

# XN1B301

Silicon PNP epitaxial planer transistor (Tr1)  
 Silicon NPN epitaxial planer transistor (Tr2)

For general amplification

### ■ Features

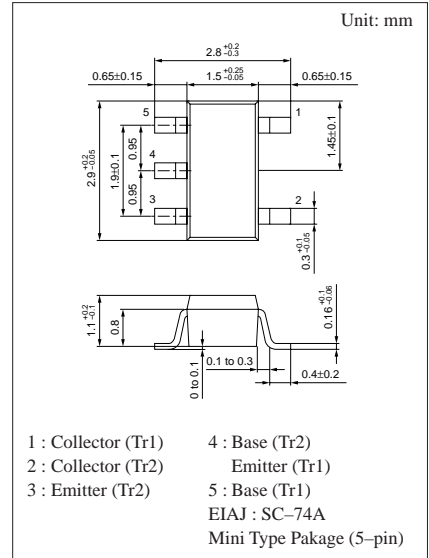
- Two elements incorporated into one package.  
 (Tr1 emitter is connected to Tr2 base.)
- Reduction of the mounting area and assembly cost by one half.

### ■ Basic Part Number of Element

- 2SB709A+2SD601A

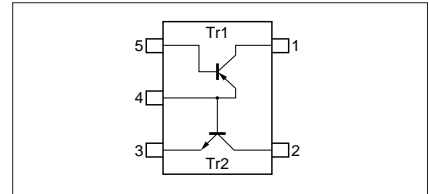
### ■ Absolute Maximum Ratings (Ta=25°C)

	Parameter	Symbol	Ratings	Unit
Tr1	Collector to base voltage	$V_{CBO}$	-60	V
	Collector to emitter voltage	$V_{CEO}$	-50	V
	Emitter to base voltage	$V_{EBO}$	-7	V
	Collector current	$I_C$	-100	mA
	Peak collector current	$I_{CP}$	-200	mA
Tr2	Collector to base voltage	$V_{CBO}$	60	V
	Collector to emitter voltage	$V_{CEO}$	50	V
	Emitter to base voltage	$V_{EBO}$	7	V
	Collector current	$I_C$	100	mA
	Peak collector current	$I_{CP}$	200	mA
Overall	Total power dissipation	$P_T$	300	mW
	Junction temperature	$T_j$	150	°C
	Storage temperature	$T_{sig}$	-55 to +150	°C



Marking Symbol: 4Q

Internal Connection



### ■ Electrical Characteristics (T<sub>a</sub>=25°C)

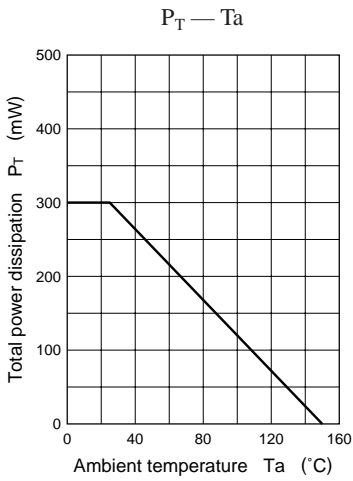
#### ● Tr1

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector to base voltage	V <sub>CBO</sub>	I <sub>C</sub> = -10μA, I <sub>E</sub> = 0	-60			V
Collector to emitter voltage	V <sub>CEO</sub>	I <sub>C</sub> = -2mA, I <sub>B</sub> = 0	-50			V
Emitter to base voltage	V <sub>EBO</sub>	I <sub>E</sub> = -10μA, I <sub>C</sub> = 0	-7			V
Collector cutoff current	I <sub>CBO</sub>	V <sub>CB</sub> = -20V, I <sub>E</sub> = 0			-0.1	μA
	I <sub>CEO</sub>	V <sub>CE</sub> = -10V, I <sub>B</sub> = 0			-100	μA
Forward current transfer ratio	h <sub>FE</sub>	V <sub>CE</sub> = -10V, I <sub>C</sub> = -2mA	160		460	
Collector to emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> = -100mA, I <sub>B</sub> = -10mA		-0.3	-0.5	V
Transition frequency	f <sub>T</sub>	V <sub>CB</sub> = -10V, I <sub>E</sub> = 1mA, f = 200MHz		80		MHz
Collector output capacitance	C <sub>ob</sub>	V <sub>CB</sub> = -10V, I <sub>E</sub> = 0, f = 1MHz		2.7		pF

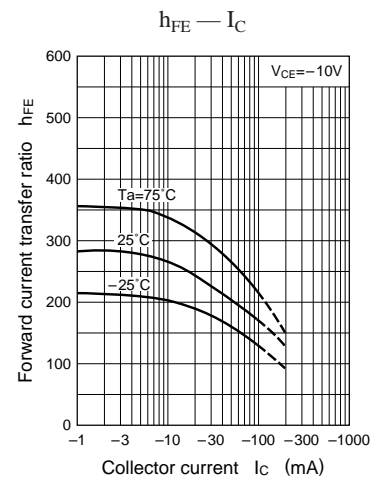
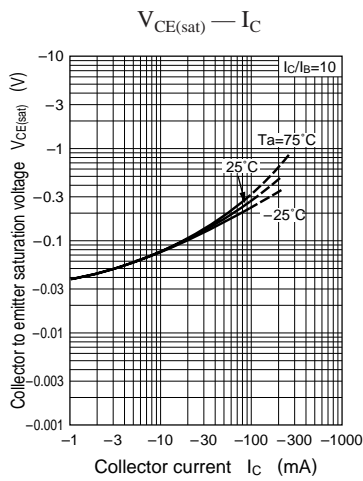
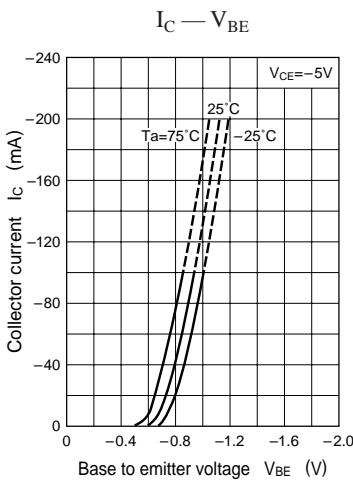
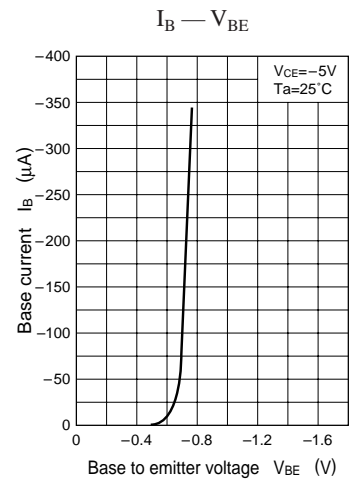
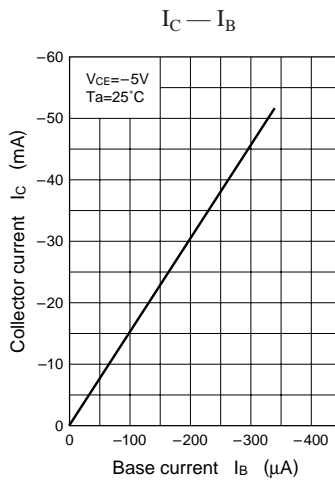
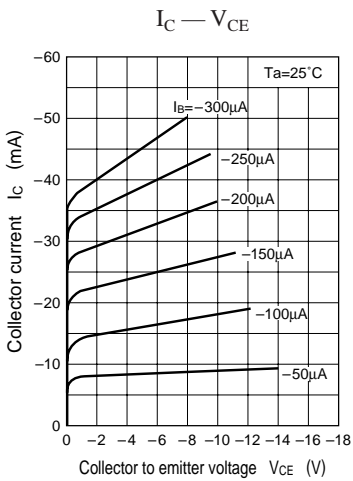
#### ● Tr2

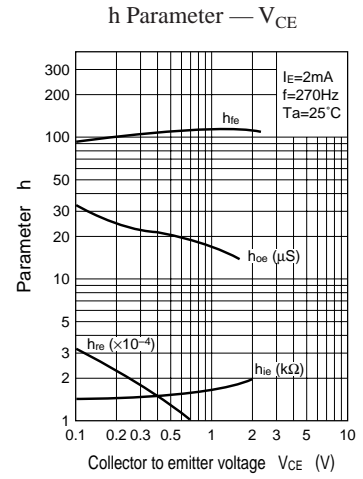
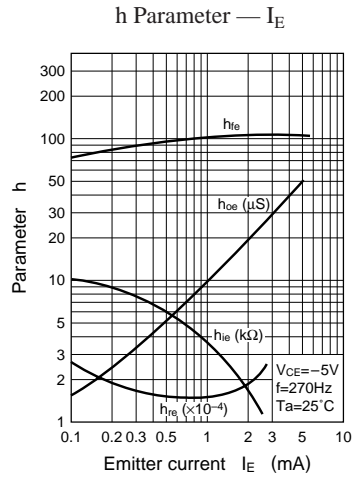
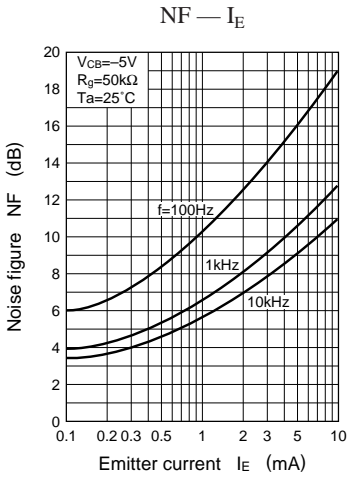
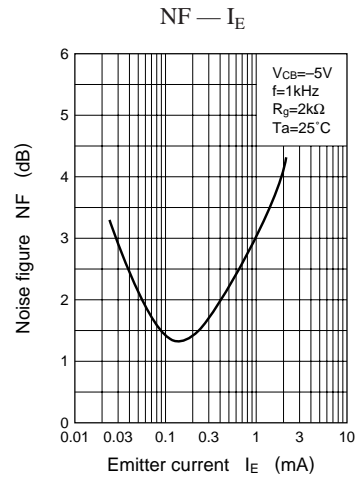
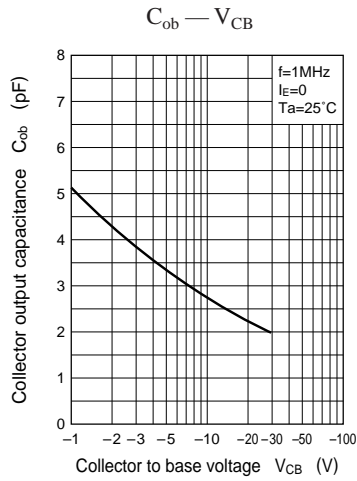
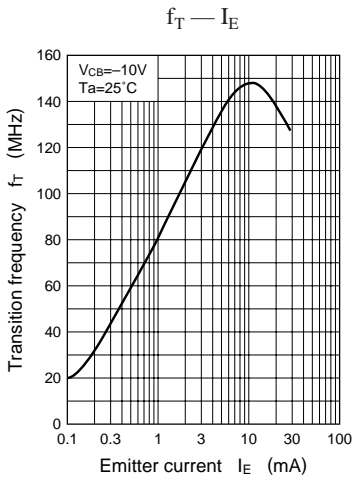
Parameter	Symbol	Conditions	min	typ	max	Unit
Collector to base voltage	V <sub>CBO</sub>	I <sub>C</sub> = 10μA, I <sub>E</sub> = 0	60			V
Collector to emitter voltage	V <sub>CEO</sub>	I <sub>C</sub> = 2mA, I <sub>B</sub> = 0	50			V
Emitter to base voltage	V <sub>EBO</sub>	I <sub>E</sub> = 10μA, I <sub>C</sub> = 0	7			V
Collector cutoff current	I <sub>CBO</sub>	V <sub>CB</sub> = 20V, I <sub>E</sub> = 0			0.1	μA
	I <sub>CEO</sub>	V <sub>CE</sub> = 10V, I <sub>B</sub> = 0			100	μA
Forward current transfer ratio	h <sub>FE</sub>	V <sub>CE</sub> = 10V, I <sub>C</sub> = 2mA	160		460	
Collector to emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> = 100mA, I <sub>B</sub> = 10mA		0.1	0.3	V
Transition frequency	f <sub>T</sub>	V <sub>CB</sub> = 10V, I <sub>E</sub> = -2mA, f = 200MHz		150		MHz
Collector output capacitance	C <sub>ob</sub>	V <sub>CB</sub> = 10V, I <sub>E</sub> = 0, f = 1MHz		3.5		pF

Common characteristics chart

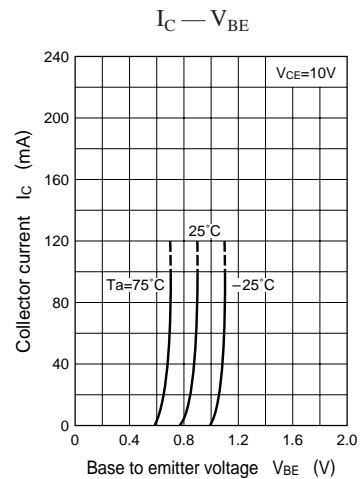
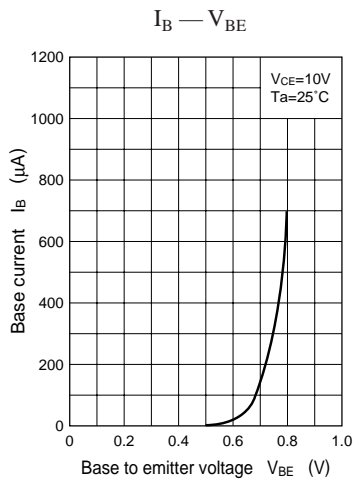
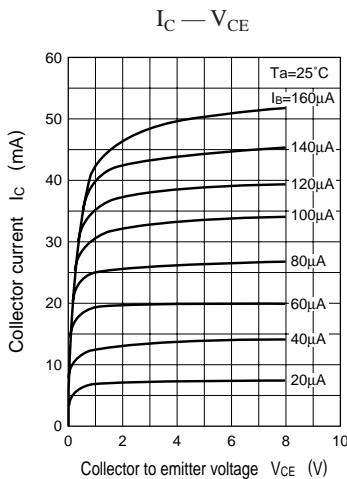


Characteristics charts of Tr1

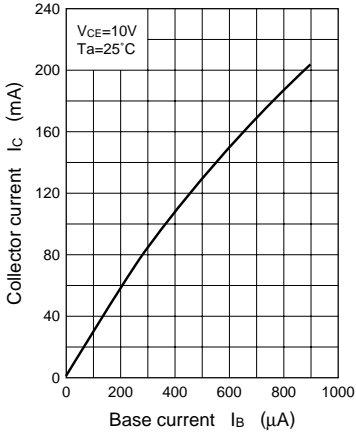




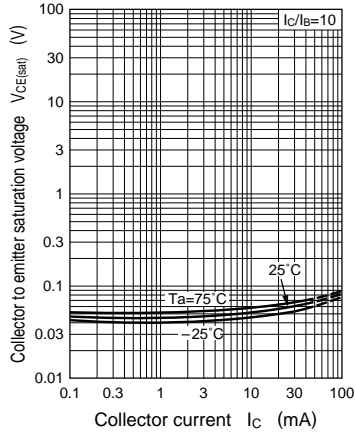
Characteristics charts of Tr2



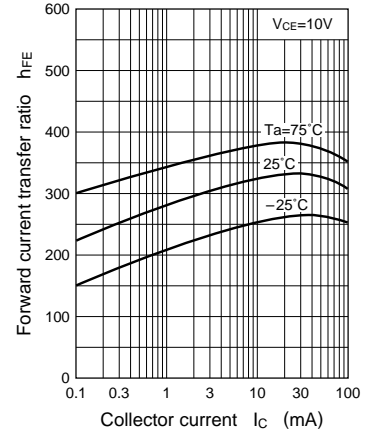
$I_C - I_B$



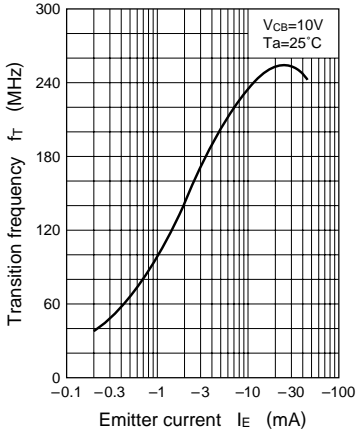
$V_{CE(sat)} - I_C$



$h_{FE} - I_C$



$f_T - I_E$



$NV - I_C$

