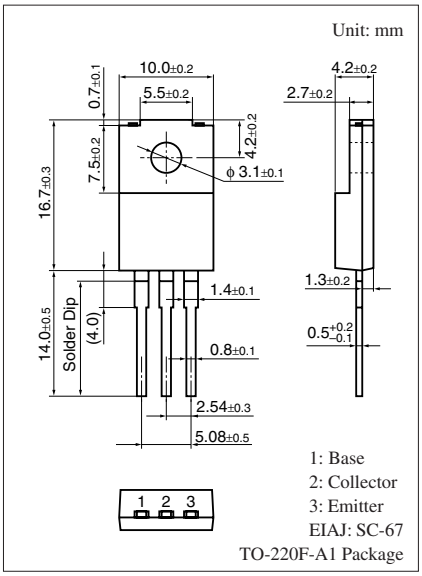
# 2SB1299

## Silicon PNP epitaxial planar type

For power amplification




### ■ Features

- High forward current transfer ratio $h_{FE}$
- Satisfactory linearity of forward current transfer ratio $h_{FE}$
- Full-pack package which can be installed to the heat sink with one screw.

### ■ 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 | | $I_C$ | −3 | A |
| Peak collector current | | $I_{CP}$ | −6 | A |
| Base current | | $I_B$ | −1 | A |
| Collector power dissipation | $T_C = 25°C$ | $P_C$ | 40 | W |
| | | | 2 | |
| Junction temperature | | $T_j$ | 150 | °C |
| Storage temperature | | $T_{stg}$ | −55 to +150 | °C |

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

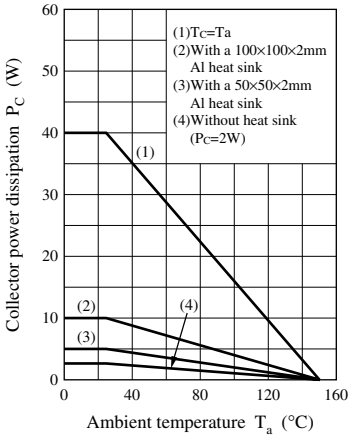
| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Collector-emitter voltage (Base open) | $V_{CEO}$ | $I_C = -25$ mA, $I_B = 0$ | −60 | | | V |
| Collector-base cutoff current (Emitter open) | $I_{CBO}$ | $V_{CB} = -60$ V, $I_E = 0$ | | | −100 | μA |
| Collector-emitter cutoff current (Base open) | $I_{CEO}$ | $V_{CE} = -40$ V, $I_B = 0$ | | | −100 | μA |
| Emitter-base cutoff current (Collector open) | $I_{EBO}$ | $V_{EB} = -6$ V, $I_C = 0$ | | | −100 | μA |
| Forward current transfer ratio * | $h_{FE}$ | $V_{CE} = -4$ V, $I_C = -0.5$ A | 300 | | 700 | — |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = -2$ A, $I_B = -0.05$ A | | | −1 | V |
| Transition frequency | $f_T$ | $V_{CE} = -12$ V, $I_C = -0.2$ A, f = 10 MHz | | 30 | | MHz |

Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

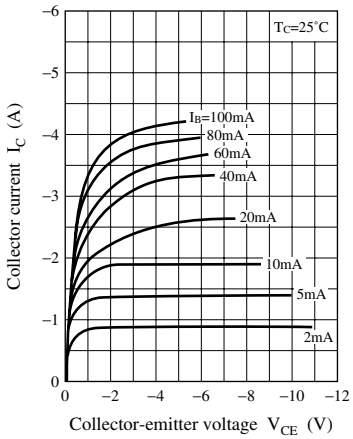
2. *: Rank classification

| Rank | Q | P |
|---|---|---|
| $h_{FE}$ | 300 to 500 | 400 to 700 |

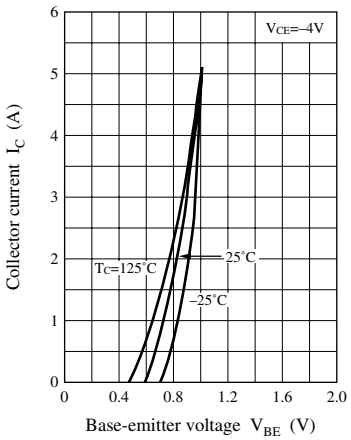
$P_C$ — $T_a$



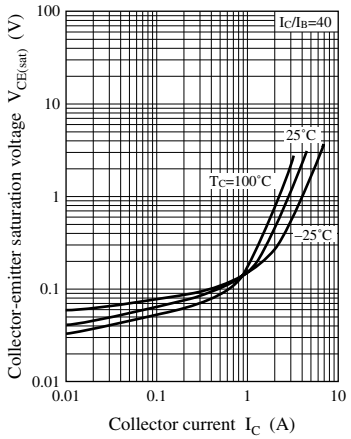

$I_C$ — $V_{CE}$



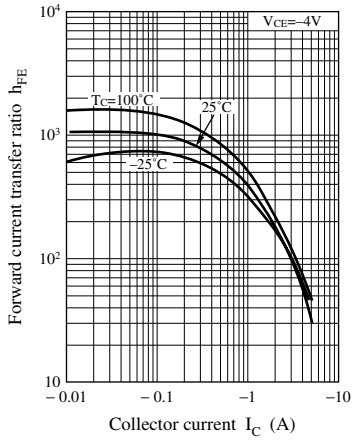

$I_C$ — $V_{BE}$



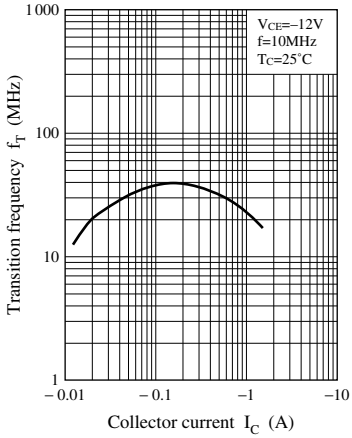

$V_{CE(sat)}$ — $I_C$



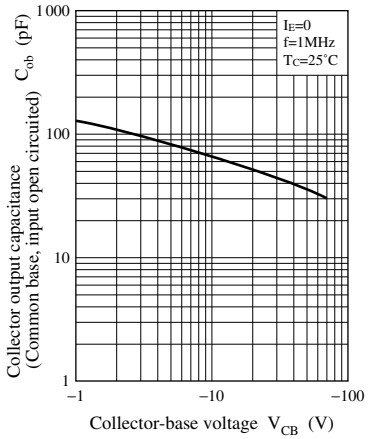

$h_{FE}$ — $I_C$



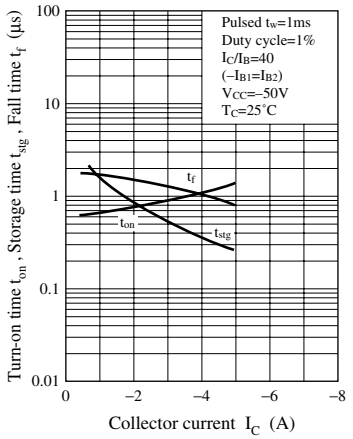

$f_T$ — $I_C$



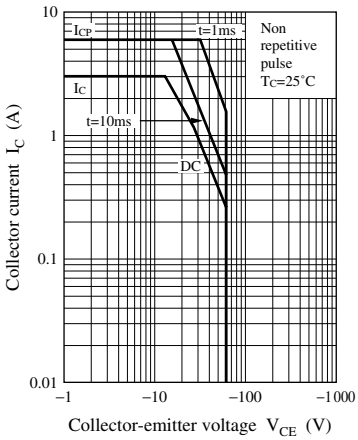

$C_{ob}$ — $V_{CB}$

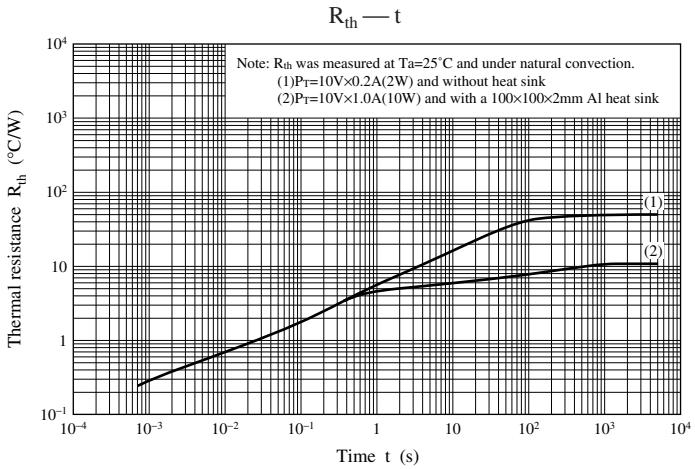



$t_{on}$, $t_{stg}$, $t_f$ — $I_C$




Safe operation area




$R_{th}$ — t
Note: $R_{th}$ was measured at Ta=25°C and under natural convection.
(1)$P_T$=10V×0.2A(2W) and without heat sink
(2)$P_T$=10V×1.0A(10W) and with a 100×100×2mm Al heat sink
Thermal resistance $R_{th}$ (°C/W)
$10^4$
$10^3$
$10^2$
10
1
$10^{-1}$
$10^{-4}$
$10^{-3}$
$10^{-2}$
$10^{-1}$
1
10
$10^2$
$10^3$
$10^4$
Time t (s)
(1)
(2)

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