

# Power Transistor (80V, 0.5A)

## 2SD1782K

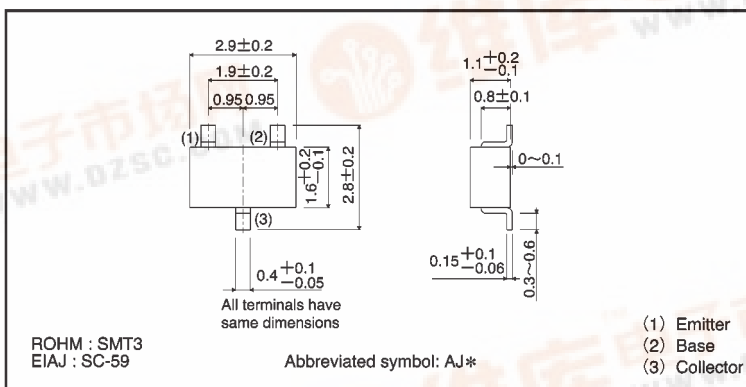
### ●Features

- 1) Low  $V_{CE(sat)}$ .  
 $V_{CE(sat)} = 0.2V$  (Typ.)  
( $I_C / I_B = 0.5A / 50mA$ )
- 2) High  $V_{CEO}$ ,  $V_{CEO} = 80V$
- 3) Complements the 2SB1198K.

### ●Structure

Epitaxial planar type  
NPN silicon transistor

### ●External dimensions (Units: mm)



### ●Absolute maximum ratings ( $T_a = 25^\circ C$ )

| Parameter                   | Symbol    | Limits          | Unit       |
|-----------------------------|-----------|-----------------|------------|
| Collector-base voltage      | $V_{CBO}$ | 80              | V          |
| Collector-emitter voltage   | $V_{CEO}$ | 80              | V          |
| Emitter-base voltage        | $V_{EBO}$ | 5               | V          |
| Collector current           | $I_C$     | 0.5             | A          |
| Collector power dissipation | $P_C$     | 0.2             | W          |
| Junction temperature        | $T_j$     | 150             | $^\circ C$ |
| Storage temperature         | $T_{stg}$ | $-55 \sim +150$ | $^\circ C$ |

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

| Parameter                            | Symbol        | Min. | Typ. | Max. | Unit    | Conditions                        |
|--------------------------------------|---------------|------|------|------|---------|-----------------------------------|
| Collector-base breakdown voltage     | $BV_{CBO}$    | 80   | —    | —    | V       | $I_C=50\mu A$                     |
| Collector-emitter breakdown voltage  | $BV_{CEO}$    | 80   | —    | —    | V       | $I_C=2mA$                         |
| Emitter-base breakdown voltage       | $BV_{EBO}$    | 5    | —    | —    | V       | $I_E=50\mu A$                     |
| Collector cutoff current             | $I_{CBO}$     | —    | —    | 0.5  | $\mu A$ | $V_{CB}=50V$                      |
| Emitter cutoff current               | $I_{EBO}$     | —    | —    | 0.5  | $\mu A$ | $V_{EB}=4V$                       |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | —    | 0.2  | 0.5  | V       | $I_C/I_B=500mA/50mA$              |
| DC current transfer ratio            | $h_{FE}$      | 120  | —    | 390  | —       | $V_{CE}=3V, I_C=100mA$            |
| Transition frequency                 | $f_T$         | —    | 180  | —    | MHz     | $V_{CE}=10V, I_E=-50mA, f=100MHz$ |
| Output capacitance                   | $C_{ob}$      | —    | 7.5  | —    | pF      | $V_{CB}=10V, I_E=0A, f=1MHz$      |

## ●Packaging specifications and $h_{FE}$

| Type     | $h_{FE}$ | Package                      | Taping |
|----------|----------|------------------------------|--------|
|          |          | Code                         | T146   |
|          |          | Basic ordering unit (pieces) | 3000   |
| 2SD1782K | QR       |                              | ○      |

$h_{FE}$  values are classified as follows :

| Item     | Q       | R       |
|----------|---------|---------|
| $h_{FE}$ | 120~270 | 180~390 |

## ●Electrical characteristic curves

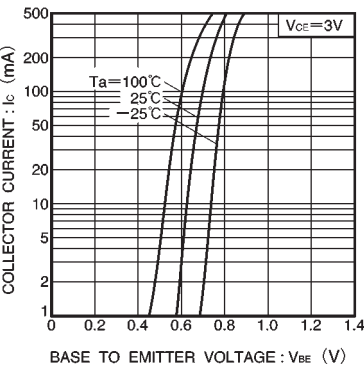


Fig.1 Grounded emitter propagation characteristics

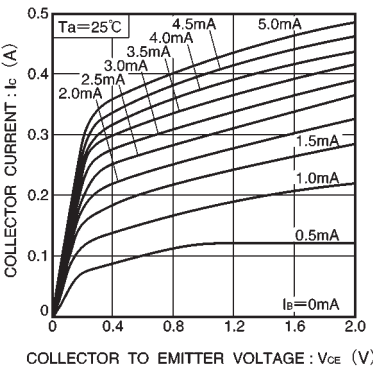


Fig.2 Grounded emitter output characteristics

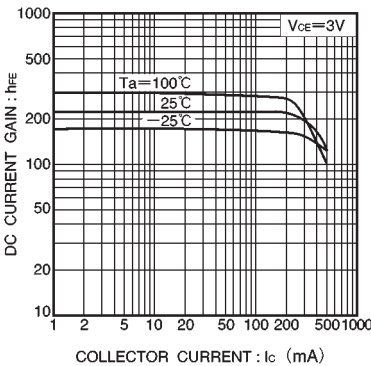


Fig.3 DC current gain vs. collector current

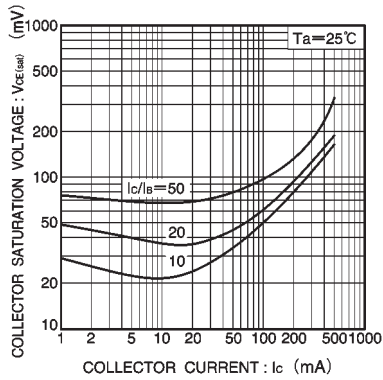


Fig.4 Collector-emitter saturation voltage vs. collector current ( I )

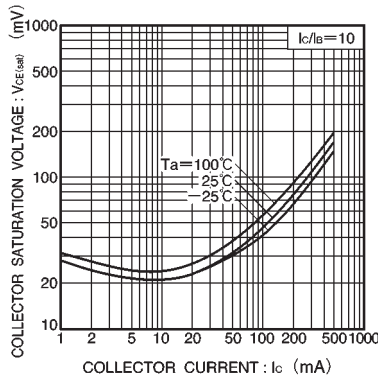


Fig.5 Collector-emitter saturation voltage vs. collector current ( II )

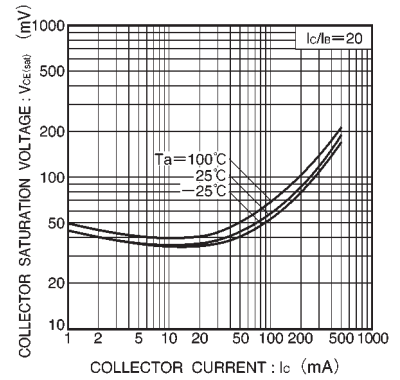


Fig.6 Collector-emitter saturation voltage vs. collector current ( III )

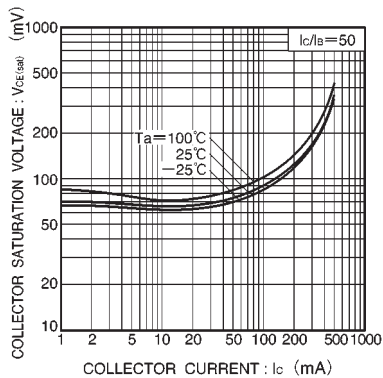


Fig.7 Collector-emitter saturation voltage vs. collector current ( IV )

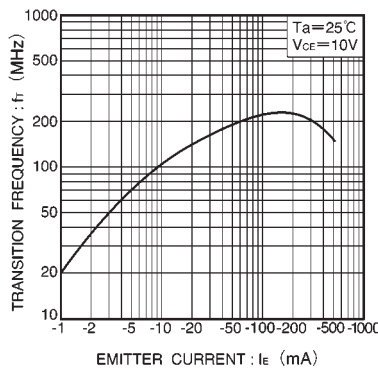


Fig.8 Gain bandwidth product vs. emitter current

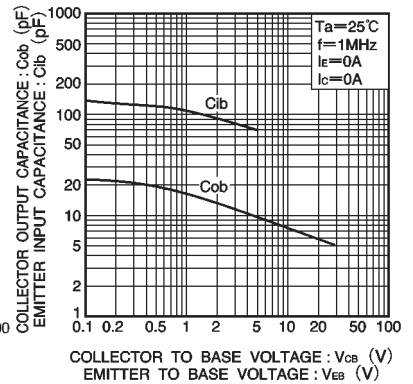


Fig.9 Collector output capacitance vs. collector-base voltage  
Emitter input capacitance vs. emitter-base voltage