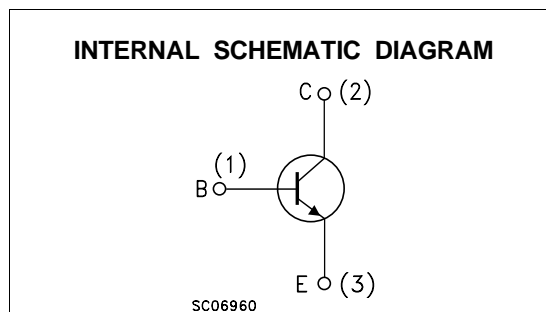
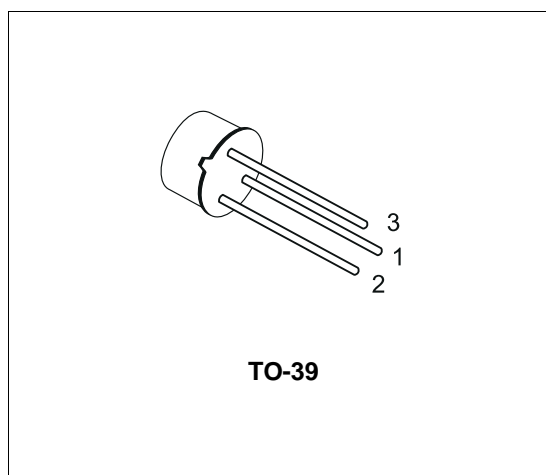


## SMALL SIGNAL NPN TRANSISTOR

### DESCRIPTION

The 2N3019 is a silicon Planar Epitaxial NPN transistor in Jedec TO-39 metal case, designed for high-current, high frequency amplifier application. It features high gain and low saturation voltage.



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage ( $I_E = 0$ )	140	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	80	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	7	V
$I_C$	Collector Current	1	A
$P_{tot}$	Total Dissipation at $T_{amb} \leq 25\text{ }^\circ\text{C}$ at $T_C \leq 25\text{ }^\circ\text{C}$	0.8	W
		5	W
$T_{stg}$	Storage Temperature	-65 to 175	$^\circ\text{C}$
$T_j$	Max. Operating Junction Temperature	175	$^\circ\text{C}$

## THERMAL DATA

$R_{thj-case}$	Thermal Resistance Junction-Case	Max	30	$^{\circ}C/W$
$R_{thj-amb}$	Thermal Resistance Junction-Ambient	Max	187.5	$^{\circ}C/W$

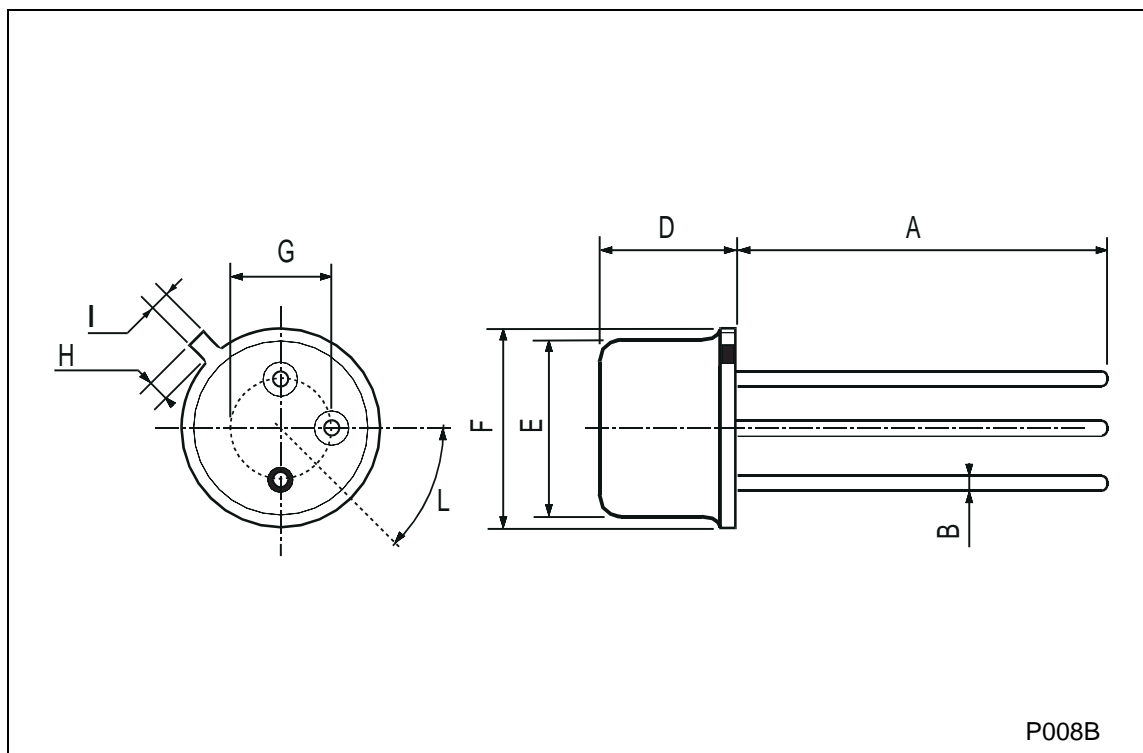
ELECTRICAL CHARACTERISTICS ( $T_{case} = 25^{\circ}C$  unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector Cut-off Current ( $I_E = 0$ )	$V_{CB} = 90 V$ $V_{CB} = 90 V \quad T_C = 150^{\circ}C$			10 10	nA $\mu A$
$I_{EBO}$	Emitter Cut-off Current ( $I_C = 0$ )	$V_{EB} = 5 V$			10	nA
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ( $I_E = 0$ )	$I_C = 100 \mu A$	140			V
$V_{(BR)CEO}^*$	Collector-Emitter Breakdown Voltage ( $I_B = 0$ )	$I_C = 10 mA$	80			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ( $I_C = 0$ )	$I_E = 100 \mu A$	7			V
$V_{CE(sat)}^*$	Collector-Emitter Saturation Voltage	$I_C = 150 mA \quad I_B = 15 mA$ $I_C = 500 mA \quad I_B = 50 mA$			0.2 0.5	V V
$V_{BE(sat)}^*$	Base-Emitter Saturation Voltage	$I_C = 150 mA \quad I_B = 15 mA$			1.1	V
$h_{FE}^*$	DC Current Gain	$I_C = 0.1 mA \quad V_{CE} = 10 V$ $I_C = 10 mA \quad V_{CE} = 10 V$ $I_C = 150 mA \quad V_{CE} = 10 V$ $I_C = 500 mA \quad V_{CE} = 10 V$ $I_C = 1 A \quad V_{CE} = 10 V$ $I_C = 150 mA \quad V_{CE} = 10 V$ $T_{amb} = -55^{\circ}C$	50 90 100 50 15 40		300	
$h_{fe}^*$	Small Signal Current Gain	$I_C = 1 mA \quad V_{CE} = 5 V \quad f = 1KHz$	80		400	
$f_T$	Transition Frequency	$I_C = 50 mA \quad V_{CE} = 10 V \quad f = 20MHz$	100			MHz
$C_{CBO}$	Collector-Base Capacitance	$I_E = 0 \quad V_{CB} = 10 V \quad f = 1MHz$			12	pF
$C_{EBO}$	Emitter-Base Capacitance	$I_C = 0 \quad V_{EB} = 0.5 V \quad f = 1MHz$			60	pF
NF	Noise Figure	$I_C = 0.1 mA \quad V_{CE} = 10 V$ $f = 1KHz \quad R_g = 1K\Omega$			4	dB
$\tau_{bb}, C_{b'c}$	Feedback Time Constant	$I_C = 10 mA \quad V_{CE} = 10 V \quad f = 4MHz$			400	ps

\* Pulsed: Pulse duration = 300  $\mu s$ , duty cycle  $\leq 1\%$

## 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° (typ.)					



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