

2N3019  
2N3020

**NPN SILICON TRANSISTOR**



**TO-39 CASE**



[www.centrasemi.com](http://www.centrasemi.com)

**DESCRIPTION:**

The CENTRAL SEMICONDUCTOR 2N3019, 2N3020 types are NPN silicon transistors designed for general purpose amplifier applications.

**MARKING: FULL PART NUMBER**

**MAXIMUM RATINGS:** ( $T_A=25^\circ\text{C}$ )

Collector-Base Voltage
Collector-Emitter Voltage
Emitter-Base Voltage
Continuous Collector Current
Power Dissipation
Power Dissipation ( $T_C=25^\circ\text{C}$ )
Operating and Storage Junction Temperature

SYMBOL		UNITS
$V_{CB0}$	140	V
$V_{CEO}$	80	V
$V_{EBO}$	7.0	V
$I_C$	1.0	A
$P_D$	0.8	W
$P_D$	5.0	W
$T_J, T_{stg}$	-65 to +200	$^\circ\text{C}$

**ELECTRICAL CHARACTERISTICS:** ( $T_A=25^\circ\text{C}$  unless otherwise noted)

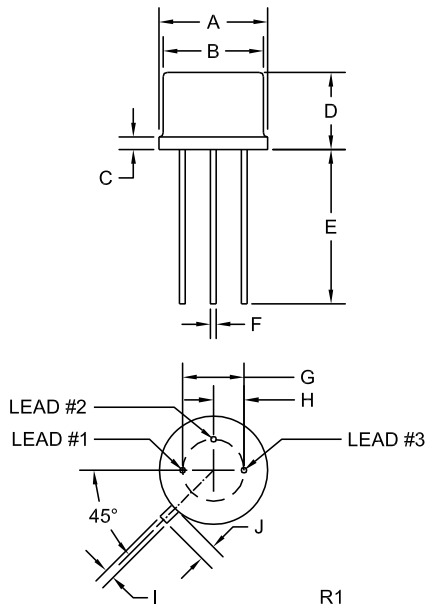
SYMBOL	TEST CONDITIONS	2N3019		2N3020		UNITS
		MIN	MAX	MIN	MAX	
$I_{CBO}$	$V_{CB}=90\text{V}$	-	10	-	10	nA
$I_{CBO}$	$V_{CB}=90\text{V}, T_A=150^\circ\text{C}$	-	10	-	10	$\mu\text{A}$
$I_{EBO}$	$V_{EB}=5.0\text{V}$	-	10	-	10	nA
$BV_{CB0}$	$I_C=100\mu\text{A}$	140	-	140	-	V
$BV_{CEO}$	$I_C=30\text{mA}$	80	-	80	-	V
$BV_{EBO}$	$I_E=100\mu\text{A}$	7.0	-	7.0	-	V
$V_{CE(SAT)}$	$I_C=150\text{mA}, I_B=15\text{mA}$	-	0.2	-	0.2	V
$V_{CE(SAT)}$	$I_C=500\text{mA}, I_B=50\text{mA}$	-	0.5	-	0.5	V
$V_{BE(SAT)}$	$I_C=150\text{mA}, I_B=15\text{mA}$	-	1.1	-	1.1	V
$h_{FE}$	$V_{CE}=10\text{V}, I_C=100\mu\text{A}$	50	-	30	200	
$h_{FE}$	$V_{CE}=10\text{V}, I_C=10\text{mA}$	90	-	40	200	
$h_{FE}$	$V_{CE}=10\text{V}, I_C=150\text{mA}$	100	300	40	200	
$h_{FE}$	$V_{CE}=10\text{V}, I_C=150\text{mA}, T_A=-55^\circ\text{C}$	40	-	-	-	
$h_{FE}$	$V_{CE}=10\text{V}, I_C=500\text{mA}$	50	-	30	120	
$h_{FE}$	$V_{CE}=10\text{V}, I_C=1.0\text{A}$	15	-	15	-	
$f_T$	$V_{CE}=10\text{V}, I_C=50\text{mA}, f=20\text{MHz}$	100	-	100	-	MHz
$C_{ob}$	$V_{CB}=10\text{V}, I_E=0, f=1.0\text{MHz}$	-	12	-	12	pF
$C_{ib}$	$V_{EB}=0.5\text{V}, I_C=0, f=1.0\text{MHz}$	-	60	-	60	pF
$r_b'C_c$	$V_{CB}=10\text{V}, I_C=10\text{mA}, f=4.0\text{MHz}$	-	400	-	400	ps
NF	$V_{CE}=10\text{V}, I_C=100\mu\text{A}, f=1.0\text{kHz}, R_S=1.0\text{k}\Omega$	-	4.0	-	-	dB

R3 (22-July 2021)

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TO-39 CASE - MECHANICAL OUTLINE



SYMBOL	DIMENSIONS			
	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A (DIA)	0.335	0.370	8.51	9.40
B (DIA)	0.315	0.335	8.00	8.51
C	-	0.040	-	1.02
D	0.240	0.260	6.10	6.60
E	0.500	-	12.70	-
F (DIA)	0.016	0.021	0.41	0.53
G (DIA)	0.200		5.08	
H	0.100		2.54	
I	0.028	0.034	0.71	0.86
J	0.029	0.045	0.74	1.14

TO-39 (REV: R1)

LEAD CODE:

- 1) Emitter
- 2) Base
- 3) Collector

MARKING: FULL PART NUMBER

R3 (22-July 2021)

## OUTSTANDING SUPPORT AND SUPERIOR SERVICES



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### PRODUCT SUPPORT

Central's operations team provides the highest level of support to insure product is delivered on-time.

- Supply management (Customer portals)
- Inventory bonding
- Consolidated shipping options
- Custom bar coding for shipments
- Custom product packing

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### DESIGNER SUPPORT/SERVICES

Central's applications engineering team is ready to discuss your design challenges. Just ask.

- Free quick ship samples (2<sup>nd</sup> day air)
- Online technical data and parametric search
- SPICE models
- Custom electrical curves
- Environmental regulation compliance
- Customer specific screening
- Up-screening capabilities
- Special wafer diffusions
- PbSn plating options
- Package details
- Application notes
- Application and design sample kits
- Custom product and package development

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### REQUESTING PRODUCT PLATING

1. If requesting Tin/Lead plated devices, add the suffix "TIN/LEAD" to the part number when ordering (example: 2N2222A TIN/LEAD).
2. If requesting Lead (Pb) Free plated devices, add the suffix "PBFREE" to the part number when ordering (example: 2N2222A PBFREE).

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### CONTACT US

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