SGS-THOMSON MICROELECTRONICS

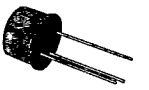
S G S-THOMSON

BSX29

SWITCH AND RF AMPLIFIER

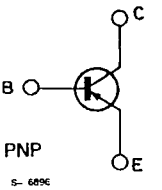
DESCRIPTION

The BSX29 is a silicon planar epitaxial PNP transistor in Jedec TO-18 metal case. It is designed for saturated and nonsaturated switching circuits requiring up to 200mA of collector current.



TO-18

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base Voltage ($I_E = 0$)	– 12	V
V_{CES}	Collector-emitter Voltage ($V_{BE} = 0$)	– 12	V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)	– 12	V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)	– 4	V
I_C	Collector Current	– 200	mA
P_{tot}	Total Power Dissipation at $T_{amb} \leq 25$ °C at $T_{case} \leq 25$ °C	0.36 1.2	W W
T_{stg}, T_j	Storage and Junction Temperature	– 65 to 200	°C

THERMAL DATA

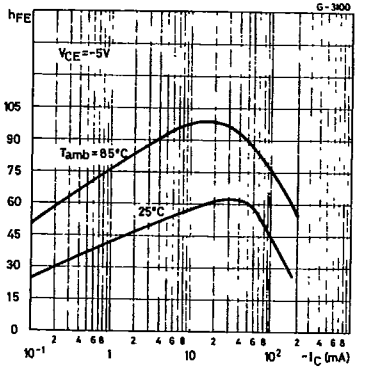
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max	146	°C/W
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max	486	°C/W

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

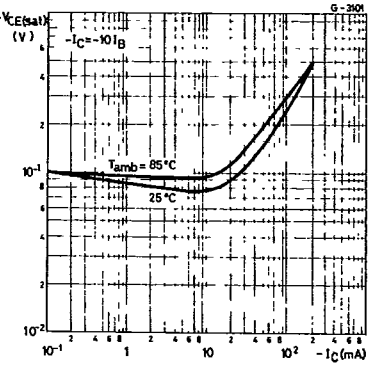
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cutoff Current (V_{BE} = 0)	V_{CE} = − 6 V V_{CE} = − 6 V T_{amb} = 85 °C			− 80 − 5	nA µA
$V_{(BR)CBO}$	Collector-base Breakdown Voltage (I_E = 0)	I_C = − 10 µA	− 12			V
$V_{(BR)CES}$	Collector-emitter Breakdown Voltage (V_{BE} = 0)	I_C = − 10 µA	− 12			V
$V_{(BR)CEO}$*	Collector-emitter Breakdown Voltage (I_B = 0)	I_C = − 10 mA	− 12			V
$V_{(BR)EBO}$	Emitter-base Breakdown Voltage (I_C = 0)	I_E = − 100 µA	− 4			V
$V_{CE(sat)}$*	Collector-emitter Saturation Voltage	I_C = − 10 mA I_B = − 1 mA I_C = − 30 mA I_B = − 3 mA I_C = − 100 mA I_B = − 10 mA I_C = − 30 mA I_B = − 3 mA T_{amb} = 85 °C		− 0.07 − 0.1 − 0.25 − 0.15	− 0.15 − 0.2 − 0.5 − 0.4	V V V V
$V_{BE(sat)}$*	Base-emitter Saturation Voltage	I_C = − 10 mA I_B = − 1 mA I_C = − 30 mA I_B = − 3 mA I_C = − 100 mA I_B = − 10 mA	− 0.75 − 0.80 	 − 1.4	− 0.95 − 1 − 1.7	V V V
h_{FE}*	DC Current Gain	I_C = − 10 mA V_{CE} = − 0.3 V I_C = − 30 mA V_{CE} = − 0.5 V I_C = − 100 mA V_{CE} = − 1 V	25 30 20	50 60 40	 120 	
f_T	Transition Frequency	I_C = − 30 mA V_{CE} = − 10 V f = 100 MHz	400	700		MHz
C_{EBO}	Emitter-base Capacitance	I_C = 0 V_{EB} = − 0.5 V f = 1 MHz		3.8	6	pF
C_{CBO}	Collector-base Capacitance	I_E = 0 V_{CB} = − 5 V f = 1 MHz		3.3	6	pF
t_{on}**	Turn-on Time	I_C = − 30 mA V_{CC} = − 2 V I_{B1} = − 1.5 mA		25	60	ns
t_{off}**	Turn-off Time	I_C = − 30 mA V_{CC} = − 2 V I_{B1} = − I_{B2} = − 1.5 mA		35	90	ns

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

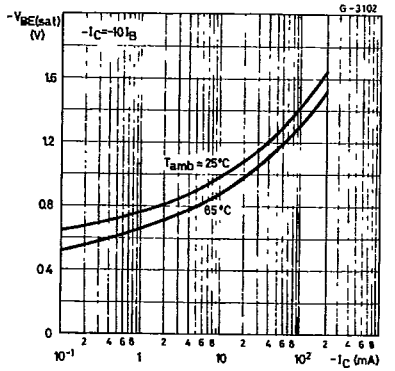
DC Current Gain.



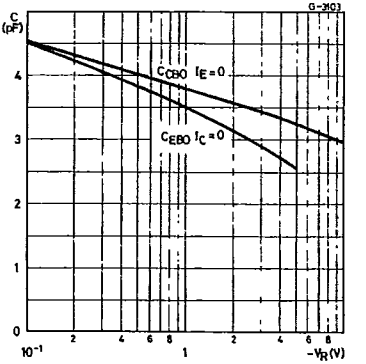
Collector-emitter Saturation Voltage.



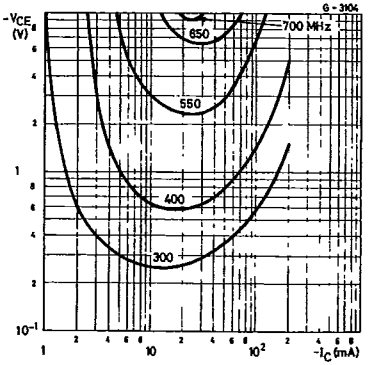
Base-emitter Saturation Voltage.



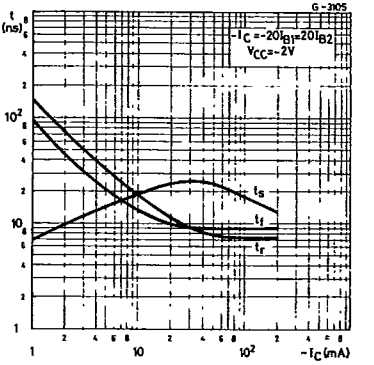
Emitter-base and Collector-base Capacitances.



Contours of Constant Transition Frequency.



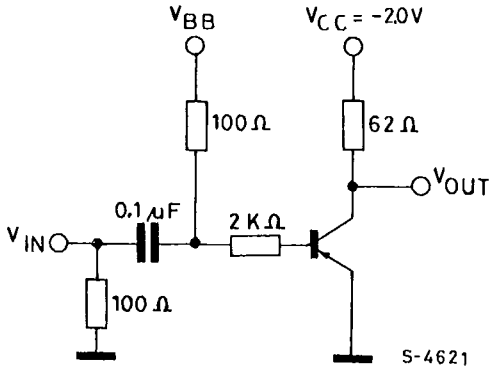
Switching Characteristics.



T-37-09

TEST CIRCUIT

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



PULSE GENERATOR :
t_r ≤ 1.0ns
PW = 400ns
Z_{IN} = 50Ω

TO OSCILLOSCOPE :
t_r ≤ 1.0ns
Z_{IN} ≥ 100KΩ

t_{on} V_{BB} = + 3.0V, V_{IN} = − 7.0V
t_{off} V_{BB} = − 4.0V, V_{IN} = + 6.0V