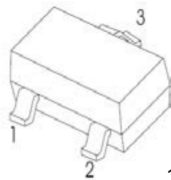




FEATURES

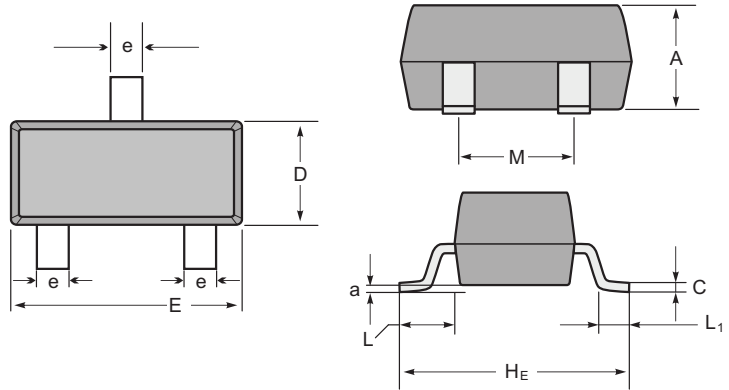
- High Collector Current.
- Complementary to S9012.
- Excellent h_{FE} Linearity.



1.BASE
2.EMITTER
3.COLLECTOR

Marking

Type number	Marking code
S9013	J3



SOT-23 mechanical data

UNIT		A	C	D	E	H _E	e	M	L	L ₁	a
mm	max	1.1	0.15	1.4	3.0	2.6	0.5	1.95	0.55	0.36	0.0
	min	0.9	0.08	1.2	2.8	2.2	0.3	1.7	(ref)	(ref)	0.15
mil	max	43	6	55	118	102	20	77	22	14	0.0
	min	35	3	47	110	87	12	67	(ref)	(ref)	6

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	$^\circ\text{C}$

CLASSIFICATION OF h_{FE}

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

S9013

ELECTRICAL CHARACTERISTICS (TA = 25°C unless otherwise noted.) OFF CHARACTERISTICS

Characteristic	Symbol	Min	Max	Unit
Collector–Emitter Breakdown Voltage(3) (IC = 1.0 mA, IB = 0)	V _{(BR)CEO}	25	—	Vdc
Collector–Base Breakdown Voltage (IC = 100 µA, IE = 0)	V _{(BR)CBO}	40	—	Vdc
Emitter–Base Breakdown Voltage (IE = 100 µA, IC = 0)	V _{(BR)EBO}	5.0	—	Vdc
Collector cut-off current (VCB = 40 Vdc, IE = 0)	ICBO	—	0.1	µA
Collector cut-off current (VCE = 20 Vdc, IB = 0)	ICEO	—	0.1	µA
Emitter cut-off current (VEB = 5 Vdc, IC = 0)	IEBO	—	0.1	µA

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 (TA = 25°C unless otherwise noted) (Continued) ON CHARACTERISTIC S₃ ()

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

SMALL–SIGNAL CHARACTERISTICS

Current–Gain — Bandwidth Product (IC = 20 mA, VCE = 6.0 Vdc, f = 30 MHz)	f _T	150	—	MHz
Collector output capacitance (VCB = 6.0 Vdc, IE = 0, f = 1.0 MHz)	C _{ob}	—	8.0	pF

RATING AND CHARACTERISTIC CURVES (S9013)

Fig.1 Power Derating Curve

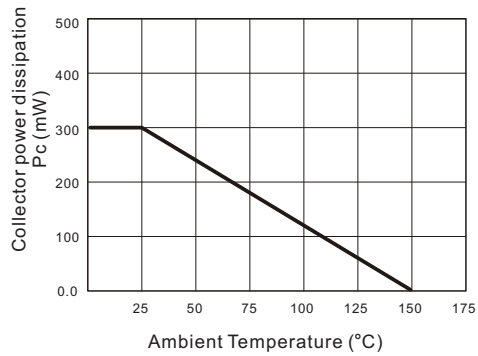


Fig.2 Static characteristics

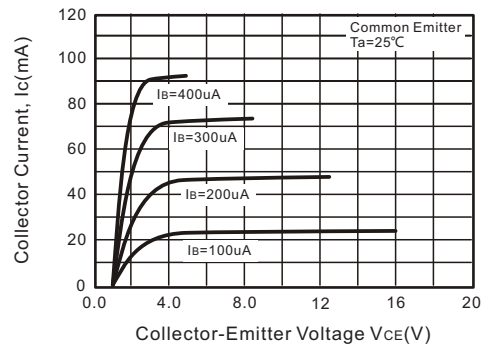


Fig.3 h_{FE} -- I_c

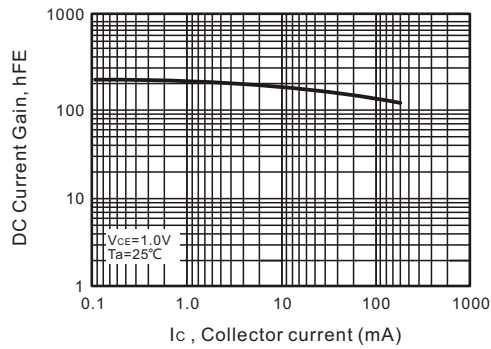


Fig.4 I_c -- V_{BE}

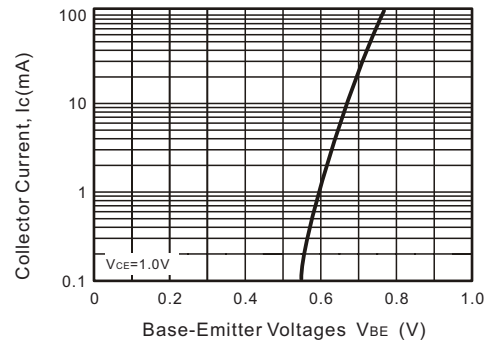


Fig.5 V_{BEsat} -- I_c

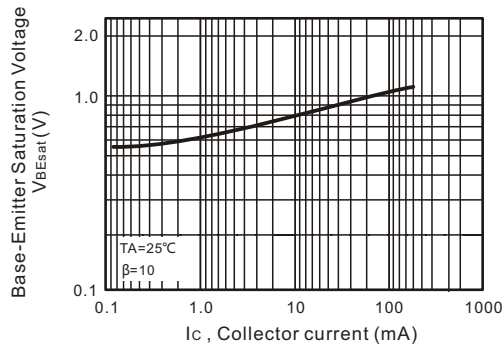


Fig.6 V_{CEsat} -- I_c

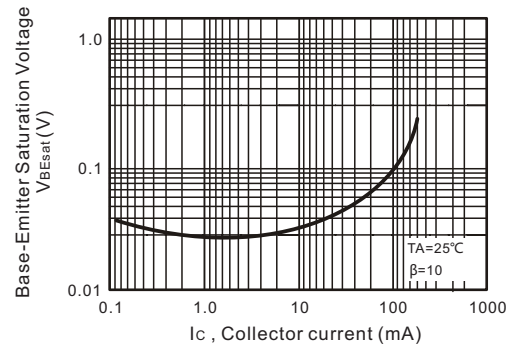


Fig.7 f_t -- I_c

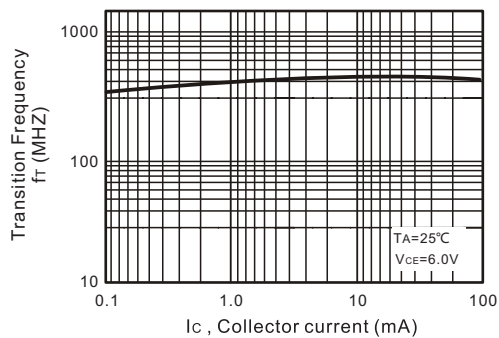


Fig.8 C_{ob}/C_{ib} -- V_{CB}/V_{EB}

