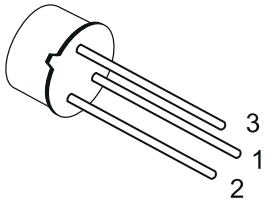
# 2N3439
# 2N3440

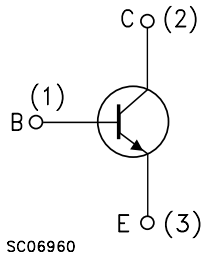
## SILICON NPN TRANSISTORS

- STMicroelectronics PREFERRED SALESTYPES
- NPN TRANSISTOR




**TO-39**

**INTERNAL SCHEMATIC DIAGRAM**




### DESCRIPTION

The 2N3439 and 2N3440 are silicon epitaxial planar NPN transistors in jedec TO-39 metal case designed for use in consumer and industrial line-operated applications.

These devices are particularly suited as drivers in high-voltage low current inverters, switching and series regulators.

### ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | | Unit |
|---|---|---|---|---|
| | | 2N3439 | 2N3440 | |
| $V_{CBO}$ | Collector-Base Voltage ($I_E$ = 0) | 450 | 300 | V |
| $V_{CEO}$ | Collector-Emitter Voltage ($I_B$ = 0) | 350 | 250 | V |
| $V_{EBO}$ | Emitter-Base Voltage ($I_C$ = 0) | 7 | | V |
| $I_C$ | Collector Current | 1 | | A |
| $I_B$ | Base Current | 0.5 | | A |
| $P_{tot}$ | Total Dissipation at $T_c \leq 25\ ^oC$ | 10 | | W |
| $P_{tot}$ | Total Dissipation at $T_{amb} \leq 50\ ^oC$ | 1 | | W |
| $T_{stg}$ | Storage Temperature | -65 to 200 | | $^oC$ |
| $T_j$ | Max. Operating Junction Temperature | 200 | | $^oC$ |

## THERMAL DATA

| | | | | |
|---|---|---|---|---|
| $R_{thj\text{-}case}$ | Thermal Resistance Junction-case | Max | 17.5 | $^oC/W$ |
| $R_{thj\text{-}amb}$ | Thermal Resistance Junction-ambient | Max | 175 | $^oC/W$ |

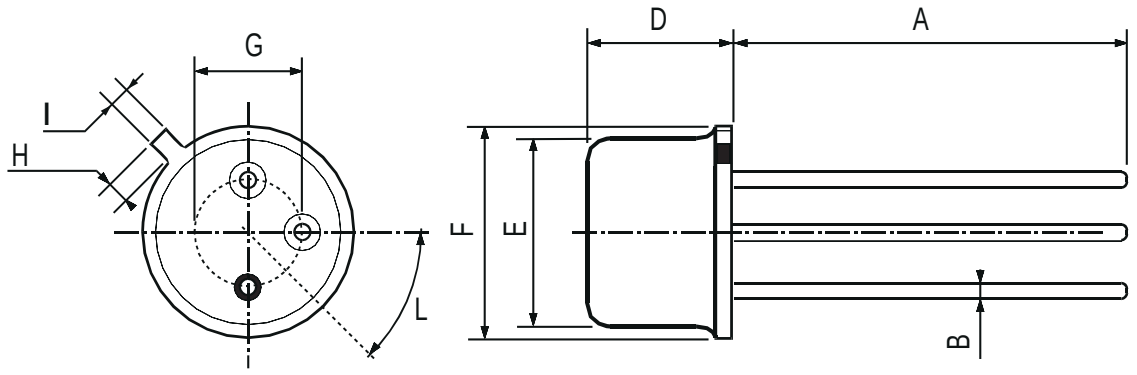
## ELECTRICAL CHARACTERISTICS ($T_{case}$ = 25 $^oC$ unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_{CBO}$ | Collector Cut-off Current ($I_E$ = 0) | for **2N3439** $V_{CB}$ = 360 V<br>for **2N3440** $V_{CB}$ = 250 V | | | 20<br>20 | µA<br>µA |
| $I_{CEO}$ | Collector Cut-off Current ($I_B$ = 0) | for **2N3439** $V_{CE}$ = 300 V<br>for **2N3440** $V_{CE}$ = 200 V | | | 20<br>50 | µA<br>µA |
| $I_{CEX}$ | Collector Cut-off Current ($V_{BE}$ = -1.5V) | for **2N3439** $V_{CE}$ = 450 V<br>for **2N3440** $V_{CE}$ = 300 V | | | 500<br>500 | µA<br>µA |
| $I_{EBO}$ | Emitter Cut-off Current ($I_C$ = 0) | $V_{EB}$ = 6 V | | | 20 | µA |
| $V_{CEO(sus)}$* | Collector-Emitter Sustaining Voltage | $I_C$ = 50 mA<br>for **2N3439**<br>for **2N3440** | <br>350<br>250 | | | <br>V<br>V |
| $V_{CE(sat)}$* | Collector-Emitter Saturation Voltage | $I_C$ = 50 mA $I_B$ = 4 mA | | | 0.5 | V |
| $V_{BE(sat)}$* | Base-Emitter Saturation Voltage | $I_C$ = 50 mA $I_B$ = 4 mA | | | 1.3 | V |
| $h_{FE}$* | DC Current Gain | $I_C$ = 20 mA $V_{CE}$ = 10 V<br>$I_C$ = 2 mA $V_{CE}$ = 10 V for **2N3439** | 40<br>30 | | 160 | |
| $h_{FE}$ | Small Signal Current Gain | $I_C$ = 5 mA $V_{CE}$ = 10 V f = 1KHz | 25 | | | |
| $f_T$ | Transition frequency | $I_C$ = 5 mA $V_{CE}$ = 10 V f = 5MHz | 15 | | | MHz |

* Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %

## TO-39 MECHANICAL DATA

| DIM. | mm | | | inch | | |
|---|---|---|---|---|---|---|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 12.7 | | | 0.500 | | |
| B | | | 0.49 | | | 0.019 |
| D | | | 6.6 | | | 0.260 |
| E | | | 8.5 | | | 0.334 |
| F | | | 9.4 | | | 0.370 |
| G | 5.08 | | | 0.200 | | |
| H | | | 1.2 | | | 0.047 |
| I | | | 0.9 | | | 0.035 |
| L | $45^{o}$ (typ.) | | | | | |

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