

Medium power transistor (–60V, –0.5A)

2SA2090

●Features

- 1) High speed switching. (T_f : Typ. : 35ns at $I_c = 500\text{mA}$)
- 2) Low saturation voltage, typically.
(Typ. : -150mV at $I_c = -100\text{mA}$, $I_B = -10\text{mA}$)
- 3) Strong discharge power for inductive load and capacitance load.
- 4) Complements the 2SC5868.

●Applications

High speed switching, Low noise

●Structure

NPN Silicon epitaxial planar

●Packaging Specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	3000
2SA2090		○

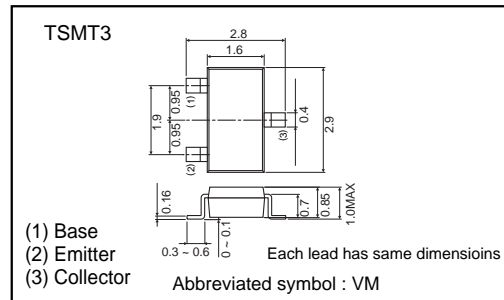
●Absolute maximum ratings ($T_a=25^\circ\text{C}$)

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	I_c	–0.5	A
	I_{cP}	–1.0	A ^{*1}
Power dissipation	P_c	500	mW ^{*2}
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	–55 to +150	°C

*1 $P_w=10\text{ms}$

*2 Each terminal mounted on a recommended land.

●Dimensions (Unit : mm)



Transistors

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-emitter breakdown voltage	BV_{CEO}	-60	-	-	V	$I_C = -1\text{mA}$
Collector-base breakdown voltage	BV_{CBO}	-60	-	-	V	$I_C = -100\text{mA}$
Emitter-base breakdown voltage	BV_{EBO}	-6	-	-	V	$I_E = -100\mu\text{A}$
Collector cut-off current	I_{CBO}	-	-	-1.0	μA	$V_{CB} = -60\text{V}$
Emitter cut-off current	I_{EBO}	-	-	-1.0	μA	$V_{EB} = -4\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$	-	-150	-300	mV	$I_C = -100\text{mA}, I_B = -10\text{mA}$
DC current gain	h_{FE}	120	-	270	-	$V_{CE} = -2\text{V}, I_C = -50\text{mA}$
Transition frequency	f_T	-	400	-	MHz	$V_{CE} = -10\text{V}, I_E = 100\text{mA}, f = 10\text{MHz} \text{ *1}$
Collector output capacitance	C_{ob}	-	10	-	pF	$V_{CB} = -10\text{V}, I_E = 0\text{mA}, f = 1\text{MHz}$
Turn-on time	T_{on}	-	35	-	ns	$I_C = -500\text{mA}, I_{B1} = -50\text{mA}$
Storage time	T_{stg}	-	100	-	ns	$I_{B2} = 50\text{mA}$
Fall time	T_f	-	60	-	ns	$V_{CC} = -25\text{V} \text{ *1}$

*1 Measured using pulse current

● h_{FE} RANK

Q
120-270

●Electrical characteristic curves

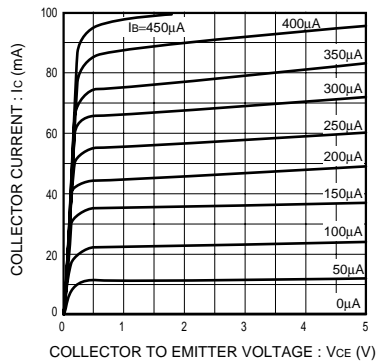


Fig.1 Typical output characteristics

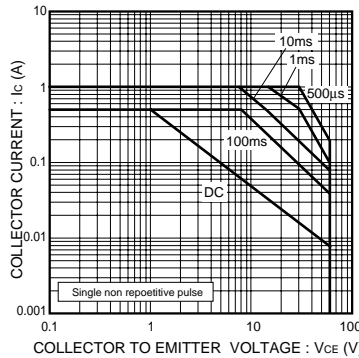


Fig.2 Safe operating area

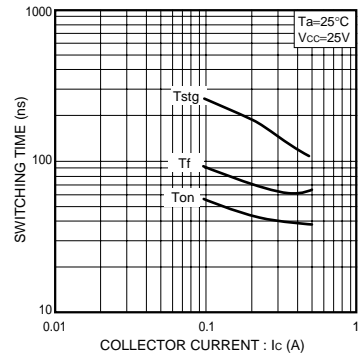


Fig.3 Switching Time

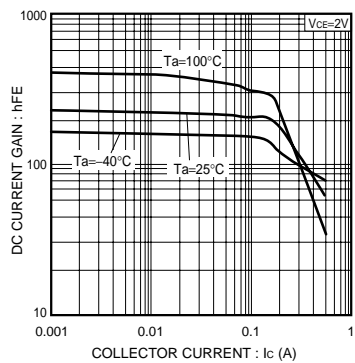


Fig.4 DC current gain vs. collector current (I)

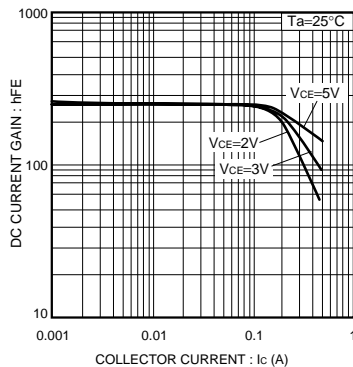


Fig.5 DC current gain vs. collector current (II)

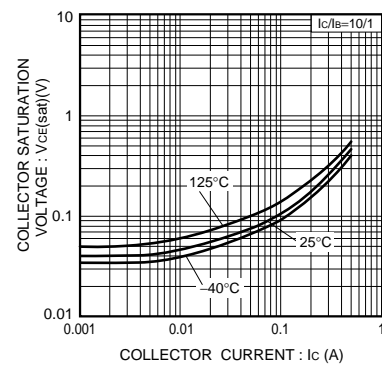


Fig.6 Collector-emitter saturation voltage vs. collector current (I)

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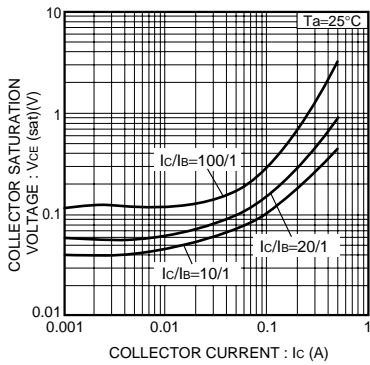


Fig.7 Collector-emitter saturation voltage vs. collector current (II)

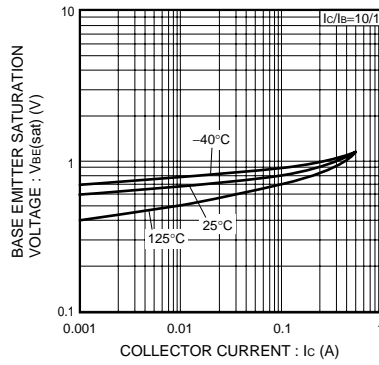


Fig.8 Base-emitter saturation voltage vs. collector current

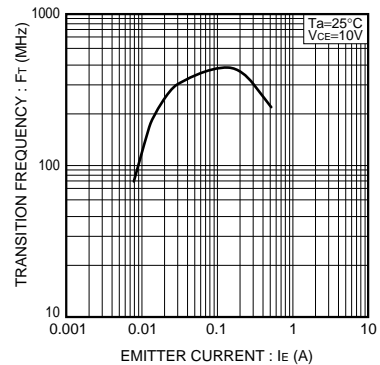


Fig.9 Transition frequency

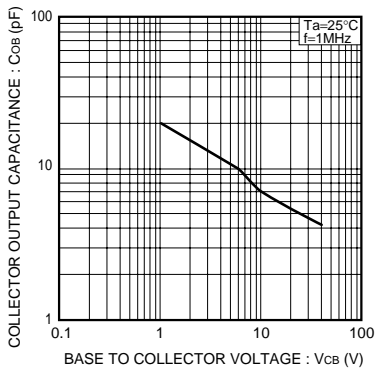


Fig.10 Collector output capacitance

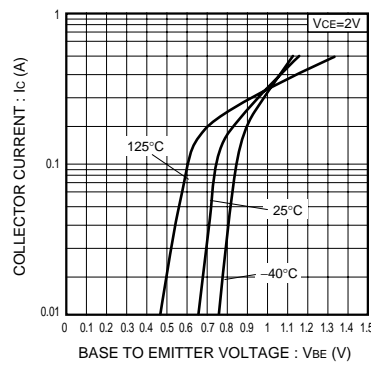
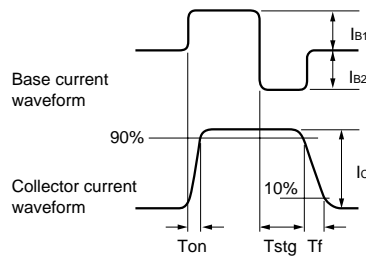
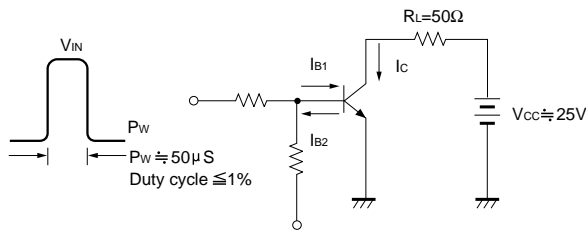


Fig.11 Ground emitter propagation characteristics

●Switching characteristics measurement circuit



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