



## 2SB1124/2SD1624

### High Current Switching Applications

#### Applications

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

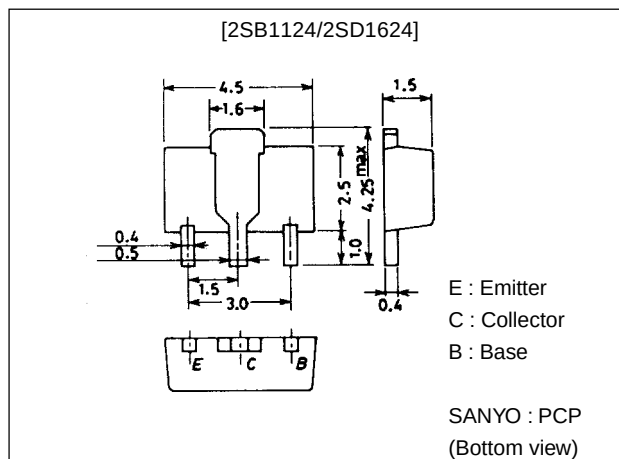
#### Features

- Adoption of FBET, MBIT processes.
- Low collector-to-emitter saturation voltage.
- Fast switching speed.
- Large current capacity and wide ASO.

#### Package Dimensions

unit:mm

2038



() : 2SB1124

#### Specifications

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

| 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        | $P_C$     |                                                      | 500         | mW   |
|                              |           | Mounted on ceramic board (250mm <sup>2</sup> ×0.8mm) | 1.5         | W    |
| Junction Temperature         | $T_J$     |                                                      | 150         | °C   |
| Storage Temperature          | $T_{stg}$ |                                                      | -55 to +150 | °C   |

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

| 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) |      | pF            |
|                          |           |                                            |         | 25   |      | pF            |

\* ; The 2SB1124/2SD1624 are classified by 100mA  $h_{FE}$  as follows :

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

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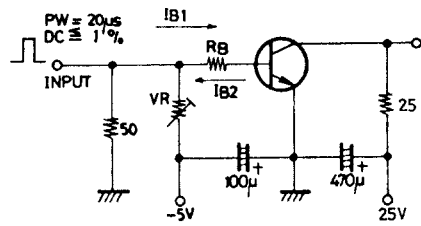
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

92098HA (KT)/3307AT, TS No.2019-1/4

2SB1124/2SD1624

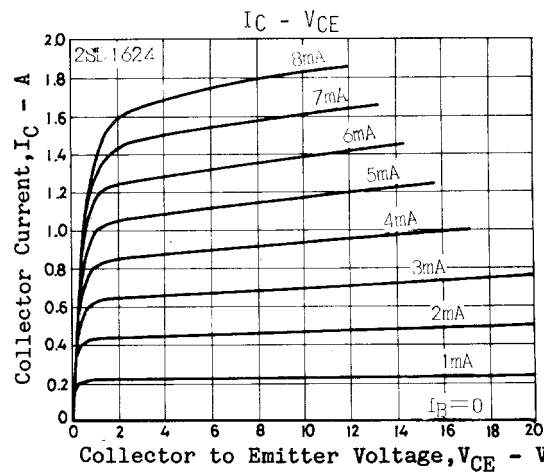
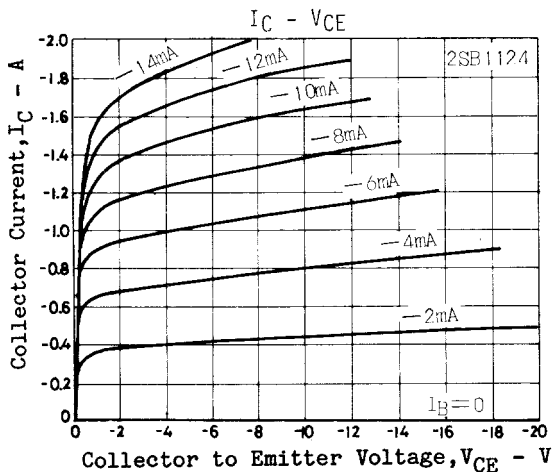
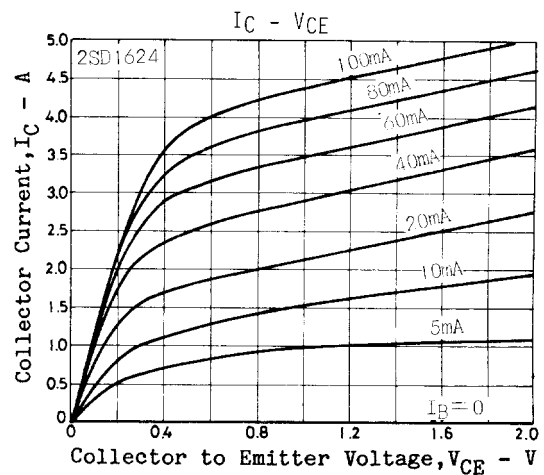
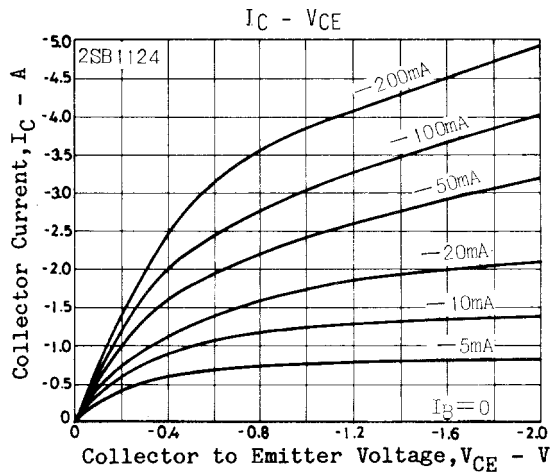
| Parameter                               | Symbol        | Conditions                  | Ratings |         |        | Unit |
|-----------------------------------------|---------------|-----------------------------|---------|---------|--------|------|
|                                         |               |                             | min     | typ     | max    |      |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=(-)2A, I_B=(-)100mA$   |         | (-0.35) | (-0.7) | V    |
|                                         |               |                             |         | 0.19    | 0.5    | V    |
| Base-to-Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C=(-)2A, I_B=(-)100mA$   |         | (-0.94) | (-1.2) | V    |
| Collector-to-Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C=(-)10\mu A, I_E=0$     | (-)60   |         |        | V    |
| Collector-to-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C=(-)1mA, R_{BE}=\infty$ | (-)50   |         |        | V    |
| Emitter-to-Base Breakdown Voltage       | $V_{(BR)EBO}$ | $I_E=(-)10\mu A, I_C=0$     | (-)6    |         |        | V    |
| Turn-ON Time                            | $t_{on}$      | See specified Test Circuit. |         | 70      |        | ns   |
|                                         |               |                             |         | (70)    |        | ns   |
| Storage Time                            | $t_{stg}$     | See specified Test Circuit. |         | 650     |        | ns   |
|                                         |               |                             |         | (450)   |        | ns   |
| Fall Time                               | $t_f$         | See specified Test Circuit. |         | 35      |        | ns   |
|                                         |               |                             |         | (35)    |        | ns   |

Switching Time Test Circuit

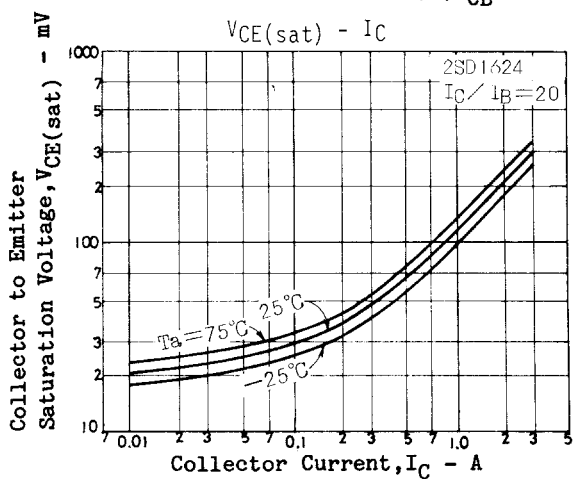
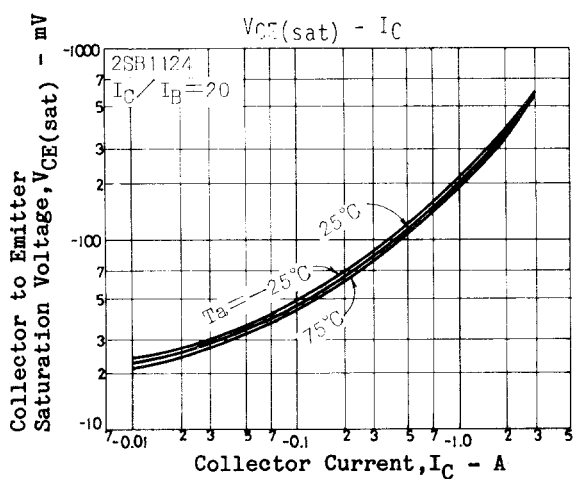
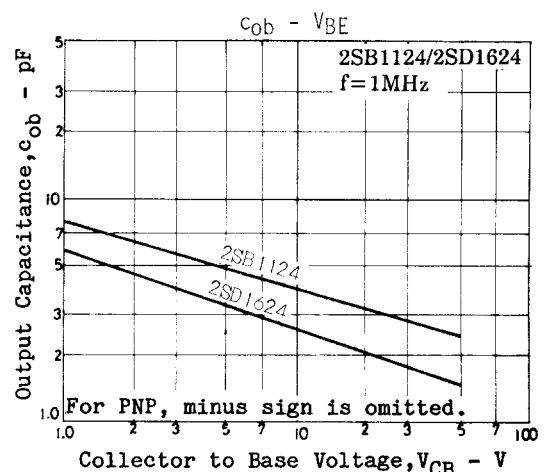
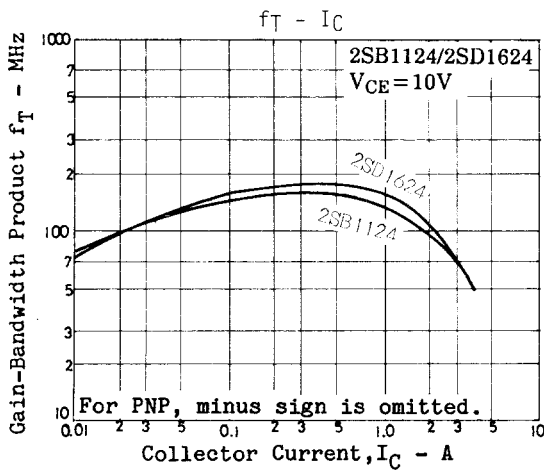
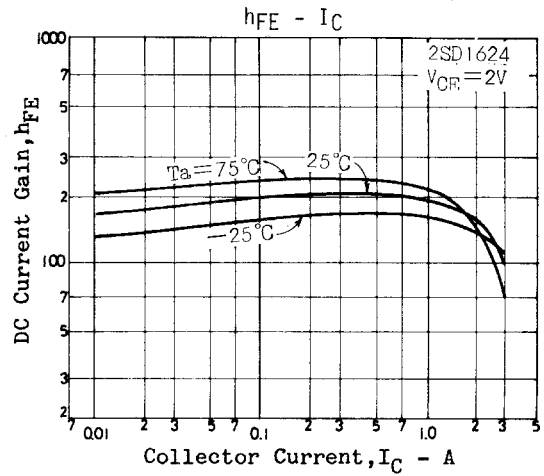
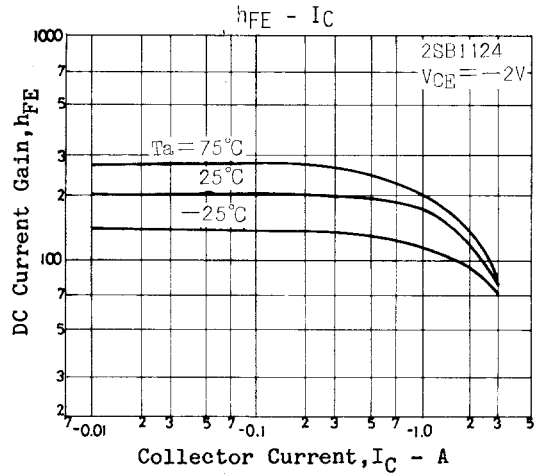
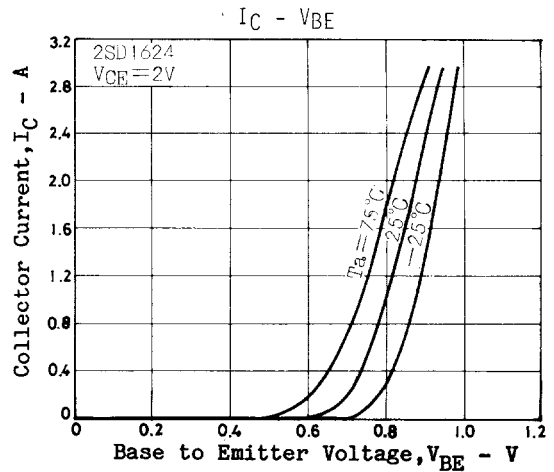
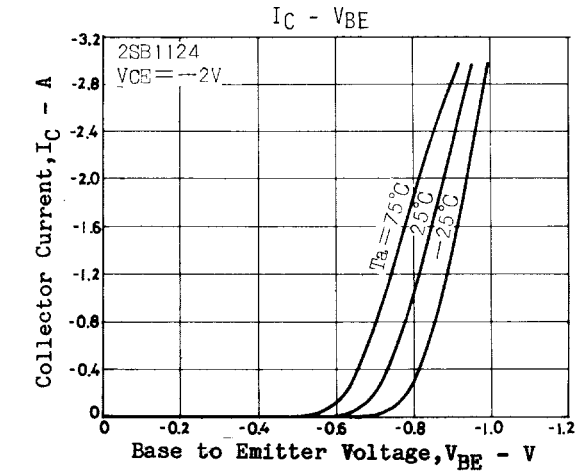


Marking 2SB1124:BG  
2SD1624:DG  
 $h_{FE}$  rank :R,S,T,U

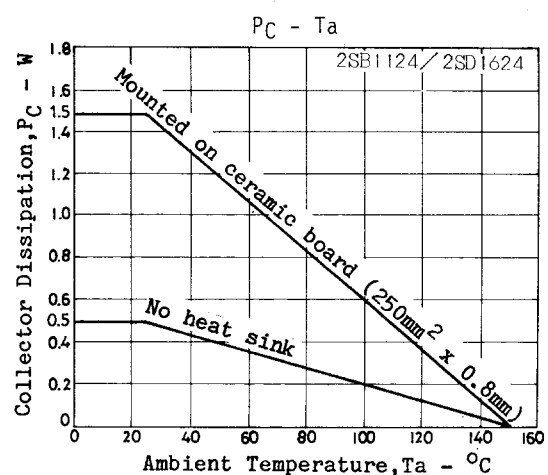
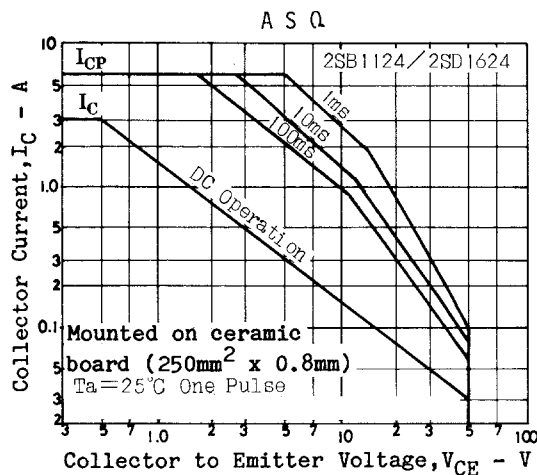
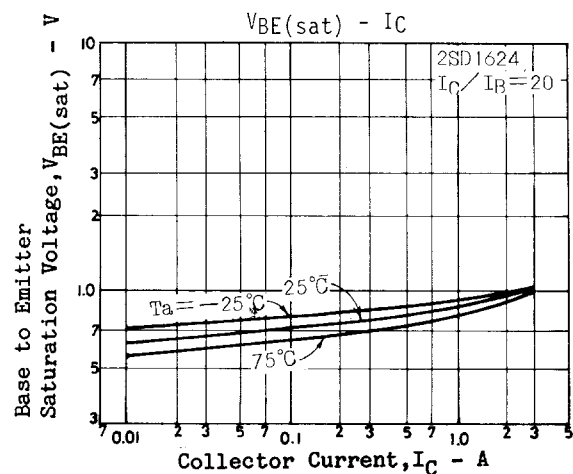
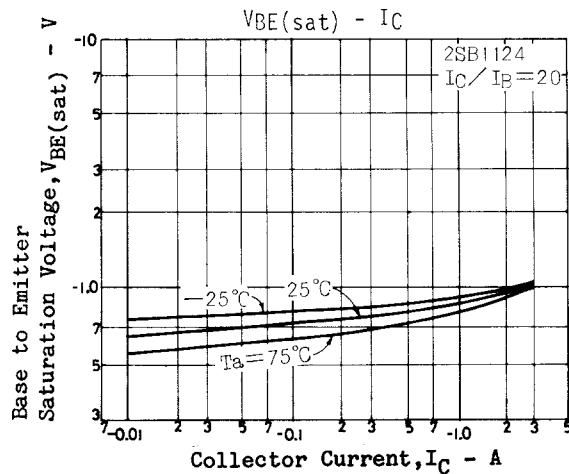
$10I_{B1} = -10I_{B2} = I_C = 1A$   
(For PNP, the polarity is reversed.)  
Unit (resistance :  $\Omega$ , capacitance : F)



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