# 2SD1198, 2SD1198A

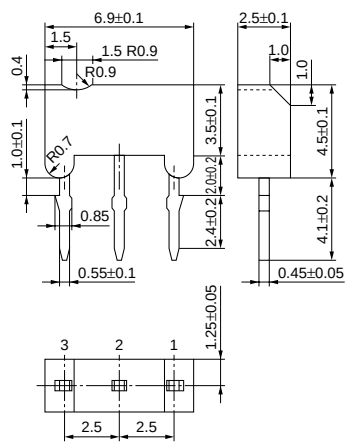
## Silicon NPN epitaxial planer type darlington

For low-frequency amplification

### Features

- Forward current transfer ratio $h_{FE}$ is designed high, which is appropriate to the driver circuit of motors and printer bammer: $h_{FE}$ = 4000 to 40000.
- A shunt resistor is omitted from the driver.
- M type package allowing easy automatic and manual insertion as well as stand-alone fixing to the printed circuit board.

Unit: mm




1:Base
2:Collector
3:Emitter

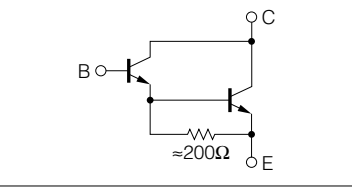
EIAJ:SC–71
M Type Mold Package

### Absolute Maximum Ratings (Ta=25˚C)

| Parameter | | Symbol | Ratings | Unit |
|---|---|---|---|---|
| Collector to base voltage | 2SD1198 | $V_{CBO}$ | 30 | V |
| | 2SD1198A | | 60 | |
| Collector to emitter voltage | 2SD1198 | $V_{CEO}$ | 25 | V |
| | 2SD1198A | | 50 | |
| Emitter to base voltage | | $V_{EBO}$ | 5 | V |
| Peak collector current | | $I_{CP}$ | 1.5 | A |
| Collector current | | $I_C$ | 1 | A |
| Collector power dissipation | | $P_C$* | 1 | W |
| Junction temperature | | $T_j$ | 150 | ˚C |
| Storage temperature | | $T_{stg}$ | –55 ~ +150 | ˚C |

* Printed circuit board: Copper foil area of 1cm$^2$ or more, and the board thickness of 1.7mm for the collector portion

Internal Connection




### Electrical Characteristics (Ta=25˚C)

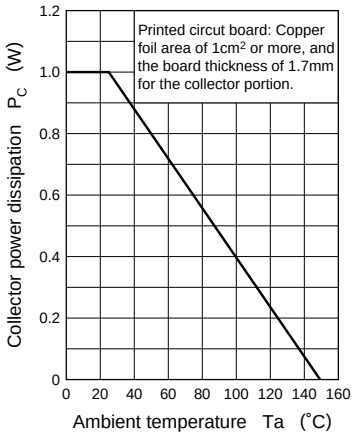
| Parameter | | Symbol | Conditions | min | typ | max | Unit |
|---|---|---|---|---|---|---|---|
| Collector cutoff current | 2SD1198 | $I_{CBO}$ | $V_{CB}$ = 25V, $I_E$ = 0 | | | 100 | nA |
| | 2SD1198A | | $V_{CB}$ = 45V, $I_E$ = 0 | | | 100 | |
| Emitter cutoff current | | $I_{EBO}$ | $V_{EB}$ = 4V, $I_C$ = 0 | | | 100 | nA |
| Collector to base voltage | 2SD1198 | $V_{CBO}$ | $I_C$ = 100μA, $I_B$ = 0 | 30 | | | V |
| | 2SD1198A | | | 60 | | | |
| Collector to emitter voltage | 2SD1198 | $V_{CEO}$ | $I_C$ = 1mA, $I_B$ = 0 | 25 | | | V |
| | 2SD1198A | | | 50 | | | |
| Emitter to base voltage | | $V_{EBO}$ | $I_E$ = 100μA, $I_C$ = 0 | 5 | | | V |
| Forward current transfer ratio | | $h_{FE}$*1 | $V_{CE}$ = 10V, $I_C$ = 1A*2 | 4000 | | 40000 | |
| Collector to emitter saturation voltage | | $V_{CE(sat)}$ | $I_C$ = 1A, $I_B$ = 1mA*2 | | | 1.8 | V |
| Base to emitter saturation voltage | | $V_{BE(sat)}$ | $I_C$ = 1A, $I_B$ = 1mA*2 | | | 2.2 | V |
| Transition frequency | | $f_T$ | $V_{CB}$ = 10V, $I_E$ = –50mA, f = 200MHz | | 150 | | MHz |

*1 $h_{FE}$ Rank classification

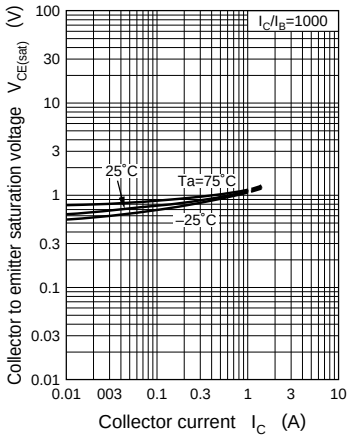
| Rank | Q | R | S |
|---|---|---|---|
| $h_{FE}$ | 4000 ~ 10000 | 8000 ~ 20000 | 16000 ~ 40000 |

*2 Pulse measurement

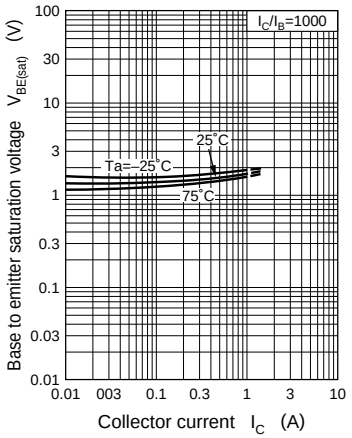
$P_C$ — Ta



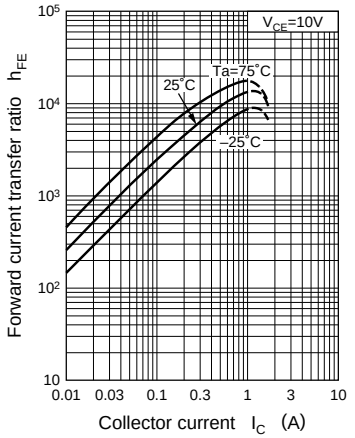

$V_{CE(sat)}$ — $I_C$




$V_{BE(sat)}$ — $I_C$




$h_{FE}$ — $I_C$




$C_{ob}$ — $V_{CB}$