

# Midium Power Transistors (-50V / -3A)

# **2SAR533P**

#### Structure

PNP Silicon epitaxial planar transistor

#### Features

- 1) Low saturation voltage, typically  $V_{CE (sat)}$  = -0.4V (Max.) (I<sub>C</sub> / I<sub>B</sub>= -1A / -50mA)
- 2) High speed switching

### Applications

Driver

#### Packaging specifications

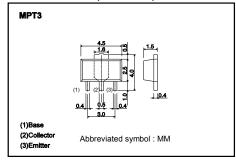
Туре	Package	Taping			
	Code	T100			
	Basic ordering unit (pieces)	1000			
2SAR533P		0			

## ◆ Absolute maximum ratings (Ta = 25°C)

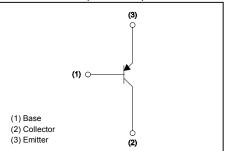
Para	Symbol	Limits	Unit	
Collector-base voltage		$V_{CBO}$	-50	V
Collector-emitter voltage		$V_{CEO}$	-50	V
Emitter-base voltage		$V_{EBO}$	-6	V
Collector current	DC	I <sub>C</sub>	-3	Α
	Pulsed	I <sub>CP</sub> *1	-6	Α
Power dissipation		P <sub>D</sub> *2	0.5	W
		P <sub>D</sub> *3	2	W
Junction temperature		Tj	150	°C
Range of storage temperature		$T_{stg}$	-55 to 150	°C

<sup>\*1</sup> Pw=10ms, Single Pulse

#### Dimensions (Unit : mm)



#### Inner circuit (Unit : mm)



<sup>\*2</sup> Each terminal mounted on a recommended land.

<sup>\*3</sup> Mounted on a ceramic board. (40x40x0.7mm³)

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# ●Electrical characteristic (Ta = 25°C)

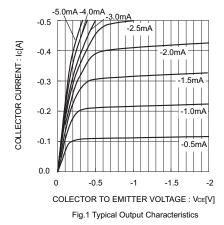
Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions	
Collector-emitter breakdown voltage	$BV_{CEO}$	-50	-	-	V	I <sub>C</sub> = -1mA	
Collector-base breakdown voltage	$BV_{CBO}$	-50	-	-	V	I <sub>C</sub> = -100μA	
Emitter-base breakdown voltage	$BV_{EBO}$	-6	-	-	V	I <sub>E</sub> = -100μA	
Collector cut-off current	I <sub>CBO</sub>	-	-	-1	μA	V <sub>CB</sub> = -50V	
Emitter cut-off current	I <sub>EBO</sub>	-	-	-1	μA	V <sub>EB</sub> = -4V	
Collector-emitter staturation voltage	V <sub>CE(sat)</sub> *1	-	-200	-400	mV	$I_C = -1A$ , $I_B = -50mA$	
DC current gain	$h_FE$	180	-	450	-	$V_{CE}$ = -3V, $I_{C}$ = -50mA	
Transition frequency	f <sub>T</sub> *1	ı	300	ı	MHz	V <sub>CE</sub> = -10V I <sub>E</sub> =500mA, f=100MHz	
Collector output capacitance	C <sub>ob</sub>	ı	24	ı	pF	V <sub>CB</sub> = -10V, I <sub>E</sub> =0A f=1MHz	
Turn-on time	t <sub>on</sub> *2	-	45	-	ns	I = 150 I = 150mA	
Storage time	t <sub>stg</sub> *2	-	250	-	ns	I <sub>C</sub> = -1.5A, I <sub>B1</sub> = -150mA, I <sub>B2</sub> =150mA, V <sub>CC</sub> ~-10V	
Fall time	t <sub>f</sub> *2	-	35	-	ns	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	

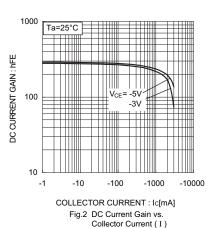
<sup>\*1</sup> Pulsed

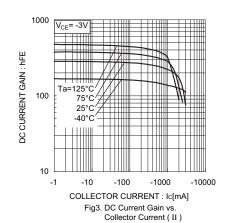
<sup>\*2</sup> See switching time test circuit

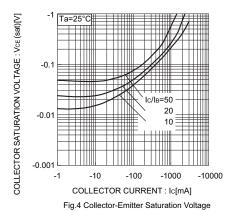
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#### •Electrical characteristic curves

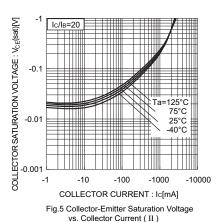


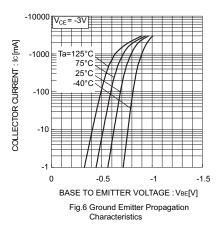


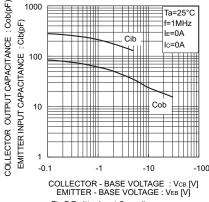


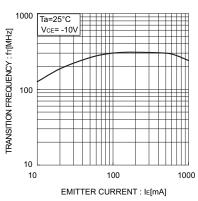


vs. Collector Current (I)









-0.1 Single pulse
-10 S

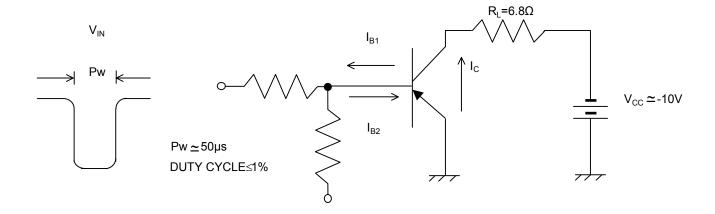
Fig.7 Emitter Input Capacitance vs. Emitter-Base Voltage Collector Output Capacitance vs. Collector-Base Voltage

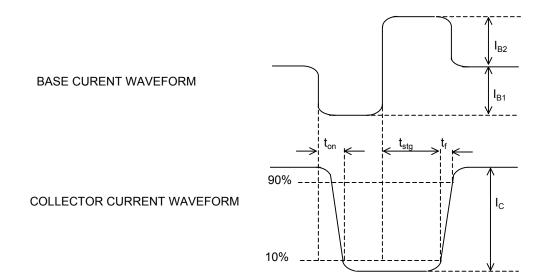
Fig.8 Gain Bandwidth Product vs. Emitter Current

Fig.9 Safe Operating Area

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# •Switching time test circuit





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