

## NPN SWITCHING TRANSISTOR

- STMicroelectronics PREFERRED SALESTYPE
- NPN TRANSISTOR
- VERY LOW SATURATION VOLTAGE
- FAST TURN-OFF AND TURN-ON

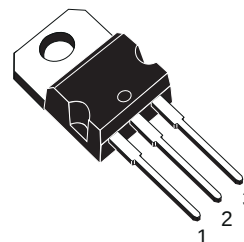
### APPLICATIONS:

- SWITCHING REGULATORS
- SOLENOID / RELAY DRIVERS

### DESCRIPTION

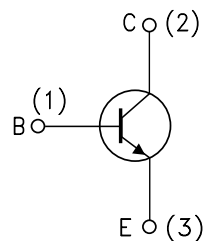
High speed transistor suited for low voltage applications.

High frequency and efficiency converters switching regulators motor control.



TO-220

### INTERNAL SCHEMATIC DIAGRAM



SC06960

### ABSOLUTE MAXIMUM RATINGS

| Symbol    | Parameter                                               | Value       | Unit               |
|-----------|---------------------------------------------------------|-------------|--------------------|
| $V_{CBO}$ | Collector-base Voltage ( $I_E = 0$ )                    | 400         | V                  |
| $V_{CEO}$ | Collector-Emitter Voltage ( $I_B = 0$ )                 | 200         | V                  |
| $V_{EBO}$ | Emitter-Base Voltage ( $I_C = 0$ )                      | 7           | V                  |
| $I_C$     | Collector Current                                       | 10          | A                  |
| $I_{CM}$  | Collector Peak Current ( $t_p < 5ms$ )                  | 15          | A                  |
| $I_B$     | Base Current                                            | 2           | A                  |
| $I_{BM}$  | Base Peak Current ( $t_p < 5ms$ )                       | 4           | A                  |
| $P_{tot}$ | Total Dissipation at $T_c < 25\text{ }^{\circ}\text{C}$ | 85          | W                  |
| $P_{tot}$ | Total Dissipation at $T_c < 60\text{ }^{\circ}\text{C}$ | 65          | W                  |
| $T_{stg}$ | Storage Temperature                                     | -65 to +175 | $^{\circ}\text{C}$ |
| $T_j$     | Max. Operating Junction Temperature                     | 175         | $^{\circ}\text{C}$ |

**THERMAL DATA**

|                       |                                  |     |      |      |
|-----------------------|----------------------------------|-----|------|------|
| R <sub>thj-case</sub> | Thermal Resistance Junction-case | Max | 1.76 | °C/W |
|-----------------------|----------------------------------|-----|------|------|

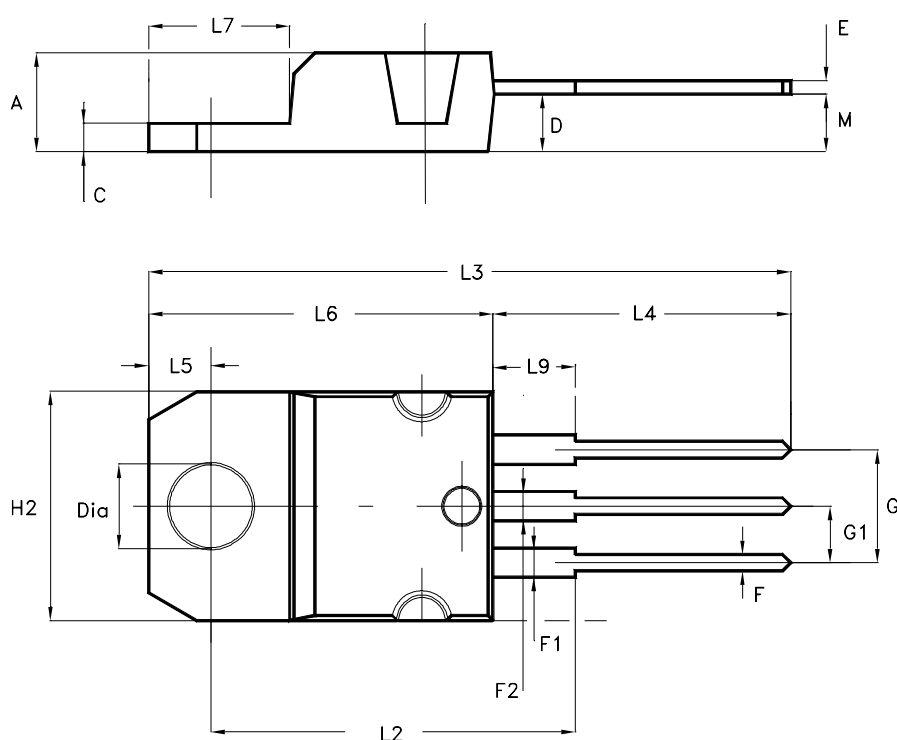
**ELECTRICAL CHARACTERISTICS** (T<sub>case</sub> = 25 °C unless otherwise specified)

| Symbol                                              | Parameter                                                   | Test Conditions                                                                                                                                    | Min. | Typ. | Max.             | Unit           |
|-----------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------------------|----------------|
| I <sub>CEr</sub>                                    | Collector Cut-off Current (R <sub>BE</sub> = 50Ω)           | V <sub>CE</sub> = 400V T <sub>c</sub> = 125°C                                                                                                      |      |      | 3                | mA             |
| I <sub>CEX</sub>                                    | Collector Cut-off Current (V <sub>BE</sub> = -1.5V)         | V <sub>CE</sub> = 400V T <sub>c</sub> = 125°C                                                                                                      |      |      | 1                | mA             |
| I <sub>EBO</sub>                                    | Emitter Cut-off Current (I <sub>C</sub> = 0)                | V <sub>EB</sub> = 5 V                                                                                                                              |      |      | 1                | mA             |
| V <sub>CEO(sus)*</sub>                              | Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0)   | I <sub>C</sub> = 0.2 A                                                                                                                             | 200  |      |                  | V              |
| V <sub>EBO</sub>                                    | Emitter-Base Voltage (I <sub>C</sub> = 0)                   | I <sub>E</sub> = 50 mA                                                                                                                             | 7    |      | 30               | V              |
| V <sub>CE(sat)*</sub>                               | Collector-Emitter Saturation Voltage                        | I <sub>C</sub> = 3 A I <sub>B</sub> = 0.3 A<br>I <sub>C</sub> = 6 A I <sub>B</sub> = 0.6 A                                                         |      |      | 0.7<br>1.5       | V<br>V         |
| V <sub>BE(sat)*</sub>                               | Base-Emitter Saturation Voltage                             | I <sub>C</sub> = 6 A I <sub>B</sub> = 0.6 A                                                                                                        |      |      | 2                | V              |
| t <sub>on</sub><br>t <sub>s</sub><br>t <sub>f</sub> | RESISTIVE LOAD<br>Storage Time<br>Fall Time<br>Turn-on Time | V <sub>CC</sub> = 150 V I <sub>C</sub> = 6 A<br>V <sub>BE</sub> = - 6 V I <sub>B1</sub> = 0.6 A<br>R <sub>BB</sub> = 5 Ω I <sub>B2</sub> = - 1.2 A |      |      | 1<br>1.5<br>0.25 | μs<br>μs<br>μs |
| t <sub>s</sub><br>t <sub>f</sub>                    | INDUCTIVE LOAD<br>Storage Time<br>Fall Time                 | V <sub>CC</sub> = 150 V I <sub>C</sub> = 6 A<br>I <sub>B1</sub> = 0.6 A V <sub>BE</sub> = - 5 V<br>L <sub>B</sub> = 3 μH T <sub>c</sub> = 125 °C   |      |      | 3<br>0.2         | μs<br>μs       |

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

# TO-220 MECHANICAL DATA

| DIM. | mm    |       |       | inch  |       |       |
|------|-------|-------|-------|-------|-------|-------|
|      | MIN.  | TYP.  | MAX.  | MIN.  | TYP.  | MAX.  |
| A    | 4.40  |       | 4.60  | 0.173 |       | 0.181 |
| C    | 1.23  |       | 1.32  | 0.048 |       | 0.052 |
| D    | 2.40  |       | 2.72  | 0.094 |       | 0.107 |
| E    | 0.49  |       | 0.70  | 0.019 |       | 0.027 |
| F    | 0.61  |       | 0.88  | 0.024 |       | 0.034 |
| F1   | 1.14  |       | 1.70  | 0.044 |       | 0.067 |
| F2   | 1.14  |       | 1.70  | 0.044 |       | 0.067 |
| G    | 4.95  |       | 5.15  | 0.194 |       | 0.202 |
| G1   | 2.40  |       | 2.70  | 0.094 |       | 0.106 |
| H2   | 10.00 |       | 10.40 | 0.394 |       | 0.409 |
| L2   |       | 16.40 |       |       | 0.645 |       |
| L4   | 13.00 |       | 14.00 | 0.511 |       | 0.551 |
| L5   | 2.65  |       | 2.95  | 0.104 |       | 0.116 |
| L6   | 15.25 |       | 15.75 | 0.600 |       | 0.620 |
| L7   | 6.20  |       | 6.60  | 0.244 |       | 0.260 |
| L9   | 3.50  |       | 3.93  | 0.137 |       | 0.154 |
| M    |       | 2.60  |       |       | 0.102 |       |
| DIA. | 3.75  |       | 3.85  | 0.147 |       | 0.151 |



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