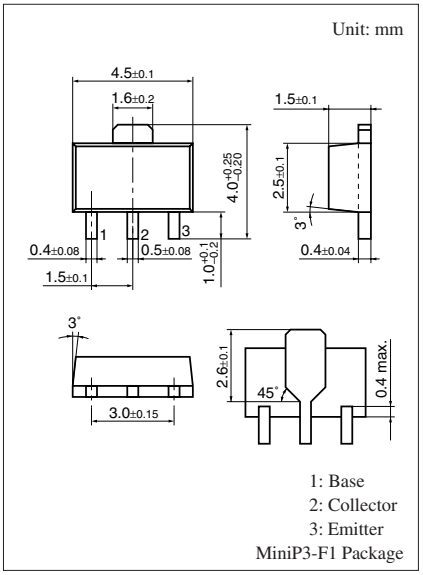
# 2SB1699

## Silicon PNP epitaxial planar type

For power amplification

### ■ Features

- Low collector-emitter saturation voltage $V_{CE(sat)}$
- Mini Power type package, allowing downsizing of the equipment and automatic insertion through the tape packing and the magazine packing.




Marking Symbol: 3A

### ■ Absolute Maximum Ratings $T_a = 25°C$

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Collector-base voltage (Emitter open) | $V_{CBO}$ | −60 | V |
| Collector-emitter voltage (Base open) | $V_{CEO}$ | −60 | V |
| Emitter-base voltage (Collector open) | $V_{EBO}$ | −6 | V |
| Collector current | $I_C$ | −2 | A |
| Peak collector current | $I_{CP}$ | −4 | A |
| Collector power dissipation * | $P_C$ | 1 | W |
| Junction temperature | $T_j$ | 150 | °C |
| Storage temperature | $T_{stg}$ | −55 to +150 | °C |

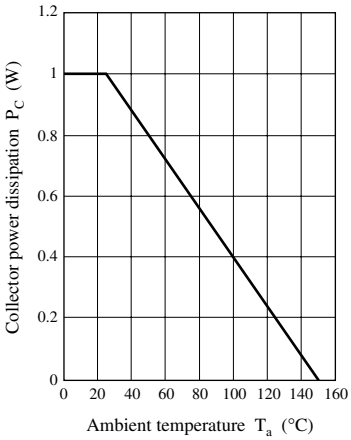
Note) ∗: Print circuit board: Copper foil area of 1 cm$^2$ or more, and the board thickness of 1.7 mm for the collector portion

### ■ Electrical Characteristics $T_a = 25°C \pm 3°C$

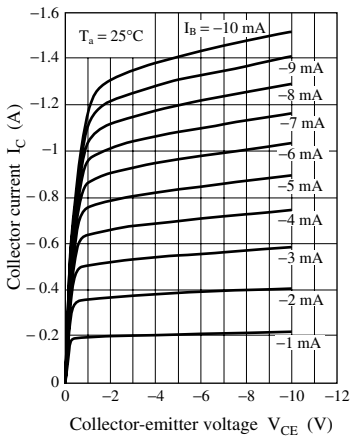
| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Collector-emitter voltage (Base open) | $V_{CEO}$ | $I_C = -1$ mA, $I_B = 0$ | −60 | | | V |
| Collector-base cutoff current (Emitter open) | $I_{CBO}$ | $V_{CB} = -60$ V, $I_E = 0$ | | | −100 | µA |
| Collector-emitter cut-off current (Base open) | $I_{CEO}$ | $V_{CE} = -60$ V, $I_B = 0$ | | | −100 | µA |
| Forward current transfer ratio * | $h_{FE1}$ | $V_{CE} = -4$ V, $I_C = -1$ A | 80 | | 250 | — |
| | $h_{FE2}$ | $V_{CE} = -4$ V, $I_C = -0.2$ A | 60 | | | |
| | $h_{FE3}$ | $V_{CE} = -4$ V, $I_C = -2$ A | 30 | | | |
| Collector-emitter saturation voltage * | $V_{CE(sat)}$ | $I_C = -2$ A, $I_B = -250$ mA | | | −0.5 | V |
| Turn-on time | $t_{on}$ | $I_C = -1$ A, $I_{B1} = 0.1$ A | | 0.2 | | µs |
| Storage time | $t_{stg}$ | $I_{B2} = -0.1$ A, $V_{CC} = -50$ V | | 0.4 | | µs |
| Fall time | $t_f$ | | | 0.1 | | µs |
| Transition frequency | $f_T$ | $V_{CB} = -10$ V, $I_E = 50$ mA, f = 200 MHz | | 180 | | MHz |

Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.
2. ∗: Pulse measurement

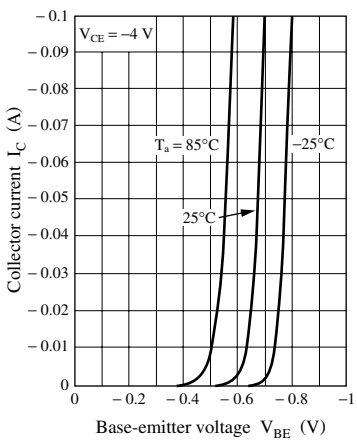
$P_C$ — $T_a$



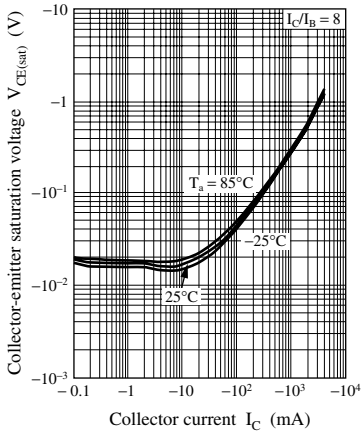

$I_C$ — $V_{CE}$



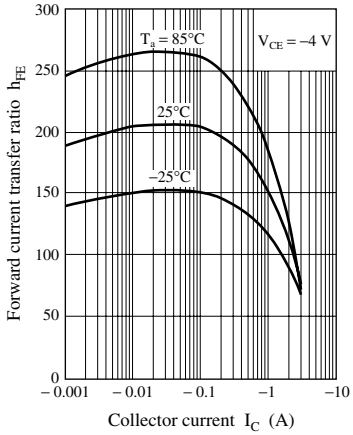

$I_C$ — $V_{BE}$



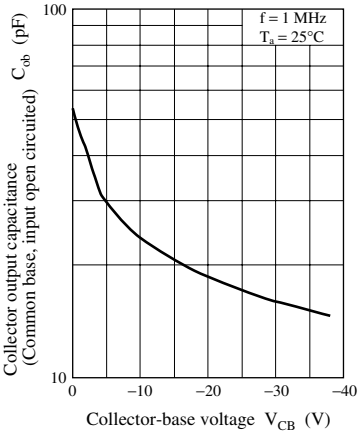

$V_{CE(sat)}$ — $I_C$




$h_{FE}$ — $I_C$




$C_{ob}$ — $V_{CB}$



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