

XN4609

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

For amplification of low frequency output (Tr1)
 For general amplification (Tr2)

■ Features

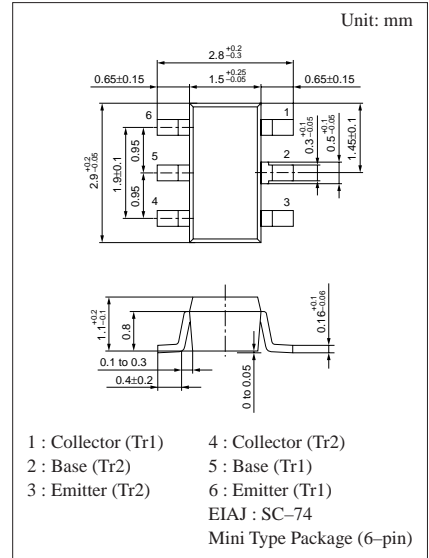
- Two elements incorporated into one package.
- Reduction of the mounting area and assembly cost by one half.

■ Basic Part Number of Element

- 2SD1328+2SB709A

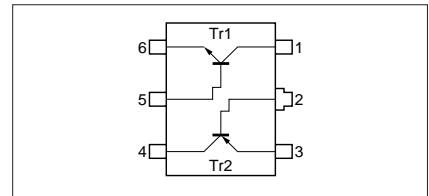
■ Absolute Maximum Ratings (Ta=25°C)

	Parameter	Symbol	Ratings	Unit
Tr1	Collector to base voltage	V_{CBO}	25	V
	Collector to emitter voltage	V_{CEO}	20	V
	Emitter to base voltage	V_{EBO}	12	V
	Collector current	I_C	0.5	A
	Peak collector current	I_{CP}	1	A
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_{stg}	-55 to +150	°C



Marking Symbol: 5F

Internal Connection



■ Electrical Characteristics (Ta=25°C)

● Tr1

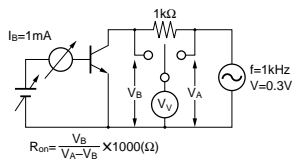
Parameter	Symbol	Conditions	min	typ	max	Unit
Collector to base voltage	V _{CBO}	I _C = 10μA, I _E = 0	25			V
Collector to emitter voltage	V _{CEO}	I _C = 1mA, I _B = 0	20			V
Emitter to base voltage	V _{EBO}	I _E = 10μA, I _C = 0	12			V
Collector cutoff current	I _{CBO}	V _{CB} = 25V, I _E = 0			0.1	μA
Forward current transfer ratio	h _{FE1}	V _{CE} = 2V, I _C = 0.5A ^{*1}	200		800	
	h _{FE2}	V _{CE} = 2V, I _C = 1A ^{*1}	60			
Collector to emitter saturation voltage	V _{CE(sat)}	I _C = 0.5A, I _B = 20mA		0.13	0.4	V
Base to emitter saturation voltage	V _{BE(sat)}	I _C = 0.5A, I _B = 20mA			1.2	V
Transition frequency	f _T	V _{CB} = 10V, I _E = -50mA, f = 200MHz		200		MHz
Collector output capacitance	C _{ob}	V _{CB} = 10V, I _E = 0, f = 1MHz		10		pF
ON Resistance	R _{on} ^{*2}			1.0		Ω

● Tr2

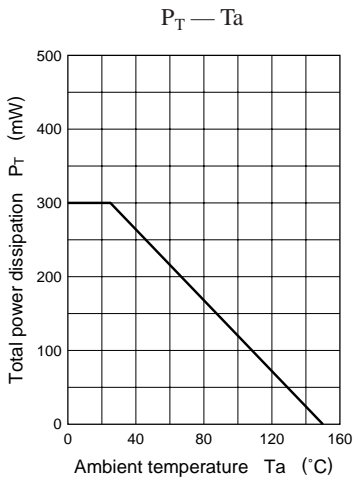
Parameter	Symbol	Conditions	min	typ	max	Unit
Collector to base voltage	V _{CBO}	I _C = -10μA, I _E = 0	-60			V
Collector to emitter voltage	V _{CEO}	I _C = -2mA, I _B = 0	-50			V
Emitter to base voltage	V _{EBO}	I _E = -10μA, I _C = 0	-7			V
Collector cutoff current	I _{CBO}	V _{CB} = -20V, I _E = 0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

*1 Pulse measurement

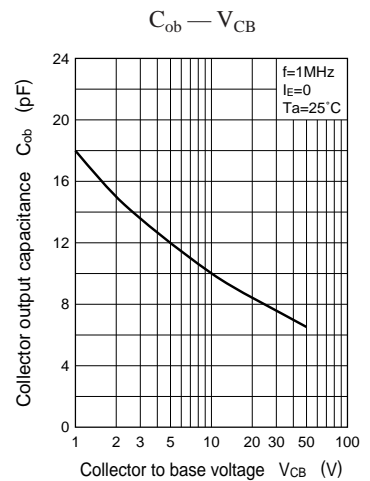
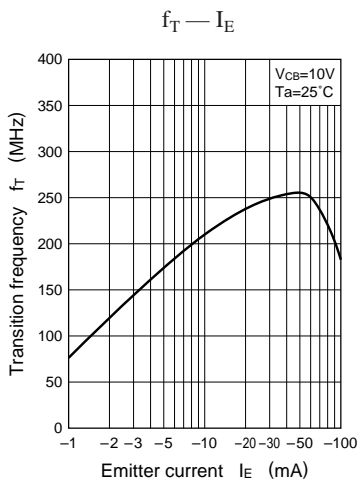
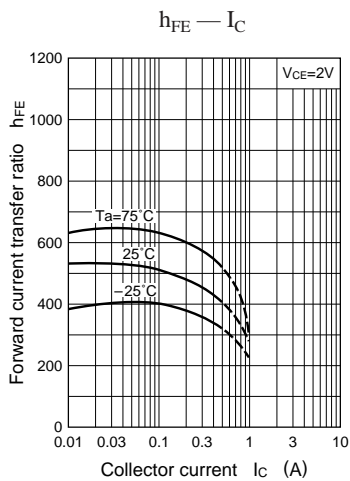
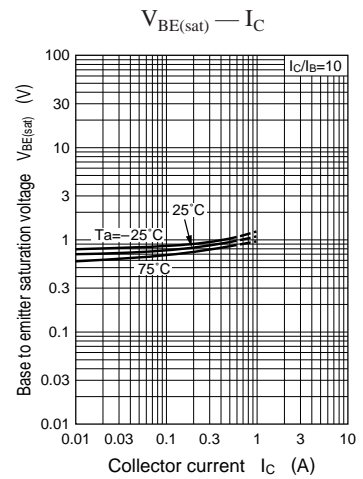
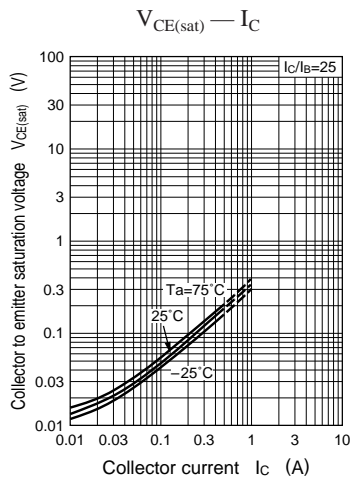
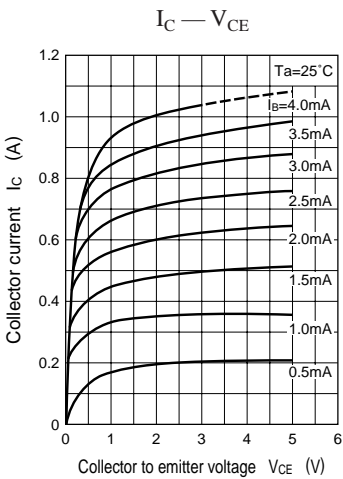
*2 R_{on} test circuit



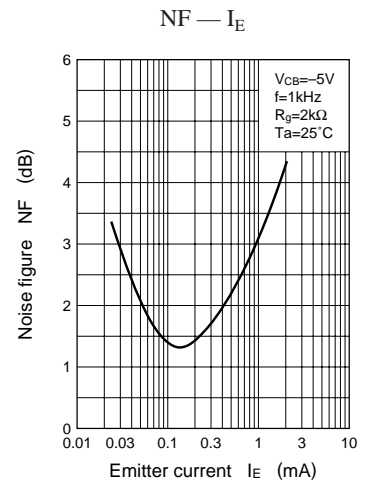
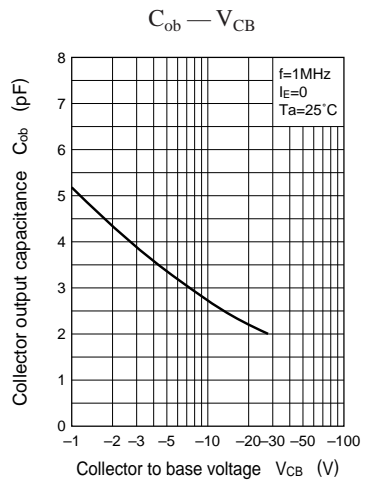
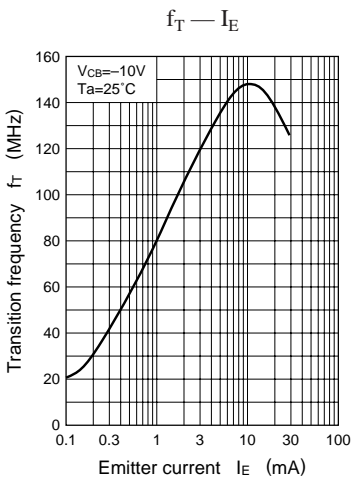
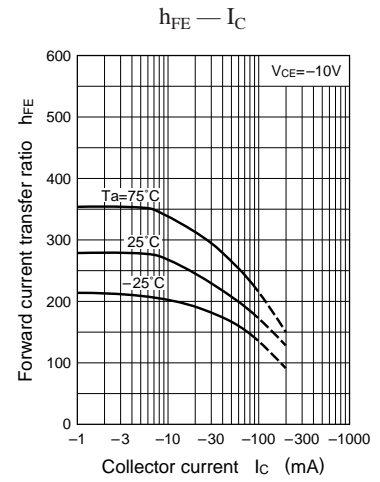
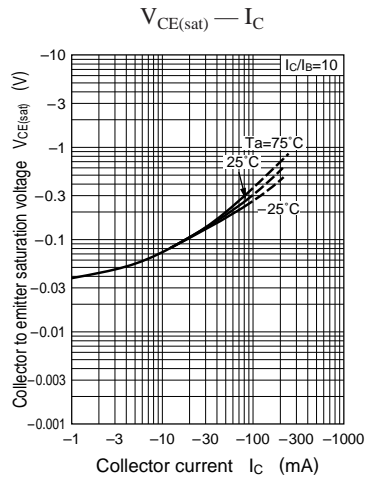
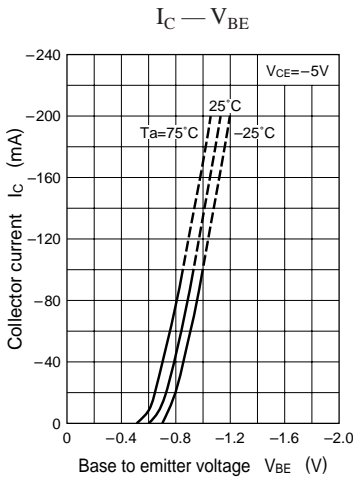
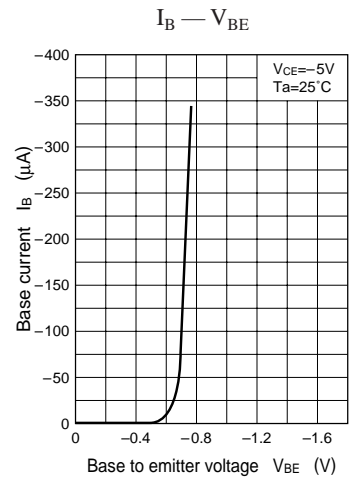
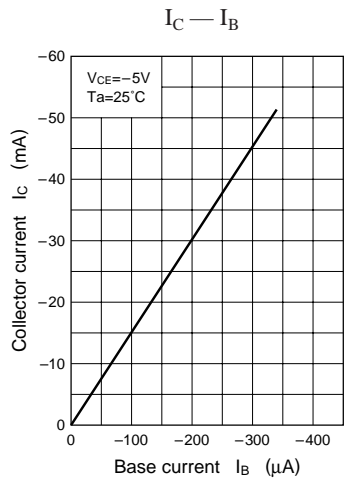
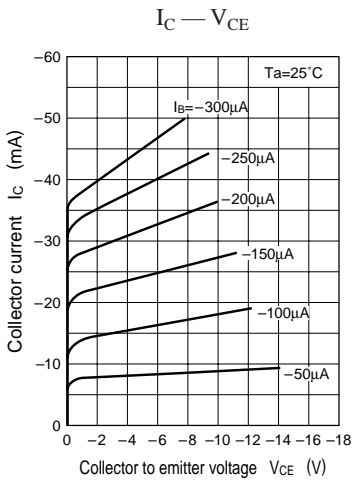
Common characteristics chart



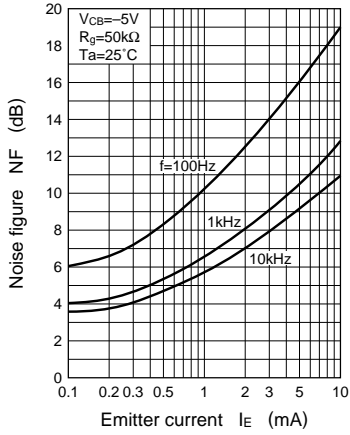
Characteristics charts of Tr1



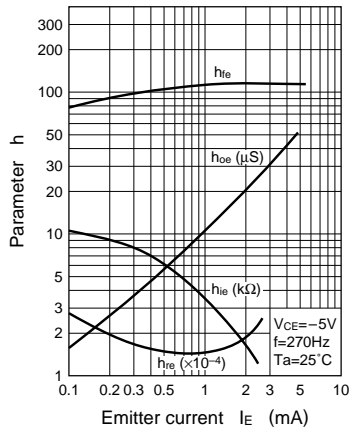
Characteristics charts of Tr2



NF — I_E



h Parameter — I_E



h Parameter — V_{CE}

