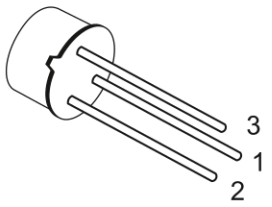
2N2102

EPITAXIAL PLANAR NPN

- GENERAL PURPOSE AMPLIFIER AND SWITCH

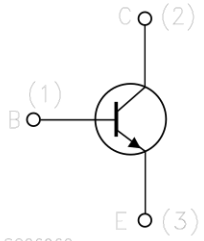
DESCRIPTION

The 2N2102 is a silicon Planar Epitaxial NPN transistor in Jedec TO-39 metal case. It is intended for a wide variety of small-signall 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 Dissipation at $T_{amb} \leq 25\ ^oC$ at $T_C \leq 25\ ^oC$	1 5	W W
T_{stg}	Storage Temperature	-65 to 175	^oC
T_j	Max. Operating Junction Temperature	175	^oC

THERMAL DATA

$R_{thj\text{-}case}$	Thermal Resistance Junction-Case	Max	30	°C/W
$R_{thj\text{-}amb}$	Thermal Resistance Junction-Ambient	Max	150	°C/W

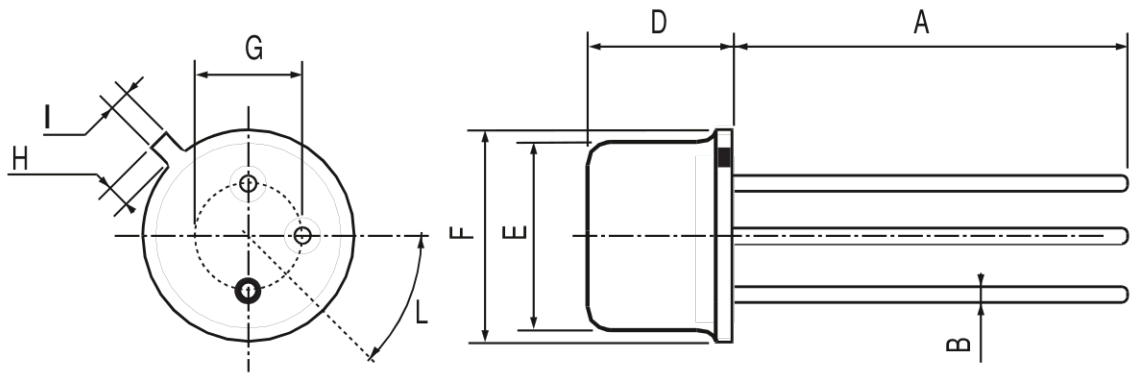
ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current (I_E = 0)	V_{CB} = 60 V V_{CB} = 60 V T_C = 150 °C			2 2	nA µA
I_{EBO}	Emitter Cut-off 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 V_{CE} = 10 V I_C = 100 µA V_{CE} = 10 V I_C = 10 mA V_{CE} = 10 V I_C = 150 mA V_{CE} = 10 V I_C = 500 mA V_{CE} = 10 V I_C = 1 A V_{CE} = 10 V	10 20 35 40 25 10		 120	
h_{fe}*	High Frequency Current Gain	I_C = 50 mA V_{CE} = 10 V f = 20 MHz		6		
NF	Noise Figure	I_C = 300 µA V_{CE} = 10 V f = 1 KHz BW = 1 Hz R_g = 510 Ω			8	dB
C_{CBO}	Collector-Base Capacitance	I_E = 0 V_{CB} = 10 V f = 1MHz			15	pF
C_{EBO}	Emitter-Base Capacitance	I_C = 0 V_{EB} = 0.5 V f = 1MHz			80	pF

*Pulsed: Pulse duration = 300 µs, duty cycle ≤1 %

TO-39 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	12.7			0.500		
B			0.49			0.019
D			6.6			0.260
E			8.5			0.334
F			9.4			0.370
G	5.08			0.200		
H			1.2			0.047
I			0.9			0.035
L	45^{o} (typ.)					



P008B