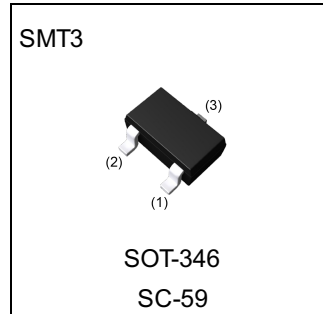


Parameter	Value
$V_{CEO}$	32V
$I_C$	800mA

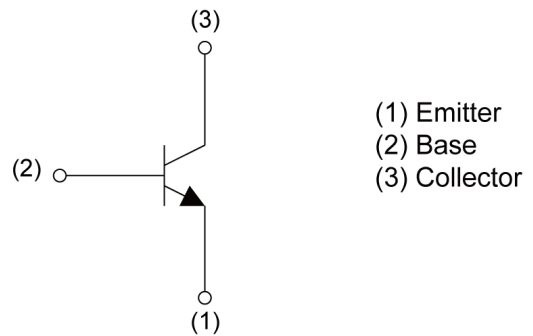
### ●Outline



### ●Features

- 1) Very low  $V_{CE(sat)}$ .  
 $V_{CE(sat)}=0.1V(Typ.)$   
 $(I_C/I_B=500mA/50mA)$
- 2) High current capacity in compact package.
- 3) Complements the 2SB1197K.

### ●Inner circuit



### ●Application

POWER AMPLIFIER

### ●Packaging specifications

Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
2SD1781K	SMT3	2928	T146	180	8	3000	AF

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

Parameter	Symbol	Values	Unit
Collector-base voltage	$V_{CBO}$	40	V
Collector-emitter voltage	$V_{CEO}$	32	V
Emitter-base voltage	$V_{EBO}$	5	V
Collector current	$I_C$	800	mA
	$I_{CP}^{*1}$	1.5	A
Power dissipation	$P_D^{*2}$	200	mW
Junction temperature	$T_j$	150	$^\circ\text{C}$
Range of storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

● **Electrical characteristics** ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Collector-base breakdown voltage	$BV_{CBO}$	$I_C = 50\mu\text{A}$	40	-	-	V
Collector-emitter breakdown voltage	$BV_{CEO}$	$I_C = 1\text{mA}$	32	-	-	V
Emitter-base breakdown voltage	$BV_{EBO}$	$I_E = 50\mu\text{A}$	5	-	-	V
Collector cut-off current	$I_{CBO}$	$V_{CB} = 20\text{V}$	-	-	500	nA
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 4\text{V}$	-	-	500	nA
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 500\text{mA}, I_B = 50\text{mA}$	-	100	400	mV
DC current gain	$h_{FE}$	$V_{CE} = 3\text{V}, I_C = 100\text{mA}$	120	-	390	-
Transition frequency	$f_T$	$V_{CE} = 5\text{V}, I_E = -50\text{mA}, f = 100\text{MHz}$	-	150	-	MHz
Output capacitance	$C_{ob}$	$V_{CB} = 10\text{V}, I_E = 0\text{A}, f = 1\text{MHz}$	-	15	-	pF

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

rank	Q	R	-	-	-
$h_{FE}$	120-270	180-390	-	-	-

\*1  $P_w=100\text{ms}$  Single pulse

\*2 Each terminal mounted on a reference land.

● Electrical characteristic curves ( $T_a = 25^\circ\text{C}$ )

Fig.1 Ground Emitter Propagation Characteristics

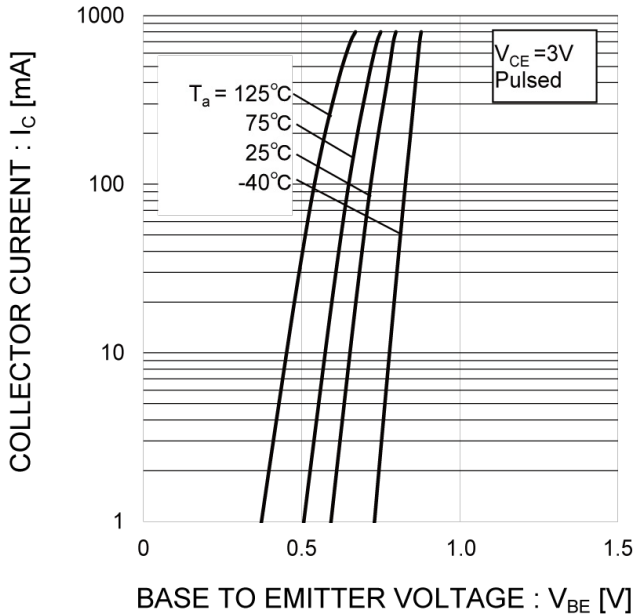


Fig.2 Typical Output Characteristics

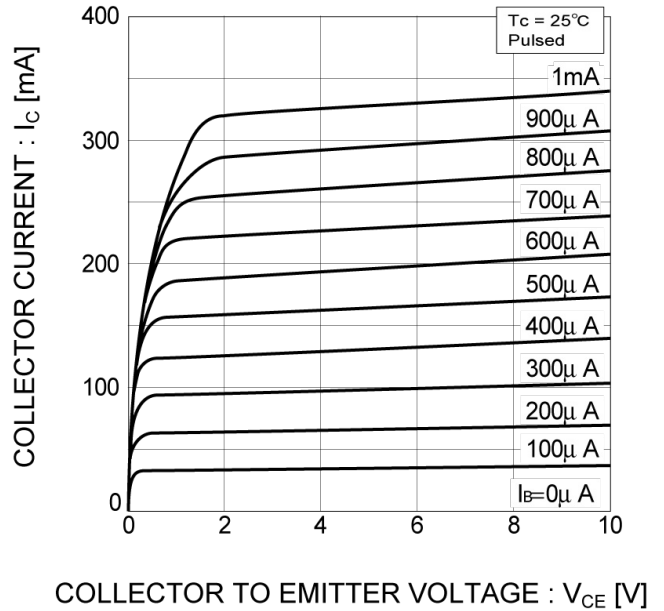


Fig.3 DC Current Gain vs. Collector Current (I)

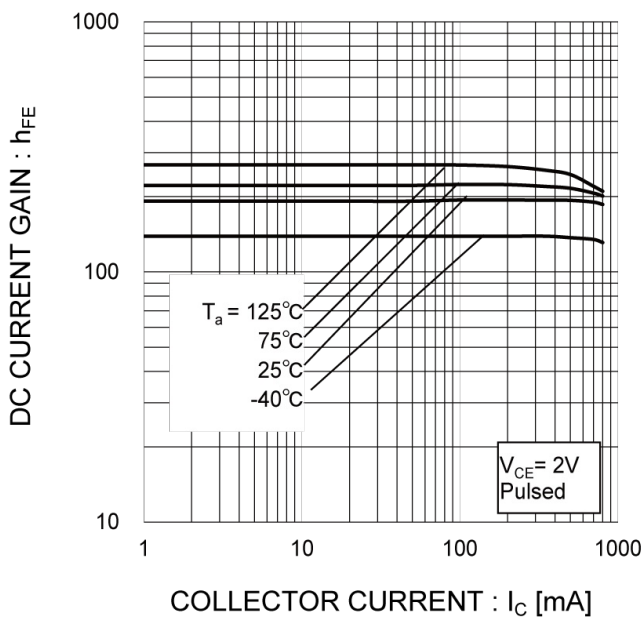
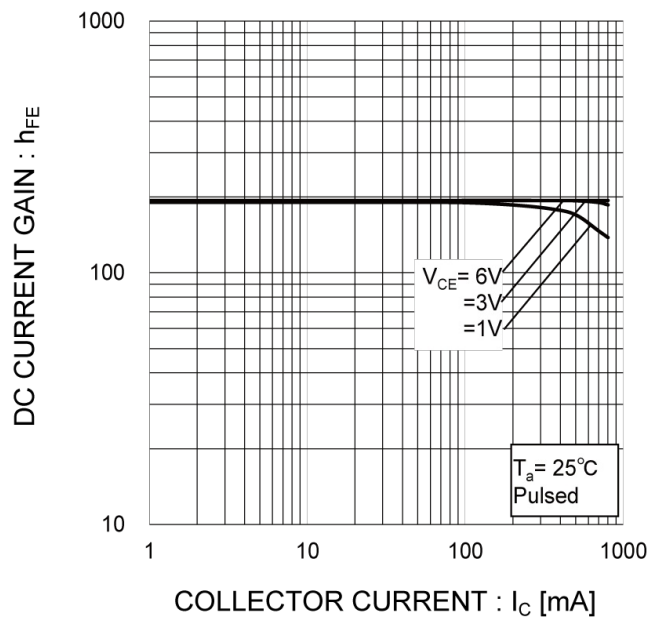


Fig.4 DC Current Gain vs. Collector Current (II)



● Electrical characteristic curves ( $T_a = 25^\circ\text{C}$ )

Fig.5 Collector-Emitter Saturation Voltage vs. Collector Current (I)

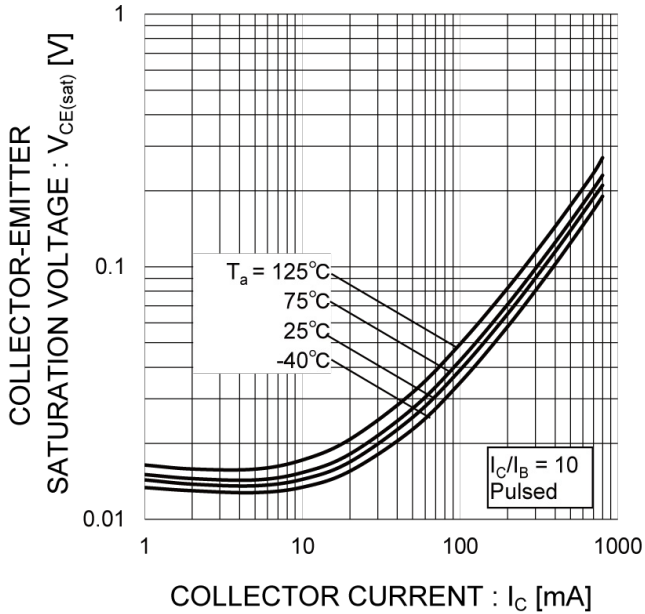


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

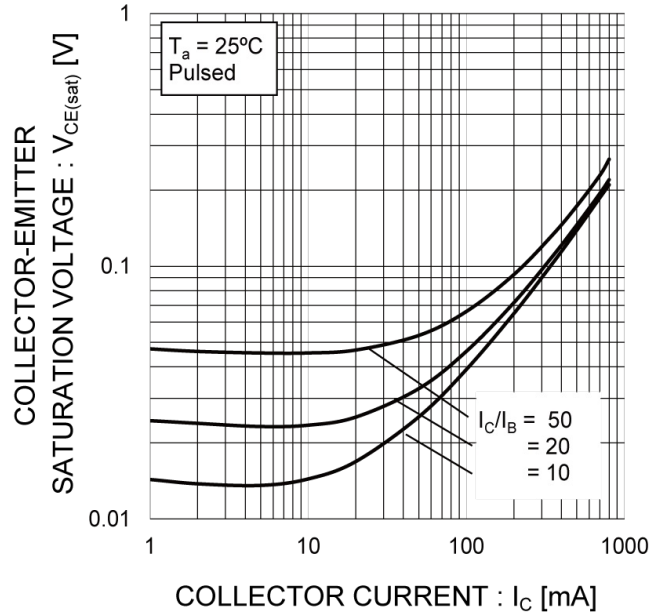


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

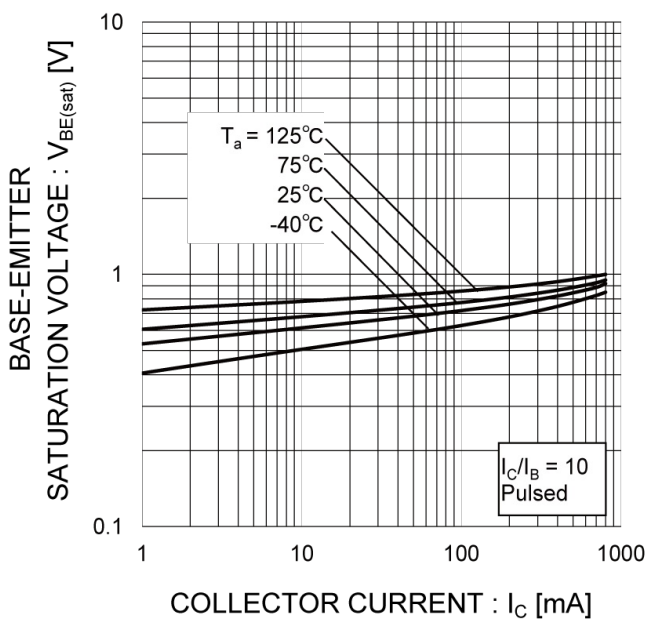
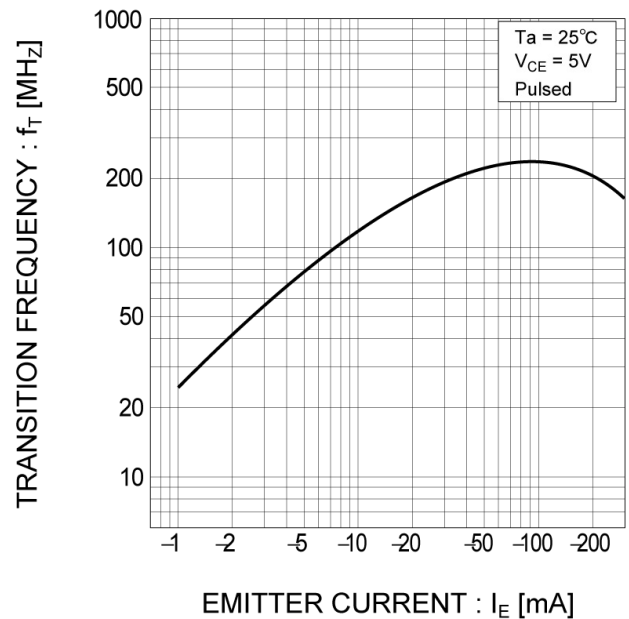


Fig.8 Gain Bandwidth Product vs. Emitter Current



●Electrical characteristic curves( $T_a = 25^\circ\text{C}$ )

Fig.9 Emitter Input Capacitance vs.  
Emitter-Base Voltage  
Collector Output Capacitance vs.  
Collector-Base Voltage

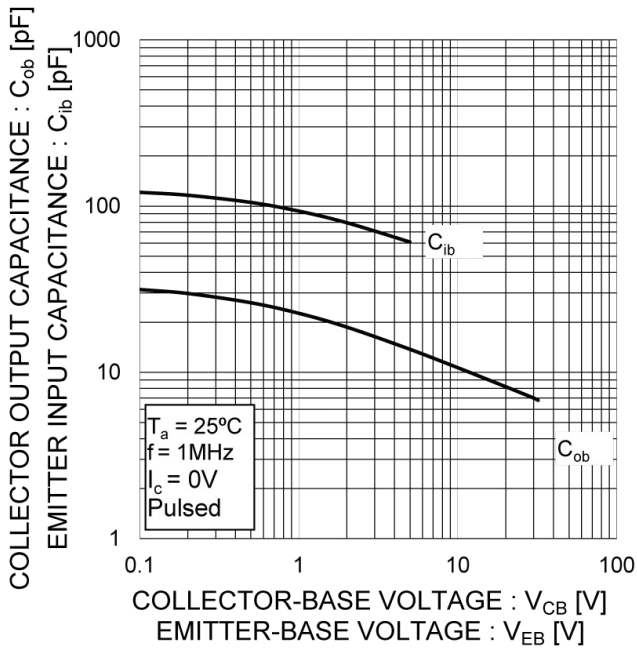
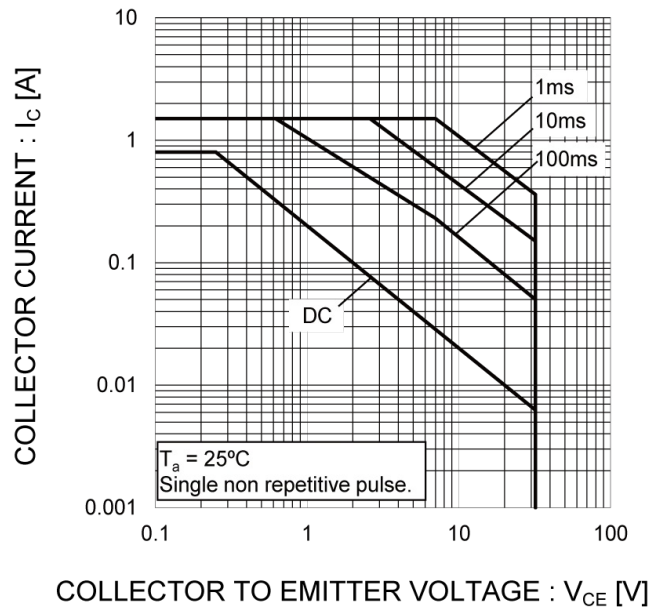
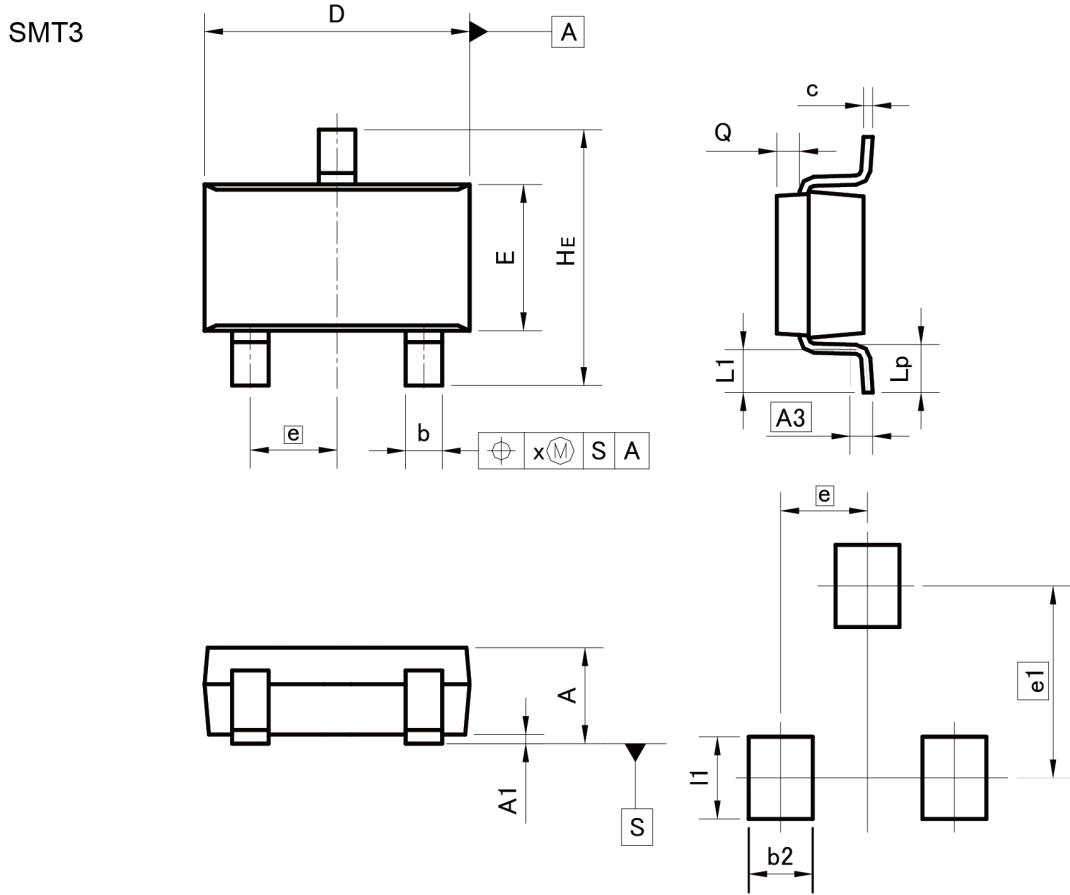


Fig.10 Safe Operating Area



●Dimensions



Pattern of terminal position areas  
[Not a recommended pattern of soldering pads]

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.00	1.30	0.039	0.051
A1	0.00	0.10	0.000	0.004
A3	0.25		0.010	
b	0.35	0.50	0.014	0.020
c	0.09	0.25	0.004	0.010
D	2.80	3.00	0.110	0.118
E	1.50	1.80	0.059	0.071
e	0.95		0.037	
HE	2.60	3.00	0.102	0.118
L1	0.30	0.60	0.012	0.024
Lp	0.40	0.70	0.016	0.028
Q	0.20	0.30	0.008	0.012
x	-	0.10	-	0.004
y	-	0.10	-	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	-	0.60	-	0.024
e1	2.10		0.083	
l1	-	0.90	-	0.035

Dimension in mm/inches

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