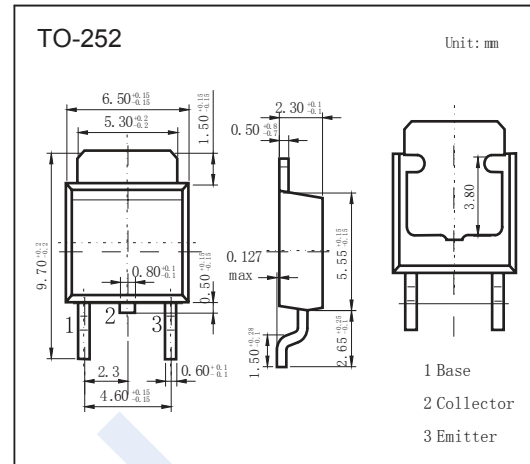


## PNP Transistors

## 2SB1204

## ■ Features

- Low collector-to-emitter saturation voltage.
- High current and high  $f_t$
- Fast switching time.
- Complementary to 2SD1804

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

| Parameter                      | Symbol    | Rating     | Unit             |
|--------------------------------|-----------|------------|------------------|
| Collector - Base Voltage       | $V_{CB0}$ | -60        | V                |
| Collector - Emitter Voltage    | $V_{CE0}$ | -50        |                  |
| Emitter - Base Voltage         | $V_{EB0}$ | -6         |                  |
| Collector Current - Continuous | $I_C$     | -8         | A                |
| Collector Current - Pulse      | $I_{CP}$  | -12        |                  |
| Collector Power Dissipation    | $P_C$     | 20         | W                |
| $T_c = 25^\circ\text{C}$       |           | 1          |                  |
| 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    | $V_{CB0}$     | $I_C = -100 \mu\text{A}$ , $I_E = 0$            | -60  |       |      | V             |
| Collector- emitter breakdown voltage | $V_{CE0}$     | $I_C = -1 \text{ mA}$ , $R_{BE} = \infty$       | -50  |       |      |               |
| Emitter - base breakdown voltage     | $V_{EB0}$     | $I_E = -100 \mu\text{A}$ , $I_C = 0$            | -6   |       |      |               |
| Collector-base cut-off current       | $I_{CBO}$     | $V_{CB} = -50\text{V}$ , $I_E = 0$              |  |       | -1   | $\mu\text{A}$ |
| Emitter cut-off current              | $I_{EBO}$     | $V_{EB} = -5\text{V}$ , $I_C = 0$               |  |       | -1   |               |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = -4 \text{ A}$ , $I_B = -200\text{mA}$    |  | -0.25 | -0.5 | V             |
| Base - emitter saturation voltage    | $V_{BE(sat)}$ | $I_C = -4 \text{ A}$ , $I_B = -200\text{mA}$    |  | -0.95 | -1.3 |               |
| DC current gain                      | $h_{FE}$      | $V_{CE} = -2\text{V}$ , $I_C = -500 \text{ mA}$ | 70   |       | 400  |               |
|                                      |               | $V_{CE} = -2\text{V}$ , $I_C = -6 \text{ A}$    | 35   |       |      |               |
| Turn-ON Time                         | $t_{on}$      | See specified Test Circuit                      |  | 50    |      | ns            |
| Storage Time                         | $t_{stg}$     |   |  | 450   |      |               |
| Fall Time                            | $t_f$         |   |  | 20    |      |               |
| Collector output capacitance         | $C_{ob}$      |   | $V_{CB} = -10\text{V}$ , $I_E = 0$ , $f = 1\text{MHz}$ |       | 95   |               |
| Transition frequency                 | $f_t$         | $V_{CE} = -5\text{V}$ , $I_C = -1 \text{ A}$    |  | 130   |      | MHz           |

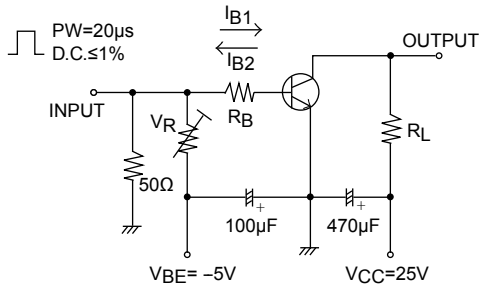
■ Classification of  $h_{fe}(1)$ 

| Type  | 2SB1204-Q | 2SB1204-R | 2SB1204-S | 2SB1204-T |
|-------|-----------|-----------|-----------|-----------|
| Range | 70-140    | 100-200   | 140-280   | 200-400   |

## PNP Transistors

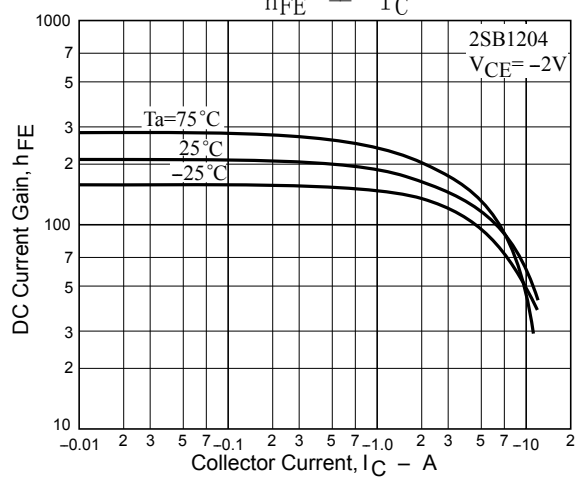
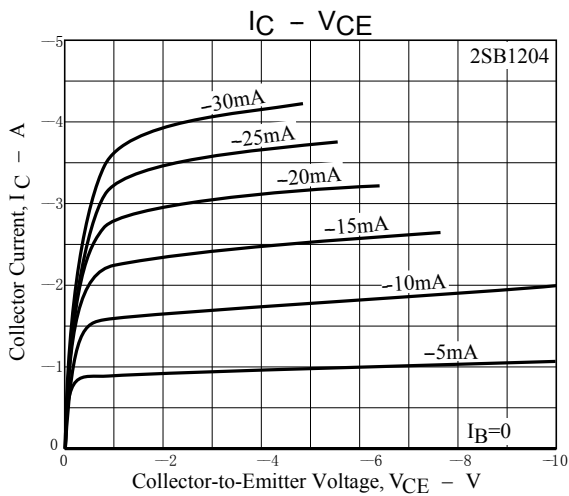
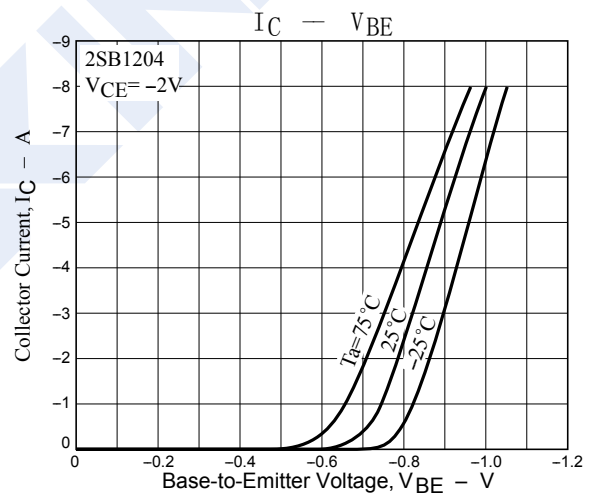
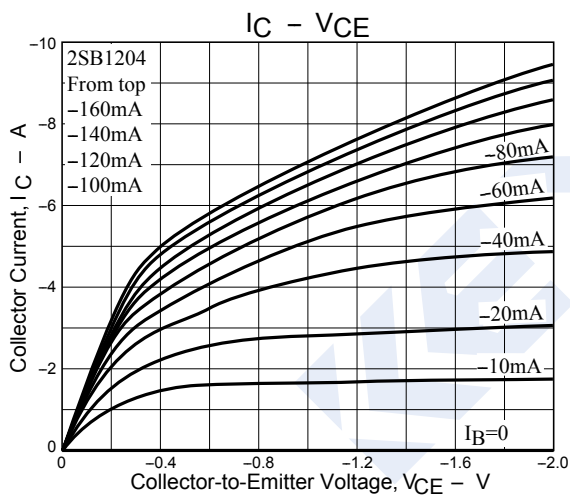
### 2SB1204

#### Switching Time Test Circuit



$I_C = 10I_{B1} = -10I_{B2} = 4A$   
 (For PNP, the polarity is reversed.)

#### Typical Characteristics



### PNP Transistors

### 2SB1204

■ Typical Characteristics

