

## TO-126 Plastic-Encapsulate Transistors

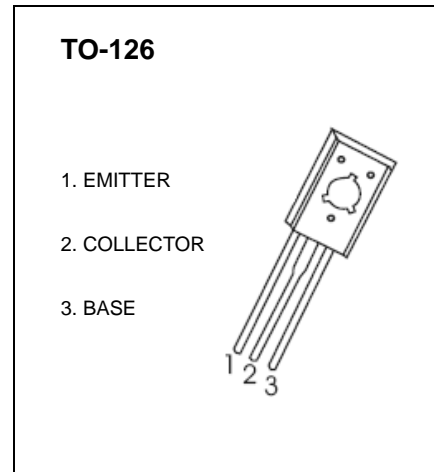
### BD439/441 TRANSISTOR (NPN)

#### FEATURES

- Amplifier and Switching Applications

#### MAXIMUM RATINGS( $T_a=25^{\circ}\text{C}$ unless otherwise noted)

| Symbol    | Parameter                     |       | Value   | Units              |
|-----------|-------------------------------|-------|---------|--------------------|
| $V_{CBO}$ | Collector-Base Voltage        | BD439 | 60      | V                  |
|           |                               | BD441 | 80      |                    |
| $V_{CEO}$ | Collector-Emitter Voltage     | BD439 | 60      | V                  |
|           |                               | BD441 | 80      |                    |
| $V_{EBO}$ | Emitter-Base Voltage          |       | 5       | V                  |
| $I_C$     | Collector Current –Continuous |       | 4       | A                  |
| $P_C$     | Collector Power Dissipation   |       | 1.25    | W                  |
| $T_J$     | Junction Temperature          |       | 150     | $^{\circ}\text{C}$ |
| $T_{stg}$ | Storage Temperature           |       | -55-150 | $^{\circ}\text{C}$ |

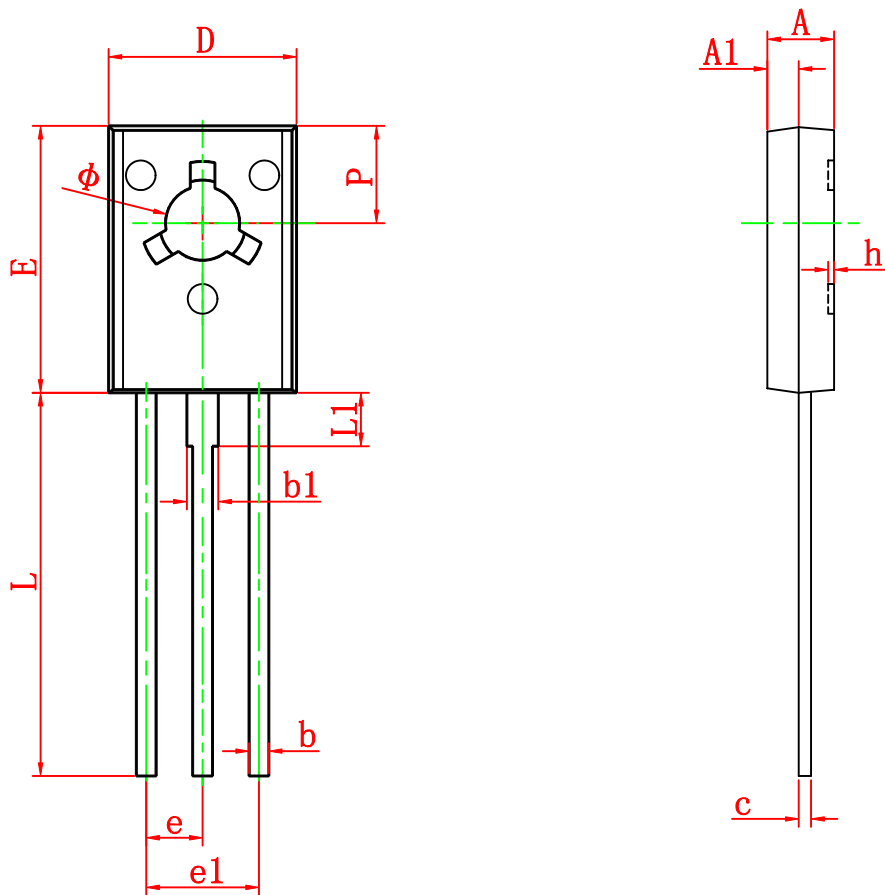


#### ELECTRICAL CHARACTERISTICS ( $T_a=25^{\circ}\text{C}$ unless otherwise specified)

| Parameter                            | Symbol                            | Test conditions                      | Min   | Typ | Max | Unit |
|--------------------------------------|-----------------------------------|--------------------------------------|-------|-----|-----|------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$                     | $I_C=100\mu\text{A}, I_E=0$          | BD439 | 60  |     | V    |
|                                      |                                   |                                      | BD441 | 80  |     |      |
| Collector-emitter breakdown voltage  | $V_{CEO(SUS)}^{(1)}$              | $I_C=100\text{mA}, I_B=0$            | BD439 | 60  |     | V    |
|                                      |                                   |                                      | BD441 | 80  |     |      |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$                     | $I_E=100\mu\text{A}, I_C=0$          |       | 5   |     | V    |
| Collector cut-off current            | $I_{CBO}$                         | $V_{CB}=60\text{V}, I_E=0$           | BD439 |     |     | 100  |
|                                      |                                   | $V_{CB}=80\text{V}, I_E=0$           | BD441 |     |     |      |
| Emitter cut-off current              | $I_{EBO}$                         | $V_{EB}=5\text{V}, I_E=0$            |       |     | 1   | mA   |
| DC current gain                      | $h_{FE(1)}^{(1)}$                 | $V_{CE}=1\text{V}, I_C=500\text{mA}$ |       | 40  | 475 |      |
|                                      | $h_{FE(2)}^{(1)}$                 | $V_{CE}=5\text{V}, I_C=10\text{mA}$  | BD439 | 20  |     |      |
|                                      |                                   |                                      | BD441 | 15  |     |      |
| $h_{FE(3)}^{(1)}$                    | $V_{CE}=1\text{V}, I_C=2\text{A}$ | BD439                                | 25    |     |     |      |
|                                      |                                   | BD441                                | 15    |     |     |      |
| Collector-emitter saturation voltage | $V_{CE(sat)}^{(1)}$               | $I_C=3\text{A}, I_B=0.3\text{A}$     |       |     | 0.8 | V    |
| Base-emitter voltage                 | $V_{BE}^{(1)}$                    | $V_{CE}=1\text{V}, I_C=2\text{A}$    |       |     | 1.1 | V    |
| Transition frequency                 | $f_T$                             | $V_{CE}=1\text{V}, I_C=250\text{mA}$ | 3     |     |     | MHz  |

<sup>(1)</sup>Pulse test

# TO-126 Package Outline Dimensions



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min                       | Max    | Min                  | Max   |
| A      | 2.500                     | 2.900  | 0.098                | 0.114 |
| A1     | 1.100                     | 1.500  | 0.043                | 0.059 |
| b      | 0.660                     | 0.860  | 0.026                | 0.034 |
| b1     | 1.170                     | 1.370  | 0.046                | 0.054 |
| c      | 0.450                     | 0.600  | 0.018                | 0.024 |
| D      | 7.400                     | 7.800  | 0.291                | 0.307 |
| E      | 10.600                    | 11.000 | 0.417                | 0.433 |
| e      | 2.290 TYP                 |        | 0.090 TYP            |       |
| e1     | 4.480                     | 4.680  | 0.176                | 0.184 |
| h      | 0.000                     | 0.300  | 0.000                | 0.012 |
| L      | 15.300                    | 15.700 | 0.602                | 0.618 |
| L1     | 2.100                     | 2.300  | 0.083                | 0.091 |
| P      | 3.900                     | 4.100  | 0.154                | 0.161 |
| $\Phi$ | 3.000                     | 3.200  | 0.118                | 0.126 |