S9013

ROHS

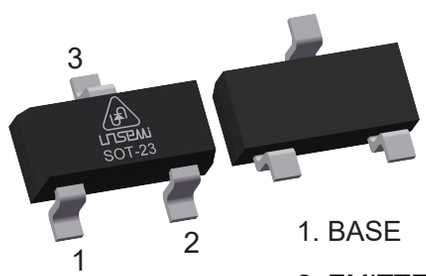
Plastic-Encapsulate Transistor(NPN)

www.unsemi.com

Feature

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

SOT-23



1. BASE
2. EMITTER
3. COLLECTOR

Mechanical Data

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

Maximum Ratings (T_A=25℃ Unless Otherwise Noted)

Parameter	Symbol	Value	Units
Collector-Base Voltage	V_{CBO}	40	V
Collector-Emitter Voltage	V_{CEO}	25	V
Emitter-Base Voltage	V_{EBO}	5.0	V
Collector Current	I_C	0.5	A
Collector Power Dissipation	P_C	0.3	W
Thermal Resistance From Junction To Ambient	$R_{\theta JA}$	416	℃/W
Junction Temperature Range	T_J	-55~+150	℃
Storage Temperature Range	Tstg	-55~+150	℃

Electrical Characteristics(T_A=25℃ 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	Cob	V_{CB} = 6V, I_E = 0, f = 1MHZ			8.0	pF

Classification of h_{FE}

Parameter	Unit
h_{FE}	200-350

Electrical Characteristics Curves

Fig. 1 Static Characteristic

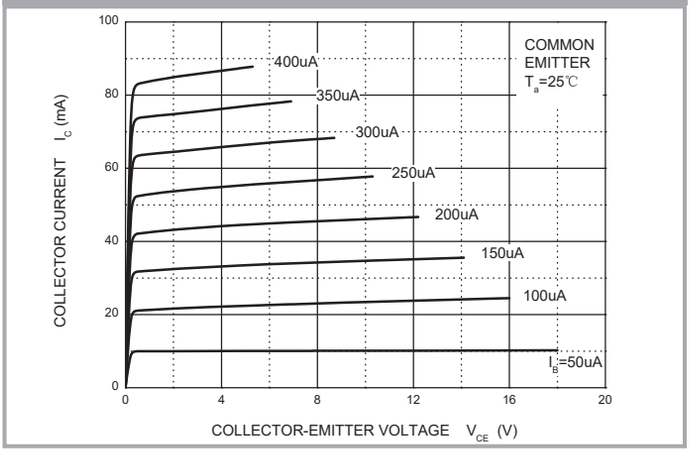


Fig. 2 hFE — Ic

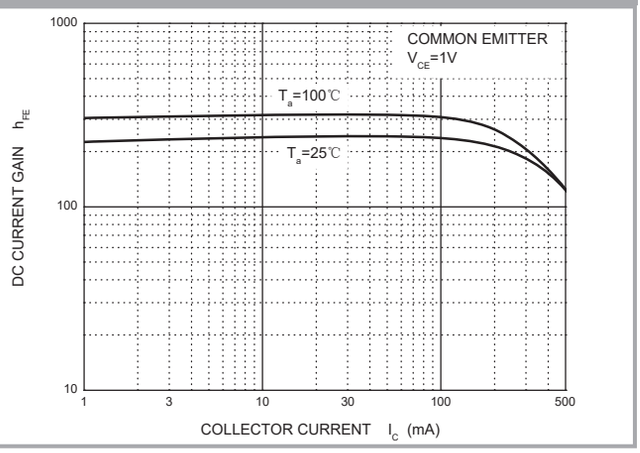


Fig. 3 $V_{CE(sat)}$ — Ic

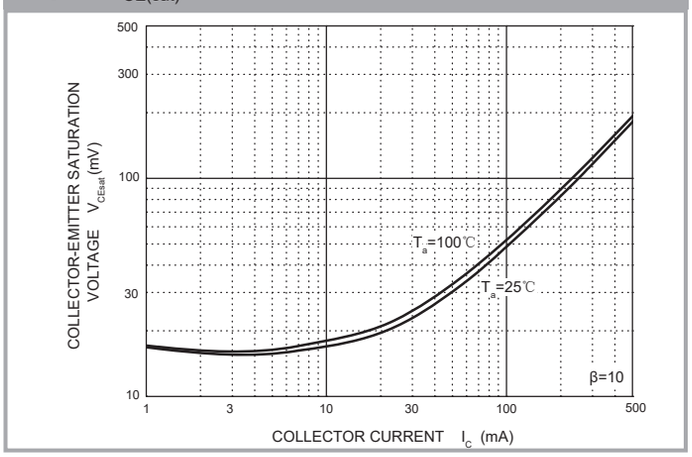


Fig. 4 $V_{BE(sat)}$ — Ic

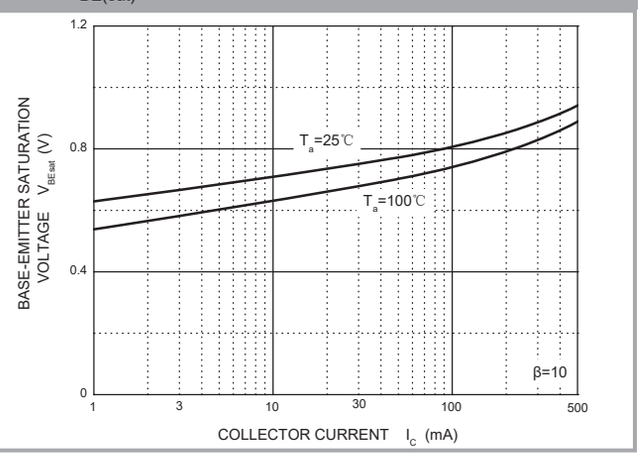


Fig. 5 Ic — VBE

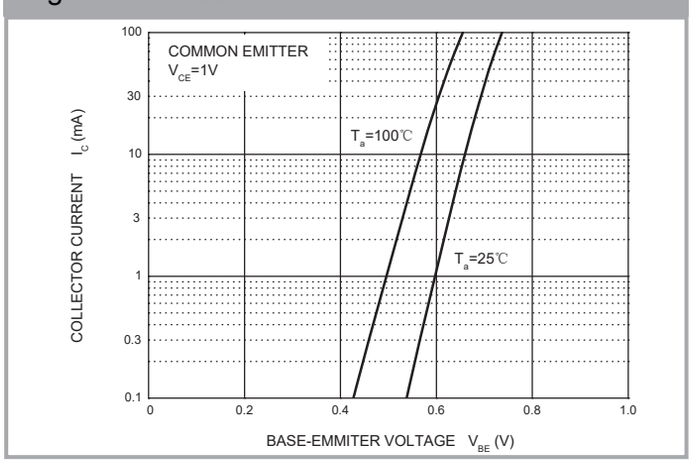
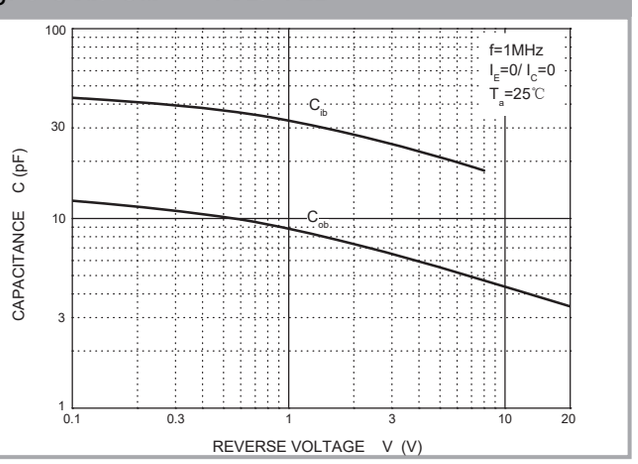


Fig. 6 Cob/ Cib — VCB/ VEB



Electrical Characteristics Curves

Fig. 7 fT — Ic

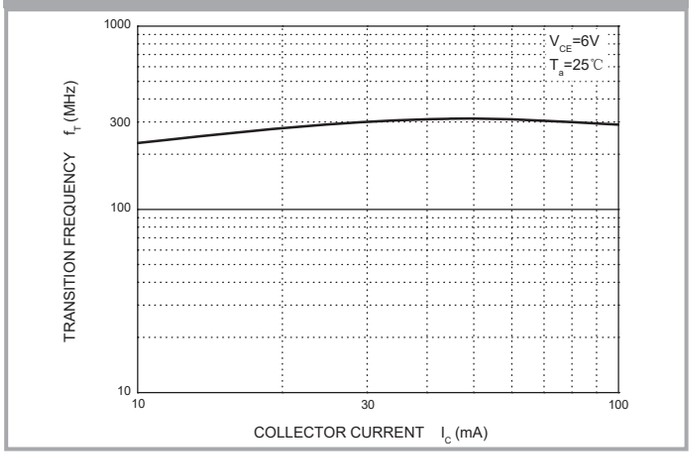
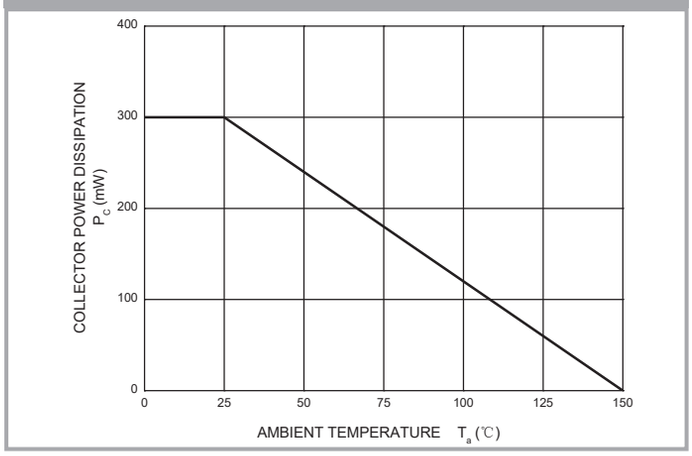
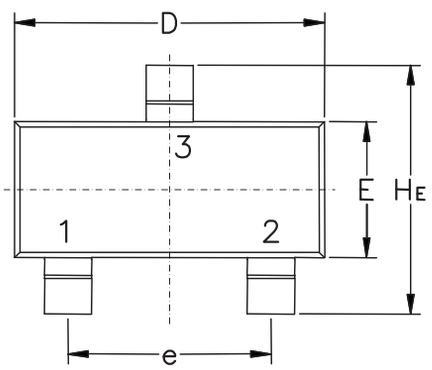


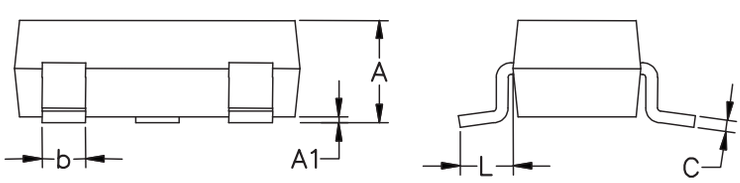
Fig. 8 Pc — Ta



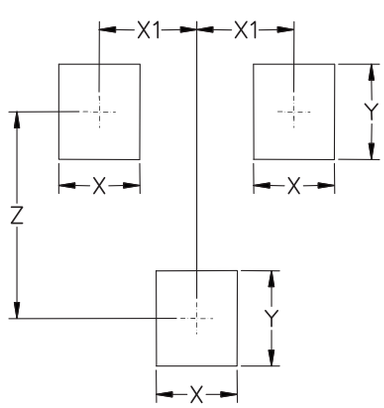
SOT-23 Package Outine & Dimensions (Units: mm / in)



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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ROHS

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