

**Type 2N3019**  
**Geometry 4500**  
**Polarity NPN**  
**Qual Level: JAN - JANS**

**Generic Part Number:**  
**2N3019**

**REF: MIL-PRF-19500/391**

**Features:**

[Request Quotation](#)

- General-purpose transistor for switching and amplifier applications.
- Housed in a TO-5 case.
- Also available in chip form using the 4500 chip geometry.
- The Min and Max limits shown are per MIL-PRF-19500/391 which Semicoa meets in all cases.
- [Radiation Graphs available.](#)



TO-5

**Maximum Ratings**

$T_C = 25^{\circ}\text{C}$  unless otherwise specified

Rating	Symbol	Rating	Unit
Collector-Emitter Voltage	$V_{CEO}$	80	V
Collector-Base Voltage	$V_{CBO}$	140	V
Emitter-Base Voltage	$V_{EBO}$	7.0	V
Collector Current, Continuous	$I_C$	1.0	mA
Operating Junction Temperature	$T_J$	-55 to +175	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55 to +175	$^{\circ}\text{C}$

### Electrical Characteristics

 $T_C = 25^\circ\text{C}$  unless otherwise specified

OFF Characteristics	Symbol	Min	Max	Unit
Collector-Base Breakdown Voltage $I_C = 100 \mu\text{A}$	$V_{(BR)CBO}$	140	---	V
Collector-Emitter Breakdown Voltage $I_E = 0 \text{ A}$	$V_{(BR)CEO}$	80	---	V
Emitter-Base Breakdown Voltage $I_E = 100 \mu\text{A}$	$V_{(BR)EBO}$	7.0	---	V
Collector-Emitter Cutoff Current $V_{CE} = 90 \text{ V}$	$I_{CES}$	---	10	nA
Emitter-Base Cutoff Current $V_{EB} = 5 \text{ V}$	$I_{EBO}$	---	10	nA

ON Characteristics	Symbol	Min	Max	Unit
<b>DC Current Gain</b>				
$I_C = 150 \text{ mA}, V_{CE} = 10 \text{ V}$	$h_{FE1}$	100	300	---
$I_C = 0.1 \text{ mA}, V_{CE} = 10 \text{ V}$	$h_{FE2}$	50	200	---
$I_C = 10 \text{ mA}, V_{CE} = 10 \text{ V}$ (pulse test)	$h_{FE3}$	90	---	---
$I_C = 500 \text{ mA}, V_{CE} = 10 \text{ V}$ (pulse test)	$h_{FE4}$	50	200	---
$I_C = 1 \text{ A}, V_{CE} = 10 \text{ V}$ (pulse test)	$h_{FE5}$	15	---	---
<b>Collector-Emitter Saturation Voltage</b>				
$I_C = 150 \text{ mA}, I_B = 15 \text{ mA}$ (pulse test)	$V_{CE(sat)1}$	---	0.2	V dc
$I_C = 500 \text{ mA}, I_B = 50 \text{ mA}$ (pulse test)	$V_{CE(sat)2}$	---	0.5	V dc
<b>Base-Emitter Saturation Voltage</b>				
$I_C = 150 \text{ mA}, I_B = 15 \text{ mA}$ (pulse test)	$V_{BE(sat)}$	---	1.1	V dc

Small Signal Characteristics	Symbol	Min	Max	Unit
Short Circuit Forward Current Transfer Ratio $I_C = 1 \text{ mA}, V_{CE} = 5 \text{ V}, f = 1 \text{ kHz}$	AC $h_{FE}$	80	400	---
Magnitude of Common Emitter Short Circuit Forward Current Transfer Ratio $V_{CE} = 10 \text{ V}, I_C = 50 \text{ mA}, f = 200 \text{ MHz}$	$ h_{FE} $	5.0	20	---
Open Circuit Output Capacitance $V_{CB} = 10 \text{ V}, I_E = 0, 100 \text{ kHz} < f < 1 \text{ MHz}$	$C_{OBO}$	---	12	pF
Input Capacitance, Output Open Circuited $V_{EB} = 2.0 \text{ V}, I_C = 0, 100 \text{ kHz} < f < 1 \text{ MHz}$	$C_{IBO}$	---	60	pF
Collector-Base Time Constant $V_{CE} = 10 \text{ V}, I_C = 10 \text{ mA}, f = 79.8 \text{ MHz}$	$r_b C_C$	---	400	ps
Noise Figure $V_{CE} = 10 \text{ V}, I_C = 100 \mu\text{A}, R_g = 1 \text{ k}\Omega$	NF	---	4	dB

Switching Characteristics	Symbol	Min	Max	Unit
Pulse Repose $15 \mu\text{s} \leq t_{\text{min}} \leq t_{\text{pulse}} \leq 1 \text{ ms}$	$t_{ON} + t_{OFF}$	--	30	s