Midium Power Transistors (−80V / −0.7A)

2SAR514R

● Features

1) Low saturation voltage, typically
   $V_{CE\ (sat)}$ = -0.4V (Max.) (I_C / I_B= -300mA / -15mA)
2) High speed switching

● Structure

PNP Silicon epitaxial planar transistor

● Applications

Driver

● Packaging specifications

Type	Package	TSMT3
	Code	TL
	Basic ordering unit (pieces)	3000

● Absolute maximum ratings (Ta = 25°C)

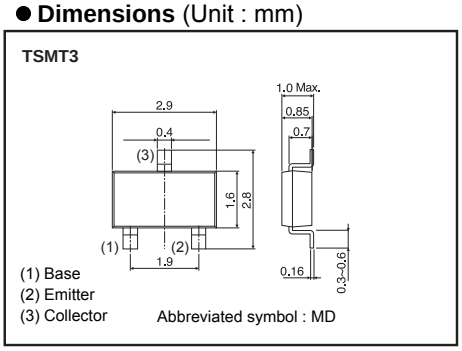
Parameter		Symbol	Limits	Unit
Collector-base voltage		V_{CBO}	-80	V
Collector-emitter voltage		V_{CEO}	-80	V
Emitter-base voltage		V_{EBO}	-6	V
Collector current	DC	I_C	-0.7	A
	Pulsed	I_{CP} *1	-1.4	A
Power dissipation		P_D *2	0.5	W
		P_D *3	1.0	W
Junction temperature		T_j	150	°C
Range of storage temperature		T_{stg}	-55 to 150	°C

*1 Pw=10ms, Single Pulse

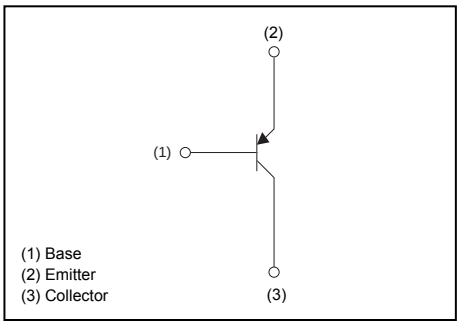
*2 Mounted on a recommended land.

*3 Mounted on a 40 x 40 x 0.7[mm^3] ceramic substrate.

● Dimensions (Unit : mm)



● Inner circuit



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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-emitter breakdown voltage	BV_{CEO}	-80	-	-	V	I_C= -1mA
Collector-base breakdown voltage	BV_{CBO}	-80	-	-	V	I_C= -100μA
Emitter-base breakdown voltage	BV_{EBO}	-6	-	-	V	I_E= -100μA
Collector cut-off current	I_{CBO}	-	-	-1	μA	V_{CB}= -80V
Emitter cut-off current	I_{EBO}	-	-	-1	μA	V_{EB}= -4V
Collector-emitter staturation voltage	$V_{CE(sat)}$	-	-200	-400	mV	I_C= -300mA, I_B= -15mA
DC current gain	h_{FE}	120	-	390	-	V_{CE}= -3V, I_C= -100mA
Transition frequency	f_T	-	380	-	MHz	V_{CE}= -10V I_E=200mA, f=100MHz
Collector output capacitance	C_{ob}	-	10	-	pF	V_{CB}= -10V, I_E=0A f=1MHz
Turn-on time	t_{on} *	-	50	-	ns	I_C= -0.35A, I_{B1}= -35mA, I_{B2}=35mA, V_{CC}≒ -10V
Storage time	t_{stg} *	-	350	-	ns	
Fall time	t_f *	-	50	-	ns	

* See switching time test circuit

●Electrical characteristic curves (Ta = 25°C)

Fig.1 Typical Output Characteristics

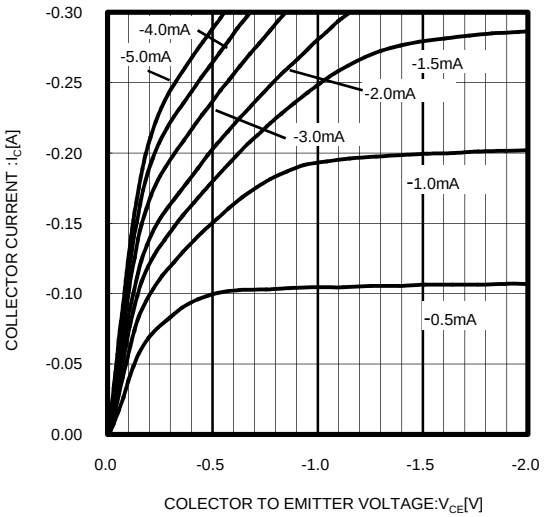


Fig.2 DC Current Gain vs. Collector Current(Ⅰ)

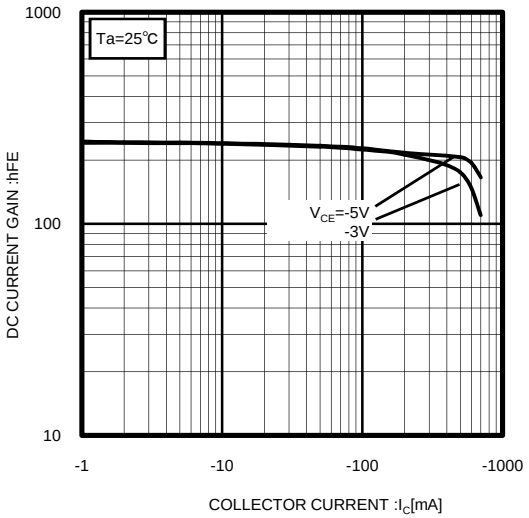


Fig.3 DC Current Gain vs. Collector Current(Ⅱ)

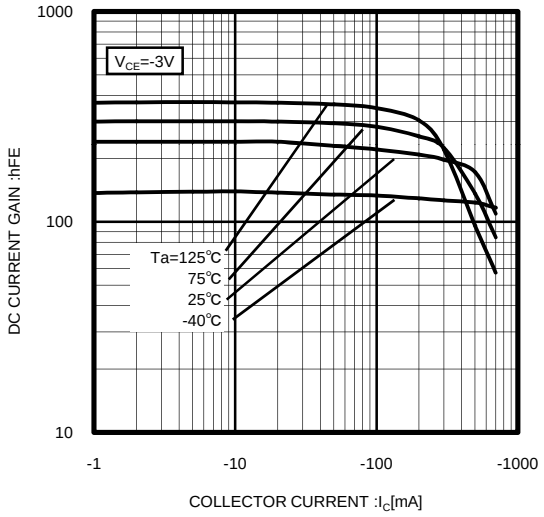


Fig.4 Collector-Emitter Saturation Voltage vs. Collector Current(Ⅰ)

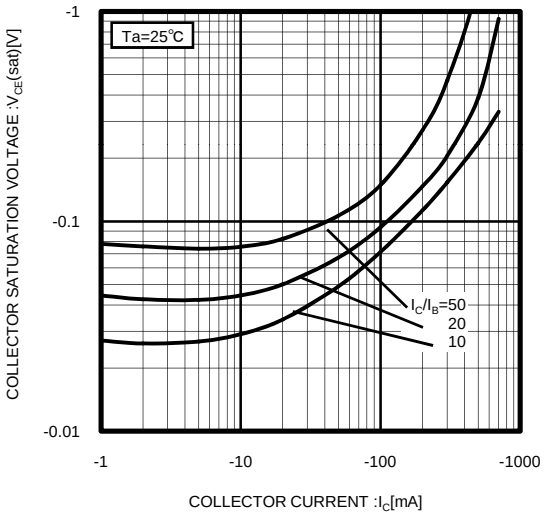


Fig.5 Collector-Emitter Saturation Voltage vs. Collector Current(Ⅱ)

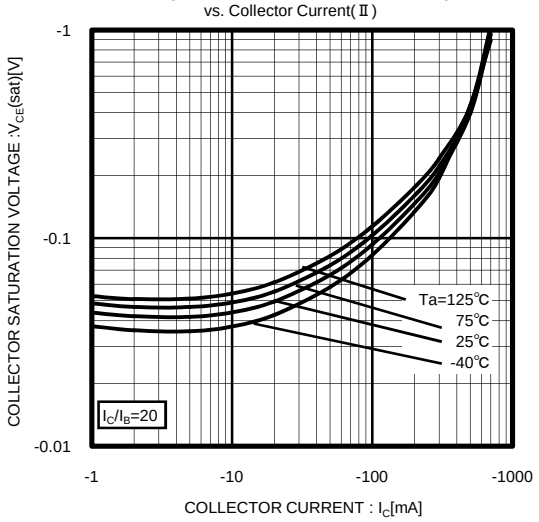


Fig.6 Ground Emitter Propagation Characteristics

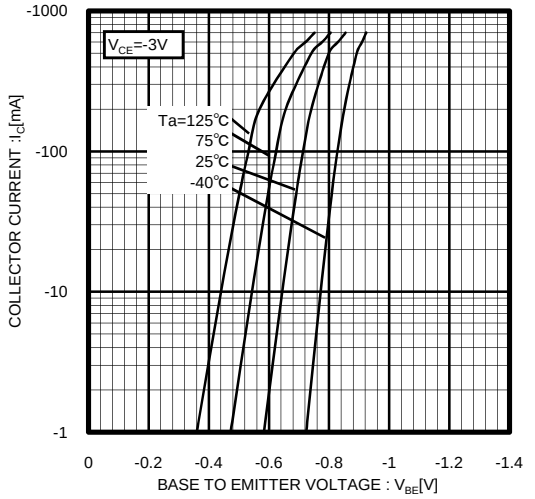


Fig.7 Emitter input capacitance vs. Emitter-Base Voltage
Collector output capacitance vs.Collector-Base Voltage

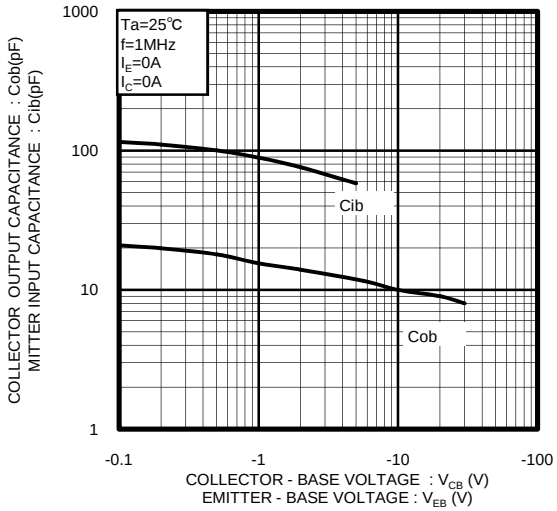


Fig8. Gain Bandwidth Product vs. Emitter Current

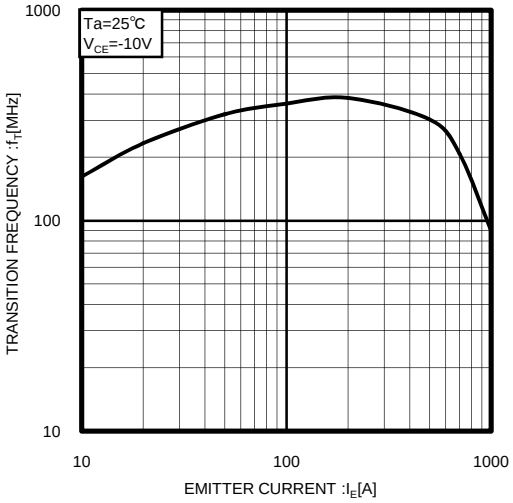
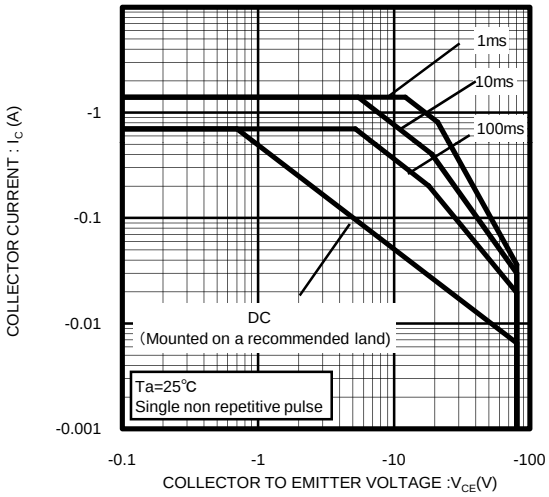
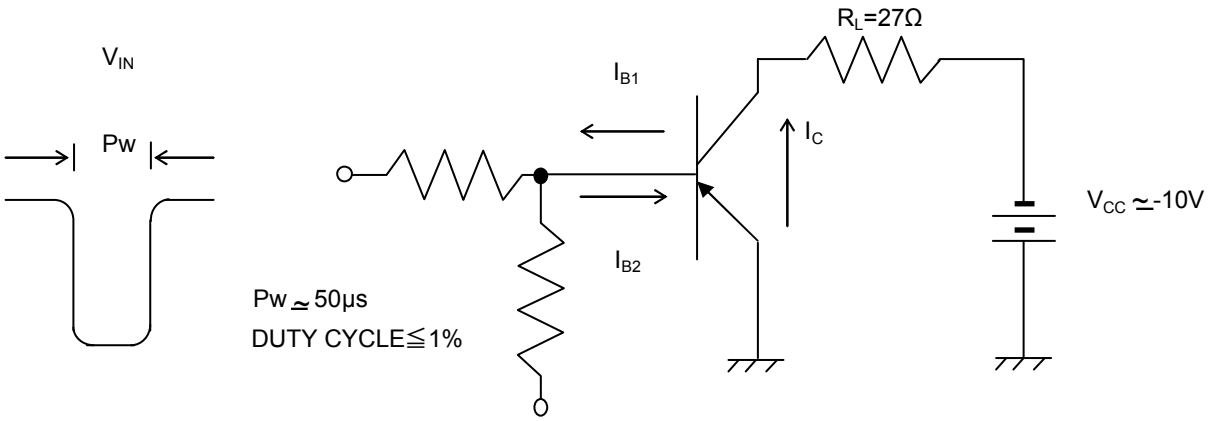
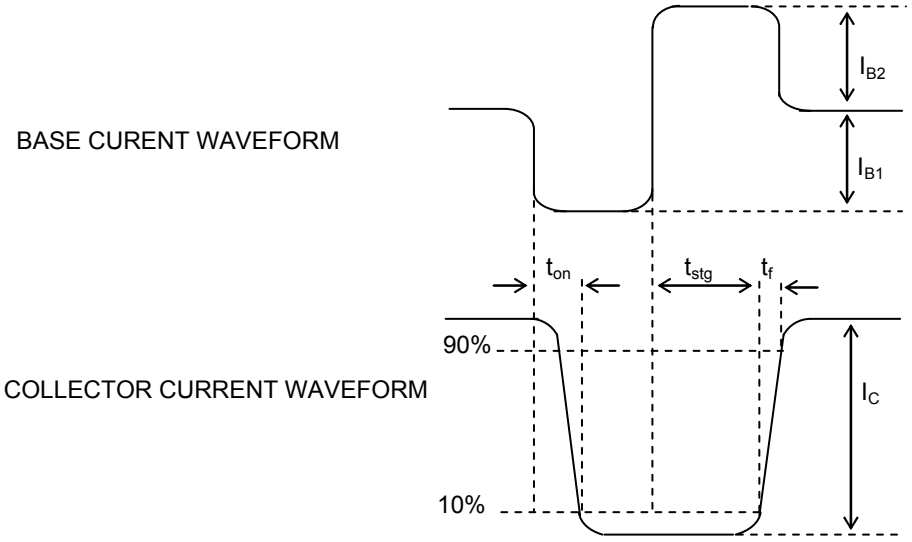


Fig9. Safe operating area



● **Switching time test circuit**





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