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# Medium power transistor (–60V, –0.5A)

## 2SA2090

### ●Features

- 1) High speed switching. (Tf : Typ. : 35ns at Ic = 500mA)
- 2) Low saturation voltage, typically.  
(Typ. : –150mV at Ic = –100mA, Ib = –10mA)
- 3) Strong discharge power for inductive load and capacitance load.
- 4) Complements the 2SC5868.

### ●Applications

High speed switching, Low noise

### ●Structure

PNP Silicon epitaxial planar

### ●Packaging specifications

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

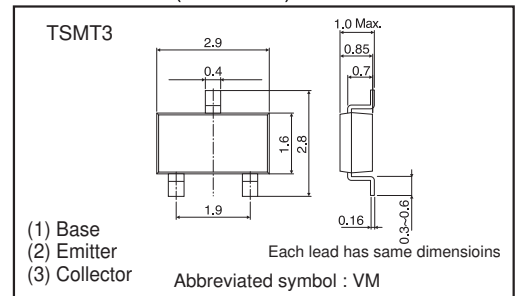
### ●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V <sub>CB0</sub>	–60	V
Collector-emitter voltage	V <sub>CE0</sub>	–60	V
Emitter-base voltage	V <sub>EB0</sub>	–6	V
Collector current	I <sub>c</sub>	–0.5	A
	I <sub>cP</sub>	–1.0	A <sup>*1</sup>
Power dissipation	P <sub>c</sub>	500	mW <sup>*2</sup>
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	–55 to +150	°C

\*1 Pw=10ms

\*2 Each terminal mounted on a recommended land.

### ●Dimensions (Unit : mm)



●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	$\mu\text{A}$	$V_{CB} = -60\text{V}$
Emitter cut-off current	$I_{EBO}$	-	-	-1.0	$\mu\text{A}$	$V_{EB} = -4\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$	-	-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	$V_{CE} = -10\text{V}, I_E = 100\text{mA}, f = 10\text{MHz}$ *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	$V_{CC} = -25\text{V}$ *1

\*1 Measured using pulse current

●hFE RANK

Q
120-270

●Electrical characteristic curves

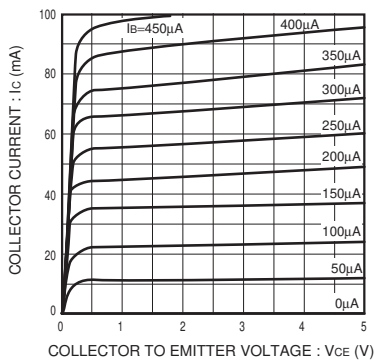


Fig.1 Typical output characteristics

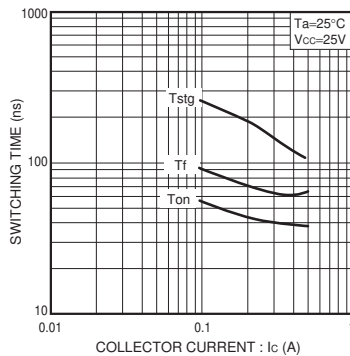


Fig.2 Switching Time

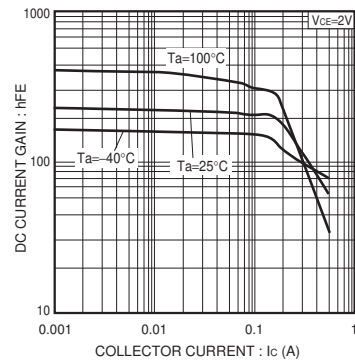


Fig.3 DC current gain vs. collector current ( I )

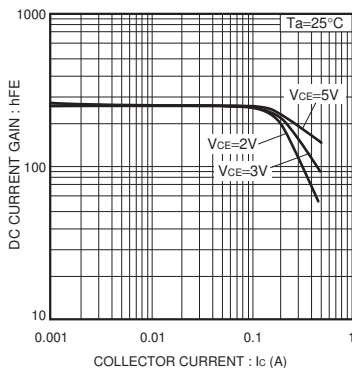


Fig.4 DC current gain vs. collector current (II)

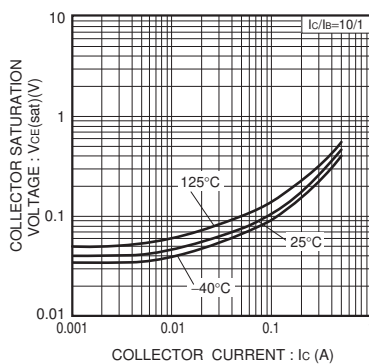


Fig.5 Collector-emitter saturation voltage vs. collector current ( I )

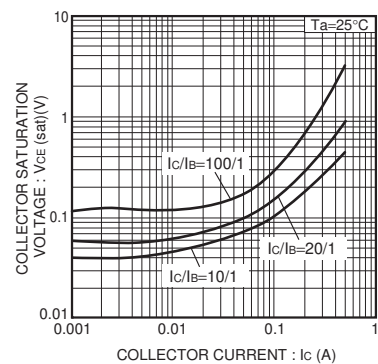


Fig.6 Collector-emitter saturation voltage vs. collector current (II)

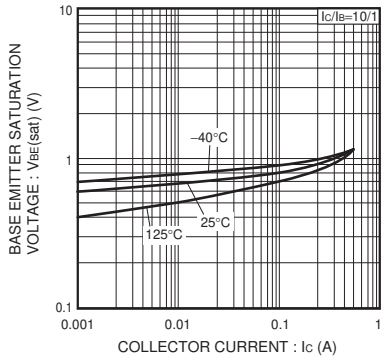


Fig.7 Base-emitter saturation voltage vs. collector current

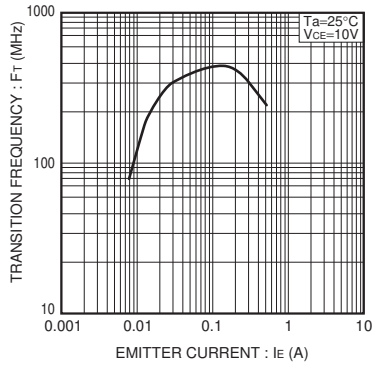


Fig.8 Transition frequency

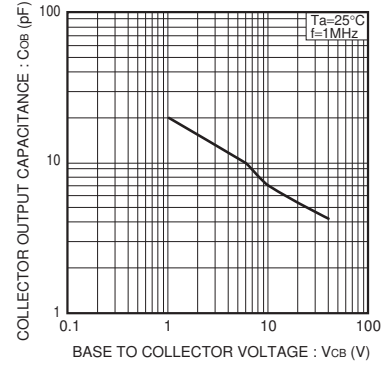


Fig.9 Collector output capacitance

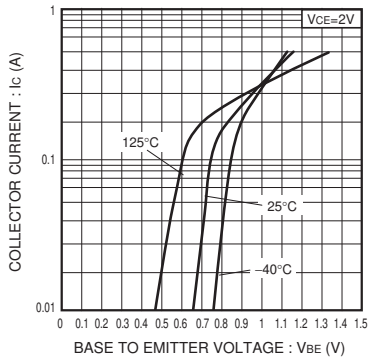
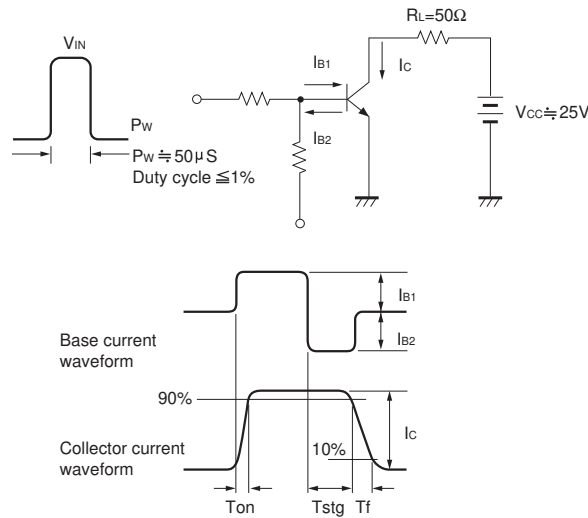


Fig.10 Ground emitter propagation characteristics

●Switching characteristics measurement circuits



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