

# Small Signal Transistors

## TO-18 Case (Continued)



| TYPE NO. | DESCRIPTION     | BV <sub>CBO</sub><br>(V) | BV <sub>CEO</sub><br>(V) | BV <sub>EBO</sub><br>(V) | I <sub>CBO</sub> @<br>(mA)                     | V <sub>CB</sub><br>(V) | h <sub>FE</sub> |     | @ I <sub>C</sub><br>(mA) | @ V <sub>CE</sub><br>(V) | V <sub>CE(SAT)</sub> @ I <sub>C</sub><br>(V) | C <sub>ob</sub><br>(pF) | f <sub>T</sub><br>(MHz) | NF<br>(dB) | t <sub>on</sub><br>(ns) | t <sub>off</sub><br>(ns) |
|----------|-----------------|--------------------------|--------------------------|--------------------------|------------------------------------------------|------------------------|-----------------|-----|--------------------------|--------------------------|----------------------------------------------|-------------------------|-------------------------|------------|-------------------------|--------------------------|
|          |                 | MIN                      | MIN                      | MIN                      | MAX<br>*I <sub>CES</sub><br>**I <sub>CEV</sub> |                        | MIN             | MAX |                          |                          | MAX                                          | MAX                     | MIN                     | MAX        | MAX                     | MAX                      |
| 2N2896   | NPN AMPL/SWITCH | 140                      | 90                       | 7.0                      | 0.01                                           | 60                     | 60              | 200 | 150                      | 10                       | 0.6                                          | 150                     | 120                     | --         | --                      | --                       |
| 2N2897   | NPN AMPL/SWITCH | 60                       | 45                       | 7.0                      | 0.05                                           | 60                     | 50              | 200 | 150                      | 10                       | 1.0                                          | 150                     | 100                     | --         | --                      | --                       |
| 2N2906   | PNP AMPL/SWITCH | 60                       | 60                       | 5.0                      | 0.01                                           | 50                     | 40              | 120 | 150                      | 10                       | 0.4                                          | 150                     | 200                     | --         | --                      | 100                      |
| 2N2906A  | PNP AMPL/SWITCH | 60                       | 60                       | 5.0                      | 0.01                                           | 50                     | 40              | 120 | 150                      | 10                       | 0.4                                          | 150                     | 200                     | --         | --                      | 100                      |
| 2N2907   | PNP AMPL/SWITCH | 60                       | 60                       | 5.0                      | 0.01                                           | 50                     | 100             | 300 | 150                      | 10                       | 0.4                                          | 150                     | 200                     | --         | --                      | 100                      |
| 2N2907A  | PNP AMPL/SWITCH | 60                       | 60                       | 5.0                      | 0.01                                           | 50                     | 100             | 300 | 150                      | 10                       | 0.4                                          | 150                     | 200                     | --         | --                      | 100                      |
| 2N2952   | NPN AMPL/SWITCH | 60                       | 20                       | 5.0                      | 0.1                                            | 50                     | 20              | --  | 150                      | 10                       | 0.5                                          | 150                     | 200                     | --         | --                      | --                       |
| 2N3009   | NPN SAT SWITCH  | 40                       | 15                       | 4.0                      | 0.5*                                           | 20                     | 30              | 120 | 30                       | 0.4                      | 0.5                                          | 300                     | 350                     | --         | 15                      | 25                       |
| 2N3011   | NPN SAT SWITCH  | 30                       | 12                       | 5.0                      | 0.4*                                           | 20                     | 30              | 120 | 10                       | 0.35                     | 0.5                                          | 100                     | 400                     | --         | 15                      | 20                       |
| 2N3012   | PNP SAT SWITCH  | 12                       | 12                       | 4.0                      | 0.08*                                          | 6.0                    | 30              | 120 | 30                       | 0.5                      | 0.2                                          | 30                      | 400                     | --         | 60                      | 75                       |
| 2N3013   | NPN SAT SWITCH  | 40                       | 15                       | 5.0                      | 0.3*                                           | 20                     | 30              | 120 | 30                       | 0.4                      | 0.5                                          | 300                     | 350                     | --         | 15                      | 25                       |
| 2N3014   | NPN SAT SWITCH  | 40                       | 20                       | 5.0                      | 0.3*                                           | 20                     | 30              | 120 | 30                       | 0.4                      | 0.35                                         | 100                     | 350                     | --         | 16                      | 25                       |
| 2N3073   | PNP AMPL/SWITCH | 60                       | 60                       | 4.0                      | 0.01*                                          | 30                     | 30              | 130 | 50                       | 1.0                      | 0.25                                         | 50                      | 130                     | --         | 40                      | 100                      |
| 2N3115   | NPN AMPL/SWITCH | 20                       | 20                       | 5.0                      | --                                             | --                     | 40              | 120 | 150                      | 10                       | 0.5                                          | 150                     | 250                     | --         | --                      | --                       |
| 2N3116   | NPN AMPL/SWITCH | 20                       | 20                       | 5.0                      | --                                             | --                     | 100             | 300 | 150                      | 10                       | 0.5                                          | 150                     | 250                     | --         | --                      | --                       |
| 2N3117   | NPN AMPL/SWITCH | 60                       | 60                       | 6.0                      | 10nA                                           | 45                     | 250             | 500 | 0.01                     | 10                       | 0.35                                         | 1.0                     | 45                      | 60         | --                      | --                       |
| 2N3121   | PNP AMPL/SWITCH | 45                       | 45                       | 4.0                      | 0.01                                           | 30                     | 30              | --  | 150                      | 10                       | 0.5                                          | 150                     | 10                      | 130        | --                      | --                       |
| 2N3135   | PNP AMPL/SWITCH | 50                       | 35                       | 4.0                      | 0.05                                           | 30                     | 40              | --  | 150                      | 10                       | 0.5                                          | 150                     | 10                      | 200        | --                      | --                       |
| 2N3136   | PNP AMPL/SWITCH | 50                       | 35                       | 4.0                      | 0.05                                           | 30                     | 100             | 300 | 150                      | 10                       | 0.6                                          | 150                     | 10                      | 200        | --                      | --                       |
| 2N3209   | PNP SAT SWITCH  | 20                       | 20                       | 4.0                      | 0.08                                           | 10                     | 25              | --  | 10                       | 0.3                      | 0.15                                         | 10                      | 50                      | 400        | --                      | 60                       |
| 2N3210   | NPN SAT SWITCH  | 40                       | 15                       | 5.0                      | --                                             | --                     | 30              | 120 | 10                       | 5.0                      | 0.5                                          | 100                     | 400                     | --         | 15                      | 20                       |
| 2N3241A  | NPN AMPL/SWITCH | 30                       | 25                       | 7.5                      | 100                                            | 25                     | 100             | 200 | 10                       | 10                       | 0.25                                         | 200                     | 20                      | 50         | 10                      | --                       |
| 2N3242A  | NPN AMPL/SWITCH | 40                       | 40                       | 8.0                      | 10                                             | 25                     | 125             | 300 | 10                       | 10                       | 0.3                                          | 300                     | 20                      | 50         | 6.0                     | --                       |
| 2N3246   | NPN LOW NOISE   | 60                       | 40                       | 10                       | 0.10                                           | 40                     | 400             | --  | 1.0                      | 5.0                      | 0.5                                          | 5.0                     | 60                      | 2.0        | --                      | --                       |
| 2N3248   | PNP SAT SWITCH  | 15                       | 12                       | 5.0                      | 0.05                                           | 10                     | 50              | 150 | 10                       | 1.0                      | 0.125                                        | 10                      | 8.0                     | 250        | --                      | 15                       |
| 2N3249   | PNP SAT SWITCH  | 15                       | 12                       | 5.0                      | 0.05**                                         | 10                     | 100             | 300 | 0.1                      | 1.0                      | 0.25                                         | 50                      | 8.0                     | 300        | --                      | 90                       |
| 2N3250A  | PNP AMPL/SWITCH | 60                       | 60                       | 5.0                      | 0.02                                           | 40                     | 50              | 150 | 10                       | 1.0                      | 0.25                                         | 10                      | 6.0                     | 250        | --                      | 35                       |
| 2N3251A  | PNP AMPL/SWITCH | 60                       | 60                       | 5.0                      | 0.02                                           | 40                     | 100             | 300 | 10                       | 1.0                      | 0.25                                         | 10                      | 6.0                     | 300        | --                      | 35                       |
| 2N3301   | NPN AMPL/SWITCH | 60                       | 30                       | 5.0                      | 0.01                                           | 50                     | 40              | 120 | 150                      | 10                       | 0.22                                         | 150                     | 8.0                     | 250        | --                      | --                       |
| 2N3302   | NPN AMPL/SWITCH | 60                       | 30                       | 5.0                      | 0.01                                           | 50                     | 100             | 300 | 150                      | 10                       | 0.22                                         | 150                     | 8.0                     | 250        | --                      | --                       |
| 2N3496   | PNP AMPL/SWITCH | 80                       | 80                       | 4.0                      | 0.1                                            | 50                     | 40              | --  | 10                       | 10                       | 0.3                                          | 10                      | 7.0                     | 200        | --                      | --                       |
| 2N3497   | PNP AMPL/SWITCH | 120                      | 120                      | 4.0                      | 0.1                                            | 90                     | 40              | --  | 10                       | 10                       | 0.35                                         | 10                      | 6.0                     | 150        | --                      | --                       |
| 2N3504   | PNP AMPL/SWITCH | 45                       | 45                       | 5.0                      | --                                             | --                     | 100             | 300 | 150                      | 10                       | 0.25                                         | 50                      | 8.0                     | 200        | --                      | --                       |
| 2N3505   | PNP AMPL/SWITCH | 60                       | 60                       | 5.0                      | 0.01                                           | 30                     | 100             | 300 | 150                      | 10                       | 0.4                                          | 150                     | 8.0                     | 200        | --                      | --                       |
| 2N3545   | PNP SAT SWITCH  | 20                       | 20                       | 5.0                      | --                                             | --                     | 40              | 120 | 10                       | 1.0                      | 0.5                                          | 100                     | 8.0                     | 250        | --                      | 60                       |
| 2N3546   | PNP SAT SWITCH  | 15                       | 12                       | 4.5                      | 0.01                                           | 10                     | 30              | 120 | 10                       | 1.0                      | 0.5                                          | 100                     | 6.0                     | 700        | --                      | 40                       |
| 2N3547   | PNP LOW NOISE   | 60                       | 60                       | 6.0                      | 0.025                                          | 45                     | 100             | 500 | 1.0                      | 5.0                      | 1.0                                          | 10                      | 8.0                     | 45         | 5.0                     | --                       |
| 2N3548   | PNP LOW NOISE   | 60                       | 45                       | 6.0                      | 0.01                                           | 45                     | 100             | 300 | 0.01                     | 5.0                      | 1.0                                          | 10                      | 8.0                     | 60         | 4.0                     | --                       |
| 2N3549   | PNP LOW NOISE   | 60                       | 60                       | 6.0                      | 0.01                                           | 45                     | 100             | 500 | 0.01                     | 5.0                      | 1.0                                          | 10                      | 8.0                     | 60         | 4.0                     | --                       |
| 2N3550   | PNP LOW NOISE   | 60                       | 45                       | 8.0                      | 0.01                                           | 45                     | 200             | 600 | 0.01                     | 5.0                      | 0.5                                          | 5.0                     | 8.0                     | 60         | 4.0                     | --                       |

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