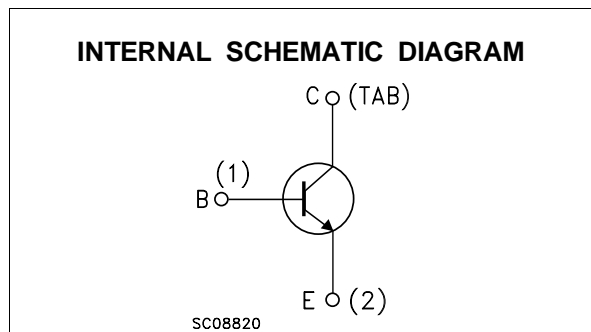
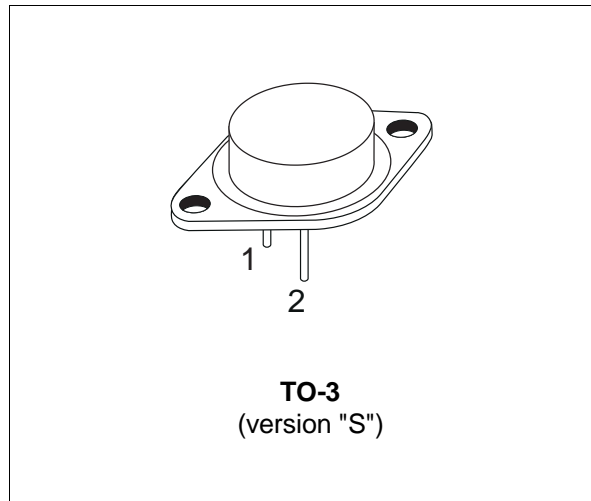


## FAST-SWITCHING POWER TRANSISTOR

- STMicroelectronics PREFERRED SALESTYPE
- NPN TRANSISTOR
- HIGH VOLTAGE
- FAST SWITCHING
- OFF-LINE APPLICATIONS TO 380V

### APPLICATIONS

- SWITCH MODE POWER SUPPLIES
- UNINTERRUPTABLE POWER SUPPLY
- DC AND AC MOTOR CONTROL



### ABSOLUTE MAXIMUM RATINGS

| Symbol    | Parameter   | Value      | Unit |
|-----------|---|------------|------|
| $V_{CEV}$ | Collector-Emitter Voltage ( $V_{BE} = -1.5\text{ V}$ )  | 850        | V    |
| $V_{CEO}$ | Collector-Emitter Voltage ( $I_B = 0$ )                 | 450        | V    |
| $V_{EBO}$ | Emitter-Base Voltage ( $I_C = 0$ )                      | 7          | V    |
| $I_C$     | Collector Current                                       | 45         | A    |
| $I_{CM}$  | Collector Peak Current                                  | 60         | A    |
| $I_B$     | Base Current  | 9          | A    |
| $I_{BM}$  | Base Peak Current ( $t_p < 5\text{ ms}$ )               | 15         | A    |
| $P_{tot}$ | Total Power Dissipation at $T_{case} \leq 25\text{ °C}$ | 300        | W    |
| $T_{stg}$ | Storage Temperature                                     | -65 to 200 | °C   |
| $T_j$     | Junction Temperature                                    | 200        | °C   |

# BUX348

## THERMAL DATA

|                       |                                  |     |      |      |
|-----------------------|----------------------------------|-----|------|------|
| R <sub>thj-case</sub> | Thermal Resistance Junction-case | Max | 0.58 | °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> = 10 Ω)        | V <sub>CE</sub> = V <sub>CEV</sub><br>V <sub>CE</sub> = V <sub>CEV</sub> T <sub>c</sub> = 100 °C                             |      |             | 0.4<br>2   | mA<br>mA |
| I <sub>CEV</sub>       | Collector Cut-off Current (V <sub>BE</sub> = -1.5V)       | V <sub>CE</sub> = V <sub>CEV</sub><br>V <sub>CE</sub> = V <sub>CEV</sub> T <sub>c</sub> = 100 °C                             |      |             | 0.4<br>2   | 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> = 0.2 A      L = 25 mH  | 450  |             |            | V        |
| V <sub>EBO</sub>       | Emitter-Base Voltage (I <sub>C</sub> = 0)                 | I <sub>E</sub> = 100 mA  | 7    |             |            | V        |
| V <sub>CE(sat)*</sub>  | Collector-Emitter Saturation Voltage                      | I <sub>C</sub> = 30 A    I <sub>B</sub> = 6 A<br>I <sub>C</sub> = 30 A    I <sub>B</sub> = 6 A      T <sub>j</sub> = 100 °C  |      | 0.7<br>1.35 | 0.9<br>2   | V<br>V   |
| V <sub>BE(sat)*</sub>  | Base-Emitter Saturation Voltage                           | I <sub>C</sub> = 30 A    I <sub>B</sub> = 6 A<br>I <sub>C</sub> = 30 A    I <sub>B</sub> = 6 A      T <sub>j</sub> = 100 °C  |      | 1.12<br>1.1 | 1.5<br>1.5 | V<br>V   |
| di <sub>C</sub> /dt    | Rated of Rise on-state Collector Current                  | V <sub>CC</sub> = 300V    I <sub>B1</sub> = 9 A      R <sub>C</sub> = 0<br>t <sub>p</sub> = 3μs      T <sub>j</sub> = 100 °C | 125  | 250         |            | A/μs     |
| V <sub>CE(3μs)*</sub>  | Collector-Emitter Dynamic Voltage                         | V <sub>CC</sub> = 300V      I <sub>B1</sub> = 9 A<br>R <sub>C</sub> = 10 Ω      T <sub>j</sub> = 100 °C                      |      | 4.4         | 8          | V        |
| V <sub>CE(5μs)*</sub>  | Collector-Emitter Dynamic Voltage                         | V <sub>CC</sub> = 300V      I <sub>B1</sub> = 9 A<br>R <sub>C</sub> = 10 Ω      T <sub>j</sub> = 100 °C                      |      | 2.3         | 4          | V        |

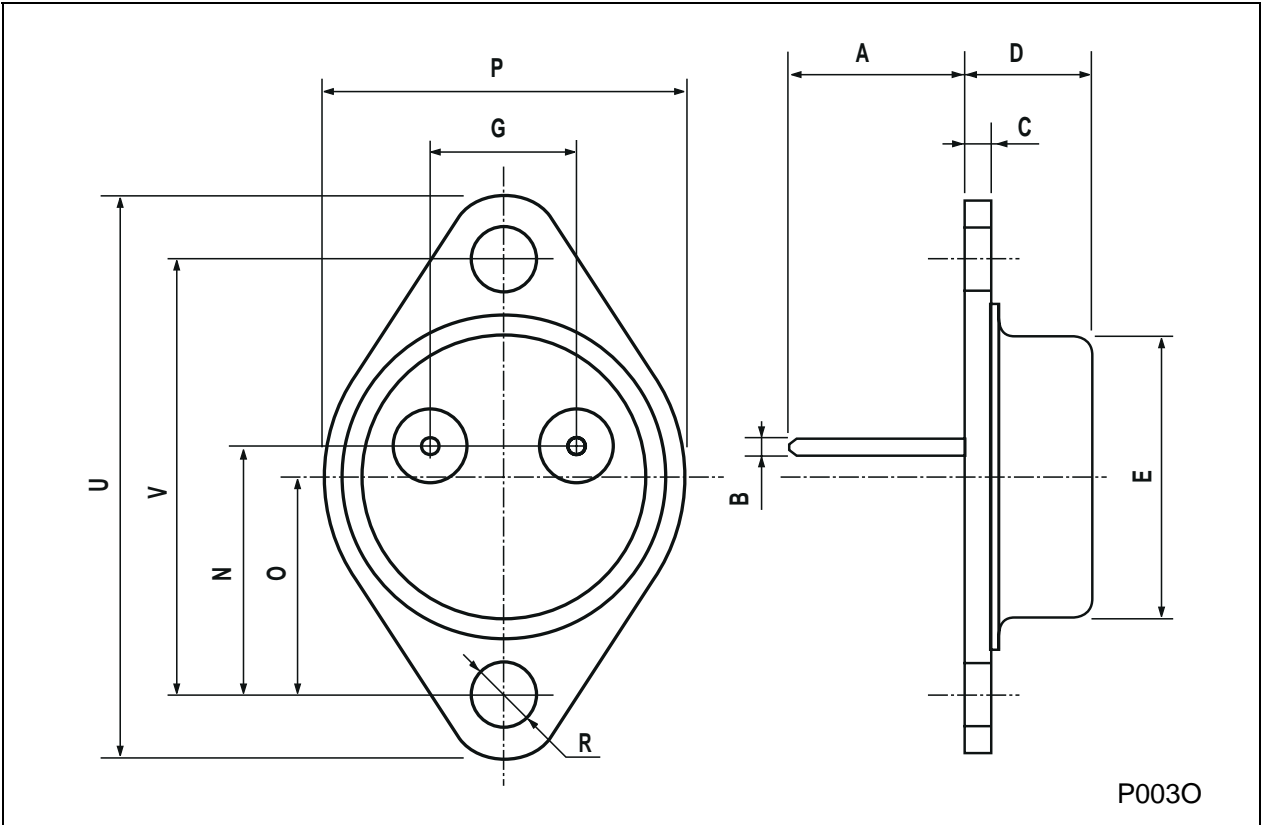
## INDUCTIVE LOAD

| Symbol           | Parameter   | Test Conditions  | Min. | Typ. | Max. | Unit |
|------------------|---|--|------|------|------|------|
| t <sub>s</sub>   | Storage Time                                      | V <sub>CC</sub> = 50 V      V <sub>Clamp</sub> = 450 V   |      | 2.75 | 4.5  | μs   |
| t <sub>f</sub>   | Fall Time   | I <sub>C</sub> = 30 A      I <sub>B1</sub> = 6 A   |      | 0.12 | 0.4  | μs   |
| t <sub>c</sub>   | Crossover Time                                    | V <sub>BB</sub> = -5 V      L <sub>C</sub> = 80 μH<br>R <sub>BB</sub> = 0.4 Ω      T <sub>j</sub> = 100 °C   |      | 0.44 | 0.7  | μs   |
| V <sub>CEW</sub> | Maximum Collector Emitter Voltage without Snubber | V <sub>CC</sub> = 50 V      I <sub>CWoff</sub> = 45 A<br>V <sub>BB</sub> = -5 V      I <sub>B1</sub> = 6 A<br>L <sub>C</sub> = 55 μH      R <sub>BB</sub> = 0.4 Ω<br>T <sub>j</sub> = 125 °C | 450  |      |      | V    |

\* Pulsed : Pulse duration = 300 ms, duty cycle = 2%

**TO-3 (version S) MECHANICAL DATA**

| DIM. | mm    |      |       | inch  |      |       |
|------|-------|------|-------|-------|------|-------|
|      | MIN.  | TYP. | MAX.  | MIN.  | TYP. | MAX.  |
| A    | 11.00 |      | 13.10 | 0.433 |      | 0.516 |
| B    | 1.47  |      | 1.60  | 0.058 |      | 0.063 |
| 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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