SOT-23

1. BASE
2. EMITTER
3. COLLECTOR

Marking: 2T1

Features

- As complementary type the NPN transistor S9013 is recommended
- Epitaxial planar die construction

Maximum Ratings

(Ratings at 25℃ ambient temperature unless otherwise specified.)

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	-40	V
V_{CEO}	Collector-Emitter Voltage	-25	V
V_{EBO}	Emitter-Base Voltage	-5	V
I_C	Collector Current -Continuous	-500	mA
P_C	Total Device Dissipation	300	mW
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	416	℃/W
T_J	Junction Temperature	150	℃
T_{stg}	Storage Temperature	-55 to +150	℃

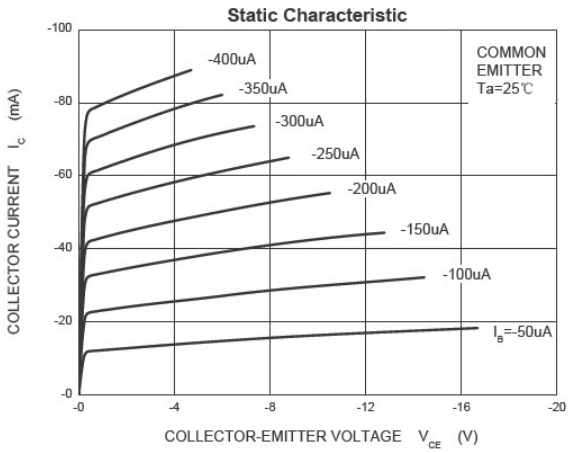
Electrical Characteristics

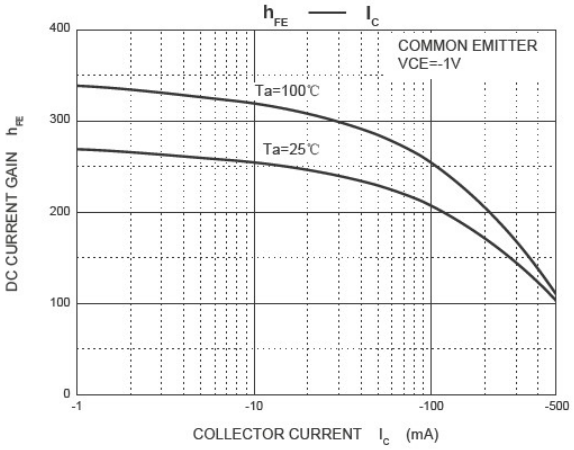
(Ratings at 25℃ ambient temperature unless otherwise specified).

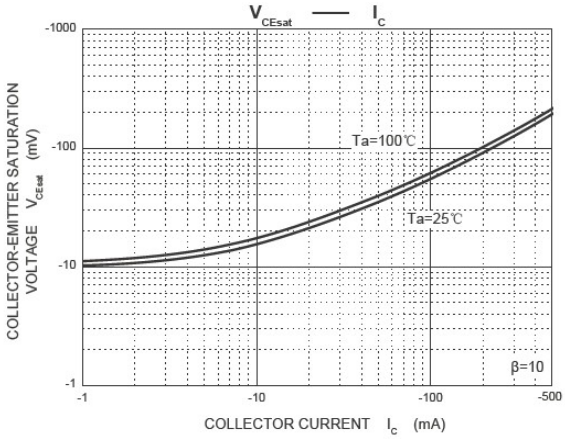
Parameter	Symbols	Test Condition	Limits		Unit
			Min	Max	
Collector-base breakdown voltage	$V_{(BR)CBO}$	I_C=-100uA, I_E=0	-40		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	I_C=-1mA, I_B=0	-25		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	I_E=-100uA, I_C=0	-5		V
Collector cut-off current	I_{CEO}	V_{CE}=-20V, I_B=0		-100	nA
Collector cut-off current	I_{CBO}	V_{CB}=-40V, I_E=0		-100	nA
Emitter cut-off current	I_{EBO}	V_{EB}=-5V, I_C=0		-100	nA
DC current gain	h_{FE}	V_{CE}=-1V, I_C=-50mA	120	400	
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C=-500mA, I_B=-50mA		-0.60	V
Base -emitter saturation voltage	$V_{BE(sat)}$	I_C=-500mA, I_B=-50mA		-1.20	V
Transition frequency	f_T	V_{CE}=-6V, I_C=-20mA,f=30MHz	150		MHz
Collector output capacitance	Cob	V_{CB}=-10V, I_E=0, f=1MHz		5	pF

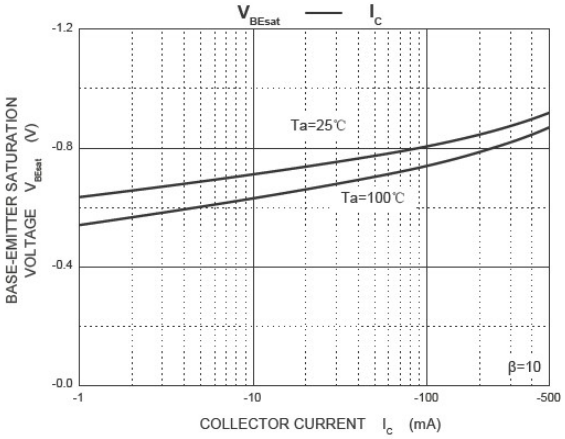
CLASSIFICATION OF $h_{FE(1)}$

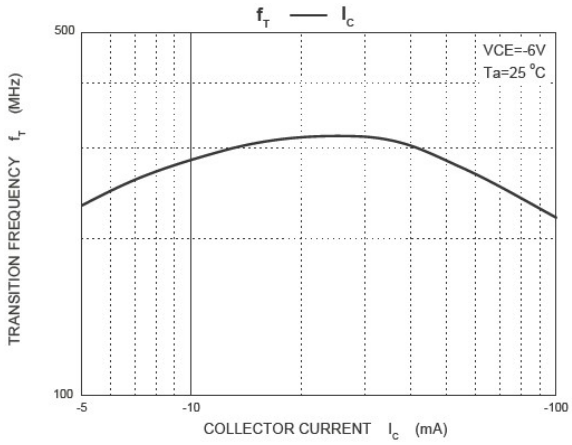
RANK	L	H	J
RANGE	120-200	200-350	300-400

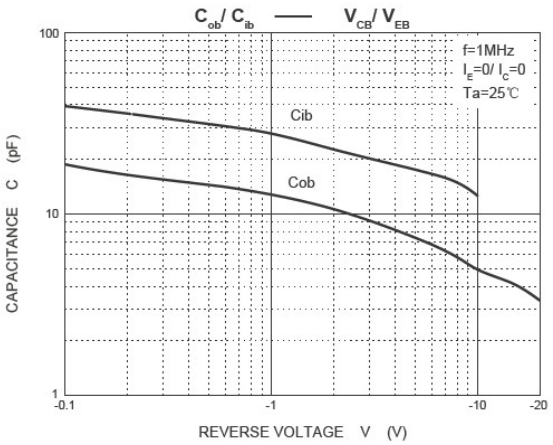

Static Characteristic
COMMON EMITTER Ta=25℃
-400uA
-350uA
-300uA
-250uA
-200uA
-150uA
-100uA
I_B=-50uA
COLLECTOR CURRENT I_C (mA)
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)

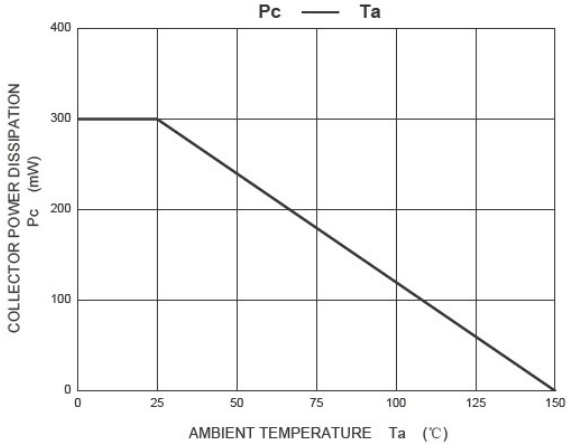

h_{FE} —— I_C
COMMON EMITTER VCE=-1V
Ta=100℃
Ta=25℃
DC CURRENT GAIN h_{FE}
COLLECTOR CURRENT I_C (mA)


V_{CEsat} —— I_C
Ta=100℃
Ta=25℃
β=10
COLLECTOR-EMITTER SATURATION VOLTAGE V_{CEsat} (mV)
COLLECTOR CURRENT I_C (mA)


V_{BEsat} —— I_C
Ta=25℃
Ta=100℃
β=10
BASE-EMITTER SATURATION VOLTAGE V_{BEsat} (V)
COLLECTOR CURRENT I_C (mA)


f_T —— I_C
VCE=-6V
Ta=25 °C
TRANSITION FREQUENCY f_T (MHz)
COLLECTOR CURRENT I_C (mA)


C_{ob}/ C_{ib} —— V_{CB}/ V_{EB}
f=1MHz
I_E=0/ I_C=0
Ta=25℃
Cib
Cob
CAPACITANCE C (pF)
REVERSE VOLTAGE V (V)


Pc —— Ta
COLLECTOR POWER DISSIPATION Pc (mW)
AMBIENT TEMPERATURE Ta (℃)