



# STL72

## MEDIUM VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

- n MEDIUM VOLTAGE CAPABILITY
- n LOW SPREAD OF DYNAMIC PARAMETERS
- n MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- n VERY HIGH SWITCHING SPEED

### APPLICATIONS

- n ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING

### DESCRIPTION

The device is manufactured using high voltage Multi-Epitaxial Planar technology for high switching speeds and medium voltage capability.

It uses a Cellular Emitter structure with planar edge termination to enhance switching speeds while maintaining the wide RBSOA.

The STL series is designed for use in Compact Fluorescent Lamps.

Figure 1: Package

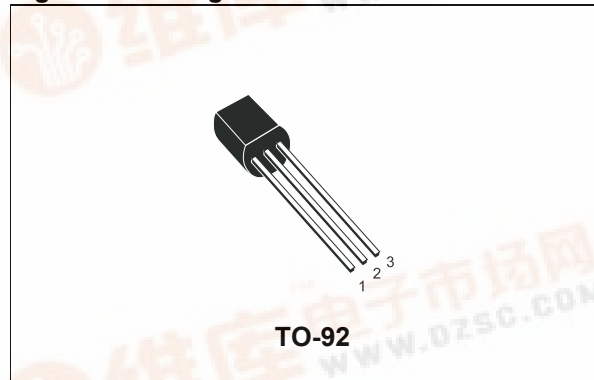


Figure 2: Internal Schematic Diagram

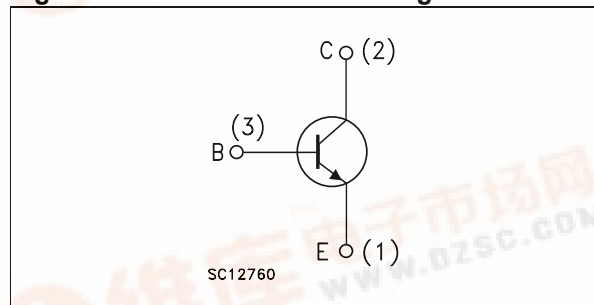


Table 1: Order Codes

| Part Number | Marking                  | Package | Packaging |
|-------------|--------------------------|---------|-----------|
| STL72       | L72 L<br>or (#)<br>L72 H | TO-92   | Bulk      |

# See:note on page 2

## STL72

**Table 2: Absolute Maximum Ratings**

| Symbol    | Parameter   | Value      | Unit             |
|-----------|---|------------|------------------|
| $V_{CES}$ | Collector-Emitter Voltage ( $V_{BE} = 0$ )            | 700        | V                |
| $V_{CEO}$ | Collector-Emitter Voltage ( $I_B = 0$ )               | 400        | V                |
| $V_{EBO}$ | Emitter-Base Voltage ( $I_C = 0$ )                    | 9          | V                |
| $I_C$     | Collector Current                                     | 1          | A                |
| $I_{CM}$  | Collector Peak Current ( $t_p < 5\text{ms}$ )         | 2          | A                |
| $I_B$     | Base Current  | 0.5        | A                |
| $I_{BM}$  | Base Peak Current ( $t_p < 5\text{ms}$ )              | 1          | A                |
| $P_{tot}$ | Total Dissipation at $T_C = 25\text{ }^\circ\text{C}$ | 1          | W                |
| $T_{stg}$ | Storage Temperature                                   | -65 to 150 | $^\circ\text{C}$ |
| $T_J$     | Max. Operating Junction Temperature                   | 150        | $^\circ\text{C}$ |

**Table 3: Thermal Data**

|               |                                     |     |     |                    |
|---------------|-------------------------------------|-----|-----|--------------------|
| $R_{thj-amb}$ | Thermal Resistance Junction-Ambient | Max | 120 | $^\circ\text{C/W}$ |
|---------------|-------------------------------------|-----|-----|--------------------|

**Table 4: Electrical Characteristics ( $T_{case} = 25\text{ }^\circ\text{C}$  unless otherwise specified)**

| Symbol           | Parameter   | Test Conditions  | Min. | Typ. | Max. | Unit          |
|------------------|---|--|------|------|------|---------------|
| $I_{CEV}$        | Collector Cut-off Current<br>( $V_{BE} = -1.5\text{ V}$ ) | $V_{CE} = 700\text{ V}$  |      |      | 1    | mA            |
|                  |   | $V_{CE} = 700\text{ V}$ $T_j = 125\text{ }^\circ\text{C}$  |      |      | 5    | mA            |
| $I_{EBO}$        | Emitter-Cut-off Current<br>( $I_C = 0$ )                  | $V_{EB} = 9\text{ V}$  |      |      | 1    | mA            |
| $V_{CEO(sus)}^*$ | Collector-Emitter<br>Sustaining Voltage<br>( $I_B = 0$ )  | $I_C = 1\text{ mA}$ $L = 25\text{ mH}$   | 400  |      |      | V             |
| $V_{CE(sat)}^*$  | Collector-Emitter<br>Saturation Voltage                   | $I_C = 0.2\text{ A}$ $I_B = 40\text{ mA}$  |      | 0.15 | 0.4  | V             |
|                  |   | $I_C = 0.4\text{ A}$ $I_B = 80\text{ mA}$  |      | 0.25 | 0.5  | V             |
| $V_{BE(sat)}^*$  | Base-Emitter Saturation<br>Voltage                        | $I_C = 0.4\text{ A}$ $I_B = 80\text{ mA}$  |      | 0.95 | 1.1  | V             |
| $h_{FE}$         | DC Current Gain #   | $I_C = 0.4\text{ A}$ $V_{CE} = 5\text{ V}$   |      |      |      |               |
|                  |   | Group L  | 10   |      | 16   |               |
|                  |   | Group H  | 15   |      | 23   |               |
|                  |   | $I_C = 1\text{ A}$ $V_{CE} = 10\text{ V}$  | 5    |      | 15   |               |
| $t_f$            | INDUCTIVE LOAD<br>Fall Time                               | $I_C = 0.25$ $V_{Clamp} = 300\text{ V}$<br>$I_{B1} = -I_{B2} = 50\text{ mA}$ $L = 3\text{ mH}$<br>(see figure 3) |      | 0.3  |      | $\mu\text{s}$ |

\* Pulsed: Pulsed duration = 300  $\mu\text{s}$ , duty cycle  $\leq 1.5\%$ .

# The product is pre-selected in DC current gain (Group L and Group H). STMicroelectronics reserves the right to ship either groups according to production availability. Please contact your nearest STMicroelectronics sales office for delivery details.

Figure 3: Inductive Load Switching Test Circuit

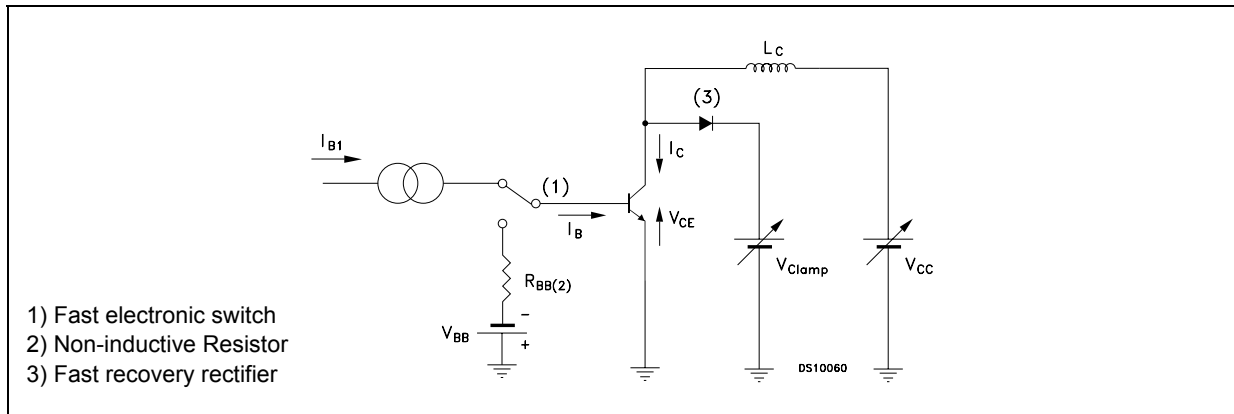
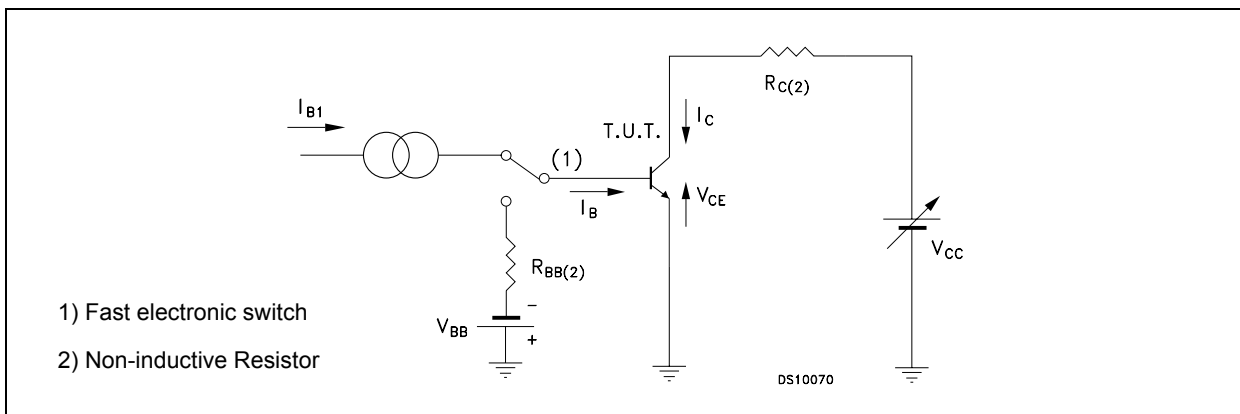
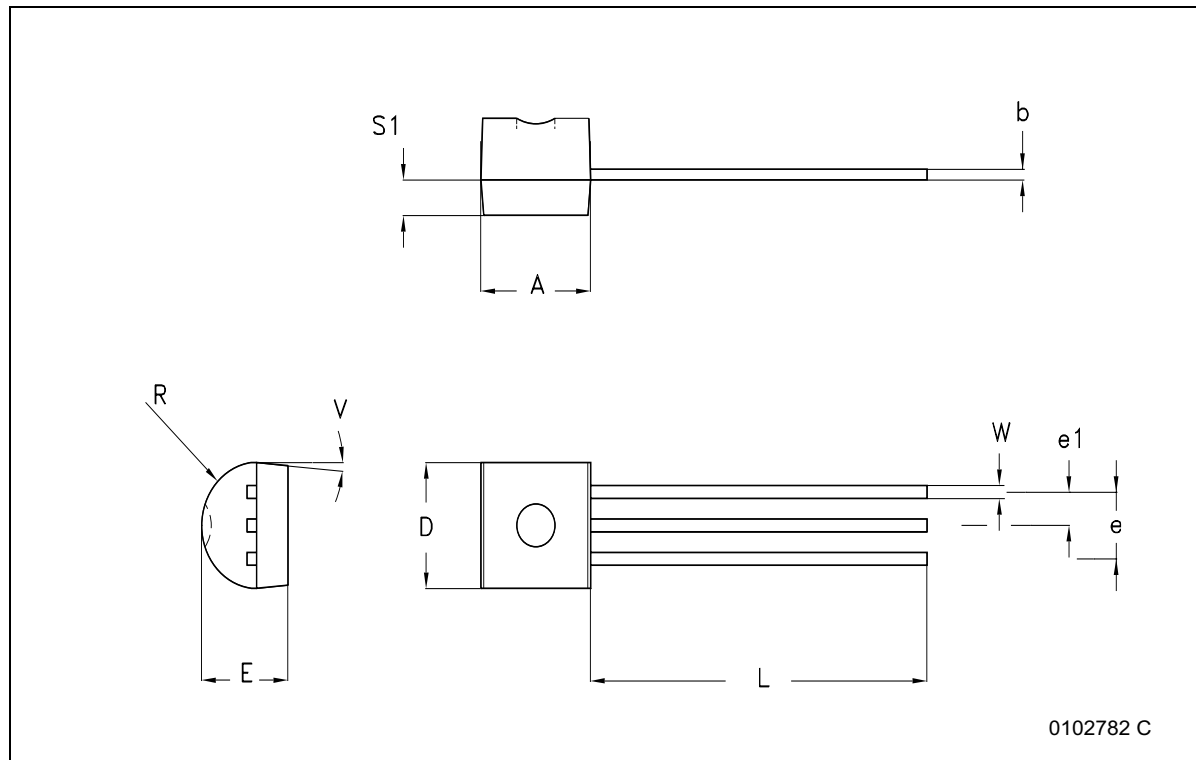


Figure 4: Resistive Load Switching Test Circuit



**TO-92 BULK SHIPMENT MECHANICAL DATA**

| DIM. | mm.   |     |       |
|------|-------|-----|-------|
|      | MIN.  | TYP | MAX.  |
| A    | 4.32  |     | 4.95  |
| b    | 0.36  |     | 0.51  |
| D    | 4.45  |     | 4.95  |
| E    | 3.30  |     | 3.94  |
| e    | 2.41  |     | 2.67  |
| e1   | 1.14  |     | 1.40  |
| L    | 12.70 |     | 15.49 |
| R    | 2.16  |     | 2.41  |
| S1   | 0.92  |     | 1.52  |
| W    | 0.41  |     | 0.56  |
| V    |       | 5°  |       |



**Figure 5: Revision History**

| <b>Release Date</b> | <b>Version</b> | <b>Change Designator</b> |
|---------------------|----------------|--------------------------|
| 01-Apr-2005         | 1              | Initial release          |
| 12-Jul-2005         | 2              | New hfe range values     |

Information furnished is believed to be accurate and reliable. However, STMicroelectronics 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 STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics  
All other names are the property of their respective owners

© 2005 STMicroelectronics - All Rights Reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan -  
Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America  
[www.st.com](http://www.st.com)