S9013 TRANSISTOR (NPN)

TO-92

1. EMITTER
2. BASE
3. COLLECTOR

FEATURE

- Complementary to S9012
- Excellent h_{FE} linearity

MAXIMUM RATINGS T_A=25℃ unless otherwise noted

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	Collector Dissipation	625	mW
T_J	Junction Temperature	150	℃
T_{stg}	Storage Temperature	-55-150	℃

ELECTRICAL CHARACTERISTICS (Tamb=25℃ unless otherwise specified)

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	$V(BR)_{CBO}$	I_C= 100μA , 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= 100μA , I_C=0	5			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_E=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	64		400	
	$h_{FE(2)}$	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 voltage	$V_{BE(sat)}$	I_C= 500mA, I_B= 50mA			1.2	V
Transition frequency	f_T	V_{CE}=6V,I_C=20mA,f=30MHz	150			MHz

CLASSIFICATION OF $h_{FE(1)}$

Rank	D	E	F	G	H	I	J
Range	64-91	78-112	96-135	112-166	144-202	190-300	300-400

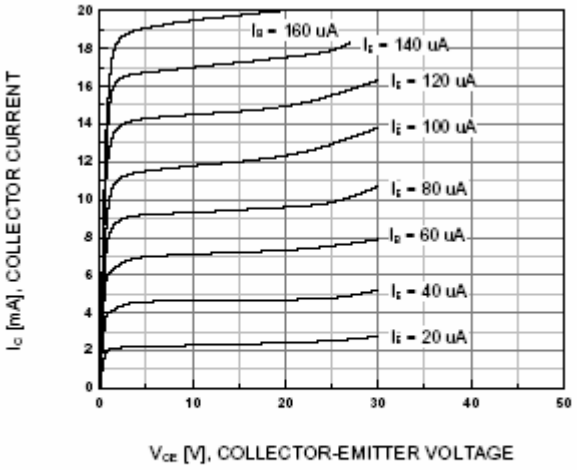

Figure 1. Static Characteristic

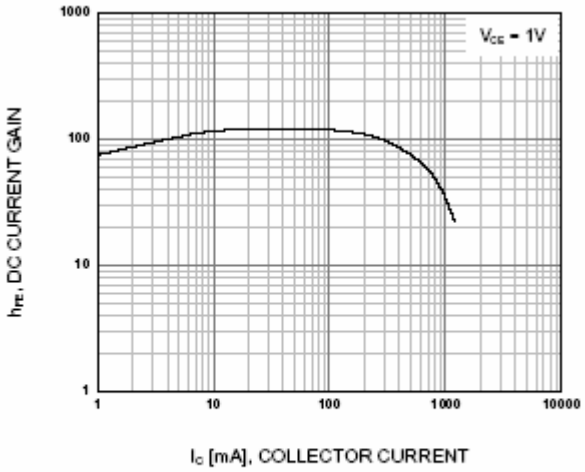

Figure 2. DC current Gain

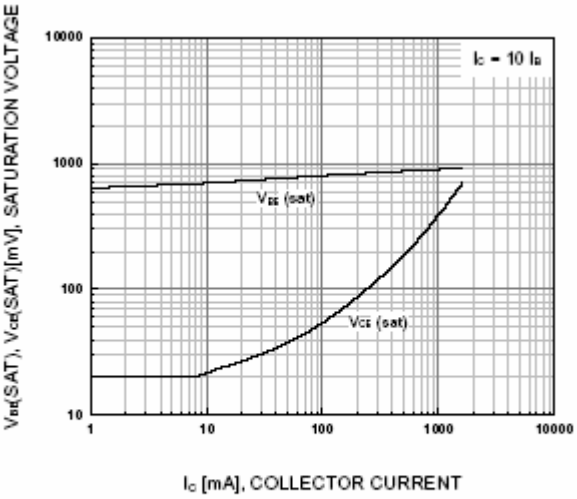

Figure 3. Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage

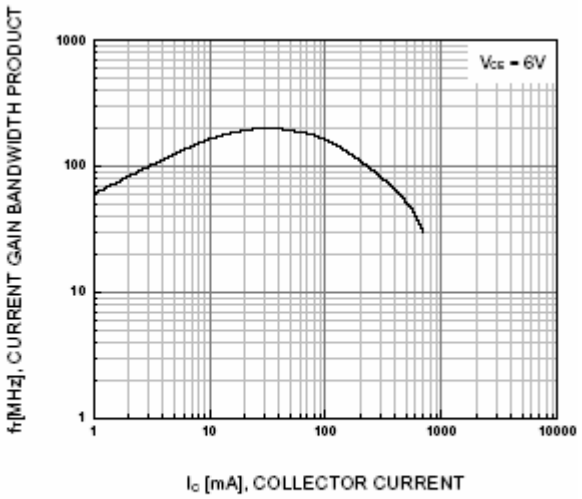

Figure 4. Current Gain Bandwidth Product