

# 2SD1980F5

## Transistor, NPN, Darlington pair

### Features

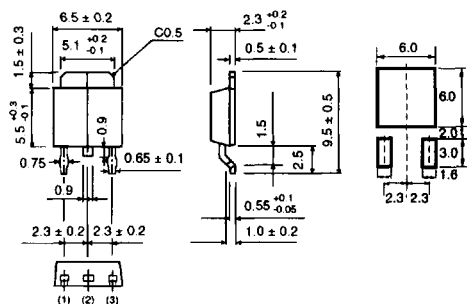
- available in CPT F5 (SC-63) package
- package marking: D1980★□, where ★ is  $h_{FE}$  code and □ is lot number
- Darlington connection provides high DC current gain ( $h_{FE}$ )
- damper diode is incorporated
- built-in resistors between base and emitter

### Applications

- motor drive
- relay drive

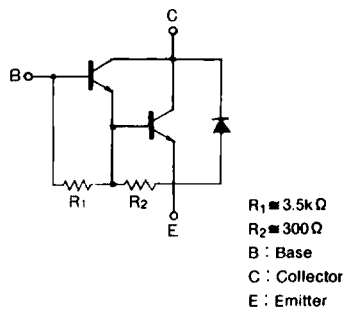
### Dimensions (Units : mm)

2SD1980 (CPT F5)



- (1) Base
- (2) Collector
- (3) Emitter

### Equivalent circuit



- R1 = 3.5 kΩ
- R2 = 300 Ω
- B : Base
- C : Collector
- E : Emitter

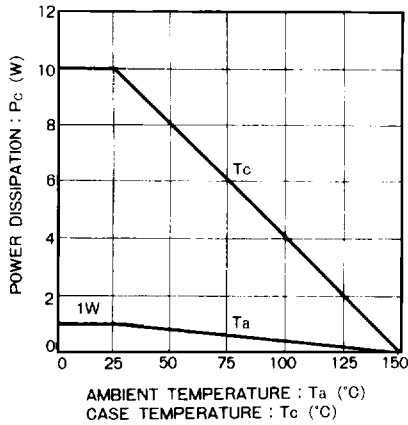
**2SD1980F5** Transistor, NPN, 2SD series**Absolute maximum ratings ( $T_a = 25^\circ\text{C}$ )**

| Parameter                    | Symbol    | Limits          | Unit             | Conditions                   |
|------------------------------|-----------|-----------------|------------------|------------------------------|
| Collector-to-base voltage    | $V_{CBO}$ | 100             | V                |                              |
| Collector-to-emitter voltage | $V_{CEO}$ | 100             | V                |                              |
| Emitter-to-base voltage      | $V_{EBO}$ | 6               | V                |                              |
| Collector current            | $I_C$     | 2               | A                | DC                           |
|                              |           | 3               |                  | Single pulse, $P_W = 100$ ms |
| Collector dissipation        | $P_C$     | 1               | W                | $T_a = 25^\circ\text{C}$     |
|                              |           | 10              | W                | $T_C = 25^\circ\text{C}$     |
| Junction temperature         | $T_j$     | 150             | $^\circ\text{C}$ |                              |
| Storage temperature          | $T_{stg}$ | $-55 \sim +150$ | $^\circ\text{C}$ |                              |

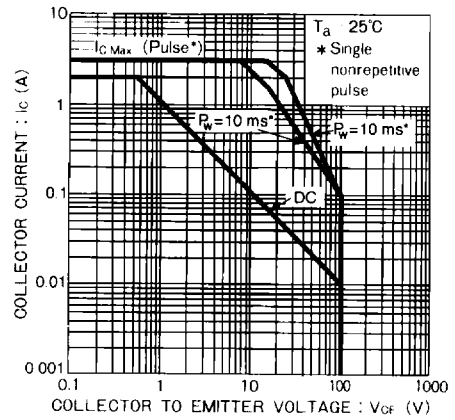
**Electrical characteristics (unless otherwise noted,  $T_a = 25^\circ\text{C}$ )**

| Parameter                               | Symbol        | Min  | Typical | Max   | Unit          | Conditions                                                          |
|-----------------------------------------|---------------|------|---------|-------|---------------|---------------------------------------------------------------------|
| Collector-to-base breakdown voltage     | $BV_{CBO}$    | 100  |         |       | V             | $I_C = 50 \mu\text{A}$                                              |
| Collector-to-emitter breakdown voltage  | $BV_{CEO}$    | 100  |         |       | V             | $I_C = 5 \text{ mA}$                                                |
| Collector cutoff current                | $I_{CBO}$     |      |         | 10    | $\mu\text{A}$ | $V_{CB} = 100 \text{ V}$                                            |
| Emitter cutoff current                  | $I_{EBO}$     |      |         | 3     | mA            | $V_{EB} = 5 \text{ V}$                                              |
| DC current gain                         | $h_{FE}$      | 1000 |         | 10000 |               | $V_{CE} = 2 \text{ V}$ , $I_C = 1 \text{ A}$ , single pulse         |
| Collector-to-emitter saturation voltage | $V_{CE(sat)}$ |      |         | 1.5   | V             | $I_C/I_B = 1 \text{ A}/1 \text{ mA}$ , single pulse                 |
| Output capacitance                      | $C_{ob}$      |      | 25      |       | pF            | $V_{CB} = 10 \text{ V}$ , $I_E = 0 \text{ A}$ , $f = 1 \text{ MHz}$ |

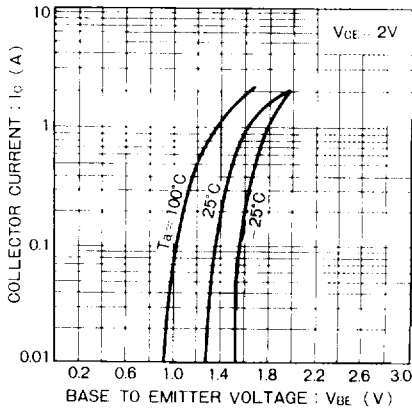
## Electrical characteristic curves



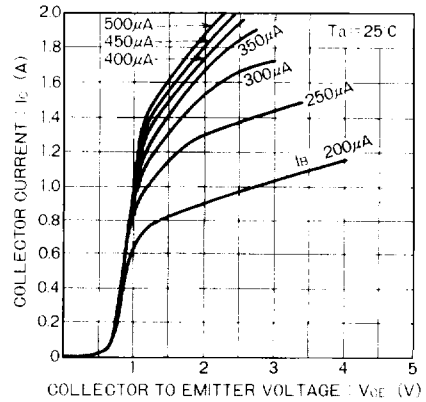
**Figure 1**



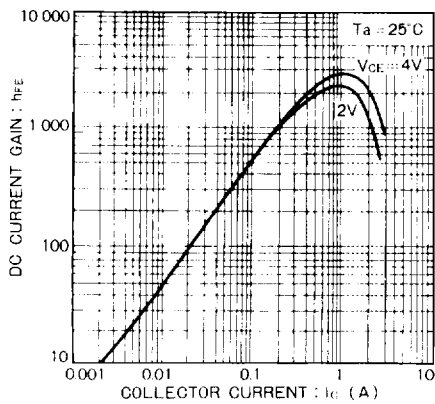
**Figure 2**



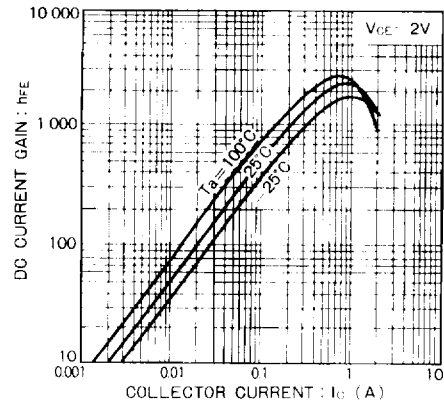
**Figure 3**



**Figure 4**

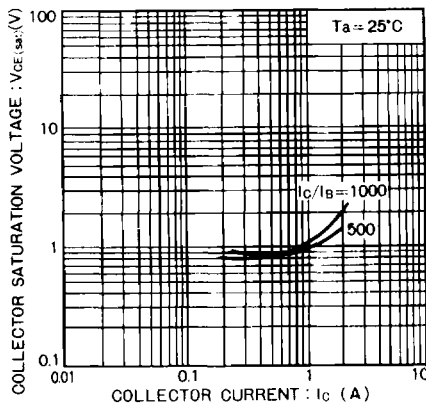


**Figure 5**

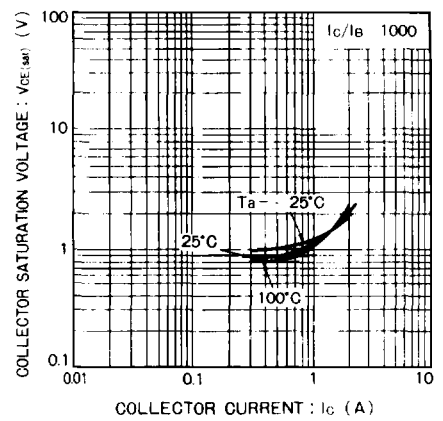


**Figure 6**

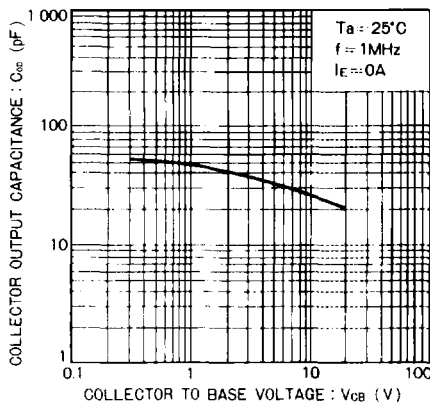
# **2SD1980F5 Transistor, NPN, 2SD series**



**Figure 7**



**Figure 8**



**Figure 9**

## **Ordering information**

|                                                    |      |
|----------------------------------------------------|------|
| Package                                            | Tape |
| Code                                               | TL   |
| Basic order quantity                               | 2500 |
| 2SD1980F5, $h_{FE} = 1k \sim 10k$                  | ☆    |
| ★ = Standard, ☆ = Semi-standard, * = Special order |      |