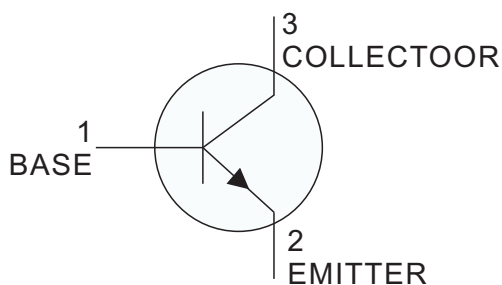
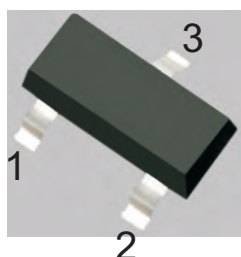


FEATURES

- High Collector Current.
- Complementary to S9012.
- Excellent hFE Linearity.

SOT-23



DEVICE MARKING
S9013 = J3

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	25	Vdc
Collector–Base Voltage	V_{CBO}	40	Vdc
Emitter–Base Voltage	V_{EBO}	5.0	Vdc
Collector Current — Continuous	I_C	500	mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR– 5 Board, (1) $T_A = 25^\circ\text{C}$	P_D	300	mW
Junction and Storage Temperature	T_J, T_{stg}	– 55 to +150	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

OFF CHARACTERISTICS

Characteristic	Symbol	Min	Max	Unit
Collector–Emitter Breakdown Voltage(3) ($I_C = 1.0\text{ mAdc}$, $I_B = 0$)	$V_{(BR)CEO}$	25	–	Vdc
Collector–Base Breakdown Voltage ($I_C = 100\text{ }\mu\text{Adc}$, $I_E = 0$)	$V_{(BR)CBO}$	40	–	Vdc
Emitter–Base Breakdown Voltage ($I_E = 100\text{ }\mu\text{Adc}$, $I_C = 0$)	$V_{(BR)EBO}$	5.0	–	Vdc
Collector cut-off current ($V_{CB} = 40\text{ Vdc}$, $I_E = 0$)	I_{CBO}	–	0.1	μAdc
Collector cut-off current ($V_{CE} = 20\text{ Vdc}$, $I_B = 0$)	I_{CEO}	–	0.1	μAdc
Emitter cut-off current ($V_{EB} = 5\text{ Vdc}$, $I_C = 0$)	I_{EBO}	–	0.1	μAdc

1. FR–5 = $1.0 \times 0.75 \times 0.062\text{ in.}$

2. Alumina = $0.4 \times 0.3 \times 0.024\text{ in.}$ 99.5% alumina.

3. Pulse Test: Pulse Width $< 300\text{ }\mu\text{s}$, Duty Cycle $< 2.0\%$.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (Continued) ON CHARACTERISTICS (3)

Characteristic	Symbol	Min	Max	Unit
DC Current Gain	h _{FE}			—
(I _C = 50 mA _{DC} , V _{CE} = 1 V _{DC})		120	400	
(I _C = 500 mA _{DC} , V _{CE} = 1 V _{DC})		40	—	
Collector–Emitter Saturation Voltage	V _{CE(sat)}			V _{DC}
(I _C = 500 mA _{DC} , I _B = 50 mA _{DC})(3)		—	0.6	
Base–Emitter Saturation Voltage(3)	V _{BE(sat)}			V _{DC}
(I _C = 500 mA _{DC} , I _B = 50 mA _{DC})		—	1.2	
Base-emitter voltage (V _{CB} =1V, I _C =10mA)	V _{BE}	—	0.7	

SMALL–SIGNAL CHARACTERISTICS

Current–Gain — Bandwidth Product (I _C = 20mA _{DC} , V _{CE} = 6.0V _{DC} , f = 30MHz)	f _T	150	—	MHz
Collector output capacitance (V _{CB} = 6.0V _{DC} , I _E = 0, f = 1.0 MHz)	C _{ob}	—	8.0	pF

CLASSIFICATION OF h_{FE}

Rank	L	H	J
Range	120-200	200-350	300-400

3. Pulse Test: Pulse Width <300 μs, Duty Cycle <2.0%.

TYPICAL CHARACTERISTICS

Fig.1 Power Derating Curve

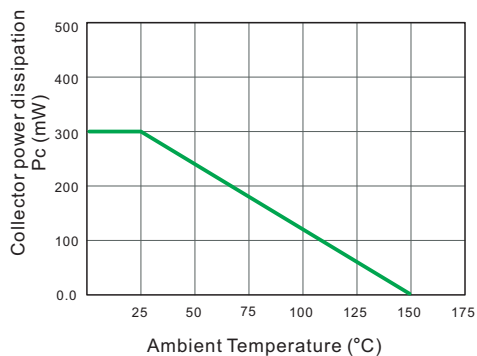


Fig.2 Static characteristics

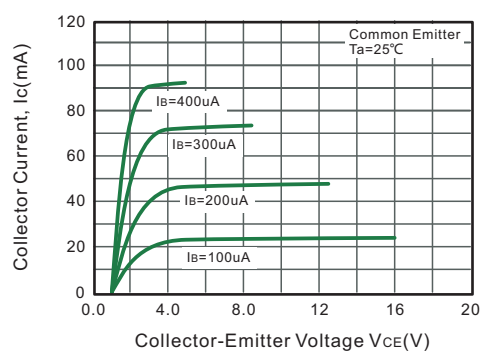


Fig.3 hFE--Ic

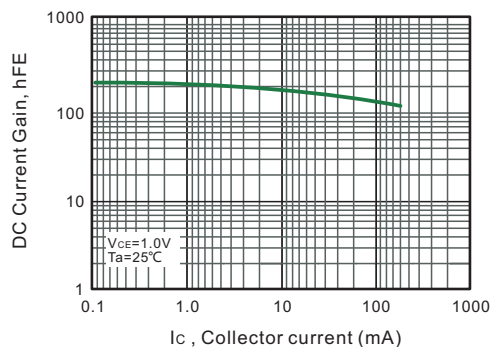


Fig.4 Ic--VBE

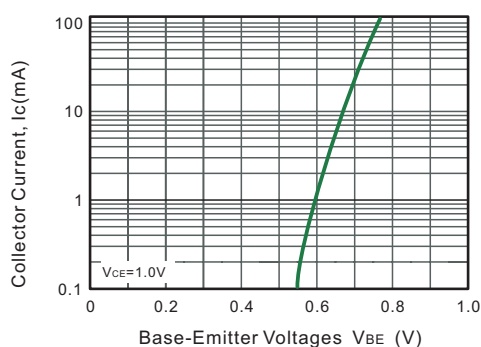


Fig.5 VBEsat--Ic

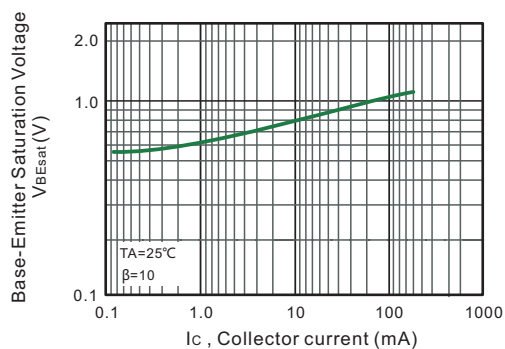


Fig.6 VCEsat--Ic

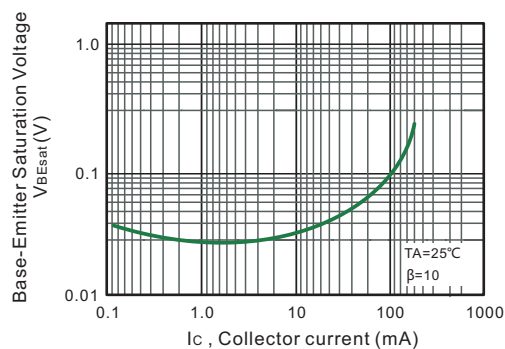


Fig.7 ft--Ic

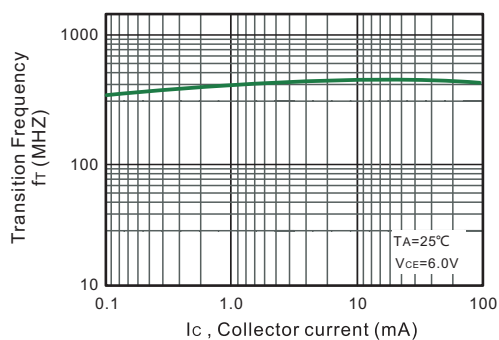
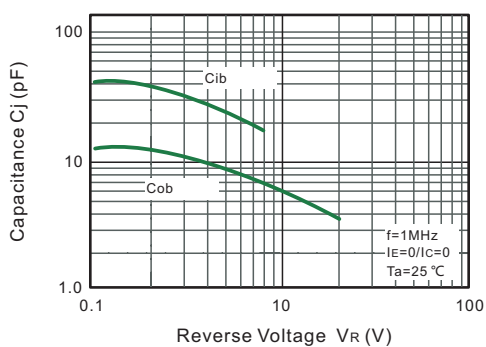
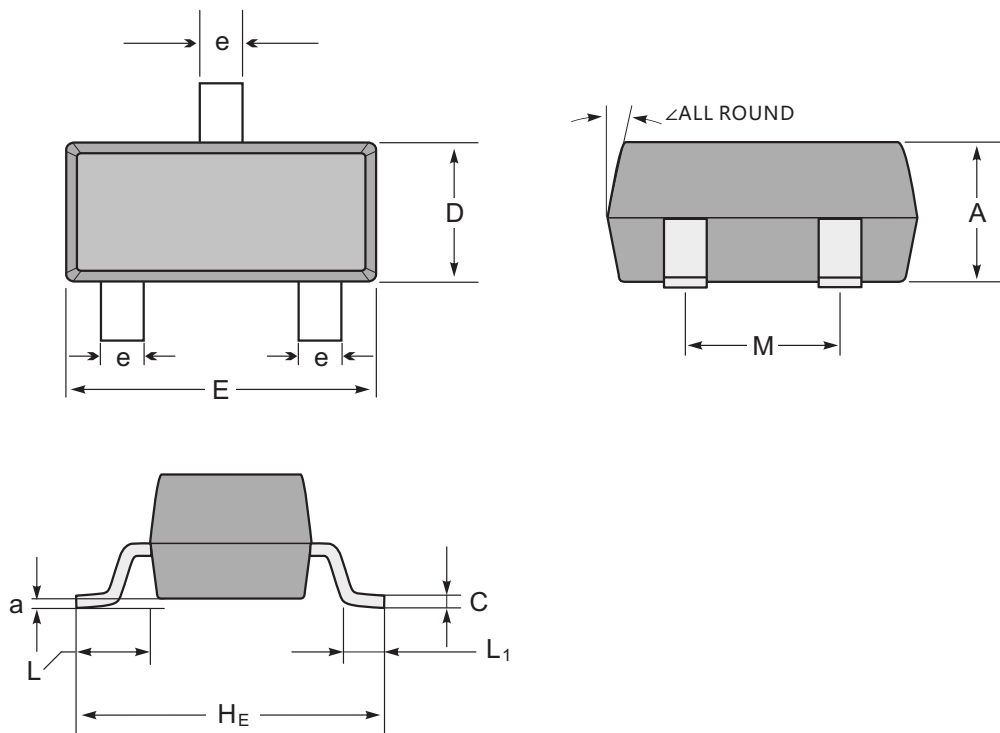


Fig.8 Cob/Cib--VCB/VEB



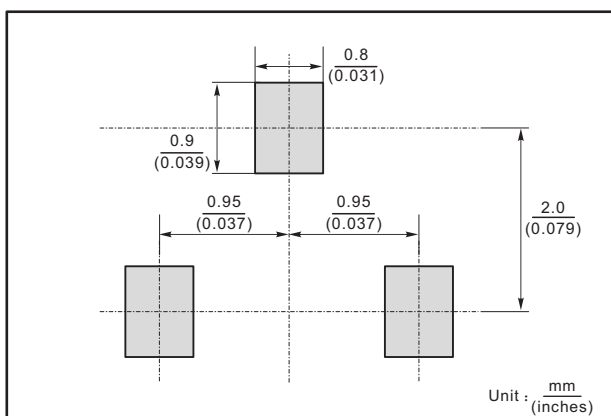
SOT-23 Package Outline Dimensions



SOT-23 mechanical data

UNIT		A	C	D	E	HE	e	M	L	L1	a	∠
mm	max	1.1	0.15	1.4	3.0	2.6	0.5	1.95	0.55 (ref)	0.36 (ref)	0.0	12°
	min	0.9	0.08	1.2	2.8	2.2	0.3	1.7			0.15	
mil	max	43	6	55	118	102	20	77	22 (ref)	14 (ref)	0.0	
	min	35	3	47	110	87	12	67			6	

The recommended mounting pad size

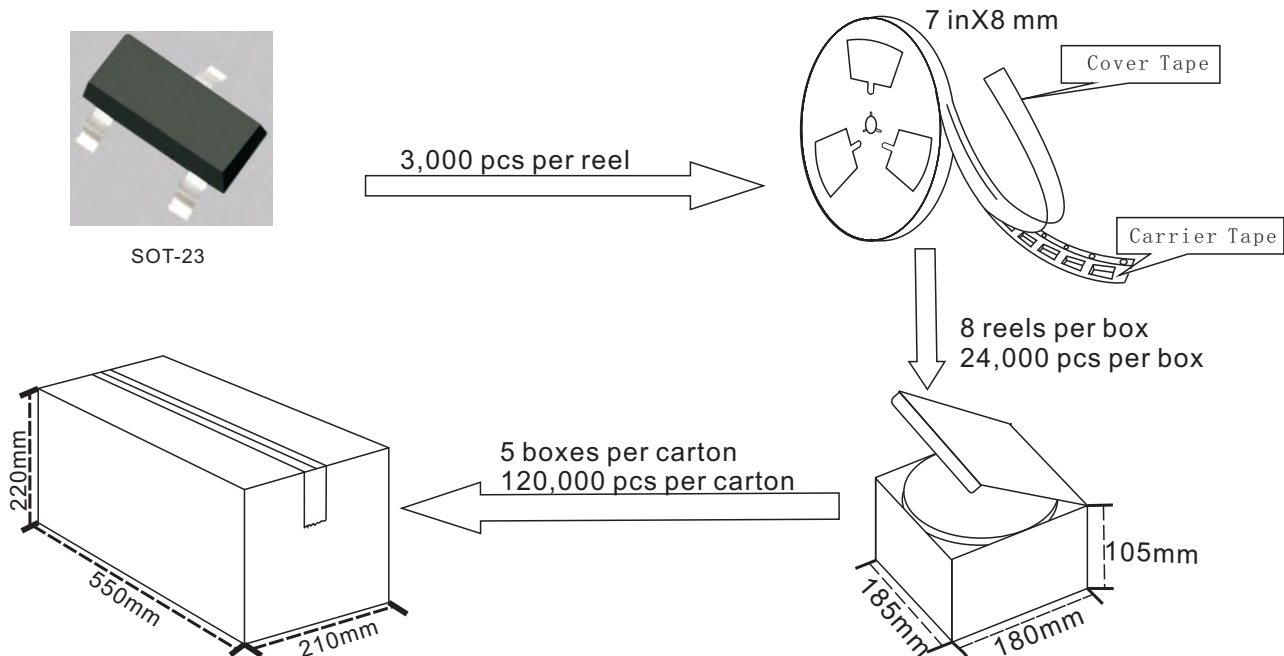


Marking

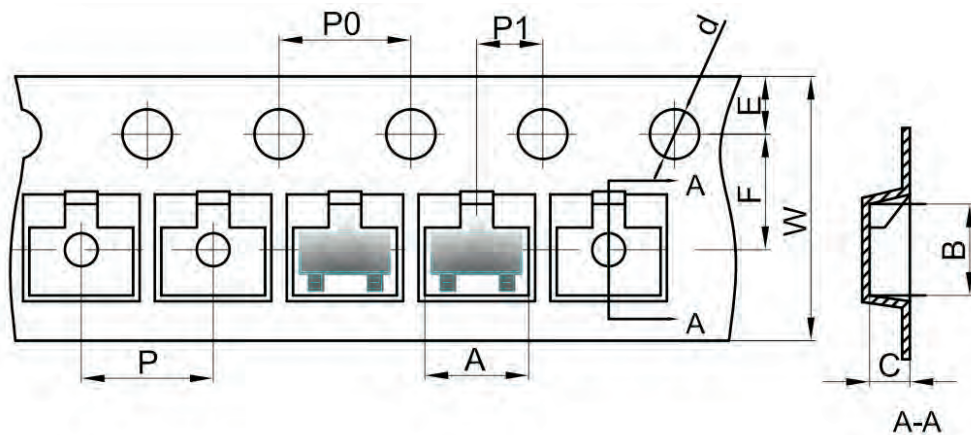
Type number	Marking code
S9013	J3

SOT-23 Packing

1.The method of packaging and dimension are shown as below figure. (Dimension in mm)



SOT-23 Embossed Carrier Tape



Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

SOT-23 Tape Leader and Trailer

