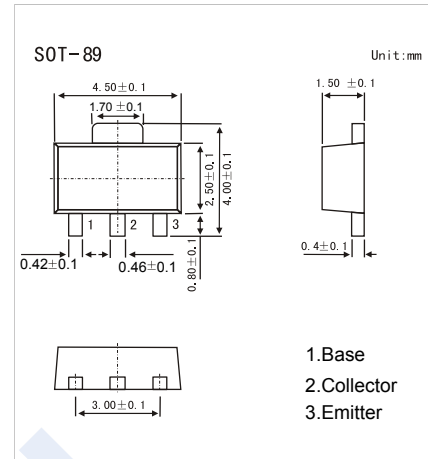
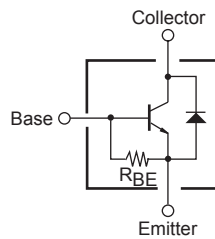


## NPN Transistors

### 2SD1999

#### ■ Features

- Low saturation voltage.
- Large current capacity.
- Complementary to 2SB1325



#### ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

| Parameter                      | Symbol    | Rating     | Unit             |
|--------------------------------|-----------|------------|------------------|
| Collector - Base Voltage       | $V_{CB0}$ | 25         | V                |
| Collector - Emitter Voltage    | $V_{CE0}$ | 20         |                  |
| Emitter - Base Voltage         | $V_{EB0}$ | 6          |                  |
| Collector Current - Continuous | $I_C$     | 4          | A                |
| Collector Current - Pulse      | $I_{CP}$  | 6          |                  |
| Collector Power Dissipation    | $P_C$     | 1.5        | W                |
| Junction Temperature           | $T_J$     | 150        | $^\circ\text{C}$ |
| Storage Temperature Range      | $T_{stg}$ | -55 to 150 |                  |

#### ■ Electrical Characteristics $T_a = 25^\circ\text{C}$

| Parameter                            | Symbol        | Test Conditions                                 | Min | Typ | Max | Unit             |
|--------------------------------------|---------------|---|-----|-----|-----|------------------|
| Collector- base breakdown voltage    | $V_{CB0}$     | $I_C = 100 \mu\text{A}$ , $I_E = 0$             | 25  |     |     | V                |
| Collector- emitter breakdown voltage | $V_{CE0}$     | $I_C = 10 \text{ mA}$ , $R_{BE} = \infty$       | 20  |     |     |                  |
| Emitter - base breakdown voltage     | $V_{EB0}$     | $I_E = 100 \mu\text{A}$ , $I_C = 0$             | 6   |     |     |                  |
| Collector-base cut-off current       | $I_{CB0}$     | $V_{CB} = 20 \text{ V}$ , $I_E = 0$             |     |     | 1   | $\mu\text{A}$    |
| Emitter cut-off current              | $I_{EB0}$     | $V_{EB} = 5 \text{ V}$ , $I_C = 0$              |     |     | 0.1 |                  |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = 3 \text{ A}$ , $I_B = 150 \text{ mA}$    |     |     | 0.5 | V                |
| Base - emitter saturation voltage    | $V_{BE(sat)}$ | $I_C = 3 \text{ A}$ , $I_B = 150 \text{ mA}$    |     |     | 1.5 |                  |
| DC current gain                      | $h_{FE(1)}$   | $V_{CE} = 2 \text{ V}$ , $I_C = 500 \text{ mA}$ | 70  |     |     |                  |
|                                      | $h_{FE(2)}$   | $V_{CE} = 2 \text{ V}$ , $I_C = 3 \text{ A}$    | 50  |     |     |                  |
| Diode forward voltage                | $V_F$         | $I_F = 0.5 \text{ A}$                           |     |     | 1.5 | V                |
| Base-to-emitter resistance           | $R_{BE}$      |   |     | 1.5 |     | $\text{K}\Omega$ |
| Collector output capacitance         | $C_{ob}$      | $V_{CB} = 10 \text{ V}$ , $f = 1 \text{ MHz}$   |     | 45  |     | $\text{pF}$      |
| Transition frequency                 | $f_T$         | $V_{CE} = 2 \text{ V}$ , $I_C = 500 \text{ mA}$ |     | 200 |     | MHz              |

#### ■ Marking

|         |    |
|---------|----|
| Marking | DN |
|---------|----|

## NPN Transistors

### 2SD1999

■ Typical Characteristics

