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1 Electrical ratings

Table 2. Absolute maximum rating

| Symbol | Parameter | Value | Unit |
|-----------|--|---------------|------------------|
| V_{CES} | Collector-emitter voltage ($V_{BE} = 0$) | 1050 | V |
| V_{CEO} | Collector-emitter voltage ($I_B = 0$) | 400 | V |
| V_{EBO} | Emitter-base voltage ($I_C = 0$, $I_B = 2$ A, $t_p < 10$ ms) | $V_{(BR)EBO}$ | V |
| I_C | Collector current | 4 | A |
| I_{CM} | Collector peak current ($t_p < 5$ ms) | 8 | A |
| I_B | Base current | 2 | A |
| I_{BM} | Base peak current ($t_p < 5$ ms) | 4 | A |
| P_{tot} | Total dissipation at $T_C = 25^\circ\text{C}$ | 45 | 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

| Symbol | Parameter | Value | Unit |
|----------------|---------------------------------------|-------|--------------------|
| $R_{thj-case}$ | Thermal resistance junction - case | 2.78 | $^\circ\text{C/W}$ |
| $R_{thj-amb}$ | Thermal resistance junction - ambient | 73 | $^\circ\text{C/W}$ |

2 Electrical characteristics

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

Table 4. Electrical characteristics

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|----------------------|--|--|------|------|------|---------------|
| I_{CES} | Collector cut-off current ($V_{BE} = 0$) | $V_{CE} = 1050\text{ V}$ | | 0.2 | 10 | μA |
| I_{CEO} | Collector cut-off current ($I_B = 0$) | $V_{CE} = 400\text{ V}$ | | 10 | 250 | μA |
| $V_{(BR)EBO}$ | Emitter base breakdown voltage ($I_C = 0$) | $I_E = 1\text{ mA}$ | 15 | 19 | 24 | V |
| $V_{CEO(sus)}^{(1)}$ | Collector-emitter sustaining voltage ($I_B = 0$) | $I_C = 10\text{ mA}$ | 400 | 450 | | V |
| $V_{CE(sat)}^{(1)}$ | Collector-emitter saturation voltage | $I_C = 1\text{ A}$ $I_B = 0.2\text{ A}$ | | 0.15 | 0.5 | V |
| | | $I_C = 3.5\text{ A}$ $I_B = 1\text{ A}$ | | 0.6 | 1.5 | V |
| $V_{BE(sat)}^{(1)}$ | Base-emitter saturation voltage | $I_C = 3.5\text{ A}$ $I_B = 1\text{ A}$ | | 1.1 | 1.5 | V |
| $h_{FE}^{(1)}$ | DC current gain | $I_C = 0.1\text{ A}$ $V_{CE} = 5\text{ V}$ | 48 | 75 | 100 | |
| | | $I_C = 0.8\text{ A}$ $V_{CE} = 3\text{ V}$ | 25 | 35 | 50 | |
| t_s t_f | Resistive load | $I_C = 2\text{ A}$ $V_{CC} = 125\text{ V}$ | | | | |
| | Storage time | $I_{B1} = -I_{B2} = 400\text{ mA}$ | | 2.4 | 3.5 | μs |
| | Fall time | $t_p = 300\text{ }\mu\text{s}$ $V_{BE(off)} = -5\text{ V}$ | | 350 | 500 | ns |
| E_{ar} | Repetitive avalanche energy | $L = 2\text{ mH}$ $C = 1.8\text{ nF}$ $V_{BE(off)} = -5\text{ V}$ | 6 | | | mJ |

1. Pulsed duration = 300 ms, duty cycle $\leq 1.5\%$

2.1 Electrical characteristics (curves)

Figure 2. Safe operating area

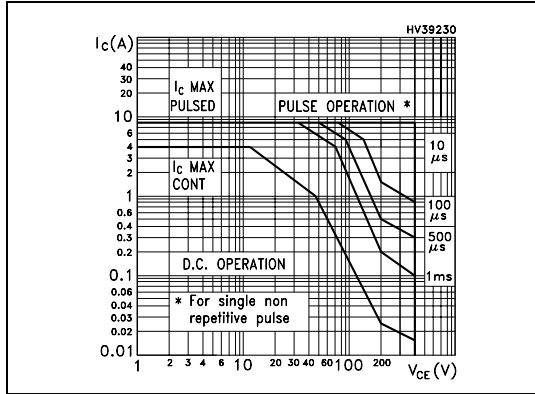


Figure 3. Derating curve

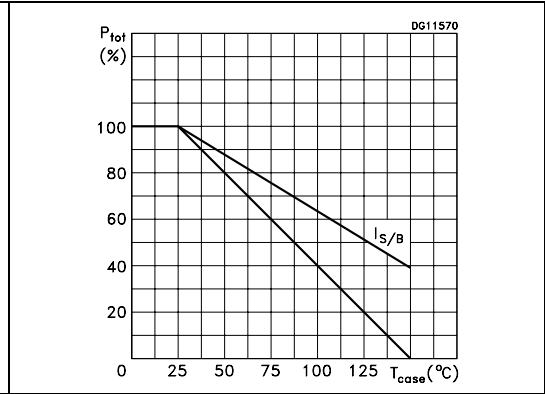


Figure 4. Output characteristics

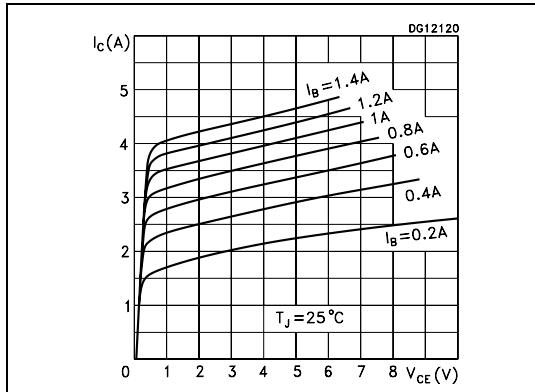


Figure 5. DC current gain

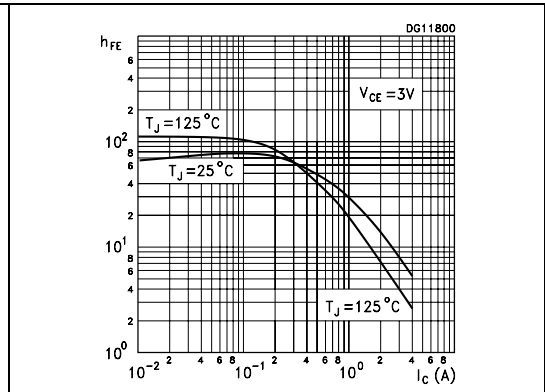


Figure 6. DC current gain

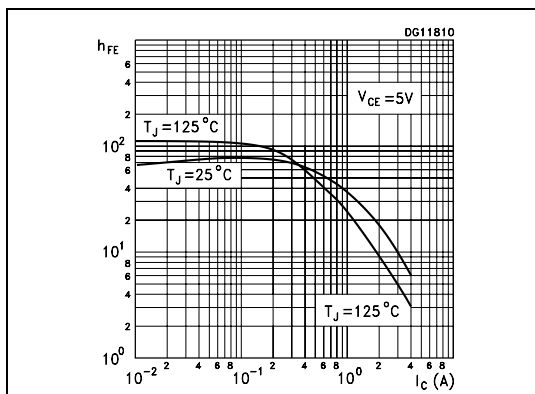


Figure 7. Collector - emitter saturation voltage

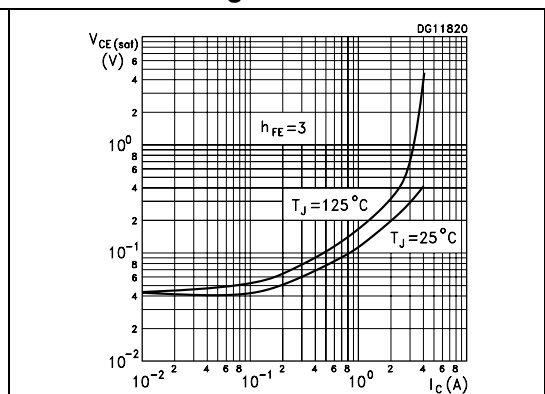


Figure 8. Base-emitter saturation voltage

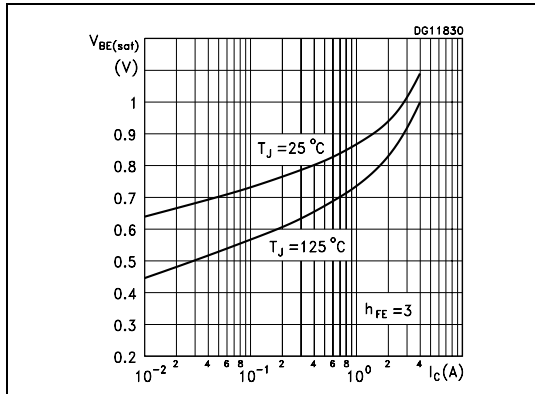


Figure 9. Resistive load switching on times ($h_{FE} = 5$)

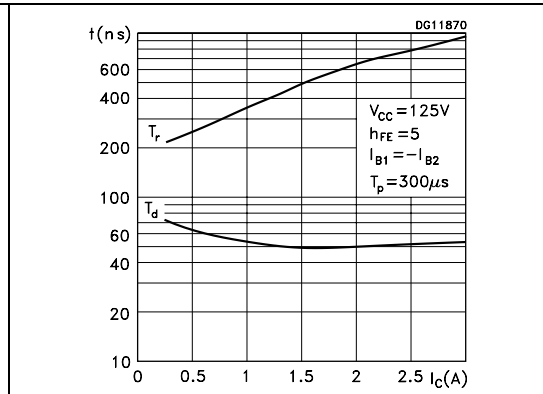


Figure 10. Resistive load switching off times ($h_{FE} = 5$)

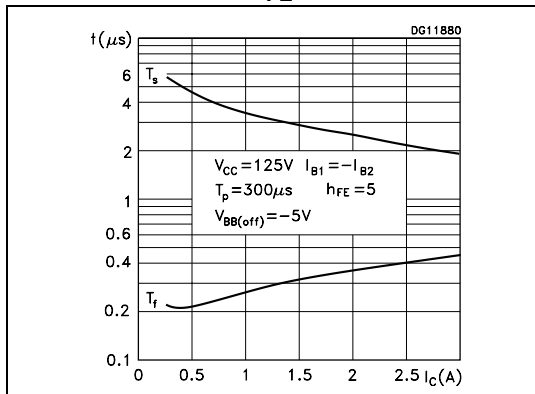


Figure 11. Resistive load switching on times ($h_{FE} = 10$)

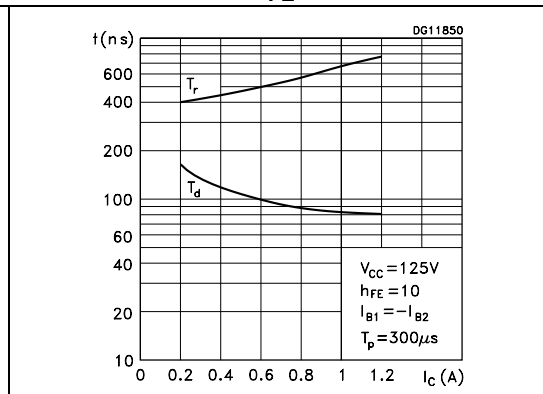


Figure 12. Resistive load switching off times ($h_{FE} = 10$)

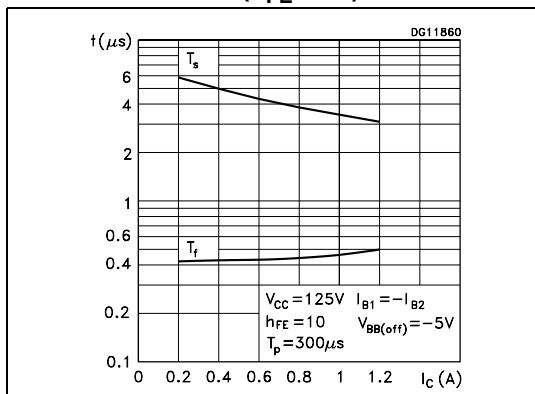
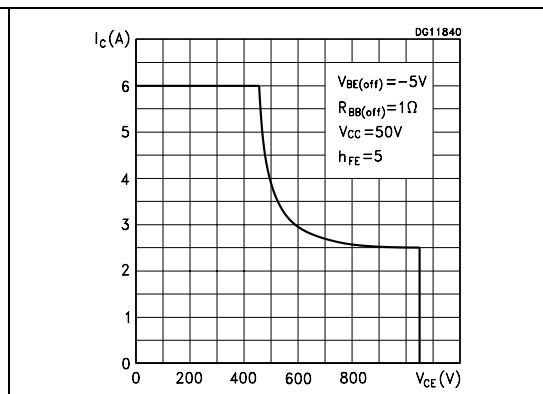


Figure 13. Reverse biased SOA



3 Test circuit

Figure 14. Energy rating test circuit

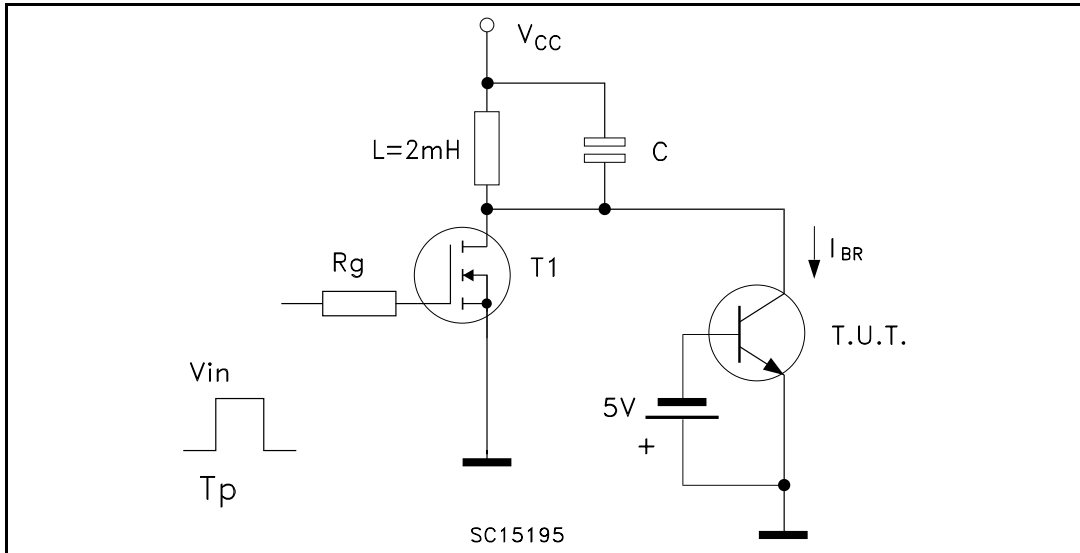
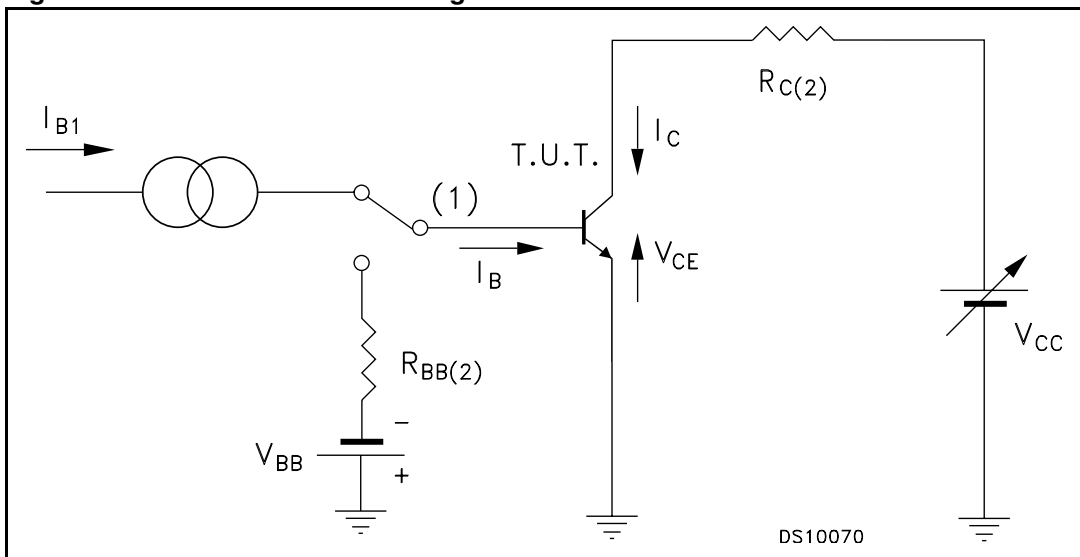


Figure 15. Resistive load switching test circuit

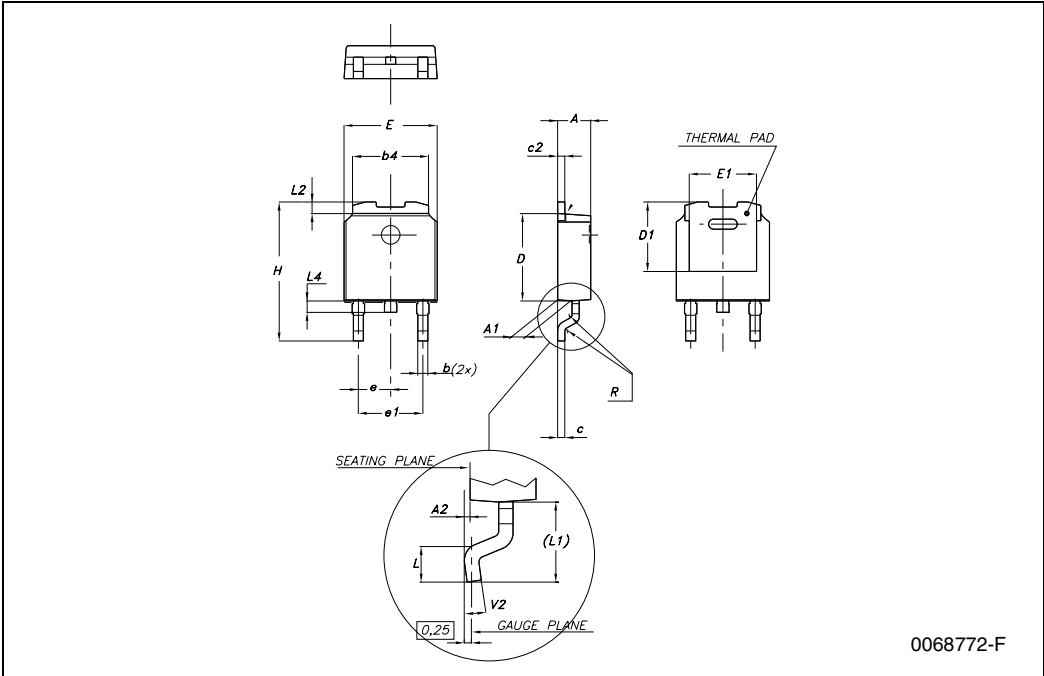


4 Package mechanical data

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

DPAK MECHANICAL DATA

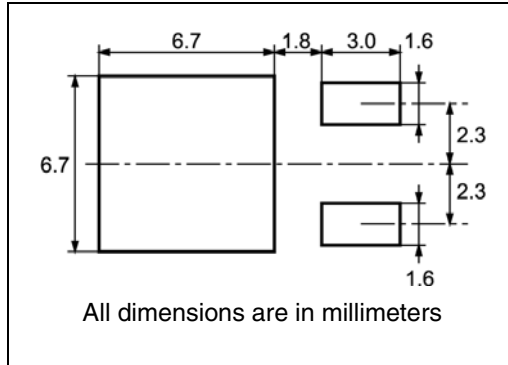
| DIM. | mm. | | | inch | | |
|------|------|------|------|-------|-------|-------|
| | MIN. | TYP | MAX. | MIN. | TYP. | MAX. |
| A | 2.2 | | 2.4 | 0.086 | | 0.094 |
| A1 | 0.9 | | 1.1 | 0.035 | | 0.043 |
| A2 | 0.03 | | 0.23 | 0.001 | | 0.009 |
| B | 0.64 | | 0.9 | 0.025 | | 0.035 |
| b4 | 5.2 | | 5.4 | 0.204 | | 0.212 |
| C | 0.45 | | 0.6 | 0.017 | | 0.023 |
| C2 | 0.48 | | 0.6 | 0.019 | | 0.023 |
| D | 6 | | 6.2 | 0.236 | | 0.244 |
| D1 | | 5.1 | | | 0.200 | |
| E | 6.4 | | 6.6 | 0.252 | | 0.260 |
| E1 | | 4.7 | | | 0.185 | |
| e | | 2.28 | | | 0.090 | |
| e1 | 4.4 | | 4.6 | 0.173 | | 0.181 |
| H | 9.35 | | 10.1 | 0.368 | | 0.397 |
| L | 1 | | | 0.039 | | |
| (L1) | | 2.8 | | | 0.110 | |
| L2 | | 0.8 | | | 0.031 | |
| L4 | 0.6 | | 1 | 0.023 | | 0.039 |
| R | | 0.2 | | | 0.008 | |
| V2 | 0° | | 8° | 0° | | 8° |



0068772-F

5 Packaging mechanical data

DPAK FOOTPRINT



TAPE AND REEL SHIPMENT

| DIM. | mm | | inch | |
|------|------|------|-------|--------|
| | MIN. | MAX. | MIN. | MAX. |
| A | | 330 | | 12.992 |
| B | 1.5 | | 0.059 | |
| C | 12.8 | 13.2 | 0.504 | 0.520 |
| D | 20.2 | | 0.795 | |
| G | 16.4 | 18.4 | 0.645 | 0.724 |
| N | 50 | | 1.968 | |
| T | | 22.4 | | 0.881 |

| DIM. | mm | | inch | |
|------|------|------|-------|-------|
| | MIN. | MAX. | MIN. | MAX. |
| A0 | 6.8 | 7 | 0.267 | 0.275 |
| B0 | 10.4 | 10.6 | 0.409 | 0.417 |
| B1 | | 12.1 | | 0.476 |
| D | 1.5 | 1.6 | 0.059 | 0.063 |
| D1 | 1.5 | | 0.059 | |
| E | 1.65 | 1.85 | 0.065 | 0.073 |
| F | 7.4 | 7.6 | 0.291 | 0.299 |
| K0 | 2.55 | 2.75 | 0.100 | 0.108 |
| P0 | 3.9 | 4.1 | 0.153 | 0.161 |
| P1 | 7.9 | 8.1 | 0.311 | 0.319 |
| P2 | 1.9 | 2.1 | 0.075 | 0.082 |
| R | 40 | | 1.574 | |
| W | 15.7 | 16.3 | 0.618 | 0.641 |

| BASE QTY | BULK QTY |
|----------|----------|
| 2500 | 2500 |

6 Revision history

Table 5. Document revision history

| Date | Revision | Changes |
|-------------|----------|----------------|
| 09-Aug-2007 | 1 | First release. |

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