

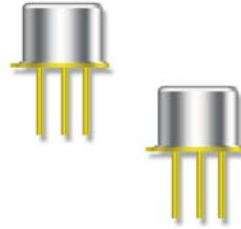
# PNP Power Silicon Transistor

## 2N6193



### Features

- Available in commercial, JAN, JANTX, JANTXV, JANS and JANSR 100K rads (Si) per MIL-PRF-19500/561
- TO-39 (TO-205AD) Package



### Maximum Ratings

| Ratings                                                                             | Symbol            | Value       | Units            |
|-------------------------------------------------------------------------------------|-------------------|-------------|------------------|
| Collector - Emitter Voltage                                                         | $V_{CEO}$         | 100         | Vdc              |
| Collector - Base Voltage                                                            | $V_{CBO}$         | 100         | Vdc              |
| Emitter - Base Voltage                                                              | $V_{EBO}$         | 6.0         | Vdc              |
| Collector Current                                                                   | $I_C$             | 5.0         | Adc              |
| Base Current                                                                        | $I_B$             | 1.0         | Adc              |
| Total Power Dissipation<br>@ $T_A = 25^\circ\text{C}$<br>@ $T_C = 25^\circ\text{C}$ | $P_T$             | 1.0<br>17.5 | W<br>W           |
| Operating & Storage Temperature Range                                               | $T_{op}, T_{stg}$ | -65 to +200 | $^\circ\text{C}$ |

### Thermal Characteristics

| Characteristics                      | Symbol          | Maximum | Units              |
|--------------------------------------|-----------------|---------|--------------------|
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 10      | $^\circ\text{C/W}$ |

### Electrical Characteristics ( $T_A = 250^\circ\text{C}$ unless otherwise noted)

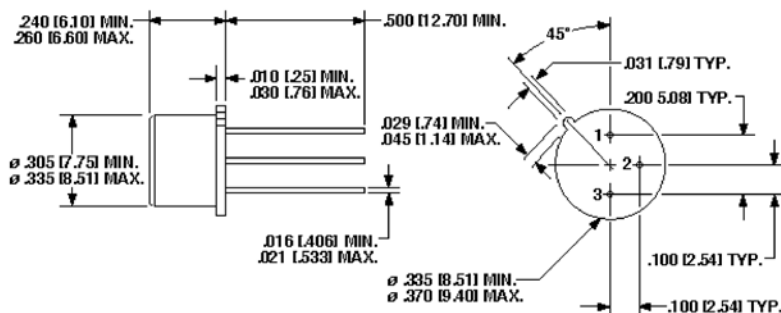
| OFF Characteristics                                                                        | Symbol        | Minimum | Maximum | Units           |
|--------------------------------------------------------------------------------------------|---------------|---------|---------|-----------------|
| Collector - Emitter Breakdown Voltage<br>$I_C = 50 \text{ mAdc}$                           | $V_{(BR)CEO}$ | 100     | - - -   | Vdc             |
| Collector - Emitter Cutoff Current<br>$V_{CE} = 100 \text{ Vdc}$                           | $I_{CEO}$     | - - -   | 100     | $\mu\text{Adc}$ |
| Emitter - Base Cutoff Current<br>$V_{EB} = 6.0 \text{ Vdc}$                                | $I_{EBO}$     | - - -   | 100     | $\mu\text{Adc}$ |
| Collector - Emitter Cutoff Current<br>$V_{CE} = 90 \text{ Vdc}, V_{BE} = +1.5 \text{ Vdc}$ | $I_{CEX}$     | - - -   | 10      | $\mu\text{Adc}$ |
| Collector - Base Cutoff Current<br>$V_{CE} = 100 \text{ Vdc}$                              | $I_{CBO}$     | - - -   | 10      | $\mu\text{Adc}$ |



## Electrical Characteristics -con't

| ON Characteristics                                                                                                                                                                    |                                                                                                                   | Symbol                                              | Mimimum | Maximum    | Units |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|---------|------------|-------|
| DC Current Drain<br>I <sub>C</sub> = 0.5 Adc, V <sub>CE</sub> = 2.0 Vdc<br>I <sub>C</sub> = 2.0 Adc, V <sub>CE</sub> = 2.0 Vdc<br>I <sub>C</sub> = 5.0 Adc, V <sub>CE</sub> = 2.0 Vdc |                                                                                                                   | H <sub>FE</sub>                                     | 60      |            |       |
|                                                                                                                                                                                       |                                                                                                                   |                                                     | 60      | 240        |       |
|                                                                                                                                                                                       |                                                                                                                   |                                                     | 40      |            |       |
|                                                                                                                                                                                       |                                                                                                                   |                                                     |         |            |       |
| Collector-Emitter Saturation Voltage<br>I <sub>C</sub> = 2.0 Adc, I <sub>B</sub> = 0.2 Adc<br>I <sub>C</sub> = 5.0 Adc, I <sub>B</sub> = 0.5 Adc                                      |                                                                                                                   | V <sub>CE(sat)</sub>                                | - - -   | 0.7<br>1.2 | Vdc   |
| Base-Emitter Saturation Voltage<br>I <sub>C</sub> = 2.0 Adc, I <sub>B</sub> = 0.2 Adc<br>I <sub>C</sub> = 5.0 Adc, I <sub>B</sub> = 0.5 Adc                                           |                                                                                                                   | V <sub>BE(sat)</sub>                                | - - -   | 1.2<br>1.8 | Vdc   |
| DYNAMIC Characteristics                                                                                                                                                               |                                                                                                                   |                                                     |         |            |       |
| Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio<br>I <sub>C</sub> = 0.5 Adc, V <sub>CE</sub> = 10.0 Vdc, f = 10 MHz                             |                                                                                                                   | h <sub>fe</sub>                                     | 3       | 15         |       |
| Output Capacitance<br>V <sub>CB</sub> = 10 Vdc, I <sub>E</sub> = 0, 100 kHz ≤ f ≤ 1.0 MHz                                                                                             |                                                                                                                   | C <sub>obo</sub>                                    | - - -   | 300        | pF    |
| Output Capacitance<br>V <sub>BE</sub> = 2.0 Vdc, I <sub>E</sub> = 0, 100 kHz ≤ f ≤ 1.0 MHz                                                                                            |                                                                                                                   | C <sub>ibo</sub>                                    | - - -   | 1250       | pF    |
| SWITCHING Characteristics                                                                                                                                                             |                                                                                                                   |                                                     |         |            |       |
| Delay Time                                                                                                                                                                            | V <sub>CC</sub> = -40 Vdc, V <sub>BE(off)</sub> = 2.3 Vdc,<br>I <sub>C</sub> = 2.0 Adc, I <sub>B1</sub> = 0.2 Adc | t <sub>d</sub>                                      | - - -   | 100        | ns    |
| Rise Time                                                                                                                                                                             |                                                                                                                   | t <sub>r</sub>                                      | - - -   | 100        | ns    |
| Storage Time                                                                                                                                                                          | V <sub>CC</sub> = -40 Vdc, I <sub>C</sub> = 2.0 Adc,<br>I <sub>B1</sub> = -I <sub>B2</sub> = 0.2 Adc              | t <sub>s</sub>                                      | - - -   | 2.0        | µs    |
| Fall Time                                                                                                                                                                             |                                                                                                                   | t <sub>f</sub>                                      | - - -   | 200        | ns    |
| SAFE OPERATING AREA                                                                                                                                                                   |                                                                                                                   |                                                     |         |            |       |
| DC Tests:                                                                                                                                                                             |                                                                                                                   | T <sub>C</sub> = +25 °C, 1 Cycle, t = 0.5s          |         |            |       |
| Test 1:                                                                                                                                                                               |                                                                                                                   | V <sub>CE</sub> = 2.0 Vdc, I <sub>C</sub> = 5.0 Adc |         |            |       |
| Test 2:                                                                                                                                                                               |                                                                                                                   | V <sub>CE</sub> = 90 Vdc, I <sub>C</sub> = 55 mAdc  |         |            |       |

## Outline Drawing



Note: All dimensions are inches [mm].

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