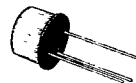
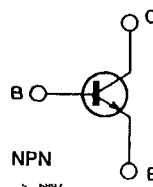


HIGH-VOLTAGE, HIGH-CURRENT SWITCH**DESCRIPTION**

The BSX33 is a silicon planar epitaxial NPN transistor in Jedec TO-18 metal case, designed for high voltage and high current switching applications. It features useful current gain from 100 μ A to 500mA and a low saturation voltage allowing switching operation at 1A.



TO-18

INTERNAL SCHEMATIC DIAGRAM**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base Voltage ($I_E = 0$)	85	V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)	55	V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)	7	V
I_C	Collector Current	1	A
P_{tot}	Total Power Dissipation at $T_{amb} \leq 25^\circ\text{C}$ at $T_{case} \leq 25^\circ\text{C}$	0.5 1.8	W W
T_{stg}, T_J	Storage and Junction Temperature	- 55 to 200	$^\circ\text{C}$

THERMAL DATA

R _{th j-case}	Thermal Resistance Junction-case	Max	97	°C/W
R _{th j-amb}	Thermal Resistance Junction-ambient	Max	350	°C/W

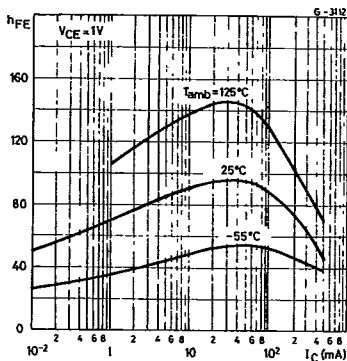
ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I _{CBO}	Collector Cutoff Current (I _E = 0)	V _{CB} = 60 V V _{CB} = 60 V T _{amb} = 150 °C			10 10	nA μA
I _{EBO}	Emitter Cutoff Current (I _C = 0)	V _{EB} = 5 V			10	nA
V _{(BR)CBO}	Collector-base Breakdown Voltage (I _E = 0)	I _C = 100 μA	85			V
V _{(BR)CEO} *	Collector-emitter Breakdown Voltage (I _B = 0)	I _C = 30 mA	55			V
V _{(BR)EBO}	Emitter-base Breakdown Voltage (I _C = 0)	I _E = 100 μA	7			V
V _{CE(sat)} *	Collector-emitter Saturation Voltage	I _C = 50 mA I _B = 5 mA I _C = 150 mA I _B = 15 mA I _C = 1 A I _B = 0.1 mA		0.08 0.15 0.6	0.3 1	V V V
V _{BE(sat)} *	Base-emitter Saturation Voltage	I _C = 50 mA I _B = 5 mA I _C = 150 mA I _B = 15 mA I _C = 1 A I _B = 0.1 mA		0.76 0.85 1.2	1.1 1.6	V V V
h _{FE} *	DC Current Gain	I _C = 100 μA V _{CE} = 1 V I _C = 10 mA V _{CE} = 1 V I _C = 50 mA V _{CE} = 1 V I _C = 150 mA V _{CE} = 1 V I _C = 500 mA V _{CE} = 1 V	20 50 50 40 20	50 85 95 80 45		
h _{fe}	Small Signal Current Gain	I _C = 1 mA f = 1 kHz V _{CE} = 5 V		85		
f _T	Transition Frequency	I _C = 50 mA f = 20 MHz V _{CE} = 10 V	60	90		MHz
C _{EBO}	Emitter-base Capacitance	I _C = 0 f = 1 MHz V _{EB} = 0.5 V		50	80	pF
C _{CBO}	Collector-base Capacitance	I _E = 0 f = 1 MHz V _{CB} = 10 V		12	20	pF
h _{ie}	Input Impedance	I _C = 1 mA f = 1 kHz V _{CE} = 5 V		2		kΩ
h _{re}	Reverse Voltage Transfer Ratio	I _C = 1 mA f = 1 kHz V _{CE} = 5 V		2.2 x 10 ⁻⁴		
h _{oe}	Output Admittance	I _C = 1 mA f = 1 kHz V _{CE} = 5 V		8		μs
t _{on}	Turn-on Time	I _C = 150 mA I _{B1} = 7.5 mA V _{CC} = 20 V		120	200	ns
t _{off}	Turn-off Time	I _C = 150 mA I _{B1} = - I _{B2} = 7.5 mA V _{CC} = 20 V		350	800	ns

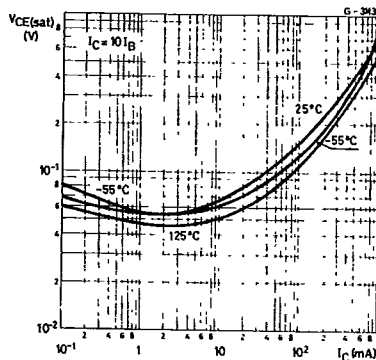
* Pulsed : pulse duration = 300μs, duty cycle = 1%.

T-35-11

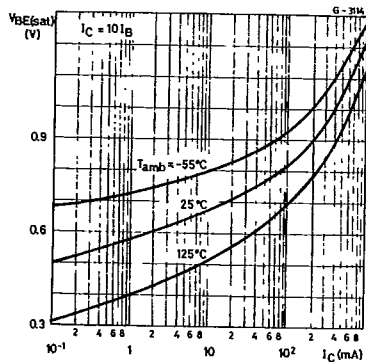
DC Current Gain.



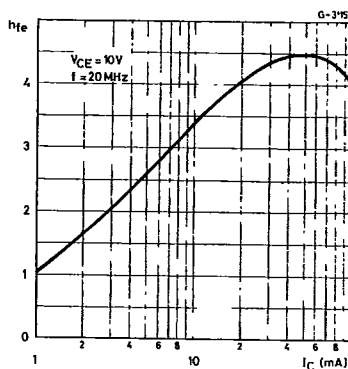
Collector-emitter Saturation Voltage.



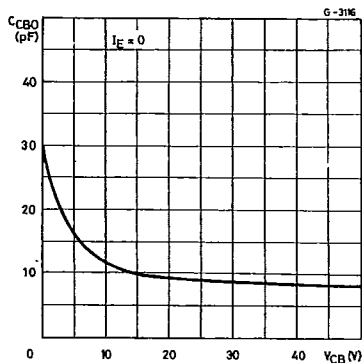
Base-emitter Saturation Voltage.



High Frequency Current Gain.



Collector-base Capacitance.



Collector Cutoff Current.

