

# XN0B301 (XN1B301)

Silicon PNP epitaxial planar type (Tr1)  
Silicon NPN epitaxial planar type (Tr2)

For general amplification

## ■ Features

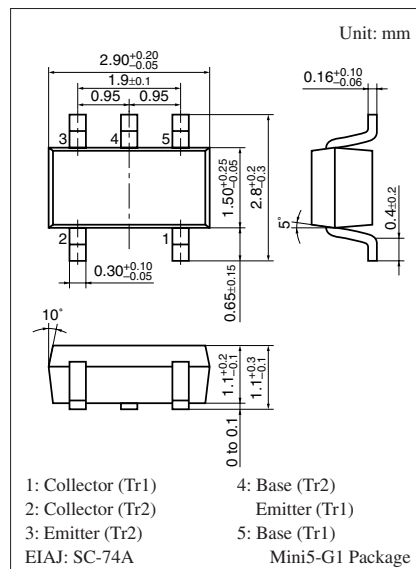
- Two elements incorporated into one package
- Reduction of the mounting area and assembly cost by one half

## ■ Basic Part Number

- 2SB0709A (2SB709A) + 2SD0601A (2SD601A)

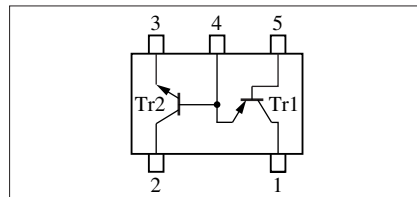
## ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

	Parameter	Symbol	Rating	Unit
Tr1	Collector-base voltage (Emitter open)	$V_{\text{CBO}}$	-60	V
	Collector-emitter voltage (Base open)	$V_{\text{CEO}}$	-50	V
	Emitter-base voltage (Collector open)	$V_{\text{EBO}}$	-7	V
	Collector current	$I_{\text{C}}$	-100	mA
	Peak collector current	$I_{\text{CP}}$	-200	mA
Tr2	Collector-base voltage (Emitter open)	$V_{\text{CBO}}$	60	V
	Collector-emitter voltage (Base open)	$V_{\text{CEO}}$	50	V
	Emitter-base voltage (Collector open)	$V_{\text{EBO}}$	7	V
	Collector current	$I_{\text{C}}$	100	mA
	Peak collector current	$I_{\text{CP}}$	200	mA
Overall	Total power dissipation	$P_{\text{T}}$	300	mW
	Junction temperature	$T_{\text{j}}$	150	$^\circ\text{C}$
	Storage temperature	$T_{\text{stg}}$	-55 to +150	$^\circ\text{C}$



Marking Symbol: 4Q

Internal Connection



Note) The part number in the parenthesis shows conventional part number.

## ■ Electrical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

### • Tr1

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)	$V_{CBO}$	$I_C = -10 \mu\text{A}, I_E = 0$	-60			V
Collector-emitter voltage (Base open)	$V_{CEO}$	$I_C = -2 \text{mA}, I_B = 0$	-50			V
Emitter-base voltage (Collector open)	$V_{EBO}$	$I_E = -10 \mu\text{A}, I_C = 0$	-7			V
Collector-base cutoff current (Emitter open)	$I_{CBO}$	$V_{CB} = -20 \text{V}, I_E = 0$			-0.1	$\mu\text{A}$
Collector-emitter cutoff current (Base open)	$I_{CEO}$	$V_{CE} = -10 \text{V}, I_B = 0$			-100	$\mu\text{A}$
Forward current transfer ratio	$h_{FE}$	$V_{CE} = -10 \text{V}, I_C = -2 \text{mA}$	160		460	—
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -100 \text{mA}, I_B = -10 \text{mA}$		-0.3	-0.5	V
Transition frequency	$f_T$	$V_{CB} = -10 \text{V}, I_E = 1 \text{mA}, f = 200 \text{MHz}$		80		MHz
Collector output capacitance (Common base, input open circuited)	$C_{ob}$	$V_{CB} = -10 \text{V}, I_E = 0, f = 1 \text{MHz}$		2.7		pF

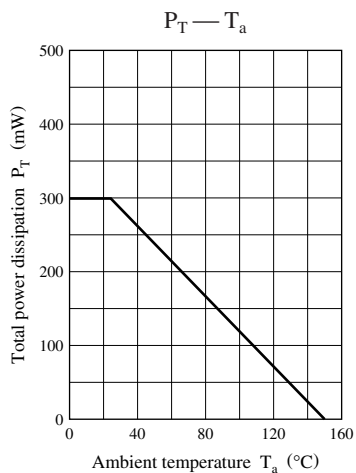
Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

### • Tr2

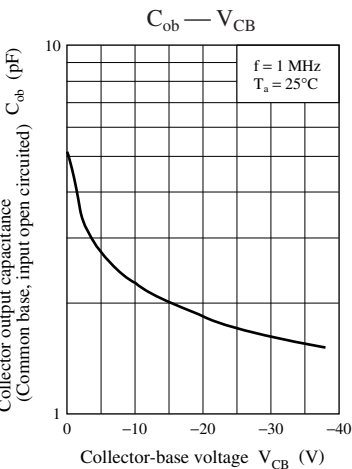
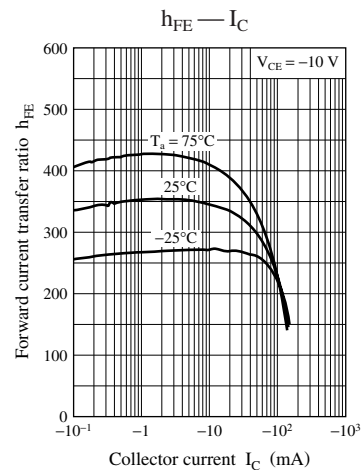
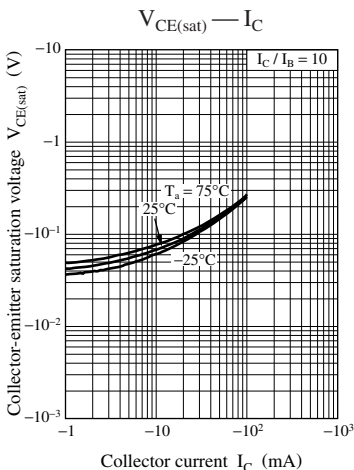
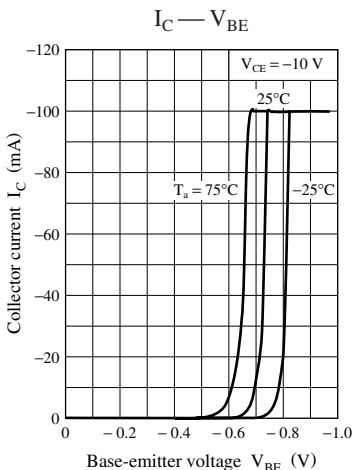
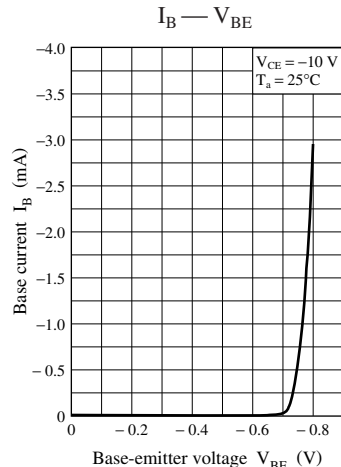
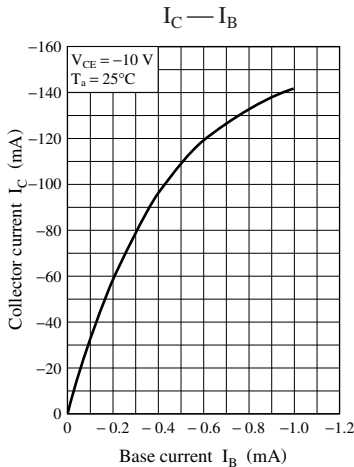
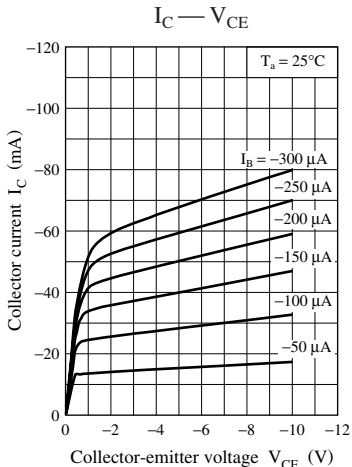
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)	$V_{CBO}$	$I_C = 10 \mu\text{A}, I_E = 0$	60			V
Collector-emitter voltage (Base open)	$V_{CEO}$	$I_C = 2 \text{mA}, I_B = 0$	50			V
Emitter-base voltage (Collector open)	$V_{EBO}$	$I_E = 10 \mu\text{A}, I_C = 0$	7			V
Collector-base cutoff current (Emitter open)	$I_{CBO}$	$V_{CB} = 20 \text{V}, I_E = 0$			0.1	$\mu\text{A}$
Collector-emitter cutoff current (Base open)	$I_{CEO}$	$V_{CE} = 10 \text{V}, I_B = 0$			100	$\mu\text{A}$
Forward current transfer ratio	$h_{FE}$	$V_{CE} = 10 \text{V}, I_C = 2 \text{mA}$	160		460	—
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 100 \text{mA}, I_B = 10 \text{mA}$		0.1	0.3	V
Transition frequency	$f_T$	$V_{CB} = 10 \text{V}, I_E = -2 \text{mA}, f = 200 \text{MHz}$		150		MHz
Collector output capacitance (Common base, input open circuited)	$C_{ob}$	$V_{CB} = 10 \text{V}, I_E = 0, f = 1 \text{MHz}$		3.5		pF

Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

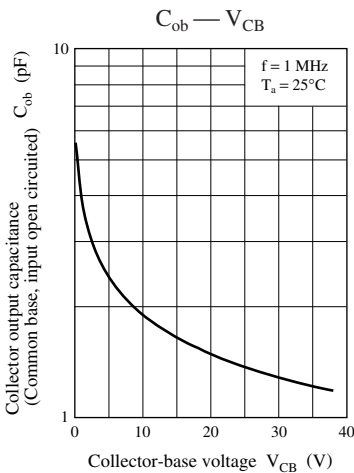
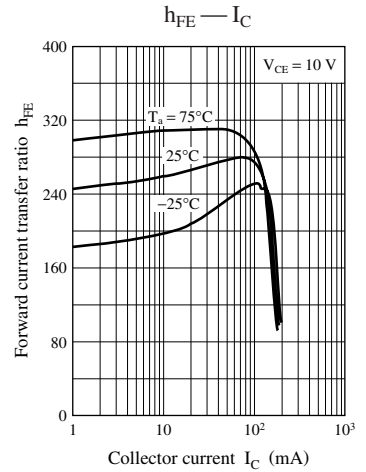
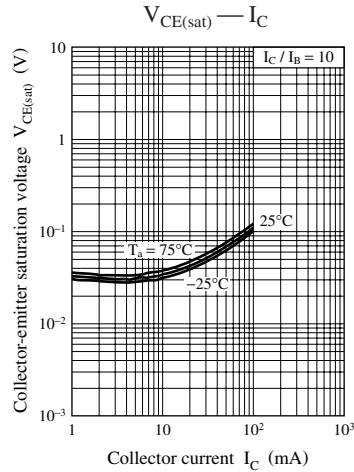
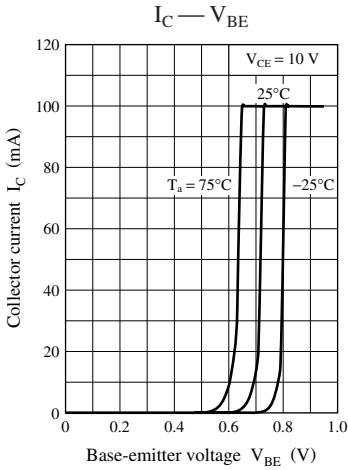
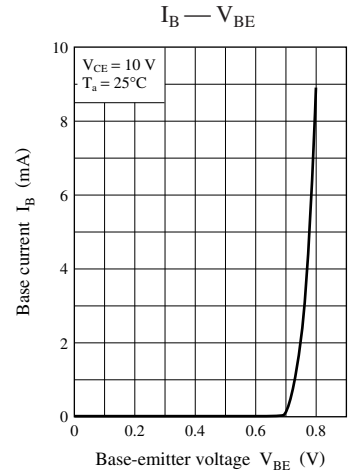
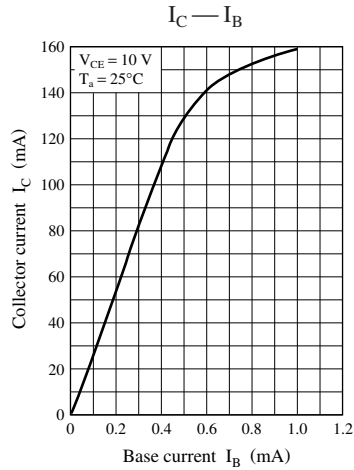
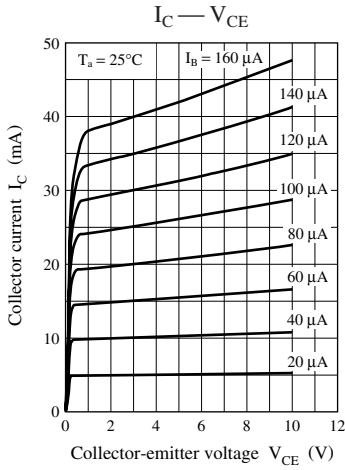
Common characteristics chart



Characteristics charts of Tr1



Characteristics charts of Tr2



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