

### 12. SWITCHING TRANSISTORS

IN ORDER OF (1) MAX RISE TIME, (2) fab & (3) TYPE No.

| LINE No. | TYPE No.  | fab      | MAX RISE TIME tr (s) | MAX DELAY TIME td (s) | MAX STORE TIME ts (s) | MAX FALL TIME tf (s) | MAX. P <sub>c</sub> IN FREE AIR @ 25°C (W) | BIAS    |        |        | MAX. SAT. RES. (Ω) | Cob (F) | r <sub>bb</sub> X Cob (s) | STRUCTURE P-N-P N-N-P-N | M A T | MAX. TEMP (°C) | DWG # Y200 s/a T0200 Ser. | L C O D E |
|----------|-----------|----------|----------------------|-----------------------|-----------------------|----------------------|--|---------|--------|--------|--------------------|---------|---------------------------|-------------------------|-------|----------------|---------------------------|-----------|
|          |           |          |                      |                       |                       |                      |  | Vcb (V) | le (A) | hFE    |                    |         |                           |                         |       |                |                           |           |
| 1        | 2N2352A   | 50.0M\$  | 70n                  |                       | 150n                  | 50n                  | 400m                                       | 1.0     | 150m   | 60 Δ#  | 1.6                | 20pZ    | N-PE                      | Si                      | 200J  | T046           | A                         |           |
| 2        | 2N2364    | 50.0M\$  | 70n                  | 50n                   | 500n                  | 100n                 | 400m                                       | 1.0     | 150m   | 120 Δ# | 2.3                | 15pZ    | N-PE                      | Si                      | 200J  | T046           | A                         |           |
| 3        | 2N2364A   | 50.0M\$Δ | 70n                  | 50n                   | 500n                  | 100n                 | 400m                                       | 1.0     | 150m   | 120 Δ# | 1.6                | 15pZ    | N-PE                      | Si                      | 200J  | T046           | A                         |           |
| 4        | A5T2192   | 50M\$Δ   | 70n                  |                       | 150n                  | 50n                  | 625m                                       | 1.0     | 150m   | 100 Δ  | 2.3                | 20pZ    | N                         | Si                      | 150S  | R203           | A                         |           |
| 5        | A5T2193   | 50M\$Δ   | 70n                  |                       | 150n                  | 50n                  | 625m                                       | 1.0     | 150m   | 40 Δ   | 1.7                | 20pZ    | N                         | Si                      | 150S  | R203           | A                         |           |
| 6#       | BSY46     | 50.0M\$Δ | 70n                  |                       | 150n                  | 50n                  | 800m                                       | 1.0     | 150m   | 80 #   |                    | 20pZ    | N-PE                      | Si                      | 200J  | T05            | A                         |           |
| 7        | MM2193A   | 50M\$Δ   | 70n                  |                       | 150n                  | 50n                  | 5.0 Φ                                      | 1.0     | 100m   | 15 Δ   | 1.6                | 20pZ    | N-AN                      | Si                      | 200J  | T039           | A                         |           |
| 8        | 2N4036    | 60M\$Δ   | 70n                  |                       | 600n                  | 100n                 | 7.0 Φ                                      | 1.0     | 150m   | 40     | 4.3m               |         | P                         | Si                      | 200J  | T05            | A                         |           |
| 9#       | BFR23     | 60M\$Δ   | 70n                  | 110nΦ                 | 600n                  | 100n                 | 7.0 Φ                                      | 1.0     | 500m   | 20 Δ   |                    | 30p     | P                         | Si                      | 200J  | T039           | A                         |           |
| 10       | 2N770     | 75M\$Δ   | 70n                  |                       | 20n                   | 40n                  | 150m                                       | 1.0     | 10m    | 60 Δ   | 2.5                | 3.5pZ   | N                         | Si                      | 150S  | T018           | A                         |           |
| 11       | 2N772     | 75M\$Δ   | 70n                  |                       | 40n                   | 70n                  | 150m                                       | 5.0     | 20m    | 20 Δ   | 2.5                | 3.5pZ   | N                         | Si                      | 150S  | T018           | A                         |           |
| 12       | 2N3638    | 100M\$Δ  | 70n                  | 20n                   | 140n                  | 70n                  | 700m                                       | 1.0     | 50m    | 30 Δ#  |                    | 20pZ    | P                         | Si                      | 125J  | R110a          | A                         |           |
| 13       | 2N5142    | 100M\$Δ  | 70n                  | 50n                   | 150n                  | 75n                  | 700m                                       | 1.0     | 50m    | 30 Δ#  |                    | 10pS    | P                         | Si                      | 125J  | T0105          | A                         |           |
| 14       | 2N5143    | 100M\$Δ  | 70n                  | 50n                   | 150n                  | 75n                  | 500m                                       | 1.0     | 50m    | 30 Δ#  |                    | 10pS    | P                         | Si                      | 125J  | T0106          | A                         |           |
| 15#      | A5T3638   | 100M\$Δ  | 70n                  | 20n                   | 140n                  | 70n                  | 625m                                       | 1.0     | 50m    | 30 Δ   | 3.3                | 20pZ    | P                         | Si                      | 150S  | R203           | A                         |           |
| 16       | MPS3638   | 100M\$Δ  | 70n                  |                       | 70n                   | 310m                 | 1.0  | 50m     | 30 Δ   |        |                    | 20pZ    | P-EA                      | Si                      | 135   | T092           | A                         |           |
| 17       | MPS3638#  | 100M\$   | 70n                  | 20n                   | 140n                  | 70n                  | 700m                                       | 1.0     | 10m    | 20 Δ#  | 5.0 #              | 10pS    | P1PE                      | Si                      | 150S  | T092           | A                         |           |
| 18       | MPS3638A# | 100M\$   | 70n                  | 20n                   | 140n                  | 70n                  | 700m                                       | 1.0     | 10m    | 100 Δ# | 5.0 #              | 10pS    | P1PE                      | Si                      | 150S  | T092           | A                         |           |
| 19#      | MPS3638K  | 100M\$Δ  | 70n                  | 20n                   | 140n                  | 70n                  | 1.2 Φ                                      | 1.0     | 10m    | 20 Δ#  | 5.0 #              | 20pZ    | PPL                       | Si                      | 175A  | X167           | A                         |           |
| 20#      | MPS3638L  | 100M\$Δ  | 70n                  | 20n                   | 140n                  | 70n                  | 1.2 Φ                                      | 1.0     | 10m    | 20 Δ#  | 5.0 #              | 20pZ    | PPL                       | Si                      | 175A  | X168           | A                         |           |
| 21#      | MPS3638M  | 100M\$Δ  | 70n                  | 20n                   | 140n                  | 70n                  | 1.2 Φ                                      | 1.0     | 10m    | 20 Δ#  | 5.0 #              | 20pZ    | PPL                       | Si                      | 175A  | X169           | A                         |           |
| 22       | TP3638    | 100M\$Δ  | 70n                  | 20n                   | 140n                  | 70n                  | 360m                                       | 1.0     | 10m    | 20 Δ#  |                    | 20pS    | P-PL                      | Si                      | 150J  | R203a          | A                         |           |
| 23       | TP5142    | 100M     | 70n                  | 50n                   | 150n                  | 75n                  | 625m                                       | 1.0     | 50m    | 30 Δ   |                    | 10p     | P                         | Si                      | 200J  | T092           | A                         |           |
| 24       | 2N1199    | 140M\$   | 70n                  |                       | 20n                   | 40n                  | 150m                                       | 1.0     | 20m    | 25     | 25                 | 3.5pZ   | N-DA                      | Ge                      | 150S  | T09            | A                         |           |
| 25       | 2N1472    | 140M\$   | 70n                  |                       | 40n                   | 70n                  | 150m                                       | 5.0     | 10m    | 35     | 25                 | 3.5pZ   | N-DA                      | Ge                      | 150S  | T09            | A                         |           |
| 26#      | 2SC1816   | 140M\$   | 70n                  | 40n                   | 60n                   | 70n                  | 1.3  | 2.0     | 100m   | 100 *  | 400m               | 45p     | N-ME                      | Si                      | 120J  | Y220b          | D                         |           |
| 27#      | 2SC1816H  | 140M\$   | 70n                  | 40n                   | 60n                   | 70n                  | 1.7  | 2.0     | 100m   | 100 *  | 400m               | 45p     | N-ME                      | Si                      | 120J  | Y220b          | D                         |           |
| 28       | 2N3638A   | 150M\$Δ  | 70n                  | 20n                   | 140n                  | 70n                  | 700m                                       | 1.0     | 10m    | 80 Δ   |                    | 10pZ    | P                         | Si                      | 125J  | R110a          | A                         |           |
| 29#      | A5T3638A  | 150M\$Δ  | 70n                  | 20n                   | 140n                  | 70n                  | 625m                                       | 1.0     | 50m    | 100 Δ  | 3.3                | 10pZ    | P                         | Si                      | 150S  | R203           | A                         |           |
| 30       | MPS3638A  | 150M\$Δ  | 70n                  | 20n                   | 140n                  | 70n                  | 310m                                       | 1.0     | 50m    | 100 Δ  |                    | 10pZ    | P-EA                      | Si                      | 135   | T092           | A                         |           |
| 31#      | MPS3638AK | 150M\$Δ  | 70n                  | 20n                   | 140n                  | 70n                  | 1.2 Φ                                      | 1.0     | 10m    | 100 Δ# | 5.0 #              | 10pZ    | PPL                       | Si                      | 175A  | X167           | A                         |           |
| 32#      | MPS3638AL | 150M\$Δ  | 70n                  | 20n                   | 140n                  | 70n                  | 1.2 Φ                                      | 1.0     | 10m    | 100 Δ# | 5.0 #              | 10pZ    | PPL                       | Si                      | 175A  | X168           | A                         |           |
| 33#      | MPS3638AM | 150M\$Δ  | 70n                  | 20n                   | 140n                  | 70n                  | 1.2 Φ                                      | 1.0     | 10m    | 100 Δ# | 5.0 #              | 10pZ    | PPL                       | Si                      | 175A  | X169           | A                         |           |
| 34       | TP3638A   | 150M\$Δ  | 70n                  | 20n                   | 140n                  | 70n                  | 360m                                       | 1.0     | 10m    | 100 Δ# |                    | 10pS    | P-PL                      | Si                      | 150J  | R203a          | A                         |           |
| 35       | 2N4452    | 200M\$Δ  | 70n                  | 25n                   | 140n                  | 70n                  | 3 Φ  | 1.0     | 10m    | 120 Δ  |                    | 8pZ     | P                         | Si                      | 200J  | T046           | A                         |           |
| 36#      | 2SC715    | 200M\$   | 70n                  |                       | 170n                  | 60n                  | 125m                                       | 6.0     | 10m    | 80     |                    | 3.0p    | N-PE                      | Si                      | 125J  | R145           | D                         |           |
| 37#      | BFY72     | 250M\$Δ  | 70n                  |                       | 170n                  | 3.0 Φ                | 3.0 Φ                                      | 1.0     | 1.0m   | 85     |                    | 8.0pZ   | N-DPE                     | Si                      | 200J  | T05            | A                         |           |
| 38       | 2N828     | 300M\$Δ  | 70n                  |                       | 50n                   | 50n                  | 300m                                       | .30     | 10m    | 25 Δ   | 20                 | 6.0pZ   | N                         | Ge                      | 100J  | T018           | A                         |           |
| 39       | 2N3723    | 300M\$Δ  | 70n                  | 15n                   | 110n                  | 50n                  | 800m                                       | 1.0     | 100m   | 40 Δ#  |                    | 9.0pZ   | P                         | Si                      | 200J  | T05            | A                         |           |
| 40       | 2N5141    | 300M\$Δ  | 70n                  | 45n                   | 100n                  | 60n                  | 500m                                       | 2.0     | 10m    | 25 Δ#  |                    | 7pS     | P                         | Si                      | 125J  | T0106          | A                         |           |
| 41#      | 2SC423    | 500M\$   | 70n                  |                       | 120n                  | 60n                  | 500m                                       | 5.0     | 20m    | 80     |                    | 5.0p    | N-PE                      | Si                      | 175J  | T039           | A                         |           |
| 42#      | 2SC933    | 500M\$   | 70n                  |                       | 120n                  | 60n                  | 300m                                       | 5.0     | 20m    | 150    |                    |         | N-PE                      | Si                      | 125J  | T092           | B                         |           |
| 43#      | 2SC934    | 500M\$   | 70n                  |                       | 120n                  | 60n                  | 200m                                       | 5.0     | 20m    | 80     |                    |         | N-PE                      | Si                      | 125J  | T0104          | A                         |           |
| 44#      | 2SA711    | 800M\$Δ  | 70n                  |                       | 130n                  | 170n                 | 300m                                       | 1.0     | 10m    | 70 Δ   |                    | 4.0pZ   | P-E                       | Si                      | 150J  | T018           | A                         |           |
| 45       | 2N2930    | 4.0M\$Δ  | 73n                  | 350n                  | 73n                   | 250m                 | .60  | 100m    | 50 Δ   | 2.5    |                    | 20pZ    | Ge                        | 100S                    | T05   | A              |                           |           |
| 46       | 2N695     | 75n      | 75n                  |                       | 100n                  | 100n                 | 75m  | 300m    | 10m    | 25 Δ   | 2.0                | 5.0pZ   | P                         | Ge                      | 100J  | T017           | A                         |           |
| 47       | JAN2N695  | 75n      | 75n                  |                       | 100n                  | 100n                 | 150m                                       | 300m    | 10m    | 25 Δ   | 2.0                | 5.0pZ   | P                         | Ge                      | 100J  | T017           | A                         |           |
| 48       | JAN2N705  | 75n      | 75n                  |                       | 100n                  | 100n                 | 150m                                       | 300m    | 10m    | 10 Δ   |                    | 5.0pZ   | Ge                        | 100J                    | T018  | A              |                           |           |
| 49       | 2N705A    | 75n      | 75n                  |                       | 50n                   | 75n                  | 150m                                       | 300m    | 10m    | 25 Δ   | 3.0                | 8.0pZ   | P                         | Ge                      | 100J  | T018           | A                         |           |
| 50       | 2N710A    | 75n      | 75n                  |                       | 50n                   | 75n                  | 50m  | 500m    | 10m    | 25 Δ   | 5.0                | 8.0pZ   | P                         | Ge                      | 100S  | T018           | A                         |           |
| 51       | 2N782     | 75n      | 75n                  |                       | 35n                   | 75n                  | 300m                                       | .25     | 10m    | 20 Δ   |                    |         | P                         | Ge                      | 100J  | T018           | A                         |           |
| 52       | 2N5019    | 75n      | 75n                  | 15n                   | 100n                  |                      | 1.8 Φ                                      | 10      | 2.0m   | 1.0 Δ  | 150 \$             | 45pS    | P                         | Si                      | 200J  | T018           | DA                        |           |
| 53       | MEM562C   | 75n      | 75n                  | 55n                   |                       | 170n                 | 500m                                       |         |        |        | 350 \$             | 3.0pS   | N*s                       | Si                      | 100J  | T072           | DR                        |           |
| 54       | P1087E    | 75n      | 75n                  | 15n                   |                       | 100n                 | 350m                                       |         |        |        |                    | 45pS    | P                         | Si                      | 125J  | R97b           | DB                        |           |
| 55       | P1087RR   | 75n      | 75n                  | 15n                   |                       | 75n                  | 300m                                       |         |        |        | 150 *              | 45pS    | P                         | Si                      | 150S  | T092           | DF                        |           |
| 56       | ETP2008   | 20M\$Δ   | 75n                  |                       | 75n                   | 800m                 | 50   | 5.0m    | 65 t   | 150    |                    | 7.0p    | N-PL                      | Si                      | 175J  | T05            | A                         |           |
| 57       | 2N865     | 24M\$Δ   | 75n                  |                       | 100n                  | 75n                  | 150m                                       | 500m    | 5.0m   | 45 Δ   | 2.0                | 9.0pZ   | P                         | Si                      | 140S  | T018           | A                         |           |
| 58#      | 2SC1636   | 30M\$    | 75n                  | 30n                   | 600n                  | 130n                 | 300m                                       | 3.0 Φ   | 1.0m   | 2.0k   | 7.5                | 4.0p    | N-E                       | Si                      | 120J  | X153           | B                         |           |
| 59       | 2N2695    | 100M\$Δ  | 75n                  |                       | 170n                  | 360m                 | 360m                                       | 1.0     | 50m    | 30 t#  | 3.0                | 20pZ    | P-E                       | Si                      | 200J  | T046           | A                         |           |
| 60       | 2N2696    | 100M\$Δ  | 75n                  |                       | 170n                  | 360m                 | 360m                                       | 1.0     | 50m    | 30 t#  | 3.0                | 20pZ    | P-E                       | Si                      | 200J  | T018           | A                         |           |
| 61       | 2N2927    | 100M\$Δ  | 75n                  |                       | 170n                  | 3.0 Φ                | 3.0 Φ                                      | 1.0     | 50m    | 30 t#  | 5.0                | 20pZ    | P                         | Si                      | 200J  | T05            | A                         |           |
| 62#      | BD124     | 120M\$   | 75n                  | 15n                   | 240n                  | 40n                  | 15 Φ                                       | 5.0     | 500m   | 75     | 500m               |         | N-PE                      | Si                      | 175J  | F9b            | C                         |           |
| 63       | 2N2400    | 150M\$Δ  | 75n                  | 140n                  | 130n                  | 150m                 | .50  | 10m     | 30 Δ   | 22     |                    | 4.0pZ   | Ge                        | 100S                    | T018  | A              |                           |           |
| 64       | 2N2401    | 200M\$Δ  | 75n                  | 120n                  |                       | 110n                 | 150m                                       | .50     | 50m    | 40 Δ   | 20                 | 4.0pZ   | Ge                        | 100S                    | T018  | A              |                           |           |
| 65       | 2N3133    | 200M\$Δ  | 75n                  |                       | 150n                  | 600m                 | 10   | 150m    | 120 Δ  |        |                    | 10pZ    | P                         | Si                      | 200S  | T05            | A                         |           |
| 66       | 2N3134    | 200M\$Δ  | 75n                  |                       | 150n                  | 600m                 | 10   | 150m    | 300 Δ  |        |                    | 10pZ    | P                         | Si                      | 200S  | T05            | A                         |           |
| 67       | 2N3135    | 200M\$Δ  | 75n                  |                       | 150n                  | 400m                 | 10   | 150m    | 120 Δ  |        |                    | 10pZ    | P                         | Si                      | 200S  | T018           | A                         |           |
| 68       | 2N3136    | 200M\$Δ  | 75n                  |                       | 150n                  | 400m                 | 10   | 150m    | 300 Δ  |        |                    | 10pZ    | P                         | Si                      | 200S  | T018           | A                         |           |
| 69       | TP3135    | 200M     | 75n                  |                       | 150n                  | 400m                 | .50  | 150m    | 40     |        |                    | 10p     | N                         | Si                      | 200S  | T092           | A                         |           |
| 70       | TP3136    | 200M     | 75n                  |                       | 150n                  | 400m                 | .50  | 150m    | 100    |        |                    | 10p     | N                         | Si                      | 200S  | T092           | A                         |           |
| 71       | 2N2402    | 250M\$Δ  | 75n                  | 100n                  |                       | 100n                 | 150m                                       | .50     | 50m    | 50 Δ   | 20                 | 4.0pZ   | P                         | Ge                      | 100S  | T018           | A                         |           |
| 72       | 2N2958    | 250M\$Δ  | 75n                  | 20n                   | 300n                  | 200n                 | 3.0 Φ                                      | 10      | 150m   | 120    |                    | 8.0pZ   | N                         | Si                      | 200S  | T05            | A                         |           |
| 73       | 2N2959    | 250M\$Δ  | 75n                  | 20n                   | 300n                  | 200n                 | 3.0 Φ                                      | 10      | 150m   | 300    |                    | 8.0pZ   | N                         | Si                      | 200S  | T05            | A                         |           |
| 74       | 2N2960    | 250M\$Δ  | 75n                  | 20n                   | 300n                  | 200n                 | 3.0 Φ                                      | 10      | 1.0m   | 50 Δ   |                    | 8.0pZ   | N                         | Si                      | 200S  | T05            | A                         |           |
| 75       | 2N2961    | 250M\$Δ  | 75n                  | 20n                   | 300n                  | 200n                 | 3.0 Φ                                      | 10      | 500m   | 30 Δ#  |                    | 8.0pZ   | N                         | Si                      | 200S  | T05            | A                         |           |
| 76       | 2N3115    | 250M\$Δ  | 75n                  | 20n                   | 300n                  | 200n                 | 400m                                       | 10      | 150m   | 40 Δ   |                    | 8.0pZ   | N                         | Si                      | 175J  | T018           | A                         |           |
| 77       | 2N3116    | 250M\$Δ  | 75n                  | 20n                   | 300n                  | 200n                 | 400m                                       | 10      | 150m   | 100 Δ  |                    | 8.0pZ   | N                         | Si                      | 175J  | T018           | A                         |           |
| 78       | JAN2N2481 | 300M\$Δ  | 75n                  | 20n                   | 45n                   | 360m                 | 1.0  | 10m     | 120    |        | 25                 | 5.0pZ   | N                         | Si                      | 200J  | T018           | A                         |           |
| 79       | SDT6110   | 350M\$Δ  | 75n                  |                       | 75n                   | 10                   | 5.0  | 5.0     | 70 Δ#  |        |                    | 25pZ    | N                         | Si                      | 200J  | T05            | A                         |           |
| 80       | SDT6111   | 350M\$Δ  | 75n                  |                       | 75n                   | 10                   | 5.0  | 5.0     | 70 Δ#  |        |                    | 25pZ    | N                         | Si                      | 200J  | T05            | A                         |           |
| 81       | SDT6112   | 350M\$Δ  | 75n                  |                       | 75n                   | 10                   | 5.0  | 5.0     | 70 Δ#  |        |                    | 25pZ    | N                         | Si                      | 200J  | T05            | A                         |           |
| 82       | SDT6113   | 350M\$Δ  | 75n                  |                       | 75n                   | 23                   | 5.0  | 5.0     | 70 Δ#  |        |                    | 25pZ    | N                         | Si                      | 200J  | T060           | A                         |           |
| 83       | SDT6114   | 350M\$Δ  | 75n                  |                       | 75n                   | 23                   |  |         |        |        |                    |         |                           |                         |       |                |                           |           |