

# General purpose amplification (–30V, –1A)

## 2SB1694

### ●Application

Low frequency amplifier  
Driver

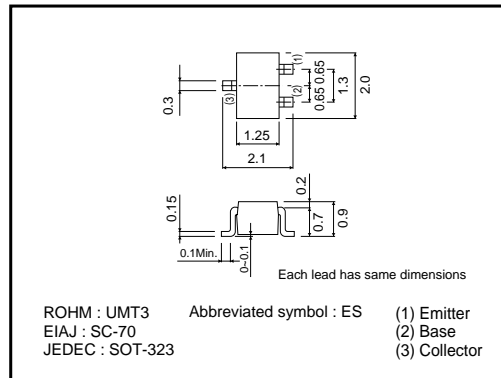
### ●Features

- 1) A collector current is large.
- 2) Collector saturation voltage is low.

$$V_{CE(sat)} \leq -380\text{mV}$$

$$\text{At } I_C = -500\text{mA} / I_B = -25\text{mA}$$

### ●External dimensions (Units : mm)



### ●Absolute maximum ratings (Ta=25°C)

| Parameter                    | Symbol    | Limits   | Unit |
|------------------------------|-----------|----------|------|
| Collector-base voltage       | $V_{CB0}$ | –30      | V    |
| Collector-emitter voltage    | $V_{CE0}$ | –30      | V    |
| Emitter-base voltage         | $V_{EB0}$ | –6       | V    |
| Collector current            | $I_C$     | –1       | A    |
|                              | $I_{CP}$  | –2       | A*   |
| Power dissipation            | $P_C$     | 200      | mW   |
| Junction temperature         | $T_j$     | 150      | °C   |
| Range of storage temperature | $T_{stg}$ | –55~+150 | °C   |

\*Single pulse,  $P_W=1\text{ms}$

### ●Packaging specifications

| Type    | Package                      | Taping |
|---------|------------------------------|--------|
|         | Code                         | T106   |
|         | Basic ordering unit (pieces) | 3000   |
| 2SB1694 |                              | ○      |

### ●Electrical characteristics (Ta=25°C)

| Parameter                            | Symbol        | Min. | Typ. | Max. | Unit | Conditions  |
|--------------------------------------|---------------|------|------|------|------|---|
| Collector-base breakdown voltage     | $BV_{CB0}$    | –30  | –    | –    | V    | $I_C = -10\mu\text{A}$  |
| Collector-emitter breakdown voltage  | $BV_{CE0}$    | –30  | –    | –    | V    | $I_C = -1\text{mA}$   |
| Emitter-base breakdown voltage       | $BV_{EB0}$    | –6   | –    | –    | V    | $I_E = -10\mu\text{A}$  |
| Collector cutoff current             | $I_{CBO}$     | –    | –    | –100 | nA   | $V_{CB} = -30\text{V}$  |
| Emitter cutoff current               | $I_{EBO}$     | –    | –    | –100 | nA   | $V_{EB} = -30\text{V}$  |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | –    | –180 | –380 | mV   | $I_C = -500\text{mA}, I_B = -25\text{mA}$                         |
| DC current gain                      | $h_{FE}$      | 270  | –    | 680  | –    | $V_{CE} = -2\text{V}, I_C = -100\text{mA}^{*1}$                   |
| Transition frequency                 | $f_T$         | –    | 320  | –    | MHz  | $V_{CE} = -2\text{V}, I_E = 100\text{mA}, f = 100\text{MHz}^{*1}$ |
| Corrector output capacitance         | $C_{ob}$      | –    | 7    | –    | pF   | $V_{CB} = -10\text{V}, I_E = 0\text{A}, f = 1\text{MHz}$          |

\*1 Pulsed

Transistors

●Electrical characteristic curves

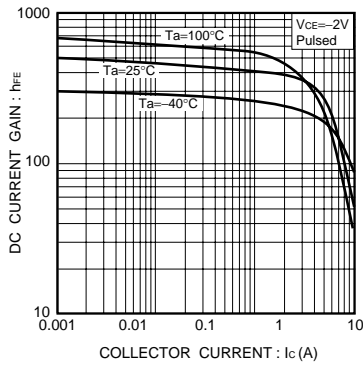


Fig.1 DC current gain vs. collector current

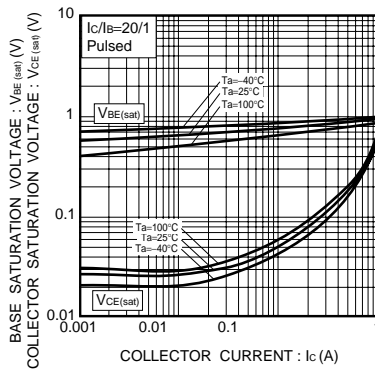


Fig.2 Collector-emitter saturation voltage base-emitter saturation voltage vs. collector current

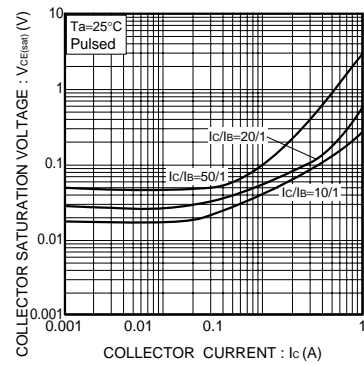


Fig.3 Collector-emitter saturation voltage vs. collector current

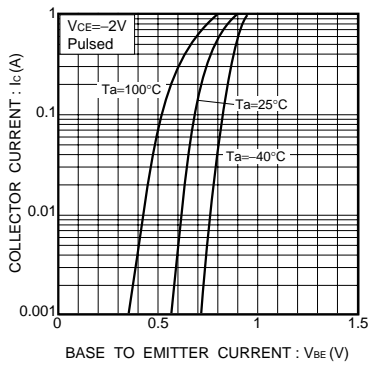


Fig.4 Grounded emitter propagation characteristics

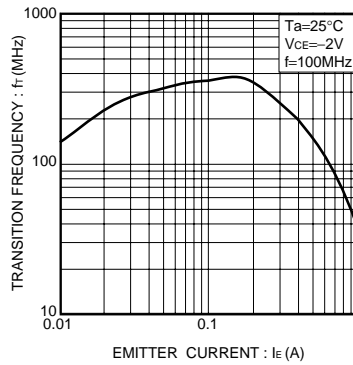


Fig.5 Gain bandwidth product vs. emitter current

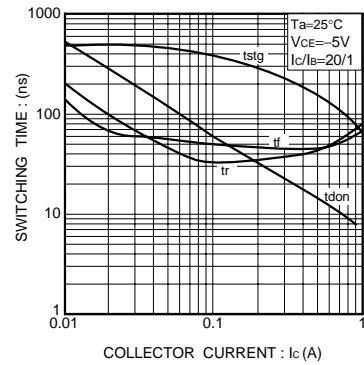


Fig.6 Switching time

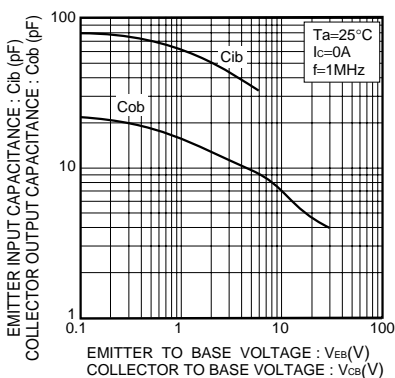


Fig.7 Collector output capacitance vs. collector-base voltage  
Emitter input capacitance vs. emitter-base voltage

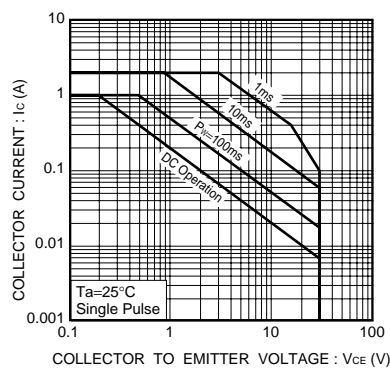


Fig.8 Safe Operating Area