# NPN Silicon Transistors

**NPN Silicon Epitaxial Planar Transistors** ($I_C$ = 1 A) in TO-39 (≈TO-5) metal case

| Type | Maximum ratings | | | | | | | Characteristics at $T_{amb}$ = 25 °C | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | @ $T_{amb}$ = 25 °C | @ $T_{case}$ = 25 °C ($T_{case}$ = 100 °C) | | | | |
| | $V_{CB0}$ V | $V_{CE0}$ V | $V_{EB0}$ V | $I_C$ A | $P_{tot}$ W | $P_{tot}$ W | $T_j$ °C | $\Theta_{case}$ ($\Theta_{amb}$) °C/W | $I_{CB0}$ nA ($I_{CE0}$ μA) | @ $V_{CB}$ V ($V_{CE}$ V) |
| **BSY 81** | 40 | 18 | 5 | 1 | 0,9 | 5 | 200 | < 35 (< 194) | < 100 | 30 |
| **BSY 82** | 40 | 18 | 5 | 1 | 0,9 | 5 | 200 | < 35 (< 194) | < 100 | 30 |
| **BSY 83** ≈ BSY 40, 2 N 2297 | 80 | 35 | 7 | 1 | 0,9 | 5 | 200 | < 35 (< 194) | < 10 | 60 |
| **BSY 84** | 80 | 35 | 7 | 1 | 0,9 | 5 | 200 | < 35 (< 194) | < 10 | 60 |
| **BSY 85** ≈ 2 N 2193 A | 120 | 64 | 7 | 1 | 0,9 | 5 | 200 | < 35 (< 194) | < 10 | 90 |
| **BSY 86** | 120 | 64 | 7 | 1 | 0,9 | 5 | 200 | < 35 (< 194) | < 10 | 90 |
| **BFY 50** | 80 | 35 | 6 | 1 | 0,8 | (2,8) | 200 | < 35 (< 220) | < 50 | 60 |
| **BFY 51** | 60 | 30 | 6 | 1 | 0,8 | (2,8) | 200 | < 35 (< 220) | < 50 | 40 |
| **BFY 52** | 40 | 20 | 6 | 1 | 0,8 | (2,8) | 200 | < 35 (< 220) | < 50 | 30 |

| Type | Characteristics at $T_{amb}$ = 25 °C | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | @ $V_{CE}$ = 10 V $I_C$ = 0,1 mA | $I_C$ = 10 mA ($V_{CE}$ = 6 V) | $I_C$ = 0,15 A ($V_{CE}$ = 6 V) | $I_C$ = 0,5 A ($V_{CE}$ = 2 V) | $I_C$ = 1 A ($V_{CE}$ = 1 V) | @ $I_C$ = 1 A $I_B$ = 0,1 A | | | @ $V_{CB0}$ = 10 V (12 V) |
| | $h_{21E}$ | $h_{21E}$ | $h_{21E}$ | $h_{21E}$ | $h_{21E}$ | $V_{CE\,sat}$ V | $f_T$ MHz | @ $V_{CE}/I_C$ V/mA | $C_{22b}$ pF |
| BSY 81 | > 20 | > 35 | 40 . . . 120 | > 30 | > 15 | < 1,2 | 100 | 10/50 | < 15 |
| BSY 82 | > 35 | > 75 | 100 . . . 300 | > 40 | > 20 | < 1,2 | 120 | 10/50 | < 15 |
| BSY 83 | > 20 | > 35 | 40 . . . 120 | > 30 | > 15 | < 1 | 100 | 10/50 | < 15 |
| BSY 84 | > 35 | > 75 | 100 . . . 300 | > 40 | > 20 | < 1 | 120 | 10/50 | < 15 |
| BSY 85 | > 20 | > 35 | 40 . . . 120 | > 30 | > 15 | < 1 | 110 | 10/50 | < 15 |
| BSY 86 | > 35 | > 75 | 100 . . . 300 | > 40 | > 20 | < 1 | 130 | 10/50 | < 15 |
| BFY 50 | — | (> 20) | (> 30) | — | (> 15) | < 1 | 100 | 6/50 | (7) |
| BFY 51 | — | (> 30) | (> 40) | — | (> 15) | < 1,6 | 110 | 6/50 | (7) |
| BFY 52 | — | (> 30) | (> 60) | — | (> 15) | < 1,6 | 120 | 6/50 | (7) |

**NPN Silicon Epitaxial Planar Transistors** in TO-39 (≈ TO-5) in metal case, for video output stages

| Type | Maximum ratings | | | | | | Characteristics at $T_{amb}$ = 25 °C | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | @ $R_{BE}$ = 1 kΩ | | | @ $T_{case}$ = 25 °C (100 °C) | | @ $V_{CE}$ = 10 V $I_C$ = 30 mA | @ $I_C$ = 30 mA $I_B$ = 6 mA | | | | | | |
| | $V_{CB0}$ V | $V_{CER}$ V ($V_{CE0}$ V) | $V_{EB0}$ V | $I_C$ mA | $P_{tot}$ W | $T_j$ °C | $h_{21E}$ | $V_{CE\,sat}$ V | $I_{CB0}$ nA | @ $V_{CB}$ V | $f_T$ MHz | @ $V_{CE}/I_C$ V/mA | $C_{22b}$ pF | @ $V_{CB0}$ V |
| **BF 117** | 140 | (140) | 5 | 100 | (1,27) | 175 | > 25 | < 1 | < 10 | 100 | 80 | 10/20 | 2 | 20 |
| **BF 118** | 250 | 250 | 5 | 100 | 5 | 175 | > 25 | < 1 | < 50 | 200 | 110 | 10/30 | 3,5 | 30 |
| **BF 119** | 160 | 160 | 5 | 100 | 5 | 175 | > 25 | < 1 | < 50 | 100 | 110 | 10/30 | 3,5 | 30 |

**NPN Silicon Epitaxial Planar Transistor** in TO-18 metal case. Driver for numerical indicator tubes

| Type | Maximum ratings | | | | | | Characteristics at $T_{amb}$ = 25 °C | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | @ $V_{EB}$ = 1 V | | | @ $T_{amb}$ = 25 °C | | | @ $V_{CE}$ = 1 V $I_C$ = 1 mA | @ $I_C$ = 2 mA $I_B$ = 0,2 mA | @ $V_{CB}$ = 90 V | |
| | $V_{CB0}$ V | $V_{CEV}$ V | $V_{EB0}$ V | $I_C$ mA | $P_{tot}$ mW | $T_j$ °C | $h_{21\,E}$ | $V_{CE\,sat}$ V | $I_{CB0}$ nA | $\Theta_{amb}$ °C/mW |
| **BSY 79** | 120 | 120 | 5 | 30 | 300 | 175 | > 30 | 0,3 (< 0,5) | < 50 | < 0,5 |

Red = New Type