

# 2SD1991, 2SD1991A

Silicon NPN Epitaxial Planar Type

For general amplification  
Complementary pair with 2SB1320 and 2SB1320A

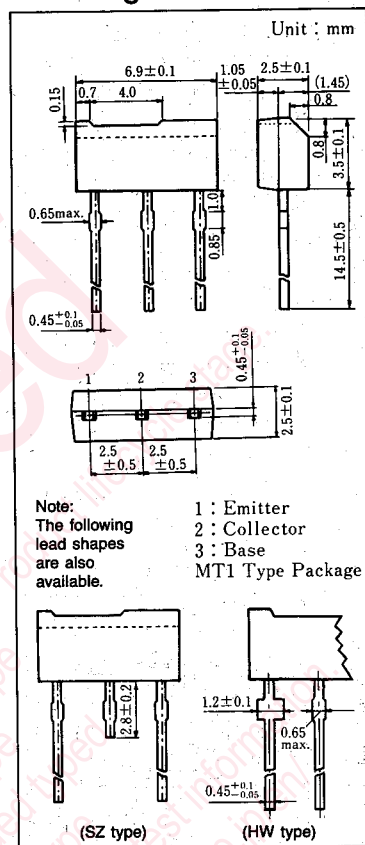
## ■ Features

- High DC current gain  $h_{FE}$
- Low collector-emitter saturation voltage  $V_{CE(sat)}$
- Automatic insertion by radial tapering possible

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

Item	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	30	V
		60	
Collector-Emitter Voltage	V <sub>CEO</sub>	25	V
		50	
Emitter-Base Voltage	V <sub>EBO</sub>	7	V
Peak Collector Voltage	I <sub>CP</sub>	200	mA
Collector Current	I <sub>C</sub>	100	mA
Collector Power Dissipation	P <sub>C</sub>	400	mW
Junction Temperature	T <sub>j</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55 ~ +150	°C

## ■ Package Dimensions

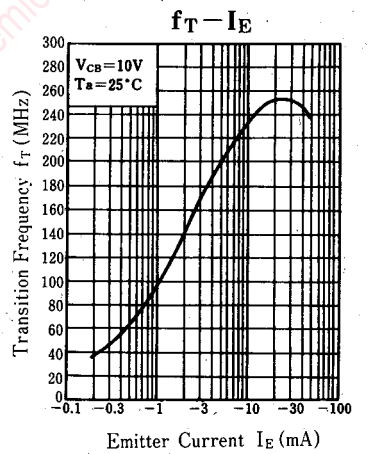
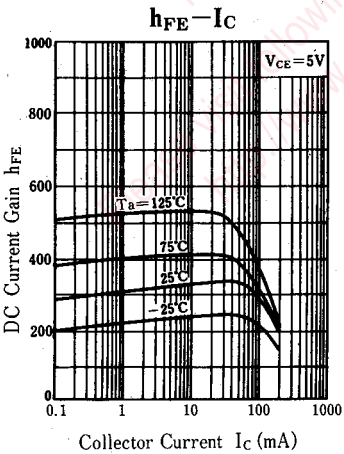
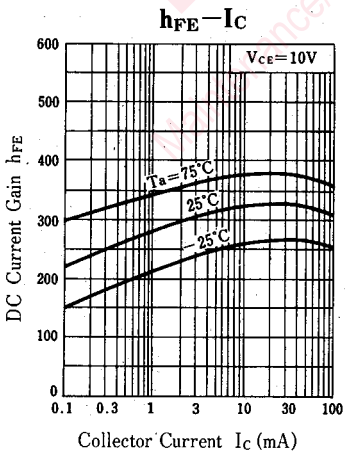
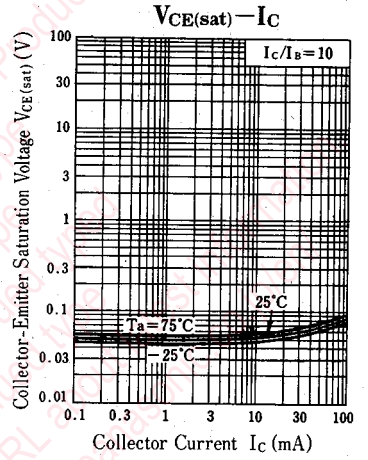
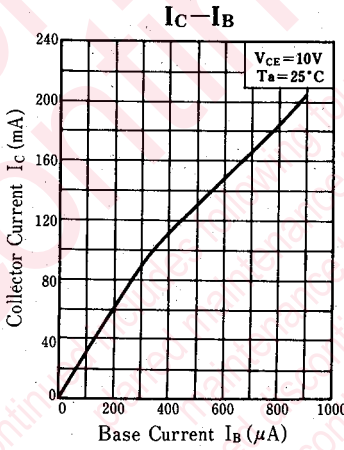
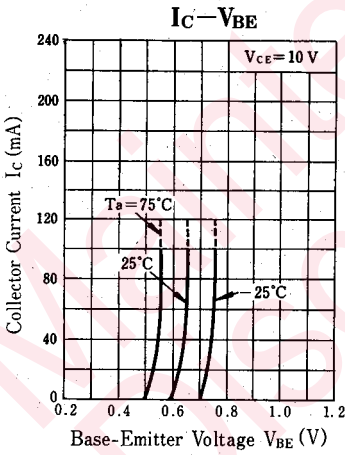
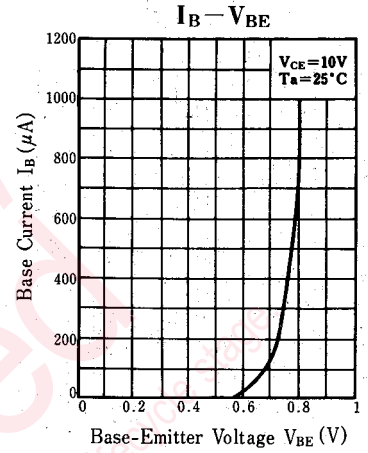
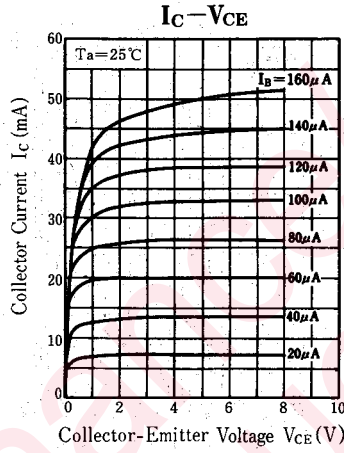
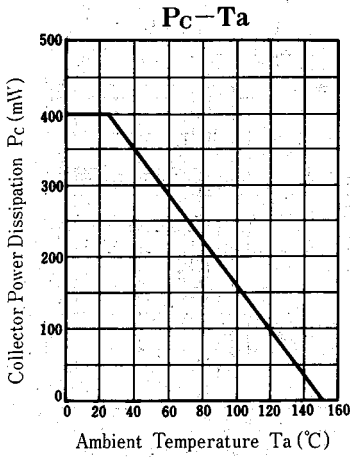


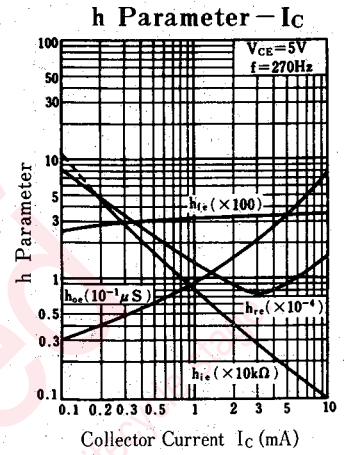
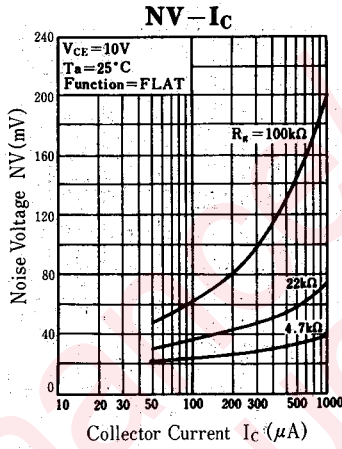
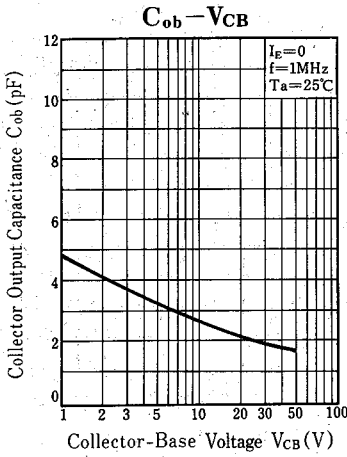
## ■ Electrical Characteristics (Ta=25°C)

Item	Symbol	Condition	min.	typ.	max.	Unit
Collector Cutoff Current	I <sub>CBO</sub>	V <sub>CB</sub> = 20 V, I <sub>E</sub> = 0			1	μA
	I <sub>CEO</sub>	V <sub>CE</sub> = 20 V, I <sub>B</sub> = 0			1	μA
Collector-Base Voltage	V <sub>CBO</sub>	I <sub>C</sub> = 10 μA, I <sub>E</sub> = 0	30			V
			60			
Collector-Emitter Voltage	V <sub>CEO</sub>	I <sub>C</sub> = 2 mA, I <sub>B</sub> = 0	25			V
			50			
Emitter-Base Voltage	V <sub>EBO</sub>	I <sub>E</sub> = 10 μA, I <sub>C</sub> = 0	7			V
DC Current Gain	h <sub>FE1</sub> *	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 2 mA	160		460	
	h <sub>FE2</sub>	V <sub>CE</sub> = 2 V, I <sub>C</sub> = 100 mA	90			
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> = 100 mA, I <sub>B</sub> = 10 mA		0.3	0.5	V
Transition Frequency	f <sub>T</sub>	V <sub>CB</sub> = 10 V, I <sub>E</sub> = -2 mA, f = 200 MHz		150		MHz
Noise Voltage	NV	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 1 mA, G <sub>v</sub> = 80 dB, R <sub>g</sub> = 100 kΩ, Function = FLAT		300		mV
Collector Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0, f = 1 MHz		3.5		pF

\* h<sub>FE1</sub> Ranking

Rank	Q	R	S
h <sub>FE1</sub>	160 ~ 260	200 ~ 340	290 ~ 460





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