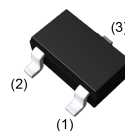


Parameter	Value
V_{CEO}	32V
I_C	800mA

●Outline

SMT3

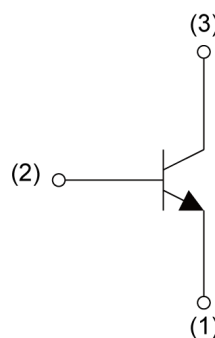


2SD1781K
SOT-346

●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



- (1) Emitter
(2) Base
(3) Collector

●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}	$I_{\text{C}} = 50\mu\text{A}$	40	-	-	V
Collector-emitter breakdown voltage	BV_{CEO}	$I_{\text{C}} = 1\text{mA}$	32	-	-	V
Emitter-base breakdown voltage	BV_{EBO}	$I_{\text{E}} = 50\mu\text{A}$	5	-	-	V
Collector cut-off current	I_{CBO}	$V_{\text{CB}} = 20\text{V}$	-	-	500	nA
Emitter cut-off current	I_{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_{FE}	$V_{\text{CE}} = 3\text{V}$, $I_{\text{C}} = 100\text{mA}$	120	-	390	-
Transition frequency	f_{T}	$V_{\text{CE}} = 5\text{V}$, $I_{\text{E}} = -50\text{mA}$, $f = 100\text{MHz}$	-	150	-	MHz
Output capacitance	C_{ob}	$V_{\text{CB}} = 10\text{V}$, $I_{\text{E}} = 0\text{A}$, $f = 1\text{MHz}$	-	15	-	pF

h_{FE} values are classified as follows :

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

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

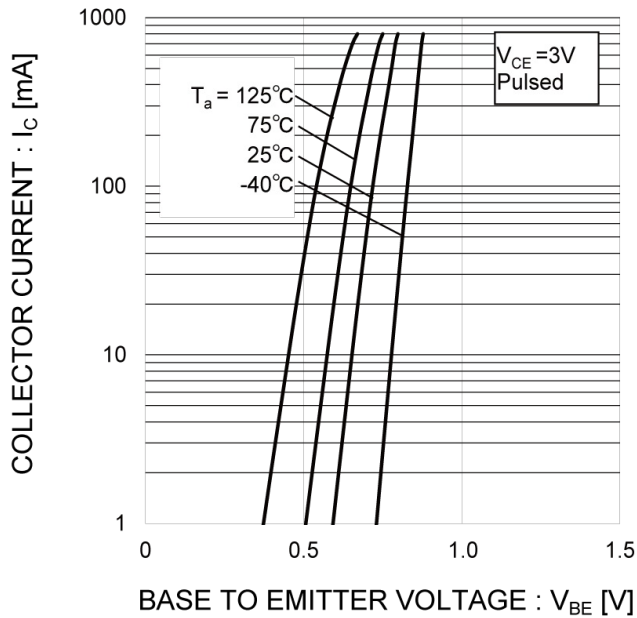


Fig.2 Typical Output Characteristics

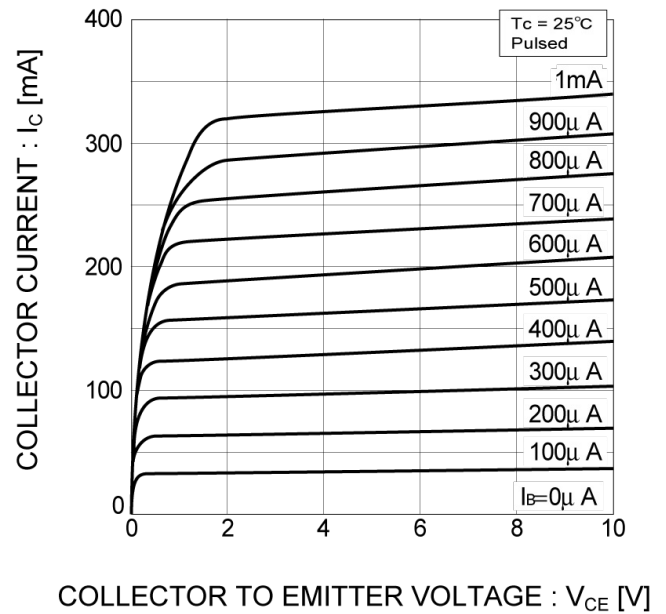


Fig.3 DC Current Gain vs. Collector Current (I)

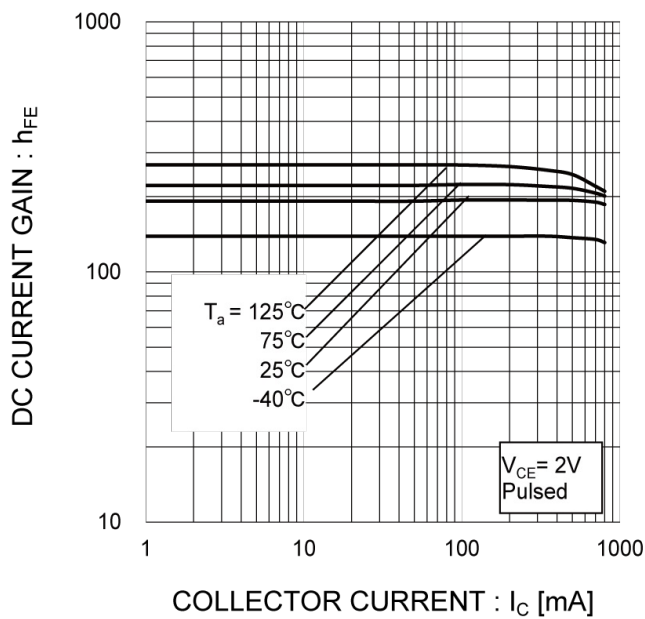
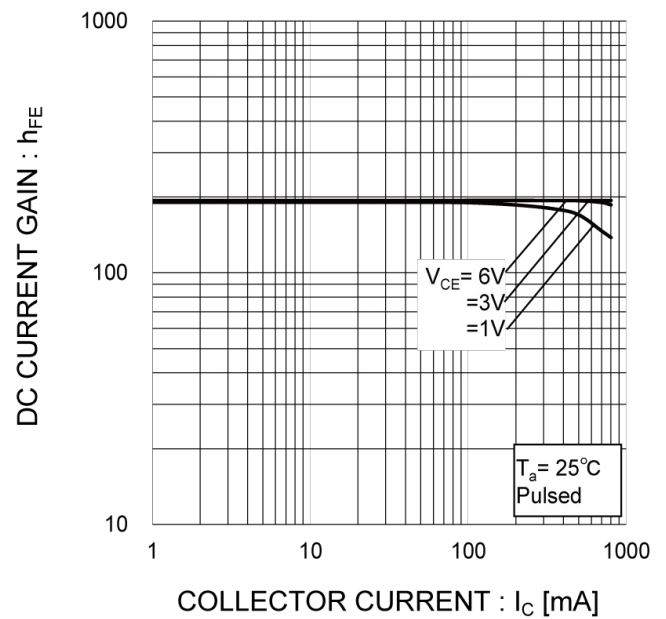


Fig.4 DC Current Gain vs. Collector Current (II)



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

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

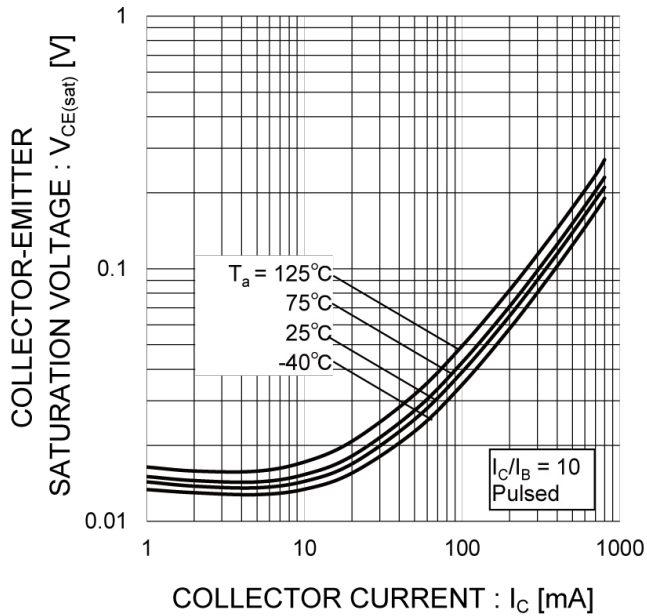


Fig.6 Collector-Emitter Saturation
Voltage vs. Collector Current (II)

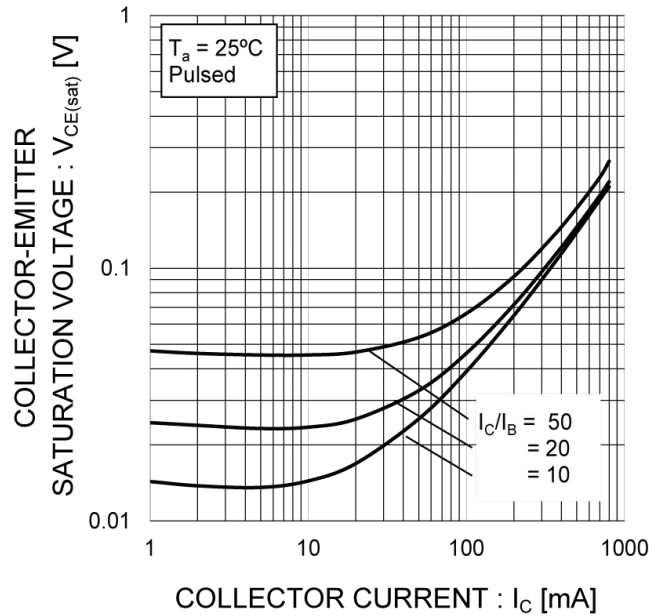


Fig.7 Base-Emitter Saturation Voltage
vs. Collector Current

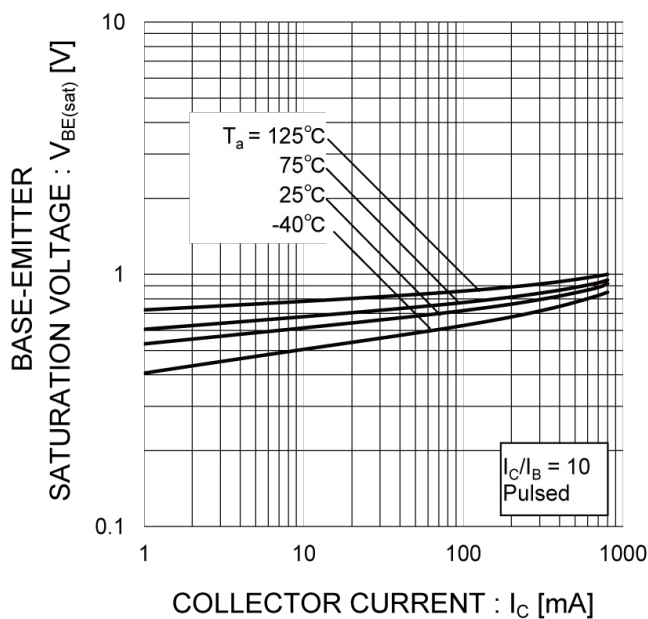
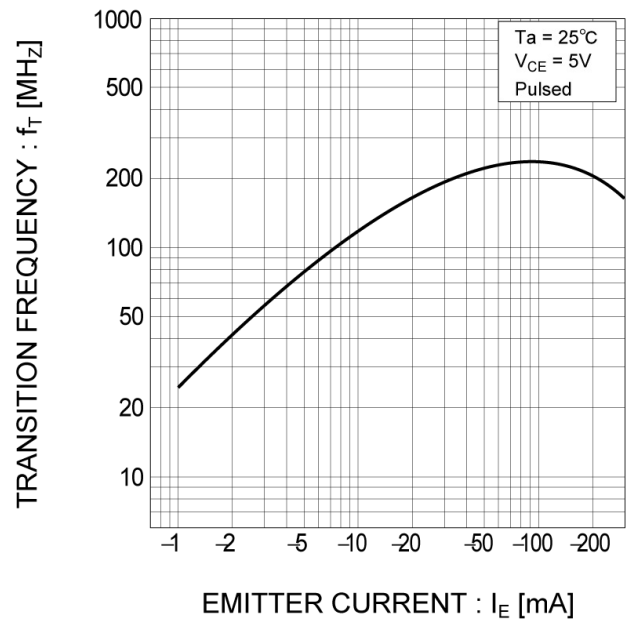


Fig.8 Gain Bandwidth Product vs.
Emitter Current



●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

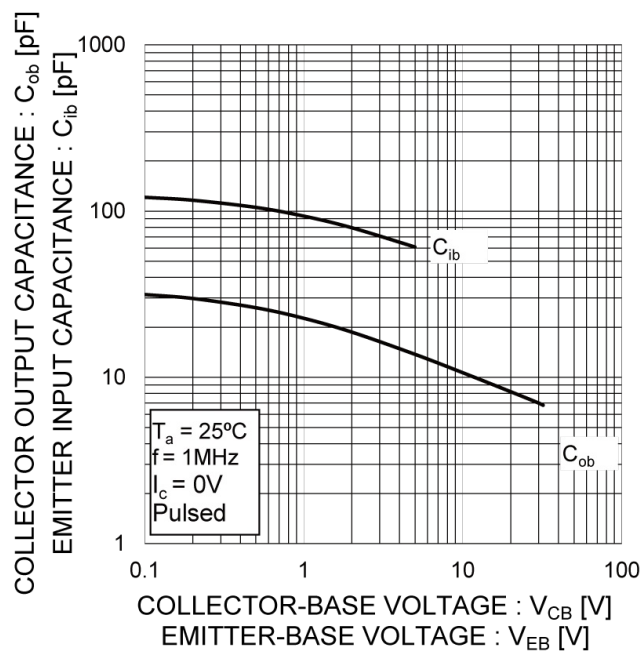
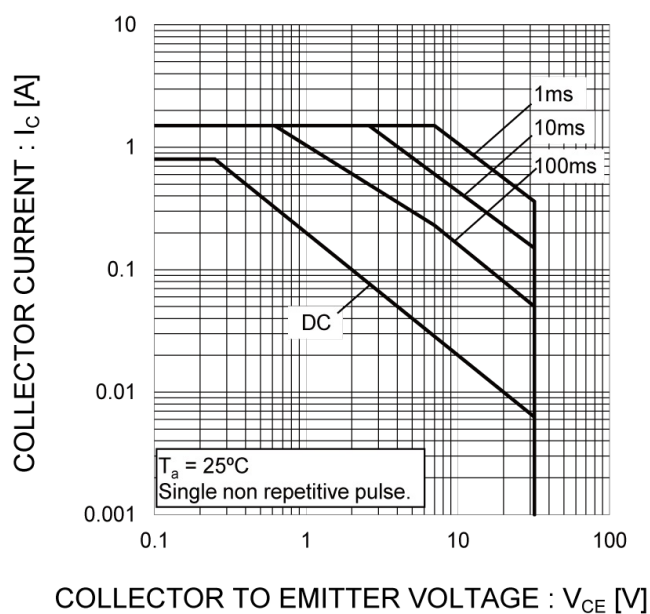
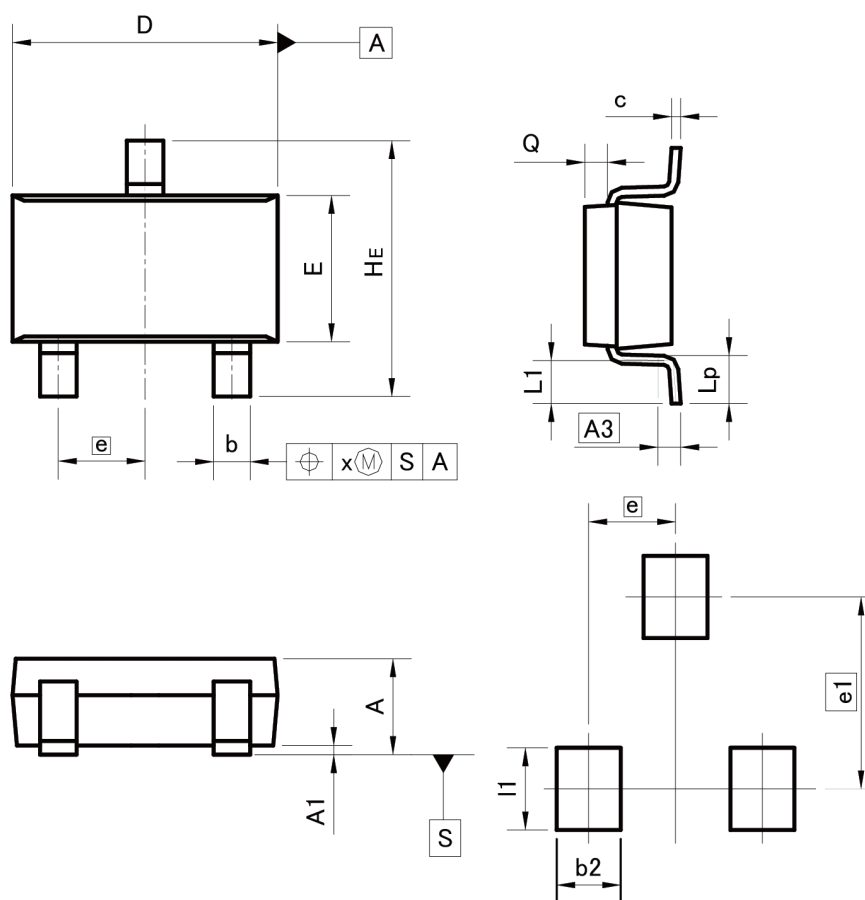


Fig.10 Safe Operating Area



●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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