

# Power transistor (−60V, −5A)

## 2SA2096

### ●Features

- 1) High speed switching.  
(Tf : Typ. : 25ns at  $I_c = -5A$ )
- 2) Low saturation voltage, typically  
(Typ. : −200mV at  $I_c = -3A$ ,  $I_B = -0.3A$ )
- 3) Strong discharge power for inductive load and capacitance load.
- 4) Complements the 2SC5881

### ●Applications

Low frequency amplifier  
High speed switching

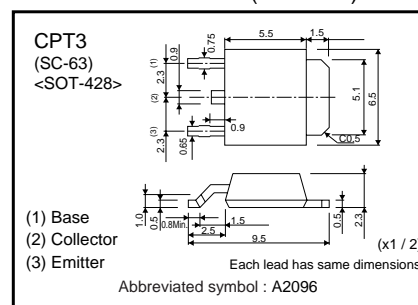
### ●Structure

PNP Silicon epitaxial planar transistor

### ●Packaging specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	2500
2SA2096		○

### ●External dimensions (Unit : mm)



### ●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	$I_c$	−5.0	A
	Pulsed	$I_{cP}$	−10.0	A *1
Power dissipation		$P_c$	1.0	W *2
			10.0	W *3
Junction temperature		$T_j$	150	°C
Range of storage temperature		$T_{stg}$	−55 to 150	°C

\*1  $P_W=100ms$

\*2  $T_a=25^{\circ}C$

\*3  $T_c=25^{\circ}C$

## Transistors

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Collector-emitter breakdown voltage	$BV_{CEO}$	-60	-	-	V	$I_C = -1\text{mA}$
Collector-base breakdown voltage	$BV_{CBO}$	-60	-	-	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	$I_{CBO}$	-	-	-1.0	$\mu\text{A}$	$V_{CB} = -40\text{V}$
Emitter cut-off current	$I_{EBO}$	-	-	-1.0	$\mu\text{A}$	$V_{EB} = -4\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$	-	-200	-500	mV	$I_C = -3\text{mA}$ $I_B = -0.3\text{mA}$
DC current gain	$h_{FE}$	120	-	270	-	$V_{CE} = -2\text{V}$ $I_C = -100\text{mA}$
Transition frequency	$f_T$	-	170	-	MHz	$V_{CE} = -10\text{V}$ $I_E = 100\text{mA}$ $f = 10\text{MHz}$
Corrector output capacitance	$C_{ob}$	-	75	-	pF	$V_{CB} = -10\text{V}$ $I_E = 0\text{mA}$ $f = 1\text{MHz}$
Turn-on time	$T_{on}$	-	25	-	ns	$I_C = -5.0\text{A}$ $I_{B1} = -500\text{mA}$
Storage time	$T_{stg}$	-	130	-	ns	$I_{B2} = 500\text{mA}$
Fall time	$T_f$	-	25	-	ns	$V_{CC} = -25\text{V}$

\*1 Non repetitive pulse

\*2 See Switching characteristics measurement circuits

● $h_{FE}$  RANK

Q
120-270

## ●Electrical characteristic curves

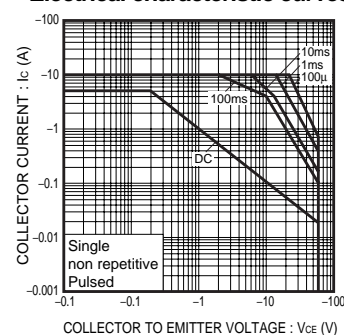


Fig.1 Safe Operating Area

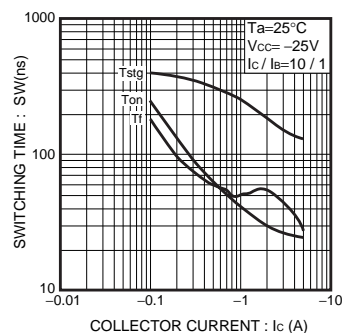


Fig.2 Switching Time

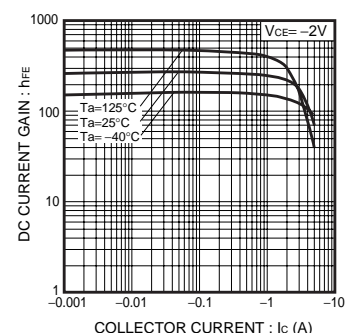


Fig.3 DC Current Gain vs. Collector Current (I)

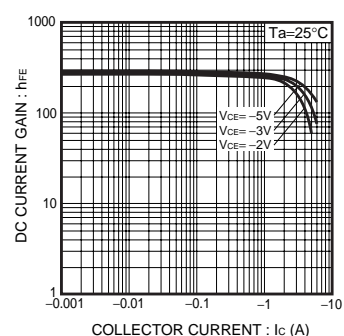


Fig.4 DC Current Gain vs. Collector Current (II)

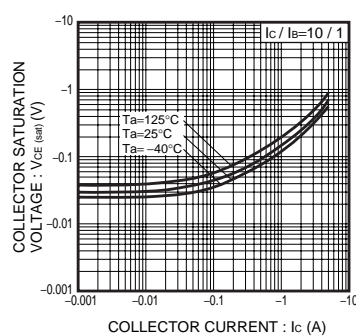


Fig.5 Collector-Emitter Saturation Voltage vs. Collector Current (I)

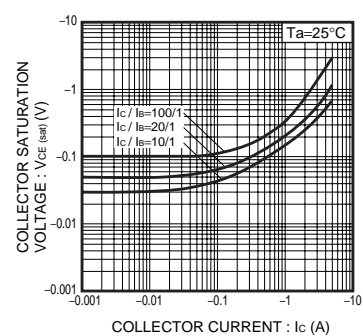


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

## Transistors

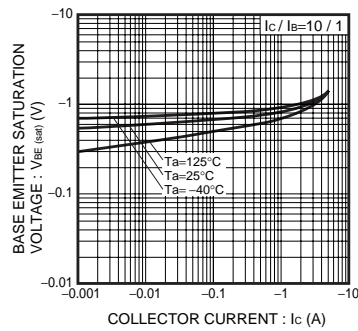


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

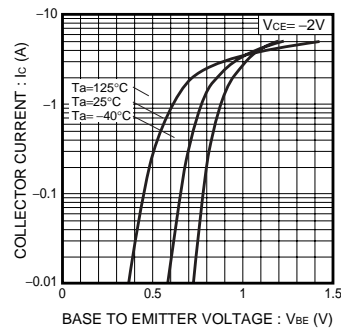


Fig.8 Grounded Emitter Propagation Characteristics

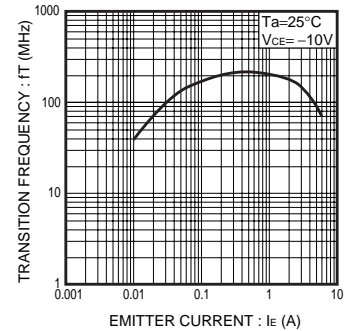


Fig.9 Transition Frequency

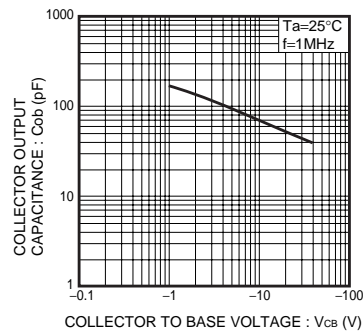
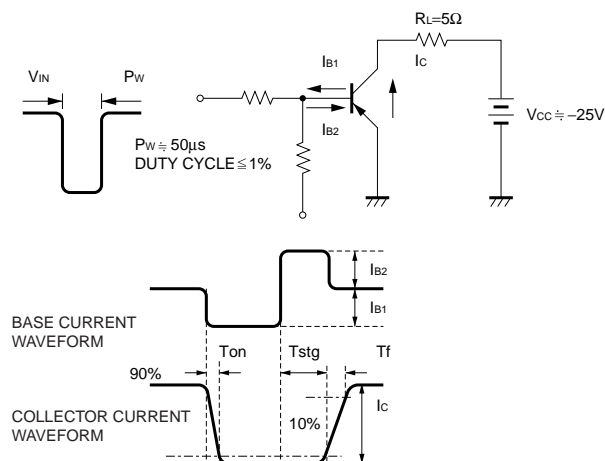


Fig.10 Collector Output Capacitance

●Switching characteristics measurement circuits



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