



ST631K

LOW VOLTAGE PNP POWER TRANSISTOR

PRELIMINARY DATA

Features

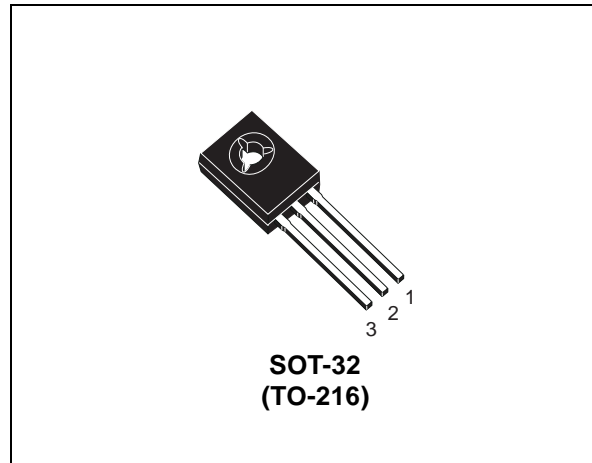
- LOW SATURATION VOLTAGE

Applications

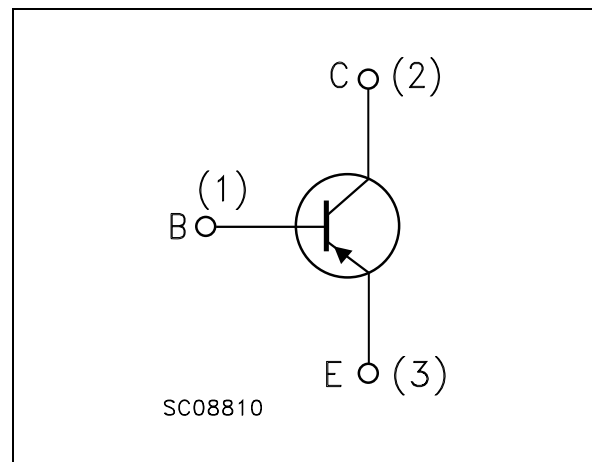
- SCANNING VELOCITY MODULATION IN CRT DISPLAYS
- MEDIUM POWER LINEAR AND SWITCHING APPLICATIONS

Description

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



Internal Schematic Diagram



Order Codes

| Part Number | Marking | Package | Packing |
|-------------|---------|---------|---------|
| ST600K | 631K | 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 ($I_E = 0$) | $V_{CB} = -50V$ | | | -1 | μA |
| I_{EBO} | Emitter Cut-off Current ($I_C = 0$) | $V_{EB} = -4V$ | | | -1 | μA |
| $V_{(BR)CBO}$ <i>Note: 1</i> | Collector-Base Breakdown Voltage ($I_E = 0$) | $I_C = -10\mu A$ | -120 | | | V |
| $V_{(BR)CEO}$ <i>Note: 1</i> | Collector-Emitter Breakdown Voltage ($I_C = 0$) | $I_E = -1\text{ mA}$ | -120 | | 1 | V |
| $V_{(BR)EBO}$ <i>Note: 1</i> | Collector-Emitter Breakdown Voltage ($I_B = 0$) | $I_C = -10\text{ mA}$ | -120 | | 1 | V |
| $V_{CE(sat)}$ <i>Note: 1</i> | Collector-Emitter Saturation Voltage | $I_C = -500\text{ mA}$ $I_B = -50\text{ mA}$ | | | -0.5 | V |
| $V_{BE(sat)}$ <i>Note: 1</i> | Base-Emitter Saturation Voltage | $I_C = -500\text{ mA}$ $I_B = -50\text{ mA}$ | | | -1.2 | V |
| h_{FE} <i>Note: 1</i> | DC Current Gain | $I_C = -100\text{ mA}$ $V_{CE} = -5\text{ V}$ $I_C = -500\text{ mA}$ $V_{CE} = -5\text{ V}$ | 120 50 | | 280 | |
| C_{CBO} | Collector-Base Capacitance ($I_B = 0$) | $V_{CB} = -10\text{ V}$ $f=1\text{MHz}$ | | 40 | | pF |
| t_{on} t_{off} t_s | INDUCTIVE LOAD Turn-On Time Turn-Off Time Storage Time | $I_C = -500\text{ mA}$ $V_{CC} = -12V$ $I_{B1} = -I_{B2} = -50\text{ mA}$ $t_p = 20\mu s$ | | 100 500 800 | | ns ns ns |

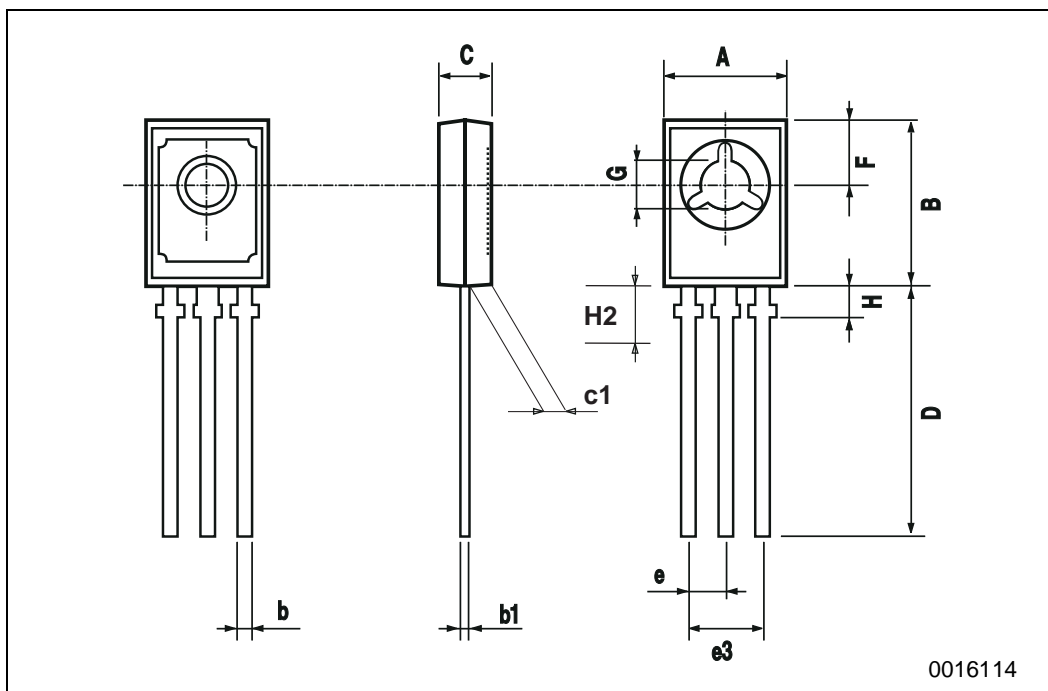
Note: 1 Pulsed duration = 300 μs , duty cycle $\leq 1.5\%$.

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

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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