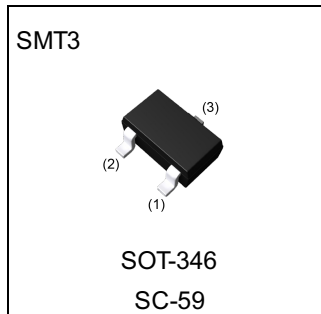


Parameter	Value
$V_{CEO}$	32V
$I_C$	800mA

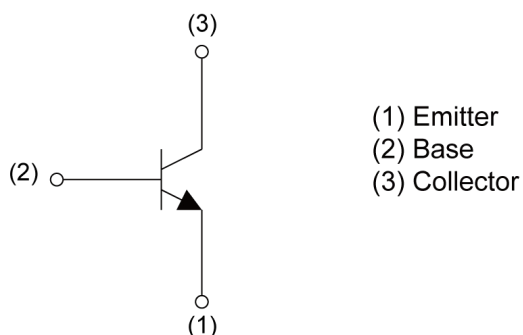
## ●Outline



## ●Features

- 1)Very low  $V_{CE(sat)}$ .  
 $V_{CE(sat)}=0.1V(Typ.)$   
 $(I_C/I_B=500mA/50mA)$
- 2)Higt 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	$V_{\text{CBO}}$	40	V
Collector-emitter voltage	$V_{\text{CEO}}$	32	V
Emitter-base voltage	$V_{\text{EBO}}$	5	V
Collector current	$I_{\text{C}}$	800	mA
	$I_{\text{CP}}^{*1}$	1.5	A
Power dissipation	$P_{\text{D}}^{*2}$	200	mW
Junction temperature	$T_{\text{j}}$	150	$^\circ\text{C}$
Range of storage temperature	$T_{\text{stg}}$	-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	$BV_{\text{CBO}}$	$I_{\text{C}} = 50\mu\text{A}$	40	-	-	V
Collector-emitter breakdown voltage	$BV_{\text{CEO}}$	$I_{\text{C}} = 1\text{mA}$	32	-	-	V
Emitter-base breakdown voltage	$BV_{\text{EBO}}$	$I_{\text{E}} = 50\mu\text{A}$	5	-	-	V
Collector cut-off current	$I_{\text{CBO}}$	$V_{\text{CB}} = 20\text{V}$	-	-	500	nA
Emitter cut-off current	$I_{\text{EBO}}$	$V_{\text{EB}} = 4\text{V}$	-	-	500	nA
Collector-emitter saturation voltage	$V_{\text{CE(sat)}}$	$I_{\text{C}} = 500\text{mA}$ , $I_{\text{B}} = 50\text{mA}$	-	100	400	mV
DC current gain	$h_{\text{FE}}$	$V_{\text{CE}} = 3\text{V}$ , $I_{\text{C}} = 100\text{mA}$	120	-	390	-
Transition frequency	$f_{\text{T}}$	$V_{\text{CE}} = 5\text{V}$ , $I_{\text{E}} = -50\text{mA}$ , $f = 100\text{MHz}$	-	150	-	MHz
Output capacitance	$C_{\text{ob}}$	$V_{\text{CB}} = 10\text{V}$ , $I_{\text{E}} = 0\text{A}$ , $f = 1\text{MHz}$	-	15	-	pF

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

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

\*1  $P_{\text{W}}=100\text{ms}$  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

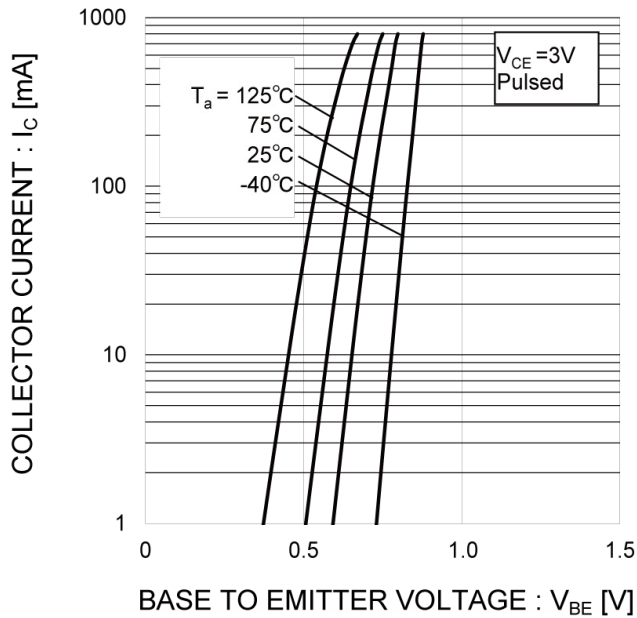


Fig.2 Typical Output Characteristics

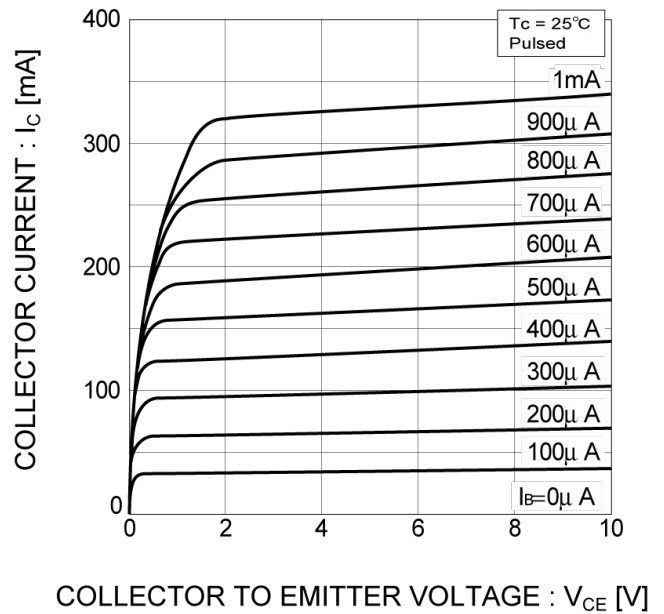


Fig.3 DC Current Gain vs. Collector Current (I)

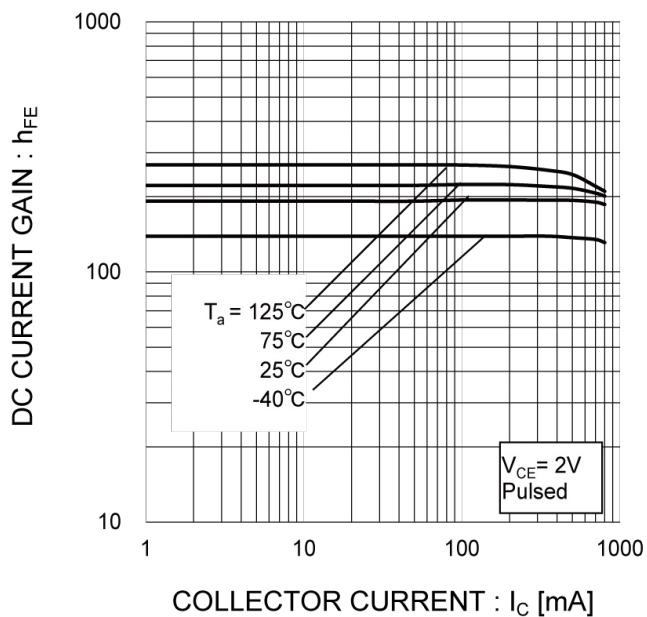
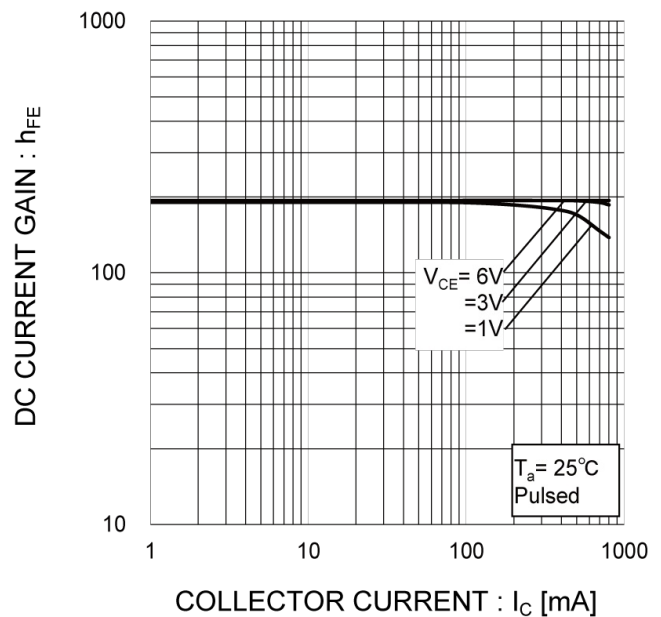


Fig.4 DC Current Gain vs. Collector Current (II)



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

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

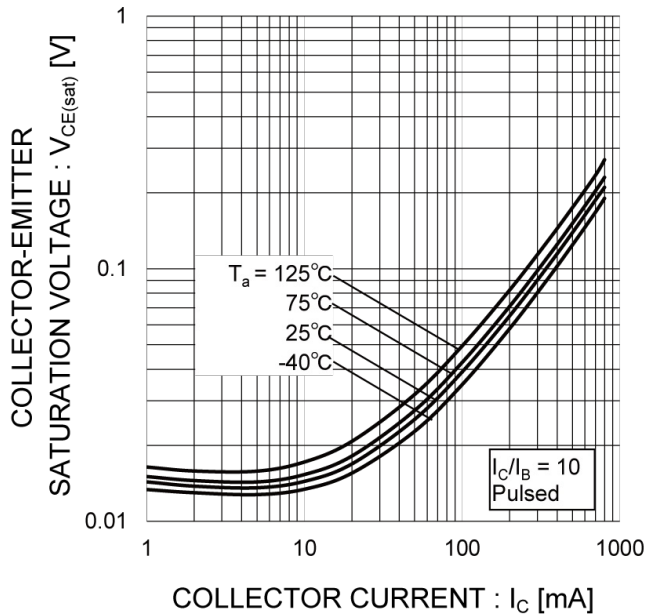


Fig.6 Collector-Emitter Saturation  
Voltage vs. Collector Current (II)

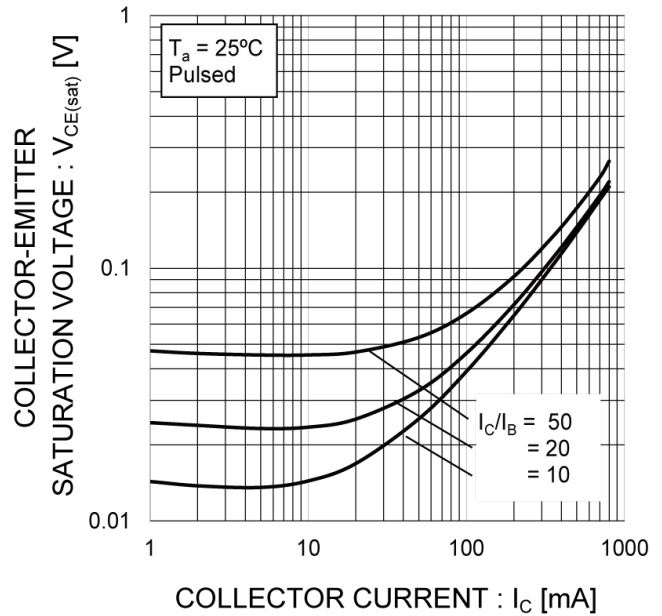


Fig.7 Base-Emitter Saturation Voltage  
vs. Collector Current

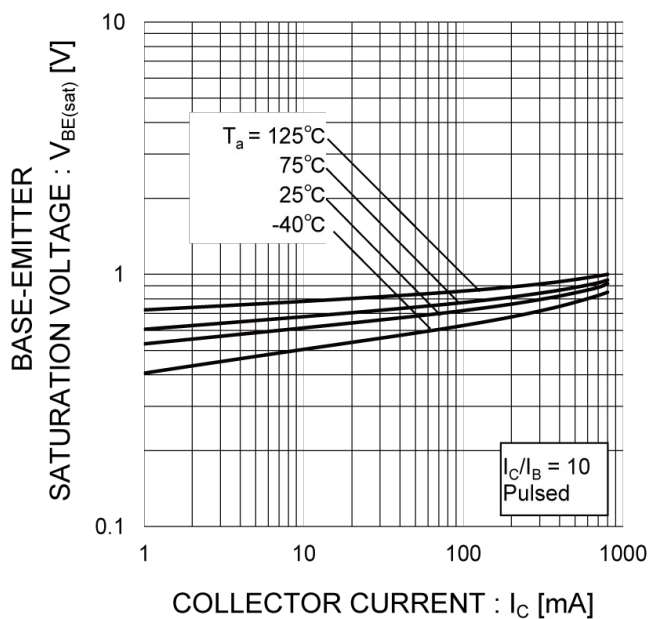
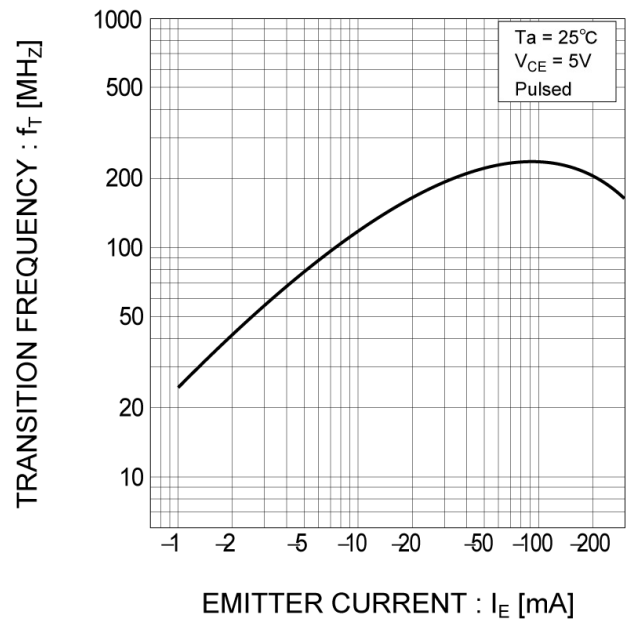


Fig.8 Gain Bandwidth Product vs.  
Emitter Current



●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

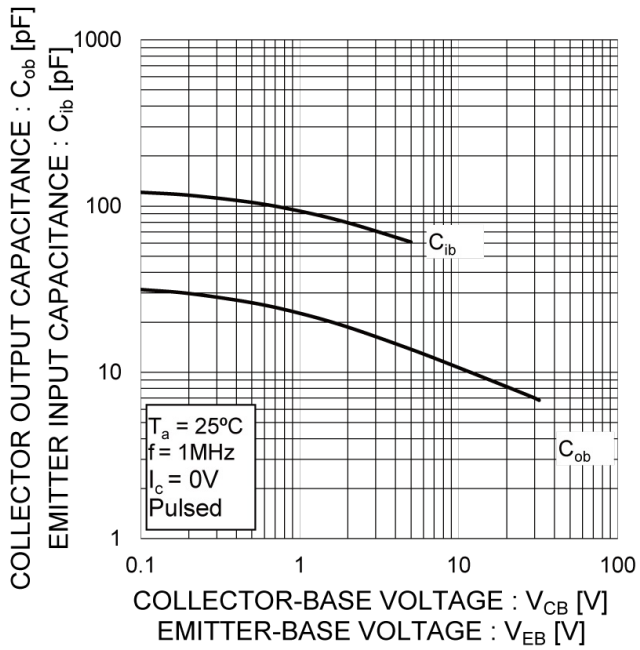
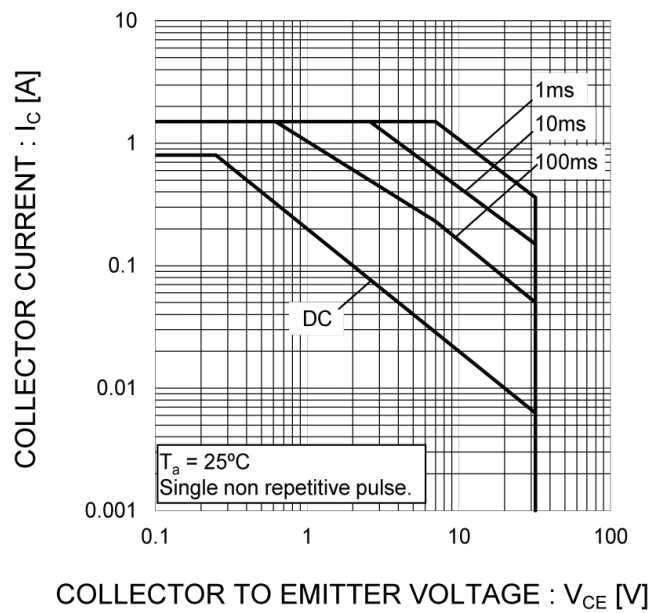
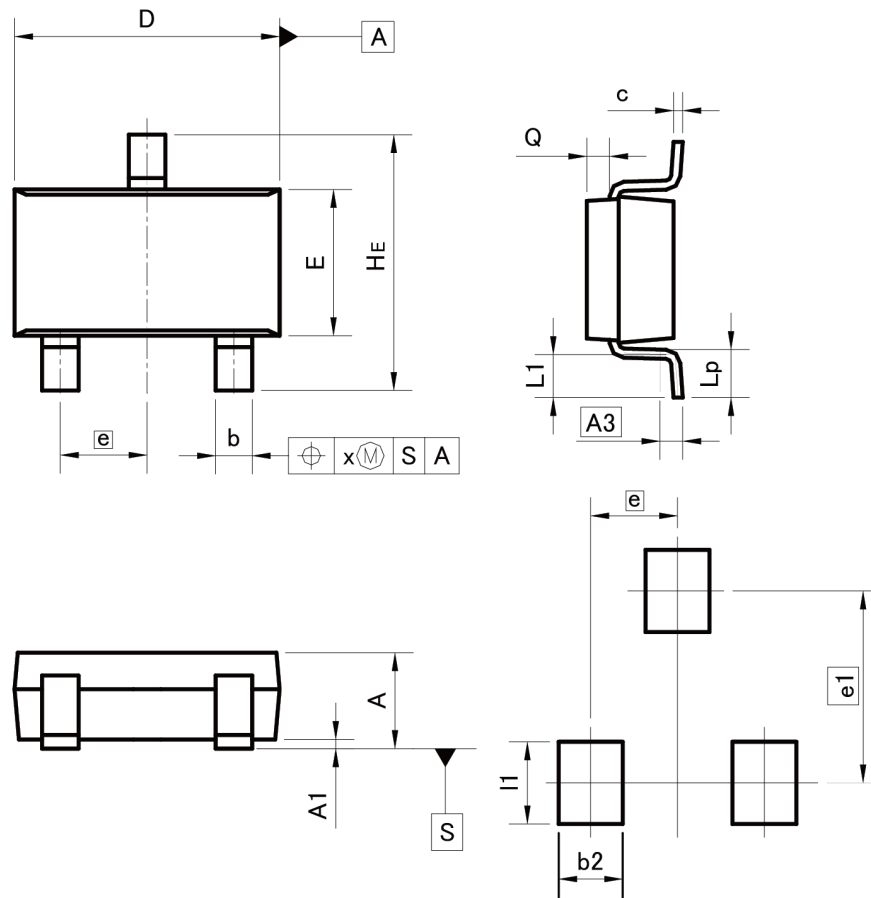


Fig.10 Safe Operating Area



## ●Dimensions

SMT3



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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