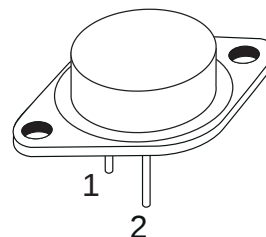


## FAST-SWITCHING POWER TRANSISTOR

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

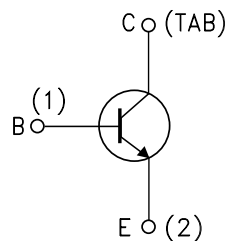
### APPLICATIONS

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



**TO-3**  
(version "S")

### INTERNAL SCHEMATIC DIAGRAM



### 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                                                    | 15         | A                |
| $P_{tot}$ | Total Power Dissipation at $T_{case} \leq 25 \text{ }^\circ\text{C}$ | 300        | W                |
| $T_{stg}$ | Storage Temperature                                                  | -65 to 200 | $^\circ\text{C}$ |
| $T_j$     | Junction Temperature                                                 | 200        | $^\circ\text{C}$ |

## 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>CE</sub> = V <sub>CEV</sub> V <sub>BE</sub> = -1.5V<br>V <sub>CE</sub> = V <sub>CEV</sub> V <sub>BE</sub> = -1.5V 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>C</sub> = 0.2 A L = 25 mH                                                                                                                 | 450  |             |            | V        |
| V <sub>EB0</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        |

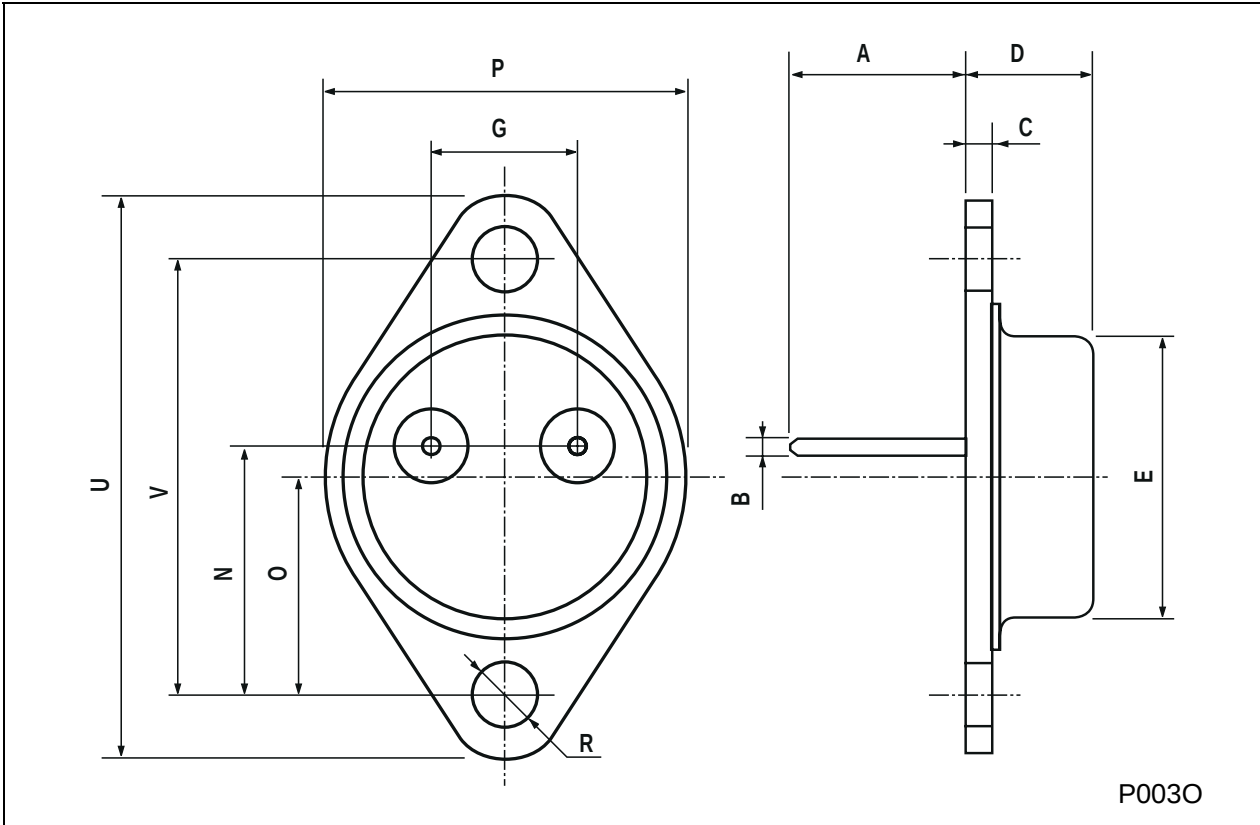
## INDUCTIVE LOAD

| 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 μs, 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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