

# 2SB1502

## Silicon PNP epitaxial planar type Darlington

For power amplification

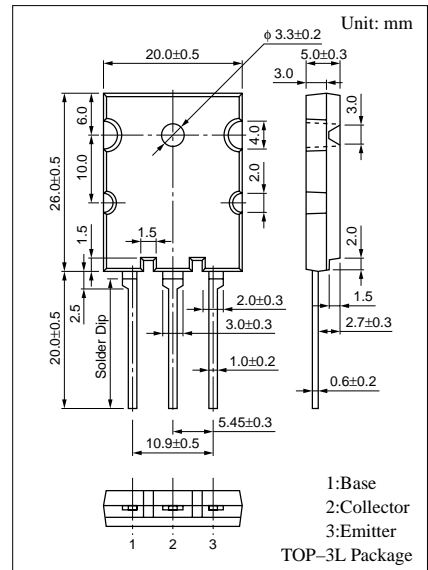
Complementary to 2SD2275

### Features

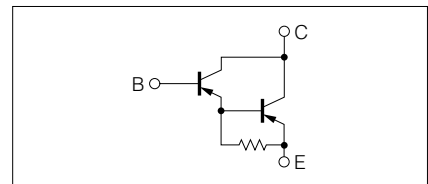
- Optimum for 55W HiFi output
- High forward current transfer ratio  $h_{FE}$ : 5000 to 30000
- Low collector to emitter saturation voltage  $V_{CE(sat)}$ : < 2.5V

### Absolute Maximum Ratings ( $T_C=25^\circ\text{C}$ )

| Parameter                    | Symbol    | Rated                  | Unit             |
|------------------------------|-----------|------------------------|------------------|
| Collector to base voltage    | $V_{CBO}$ | -120                   | V                |
| Collector to emitter voltage | $V_{CEO}$ | -100                   | V                |
| Emitter to base voltage      | $V_{EBO}$ | -5                     | V                |
| Peak collector current       | $I_{CP}$  | -8                     | A                |
| Collector current            | $I_C$     | -5                     | A                |
| Collector power dissipation  | $P_C$     | $T_C=25^\circ\text{C}$ | 60               |
|                              |           | $T_a=25^\circ\text{C}$ | 3.5              |
| Junction temperature         | $T_j$     | 150                    | $^\circ\text{C}$ |
| Storage temperature          | $T_{stg}$ | -55 to +150            | $^\circ\text{C}$ |



### Internal Connection



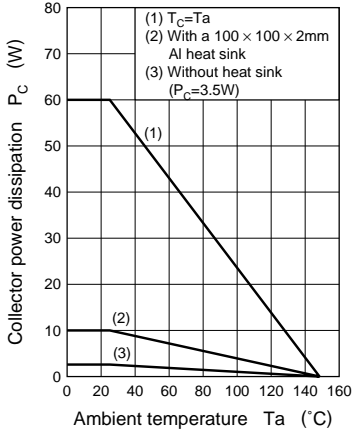
### Electrical Characteristics ( $T_C=25^\circ\text{C}$ )

| Parameter                               | Symbol        | Conditions  | min  | typ | max   | Unit          |
|---|---------------|---|------|-----|-------|---------------|
| Collector cutoff current                | $I_{CBO}$     | $V_{CB} = -120\text{V}, I_E = 0$  |      |     | -100  | $\mu\text{A}$ |
|   | $I_{CEO}$     | $V_{CE} = -100\text{V}, I_B = 0$  |      |     | -100  | $\mu\text{A}$ |
| Emitter cutoff current                  | $I_{EBO}$     | $V_{EB} = -5\text{V}, I_C = 0$  |      |     | -100  | $\mu\text{A}$ |
| Collector to emitter voltage            | $V_{CEO}$     | $I_C = -30\text{mA}, I_B = 0$   | -100 |     |       | V             |
| Forward current transfer ratio          | $h_{FE1}$     | $V_{CE} = -5\text{V}, I_C = -1\text{A}$   | 2000 |     |       |               |
|   | $h_{FE2}^*$   | $V_{CE} = -5\text{V}, I_C = -4\text{A}$   | 5000 |     | 30000 |               |
| Collector to emitter saturation voltage | $V_{CE(sat)}$ | $I_C = -4\text{A}, I_B = -4\text{mA}$   |      |     | -2.5  | V             |
| Base to emitter saturation voltage      | $V_{BE(sat)}$ | $I_C = -4\text{A}, I_B = -4\text{mA}$   |      |     | -3.0  | V             |
| Transition frequency                    | $f_T$         | $V_{CE} = -10\text{V}, I_C = -0.5\text{A}, f = 1\text{MHz}$                         |      | 20  |       | MHz           |
| Turn-on time                            | $t_{on}$      | $I_C = -4\text{A}, I_{B1} = -4\text{mA}, I_{B2} = 4\text{mA}, V_{CC} = -50\text{V}$ |      | 1.0 |       | $\mu\text{s}$ |
| Storage time                            | $t_{stg}$     |   |      | 0.8 |       | $\mu\text{s}$ |
| Fall time                               | $t_f$         |   |      | 1.0 |       | $\mu\text{s}$ |

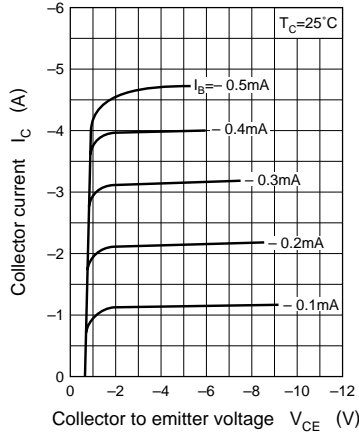
\* $h_{FE2}$  Rank classification

| Rank      | Q             | S             | P             |
|-----------|---------------|---------------|---------------|
| $h_{FE2}$ | 5000 to 15000 | 7000 to 21000 | 8000 to 30000 |

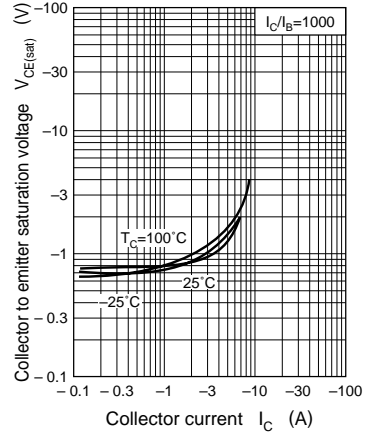
$P_C - T_a$



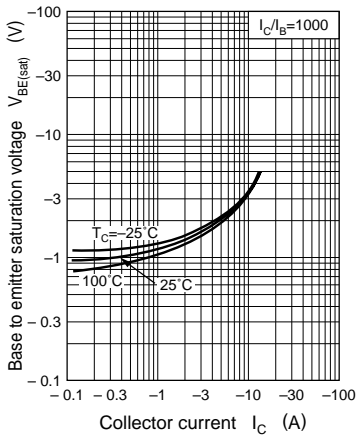
$I_C - V_{CE}$



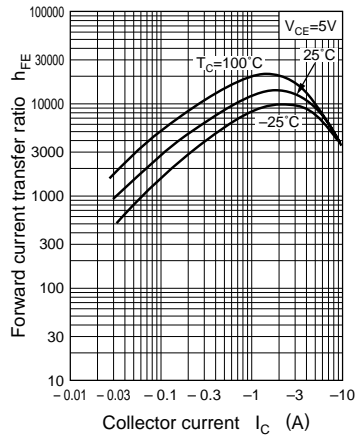
$V_{CE(sat)} - I_C$



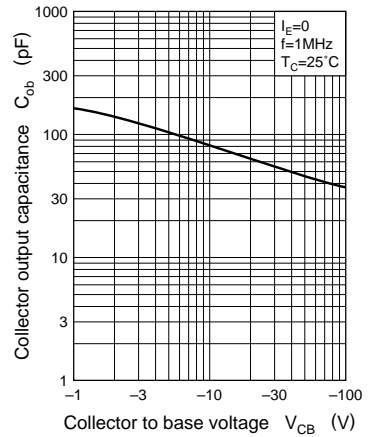
$V_{BE(sat)} - I_C$



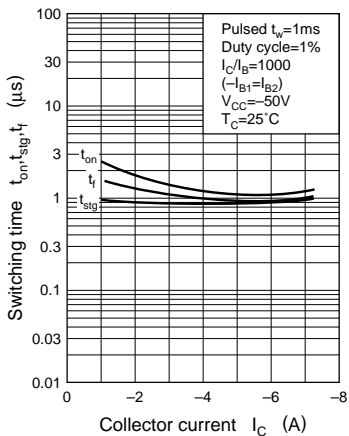
$h_{FE} - I_C$



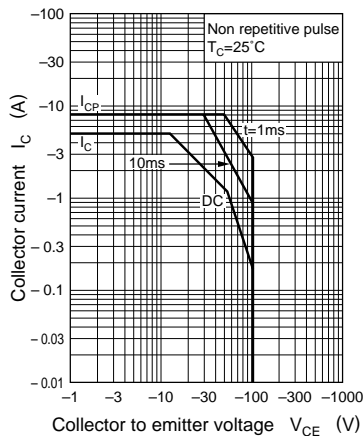
$C_{ob} - V_{CB}$



$t_{on}, t_{stg}, t_f - I_C$



Area of safe operation (ASO)



$$R_{th(t)} - t$$

