-1A / -60V Bipolar transistor

2SA2092

●Applications

High-speed switching, low frequency amplification

●Feature

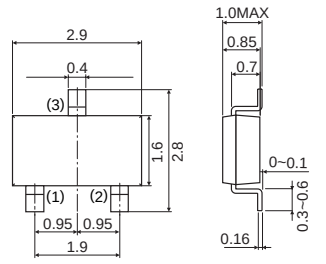
1) High speed switching. (tf : Typ. : 30ns at I_C = -1A)
2) Low saturation voltage.
   (Typ. : −200mV at I_C = −500mA, I_B = −50mA)
3) Strong discharge resistance for inductive load and capacitance load.
4) Low switching noise.

●Structure

PNP epitaxial planar silicon transistor

●External dimensions (Unit : mm)

TSMT3



(1) Base
(2) Emitter
(3) Collector

Each lead has same dimensions

Abbreviated symbol : VN

●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	−1	A
	PULSE	I_{CP} *1	−2	A
Power dissipation		P_C *2	500	mW
Junction temperature		Tj	150	°C
Range of storage temperature		Tstg	−55 to +150	°C

*1 Pw=10ms
*2 Each terminal mounted on a recommended land

●Packaging specifications

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

●h_{FE} rank

Q
120-270

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
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= −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	Cob	−	15	−	pF	V_{CB}= −10V, I_E=0, f=1MHz
Turn-on time	ton	−	30	−	ns	I_C= −1A, I_{B1}= −100mA I_{B2}=100mA V_{CC} ≃ −25V
Storage time	tstg	−	100	−	ns	
Fall time	tf *2	−	30	−	ns	

*1 Pulse measurement
*2 See switching test circuit
*3 h_{FE} rank

● **Electrical characteristics curve**

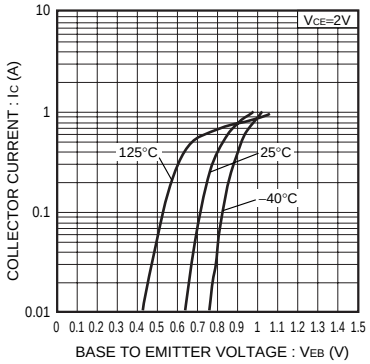


Fig.1 Grounded emitter propagation characteristics

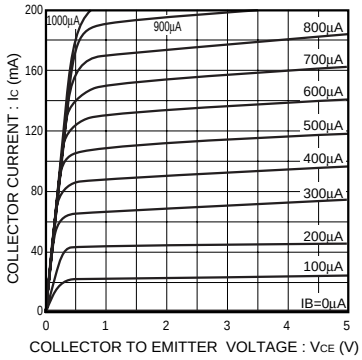


Fig.2 Typical output characteristics

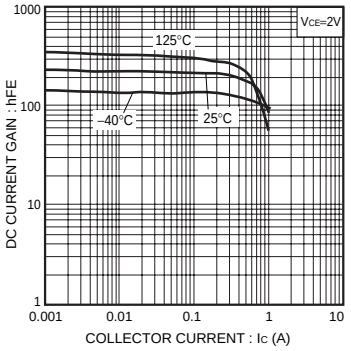


Fig.3 DC current gain vs. collector current (I)

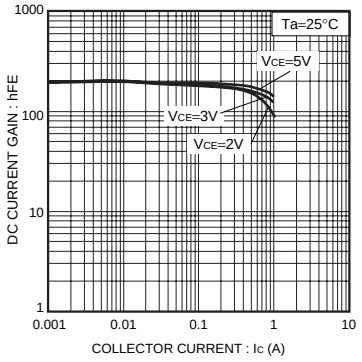


Fig.4 DC current gain vs. collector current (II)

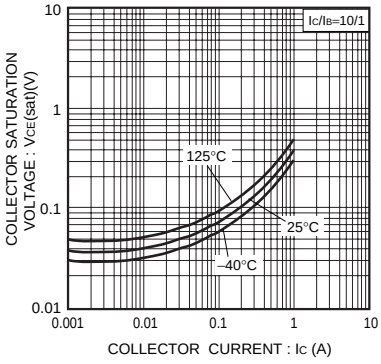


Fig.5 Collector-emitter saturation voltage vs. collector current (I)

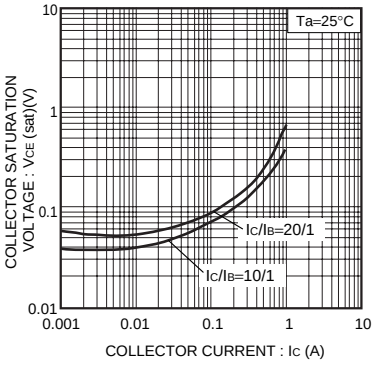


Fig.6 Collector-emitter saturation voltage vs. collector current (II)

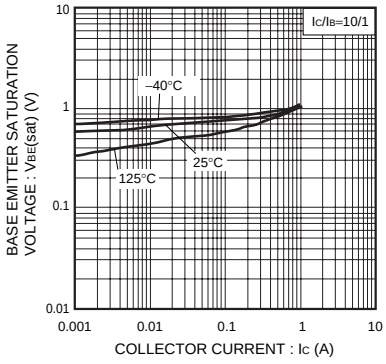


Fig.7 Base-emitter saturation voltage vs. collector current

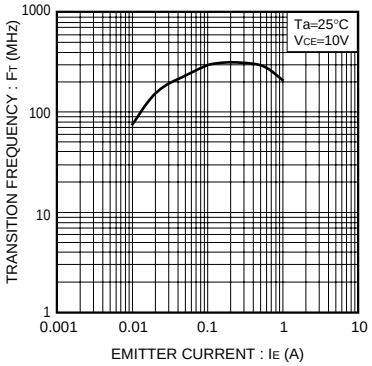


Fig.8 Transition frequency

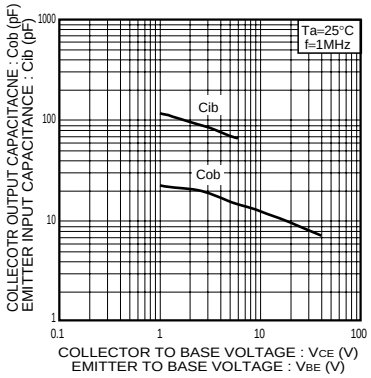


Fig.9 Collector output capacitance Emitter input capacitance

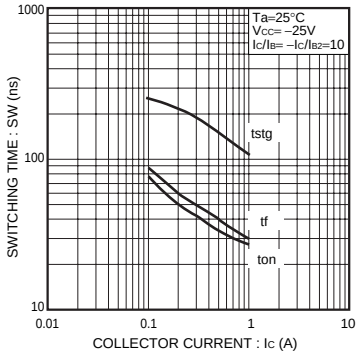


Fig.10 Switching Time

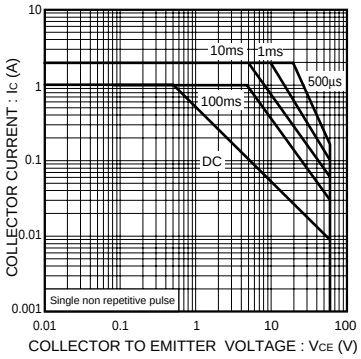
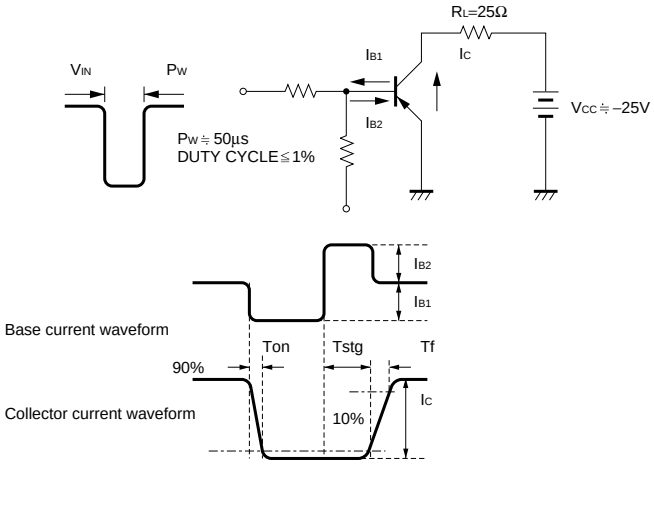


Fig.11 Safe operating area

●Switching test circuit



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