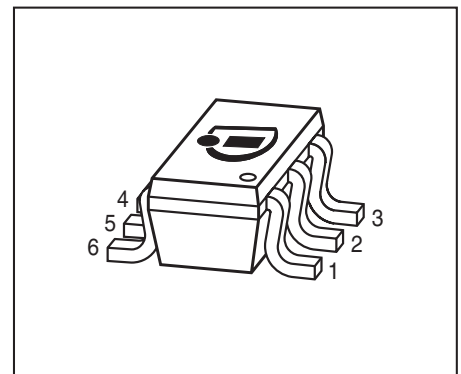
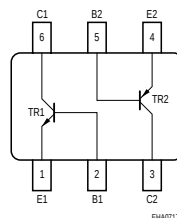
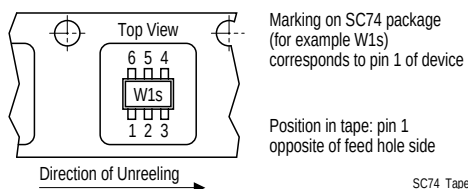


## NPN / PNP Silicon AF Transistor Array

- High breakdown voltage
- Low collector-emitter saturation voltage
- Two (galvanic) internal isolated NPN/PNP Transistor in one package
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101



### Tape loading orientation



| Type       | Marking | Pin Configuration |     |     |     |     |     | Package |
|------------|---------|-------------------|-----|-----|-----|-----|-----|---------|
| SMBTA06UPN | s2P     | 1=E               | 2=B | 3=C | 4=E | 5=B | 6=C | SC74    |

### Maximum Ratings

| Parameter                                     | Symbol    | Value       | Unit |
|-----------------------------------------------|-----------|-------------|------|
| Collector-emitter voltage                     | $V_{CEO}$ | 80          | V    |
| Collector-base voltage                        | $V_{CBO}$ | 80          |      |
| Emitter-base voltage                          | $V_{EBO}$ | 4           |      |
| 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>$T_S \leq 115$ °C | $P_{tot}$ | 330         | 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> | $R_{thJS}$ | $\leq 105$ | 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<br>$I_C = 1\text{ mA}, I_B = 0$                                                          | $V_{(BR)CEO}$ | 80         | -      | -         | V             |
| Collector-base breakdown voltage<br>$I_C = 100\text{ }\mu\text{A}, I_E = 0$                                                  | $V_{(BR)CBO}$ | 80         | -      | -         |               |
| Emitter-base breakdown voltage<br>$I_E = 10\text{ }\mu\text{A}, I_C = 0$                                                     | $V_{(BR)EBO}$ | 4          | -      | -         |               |
| Collector-base cutoff current<br>$V_{CB} = 80\text{ V}, I_E = 0$<br>$V_{CB} = 80\text{ V}, I_E = 0, T_A = 150^\circ\text{C}$ | $I_{CBO}$     | -<br>-     | -<br>- | 0.1<br>20 | $\mu\text{A}$ |
| Collector-emitter cutoff current<br>$V_{CE} = 60\text{ V}, I_B = 0$                                                          | $I_{CEO}$     | -          | -      | 100       | nA            |
| DC current gain <sup>2)</sup><br>$I_C = 10\text{ mA}, V_{CE} = 1\text{ V}$<br>$I_C = 100\text{ mA}, V_{CE} = 1\text{ V}$     | $h_{FE}$      | 100<br>100 | -<br>- | -<br>-    | -             |
| Collector-emitter saturation voltage <sup>2)</sup><br>$I_C = 100\text{ mA}, I_B = 10\text{ mA}$                              | $V_{CEsat}$   | -          | -      | 0.25      | V             |
| Base-emitter voltage <sup>2)</sup><br>$I_C = 100\text{ mA}, V_{CE} = 1\text{ V}$                                             | $V_{BE(ON)}$  | -          | -      | 1.2       |               |

**AC Characteristics**

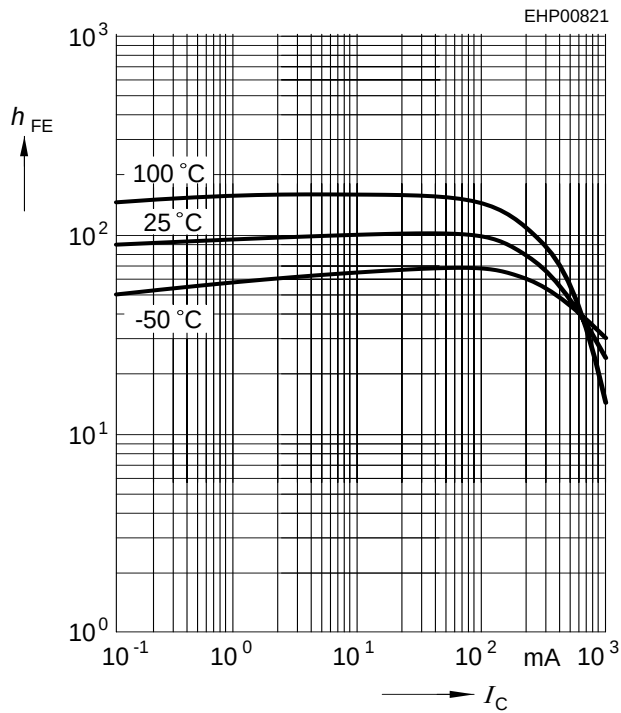
|                                                                                      |          |   |     |   |     |
|--------------------------------------------------------------------------------------|----------|---|-----|---|-----|
| Transition frequency<br>$I_C = 20\text{ mA}, V_{CE} = 5\text{ V}, f = 20\text{ MHz}$ | $f_T$    | - | 100 | - | MHz |
| Collector-base capacitance<br>$V_{CB} = 10\text{ V}, f = 1\text{ MHz}$               | $C_{cb}$ | - | 7   | - | pF  |

<sup>1)</sup>For calculation of  $R_{thJA}$  please refer to Application Note AN077 (Thermal Resistance Calculation)

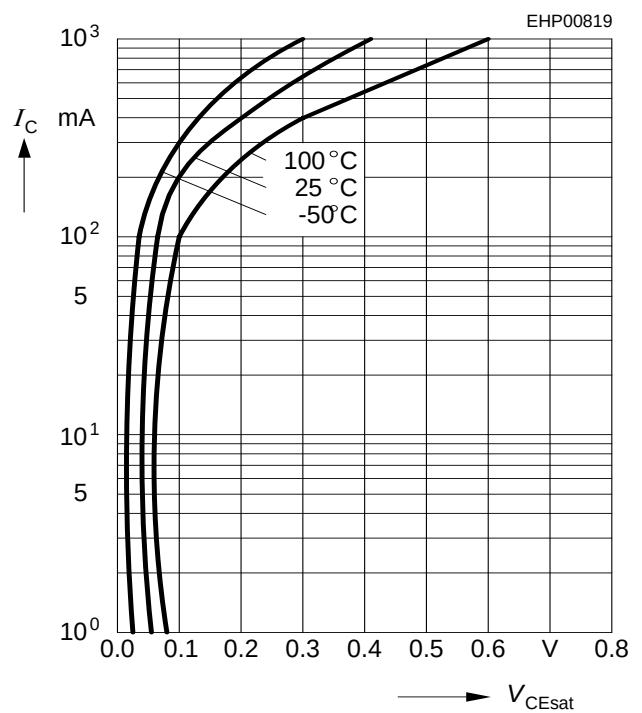
<sup>2)</sup>Pulse test:  $t < 300\mu\text{s}; D < 2\%$

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

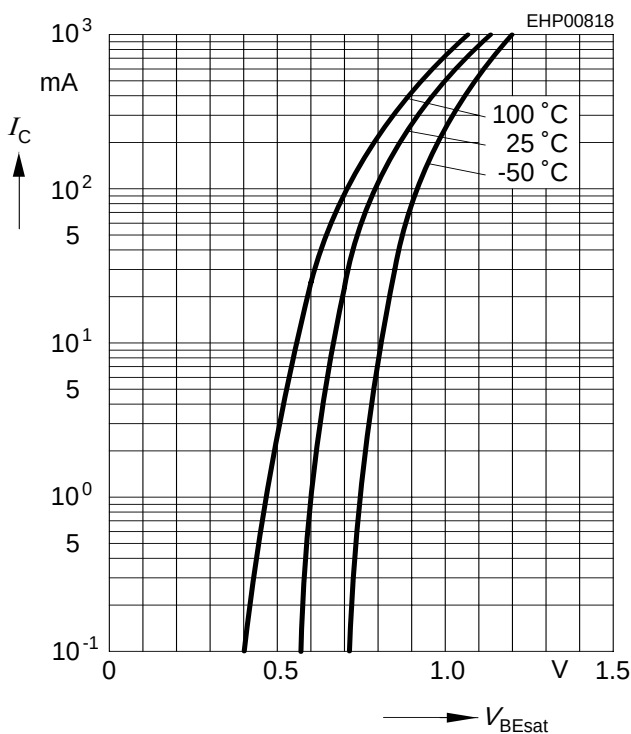
$$V_{CE} = 1 \text{ V}$$


**Collector-emitter saturation voltage**

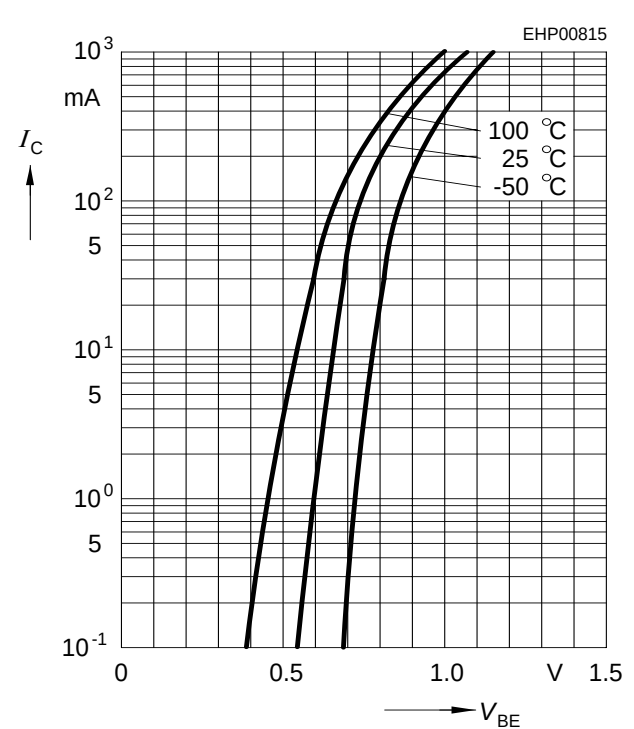
$$I_C = f(V_{CEsat}), h_{FE} = 10$$


**Base-emitter saturation voltage**

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

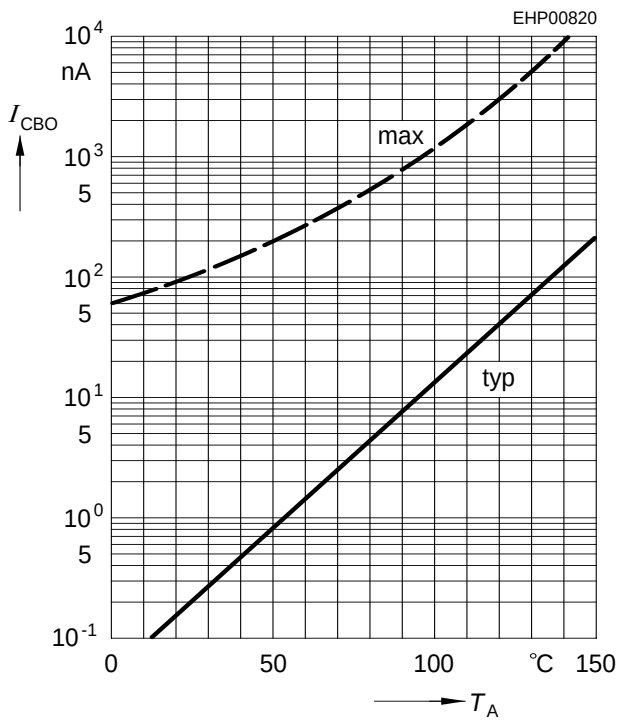

**Collector current  $I_C = f(V_{BE})$** 

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



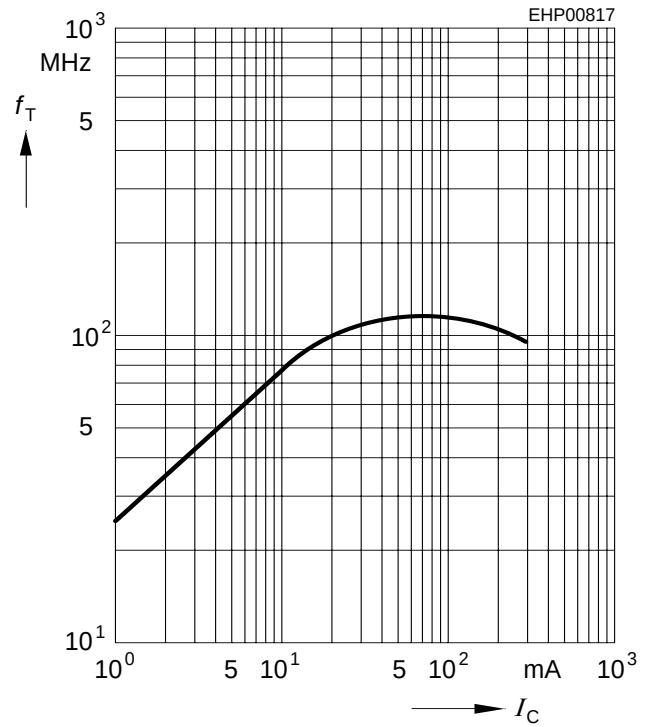
**Collector cutoff current**  $I_{CBO} = f(T_A)$

$V_{CBO} = 80 \text{ V}$



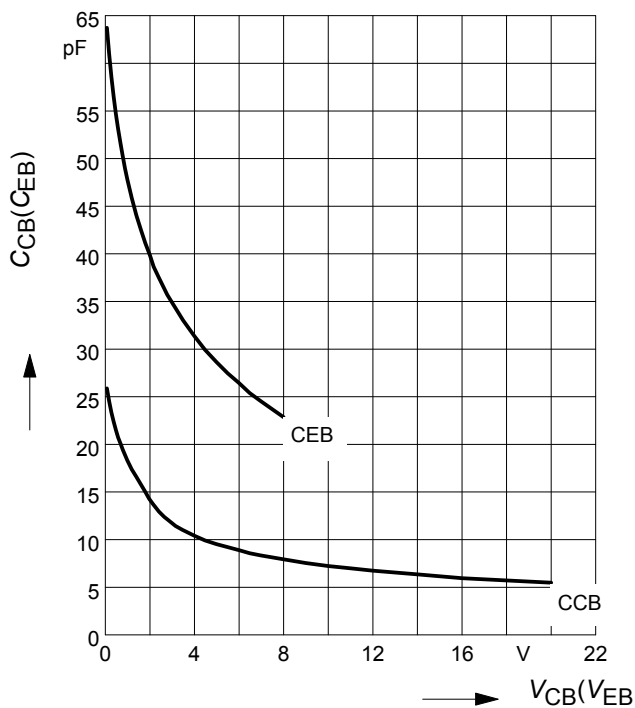
**Transition frequency**  $f_T = f(I_C)$

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

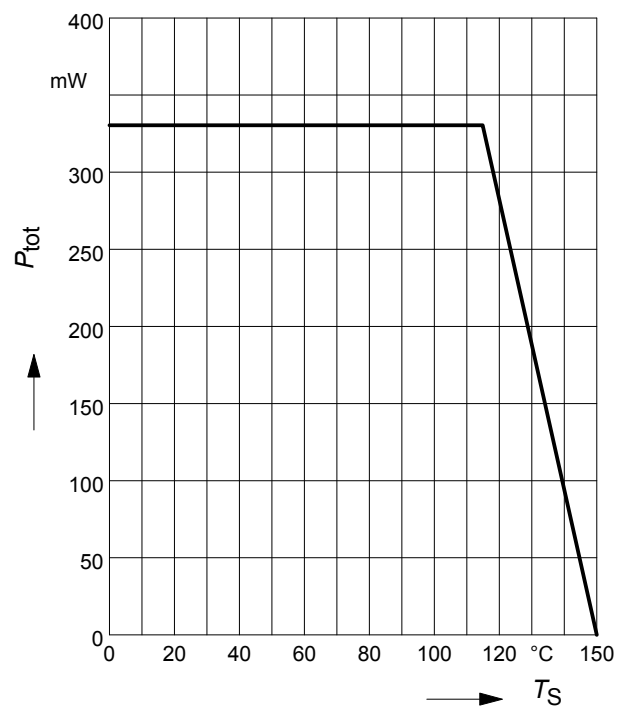


**Collector-base capacitance**  $C_{cb} = f(V_{CB})$

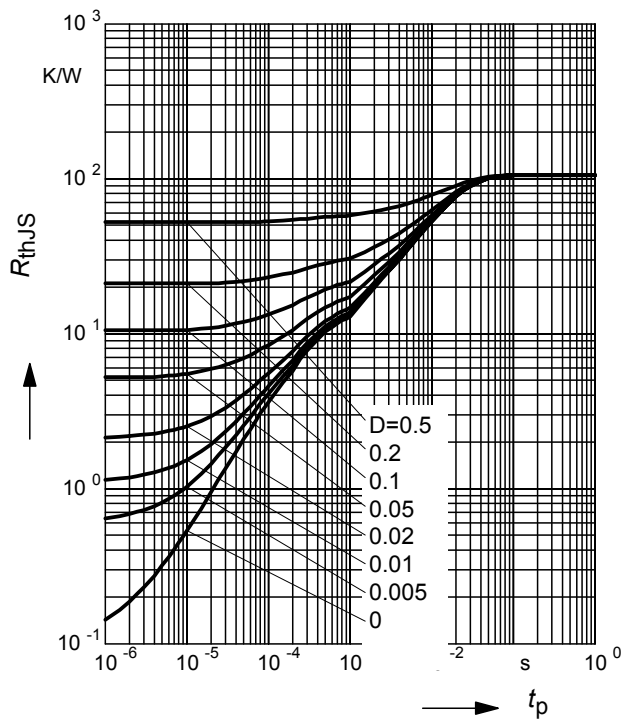
**Emitter-base capacitance**  $C_{eb} = f(V_{EB})$



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

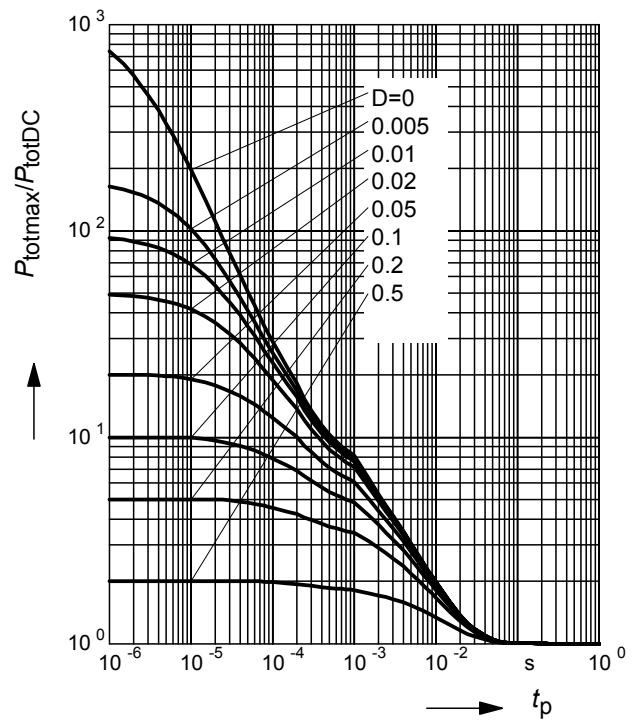


### Permissible Pulse Load $R_{thJS} = f(t_p)$

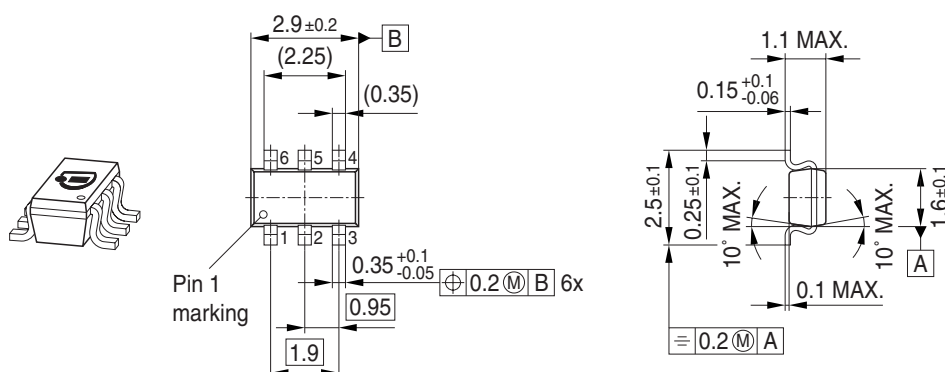


### Permissible Pulse Load

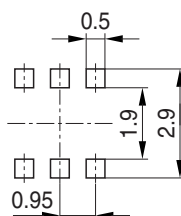
$$P_{totmax}/P_{totDC} = f(t_p)$$



## Package Outline

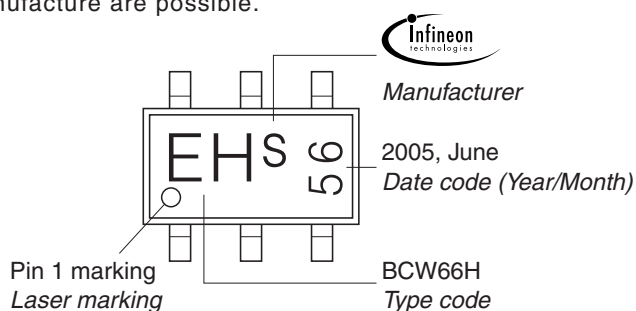


## Foot Print



## Marking Layout (Example)

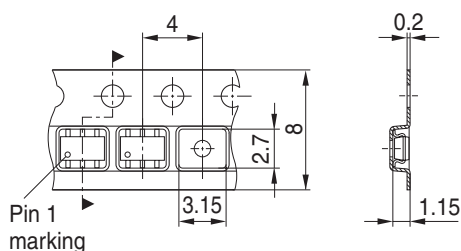
Small variations in positioning of Date code, Type code and Manufacture are possible.



## Standard Packing

Reel ø180 mm = 3.000 Pieces/Reel  
Reel ø330 mm = 10.000 Pieces/Reel

For symmetric types no defined Pin 1 orientation in reel.



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