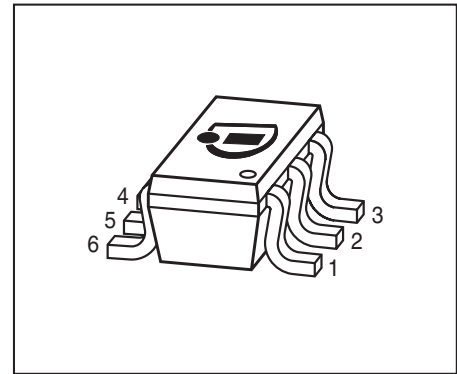


**NPN Silicon AF Transistor**

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



| Type    | Marking | Pin Configuration |     |     |     |     |     | Package |
|---------|---------|-------------------|-----|-----|-----|-----|-----|---------|
| BC817SU | B6s     | 1=E               | 2=C | 3=C | 4=C | 5=C | 6=B | SC74    |

**Maximum Ratings**

| Parameter  | Symbol    | Value       | Unit |
|--|-----------|-------------|------|
| Collector-emitter voltage                                | $V_{CEO}$ | 45          | V    |
| Collector-base voltage                                   | $V_{CBO}$ | 50          |      |
| Emitter-base voltage                                     | $V_{EBO}$ | 5           |      |
| Collector current  | $I_C$     | 500         | 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-<br>$T_S \leq 100^\circ\text{C}$ | $P_{tot}$ | 1000        | mW   |
| Junction temperature                                     | $T_j$     | 150         | °C   |
| Storage temperature                                      | $T_{stg}$ | -65 ... 150 |      |

**Thermal Resistance**

| Parameter                                | Symbol     | Value     | Unit |
|--|------------|-----------|------|
| Junction - soldering point <sup>1)</sup> | $R_{thJS}$ | $\leq 50$ | 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>$I_C = 10\text{ mA}, I_B = 0$   | $V_{(BR)CEO}$ | 45        | -        | -         | V             |
| Collector-base breakdown voltage<br>$I_C = 10\text{ }\mu\text{A}, I_E = 0$   | $V_{(BR)CBO}$ | 50        | -        | -         |               |
| Emitter-base breakdown voltage<br>$I_E = 10\text{ }\mu\text{A}, I_C = 0$   | $V_{(BR)EBO}$ | 5         | -        | -         |               |
| Collector-base cutoff current<br>$V_{CB} = 25\text{ V}, I_E = 0$<br>$V_{CB} = 25\text{ V}, I_E = 0, T_A = 150\text{ }^\circ\text{C}$ | $I_{CBO}$     | -         | -        | 0.1<br>50 | $\mu\text{A}$ |
| Emitter-base cutoff current<br>$V_{EB} = 4\text{ V}, I_C = 0$  | $I_{EBO}$     | -         | -        | 100       | nA            |
| DC current gain <sup>1)</sup><br>$I_C = 100\text{ mA}, V_{CE} = 1\text{ V}$<br>$I_C = 500\text{ mA}, V_{CE} = 1\text{ V}$            | $h_{FE}$      | 160<br>40 | 250<br>- | 400<br>-  | -             |
| Collector-emitter saturation voltage <sup>1)</sup><br>$I_C = 500\text{ mA}, I_B = 50\text{ mA}$                                      | $V_{CEsat}$   | -         | -        | 0.4       | V             |
| Base emitter saturation voltage <sup>1)</sup><br>$I_C = 500\text{ mA}, I_B = 50\text{ mA}$   | $V_{BEsat}$   | -         | -        | 1.2       |               |

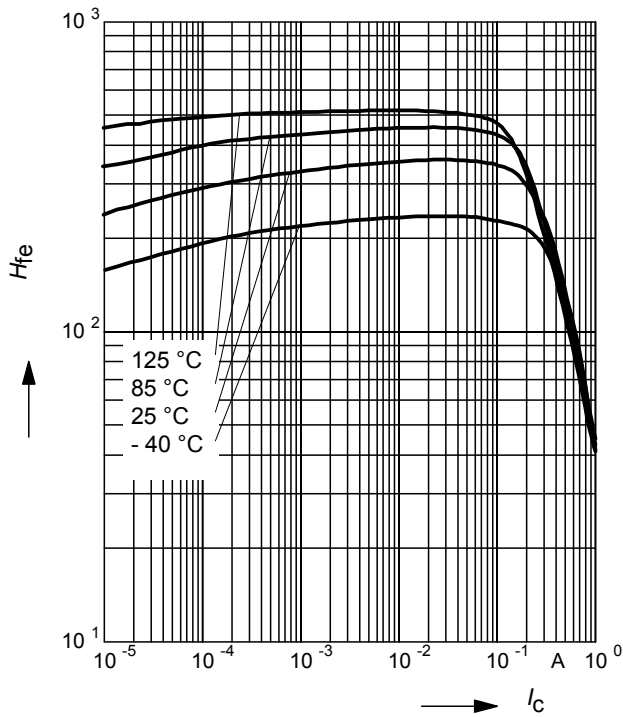
**AC Characteristics**

|   |          |   |     |   |     |
|---|----------|---|-----|---|-----|
| Transition frequency<br>$I_C = 50\text{ mA}, V_{CE} = 5\text{ V}, f = 100\text{ MHz}$ | $f_T$    | - | 170 | - | MHz |
| Collector-base capacitance<br>$f = 1\text{ MHz}, V_{BE} = 10\text{ V}$                | $C_{cb}$ | - | 3   | - | pF  |
| Emitter-base capacitance<br>$V_{EB} = 0.5\text{ V}, f = 1\text{ MHz}$                 | $C_{eb}$ | - | 40  | - |     |

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

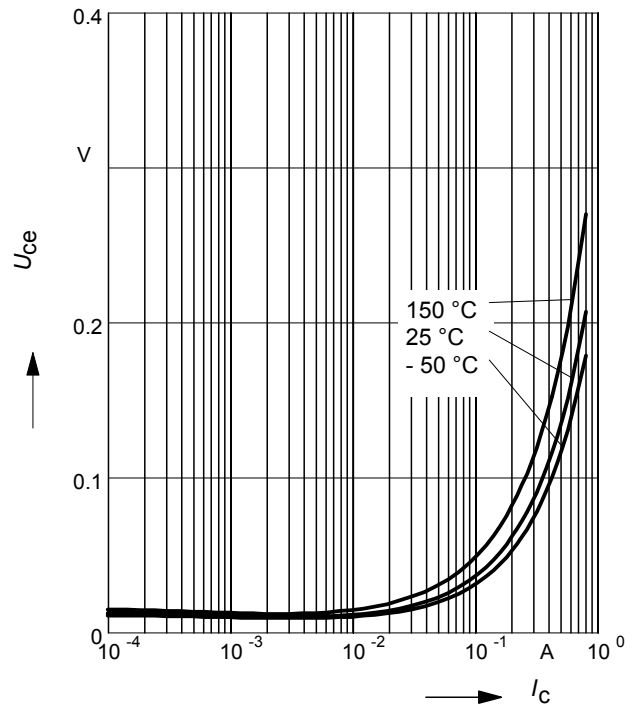
**DC current gain  $h_{FE} = f(I_C)$**

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



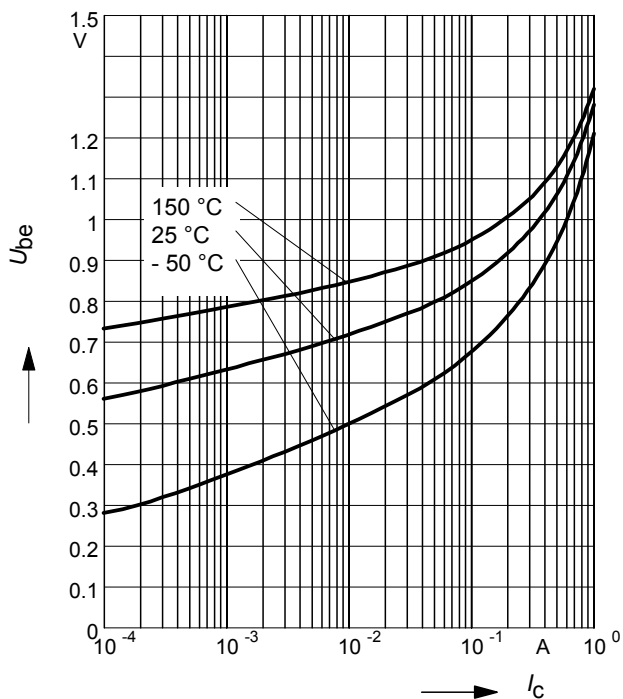
**Collector-emitter saturation voltage**

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



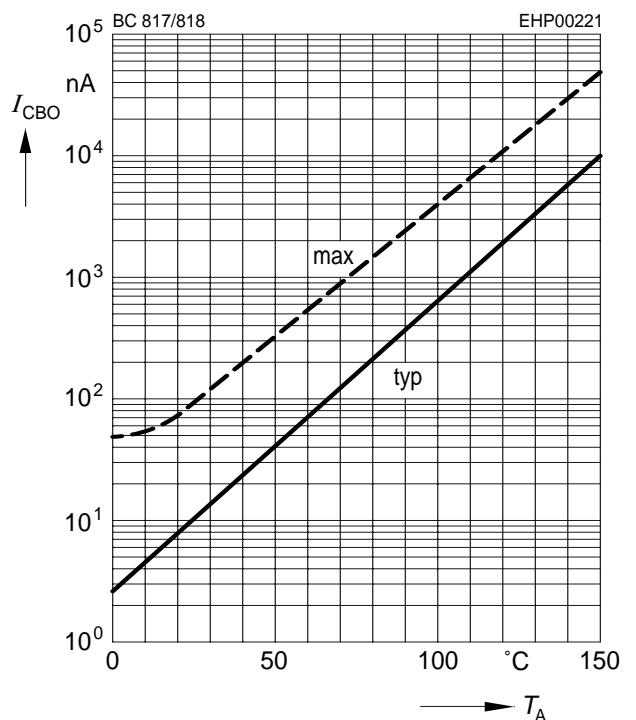
**Base-emitter saturation voltage**

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



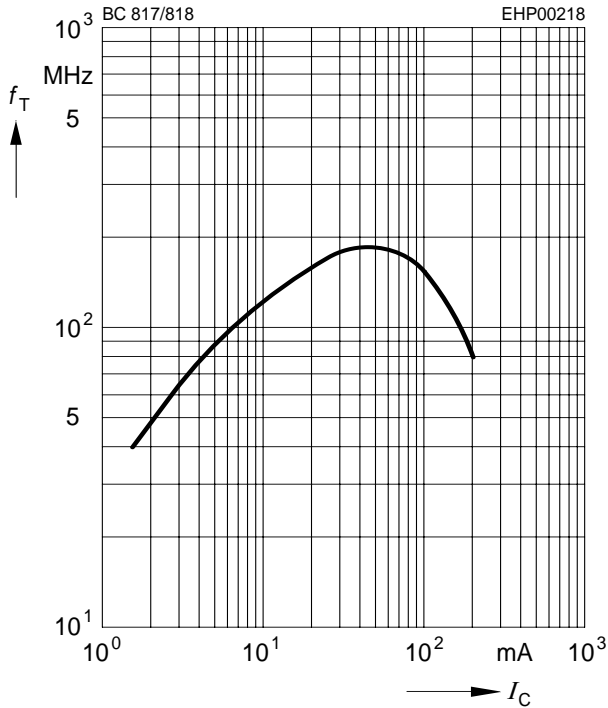
**Collector cutoff current  $I_{CBO} = f(T_A)$**

$V_{CBO} = 25\text{ V}$

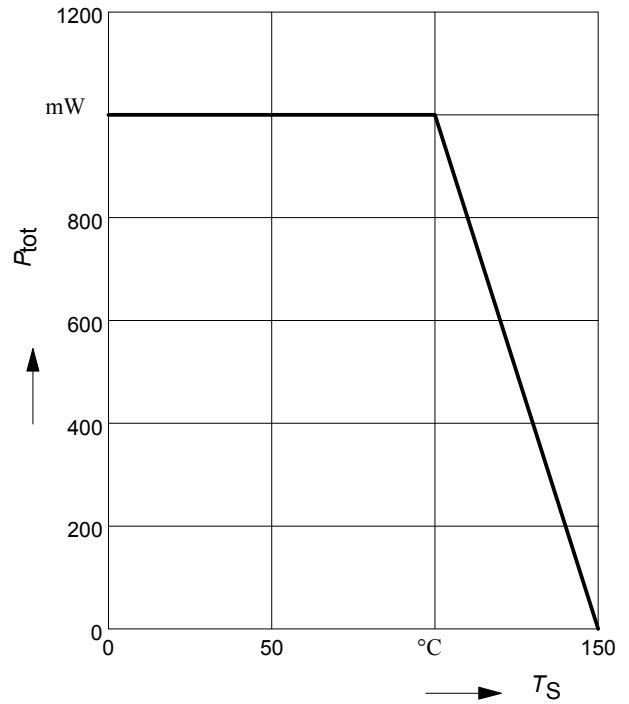


Transition frequency  $f_T = f(I_C)$

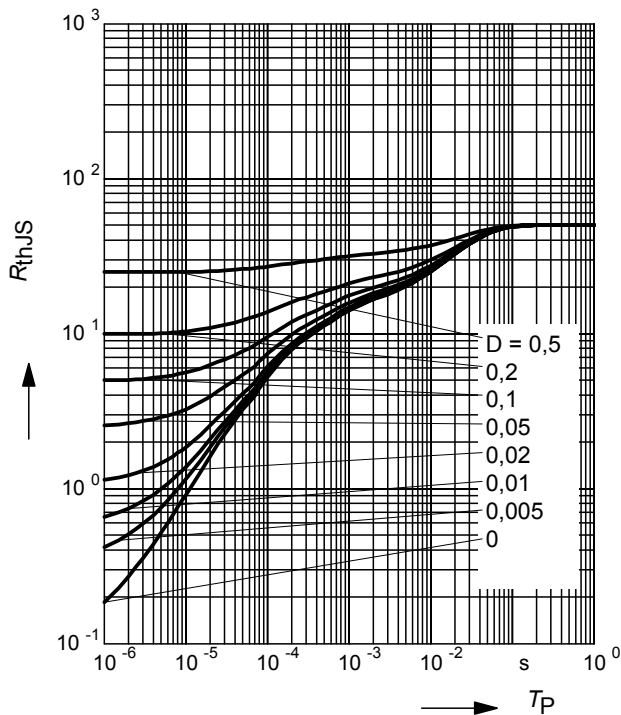
$V_{CE}$  = parameter in V,  $f = 2$  GHz



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

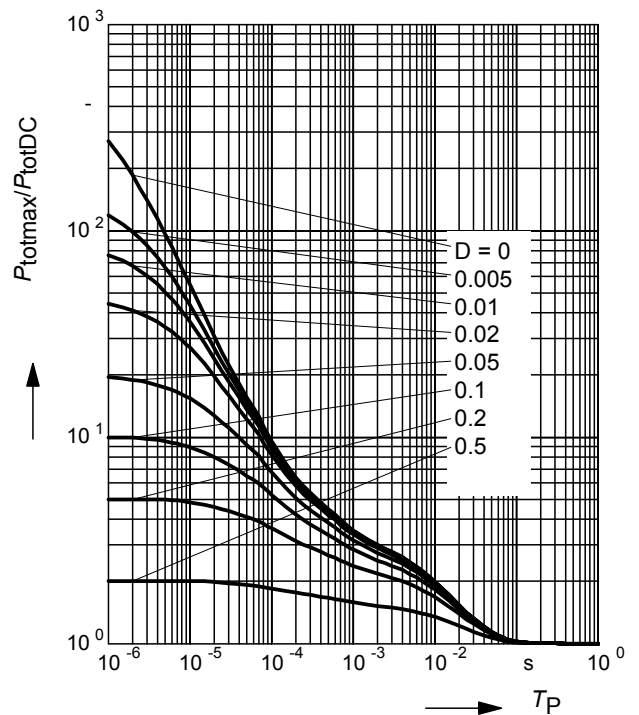


Permissible Pulse Load  $R_{thJS} = f(t_p)$

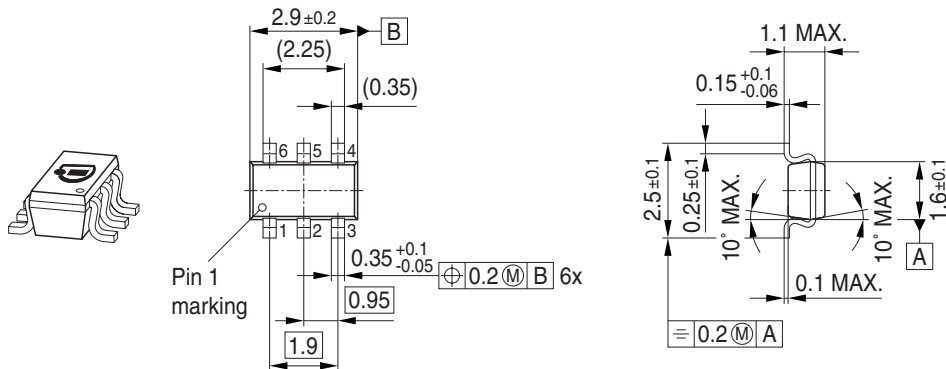


Permissible Pulse Load

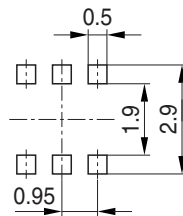
$P_{totmax}/P_{totDC} = f(t_p)$



Package Outline

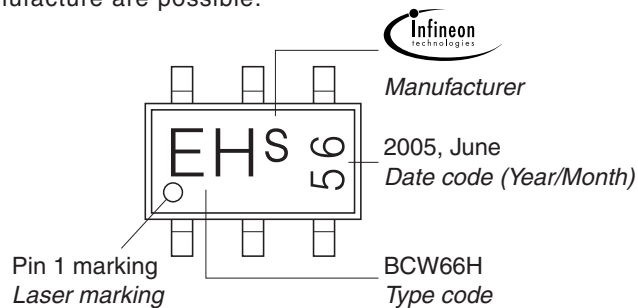


Foot Print



Marking Layout (Example)

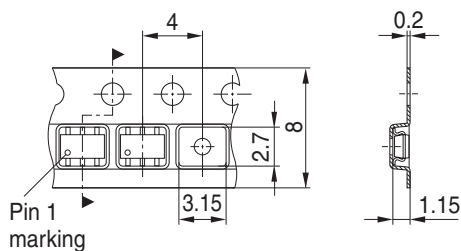
Small variations in positioning of Date code, Type code and Manufacture are possible.



Standard Packing

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

For symmetric types no defined Pin 1 orientation in reel.



**Edition 2009-11-16**

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

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