



NPN 2N3019 – 2N3020

SILICON PLANAR EPITAXIAL TRANSISTORS

The 2N3019 and 2N3020 are NPN transistors mounted in TO-39 metal case .
They are intended for high-current, high-frequency amplifier applications.
They feature high gain and low saturation voltages.

Compliance to RoHS

ABSOLUTE MAXIMUM RATINGS

Symbol	Ratings		Value	Unit	
V_{CEO}	Collector-Emitter Voltage		2N3019	80	V
			2N3020		
V_{CBO}	Collector-Base Voltage		2N3019	140	V
			2N3020		
V_{EBO}	Emitter-Base Voltage		2N3019	7	V
			2N3020		
I_C	Collector Current		2N3019	1	A
			2N3020		
P_D	Total Power Dissipation	@ $T_{amb} = 25^\circ$	2N3019	0.8	Watts
			2N3020		
P_D	Total Power Dissipation	@ $T_{case} = 25^\circ$	2N3019	5	
			2N3020		
T_J	Junction Temperature		2N3019	200	$^\circ\text{C}$
			2N3020		
T_{Stg}	Storage Temperature range		2N3019	-65 to +200	$^\circ\text{C}$
			2N3020		

THERMAL CHARACTERISTICS

Symbol	Ratings		Value	Unit
R_{thJ-a}	Thermal Resistance, Junction to ambient in free air	2N3019	35	$^\circ\text{C/W}$
		2N3020		
R_{thJ-c}	Thermal Resistance, Junction to case	2N3019	219	$^\circ\text{C/W}$
		2N3020		

NPN 2N3019 – 2N3020

ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

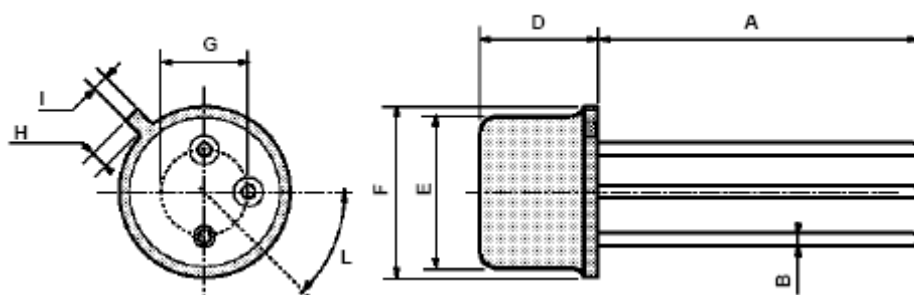
Symbol	Ratings	Test Condition(s)	Min	Typ	Mx	Unit
I_{CBO}	Collector Cutoff Current	$V_{CB}=950\text{ V}, I_E=0$	2N3019	-	-	10 nA
			2N3020	-	-	
		$V_{CB}=90\text{ V}, I_E=0, T_j=150^\circ\text{C}$	2N3019	-	-	10 μA
			2N3020	-	-	
I_{EBO}	Emitter Cutoff Current	$V_{EB}=5\text{ V}, I_C=0$	2N3019	-	-	10 nA
			2N3020	-	-	
V_{CEO}	Collector Emitter Breakdown Voltage	$I_C=10\text{ mA}, I_B=0$	2N3019	80	-	- V
			2N3020			
V_{CBO}	Collector Base Breakdown Voltage	$I_C=100\text{ }\mu\text{A}, I_E=0$	2N3019	140	-	- V
			2N3020			
V_{EBO}	Emitter Base Breakdown Voltage	$I_E=100\text{ }\mu\text{A}, I_C=0$	2N3019	7	-	- V
			2N3020			
$h_{FE} (1)$	DC Current Gain	$I_C=0.1\text{ mA}, V_{CE}=10\text{ V}$	2N3019	50	-	-
			2N3020	30	-	100
		$I_C=10\text{ mA}, V_{CE}=10\text{ V}$	2N3019	90	-	-
			2N3020	40	-	120
		$I_C=150\text{ mA}, V_{CE}=10\text{ V}$	2N3019	100	-	300
			2N3020	40	-	120
		$I_C=500\text{ mA}, V_{CE}=10\text{ V}$	2N3019	50	-	-
			2N3020	30	-	100
		$I_C=1\text{ A}, V_{CE}=10\text{ V}$	2N3019	15	-	-
			2N3020			
$V_{CE(SAT)} (1)$	Collector-Emitter saturation Voltage	$I_C=150\text{ mA}, I_B=15\text{ mA}$	2N3019	-	-	0.2
			2N3020	-	-	
		$I_C=500\text{ mA}, I_B=50\text{ mA}$	2N3019	-	-	0.5
			2N3020	-	-	
$V_{BE(SAT)} (1)$	Base-Emitter saturation Voltage	$I_C=150\text{ mA}, I_B=15\text{ mA}$	2N3019	-	-	1.1
f_T	Transition frequency	$I_C=50\text{ mA}, V_{CE}=10\text{ V}$ $f=20\text{ MHz}$	2N3019	100	-	- MHz
			2N3020	80	-	-
h_{fe}	Small Signal Current Gain	$I_C=1\text{ mA}, V_{CE}=5\text{ V}$ $f=1\text{ kHz}$	2N3019	80	-	400
			2N3020	30	-	200
NF	Noise Figure	$I_C=100\text{ }\mu\text{A}, V_{CE}=10\text{ V}$ $f=1\text{ kHz}, R_g=1\text{ k}\Omega$	2N3019	-	-	4 dB
C_{CBO}	Collector-Base capacitance	$I_E=0, V_{CB}=10\text{ V}$ $f=1\text{ MHz}$	2N3019	-	-	12 pF
			2N3020	-	-	
C_{EBO}	Emitter-Base capacitance	$I_C=0, V_{EB}=0.5\text{ V}$ $f=1\text{ MHz}$	2N3019	-	-	60 pF
			2N3020	-	-	
$r_{bb'}C_{b'c}$	Feedback Time Constant	$I_C=10\text{ mA}, V_{CE}=10\text{ V}$ $f=4\text{ MHz}$	2N3019	-	-	400 ps
			2N3020	-	-	

(1) Pulse conditions : $t_p < 300\text{ }\mu\text{s}$, $\delta = 2\%$

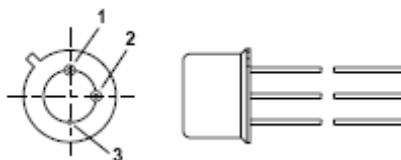
NPN 2N3019 – 2N3020

MECHANICAL DATA CASE TO-39

DIMENSIONS (mm)			
	min	typ	max
A	12.7	-	-
B	-	-	0.49
D	-	-	6.6
E	-	-	8.5
F	-	-	9.4
G	5.08	-	-
H	-	-	1.2
I	-	-	0.9
L	45°	-	-



Pin 1 :	Emitter
Pin 2 :	Base
Case :	Collector



Information furnished is believed to be accurate and reliable. However, CS assumes no responsibility for the consequences of use of such information nor for errors that could appear.

Data are subject to change without notice.