



## STN749

### MEDIUM CURRENT, HIGH PERFORMANCE, LOW VOLTAGE PNP TRANSISTOR

| Ordering Code | Marking |
|---------------|---------|
| STN749        | N749    |

- VERY LOW COLLECTOR TO EMITTER SATURATION VOLTAGE
- DC CURRENT GAIN,  $h_{FE} > 100$
- 3 A CONTINUOUS COLLECTOR CURRENT
- SOT-223 PLASTIC PACKAGE FOR SURFACE MOUNTING CIRCUITS
- AVAILABLE IN TAPE AND REEL PACKING

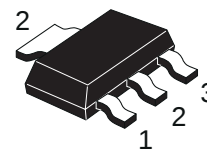
#### APPLICATIONS

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

#### DESCRIPTION

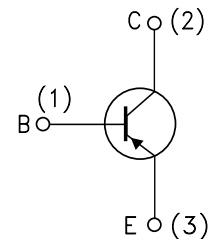
The device is manufactured in low voltage PNP Planar Technology by using a "Base Island" layout.

The resulting Transistor shows exceptional high gain performance coupled with very low saturation voltage.



SOT-223

#### INTERNAL SCHEMATIC DIAGRAM



SC08810

#### ABSOLUTE MAXIMUM RATINGS

| Symbol    | Parameter                               | Value      | Unit |
|-----------|-----------------------------------------|------------|------|
| $V_{CBO}$ | Collector-Base Voltage ( $I_E = 0$ )    | -35        | V    |
| $V_{CEO}$ | Collector-Emitter Voltage ( $I_B = 0$ ) | -25        | V    |
| $V_{EBO}$ | Emitter-Base Voltage ( $I_C = 0$ )      | -5         | V    |
| $I_C$     | Collector Current                       | -3         | A    |
| $I_{CM}$  | Collector Peak Current ( $t_p < 5$ ms)  | -6         | A    |
| $P_{tot}$ | Total Dissipation at $T_{amb} = 25$ °C  | 1.6        | W    |
| $T_{stg}$ | Storage Temperature                     | -65 to 150 | °C   |
| $T_j$     | Max. Operating Junction Temperature     | 150        | °C   |

## THERMAL DATA

|                 |                                     |     |    |      |
|-----------------|-------------------------------------|-----|----|------|
| $R_{thj-amb}$ • | Thermal Resistance Junction-Ambient | Max | 78 | °C/W |
|-----------------|-------------------------------------|-----|----|------|

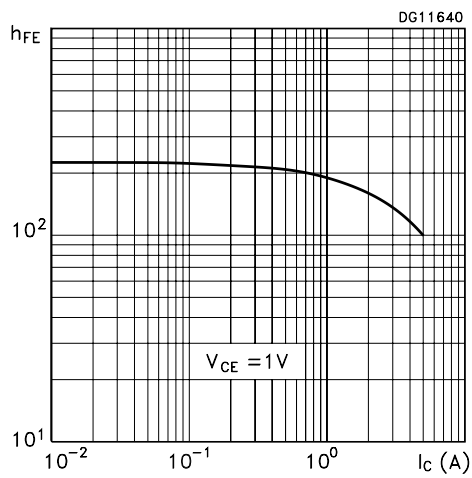
• Device mounted on a PCB area of 1 cm<sup>2</sup>.

ELECTRICAL CHARACTERISTICS ( $T_{case} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)

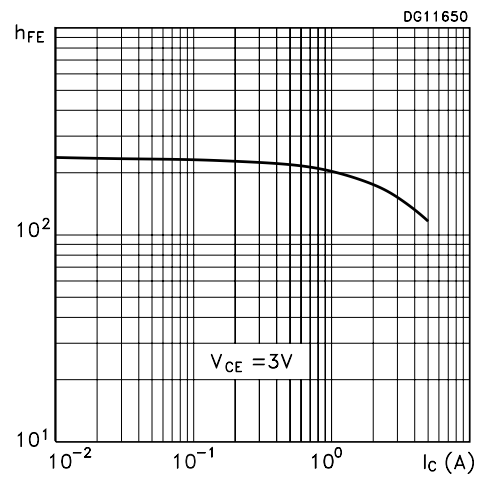
| Symbol          | Parameter                                         | Test Conditions                                                                                                                                                                        | Min.                  | Typ. | Max.         | Unit                |
|-----------------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------|--------------|---------------------|
| $I_{CBO}$       | Collector Cut-off Current ( $I_E = 0$ )           | $V_{CB} = -30\text{ V}$<br>$V_{CB} = -30\text{ V}$ $T_j = 100\text{ }^{\circ}\text{C}$                                                                                                 |                       |      | -100<br>-10  | nA<br>$\mu\text{A}$ |
| $I_{EBO}$       | Emitter Cut-off Current ( $I_C = 0$ )             | $V_{EB} = -4\text{ V}$                                                                                                                                                                 |                       |      | -100         | nA                  |
| $V_{(BR)CEO}^*$ | Collector-Emitter Breakdown Voltage ( $I_B = 0$ ) | $I_C = -10\text{ mA}$                                                                                                                                                                  | -25                   |      |              | V                   |
| $V_{(BR)CBO}$   | Collector-Base Breakdown Voltage ( $I_E = 0$ )    | $I_C = -100\text{ }\mu\text{A}$                                                                                                                                                        | -35                   |      |              | V                   |
| $V_{(BR)EBO}$   | Emitter-Base Breakdown Voltage ( $I_C = 0$ )      | $I_E = -100\text{ }\mu\text{A}$                                                                                                                                                        | -5                    |      |              | V                   |
| $V_{CE(sat)}^*$ | Collector-Emitter Saturation Voltage              | $I_C = -1\text{ A}$ $I_B = -100\text{ mA}$<br>$I_C = -3\text{ A}$ $I_B = -300\text{ mA}$                                                                                               |                       |      | -0.3<br>-0.6 | V<br>V              |
| $V_{BE(sat)}^*$ | Base-Emitter Saturation Voltage                   | $I_C = -1\text{ A}$ $I_B = -100\text{ mA}$                                                                                                                                             |                       |      | -1.25        | V                   |
| $V_{BE(on)}$    | Base-Emitter Turn-On Voltage                      | $I_C = -1\text{ A}$ $V_{CE} = -2\text{ V}$                                                                                                                                             |                       |      | -1           | V                   |
| $h_{FE}^*$      | DC Current Gain                                   | $I_C = -50\text{ mA}$ $V_{CE} = -2\text{ V}$<br>$I_C = -1\text{ A}$ $V_{CE} = -2\text{ V}$<br>$I_C = -2\text{ A}$ $V_{CE} = -2\text{ V}$<br>$I_C = -6\text{ A}$ $V_{CE} = -2\text{ V}$ | 70<br>100<br>75<br>15 |      | 300          |                     |

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

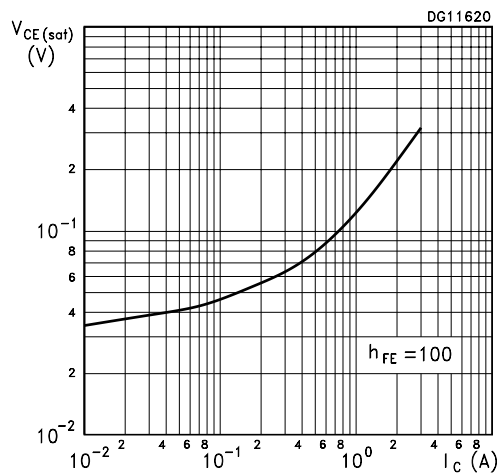
DC Current Gain



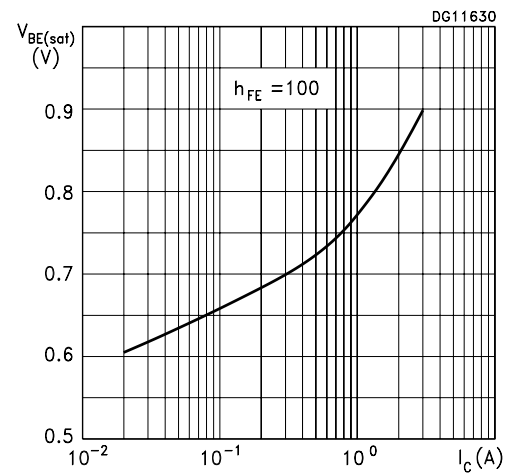
DC Current Gain



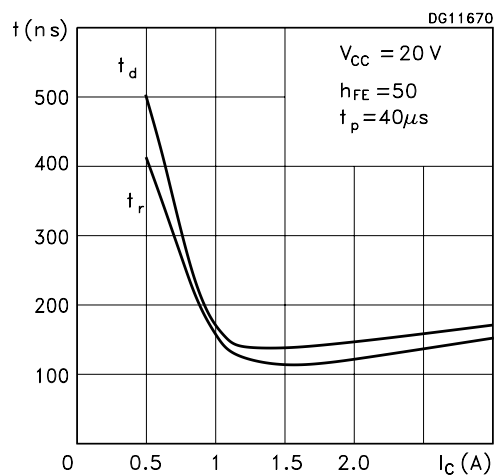
Collector-Emitter Saturation Voltage



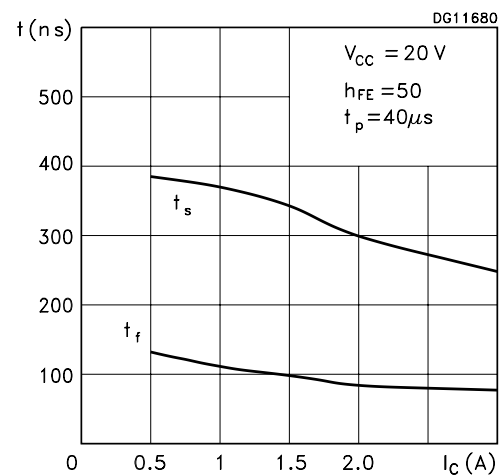
Base-Emitter Saturation Voltage

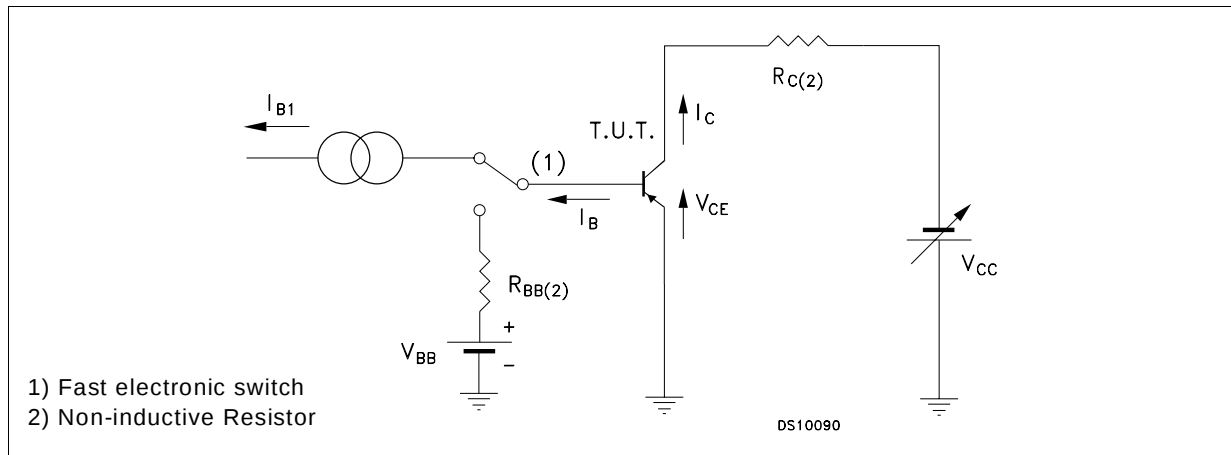


Switching Times Resistive Load



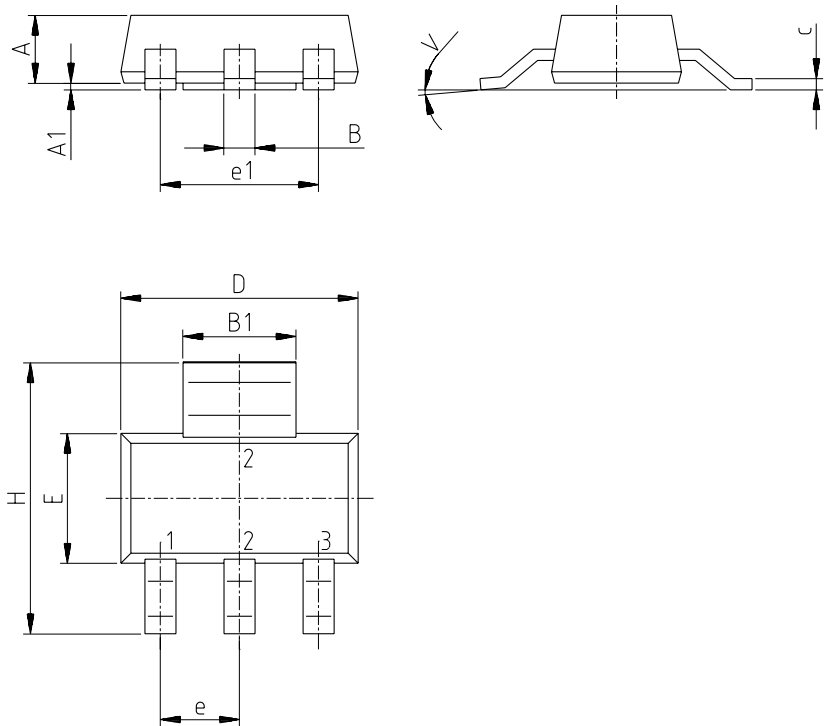
Switching Times Resistive Load



**Figure 1:** Resistive Load Switching Test Circuit.

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 |      |       |       |       |



P008B

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