

**Type 2N3019S**

**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-39](#) 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.](#)



**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 $I_C = 30\ \text{mA}$	$V_{(BR)CEO}$	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 Response 15 ns, 50 ohm input pulse	$t_{ON+} t_{OFF}$	---	30	ns