

NPN power transistors

Features

- NPN transistors

Applications

- Linear and switching industrial equipment

Description

The devices are manufactured in Planar technology with “Base Island” layout. The resulting transistor shows exceptional high gain performance coupled with very low saturation voltage. The PNP type of 2N5192 is 2N5195.

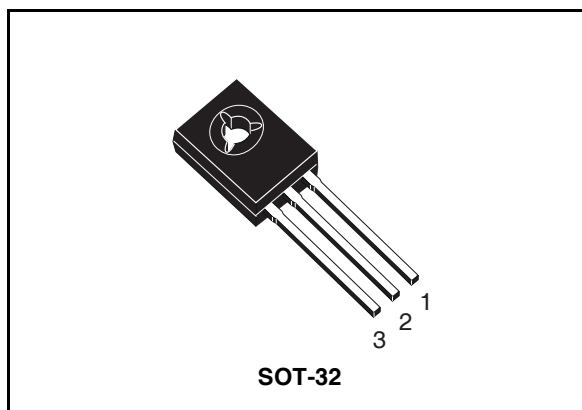


Figure 1. Internal schematic diagram

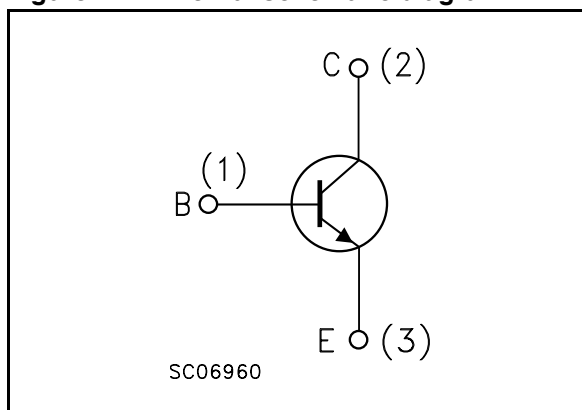


Table 1. Devices summary

| Order code | Marking | Package | Packaging |
|------------|---------|---------|-----------|
| 2N5191 | 2N5191 | SOT-32 | Tube |
| 2N5192 | 2N5192 | SOT-32 | Tube |

1 Electrical ratings

Table 2. Absolute maximum rating

| Symbol | Parameter | Value | | Unit |
|-----------|--|------------|--------|------------------|
| | | 2N5191 | 2N5192 | |
| V_{CBO} | Collector-base voltage ($I_E = 0$) | 60 | 80 | V |
| V_{CEO} | Collector-base voltage ($I_B = 0$) | 60 | 80 | V |
| V_{EBO} | Emitter-base voltage ($I_C = 0$) | 5 | | V |
| I_C | Collector current | 4 | | A |
| I_{CM} | Collector peak current | 7 | | A |
| I_B | Base current | 1 | | A |
| P_{TOT} | Total dissipation at $T_{case} = 25^\circ\text{C}$ | 40 | | W |
| T_{stg} | Storage temperature | -65 to 150 | | $^\circ\text{C}$ |
| T_J | Max. operating junction temperature | 150 | | $^\circ\text{C}$ |

2 Electrical characteristics

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

Table 3. Electrical characteristics

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-----------------------------|---|--|---------------------|------|------------|----------|
| I_{CBO} | Collector cut-off current ($I_{\text{E}} = 0$) | $V_{\text{CB}} = \text{rated } V_{\text{CBO}}$ | | | 0.1 | mA |
| I_{CEX} | Collector cut-off current ($V_{\text{BE}} = -1.5\text{V}$) | $V_{\text{CE}} = \text{rated } V_{\text{CEO}}$ $V_{\text{CE}} = \text{rated } V_{\text{CEO}} \quad T_{\text{c}}=125^{\circ}\text{C}$ | | | 0.1 2 | mA mA |
| I_{CEO} | Collector cut-off current ($I_{\text{B}} = 0$) | $V_{\text{CE}} = \text{rated } V_{\text{CEO}}$ | | | 1 | mA |
| I_{EBO} | Emitter cut-off current ($I_{\text{C}} = 0$) | $V_{\text{EB}} = 5\text{V}$ | | | 1 | mA |
| $V_{\text{CEO(sus)}}^{(1)}$ | Collector-emitter sustaining voltage ($I_{\text{B}} = 0$) | $I_{\text{C}} = 100\text{mA}$ for 2N5191 for 2N5192 | 60 80 | | | V V |
| $V_{\text{CE(sat)}}^{(1)}$ | Collector-emitter saturation voltage | $I_{\text{C}} = 1.5\text{A} \quad I_{\text{B}} = 0.15\text{A}$ $I_{\text{C}} = 4\text{A} \quad I_{\text{B}} = 1\text{A}$ | | | 0.6 1.4 | V V |
| $V_{\text{BE}}^{(1)}$ | Base-emitter voltage | $I_{\text{C}} = 1.5\text{A} \quad V_{\text{CE}} = 2\text{V}$ | | | 1.2 | V |
| h_{FE} | DC current gain | $I_{\text{C}} = 1.5\text{A} \quad V_{\text{CE}} = 2\text{V}$ for 2N5191 for 2N5192 $I_{\text{C}} = 4\text{A} \quad V_{\text{CE}} = 2\text{V}$ for 2N5191 for 2N5192 | 25 20 10 7 | | 100 80 | |

Note (1) Pulsed duration = 300 μs , duty cycle $\leq 1.5\%$

2.1 Electrical characteristic (curves)

Figure 2. DC current gain

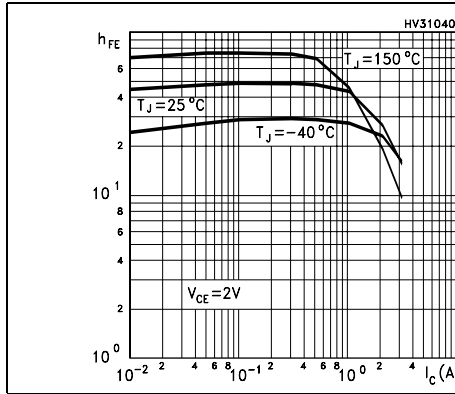


Figure 3. DC current gain

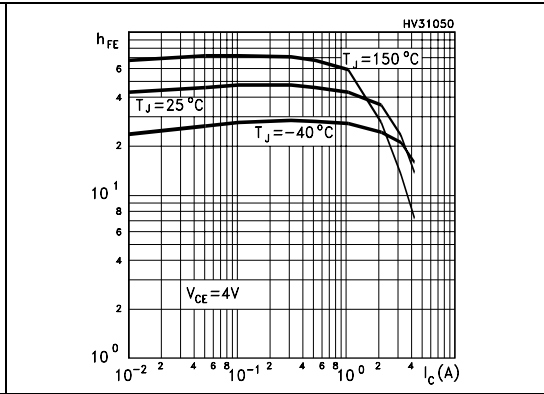


Figure 4. Collector-emitter saturation voltage

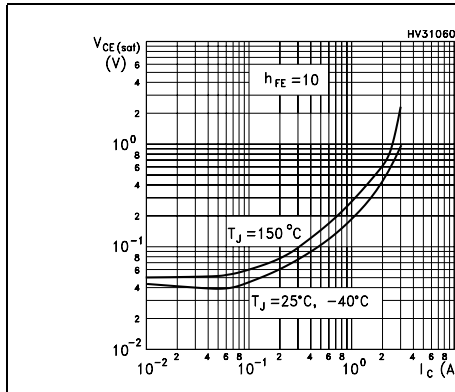


Figure 5. Base-emitter saturation voltage

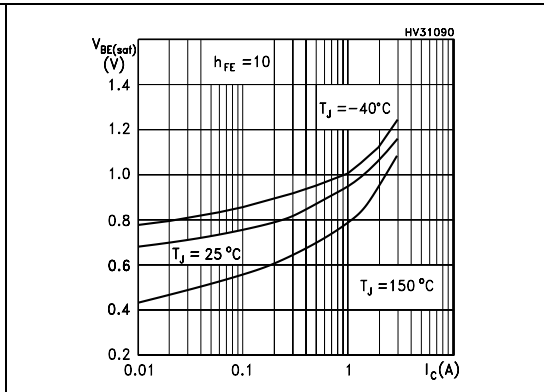


Figure 6. Base-emitter on voltage

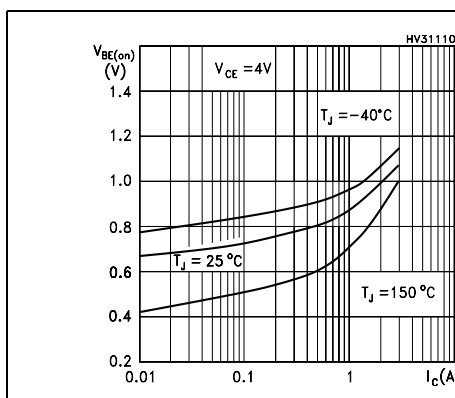


Figure 7. Resistive load switching time

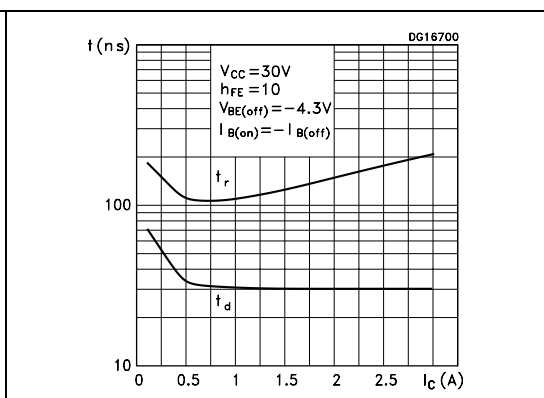
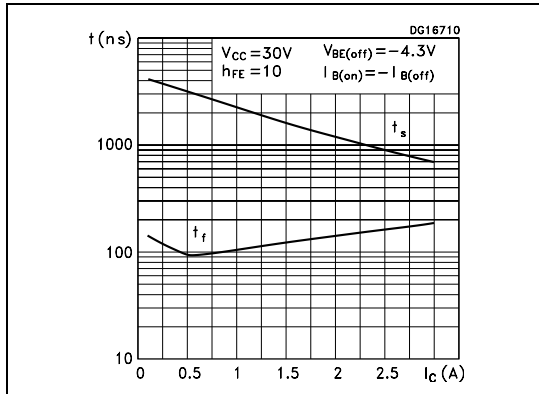
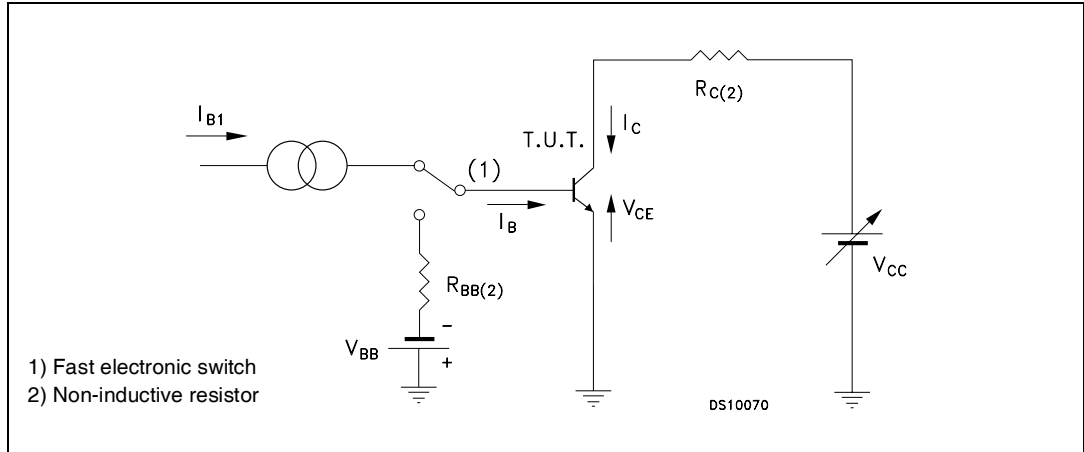


Figure 8. Resistive load switching time



2.2 Test circuit

Figure 9. Resistive load switching test circuit

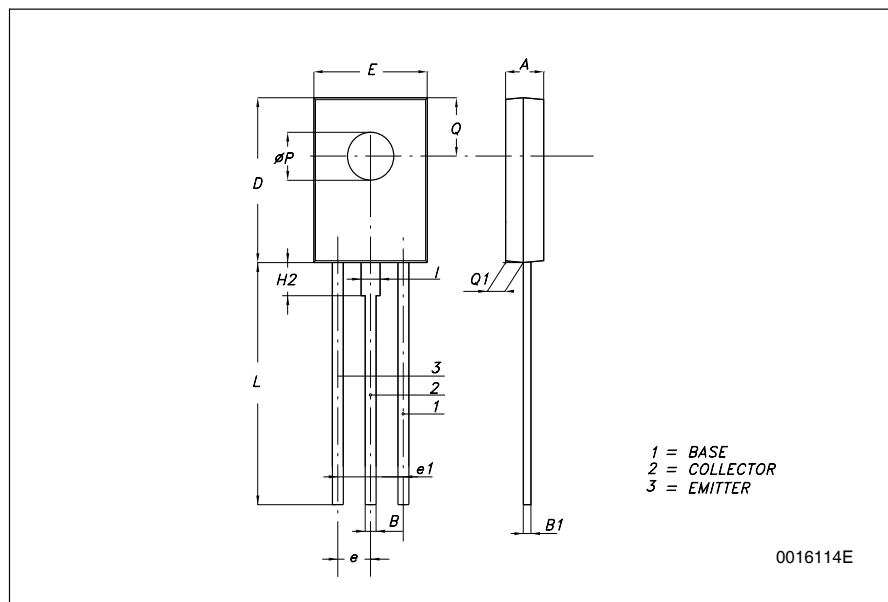


3 Package mechanical data

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. | | |
|------|------|------|-------|
| | MIN. | TYP | MAX. |
| A | 2.4 | | 2.9 |
| B | 0.64 | | 0.88 |
| B1 | 0.39 | | 0.63 |
| D | 10.5 | | 11.05 |
| E | 7.4 | | 7.8 |
| e | 2.04 | 2.29 | 2.54 |
| e1 | 4.07 | 4.58 | 5.08 |
| L | 15.3 | | 16 |
| P | 2.9 | | 3.2 |
| Q | | 3.8 | |
| Q1 | 1 | | 1.52 |
| H2 | | 2.15 | |
| I | | 1.27 | |



4 Revision history

Table 4. Revision history

| Date | Revision | Changes |
|-------------|-----------------|--|
| 01-Dec-2000 | 1 | Initial release. |
| 14-Jan-2004 | 2 | Technical migration from ST-Press to EDOCS |
| 28-Jun-2007 | 3 | Figures 2,3,4,5,6,7, 8 and figure 9 have been added. |

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