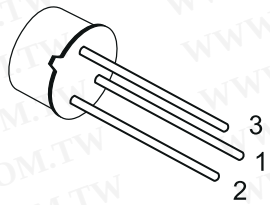
2N3019

SMALL SIGNAL NPN TRANSISTOR

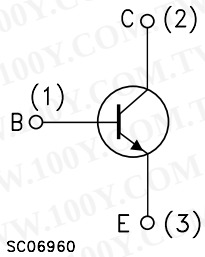
DESCRIPTION

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



TO-39

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 $T_{amb} \leq 25\ ^oC$ at $T_C \leq 25\ ^oC$	0.8 5	W W
T_{stg}	Storage Temperature	-65 to 175	^oC
T_j	Max. Operating Junction Temperature	175	^oC

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

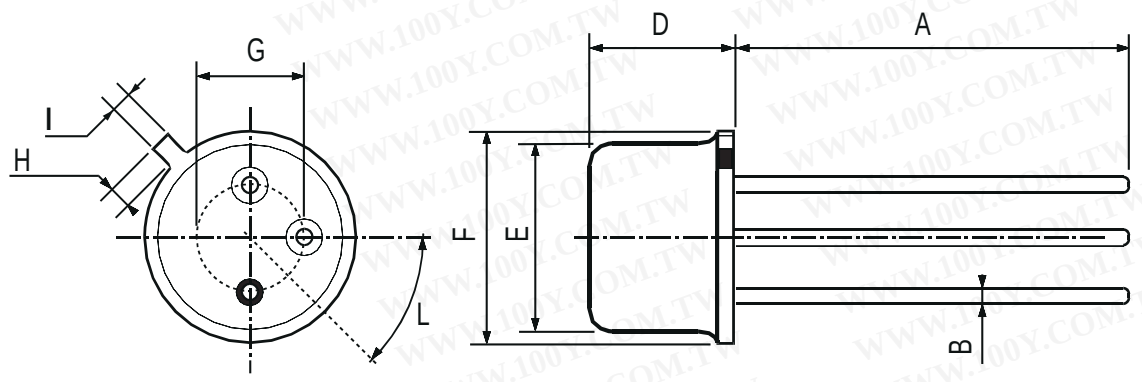
ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

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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