



**MJ2501**  
**MJ3001**

## COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

- STMicroelectronics PREFERRED SALESTYPES
- COMPLEMENTARY PNP - NPN DEVICES

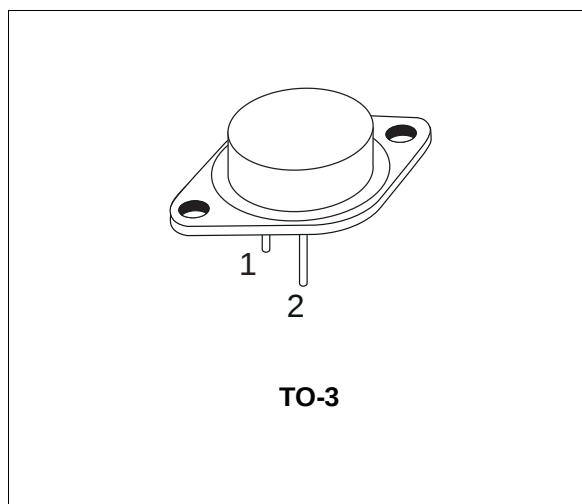
### APPLICATION

- AUDIO POWER AMPLIFIER
- DC-AC CONVERTER
- EASY DRIVER FOR LOW VOLTAGE DC MOTOR
- GENERAL POWER SWITCHING

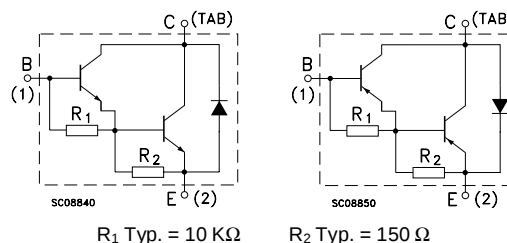
### DESCRIPTION

The MJ2501 is a Silicon Epitaxial-Base PNP power transistors in monolithic Darlington configuration, mounted in Jedec TO-3 metal case. It is intended for use in power linear and switching applications.

The complementary NPN type is the MJ3001.



### INTERNAL SCHEMATIC DIAGRAM



### ABSOLUTE MAXIMUM RATINGS

| Symbol    | Parameter                                        |     | Value      | Unit             |
|-----------|--------------------------------------------------|-----|------------|------------------|
|           |                                                  | PNP | MJ2501     |                  |
|           |                                                  | NPN | MJ3001     |                  |
| $V_{CBO}$ | Collector-base Voltage ( $I_E = 0$ )             |     | 80         | V                |
| $V_{CEO}$ | Collector-emitter Voltage ( $I_B = 0$ )          |     | 80         | V                |
| $V_{EBO}$ | Emitter-base Voltage ( $I_C = 0$ )               |     | 5          | V                |
| $I_C$     | Collector Current                                |     | 10         | A                |
| $I_B$     | Base Current                                     |     | 0.2        | A                |
| $P_{tot}$ | Total Dissipation at $T_c \leq 25^\circ\text{C}$ |     | 150        | W                |
| $T_{stg}$ | Storage Temperature                              |     | -65 to 200 | $^\circ\text{C}$ |
| $T_j$     | Max. Operating Junction Temperature              |     | 200        | $^\circ\text{C}$ |

For PNP types voltage and current values are negative.

**THERMAL DATA**

|                       |                                  |     |      |      |
|-----------------------|----------------------------------|-----|------|------|
| R <sub>thj-case</sub> | Thermal Resistance Junction-case | Max | 1.17 | °C/W |
|-----------------------|----------------------------------|-----|------|------|

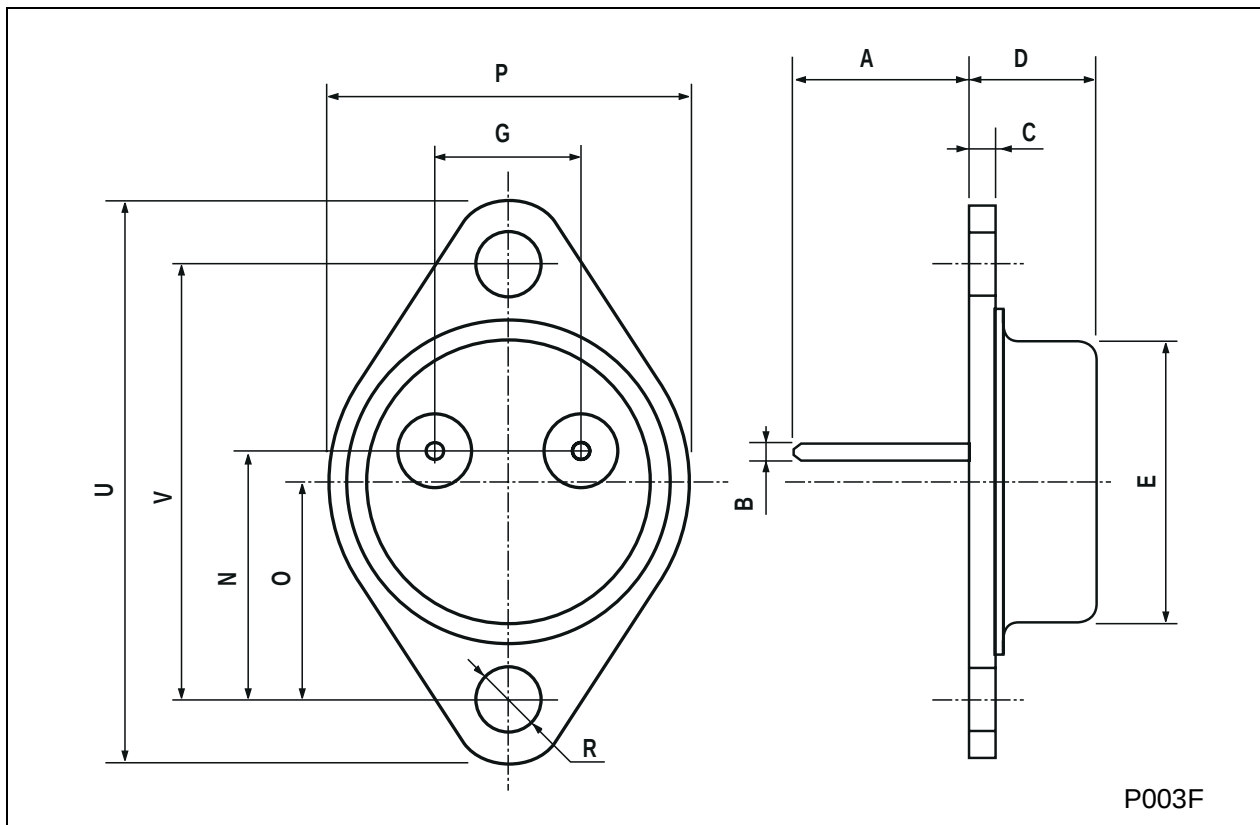
**ELECTRICAL CHARACTERISTICS** (T<sub>case</sub> = 25 °C unless otherwise specified)

| Symbol                  | Parameter                                                 | Test Conditions                                                                | Min. | Typ. | Max.   | Unit     |
|-------------------------|-----------------------------------------------------------|--------------------------------------------------------------------------------|------|------|--------|----------|
| I <sub>CER</sub>        | Collector Cut-off Current (R <sub>BE</sub> = 1 KΩ)        | V <sub>CE</sub> = 80 V<br>T <sub>case</sub> = 150 °C<br>V <sub>CE</sub> = 80 V |      |      | 1<br>5 | mA<br>mA |
| I <sub>CEO</sub>        | Collector Cut-off Current (I <sub>B</sub> = 0)            | V <sub>CE</sub> = 30 V<br>V <sub>CE</sub> = 40 V                               |      |      | 1<br>1 | mA<br>mA |
| I <sub>EBO</sub>        | Emitter Cut-off Current (I <sub>C</sub> = 0)              | V <sub>EB</sub> = 5 V                                                          |      |      | 2      | mA       |
| V <sub>CEO(sus)</sub> * | Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0) | I <sub>C</sub> = 100 mA                                                        | 80   |      |        | V        |
| V <sub>CE(sat)</sub> *  | Collector-emitter Saturation Voltage                      | I <sub>C</sub> = 5 A<br>I <sub>C</sub> = 10 A                                  |      |      | 2<br>4 | V<br>V   |
| V <sub>BE</sub> *       | Base-emitter Voltage                                      | I <sub>C</sub> = 5 A<br>V <sub>CE</sub> = 3 V                                  |      |      | 3      | V        |
| h <sub>FE</sub> *       | DC Current Gain                                           | I <sub>C</sub> = 5 A<br>V <sub>CE</sub> = 3 V                                  | 1000 |      |        |          |

\* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %  
For PNP types voltage and current values are negative.

## TO-3 MECHANICAL DATA

| DIM. | mm    |      |       | inch  |      |       |
|------|-------|------|-------|-------|------|-------|
|      | MIN.  | TYP. | MAX.  | MIN.  | TYP. | MAX.  |
| A    | 11.00 |      | 13.10 | 0.433 |      | 0.516 |
| B    | 0.97  |      | 1.15  | 0.038 |      | 0.045 |
| C    | 1.50  |      | 1.65  | 0.059 |      | 0.065 |
| D    | 8.32  |      | 8.92  | 0.327 |      | 0.351 |
| E    | 19.00 |      | 20.00 | 0.748 |      | 0.787 |
| G    | 10.70 |      | 11.10 | 0.421 |      | 0.437 |
| N    | 16.50 |      | 17.20 | 0.649 |      | 0.677 |
| P    | 25.00 |      | 26.00 | 0.984 |      | 1.023 |
| R    | 4.00  |      | 4.09  | 0.157 |      | 0.161 |
| U    | 38.50 |      | 39.30 | 1.515 |      | 1.547 |
| V    | 30.00 |      | 30.30 | 1.187 |      | 1.193 |



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