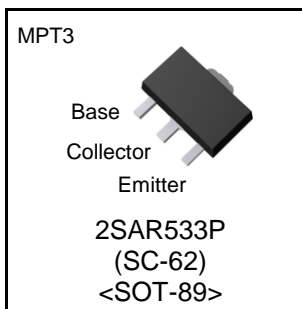


### ●Outline

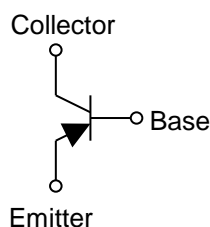


Parameter	Value
$V_{CEO}$	-50V
$I_C$	-3.0A

### ●Features

- 1) Suitable for Middle Power Driver
- 2) Complementary NPN Types : 2SCR533P
- 3) Low  $V_{CE(sat)}$   
 $V_{CE(sat)} = -0.4V$  Max. ( $I_C/I_B = -1A/-50mA$ )
- 4) Lead Free/RoHS Compliant.

### ●Inner circuit



### ●Applications

Motor driver , LED driver  
Power supply

### ●Packaging specifications

Part No.	Package	Package size (mm)	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit (pcs)	Marking
2SAR533P	MPT3	4540	T100	180	12	1,000	MM

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

Parameter		Symbol	Values	Unit
Collector-base voltage		V <sub>CBO</sub>	−50	V
Collector-emitter voltage		V <sub>CEO</sub>	−50	V
Emitter-base voltage		V <sub>EBO</sub>	−6	V
Collector current	DC	I <sub>C</sub>	−3.0	A
	Pulsed	I <sub>CP</sub> <sup>*1</sup>	−6.0	A
Power dissipation	2SAR533P	P <sub>D</sub>	0.5 <sup>*2</sup>	W
			2.0 <sup>*3</sup>	W
Junction temperature		T <sub>j</sub>	150	°C
Range of storage temperature		T <sub>stg</sub>	−55 to +150	°C

\*1  $P_w=10ms$  , single pulse \*2 Each terminal mounted on a reference land

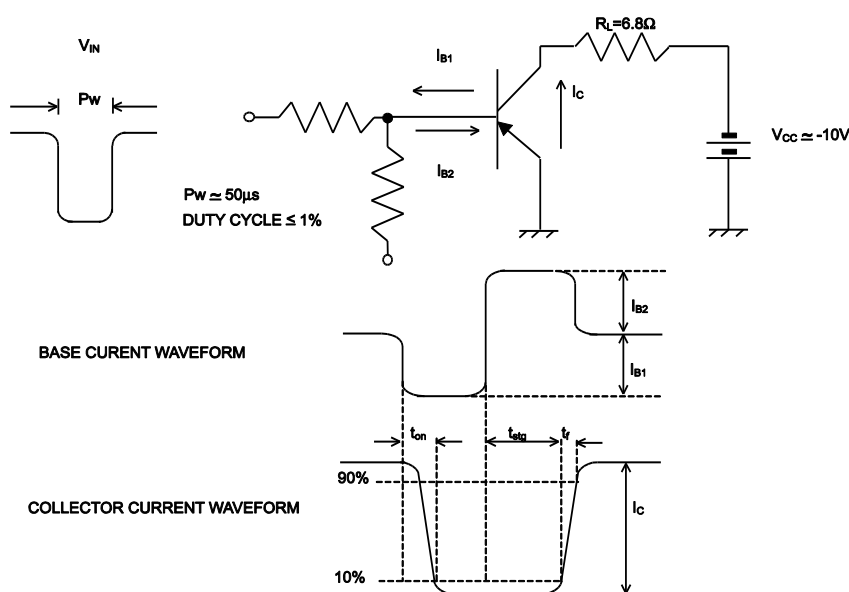
\*3 Mounted on a ceramic board (40×40×0.7mm)

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Collector-emitter breakdown voltage	$BV_{CEO}$	$I_C = -1\text{mA}$	-50	-	-	V
Collector-base breakdown voltage	$BV_{CBO}$	$I_C = -100\mu\text{A}$	-50	-	-	V
Emitter-base breakdown voltage	$BV_{EBO}$	$I_E = -100\mu\text{A}$	-6	-	-	V
Collector cut-off current	$I_{CBO}$	$V_{CB} = -50\text{V}$	-	-	-1	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = -4\text{V}$	-	-	-1	$\mu\text{A}$
Collector-emitter saturation voltage	$V_{CE(sat)}^{*1}$	$I_C = -1\text{A}, I_B = -50\text{mA}$	-	-0.20	-0.40	V
DC current gain	$h_{FE}$	$V_{CE} = -3\text{V}, I_C = -50\text{mA}$	180	-	450	-
Transition frequency	$f_T$	$V_{CE} = -10\text{V}, I_E = -500\text{mA}$ $f = 100\text{MHz}$	-	300	-	MHz
Output capacitance	$C_{ob}$	$V_{CB} = -10\text{V}, I_E = 0\text{A}$ $f = 1\text{MHz}$	-	24	-	pF
Turn-on time	$t_{on}^{*2}$	$I_C = -1.5\text{A}$ $I_{B1} = -150\text{mA}$ $I_{B2} = 150\text{mA}$ $V_{CC} \approx -10\text{V}$	-	45	-	ns
Storage time	$t_{stg}^{*2}$		-	250	-	ns
Fall time	$t_f^{*2}$		-	35	-	ns

\*1 Pulsed

\*2 See switching time test circuit

**●Switching time test circuit**


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

Fig.1 Ground Emitter Propagation Characteristics

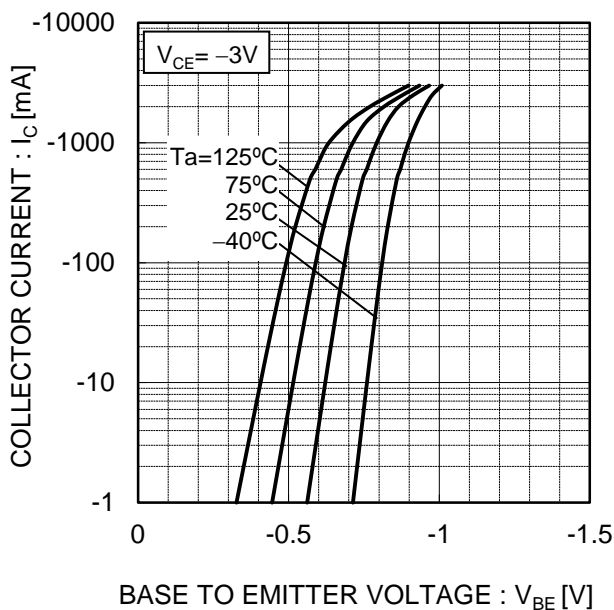


Fig.2 Typical Output Characteristics

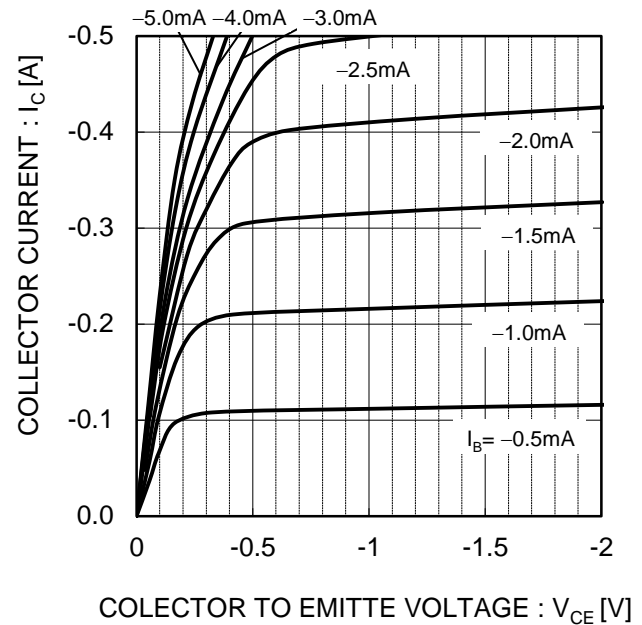


Fig.3 DC Current Gain vs. Collector Current(I)

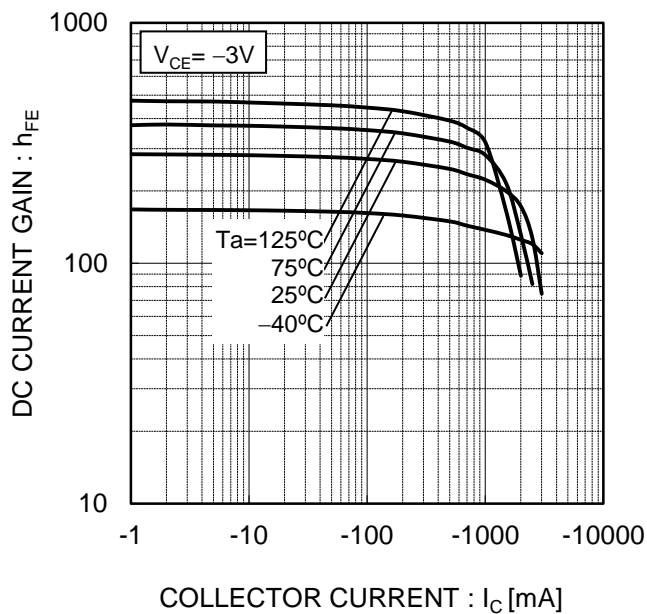
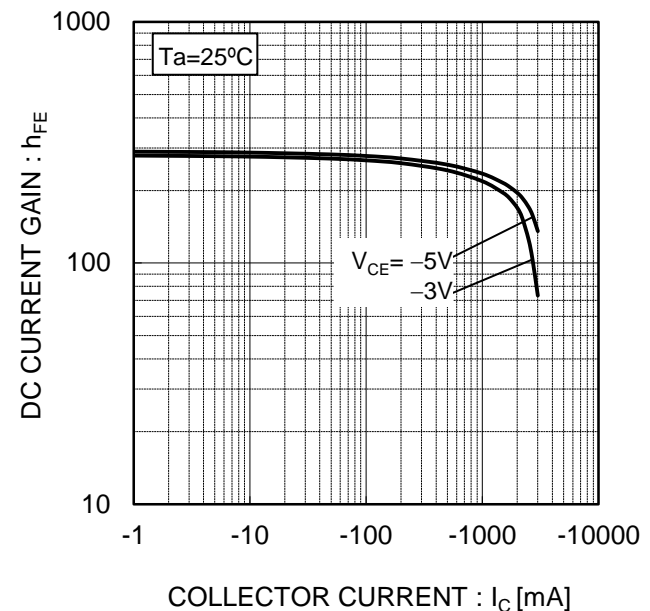


Fig.4 DC current gain vs. output current (II)



●Electrical characteristic curves(Ta = 25°C)

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

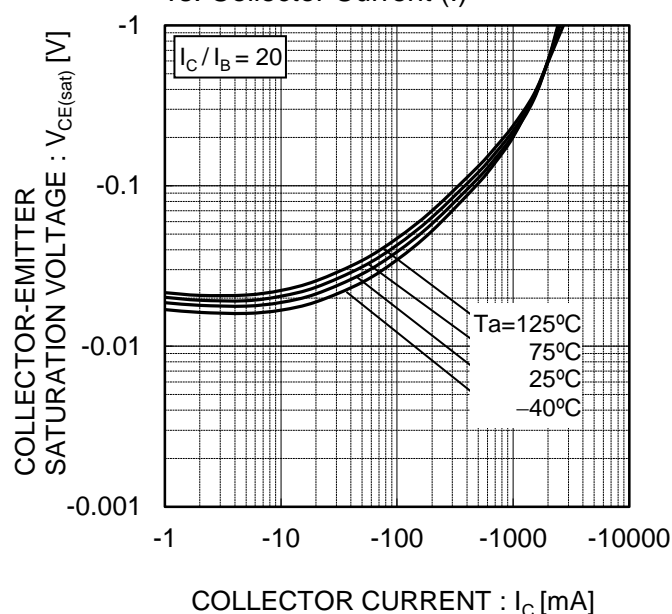


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

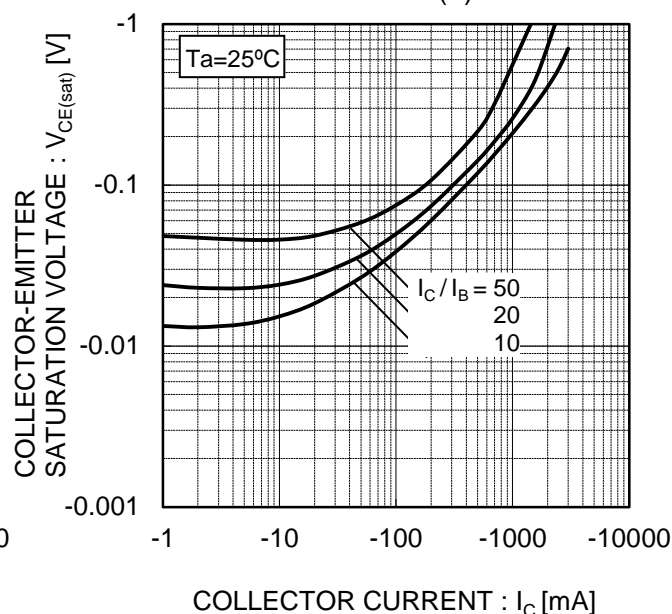


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

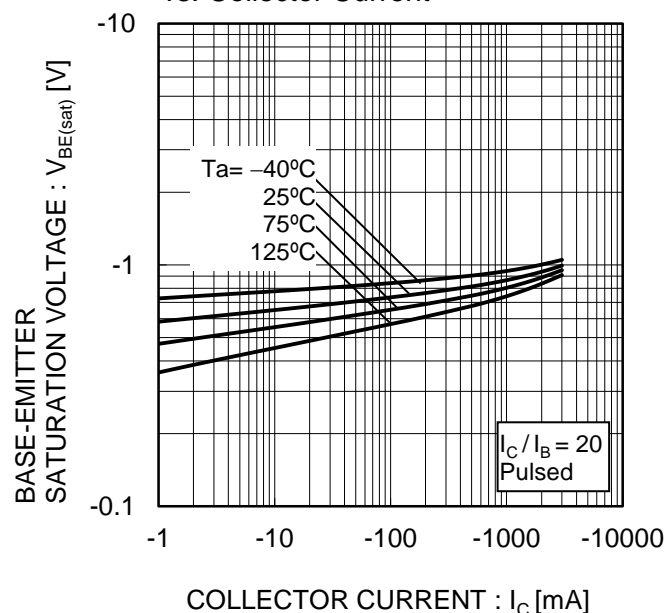
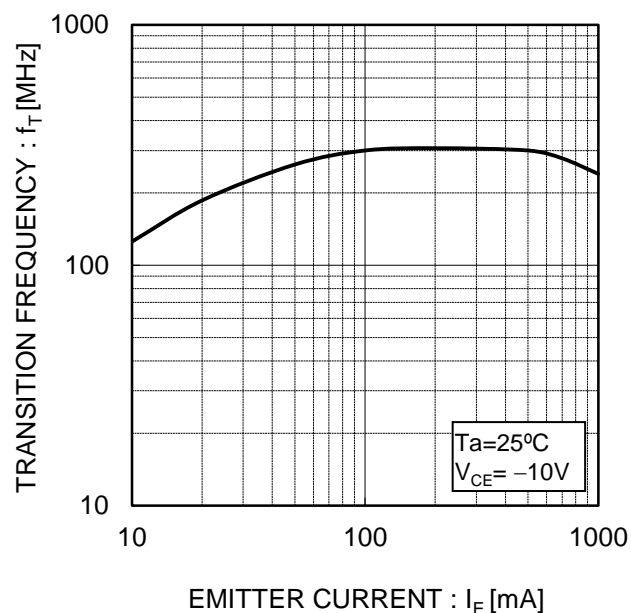


Fig.8 Gain Bandwidth Product vs. Emitter Current



# ●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

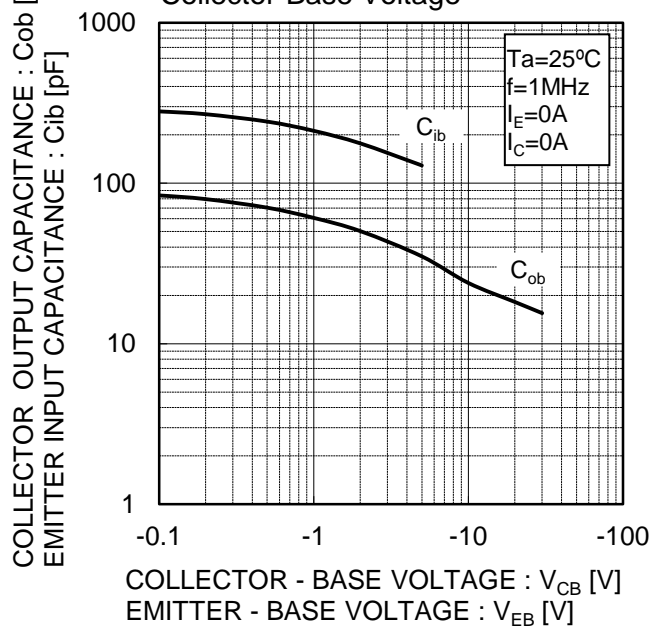
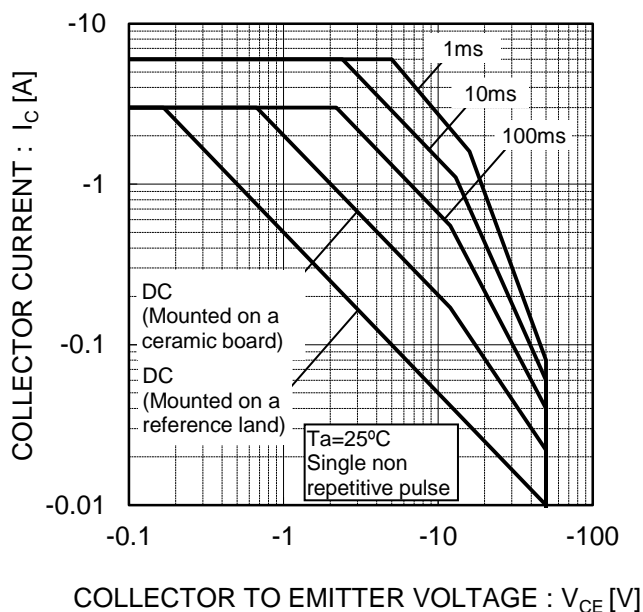
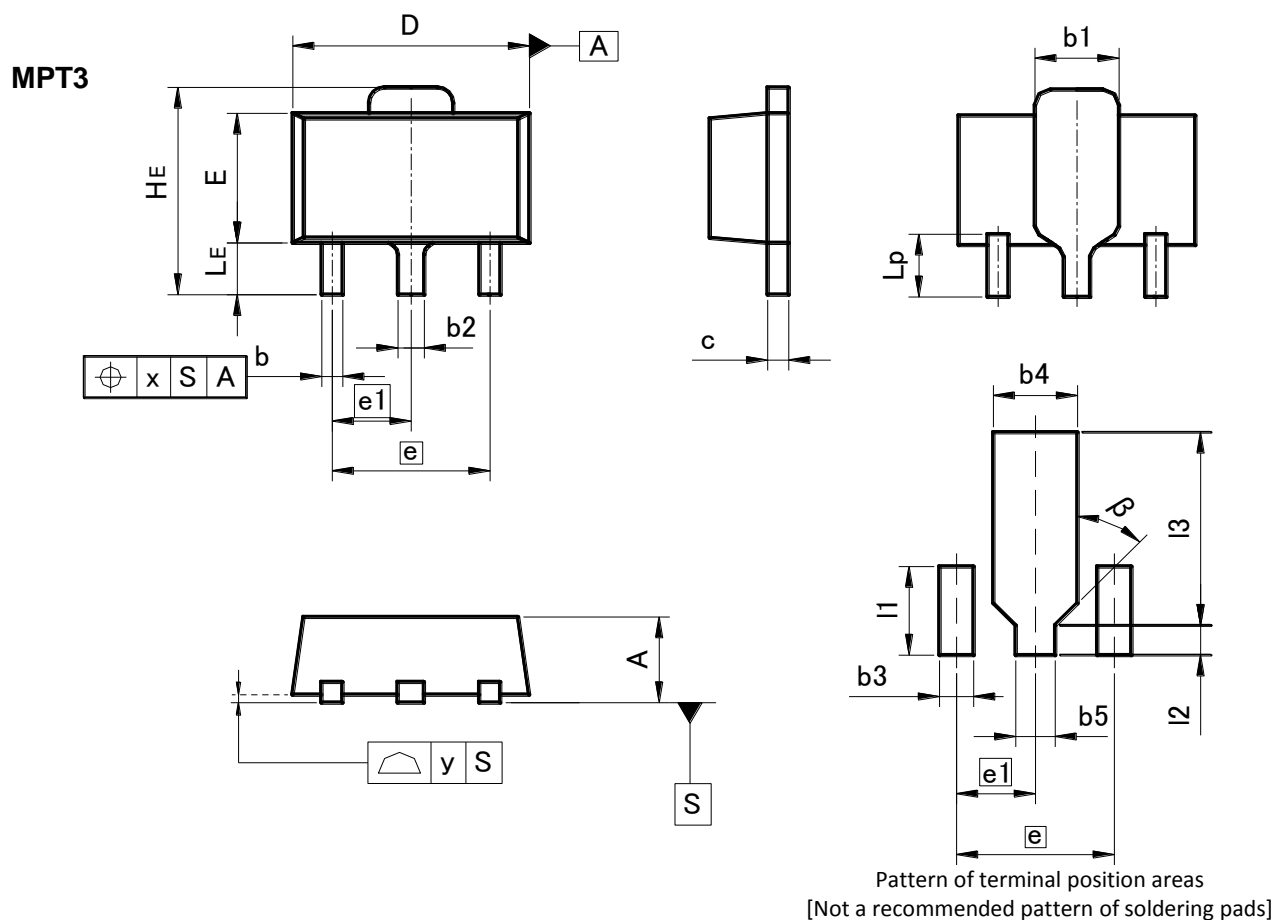


Fig.10 Safe Operating Area



## ●Dimensions (Unit : mm)



DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.40	1.50	0.055	0.059
b	0.30	0.50	0.012	0.020
b1	1.50	1.70	0.059	0.067
b2	0.40	0.60	0.016	0.024
c	0.35	0.50	0.014	0.020
D	4.40	4.70	0.173	0.185
E	2.40	2.70	0.094	0.106
e	3.00		0.118	
e1	1.50		0.059	
HE	3.70	4.30	0.146	0.169
LE	0.80	1.20	0.031	0.047
Lp	1.01	1.41	0.040	0.056
x	—	0.15	—	0.006
y	—	0.10	—	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b3	—	0.65	—	0.026
b4	—	1.70	—	0.067
b5	—	0.75	—	0.030
l1	—	1.71	—	0.067
l2	—	0.58	—	0.023
l3	—	3.72	—	0.146
β	45°		45°	

Dimension in mm / inches

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