

**TO-92 Plastic-Encapsulate Transistors**

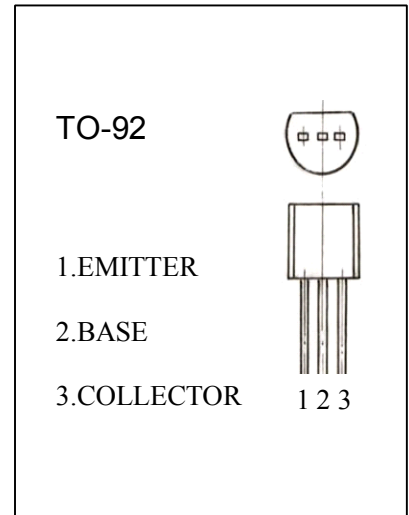
**FEATURES** z

Complementary to S9012 z

Excellent hFE linearity

**MAXIMUM RATINGS** (TA=25°C unless otherwise noted)

Symbol	Parameter	Value	Units
V <sub>CB0</sub>	Collector-Base Voltage	40	V
V <sub>CE0</sub>	Collector-Emitter Voltage	25	V
V <sub>EB0</sub>	Emitter-Base Voltage	5	V
I <sub>c</sub>	Collector Current -Continuous	500	mA
P <sub>c</sub>	Collector Power Dissipation	625	mW
T <sub>j</sub>	Junction Temperature	150	°C
T <sub>stg</sub>	Storage Temperature	-55-150	°C



**ELECTRICAL CHARACTERISTICS** (Tamb=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	V <sub>(BR)CBO</sub>	I <sub>c</sub> = 100μA, I <sub>E</sub> =0	40			V
Collector-emitter breakdown voltage	V <sub>(BR)CEO</sub>	I <sub>c</sub> = 0.1mA, I <sub>B</sub> =0	25			V
Emitter-base breakdown voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =100μA, I <sub>c</sub> =0	5			V
Collector cut-off current	I <sub>CB0</sub>	V <sub>CB</sub> =40V, I <sub>E</sub> =0			0.1	μA
Collector cut-off current	I <sub>CE0</sub>	V <sub>CE</sub> =20V, I <sub>B</sub> =0			0.1	μA
Emitter cut-off current	I <sub>EBO</sub>	V <sub>EB</sub> = 5V, I <sub>c</sub> =0			0.1	μA
DC current gain	h <sub>FE(1)</sub>	V <sub>CE</sub> =1V, I <sub>c</sub> = 50mA	64		400	
	h <sub>FE(2)</sub>	V <sub>CE</sub> =1V, I <sub>c</sub> =500mA	40			
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>c</sub> =500mA, I <sub>B</sub> = 50mA			0.6	V
Base-emitter saturation voltage	V <sub>BE(sat)</sub>	I <sub>c</sub> =500mA, I <sub>B</sub> = 50mA			1.2	V
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> =6V, I <sub>c</sub> = 20mA f=30MHZ	150			MHZ

**CLASSIFICATION OF hFE(1)**

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

# Typical Characteristics

# S9013

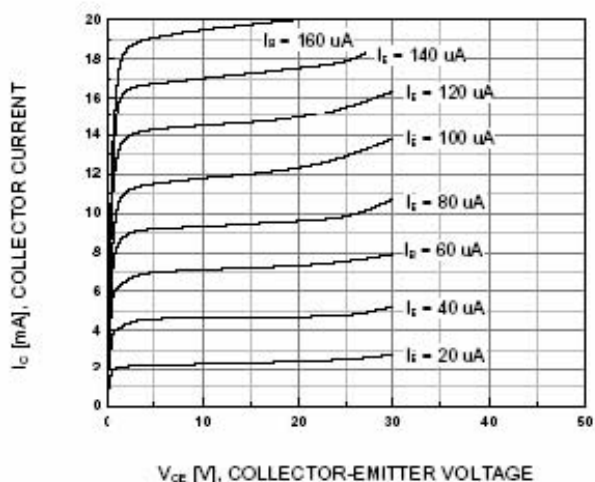


Figure 1. Static Characteristic

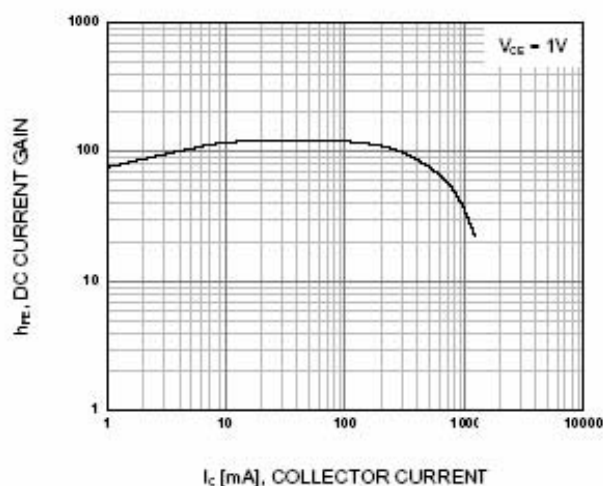


Figure 2. DC current Gain

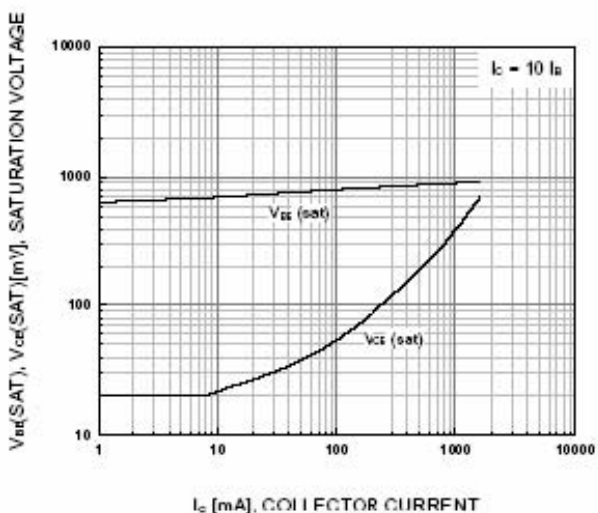


Figure 3. Base-Emitter Saturation Voltage  
Collector-Emmitter Saturation Voltage

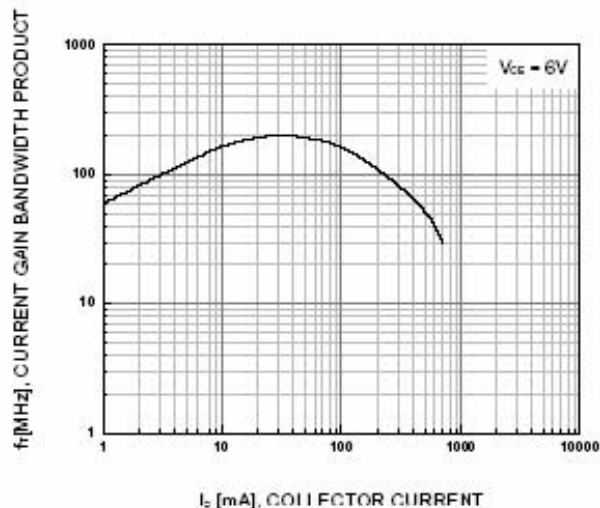


Figure 4. Current Gain Bandwidth Product