



STL73

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 COMPACT FLUORESCENT LAMPS (CFLS)

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

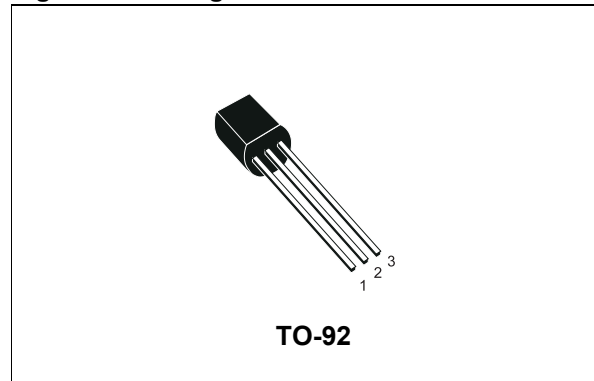


Figure 2: Internal Schematic Diagram

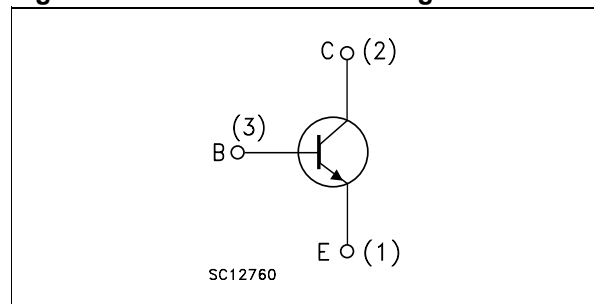


Table 1: Order Codes

| Part Number | Marking | Package | Packaging |
|-------------|--------------------------|---------|-----------|
| STL73 | L73 L or (#) L73 H | TO-92 | Bulk |

See:note on page 2

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 ($I_C = 0$) | $V_{(BR)EBO}$ | V |
| I_C | Collector Current | 1.5 | A |
| I_{CM} | Collector Peak Current ($t_p < 5\text{ms}$) | 3 | A |
| I_B | Base Current | 0.5 | A |
| I_{BM} | Base Peak Current ($t_p < 5\text{ms}$) | 1.5 | A |
| P_{tot} | Total Dissipation at $T_C = 25\text{ }^\circ\text{C}$ | 1.1 | 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 | 112 | $^\circ\text{C/W}$ |
|---------------|-------------------------------------|-----|-----|--------------------|

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 ($V_{BE} = -1.5\text{ V}$) | $V_{CE} = 700\text{ V}$ | | | 1 | mA |
| | | $V_{CE} = 700\text{ V}$ $T_J = 125\text{ }^\circ\text{C}$ | | | 5 | mA |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage ($I_C = 0$) | $i_E = 10\text{ mA}$ | 9 | | 18 | V |
| $V_{CEO(sus)}^*$ | Collector-Emitter Sustaining Voltage ($I_B = 0$) | $I_C = 10\text{ mA}$ | 400 | | | V |
| $V_{CE(sat)}^*$ | Collector-Emitter Saturation Voltage | $I_C = 0.3\text{ A}$ $I_B = 60\text{ mA}$ | | 0.15 | 0.4 | V |
| | | $I_C = 0.6\text{ A}$ $I_B = 120\text{ mA}$ | | 0.25 | 0.6 | V |
| | | $I_C = 1\text{ A}$ $I_B = 250\text{ mA}$ | | 0.4 | 1 | V |
| $V_{BE(sat)}^*$ | Base-Emitter Saturation Voltage | $I_C = 0.6\text{ A}$ $I_B = 120\text{ mA}$ | | 0.95 | 1.1 | V |
| h_{FE} | DC Current Gain # | $I_C = 0.6\text{ A}$ $V_{CE} = 3\text{ V}$ | | | | |
| | | Group L | 10 | | 16 | |
| | | Group H | 15 | | 21 | |
| t_f | RESISTIVE LOAD Rise Time Storage Time Fall Time | $I_C = 1$ $V_{CC} = 125\text{ V}$ | | | | |
| | | $I_{B1} = -I_{B2} = 200\text{ mA}$ $t_p = 25\text{ }\mu\text{s}$ | | | 1 | μs |
| | | (see figure 4) | | | 4 | μs |
| t_f | INDUCTIVE LOAD Fall Time | $I_C = 0.3$ $V_{Clamp} = 300\text{ V}$ | | | | |
| | | $I_{B1} = -I_{B2} = 60\text{ mA}$ $L = 3\text{ mH}$ | | 0.3 | | μs |
| | | (see figure 3) | | | | |

* Pulsed: Pulsed duration = 300 μs , 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

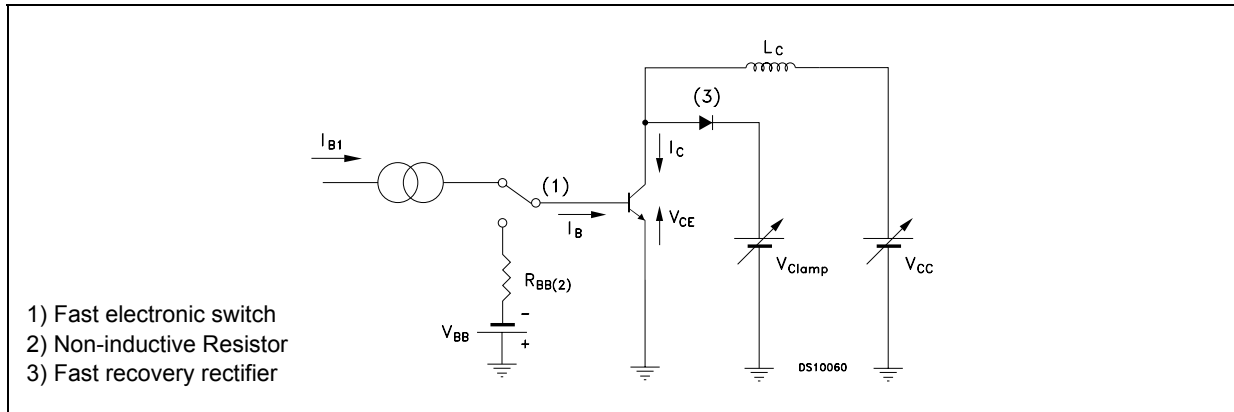
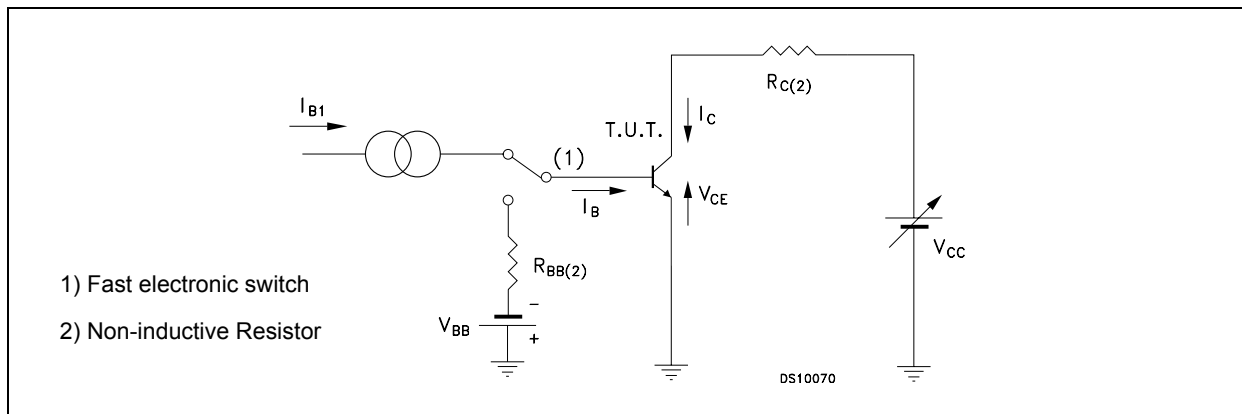


Figure 4: Resistive Load Switching Test Circuit



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° | |

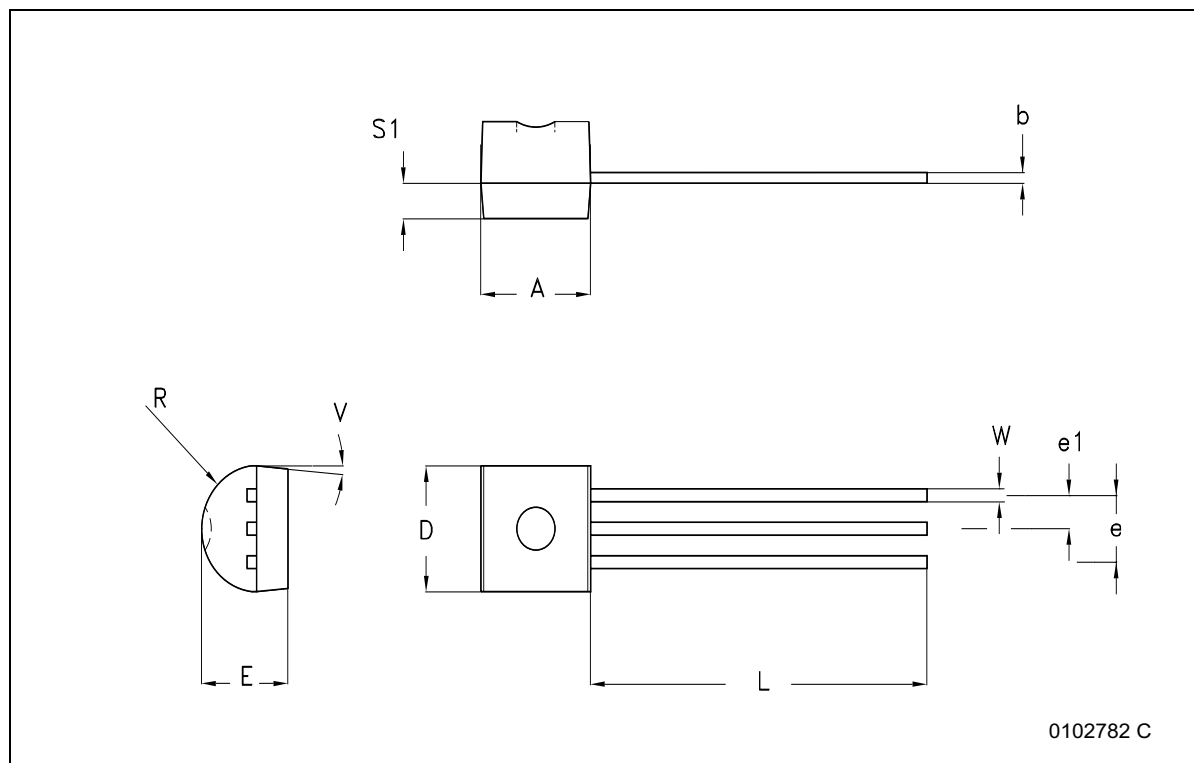


Figure 5: Revision History

| Release Date | Version | Change Designator |
|---------------------|----------------|--------------------------|
| 11-Jul-2005 | 1 | First Release. |

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