

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)

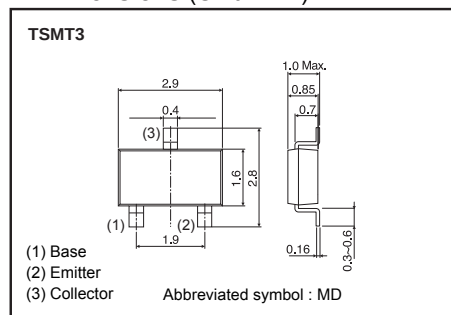
Parameter		Symbol	Limits	Unit
Collector-base voltage		V_{CBO}	-80	V
Collector-emitter voltage		V_{CEO}	-80	V
Emitter-base voltage		V_{EBO}	-6	V
Collector current	DC	I_C	-0.7	A
	Pulsed	I_{CP}^{*1}	-1.4	A
Power dissipation		P_D^{*2}	0.5	W
		P_D^{*3}	1.0	W
Junction temperature		T_j	150	°C
Range of storage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

*1 $P_w=10ms$, Single Pulse

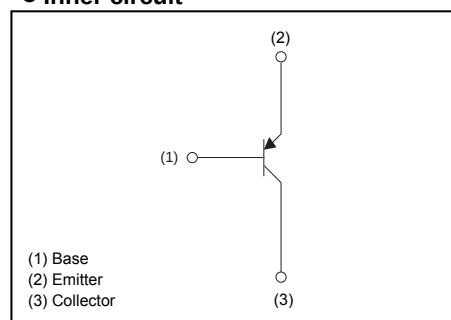
*2 Mounted on a recommended land.

*3 Mounted on a $40 \times 40 \times 0.7[mn^2]$ 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	$I_C = -1\text{mA}$
Collector-base breakdown voltage	BV_{CBO}	-80	-	-	V	$I_C = -100\mu\text{A}$
Emitter-base breakdown voltage	BV_{EBO}	-6	-	-	V	$I_E = -100\mu\text{A}$
Collector cut-off current	I_{CBO}	-	-	-1	μA	$V_{CB} = -80\text{V}$
Emitter cut-off current	I_{EBO}	-	-	-1	μA	$V_{EB} = -4\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$	-	-200	-400	mV	$I_C = -300\text{mA}$, $I_B = -15\text{mA}$
DC current gain	h_{FE}	120	-	390	-	$V_{CE} = -3\text{V}$, $I_C = -100\text{mA}$
Transition frequency	f_T	-	380	-	MHz	$V_{CE} = -10\text{V}$ $I_E = 200\text{mA}$, $f = 100\text{MHz}$
Collector output capacitance	C_{ob}	-	10	-	pF	$V_{CB} = -10\text{V}$, $I_E = 0\text{A}$ $f = 1\text{MHz}$
Turn-on time	t_{on}^*	-	50	-	ns	$I_C = -0.35\text{A}$, $I_{B1} = -35\text{mA}$, $I_{B2} = 35\text{mA}$, $V_{CC} \sim -10\text{V}$
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

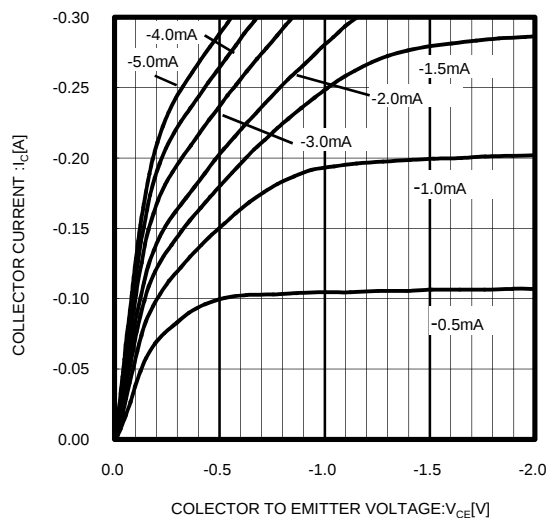


Fig.2 DC Current Gain vs. Collector Current(I)

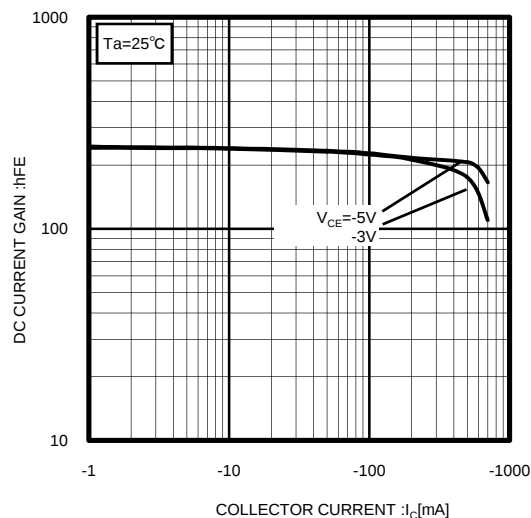


Fig.3 DC Current Gain vs. Collector Current(II)

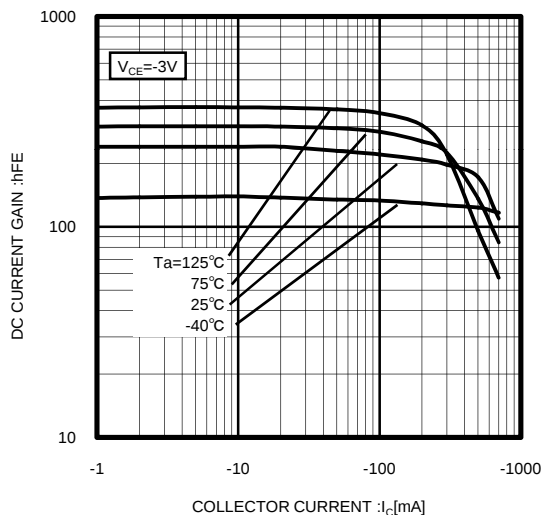


Fig.4 Collector-Emitter Saturation Voltage vs. Collector Current(I)

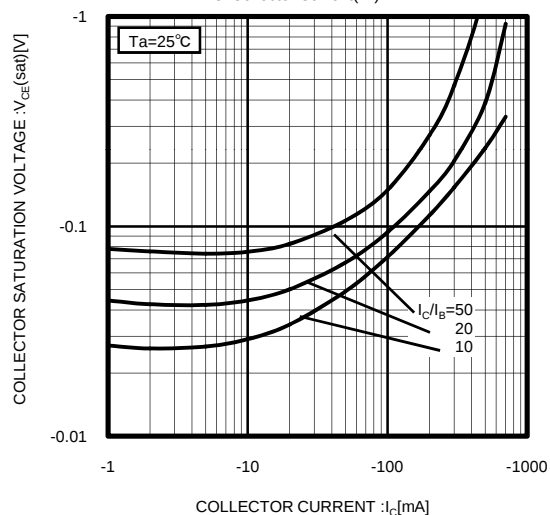


Fig.5 Collector-Emitter Saturation Voltage vs. Collector Current(II)

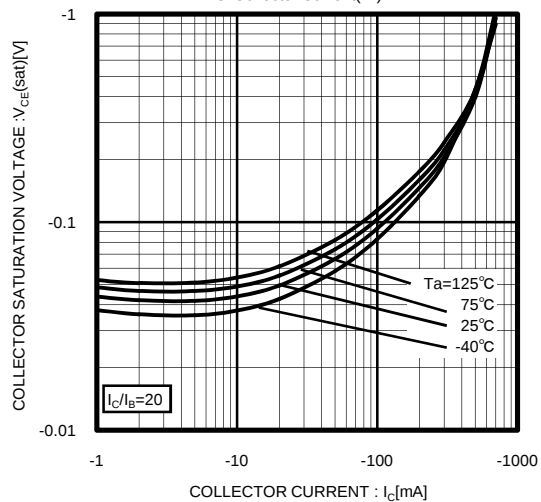


Fig.6 Ground Emitter Propagation Characteristics

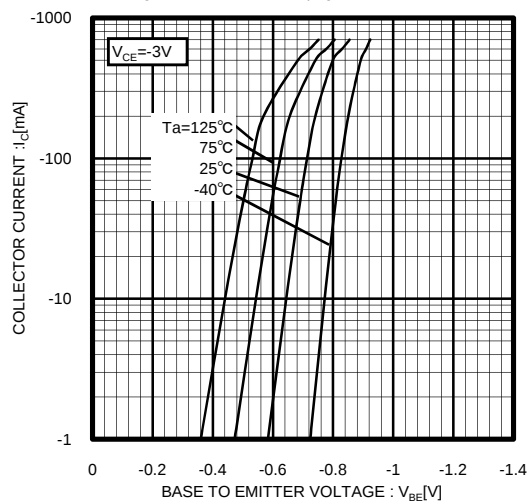


Fig.7 Emitter input capacitance vs. Emitter-Base Voltage
Collector output capacitance vs. Collector-Base Voltage

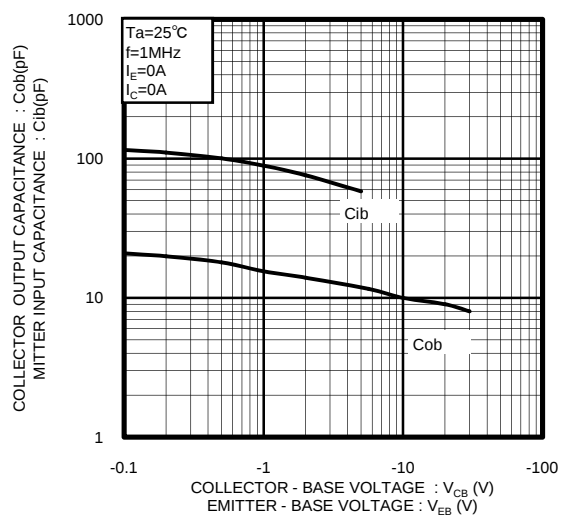


Fig.8 Gain Bandwidth Product vs. Emitter Current

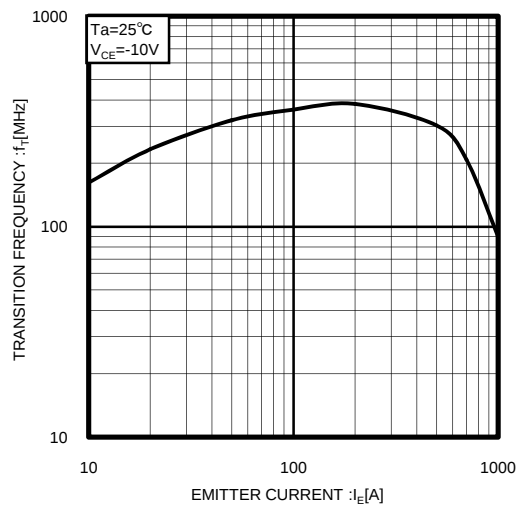
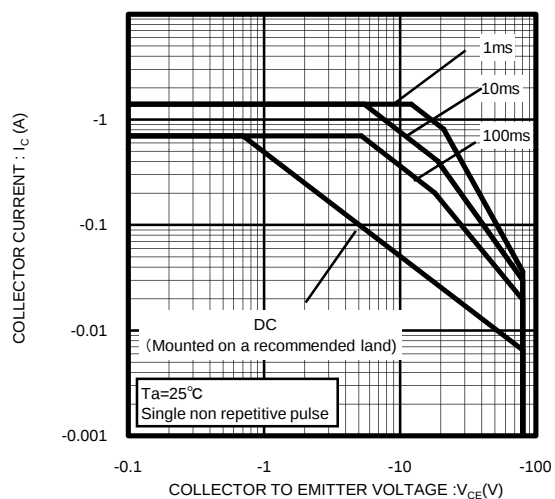
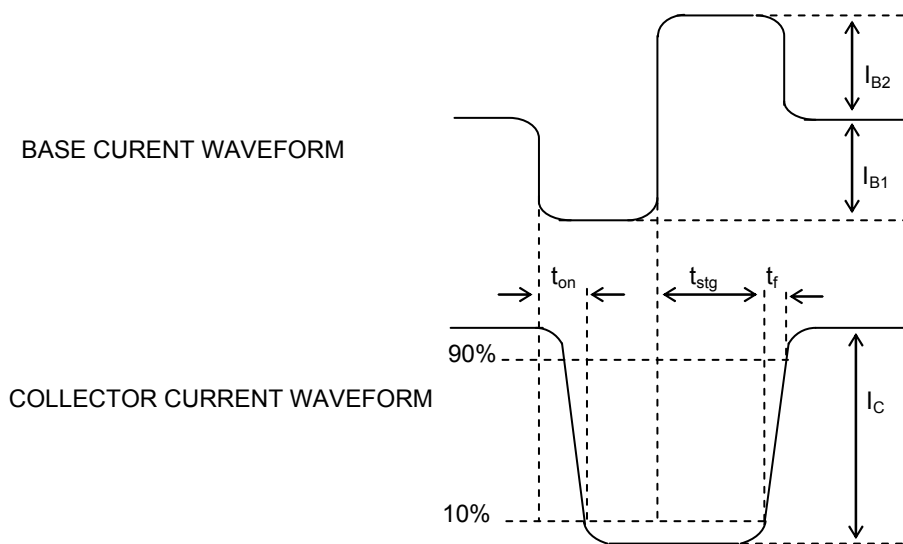
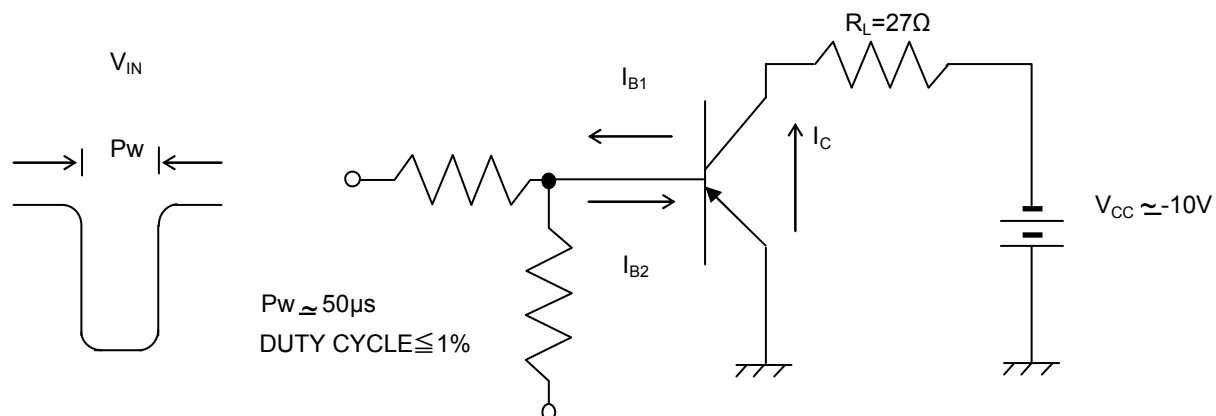


Fig.9. Safe operating area



● Switching time test circuit



Notes

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