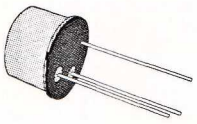
SGS-THOMSON
MICROELECTRONICS

2N2102

GENERAL PURPOSE AMPLIFIER AND SWITCH

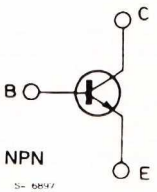
DESCRIPTION

The 2N2102 is a silicon planar epitaxial NPN transistor in Jedec TO-39 metal case. It is intended for a wide variety of small-signal and medium power applications in military and industrial equipments.



TO-39

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base Voltage (I_E = 0)	120	V
V_{CEO}	Collector-emitter Voltage (I_B = 0)	65	V
V_{CER}	Collector-emitter Voltage ($R_{BE} \leq 10\ \Omega$)	80	V
V_{EBO}	Emitter-base Voltage (I_C = 0)	7	V
I_C	Collector Current	1	A
P_{tot}	Total Power Dissipation at $T_{amb} \leq 25$ °C at $T_{case} \leq 25$ °C	1 5	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	35	°C/W
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max	175	°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			2 2	nA µA
I_{EBO}	Emitter Cutoff Current (I_C = 0)	V_{EB} = 5 V				5	nA
$V_{(BR)\ CBO}$	Collector-base Breakdown Voltage (I_E = 0)	I_C = 100 µA		120			V
$V_{CEO\ (sus)}$*	Collector-emitter Sustaining Voltage (I_B = 0)	I_C = 30 mA		65			V
$V_{CE\ (sat)}$*	Collector-emitter Saturation Voltage	I_C = 150 mA	I_B = 15 mA			0.5	V
$V_{BE\ (sat)}$*	Base-emitter Saturation Voltage	I_C = 150 mA	I_B = 15 mA			1.1	V
h_{FE}*	DC Current Gain	I_C = 10 µA I_C = 100 µA I_C = 10 mA I_C = 150 mA I_C = 500 mA I_C = 1 A	V_{CE} = 10 V V_{CE} = 10 V V_{CE} = 10 V V_{CE} = 10 V V_{CE} = 10 V V_{CE} = 10 V	10 20 35 40 25 10		 120 	
h_{fe}	High Frequency Current Gain	I_C = 50 mA f = 20 MHz	V_{CE} = 10 V		6		
NF	Noise Figure	I_C = 300 µA BW = 1 Hz	V_{CE} = 10 V f = 1 KHz R_G = 510 Ω			8	dB
C_{CBO}	Collector-base Capacitance	I_E = 0 f = 1 MHz	V_{CB} = 10 V			15	pF
C_{EBO}	Emitter-base Capacitance	I_C = 0 f = 1 MHz	V_{EB} = 0.5 V			80	pF

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