

# Small Signal Transistors

## TO-92 Case



| TYPE NO. | DESCRIPTION     | LEAD CODE | V <sub>CB0</sub> | V <sub>CEO</sub>                | V <sub>EBO</sub> | I <sub>CB0</sub> @                                    | V <sub>CB</sub> | h <sub>FE</sub> |                                   | @ V <sub>CE</sub> | @ I <sub>C</sub> | V <sub>CE (SAT)</sub> @ I <sub>C</sub> |      | C <sub>ob</sub>                 | f <sub>T</sub>       | NF          | t <sub>off</sub> |
|----------|-----------------|-----------|------------------|---------------------------------|------------------|---|-----------------|-----------------|-----------------------------------|-------------------|------------------|--|------|---------------------------------|----------------------|-------------|------------------|
|          |                 |           | (V)              | (V)<br>*V <sub>CES</sub><br>MIN | (V)<br>MIN       | (nA)<br>*I <sub>CES</sub><br>*I <sub>CEV</sub><br>MAX | (V)             | MIN             | *h <sub>FE</sub><br>(1kHz)<br>MAX | (V)               | (mA)             | (V)                                    | (mA) | (pF)<br>*C <sub>rb</sub><br>MAX | (MHz)<br>*TYP<br>MIN | (dB)<br>MAX | MAX              |
| 2N2712   | NPN AMPL/SWITCH | ECB       | 18               | 18                              | 5.0              | 500   | 18              | 75              | 250                               | --                | --               | --                                     | --   | 12                              | --                   | 2.8         | --               |
| 2N2714   | NPN AMPL/SWITCH | ECB       | 18               | 18                              | 5.0              | 100   | 18              | 75              | 250                               | 0.30              | 50               | 1.20                                   | 50   | --                              | --                   | --          | --               |
| 2N2923   | NPN LOW NOISE   | ECB       | 25               | 25                              | 5.0              | 100   | 25              | 90              | 180*                              | --                | --               | --                                     | --   | 10                              | 160*                 | --          | --               |
| 2N2924   | NPN LOW NOISE   | ECB       | 25               | 25                              | 5.0              | 100   | 25              | 150             | 300*                              | --                | --               | --                                     | --   | 10                              | 160*                 | --          | --               |
| 2N2925   | NPN LOW NOISE   | ECB       | 25               | 25                              | 5.0              | 100   | 25              | 235             | 470*                              | --                | --               | --                                     | --   | 10                              | 160*                 | 2.8         | --               |
| 2N2926   | NPN LOW NOISE   | ECB       | 25               | 25                              | 5.0              | 500   | 18              | 35              | 470*                              | --                | --               | --                                     | --   | 10                              | 120*                 | 2.8         | --               |
| 2N3391A  | NPN LOW NOISE   | ECB       | 25               | 25                              | 5.0              | 100   | 25              | 250             | 500                               | 4.50              | 2.0              | --                                     | --   | 10                              | 120*                 | 5.0         | --               |
| 2N3392   | NPN LOW NOISE   | ECB       | 25               | 25                              | 5.0              | 100   | 25              | 150             | 300                               | 4.50              | 2.0              | --                                     | --   | 10                              | 120*                 | --          | --               |
| 2N3393   | NPN LOW NOISE   | ECB       | 25               | 25                              | 5.0              | 100   | 25              | 90              | 180                               | 4.50              | 2.0              | --                                     | --   | 10                              | 120*                 | --          | --               |
| 2N3395   | NPN LOW NOISE   | ECB       | 25               | 25                              | 5.0              | 100   | 25              | 150             | 500                               | 4.50              | 2.0              | --                                     | --   | 10                              | --                   | --          | --               |
| 2N3396   | NPN LOW NOISE   | ECB       | 25               | 25                              | 5.0              | 100   | 25              | 90              | 500                               | 4.50              | 2.0              | --                                     | --   | 10                              | --                   | --          | --               |
| 2N3397   | NPN LOW NOISE   | ECB       | 25               | 25                              | 5.0              | 100   | 25              | 55              | 500                               | 4.50              | 2.0              | --                                     | --   | 10                              | --                   | --          | --               |
| 2N3398   | NPN LOW NOISE   | ECB       | 25               | 25                              | 5.0              | 100   | 25              | 55              | 800                               | 4.50              | 2.0              | --                                     | --   | 10                              | --                   | --          | --               |
| 2N3415   | NPN LOW NOISE   | ECB       | 25               | 25                              | 5.0              | 100   | 25              | 180             | 540                               | 4.50              | 2.0              | 0.30                                   | 50   | --                              | --                   | --          | --               |
| 2N3416   | NPN LOW NOISE   | ECB       | 50               | 50                              | 5.0              | 100   | 25              | 75              | 225                               | 4.50              | 2.0              | 0.30                                   | 50   | --                              | --                   | --          | --               |
| 2N3417   | NPN LOW NOISE   | ECB       | 50               | 50                              | 5.0              | 100   | 50              | 180             | 540                               | 4.50              | 2.0              | 0.30                                   | 50   | --                              | --                   | --          | --               |
| 2N3702   | PNP AMPL/SWITCH | ECB       | 40               | 25                              | 5.0              | 100   | 20              | 60              | 300                               | 5.0               | 0.05             | 0.25                                   | 50   | 12                              | 100                  | --          | --               |
| 2N3703   | PNP AMPL/SWITCH | ECB       | 50               | 30                              | 5.0              | 100   | 20              | 30              | 150                               | 5.0               | 50               | 0.25                                   | 50   | 12                              | 100                  | --          | --               |
| 2N3704   | NPN AMPL/SWITCH | ECB       | 50               | 30                              | 5.0              | 100   | 20              | 100             | 300                               | 2.0               | 50               | 0.60                                   | 100  | 12                              | 100                  | --          | --               |
| 2N3705   | NPN AMPL/SWITCH | ECB       | 50               | 30                              | 5.0              | 100   | 20              | 50              | 150                               | 2.0               | 50               | 0.80                                   | 100  | 12                              | 100                  | --          | --               |
| 2N3706   | NPN AMPL/SWITCH | ECB       | 40               | 20                              | 5.0              | 100   | 20              | 30              | 600                               | 2.0               | 50               | 1.0                                    | 100  | 12                              | 100                  | --          | --               |
| 2N3707   | NPN LOW NOISE   | ECB       | 30               | 30                              | 6.0              | 100   | 20              | 100             | 400                               | 5.0               | 1.0              | 1.0                                    | 10   | --                              | --                   | 5.0         | --               |
| 2N3708   | NPN LOW NOISE   | ECB       | 30               | 30                              | 6.0              | 100   | 20              | 45              | 660                               | 5.0               | 1.0              | 1.0                                    | 10   | --                              | --                   | 5.0         | --               |
| 2N3709   | NPN LOW NOISE   | ECB       | 30               | 30                              | 6.0              | 100   | 20              | 45              | 165                               | 5.0               | 1.0              | 1.0                                    | 10   | --                              | --                   | 5.0         | --               |
| 2N3710   | NPN LOW NOISE   | ECB       | 30               | 30                              | 6.0              | 100   | 20              | 90              | 330                               | 5.0               | 1.0              | 1.0                                    | 10   | --                              | --                   | 5.0         | --               |
| 2N3711   | NPN LOW NOISE   | ECB       | 30               | 30                              | 6.0              | 100   | 20              | 180             | 660                               | 5.0               | 1.0              | 1.0                                    | 10   | --                              | --                   | 5.0         | --               |
| 2N3859A  | NPN LOW NOISE   | ECB       | 60               | 60                              | 6.0              | 50  | 60              | 100             | 200                               | 4.50              | 2.0              | 0.125                                  | 10   | 4.0                             | --                   | 5.0         | --               |
| 2N3860   | NPN LOW NOISE   | ECB       | 30               | 30                              | 4.0              | 50  | 30              | 150             | 300                               | 4.50              | 2.0              | 0.125                                  | 10   | 4.0                             | 90                   | --          | --               |
| 2N3903   | NPN AMPL/SWITCH | EBC       | 60               | 40                              | 6.0              | 50*   | 30              | 50              | 150                               | 1.0               | 10               | 0.30                                   | 50   | 4.0                             | 250                  | 6.0         | 225              |
| 2N3904   | NPN AMPL/SWITCH | EBC       | 60               | 40                              | 6.0              | 50*   | 30              | 100             | 300                               | 1.0               | 10               | 0.30                                   | 50   | 4.0                             | 300                  | 5.0         | 250              |
| 2N3905   | PNP AMPL/SWITCH | EBC       | 40               | 40                              | 5.0              | 50*   | 30              | 50              | 150                               | 1.0               | 10               | 0.40                                   | 50   | 4.5                             | 200                  | 5.0         | 260              |
| 2N3906   | PNP AMPL/SWITCH | EBC       | 40               | 40                              | 5.0              | 50*   | 30              | 100             | 300                               | 1.0               | 10               | 0.40                                   | 50   | 4.5                             | 250                  | 4.0         | 300              |
| 2N4058   | PNP LOW NOISE   | ECB       | 30               | 30                              | 6.0              | 100   | 20              | 100             | 400                               | 5.0               | 0.10             | 0.70                                   | 10   | --                              | --                   | 5.0         | --               |
| 2N4123   | NPN AMPL/SWITCH | EBC       | 40               | 30                              | 5.0              | 50  | 20              | 50              | 150                               | 1.0               | 2.0              | 0.30                                   | 50   | 4.0                             | 250                  | 6.0         | --               |
| 2N4124   | NPN AMPL/SWITCH | EBC       | 30               | 25                              | 5.0              | 50  | 20              | 120             | 360                               | 1.0               | 2.0              | 0.30                                   | 50   | 4.0                             | 300                  | 5.0         | --               |
| 2N4125   | PNP AMPL/SWITCH | EBC       | 30               | 30                              | 4.0              | 50  | 20              | 50              | 150                               | 1.0               | 2.0              | 0.40                                   | 50   | 4.5                             | 200                  | 5.0         | --               |
| 2N4126   | PNP AMPL/SWITCH | EBC       | 25               | 25                              | 4.0              | 50  | 20              | 120             | 360                               | 1.0               | 2.0              | 0.40                                   | 50   | 4.5                             | 250                  | 4.0         | --               |
| 2N4264   | NPN SAT SWITCH  | EBC       | 30               | 15                              | 6.0              |   | 12              | 40              | 160                               | 1.0               | 10               | 0.35                                   | 100  | 4.0                             | 350                  | --          | 35               |
| 2N4287   | NPN LOW NOISE   | ECB       | 45               | 45                              | 7.0              | 10  | 30              | 150             | 600                               | 5.0               | 1.0              | 0.35                                   | 1.0  | 6.0                             | 40                   | 5.0         | --               |
| 2N4289   | PNP LOW NOISE   | ECB       | 60               | 45                              | 7.0              | 10  | 45              | 150             | 600                               | 0.35              | 1.0              | 0.80                                   | 1.0  | 8.0                             | 40                   | 4.0         | --               |
| 2N4400   | NPN AMPL/SWITCH | EBC       | 60               | 40                              | 6.0              | 100*  | 35              | 50              | 150                               | 1.0               | 150              | 0.75                                   | 500  | 6.5                             | 200                  | --          | 255              |

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(14-May 2015)

# Small Signal Transistors

## TO-92 Case (Continued)



TO-92



TO-92-18R

| TYPE NO. | DESCRIPTION      | LEAD CODE | V <sub>CB0</sub> | V <sub>CEO</sub>                    | V <sub>EBO</sub> | I <sub>CB0</sub> @  | V <sub>CB</sub> | h <sub>FE</sub> |  | @ V <sub>CE</sub> | @ I <sub>C</sub> | V <sub>CE (SAT)</sub> @ I <sub>C</sub> |      | C <sub>ob</sub> | f <sub>T</sub> | NF   | t <sub>off</sub> |
|----------|------------------|-----------|------------------|-------------------------------------|------------------|---|-----------------|-----------------|--|-------------------|------------------|--|------|-----------------|----------------|------|------------------|
|          |                  |           | (V)              | (V)                                 | (V)              | (nA)  | (V)             |                 |  | (V)               | (mA)             | (V)                                    | (mA) | (pF)            | (MHz)          | (dB) |                  |
|          |                  |           | MIN              | <sup>*V</sup> <sub>CES</sub><br>MIN | MIN              | <sup>*I</sup> <sub>CES</sub><br><sup>*I</sup> <sub>CEV</sub><br>MAX |                 | MIN             | <sup>*h</sup> <sub>FE</sub><br>(1kHz)<br>MAX |                   |                  |  |      | MAX             | MIN            | MAX  | MAX              |
| 2N4401   | NPN AMPL/SWITCH  | EBC       | 60               | 40                                  | 6.0              | 100*  | 35              | 100             | 300  | 1.0               | 150              | 0.75                                   | 500  | 6.5             | 250            | --   | 255              |
| 2N4402   | PNP AMPL/SWITCH  | EBC       | 40               | 40                                  | 5.0              | 100*  | 35              | 50              | 150  | 2.0               | 150              | 0.75                                   | 500  | 8.5             | 150            | -    | 255              |
| 2N4403   | PNP AMPL/SWITCH  | EBC       | 40               | 40                                  | 5.0              | 100*  | 35              | 100             | 300  | 2.0               | 150              | 0.75                                   | 500  | 8.5             | 200            | --   | 255              |
| 2N4410   | NPN LOW NOISE    | EBC       | 120              | 80                                  | 5.0              | 10  | 100             | 60              | 400  | 1.0               | 10               | 0.20                                   | 1.0  | 12              | 60             | --   | --               |
| 2N4424   | NPN LOW NOISE    | ECB       | 60               | 40                                  | 5.0              | 30  | 40              | 180             | 500  | 0.45              | 0.30             | 50                                     | --   | --              | --             | --   | --               |
| 2N4952   | NPN AMPL/SWITCH  | ECB       | 60               | 30                                  | 5.0              | 50  | 40              | 100             | 300  | 10                | 150              | 0.30                                   | 150  | 8.0             | 250            | --   | 400              |
| 2N4953   | NPN AMPL/SWITCH  | ECB       | 60               | 30                                  | 5.0              | 50  | 40              | 200             | 600  | 10                | 150              | 0.30                                   | 150  | 8.0             | 250            | --   | 400              |
| 2N5086   | PNP LOW NOISE    | EBC       | 50               | 50                                  | 3.0              | 10  | 10              | 150             | 500  | 5.0               | 0.10             | 0.30                                   | 10   | 4.0             | 40             | 3.0  | --               |
| 2N5087   | PNP LOW NOISE    | EBC       | 50               | 50                                  | 3.0              | 10  | 10              | 250             | 800  | 5.0               | 0.10             | 0.30                                   | 10   | 4.0             | 40             | 2.0  | --               |
| 2N5088   | NPN LOW NOISE    | EBC       | 35               | 30                                  | 4.5              | 50  | 20              | 300             | 900  | 5.0               | 0.10             | 0.50                                   | 10   | 4.0             | 50             | 3.0  | --               |
| 2N5089   | NPN LOW NOISE    | EBC       | 30               | 25                                  | 4.5              | 50  | 15              | 400             | 1,200  | 5.0               | 0.10             | 0.50                                   | 10   | 4.0             | 50             | 2.0  | --               |
| 2N5172   | NPN LOW NOISE    | ECB       | 25               | 25                                  | 5.0              | 100   | 25              | 100             | 500  | 10                | 10               | 0.25                                   | 10   | 13              | 200*           | --   | --               |
| 2N5209   | NPN LOW NOISE    | EBC       | 50               | 50                                  | 4.5              | 50  | 35              | 100             | 300  | 5.0               | 0.10             | 0.70                                   | 10   | 4.0             | 30             | 3.0  | --               |
| 2N5210   | NPN LOW NOISE    | EBC       | 50               | 50                                  | 4.5              | 50  | 35              | 200             | 600  | 5.0               | 0.10             | 0.70                                   | 10   | 4.0             | 30             | 2.0  | --               |
| 2N5223   | NPN AMPL/SWITCH  | EBC       | 25               | 20                                  | 3.0              | 100   | 10              | 50              | 800  | 0.70              | 10               | 1.20                                   | 10   | 4.0             | 150            | --   | --               |
| 2N5225   | NPN AMPL/SWITCH  | EBC       | 25               | 25                                  | 4.0              | 300   | 15              | 30              | 600  | 10                | 50               | 0.80                                   | 100  | 20              | 50             | --   | --               |
| 2N5226   | PNP AMPL/SWITCH  | EBC       | 25               | 25                                  | 4.0              | 300   | 15              | 30              | 600  | 10                | 50               | 0.80                                   | 100  | 8.0             | 50             | --   | --               |
| 2N5227   | PNP LOW NOISE    | EBC       | 30               | 30                                  | 3.0              | 100   | 10              | 50              | 700  | 10                | 2.0              | 0.40                                   | 10   | 10              | 100            | --   | 5.0              |
| 2N5232A  | NPN LOW NOISE    | ECB       | 70               | 50                                  | 5.0              | 30  | 50              | 250             | 500  | 5.0               | 2.0              | 0.125                                  | 10   | 4.0             | --             | 5.0  | --               |
| 2N5306   | NPN DARLINGTON   | ECB       | 25               | 25                                  | 12               | 100   | 25              | 7,000           | 70,000                                       | 5.0               | 2.0              | 1.40                                   | 200  | 10              | 60             | --   | --               |
| 2N5308   | NPN DARLINGTON   | ECB       | 40               | 40                                  | 12               | 100   | 40              | 7,000           | 70,000                                       | 5.0               | 2.0              | 1.40                                   | 200  | 10              | 60             | --   | --               |
| 2N5356   | PNP AMPL/SWITCH  | ECB       | 25               | 25                                  | 4.0              | 100   | 25              | 250             | 500  | 1.0               | 50               | 0.25                                   | 50   | 8.0             | 250*           | --   | --               |
| 2N5366   | PNP AMPL/SWITCH  | ECB       | 40               | 40                                  | 4.0              | 100   | 40              | 100             | 300  | 1.0               | 50               | 0.25                                   | 50   | 8.0             | 250*           | --   | --               |
| 2N5367   | PNP AMPL/SWITCH  | ECB       | 40               | 40                                  | 4.0              | 100   | 40              | 250             | 500  | 1.0               | 50               | 0.25                                   | 50   | 8.0             | 250*           | --   | --               |
| 2N5374   | PNP AMPL/SWITCH  | CBE†      | 60               | 30                                  | 5.0              | 50  | 40              | 200             | 400  | 10                | 150              | 0.30                                   | 150  | 10              | 150            | --   | --               |
| 2N5375   | PNP AMPL/SWITCH  | CBE†      | 40               | 30                                  | 5.0              | 50  | 30              | 40              | 400  | 10                | 150              | 0.30                                   | 150  | 10              | 150            | --   | --               |
| 2N5376   | NPN AMPL/SWITCH  | CBE†      | 60               | 30                                  | 5.0              | 10  | 30              | 120             | --   | 5.0               | 1.0              | --                                     | --   | 8.0             | --             | --   | --               |
| 2N5377   | NPN AMPL/SWITCH  | CBE†      | 60               | 30                                  | 5.0              | 10  | 30              | 120             | --   | 5.0               | 1.0              | --                                     | --   | 8.0             | --             | --   | --               |
| 2N5381   | NPN AMPL/SWITCH  | CBE†      | 60               | 40                                  | 6.0              | 50  | 30              | 100             | 300  | 1.0               | 10               | 12                                     | 10   | 4.0             | 300            | 5.0  | --               |
| 2N5383   | PNP AMPL/SWITCH  | CBE†      | 40               | 40                                  | 5.0              | 50  | 30              | 100             | 300  | 1.0               | 10               | 0.25                                   | 10   | 4.5             | 250            | 4.0  | --               |
| 2N5400   | PNP HIGH VOLTAGE | EBC       | 130              | 120                                 | 5.0              | 100   | 100             | 40              | 180  | 5.0               | 10               | 0.50                                   | 50   | 6.0             | 100            | 8.0  | --               |
| 2N5401   | PNP HIGH VOLTAGE | EBC       | 160              | 150                                 | 5.0              | 50  | 120             | 60              | 240  | 5.0               | 10               | 0.50                                   | 50   | 6.0             | 100            | 8.0  | --               |
| 2N5447   | PNP AMPL/SWITCH  | CBE†      | 40               | 25                                  | 5.0              | 100   | 20              | 60              | 300  | 5.0               | 50               | 0.25                                   | 50   | 12              | 100            | --   | --               |
| 2N5448   | PNP AMPL/SWITCH  | CBE†      | 50               | 30                                  | 5.0              | 100   | 20              | 30              | 150  | 5.0               | 50               | 0.25                                   | 50   | 12              | 100            | --   | --               |
| 2N5449   | NPN AMPL/SWITCH  | CBE†      | 50               | 30                                  | 5.0              | 100   | 20              | 100             | 300  | 2.0               | 50               | 0.6                                    | 100  | 12              | 100            | --   | --               |
| 2N5450   | NPN AMPL/SWITCH  | CBE†      | 50               | 30                                  | 5.0              | 100   | 20              | 50              | 150  | 2.0               | 50               | 0.8                                    | 100  | 12              | 100            | --   | --               |
| 2N5451   | NPN AMPL/SWITCH  | CBE†      | 40               | 20                                  | 5.0              | 100   | 20              | 30              | 600  | 2.0               | 50               | 1.0                                    | 100  | 12              | 100            | --   | --               |
| 2N5550   | NPN HIGH VOLTAGE | EBC       | 160              | 140                                 | 6.0              | 100   | 100             | 60              | 250  | 5.0               | 10               | 0.25                                   | 50   | 6.0             | 100            | 10   | --               |
| 2N5551   | NPN HIGH VOLTAGE | EBC       | 180              | 160                                 | 6.0              | 50  | 120             | 80              | 250  | 5.0               | 10               | 0.20                                   | 50   | 6.0             | 100            | 8.0  | --               |
| 2N5769   | NPN SAT SWITCH   | EBC       | 40               | 15                                  | 4.5              | 400   | 20              | 40              | 120  | 0.35              | 10               | 0.50                                   | 100  | 4.0             | 500            | --   | 18               |
| 2N5770   | NPN RF OSC       | EBC       | 30               | 15                                  | 3.0              | 10  | 15              | 50              | 200  | 1.0               | 8.0              | 0.40                                   | 10   | 1.1             | 800            | --   | --               |
| 2N5771   | PNP SAT SWITCH   | EBC       | 15               | 15                                  | 4.5              | 10  | 8.0             | 50              | 120  | 0.30              | 10               | 0.60                                   | 50   | 3.0             | 850            | --   | 20               |
| 2N5772   | NPN SAT SWITCH   | EBC       | 40               | 15                                  | 5.0              | 500*  | 20              | 30              | 120  | 0.40              | 30               | 0.50                                   | 300  | 5.0             | 350            | --   | 28               |
| 2N5810   | NPN AMPL/SWITCH  | CBE†      | 35               | 25                                  | 5.0              | 100   | 25              | 60              | 200  | 2.0               | 2.0              | 0.75                                   | 500  | 15              | 100            | --   | --               |
| 2N5811   | PNP AMPL/SWITCH  | CBE†      | 35               | 25                                  | 5.0              | 100   | 25              | 60              | 200  | 2.0               | 2.0              | 0.75                                   | 500  | 15              | 100            | --   | --               |

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† TO-92-18R

(6-December 2004)

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## TO-92 Case (Continued)



TO-92



TO-92-18R

| TYPE NO. | DESCRIPTION      | LEAD CODE | $V_{CBO}$ | $V_{CEO}$          | $V_{EBO}$ | $I_{CBO} @$                       | $V_{CB}$ | $h_{FE}$ |         | $@ V_{CE}$ | $@ I_C$ | $V_{CE(SAT)} @ I_C$ |       | $C_{ob}$ | $f_T$ | NF   | $t_{off}$ |
|----------|------------------|-----------|-----------|--------------------|-----------|-----------------------------------|----------|----------|---------|------------|---------|---------------------|-------|----------|-------|------|-----------|
|          |                  |           | (V)       | (V)                | (V)       | (nA)                              | (V)      | MIN      | MAX     | (V)        | (mA)    | (V)                 | (mA)  | (pF)     | (MHz) | (dB) |           |
|          |                  |           | MIN       | * $V_{CES}$<br>MIN | MIN       | * $I_{CES}$<br>* $I_{CEV}$<br>MAX |          |          |         |            |         |                     |       | MAX      | MIN   | MAX  | MAX       |
| 2N5812   | NPN AMPL/SWITCH  | CBE†      | 35        | 25                 | 5.0       | 100                               | 25       | 150      | 500     | 2.0        | 2.0     | 0.75                | 500   | 15       | 135   | --   | --        |
| 2N5813   | PNP AMPL/SWITCH  | CBE†      | 35        | 25                 | 5.0       | 100                               | 25       | 150      | 500     | 2.0        | 2.0     | 0.75                | 500   | 15       | 135   | --   | --        |
| 2N5816   | NPN AMPL/SWITCH  | CBE†      | 50        | 40                 | 5.0       | 100                               | 25       | 100      | 200     | 2.0        | 2.0     | 0.75                | 500   | 15       | 120   | --   | --        |
| 2N5817   | PNP AMPL/SWITCH  | CBE†      | 50        | 40                 | 5.0       | 100                               | 25       | 100      | 200     | 2.0        | 2.0     | 0.75                | 500   | 15       | 120   | --   | --        |
| 2N5818   | NPN AMPL/SWITCH  | CBE†      | 50        | 40                 | 5.0       | 100                               | 25       | 150      | 300     | 2.0        | 2.0     | 0.75                | 500   | 15       | 135   | --   | --        |
| 2N5819   | PNP AMPL/SWITCH  | CBE†      | 50        | 40                 | 5.0       | 100                               | 25       | 150      | 300     | 2.0        | 2.0     | 0.75                | 500   | 15       | 135   | --   | --        |
| 2N5822   | NPN AMPL/SWITCH  | CBE†      | 70        | 60                 | 5.0       | 100                               | 25       | 100      | 250     | 2.0        | 2.0     | 0.75                | 500   | 15       | 120   | --   | --        |
| 2N5823   | PNP AMPL/SWITCH  | CBE†      | 70        | 60                 | 5.0       | 100                               | 25       | 100      | 250     | 2.0        | 2.0     | 0.75                | 500   | 15       | 120   | --   | --        |
| 2N5830   | NPN HIGH VOLTAGE | EBC       | 120       | 100                | 5.0       | 50                                | 100      | 80       | 500     | 5.0        | 10      | 0.25                | 50    | 4.0      | 100   | --   | --        |
| 2N5831   | PNP HIGH VOLTAGE | EBC       | 160       | 140                | 5.0       | 50                                | 120      | 80       | 500     | 5.0        | 10      | 0.25                | 50    | 4.0      | 100   | --   | --        |
| 2N5961   | NPN LOW NOISE    | EBC       | 60        | 60                 | 8.0       | 2.0                               | 60       | 170      | 700     | 5.0        | 10      | 0.20                | 10    | 4.0      | 100   | 3.0  | --        |
| 2N5962   | NPN LOW NOISE    | EBC       | 45        | 45                 | 8.0       | 2.0                               | 45       | 600      | 1,400   | 5.0        | 10      | 0.20                | 10    | 4.0      | 100   | 3.0  | --        |
| 2N5963   | NPN LOW NOISE    | EBC       | 30        | 30                 | 8.0       | 2.0                               | 30       | 1,200    | 2,000   | 5.0        | 10      | 0.20                | 10    | 4.0      | 150   | 3.0  | --        |
| 2N6076   | PNP LOW NOISE    | ECB       | 25        | 25                 | 5.0       | 100                               | 25       | 100      | 500     | 10         | 10      | 0.25                | 10    | 13       | 200*  | --   | --        |
| 2N6426   | NPN DARLINGTON   | EBC       | 40        | 40                 | 12        | 50                                | 30       | 20,000   | 200,000 | 5.0        | 500     | 1.50                | 500   | 7.0      | 150   | 10   | --        |
| 2N6427   | PNP DARLINGTON   | EBC       | 40        | 40                 | 12        | 50                                | 30       | 14,000   | 140,000 | 5.0        | 500     | 1.50                | 500   | 7.0      | 130   | 10   | --        |
| 2N6515   | NPN HIGH VOLTAGE | EBC       | 250       | 250                | 6.0       | 50                                | 150      | 45       | 220     | 10         | 50      | 1.0                 | 50    | 6.0      | 40    | --   | --        |
| 2N6516   | PNP HIGH VOLTAGE | EBC       | 300       | 300                | 6.0       | 50                                | 200      | 40       | 200     | 10         | 50      | 1.0                 | 50    | 6.0      | 40    | --   | --        |
| 2N6517   | NPN HIGH VOLTAGE | EBC       | 350       | 350                | 6.0       | 50                                | 250      | 20       | 100     | 10         | 50      | 1.0                 | 50    | 6.0      | 40    | --   | --        |
| 2N6518   | PNP HIGH VOLTAGE | EBC       | 250       | 250                | 5.0       | 50                                | 150      | 45       | 220     | 10         | 50      | 1.0                 | 50    | 6.0      | 40    | --   | --        |
| 2N6519   | PNP HIGH VOLTAGE | EBC       | 300       | 300                | 5.0       | 50                                | 200      | 40       | 200     | 10         | 50      | 1.0                 | 50    | 6.0      | 40    | --   | --        |
| 2N6520   | PNP HIGH VOLTAGE | EBC       | 350       | 350                | 5.0       | 50                                | 250      | 20       | 100     | 10         | 50      | 1.0                 | 50    | 6.0      | 40    | --   | --        |
| BC307    | AMPL/SWITCH      | CBE       | 50        | 45                 | 5.0       | 15*                               | 45       | 120      | 800     | 5.0        | 2.0     | 0.3                 | 10    | 6.0      | 130*  | 10-  | --        |
| BC308    | AMPL/SWITCH      | CBE       | 30        | 25                 | 5.0       | 15*                               | 25       | 120      | 800     | 5.0        | 2.0     | 0.3                 | 10    | 6.0      | 130*  | 10   | --        |
| BC309    | AMPL/SWITCH      | CBE       | 25        | 25                 | 5.0       | 15*                               | 25       | 120      | 800     | 5.0        | 2.0     | 0.3                 | 10    | 6.0      | 130*  | 10   | --        |
| BCX38A   | NPN DARLINGTON   | EBC       | 80        | 60                 | 10        | 100                               | 60       | 1,000    | --      | 5.0        | 500     | 1.25                | 800   | --       | --    | --   | --        |
| BCX38B   | NPN DARLINGTON   | EBC       | 80        | 60                 | 10        | 100                               | 60       | 4,000    | --      | 5.0        | 500     | 1.25                | 800   | --       | --    | --   | --        |
| BCX38C   | NPN DARLINGTON   | EBC       | 80        | 60                 | 10        | 100                               | 60       | 10,000   | --      | 5.0        | 500     | 1.25                | 800   | --       | --    | --   | --        |
| GES6014  | NPN AMPL/SWITCH  | EBC       | 70        | 60                 | 5.0       | 10                                | 25       | 100      | 300     | 1.0        | 10      | 0.50                | 500   | 10       | 105   | 5.0  | 400       |
| MPS404A  | PNP CHOPPER      | EBC       | 40        | 35                 | 25        | 100                               | 10       | 100      | 400     | 0.15       | 12      | 0.15                | 12    | 40       | --    | --   | --        |
| MPS650   | NPN HIGH CURRENT | EBC       | 60        | 40                 | 5.0       | 100                               | 60       | 40       | --      | 2.0        | 2,000   | 0.50                | 2,000 | --       | 75    | --   | --        |
| MPS651   | NPN HIGH CURRENT | EBC       | 80        | 60                 | 5.0       | 100                               | 80       | 40       | --      | 2.0        | 2,000   | 0.50                | 2,000 | --       | 75    | --   | --        |
| MPS750   | PNP HIGH CURRENT | EBC       | 60        | 40                 | 5.0       | 100                               | 60       | 40       | --      | 2.0        | 2,000   | 0.50                | 2,000 | --       | 75    | --   | --        |
| MPS751   | PNP HIGH CURRENT | EBC       | 80        | 60                 | 5.0       | 100                               | 80       | 40       | --      | 2.0        | 2,000   | 0.50                | 2,000 | --       | 75    | --   | --        |
| MPS3392  | NPN AMPL/SWITCH  | EBC       | 25        | 25                 | 5.0       | 100                               | 18       | 150      | 300     | 4.5        | 2.0     | --                  | --    | 10       | --    | --   | --        |
| MPS3395  | NPN AMPL/SWITCH  | EBC       | 25        | 25                 | 5.0       | 100                               | 18       | 150      | 500     | 4.5        | 2.0     | --                  | --    | 10       | --    | --   | --        |
| MPS3396  | NPN AMPL/SWITCH  | EBC       | 25        | 25                 | 5.0       | 100                               | 18       | 90       | 500     | 4.5        | 2.0     | --                  | --    | 10       | --    | --   | --        |
| MPS3397  | NPN AMPL/SWITCH  | EBC       | 25        | 25                 | 5.0       | 100                               | 18       | 55       | 500     | 4.5        | 2.0     | --                  | --    | 10       | --    | --   | --        |
| MPS3398  | NPN AMPL/SWITCH  | EBC       | 25        | 25                 | 5.0       | 100                               | 18       | 55       | 800     | 4.5        | 2.0     | --                  | --    | 10       | --    | --   | --        |
| MPS3415  | NPN LOW NOISE    | EBC       | 25        | 25                 | 5.0       | 100                               | 25       | 180      | 540     | 4.5        | 2.0     | 0.30                | 50    | --       | --    | --   | --        |
| MPS3702  | PNP AMPL/SWITCH  | EBC       | 40        | 25                 | 5.0       | 100                               | 20       | 60       | 300     | 5.0        | 50      | 0.25                | 50    | 12       | 100   | --   | --        |
| MPS3704  | NPN AMPL/SWITCH  | EBC       | 50        | 30                 | 5.0       | 100                               | 20       | 100      | 300     | 2.0        | 50      | 0.60                | 100   | 12       | 100   | --   | --        |
| MPS3706  | NPN AMPL/SWITCH  | EBC       | 40        | 20                 | 5.0       | 100                               | 20       | 30       | 600     | 2.0        | 50      | 1.0                 | 100   | 12       | 100   | --   | --        |
| MPS3707  | NPN LOW NOISE    | EBC       | 30        | 30                 | 6.0       | 100                               | 20       | 100      | 400     | 5.0        | 0.10    | 1.0                 | 10    | 4.0      | --    | 5.0  | --        |
| MPS3708  | NPN LOW NOISE    | EBC       | 30        | 30                 | 6.0       | 100                               | 20       | 45       | 660     | 5.0        | 1.0     | 1.0                 | 10    | --       | --    | --   | --        |

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† TO-92-18R

(24-November 2008)

# Small Signal Transistors

## TO-92 Case (Continued)



| TYPE NO. | DESCRIPTION     | LEAD CODE | V <sub>CBO</sub><br>(V) | V <sub>CEO</sub><br>(V) | V <sub>EBO</sub><br>(V) | I <sub>CBO</sub> @       |                          | h <sub>FE</sub> |        | @ V <sub>CE</sub> |     | @ I <sub>C</sub> |      | V <sub>CE</sub> (SAT) @ I <sub>C</sub> |      | C <sub>ob</sub><br>(pF) | f <sub>T</sub><br>(MHz) | NF<br>(dB) | t <sub>off</sub> |     |     |
|----------|-----------------|-----------|-------------------------|-------------------------|-------------------------|--------------------------|--------------------------|-----------------|--------|-------------------|-----|------------------|------|--|------|-------------------------|-------------------------|------------|------------------|-----|-----|
|          |                 |           |                         |                         |                         | I <sub>CES</sub><br>(nA) | I <sub>CEV</sub><br>(nA) | MIN             | MAX    | MIN               | MAX | MIN              | MAX  | MIN                                    | MAX  |                         |                         |            |                  | MIN | MAX |
|          |                 |           |                         |                         |                         |                          |                          |                 |        |                   |     |                  |      |  |      |                         |                         |            |                  |     |     |
| MPS3710  | NPN LOW NOISE   | EBC       | 30                      | 30                      | 6.0                     | 100                      | 20                       | 90              | 330    | 5.0               | 1.0 | 1.0              | 10   | --                                     | --   | --                      | --                      |            |                  |     |     |
| MPS3711  | NPN LOW NOISE   | EBC       | 30                      | 30                      | 6.0                     | 100                      | 20                       | 180             | 660    | 1.0               | 1.0 | 1.0              | 10   | --                                     | --   | --                      | --                      |            |                  |     |     |
| MPS3721  | NPN LOW NOISE   | EBC       | 18                      | 18                      | 5.0                     | 500                      | 18                       | 60              | 660    | 10                | 2.0 | --               | --   | 3.5                                    | --   | --                      | --                      |            |                  |     |     |
| MPS3826  | NPN AMPL/SWITCH | EBC       | 60                      | 45                      | 4.0                     | 100                      | 30                       | 40              | 160    | 10                | 10  | --               | --   | 3.5                                    | 200  | --                      | --                      |            |                  |     |     |
| MPS3827  | NPN AMPL/SWITCH | EBC       | 60                      | 45                      | 4.0                     | 100                      | 30                       | 100             | 400    | 10                | 10  | --               | --   | 3.5                                    | 200  | --                      | --                      |            |                  |     |     |
| MPS5172  | NPN LOW NOISE   | EBC       | 25                      | 25                      | 5.0                     | 100                      | 25                       | 100             | 500    | 10                | 10  | 0.25             | 10   | 10                                     | 120* | --                      | --                      |            |                  |     |     |
| MPS5306  | NPN DARLINGTON  | EBC       | 25                      | 25                      | 12                      | 100                      | 25                       | 7,000           | 70,000 | 5.0               | 2.0 | 1.40             | 200  | 10                                     | 60   | --                      | --                      |            |                  |     |     |
| MPS5308  | NPN DARLINGTON  | EBC       | 40                      | 40                      | 12                      | 100                      | 40                       | 7,000           | 70,000 | 5.0               | 2.0 | 1.40             | 200  | 10                                     | 60   | --                      | --                      |            |                  |     |     |
| MPS6507  | NPN RF OSC      | EBC       | 30                      | 20                      | 3.0                     | 50                       | 15                       | 25              | --     | 10                | 2.0 | --               | --   | 2.5                                    | 700  | --                      | --                      |            |                  |     |     |
| MPS6511  | NPN RF OSC      | EBC       | 30                      | 20                      | 3.0                     | 50                       | 15                       | 25              | --     | 10                | 10  | --               | --   | 2.5                                    | --   | --                      | --                      |            |                  |     |     |
| MPS6512  | NPN AMPL/SWITCH | EBC       | 40                      | 30                      | 4.0                     | 50                       | 30                       | 50              | 100    | 10                | 2.0 | 0.50             | 50   | 3.5                                    | --   | --                      | --                      |            |                  |     |     |
| MPS6513  | NPN AMPL/SWITCH | EBC       | 40                      | 30                      | 4.0                     | 50                       | 30                       | 90              | 180    | 10                | 2.0 | 0.50             | 50   | 3.5                                    | --   | --                      | --                      |            |                  |     |     |
| MPS6514  | NPN AMPL/SWITCH | EBC       | 40                      | 25                      | 4.0                     | 50                       | 30                       | 150             | 300    | 10                | 2.0 | 0.50             | 50   | 3.5                                    | --   | --                      | --                      |            |                  |     |     |
| MPS6515  | NPN AMPL/SWITCH | EBC       | 40                      | 25                      | 4.0                     | 50                       | 30                       | 250             | 500    | 10                | 2.0 | 0.50             | 50   | 3.5                                    | --   | --                      | --                      |            |                  |     |     |
| MPS6516  | PNP AMPL/SWITCH | EBC       | 40                      | 40                      | 4.0                     | 50                       | 30                       | 50              | 100    | 10                | 2.0 | 0.50             | 50   | 4.0                                    | --   | --                      | --                      |            |                  |     |     |
| MPS6517  | PNP AMPL/SWITCH | EBC       | 40                      | 40                      | 4.0                     | 50                       | 30                       | 90              | 180    | 10                | 2.0 | 0.50             | 50   | 4.0                                    | --   | --                      | --                      |            |                  |     |     |
| MPS6518  | PNP AMPL/SWITCH | EBC       | 40                      | 40                      | 4.0                     | 50                       | 30                       | 150             | 300    | 10                | 2.0 | 0.50             | 50   | 4.0                                    | --   | --                      | --                      |            |                  |     |     |
| MPS6519  | PNP AMPL/SWITCH | EBC       | 25                      | 25                      | 4.0                     | 50                       | 20                       | 250             | 500    | 10                | 2.0 | 0.50             | 50   | 4.0                                    | --   | --                      | --                      |            |                  |     |     |
| MPS6520  | NPN LOW NOISE   | EBC       | 40                      | 25                      | 4.0                     | 50                       | 30                       | 200             | 400    | 10                | 2.0 | 0.50             | 50   | 3.5                                    | --   | 3.0                     | --                      |            |                  |     |     |
| MPS6521  | NPN LOW NOISE   | EBC       | 40                      | 25                      | 4.0                     | 50                       | 30                       | 300             | 600    | 10                | 2.0 | 0.50             | 50   | 3.5                                    | --   | 3.0                     | --                      |            |                  |     |     |
| MPS6522  | PNP LOW NOISE   | EBC       | 25                      | 25                      | 4.0                     | 50                       | 20                       | 200             | 400    | 10                | 2.0 | 0.50             | 50   | 3.5                                    | --   | 3.0                     | --                      |            |                  |     |     |
| MPS6523  | PNP LOW NOISE   | EBC       | 25                      | 25                      | 4.0                     | 50                       | 20                       | 300             | 600    | 10                | 2.0 | 0.50             | 50   | 3.5                                    | --   | 3.0                     | --                      |            |                  |     |     |
| MPS6531  | NPN AMPL/SWITCH | EBC       | 60                      | 40                      | 5.0                     | 50                       | 40                       | 90              | 270    | 1.0               | 100 | 0.30             | 100  | 5.0                                    | --   | --                      | --                      |            |                  |     |     |
| MPS6532  | NPN AMPL/SWITCH | EBC       | 50                      | 30                      | 5.0                     | 100                      | 30                       | 30              | --     | 1.0               | 100 | 0.50             | 100  | 5.0                                    | --   | --                      | --                      |            |                  |     |     |
| MPS6534  | PNP AMPL/SWITCH | EBC       | 40                      | 40                      | 4.0                     | 50                       | 30                       | 90              | 270    | 1.0               | 100 | 0.30             | 100  | 7.0                                    | --   | --                      | --                      |            |                  |     |     |
| MPS6535  | PNP AMPL/SWITCH | EBC       | 30                      | 30                      | 4.0                     | 50                       | 30                       | 30              | --     | 1.0               | 100 | 0.50             | 100  | 7.0                                    | --   | --                      | --                      |            |                  |     |     |
| MPS6560  | NPN AMPL/SWITCH | EBC       | 25                      | 25                      | 5.0                     | 100                      | 20                       | 50              | 200    | 1.0               | 500 | 0.50             | 500  | 30                                     | 60   | --                      | --                      |            |                  |     |     |
| MPS6561  | NPN AMPL/SWITCH | EBC       | 20                      | 20                      | 4.0                     | 100                      | 20                       | 50              | 200    | 1.0               | 350 | 0.50             | 350  | 30                                     | 60   | --                      | --                      |            |                  |     |     |
| MPS6562  | PNP AMPL/SWITCH | EBC       | 25                      | 25                      | 5.0                     | 100                      | 20                       | 50              | 200    | 1.0               | 500 | 0.50             | 500  | 30                                     | 60   | --                      | --                      |            |                  |     |     |
| MPS6563  | PNP AMPL/SWITCH | EBC       | 20                      | 20                      | 4.0                     | 100                      | 20                       | 50              | 200    | 1.0               | 350 | 0.50             | 350  | 30                                     | 60   | --                      | --                      |            |                  |     |     |
| MPS6564  | NPN AMPL/SWITCH | EBC       | --                      | 45                      | 5.0                     | 500                      | 40                       | 25              | --     | 5.0               | 40  | 0.50             | 10   | 4.0                                    | --   | --                      | --                      |            |                  |     |     |
| MPS6566  | NPN AMPL/SWITCH | EBC       | 60                      | 45                      | 4.0                     | 100                      | 30                       | 100             | 400    | 10                | 10  | 0.40             | 10   | 3.5                                    | --   | --                      | --                      |            |                  |     |     |
| MPS6601  | NPN AMPL/SWITCH | EBC       | 25                      | 25                      | 4.0                     | 100                      | 25                       | 50              | --     | 1.0               | 500 | 0.60             | 1000 | 50                                     | 100  | --                      | --                      |            |                  |     |     |
| MPS6602  | NPN AMPL/SWITCH | EBC       | 40                      | 40                      | 4.0                     | 100                      | 30                       | 50              | --     | 1.0               | 500 | 0.60             | 1000 | 50                                     | 100  | --                      | --                      |            |                  |     |     |
| MPS6651  | PNP AMPL/SWITCH | EBC       | 25                      | 25                      | 4.0                     | 100                      | 25                       | 50              | --     | 1.0               | 500 | 0.60             | 1000 | 50                                     | 100  | --                      | --                      |            |                  |     |     |
| MPS6652  | PNP AMPL/SWITCH | EBC       | 40                      | 40                      | 4.0                     | 100                      | 30                       | 50              | --     | 1.0               | 500 | 0.60             | 1000 | 50                                     | 100  | --                      | --                      |            |                  |     |     |
| MPS8097  | NPN LOW NOISE   | EBC       | 60                      | 40                      | 6.0                     | 30                       | 40                       | 250             | 5.0    | 0.10              | --  | --               | 4.0  | --                                     | 2.0  | --                      | --                      |            |                  |     |     |
| MPS8098  | NPN AMPL/SWITCH | EBC       | 60                      | 60                      | 6.0                     | 100                      | 60                       | 100             | 300    | 5.0               | 1.0 | 0.30             | 100  | 6.0                                    | 150  | --                      | --                      |            |                  |     |     |
| MPS8099  | NPN AMPL/SWITCH | EBC       | 80                      | 80                      | 6.0                     | 100                      | 80                       | 100             | 300    | 5.0               | 1.0 | 0.30             | 100  | 6.0                                    | 150  | --                      | --                      |            |                  |     |     |
| MPS8598  | PNP AMPL/SWITCH | EBC       | 60                      | 60                      | 5.0                     | 100                      | 60                       | 100             | 300    | 5.0               | 1.0 | 0.30             | 100  | 8.0                                    | 150  | --                      | --                      |            |                  |     |     |
| MPS8599  | PNP AMPL/SWITCH | EBC       | 80                      | 80                      | 5.0                     | 100                      | 80                       | 100             | 300    | 5.0               | 1.0 | 0.30             | 100  | 8.0                                    | 150  | --                      | --                      |            |                  |     |     |
| MPSA05   | NPN AMPL/SWITCH | EBC       | 60                      | 60                      | 4.0                     | 100                      | 60                       | 50              | --     | 1.0               | 100 | 0.25             | 100  | --                                     | 100  | --                      | --                      |            |                  |     |     |
| MPSA06   | NPN AMPL/SWITCH | EBC       | 80                      | 80                      | 4.0                     | 100                      | 80                       | 50              | --     | 1.0               | 100 | 0.25             | 100  | --                                     | 100  | --                      | --                      |            |                  |     |     |
| MPSA13   | NPN DARLINGTON  | EBC       | 30                      | 30*                     | 10                      | 100                      | 30                       | 10,000          | --     | 5.0               | 100 | 1.50             | 100  | --                                     | 125  | --                      | --                      |            |                  |     |     |
| MPSA14   | NPN DARLINGTON  | EBC       | 30                      | 30*                     | 10                      | 100                      | 30                       | 20,000          | --     | 5.0               | 100 | 1.50             | 100  | --                                     | 125  | --                      | --                      |            |                  |     |     |
| MPSA18   | NPN LOW NOISE   | EBC       | 45                      | 45                      | 6.5                     | 50                       | 30                       | 500             | 1,500  | 5.0               | 10  | --               | --   | 3.0                                    | 100  | 1.5                     | --                      |            |                  |     |     |
| MPSA20   | NPN AMPL/SWITCH | EBC       | --                      | 40                      | 4.0                     | 100                      | 30                       | 40              | 400    | 10                | 5.0 | 0.25             | 10   | 4.0                                    | 125  | --                      | --                      |            |                  |     |     |

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# Small Signal Transistors

## TO-92 Case (Continued)



| TYPE NO. | DESCRIPTION      | LEAD CODE | V <sub>CBO</sub> | V <sub>CEO</sub>           | V <sub>EBO</sub> | I <sub>CBO</sub> @         | V <sub>CB</sub> | h <sub>FE</sub> |     | @ V <sub>CE</sub> | @ I <sub>C</sub> | V <sub>CE (SAT)</sub> @ I <sub>C</sub> |      | C <sub>ob</sub>            | f <sub>T</sub>          | NF          | t <sub>off</sub> |
|----------|------------------|-----------|------------------|----------------------------|------------------|----------------------------|-----------------|-----------------|-----|-------------------|------------------|--|------|----------------------------|-------------------------|-------------|------------------|
|          |                  |           | (V)              | (V)                        | (V)              | (nA)                       |                 | MIN             | MAX | (V)               | (mA)             | (V)                                    | (mA) | (pF)                       | (MHz)                   | (dB)        |                  |
|          |                  |           | MIN              | *V <sub>CE(S)</sub><br>MIN | MIN              | *I <sub>CE(S)</sub><br>MAX |                 |                 |     |                   |                  |  |      | *h <sub>FE</sub><br>(1kHz) | *C <sub>rb</sub><br>MAX | *TYP<br>MIN | MAX              |
| MPSA25   | NPN DARLINGTON   | EBC       | 40               | 40*                        | 10               | 100                        | 30              | 10,000          | --  | 5.0               | 100              | 1.50                                   | 100  | 125                        | --                      | --          | --               |
| MPSA26   | NPN DARLINGTON   | EBC       | 50               | 50*                        | 10               | 100                        | 40              | 10,000          | --  | 5.0               | 100              | 1.50                                   | 100  | 125                        | --                      | --          | --               |
| MPSA27   | NPN DARLINGTON   | EBC       | 60               | 60*                        | 10               | 100                        | 50              | 10,000          | --  | 5.0               | 100              | 1.50                                   | 100  | 125                        | --                      | --          | --               |
| MPSA28   | NPN DARLINGTON   | EBC       | 80               | 80*                        | 12               | 100                        | 60              | 10,000          | --  | 5.0               | 100              | 1.50                                   | 100  | 8.0                        | 125                     | --          | --               |
| MPSA29   | NPN DARLINGTON   | EBC       | 100              | 100                        | 12               | 100                        | 80              | 10,000          | --  | 5.0               | 100              | 1.50                                   | 100  | 8.0                        | 125                     | --          | --               |
| MPSA42   | NPN HIGH VOLTAGE | EBC       | 300              | 300                        | 6.0              | 100                        | 200             | 40              | --  | 10                | 30               | 0.50                                   | 20   | 3.0                        | 50                      | --          | --               |
| MPSA44   | NPN HIGH VOLTAGE | EBC       | 500              | 400                        | 6.0              | 100                        | 400             | 50              | 200 | 10                | 10               | 0.75                                   | 50   | 6.0                        | 20                      | --          | --               |
| MPSA45   | NPN HIGH VOLTAGE | EBC       | 400              | 350                        | 6.0              | 100                        | 320             | 50              | 200 | 10                | 10               | 0.75                                   | 50   | 6.0                        | 20                      | --          | --               |
| MPSA55   | PNP AMPL/SWITCH  | EBC       | 60               | 60                         | 4.0              | 100                        | 60              | 50              | --  | 1.0               | 100              | 0.25                                   | 100  | --                         | 50                      | --          | --               |
| MPSA56   | PNP AMPL/SWITCH  | EBC       | 80               | 80                         | 4.0              | 100                        | 80              | 50              | --  | 1.0               | 100              | 0.25                                   | 100  | --                         | 50                      | --          | --               |
| MPSA62   | PNP DARLINGTON   | EBC       | 20               | 20*                        | 10               | 100                        | 15              | 20,000          | --  | 5.0               | 10               | 1.0                                    | 10   | --                         | 125                     | --          | --               |
| MPSA63   | PNP DARLINGTON   | EBC       | 30               | 30*                        | 10               | 100                        | 30              | 10,000          | --  | 5.0               | 100              | 1.50                                   | 100  | --                         | 125                     | --          | --               |
| MPSA64   | PNP DARLINGTON   | EBC       | 30               | 30*                        | 10               | 100                        | 30              | 20,000          | --  | 5.0               | 100              | 1.50                                   | 100  | --                         | 125                     | --          | --               |
| MPSA65   | PNP DARLINGTON   | EBC       | 30               | 30*                        | 8.0              | 100                        | 30              | 20,000          | --  | 5.0               | 100              | 1.50                                   | 100  | --                         | 100                     | --          | --               |
| MPSA66   | PNP DARLINGTON   | EBC       | 30               | 30*                        | 8.0              | 100                        | 30              | 40,000          | --  | 5.0               | 100              | 1.50                                   | 100  | --                         | 100                     | --          | --               |
| MPSA70   | PNP LOW NOISE    | EBC       | --               | 40                         | 4.0              | 100                        | 30              | 40              | 400 | 10                | 5.0              | 0.25                                   | 10   | 4.0                        | 125                     | --          | --               |
| MPSA75   | PNP DARLINGTON   | EBC       | 40               | 40*                        | 10               | 100                        | 30              | 10,000          | --  | 5.0               | 100              | 1.50                                   | 100  | --                         | 125                     | --          | --               |
| MPSA76   | PNP DARLINGTON   | EBC       | 50               | 50*                        | 10               | 100                        | 40              | 10,000          | --  | 5.0               | 100              | 1.50                                   | 100  | --                         | 125                     | --          | --               |
| MPSA77   | PNP DARLINGTON   | EBC       | 60               | 60*                        | 10               | 100                        | 50              | 10,000          | --  | 5.0               | 100              | 1.50                                   | 100  | --                         | 125                     | --          | --               |
| MPSA92   | PNP HIGH VOLTAGE | EBC       | 300              | 300                        | 5.0              | 250                        | 200             | 25              | --  | 10                | 30               | 0.5                                    | 20   | 6.0                        | 50                      | --          | --               |
| MPSA94   | PNP HIGH VOLTAGE | EBC       | 500              | 400                        | 6.0              | 100                        | 400             | 50              | 200 | 10                | 10               | 0.75                                   | 50   | 6.0                        | 20                      | --          | --               |
| MPSD04   | NPN DARLINGTON   | EBC       | --               | 25*                        | 10               | 1,000                      | 20              | 1,000           | --  | 5.0               | 300              | 1.0                                    | 100  | --                         | 100                     | --          | --               |
| MPSD54   | PNP DARLINGTON   | EBC       | --               | 25*                        | 10               | 1,000                      | 20              | 1,000           | --  | 5.0               | 100              | 1.0                                    | 100  | --                         | 100                     | --          | --               |
| MPSH10   | NPN RF OSC       | BEC       | 30               | 25                         | 3.0              | 100                        | 25              | 60              | --  | 10                | 4.0              | 0.50                                   | 4.0  | 0.65*                      | 650                     | --          | --               |
| MPSH11   | NPN RF OSC       | BEC       | 30               | 25                         | 3.0              | 100                        | 25              | 60              | --  | 10                | 4.0              | 0.50                                   | 4.0  | 0.90*                      | 650                     | --          | --               |
| MPSL01   | NPN HIGH VOLTAGE | EBC       | 140              | 120                        | 5.0              | 1,000                      | 75              | 50              | 300 | 5.0               | 10               | 0.30                                   | 50   | 8.0                        | 60                      | --          | --               |
| MPSL51   | PNP HIGH VOLTAGE | EBC       | 100              | 100                        | 4.0              | 1,000                      | 50              | 40              | 250 | 5.0               | 50               | 0.30                                   | 50   | 8.0                        | 60                      | --          | --               |
| PN918    | NPN RF OSC       | EBC       | 30               | 15                         | 3.0              | 10                         | 15              | 20              | --  | 1.0               | 3.0              | 0.40                                   | 10   | 1.7                        | 600                     | 6.0         | --               |
| PN2222A  | NPN AMPL/SWITCH  | EBC       | 75               | 40                         | 6.0              | 10                         | 60              | 100             | 300 | 10                | 150              | 1.0                                    | 500  | 8.0                        | 300                     | 4.0         | 285              |
| PN2369A  | NPN SAT SWITCH   | EBC       | 40               | 15                         | 4.5              | 400                        | 20              | 40              | 120 | 0.35              | 10               | 0.50                                   | 100  | 4.0                        | 500                     | --          | 18               |
| PN2484   | NPN LOW NOISE    | EBC       | 60               | 60                         | 6.0              | 10                         | 45              | 250             | --  | 5.0               | 1.0              | 0.30                                   | 1.0  | 6.0                        | --                      | 3.0         | --               |
| PN2906   | PNP AMPL/SWITCH  | EBC       | 60               | 40                         | 5.0              | 20                         | 50              | 40              | 120 | 10                | 150              | 1.60                                   | 500  | 8.0                        | 200                     | --          | 100              |
| PN2906A  | PNP AMPL/SWITCH  | EBC       | 60               | 60                         | 5.0              | 10                         | 50              | 40              | 120 | 10                | 150              | 1.60                                   | 500  | 8.0                        | 200                     | --          | 100              |
| PN2907   | PNP AMPL/SWITCH  | EBC       | 60               | 40                         | 5.0              | 20                         | 50              | 100             | 300 | 10                | 150              | 1.60                                   | 500  | 8.0                        | 200                     | --          | 100              |
| PN2907A  | PNP AMPL/SWITCH  | EBC       | 60               | 60                         | 5.0              | 10                         | 50              | 100             | 300 | 10                | 150              | 1.60                                   | 500  | 8.0                        | 200                     | --          | 100              |
| PN3563   | NPN RF OSC       | EBC       | 30               | 12                         | 2.0              | 50                         | 15              | 20              | 200 | 10                | 8.0              | --                                     | --   | 1.7                        | 600                     | --          | --               |
| PN3564   | NPN RF OSC       | EBC       | 30               | 15                         | 4.0              | 50                         | 15              | 20              | 200 | 10                | 15               | 0.30                                   | 20   | 3.5                        | 400                     | --          | --               |
| PN3565   | NPN LOW NOISE    | EBC       | 30               | 25                         | 6.0              | 50                         | 25              | 150             | 600 | 10                | 1.0              | 0.35                                   | 1.0  | 4.0                        | 40                      | --          | --               |
| PN3566   | NPN AMPL/SWITCH  | EBC       | 40               | 30                         | 5.0              | 50                         | 20              | 150             | 600 | 10                | 10               | 1.0                                    | 100  | 25                         | 40                      | --          | --               |
| PN3567   | NPN AMPL/SWITCH  | EBC       | 80               | 40                         | 5.0              | 50                         | 40              | 40              | 120 | 1.0               | 150              | 0.25                                   | 150  | 20                         | 60                      | --          | --               |
| PN3568   | NPN AMPL/SWITCH  | EBC       | 80               | 60                         | 5.0              | 50                         | 40              | 40              | 120 | 1.0               | 150              | 0.25                                   | 150  | 20                         | 60                      | --          | --               |
| PN3569   | NPN AMPL/SWITCH  | EBC       | 80               | 40                         | 5.0              | 50                         | 40              | 100             | 300 | 1.0               | 150              | 0.25                                   | 150  | 20                         | 60                      | --          | --               |
| PN3638A  | PNP AMPL/SWITCH  | EBC       | 25               | 25                         | 4.0              | 35*                        | 15              | 100             | --  | 1.0               | 50               | 1.0                                    | 300  | 10                         | 150                     | --          | 170              |
| PN3639   | PNP SAT SWITCH   | EBC       | 6.0              | 6.0                        | 4.0              | 10*                        | 3.0             | 30              | 120 | 0.30              | 10               | 0.50                                   | 50   | 3.5                        | 500                     | --          | 60               |
| PN3640   | PNP SAT SWITCH   | EBC       | 12               | 12                         | 4.0              | 10*                        | 6.0             | 30              | 120 | 0.30              | 10               | 0.60                                   | 50   | 3.5                        | 500                     | --          | 75               |

# Small Signal Transistors

## TO-92 Case (Continued)



| TYPE NO. | DESCRIPTION     | LEAD CODE | V <sub>CB0</sub><br>(V) | V <sub>CEO</sub><br>(V) | V <sub>EBO</sub><br>(V) | I <sub>CBO</sub> @<br>(nA) | V <sub>CB</sub><br>(V) | h <sub>FE</sub>          |                          | @V <sub>CE</sub><br>(V) | @I <sub>C</sub><br>(mA) | V <sub>CE(SAT)</sub> @ I <sub>C</sub> |       | C <sub>ob</sub><br>(pF) | f <sub>T</sub><br>(MHz) | NF<br>(dB) | t <sub>off</sub> |
|----------|-----------------|-----------|-------------------------|-------------------------|-------------------------|----------------------------|------------------------|--------------------------|--------------------------|-------------------------|-------------------------|---------------------------------------|-------|-------------------------|-------------------------|------------|------------------|
|          |                 |           |                         |                         |                         |                            |                        | *I <sub>CES</sub><br>MIN | *I <sub>CEV</sub><br>MAX |                         |                         | MIN                                   | MAX   |                         |                         |            |                  |
| PN3641   | NPN AMPL/SWITCH | EBC       | 60                      | 30                      | 5.0                     | 50*                        | 50                     | 40                       | 120                      | 10                      | 150                     | 0.22                                  | 150   | 8.0                     | 150                     | --         | 150              |
| PN3642   | NPN AMPL/SWITCH | EBC       | 60                      | 45                      | 5.0                     | 50*                        | 50                     | 40                       | 120                      | 10                      | 150                     | 0.22                                  | 150   | 8.0                     | 150                     | --         | 150              |
| PN3643   | NPN AMPL/SWITCH | EBC       | 60                      | 30                      | 5.0                     | 50*                        | 50                     | 100                      | 300                      | 10                      | 150                     | 0.22                                  | 150   | 8.0                     | 250                     | --         | 150              |
| PN3644   | PNP AMPL/SWITCH | EBC       | 45                      | 45                      | 5.0                     | 35*                        | 30                     | 100                      | 300                      | 10                      | 150                     | 1.0                                   | 300   | 8.0                     | 200                     | --         | 100              |
| PN3645   | PNP AMPL/SWITCH | EBC       | 60                      | 60                      | 5.0                     | 35*                        | 50                     | 100                      | 300                      | 10                      | 150                     | 1.0                                   | 300   | 8.0                     | 200                     | --         | 100              |
| PN3646   | NPN SAT SWITCH  | EBC       | 40                      | 15                      | 5.0                     | 500*                       | 20                     | 30                       | 120                      | 0.40                    | 30                      | 0.50                                  | 300   | 5.0                     | 350                     | --         | 28               |
| PN3694   | NPN AMPL/SWITCH | EBC       | 45                      | 45                      | 4.0                     | 50                         | 30                     | 100                      | 400                      | 10                      | 10                      | --                                    | --    | 6.0                     | 200                     | --         | --               |
| PN4033   | PNP AMPL/SWITCH | EBC       | 80                      | 80                      | 5.0                     | 50                         | 60                     | 100                      | 300                      | 5.0                     | 100                     | 0.5                                   | 500   | 20                      | --                      | --         | 50               |
| PN4249   | PNP LOW NOISE   | EBC       | 60                      | 60                      | 5.0                     | 10                         | 40                     | 100                      | 300                      | 5.0                     | 0.10                    | 0.25                                  | 10    | 6.0                     | 40                      | 3.0        | --               |
| PN4250A  | PNP LOW NOISE   | EBC       | 60                      | 60                      | 5.0                     | 10                         | 50                     | 250                      | 700                      | 5.0                     | 0.10                    | 0.25                                  | 10    | 6.0                     | 50                      | 2.0        | --               |
| PN4258   | PNP SAT SWITCH  | EBC       | 12                      | 12                      | 4.5                     | 10*                        | 6.0                    | 30                       | 120                      | 3.0                     | 10                      | 0.50                                  | 50    | 3.0                     | 700                     | --         | 20               |
| PN4274   | NPN SAT SWITCH  | EBC       | 30                      | 12                      | 4.5                     | 400*                       | 20                     | 35                       | 120                      | 1.0                     | 10                      | 0.50                                  | 100   | 4.0                     | 400                     | --         | 12               |
| PN4275   | NPN SAT SWITCH  | EBC       | 40                      | 15                      | 4.5                     | 400*                       | 20                     | 35                       | 120                      | 1.0                     | 10                      | 0.50                                  | 100   | 4.0                     | 400                     | --         | 12               |
| PN4354   | PNP AMPL/SWITCH | EBC       | 60                      | 60                      | 5.0                     | 50                         | 50                     | 50                       | 500                      | 10                      | 10                      | 0.50                                  | 500   | 30                      | 100                     | 3.0        | 400              |
| PN4355   | PNP AMPL/SWITCH | EBC       | 60                      | 60                      | 5.0                     | 50                         | 50                     | 100                      | 400                      | 10                      | 10                      | 1.0                                   | 1,000 | 30                      | 100                     | 3.0        | 400              |
| PN4356   | PNP AMPL/SWITCH | EBC       | 80                      | 80                      | 5.0                     | 50                         | 50                     | 50                       | 250                      | 10                      | 10                      | 0.50                                  | 500   | 30                      | 100                     | 3.0        | 400              |
| PN4916   | PNP AMPL/SWITCH | EBC       | 30                      | 30                      | 5.0                     | 25                         | 15                     | 70                       | 200                      | 1.0                     | 10                      | 0.30                                  | 50    | 4.5                     | 400                     | 4.0        | --               |
| PN4917   | PNP AMPL/SWITCH | EBC       | 30                      | 30                      | 5.0                     | 25                         | 15                     | 150                      | 300                      | 1.0                     | 10                      | 0.30                                  | 50    | 4.5                     | 450                     | 4.0        | --               |
| PN5127   | NPN AMPL/SWITCH | EBC       | 20                      | 12                      | 3.0                     | 50                         | 10                     | 15                       | 300                      | 10                      | 2.0                     | 0.30                                  | 10    | 3.5                     | 150                     | --         | --               |
| PN5128   | NPN AMPL/SWITCH | EBC       | 15                      | 12                      | 3.0                     | 50                         | 10                     | 35                       | 350                      | 10                      | 50                      | 0.25                                  | 150   | 10                      | 150                     | --         | --               |
| PN5129   | NPN AMPL/SWITCH | EBC       | 15                      | 12                      | 3.0                     | 50                         | 10                     | 35                       | 350                      | 10                      | 50                      | 0.25                                  | 150   | 10                      | --                      | --         | --               |
| PN5130   | NPN RF OSC      | EBC       | 30                      | 12                      | 1.0                     | 50                         | 10                     | 15                       | 250                      | 10                      | 8.0                     | 0.60                                  | 10    | 1.7                     | --                      | 400        | --               |
| PN5131   | NPN AMPL/SWITCH | EBC       | 20                      | 15                      | 3.0                     | 50                         | 10                     | 30                       | 50                       | 1.0                     | 10                      | 1.0                                   | 10    | 6.0                     | 100                     | --         | --               |
| PN5132   | NPN AMPL/SWITCH | EBC       | 20                      | 20                      | 3.0                     | 50                         | 10                     | 30                       | 400                      | 10                      | 10                      | 2.0                                   | 10    | 3.5                     | 200                     | 4.0        | --               |
| PN5133   | NPN LOW NOISE   | EBC       | 20                      | 18                      | 3.0                     | 50                         | 15                     | 60                       | 1,000                    | 5.0                     | 1.0                     | 0.40                                  | 1.0   | 5.0                     | 40                      | --         | --               |
| PN5134   | NPN SAT SWITCH  | EBC       | 20                      | 10                      | 3.5                     | 10,000                     | 15                     | 20                       | 150                      | 1.0                     | 10                      | 0.25                                  | 10    | 4.0                     | --                      | --         | 18               |
| PN5135   | NPN AMPL/SWITCH | EBC       | 30                      | 25                      | 4.0                     | 300                        | 15                     | 50                       | 600                      | 10                      | 10                      | 1.0                                   | 100   | 25                      | 40                      | --         | --               |
| PN5136   | NPN AMPL/SWITCH | EBC       | 30                      | 20                      | 3.0                     | 100                        | 20                     | 20                       | 400                      | 1.0                     | 150                     | 0.25                                  | 150   | 35                      | 40                      | --         | --               |
| PN5137   | NPN AMPL/SWITCH | EBC       | 30                      | 20                      | 3.0                     | 100                        | 20                     | 20                       | 400                      | 1.0                     | 150                     | 0.25                                  | 150   | 35                      | 40                      | --         | --               |
| PN5138   | PNP AMPL/SWITCH | EBC       | 30                      | 30                      | 5.0                     | 50                         | 20                     | 50                       | 800                      | 10                      | 0.10                    | 0.30                                  | 10    | 7.0                     | 30                      | --         | --               |
| PN5139   | PNP AMPL/SWITCH | EBC       | 20                      | 20                      | 5.0                     | 50*                        | 15                     | 40                       | --                       | 1.0                     | 10                      | 0.50                                  | 50    | 5.0                     | 300                     | --         | 200              |
| PN5142   | PNP AMPL/SWITCH | EBC       | 20                      | 20                      | 4.0                     | 50*                        | 12                     | 30                       | --                       | 1.0                     | 50                      | 2.0                                   | 300   | 10                      | --                      | --         | 200              |
| PN5143   | PNP AMPL/SWITCH | EBC       | 20                      | 20                      | 4.0                     | 50*                        | 12                     | 30                       | --                       | 1.0                     | 50                      | 2.0                                   | 300   | 10                      | --                      | --         | 200              |
| PN5825   | NPN AMPL/SWITCH | EBC       | 50                      | 40                      | 5.0                     | 50                         | 40                     | 100                      | 200                      | 5.0                     | 2.0                     | 0.125                                 | 10    | 4.0                     | 90                      | --         | --               |
| PN5826   | NPN AMPL/SWITCH | EBC       | 50                      | 40                      | 5.0                     | 50                         | 40                     | 150                      | 300                      | 5.0                     | 2.0                     | 0.125                                 | 10    | 4.0                     | 90                      | --         | --               |
| PN5827   | NPN AMPL/SWITCH | EBC       | 50                      | 40                      | 5.0                     | 50                         | 40                     | 250                      | 500                      | 5.0                     | 2.0                     | 0.125                                 | 10    | 4.0                     | 90                      | --         | --               |
| PN5828   | NPN AMPL/SWITCH | EBC       | 50                      | 40                      | 5.0                     | 50                         | 40                     | 400                      | 800                      | 5.0                     | 2.0                     | 0.125                                 | 10    | 4.0                     | 90                      | --         | --               |
| PN5910   | PNP SAT SWITCH  | EBC       | 20                      | 20                      | 4.5                     | 10*                        | 10                     | 30                       | 120                      | 0.30                    | 10                      | 0.50                                  | 50    | 3.0                     | 700                     | --         | 20               |
| PN6010   | NPN AMPL/SWITCH | EBC       | 50                      | 40                      | 5.0                     | 10                         | 25                     | 100                      | 300                      | 1.0                     | 10                      | 0.50                                  | 500   | 10                      | 105                     | 5.0        | 400              |

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