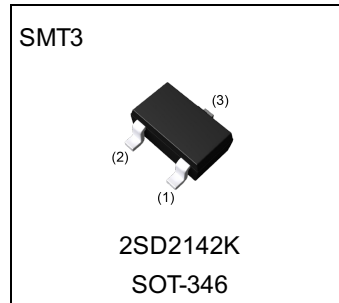


Parameter	Value
V_{CES}	30V
I_C	300mA

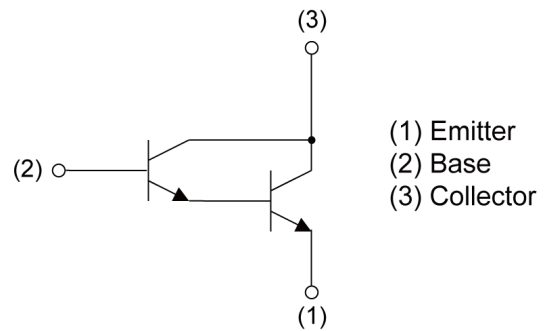
●Outline



●Features

- 1)Darlington connection for a high h_{FE} .
(DC current gain=5000(Min.)at $V_{CE}=3V$, $I_C=10mA$)
- 2)High input impedance.

●Inner circuit



●Application

High gain amplifier

●Packaging specifications

Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
2SD2142K	SMT3	2928	T146	180	8	3000	R1M

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

Parameter	Symbol	Values	Unit
Collector-base voltage	V_{CBO}	30	V
Collector-emitter voltage	V_{CES}	30	V
Emitter-base voltage	V_{EBO}	10	V
Collector current	I_C	300	mA
Power dissipation	P_D	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}	$I_C = 10\mu\text{A}$	30	-	-	V
Collector-emitter breakdown voltage	BV_{CES}	$I_C = 100\mu\text{A}$	30	-	-	V
Emitter-base breakdown voltage	BV_{EBO}	$I_E = 10\mu\text{A}$	10	-	-	V
Collector cut-off current	I_{CBO}	$V_{CB} = 30\text{V}$	-	-	100	nA
Emitter cut-off current	I_{EBO}	$V_{EB} = 10\text{V}$	-	-	100	nA
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 100\text{mA}, I_B = 0.1\text{mA}$	-	-	1.5	V
Base-emitter turn on voltage	$V_{BE(on)}^{*1}$	$V_{CE} = 5\text{V}, I_C = 100\text{mA}$	-	-	2	V
DC current gain	h_{FE1}	$V_{CE} = 5\text{V}, I_C = 10\text{mA}$	5k	-	-	-
	h_{FE2}^{*1}	$V_{CE} = 5\text{V}, I_C = 100\text{mA}$	10k	-	-	
Transition frequency	f_T^{*2}	$V_{CE} = 5\text{V}, I_E = -10\text{mA}, f = 100\text{MHz}$	125	-	-	MHz
Output capacitance	C_{ob}	$V_{CB} = 10\text{V}, I_E = 0\text{A}, f = 100\text{kHz}$	-	5.4	-	pF

*1 Pulse test

*2 Characteristics of built-in transistor

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

Fig.1 Typical output characteristics (I)

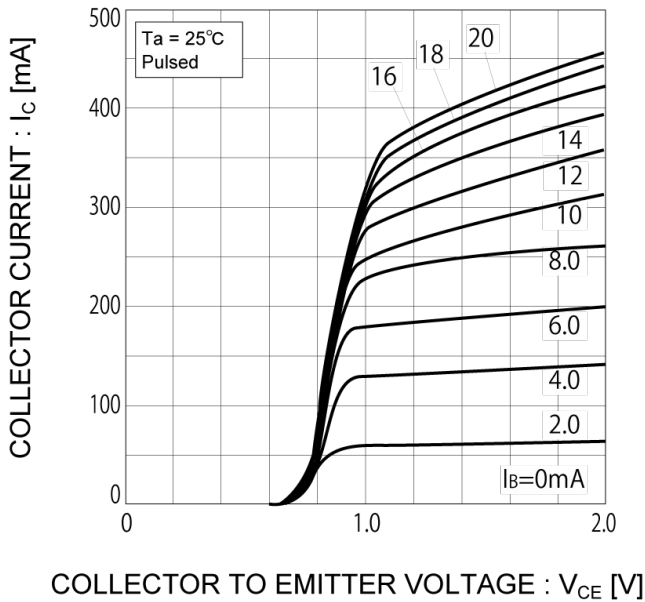


Fig.2 Typical output characteristics (II)

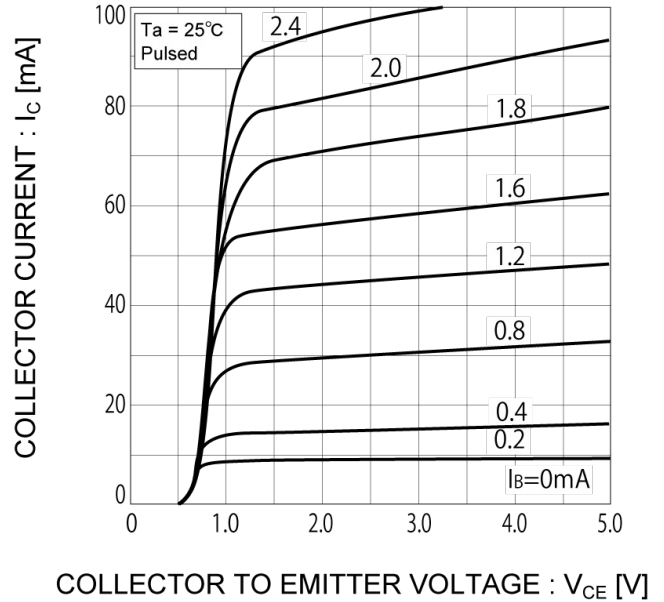


Fig.3 Base emitter 'ON' voltage vs. collector current

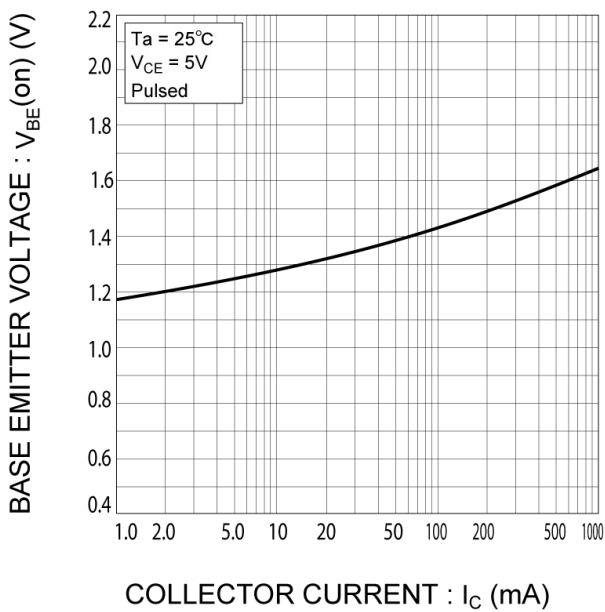
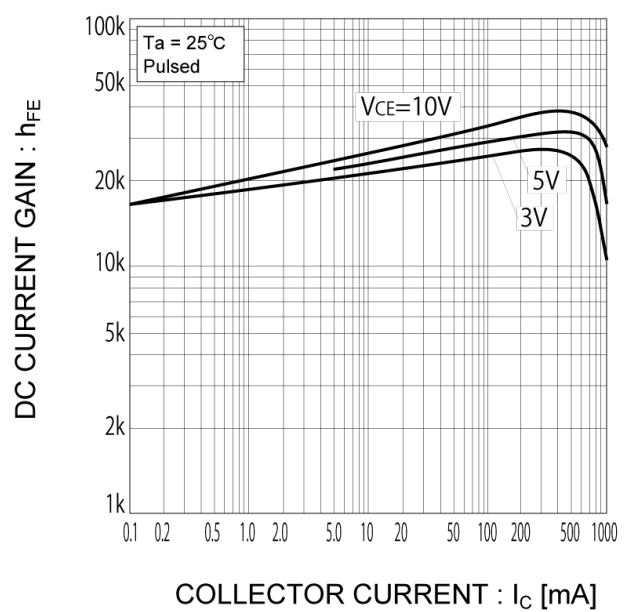


Fig.4 DC current gain vs. collector current (I)



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

Fig.5 DC current gain vs. collector current (II)

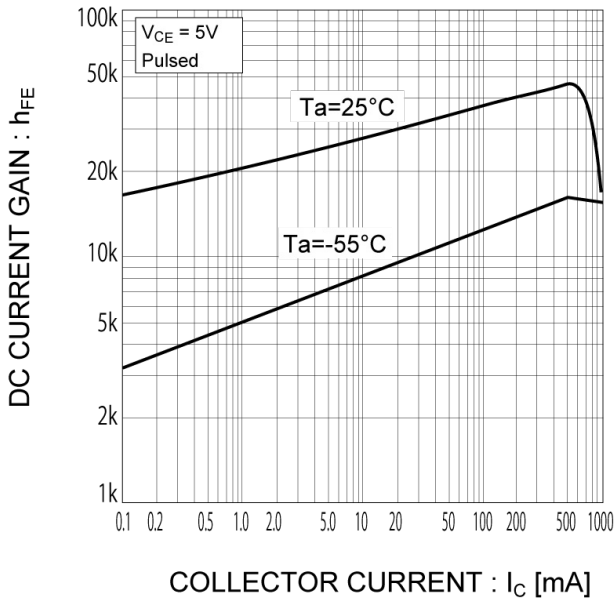


Fig.6 Collector emitter saturation voltage vs. collector current

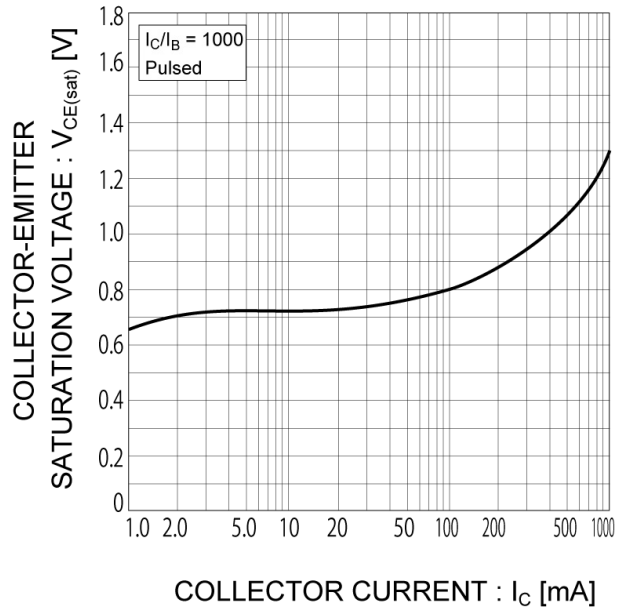


Fig.7 Base emitter saturation voltage vs. collector current

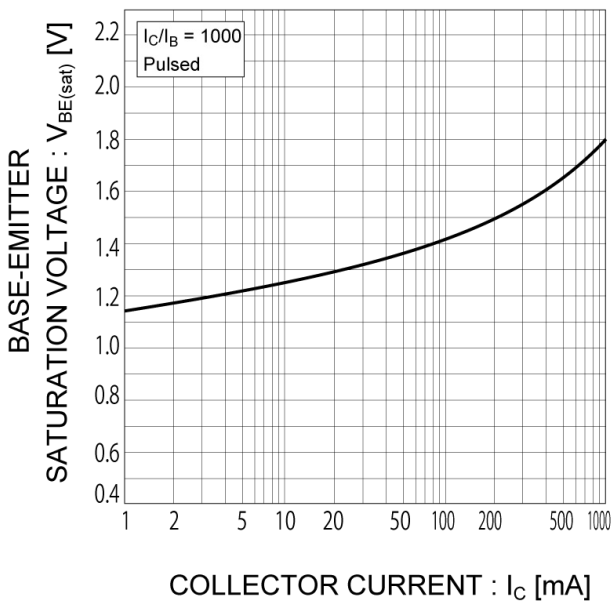
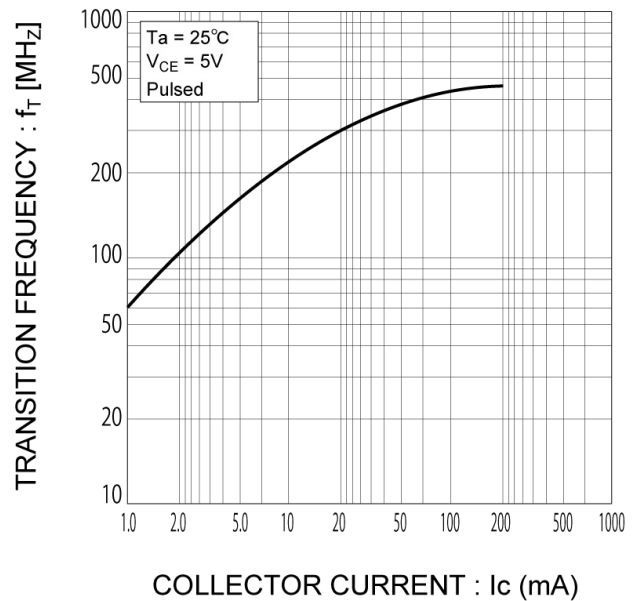


Fig.8 Current gain-bandwidth product vs. collector current



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

Fig.9 Capacitance vs. reverse bias voltage

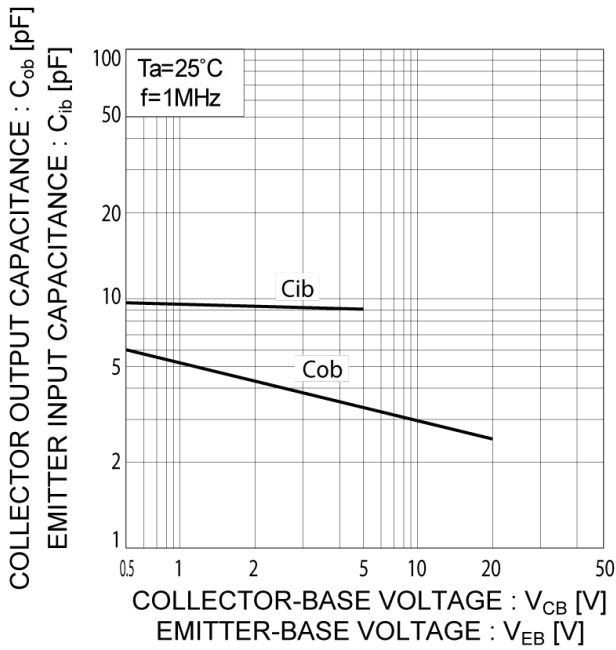
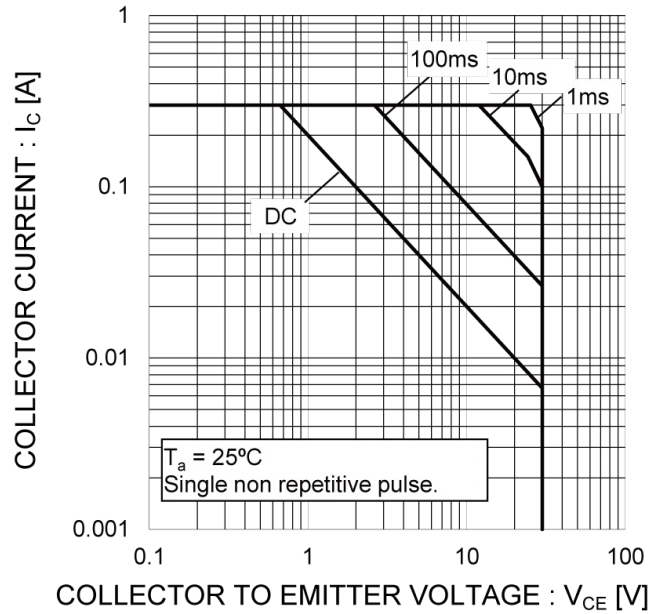
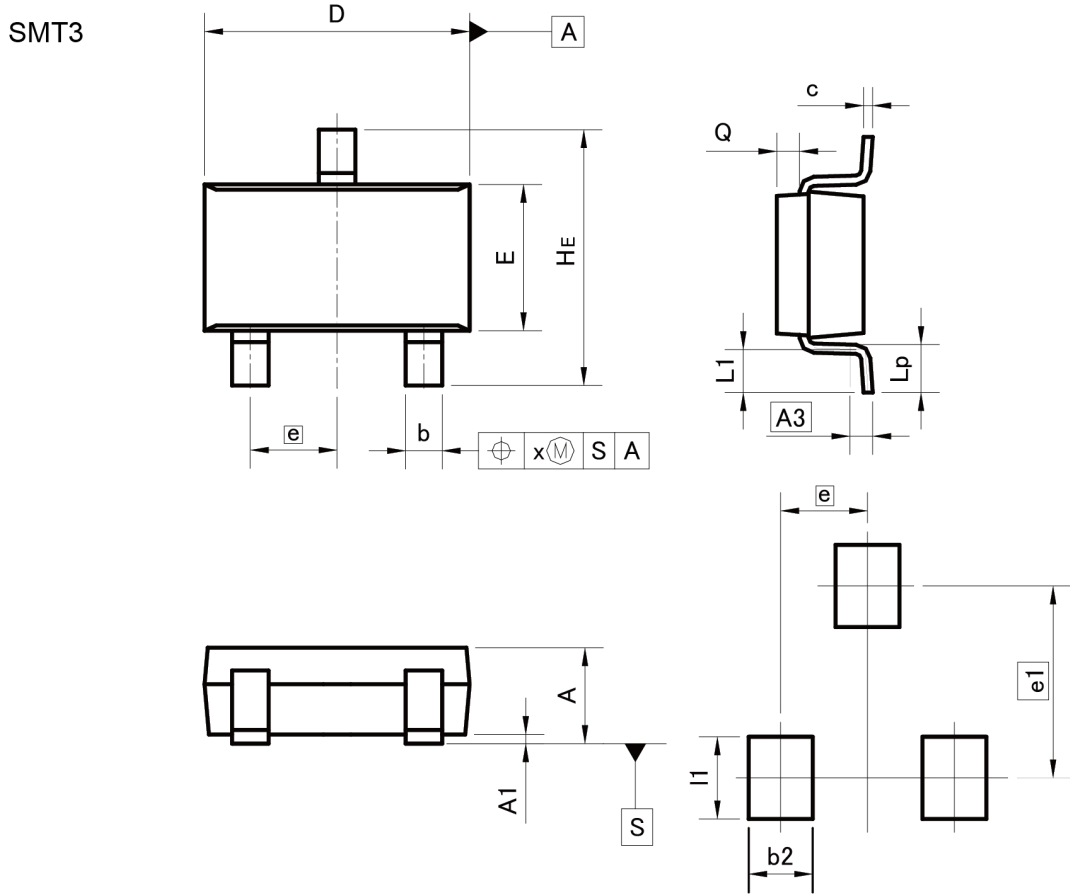


Fig.10 Safe Operating Area



●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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