

**Type 2N3019S**

**Geometry 4500**

**Polarity NPN**

**Qual Level: JAN - JANS**

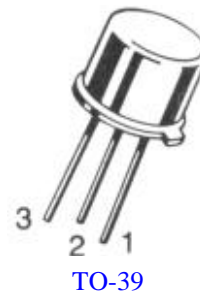
**Generic Part Number:  
2N3019**

**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<br>$I_C = 100 \mu\text{A}$  | $V_{(BR)CBO}$ | 140 | --- | V    |
| Collector-Emitter Breakdown Voltage<br>$I_C = 30 \text{ mA}$ | $V_{(BR)CEO}$ | 80  | --- | V    |
| Emitter-Base Breakdown Voltage<br>$I_E = 100 \mu\text{A}$    | $V_{(BR)EBO}$ | 7.0 | --- | V    |
| Collector-Emitter Cutoff Current<br>$V_{CE} = 90 \text{ V}$  | $I_{CES}$     | --- | 10  | nA   |
| Emitter-Base Cutoff Current<br>$V_{EB} = 5 \text{ V}$        | $I_{EBO}$     | --- | 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<br>$I_C = 1 \text{ mA}, V_{CE} = 5 \text{ V}, f = 1 \text{ kHz}$                                 | AC $h_{FE}$ | 80  | 400 | ---  |
| Magnitude of Common Emitter Short Circuit Forward Current Transfer Ratio<br>$V_{CE} = 10 \text{ V}, I_C = 50 \text{ mA}, f = 200 \text{ MHz}$ | $ h_{FE} $  | 5.0 | 20  | ---  |
| Open Circuit Output Capacitance<br>$V_{CB} = 10 \text{ V}, I_E = 0, 100 \text{ kHz} < f < 1 \text{ MHz}$                                      | $C_{OBO}$   | --- | 12  | pF   |
| Input Capacitance, Output Open Circuited<br>$V_{EB} = 2.0 \text{ V}, I_C = 0, 100 \text{ kHz} < f < 1 \text{ MHz}$                            | $C_{IBO}$   | --- | 60  | pF   |
| Collector-Base Time Constant<br>$V_{CE} = 10 \text{ V}, I_C = 10 \text{ mA}, f = 79.8 \text{ MHz}$  | $r_b C_C$   | --- | 400 | ps   |
| Noise Figure<br>$V_{CE} = 10 \text{ V}, I_C = 100 \mu\text{A}, R_g = 1 \text{ k}\Omega$   | NF          | --- | 4   | dB   |

| Switching Characteristics                   | Symbol            | Min | Max | Unit |
|---|-------------------|-----|-----|------|
| Pulse Response<br>15 ns, 50 ohm input pulse | $t_{ON+} t_{OFF}$ | --- | 30  | ns   |