

# Small Signal Transistors

## TO-39 Case (Continued)



| TYPE NO. | DESCRIPTION      | V <sub>CBO</sub> | V <sub>CEO</sub>         | V <sub>EBO</sub> | I <sub>CBO</sub> @<br>(μA)<br>*I <sub>CEO</sub><br>**I <sub>CEV</sub><br>***I <sub>CER</sub> | V <sub>CB</sub> | h <sub>FE</sub> |     | @ I <sub>C</sub><br>(mA) | @ V <sub>CE</sub><br>(V) | V <sub>CE(SAT)</sub> @ I <sub>C</sub> |       | f <sub>T</sub> | C <sub>ob</sub> | t <sub>on</sub> | t <sub>off</sub> | NF   |
|----------|------------------|------------------|--------------------------|------------------|--|-----------------|-----------------|-----|--------------------------|--------------------------|---------------------------------------|-------|----------------|-----------------|-----------------|------------------|------|
|          |                  | (V)              | (V)                      | (V)              |  |                 | (V)             | (V) |                          |                          | (V)                                   | (MHz) | (pF)           | (ns)            | (ns)            | (dB)             |      |
|          |                  | MIN              | *V <sub>CER</sub><br>MIN | MIN              |  |                 | MIN             | MIN |                          |                          | MAX                                   | MAX   | MIN            | MAX             | MAX             | MAX              | MAX  |
| BFX86    | NPN AMPL/SWITCH  | 45               | 35                       | 6.0              | 0.50   | 30              | 70              | 300 | 150                      | 10                       | 1.00                                  | 500   | --             | --              | --              | --               | --   |
| BFX87    | PNP AMPL/SWITCH  | 50               | 50                       | 4.0              | 0.50   | 50              | 40              | --  | 150                      | 10                       | 0.40                                  | 150   | 100            | 12              | 60              | 150              | --   |
| BFX88    | PNP AMPL/SWITCH  | 40               | 40                       | 4.0              | 0.50   | 40              | 40              | --  | 150                      | 10                       | 0.40                                  | 150   | 12             | 60              | 150             | --               | --   |
| BFX98    | NPN AMPL/SWITCH  | 150              | 150                      | 6.0              | 0.10   | 100             | 15              | --  | 100                      | 10                       | 1.00                                  | 25    | --             | --              | --              | --               | --   |
| BFY50    | NPN AMPL/SWITCH  | 80               | 35                       | 6.0              | 0.05   | 60              | 30              | --  | 150                      | 10                       | 1.00                                  | 1,000 | 60             | 12              | --              | --               | --   |
| BFY51    | NPN AMPL/SWITCH  | 60               | 30                       | 6.0              | 0.05   | 40              | 40              | --  | 150                      | 10                       | 1.60                                  | 1,000 | 50             | 12              | --              | --               | --   |
| BFY52    | NPN AMPL/SWITCH  | 40               | 20                       | 6.0              | 0.05   | 30              | 60              | --  | 150                      | 10                       | 1.6                                   | 1,000 | 50             | 12              | --              | --               | --   |
| BFY55    | NPN AMPL/SWITCH  | 80               | 35                       | 7.0              | 0.01   | 60              | 40              | 120 | 150                      | 10                       | 1.00                                  | 1,000 | 60             | 12              | --              | --               | --   |
| BFY56A   | NPN AMPL/SWITCH  | 85               | 55                       | 7.0              | 0.02**   | 50              | 40              | 120 | 150                      | 1.0                      | 1.00                                  | 1,000 | 60             | 25              | 225             | 800              | --   |
| BFY57    | NPN AMPL/SWITCH  | 125              | 125                      | 5.0              | 0.10   | 100             | 30              | 150 | 30                       | 10                       | 1.50                                  | 50    | --             | --              | --              | --               | --   |
| BFY63    | NPN AMPL/SWITCH  | 30               | 15                       | 4.0              | 0.05   | 20              | 20              | 120 | 50                       | 5.0                      | 0.30                                  | 50    | --             | --              | --              | --               | --   |
| BFY64    | PNP AMPL/SWITCH  | 40               | 40                       | 5.0              | 0.03**   | 25              | 80              | --  | 10                       | 10                       | 0.50                                  | 150   | 200            | 10              | 50              | 120              | --   |
| BFY68A   | NPN AMPL/SWITCH  | 60               | 25                       | 5.0              | 0.075  | 30              | 75              | --  | 10                       | 10                       | 1.50                                  | 150   | --             | --              | --              | --               | --   |
| BSS44    | PNP AMPL/SWITCH  | 65               | 60                       | 6.0              | 500**  | 60              | 40              | --  | 2,000                    | 2.0                      | 1.00                                  | 5.0   | 80*            | 100             | 65*             | 450*             | --   |
| BSS46    | PNP AMPL/SWITCH  | 85               | 80                       | 6.0              | 500**  | 60              | 25              | --  | 500                      | 2.0                      | 1.40                                  | 5.0   | 80*            | 100             | 65*             | 450*             | --   |
| BSV12    | PNP AMPL/SWITCH  | 80               | 80                       | 5.0              | 0.01   | 80              | 63              | 250 | 100                      | 1.0                      | 0.50                                  | 100   | --             | --              | --              | --               | --   |
| BSV15    | PNP AMPL/SWITCH  | 40               | 40                       | 5.0              | 0.10**   | 40              | 40              | 250 | 100                      | 1.0                      | 1.00                                  | 500   | 50             | 30              | 500             | --               | --   |
| BSV16    | PNP AMPL/SWITCH  | 60               | 60                       | 5.0              | 0.10**   | 60              | 40              | 250 | 100                      | 1.0                      | 1.00                                  | 500   | 50             | 30              | 500             | --               | --   |
| BSV17    | PNP AMPL/SWITCH  | 90               | 80                       | 5.0              | 0.10**   | 80              | 40              | 160 | 100                      | 1.0                      | 1.00                                  | 500   | 50             | 30              | 500             | --               | --   |
| BSV64    | NPN HIGH CURRENT | 100              | 80                       | 5.0              | 10   | 60              | 40              | --  | 2,000                    | 2.0                      | 1.00                                  | 5.0K  | 100*           | 80              | 600             | 1,200            | --   |
| BSW65    | NPN HIGH VOLTAGE | 80               | 80                       | 6.0              | 100  | 40              | 40              | --  | 100                      | 5.0                      | 1.00                                  | 1,000 | 80*            | 35              | 300*            | 1,000*           | --   |
| BSW66    | NPN HIGH VOLTAGE | 100              | 100                      | 6.0              | 100  | 50              | 40              | --  | 100                      | 5.0                      | 1.00                                  | 1,000 | 80*            | 35              | 500*            | 1,000*           | --   |
| BSW67    | NPN HIGH VOLTAGE | 120              | 120                      | 6.0              | 100  | 60              | 40              | --  | 100                      | 5.0                      | 1.00                                  | 1,000 | 80*            | 35              | 500*            | 1,000*           | --   |
| BSW68    | NPN HIGH VOLTAGE | 150              | 150                      | 6.0              | 100  | 75              | 40              | --  | 100                      | 5.0                      | 1.00                                  | 1,000 | 80*            | 35              | 500*            | 1,000*           | --   |
| BSW68A   | NPN AMPL/SWITCH  | 150              | 150                      | 6.0              | 100  | 75              | 30              | --  | 500                      | 5.0                      | 1.00                                  | 1,000 | 80*            | 35              | 500*            | 1,000*           | --   |
| BSX45    | NPN AMPL/SWITCH  | 80               | 40                       | 7.0              | 0.03**   | 60              | 40              | 250 | 100                      | 1.0                      | 1.00                                  | 1,000 | 50             | 25              | --              | --               | 3.5* |
| BSX46    | NPN AMPL/SWITCH  | 100              | 60                       | 7.0              | 0.03**   | 60              | 40              | 250 | 100                      | 1.0                      | 1.00                                  | 1,000 | 50             | 20              | --              | --               | 3.5* |
| BSX47    | NPN AMPL/SWITCH  | 120              | 80                       | 7.0              | 0.03**   | 80              | 40              | 160 | 100                      | 1.0                      | 0.90                                  | 500   | 50             | 15              | --              | --               | 3.5* |
| BSX59    | NPN CORE DRIVER  | 70               | 45                       | 5.0              | 0.50   | 40              | 30              | 90  | 500                      | 1.0                      | 1.00                                  | 1,000 | 250            | 10              | 35              | 60               | --   |
| BSX60    | NPN CORE DRIVER  | 70               | 30                       | 5.0              | 0.50   | 40              | 30              | 90  | 500                      | 1.0                      | 1.00                                  | 1,000 | 250            | 10              | 40              | 70               | --   |
| BSX61    | NPN CORE DRIVER  | 70               | 45                       | 5.0              | 0.50   | 40              | 30              | 90  | 500                      | 1.0                      | 1.30                                  | 1,000 | 250            | 10              | 50              | 100              | --   |
| BSX62    | NPN HIGH CURRENT | 60               | 40                       | 5.0              | 0.10**   | 40              | 63              | 250 | 1,000                    | 1.0                      | 0.80                                  | 2,000 | 30             | 70              | 300             | 1,500            | --   |
| BSX63    | NPN HIGH CURRENT | 80               | 60                       | 5.0              | 0.10**   | 60              | 63              | 250 | 1,000                    | 1.0                      | 0.80                                  | 2,000 | 30             | 70              | 300             | 1,500            | --   |
| BSX64    | NPN HIGH CURRENT | 100              | 80                       | 5.0              | 0.10**   | 80              | 63              | 160 | 1,000                    | 1.0                      | 0.80                                  | 2,000 | 30             | 70              | 300             | 1,500            | --   |
| BSX95    | NPN AMPL/SWITCH  | 75               | 30                       | 7.0              | 0.01   | 60              | 40              | 120 | 150                      | 10                       | 0.20                                  | 150   | 100            | 25              | --              | --               | --   |
| BSX96    | NPN AMPL/SWITCH  | 75               | 30                       | 7.0              | 0.01   | 60              | 100             | 300 | 150                      | 10                       | 0.20                                  | 150   | 100            | 25              | --              | --               | --   |
| BSY34    | NPN AMPL/SWITCH  | 60               | 40                       | 5.0              | 0.07   | 50              | 25              | --  | 100                      | 1.0                      | 1.00                                  | 500   | --             | --              | --              | --               | --   |
| BSY51    | NPN AMPL/SWITCH  | 60               | 25                       | 5.0              | 0.10   | 30              | 40              | 120 | 150                      | 10                       | 0.80                                  | 150   | 100*           | --              | --              | --               | --   |