

## S9013 NPN Transistors

### General description

SOT-23 Plastic-Encapsulate Transistors

### SOT-23

#### FEATURES

- Complementary to S9012
- Power Dissipation of 300mW
- High Stability and High Reliability

#### MECHANICAL DATA

- SOT-23 Small Outline Plastic Package
- Epoxy UL: 94V-0
- Mounting Position: Any

1. BASE  
2. EMITTER  
3. COLLECTOR



**Marking: J3**

### Maximum Ratings & Thermal Characteristics T<sub>A</sub> = 25°C unless otherwise noted

Parameters	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	40	V
Collector-Emitter Voltage	V <sub>CEO</sub>	25	V
Emitter -Base Voltage	V <sub>EBO</sub>	5	V
Collector Current-Continuous	I <sub>C</sub>	500	mA
Collector Power Dissipation	P <sub>C</sub>	300	mW
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55-+150	°C
Thermal resistance From junction to ambient	R <sub>θJA</sub>	416	°C/W

### Electrical Characteristics T<sub>A</sub> = 25°C unless otherwise noted

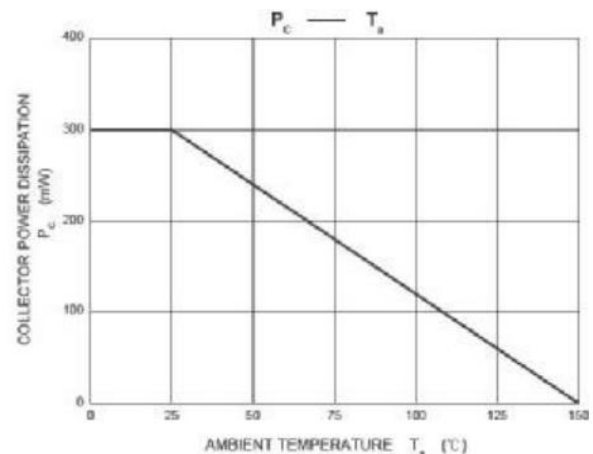
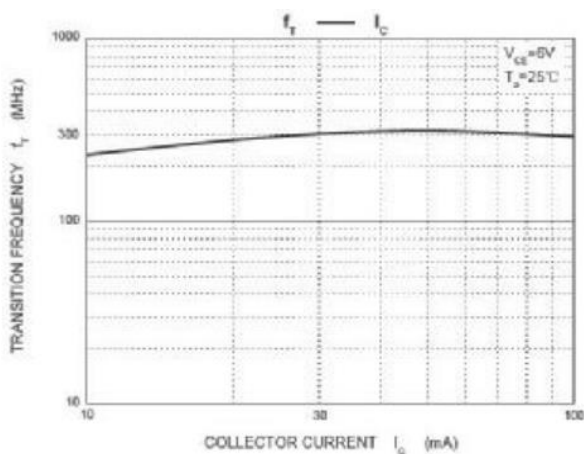
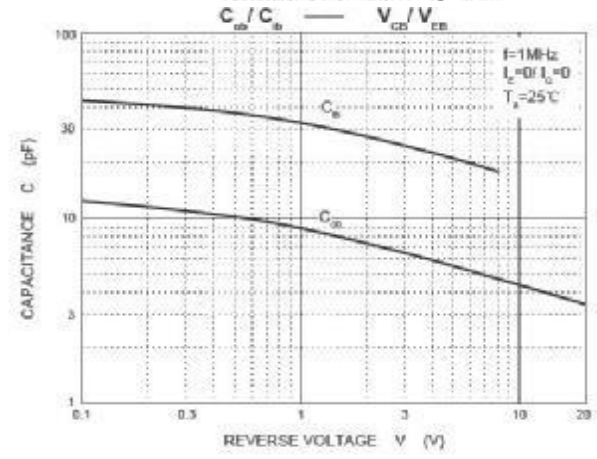
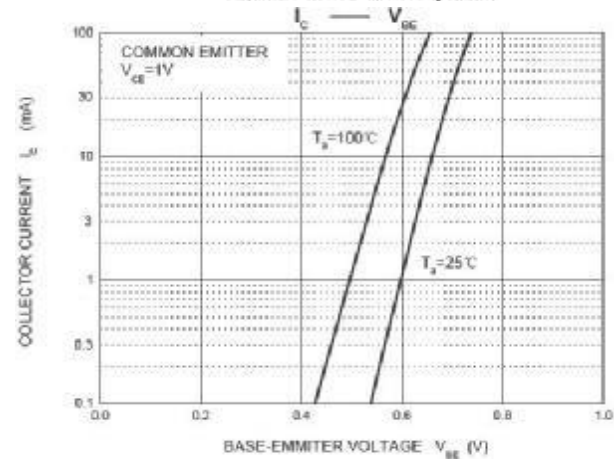
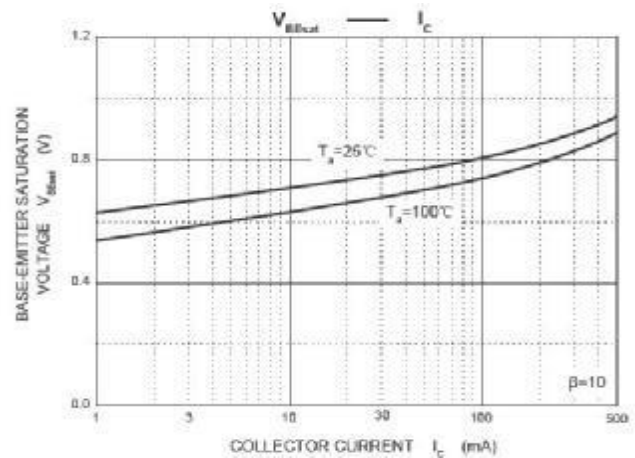
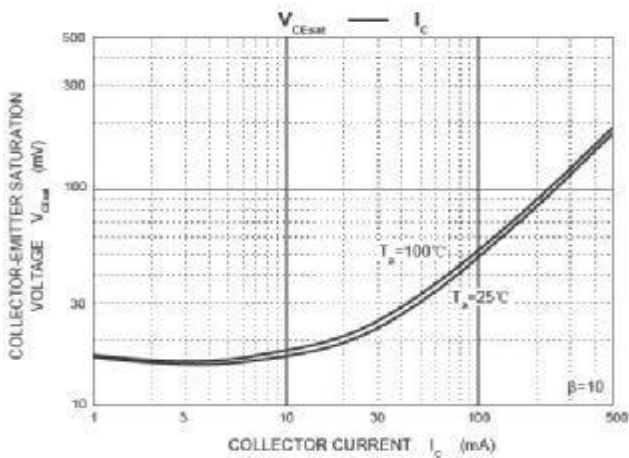
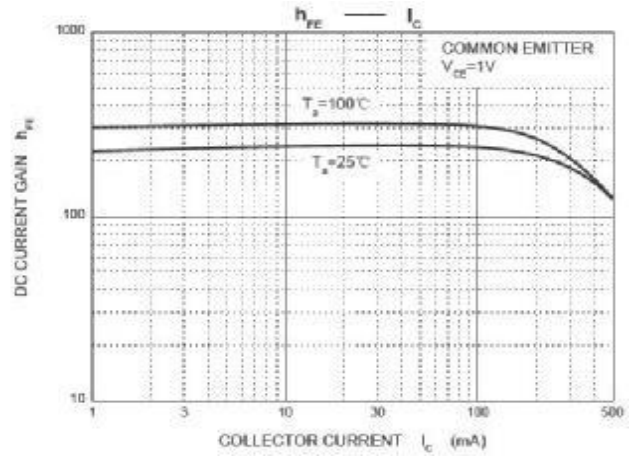
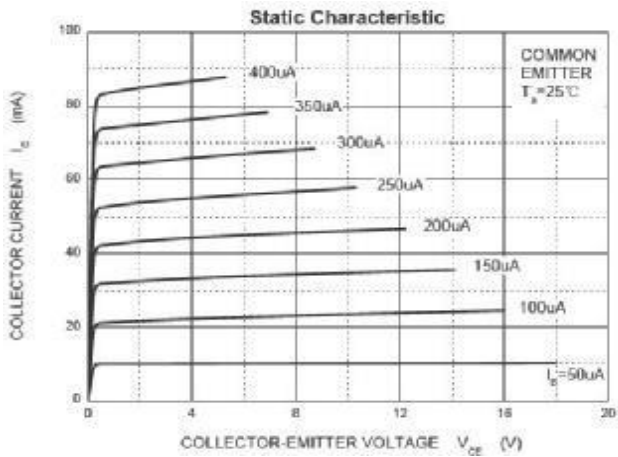
Parameter	Symbols	Test Condition	Limits		Unit
			Min	Max	
Collector-base breakdown voltage	V(BR)CBO	I <sub>C</sub> =100μA, I <sub>E</sub> =0	40		V
Collector-emitter breakdown voltage	V(BR)CEO	I <sub>C</sub> =1mA, I <sub>B</sub> =0	25		V
Emitter-base breakdown voltage	V(BR)EBO	I <sub>E</sub> =100μA, I <sub>C</sub> =0	5		V
Collector cut-off current	I <sub>CEO</sub>	V <sub>CE</sub> =20V, I <sub>B</sub> =0		100	nA
Collector cut-off current	I <sub>CBO</sub>	V <sub>CB</sub> =40V, I <sub>E</sub> =0		100	nA
Emitter cut-off current	I <sub>EBO</sub>	V <sub>EB</sub> =5V, I <sub>C</sub> =0		100	nA
DC current gain	h <sub>FE</sub> (1)	V <sub>CE</sub> =1V, I <sub>C</sub> =50mA	120	400	
	h <sub>FE</sub> (2)	V <sub>CE</sub> =1V, I <sub>C</sub> =500mA	40		
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =500mA, I <sub>B</sub> =50mA		0.60	V
Base -emitter saturation voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =500mA, I <sub>B</sub> =50mA		1.20	V
Base -emitter voltage	V <sub>BE</sub>	V <sub>CB</sub> =1V, I <sub>C</sub> =10mA		0.70	V
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> =6V, I <sub>C</sub> =20mA, f=30MHz	150		MHz
Collector output capacitance	C <sub>ob</sub>	V <sub>CB</sub> =6V, I <sub>E</sub> =0, f=1MHz		8	pF

### CLASSIFICATION OF h<sub>FE</sub>(1)

RANK	L	H	J
RANGE	120-200	200-350	300-400

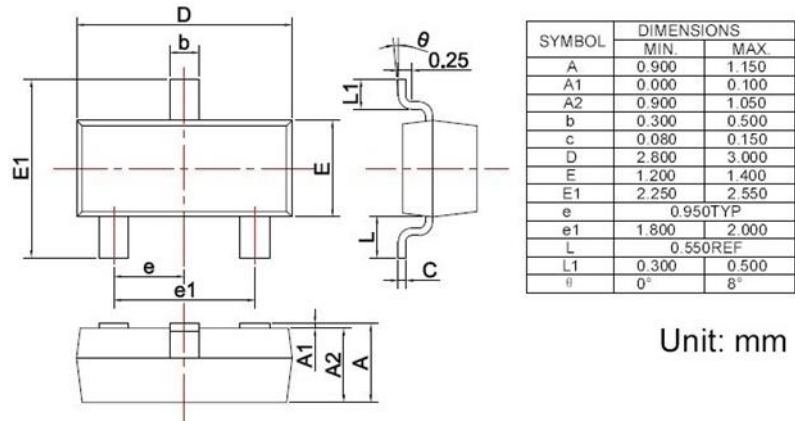
# S9013

## Typical characteristics

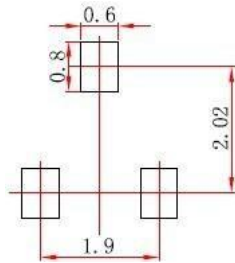


# S9013

## SOT-23 PACKAGE OUTLINE Plastic surface mounted package



Recommended land dimensions for SOT-23 diode. Electrode patterns for PCBs



- Note:
1. Controlling dimension: in millimeters.
  2. General tolerance: ± 0.05mm.
  3. The pad layout is for reference purposes only.

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