

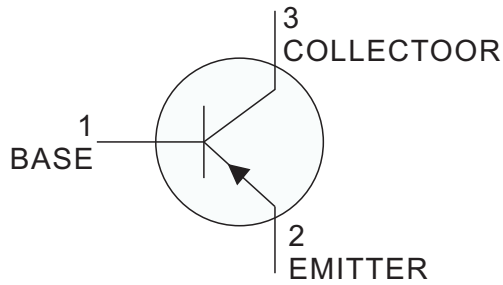
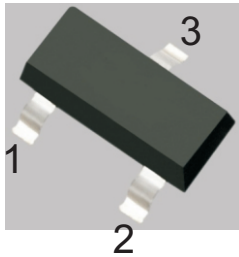
General Purpose Transistor

PNP Silicon

FEATURES

- High Collector Current
- Complementary To S9013
- Excellent hFE Linearity

SOT-23



DEVICE MARKING
S9012 = 2T1

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 (TA = 25°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 ($I_c = -0.1 \text{ mAdc}, I_E = 0$)	$V_{(BR)CBO}$	-40	–	Vdc
Emitter–Base Breakdown Voltage ($I_E = -0.1 \text{ mAdc}, I_c = 0$)	$V_{(BR)EBO}$	-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 x 0.75 x 0.062 in.

2. Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.

3. Pulse Test: Pulse Width <300 μs , 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	
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 = -50mA _{dc})		—	-1.2	

SMALL–SIGNAL CHARACTERISTICS

Current–Gain — Bandwidth Product (I _C = -20mA _{dc} , V _{CE} = -6.0V _{dc} , f = 30MHz)	f _t	150	—	MHz
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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

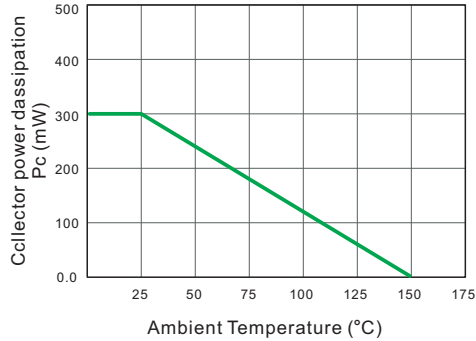


Fig.2 Static characteristics

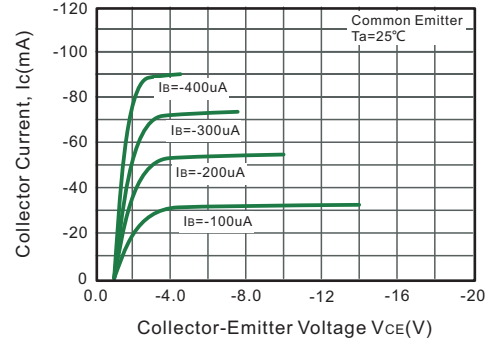


Fig.3 h_{FE} -- I_c

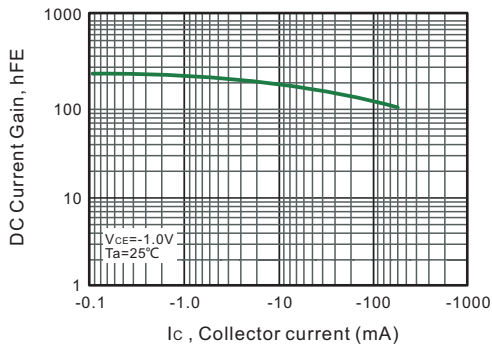


Fig.4 I_c -- V_{BE}

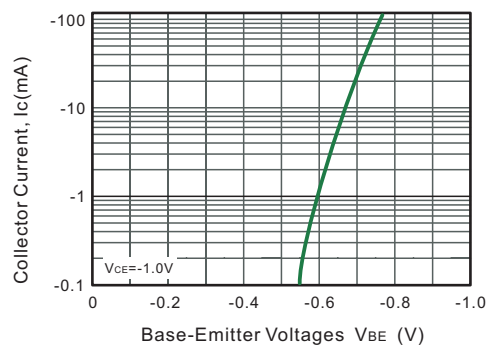


Fig.5 V_{BEsat} -- I_c

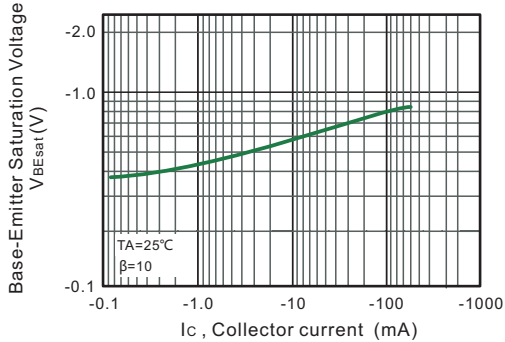


Fig.6 V_{CEsat} -- I_c

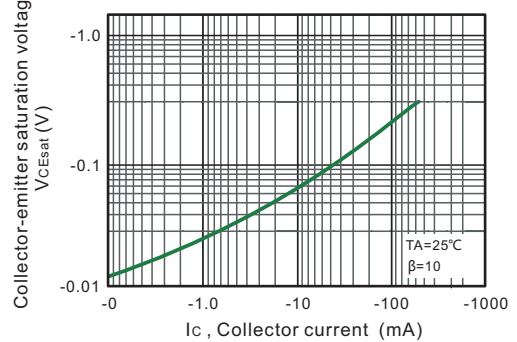


Fig.7 f_t -- I_c

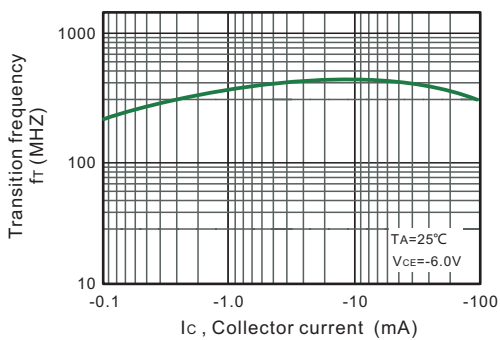
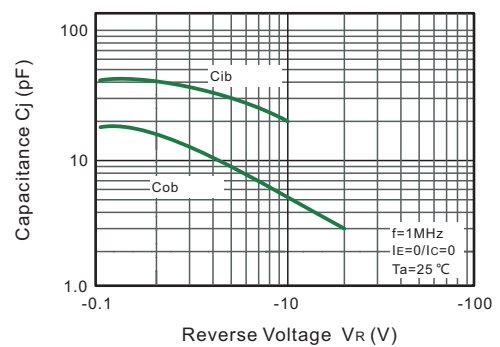
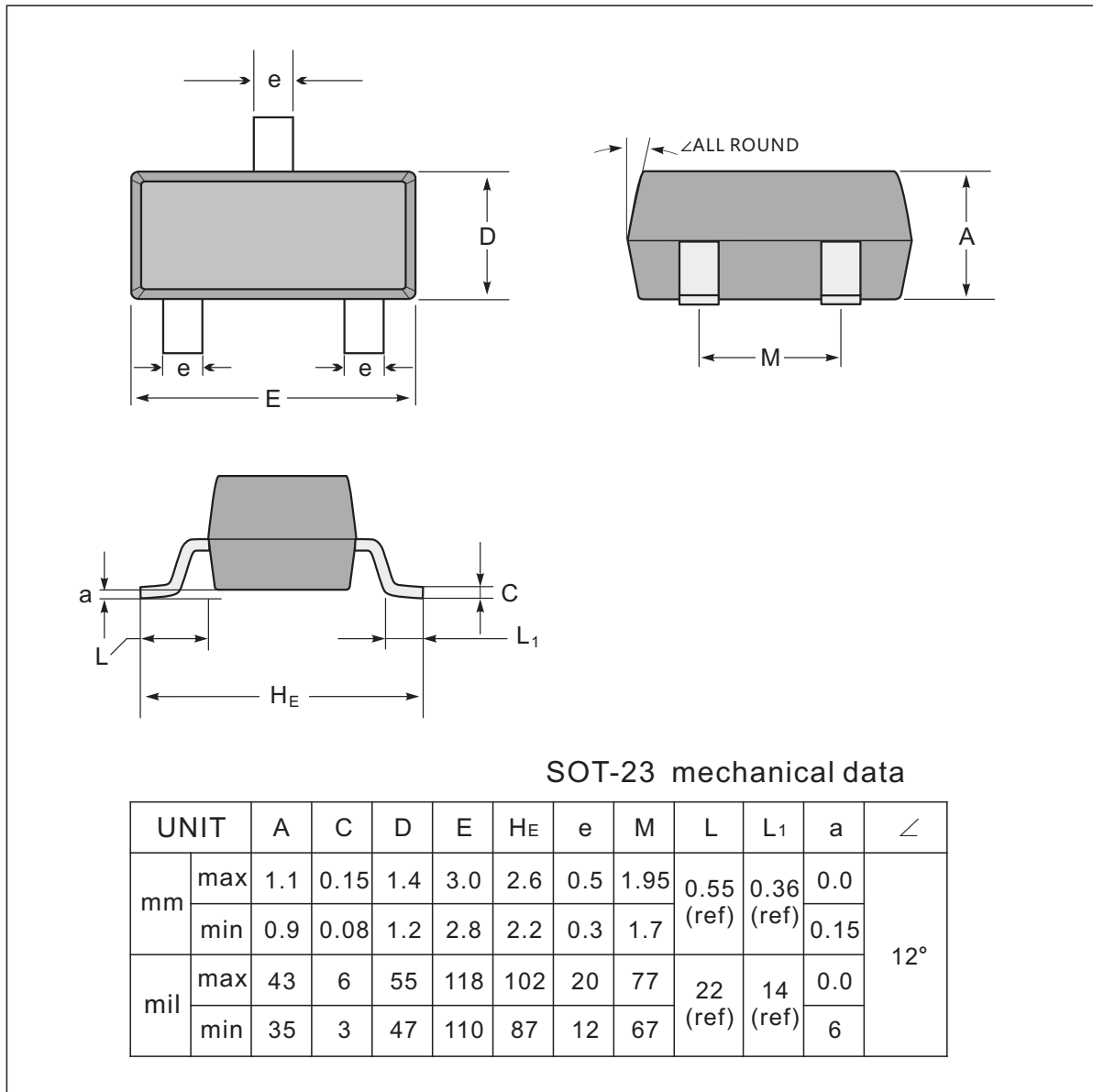


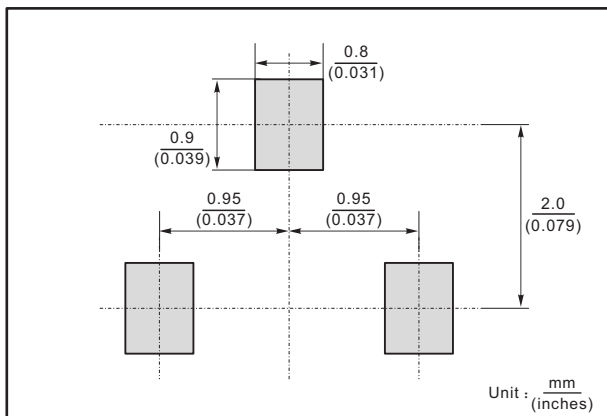
Fig.8 C_{ob}/C_{ib} -- V_{CB}/V_{EB}



SOT-23 Package Outline Dimensions



The recommended mounting pad size

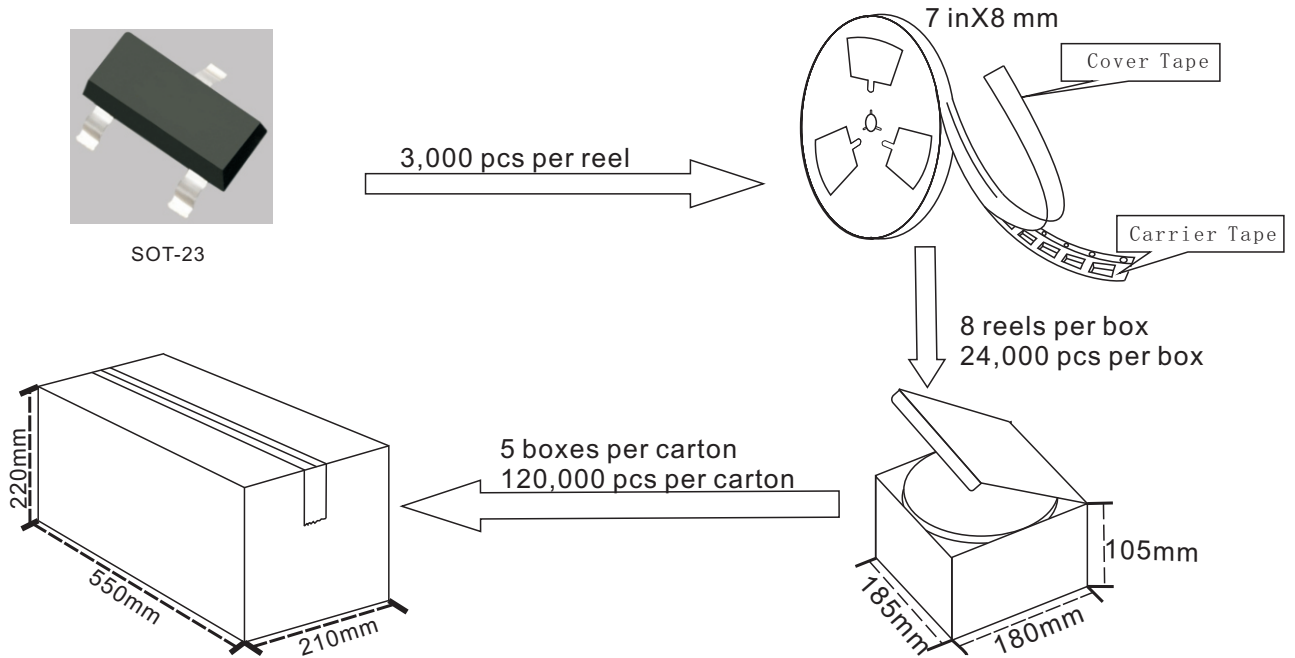


Marking

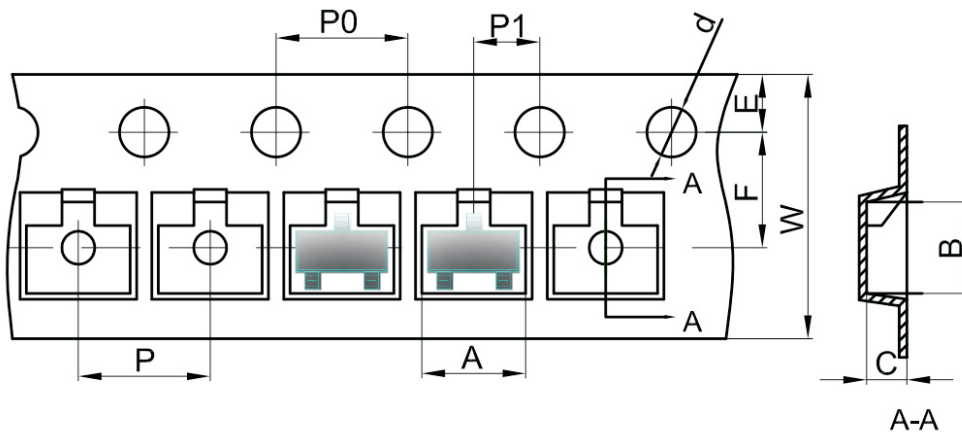
Type number	Marking code
S9012	2T1

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

