Midium Power Transistors (30V / 5A)

2SCR542D

● Structure

NPN Silicon epitaxial planar transistor

● Features

1) Low saturation voltage

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

2) High speed switching

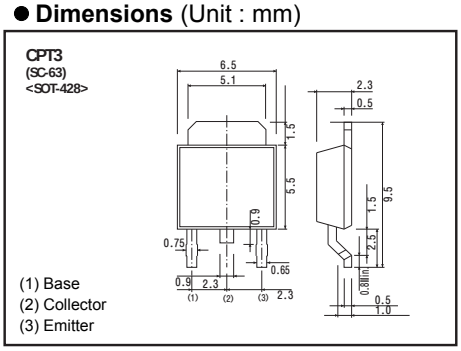
● Applications

Driver

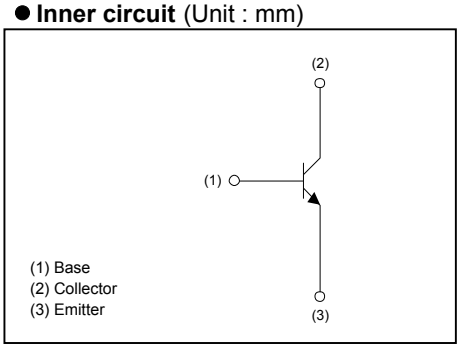
● Packaging specifications

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

● Dimensions (Unit : mm)



● Inner circuit (Unit : mm)



●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 Pw=10ms, Single Pulse

*2 Mounted on a substrate

*3 T_C=25°C

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-emitter breakdown voltage	BV_{CEO}	30	-	-	V	I_C= 1mA
Collector-base breakdown voltage	BV_{CBO}	30	-	-	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}= 30V
Emitter cut-off current	I_{EBO}	-	-	1	μA	V_{EB}= 4V
Collector-emitter staturation voltage	$V_{CE(sat)}$ *1	-	200	400	mV	I_C= 2A, I_B= 100mA
DC current gain	h_{FE}	200	-	500	-	V_{CE}= 2V, I_C= 500mA
Transition frequency	f_T *1	-	250	-	MHz	V_{CE}= 10V I_E=-100mA, f=100MHz
Collector output capacitance	C_{ob}	-	25	-	pF	V_{CB}= 10V, I_E=0A f=1MHz
Turn-on time	t_{on} *2	-	40	-	ns	I_C= 2.5A, I_{B1}= 250mA, I_{B2}=-250mA, V_{CC}≃10V
Storage time	t_{stg} *2	-	320	-	ns	
Fall time	t_f *2	-	25	-	ns	

*1 Pulsed

*2 See switching time test circuit

●Electrical characteristic curves (Ta=25°C)

Fig1. Typical Output Characteristics

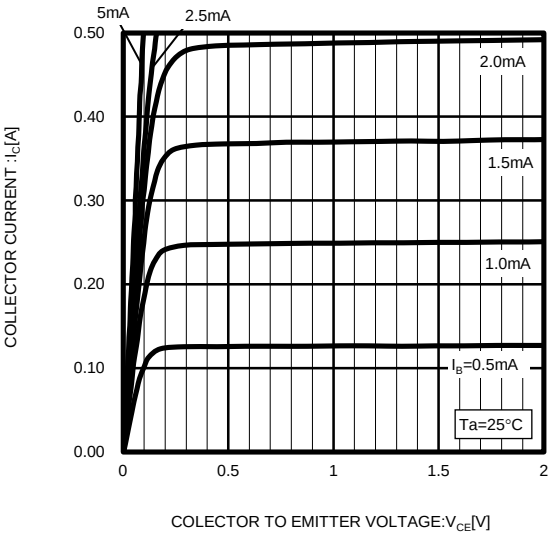


Fig2. DC Current Gain vs. Collector Current(Ⅰ)

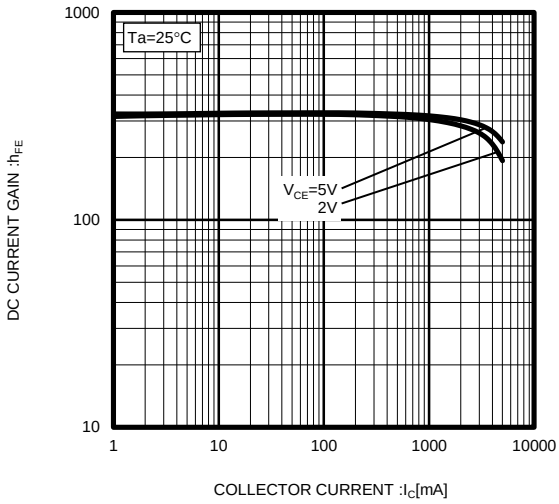


Fig3. DC Current Gain vs.Collector Current(Ⅱ)

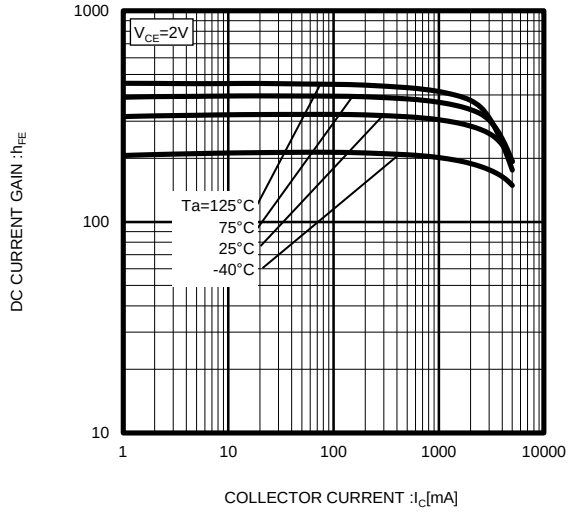


Fig.4 Collector-Emitter Saturation Voltage vs. Collector Current (Ⅰ)

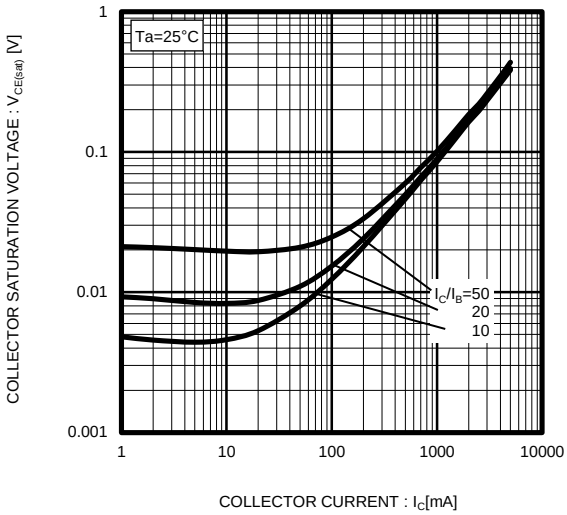


Fig.5 Collector-Emitter Saturation Voltage vs. Collector Current (Ⅱ)

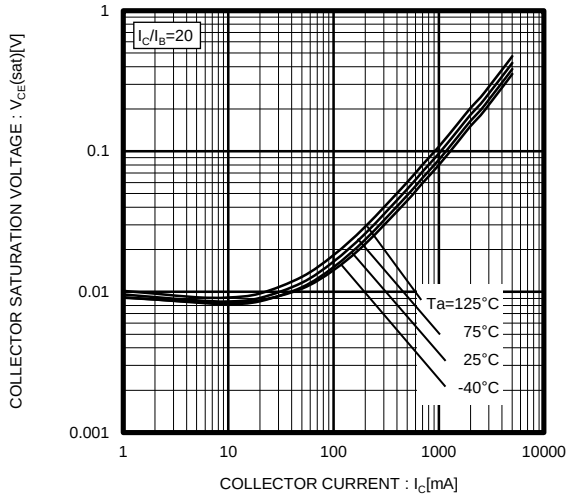


Fig.6 Ground Emitter Propagation Characteristics

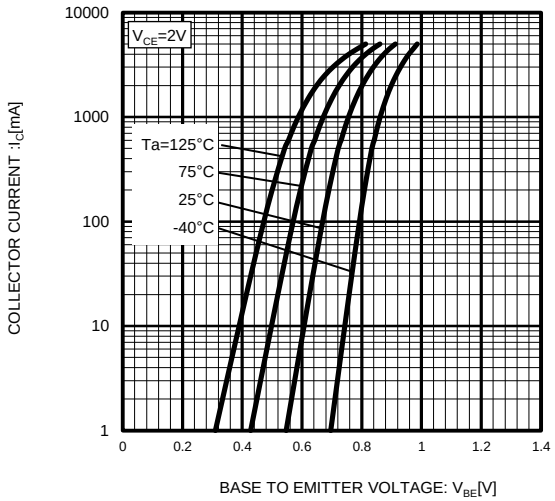


Fig.7 Emitter input capacitance vs. Emitter-Base Voltage
Collector output capacitance vs. Collector-Base Voltage

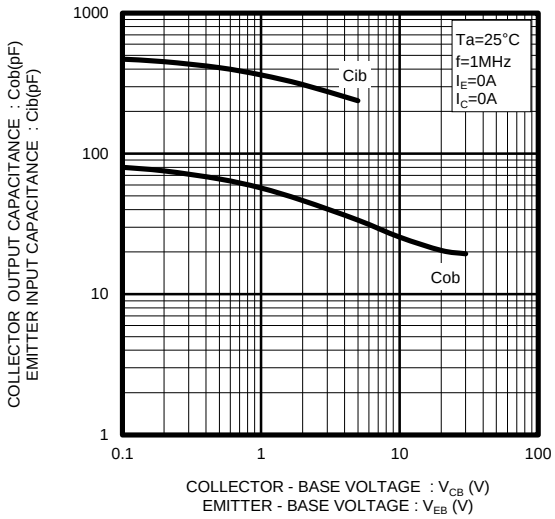


Fig8. Gain Bandwidth Product vs. Emitter Current

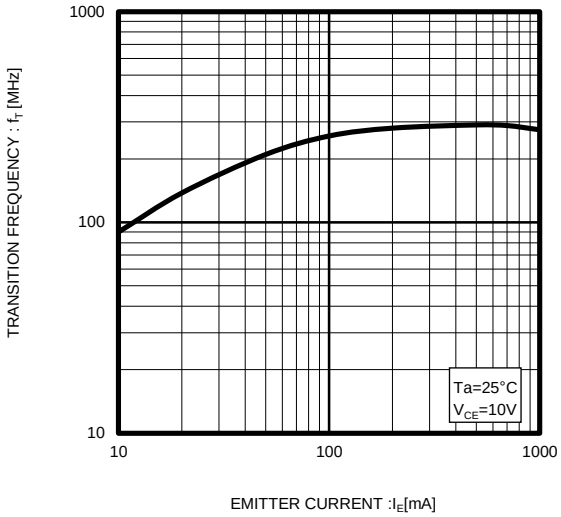
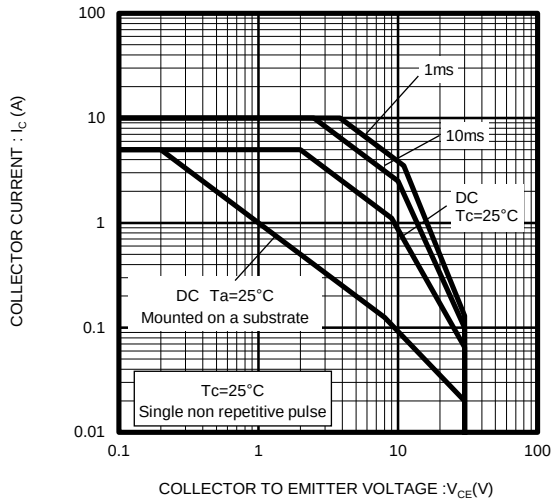
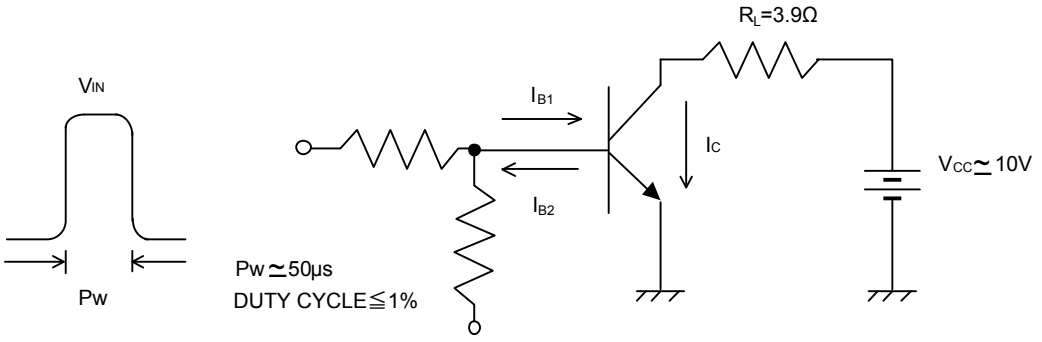


Fig9. SAFE OPERATING AREA

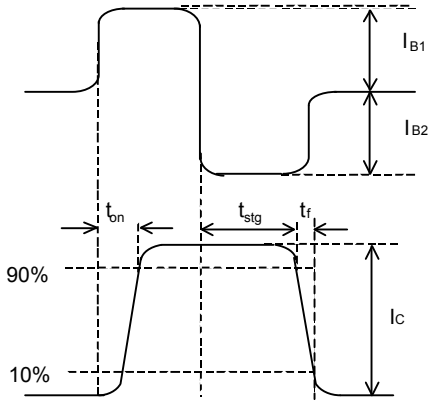


● **Switching time test circuit**



BASE CURENT WAVEFORM

COLLECTOR CURRENT WAVEFORM



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