

NPN Silicon AF Transistors

- For general AF applications
- High current gain
- Low collector-emitter saturation voltage
- Complementary type: BCW68 (PNP)
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101



| Type | Marking | Pin Configuration | | | Package |
|---------|---------|-------------------|-----|-----|---------|
| | | 1=B | 2=E | 3=C | |
| BCW66KF | EFs | 1=B | 2=E | 3=C | SOT23 |
| BCW66KG | EGs | 1=B | 2=E | 3=C | SOT23 |
| BCW66KH | EHs | 1=B | 2=E | 3=C | SOT23 |

Maximum Ratings

| Parameter | Symbol | Value | Unit |
|---|-----------|-------------|------|
| Collector-emitter voltage | V_{CEO} | 45 | V |
| Collector-base voltage | V_{CBO} | 75 | |
| Emitter-base voltage | V_{EBO} | 5 | |
| Collector current | I_C | 800 | mA |
| Peak collector current, $t_p \leq 10$ ms | I_{CM} | 1 | A |
| Base current | I_B | 100 | mA |
| Peak base current | I_{BM} | 200 | |
| Total power dissipation- $T_S \leq 115$ °C | P_{tot} | 500 | mW |
| Junction temperature | T_j | 150 | °C |
| Storage temperature | T_{stg} | -65 ... 150 | |

Thermal Resistance

| Parameter | Symbol | Value | Unit |
|--|------------|-----------|------|
| Junction - soldering point ¹⁾ | R_{thJS} | ≤ 70 | 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 $I_C = 10\text{ mA}, I_B = 0$ | $V_{(BR)CEO}$ | 45 | - | - | V |
| Collector-base breakdown voltage $I_C = 10\text{ }\mu\text{A}, I_E = 0$ | $V_{(BR)CBO}$ | 75 | - | - | |
| Emitter-base breakdown voltage $I_E = 10\text{ }\mu\text{A}, I_C = 0$ | $V_{(BR)EBO}$ | 5 | - | - | |
| Collector-base cutoff current $V_{CB} = 45\text{ V}, I_E = 0$ $V_{CB} = 45\text{ V}, I_E = 0, T_A = 150\text{ }^\circ\text{C}$ | I_{CBO} | - | - | 0.02 20 | μA |
| Emitter-base cutoff current $V_{EB} = 5\text{ V}, I_C = 0$ | I_{EBO} | - | - | 20 | nA |
| DC current gain ²⁾ $I_C = 100\text{ }\mu\text{A} - 10\text{ mA}, V_{CE} = 1\text{ V}, \text{hFE-grp.F}$ $I_C = 100\text{ }\mu\text{A} - 10\text{ mA}, V_{CE} = 1\text{ V}, \text{hFE-grp.G}$ $I_C = 100\text{ }\mu\text{A} - 10\text{ mA}, V_{CE} = 1\text{ V}, \text{hFE-grp.H}$ $I_C = 100\text{ mA}, V_{CE} = 1\text{ V}, \text{hFE-grp.F}$ $I_C = 100\text{ mA}, V_{CE} = 1\text{ V}, \text{hFE-grp.G}$ $I_C = 100\text{ mA}, V_{CE} = 1\text{ V}, \text{hFE-grp.H}$ $I_C = 500\text{ mA}, V_{CE} = 1\text{ V}, \text{hFE-grp.F, G, H}$ | h_{FE} | 75 110 180 100 160 250 40 | - - - 160 250 350 - | - - - 250 400 630 - | - |
| Collector-emitter saturation voltage ²⁾ $I_C = 100\text{ mA}, I_B = 10\text{ mA}$ $I_C = 500\text{ mA}, I_B = 50\text{ mA}$ | V_{CEsat} | - - | - - | 0.3 0.45 | V |
| Base emitter saturation voltage ²⁾ $I_C = 100\text{ mA}, I_B = 10\text{ mA}$ $I_C = 500\text{ mA}, I_B = 50\text{ mA}$ | V_{BEsat} | - - | - - | 1.25 1.25 | |

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

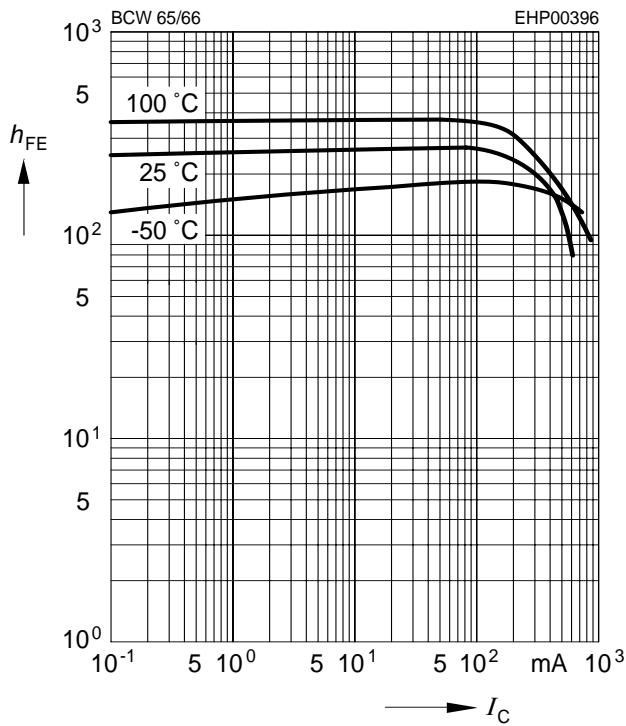
²Pulse test: $t < 300\text{ }\mu\text{s}; D < 2\%$

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

| Parameter | Symbol | Values | | | Unit |
|--|----------|--------|------|------|------|
| | | min. | typ. | max. | |
| AC Characteristics | | | | | |
| Transition frequency $I_C = 50\text{ mA}$, $V_{CE} = 5\text{ V}$, $f = 20\text{ MHz}$ | f_T | - | 170 | - | MHz |
| Collector-base capacitance $V_{CB} = 10\text{ V}$, $f = 1\text{ MHz}$ | C_{cb} | - | 3 | - | pF |
| Emitter-base capacitance $V_{EB} = 0.5\text{ V}$, $f = 1\text{ MHz}$ | C_{eb} | - | 40 | - | |

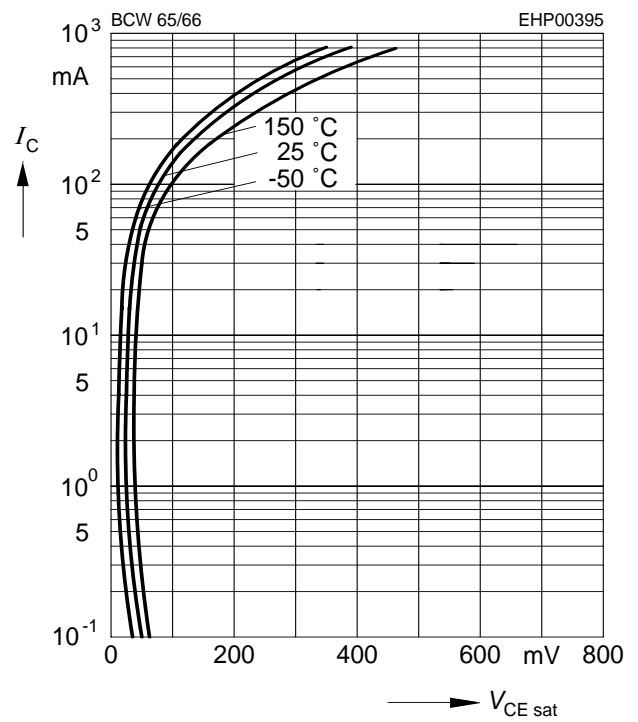
DC current gain $h_{FE} = f(I_C)$

$V_{CE} = 1\text{ V}$



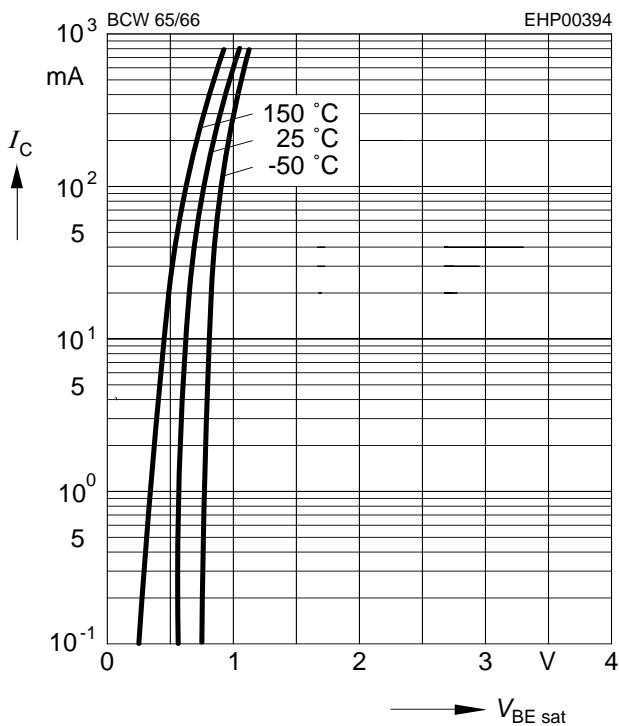
Collector-emitter saturation voltage

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



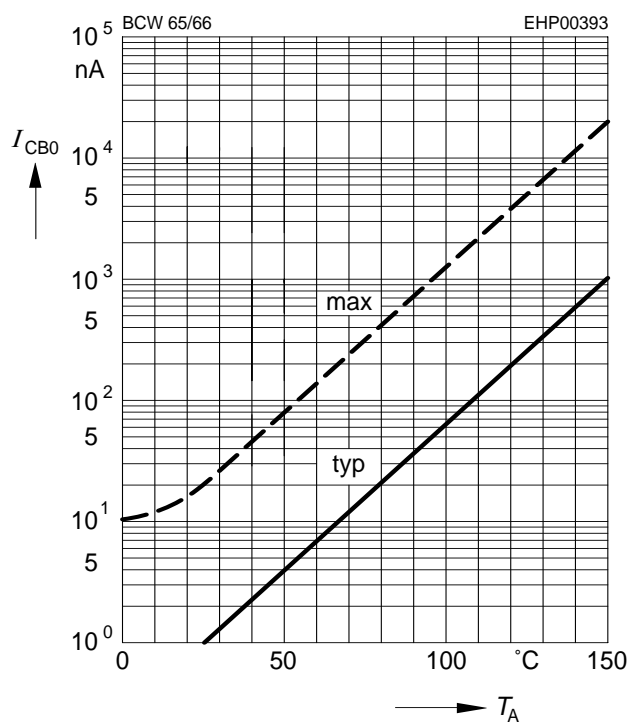
Base-emitter saturation voltage

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



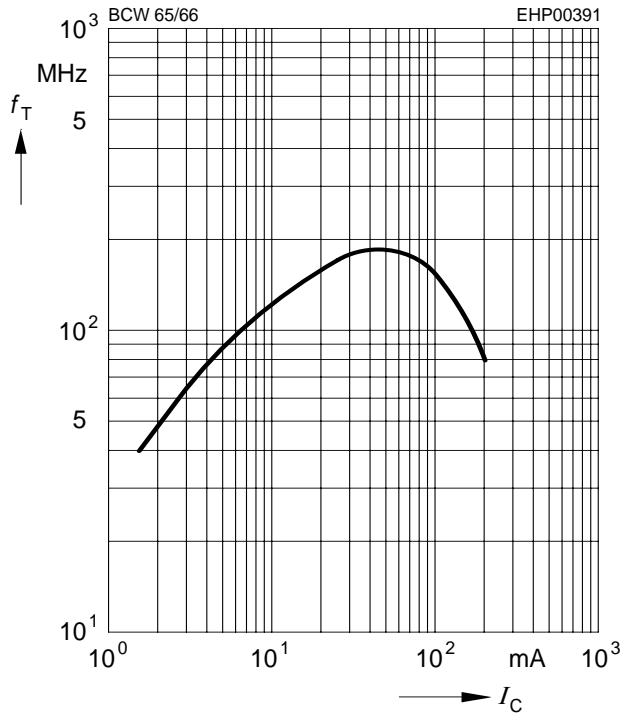
Collector cutoff current $I_{CBO} = f(T_A)$

$V_{CB} = V_{CEmax}$



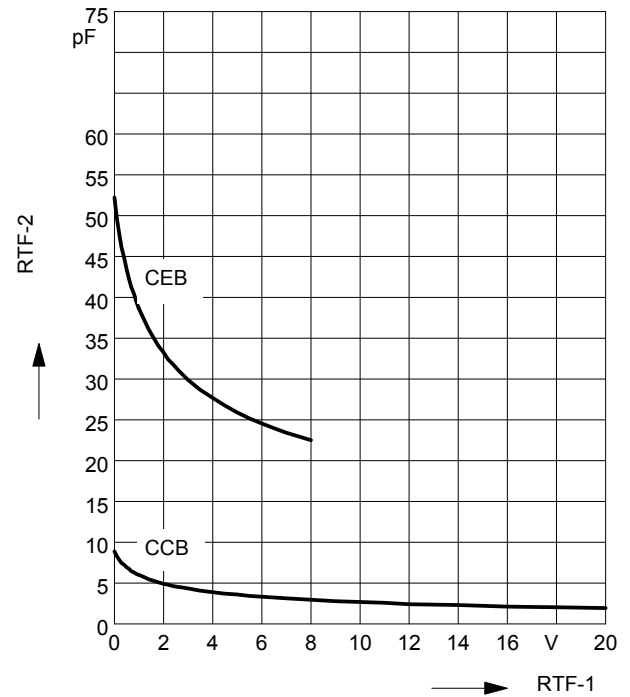
Transition frequency $f_T = f(I_C)$

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

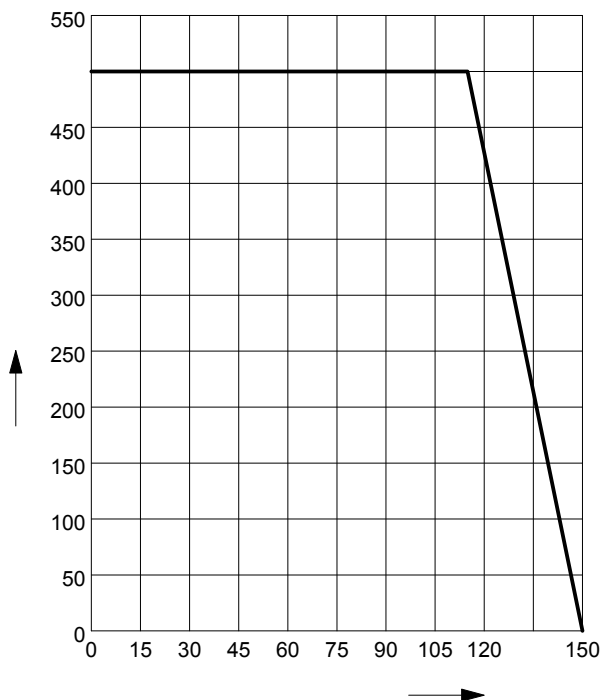


Collector-base capacitance $C_{cb} = f(V_{CB})$

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

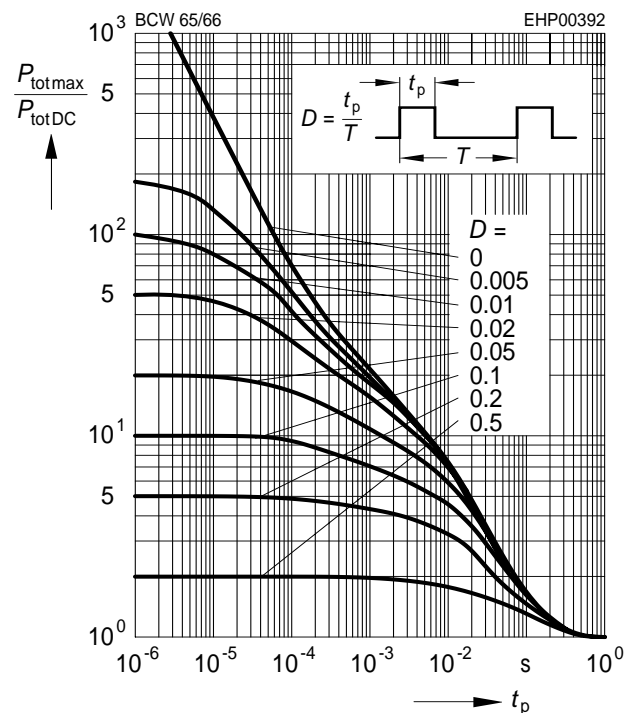


Total power dissipation $P_{tot} = f(T_S)$



Permissible Pulse Load

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

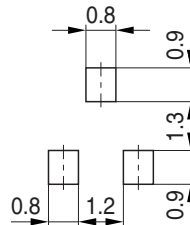


Package Outline



1) Lead width can be 0.6 max. in dambar area

Foot Print

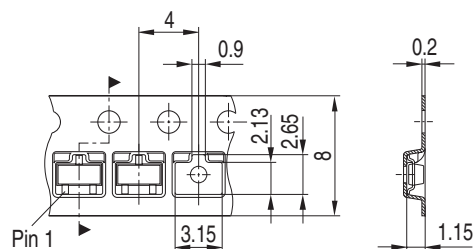


Marking Layout (Example)



Standard Packing

Reel \varnothing 180 mm = 3.000 Pieces/Reel
 Reel \varnothing 330 mm = 10.000 Pieces/Reel



Edition 2009-11-16

**Published by
Infineon Technologies AG
81726 Munich, Germany**

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