

# 2SD1991A

## Silicon NPN epitaxial planer type

For general amplification

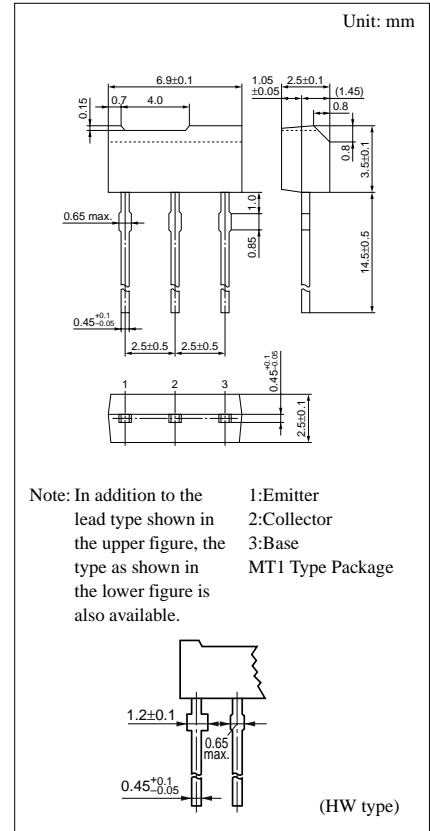
Complementary to 2SB1320A

### Features

- High forward current transfer ratio  $h_{FE}$ .
- Low collector to emitter saturation voltage  $V_{CE(sat)}$ .
- Allowing supply with the radial taping.

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

| Parameter                    | Symbol    | Ratings    | Unit |
|------------------------------|-----------|------------|------|
| Collector to base voltage    | $V_{CBO}$ | 60         | V    |
| Collector to emitter voltage | $V_{CEO}$ | 50         | V    |
| Emitter to base voltage      | $V_{EBO}$ | 7          | V    |
| Peak collector current       | $I_{CP}$  | 200        | mA   |
| Collector current            | $I_C$     | 100        | mA   |
| Collector power dissipation  | $P_C$     | 400        | mW   |
| Junction temperature         | $T_j$     | 150        | °C   |
| Storage temperature          | $T_{stg}$ | -55 ~ +150 | °C   |



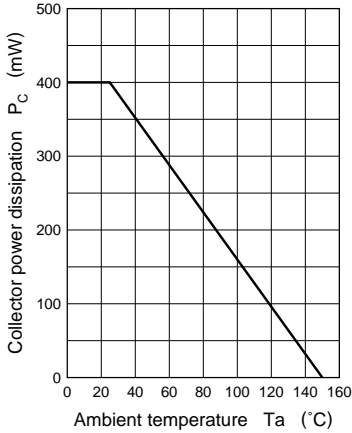
### Electrical Characteristics (Ta=25°C)

| Parameter                               | Symbol        | Conditions                             | min | typ | max | Unit    |
|---|---------------|--|-----|-----|-----|---------|
| Collector cutoff current                | $I_{CBO}$     | $V_{CB} = 20V, I_E = 0$                |     |     | 1   | $\mu A$ |
|   | $I_{CEO}$     | $V_{CE} = 20V, I_B = 0$                |     |     | 1   | $\mu A$ |
| Collector to base voltage               | $V_{CBO}$     | $I_C = 10\mu A, I_E = 0$               | 60  |     |     | V       |
| Collector to emitter voltage            | $V_{CEO}$     | $I_C = 2mA, I_B = 0$                   | 50  |     |     | V       |
| Emitter to base voltage                 | $V_{EBO}$     | $I_E = 10\mu A, I_C = 0$               | 7   |     |     | V       |
| Forward current transfer ratio          | $h_{FE1}^*$   | $V_{CE} = 10V, I_C = 2mA$              | 160 |     | 460 |         |
|   | $h_{FE2}$     | $V_{CE} = 2V, I_C = 100mA$             | 90  |     |     |         |
| Collector to emitter saturation voltage | $V_{CE(sat)}$ | $I_C = 100mA, I_B = 10mA$              |     | 0.1 | 0.3 | V       |
| Transition frequency                    | $f_T$         | $V_{CB} = 10V, I_E = -2mA, f = 200MHz$ |     | 150 |     | MHz     |
| Collector output capacitance            | $C_{ob}$      | $V_{CB} = 10V, I_E = 0, f = 1MHz$      |     | 3.5 |     | pF      |

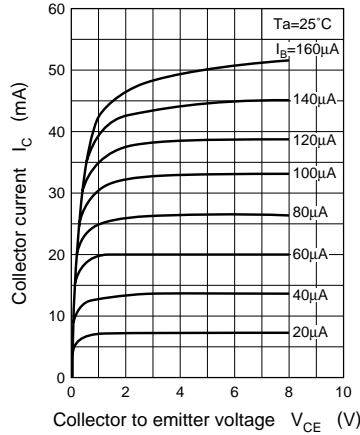
\* $h_{FE1}$  Rank classification

| Rank      | Q         | R         | S         |
|-----------|-----------|-----------|-----------|
| $h_{FE1}$ | 160 ~ 260 | 210 ~ 340 | 290 ~ 460 |

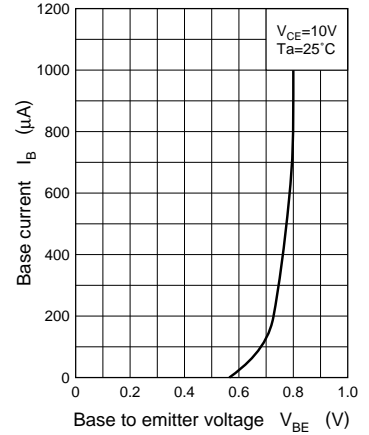
$P_C - T_a$



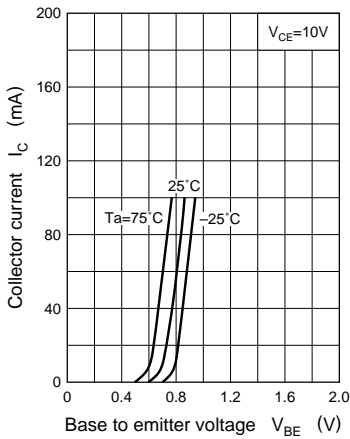
$I_C - V_{CE}$



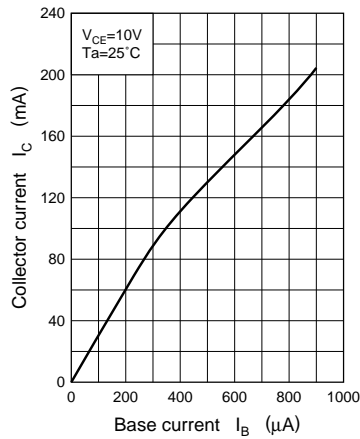
$I_B - V_{BE}$



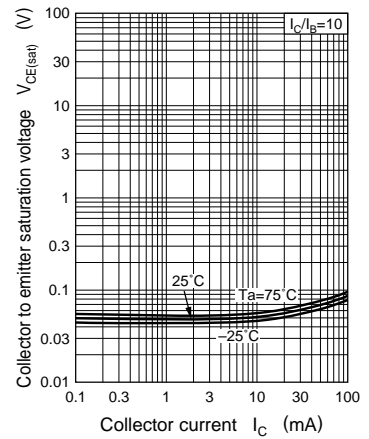
$I_C - V_{BE}$



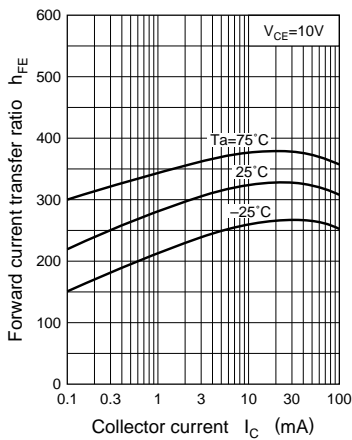
$I_C - I_B$



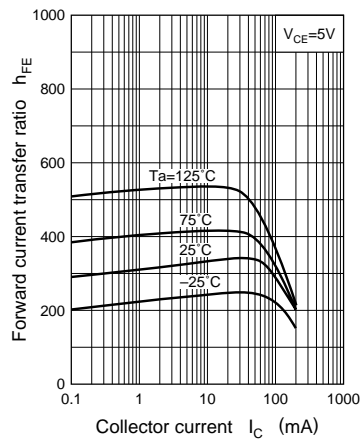
$V_{CE(sat)} - I_C$



$h_{FE} - I_C$



$h_{FE} - I_C$



$f_T - I_E$

