



STN888

HIGH CURRENT, HIGH PERFORMANCE, LOW VOLTAGE PNP TRANSISTOR

Features

- VERY LOW COLLECTOR TO EMITTER SATURATION VOLTAGE
- D.C. CURRENT GAIN, $h_{FE} > 100$
- 5 A CONTINUOUS COLLECTOR CURRENT
- SOT-223 PLASTIC PACKAGE FOR SURFACE MOUNTING CIRCUITS
- AVAILABLE IN TAPE & REEL PACKING
- IN COMPLIANCE WITH THE 2002/93/EC EUROPEAN DIRECTIVE

Applications

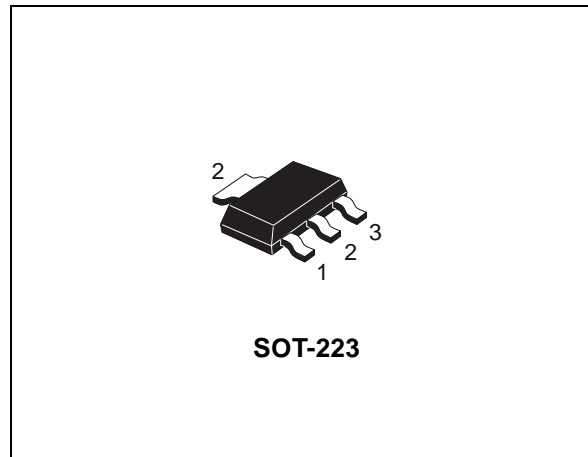
- POWER MANAGEMENT IN PORTABLE EQUIPMENT
- VOLTAGE REGULATION IN BIAS SUPPLY CIRCUITS
- SWITCHING REGULATOR IN BATTERY CHARGER APPLICATIONS
- HEAVY LOAD DRIVER

Description

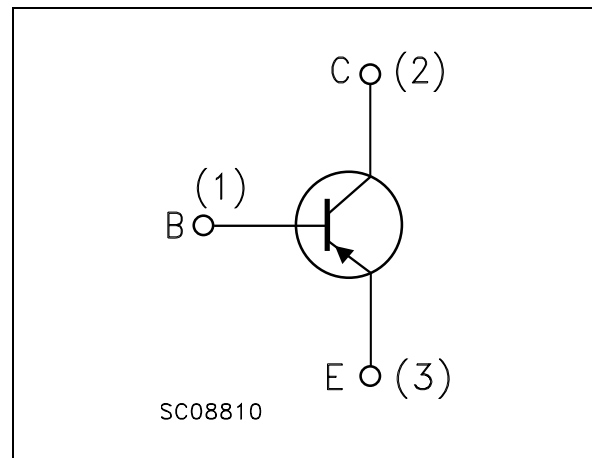
The device is manufactured in low voltage PNP Planar Technology by using a "Base Island" layout. The resulting transistor shows exceptional high gain performance coupled with very low saturation voltage.

Order Codes

| Part Number | Marking | Package | Packing |
|-------------|---------|---------|-------------|
| STN888 | N888 | SOT-223 | Tape & Reel |



Internal Schematic Diagram



1 Absolute Maximum Ratings

Table 1. Absolute Maximum Rating

| Symbol | Parameter | Value | Unit |
|-----------|---|------------|------------------|
| V_{CBO} | Collector-Base Voltage ($I_E = 0$) | -45 | V |
| V_{CEO} | Collector-Emitter Voltage ($I_B = 0$) | -30 | V |
| V_{EBO} | Emitter-Base Voltage ($I_C = 0$) | -6 | V |
| I_C | Collector Current | -5 | A |
| I_{CM} | Collector Peak Current ($t_P < 5\text{ms}$) | -10 | A |
| P_{TOT} | Total dissipation at $T_C = 25^\circ\text{C}$ | 1.6 | W |
| T_{stg} | Storage Temperature | -65 to 150 | $^\circ\text{C}$ |
| T_J | Max. Operating Junction Temperature | 150 | $^\circ\text{C}$ |

Table 2. Thermal Data

| Symbol | Parameter | Value | Unit |
|---------------|-------------------------------------|--------|---------------------------|
| $R_{thj-amb}$ | Thermal Resistance Junction-Ambient | Max 78 | $^\circ\text{C}/\text{W}$ |

2 Electrical Characteristics

($T_{CASE} = 25^{\circ}C$; unless otherwise specified)

Table 3. Electrical Characteristics

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|----------------------------------|--|---|------|------|-------|---------|
| I_{CBO} | Collector Cut-off Current ($I_E = 0$) | $V_{CB} = -30V$ | | | -10 | μA |
| | | $V_{CB} = -30V$ $T_C = 100^{\circ}C$ | | | -100 | μA |
| I_{EBO} | Emitter Cut-off Current ($I_C = 0$) | $V_{EB} = -6V$ | | | -10 | μA |
| $V_{(BR)CEO}$ <i>Note: 1</i> | Collector-Emitter Breakdown Voltage ($I_B = 0$) | $I_C = -10mA$ | -30 | | | V |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage ($I_E = 0$) | $I_C = -100\mu A$ | -45 | | | V |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage ($I_C = 0$) | $I_E = -100\mu A$ | -6 | | | V |
| $V_{CE(sat)}$ <i>Note: 1</i> | Collector-Emitter Saturation Voltage | $I_C = -500mA$ $I_B = -5mA$ | | | -0.15 | V |
| | | $I_C = -2A$ $I_B = -50mA$ | | | -0.35 | V |
| | | $I_C = -5A$ $I_B = -250mA$ | | | -0.70 | V |
| | | $I_C = -6A$ $I_B = -250mA$ | | -0.7 | | V |
| | | $I_C = -8A$ $I_B = -400mA$ | | -1.0 | | V |
| | | $I_C = -10A$ $I_B = -500mA$ | | -1.2 | | V |
| $V_{BE(sat)}$ <i>Note: 1</i> | Base-Emitter Saturation Voltage | $I_C = -2A$ $I_B = -50mA$ | | | -1.1 | V |
| | | $I_C = -6A$ $I_B = -250mA$ | | -1.2 | | V |
| h_{FE} <i>Note: 1</i> | DC Current Gain | $I_C = -10mA$ $V_{CE} = -1V$ | 120 | 200 | | |
| | | $I_C = -500mA$ $V_{CE} = -1V$ | 100 | 200 | 300 | |
| | | $I_C = -5A$ $V_{CE} = -1V$ | 70 | 100 | | |
| | | $I_C = -5A$ $V_{CE} = -1V$ $t_j = 100^{\circ}C$ | | 100 | | |
| | | $I_C = -8A$ $V_{CE} = -1V$ | | 55 | | |
| | | $I_C = -10A$ $V_{CE} = -1V$ | | 35 | | |
| t_d t_r t_s t_f | INDUCTIVE LOAD Delay Time Rise Time Storage Time Fall Time | $I_C = -3A$ $V_{CC} = -20V$ $I_{B1} = -I_{B2} = -60mA$ (see Figure 7) | | | | |
| | | | | 180 | 220 | ns |
| | | | | 160 | 210 | ns |
| | | | | 250 | 300 | ns |
| | | | 80 | 100 | ns | |

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

2.1 Typical Characteristics

Figure 1. DC Current Gain

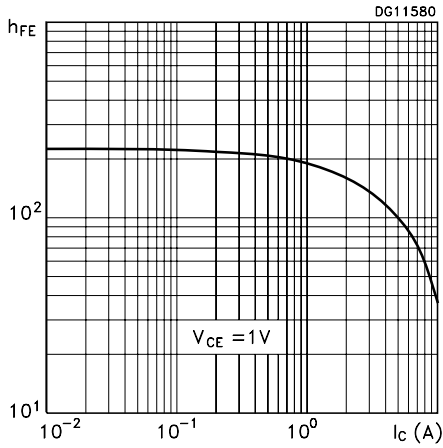


Figure 2. DC Current Gain

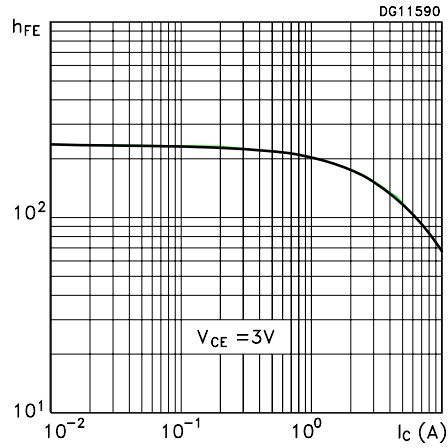


Figure 3. Collector-Emitter Saturation Voltage Figure 4. Base-Emitter Saturation Voltage

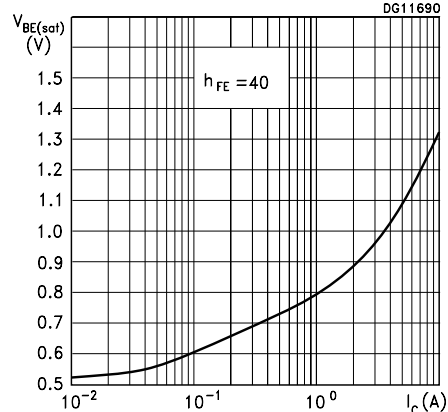
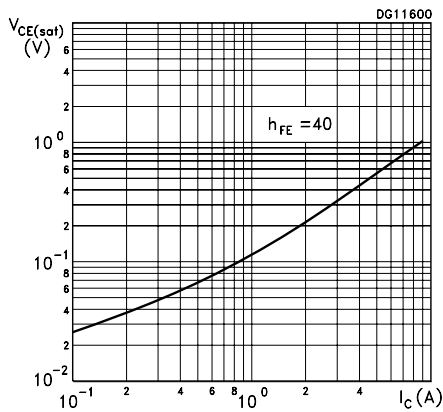


Figure 5. Switching Times Resistive Load

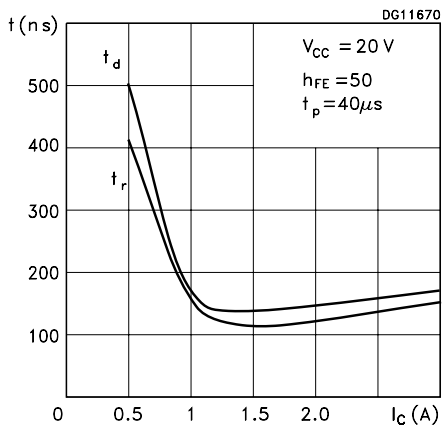
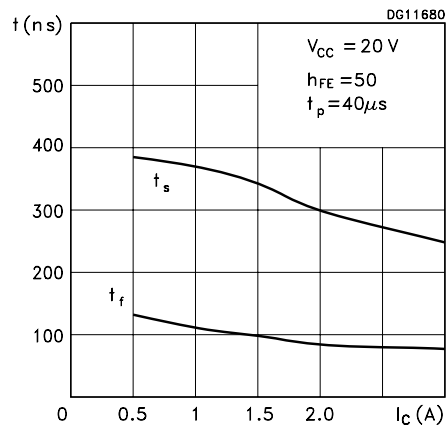
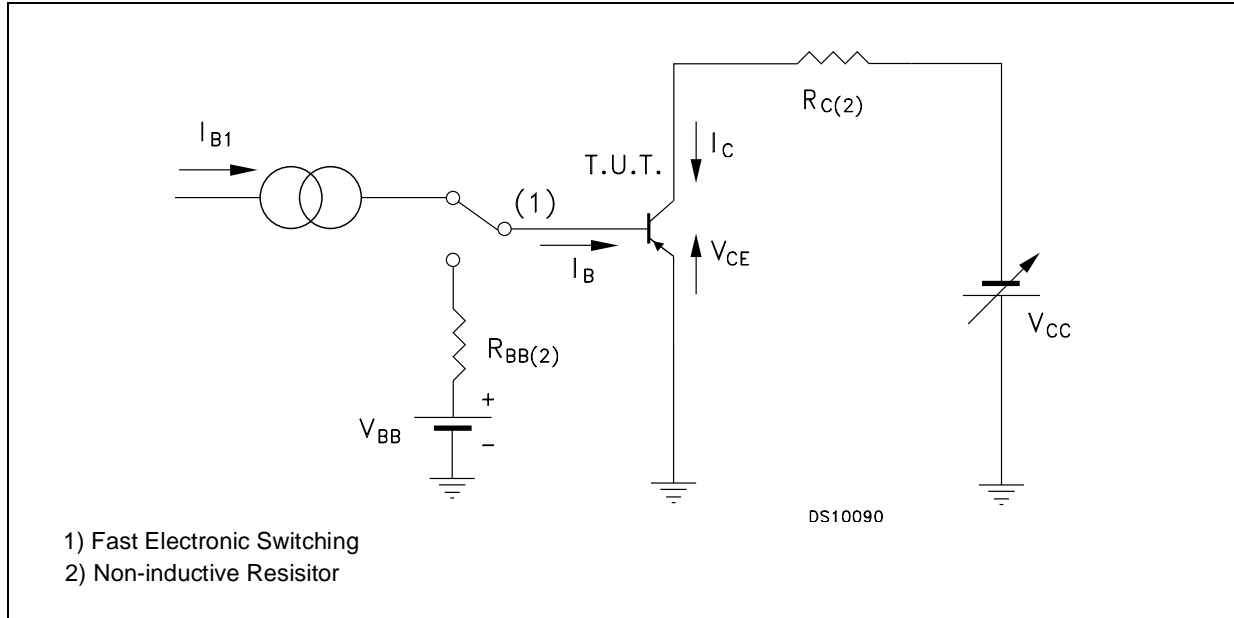


Figure 6. Switching Times Resistive Load



3 Test Circuits

Figure 7. Resistive Load Switching Test Circuit

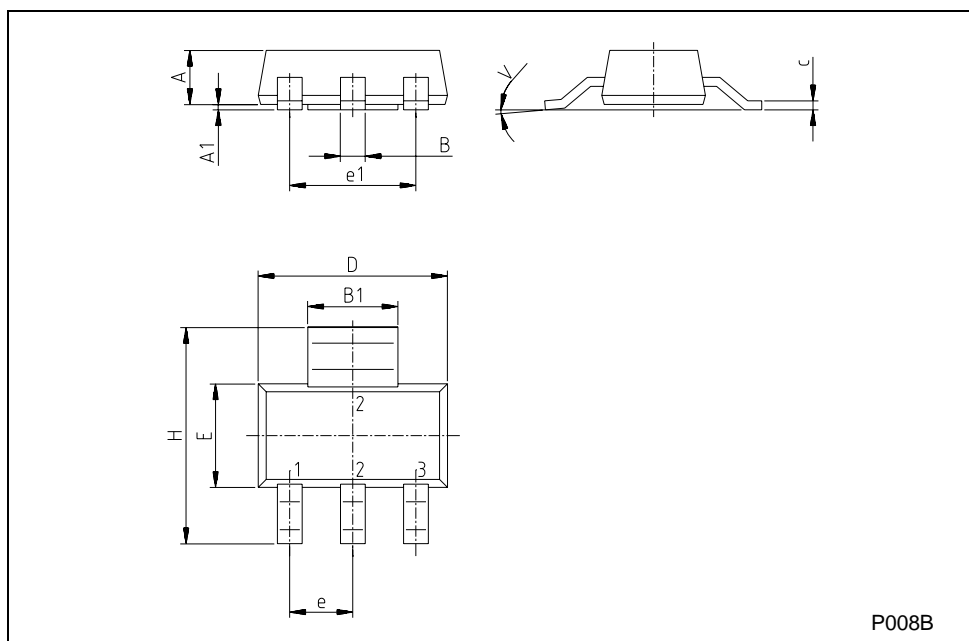


4 Package Mechanical Data

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-223 MECHANICAL DATA

| DIM. | mm | | | inch | | |
|------|------|------|------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | | | 1.80 | | | 0.071 |
| B | 0.60 | 0.70 | 0.80 | 0.024 | 0.027 | 0.031 |
| B1 | 2.90 | 3.00 | 3.10 | 0.114 | 0.118 | 0.122 |
| c | 0.24 | 0.26 | 0.32 | 0.009 | 0.010 | 0.013 |
| D | 6.30 | 6.50 | 6.70 | 0.248 | 0.256 | 0.264 |
| e | | 2.30 | | | 0.090 | |
| e1 | | 4.60 | | | 0.181 | |
| E | 3.30 | 3.50 | 3.70 | 0.130 | 0.138 | 0.146 |
| H | 6.70 | 7.00 | 7.30 | 0.264 | 0.276 | 0.287 |
| V | | | 10° | | | 10° |
| A1 | | 0.02 | | | | |



5 Revision History

| Date | Revision | Changes |
|-------------|----------|------------------|
| 03-Aug-2005 | 1 | Initial release. |

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