

**BFX 90**  
**BFX 91**

## SILICON PLANAR PNP

### HIGH-VOLTAGE AMPLIFIERS

The BFX 90 and BFX 91 are silicon planar epitaxial PNP transistors in Jedec TO-18 (BFX 90) and Jedec TO-39 (BFX 91) metal cases.

Both devices feature high voltage, high gain, low noise and excellent current gain linearity from 10  $\mu$ A to 50 mA.

### ABSOLUTE MAXIMUM RATINGS

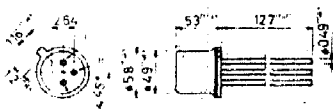
|                |  |            |            |
|----------------|--|------------|------------|
| $V_{CBO}$      | Collector-base voltage ( $I_E = 0$ )                 | -180       | V          |
| $V_{CEO}$      | Collector-emitter voltage ( $I_B = 0$ )              | -180       | V          |
| $V_{EBO}$      | Emitter-base voltage ( $I_C = 0$ )                   | -6         | V          |
| $I_C$          | Collector current                                    | -100       | mA         |
| $P_{tot}$      | Total power dissipation at $T_{amb} \leq 25^\circ C$ | for BFX 90 | 0.4 W      |
|                |  | for BFX 91 | 0.7 W      |
|                | at $T_{case} \leq 25^\circ C$                        | for BFX 90 | 1.4 W      |
|                |  | for BFX 91 | 2.5 W      |
| $T_{stg}, T_j$ | Storage and junction temperature                     | -55 to 200 | $^\circ C$ |

### MECHANICAL DATA

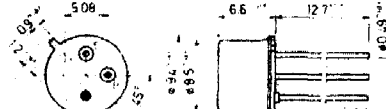
Dimensions in mm

Collector connected to case

Collector connected to case



(sim. to TO-18)



(sim. to TO-39)

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**THERMAL DATA**

|                  |                                     |     | BFX 90   | BFX 91   |
|------------------|-------------------------------------|-----|----------|----------|
| $R_{th\ j-case}$ | Thermal resistance junction-case    | max | 125 °C/W | 70 °C/W  |
| $R_{th\ j-amb}$  | Thermal resistance junction-ambient | max | 438 °C/W | 250 °C/W |

**ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25^{\circ}C$  unless otherwise specified)

| Parameter   | Test conditions   | Min.  | Typ.  | Max. | Unit    |
|---|---|-------|-------|------|---------|
| $I_{CBO}$ Collector cutoff current ( $I_E = 0$ )                  | $V_{CB} = -100V$<br>$V_{CB} = -100V$ $T_{amb} = 125^{\circ}C$   | -0.2  | -10   |      | nA      |
|   |   | -0.03 | -10   |      | $\mu A$ |
| $I_{EBO}$ Emitter cutoff current ( $I_C = 0$ )                    | $V_{EB} = -4V$  | -0.2  | -10   |      | nA      |
| $V_{(BR)CBO}$ Collector-base breakdown voltage ( $I_E = 0$ )      | $I_C = -10 \mu A$   | -180  |       |      | V       |
| $V_{CEO(sus)}$ Collector-emitter sustaining voltage ( $I_B = 0$ ) | $I_C = -2 mA$   | -180  |       |      | V       |
| $V_{(BR)EBO}$ Emitter-base breakdown voltage ( $I_C = 0$ )        | $I_E = -10 \mu A$   | -6    |       |      | V       |
| $V_{CE(sat)}$ * Collector-emitter saturation voltage              | $I_C = -10 mA$ $I_B = -1 mA$  | -0.1  | -0.25 |      | V       |
| $V_{BE(sat)}$ * Base-emitter saturation voltage                   | $I_C = -10 mA$ $I_B = -1 mA$  | -0.74 | -0.9  |      | V       |
| $h_{FE}$ DC current gain  | $I_C = -10 \mu A$ $V_{CE} = -10V$<br>$I_C = -1 mA$ $V_{CE} = -10V$<br>$I_C = -10 mA$ $V_{CE} = -10V$<br>$I_C = -10 \mu A$ $V_{CE} = -10V$<br>$T_{amb} = -55^{\circ}C$<br>$I_C = -100 \mu A$ $V_{CE} = -10V$<br>$T_{amb} = -55^{\circ}C$ | 60    | 110   |      | -       |
|   |   | 80    | 170   |      | -       |
|   |   | 80    | 200   | 300  | -       |
|   |   | 15    | 60    |      | -       |
|   |   | 30    | 90    |      | -       |
|   |   |       |       |      |         |
| $h_{fe}$ Small signal current gain                                | $I_C = -1 mA$ $V_{CE} = -10V$<br>$f = 1 kHz$  | 100   | 400   |      | -       |
| $f_T$ Transition frequency  | $I_C = -1 mA$ $V_{CE} = -10V$<br>$f = 20 MHz$   | 40    | 60    | 160  | MHz     |

**ELECTRICAL CHARACTERISTICS** (continued)

| Parameter                            | Test conditions   | Min. | Typ. | Max. | Unit      |
|--------------------------------------|---|------|------|------|-----------|
| $C_{EBO}$ Emitter-base capacitance   | $I_C = 0$ $V_{EB} = -0.5V$<br>$f = 1 MHz$   |      | 20   | 25   | pF        |
| $C_{CBO}$ Collector-base capacitance | $I_E = 0$ $V_{CB} = -5V$<br>$f = 1 MHz$   |      | 5    | 7    | pF        |
| NF Noise figure                      | $I_C = -10 \mu A$ $V_{CE} = -5V$<br>$R_g \equiv 10 k\Omega$<br>$f = 10 kHz$ $B = 2 kHz$<br>$f = 1 kHz$ $B = 200 Hz$<br>$f = 100 Hz$ $B = 20 Hz$ |      | 1    | 3    | dB        |
|                                      |   |      | 1    | 3    | dB        |
|                                      |   |      | 2    | 10   | dB        |
|                                      |   |      |      |      |           |
| $h_{ie}$ Input impedance             | $I_C = -1 mA$ $V_{CE} = -10V$<br>$f = 1 kHz$  | 2.5  |      | 12   | $k\Omega$ |
| $h_{oe}$ Output admittance           | $I_C = -1 mA$ $V_{CE} = -10V$<br>$f = 1 kHz$  | 5    |      | 25   | $\mu S$   |

This datasheet has been downloaded from:

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Datasheets for electronic components.