

# 2SC5993

## Silicon NPN epitaxial planar type

For power amplification

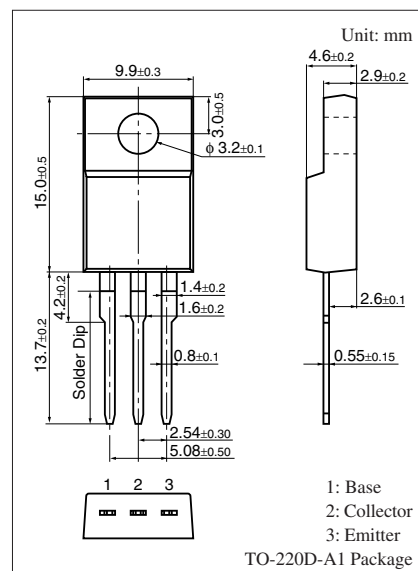
For TV VM circuit

### ■ Features

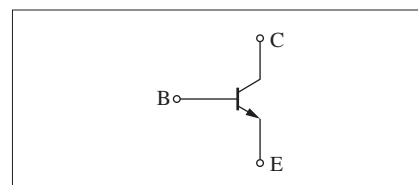
- Satisfactory linearity of forward current transfer ratio  $h_{FE}$
- High transition frequency ( $f_T$ )
- Full-pack package which can be installed to the heat sink with one screw.

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

| Parameter                             | Symbol                   | Rating      | Unit             |
|---------------------------------------|--------------------------|-------------|------------------|
| Collector-base voltage (Emitter open) | $V_{CBO}$                | 180         | V                |
| Collector-emitter voltage (Base open) | $V_{CEO}$                | 180         | V                |
| Emitter-base voltage (Collector open) | $V_{EBO}$                | 6           | V                |
| Collector current                     | $I_C$                    | 1.5         | A                |
| Peak collector current                | $I_{CP}$                 | 3           | A                |
| Collector power dissipation           | $P_C$                    | 20          | W                |
|                                       | $T_a = 25^\circ\text{C}$ | 2.0         |                  |
| Junction temperature                  | $T_j$                    | 150         | $^\circ\text{C}$ |
| Storage temperature                   | $T_{stg}$                | -55 to +150 | $^\circ\text{C}$ |



### Internal Connection



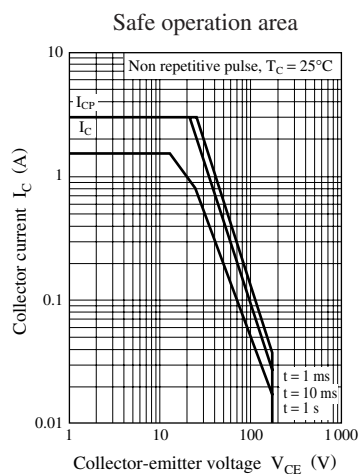
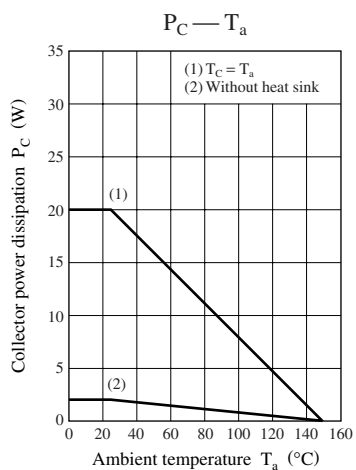
### ■ Electrical Characteristics $T_C = 25^\circ\text{C} \pm 3^\circ\text{C}$

| Parameter  | Symbol        | Conditions  | Min | Typ | Max | Unit          |
|--|---------------|---|-----|-----|-----|---------------|
| Collector-emitter voltage (Base open)                            | $V_{CEO}$     | $I_C = 10\text{ mA}$ , $I_B = 0$                                    | 180 |     |     | V             |
| Collector-base cutoff current (Emitter open)                     | $I_{CBO}$     | $V_{CB} = 180\text{ V}$ , $I_E = 0$                                 |     |     | 100 | $\mu\text{A}$ |
| Emitter-base cutoff current (Collector open)                     | $I_{EBO}$     | $V_{EB} = 6\text{ V}$ , $I_C = 0$                                   |     |     | 100 | $\mu\text{A}$ |
| Forward current transfer ratio *                                 | $h_{FE}$      | $V_{CE} = 5\text{ V}$ , $I_C = 0.1\text{ A}$                        | 60  |     | 240 | —             |
| Collector-emitter saturation voltage                             | $V_{CE(sat)}$ | $I_C = 1\text{ A}$ , $I_B = 0.1\text{ A}$                           |     |     | 0.5 | V             |
| Transition frequency   | $f_T$         | $V_{CE} = 10\text{ V}$ , $I_C = 0.2\text{ A}$ , $f = 10\text{ MHz}$ |     | 130 |     | MHz           |
| Collector output capacitance (Common base, input open circuited) | $C_{ob}$      | $V_{CB} = 10\text{ V}$ , $I_E = 0$ , $f = 1\text{ MHz}$             |     | 10  |     | pF            |
| Turn-on time   | $t_{on}$      | $I_C = 0.4\text{ A}$ , Resistance loaded                            |     | 0.1 |     | $\mu\text{s}$ |
| Storage time   | $t_{stg}$     | $I_{B1} = 0.04\text{ A}$ , $I_{B2} = -0.04\text{ A}$                |     | 1.5 |     | $\mu\text{s}$ |
| Fall time  | $t_f$         | $V_{CC} = 100\text{ V}$   |     | 0.1 |     | $\mu\text{s}$ |

Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

2. \*: Rank classification

| Rank     | Q         | P          |
|----------|-----------|------------|
| $h_{FE}$ | 60 to 140 | 120 to 240 |



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