

# Medium Power Transistor (32V, 0.8A) 2SD1781K

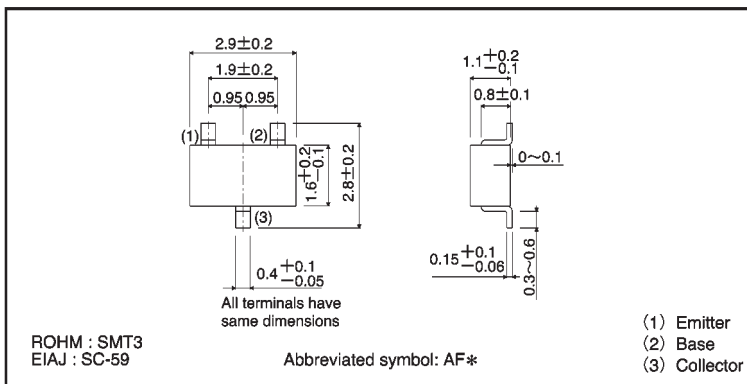
## ●Features

- 1) Very low  $V_{CE(sat)}$ .  
 $V_{CE(sat)} < 0.4 \text{ V (Typ.)}$   
( $I_C / I_B = 500\text{mA} / 50\text{mA}$ )
- 2) High current capacity in compact package.
- 3) Complements the 2SB1197K..

## ● Structure

Epitaxial planar type  
NPN silicon transistor

● External dimensions (Units: mm)



\* Denotes hFE

●Absolute maximum ratings (Ta = 25°C)

| Parameter                   | Symbol    | Limits   | Unit        |
|-----------------------------|-----------|----------|-------------|
| Collector-base voltage      | $V_{CBO}$ | 40       | V           |
| Collector-emitter voltage   | $V_{CEO}$ | 32       | V           |
| Emitter-base voltage        | $V_{EBO}$ | 5        | V           |
| Collector current           | $I_C$     | 0.8      | A (DC)      |
|                             |           | 1.5      | A (Pulse) * |
| Collector power dissipation | $P_C$     | 200      | mW          |
| Junction temperature        | $T_j$     | 150      | °C          |
| Storage temperature         | $T_{stg}$ | -55~+150 | °C          |

\* Single pulse Pw=100ms

●Electrical characteristics (Ta = 25°C)

| Parameter                            | Symbol        | Min. | Typ. | Max. | Unit    | Conditions                       |
|--------------------------------------|---------------|------|------|------|---------|----------------------------------|
| Collector-base breakdown voltage     | $BV_{CBO}$    | 40   | —    | —    | V       | $I_C=50\mu A$                    |
| Collector-emitter breakdown voltage  | $BV_{CEO}$    | 32   | —    | —    | V       | $I_C=1mA$                        |
| Emitter-base breakdown voltage       | $BV_{EBO}$    | 5    | —    | —    | V       | $I_E=50\mu A$                    |
| Collector cutoff current             | $I_{CBO}$     | —    | —    | 0.5  | $\mu A$ | $V_{CB}=20V$                     |
| Emitter cutoff current               | $I_{EBO}$     | —    | —    | 0.5  | $\mu A$ | $V_{EB}=4V$                      |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | —    | —    | 0.4  | V       | $I_C/I_B=500mA/50mA$             |
| DC current transfer ratio            | $h_{FE}$      | 120  | —    | 390  | —       | $V_{CE}=3V, I_C=100mA$           |
| Transition frequency                 | $f_T$         | —    | 150  | —    | MHz     | $V_{CE}=5V, I_E=-50mA, f=100MHz$ |
| Output capacitance                   | $C_{ob}$      | —    | 10   | —    | 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   |
| 2SD1781K | QR       |                              | ○      |

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

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

●Electrical characteristic curves

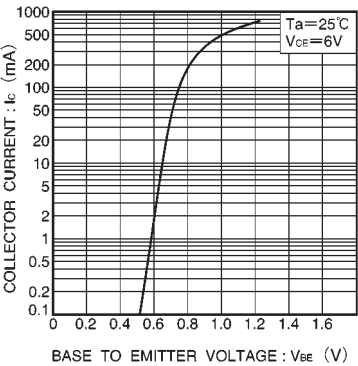


Fig.1 Grounded emitter propagation characteristics

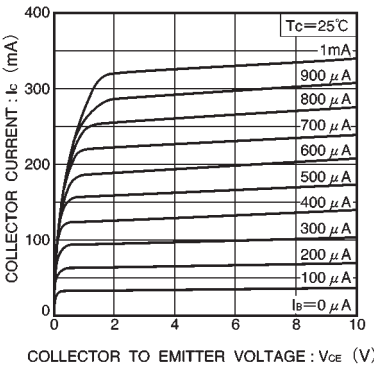


Fig.2 Grounded emitter output characteristics

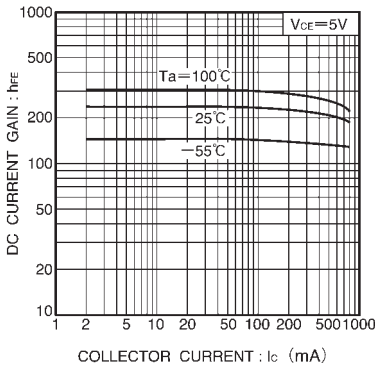


Fig.3 DC current gain vs. collector current

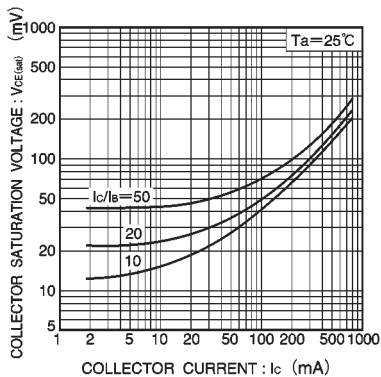


Fig.4 Collector-emitter saturation voltage vs. collector current ( I )

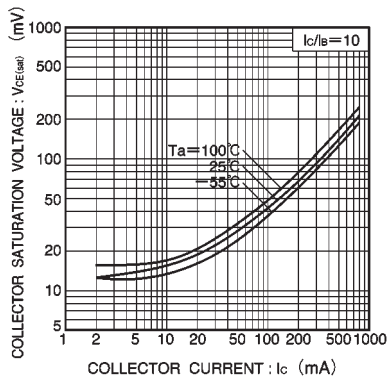


Fig.5 Collector-emitter saturation voltage vs. collector current ( II )

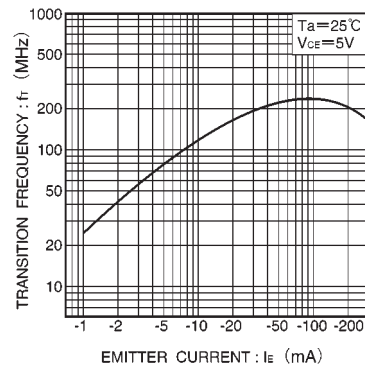


Fig.6 Gain bandwidth product vs. emitter current

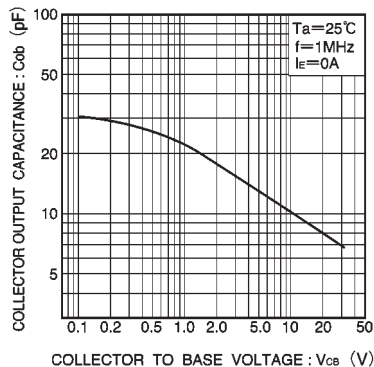


Fig.7 Collector output capacitance vs. collector-base voltage

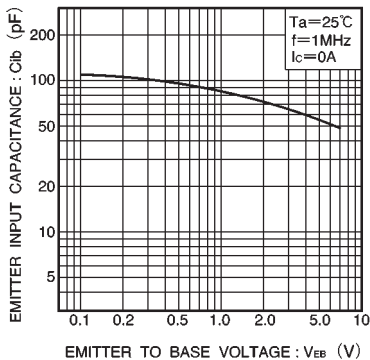


Fig.8 Emitter input capacitance vs. emitter-base voltage