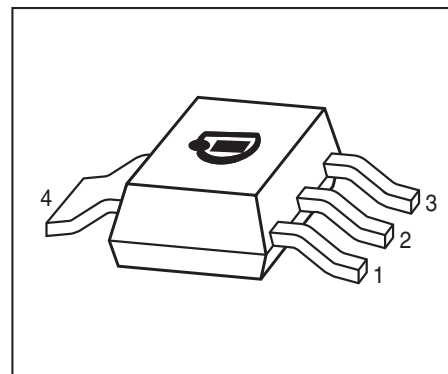


## PNP Silicon High-Voltage Transistors

- Suitable for video output stages in TV sets and switching power supplies
- High breakdown voltage
- Low collector-emitter saturation voltage
- Complementary types: BFN38 (NPN)
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101



| Type  | Marking | Pin Configuration |     |     |     |   |   | Package |
|-------|---------|-------------------|-----|-----|-----|---|---|---------|
| BFN39 | BFN39   | 1=B               | 2=C | 3=E | 4=C | - | - | SOT223  |

### Maximum Ratings

| Parameter                                     | Symbol    | Value       | Unit |
|-----------------------------------------------|-----------|-------------|------|
| Collector-emitter voltage                     | $V_{CEO}$ | 300         | V    |
| Collector-base voltage                        | $V_{CBO}$ | 300         |      |
| Emitter-base voltage                          | $V_{EBO}$ | 5           |      |
| Collector current                             | $I_C$     | 200         | mA   |
| Peak collector current, $t_p \leq 10$ ms      | $I_{CM}$  | 500         |      |
| Base current                                  | $I_B$     | 100         |      |
| Peak base current                             | $I_{BM}$  | 200         |      |
| Total power dissipation-<br>$T_S \leq 124$ °C | $P_{tot}$ | 1.5         | W    |
| Junction temperature                          | $T_j$     | 150         | °C   |
| Storage temperature                           | $T_{stg}$ | -65 ... 150 |      |

### Thermal Resistance

| Parameter                                | Symbol     | Value     | Unit |
|------------------------------------------|------------|-----------|------|
| Junction - soldering point <sup>1)</sup> | $R_{thJS}$ | $\leq 17$ | K/W  |

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

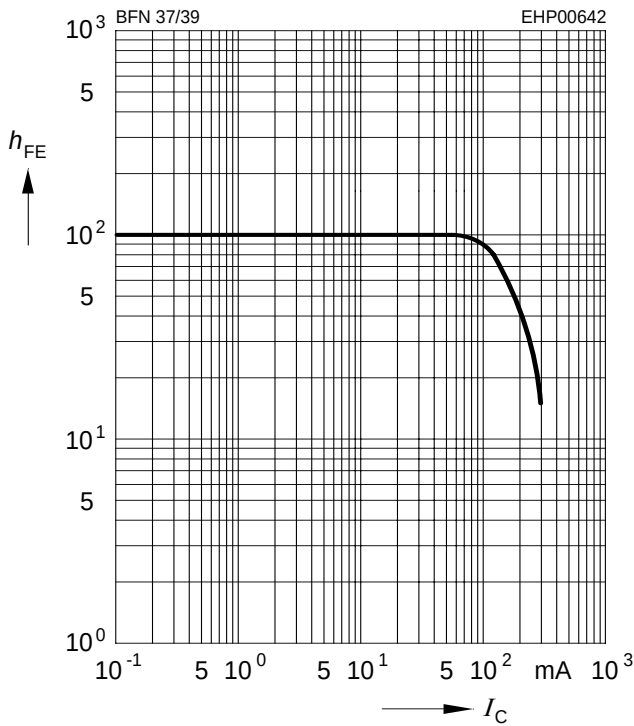
**Electrical Characteristics** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

| Parameter                                                                                                                                                              | Symbol        | Values         |             |             | Unit          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------|-------------|-------------|---------------|
|                                                                                                                                                                        |               | min.           | typ.        | max.        |               |
| DC Characteristics                                                                                                                                                     |               |                |             |             |               |
| Collector-emitter breakdown voltage<br>$I_C = 1\text{ mA}, I_B = 0$                                                                                                    | $V_{(BR)CEO}$ | 300            | -           | -           | V             |
| Collector-base breakdown voltage<br>$I_C = 100\text{ }\mu\text{A}, I_E = 0$                                                                                            | $V_{(BR)CBO}$ | 300            | -           | -           |               |
| Emitter-base breakdown voltage<br>$I_E = 100\text{ }\mu\text{A}, I_C = 0$                                                                                              | $V_{(BR)EBO}$ | 5              | -           | -           |               |
| Collector-base cutoff current<br>$V_{CB} = 250\text{ V}, I_E = 0$<br>$V_{CB} = 250\text{ V}, I_E = 0, T_A = 150\text{ }^\circ\text{C}$                                 | $I_{CBO}$     | -<br>-         | -<br>-      | 0.1<br>20   | $\mu\text{A}$ |
| Emitter-base cutoff current<br>$V_{EB} = 5\text{ V}, I_C = 0$                                                                                                          | $I_{EBO}$     | -              | -           | 100         | nA            |
| DC current gain <sup>1)</sup><br>$I_C = 1\text{ mA}, V_{CE} = 10\text{ V}$<br>$I_C = 10\text{ mA}, V_{CE} = 10\text{ V}$<br>$I_C = 30\text{ mA}, V_{CE} = 10\text{ V}$ | $h_{FE}$      | 25<br>40<br>30 | -<br>-<br>- | -<br>-<br>- | -             |
| Collector-emitter saturation voltage <sup>1)</sup><br>$I_C = 20\text{ mA}, I_B = 2\text{ mA}$                                                                          | $V_{CEsat}$   | -              | -           | 0.5         | V             |
| Base emitter saturation voltage <sup>1)</sup><br>$I_C = 20\text{ mA}, I_B = 2\text{ mA}$                                                                               | $V_{BEsat}$   | -              | -           | 0.9         |               |
| AC Characteristics                                                                                                                                                     |               |                |             |             |               |
| Transition frequency<br>$I_C = 20\text{ MHz}, V_{CE} = 10\text{ V}, f = 100\text{ MHz}$                                                                                | $f_T$         | -              | 100         | -           | MHz           |
| Collector-base capacitance<br>$V_{CB} = 30\text{ V}, f = 1\text{ MHz}$                                                                                                 | $C_{cb}$      | -              | 2.5         | -           | pF            |

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

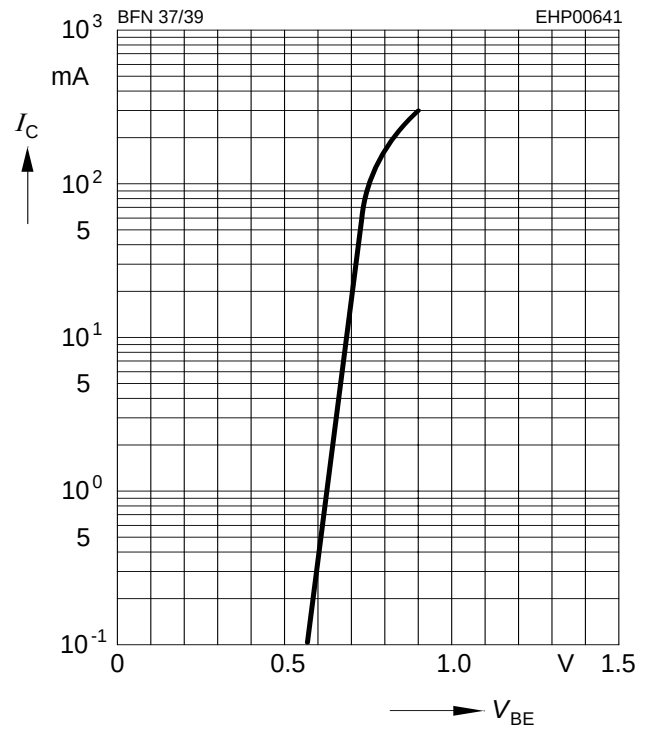
**DC current gain  $h_{FE} = f(I_C)$**

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



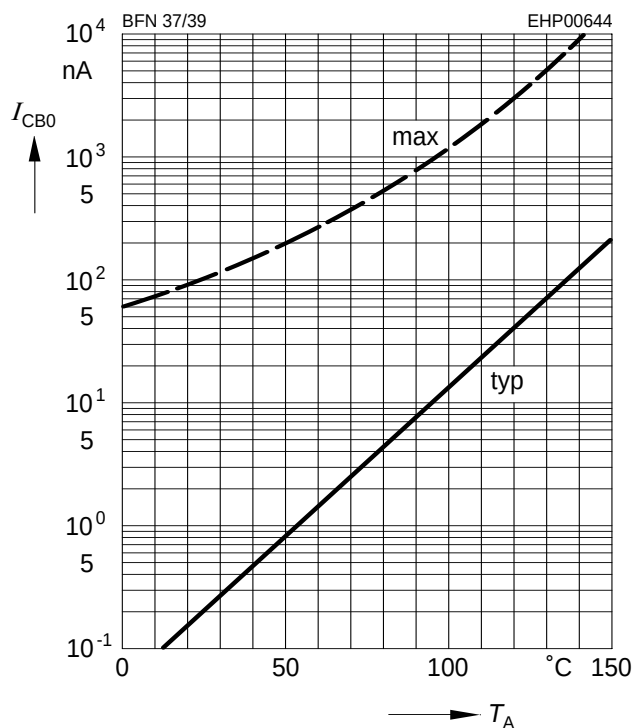
**Collector current  $I_C = f(V_{BE})$**

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



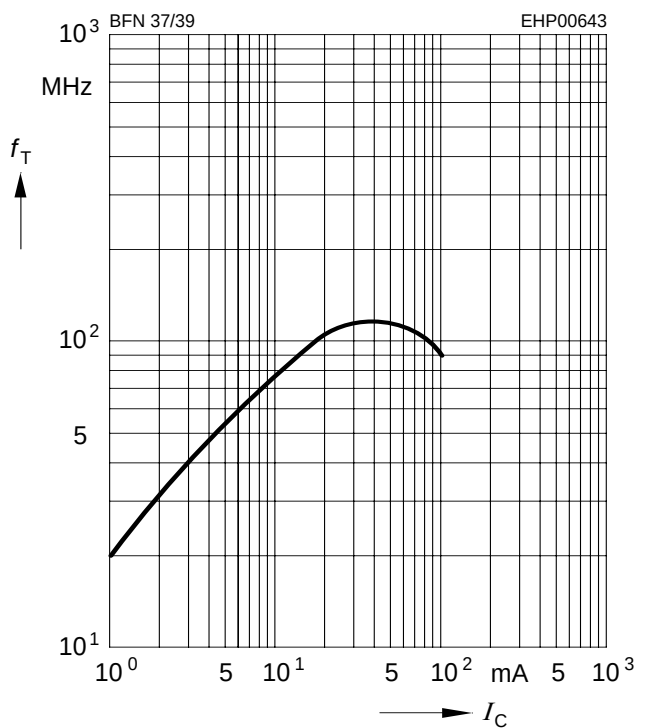
**Collector cutoff current  $I_{CBO} = f(T_A)$**

$V_{CBO} = 200\text{ V}$



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

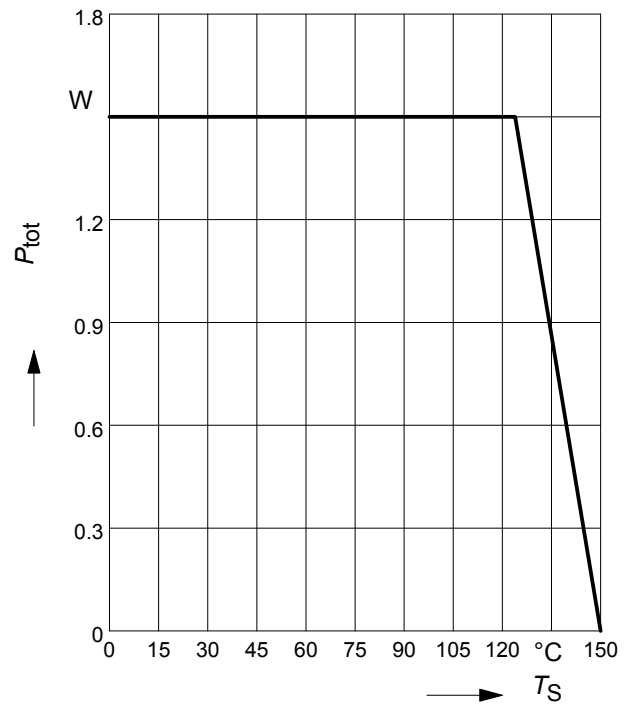
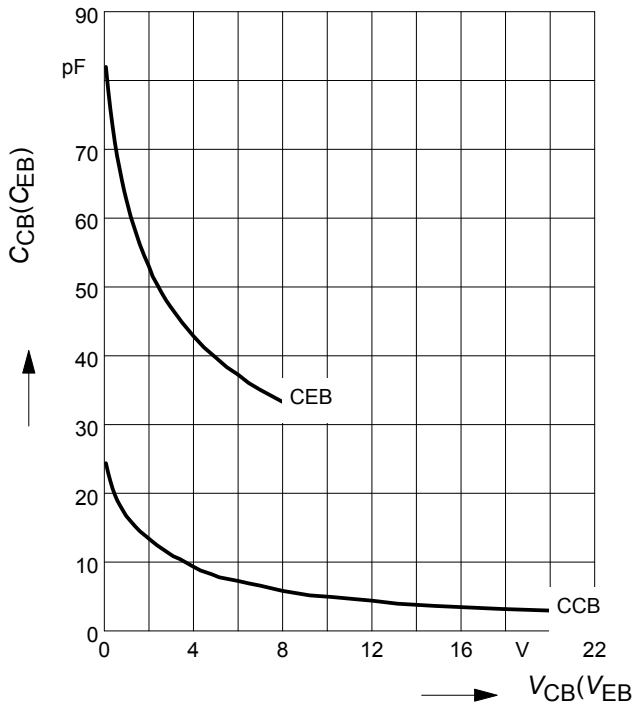
$V_{CE} = 10\text{ V}$



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

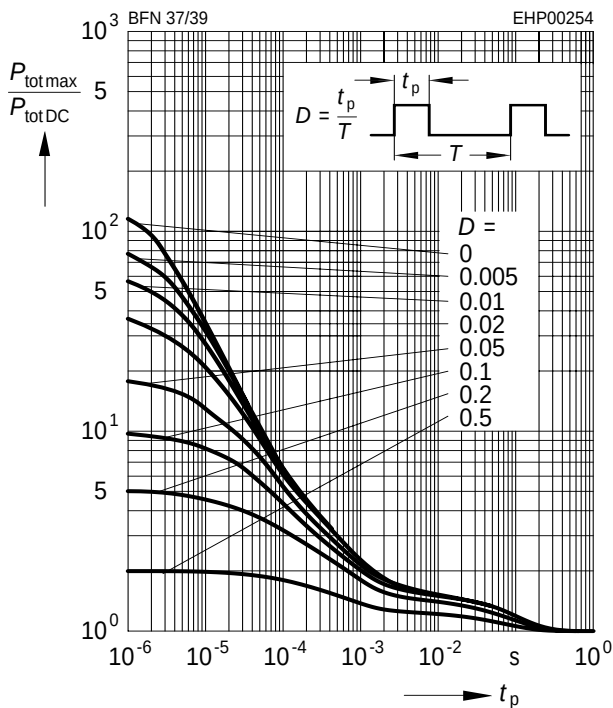
Emitter-base capacitance  $C_{eb} = f(V_{EB})$

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

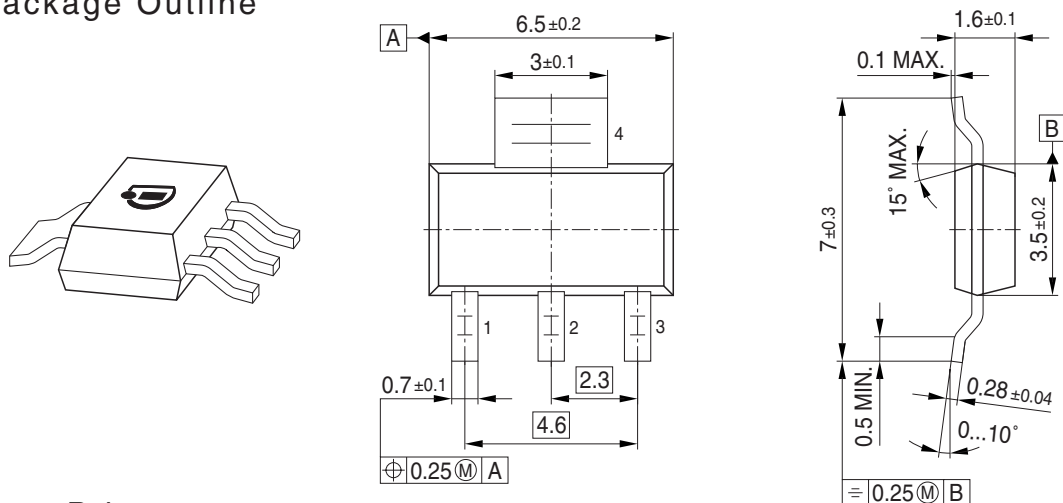


### Permissible Pulse Load

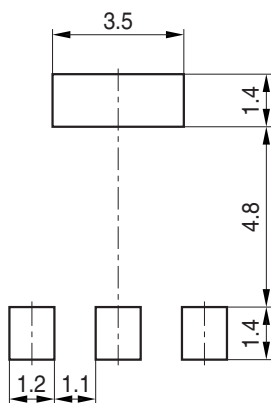
$P_{totmax}/P_{totDC} = f(t_p)$



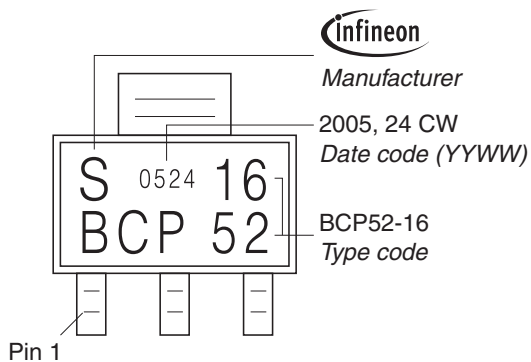
## Package Outline



## Foot Print

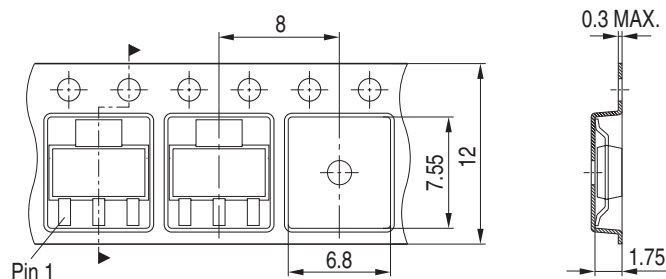


## Marking Layout (Example)



## Packing

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



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