

NPN TRANSISTORS



TO-92/TO-226AA

'2N' and 'TP' DEVICE TYPES

ELECTRICAL CHARACTERISTICS at $T_A = 25^\circ\text{C}$

| Device Type | I_C Max. (mA) | $V_{(BR)CBO}$ (V) | $V_{(BR)CEO}$ (V) | $V_{(BR)EBO}$ (V) | I_{CBO} | | DC Current Gain | | | | $V_{CE(sat)}$ | | f_T | | C_{ob}^1 (pF) | t_s^1 (ns) | NF ¹ (dB) | Pinning 1, 2, 3 |
|-------------|--------------------|----------------------|----------------------|----------------------|-----------|-------------------|------------------|------------------|-----------------|-------------------|---------------|-----------------|------------|-----------------|--------------------|-----------------|-------------------------|--------------------|
| | | | | | Max. (nA) | @ V_{CB} (V) | h_{FE} Min. | h_{FE} Max. | @ I_C (mA) | @ V_{CE} (V) | Max. (V) | @ I_C (mA) | Min. (MHz) | @ I_C (mA) | | | | |
| TP918 | 50 | 30 | 15 | 3.0 | 10 | 15 | 20 | — | 3.0 | 1.0 | 0.4 | 10 | 600 | 4.0 | 1.7 | — | — | EBC |
| TP2221 | 500 | 60 | 30 | 5.0 | 10 | 50 | 40 | 120 | 150 | 10 | 0.4 | 150 | 250 | 20 | 8.0 | — | — | EBC |
| TP2221A | 500 | 75 | 40 | 6.0 | 10 | 60 | 40 | 120 | 150 | 10 | 0.3 | 150 | 250 | 20 | 8.0 | 225 | — | EBC |
| TP2222 | 500 | 60 | 30 | 5.0 | 10 | 50 | 100 | 300 | 150 | 10 | 0.4 | 150 | 250 | 20 | 8.0 | — | — | EBC |
| TP2222A | 500 | 75 | 40 | 6.0 | 10 | 60 | 100 | 300 | 150 | 10 | 0.3 | 150 | 250 | 20 | 8.0 | 225 | — | EBC |
| 2N3414 | 500 | 25 | 25 | 5.0 | 100 | 25 | 75 | 225 | 2.0 | 4.5 | 0.3 | 50 | — | — | — | — | — | ECB |
| 2N3415 | 500 | 25 | 25 | 5.0 | 100 | 25 | 180 | 540 | 2.0 | 4.5 | 0.3 | 50 | — | — | — | — | — | ECB |
| 2N3416 | 500 | 50 | 50 | 5.0 | 100 | 50 | 75 | 225 | 2.0 | 4.5 | 0.3 | 50 | — | — | — | — | — | ECB |
| 2N3417 | 500 | 50 | 50 | 5.0 | 100 | 50 | 180 | 540 | 2.0 | 4.5 | 0.3 | 50 | — | — | — | — | — | ECB |
| 2N3904 | 200 | 60 | 40 | 6.0 | 50 | 30 | 100 | 300 | 10 | 1.0 | 0.2 | 10 | 300 | 10 | 4.0 | — | 5.0 | EBC |
| 2N4401 | 500 | 60 | 40 | 6.0 | 100 | 30 | 100 | 300 | 150 | 1.0 | 0.4 | 150 | 250 | 20 | 6.5 | 225 | — | EBC |
| 2N4424 | 500 | 40 | 40 | 5.0 | 100 | 25 | 180 | 540 | 2.0 | 4.5 | 0.3 | 50 | — | — | — | — | — | ECB |
| 2N5088 | 100 | 35 | 30 | — | 50 | 20 | 300 | 900 | 0.1 | 5.0 | 0.5 | 10 | — | — | 4.0 | — | 3.0 | EBC |
| 2N5089 | 100 | 30 | 25 | — | 50 | 15 | 400 | 1200 | 0.1 | 5.0 | 0.5 | 10 | — | — | 4.0 | — | 2.0 | EBC |
| 2N5172 | 500 | 25 | 25 | 5.0 | 100 | 25 | 100 | 500 | 10 | 10 | 0.25 | 10 | — | — | 10 | — | — | ECB |
| 2N5307 | 500 | 40 | 40 | 12 | 100 | 40 | 2k | 20k | 2.0 | 5.0 | 1.4 | 200 | 60 | 2.0 | 10 | — | — | ECB |
| 2N5308 | 500 | 40 | 40 | 12 | 100 | 40 | 7k | 70k | 2.0 | 5.0 | 1.4 | 200 | 60 | 2.0 | 10 | — | — | ECB |
| TP5376 | 500 | 60 | 30 | 5.0 | 10 | 30 | 120 | — | 1.0 | 5.0 | — | — | — | — | 8.0 | — | — | EBC |
| 2N6427 | 500 | 40 | 40 | 12 | 50 | 30 | 10k | 100k | 10 | 5.0 | 1.2 | 50 | 130 | 10 | 7.0 | — | 10 | EBC |

NOTES: 1) Maximum at typical JEDEC conditions.

2) μA .

3) $V_{(BR)CES}/I_{CES}$, as applicable.

4) mA.

5) $V_{(BR)CER}$ at $R = 10\Omega$.

NPN TRANSISTORS

TO-92/TO-226AA

'MPS' DEVICE TYPES

ELECTRICAL CHARACTERISTICS at $T_A = 25^\circ\text{C}$

| Device Type | I_C Max. (mA) | $V_{(BR)CBO}$ (V) | $V_{(BR)CEO}$ (V) | $V_{(BR)EBO}$ (V) | I_{CBO} | | DC Current Gain | | | | $V_{CE(sat)}$ | | f_T | | C_{ob}^1 (pF) | t_s^1 (ns) | NF ¹ (dB) | Pinning 1, 2, 3 |
|-------------|--------------------|----------------------|----------------------|----------------------|-----------|-------------------|------------------|------------------|-----------------|-------------------|---------------|-----------------|------------|-----------------|--------------------|-----------------|-------------------------|--------------------|
| | | | | | Max. (nA) | @ V_{CB} (V) | h_{FE} Min. | h_{FE} Max. | @ I_C (mA) | @ V_{CE} (V) | Max. (V) | @ I_C (mA) | Min. (MHz) | @ I_C (mA) | | | | |
| | | | | | | | | | | | | | | | | | | |
| MPS6520 | 200 | 40 | 25 | 4.0 | 50 | 30 | 200 | 400 | 2.0 | 10 | 0.5 | 50 | — | — | 3.5 | — | 3.0 | EBC |
| MPS6521 | 200 | 40 | 25 | 4.0 | 50 | 30 | 300 | 600 | 2.0 | 10 | 0.5 | 50 | — | — | 3.5 | — | 3.0 | EBC |
| MPSA05 | 800 | 60 | 60 | 4.0 | 100 | 60 | 50 | — | 100 | 1.0 | 0.25 | 100 | 100 | 10 | — | — | — | EBC |
| MPSA06 | 800 | 80 | 80 | 4.0 | 100 | 80 | 50 | — | 100 | 1.0 | 0.25 | 100 | 100 | 10 | — | — | — | EBC |
| MPSA14 | 500 | 30 ³ | — | 10 | 100 | 30 | 20k | — | 100 | 5.0 | 1.5 | 100 | 125 | 10 | — | — | — | EBC |
| MPSA42 | 500 | 300 | 300 | 6.0 | 100 | 200 | 40 | — | 30 | 10 | 0.5 | 20 | 50 | 10 | 3.0 | — | — | EBC |
| MPSA43 | 500 | 200 | 200 | 6.0 | 100 | 160 | 40 | — | 30 | 10 | 0.5 | 20 | 50 | 10 | 4.0 | — | — | EBC |

NOTES: 1) Maximum at typical JEDEC conditions.

2) μA .

3) $V_{(BR)CES}/I_{CES}$, as applicable.

4) mA.

5) $V_{(BR)CER}$ at $R = 10\Omega$.