

Power transistor (−60V, −2A)

2SA2093

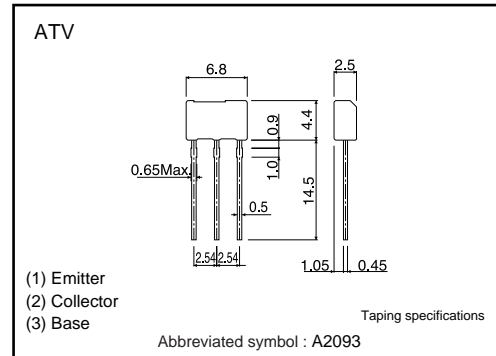
●Features

- 1) High speed switching.
(t_f : Typ. : 30ns at $I_c = -2A$)
- 2) Low saturation voltage, typically
(Typ. : $-200mV$ at $I_c = -1.0A$, $I_B = -0.1A$)
- 3) Strong discharge power for inductive load and capacitance load.
- 4) Complements the 2SC5880

●Applications

Small signal low frequency amplifier
High speed switching

●Dimensions (Unit : mm)



●Structure

PNP Silicon epitaxial planar transistor

●Packaging specifications

Type	Package	Taping
	Code	TV2
	Basic ordering unit (pieces)	2500
2SA2093		○

●Absolute maximum ratings ($T_a=25^\circ C$)

Parameter	Symbol	Limits	Unit	
Collector-base voltage	V_{CBO}	−60	V	
Collector-emitter voltage	V_{CEO}	−60	V	
Emitter-base voltage	V_{EBO}	−6	V	
Collector current	DC	I_c	−2.0	A
	Pulsed	I_{cP}	−4.0	A *
Power dissipation	P_c	1.0	W	
Junction temperature	T_j	150	$^\circ C$	
Range of storage temperature	T_{stg}	−55 to 150	$^\circ C$	

* $P_w=10ms$

Transistors

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Collector-emitter breakdown voltage	BV _{CEO}	-60	-	-	V	I _C = -1mA
Collector-base breakdown voltage	BV _{CBO}	-60	-	-	V	I _C = -100μA
Emitter-base breakdown voltage	BV _{EBO}	-6	-	-	V	I _E = -100μA
Collector cut-off current	I _{CBO}	-	-	-1.0	μA	V _{CB} = -40V
Emitter cut-off current	I _{EBO}	-	-	-1.0	μA	V _{EB} = -4V
Collector-emitter saturation voltage	V _{CE (sat)}	-	-200	-500	mV	I _C = -1.0A I _B = -100mA
DC current gain	h _{FE}	120	-	390	-	V _{CE} = -2V I _C = -100mA
Transition frequency	f _r	-	310	-	MHz	V _{CE} = -10V I _E =100mA f=10MHz
Corrector output capacitance	C _{ob}	-	25	-	pF	V _{CB} = -10V I _E =0mA f=1MHz
Turn-on time	T _{on}	-	25	-	ns	I _C = -2.0A I _{B1} = -200mA I _{B2} =200mA
Storage time	T _{stg}	-	120	-	ns	V _{CC} ≒ -25V
Fall time	T _f	-	30	-	ns	

*Single non repetitive pulse

●h_{FE} RANK

Q	R
120-270	180-390

●Electrical characteristic curves

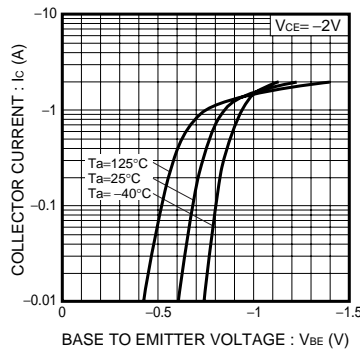


Fig.1 Grounded Emitter Propagation Characteristics

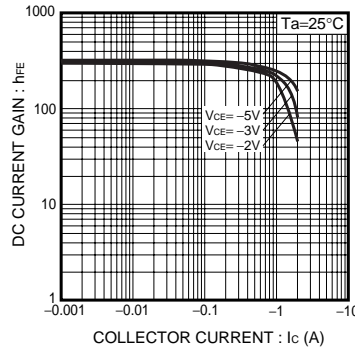


Fig.2 DC Current Gain vs. Collector Current (I)

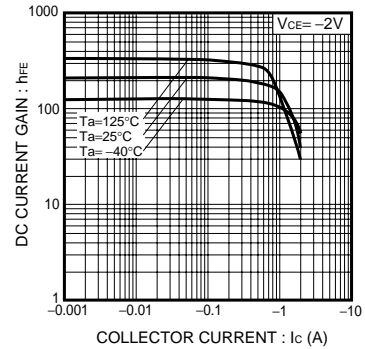


Fig.3 DC Current Gain vs. Collector Current (II)

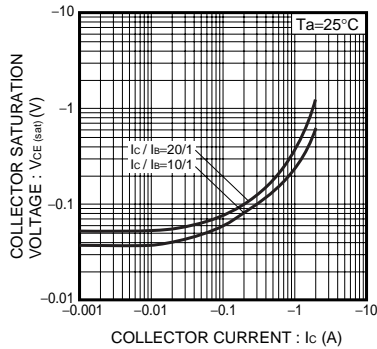


Fig.4 Collector-Emitter Saturation Voltage vs. Collector Current (I)

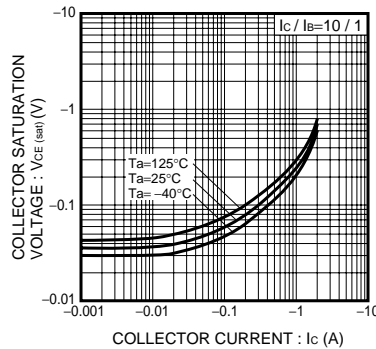


Fig.5 Collector-Emitter Saturation Voltage vs. Collector Current (II)

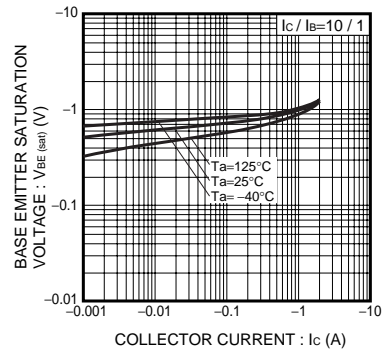


Fig.6 Base-Emitter Saturation Voltage vs. Collector Current

Transistors

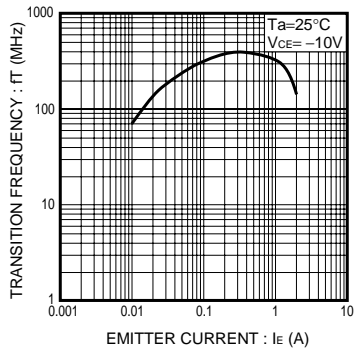


Fig.7 Transition Frequency

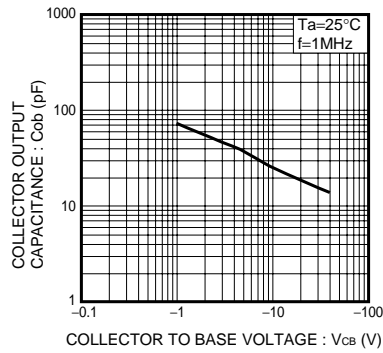


Fig.8 Collector Output Capacitance

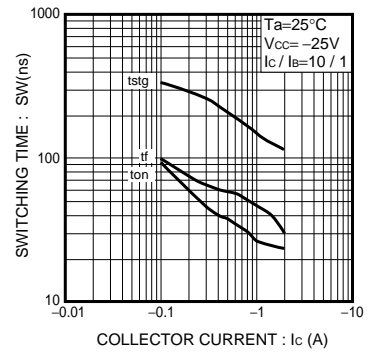


Fig.9 Switching Time

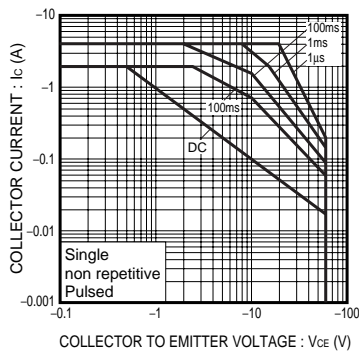
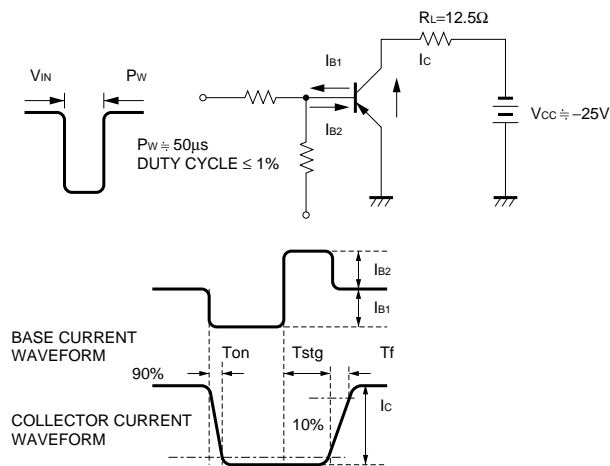


Fig.10 Safe Operating Area

●Switching characteristics measurement circuits



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