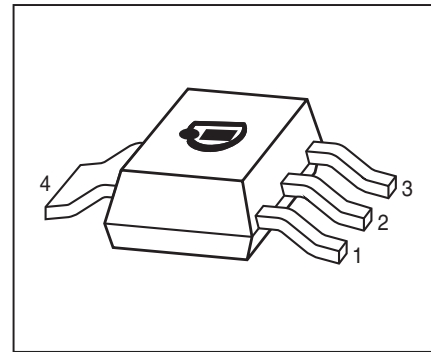


NPN Silicon AF Transistors

- For AF driver and output stages
- High collector current
- Low collector-emitter saturation voltage
- Complementary types: BCP51...BCP53 (PNP)
- Pb-free (RoHS compliant) package ¹⁾
- Qualified according AEC Q101



| Type | Marking | Pin Configuration | | | | | | Package |
|----------|---------|-------------------|-----|-----|-----|---|---|---------|
| | | 1=B | 2=C | 3=E | 4=C | - | - | |
| BCP54 | * | 1=B | 2=C | 3=E | 4=C | - | - | SOT223 |
| BCP54-16 | * | 1=B | 2=C | 3=E | 4=C | - | - | SOT223 |
| BCP55 | * | 1=B | 2=C | 3=E | 4=C | - | - | SOT223 |
| BCP55-16 | * | 1=B | 2=C | 3=E | 4=C | - | - | SOT223 |
| BCP56-10 | * | 1=B | 2=C | 3=E | 4=C | - | - | SOT223 |
| BCP56-16 | * | 1=B | 2=C | 3=E | 4=C | - | - | SOT223 |

* Marking is the same as the type-name

¹⁾Pb-containing package may be available upon special request

Maximum Ratings

| Parameter | Symbol | Value | Unit |
|--|-----------|-------------|------------------|
| Collector-emitter voltage | V_{CEO} | | V |
| BCP54 | | 45 | |
| BCP55 | | 60 | |
| BCP56 | | 80 | |
| Collector-emitter voltage | V_{CER} | | |
| BCP54 | | 45 | |
| BCP55 | | 60 | |
| BCP56 | | 100 | |
| Collector-base voltage | V_{CBO} | | |
| BCP54 | | 45 | |
| BCP55 | | 60 | |
| BCP56 | | 100 | |
| Emitter-base voltage | V_{EBO} | 5 | |
| Collector current | I_C | 1 | A |
| Peak collector current, $t_p \leq 10$ ms | I_{CM} | 1.5 | |
| Base current | I_B | 100 | mA |
| Peak base current | I_{BM} | 200 | |
| Total power dissipation- $T_S \leq 120^\circ\text{C}$ | P_{tot} | 2 | W |
| Junction temperature | T_j | 150 | $^\circ\text{C}$ |
| Storage temperature | T_{stg} | -65 ... 150 | |

Thermal Resistance

| Parameter | Symbol | Value | Unit |
|--|------------|-----------|------|
| Junction - soldering point ¹⁾ | R_{thJS} | ≤ 15 | K/W |

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

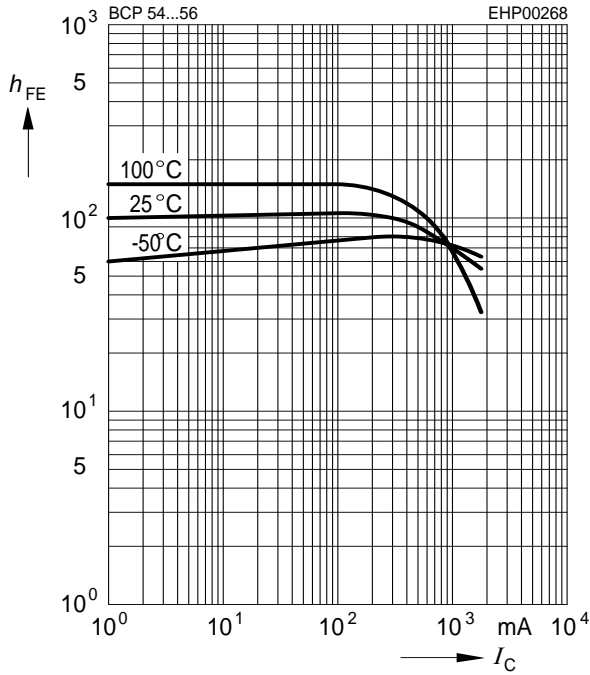
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

| Parameter | Symbol | Values | | | Unit |
|---|---------------|-----------------------------|---------------------------|-----------------------------|---------------|
| | | min. | typ. | max. | |
| DC Characteristics | | | | | |
| Collector-emitter breakdown voltage $I_C = 10\text{ mA}$, $I_B = 0$, BCP54... $I_C = 10\text{ mA}$, $I_B = 0$, BCP55... $I_C = 10\text{ mA}$, $I_B = 0$, BCP56-10, -16 | $V_{(BR)CEO}$ | 45 60 80 | - - - | - - - | V |
| Collector-base breakdown voltage $I_C = 100\text{ }\mu\text{A}$, $I_E = 0$, BCP54... $I_C = 100\text{ }\mu\text{A}$, $I_E = 0$, BCP55... $I_C = 100\text{ }\mu\text{A}$, $I_E = 0$, BCP56-10, -16 | $V_{(BR)CBO}$ | 45 60 100 | - - - | - - - | |
| Emitter-base breakdown voltage $I_E = 10\text{ }\mu\text{A}$, $I_C = 0$ | $V_{(BR)EBO}$ | 5 | - | - | |
| Collector-base cutoff current $V_{CB} = 30\text{ V}$, $I_E = 0$ $V_{CB} = 30\text{ V}$, $I_E = 0$, $T_A = 150\text{ }^\circ\text{C}$ | I_{CBO} | - - | - - | 0.1 20 | μA |
| DC current gain ¹⁾ $I_C = 5\text{ mA}$, $V_{CE} = 2\text{ V}$ $I_C = 150\text{ mA}$, $V_{CE} = 2\text{ V}$, BCP54/BCP55 $I_C = 150\text{ mA}$, $V_{CE} = 2\text{ V}$, BCP56-10 $I_C = 150\text{ mA}$, $V_{CE} = 2\text{ V}$, BCP54-16...BCP56-16 $I_C = 500\text{ mA}$, $V_{CE} = 2\text{ V}$ | h_{FE} | 25 40 63 100 25 | - - 100 160 - | - 250 160 250 - | - |
| Collector-emitter saturation voltage ¹⁾ $I_C = 500\text{ mA}$, $I_B = 50\text{ mA}$ | V_{CEsat} | - | - | 0.5 | V |
| Base-emitter voltage ¹⁾ $I_C = 500\text{ mA}$, $V_{CE} = 2\text{ V}$ | $V_{BE(ON)}$ | - | - | 1 | |
| AC Characteristics | | | | | |
| Transition frequency $I_C = 50\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 100\text{ MHz}$ | f_T | - | 100 | - | MHz |

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

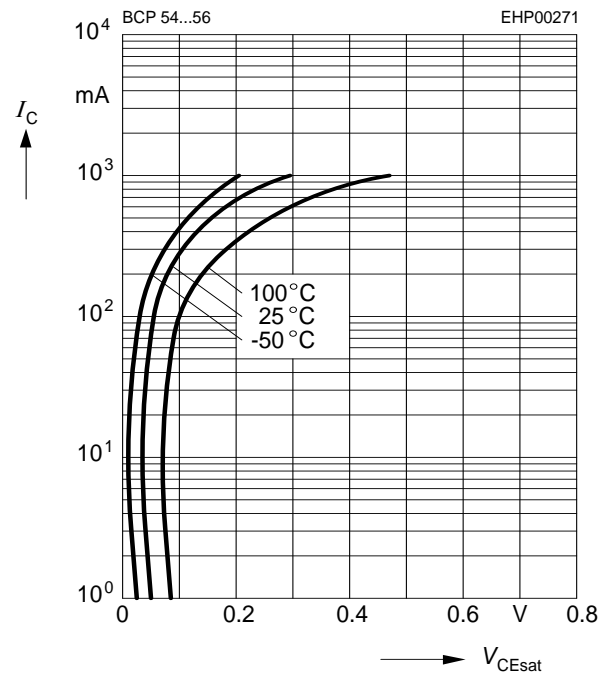
DC current gain $h_{FE} = f(I_C)$

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



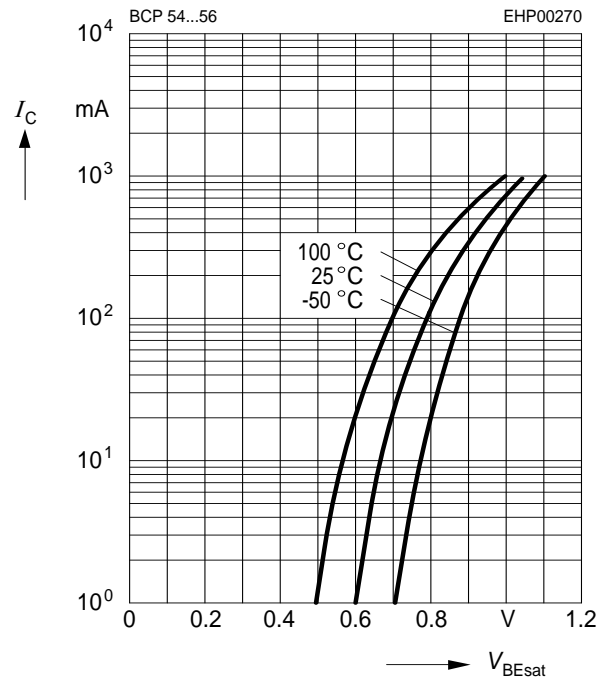
Collector-emitter saturation voltage

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



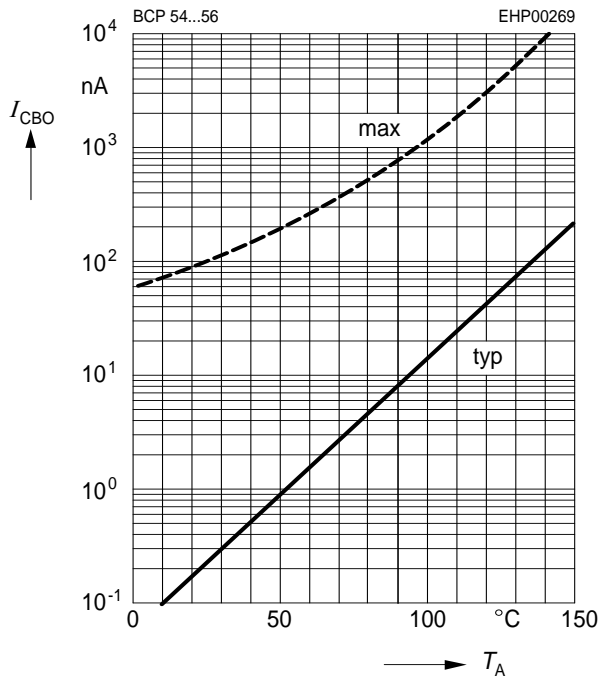
Base-emitter saturation voltage

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



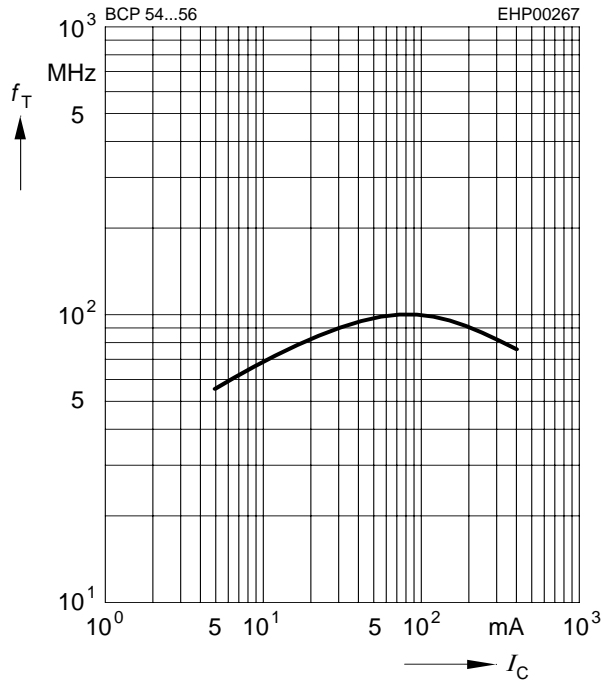
Collector cutoff current $I_{CBO} = f(T_A)$

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

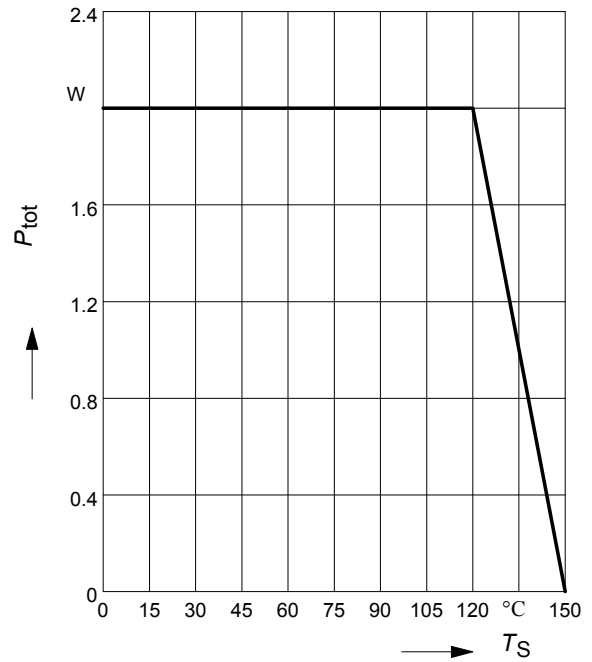


Transition frequency $f_T = f(I_C)$

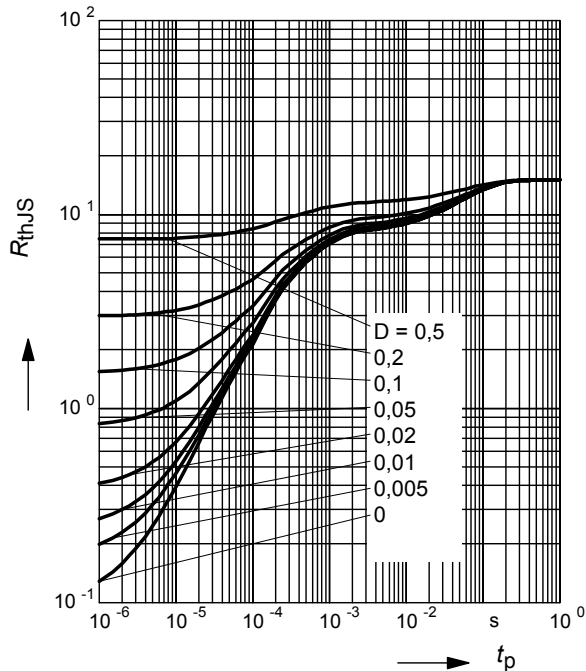
$V_{CE} = 10\text{ V}$



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

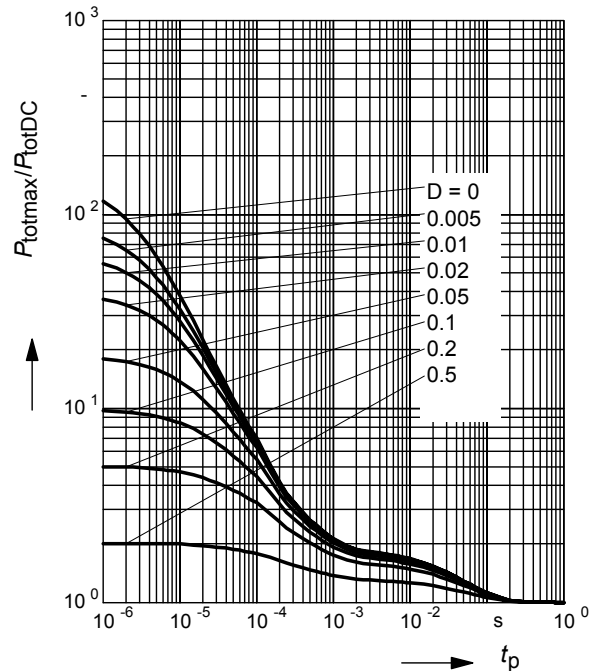


Permissible Pulse Load $R_{thJS} = f(t_p)$

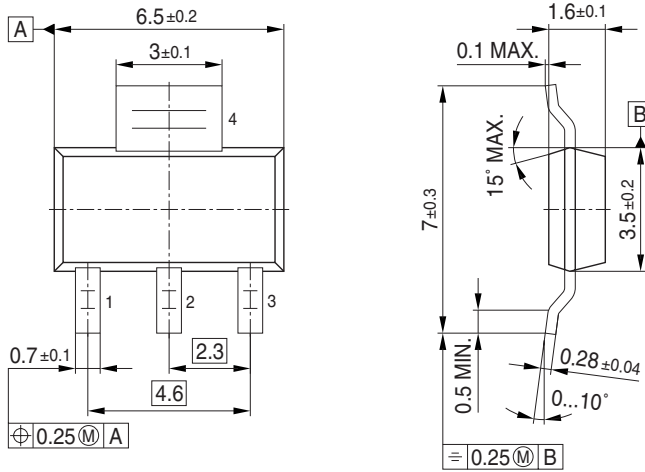


Permissible Pulse Load

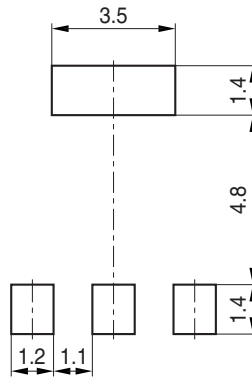
$P_{totmax}/P_{totDC} = f(t_p)$



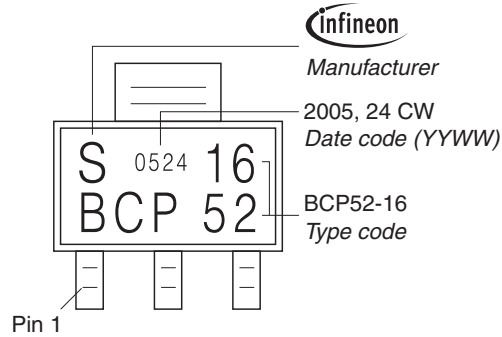
Package Outline



Foot Print

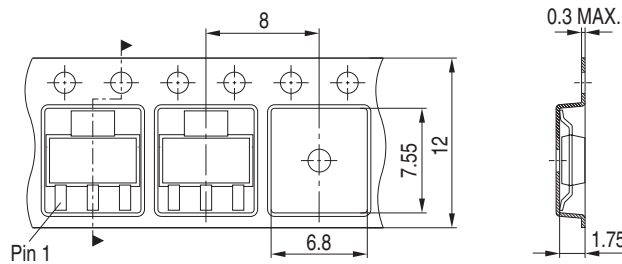


Marking Layout (Example)



Packing

Reel ϕ 180 mm = 1.000 Pieces/Reel
 Reel ϕ 330 mm = 4.000 Pieces/Reel



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