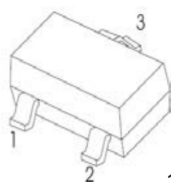




FEATURES

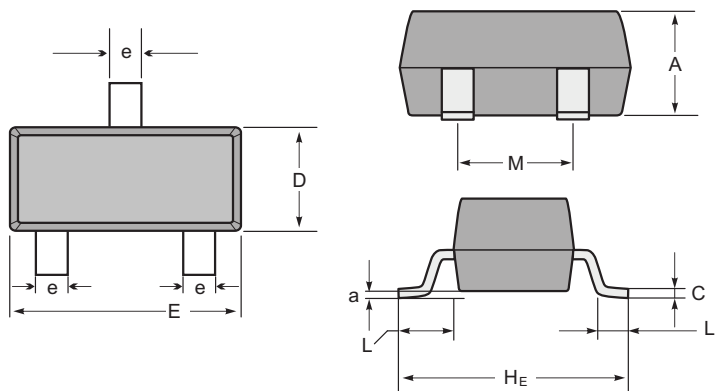
- High Collector Current
- Complementary To S9013
- Excellent hFE Linearity



1.BASE
2.EMITTER
3.COLLECTOR

Marking

Type number	Marking code
S9012	2T1



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 (ref)	0.36 (ref)	0.0
	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

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°C	P _D	300	mW
Junction and Storage Temperature	T _J , T _{stg}	– 55 to +150	°C

S9012

CLASSIFICATION OF h_{FE}

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

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

Characteristic	Symbol	Min	Max	Unit
Collector–Emitter Breakdown Voltage(3) ($I_C = -1.0\text{ mA}$, $I_B = 0$)	$V_{(BR)CEO}$	-25	—	Vdc
Collector–Base Breakdown Voltage ($I_C = -0.1\text{ mA}$, $I_E = 0$)	$V_{(BR)CBO}$	-40	—	Vdc
Emitter–Base Breakdown Voltage ($I_E = -0.1\text{ mA}$, $I_C = 0$)	$V_{(BR)EBO}$	-5.0	—	Vdc
Collector cut-off current ($V_{CB} = -40\text{ Vdc}$, $I_E = 0$)	I_{CBO}	—	-0.1	μA
Collector cut-off current ($V_{CE} = -20\text{ Vdc}$, $I_B = 0$)	I_{CEO}	—	-0.1	μA
Emitter cut-off current ($V_{EB} = -5\text{ Vdc}$, $I_C = 0$)	I_{EBO}	—	-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 ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued) ON CHARACTERISTICS (3)

Characteristic	Symbol	Min	Max	Unit
DC Current Gain	h_{FE}			—
($I_C = -50\text{ mA}$, $V_{CE} = -1\text{ Vdc}$)		120	400	
Collector–Emitter Saturation Voltage ($I_C = -500\text{ mA}$, $I_B = -50\text{ mA}$)(3)	$V_{CE(sat)}$	—	-0.6	Vdc
Base–Emitter Saturation Voltage(3) ($I_C = -500\text{ mA}$, $I_B = -50\text{ mA}$)	$V_{BE(sat)}$	—	-1.2	Vdc

SMALL–SIGNAL CHARACTERISTICS

Current–Gain — Bandwidth Product ($I_C = -20\text{ mA}$, $V_{CE} = -6.0\text{ Vdc}$, $f = 30\text{ MHz}$)	f_T	150	—	MHz
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RATING AND CHARACTERISTIC CURVES (S9012)

Fig.1 Power Derating Curve

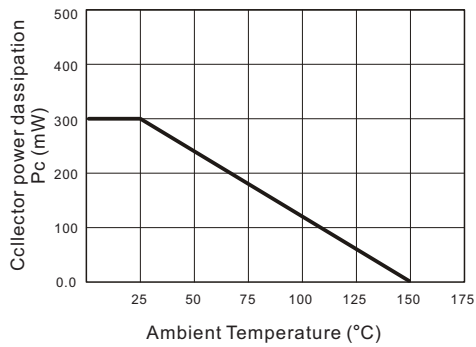


Fig.2 Static characteristics

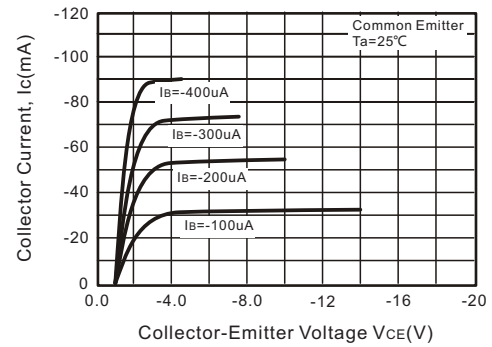


Fig.3 h_{FE} -- I_C

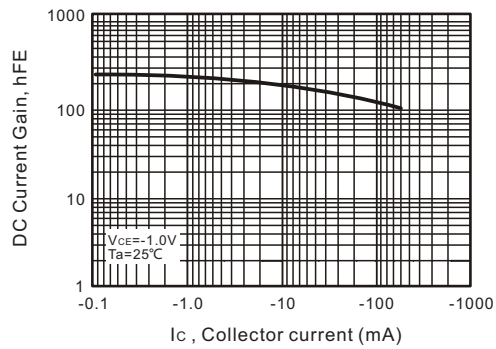


Fig.4 I_C -- V_{BE}

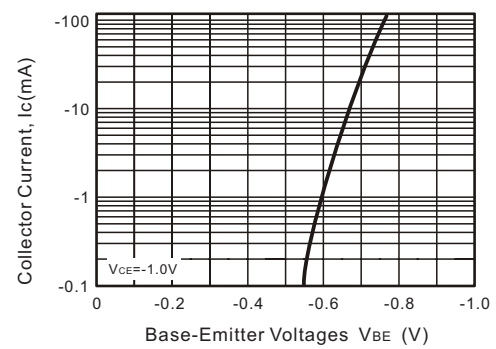


Fig.5 V_{BEsat} -- I_C

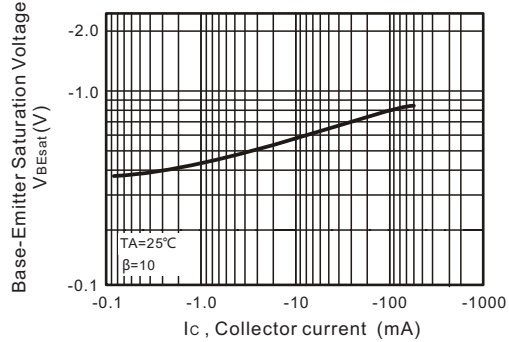


Fig.6 V_{CEsat} -- I_C

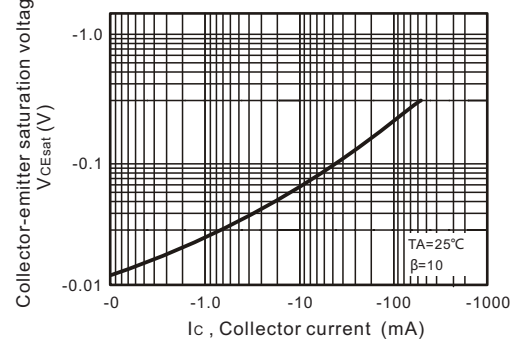


Fig.7 f_T -- I_C

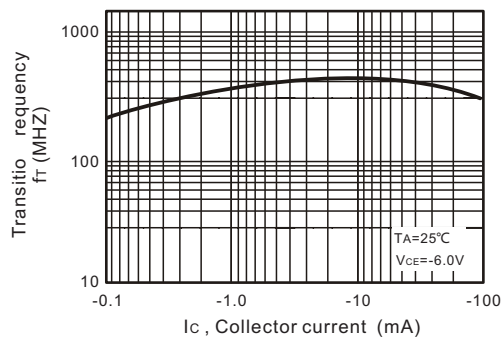


Fig.8 C_{ob}/C_{ib} -- V_{CB}/V_{EB}

