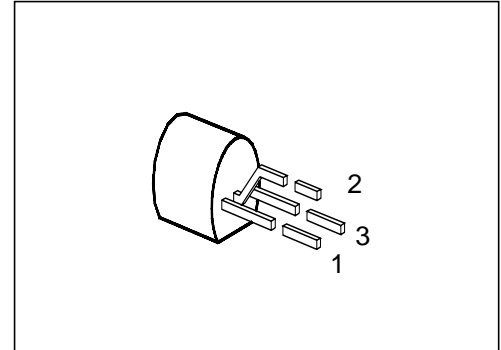


## NPN Silicon AF Switching Transistor

BCX 12

- For general AF applications
- High breakdown voltage
- Low collector-emitter saturation voltage
- Complementary type: BCX 13 (PNP)



| Type   | Marking | Ordering Code | Pin Configuration |   |   | Package <sup>1)</sup> |
|--------|---------|---------------|-------------------|---|---|-----------------------|
|        |         |               | 1                 | 2 | 3 |                       |
| BCX 12 | BCX 12  | Q62702-C25    | C                 | B | E | TO-92                 |

### Maximum Ratings

| Parameter                                     | Symbol    | Values         | Unit |
|---|-----------|----------------|------|
| Collector-emitter voltage                     | $V_{CE0}$ | 125            | V    |
| Collector-base voltage                        | $V_{CB0}$ | 125            |      |
| Emitter-base voltage                          | $V_{EB0}$ | 5              |      |
| Collector current                             | $I_C$     | 800            | mA   |
| Peak collector current                        | $I_{CM}$  | 1              | A    |
| Base current                                  | $I_B$     | 100            | mA   |
| Peak base current                             | $I_{BM}$  | 200            |      |
| Total power dissipation, $T_c = 66\text{ °C}$ | $P_{tot}$ | 625            | mW   |
| Junction temperature                          | $T_j$     | 150            | °C   |
| Storage temperature range                     | $T_{stg}$ | - 65 ... + 150 |      |

### Thermal Resistance

|                               |              |       |     |
|-------------------------------|--------------|-------|-----|
| Junction - ambient            | $R_{th\ JA}$ | ≤ 200 | K/W |
| Junction - case <sup>2)</sup> | $R_{th\ JC}$ | ≤ 135 |     |

<sup>1)</sup> For detailed information see chapter Package Outlines.

<sup>2)</sup> Mounted on Al heat sink 15 mm × 25 mm × 0.5 mm.

## Electrical Characteristics

at  $T_A = 25\text{ °C}$ , unless otherwise specified.

| Parameter | Symbol | Values |      |      | Unit |
|-----------|--------|--------|------|------|------|
|           |        | min.   | typ. | max. |      |

### DC characteristics

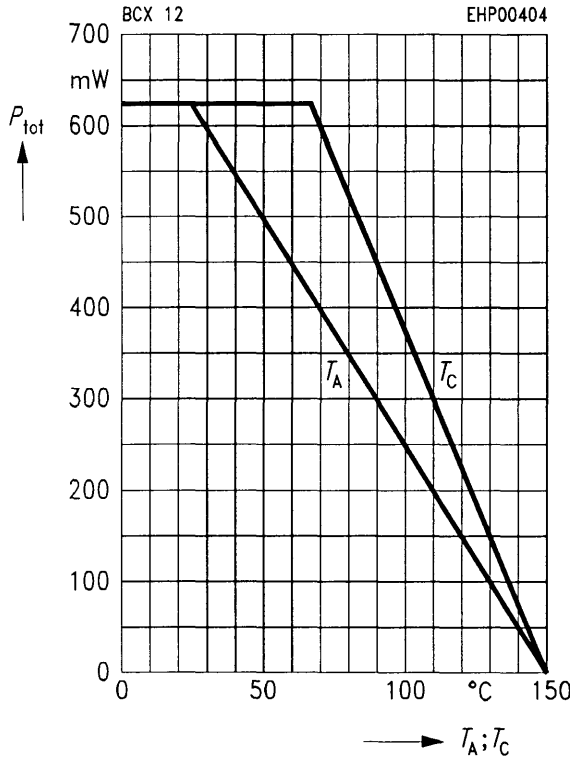
|  |               |                      |                  |                  |                     |
|--|---------------|----------------------|------------------|------------------|---------------------|
| Collector-emitter breakdown voltage<br>$I_C = 10\text{ mA}$ , $I_B = 0$  | $V_{(BR)CE0}$ | 125                  | –                | –                | V                   |
| Collector-base breakdown voltage<br>$I_C = 100\text{ }\mu\text{A}$ , $I_B = 0$   | $V_{(BR)CB0}$ | 125                  | –                | –                |                     |
| Emitter-base breakdown voltage<br>$I_E = 10\text{ }\mu\text{A}$ , $I_C = 0$  | $V_{(BR)EBS}$ | 5                    | –                | –                |                     |
| Collector-base cutoff current<br>$V_{CB} = 100\text{ V}$ , $I_E = 0$<br>$V_{CB} = 100\text{ V}$ , $I_E = 0$ , $T_A = 150\text{ °C}$  | $I_{CB0}$     | –                    | –                | 100<br>10        | nA<br>$\mu\text{A}$ |
| Emitter cutoff current<br>$V_{EB} = 4\text{ V}$  | $I_{EB0}$     | –                    | –                | 100              | nA                  |
| DC current gain <sup>1)</sup><br>$I_C = 1\text{ mA}$ , $V_{CE} = 1\text{ V}$<br>$I_C = 10\text{ mA}$ , $V_{CE} = 1\text{ V}$<br>$I_C = 100\text{ mA}$ , $V_{CE} = 1\text{ V}$<br>$I_C = 200\text{ mA}$ , $V_{CE} = 1\text{ V}$ | $h_{FE}$      | 25<br>50<br>63<br>40 | –<br>–<br>–<br>– | –<br>–<br>–<br>– | –                   |
| Collector-emitter saturation voltage <sup>1)</sup><br>$I_C = 500\text{ mA}$ , $I_B = 50\text{ mA}$   | $V_{CEsat}$   | –                    | –                | 1.0              | V                   |
| Base-emitter saturation voltage <sup>1)</sup><br>$I_C = 500\text{ mA}$ , $I_B = 50\text{ mA}$  | $V_{BEsat}$   | –                    | –                | 1.6              |                     |

### AC characteristics

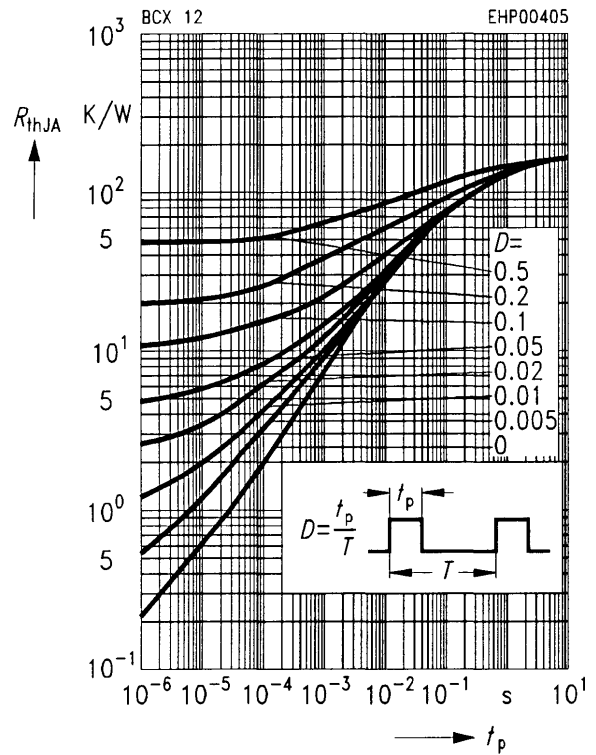
|  |           |   |     |   |     |
|--|-----------|---|-----|---|-----|
| Transition frequency<br>$I_C = 20\text{ mA}$ , $V_{CE} = 5\text{ V}$ , $f = 20\text{ MHz}$ | $f_T$     | – | 100 | – | MHz |
| Output capacitance<br>$V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$                          | $C_{obo}$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

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

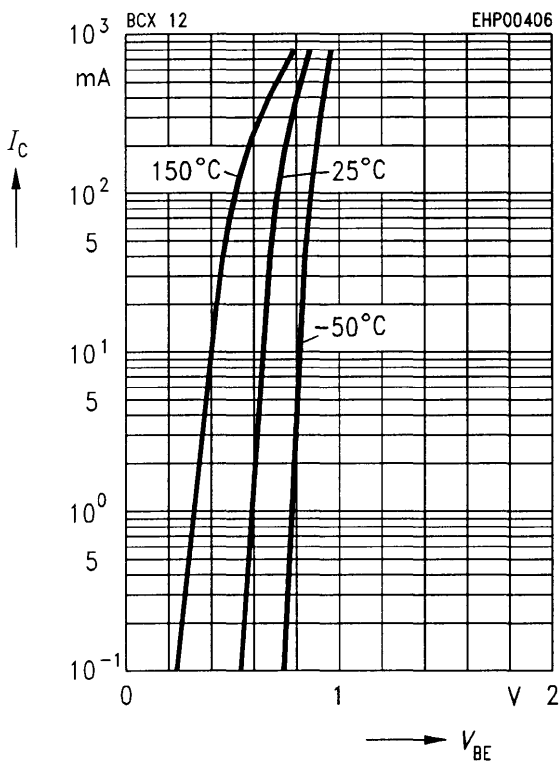
**Total power dissipation**  $P_{tot} = f(T_A; T_C)$



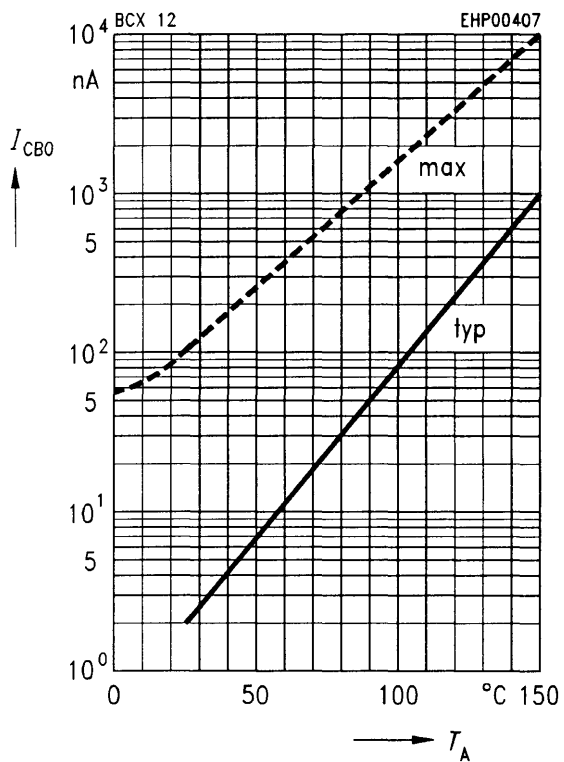
**Permissible pulse load**  $R_{thJA} = f(t_p)$



**Collector current**  $I_C = f(V_{BE})$   
 $V_C = 1 V$

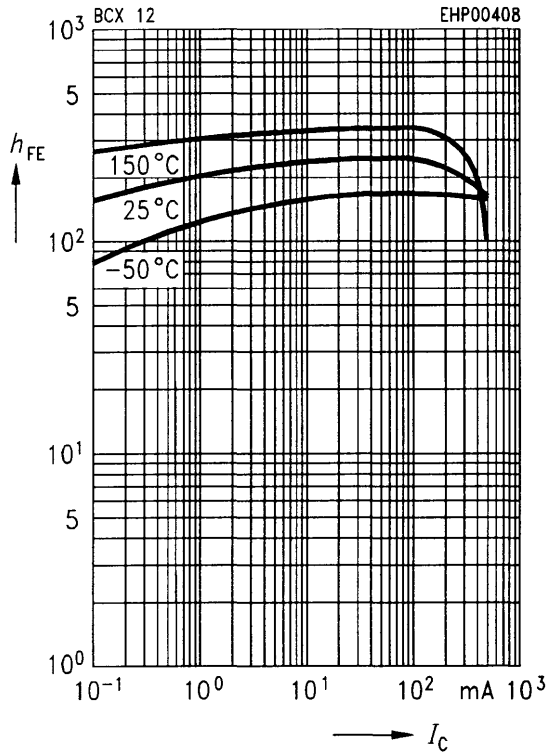


**Collector cutoff current**  $I_{CB0} = f(T_A)$   
 $V_{CB} = V_{CBmax}$



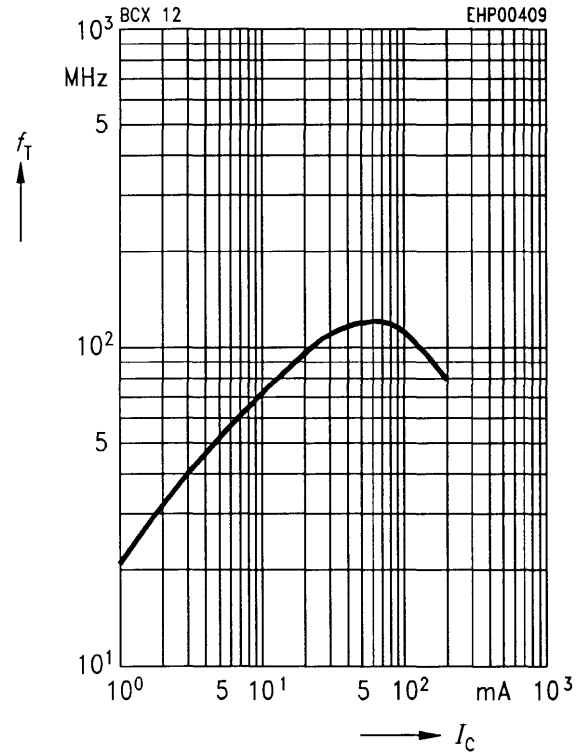
**DC current gain  $h_{FE} = f(I_C)$**

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



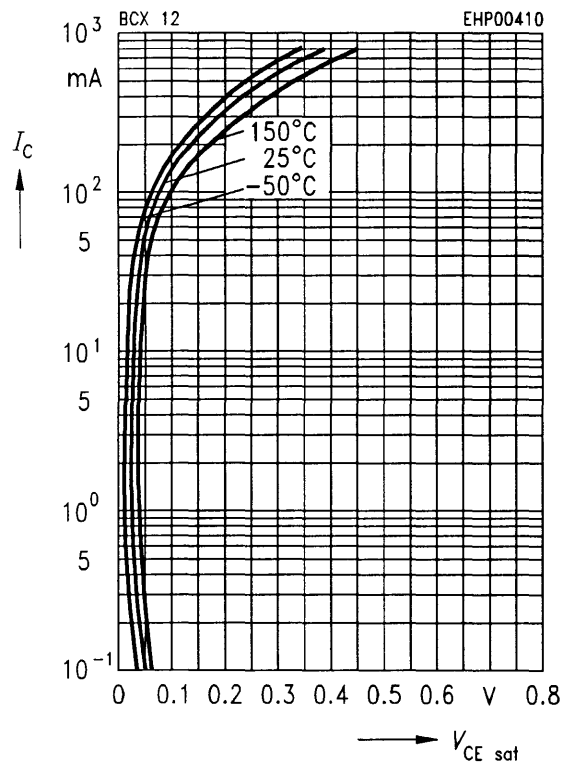
**Transition frequency  $f_T = f(I_C)$**

$f = 20 \text{ MHz}, V_{CE} = 5 \text{ V}, T_A = 25^\circ \text{ C}$



**Collector-emitter saturation voltage**

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



**Base-emitter saturation voltage**

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

