

Medium Power Transistors (-30V / -5A)

2SAR542D

● Structure

PNP Silicon epitaxial planar transistor

● Features

1) Low saturation voltage

$$V_{CE(sat)} = -0.4V \text{ (Max.) } (I_C / I_B = -2A / -100mA)$$

2) High speed switching

● Applications

Driver

● Packaging specifications

Type	Package	CPT3
	Code	TL
	Basic ordering unit (pieces)	2500

● Absolute maximum ratings (Ta=25°C)

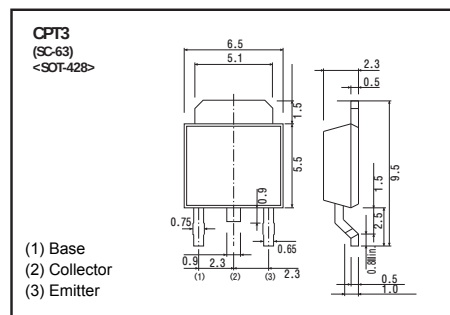
Parameter		Symbol	Limits	Unit
Collector-base voltage		V_{CBO}	-30	V
Collector-emitter voltage		V_{CEO}	-30	V
Emitter-base voltage		V_{EBO}	-6	V
Collector current	DC	I_C	-5	A
	Pulsed	I_{CP}^{*1}	-10	A
Power dissipation		P_D^{*2}	1	W
		P_D^{*3}	10	W
Junction temperature		T_j	150	°C
Range of storage temperature		T_{stg}	-55 to 150	°C

*1 $P_w=10ms$, Single Pulse

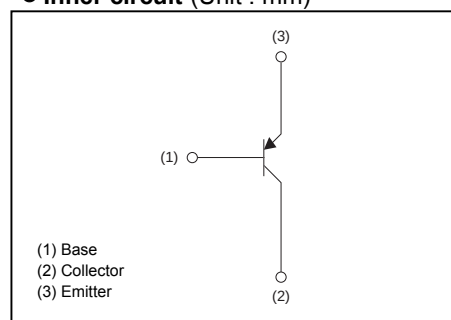
*2 Mounted on a substrate

*3 $T_c=25^\circ C$

● Dimensions (Unit : mm)



● Inner circuit (Unit : mm)



●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-emitter breakdown voltage	BV_{CEO}	-30	-	-	V	$I_C = -1\text{mA}$
Collector-base breakdown voltage	BV_{CBO}	-30	-	-	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	$V_{CB} = -30\text{V}$
Emitter cut-off current	I_{EBO}	-	-	-1	μA	$V_{EB} = -4\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}^{*1}$	-	-200	-400	mV	$I_C = -2\text{A}$, $I_B = -100\text{mA}$
DC current gain	h_{FE}	200	-	500	-	$V_{CE} = -2\text{V}$, $I_C = -500\text{mA}$
Transition frequency	f_T^{*1}	-	240	-	MHz	$V_{CE} = -10\text{V}$ $I_E = 100\text{mA}$, $f = 100\text{MHz}$
Collector output capacitance	C_{ob}	-	40	-	pF	$V_{CB} = -10\text{V}$, $I_E = 0\text{A}$ $f = 1\text{MHz}$
Turn-on time	t_{on}^{*2}	-	45	-	ns	$I_C = -2.5\text{A}$, $I_{B1} = -250\text{mA}$, $I_{B2} = 250\text{mA}$, $V_{CC} \approx -10\text{V}$
Storage time	t_{stg}^{*2}	-	200	-	ns	
Fall time	t_f^{*2}	-	25	-	ns	

*1 Pulsed

*2 See switching time test circuit

●Electrical characteristic curves (Ta=25°C)

Fig.1 Typical Output Characteristics

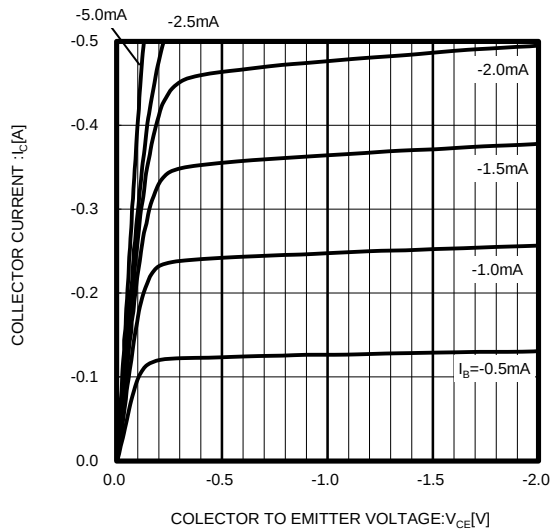


Fig.2 DC Current Gain vs. Collector Current (I)

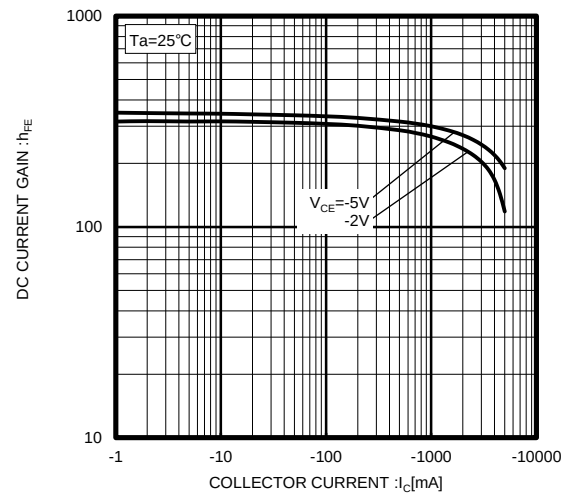


Fig.3 DC Current Gain vs. Collector Current (II)

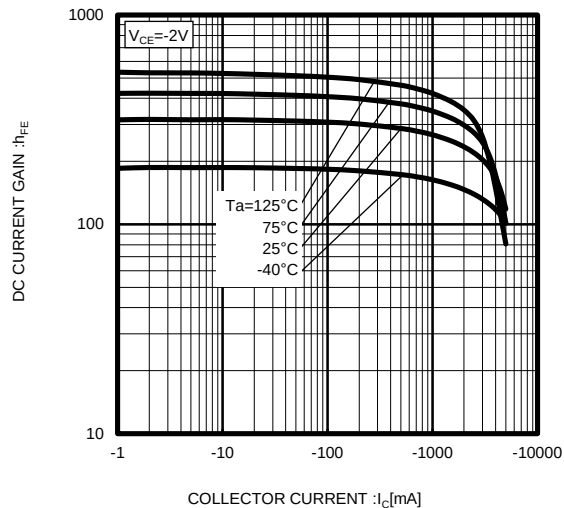


Fig.4 Collector-Emitter Saturation Voltage vs. Collector Current (II)

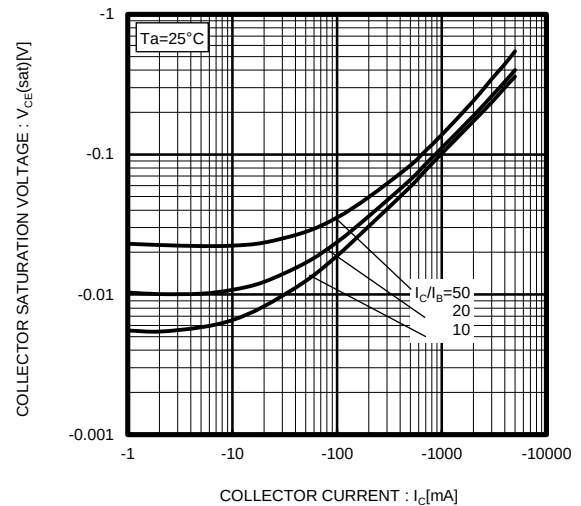


Fig.5 Collector-Emitter Saturation Voltage vs. Collector Current (II)

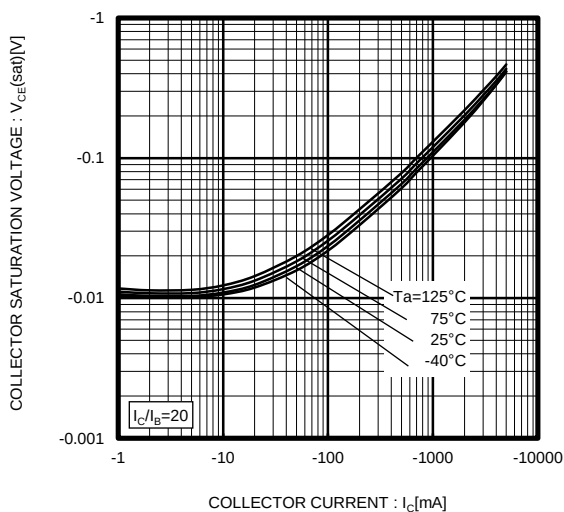


Fig.6 Ground Emitter Propagation Characteristics

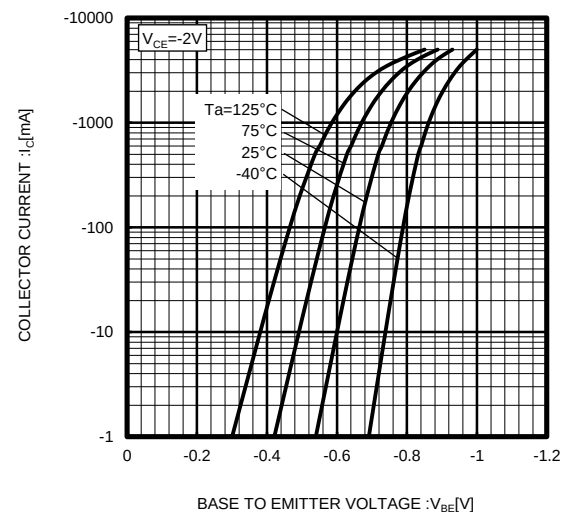


Fig.7 Emitter input capacitance vs. Emitter-Base Voltage
Collector output capacitance vs. Collector-Base Voltage

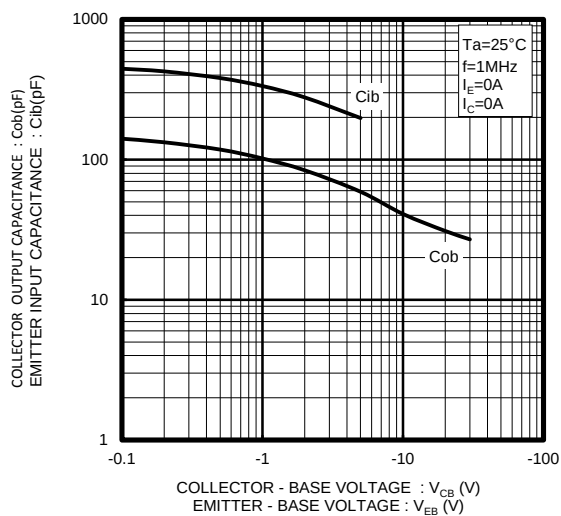


Fig8. Gain Bandwidth Product vs. Emitter Current

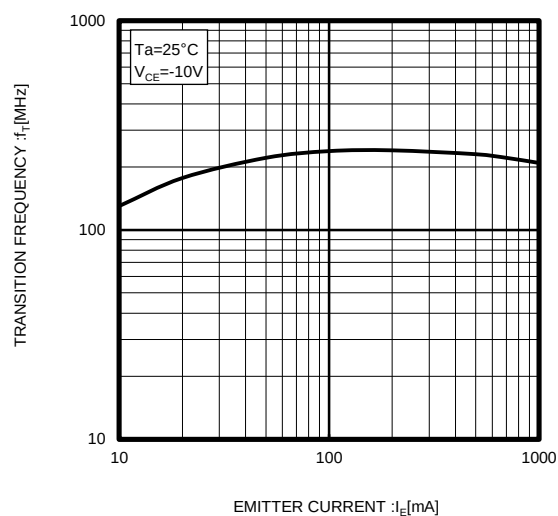
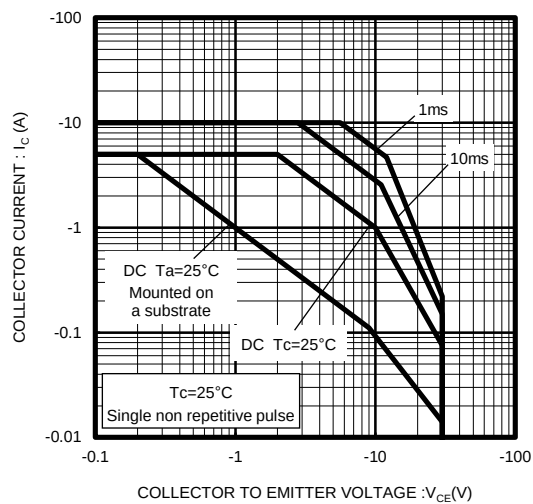
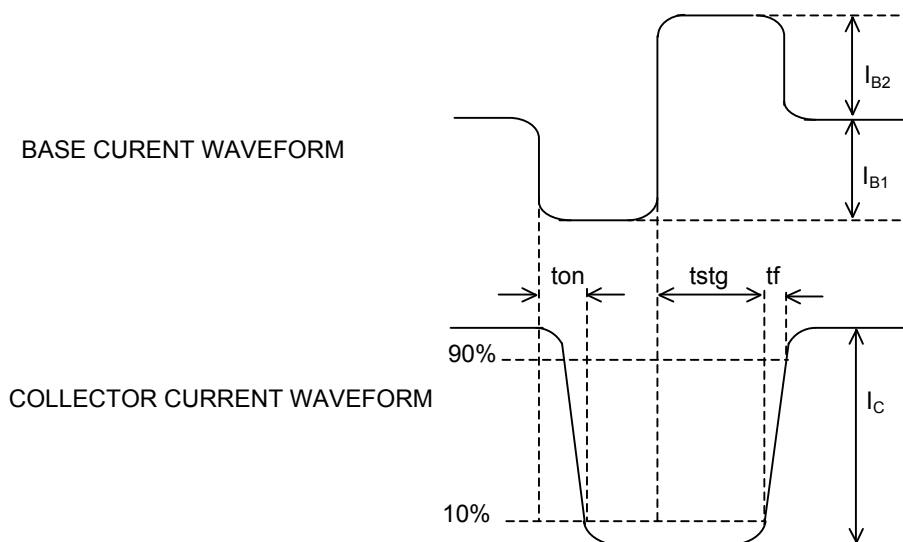
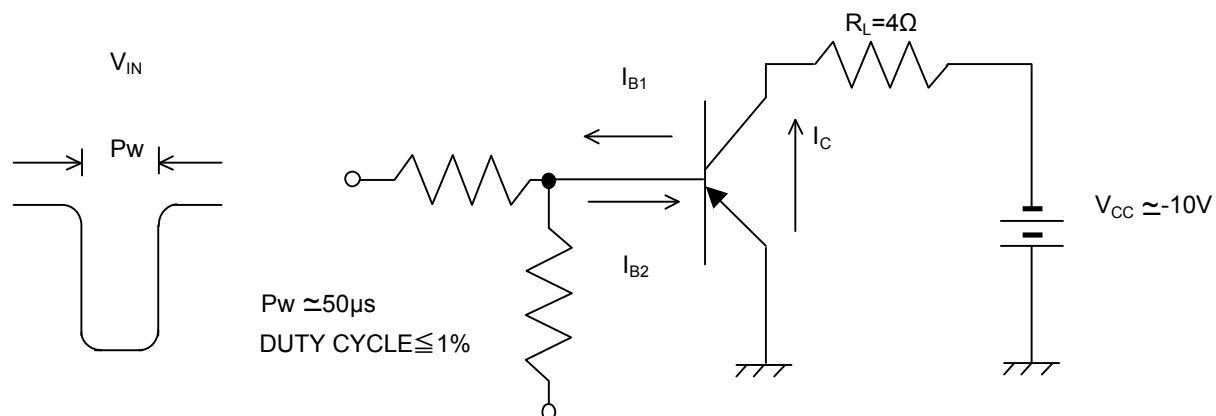


Fig9. Safe Operating Area



● Switching time test circuit



Notes

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