

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

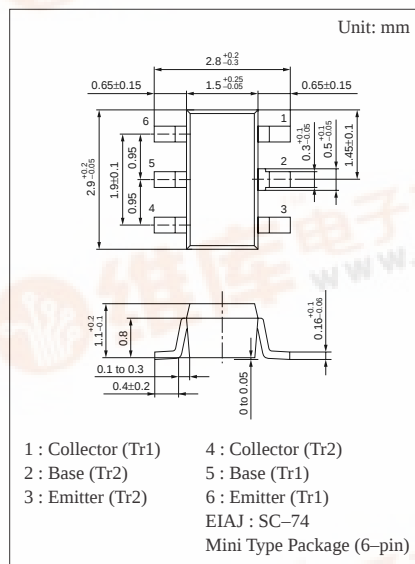
- Two elements incorporated into one package.
- Reduction of the mounting area and assembly cost by one half.

Basic Part Number of Element

- 2SD1328+2SB709A

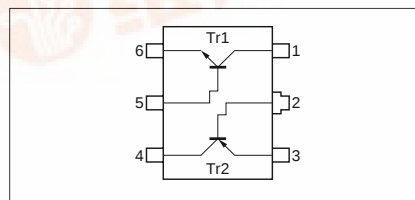
Absolute Maximum Ratings (Ta=25°C)

	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_{sig}	-55 to +150	°C



Marking Symbol: 5F

Internal Connection



■ Electrical Characteristics (Ta=25°C)

● Tr1

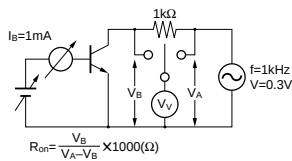
Parameter	Symbol	Conditions	min	typ	max	Unit
Collector to base voltage	V_{CBO}	$I_C = 10\mu A, I_E = 0$	25			V
Collector to emitter voltage	V_{CEO}	$I_C = 1mA, I_B = 0$	20			V
Emitter to base voltage	V_{EBO}	$I_E = 10\mu A, I_C = 0$	12			V
Collector cutoff current	I_{CBO}	$V_{CB} = 25V, I_E = 0$			0.1	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

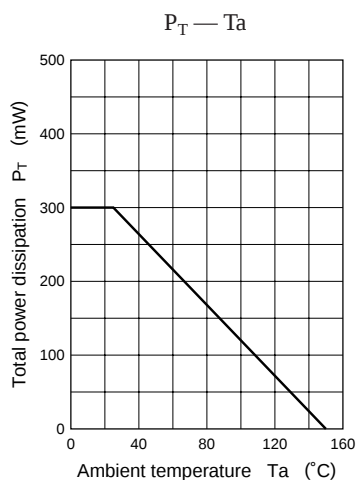
Parameter	Symbol	Conditions	min	typ	max	Unit
Collector to base voltage	V_{CBO}	$I_C = -10\mu A, I_E = 0$	-60			V
Collector to emitter voltage	V_{CEO}	$I_C = -2mA, I_B = 0$	-50			V
Emitter to base voltage	V_{EBO}	$I_E = -10\mu A, I_C = 0$	-7			V
Collector cutoff current	I_{CBO}	$V_{CB} = -20V, I_E = 0$			-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

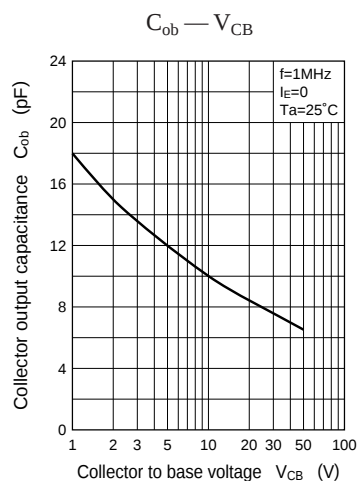
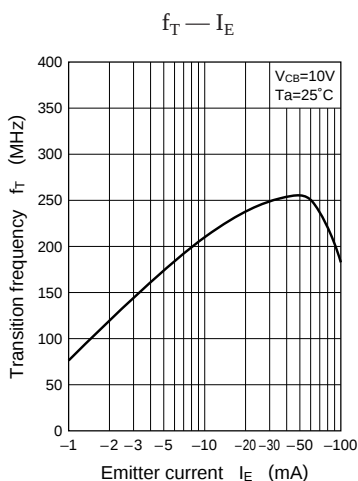
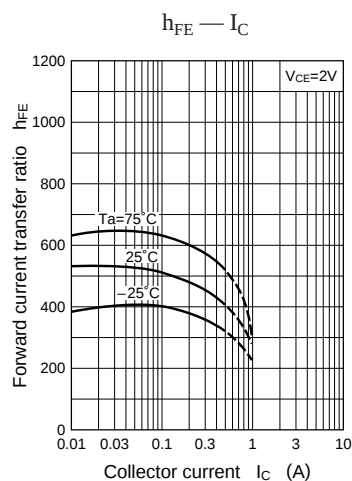
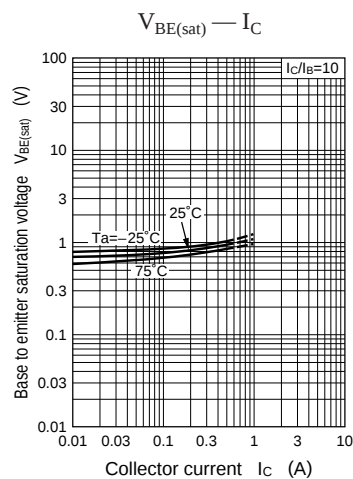
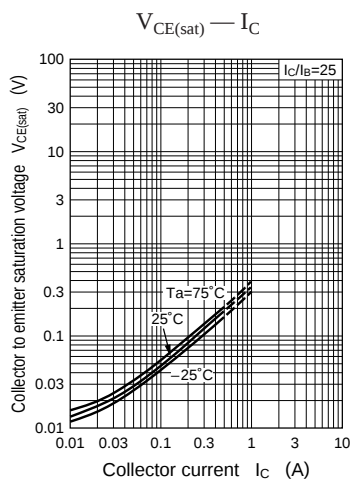
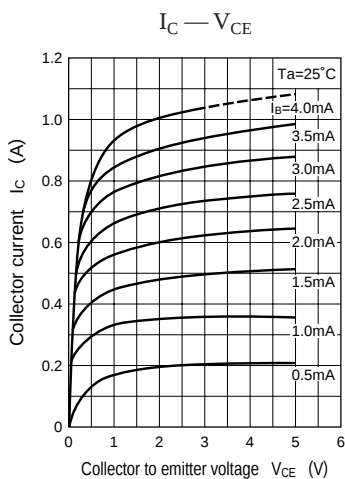
*2 R_{on} test circuit



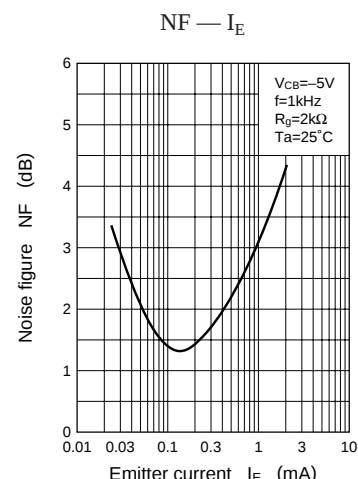
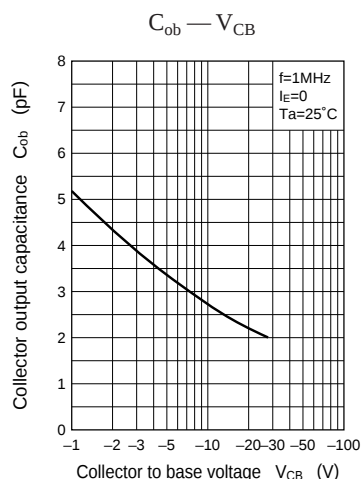
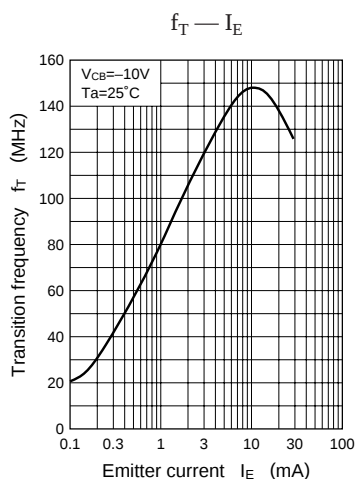
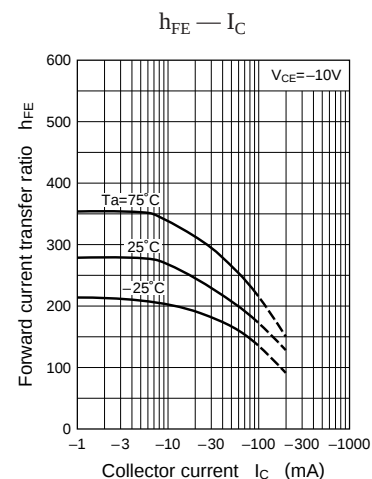
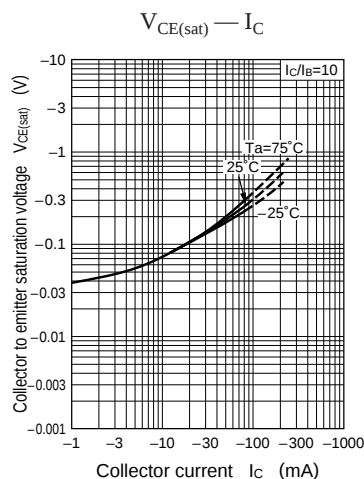
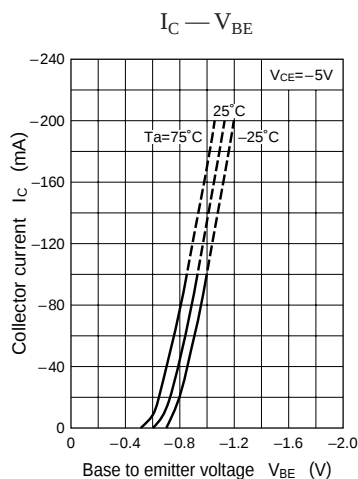
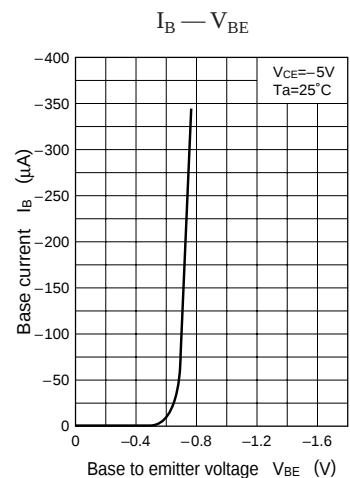
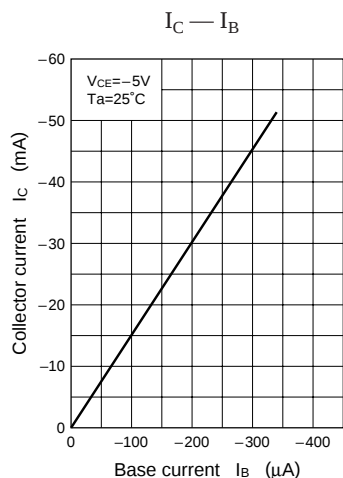
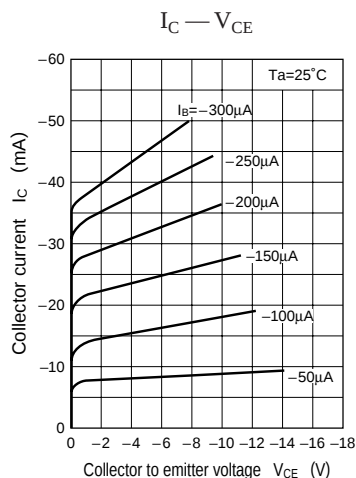
Common characteristics chart



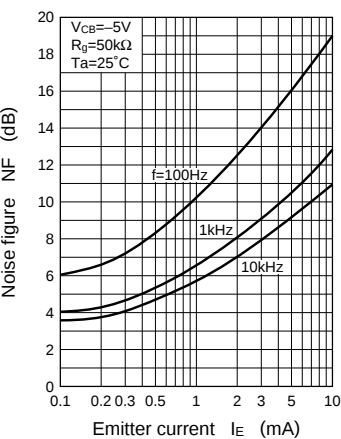
Characteristics charts of Tr1



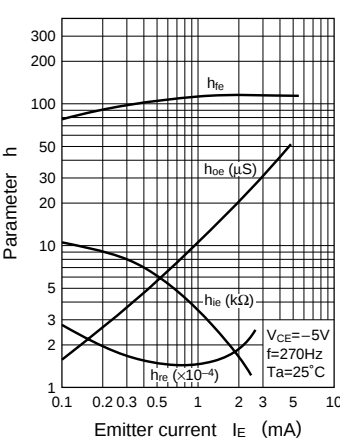
Characteristics charts of Tr2



NF — I_E



h Parameter — I_E



h Parameter — V_{CE}

