

# 2SD1633

## Silicon NPN triple diffusion planar type darlington

For voltage switching

### ■ Features

- High-speed switching
- Satisfactory linearity of forward current transfer ratio  $h_{FE}$
- Full-pack package which can be installed to the heat sink with one screw

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

| Parameter                             | Symbol             | Rating      | Unit       |
|---------------------------------------|--------------------|-------------|------------|
| Collector-base voltage (Emitter open) | $V_{CBO}$          | 100         | V          |
| Collector-emitter voltage (Base open) | $V_{CEO}$          | 100         | V          |
| Emitter-base voltage (Collector open) | $V_{EBO}$          | 7           | V          |
| Collector current                     | $I_C$              | 5           | A          |
| Peak collector current                | $I_{CP}$           | 8           | A          |
| Base current                          | $I_B$              | 0.5         | A          |
| Collector power dissipation           | $P_C$              | 30          | W          |
|                                       | $T_a = 25^\circ C$ | 2.0         |            |
| Junction temperature                  | $T_j$              | 150         | $^\circ C$ |
| Storage temperature                   | $T_{stg}$          | -55 to +150 | $^\circ C$ |

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

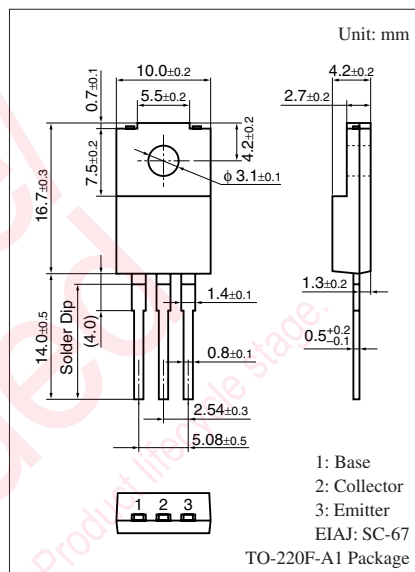
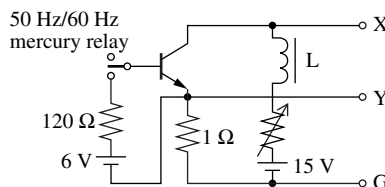
| Parameter                                     | Symbol         | Conditions                                 | Min  | Typ | Max   | Unit    |
|---|----------------|--|------|-----|-------|---------|
| Collector-emitter sustaining voltage *2       | $V_{CEO(SUS)}$ | $I_C = 0.2 A, L = 25 mH$                   | 100  |     |       | V       |
| Collector-base cutoff current (Emitter open)  | $I_{CBO}$      | $V_{CB} = 100 V, I_E = 0$                  |      |     | 100   | $\mu A$ |
| Collector-emitter cut-off current (Base open) | $I_{CEO}$      | $V_{CE} = 100 V, I_B = 0$                  |      |     | 100   | $\mu A$ |
| Emitter-base cutoff current (Collector open)  | $I_{EBO}$      | $V_{EB} = 7 V, I_C = 0$                    |      |     | 5     | mA      |
| Forward current transfer ratio *1             | $h_{FE}$       | $V_{CE} = 3 V, I_C = 3 A$                  | 1500 |     | 15000 | —       |
| Collector-emitter saturation voltage          | $V_{CE(sat)}$  | $I_C = 3 A, I_B = 3 mA$                    |      |     | 1.5   | V       |
| Base-emitter saturation voltage               | $V_{BE(sat)}$  | $I_C = 3 A, I_B = 3 mA$                    |      |     | 2.0   | V       |
| Transition frequency                          | $f_T$          | $V_{CE} = 10 V, I_C = 1 A, f = 1 MHz$      |      | 15  |       | MHz     |
| Turn-on time                                  | $t_{on}$       | $I_C = 3 A, I_{B1} = 3 mA, I_{B2} = -3 mA$ |      |     | 3     | $\mu s$ |
| Storage time                                  | $t_{stg}$      | $V_{CC} = 50 V$                            |      |     | 5     | $\mu s$ |
| Fall time                                     | $t_f$          |  |      |     | 3     | $\mu s$ |

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

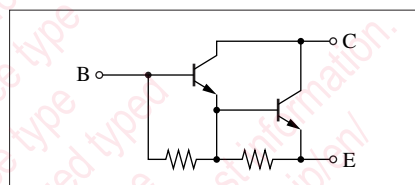
2. \*1: Rank classification

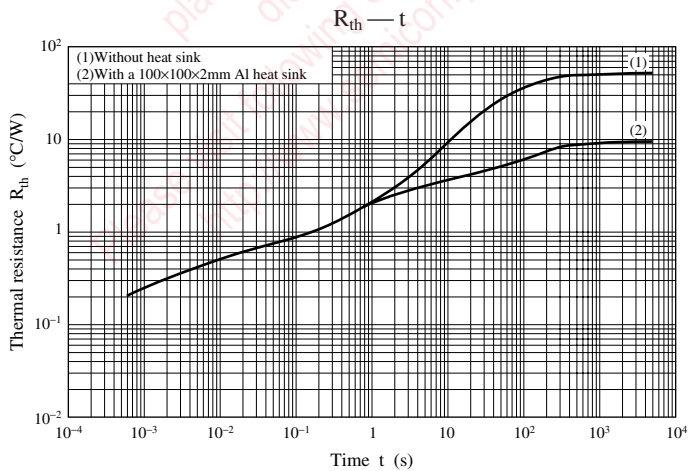
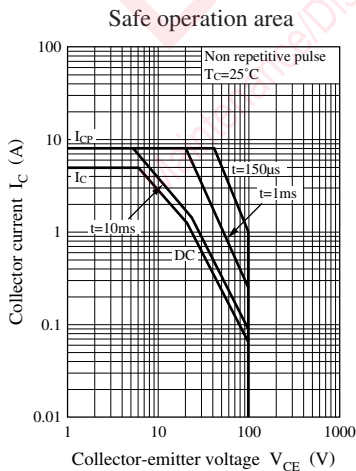
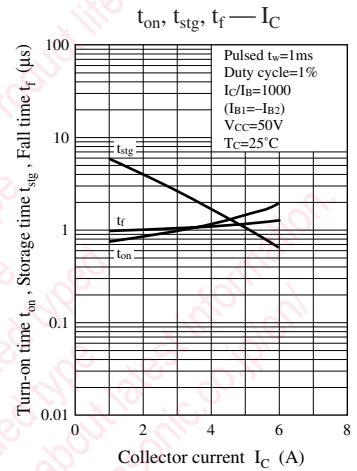
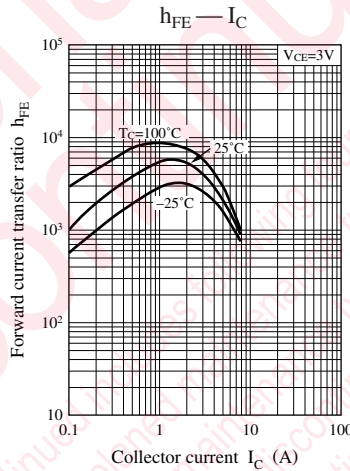
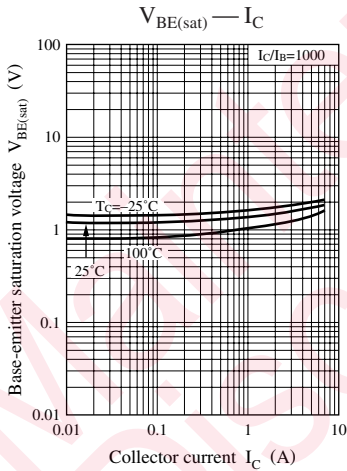
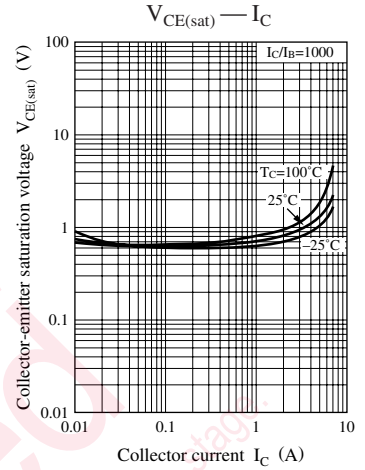
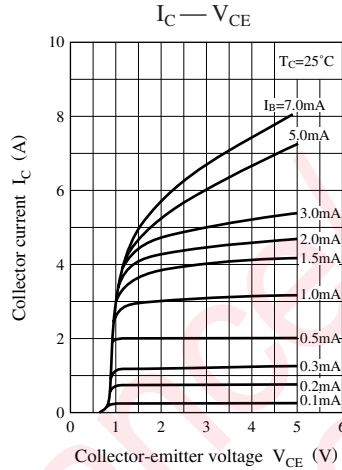
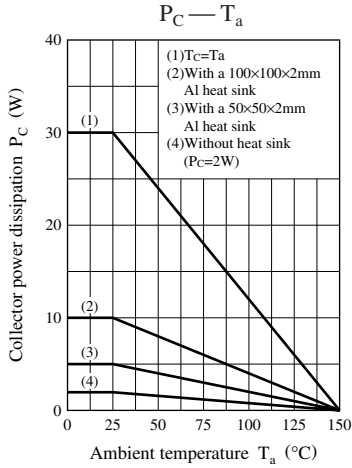
| Rank     | Q            | P             |
|----------|--------------|---------------|
| $h_{FE}$ | 1500 to 6000 | 5000 to 15000 |

\*2:  $V_{CEO(SUS)}$  test circuit



### Internal Connection





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