



# ST600K

## LOW VOLTAGE NPN POWER TRANSISTOR

PRELIMINARY DATA

### Features

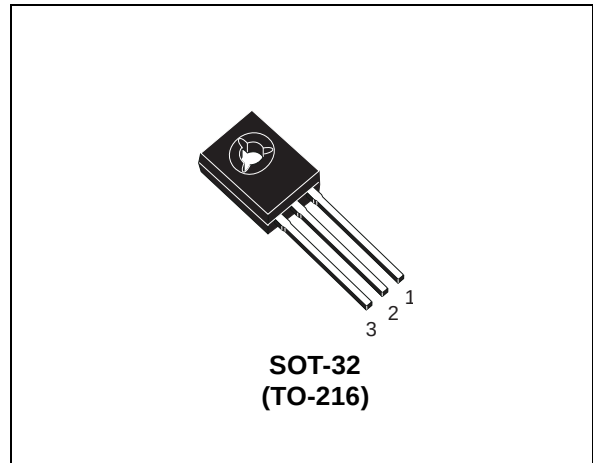
- LOW SATURATION VOLTAGE

### Applications

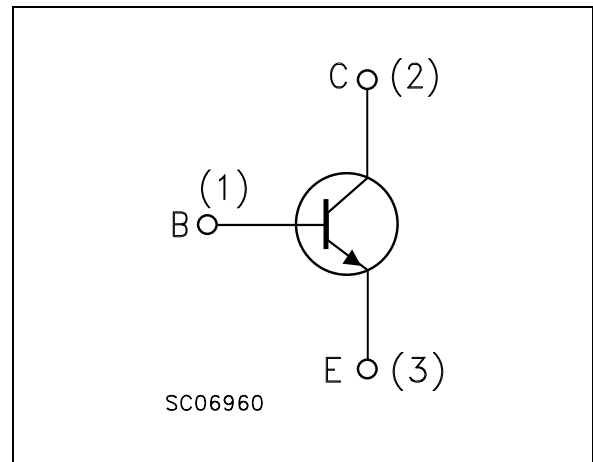
- SCANNING VELOCITY MODULATION IN CRT DISPLAYS
- MEDIUM POWER LINEAR AND SWITCHING APPLICATIONS

### Description

The ST600K is manufactured by low voltage Epitaxial Base technology and it is housed in SOT-32 plastic package. The complementary PNP type is ST631K.



### Internal Schematic Diagram



### Order Codes

| Part Number | Marking | Package | Packing |
|-------------|---------|---------|---------|
| ST600K      | 600K    | SOT-32  | TUBE    |

# 1 Absolute Maximum Ratings

**Table 1. Absolute Maximum Rating**

| Symbol    | Parameter                               | Value      | Unit       |
|-----------|-----------------------------------------|------------|------------|
| $V_{CBO}$ | Collector-Base Voltage ( $I_E = 0$ )    | 120        | V          |
| $V_{CEO}$ | Collector-Emitter Voltage ( $I_B = 0$ ) | 120        | V          |
| $V_{EBO}$ | Collector-Base Voltage ( $I_C = 0$ )    | 5          | V          |
| $I_C$     | Collector Current                       | 1          | A          |
| $I_{CM}$  | Collector Peak Current ( $t_P < 5ms$ )  | 2          | A          |
| $I_B$     | Base Current                            | 0.5        | A          |
| $I_{BM}$  | Base Peak Current ( $t_P < 5ms$ )       | 1          | A          |
| $P_{TOT}$ | Total dissipation at $T_c = 25^\circ C$ | 12.5       | W          |
| $T_{STG}$ | Storage Temperature                     | -65 to 150 | $^\circ C$ |
| $T_J$     | Max. Operating Junction Temperature     | 150        | $^\circ C$ |

**Table 2. Thermal Data**

| Symbol         | Parameter                            | Value | Unit         |
|----------------|--------------------------------------|-------|--------------|
| $R_{thJ-case}$ | Thermal Resistance Junction-Case Max | 10    | $^\circ C/W$ |
| $R_{thJ-amb}$  | Thermal Resistance Junction-Case Max | 100   | $^\circ C/W$ |

## 2 Electrical Characteristics

**Table 3. Electrical Characteristics** ( $T_{CASE} = 25^{\circ}C$ ; unless otherwise specified)

| Symbol                          | Parameter                                                       | Test Conditions                                                                            | Min.      | Typ.              | Max. | Unit           |
|---------------------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------|-----------|-------------------|------|----------------|
| $I_{CBO}$                       | Collector Cut-off Current<br>( $I_E = 0$ )                      | $V_{CB} = 50V$                                                                             |           |                   | 1    | $\mu A$        |
| $I_{EBO}$                       | Emitter Cut-off Current<br>( $I_C = 0$ )                        | $V_{EB} = 4V$                                                                              |           |                   | 1    | $\mu A$        |
| $V_{(BR)CBO}$<br><i>Note: 1</i> | Collector-Base<br>Breakdown Voltage ( $I_E = 0$ )               | $I_C = 10\mu A$                                                                            | 120       |                   |      | V              |
| $V_{(BR)CEO}$<br><i>Note: 1</i> | Collector-Emitter Breakdown<br>Voltage ( $I_C = 0$ )            | $I_E = 1\text{ mA}$                                                                        | 120       |                   | 1    | V              |
| $V_{(BR)EBO}$<br><i>Note: 1</i> | Collector-Emitter Breakdown<br>Voltage ( $I_B = 0$ )            | $I_C = 10\text{ mA}$                                                                       | 120       |                   | 1    | V              |
| $V_{CE(sat)}$<br><i>Note: 1</i> | Collector-Emitter Saturation<br>Voltage                         | $I_C = 500\text{ mA}$ $I_B = 50\text{ mA}$                                                 |           |                   | 0.5  | V              |
| $V_{BE(sat)}$<br><i>Note: 1</i> | Base-Emitter Saturation Voltage                                 | $I_C = 500\text{ mA}$ $I_B = 50\text{ mA}$                                                 |           |                   | 1.2  | V              |
| $h_{FE}$<br><i>Note: 1</i>      | DC Current Gain                                                 | $I_C = 100\text{ mA}$ $V_{CE} = 5\text{ V}$<br>$I_C = 500\text{ mA}$ $V_{CE} = 5\text{ V}$ | 120<br>50 |                   | 280  |                |
| $C_{CBO}$                       | Collector-Base Capacitance<br>( $I_B = 0$ )                     | $V_{CB} = 10\text{ V}$ $f=1\text{MHz}$                                                     |           | 40                |      | pF             |
| $t_{on}$<br>$t_{off}$<br>$t_s$  | INDUCTIVE LOAD<br>Turn-On Time<br>Turn-Off Time<br>Storage Time | $I_C = 500\text{ mA}$ $V_{CC} = 12V$<br>$I_{B1} = -I_{B2} = 50\text{ mA}$ $t_p = 20\mu s$  |           | 100<br>500<br>800 |      | ns<br>ns<br>ns |

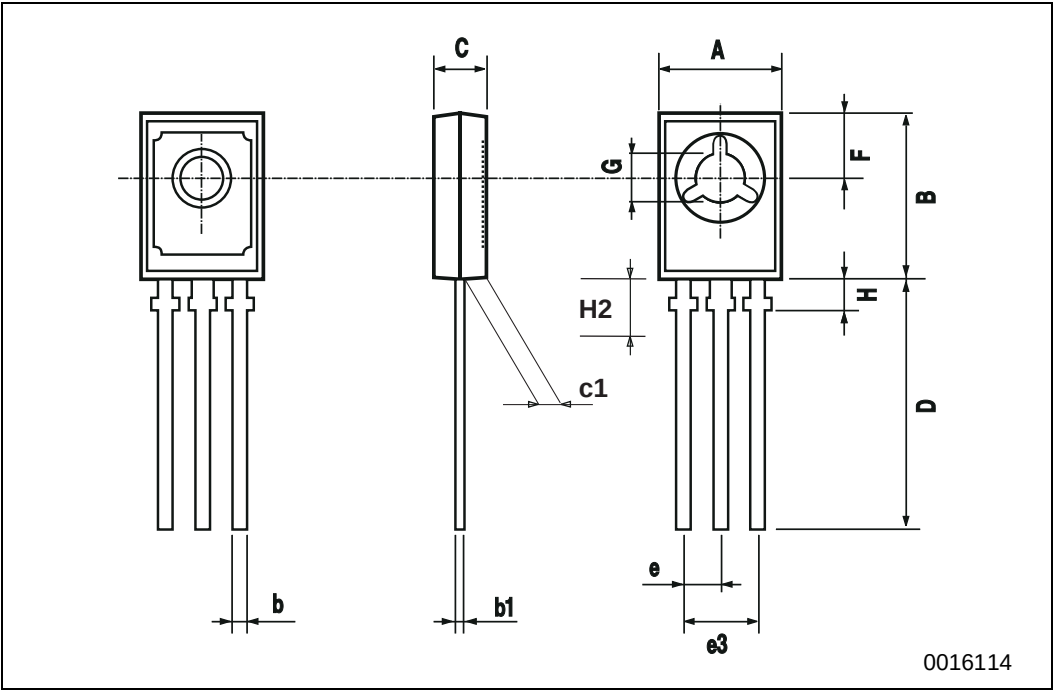
*Note: 1 Pulsed duration = 300  $\mu s$ , duty cycle  $\leq 1.5\%$ .*

### 3 Package Mechanical Data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: [www.st.com](http://www.st.com)

SOT-32 (TO-126) MECHANICAL DATA

| DIM. | mm   |      |      | inch  |       |       |
|------|------|------|------|-------|-------|-------|
|      | MIN. | TYP. | MAX. | MIN.  | TYP.  | MAX.  |
| A    | 7.4  |      | 7.8  | 0.291 |       | 0.307 |
| B    | 10.5 |      | 10.8 | 0.413 |       | 0.445 |
| b    | 0.7  |      | 0.9  | 0.028 |       | 0.035 |
| b1   | 0.49 |      | 0.75 | 0.019 |       | 0.030 |
| C    | 2.4  |      | 2.7  | 0.040 |       | 0.106 |
| c1   | 1.0  |      | 1.3  | 0.039 |       | 0.050 |
| D    | 15.4 |      | 16.0 | 0.606 |       | 0.629 |
| e    |      | 2.2  |      |       | 0.087 |       |
| e3   | 4.15 |      | 4.65 | 0.163 |       | 0.183 |
| F    |      | 3.8  |      |       | 0.150 |       |
| G    | 3    |      | 3.2  | 0.118 |       | 0.126 |
| H    |      |      | 2.54 |       |       | 0.100 |
| H2   |      | 2.15 |      |       | 0.084 |       |



## 4 Revision History

| Date        | Revision | Changes          |
|-------------|----------|------------------|
| 26-Jul-2005 | 1        | Initial release. |

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