

# Medium Power Transistor (32V, 0.8A)

## 2SD1781K

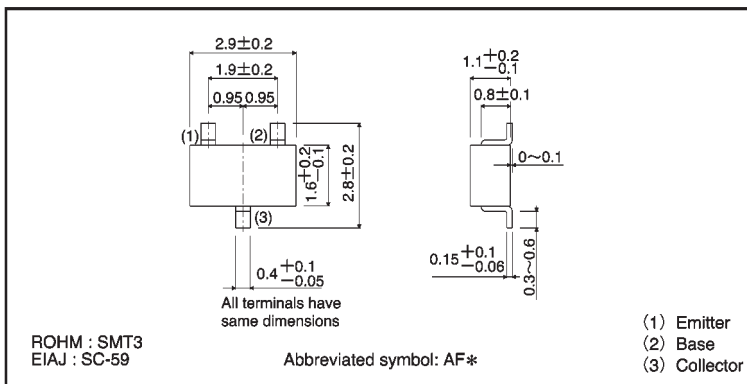
### ●Features

- 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  $h_{FE}$

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


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	$^\circ\text{C}$
Storage temperature	$T_{stg}$	$-55 \sim +150$	$^\circ\text{C}$

\* Single pulse  $P_w = 100\text{ms}$

●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

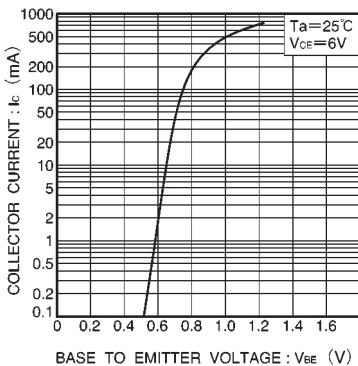


Fig.1 Grounded emitter propagation characteristics

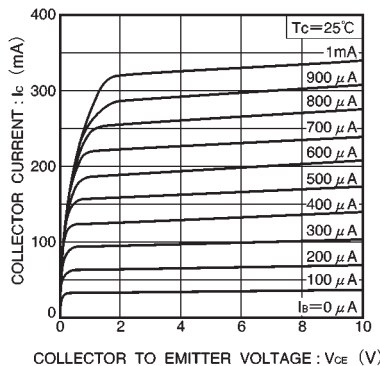


Fig.2 Grounded emitter output characteristics

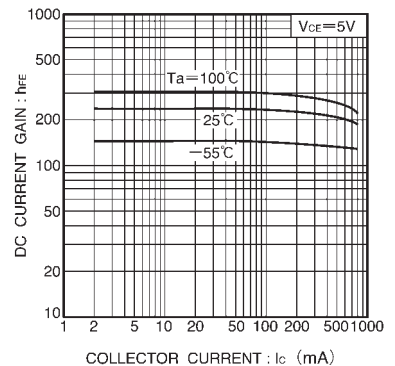


Fig.3 DC current gain vs. collector current

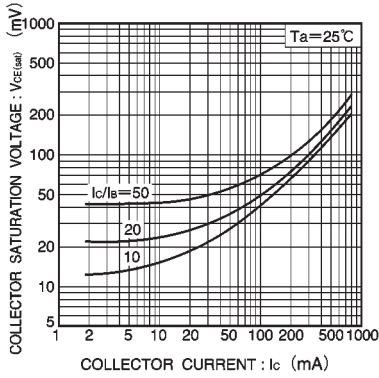


Fig.4 Collector-emitter saturation voltage vs. collector current ( I )

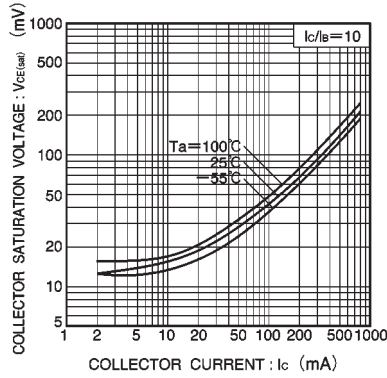


Fig.5 Collector-emitter saturation voltage vs. collector current ( II )

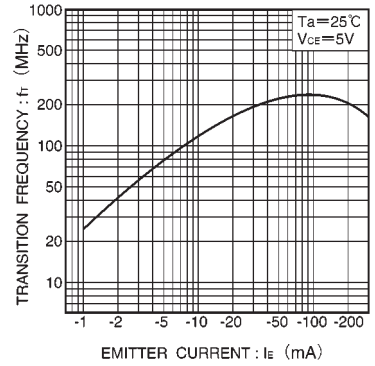


Fig.6 Gain bandwidth product vs. emitter current

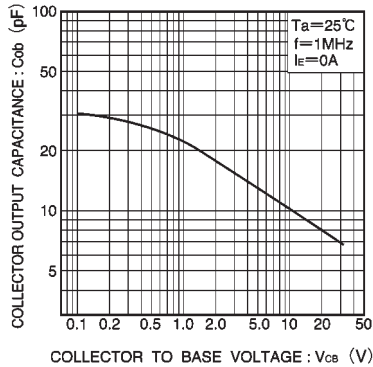


Fig.7 Collector output capacitance vs. collector-base voltage

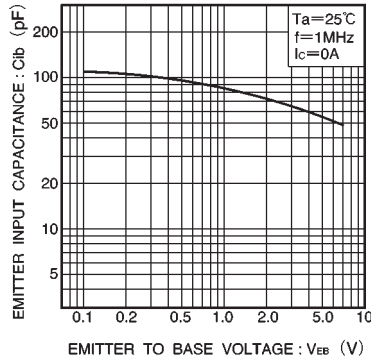


Fig.8 Emitter input capacitance vs. emitter-base voltage