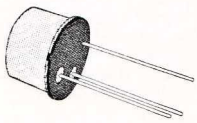
SGS-THOMSON MICROELECTRONICS

BSX32

HIGH-VOLTAGE, HIGH-CURRENT SWITCH

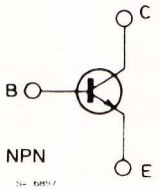
DESCRIPTION

The BSX32 is a silicon planar epitaxial NPN tran- sistor in Jedec TO-39 metal case. It is designed for high voltage, high current switching appli-



TO-39

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base Voltage (I_E = 0)	65	V
V_{CEO}	Collector-emitter Voltage (I_B = 0)	40	V
V_{EBO}	Emitter-base Voltage (I_C = 0)	6	V
I_C	Collector Current	1	mA
P_{tot}	Total Power Dissipation at $T_{amb} \leq 25$ °C at $T_{case} \leq 25$ °C	0.8 3.5	W W
T_{stg}, T_j	Storage and Junction Temperature	– 55 to 200	°C

THERMAL DATA

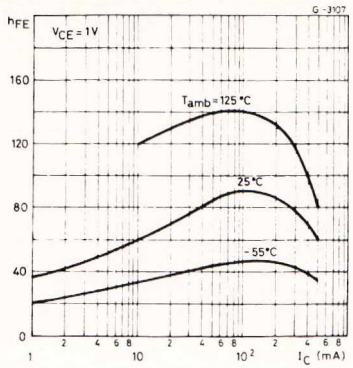
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max	50	°C/W
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max	219	°C/W

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

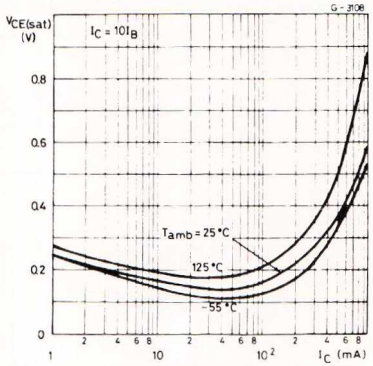
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current (I_E = 0)	V_{CB} = 50 V			0.25	4	µA
$V_{(BR)CBO}$	Collector-base Breakdown Voltage (I_E = 0)	I_C = 100 µA		65			V
$V_{(BR)CEO}$*	Collector-emitter Breakdown Voltage (I_B = 0)	I_C = 10 mA		40			V
$V_{(BR)EBO}$	Emitter-base Breakdown Voltage (I_C = 0)	I_E = 100 µA		6			V
$V_{CE(sat)}$*	Collector-emitter Saturation Voltage	I_C = 100 mA	I_B = 10 mA		0.17	0.25	V
		I_C = 500 mA	I_B = 50 mA		0.36	0.5	V
		I_C = 1A	I_B = 100 mA		0.6	0.85	V
$V_{BE(sat)}$*	Base-emitter Saturation Voltage	I_C = 100 mA	I_B = 10 mA		0.8	0.9	V
		I_C = 500 mA	I_B = 50 mA			1.5	V
		I_C = 1 A	I_B = 100 mA			2	V
h_{FE}*	DC Current Gain	I_C = 10 mA	V_{CE} = 1 V	30	60		
		I_C = 100 mA	V_{CE} = 1 V	60	90	150	
		I_C = 500 mA	V_{CE} = 1 V	25	60		
		I_C = 1 A	V_{CE} = 5 V	20	60		
		V_{CE} = 1 V	T_{amb} = − 55 °C				
			I_C = 100 mA	30	45		
			I_C = 500 mA	15	35		
f_T	Transition Frequency	I_C = 50 mA f = 100 MHz	V_{CE} = 10 V		400		MHz
C_{EBO}	Emitter-base Capacitance	I_C = 0 f = 1 MHz	V_{EB} = 0.5 V		40	55	pF
C_{CBO}	Collector-base Capacitance	I_E = 0 f = 1 MHz	V_{CB} = 10 V		6	10	pF
t_{on}**	Turn-on Time	I_C = 500 mA I_{B1} = 50 mA	V_{CC} = 30 V		22	35	ns
t_{off}**	Turn-off Time	I_C = 500 mA I_{B1} = − I_{B2} = 50 mA	V_{CC} = 30 V		40	60	ns

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

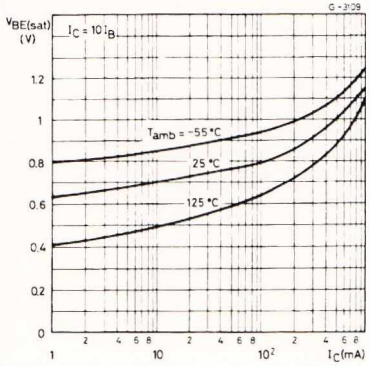
DC Current Gain.



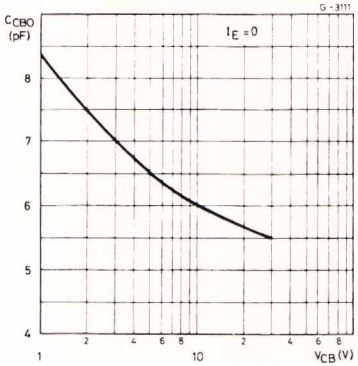
Collector-emitter Saturation Voltage.



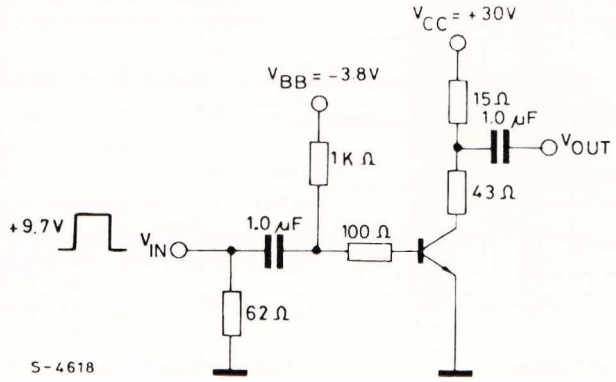
Base-emitter Saturation Voltage.



Collector-base Capacitance.



Test circuit for t_{on}, t_{off}.



PULSE GENERATOR :
t_r, $t_f \leq 1.0$ ns
PW ≈ 1.0 µs
Z_{IN} = 50 Ω
DC < 2 %

TO OSCILLOSCOPE :
t_r < 1.0 ns
$Z_{IN} \geq 100$ KΩ