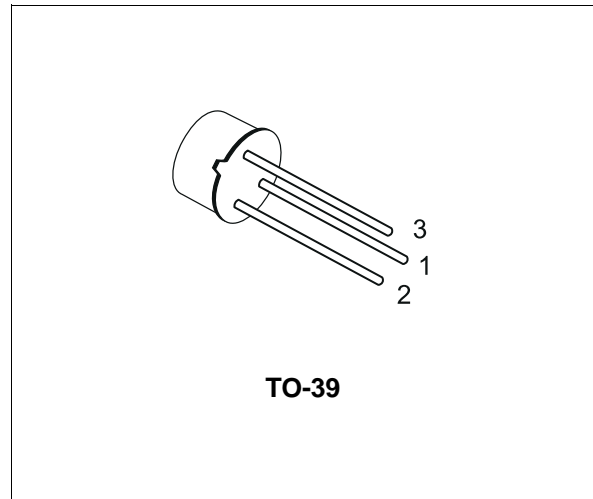


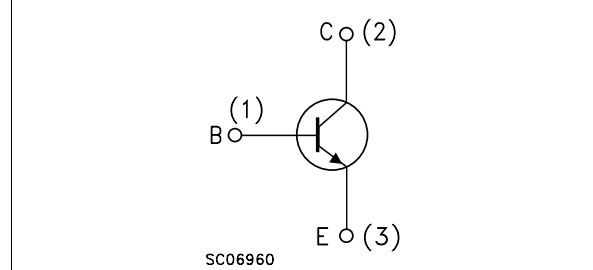
SMALL SIGNAL NPN TRANSISTOR

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.



INTERNAL SCHEMATIC DIAGRAM



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	°C/W
R _{thj-amb}	Thermal Resistance Junction-Ambient	Max	187.5	°C/W

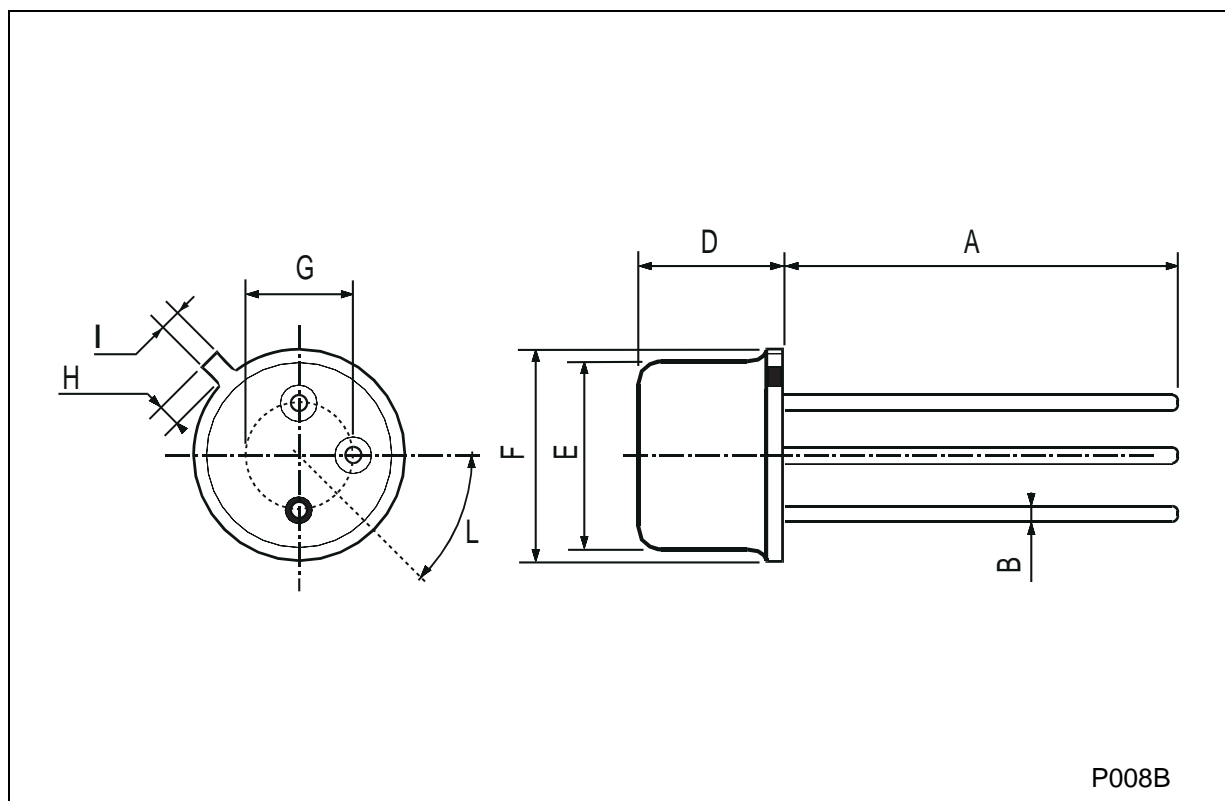
ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I _{CBO}	Collector Cut-off Current (I _E = 0)	V _{CB} = 90 V V _{CB} = 90 V T _C = 150 °C			10 10	nA μA
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 μA	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 μA	7			V
V _{CE(sat)*}	Collector-Emitter Saturation Voltage	I _C = 150 mA I _B = 15 mA I _C = 500 mA I _B = 50 mA			0.2 0.5	V 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 = 0.1 mA 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 = 1A V _{CE} = 10 V I _C = 150 mA V _{CE} = 10 V T _{amb} = -55 °C	50 90 100 50 15 40		300	
h _{fe*}	Small Signal Current Gain	I _C = 1 mA V _{CE} = 5 V f = 1KHz	80		400	
f _T	Transition Frequency	I _C = 50 mA V _{CE} = 10 V f = 20MHz	100			MHz
C _{CBO}	Collector-Base Capacitance	I _E = 0 V _{CB} = 10 V f = 1MHz			12	pF
C _{EBO}	Emitter-Base Capacitance	I _C = 0 V _{EB} = 0.5 V f = 1MHz			60	pF
NF	Noise Figure	I _C = 0.1 mA V _{CE} = 10 V f = 1KHz R _g = 1KΩ			4	dB
r _{bb'} C _{b'c}	Feedback Time Constant	I _C = 10 mA V _{CE} = 10 V f = 4MHz			400	ps

* 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° (typ.)					



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