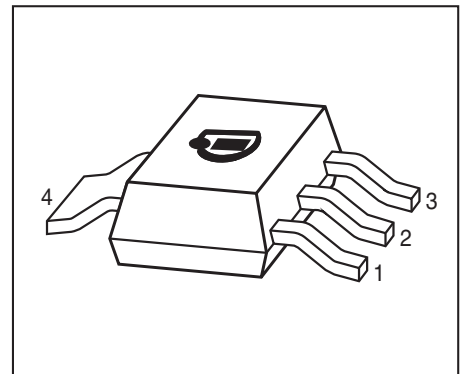


## NPN Silicon AF Transistor

- For general AF applications
- High collector current
- High current gain
- Low collector-emitter saturation voltage
- Complementary type: BCP69 (PNP)
- Pb-free (RoHS compliant) package<sup>1)</sup>
- Qualified according AEC Q101



| Type     | Marking | Pin Configuration |     |     |     |   |   | Package |
|----------|---------|-------------------|-----|-----|-----|---|---|---------|
| BCP68-25 | *       | 1=B               | 2=C | 3=E | 4=C | - | - | SOT223  |

\* Marking is the same as the type-name

## Maximum Ratings

| Parameter                                     | Symbol    | Value       | Unit |
|-----------------------------------------------|-----------|-------------|------|
| Collector-emitter voltage                     | $V_{CEO}$ | 20          | V    |
| Collector-emitter voltage                     | $V_{CES}$ | 25          |      |
| Collector-base voltage                        | $V_{CBO}$ | 25          |      |
| Emitter-base voltage                          | $V_{EBO}$ | 5           |      |
| Collector current                             | $I_C$     | 1           | A    |
| Peak collector current, $t_p \leq 10$ ms      | $I_{CM}$  | 2           |      |
| Base current                                  | $I_B$     | 100         | mA   |
| Peak base current                             | $I_{BM}$  | 200         |      |
| Total power dissipation-<br>$T_S \leq 114$ °C | $P_{tot}$ | 3           | W    |
| Junction temperature                          | $T_j$     | 150         | °C   |
| Storage temperature                           | $T_{stg}$ | -65 ... 150 |      |

<sup>1)</sup>Pb-containing package may be available upon special request

### Thermal Resistance

| Parameter                                | Symbol     | Value     | Unit |
|------------------------------------------|------------|-----------|------|
| Junction - soldering point <sup>1)</sup> | $R_{thJS}$ | $\leq 12$ | 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>$I_C = 30\text{ mA}$ , $I_B = 0$                                                                                                      | $V_{(BR)CEO}$ | 20              | -             | -             | V             |
| Collector-base breakdown voltage<br>$I_C = 10\text{ }\mu\text{A}$ , $I_E = 0$                                                                                                | $V_{(BR)CBO}$ | 25              | -             | -             |               |
| Collector-emitter breakdown voltage<br>$I_C = 10\text{ }\mu\text{A}$ , $V_{BE} = 0$                                                                                          | $V_{(BR)CES}$ | 25              | -             | -             |               |
| 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>$V_{CB} = 25\text{ V}$ , $I_E = 0$ , $T_A = 150^\circ\text{C}$                                        | $I_{CBO}$     | -<br>-          | -<br>-        | 0.1<br>100    | $\mu\text{A}$ |
| DC current gain <sup>2)</sup><br>$I_C = 5\text{ mA}$ , $V_{CE} = 10\text{ V}$<br>$I_C = 500\text{ mA}$ , $V_{CE} = 1\text{ V}$<br>$I_C = 1\text{ A}$ , $V_{CE} = 1\text{ V}$ | $h_{FE}$      | 50<br>160<br>60 | -<br>250<br>- | -<br>375<br>- | -             |
| Collector-emitter saturation voltage <sup>2)</sup><br>$I_C = 1\text{ A}$ , $I_B = 100\text{ mA}$                                                                             | $V_{CEsat}$   | -               | -             | 0.5           | V             |
| Base-emitter voltage <sup>2)</sup><br>$I_C = 5\text{ mA}$ , $V_{CE} = 10\text{ V}$<br>$I_C = 1\text{ A}$ , $V_{CE} = 1\text{ V}$                                             | $V_{BE(ON)}$  | -<br>-          | 0.6<br>-      | -<br>1        |               |

### AC Characteristics

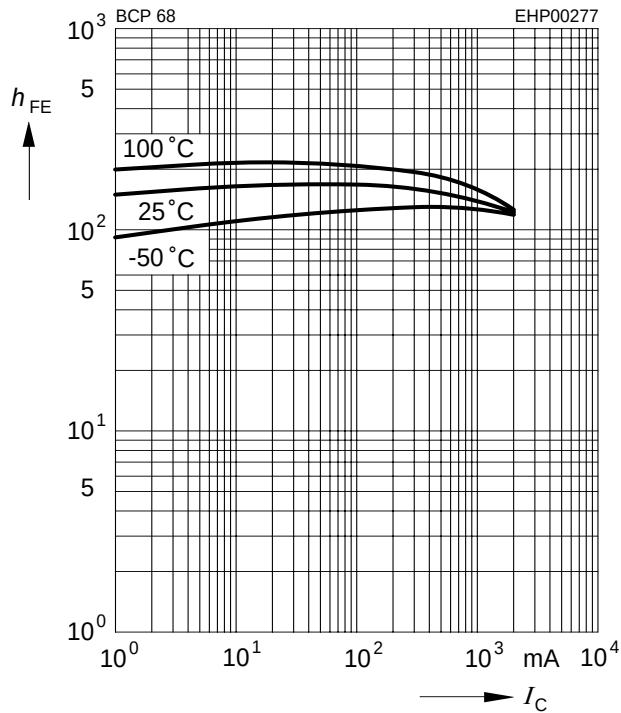
|                                                                                              |       |   |     |   |     |
|----------------------------------------------------------------------------------------------|-------|---|-----|---|-----|
| Transition frequency<br>$I_C = 100\text{ mA}$ , $V_{CE} = 5\text{ V}$ , $f = 100\text{ MHz}$ | $f_T$ | - | 100 | - | MHz |
|----------------------------------------------------------------------------------------------|-------|---|-----|---|-----|

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

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

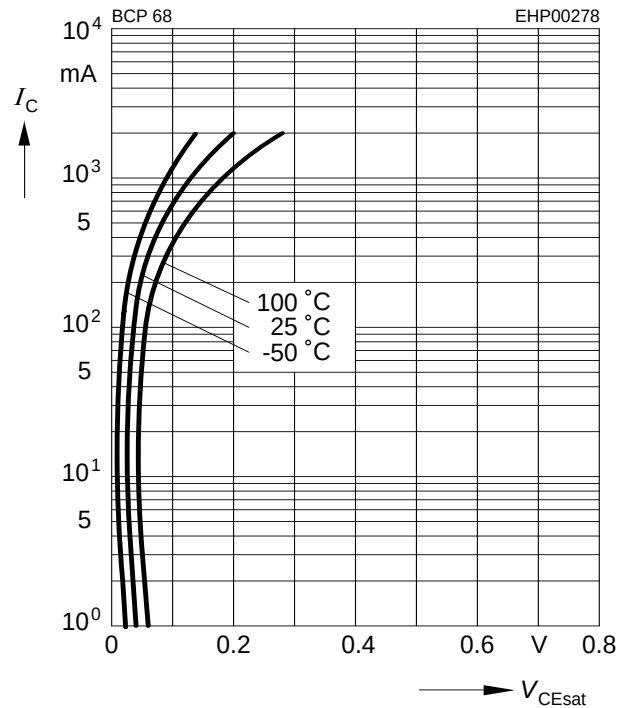
### DC current gain $h_{FE} = f(I_C)$

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



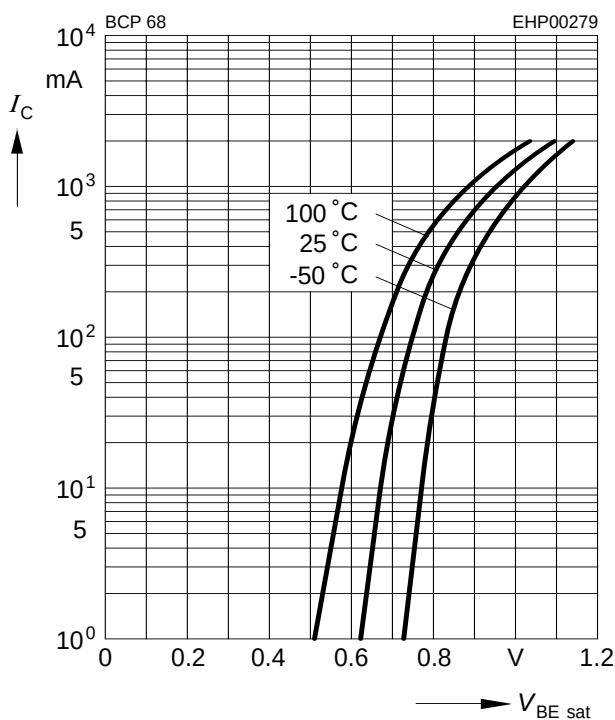
### Collector-emitter saturation voltage

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



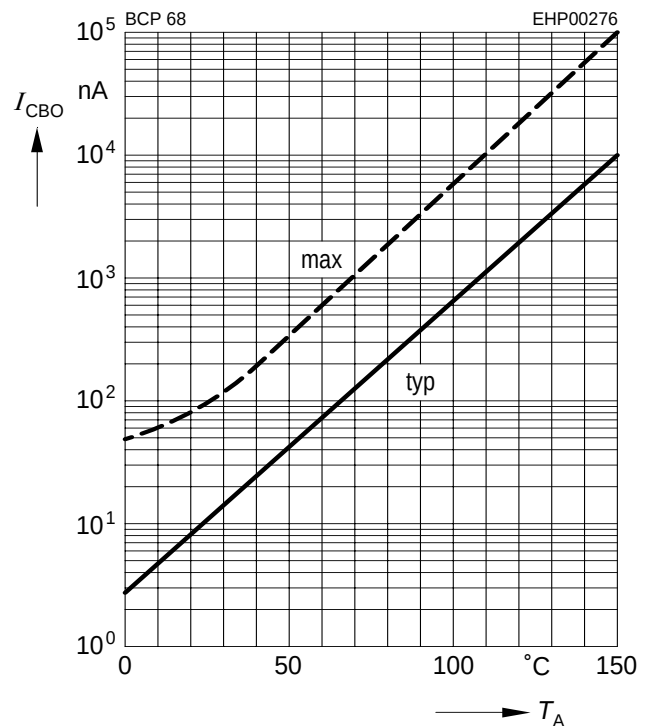
### Base-emitter saturation voltage

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



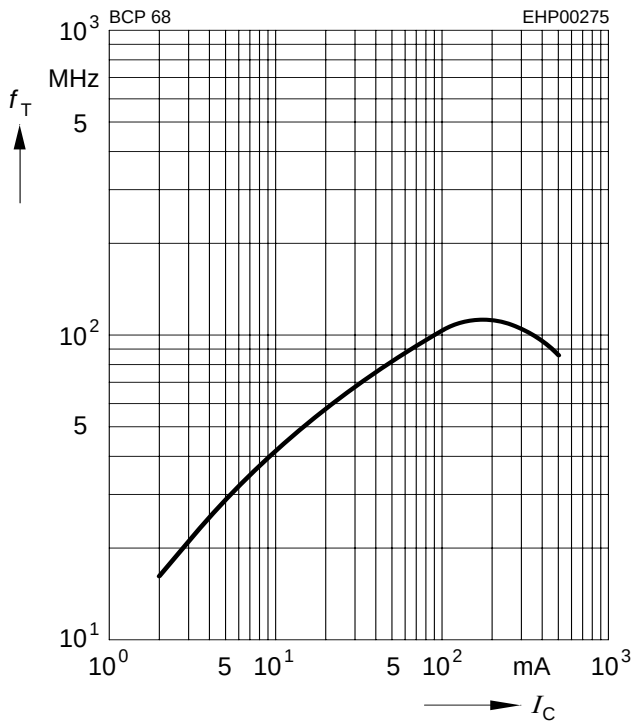
### Collector cutoff current $I_{CBO} = f(T_A)$

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

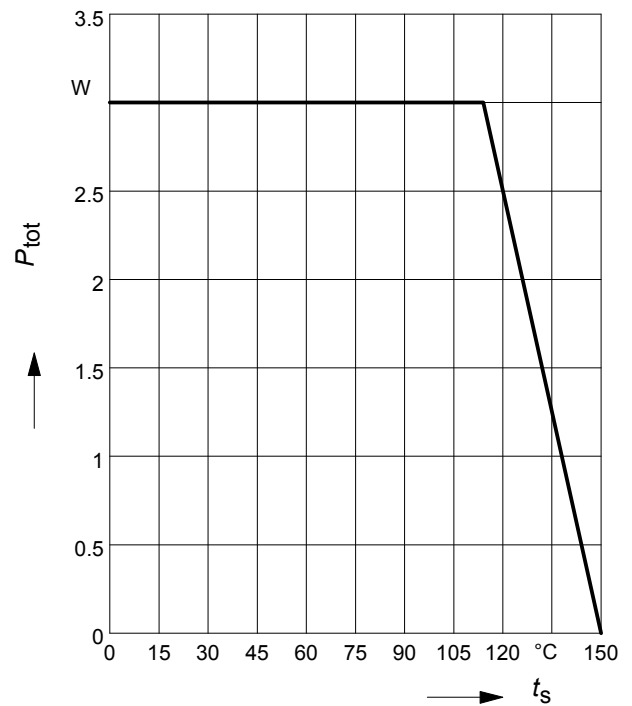


Transition frequency  $f_T = f(I_C)$

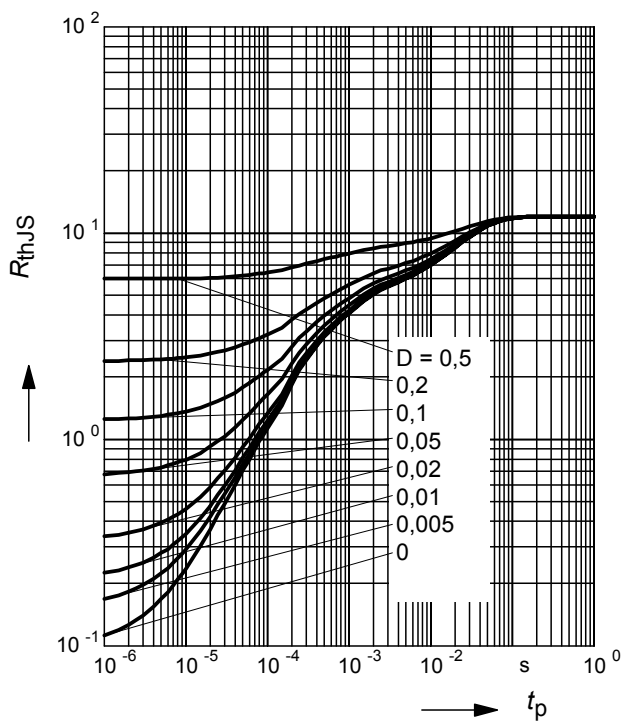
$V_{CE} = 5 \text{ V}$



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

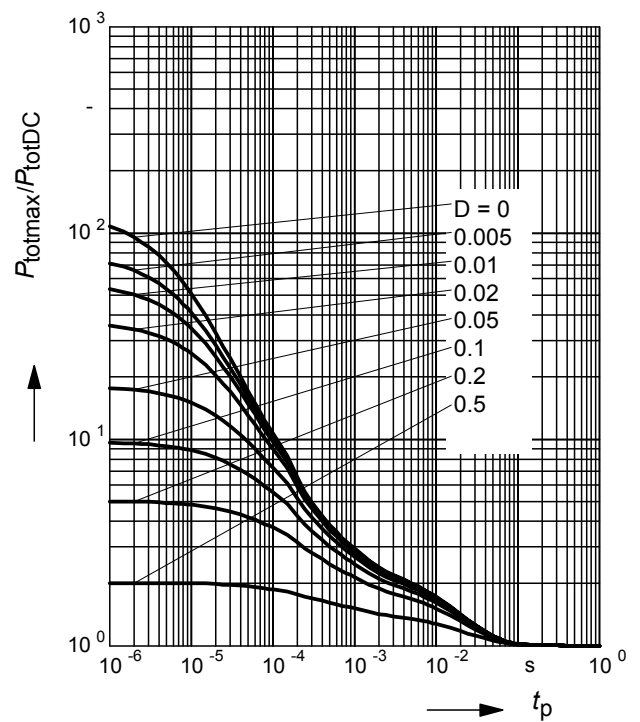


Permissible Pulse Load  $R_{thJS} = f(t_p)$

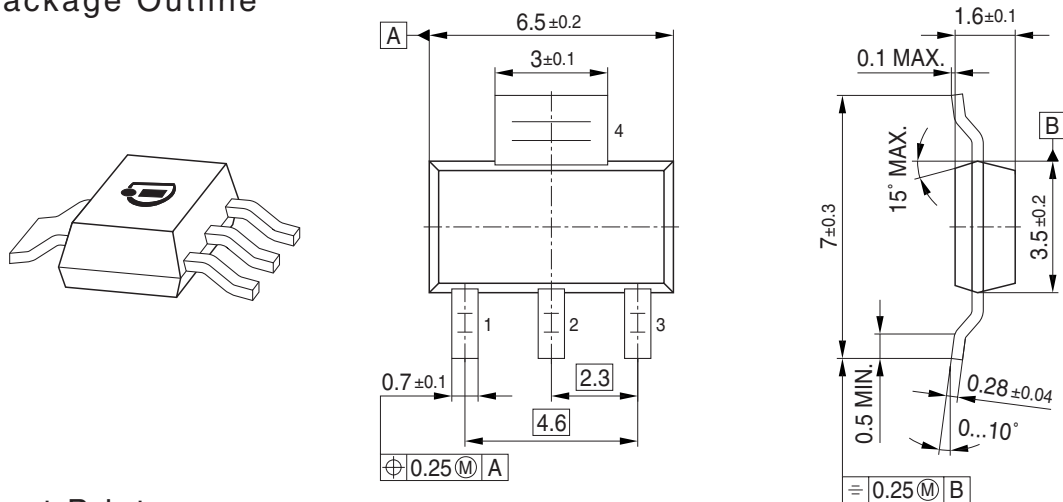


Permissible Pulse Load

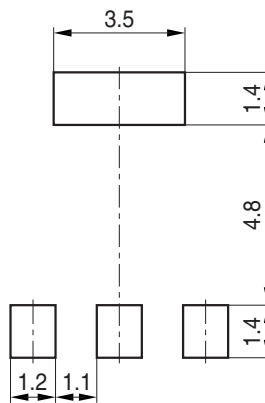
$P_{totmax}/P_{totDC} = f(t_p)$



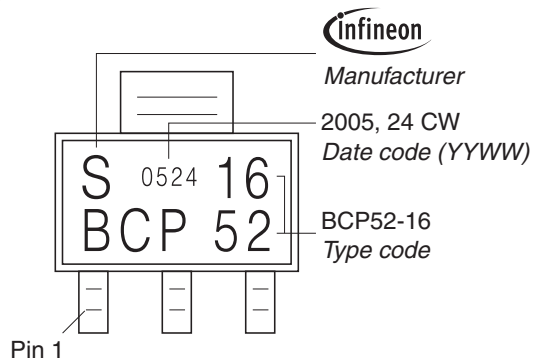
## Package Outline



## Foot Print

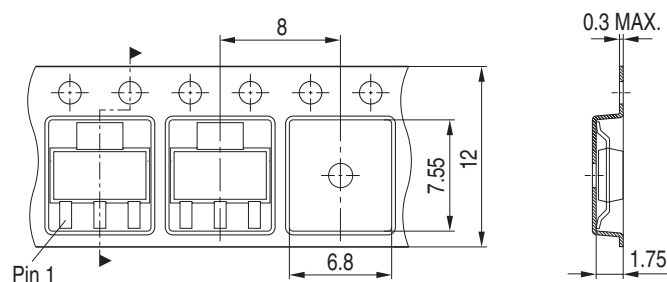


## Marking Layout (Example)



## Packing

Reel ø180 mm = 1.000 Pieces/Reel  
Reel ø330 mm = 4.000 Pieces/Reel



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