



## 2SB1202/2SD1802

### High-Current Switching Applications

#### Applications

- Voltage regulators, relay drivers, lamp drivers, electrical equipment.

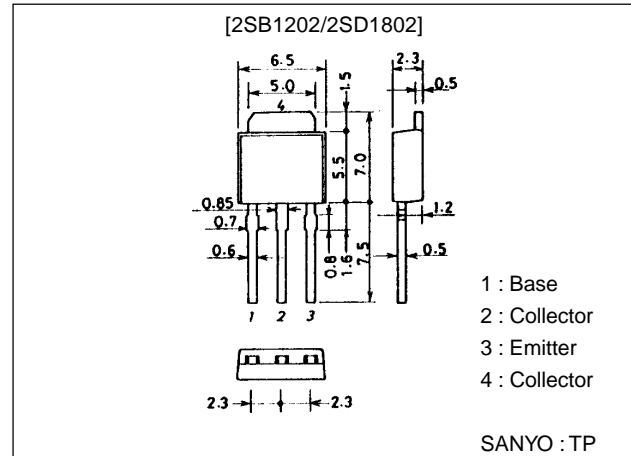
#### Features

- Adoption of FBET, MBIT processes.
- Large current capacity and wide ASO.
- Low collector-to-emitter saturation voltage.
- Fast switching speed.
- Small and slim package making it easy to make 2SB1202/2SD1802-used sets smaller.

#### Package Dimensions

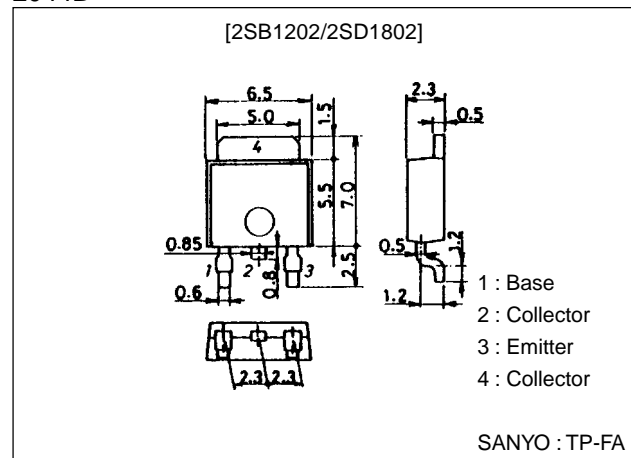
unit:mm

2045B



unit:mm

2044B



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**SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquarters**

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# 2SB1202/2SD1802

( ) : 2SB1202

## Specifications

### Absolute Maximum Ratings at Ta = 25°C

| Parameter                    | Symbol    | Conditions             | Ratings     | Unit             |
|------------------------------|-----------|------------------------|-------------|------------------|
| Collector-to-Base Voltage    | $V_{CBO}$ |                        | (-60)       | V                |
| Collector-to-Emitter Voltage | $V_{CEO}$ |                        | (-50)       | V                |
| Emitter-to-Base Voltage      | $V_{EBO}$ |                        | (-6)        | V                |
| Collector Current            | $I_C$     |                        | (-3)        | A                |
| Collector Current (Pulse)    | $I_{CP}$  |                        | (-6)        | A                |
| Collector Dissipation        | $P_C$     |                        | 1           | W                |
|                              |           | $T_c=25^\circ\text{C}$ | 15          | W                |
| Junction Temperature         | $T_J$     |                        | 150         | $^\circ\text{C}$ |
| Storage Temperature          | $T_{stg}$ |                        | -55 to +150 | $^\circ\text{C}$ |

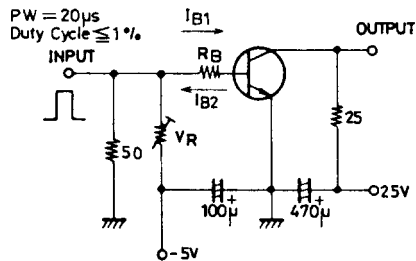
### Electrical Characteristics at Ta = 25°C

| Parameter                               | Symbol        | Conditions                             | Ratings |         |        | Unit          |
|---|---------------|--|---------|---------|--------|---------------|
|   |               |  | min     | typ     | max    |               |
| Collector Cutoff Current                | $I_{CBO}$     | $V_{CB}=-40\text{V}, I_E=0$            |         |         | (-1)   | $\mu\text{A}$ |
| Emitter Cutoff Current                  | $I_{EBO}$     | $V_{EB}=-4\text{V}, I_C=0$             |         |         | (-1)   | $\mu\text{A}$ |
| DC Current Gain                         | $h_{FE1}$     | $V_{CE}=-2\text{V}, I_C=-100\text{mA}$ | 100*    |         | 560*   |               |
|   | $h_{FE2}$     | $V_{CE}=-2\text{V}, I_C=-3\text{A}$    | 35      |         |        |               |
| Gain-Bandwidth Product                  | $f_T$         | $V_{CE}=-10\text{V}, I_C=-50\text{mA}$ |         | 150     |        | MHz           |
| Output Capacitance                      | $C_{ob}$      | $V_{CB}=-10\text{V}, f=1\text{MHz}$    |         | (39)25  |        | pF            |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=-2\text{A}, I_B=-100\text{mA}$    |         | 0.19    | 0.5    | V             |
|   |               |  |         | (-0.35) | (-0.7) | V             |
| Base-to-Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C=-2\text{A}, I_B=-100\text{mA}$    |         | (-0.94) | (-1.2) | V             |
| Collector-to-Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C=-10\mu\text{A}, I_E=0$            | (-60)   |         |        | V             |
| Collector-to-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C=-1\text{mA}, R_{BE}=\infty$       | (-50)   |         |        | V             |
| Emitter-to-Base Breakdown Voltage       | $V_{(BR)EBO}$ | $I_E=-10\mu\text{A}, I_C=0$            | (-6)    |         |        | V             |
| Turn-ON Time                            | $t_{on}$      | See specified Test Circuit             |         | 70      |        | ns            |
| Storage Time                            | $t_{stg}$     | See specified Test Circuit             |         | (450)   |        | ns            |
|   |               |  |         | 650     |        | ns            |
| Fall Time                               | $t_f$         | See specified Test Circuit             |         | 35      |        | ns            |

\* : The 2SB1202/2SD1802 are classified by 100mA  $h_{FE}$  as follows :

|       |     |       |     |       |     |       |     |
|-------|-----|-------|-----|-------|-----|-------|-----|
| 100 R | 200 | 140 S | 280 | 200 T | 400 | 280 U | 560 |
|-------|-----|-------|-----|-------|-----|-------|-----|

### Switching Time Test Circuit

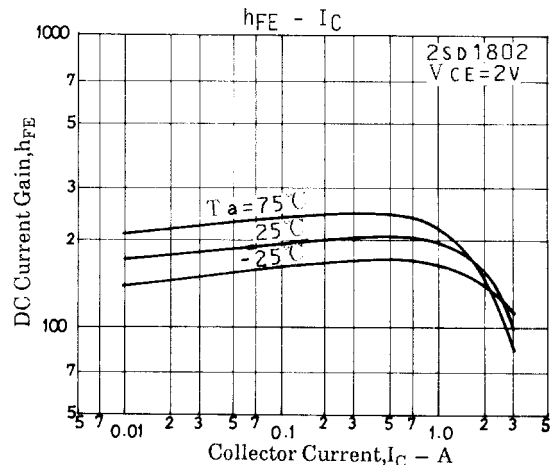
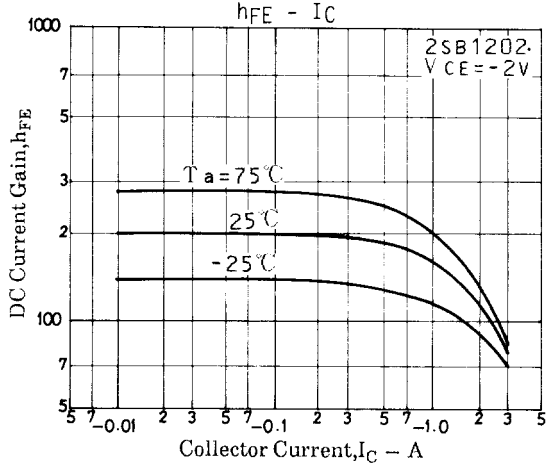
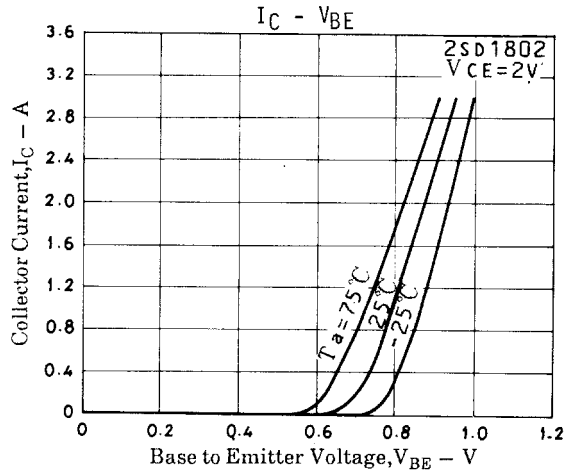
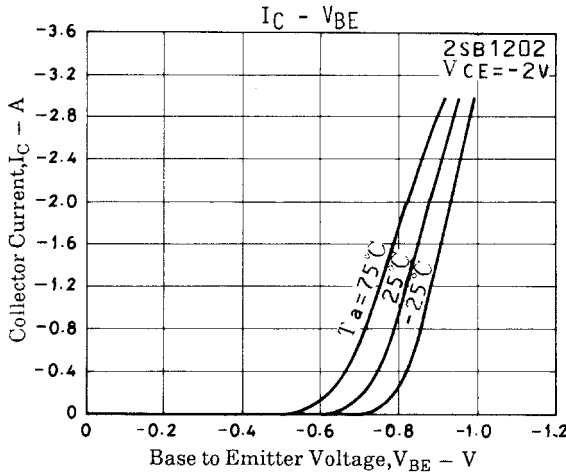
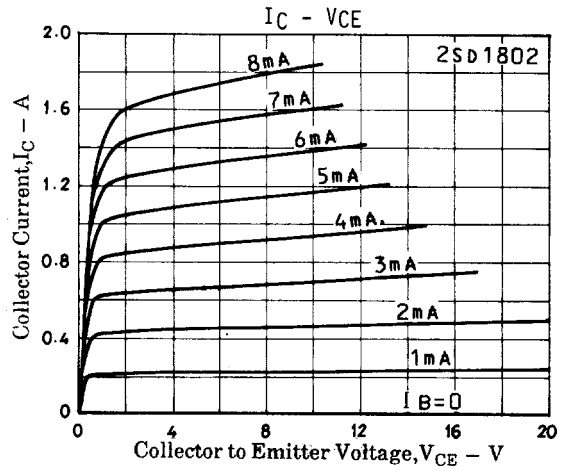
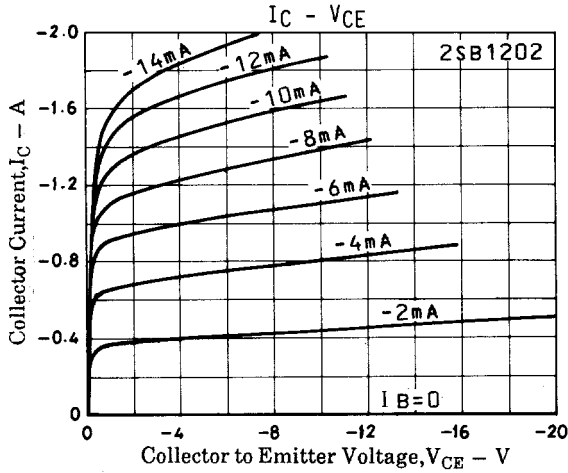
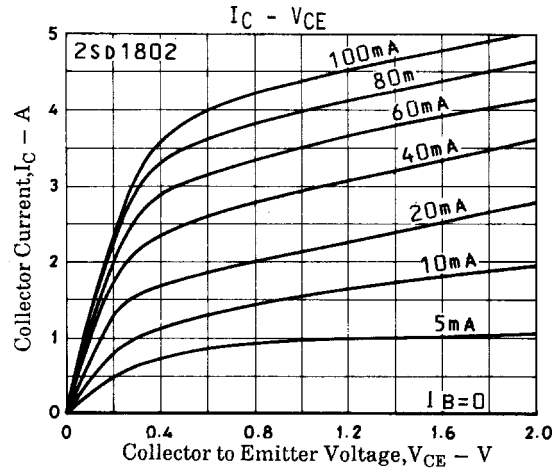
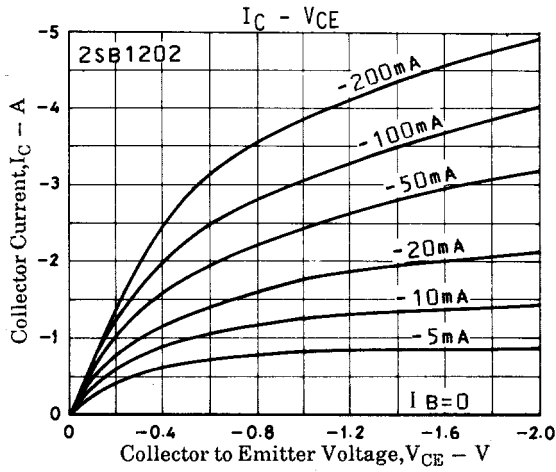


$$I_C = 10 \quad I_{B1} = -10 \quad I_{B2} = 1 \text{ A}$$

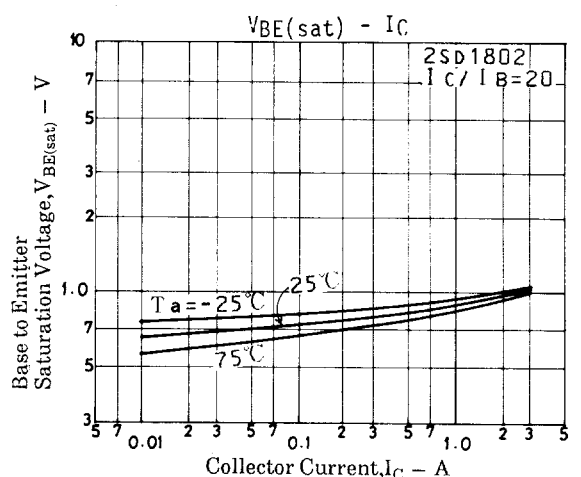
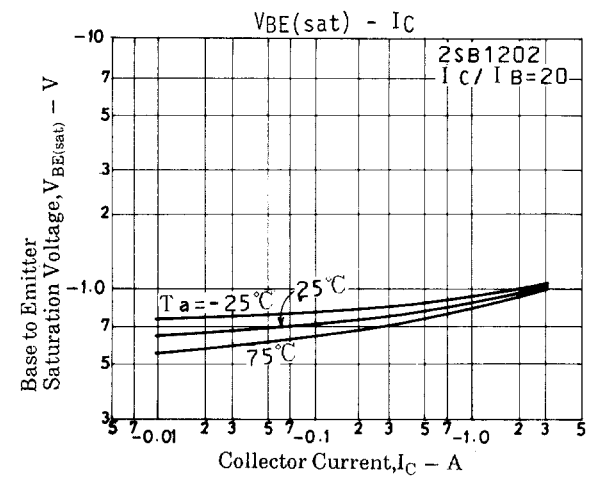
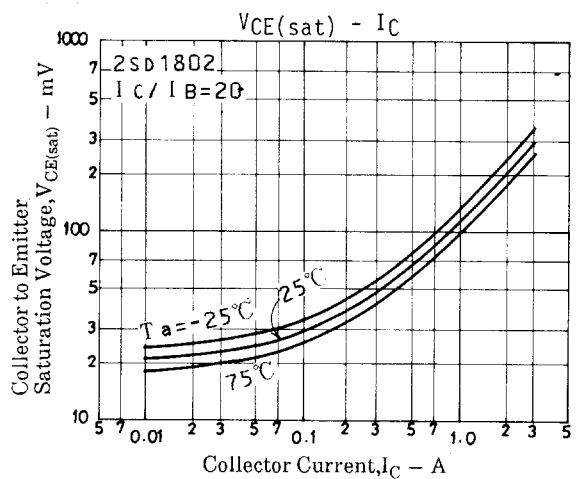
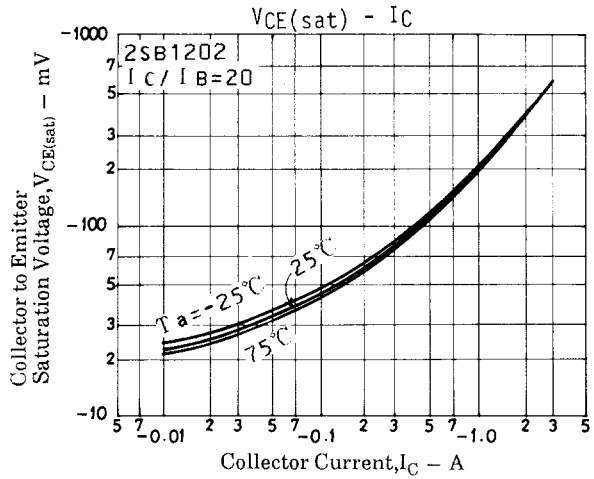
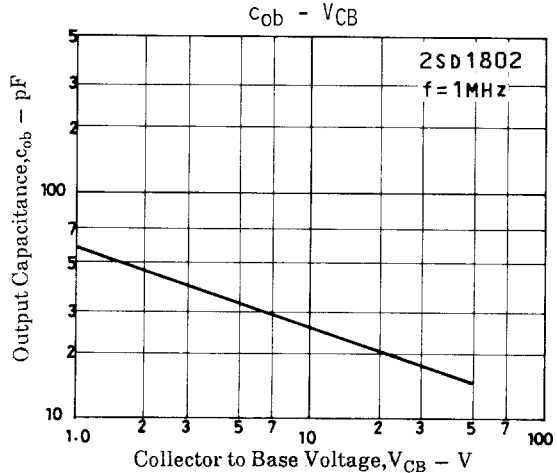
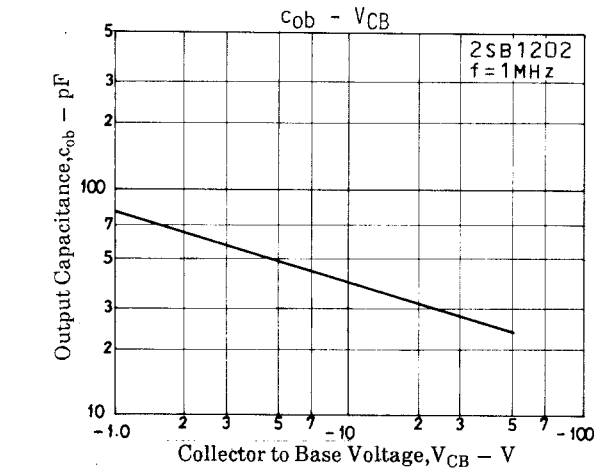
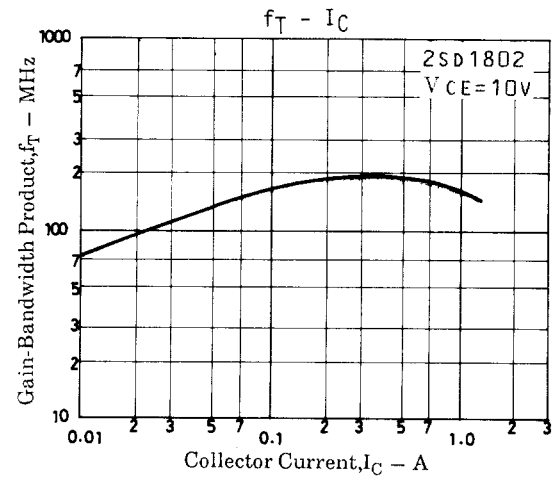
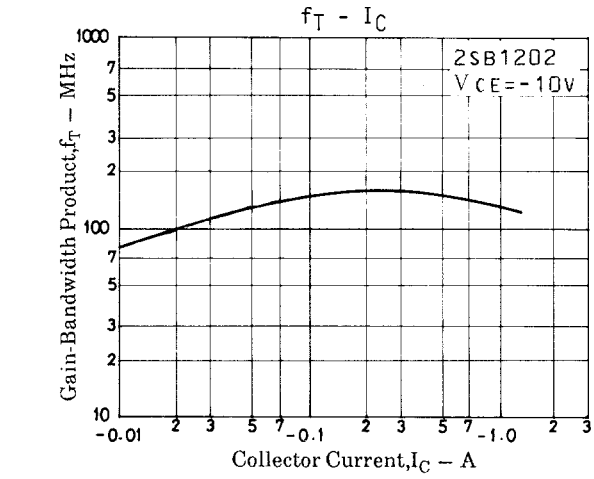
(For PNP, the polarity is reversed.)

Unit (resistance :  $\Omega$ , capacitance : F)

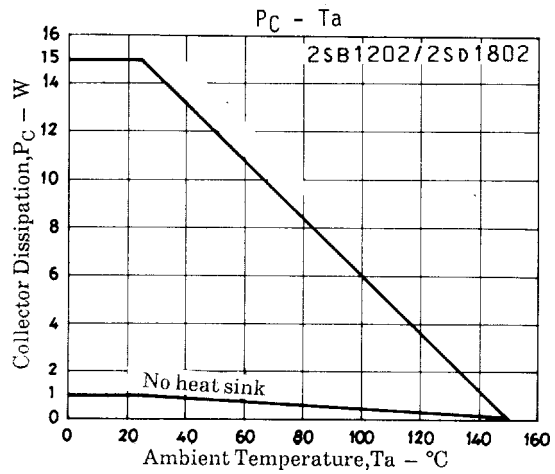
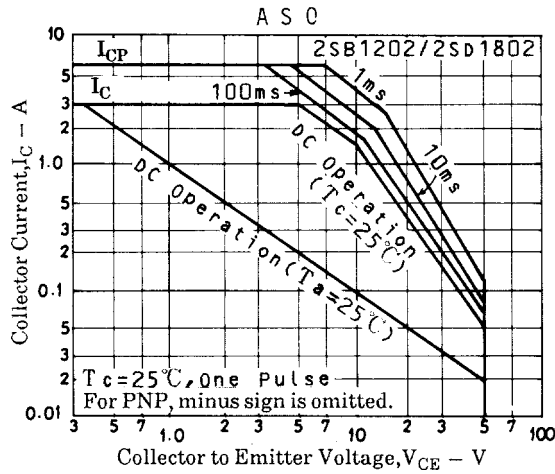
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