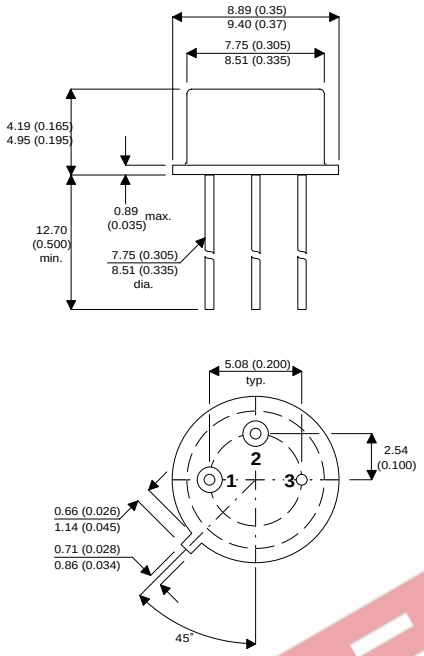
2N3019

NPN SILICON TRANSISTOR

MECHANICAL DATA
Dimensions in mm (inches)



TO39 PACKAGE

Underside View

Pin 1 = Emitter Pin 2 = Base Pin 3 = Collector

FEATURES

- **NPN High Voltage Planar Transistor**
- **Hermetic TO39 Package**
- **Full Screening Options Available**

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C unless otherwise stated)

V_{CBO}	Collector – Base Voltage	140V
V_{CEO}	Collector – Emitter Voltage	80V
V_{EBO}	Emitter – Base Voltage	7V
I_C	Collector Current	1A
P_D	Total Device Dissipation @ T_A = 25°C	0.8W
P_D	Derate above 25°C	4.6mW / °C
P_D	Total Device Dissipation @ T_C = 25°C	5W
P_D	Derate above 25°C	28.6mW / °C
T_j	Max Junction Temperature	200°C
T_{stg}	Storage Temperature	–55 to 200°C
R_{jc}	Thermal Resistance Junction to Case	16.5°C / W
R_{ja}	Thermal Resistance Junction to Ambient	89.5°C / W

Semelab plc. Telephone +44(0)1455 556565. Fax +44(0)1455 552612.
E-mail: sales@semelab.co.uk Website: http://www.semelab.co.uk

SEME LAB

2N3019

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

Parameter		Test Conditions		Min.	Typ.	Max.	Unit
$V_{(BR)CEO}$	Collector – Emitter Breakdown Voltage	I_C = 30mA	I_B = 0	80			V
$V_{(BR)CBO*}$	Collector – Base Breakdown Voltage	I_C = 100µA	I_E = 0	140			V
$V_{(BR)EBO*}$	Emitter – Base Breakdown Voltage	I_E = 100µA	I_C = 0	7			V
I_{CBO}	Collector Cut-off Current	V_{CB} = 90V	I_E = 0			0.01	µA
		V_{CB} = 90V T_{amb} = 150°C	I_E = 0			10	
I_{EBO}	Emitter Cut-off Current	V_{BE} = 5V	I_C = 0			0.010	µA
$V_{CE(sat)}$	Collector – Emitter Saturation Voltage	I_C = 150mA	I_B = 15mA			0.20	V
		I_C = 500mA	I_B = 50mA			0.50	
$V_{BE(sat)}$	Base – Emitter Saturation Voltage	I_C = 150mA	I_B = 15mA			1.1	V
h_{FE*}	DC Current Gain	I_C = 0.1mA	V_{CE} = 10V	50			—
		I_C = 10mA	V_{CE} = 10V	90			
		I_C = 150mA	V_{CE} = 10V	100		300	
		I_C = 500mA	V_{CE} = 10V	50			
		I_C = 1A	V_{CE} = 10V	15			
	T_C = –55°C	I_C = 150mA	V_{CE} = 0.5V	40			

t* Pulse test t_p = 300µs , $\delta \leq 1\%$

DYNAMIC CHARACTERISTICS (T_{case} = 25°C unless otherwise stated)

Parameter		Test Conditions			Min.	Typ.	Max.	Unit
f_T	Transition Frequency	I_C = 50mA	V_{CE} = 10V	f = 20MHz	100		400	MHz
C_{obo}	Output Capacitance	V_{CB} = 10V	I_E = 0	f = 1.0MHz			12	pF
C_{ibo}	Input Capacitance	V_{BE} = 0.5V	I_C = 0	f = 1.0MHz			60	pF
h_{fe}	Small Signal Current Gain	I_C = 1mA	V_{CE} = 5V	f = 1kHz		80	400	—
$rb'C_c$	Collector Base Time Constant	I_E = 10mA	V_{CB} = 10V	f = 79.8MHz	15		400	ps
NF	Noise Figure	I_C = 100µA	V_{CE} = 10V R_S = 1KΩ	f = 1kHz			4	db

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