

# -1A / -60V Bipolar transistor

## 2SA2092

### ●Applications

High-speed switching, low frequency amplification

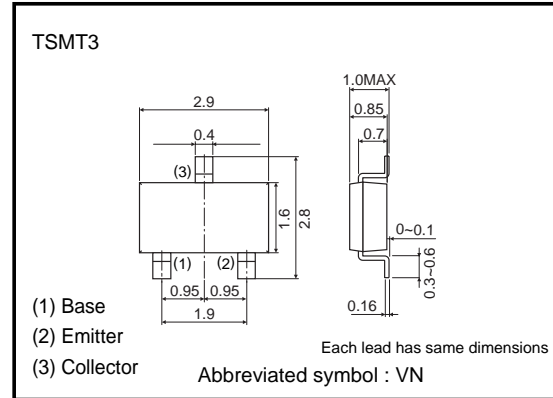
### ●Feature

- 1) High speed switching. ( $t_f$  : Typ. : 30ns at  $I_c = -1A$ )
- 2) Low saturation voltage.  
(Typ. :  $-200mV$  at  $I_c = -500mA$ ,  $I_B = -50mA$ )
- 3) Strong discharge resistance for inductive load and capacitance load.
- 4) Low switching noise.

### ●Structure

PNP epitaxial planar silicon transistor

### ●External dimensions (Unit : mm)



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

Parameter	Symbol	Limits	Unit	
Collector-base voltage	$V_{CB0}$	-60	V	
Collector-emitter voltage	$V_{CE0}$	-60	V	
Emitter-base voltage	$V_{EB0}$	-6	V	
Collector current	DC	$I_c$	-1	A
	PULSE	$I_{CP}^{*1}$	-2	A
Power dissipation	$P_C$	500	mW	
Junction temperature	$T_j$	150	$^\circ C$	
Range of storage temperature	$T_{stg}$	-55 to +150	$^\circ C$	

\*1  $P_w=10ms$

\*2 Each terminal mounted on a recommended land

### ●Packaging specifications

Package	TSMT3
Packaging type	Taping
Code	TL
Basic ordering unit (pieces)	3000
Part No.	2SA2092
	○

### ●hFE rank

Q
120-270

### ●Electrical characteristics ( $T_a=25^\circ C$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-emitter breakdown voltage	$BV_{CE0}$	-60	-	-	V	$I_c = -1mA$
Collector-base breakdown voltage	$BV_{CB0}$	-60	-	-	V	$I_c = -100\mu A$
Emitter-base breakdown voltage	$BV_{EB0}$	-6	-	-	V	$I_E = -100\mu A$
Collector cut-off current	$I_{CB0}$	-	-	-1.0	$\mu A$	$V_{CB} = -40V$
Emitter cut-off current	$I_{EB0}$	-	-	-1.0	$\mu A$	$V_{EB} = -4V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	-	-200	-500	mV	$I_c = -500mA$ , $I_B = -50mA$
DC current gain	$h_{FE}^{*3}$	120	-	270	-	$V_{CE} = -2V$ , $I_c = -100mA$
Transition frequency	$f_t^{*1}$	-	300	-	MHz	$V_{CE} = -10V$ , $I_E = 100mA$ , $f = 10MHz$
Collector output capacitance	$C_{ob}$	-	15	-	pF	$V_{CB} = -10V$ , $I_E = 0$ , $f = 1MHz$
Turn-on time	$t_{on}$	-	30	-	ns	$I_c = -1A$ , $I_{B1} = -100mA$ $I_{B2} = 100mA$
Storage time	$t_{stg}$	-	100	-	ns	
Fall time	$t_f^{*2}$	-	30	-	ns	$V_{CC} = -25V$

\*1 Pulse measurement

\*2 See switching test circuit

\*3  $h_{FE}$  rank

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● Electrical characteristics curve

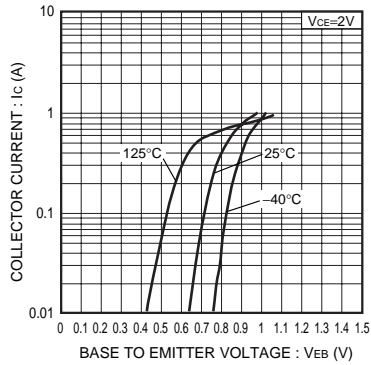


Fig.1 Grounded emitter propagation characteristics

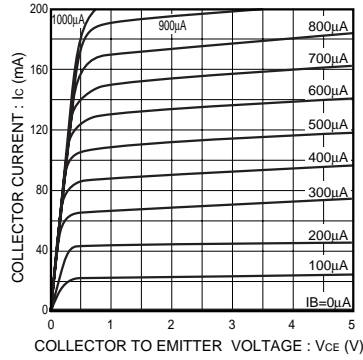


Fig.2 Typical output characteristics

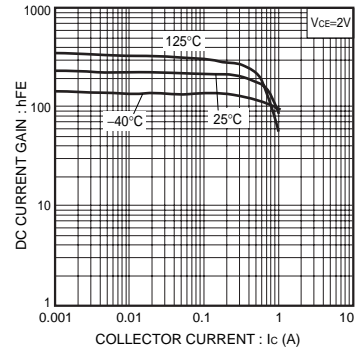


Fig.3 DC current gain vs. collector current ( I )

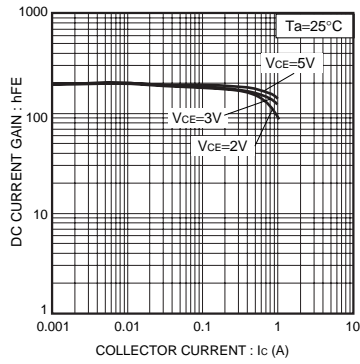


Fig.4 DC current gain vs. collector current (II)

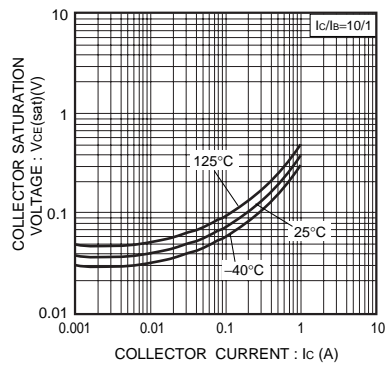


Fig.5 Collector-emitter saturation voltage vs. collector current ( I )

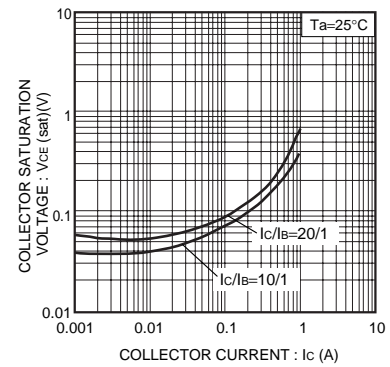


Fig.6 Collector-emitter saturation voltage vs. collector current (II)

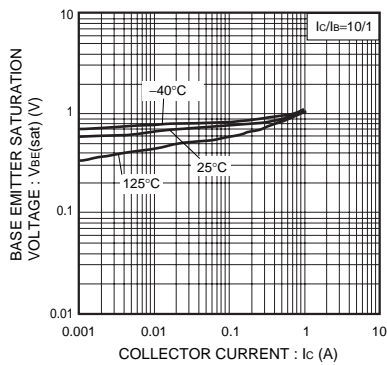


Fig.7 Base-emitter saturation voltage vs. collector current

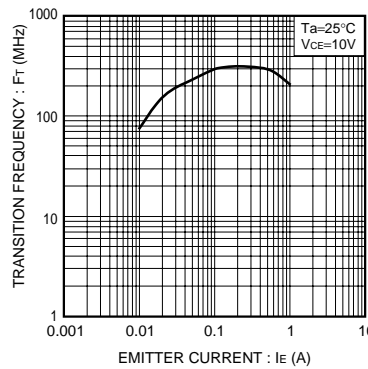


Fig.8 Transition frequency

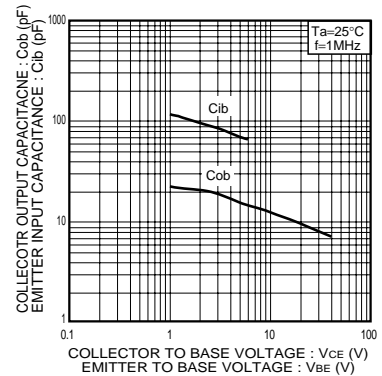
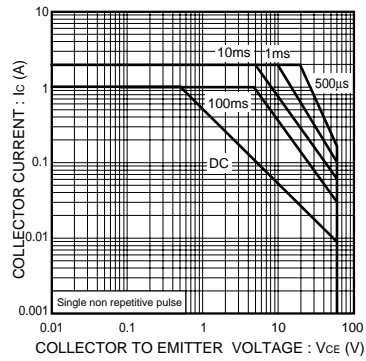
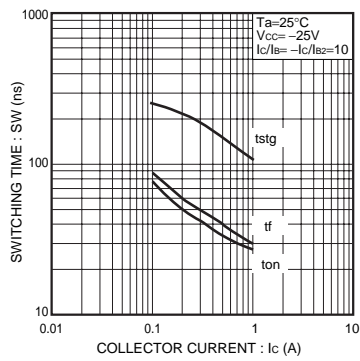
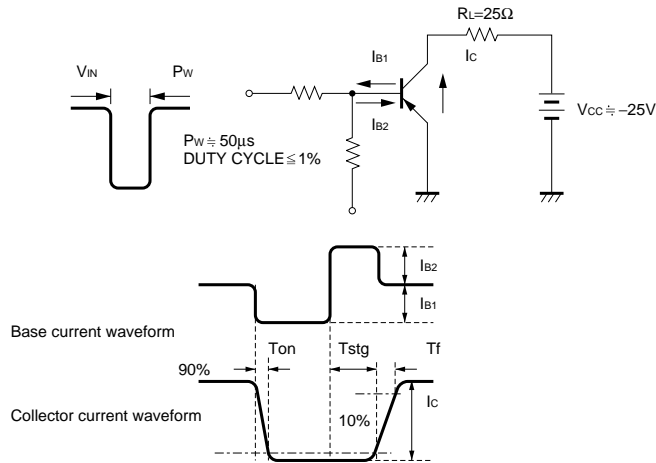


Fig.9 Collector output capacitance Emitter input capacitance

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●Switching test circuit



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