

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

## 2SAR533P

### ● Structure

PNP Silicon epitaxial planar transistor

### ● Features

- 1) Low saturation voltage, typically  
 $V_{CE(sat)} = -0.4V$  (Max.) ( $I_C / I_B = -1A / -50mA$ )
- 2) High speed switching

### ● Applications

Driver

### ● Packaging specifications

Type	Package	Taping
	Code	T100
	Basic ordering unit (pieces)	1000
2SAR533P		○

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

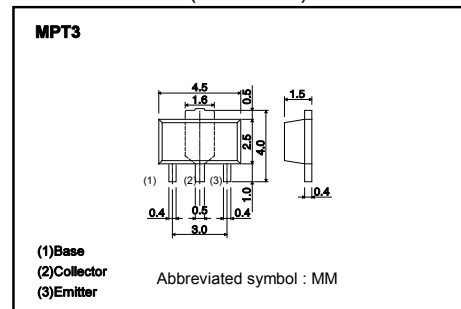
Parameter	Symbol	Limits	Unit	
Collector-base voltage	$V_{CBO}$	-50	V	
Collector-emitter voltage	$V_{CEO}$	-50	V	
Emitter-base voltage	$V_{EBO}$	-6	V	
Collector current	DC	$I_C$	-3	A
	Pulsed	$I_{CP}^{*1}$	-6	A
Power dissipation		$P_D^{*2}$	0.5	W
		$P_D^{*3}$	2	W
Junction temperature	$T_j$	150	°C	
Range of storage temperature	$T_{stg}$	-55 to 150	°C	

\*1 Pw=10ms, Single Pulse

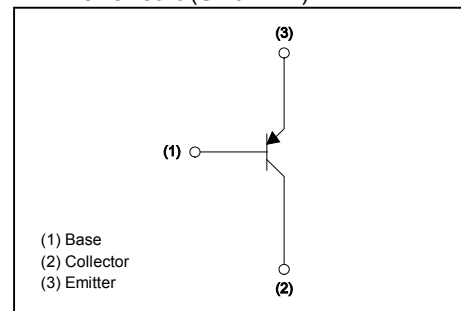
\*2 Each terminal mounted on a recommended land.

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

### ● Dimensions (Unit : mm)



### ● Inner circuit (Unit : mm)



## ●Electrical characteristic (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-emitter breakdown voltage	$BV_{CEO}$	-50	-	-	V	$I_C = -1mA$
Collector-base breakdown voltage	$BV_{CBO}$	-50	-	-	V	$I_C = -100\mu A$
Emitter-base breakdown voltage	$BV_{EBO}$	-6	-	-	V	$I_E = -100\mu A$
Collector cut-off current	$I_{CBO}$	-	-	-1	$\mu A$	$V_{CB} = -50V$
Emitter cut-off current	$I_{EBO}$	-	-	-1	$\mu A$	$V_{EB} = -4V$
Collector-emitter saturation voltage	$V_{CE(sat)}^{*1}$	-	-200	-400	mV	$I_C = -1A, I_B = -50mA$
DC current gain	$h_{FE}$	180	-	450	-	$V_{CE} = -3V, I_C = -50mA$
Transition frequency	$f_T^{*1}$	-	300	-	MHz	$V_{CE} = -10V$ $I_E = 500mA, f = 100MHz$
Collector output capacitance	$C_{ob}$	-	24	-	pF	$V_{CB} = -10V, I_E = 0A$ $f = 1MHz$
Turn-on time	$t_{on}^{*2}$	-	45	-	ns	$I_C = -1.5A, I_{B1} = -150mA,$ $I_{B2} = 150mA, V_{CC} \approx -10V$
Storage time	$t_{stg}^{*2}$	-	250	-	ns	
Fall time	$t_f^{*2}$	-	35	-	ns	

\*1 Pulsed

\*2 See switching time test circuit

●Electrical characteristic curves

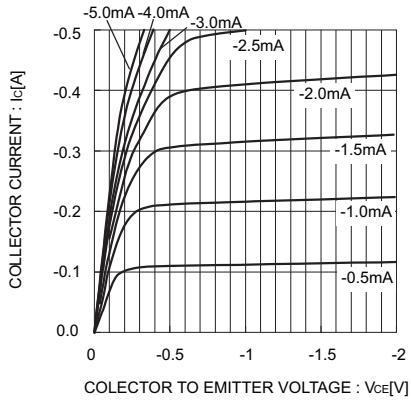


Fig.1 Typical Output Characteristics

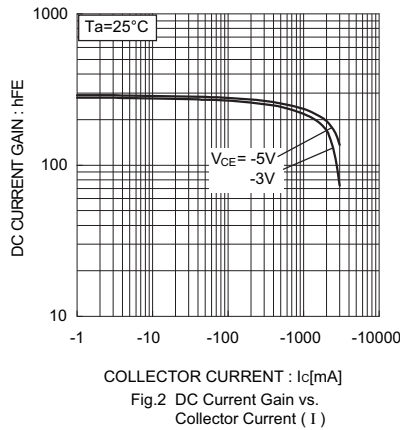


Fig.2 DC Current Gain vs. Collector Current ( I )

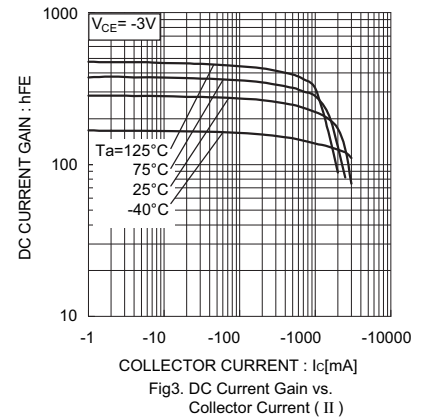


Fig.3. DC Current Gain vs. Collector Current ( II )

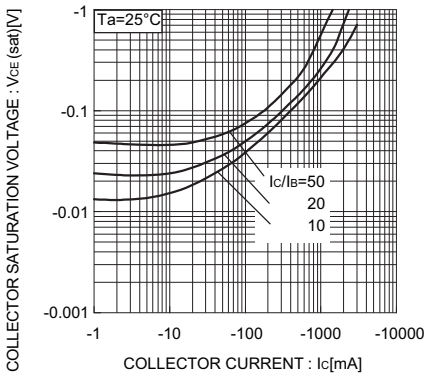


Fig.4 Collector-Emitter Saturation Voltage vs. Collector Current ( I )

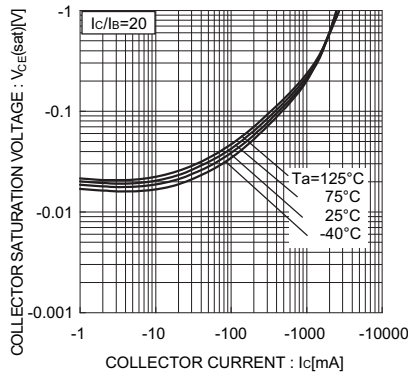


Fig.5 Collector-Emitter Saturation Voltage vs. Collector Current ( II )

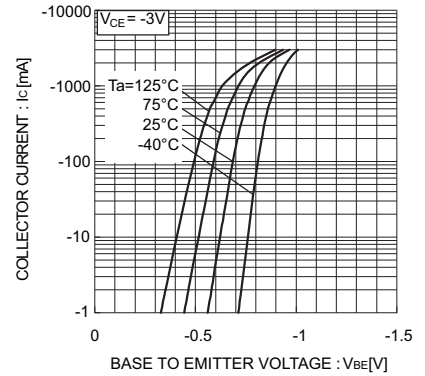


Fig.6 Ground Emitter Propagation Characteristics

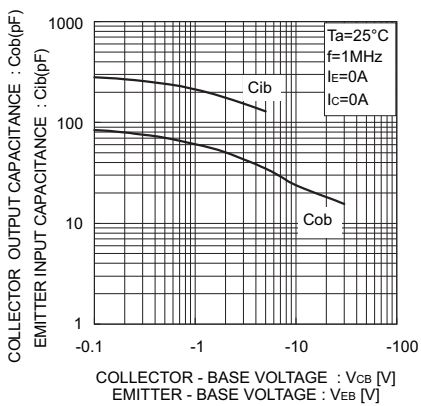


Fig.7 Emitter Input Capacitance vs. Emitter-Base Voltage  
Collector Output Capacitance vs. Collector-Base Voltage

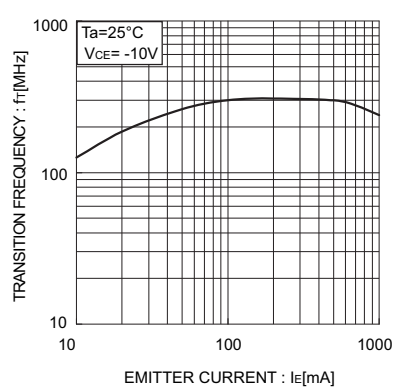


Fig.8 Gain Bandwidth Product vs. Emitter Current

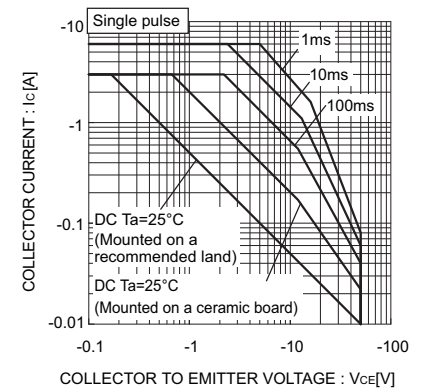
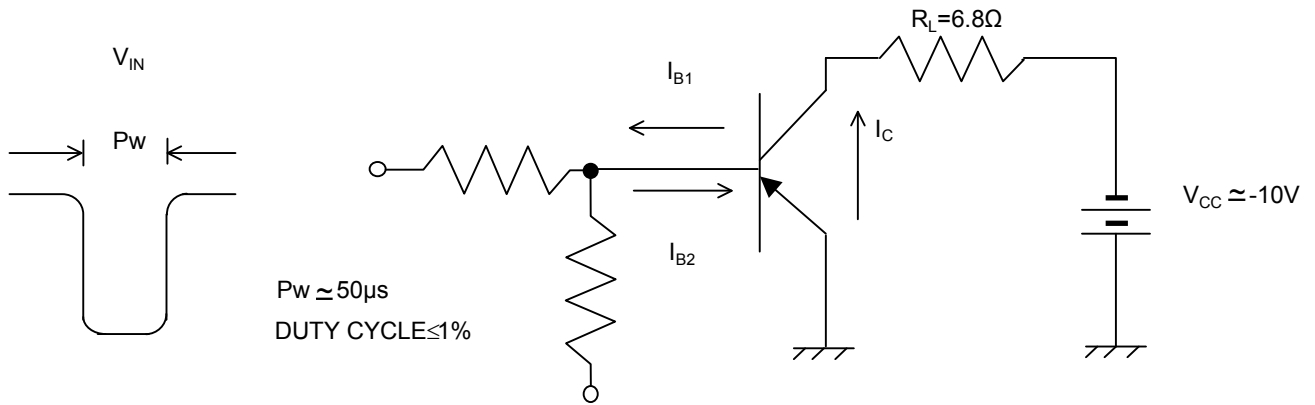
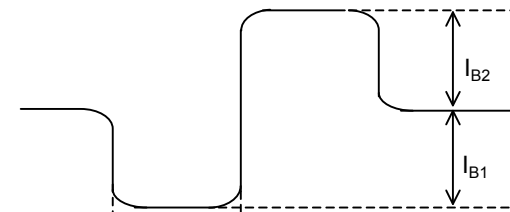


Fig.9 Safe Operating Area

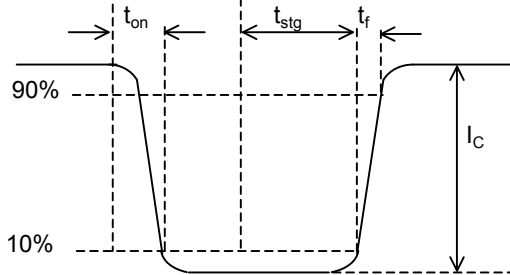
●Switching time test circuit



BASE CURENT WAVEFORM



COLLECTOR CURRENT WAVEFORM



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