

S9013

Plastic-Encapsulate Transistor(NPN)

ROHS



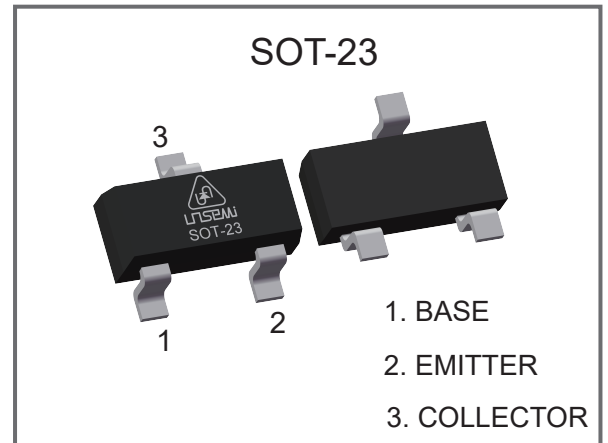
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Feature

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

Mechanical Data

- ◆ JEDEC SOT-23 Package
- ◆ Molding Compound Flammability Rating : UL 94V-0
- ◆ Quantity Per Reel : 3,000pcs
- ◆ Marking : J3



Maximum Ratings (TA=25°C Unless Otherwise Noted)

Parameter	Symbol	Value	Units
Collector-Base Voltage	V _{CB0}	40	V
Collector-Emitter Voltage	V _{CEO}	25	V
Emitter-Base Voltage	V _{EB0}	5.0	V
Collector Current	I _C	0.5	A
Collector Power Dissipation	P _C	0.3	W
Thermal Resistance From Junction To Ambient	R _{θJA}	416	°C/W
Junction Temperature Range	T _J	-55~+150	°C
Storage Temperature Range	T _{stg}	-55~+150	°C

Electrical Characteristics(TA=25°C Unless Otherwise Specified)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 0.1mA, I_E = 0$	40			V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1mA, I_B = 0$	25			V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 0.1mA, I_C = 0$	5.0			V
Collector Cut-Off Current	I_{CBO}	$V_{CB} = 40V, I_E = 0$			0.1	μA
Collector Cut-Off Current	I_{CEO}	$V_{CE} = 20V, I_B = 0$			0.1	μA
Emitter Cut-Off Current	I_{EBO}	$V_{EB} = 5V, I_C = 0$			0.1	μA
DC Current Gain	$h_{FE(1)}$	$V_{CE} = 1V, I_C = 50mA$	200		350	
	$h_{FE(2)}$	$V_{CE} = 1V, I_C = 500mA$	40			
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 500mA, I_B = 50mA$			0.6	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 500mA, I_B = 50mA$			1.2	V
Base-Emitter Voltage	V_{BE}	$V_{CB} = 1V, I_C = 10mA$			0.7	V
Transition Frequency	f_T	$V_{CE} = 6V, I_C = 20mA, f = 30MHz$	150			MHz
Collector Output Capacitance	C_{ob}	$V_{CB} = 6V, I_E = 0, f = 1MHz$			8.0	pF

Classification of hFE

Parameter	Unit
hFE	200-350

Electrical Characteristics Curves

Fig. 1 Static Characteristic

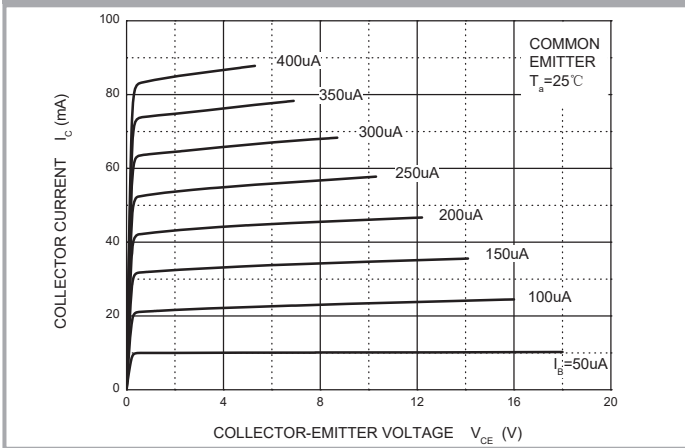


Fig. 2 $h_{FE} - I_c$

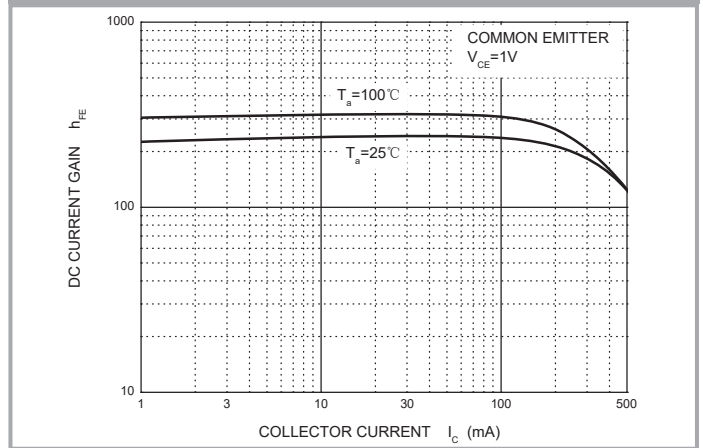


Fig. 3 $V_{CE(sat)} - I_c$

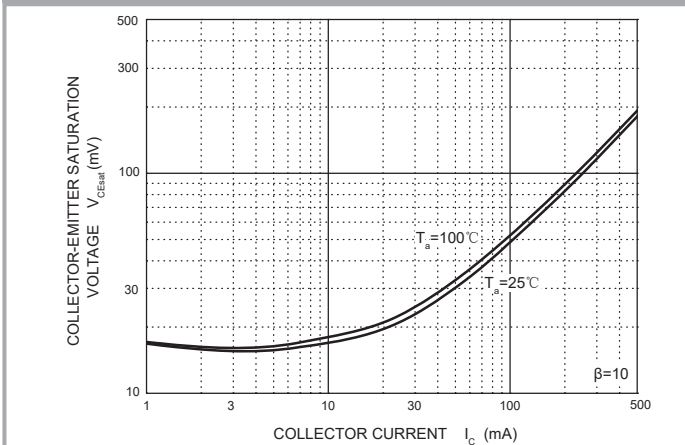


Fig. 4 $V_{BE(sat)} - I_c$

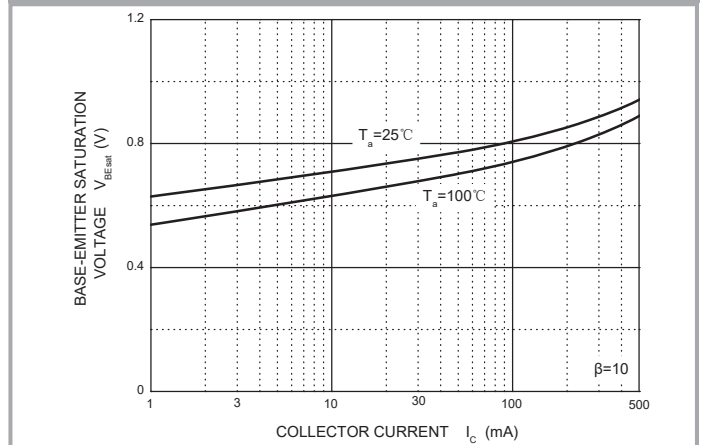


Fig. 5 $I_c - V_{BE}$

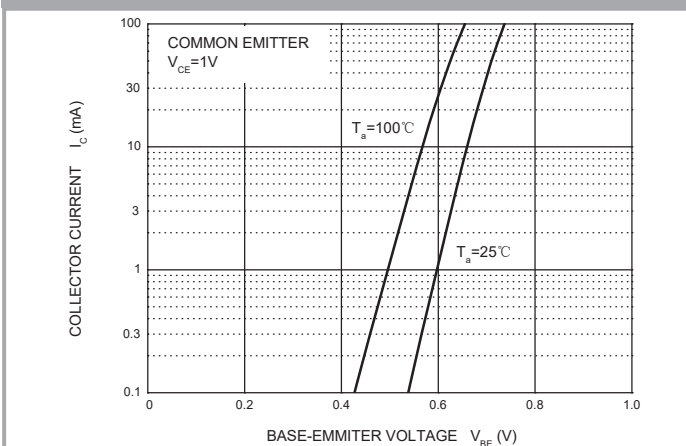
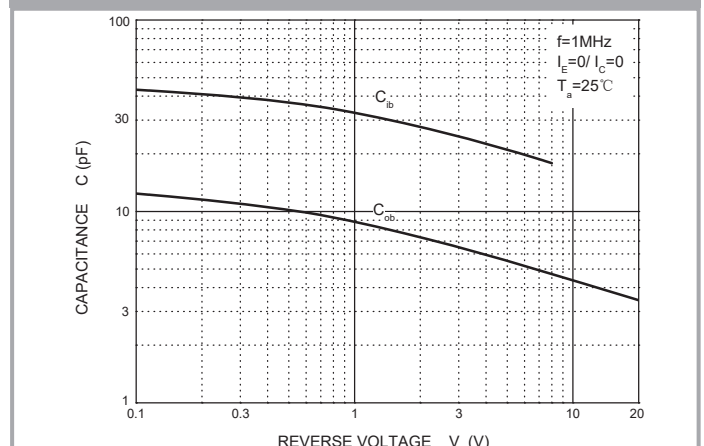


Fig. 6 $C_{ob}/C_{ib} - V_{CB}/V_{EB}$



Electrical Characteristics Curves

Fig. 7 f_T — I_c

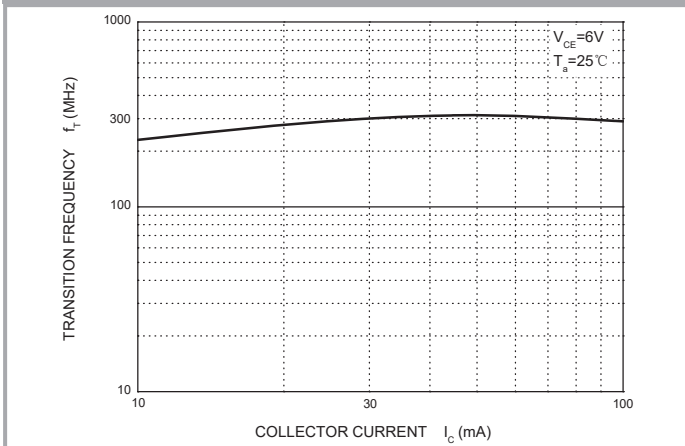
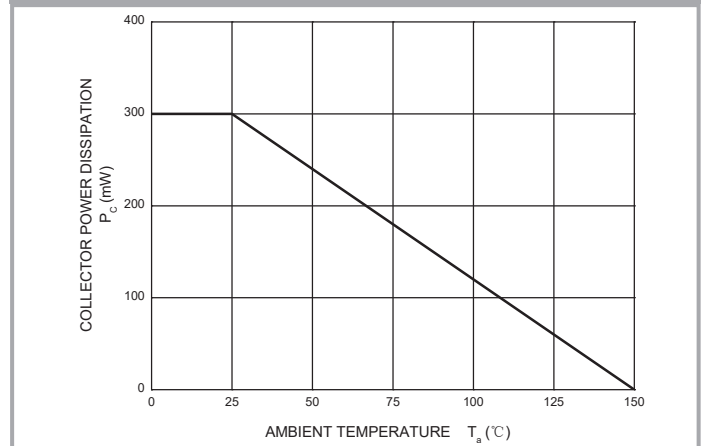
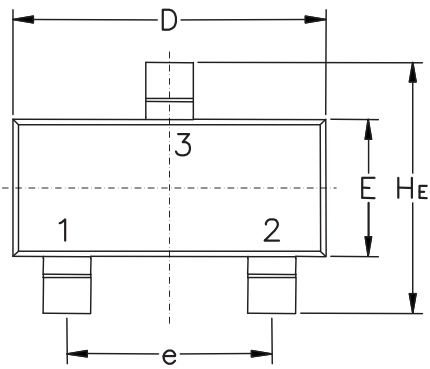


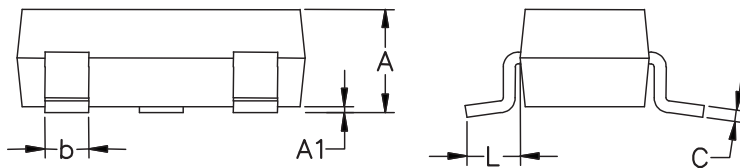
Fig. 8 P_c — T_a



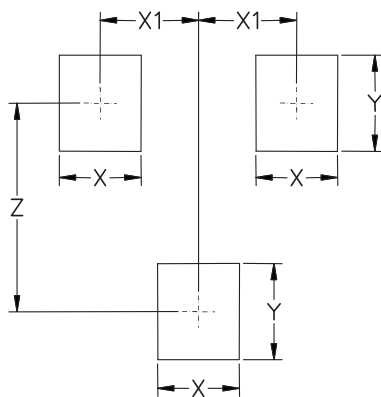
SOT-23 Package Outline & Dimensions (Units: mm / in)



Symbol	Millimeters			Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	0.89	1.00	1.11	0.035	0.040	0.044
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.37	0.44	0.50	0.015	0.018	0.020
C	0.09	0.13	0.18	0.003	0.005	0.007
D	2.80	2.90	3.04	0.110	0.114	0.120
E	1.20	1.30	1.40	0.047	0.051	0.055
e	1.78	1.90	2.04	0.070	0.075	0.081
L	0.35	0.54	0.69	0.014	0.021	0.029
HE	2.10	2.40	2.64	0.083	0.094	0.104



Soldering Footprint



Symbol	Millimeters	Inches
X	0.80	0.031
X1	0.96	0.037
Y	0.90	0.035
Z	2.00	0.079

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