

# 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

### ●Structure

PNP epitaxial planar silicon transistor

### ●Packaging specifications

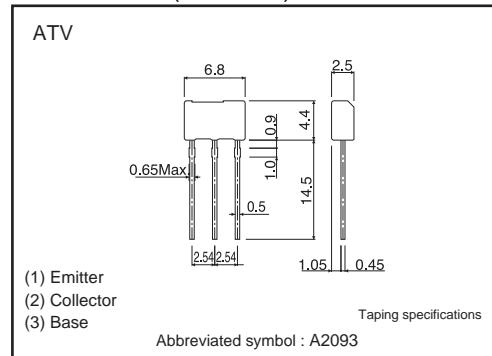
Type	Package	Taping
	Code	TV2
	Basic ordering unit (pieces)	2500
2SA2093		○

### ●Absolute maximum ratings (Ta=25°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	°C	
Range of storage temperature	$T_{stg}$	−55 to 150	°C	

\*Pw=10ms

### ●Dimensions (Unit : mm)



●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	$I_C = -100\mu A$
Emitter-base breakdown voltage	$BV_{EBO}$	-6	-	-	V	$I_E = -100\mu A$
Collector cut-off current	$I_{CBO}$	-	-	-1.0	$\mu A$	$V_{CB} = -40V$
Emitter cut-off current	$I_{EBO}$	-	-	-1.0	$\mu A$	$V_{EB} = -4V$
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	$f_T$	-	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	$I_C = -2.0A$ $I_{B1} = -200mA$ $I_{B2} = 200mA$ $V_{CC} \approx -25V$
Storage time	$T_{stg}$	-	120	-	ns	
Fall time	$T_f$	-	30	-	ns	

\*Single non repetitive pulse

●hFE RANK

Q	R
120-270	180-390

●Electrical characteristic curves

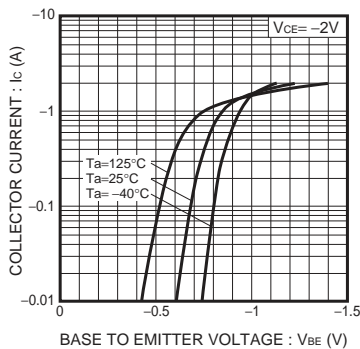


Fig.1 Grounded Emitter Propagation Characteristics

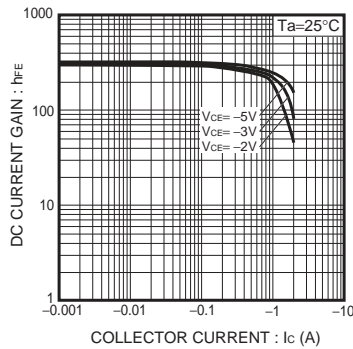


Fig.2 DC Current Gain vs. Collector Current (I)

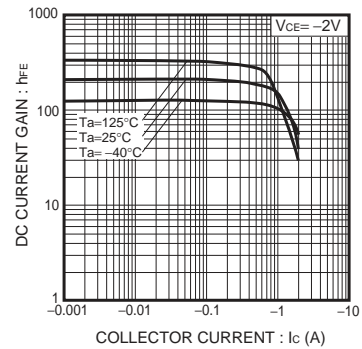


Fig.3 DC Current Gain vs. Collector Current (II)

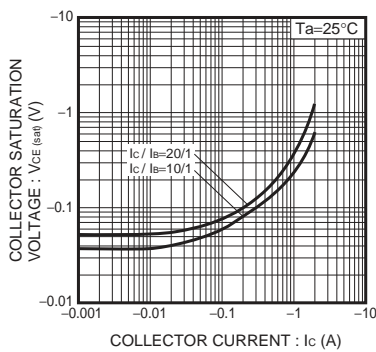


Fig.4 Collector-Emitter Saturation Voltage vs. Collector Current (I)

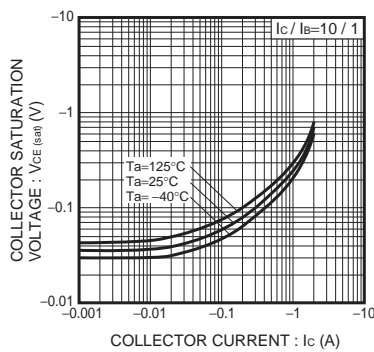


Fig.5 Collector-Emitter Saturation Voltage vs. Collector Current (II)

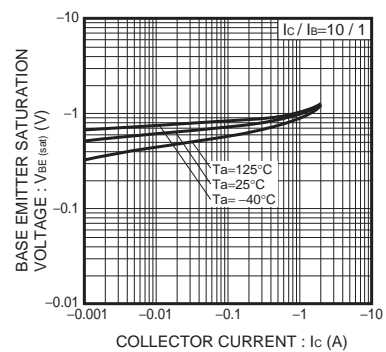


Fig.6 Base-Emitter Saturation Voltage vs. Collector Current

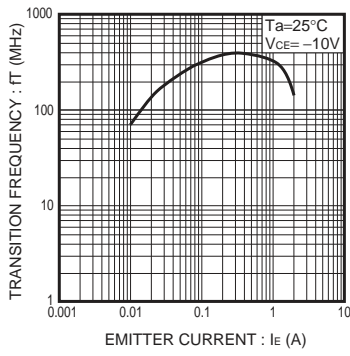


Fig.7 Transition Frequency

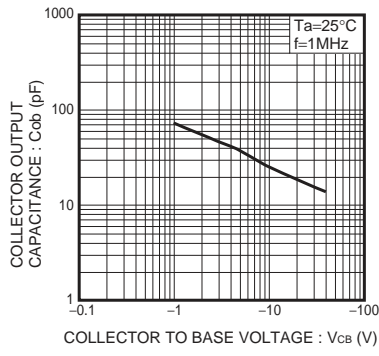


Fig.8 Collector Output Capacitance

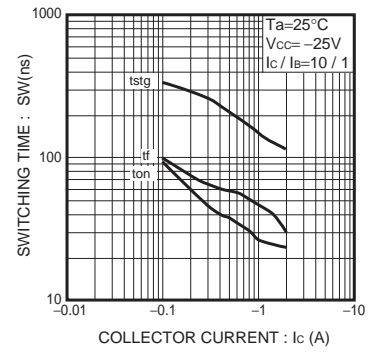
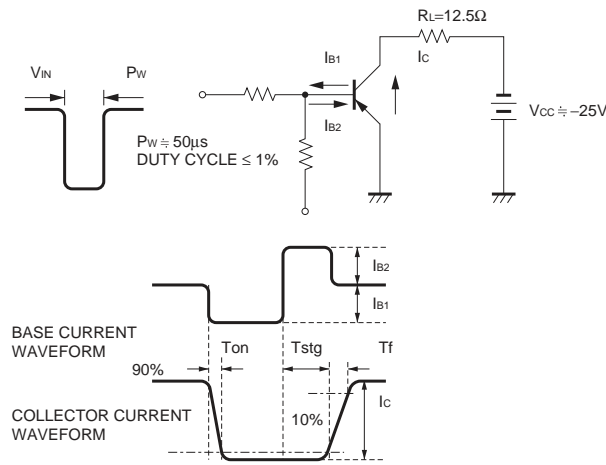


Fig.9 Switching Time

●Switching characteristics measurement circuits



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