

Silicon NPN Transistors

| Type | Con- struction | P _c Max. (mW) | Typical f _T or *f _{T1} † fab (MHz) | Absolute Max. Ratings | | | | Typical h _{FE} at (mA) (or *h _{FE}) | Max I _{CBO} at V _{CB} | | Application | Base Ref. |
|----------------------------------|-------------------|--------------------------------|--|-------------------------|-------------------------|-------------------------|------------------------|--|--|-----|-----------------------|--------------|
| | | | | V _{CB0} (V) | V _{CE0} (V) | V _{EB0} (V) | I _C (mA) | | μA | V | | |
| MULLARD (Continued) | | | | | | | | | | | | |
| <i>Current Types (Continued)</i> | | | | | | | | | | | | |
| BU126 | D | 30W | 8 | 750 | 300 | — | 6A | 15‡ at 1A | — | — | Colour TV switching | 1 |
| BU133 | D | 30W | 8 | 750 | 250 | — | 6A | 15‡ at 1A | — | — | | 1 |
| BDY93 | D | 30W | 12 | 750 | 350 | — | 6A | 15‡ at 1A | — | — | Switching and control | 1 |
| BDY94 | D | 30W | 12 | 750 | 300 | — | 6A | 15‡ at 1A | — | — | | 1 |
| BDY95 | D | 30W | 12 | 600 | 250 | — | 6A | 15‡ at 1A | — | — | General purpose | 51 |
| BD433 | E | 36W | 3 | 22 | 22 | — | 7A | 50‡ at 2A | — | — | | 51 |
| BD435 | E | 36W | 3 | 32 | 32 | — | 7A | 50‡ at 2A | — | — | Switching and control | 1 |
| BD437 | E | 36W | 3 | 45 | 45 | — | 7A | 40‡ at 2A | — | — | | 51 |
| BDY96 | D | 40W | 10 | 750 | 350 | — | 15A | 15‡ at 2A | — | — | General purpose | 1 |
| BDY97 | D | 40W | 10 | 750 | 300 | — | 15A | 15‡ at 2A | — | — | | 1 |
| BDY98 | D | 40W | 10 | 600 | 250 | — | 15A | 15‡ at 2A | — | — | Switching and control | 1 |
| BDY90 | D | 40W | 70 | 120 | 100 | — | 15A | 30‡ at 5A | — | — | | 1 |
| BDY91 | D | 40W | 70 | 100 | 80 | — | 15A | 30‡ at 5A | — | — | General purpose | 1 |
| BDY92 | D | 40W | 70 | 80 | 60 | — | 15A | 30‡ at 5A | — | — | | 1 |
| BLW64 | PE | 40W | 900 | 60 | 30 | — | 12A | 25‡ at 1A | — | — | R.F. | 61 |
| BUY86 | PE | 50W | 100 | 200 | 100 | — | 10A | 50‡ at 1A | — | — | Switching | 1 |
| BUY87 | PE | 50W | 100 | 300 | 150 | — | 7A | 30‡ at 2A | — | — | | 1 |
| BLX69 | PE | 50W | 1,000 | 36 | 18 | — | 10A | 30 at 1A | — | — | R.F. | 61 |
| BLX94 | PE | 50W | 1,000 | 65 | 33 | — | 6A | 15‡ at 1A | — | — | | 61 |
| BDX77 | E | 55W | 3 | 80 | 80 | — | 12A | 30‡ at 2A | — | — | General purpose | 52 |
| BD201 | E | 60W | 3 | 60 | 45 | — | 12A | 30‡ at 3A | — | — | | 52 |
| BD203 | E | 60W | 3 | 60 | 60 | — | 12A | 30‡ at 2A | — | — | R.F. | 61 |
| BLX13 | PE | 70W | 500 | 65 | 36 | — | 9A | 10‡ at 1A | — | — | | 61 |
| BLY93A | PE | 70W | 500 | 65 | 36 | — | 10A | 10‡ at 1A | — | — | General purpose | 61 |
| BLY89A | PE | 70W | 650 | 36 | 18 | — | 10A | 10‡ at 1A | — | — | | 61 |
| BD181 | D | 78W | — | 55 | 45 | — | 15A | 20‡ at 3A | — | — | R.F. | 61 |
| BLX95 | PE | 87.5W | 1,000 | 65 | 33 | — | 12A | 15‡ at 1.4A | — | — | | 62 |
| BLX14 | PE | 88W | 250 | 85 | 36 | — | 12A | 15‡ at 1.4A | — | — | General purpose | 1 |
| 2N4347 | D | 100W | 1 | 140 | 120 | — | 10A | 20‡ at 4A | — | — | | 61 |
| BLW60 | PE | 103W | 550 | 36 | 18 | — | 20A | 50 at 1A | — | — | R.F. | 1 |
| 2N3055 | D | 115W | 0.8 | 100 | — | 7 | 15A | 45 at 4A | — | — | | 1 |
| BDY20 | D | 115W | 1 | 100 | 60 | 7 | 15A | 45 at 4A | 5mA | 100 | A.F. amplifiers | 1 |
| BDY38 | D | 115W | 1 | 50 | 40 | 7 | 6A | 30 at 2A | 1mA | 50 | | 1 |
| BD182 | D | 117W | — | 70 | 60 | — | 15A | 20‡ at 4A | — | — | General purpose | 1 |
| BD183 | D | 117W | — | 85 | 80 | — | 15A | 20‡ at 3A | — | — | | 1 |
| BD184 | D | 117W | — | 95 | 90 | — | 15A | 20‡ at 4A | — | — | R.F. | 62 |
| 2N3442 | D | 117W | 1 | 160 | 140 | — | 15A | 20‡ at 3A | — | — | | 62 |
| BLY94 | PE | 130W | 500 | 65 | 36 | — | 12A | 10‡ at 1A | — | — | R.F. | 62 |
| BLY90 | PE | 130W | 550 | 36 | 18 | — | 20A | 10‡ at 1A | — | — | | 62 |
| BLX15 | PE | 195W | 275 | 110 | 55 | — | 20A | 10‡ at 1.4A | — | — | 62 | |

‡ Minimum value

NEWMARKET

Current Types

| | | | | | | | | | | | | |
|----------|---|-----|-----|----|----|-----|-----|------------|------|----|---------------------|---|
| NKT10419 | — | 300 | 100 | 25 | 25 | 5 | 10 | 200 at 0.1 | 0.01 | 10 | A.F. amplifiers | 2 |
| NKT10519 | — | 300 | 100 | 25 | 25 | 5 | 10 | 400 at 0.1 | 0.01 | 10 | | 2 |
| BSY95A | — | 300 | 200 | 20 | 15 | 5 | 200 | 125 at 10 | 0.05 | 10 | R.F. switching | 2 |
| BC107 | — | 300 | 250 | 50 | 45 | 5 | 100 | 310 at 2 | — | — | A.F. amplifiers | 2 |
| BC108 | — | 300 | 250 | 30 | 20 | 5 | 100 | 310 at 2 | — | — | | 2 |
| BC109 | — | 300 | 250 | 30 | 20 | 5 | 100 | 570 at 2 | — | — | A.F. pre-amplifiers | 2 |
| 2N2368 | — | 360 | — | 40 | 15 | 4.5 | 500 | 40 at 10 | 0.4 | 20 | | 2 |
| 2N2369 | — | 360 | — | 40 | 15 | 4.5 | 500 | 80 at 10 | 0.4 | 20 | R.F. switching | 2 |
| 2N2369A | — | 360 | — | 40 | 15 | 4.5 | 500 | 80 at 10 | 0.4 | 20 | | 2 |
| 2N2483 | — | 360 | — | 60 | 60 | 6 | 50 | 265 at 1 | — | — | A.F. pre-amplifiers | 2 |
| 2N2484 | — | 360 | — | 60 | 60 | 6 | 50 | 525 at 1 | 0.01 | 45 | | 2 |
| NKT13329 | — | 360 | 300 | 30 | 20 | 4 | 500 | 200 at 10 | 0.01 | 10 | R.F. switching | 2 |
| NKT13429 | — | 360 | 300 | 30 | 15 | 5 | 500 | 200 at 10 | 0.01 | 10 | | 2 |
| BSX19 | — | 360 | 400 | 40 | 15 | 4.5 | 500 | 40 at 10 | 0.4 | 20 | R.F. switching | 2 |
| BSX20 | — | 360 | 500 | 40 | 15 | 4.5 | 500 | 80 at 10 | 0.4 | 20 | | 2 |

Continued

Silicon NPN Transistors

| Type | Con- struction | P _C Max. (mW) | Typical f _T or *f ₁ † fab (MHz) | Absolute Max. Ratings | | | | Typical h _{FE} at (mA) (or *h _{fe}) | Max I _{CBO} at V _{CB} | | Application | Base Ref. |
|-----------------|-------------------|--------------------------------|---|-------------------------|-------------------------|-------------------------|------------------------|--|--|-----|---------------------------------|-------------------------------|
| | | | | V _{CB0} (V) | V _{CEO} (V) | V _{EB0} (V) | I _C (mA) | | μA | V | | |
| BFY72 | — | — | — | — | 28 | — | 500 | 90 at 500 | — | — | General purpose switching | 2 |
| BSS15 2N5320 | } | — | — | — | 75 | — | 2A | 80 at 500 | — | — | | |
| BSS16 2N5321 | | | | | | | | | | | } | |
| BSS26 | — | — | — | — | 40 | — | 1A | 45 at 500 | — | — | | Fast switching |
| BSV59 | — | — | — | — | 30 | — | 500 | 50 at 500 | — | — | | |
| BSV77 | — | — | — | — | 40 | — | 1A | 50 at 500 | — | — | | |
| BSV89 | — | — | — | — | 10 | — | 100 | 45 at 100 | — | — | | |
| BSV90 | — | — | — | — | 13.5 | — | 100 | 55 at 100 | — | — | | |
| BSV91 | — | — | — | — | 15 | — | 100 | 45 at 100 | — | — | | |
| BSV92 | — | — | — | — | 15 | — | 100 | 60 at 100 | — | — | | |
| BSV95 | — | — | — | — | 50 | — | 800 | 50 at 500 | — | — | | |
| BSX12 | — | — | — | — | 12 | — | 1A | 60 at 300 | — | — | | Fast switching |
| BSX26 | — | — | — | — | 15 | — | 300 | 55 at 100 | — | — | | |
| BSX27 | — | — | — | — | 6 | — | 30 | 80 at 10 | — | — | | |
| BSX28 | — | — | — | — | 12 | — | 100 | 50 at 100 | — | — | | |
| BSX30 | — | — | — | — | 30 | — | 300 | 63 at 150 | — | — | | |
| BSX32 | — | — | — | — | 40 | — | 500 | 60 at 1A | — | — | | |
| BSX33 | — | — | — | — | 55 | — | 500 | 80 at 150 | — | — | | General purpose switching |
| BSX39 | — | — | — | — | 20 | — | 300 | 40 at 300 | — | — | | |
| BSX87 | — | — | — | — | 15 | — | 500 | 55 at 10 | — | — | | Fast switching |
| BSX87A | — | — | — | — | 15 | — | 500 | 65 at 30 | — | — | | |
| BSX88 | — | — | — | — | 15 | — | 100 | 45 at 10 | — | — | | General purpose switching |
| BSX88A | — | — | — | — | 20 | — | 100 | 55 at 100 | — | — | | |
| BSX93 | — | — | — | — | 15 | — | 200 | 80 at 10 | — | — | | Fast switching |
| 2N760A | — | — | — | — | 60 | — | — | 76‡ at 1 | — | — | | |
| 2N929 | — | — | — | — | 45 | — | — | 350‡ at 10 | — | — | | |
| 2N930 | — | — | — | — | 45 | — | — | 600‡ at 10 | — | — | Low level amplifiers | |
| 2N2483 | — | — | — | — | 60 | — | — | 175‡ at 1 | — | — | | |
| 2N2484 | — | — | — | — | 60 | — | — | 250‡ at 1 | — | — | | |
| 2N2586 | — | — | — | — | 45 | — | — | 600‡ at 1 | — | — | | |
| 2N3117 | — | — | — | — | 60 | — | — | 400‡ at 1 | — | — | | |
| BFX69 | — | — | 80 | — | 30 | — | 500 | 80 at 150 | — | — | | General purpose amplifiers |
| BFX69A | — | — | 84 | — | 40 | — | 500 | 90 at 150 | — | — | | |
| BFR18 | — | — | 90 | — | 55 | — | 500 | 90 at 150 | — | — | | |
| BFS89 | — | — | 90 | — | 300 | — | 100 | 80 at 50 | 0.05 | 300 | High voltage R.F. amps./osc. | |
| BF252 | — | — | 100 | — | 30 | 4 | — | 30 at 2 | — | — | | Low level, low noise amps. |
| BFR16 | — | — | 100 | — | 60 | — | 10 | 350 at 1 | — | — | | |
| BFR17 | — | — | 100 | — | 60 | — | 10 | 530 at 1 | — | — | | |
| BFR19 | — | — | 100 | — | 35 | — | 500 | 80 at 150 | — | — | General purpose amplifiers | |
| BFX68 | — | — | 100 | — | 50 | — | 500 | 130 at 150 | — | — | | |
| BFY50 | — | — | 100 | — | 35 | — | 1A | 55 at 150 | — | — | | |
| BFY76 | — | — | 100 | — | 60 | — | 5 | 190 at 1 | — | — | | Low noise amplifiers |
| 2N3053 | — | — | 100 | — | 50 | — | — | 150 at 150 | — | — | High speed switching | |
| BFY51 | — | — | 110 | — | 30 | — | 1A | 70 at 150 | — | — | | General purpose amplifiers |
| BFY52 | — | — | 120 | — | 20 | — | 1A | 130 at 150 | — | — | | |
| 2N3444 | — | — | 150 | — | 50 | — | — | 40 at 500 | — | — | | High speed switching |
| BCY58 | — | — | 200 | — | 32 | — | 100 | 520 at 10 | — | — | Low level, low noise amps. | |
| BCY59 | — | — | 200 | — | 45 | — | 100 | 520 at 10 | — | — | | |
| BFX94 | — | — | 250 | — | 30 | — | — | 75 at 150 | 0.01 | 30 | | |
| BFX95 | — | — | 250 | — | 30 | — | — | 220 at 150 | 0.01 | 30 | | |
| BFX96 | — | — | 250 | — | 30 | — | — | 75 at 150 | 0.01 | 30 | | |
| BFX97 | — | — | 250 | — | 30 | — | — | 220 at 150 | 0.01 | 30 | | H.F. amplifiers |
| BFY74 | — | — | 360 | — | 45 | — | — | 75 at 10 | 0.01 | 45 | | |
| BFY75 | — | — | 360 | — | 45 | — | — | 114 at 10 | 0.01 | 45 | | |
| BFX17 | — | — | 400 | — | 40 | — | — | 50 at 500 | — | — | | |
| BFR97 2N3866 | } | — | 500 | — | 30 | — | — | 100 at 50 | — | — | | |

Continued

Silicon NPN Transistors

| Type | Con- struction | P _c Max. (mW) | Typical f _T or *f _T † fab (MHz) | Absolute Max. Ratings | | | | Typical h _{FE} at (mA) (or *h _{fe}) | Max I _{CBO} at V _{CB} | | Application | Base Ref. | |
|----------------------------------|-------------------|--------------------------------|---|-------------------------|-------------------------|-------------------------|------------------------|--|--|----|-------------------------------|-----------------|----|
| | | | | V _{CB0} (V) | V _{CE0} (V) | V _{EB0} (V) | I _C (mA) | | μA | V | | | |
| TEXAS (Continued) | | | | | | | | | | | | | |
| <i>Current Types (Continued)</i> | | | | | | | | | | | | | |
| 2N2865 | PE | 200 | 600 | 25 | 3 | 3 | 50 | 20‡ at 4 | — | — | H.F. amplifiers | 2 | |
| TIS84 | P | 250 | — | 40 | 30 | 4 | 50 | 30‡ at 4 | 0.05 | 10 | Tuner R.F. amplifiers | 24 | |
| TIS85 | P | 250 | — | 40 | 30 | 4 | 50 | 25‡ at 4 | 0.05 | 10 | I.F. amplifiers | 24 | |
| 2N3707 | P | 250 | — | 30 | 30 | 6 | 30 | 250 at 0.1 | 0.1 | 20 | Low noise amplifiers | 24 | |
| 2N3708 | P | 250 | — | 30 | 30 | 6 | 30 | 358 at 1 | 0.1 | 20 | General purpose | 24 | |
| 2N3709 | P | 250 | — | 30 | 30 | 6 | 30 | 105 at 1 | 0.1 | 20 | | 24 | |
| 2N3710 | P | 250 | — | 30 | 30 | 6 | 30 | 210 at 1 | 0.1 | 20 | | 24 | |
| 2N3711 | P | 250 | — | 30 | 30 | 6 | 30 | 420 at 1 | 0.1 | 20 | | 24 | |
| BF595 | — | 250 | 200 | 30 | 20 | — | 30 | 80 at 1 | — | — | | I.F. amplifiers | 24 |
| 2N3825 | PE | 250 | 200 | 30 | 15 | 4 | 100 | 20‡ at 2 | 0.1 | 15 | | A.M. receivers | 24 |
| BF594 | — | 250 | 260 | 30 | 20 | — | 30 | 142 at 1 | — | — | I.F. amplifiers | 24 | |
| TIS60 | PE | 300 | — | 40 | 25 | 5 | 400 | 160 at 50 | 0.1 | 20 | General purpose | 24 | |
| TIS60M | PE | 300 | — | 40 | 25 | 5 | 400 | 160 at 50 | 0.1 | 20 | | 24 | |
| 2N4010 | P | 300 | — | 60 | 60 | 10 | 50 | 500‡ at 1 | 0.01 | 45 | | 2 | |
| 2N2432 | PE | 300 | 20 | 30 | 30 | 15 | 100 | 50‡ at 1 | — | — | Choppers | 2 | |
| 2N929 | P | 300 | 30 | 45 | 45 | 5 | 30 | 40‡ at 0.01 | — | — | Low level, low noise amps. | 2 | |
| 2N930 | P | 300 | 30 | 45 | 45 | 5 | 30 | 100‡ at 0.01 | — | — | | 2 | |
| 2S501 | P | 300 | 30 | 25 | 25 | 5 | 30 | 40‡ at 0.01 | — | — | | 2 | |
| 2S502 | P | 300 | 30 | 25 | 25 | 5 | 30 | 100‡ at 0.01 | — | — | | 2 | |
| 2S503 | P | 300 | 30 | 25 | 25 | 5 | 30 | 180‡ at 0.01 | — | — | | 2 | |
| BC182 | PE | 300 | 150 | 60 | 50 | 5 | 200 | 290 at 2 | 0.015 | 50 | | 2 | |
| BC183 | PE | 300 | 150 | 45 | 30 | 5 | 200 | 475 at 2 | 0.015 | 30 | | 2 | |
| BC184 | PE | 300 | 150 | 45 | 30 | 5 | 200 | 250‡ at 2 | 0.015 | 30 | | 2 | |
| BC107 | PE | 300 | 225 | 45 | 45 | 5 | 100 | 310 at 2 | 0.015 | 45 | 2 | | |
| BC108 | PE | 300 | 225 | 20 | 20 | 5 | 100 | 310 at 2 | 0.015 | 20 | 2 | | |
| BC109 | PE | 300 | 225 | 20 | 20 | 5 | 100 | 570 at 2 | 0.015 | 20 | 2 | | |
| 2N3117 | P | 360 | — | 60 | 60 | 6 | 50 | 400‡ at 1 | 0.01 | 45 | Low level amplifiers | 2 | |
| 2N2483 | P | 360 | — | 60 | 60 | 6 | 50 | 175‡ at 1 | 0.01 | 45 | Low level, low noise amps. | 2 | |
| 2N2484 | P | 360 | — | 60 | 60 | 6 | 50 | 250‡ at 1 | 0.01 | 45 | 2 | | |
| 2N5399 | PE | 360 | — | 25 | 15 | 2 | 100 | 60 at 15 | 0.01 | 15 | V.H.F./U.H.F. amplifiers | 2 | |
| BF237 | PE | 360 | 80 | 45 | 30 | 4 | 30 | 30‡ at 1 | 0.1 | 20 | General purpose | 24 | |
| BF238 | PE | 360 | 80 | 45 | 30 | 4 | 30 | 70‡ at 1 | 0.1 | 20 | | 24 | |
| 2N3704 | PE | 360 | 100 | 50 | 30 | 5 | 800 | 200 at 50 | 0.1 | 20 | Audio amplifiers | 24 | |
| 2N3705 | PE | 360 | 100 | 50 | 30 | 5 | 800 | 100 at 50 | 0.1 | 20 | | 24 | |
| 2N3706 | PE | 360 | 100 | 40 | 20 | 5 | 800 | 315 at 50 | 0.1 | 20 | | 24 | |
| BF596 | — | 360 | 400 | 40 | 30 | — | 30 | 26‡ at 4 | — | — | Video I.F. amplifiers | 24 | |
| BF597 | — | 360 | 550 | 40 | 25 | — | 30 | 38‡ at 7 | — | — | | 24 | |
| TIS86 | PE | 400 | — | 30 | 30 | 4 | 50 | 120 at 4 | 0.1 | 15 | Mixer | 24 | |
| TIS87 | PE | 400 | — | 45 | 45 | 4 | 50 | 90 at 12 | 0.1 | 15 | I.F. amplifier | 24 | |
| 2N717 | DDP | 400 | 30 | 60 | 40 | 5 | — | 40 at 150 | 1 | 30 | Amps./osc. | 2 | |
| 2N718 | DDP | 400 | 30 | 60 | 40 | 5 | — | 80 at 150 | 1 | 30 | | 2 | |
| 2N719 | DDP | 400 | 30 | 120 | 80 | 5 | — | 40 at 150 | 2 | 60 | | 2 | |
| 2N720 | DDP | 400 | 30 | 120 | 80 | 5 | — | 80 at 150 | 2 | 60 | | 2 | |
| 2S731 | P | 400 | 30 | 30 | 30 | 3 | 50 | 20*‡ at 5 | — | — | H.F. amplifiers | 2 | |
| 2S732 | P | 400 | 30 | 30 | 30 | 3 | 50 | 40*‡ at 5 | — | — | | 2 | |
| 2S733 | P | 400 | 30 | 30 | 30 | 3 | 50 | 80*‡ at 5 | — | — | | 2 | |
| 2S102 | P | 400 | 150 | 60 | 60 | 4.5 | 50 | 20*‡ at 5 | — | — | | 2 | |
| 2S103 | P | 400 | 150 | 60 | 60 | 4.5 | 50 | 40*‡ at 5 | — | — | | 2 | |
| 2S104 | P | 400 | 150 | 60 | 60 | 4.5 | 50 | 80*‡ at 5 | — | — | | 2 | |
| BFW31 | PE | 500 | — | 50 | 30 | 5 | 700 | 270* at 10 | 0.5 | 30 | General purpose | 2 | |
| 2N720A | DDP | 500 | 30 | 120 | 100 | 7 | — | 80 at 150 | 0.01 | 90 | Amps./osc. | 2 | |
| 2N731 | DDP | 500 | 30 | 60 | 40 | 5 | 1A | 80 at 150 | 1 | 30 | | 2 | |
| 2N870 | DDP | 500 | 30 | 100 | 80 | 7 | — | 80 at 150 | 0.01 | 75 | | 2 | |
| 2N871 | DDP | 500 | 30 | 100 | 80 | 7 | — | 200 at 150 | 0.01 | 75 | | 2 | |
| 2N956 | DDP | 500 | 30 | 75 | 50 | 7 | — | 200 at 150 | 0.01 | 60 | 2 | | |
| 2N2220 | PE | 500 | 250 | 60 | 30 | 5 | 800 | 20‡ at 150 | — | — | H.F. medium power | 2 | |
| 2N2221A | PE | 500 | 250 | 60 | 30 | 5 | 800 | 40‡ at 150 | — | — | | 2 | |
| 2N2222 | PE | 500 | 250 | 60 | 30 | 5 | 800 | 100‡ at 150 | — | — | | 2 | |
| 2N2539 | PE | 500 | 250 | 60 | 30 | 5 | 800 | 50*‡ at 150 | — | — | | 2 | |
| 2N2540 | PE | 500 | 250 | 60 | 30 | 5 | 800 | 100*‡ at 150 | — | — | | 2 | |

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