# Transitron Semiconductors

NPN and PNP silicon planar transistors which are available from Transitron to JEDEC types can be supplied in the following microminiature packages: "Micro-T" (Fig. L), "Nano" (Fig. M), "Pico" and kovar tab. Complete specifications, availability and prices on request.

## SILICON PNP PLANAR TRANSISTORS

### MEDIUM POWER

| Transitron Type | Fig. | Max. Pd*, Watts | Max. Vcb Volts | Min. DC Com. Emit. Cur. Gain, β | Typ. Coll. Saturation V. at Ma | Net Ea., Lots 1-99 | Net Ea., Lots 100-999 |
|---|---|---|---|---|---|---|---|
| 2N2303 | G | 1.0 | 50 | 75 at 150ma | 1.0 at 150 | $6.60 | $4.40 |
| 2N1132 | G | 1.0 | 50 | 30 at 150ma | 1.0 at 150 | 5.60 | 3.75 |
| 2N1131 | G | 1.0 | 50 | 20 at 150ma | 1.0 at 150 | 5.10 | 3.40 |
| 2N722 | H | 0.75 | 50 | 30 at 150ma | 1.0 at 150 | 6.00 | 4.00 |
| 2N721 | H | 0.75 | 50 | 20 at 150ma | 1.0 at 150 | 4.50 | 3.00 |
| 2N1991 | G | 1.0 | 30 | 15 at 150ma | 1.0 at 150 | 3.15 | 2.10 |
| 2N978 | H | 0.75 | 30 | 15 at 150ma | 1.0 at 150 | 3.15 | 2.10 |
| 2N2904 | G | 0.6‡ | 60 | 20 at 500ma | 1.4 at 500 | 6.75 | 4.50 |
| 2N2905 | G | 0.6‡ | 60 | 30 at 500ma | 1.4 at 500 | 8.10 | 5.40 |
| 2N2906 | H | 0.4‡ | 60 | 20 at 500ma | 1.4 at 500 | 6.50 | 4.30 |
| 2N2907 | H | 0.4‡ | 60 | 30 at 500ma | 1.4 at 500 | 7.80 | 5.10 |

### HIGH CURRENT MEDIUM POWER

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ST8509 | G | 5.0 | 80 | 15 at 1.5a | 1.1 at 500 | $30.00 | $20.00 |
| ST8065 | G | 5.0 | 60 | 30 at 1.5a | 1.1 at 500 | 17.25 | 11.50 |
| 2N1084 | G | 5.0 | 60 | 15 at 1.5a | 1.1 at 500 | 17.25 | 11.50 |
| ST8500 | G | 5.0 | 40 | 15 at 500ma | 1.3 at 500 | 6.75 | 4.50 |

### INTERMEDIATE POWER

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2N2875 | C | 20 | 60 | 15 at 1.5a | 1.1 at 500 | $43.50 | $29.00 |

### MILITARY TYPES

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| USN2N1131 | G | 1 | 50 | 20 at 150ma | 1.0 at 150 | $6.00 | $4.00 |
| USN2N1132 | G | 1 | 50 | 30 at 150ma | 1.0 at 150 | 8.25 | 5.50 |

## SILICON NPN PLANAR TRANSISTORS

### MEDIUM POWER EPITAXIAL

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2N696 | G | 1.0 | 60 | 20 at 150ma | 0.7 at 150 | $1.50 | $1.00 |
| 2N697 | G | 1.0 | 60 | 40 at 150ma | 0.7 at 150 | 1.50 | 1.00 |
| 2N698 | G | 1.0 | 120 | 20 at 150ma | 2.0 at 150 | 1.57 | 1.05 |
| 2N699 | G | 1.0 | 120 | 40 at 150ma | 2.0 at 150 | 1.57 | 1.05 |
| 2N718A | H | 1.0 | 75 | 40 at 150ma | 1.0 at 150 | 2.15 | 1.43 |
| 2N720A | H | 1.0 | 120 | 40 at 150ma | 2.0 at 150 | 2.48 | 1.65 |
| 2N1613 | G | 1.7 | 75 | 40 at 150ma | 1.0 at 150 | 1.73 | 1.16 |
| 2N1711 | G | 1.7 | 75 | 100 at 150ma | 1.0 at 150 | 1.89 | 1.26 |
| 2N1893 | G | 1.7 | 120 | 40 at 150ma | 2.0 at 150 | 2.10 | 1.60 |
| 2N2217 | G | 0.8‡ | 60 | 20 at 150ma | 0.3 at 150 | 3.35 | 2.25 |
| 2N2218 | G | 0.8‡ | 60 | 40 at 150ma | 0.3 at 150 | 3.35 | 2.25 |
| 2N2219 | G | 0.8‡ | 60 | 100 at 150ma | 0.3 at 150 | 3.95 | 2.65 |
| 2N2220 | H | 0.5‡ | 60 | 20 at 150ma | 0.3 at 150 | 3.35 | 2.25 |
| 2N2221 | H | 0.5‡ | 60 | 40 at 150ma | 0.3 at 150 | 3.35 | 2.25 |
| 2N2222 | H | 0.5‡ | 60 | 100 at 150ma | 0.3 at 150 | 3.95 | 2.65 |

*At 100° C case. ‡At 25° C ambient.

### LOGIC SWITCHING EPITAXIAL (FIG. H)

| Transitron Type | Max. DC Com. Emit. Current Gain, β | Max. Coll. Vcb Volts | Typ. Cut-Off, Mc | Max. Coll. Cut-Off At 25° C Cur., μa | Max. ts nsec. | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 |
|---|---|---|---|---|---|---|---|
| 2N706 | 20 | 25 | 400 | 0.5 | 60 | $0.99 | $0.66 |
| 2N706A | 20 | 25 | 400 | 0.5 | 60 | 1.35 | .90 |
| 2N708 | 30 | 40 | 450 | 0.025 | 25 | 1.32 | .88 |
| 2N753 | 40 | 25 | 250 | 0.5 | 35 | 1.97 | 1.31 |
| 2N914 | 30 | 40 | 400 | 0.025 | 20 | 1.57 | 1.05 |
| 2N2885* | 120 | 40 | 450 | 0.025 | 25 | 8.50 | 5.90 |

*Fig. L.

### HIGH-SPEED SWITCHING EPITAXIAL (FIG. H)

| Transitron Type | Max. Volts VCEO | Max. Volts VCBO | Max. Volts VEBO | Max. ICBO μA | hFE | Max. Ccb pF | Max. Ccb At VCB V | Net Ea., Lots 1-99 | Net Ea., Lots 100-999 |
|---|---|---|---|---|---|---|---|---|---|
| 2N709 | 6 | 15 | 4 | 5.0 | 20–120 | 3.0 | 5.0 | $11.50 | $7.75 |
| 2N709A | 6 | 15 | 4 | 5.0 | 30–90 | 3.0 | 5.0 | 2.30 | 1.55 |
| 2N834 | 30 | 40 | 5 | .50 | 25 min. | 4.0 | 10.0 | 2.00 | 1.35 |
| 2N835 | 20 | 25 | 3 | .50 | 20 min. | 4.0 | 10.0 | 1.50 | 1.00 |
| 2N2784 | 6 | 15 | 4 | 0.005 | 40–120 | 3.0 | 5.0 | 5.40 | 3.60 |

### HIGH FREQUENCY SIGNAL AMPLIFIERS

| Transitron Type | Fig. | Min. DC Com. Emit. Current Gain, β | Max. Coll. Vcb Volts | Typ. Cut-Off, Mc | Max. Coll. Cut-Off at 25° C Cur., μa | Max. Coll. Cut-Off at 25° C At Vc Max. | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 |
|---|---|---|---|---|---|---|---|---|
| 2N735 | H | 40* | 80 | 100 | 10 | ..... | $ 8.95 | $5.95 |
| 2N736 | H | 80* | 80 | 100 | 10 | ..... | 8.95 | 5.95 |
| 2N738 | H | 20* | 125 | 100 | 10 | ..... | 12.50 | 8.30 |
| 2N740 | H | 80* | 125 | 100 | 10 | ..... | 12.50 | 8.30 |
| 2N758A | H | 18* | 60 | 75 | 1 | ..... | 11.60 | 7.60 |
| 2N759A | H | 36* | 60 | 70 | 1 | ..... | 2.55 | 1.70 |
| 2N760A | H | 76* | 60 | 85 | 1 | ..... | 2.55 | 1.70 |
| 2N840 | H | 30 | 45 | 85 | 1 | ..... | 3.60 | 2.45 |
| 2N843 | H | 45 | 45 | 85 | 1 | ..... | 4.65 | 3.10 |
| 2N1566 | G | 80* | 60 | 70 | 10 | ..... | 9.30 | 6.20 |
| 2N1574 | G | 80* | 100 | 85 | 10 | ..... | 13.50 | 9.00 |
| 2N2509 | H | 40 | 125 | 60 | 0.005 | 100 | 5.00 | 3.35 |
| 2N2510 | H | 150 | 100 | 60 | 0.005 | 80 | 6.00 | 4.00 |
| 2N2511 | H | 240 | 80 | 60 | 0.005 | 60 | 8.00 | 5.35 |

*AC current gain.

**Transitron offers a broad line of rectifiers, controlled rectifiers, transistors, diodes, micro-components and special products. Contact your Authorized Transitron Industrial Distributor for detailed specifications and information on new or unlisted items.**

## NPN SILICON TRANSISTORS (CONT'D)

### LOW LEVEL INPUT, LOW NOISE SIGNAL AMPLIFIERS

| Transitron Type | Fig. | Min. DC Com. Emit. Current Gain, β | Max. Coll. Vcb Volts | Typ. Cut-Off, Mc | Max. Coll. Cut-Off at 25° C Cur., μa | Max. Coll. Cut-Off at 25° C At Vc Max. | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 |
|---|---|---|---|---|---|---|---|---|
| 2N2483 | H | 10 at 10μa | 60 | 15* | 0.010 | 45 | $ 4.50 | $3.00 |
| 2N1247 | G | 15 at 5μa | 20 | 5 | 0.005 | 3 | 13.25 | 8.75 |
| 2N1248 | G | 15 at 20μa | 6 | 5 | 0.01 | 3 | 13.25 | 8.75 |
| 2N2427 | H | 20 at 10μa | 40 | 80 | 0.01 | 20 | 10.50 | 7.00 |
| 2N2484 | H | 20 at 10μa | 60 | 10* | 0.010 | 45 | 6.45 | 4.30 |
| 2N929 | H | 40 at 10μa | 45 | 40 | 0.01 | 45 | 3.30 | 2.20 |
| 2N930 | H | 100 at 10μa | 45 | 40 | 0.01 | 45 | 4.00 | 2.67 |

### LOW LEVEL AMPLIFIERS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2N3077 | H | 20 at 10μa | 80 | 10*\|0.35 V† | ..... | $9.60 | $6.40 |
| 2N3078 | H | 10 at 10μa | 80 | 15*\|0.35 V† | ..... | 6.60 | 4.40 |

*Max. db, noise figure. †$V_{CE\ (sat)}$ at $I_C = 1$ ma.

### MILITARY TYPES

| Transitron Type | Net Ea., Lots of 1-99 | Net Ea., Lots of 100-999 | Transitron Type | Net Ea., Lots of 1-99 | Net Ea., Lots of 100-999 |
|---|---|---|---|---|---|
| JAN2N929 | $5.70 | $3.80 | USA2N930 | $6.15 | $4.10 |
| JAN2N930 | 6.15 | 4.10 | | | |

### HIGH POWER

| Transitron Type | Fig. | Max. Pd At 100° C§, Watts | Max. Vcb Volts | Min. DC Com. Emit. Current Gain, β | Typ. Coll. Sat. Resis. Ohms at A. | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 |
|---|---|---|---|---|---|---|---|
| 2N389 | B | 45 | 60 | 12 at 1 a. | 2.5 at 1 | $15.00 | $10.00 |
| 2N424 | B | 45 | 80 | 12 at 1 a. | 4.0 at 1 | 16.50 | 11.00 |
| 2N1208 | A | 45 | 60 | 15 at 2 a. | 1.5 at 2 | 19.50 | 13.00 |
| 2N1210 | B | 30 | 60 | 15 at 2 a. | 0.7 at 1 | 24.00 | 16.00 |
| 2N1211 | B | 30 | 80 | 15 at 2 a. | 0.7 at 1 | 27.00 | 18.00 |
| 2N1212 | A | 45 | 60 | 12 at 1 a. | 2.5 at 1 | 15.00 | 10.00 |
| 2N1250 | B | 45 | 60 | 15 at 2 a. | 1.5 at 1 | 43.50 | 29.00 |
| 2N1616 | A | 30 | 60 | 15 at 2 a. | 0.7 at 2 | 26.00 | 17.50 |
| 2N1617 | A | 30 | 80 | 15 at 2 a. | 0.7 at 2 | 30.00 | 20.00 |
| 2N1618 | A | 30 | 100 | 15 at 2 a. | 0.7 at 2 | 35.00 | 23.50 |
| 2N1620 | B | 30 | 100 | 15 at 2 a. | 0.7 at 1 | 40.00 | 26.00 |
| 2N1722 | B | 50 | 120 | 20 at 20 a. | 0.3 at 2 | 43.50 | 29.00 |
| 2N1722A | B | 50 | 180 | 30 at 2 a. | 0.3 at 2 | 60.00 | 40.00 |
| 2N1723 | B | 50 | 120 | 50 at 2 a. | 0.5 at 2 | 48.00 | 36.00 |
| 2N1724 | A | 50 | 120 | 20 at 2 a. | 0.3 at 2 | 43.50 | 29.00 |
| 2N1724A | A | 50 | 180 | 30 at 2 a. | 0.3 at 2 | 63.00 | 42.00 |
| 2N1725 | A | 50 | 120 | 50 at 2 a. | 0.5 at 2 | 43.50 | 29.00 |

### 7/16" HEX BASE STUD-MOUNTED INTERMEDIATE POWER

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2N1647 | D | 20 | 80 | 15 at 500ma | 1.8 at 1 | $17.00 | $12.70 |
| 2N1648 | D | 20 | 120 | 15 at 500ma | 1.8 at 1 | 21.00 | 14.30 |
| 2N1649 | D | 20 | 80 | 30 at 500ma | 1.8 at 1 | 20.00 | 13.70 |
| 2N1650 | D | 20 | 120 | 30 at 500ma | 1.8 at 1 | 25.00 | 17.00 |
| 2N2150 | C | 30 | 125 | 20 at 500ma | 1.25 at 1 | 22.50 | 15.00 |
| 2N2151 | C | 30 | 125 | 40 at 500ma | 1.25 at 1 | 24.75 | 16.50 |
| 2N2866 | C | 20 | 120 | 20 at 500ma | .75 at 1 | 23.50 | 16.25 |
| 2N2867 | C | 20 | 120 | 40 at 500ma | .75 at 1 | 26.50 | 18.25 |

### HIGH VOLTAGE

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2N2018 | D | 20 | 150 | 20 at 500ma | 3.5 at 1 | $30.00 | $22.50 |
| 2N2019 | D | 20 | 200 | 20 at 500ma | 3.5 at 1 | 37.50 | 28.00 |
| 2N2020 | D | 20 | 150 | 40 at 500ma | 3.5 at 1 | 36.00 | 26.50 |
| 2N2021 | D | 20 | 200 | 40 at 500ma | 3.5 at 1 | 55.00 | 36.00 |

### SINGLE-ENDED

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2N1047B | E | 20 | 80 | 12 at 500ma | 4 at 500ma | $26.00 | $17.30 |
| 2N1048B | E | 20 | 120 | 12 at 500ma | 4 at 500ma | 38.30 | 25.50 |
| 2N1049B | E | 20 | 80 | 30 at 500ma | 4 at 500ma | 33.80 | 22.50 |
| 2N1050B | E | 20 | 120 | 30 at 500ma | 4 at 500ma | 46.90 | 31.20 |

### MEDIUM POWER FAST SWITCHING

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2N545 | G | 5 | 60 | 15 at 500ma | 3 at 500* | $19.40 | $13.25 |

### HIGH VOLTAGE

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2N341A | F | 1.2 | 125 | 20 at 5ma† | 1 at 20* | $19.50 | $13.00 |
| 2N1052 | G | 5 | 200 | 20 at 200ma | 3.5 at 200* | 18.35 | 12.25 |
| 2N1053 | G | 5 | 180 | 20 at 200ma | 3 at 200* | 13.95 | 9.30 |
| 2N1054 | G | 5 | 125 | 20 at 200ma | 2.5 at 200* | 11.70 | 7.80 |

### MULTI-PURPOSE

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2N546 | G | 5 | 30 | 15 at 500ma | 2 at 500* | $11.75 | $ 7.85 |
| 2N547 | G | 5 | 60 | 20 at 500ma | 3 at 500* | 13.50 | 9.30 |
| 2N549 | G | 5 | 60 | 20 at 200ma | 2.5 at 200* | 7.35 | 4.90 |
| 2N551 | G | 5 | 60 | 20 at 50ma | 1 at 50* | 7.35 | 4.90 |
| 2N1116 | G | 5 | 60 | 40 at 500ma | 3 at 500* | 22.00 | 15.00 |
| 2N1117 | G | 5 | 60 | 40 at 200ma | 2.5 at 200* | 12.00 | 8.00 |

### MILITARY

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| USN2N341 | F | 0.4† | 125 | 15 at 5ma‡ | 2 at 20* | $17.50 | $11.65 |
| JAN2N342 | F | 0.4† | 60 | 9 at 5ma‡ | 2 at 20* | 14.55 | 9.65 |
| JAN2N343 | F | 0.4† | 60 | 28 at 5ma‡ | 2 at 20* | 19.40 | 13.25 |
| JAN2N497 | G | 2.5 | 60 | 12 at 200ma | 4 at 200* | 3.00 | 2.00 |
| JAN2N498 | G | 2.5 | 100 | 12 at 200ma | 4 at 200* | 3.60 | 2.40 |
| USN2N545 | G | 5.0 | 60 | 15 at 500ma | 3 at 500* | 26.50 | 17.65 |
| JAN2N656 | G | 2.5 | 60 | 30 at 200ma | 4 at 200* | 3.30 | 2.20 |
| JAN2N657 | G | 2.5 | 100 | 30 at 200ma | 4 at 200* | 5.40 | 3.60 |

*Typical collector saturation voltage, volts at ma. †Ambient temperature. ‡AC current gain. §Case temperature.

**Heat Sink Mountings** for medium power transistors give a realistic 5 watts rating at 100° C. Factory-fitted, all insulation and hardware supplied.



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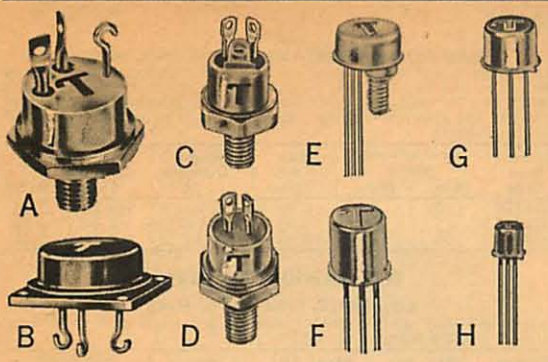
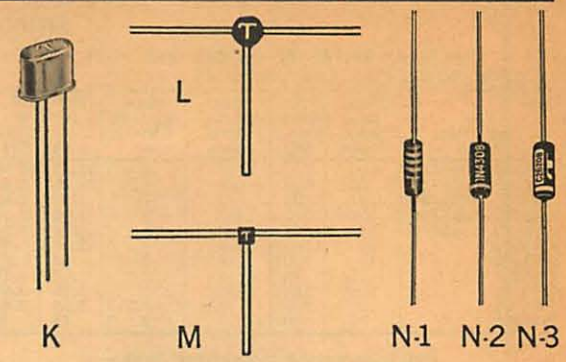
# Transitron Semiconductors




## SILICON PLANAR TRANSISTORS

### NPN REPLACEMENTS FOR GROWN JUNCTION TYPES

| Transitron Type | Fig. | Min. DC Com. Emit. Current Gain, $\beta$ | Max. Coll. $V_{cb}$ Volts | Typ. Cut-Off, Mc | Max. Coll. Cut-Off Current†, $\mu$a | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 |
|---|---|---|---|---|---|---|---|
| 2N243 | K | 60 ma‡ | 60 | 30§ | 1 | $13.75 | $9.15 |
| 2N244 | K | 60 ma‡ | 60 | 30§ | 1 | 16.50 | 11.00 |
| 2N332 | G | 9 | 45 | 10 | 0.5 | 4.65 | 3.10 |
| 2N333 | G | 18 | 45 | 11 | 0.5 | 4.65 | 3.10 |
| 2N334 | G | 18 | 45 | 12 | 0.5 | 4.65 | 3.10 |
| 2N335 | G | 37 | 45 | 13 | 0.5 | 4.90 | 3.30 |
| 2N336 | G | 78 | 45 | 15 | 0.5 | 4.90 | 3.30 |
| 2N339 | F | 9* | 55 | 30§ | 1 | 10.15 | 6.75 |
| 2N340 | F | 9* | 85 | 30§ | 1 | 10.80 | 7.20 |
| 2N341 | F | 9* | 125 | 30§ | 1 | 17.50 | 11.65 |
| 2N342 | F | 9* | 60 | 30§ | 1 | 14.55 | 9.65 |
| 2N343 | F | 29* | 60 | 30§ | 1 | 18.40 | 12.25 |
| 2N475 | G | 20* | 45 | 10 | 0.5 | 7.80 | 5.20 |
| 2N480 | G | 40* | 45 | 11 | 0.5 | 9.30 | 6.20 |
| 2N543 | G | 80* | 45 | 15 | 0.5 | 7.95 | 5.30 |
| 2N1150 | K | 18* | 45 | 9 | 50 | 8.65 | 5.75 |
| 2N1154 | K | 60 ma‡ | 50 | 30§ | 5 | 12.60 | 8.40 |
| 2N1155 | K | 50 ma‡ | 80 | 30§ | 6 | 13.10 | 8.75 |
| 2N1156 | K | 40 ma‡ | 120 | 30§ | 8 | 17.50 | 11.70 |

*AC current gain. †At 25° C and $V_c$ max. ‡Max. collector current. §Min. db power gain.

### NPN MILITARY

| Transitron Type | Fig. | Net Ea., Lots of 1-99 | Net Ea., Lots of 100-999 | Transitron Type | Fig. | Net Ea., Lots of 1-99 | Net Ea., Lots of 100-999 |
|---|---|---|---|---|---|---|---|
| JAN2N335 | G | $5.25 | $3.30 | USN2N341 | F | $17.50 | $11.65 |
| JAN2N337 | G | 5.15 | 3.40 | JAN2N342 | F | 14.55 | 9.65 |
| JAN2N338 | G | 5.80 | 3.85 | JAN2N343 | F | 19.40 | 13.25 |

## COMMERCIAL AND INDUSTRIAL SILICON PLANAR TRANSISTOR DEVICES

### LIGHT DRIVERS

| Transitron Type | Fig. | Max. $V_{CE}$ Volts | Min. DC Com. Emit. Cur. Gain, $\beta$ | Max. Coll. Cut-Off Cur., $\mu$a* | Net Ea., Lots 1-99 | Net Ea., Lots 100-999 |
|---|---|---|---|---|---|---|
| 2N1990 | G | 75 | 20 at 30 ma | 10 at 75 v. | $3.60 | $2.40 |
| ST4341 | G | 80 | 15 at 3 ma | 80 at 80 v. | 1.90 | 1.35 |

*At 25° C.

### HI-FI, RADIO AND TV TYPE

| Transitron Type | Fig. | Max. $P_d$ at 25° C # Watts | Max. $V_{cb}$ Volts | Min. DC Com. Emit. Current Gain, $\beta$ | Typical Collector Saturation, Volts | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 |
|---|---|---|---|---|---|---|---|
| ST4388 | G | 5 | 100 | 25 | 2 at 200 ma | $2.20 | $1.65 |

### NPN LOW POWER SWITCHING

Passivated epitaxial planar transistor for switching and amplifier circuits. Ultrasonically aluminum bonded to eliminate purple plague at the chip.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2N3633 | H | 0.3‡ | 15 | 25 at 30ma | 0.21 at 3ma• | $11.00 | $7.25 |

### NPN LOW LEVEL INPUT, SMALL SIGNAL & MEDIUM POWER

Medium power type unless otherwise noted.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2N1249* | G | 30‡ | 6 | 10 at 30 $\mu$a | ..... | $4.50 | $3.00 |
| 2N1417† | G | .250‡ | 15 | 30 at 1ma§ | 1.5 at 5ma | 1.45 | .95 |
| 2N1418† | G | .250‡ | 30 | 30 at 1ma§ | 1.5 at 5ma | 1.70 | 1.13 |
| 2N2038 | G | 3 | 45 | 12 at 200ma | 4 at 200ma | 1.74 | 1.16 |
| 2N2039 | G | 3 | 75 | 12 at 200ma | 4 at 200ma | 2.98 | 1.98 |
| 2N2040 | G | 3 | 45 | 30 at 200ma | 4 at 200ma | 2.04 | 1.36 |
| 2N2041 | G | 3 | 75 | 30 at 200ma | 4 at 200ma | 3.24 | 2.16 |

### PNP MEDIUM POWER

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2N978 | H | 1 | 30 | 15 at 150ma | 1.1 at 150ma | $3.15 | $2.10 |
| 2N1991 | G | 1 | 30 | 15 at 150ma | 1.1 at 150ma | 3.15 | 2.10 |
| ST8500 | G | 5 | 40 | 15 at 150ma | 1.3 at 150ma | 6.75 | 4.50 |

### NPN INTERMEDIATE POWER

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2N1886 | D | 20 | 60 | 20 at 500ma | 3 at 1 amp | $11.50 | $7.65 |

*Low level input. †Small signal type. ‡At 25° C ambient. §AC current gain. #Case temperature. •Collector-emitter saturation voltage.

## SILICON MICRODIODES (FIG. R)

### FAST SWITCHING TYPE

Max. recovery 0.3 $\mu$sec.

| Transitron Type | Max. Inv. Operating Volts | Max. Avg. Fwd. Cur., Ma at 25° C | Max. Inv. Cur. at 25° C $\mu$a at Volts | Net Ea., Lots 1-99 | Net Ea., Lots 100-999 |
|---|---|---|---|---|---|
| TMD24 | 50 | 50 | ..... | $2.50 | $1.90 |
| TMD25 | 100 | 50 | ..... | 3.15 | 2.35 |
| TMD27 | 200 | 50 | ..... | 3.40 | 2.70 |

### HIGH CONDUCTANCE TYPE

| | | | | | |
|---|---|---|---|---|---|
| TMD41 | 50 | 75 | 0.25 at 50 | $2.25 | $1.55 |
| TMD42 | 100 | 75 | 0.25 at 100 | 2.50 | 2.05 |
| TMD45 | 200 | 75 | 0.25 at 200 | 2.75 | 2.30 |

### MICROMINIATURE STABISTORS

Max. dynamic resistance, 60 ohms at 1 ma and 1 kc.

| Transitron Type | Max. Inv. Operating Volts | Max. Avg. Fwd. Cur., Ma at 25° C | Max. Inv. Cur. at 25° C $\mu$a at Volts | Net Ea., Lots 1-99 | Net Ea., Lots 100-999 |
|---|---|---|---|---|---|
| TMD20 | 0.64† | 0.85 v.‡ | 0.5 at −2 DC | $1.55 | $1.20 |
| TMD40 | 0.55† | 0.85 v.‡ | 0.5 at −2 DC | 1.85 | 1.40 |

### SILICON MICRO-ZENER DIODES

Specifications at 25° C. Test current, 5 ma. Max. dynamic resistance, 15 ohms except as noted. Max. inverse current shown is at −1 volt.

| | | | | | |
|---|---|---|---|---|---|
| TMD-01 | 5.1# | 0.75 v.* | 1.0 at −1 | $6.00 | $4.50 |
| TMD-02 | 5.6# | 0.75 v.* | 1.0 at −1 | 6.00 | 4.50 |
| TMD-03 | 6.2# | 0.75 v.* | 1.0 at −1 | 6.00 | 4.50 |
| TMD-04 | 6.8# | 0.75 v.* | 1.0 at −1 | 6.00 | 4.50 |
| TMD-05 | 7.5# | 0.75 v.* | 0.1 at −1 | 6.00 | 4.50 |
| TMD-06 | 8.2# | 0.75 v.* | 0.1 at −1 | 6.00 | 4.50 |
| TMD-07 | 9.1# | 0.75 v.* | 0.1 at −1 | 6.00 | 4.50 |
| TMD-08 | 10.0# | 0.75 v.* | 0.1 at −1 | 6.00 | 4.50 |
| TMD-09§ | 11.0# | 0.75 v.* | 0.1 at −1 | 6.00 | 4.50 |
| TMD-10§ | 12.0# | 0.75 v.* | 0.1 at −1 | 6.00 | 4.50 |

*Typical, at 5.0 ma. †Forward volts at 1 ma DC, ±10%. ‡At 20 ma DC, maximum. §Max. dynamic resistance, 20 ohms. #Nominal voltage, tolerance ±10%. For ±5% tolerance and suffix A (TMD-01A). Net Each, Lots of: 1-99..**$7.75**; 100-999..$5.75

## SILICON AND GERMANIUM STABISTORS

Semiconductor diodes specially designed and tested for use as low level voltage regulating devices. Meet tight tolerance limits in the forward, or conducting, direction with a minimum requirement in the reverse direction. All types are silicon except 1N3287 which is germanium. EVR series are epoxy encapsulated. All units are capable of passing Method 106A, MIL-STD-202B, moisture resistance testing.

| Transitron Type | Fig. | Forward Voltage Drop At 1 Ma | Forward Voltage Drop At 100Ma | Max. Dyn. Resis. at 1 Ma, Ohms | Max. Inv. Oper. Volts | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 |
|---|---|---|---|---|---|---|---|
| 1N4362 | N-1 | .60-.70 | .80-.90 | 40 | .01 v.• | $2.45 | $1.96 |
| 1N816 | N-1 | .64* | .1 | 50 | 6 | .45 | .35 |
| EVR1 | O | .06† | 0.75† | 10■ | 5 | .45 | .30 |
| EVR1A | O | .06* | 0.75* | 10■ | 5 | .55 | .33 |
| EVR1B | O | .06‡ | 0.75‡ | 10■ | 5 | .90 | .49 |
| SM72 | P | ..... | § | § | 6 | 1.50 | 1.00 |
| 1N3287 | N-1 | .26# | 1 max. | 60 | 6 | .60 | .42 |
| SG22 | N-1 | .64* | 1 max. | 60 | 6 | .45 | .35 |

*±10%. †±15%. ‡±5%. §2 v. forward at 2000 ma DC; max. dynamic resistance, 1.5 ohms at 100 ma, 1 kc. #±20%. •Max. leakage current at 25° C, $\mu$a. ■At 10 ma, 1 kc.

### MIL TYPES

| Transitron Type | Net Ea., Lots of 1-99 | Net Ea., Lots of 100-999 | Transitron Type | Net Ea., Lots of 1-99 | Net Ea., Lots of 100-999 |
|---|---|---|---|---|---|
| USN1N816W | $0.45 | $0.35 | USN1N3287W | $0.90 | $0.68 |

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# Transitron Semiconductors

## SILICON DIODES

### PLANAR EPITAXIAL DIODES (FIG. N-2)

Specifications at 25° C. Fwd. current at 1 volt.

| Transitron Type | Max. Inv. Oper. Volts | Min. Fwd. Cur., Ma | Max. Recov. Time, nsec. | Max. Cap. at 0 Volts, pF | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 |
|---|---|---|---|---|---|---|
| 1N4308 (SG5000) | 100 | 200 | 2 | 2 | $2.75 | $2.10 |
| 1N4309 (SG5100) | 50 | 400 | 2 | 4 | 2.25 | 1.60 |
| 1N4310 (SG5200) | 75 | 400 | 2 | 4 | 2.50 | 1.85 |
| 1N4311 (SG5300) | 100 | 300 | 2 | 2 | 3.00 | 2.30 |
| 1N4312 (SG5400) | 150 | 200 | 2 | 2 | 3.25 | 1.95 |
| 1N914B | 100 | 100 | 4 | 4 | 1.35 | .90 |
| 1N916B | 100 | 100 | 4 | 2 | .92 | .61 |
| 1N3064 | 75 | 10 | 4 | 2 | .67 | .48 |
| 1N3070 | 200 | 100 | 50 | 5 | 5.25 | 3.50 |
| 1N3600 | 50 | 200 | 4 | 2.5 | 3.65 | 2.50 |
| 1N4009 | 35 | 30 | 2 | 2 | .42 | .28 |

### MULTI-PURPOSE COMPUTER TYPES

| Transitron Type | Fig. | Max. Inv. Oper. Volts | Max. Avg. Fwd. Cur. at 25° C, Ma | Max. Recovery Time, μsec | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 |
|---|---|---|---|---|---|---|
| 1N643 | N-5 | 180 | 40 | 0.3 | $1.45 | $1.00 |
| 1N658 | N-5 | 100 | 200 | 0.3 | 1.76 | 1.20 |
| 1N659 | N-1 | 50 | 100 | 0.3 | .58 | .39 |
| 1N660 | N-1 | 100 | 100 | 0.3 | .69 | .46 |
| 1N661 | N-1 | 200 | 100 | 0.3 | 1.75 | 1.30 |
| 1N662 | N-5 | 90 | 40 | 0.5 | .66 | .44 |
| 1N663 | N-5 | 90 | 60 | 0.5 | 1.20 | .80 |
| 1N691 | N-1 | 70 | 200 | 0.8* | 3.38 | 2.25 |
| 1N693 | N-1 | 180 | 200 | 0.8* | 6.00 | 4.05 |
| 1N252 | N-1 | 20 | 40 | 0.15 | 1.25 | .90 |
| 1N993† | N-1 | 8 | 20 | 0.004 | 4.80 | 3.40 |
| 1N625 | N-1 | 25 | 30 | 1.0 | .43 | .29 |
| 1N629 | N-1 | 180 | 30 | 1.0 | .86 | .55 |

*Switching from 500 ma to 40 v. †S266G.

### SUBMINIATURE RECTIFIERS

| Transitron Type | Fig. | Max. Inv. Oper. Volts | Max. Average Current: Forward at 150° C Ma | Max. Average Current: Inverse at Rated Voltage μa | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 |
|---|---|---|---|---|---|---|
| 1N689 | N-1 | 600 | 150 | 200 at 150° C | $2.50 | $1.65 |
| 1N645 | N-5 | 225 | 150 | 15 at 100° C | 1.40 | .93 |
| 1N646 | N-5 | 300 | 150 | 15 at 100° C | 1.65 | 1.10 |
| 1N647 | N-5 | 400 | 150 | 20 at 100° C | 1.80 | 1.20 |
| 1N648 | N-5 | 500 | 150 | 20 at 100° C | 1.95 | 1.30 |
| 1N649 | N-5 | 600 | 150 | 20 at 100° C | 2.50 | 1.65 |

### HIGH CONDUCTANCE TYPES

| Transitron Type | Fig. | Max. Inv. Oper. Volts | Max. Current at 150° C: Average Fwd., Ma | Max. Current at 150° C: Inverse, μa at V. | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 |
|---|---|---|---|---|---|---|
| 1N482 | N-1 | 36 | 25 | 30 at 30 | $0.59 | $0.46 |
| 1N482A | N-1 | 36 | 50 | 15 at 30 | .59 | .46 |
| 1N482B | N-1 | 36 | 50 | 5 at 30 | .59 | .46 |
| 1N483 | N-1 | 70 | 25 | 30 at 60 | .61 | .47 |
| 1N483A | N-1 | 70 | 50 | 15 at 30 | .61 | .47 |
| 1N483B | N-1 | 70 | 50 | 5 at 60 | .61 | .47 |
| 1N484 | N-1 | 130 | 25 | 30 at 125 | .61 | .47 |
| 1N484A | N-1 | 130 | 50 | 15 at 125 | .61 | .47 |
| 1N484B | N-1 | 130 | 50 | 5 at 125 | .61 | .47 |
| 1N485 | N-1 | 180 | 25 | 30 at 175 | .77 | .55 |
| 1N485A | N-1 | 180 | 50 | 15 at 175 | .77 | .55 |
| 1N485B | N-1 | 180 | 50 | 5 at 175 | .77 | .55 |
| 1N486A | N-1 | 225 | 50 | 25 at 225 | .85 | .65 |
| 1N486B | N-1 | 225 | 50 | 10 at 225 | .85 | .65 |
| 1N487 | N-1 | 300 | 25 | 50 at 300 | .90 | .70 |
| 1N487A | N-1 | 300 | 50 | 25 at 300 | 1.20 | .94 |
| 1N488 | N-1 | 380 | 25 | 50 at 380 | 1.05 | .78 |
| 1N488A | N-1 | 380 | 50 | 25 at 380 | 1.54 | 1.19 |
| 1N456* | N-1 | 25 | 25 | 5 at 25 | .37 | .29 |
| 1N457* | N-5 | 60 | 25 | 5 at 60 | .36 | .30 |
| 1N458* | N-5 | 125 | 25 | 5 at 125 | .48 | .32 |
| 1N459* | N-5 | 175 | 25 | 5 at 175 | .51 | .34 |
| 1N461* | N-1 | 25 | 25 | 30 at 25 | .35 | .28 |
| 1N462* | N-1 | 60 | 25 | 30 at 60 | .38 | .30 |
| 1N463* | N-1 | 175 | 15 | 30 at 175 | .46 | .36 |
| 1N464* | N-1 | 125 | 20 | 30 at 125 | .45 | .35 |

*Available with suffix A (1N456A) at same price. Same voltage ratings but 50 mA average forward current.

### MILITARY TYPES

| Transitron Type | Net Ea., Lots of 1-99 | Net Ea., Lots of 100-999 | Transitron Type | Net Ea., Lots of 1-99 | Net Ea., Lots of 100-999 |
|---|---|---|---|---|---|
| JAN1N251 | $2.00 | $1.50 | USA1N643 | $1.45 | $1.00 |
| JAN1N457 | .36 | .30 | USA1N658 | 1.76 | 1.20 |
| JAN1N458 | .48 | .32 | USA1N662 | .90 | .60 |
| JAN1N459 | .51 | .34 | USA1N663 | 1.20 | .80 |
| JAN1N483B | .61 | .47 | USN1N914 | .45 | .30 |
| JAN1N485B | .77 | .55 | USN1N3064 | .67 | .44 |
| JAN1N486B | .85 | .65 | USN1N3600 | 3.65 | 2.50 |

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### RADIATION-RESISTANT DIODES (FIG. N-2)

Max. cap., 6 μμf at 0 volts, $V_R$ and 1 mc. Reverse recovery, 4 nsec. at 10 ma, $I_F$; 6 v., $V_R$; 1 ma, $i_{rr}$ and 100 ohms, $R_L$. Radiation tolerance $10^{16}$ neutrons/$CM^2$ for 0.1 Mev. Breakdown shown is at 5 μa, $I_R$; forward voltage, at 100 ma, $I_F$; reverse current at 25° C, ambient.

| Transitron Type | Breakdown Volts: Min. | Breakdown Volts: Max. | Max. Fwd. Volts | Reverse Current, μa at V. | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 |
|---|---|---|---|---|---|---|
| SG5250 | 50 | 75 | 0.90 | .025 at 20 | $3.25 | $2.50 |
| SG5260 | 75 | 100 | 0.90 | .025 at 20 | 3.50 | 2.75 |
| SG5270 | 100 | 125 | 0.90 | .10 at 75 | 3.75 | 3.00 |

## GERMANIUM DIODES

### COMPUTER TYPES (FIG. N-4)

1N994 (S570G) and 1N995 (S555G) are very fast switching types. Forward current at +25° C.

| Transitron Type | Max. Inv. Operating Volts | Max. Avg. Fwd. Cur., Ma | Max. Recovery Time, μsec. | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 |
|---|---|---|---|---|---|
| 1N994 | 8 | 20 | .002 | $1.75 | $1.25 |
| 1N995 | 15 | 30 | .006 | .60 | .45 |
| 1N276 | 100 | 70 | .3 | .31 | .24 |
| 1N695 | 25 | 100 | .3 | .30 | .24 |
| 1N996 | 25 | 50 | .3 | 1.15 | .87 |
| T15G | 125 | 80 | .3 | 1.70 | 1.25 |

### COMMERCIAL TYPES (FIG. N-4)

Specifications at 25° C.

| Transitron Type | Min. Fwd. Cur. at +1 v., Ma | Max. Inv. Current, μa at Volts | Max. Oper. Volts | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 |
|---|---|---|---|---|---|
| T1G | 20 | 1500 at −50 | 40 | $0.27 | $0.20 |
| T2G | 40 | 300 at −50 | 60 | .40 | .30 |
| T3G | 20 | 50 at −50 | 60 | .69 | .52 |
| T12G | 20 | 500 at −50<br>30 at −10 | 60 | .41 | .32 |
| 1N90 | 5 | 500 at −50 | 60 | .33 | .22 |
| 1N97 | 10 | 100 at −50<br>8 at −5 | 80 | .69 | .52 |
| 1N279 | 100 | 200 at −20 | 30 | .29 | .22 |

### VIDEO DETECTOR, POINT CONTACT TYPES (FIG. N-5)

Minimum rectification efficiency 65%. Specifications at 25° C.

| | | | | | |
|---|---|---|---|---|---|
| 1N60 | 5 | 67 at −10 | 30 | $0.30 | $0.23 |
| 1N60A | 5 | 60 at −10 | 40 | .40 | .29 |
| 1N87A | .1* | 30 at −1.5 | 30 | .35 | .26 |
| 1N295 | 5 | 200 at −10 | 50 | .35 | .27 |

*At 0.25 volt.

### MULTI-PURPOSE GOLD-BONDED TYPES

Specifications at 25° C.

#### MILITARY TYPES (FIG. N-5)

| Transitron Type | Fwd. Cur. Ma* | Max. Inv. Current, μa at Volts | Max. Oper. Volts | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 |
|---|---|---|---|---|---|
| JAN1N198M | 4 | 10 at −10<br>50 at −50 | 100 | $0.70 | $0.54 |
| JAN1N270 | 200 | 75 at −10#<br>100 at −50 | 80 | .32 | .25 |
| JAN1N277M | 5† | 10 at −10<br>50 at −50<br>400 at −100 | 100 | .85 | .65 |
| JAN1N81A‡ | 3 | 10 at −10 | 40 | .48 | .36 |
| USN1N3287W§ | 100 | 15 at −2 | 6 | .90 | .68 |

#### SWITCHING MILITARY TYPES (FIG. N-5)

Max. Recovery: 0.006 μsec., USN1N995M; 0.3 μsec., others.

| | | | | | |
|---|---|---|---|---|---|
| JAN1N276 | 40 | 20 at −10<br>100 at −50<br>800 at −100 | 50 | $0.31 | $0.24 |
| USN1N995M | 10† | 10 at −6 | 15 | 1.20 | .95 |
| USN1N3666M | 200 | 10 at −20 | 80 | .75 | .58 |

*Minimum at +1 volt. †Max. at 0.5 volt. ‡Point contact; Fig. Q. §Dynamic resistance 60-R max. at 1 ma, 0.1 ma rms $I_{AC}$ and 60 cps. #At 75° C.

#### HIGH TEMPERATURE TYPES (FIG. N-4)

| Transitron Type | Min. Fwd. Cur. at +1 v., Ma | Max. Inv. Current, μa at Volts | Max. Oper. Volts | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 |
|---|---|---|---|---|---|
| 1N278 | 20 | 125 at −50* | 50 | $0.88 | $0.65 |
| T20G | 20 | 500 at −50*<br>30 at −10* | 50 | 1.25 | .90 |
| T22G | 40 | 20 at −10* | 15 | 1.25 | .90 |

#### HIGH RESISTANCE TYPES (FIG. N-4)

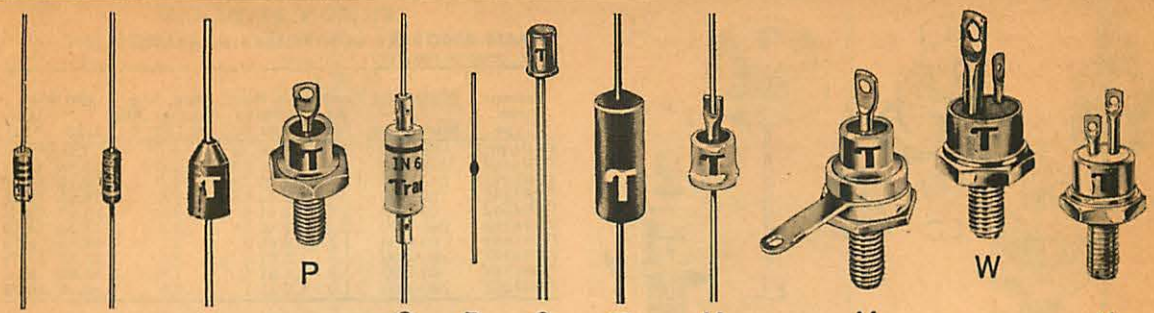
| | | | | | |
|---|---|---|---|---|---|
| T5G | 40 | 100 at −100 | 100 | $0.84 | $0.63 |
| T9G | 100 | 20 at −50<br>2 at −10 | 60 | 1.55 | 1.15 |
| T13G | 40 | 2 at −10 | 20 | 1.05 | .78 |
| 1N67A | 5 | 50 at −50† | 80 | .28 | .21 |

#### HIGH CONDUCTANCE TYPES (FIG. N-4)

| | | | | | |
|---|---|---|---|---|---|
| 1N283 | 200 | 20 at −10 | 20 | $0.51 | $0.40 |
| 1N273 | 100 | 20 at −20 | 30 | .66 | .50 |
| 1N98A | 40 | 100 at −50‡ | 80 | .31 | .24 |

*At 75° C. †And 5 at −5. ‡And 8 at −5.

# Transitron Semiconductors




## SILICON REGULATORS

Dynamic resistance given is measured by imposing a small AC current upon the test DC current.

### MILITARY TYPES (FIG. U)

| Transitron Type | Nom. Volts ±5% | Dyn. Resis. | Test Cur., Ma | Inv. Current $V_{RT}$ | Inv. Current $I_R$ μa | Net Each 1-99 | Net Each 100-999 |
|---|---|---|---|---|---|---|---|
| USN 1N3016B | 6.8 | 3.5 | 37 | 5.2 | 150 | $3.75 | $3.00 |
| USN 1N3017B | 7.5 | 4.0 | 34 | 5.7 | 100 | 3.75 | 3.00 |
| USN 1N3018B | 8.2 | 4.5 | 31 | 6.2 | 50 | 3.75 | 3.00 |
| USN 1N3019B | 9.1 | 5.0 | 28 | 6.9 | 25 | 3.75 | 3.00 |
| USN 1N3020B | 10 | 7 | 25 | 7.6 | 25 | 3.75 | 3.00 |
| USN 1N3021B | 11 | 8 | 23 | 8.4 | 10 | 3.75 | 3.00 |
| USN 1N3022B | 12 | 9 | 21 | 9.1 | 10 | 3.75 | 3.00 |
| USN 1N3023B | 13 | 10 | 19 | 9.9 | 10 | 3.75 | 3.00 |
| USN 1N3024B | 15 | 14 | 17 | 11.4 | 10 | 3.75 | 3.00 |
| USN 1N3025B | 16 | 16 | 15.5 | 12.2 | 10 | 3.75 | 3.00 |
| USN 1N3026B | 18 | 20 | 14 | 13.7 | 10 | 3.75 | 3.00 |
| USN 1N3027B | 20 | 22 | 12.5 | 15.2 | 10 | 3.75 | 3.00 |
| USN 1N3028B | 22 | 23 | 11.5 | 16.7 | 10 | 3.75 | 3.00 |
| USN 1N3029B | 24 | 25 | 10.5 | 18.2 | 10 | 3.75 | 3.00 |
| USN 1N3030B | 27 | 35 | 9.5 | 20.6 | 10 | 3.75 | 3.00 |
| USN 1N3031B | 30 | 40 | 8.5 | 22.8 | 10 | 3.75 | 3.00 |
| USN 1N3032B | 33 | 45 | 7.5 | 25.1 | 10 | 3.75 | 3.00 |

### 750-MILLIWATT TYPES (FIG. U)

| Transitron Type | Volts | Test Cur., Ma | Dyn. Resis. | Other Tolerances Available | Net Each 1-99 | Net Each 100-999 |
|---|---|---|---|---|---|---|
| 1N2032 | 4.3–5.4 | 10 | 55 | ±5% | $2.65 | $2.00 |
| 1N2035 | 7.5–10.0 | 10 | 15 | ±5% | 2.65 | 2.00 |
| 1N2038 | 13.5–18.00 | 5 | 120 | ±5% | 2.65 | 2.00 |
| 1N2040 | 20.0–27.0 | 5 | 300 | ±5% | 2.65 | 2.00 |

### 1-WATT TYPES (FIG. U)

Voltage tolerance ±20%, 1N3016–1N3051; all others ±10%.

| | | | | | | |
|---|---|---|---|---|---|---|
| 1N3016 | 6.8 | 37 | 3.5 | ±10, ±5 | $2.50 | $1.95 |
| 1N3033 | 33.0 | 7.5 | 45 | ±10, ±5 | 2.50 | 1.95 |
| 1N3043 | 91.0 | 2.8 | 250 | ±10, ±5 | 2.50 | 1.95 |
| 1N3051 | 200 | 1.2 | 1500 | ±10, ±5 | 2.50 | 1.95 |
| 1N1765 | 5.6 | 100 | 1.2 | ±5 | 2.40 | 1.60 |
| 1N1769 | 8.2 | 100 | 2.4 | ±5 | 2.80 | 1.95 |
| 1N1770 | 9.1 | 50 | 3.0 | ±5 | 2.80 | 1.95 |
| 1N1777 | 18 | 50 | 11.0 | ±5 | 2.80 | 1.95 |
| 1N1778 | 20 | 15 | 13.0 | ±5 | 2.80 | 1.95 |
| 1N1789 | 56 | 15 | 88 | ±5 | 3.10 | 2.35 |
| 1N1790 | 62 | 5 | 105 | ±5 | 3.30 | 2.45 |
| 1N1795 | 100 | 5 | 260 | ±5 | 3.30 | 2.45 |

### 1-WATT EPOXY TYPES (FIG. O)

Voltage tolerance ±20%.

| | | | | | | |
|---|---|---|---|---|---|---|
| EVR4 | 5.6 | 45 | 9 | ±10, ±5 | $0.75 | $0.50 |
| EVR12 | 12 | 21 | 17 | ±10, ±5 | .75 | .50 |
| EVR24 | 24 | 11 | 34 | ±10, ±5 | .75 | .50 |
| EVR30 | 30 | 9 | 50 | ±10, ±5 | .75 | .50 |
| EVR40 | 40 | 7 | 80 | ±10, ±5 | .75 | .50 |
| EVR56 | 56 | 4.5 | 130 | ±10, ±5 | .75 | .50 |
| EVR68 | 68 | 3 | 200 | ±10, ±5 | .75 | .50 |
| EVR75 | 75 | 3 | 225 | ±10, ±5 | .75 | .50 |
| EVR100 | 100 | 2.5 | 400 | ±10, ±5 | .75 | .50 |
| EVR110 | 110 | 2.5 | 450 | ±10, ±5 | .75 | .50 |

### 10-WATT TYPES (FIG. P)

Standard polarity cathode to case. Reverse polarity (suffix **R**) also available. Voltage tolerance ±20%, 1N2970–1N3015.

| | | | | | | |
|---|---|---|---|---|---|---|
| 1N2041 | 4.3–5.4 | 1000 | 1.0 | ±2, ±5 | $5.00 | $3.75 |
| 1N2046 | 11.0–14.5 | 500 | 2.0 | ±2, ±5 | 5.00 | 3.75 |
| 1N2049 | 20.0–27.0 | 150 | 8.0 | ±2, ±5 | 5.00 | 3.75 |
| 1N2970 | 6.8 | 370 | 1.2 | ±10, ±5 | 5.10 | 3.85 |
| 1N2988 | 27 | 95 | 7* | ±10, ±5 | 5.10 | 3.85 |
| 1N2997 | 51 | 50 | 15* | ±10, ±5 | 5.10 | 3.85 |
| 1N3005 | 100 | 25 | 40* | ±10, ±5 | 5.10 | 3.85 |
| 1N3015 | 200 | 12 | 300* | ±10, ±5 | 5.10 | 3.85 |

*Dynamic resistance measured by imposing an AC signal equal to 10% of test current upon the DC current.

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### 250-MILLIWATT TYPES (FIG. N-1)

Specifications are at 25° C. Max. temp. range −65° C to +150° C.

| Transitron Type | Volts | Test Cur., Ma | Dyn. Resis. Ohms | Nominal Tolerance | Net Each 1-99 | Net Each 100-999 |
|---|---|---|---|---|---|---|
| 1N761 | 4.3–5.4 | 10 | 40 | ..... | $1.55 | $1.30 |
| 1N761-1 | 4.5 | 10 | 40 | ±5% | 1.80 | 1.55 |
| 1N761-2 | 5.0 | 10 | 40 | ±5% | 1.80 | 1.55 |
| 1N762 | 5.2–6.4 | 10 | 18 | ..... | 1.55 | 1.30 |
| 1N762-1 | 5.5 | 10 | 18 | ±5% | 1.80 | 1.55 |
| 1N762-2 | 6.0 | 10 | 18 | ±5% | 1.80 | 1.55 |
| 1N763 | 6.2–8.0 | 10 | 7 | ..... | 1.55 | 1.30 |
| 1N763-1 | 6.5 | 10 | 7 | ±5% | 1.80 | 1.55 |
| 1N763-2 | 7.0 | 10 | 7 | ±5% | 1.80 | 1.55 |
| 1N763-3 | 7.5 | 10 | 7 | ±5% | 1.80 | 1.55 |
| 1N764 | 7.5–10.0 | 10 | 12 | ..... | 1.55 | 1.30 |
| 1N764-1 | 8.0 | 10 | 12 | ±5% | 1.80 | 1.55 |
| 1N764-2 | 8.5 | 10 | 12 | ±5% | 1.80 | 1.55 |
| 1N764-3 | 9.0 | 10 | 12 | ±5% | 1.80 | 1.55 |
| 1N764-4 | 9.5 | 10 | 12 | ±5% | 1.80 | 1.55 |
| 1N765 | 9.0–12.0 | 5 | 45 | ..... | 1.55 | 1.30 |
| 1N765-1 | 10 | 5 | 45 | ±5% | 1.80 | 1.55 |
| 1N765-2 | 11 | 5 | 45 | ±5% | 1.80 | 1.55 |
| 1N766 | 11.0–14.5 | 5 | 55 | ..... | 1.55 | 1.30 |
| 1N766-1 | 12 | 5 | 55 | ±5% | 1.80 | 1.55 |
| 1N766-2 | 13 | 5 | 55 | ±5% | 1.80 | 1.55 |
| 1N766-3 | 14 | 5 | 55 | ±5% | 1.80 | 1.55 |
| 1N767 | 13.5–18.0 | 5 | 70 | ..... | 1.55 | 1.30 |
| 1N767-1 | 15 | 5 | 70 | ±5% | 1.80 | 1.55 |
| 1N767-2 | 16 | 5 | 70 | ±5% | 1.80 | 1.55 |
| 1N767-3 | 17 | 5 | 70 | ±5% | 1.80 | 1.55 |
| 1N768 | 17.0–21.0 | 5 | 100 | ..... | 1.55 | 1.30 |
| 1N768-1 | 18 | 5 | 100 | ±5% | 1.80 | 1.55 |
| 1N768-2 | 19 | 5 | 100 | ±5% | 1.80 | 1.55 |
| 1N768-3 | 20 | 5 | 100 | ±5% | 1.80 | 1.55 |
| 1N769 | 20.0–27.0 | 5 | 150 | ..... | 1.55 | 1.30 |
| 1N769-1 | 22 | 5 | 150 | ±5% | 1.80 | 1.55 |
| 1N769-2 | 24 | 5 | 150 | ±5% | 1.80 | 1.55 |
| 1N769-3 | 26 | 5 | 150 | ±5% | 1.80 | 1.55 |
| 1N769-4 | 28 | 5 | 150 | ±5% | 1.80 | 1.55 |

### LOW VOLTAGE 250-MILLIWATT TYPES (FIG. N-1)

Specifications at 25° C. Max. temp. range −65° C to +175° C.

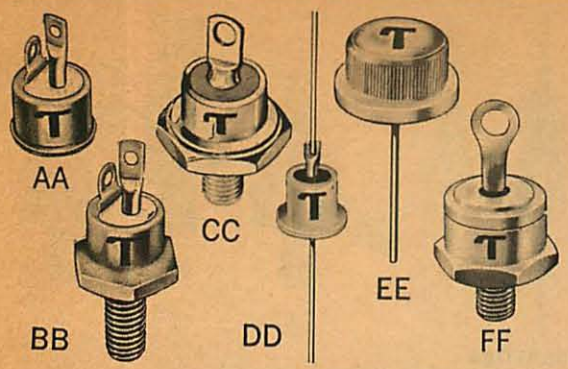
| Transitron Type | Volts | Test Cur., Ma | Dyn. Resis. Ohms | Nominal Tolerance† | Net Each 1-99 | Net Each 100-999 |
|---|---|---|---|---|---|---|
| 1N702 | 2.0–3.2 | 5 | 60* | ..... | $1.50 | $1.25 |
| 1N703 | 3.0–3.9 | 5 | 55* | ..... | 1.50 | 1.25 |
| 1N704 | 3.7–4.5 | 5 | 45* | ..... | 1.50 | 1.25 |
| 1N705 | 4.3–5.4 | 5 | 35* | ..... | 1.50 | 1.25 |
| 1N706 | 5.2–6.4 | 5 | 20* | ..... | 1.50 | 1.25 |
| 1N707 | 6.2–8.0 | 5 | 10* | ..... | 1.50 | 1.25 |
| 1N708 | 5.6 | 25 | 2.6 | ±10% | 1.50 | 1.25 |
| 1N709 | 6.2 | 25 | 4.1 | ±10% | 1.50 | 1.25 |
| 1N710 | 6.8 | 25 | 4.7 | ±10% | 1.50 | 1.25 |
| 1N711 | 7.5 | 25 | 5.3 | ±10% | 1.50 | 1.25 |
| 1N712 | 8.2 | 25 | 6.0 | ±10% | 1.50 | 1.25 |
| 1N713 | 9.1 | 12 | 7.0 | ±10% | 1.50 | 1.25 |
| 1N714 | 10 | 12 | 8.0 | ±10% | 1.50 | 1.25 |
| 1N715 | 11 | 12 | 9.0 | ±10% | 1.50 | 1.25 |
| 1N716 | 12 | 12 | 10 | ±10% | 1.50 | 1.25 |

### 400-MILLIWATT TYPES (FIG. N-1)

| | | | | | | |
|---|---|---|---|---|---|---|
| 1N746‡ | 3.3 | 20.0 | 28 | ±10% | $1.50 | $1.25 |
| 1N747‡ | 3.6 | 20.0 | 24 | ±10% | 1.50 | 1.25 |
| 1N748‡ | 3.9 | 20.0 | 23 | ±10% | 1.50 | 1.25 |
| 1N749‡ | 4.3 | 20.0 | 22 | ±10% | 1.50 | 1.25 |
| 1N740‡ | 4.7 | 20.0 | 19 | ±10% | 1.50 | 1.25 |
| 1N751‡ | 5.1 | 20.0 | 17 | ±10% | 1.50 | 1.25 |
| 1N752‡ | 5.6 | 20.0 | 11 | ±10% | 1.50 | 1.25 |
| 1N753‡ | 6.2 | 20.0 | 7 | ±10% | 1.50 | 1.25 |
| 1N754‡ | 6.8 | 20.0 | 5 | ±10% | 1.50 | 1.25 |
| 1N755‡ | 7.5 | 20.0 | 6 | ±10% | 1.50 | 1.25 |
| 1N756‡ | 8.2 | 20.0 | 8 | ±10% | 1.50 | 1.25 |
| 1N757‡ | 9.1 | 20.0 | 10 | ±10% | 1.50 | 1.25 |
| 1N758‡ | 10.0 | 20.0 | 17 | ±10% | 1.50 | 1.25 |
| 1N759‡ | 12.0 | 20.0 | 30 | ±10% | 1.50 | 1.25 |

*At 10 ma test current. †For ±5% tolerance add suffix **A** (i.e., 1N702**A**, 1N746**A**); specify nom. voltage on 1N702–1N707 types. ‡Also available in MIL type USN1N746–USN1N759, Fig. N-5. Net Each, Lots of: 1–99.....**$2.90**; 100–999.....**$2.20**

# Transitron Semiconductors




## SILICON REFERENCES

### CERTIFIED VOLTAGE REFERENCES (FIG. N-3)

Voltage stability observed over 1000 hours. Max. change in voltage at 7.5 ma over temp. range of −50° C to +100° C.

| Transitron Type | Cert. Voltage Stability | Voltage At 7.5 Ma, Volts | Temp. Stab., Mv | Max. Dyn. Resis., Ohms* | Net Each 1-99 | Net Each 100-999 |
|---|---|---|---|---|---|---|
| 1N3501 | ±.01% | 6.2—6.5 | ±6 | 12 | $30.00 | $24.00 |
| 1N3502 | ±.01% | 6.2—6.5 | ±3 | 12 | 35.00 | 28.00 |
| 1N3503 | ±.005% | 6.2—6.5 | ±6 | 12 | 48.00 | 36.00 |
| 1N3503A | ±.005% | 6.2—6.5 | ±3 | 12 | 50.00 | 40.00 |
| 1N3504 | ±.002% | 6.2—6.5 | ±6 | 12 | 60.00 | 48.00 |
| 1N3504A | ±.002% | 6.2—6.5 | ±3 | 12 | 70.00 | 56.00 |

*At 7.5 ma Iz.

### PACKAGED REFERENCE ASSEMBLIES

### CLOSE VOLTAGE TOLERANCE (FIG. T)

Voltage tolerance ±5%, SV3140, SV3145; ±2% all others.

| Transitron Type | Volts | Other Tolerances Available | Test Cur., Ma | Max. Dyn. Resis., Ohms | Net Each 1-99 | Net Each 100-999 |
|---|---|---|---|---|---|---|
| SV3140 | 1.15 | ±2% | 10.0 | 20 | $ 2.80 | $1.70 |
| SV3145 | 3 | ±2% | 10.0 | 20 | 5.40 | 3.40 |
| SV4010 | 10 | ±1% | 1.0 | 90 at 10 ma | 6.00 | 4.80 |
| SV4100 | 100 | ±1% | 0.5 | 600 at 5 ma | 10.00 | 8.00 |

### LOW TEMPERATURE COEFFICIENT (FIG. T)

| Transitron Type | Temp. Coef.* %/° C | Voltage* At 25° C Min.-Max. | Max. Dyn. Resis. 25°C* Ohms | Net Each 1-99 | Net Each 100-999 |
|---|---|---|---|---|---|
| SV3176 | ±.001 | 8.0—8.8 | 15 | $18.80 | $14.50 |
| SV3175 | ±.002 | 8.0—8.8 | 15 | 8.90 | 7.10 |
| SV3174 | ±.003 | 8.0—8.8 | 15 | 7.70 | 6.15 |
| SV3173 | ±.005 | 8.0—8.8 | 15 | 6.50 | 5.20 |
| SV3171 | ±.01 | 6.7—7.4 | 10 | 5.00 | 3.90 |
| SV3170 | ±.02 | 6.7—7.4 | 10 | 4.50 | 3.60 |
| SV3207‡ | ±.001 | 16.0—17.6 | 30 | 21.60 | 16.60 |
| SV3206‡ | ±.002 | 16.0—17.6 | 30 | 14.90 | 11.50 |
| SV8227■ | ±.001† | 12.0—13.2† | 30† | 17.30 | 12.80 |
| SV8237■ | ±.001† | 18.0—19.8† | 45† | 25.10 | 18.70 |
| SV8247■ | ±.001† | 24.0—26.4† | 60† | 33.00 | 24.55 |

### INDUSTRIAL TYPES (FIG. N-1)

| | | | | | |
|---|---|---|---|---|---|
| 1N3496 | ±.0005§ | 5.9—6.5 | 15 | $ 3.75 | $ 2.50 |
| 1N3497 | ±.001§ | 5.9—6.5 | 15 | 5.75 | 4.50 |
| 1N3498 | ±.002§ | 5.9—6.5 | 15 | 9.00 | 7.00 |
| 1N3499 | ±.005§ | 5.9—6.5 | 15 | 19.00 | 15.50 |
| 1N3500 | ±.01§ | 5.9—6.5 | 15 | 3.00 | 2.05 |

### 6.2-VOLT SUBMINIATURE (FIG. N-1)

| | | | | | |
|---|---|---|---|---|---|
| 1N829 | ±.0005♯ | 5.9—6.5† | 15† | $23.50 | $19.00 |
| 1N827A▲ | ±.001♯ | 5.9—6.5† | 10† | 14.25 | 12.25 |
| 1N825 | ±.002♯ | 5.9—6.5† | 15† | 5.60 | 4.50 |
| 1N824● | ±.005♯ | 5.9—6.5† | 15† | 9.60 | 8.00 |
| 1N823A▲ | ±.005♯ | 5.9—6.5† | 10† | 5.25 | 4.50 |
| 1N822● | ±.01♯ | 5.9—6.5† | 15† | 7.35 | 5.90 |
| 1N821A▲ | ±.01♯ | 5.9—6.5† | 10† | 3.85 | 3.10 |

### 8.4-VOLT SUBMINIATURE (FIG. N-1)

Suffix A, −55° C to +150° C range; others −55° C to +100° C.

| | | | | | |
|---|---|---|---|---|---|
| 1N3154 | ±.01 | 8.0—8.8 | 15 | $ 3.05 | $ 2.40 |
| 1N3154A | ±.01 | 8.0—8.8 | 15 | 3.70 | 3.15 |
| 1N3155 | ±.005 | 8.0—8.8 | 15 | 3.60 | 2.90 |
| 1N3155A | ±.005 | 8.0—8.8 | 15 | 5.00 | 4.30 |
| 1N3156 | ±.002 | 8.0—8.8 | 15 | 8.75 | 6.50 |
| 1N3156A | ±.002 | 8.0—8.8 | 15 | 10.25 | 7.75 |
| 1N3157 | ±.001 | 8.0—8.8 | 15 | 21.75 | 18.00 |
| 1N3157A | ±.001 | 8.0—8.8 | 15 | 24.00 | 20.00 |

*At 10 ma Iz. †At 7.5 ma Iz. ‡Matched set of two low voltage assemblies. Measured by referencing voltage at 25° C to voltages at: §0° C and +75° C; ♯−50° C and +100° C at 7.5 ma Iz. ●Double anode type. ▲Fig. N-5. ■Tolerance ±5%; ±1% and ±2% also available.

### MIL TYPES

| Transitron Type | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 | Transitron Type | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 |
|---|---|---|---|---|---|
| USAF1N429 | $ 7.25 | $ 5.50 | USN1N829 | $36.00 | $27.50 |
| USN1N821 | 5.05 | 3.50 | USN1N3154 | 4.20 | 3.50 |
| USN1N823 | 6.20 | 4.70 | USN1N3155 | 5.30 | 4.40 |
| USN1N825 | 9.00 | 7.70 | USN1N3156 | 12.50 | 9.85 |
| USN1N827 | 18.50 | 15.90 | USN1N3157 | 27.15 | 22.50 |

## SILICON RECTIFIERS

### FAST RECOVERY CONTROLLED AVALANCHE (FIG. P)

Max. reverse recovery, 0.10 μsec.

| Transitron Type | At 25° C Avalanche Volts Min.-Max. | At 25° C Avalanche Volts At Ma | Max. Fwd. Voltage V. at A. | Max. Avg. Inv. Cur., Ma at 150° C | Net Each 1-99 | Net Each 100-999 |
|---|---|---|---|---|---|---|
| TFR1205Z | 60-300 | 5 | 1.2 at 12 | 4.0 | $19.80 | $12.35 |
| TFR1210Z | 120-400 | 5 | 1.2 at 12 | 4.0 | 23.25 | 14.85 |
| TFR1220Z | 240-500 | 5 | 1.2 at 12 | 4.0 | 26.75 | 17.30 |
| TFR1240Z | 480-800 | 5 | 1.2 at 12 | 4.0 | 35.50 | 23.10 |
| TFR605Z | 60-300 | 2.5 | 1.2 at 6 | 3.0 | 16.95 | 10.75 |
| TFR620Z | 240-500 | 2.5 | 1.2 at 6 | 3.0 | 23.25 | 14.60 |
| TFR305Z | 60-300 | 1.5 | 1.2 at 3 | 2.0 | 13.50 | 8.75 |
| TFR320Z | 240-500 | 1.5 | 1.2 at 3 | 2.0 | 18.75 | 13.00 |
| TFR105Z | 60-300 | 1.0 | 1.2 at 1 | 1.0 | 10.00 | 6.50 |
| TFR120Z | 240-500 | 1.0 | 1.2 at 1 | 1.0 | 16.50 | 10.75 |

### FAST RECOVERY RECTIFIERS

| Transitron Type | Fig. | PIV Volts | Max. Fwd. At 25° C V. at A. | Max. Inv. Cur., Ma at 100° C | Max. Rev. Recov., μsec. | Net Each 1-99 | Net Each 100-999 |
|---|---|---|---|---|---|---|---|
| 1N3874 | V | 50 | 1.4 at 6 | 1 | .200 | $11.25 | $ 8.50 |
| 1N3875 | V | 100 | 1.4 at 6 | 1 | .200 | 16.50 | 10.75 |
| 1N3882 | P | 300 | 1.4 at 6 | 1 | .200 | 21.00 | 13.85 |
| 1N3883 | P | 400 | 1.4 at 6 | 1 | .200 | 25.50 | 17.00 |
| 1N3889 | P | 50 | 1.4 at 12 | 3 | .200 | 15.50 | 10.25 |
| 1N3891 | P | 200 | 1.4 at 12 | 3 | .200 | 22.00 | 14.50 |
| 1N3887 | V | 300 | 1.4 at 12 | 3 | .200 | 25.00 | 17.75 |
| 1N3888 | V | 400 | 1.4 at 12 | 3 | .200 | 27.00 | 19.00 |
| 1N3899 | CC | 50 | 1.4 at 20 | 6 | .200 | 20.00 | 13.20 |
| 1N3900 | CC | 100 | 1.4 at 20 | 6 | .200 | 27.00 | 17.80 |
| 1N3909 | CC* | 50 | 1.4 at 30 | 10 | .200 | 49.50 | 37.00 |

*With ceramic base.

### FAST RECOVERY RECTIFIERS

Ratings at 150° C, except as otherwise noted.

| Transitron Type | Fig. | Max. Avg. Fwd. Cur. Amps | Recur. PIV Volts | Max. Inv. Current Ma | Net Each 1-99 | Net Each 100-999 |
|---|---|---|---|---|---|---|
| 1N538* | DD | 0.25 | 200 | 0.3 | $0.53 | $0.34 |
| 1N540* | DD | 0.25 | 400 | 0.3 | .68 | .43 |
| 1N547* | DD | 0.25 | 600 | 0.3 | .96 | .60 |
| 1N561† | DD | 0.50 | 1000 | 0.3 | 2.40 | 1.80 |
| 1N1487† | DD | 0.75 | 100 | 0.4 | .50 | .28 |
| 1N1490† | DD | 0.75 | 400 | 0.3 | .68 | .42 |
| 1N1492† | DD | 0.75 | 600 | 0.3 | .95 | .59 |
| 1N1693† | DD | 0.60 | 200 | 0.5 | .47 | .28 |
| 1N1695† | DD | 0.60 | 400 | 0.5 | .65 | .42 |
| 1N1697† | DD | 0.60 | 600 | 0.5 | .92 | .61 |
| 1N2506 | DD | 0.10 | 1000 | 0.2 | 3.50 | 2.35 |
| 1N2508 | DD | 0.10 | 1500 | 0.2 | 9.00 | 6.00 |
| ER11† | O | 0.60 | 100 | 0.025 | .45 | .25 |
| 1N2069† | O | 0.75 | 200 | 0.01 | .45 | .27 |
| 1N2070† | O | 0.75 | 400 | 0.01 | .50 | .30 |
| 1N2071† | O | 0.75 | 600 | 0.01 | .70 | .38 |
| 1N3075 | U | 0.2 | 200 | 0.5 | .58 | .35 |
| 1N3079 | U | 0.2 | 400 | 0.5 | .70 | .40 |
| 1N3081 | U | 0.2 | 600 | 0.5 | 1.10 | .70 |
| 1N3082 (TK21) | U | 0.5 | 200 | 0.3 | 1.00 | .75 |
| 1N3083 (TK41) | U | 0.5 | 400 | 0.3 | 3.00 | 2.20 |
| 1N3084 (TK61) | U | 0.5 | 600 | 0.3 | 4.25 | 2.90 |
| TK20 | U | 0.25 | 200 | 0.2 | .55 | .33 |
| TK40 | U | 0.25 | 400 | 0.2 | .65 | .42 |
| 1N253 | P | 1.0 | 95 | 0.1 | 1.05 | .70 |
| 1N254 | P | 0.4 | 190 | 0.1 | 1.12 | .75 |
| 1N255 | P | 0.4 | 380 | 0.15 | 1.72 | 1.15 |
| 1N256 | P | 0.2 | 570 | 0.25 | 2.40 | 1.60 |
| 1N1585 | P | 3.0 | 400 | 0.5 | 3.30 | 2.25 |
| 1N1587 | P | 3.0 | 600 | 0.5 | 4.25 | 2.90 |
| 1N1130† | P | 0.3 | 1500 | 0.05 | 10.50 | 7.40 |
| TM124 | P | 1.0 | 1200 | 0.5 | 16.00 | 12.00 |
| TM155 | P | 0.4 | 1500 | 0.5 | 13.90 | 10.40 |
| 1N2493 | P | 6.0 | 200 | 2.0 | 2.00 | 1.35 |
| 1N2495 | P | 6.0 | 400 | 2.0 | 3.50 | 2.40 |
| 1N2497 | P | 6.0 | 600 | 2.0 | 4.40 | 3.00 |
| 1N1202 | P | 12.0 | 200 | 3.0 | 2.20 | 1.50 |
| 1N1204 | P | 12.0 | 400 | 3.0 | 3.75 | 2.55 |
| 1N1206 | P | 12.0 | 600 | 3.0 | 4.80 | 3.25 |
| 1N3210, R | FF | 15.0 | 200 | 10.0 | 2.90 | 2.00 |
| 1N3212, R | FF | 15.0 | 400 | 10.0 | 3.60 | 2.50 |
| 1N3214, R | FF | 15.0 | 600 | 10.0 | 5.75 | 3.85 |
| 1N3659, R | EE | 25.0 | 50 | 5.0 | .75 | .50 |
| 1N3661, R | EE | 25.0 | 200 | 4.0 | 1.15 | .76 |
| 1N3663, R | EE | 25.0 | 400 | 3.0 | 1.50 | 1.00 |
| 1N3665, R | EE | 25.0 | 600 | 2.0 | 2.75 | 1.80 |
| 1N249A | CC | 20.0 | 100 | 5.0 | 1.75 | 1.15 |
| 1N250A | CC | 20.0 | 200 | 5.0 | 2.45 | 1.65 |
| TR402 | CC | 20.0 | 400 | 5.0 | 5.40 | 3.75 |
| 1N1184 | CC | 35.0 | 100 | 6.0 | 2.40 | 1.60 |
| 1N1186 | CC | 35.0 | 200 | 6.0 | 3.45 | 2.30 |
| 1N1188 | CC | 35.0 | 400 | 6.0 | 5.85 | 3.90 |
| 1N1190 | CC | 35.0 | 600 | 6.0 | 6.90 | 4.60 |

*MIL type also available. †Ratings at 25° C, ambient.

### CERAMIC BASE REGULATORS (FIG. V)

Silicon stud mounted regulators with electrically insulated mounting bases available from Transitron. Feature high-alumina ceramic disc of low thermal resistance; high electrical insulation properties; elimination of hardware and simplification of series assemblies. Complete information on request.

**Transitron offers a broad line of rectifiers, controlled rectifiers, transistors, diodes, micro-components and special products. Contact your Authorized Transitron Industrial Distributor for detailed specifications and information on any new or unlisted items.**

# Transitron Semiconductors

## SILICON PLANAR CONTROLLED RECTIFIERS

### POWER TYPES (FIG. W)

| Transitron Type | Min. Pk. Rev. V.* | Max. Avg. Fwd. Cur., Amps at 25° C Case | Max. Avg. Fwd. Cur., Amps at 100° C Case | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 |
|---|---|---|---|---|---|
| TCR1020 | 100 | 20 | 10 | $10.50 | $ 7.00 |
| TCR2020 | 200 | 20 | 10 | 15.00 | 10.00 |
| TCR3020 | 300 | 20 | 10 | 21.00 | 14.00 |
| TCR4020 | 400 | 20 | 10 | 26.25 | 17.50 |
| 2N681 | 25 | 16 | 8 | 8.50 | 5.65 |
| 2N682 | 50 | 16 | 8 | 9.35 | 6.20 |
| 2N683 | 100 | 16 | 8 | 10.15 | 6.75 |
| 2N684 | 150 | 16 | 8 | 12.65 | 8.40 |
| 2N685 | 200 | 16 | 8 | 14.20 | 9.45 |
| 2N686 | 250 | 16 | 8 | 17.95 | 11.95 |
| 2N687 | 300 | 16 | 8 | 20.95 | 13.95 |
| 2N688 | 400 | 16 | 8 | 25.45 | 16.95 |
| 2N689 | 500 | 16 | 8 | 31.85 | 21.20 |
| TCR510 | 50 | 10 | 5 | 8.50 | 5.65 |
| TCR1010 | 100 | 10 | 5 | 9.45 | 6.30 |
| TCR1510 | 150 | 10 | 5 | 11.50 | 7.65 |
| TCR2010 | 200 | 10 | 5 | 13.50 | 9.00 |
| TCR2510 | 250 | 10 | 5 | 16.15 | 10.75 |
| TCR3010 | 300 | 10 | 5 | 18.75 | 12.50 |
| TCR3510 | 350 | 10 | 5 | 21.40 | 14.25 |
| TCR4010 | 400 | 10 | 5 | 23.65 | 15.75 |
| 2N1842 | 25 | 10 | 4† | 6.75 | 4.50 |
| 2N1843 | 50 | 10 | 4† | 7.50 | 5.00 |
| 2N1844 | 100 | 10 | 4† | 8.25 | 5.50 |
| 2N1845 | 150 | 10 | 4† | 10.10 | 6.75 |
| 2N1846 | 200 | 10 | 4† | 12.00 | 8.00 |
| 2N1847 | 250 | 10 | 4† | 14.25 | 9.50 |
| 2N1848 | 300 | 10 | 4† | 16.85 | 11.25 |
| 2N1849 | 400 | 10 | 4† | 21.30 | 14.20 |
| 2N1850 | 500 | 10 | 4† | 24.35 | 16.25 |

### POWER TYPES (FIG. X)

| | | | | | |
|---|---|---|---|---|---|
| TCR1005 | 100 | 5 | 3 | $ 7.00 | $ 4.75 |
| TCR2005 | 200 | 5 | 3 | 11.50 | 7.75 |
| TCR3005 | 300 | 5 | 3 | 16.00 | 10.65 |
| TCR4005 | 400 | 5 | 3 | 20.00 | 13.60 |
| 2N1770A | 25 | 4.7 | 3 | 6.10 | 4.05 |
| 2N1771A | 50 | 4.7 | 3 | 6.95 | 4.00 |
| 2N1772A | 100 | 4.7 | 3 | 8.55 | 5.70 |
| 2N1773A | 150 | 4.7 | 3 | 11.05 | 7.35 |
| 2N1774A | 200 | 4.7 | 3 | 12.90 | 8.50 |
| 2N1775A | 250 | 4.7 | 3 | 15.70 | 10.45 |
| 2N1776A | 300 | 4.7 | 3 | 18.35 | 12.20 |
| 2N1777A | 400 | 4.7 | 3 | 22.50 | 15.00 |
| 2N1770 | 25 | 4.7 | 3 | 5.45 | 3.65 |
| 2N1771 | 50 | 4.7 | 3 | 5.95 | 3.95 |
| 2N1772 | 100 | 4.7 | 3 | 7.20 | 4.80 |
| 2N1773 | 150 | 4.7 | 3 | 9.70 | 6.45 |
| 2N1774 | 200 | 4.7 | 3 | 10.40 | 7.60 |
| 2N1775 | 250 | 4.7 | 3 | 14.20 | 9.45 |
| 2N1776 | 300 | 4.7 | 3 | 16.45 | 10.95 |
| 2N1777 | 400 | 4.7 | 3 | 19.90 | 13.25 |
| 2N1600 | 50 | 3 | 3† | 5.70 | 3.80 |
| 2N1601 | 100 | 3 | 3† | 6.00 | 4.40 |
| 2N1602 | 200 | 3 | 3† | 10.50 | 7.00 |
| 2N1603 | 300 | 3 | 3† | 15.00 | 10.00 |
| 2N1604 | 400 | 3 | 3† | 20.00 | 13.60 |

### INDUSTRIAL TYPES (FIG. X)

| | | | | | |
|---|---|---|---|---|---|
| TCR3 | 50‡ | ..... | 3§ | $1.95 | $1.30 |
| TCR13 | 100‡ | ..... | 3§ | 2.25 | 1.50 |
| TCR23 | 200‡ | ..... | 3§ | 2.55 | 1.70 |
| TCR33 | 300‡ | ..... | 3§ | 3.75 | 2.50 |
| TCR43 | 400‡ | ..... | 3§ | 5.50 | 3.35 |

*And min. forward breakover voltage. †At 80° C case. ‡At 100° C. §At 75° C case.

### LOW LEAKAGE TYPES (FIG. X)

| Transitron Type | Min. PRV, V.* | Leakage† μa | Max. Fwd. V.‡ | Net Each 1-99 | Net Each 100-999 |
|---|---|---|---|---|---|
| TCR50 | 50 | 10 | 1.3 | $ 7.00 | $ 4.65 |
| TCR51 | 100 | 10 | 1.3 | 9.00 | 6.00 |
| TCR52 | 150 | 10 | 1.3 | 11.10 | 7.40 |
| TCR53 | 200 | 10 | 1.3 | 13.50 | 9.40 |
| TCR54 | 250 | 10 | 1.3 | 15.75 | 10.50 |
| TCR55 | 300 | 10 | 1.3 | 18.40 | 12.25 |
| TCR56 | 400 | 10 | 1.3 | 23.65 | 15.75 |

### COMMERCIAL TYPES (FIG. X)

| | | | | | |
|---|---|---|---|---|---|
| TCR70 | 50 | 50 | 1.75 | $1.95 | $1.30 |
| TCR71 | 100 | 50 | 1.75 | 2.25 | 1.50 |
| TCR72 | 150 | 50 | 1.75 | 2.45 | 1.60 |
| TCR73 | 200 | 50 | 1.75 | 2.55 | 1.70 |
| TCR74 | 250 | 50 | 1.75 | 3.30 | 2.20 |
| TCR75 | 300 | 50 | 1.75 | 3.75 | 2.50 |
| TCR76 | 400 | 50 | 1.75 | 5.50 | 3.35 |

*And min. fwd. breakdown. †Max. forward and max. reverse leakage current at 25° C. ‡At 3 amps.

### LOW CURRENT TYPES (FIG. G)

| Transitron Type | Min. PRV V.* | Max. Fwd. Ma† | Max. Gate‡ Ma | Net Each 1-99 | Net Each 100-999 |
|---|---|---|---|---|---|
| 2N1595 | 50 | 250 | 10§ | $ 3.00 | $ 2.00 |
| 2N1596 | 100 | 250 | 10§ | 4.90 | 3.25 |
| 2N1597 | 200 | 250 | 10§ | 9.40 | 6.25 |
| 2N1598 | 300 | 250 | 10§ | 14.40 | 9.60 |
| 2N1599 | 400 | 250 | 10§ | 19.30 | 12.85 |
| 2N2009 | 25 | 250 | .2 | 3.75 | 2.50 |
| 2N2010 | 50 | 250 | .2 | 4.15 | 2.75 |
| 2N2011 | 100 | 250 | .2 | 6.60 | 4.40 |
| 2N2012 | 200 | 250 | .2 | 12.50 | 8.25 |
| 2N2013 | 300 | 250 | .2 | 24.00 | 16.00 |
| 2N2014 | 400 | 250 | .2 | 34.15 | 22.75 |
| 2N1881 | 30 | 250 | 2 | 3.75 | 2.50 |
| 2N1882 | 60 | 250 | 2 | 4.15 | 2.75 |
| 2N1883 | 100 | 250 | 2 | 6.60 | 4.40 |
| 2N1884 | 150 | 250 | 2 | 9.50 | 6.35 |
| 2N1885 | 200 | 250 | 2 | 12.40 | 8.25 |
| 2N1869 | 15 | 250 | .2 | 5.10 | 3.40 |
| 2N1870 | 30 | 250 | .2 | 11.10 | 7.40 |
| 2N1871 | 60 | 250 | .2 | 12.50 | 8.40 |
| 2N1872 | 100 | 250 | .2 | 15.00 | 10.30 |
| 2N1873 | 150 | 250 | .2 | 18.00 | 12.00 |
| 2N1874 | 200 | 250 | .2 | 20.50 | 13.50 |
| 2N1875 | 15 | 250 | .02 | 12.80 | 8.55 |
| 2N1876 | 30 | 250 | .02 | 12.95 | 8.90 |
| 2N1877 | 60 | 250 | .02 | 26.90 | 19.20 |
| 2N1878 | 100 | 250 | .02 | 29.90 | 22.15 |
| 2N1879 | 150 | 250 | .02 | 36.20 | 24.15 |
| 2N1880 | 200 | 250 | .02 | 38.80 | 27.45 |
| 2N1875A | 15 | 250 | .02 | 14.10 | 9.40 |
| 2N1876A | 30 | 250 | .02 | 14.80 | 9.80 |
| 2N1877A | 60 | 250 | .02 | 27.20 | 20.15 |
| 2N1878A | 100 | 250 | .02 | 30.80 | 22.85 |
| 2N1879A | 150 | 250 | .02 | 37.00 | 24.65 |
| 2N1880A | 200 | 250 | .02 | 39.30 | 27.75 |
| 2N1870A | 30 | 250 | .2 | 12.00 | 8.00 |
| 2N1871A | 60 | 250 | .2 | 13.50 | 9.00 |
| 2N1872A | 100 | 250 | .2 | 16.50 | 11.00 |
| 2N1874A | 200 | 250 | .2 | 22.50 | 15.00 |
| 2N2322 | 25 | 1.6A• | .2# | 3.05 | 2.00 |
| 2N2323 | 50 | 1.6A• | .2# | 3.35 | 2.20 |
| 2N2324 | 100 | 1.6A• | .2# | 5.50 | 3.55 |
| 2N2325 | 150 | 1.6A• | .2# | 7.95 | 5.25 |
| 2N2326 | 200 | 1.6A• | .2# | 10.20 | 6.85 |
| 2N2327 | 250 | 1.6A• | .2# | 12.95 | 8.65 |
| 2N2328 | 300 | 1.6A• | .2# | 16.05 | 10.65 |
| 2N2329 | 400 | 1.6A• | .2# | 21.35 | 14.15 |

### LOW CURRENT TYPES (FIG. H)

| | | | | | |
|---|---|---|---|---|---|
| 2N948 | 30 | 280▲ | .02 | $ 8.45 | $ 5.90 |
| 2N949 | 60 | 280▲ | .02 | 11.00 | 7.70 |
| 2N950 | 100 | 280▲ | .02 | 16.20 | 11.35 |
| 2N951 | 200 | 280▲ | .02 | 27.00 | 18.90 |
| 2N884 | 15 | 280▲ | .02 | 7.20 | 5.05 |
| 2N885 | 30 | 280▲ | .02 | 8.65 | 6.30 |
| 2N886 | 60 | 280▲ | .02 | 9.75 | 7.30 |
| 2N887 | 100 | 280▲ | .02 | 11.85 | 8.90 |
| 2N888 | 150 | 280▲ | .02 | 16.95 | 12.75 |
| 2N889 | 200 | 280▲ | .02 | 20.00 | 15.00 |
| 2N876 | 15 | 280▲ | .2 | 5.55 | 4.05 |
| 2N877 | 30 | 280▲ | .2 | 6.75 | 5.05 |
| 2N878 | 60 | 280▲ | .2 | 7.50 | 5.90 |
| 2N879 | 100 | 280▲ | .2 | 9.85 | 7.40 |
| 2N880 | 150 | 280▲ | .2 | 14.75 | 10.00 |
| 2N881 | 200 | 280▲ | .2 | 16.95 | 12.75 |
| 2N2679 | 30 | 350■ | .02 | 12.65 | 8.85 |
| 2N2680 | 60 | 350■ | .02 | 16.95 | 11.90 |
| 2N2681 | 100 | 350■ | .02 | 25.25 | 17.85 |
| 2N2682 | 200 | 350■ | .02 | 40.50 | 28.85 |
| 2N2683 | 30 | 280■ | .02 | 8.45 | 5.90 |
| 2N2684 | 60 | 280■ | .02 | 11.25 | 7.90 |
| 2N2685 | 100 | 280■ | .02 | 16.90 | 11.85 |
| 2N2686 | 200 | 280■ | .02 | 27.00 | 18.90 |
| 2N2687 | 30 | 280■ | .2 | 4.50 | 3.15 |
| 2N2688 | 60 | 280■ | .2 | 7.05 | 4.95 |
| 2N2689 | 100 | 280■ | .2 | 11.25 | 7.90 |
| 2N2690 | 200 | 280■ | .2 | 18.00 | 12.60 |
| 2N3001 | 30‡ | 350■ | .02I | 15.00 | 10.00 |
| 2N3002 | 60‡ | 350■ | .02I | 19.80 | 13.20 |
| 2N3003 | 100‡ | 350■ | .02I | 29.32 | 19.55 |
| 2N3004 | 200‡ | 350■ | .02I | 42.60 | 28.40 |
| 2N3005 | 30‡ | 350■ | .2I | 10.50 | 7.00 |
| 2N3006 | 60‡ | 350■ | .2I | 13.20 | 8.80 |
| 2N3007 | 100‡ | 350■ | .2I | 17.75 | 11.85 |
| 2N3008 | 200‡ | 350■ | .2I | 28.35 | 18.90 |

*And min. forward breakover volts. †DC at 100° C, amb. ‡Cur. to fire at +25° C. §With 1K ohm bias. #100 ohms, RL. •Amps at 85° C case max. ▲At 25° C, amb. ■At 55° C, amb. I12 ohms, RL. ‡Bias RGK, 1K ohm for forward blocking only.

### MIL LOW CURRENT TYPES

| Transitron Type | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 |
|---|---|---|
| USN2N1870A | $14.00 | $ 9.00 |
| USN2N1871A | 15.50 | 10.00 |
| USN2N1872A | 18.50 | 12.00 |
| USN2N1874A | 24.50 | 16.50 |

### COMMERCIAL TYPES (FIG. G)

| Transitron Type | Min. Fwd. Bkdn. Volts | Max. Fwd. DC, Amps† | Max. Gate Cur., Ma‡ | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 |
|---|---|---|---|---|---|
| TCR35C | 30* | 1.0 | 3.0 | $1.40 | $0.95 |
| TCR65C | 60* | 1.0 | 3.0 | 1.50 | 1.00 |
| TCR105C | 100* | 1.0 | 3.0 | 1.70 | 1.15 |
| TCR205C | 200* | 1.0 | 3.0 | 1.90 | 1.30 |

*At +125° C; negative gate bias 0.5 v. †At +80° C amb. ‡To fire at +25° C.

### COMMERCIAL TYPES (FIG. H)

| Transitron Type | Min. Fwd. Bkdn. Volts | Max. Fwd. Cur., Ma | Max. Gate Cur., μa* | Net Each, Lots of 1-99 | Net Each, Lots of 100-999 |
|---|---|---|---|---|---|
| TSW30C | 30† | 200‡ | 400 | $2.00 | $1.40 |
| TSW60C | 60† | 200‡ | 400 | 2.15 | 1.55 |
| TSW100C | 100† | 200‡ | 400 | 2.30 | 1.70 |
| TSW200C | 200† | 200‡ | 400 | 3.10 | 2.30 |

*To fire at +25° C. †Also min. PRV. ‡Avg. at +75° C amb.

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## SWITCHES

### MEDIUM POWER BISWITCHES (FIG. AA)

Stud mounted (suffix S) units Fig. BB.

| Transitron Type | Fwd., Rev. Brkover V., Min.-Max. | Max. Cur., Amps* | Net Each 1-99 | Net Each 100-999 |
|---|---|---|---|---|
| TBS20A | 200–400 | 5 | $5.00 | $3.30 |
| TBS20B | 200–400 | 3 | 4.30 | 2.80 |
| TBS30A | 400–600 | 5 | 6.25 | 4.00 |
| TBS30B | 400–600 | 3 | 5.30 | 3.50 |
| TBS30C | 400–600 | 1 | 4.40 | 3.00 |
| TBS20AS | 200–400 | 5 | 5.20 | 3.50 |
| TBS20BS | 200–400 | 3 | 4.50 | 3.00 |
| TBS30AS | 400–600 | 5 | 6.45 | 4.20 |
| TBS30BS | 400–600 | 3 | 5.50 | 3.70 |
| TBS30CS | 400–600 | 1 | 4.60 | 3.20 |

*At 100° C.

### HIGH POWER BISWITCHES (FIG. CC)

| Transitron Type | Fwd., Rev. Brkover V., Min.-Max. | Max. Cur., Amps* | Net Each 1-99 | Net Each 100-999 |
|---|---|---|---|---|
| TBS40AS | 200–400 | 20 | $9.25 | $6.50 |
| TBS40BS | 200–400 | 15 | 8.00 | 5.75 |
| TBS40CS | 200–400 | 10 | 4.00 | 3.50 |

*At 100° C.

### TRIGGER DIODE (FIG. N-1)

| Transitron Type | $V_{BO}$ Voltage Breakover | $V_{BO}$ Voltage Symmetry | Min. Breakback Δ V. | Net Each 1-99 | Net Each 100-999 |
|---|---|---|---|---|---|
| ER900 | 32(±4) | 5 | 6 v. | $1.75 | $1.20 |

### TRANSWITCHES (FIG. H)

Max. gate current to switch on, 1.0 ma except TSW30 (1.5 ma). TSW units are planar commercial types.

| Transitron Type | Min. PRV Volts* | Max. Fwd., Ma | Max. Gate Cur.‡ | Net Each 1-99 | Net Each 100-999 |
|---|---|---|---|---|---|
| 2N764 | 30 | 200 | 40 | $4.50 | $3.15 |
| 2N765 | 60 | 200 | 40 | 4.90 | 3.45 |
| 2N766 | 100 | 200 | 40 | 5.20 | 3.85 |
| 2N767 | 200 | 200 | 40 | 7.00 | 5.20 |
| 2N1686† | 30 | 1 amp | 100 | 4.90 | 3.40 |
| 2N1687† | 60 | 1 amp | 100 | 5.20 | 3.75 |
| 2N1688† | 100 | 1 amp | 100 | 5.55 | 4.05 |
| 2N1689† | 200 | 1 amp | 100 | 7.15 | 5.40 |
| TSW30 | 30 | 30 | 8 | 3.30 | 2.30 |
| TSW31 | 30 | 200 | 10 | 3.00 | 2.10 |
| TSW61 | 60 | 200 | 10 | 3.25 | 2.30 |
| TSW101 | 100 | 200 | 10 | 3.45 | 2.55 |
| TSW201 | 200 | 200 | 10 | 4.65 | 3.45 |

*Also min. fwd. breakdown. †Fig. G. ‡To switch off, ma.

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