

## HIGH VOLTAGE IGNITION COIL DRIVER NPN POWER DARLINGTON

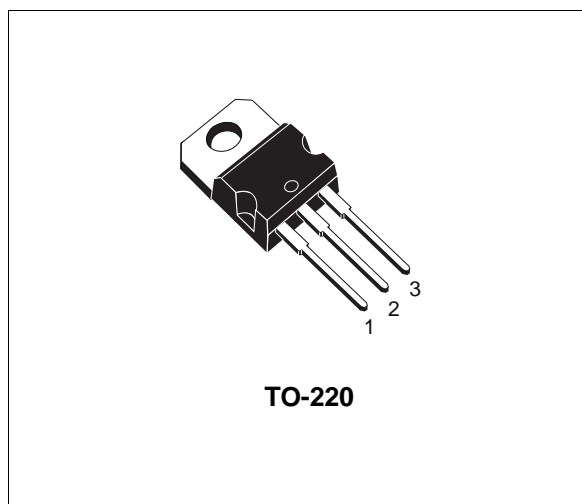
- HIGH VOLTAGE SPECIAL DARLINGTON STRUCTURE
- VERY RUGGED BIPOLAR TECHNOLOGY
- HIGH OPERATING JUNCTION TEMPERATURE
- HIGH DC CURRENT GAIN

### APPLICATION

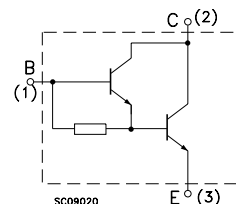
- HIGH RUGGEDNESS ELECTRONIC IGNITION FOR SMALL ENGINES

### DESCRIPTION

The ST901T is a high voltage NPN silicon transistor in monolithic special Darlington configuration mounted in Jedec TO-220 plastic package, designed for applications such as electronic ignition for small engines (scooters, lawnmowers, chainsaws).



### INTERNAL SCHEMATIC DIAGRAM



### ABSOLUTE MAXIMUM RATINGS

| Symbol    | Parameter  | Value      | Unit             |
|-----------|--|------------|------------------|
| $V_{CES}$ | Collector- Emitter Voltage ( $V_{BE} = 0$ )      | 500        | V                |
| $V_{CEO}$ | Collector-Emitter Voltage ( $I_B = 0$ )          | 350        | V                |
| $V_{EBO}$ | Emitter-Base Voltage ( $I_C = 0$ )               | 5          | V                |
| $I_C$     | Collector Current                                | 4          | A                |
| $I_{CM}$  | Collector Peak Current                           | 8          | A                |
| $I_B$     | Base Current                                     | 0.5        | A                |
| $I_{BM}$  | Base Peak Current                                | 2.5        | A                |
| $P_{tot}$ | Total Dissipation at $T_c \leq 25^\circ\text{C}$ | 30         | W                |
| $T_{stg}$ | Storage Temperature                              | -65 to 175 | $^\circ\text{C}$ |
| $T_j$     | Max. Operating Junction Temperature              | 175        | $^\circ\text{C}$ |

## ST901T

### THERMAL DATA

|                       |                                  |     |   |      |
|-----------------------|----------------------------------|-----|---|------|
| R <sub>thj-case</sub> | Thermal Resistance Junction-case | Max | 5 | °C/W |
|-----------------------|----------------------------------|-----|---|------|

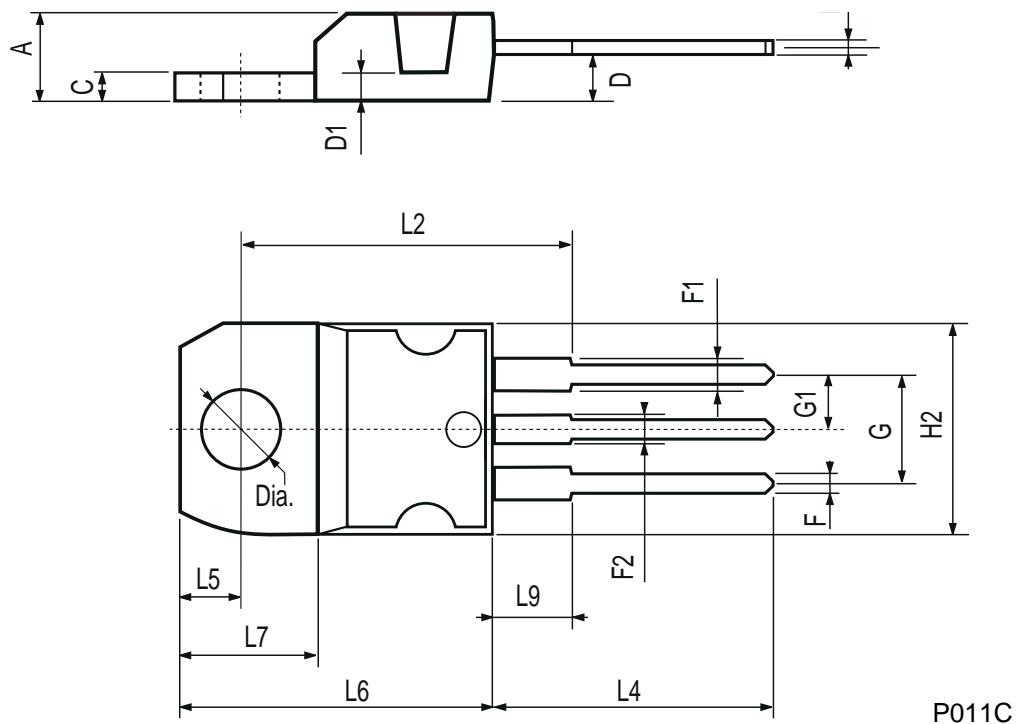
### ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

| Symbol                           | Parameter                                      | Test Conditions  | Min.        | Typ.      | Max.       | Unit     |
|----------------------------------|--|--|-------------|-----------|------------|----------|
| I <sub>CEs</sub>                 | Collector Cut-off Current (I <sub>E</sub> = 0) | V <sub>CE</sub> = 500 V<br>V <sub>CE</sub> = 500 V    T <sub>case</sub> = 125 °C   |             |           | 100<br>0.5 | μA<br>mA |
| I <sub>CEO</sub>                 | Collector Cut-off Current (I <sub>B</sub> = 0) | V <sub>CE</sub> = 350 V<br>V <sub>CE</sub> = 350 V    T <sub>case</sub> = 125 °C   |             |           | 100<br>0.5 | μA<br>mA |
| I <sub>EBO</sub>                 | Emitter Cut-off Current (I <sub>C</sub> = 0)   | V <sub>EB</sub> = 5 V  |             |           | 10         | μA       |
| V <sub>CEO(sus)*</sub>           | Collector-Emitter Sustaining Voltage           | I <sub>C</sub> = 10 mA    L = 10 mH    I <sub>B</sub> = 0  | 350         |           |            | V        |
| V <sub>CE(sat)*</sub>            | Collector-Emitter Saturation Voltage           | I <sub>C</sub> = 2 A    I <sub>B</sub> = 20 mA   |             |           | 1.3        | V        |
| V <sub>BE(sat)*</sub>            | Base-Emitter Saturation Voltage                | I <sub>C</sub> = 2 A    I <sub>B</sub> = 20 mA   |             |           | 1.8        | V        |
| h <sub>FE*</sub>                 | DC Current Gain                                | I <sub>C</sub> = 2 A    V <sub>CE</sub> = 2 V<br>I <sub>C</sub> = 4 A    V <sub>CE</sub> = 2 V   | 1500<br>500 |           |            |          |
|                                  | Functional Test                                | V <sub>CC</sub> = 24 V    V <sub>clamp</sub> = 350 V<br>L = 4 mH   | 4           |           |            | A        |
| t <sub>s</sub><br>t <sub>f</sub> | INDUCTIVE LOAD<br>Storage Time<br>Fall Time    | V <sub>CC</sub> = 12 V    V <sub>clamp</sub> = 250 V<br>L = 4 mH<br>I <sub>C</sub> = 2 A    I <sub>B</sub> = 20 mA<br>V <sub>BE</sub> = -3 V |             | 15<br>1.5 |            | μs<br>μs |

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

## 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 |       | 0.051 |
| D    | 2.40  |      | 2.72  | 0.094 |       | 0.107 |
| D1   |       | 1.27 |       |       | 0.050 |       |
| 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 |       | 0.203 |
| G1   | 2.4   |      | 2.7   | 0.094 |       | 0.106 |
| H2   | 10.0  |      | 10.40 | 0.393 |       | 0.409 |
| L2   |       | 16.4 |       |       | 0.645 |       |
| L4   | 13.0  |      | 14.0  | 0.511 |       | 0.551 |
| L5   | 2.65  |      | 2.95  | 0.104 |       | 0.116 |
| L6   | 15.25 |      | 15.75 | 0.600 |       | 0.620 |
| L7   | 6.2   |      | 6.6   | 0.244 |       | 0.260 |
| L9   | 3.5   |      | 3.93  | 0.137 |       | 0.154 |
| DIA. | 3.75  |      | 3.85  | 0.147 |       | 0.151 |



Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1997 SGS-THOMSON Microelectronics - Printed in Italy - All Rights Reserved

SGS-THOMSON Microelectronics GROUP OF COMPANIES  
Australia - Brazil - Canada - China - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands -  
Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A