

# 2SD1535

## Silicon NPN triple diffusion planar type Darlington

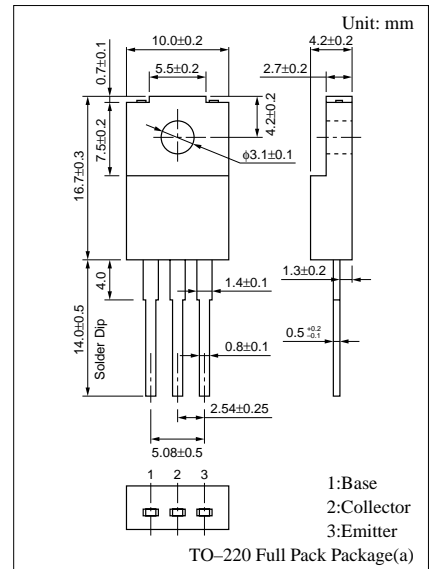
For high power amplification

### Features

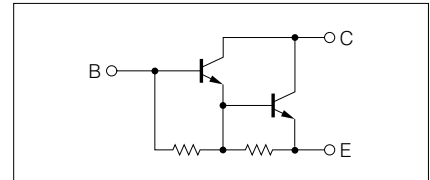
- Extremely satisfactory linearity of the forward current transfer ratio  $h_{FE}$
- High collector to base voltage  $V_{CBO}$
- Wide area of safe operation (ASO)
- Full-pack package which can be installed to the heat sink with one screw

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

| Parameter                    | Symbol    | Rated                  | Unit             |   |
|------------------------------|-----------|------------------------|------------------|---|
| Collector to base voltage    | $V_{CBO}$ | 500                    | V                |   |
| Collector to emitter voltage | $V_{CEO}$ | 400                    | V                |   |
| Emitter to base voltage      | $V_{EBO}$ | 12                     | V                |   |
| Peak collector current       | $I_{CP}$  | 14                     | A                |   |
| Collector current            | $I_C$     | 7                      | A                |   |
| Base current                 | $I_B$     | 0.5                    | A                |   |
| Collector power dissipation  | $P_C$     | $T_C=25^\circ\text{C}$ | 50               | W |
|                              |           | $T_a=25^\circ\text{C}$ | 2                |   |
| Junction temperature         | $T_j$     | 150                    | $^\circ\text{C}$ |   |
| Storage temperature          | $T_{stg}$ | -55 to +150            | $^\circ\text{C}$ |   |



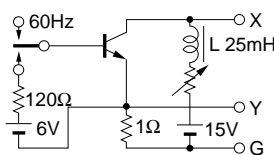
### Internal Connection



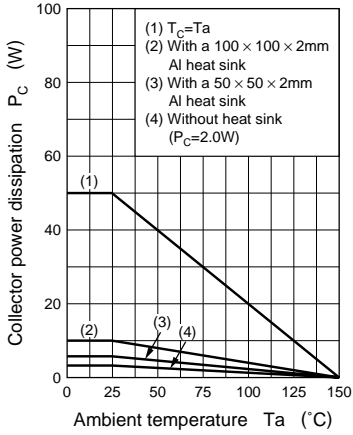
### Electrical Characteristics ( $T_C=25^\circ\text{C}$ )

| Parameter                               | Symbol           | Conditions   | min | typ | max           | Unit          |
|---|------------------|--|-----|-----|---------------|---------------|
| Collector cutoff current                | $I_{CBO}$        | $V_{CB} = 500\text{V}, I_E = 0$  |     |     | 0.1           | mA            |
|   | $I_{CEO}$        | $V_{CE} = 400\text{V}, I_B = 0$  |     |     | 0.1           | mA            |
| Emitter cutoff current                  | $I_{EBO}$        | $V_{EB} = 12\text{V}, I_C = 0$   |     |     | 100           | mA            |
| Collector to emitter voltage            | $V_{CEO(sus)}^*$ | $I_C = 100\text{mA}, R_{BZ} = \infty, L = 25\text{mH}$                               | 400 |     |               | mA            |
| Forward current transfer ratio          | $h_{FE1}$        | $V_{CE} = 2\text{V}, I_C = 2\text{A}$  | 500 |     |               |               |
|   | $h_{FE2}$        | $V_{CE} = 2\text{V}, I_C = 6\text{A}$  | 200 |     |               |               |
| Collector to emitter saturation voltage | $V_{CE(sat)}$    | $I_C = 7\text{A}, I_B = 70\text{mA}$   |     |     | 2.0           | V             |
| Base to emitter saturation voltage      | $V_{BE(sat)}$    | $I_C = 7\text{A}, I_B = 70\text{mA}$   |     |     | 2.5           | 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                            | $t_{on}$         | $I_C = 7\text{A}, I_{B1} = 70\text{mA}, I_{B2} = -70\text{mA}, V_{CC} = 300\text{V}$ |     | 1.5 |               | $\mu\text{s}$ |
| Storage time                            | $t_{stg}$        |  | 5.0 |     | $\mu\text{s}$ |               |
| Fall time                               | $t_f$            |  | 6.5 |     | $\mu\text{s}$ |               |

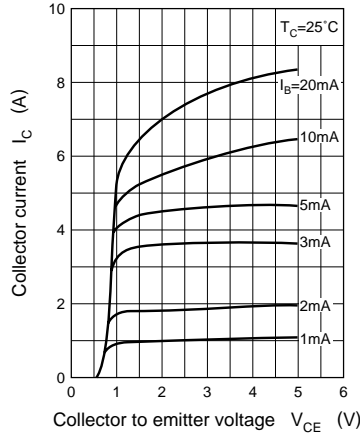
\* $V_{CEO(sus)}$  Test circuit



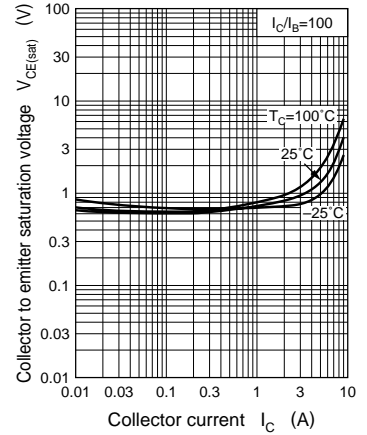
$P_C - T_a$



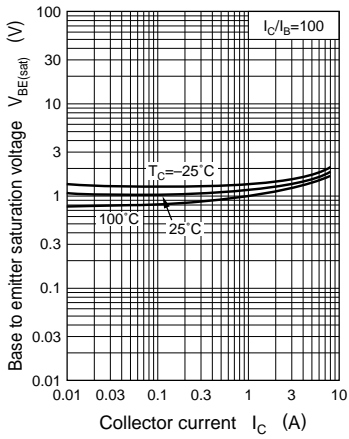
$I_C - V_{CE}$



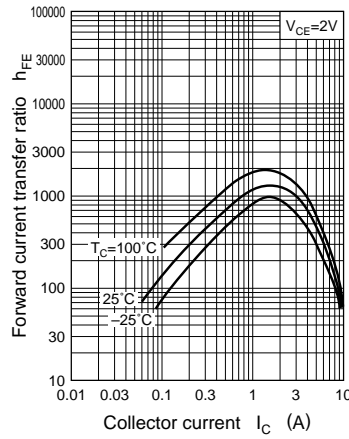
$V_{CE(sat)} - I_C$



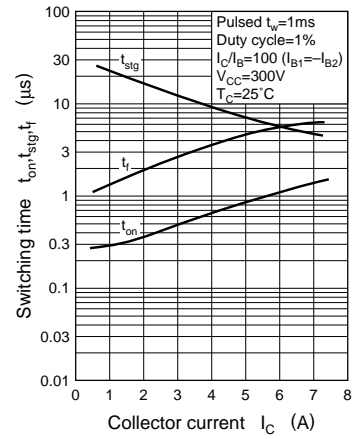
$V_{BE(sat)} - I_C$



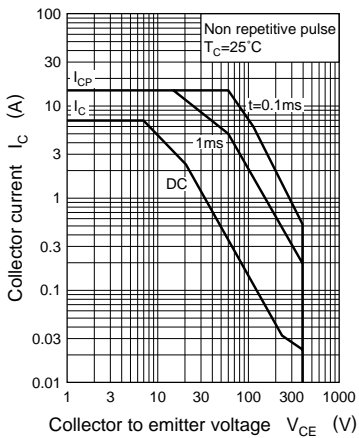
$h_{FE} - I_C$



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



Area of safe operation (ASO)



$R_{th(t)} - t$

