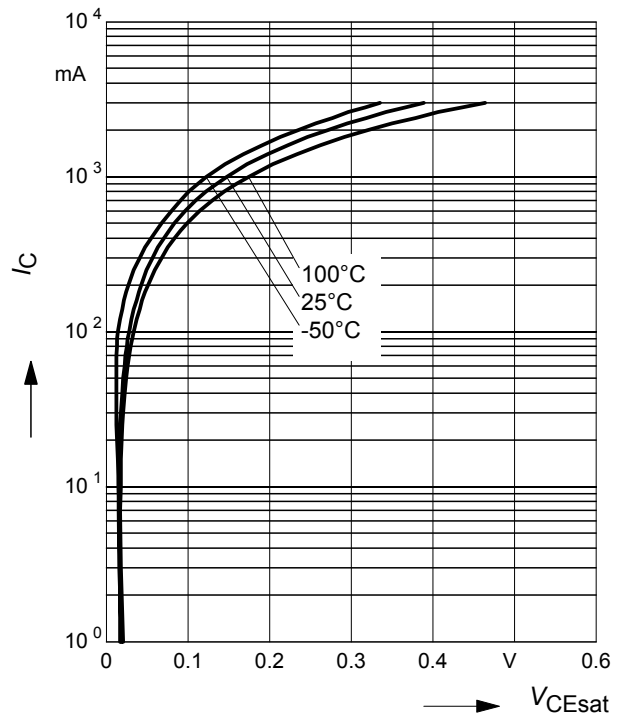
DC current gain $h_{FE} = f(I_C)$

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



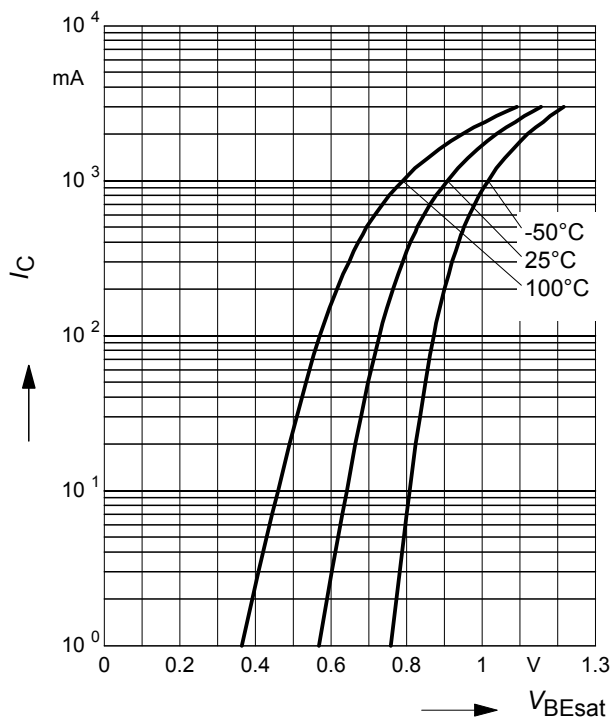
Collector-emitter saturation voltage

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



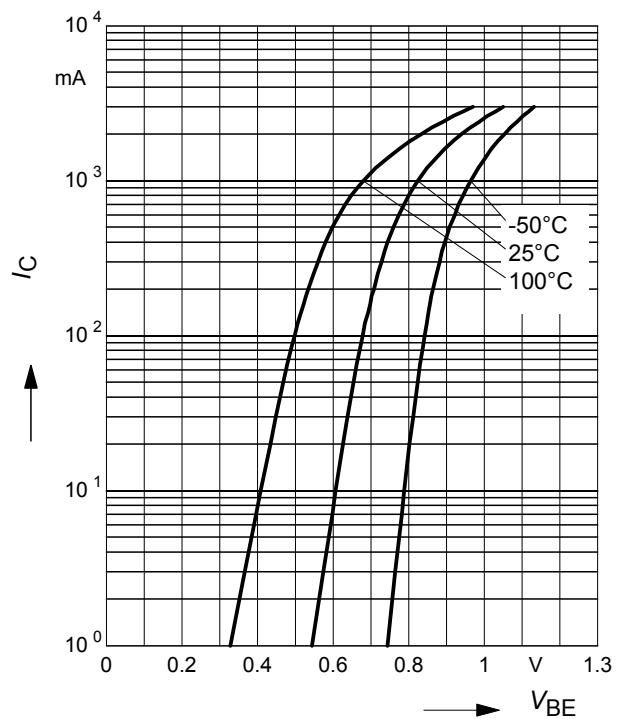
Base-emitter saturation voltage

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



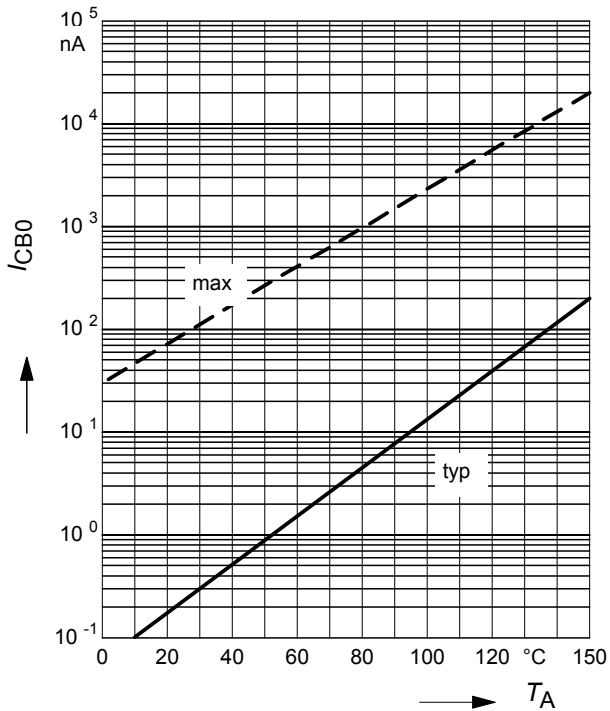
Collector current $I_C = f(V_{BE})$

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



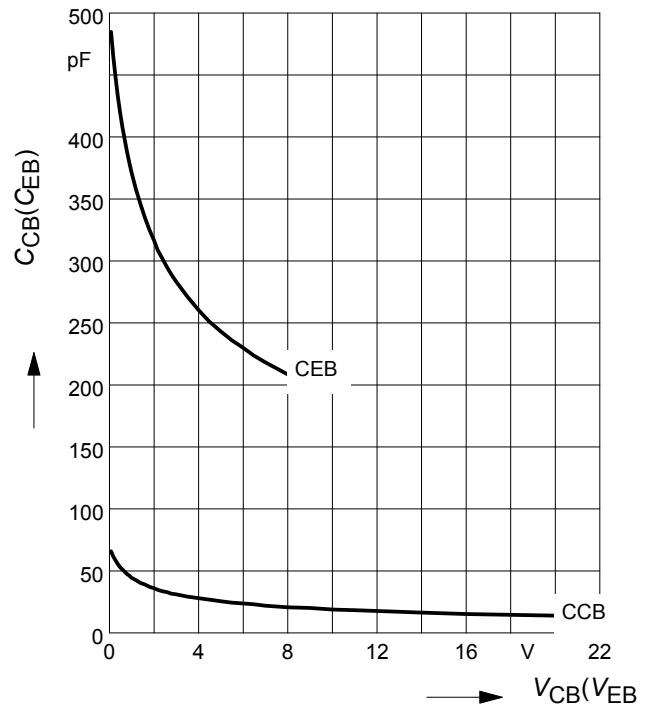
Collector cutoff current $I_{CBO} = f(T_A)$

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

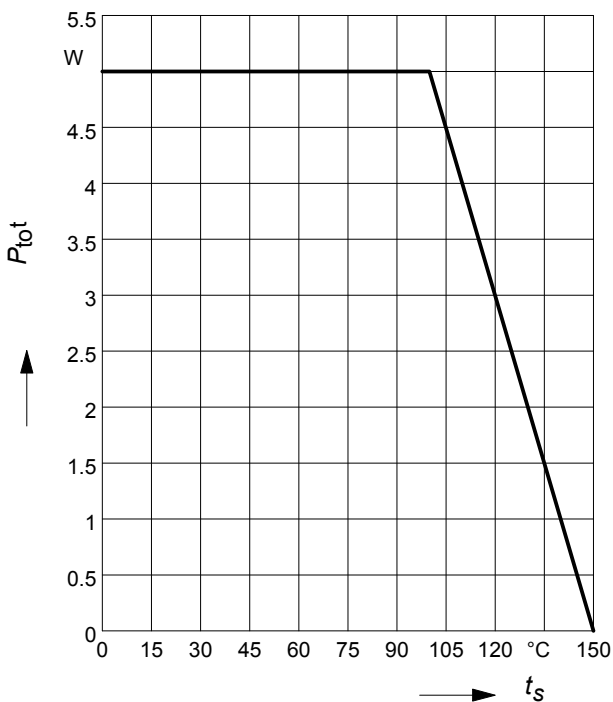


Collector-base capacitance $C_{cb} = f(V_{CB})$

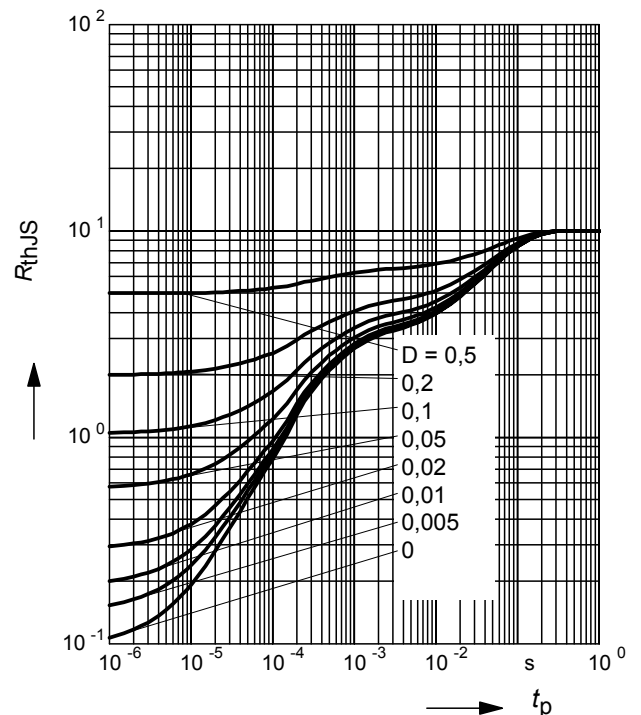
Emitter-base capacitance $C_{eb} = f(V_{EB})$



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



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

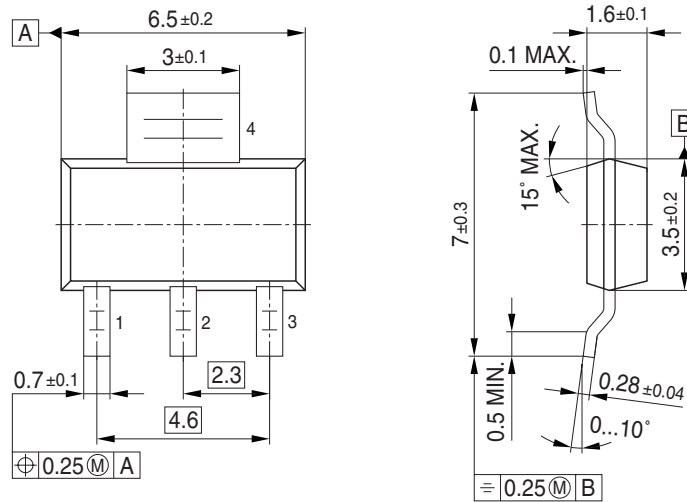


Permissible Pulse Load

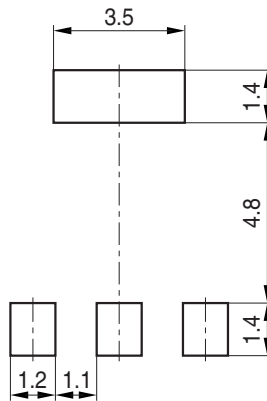
$$P_{\text{totmax}}/P_{\text{totDC}} = f(t_p)$$



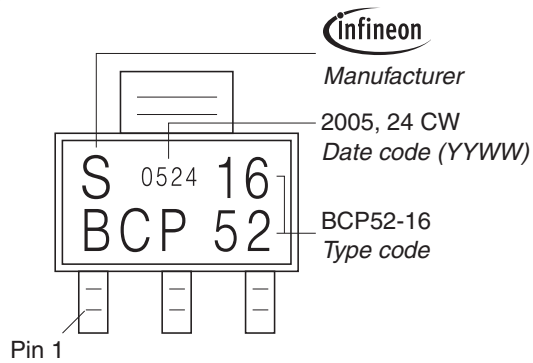
Package Outline



Foot Print

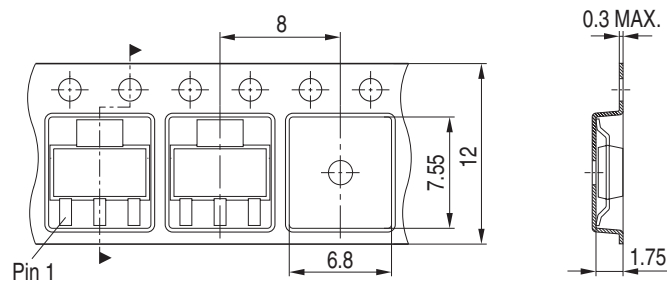


Marking Layout (Example)



Packing

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



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