

NPN power transistors

Features

- NPN transistors

Applications

- Audio, general purpose switching and amplifier transistors

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 types are BD242A and BD242C.

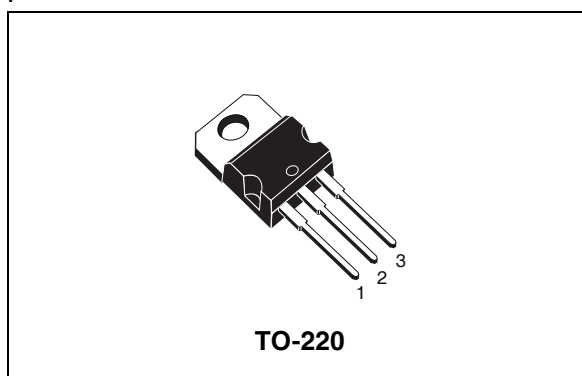


Figure 1. Internal schematic diagram

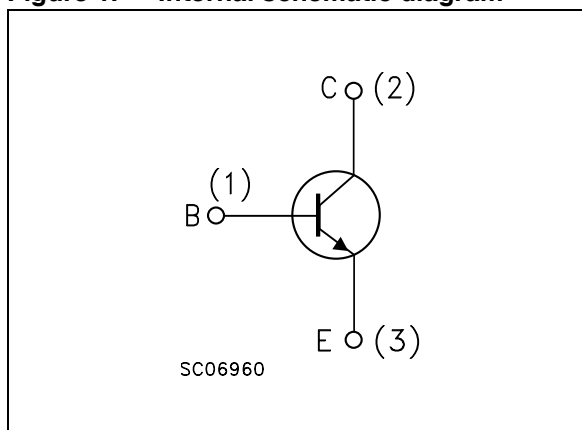


Table 1. Device summary

| Order codes | Marking | Package | Packaging |
|-------------|---------|---------|-----------|
| BD241A | BD241A | TO-220 | Tube |
| BD241C | BD241C | TO-220 | Tube |

1 Absolute maximum ratings

Table 2. Absolute maximum ratings

| Symbol | Parameter | Value | | Unit |
|-----------|--|------------|--------|------------|
| | | BD241A | BD241C | |
| V_{CER} | Collector-emitter voltage ($R_{BE} = 100\Omega$) | 70 | 115 | V |
| V_{CEO} | Collector-emitter voltage ($I_B = 0$) | 60 | 100 | V |
| V_{EBO} | Emitter-base voltage ($I_C = 0$) | 5 | | V |
| I_C | Collector current | 3 | | A |
| I_{CM} | Collector peak current ($t_p < ms$) | 5 | | A |
| I_B | Base current | 1 | | A |
| P_{TOT} | Total dissipation at $T_{case} = 25^\circ C$ | 40 | | W |
| T_{stg} | Storage temperature | -65 to 150 | | $^\circ C$ |
| T_J | Max. operating junction temperature | 150 | | $^\circ C$ |

2 Electrical characteristics

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

Table 3. Electrical characteristics

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|----------------------|--|--|-----------|------|------------|----------|
| I_{CES} | Collector cut-off current ($V_{BE} = 0$) | $V_{CE} = \text{rated } V_{CEO}$ | | | 0.2 | mA |
| I_{CEO} | Collector cut-off current ($I_B = 0$) | for BD241A $V_{CE} = 30V$ for BD241C $V_{CE} = 60V$ | | | 0.3 0.3 | mA mA |
| I_{EBO} | Emitter cut-off current ($I_C = 0$) | $V_{EB} = 5V$ | | | 1 | mA |
| $V_{CEO(sus)}^{(1)}$ | Collector-emitter sustaining voltage ($I_B = 0$) | $I_C = 30mA$ for BD241A for BD241C | 60 100 | | | V V |
| $V_{CE(sat)}^{(1)}$ | Collector-emitter saturation voltage | $I_C = 3A$ $I_B = 0.6A$ | | | 1.2 | V |
| $V_{BE}^{(1)}$ | Base-emitter voltage | $I_C = 3A$ $V_{CE} = 4V$ | | | 1.8 | V |
| $h_{FE}^{(1)}$ | DC current gain | $I_C = 1A$ $V_{CE} = 4V$ $I_C = 3A$ $V_{CE} = 4V$ | 25 10 | | | |

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

2.1 Electrical characteristic (curves)

Figure 2. Safe operating area

Figure 3. Derating curve

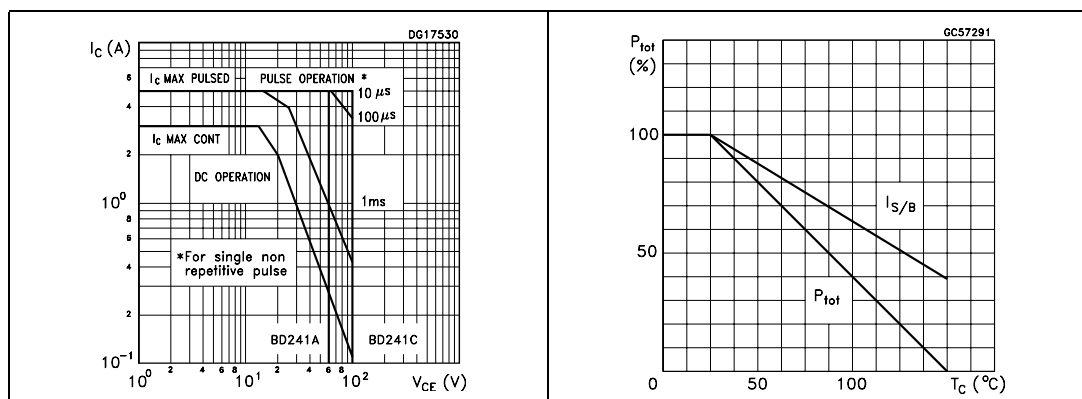


Figure 4. DC current gain

Figure 5. DC current gain

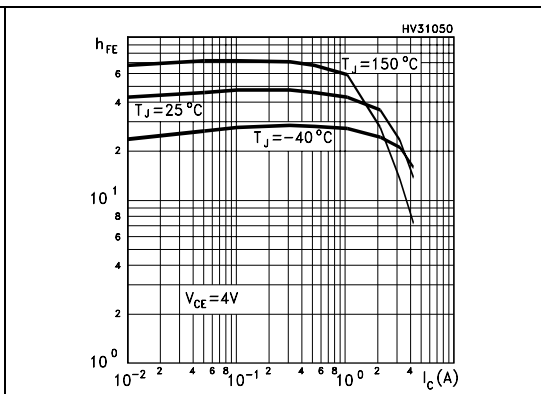
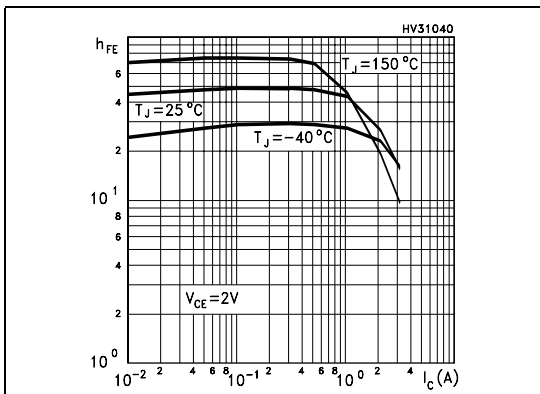


Figure 6. Collector-emitter saturation voltage

Figure 7. Base-emitter saturation voltage

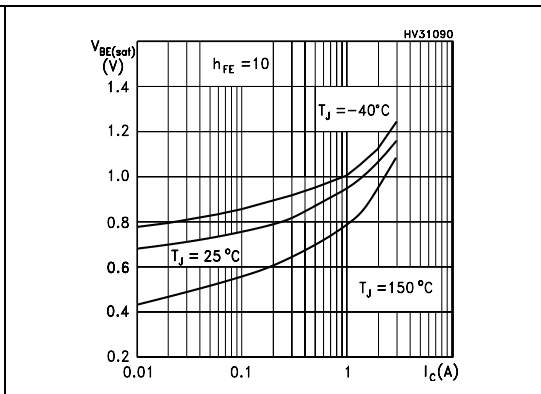
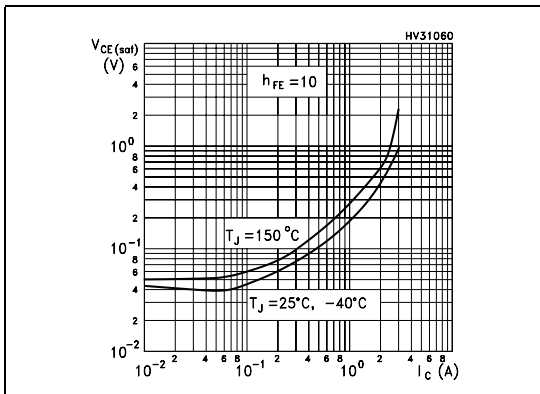


Figure 8. Base-emitter on voltage

Figure 9. Resistive load switching time

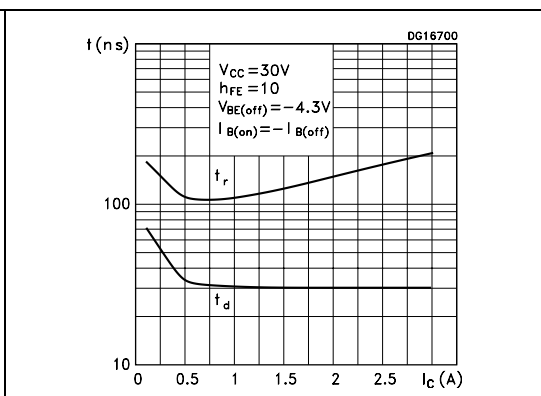
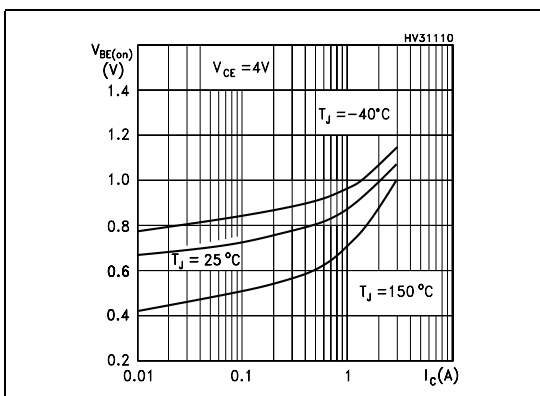
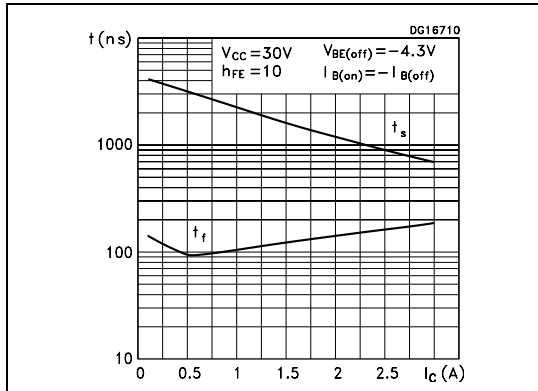
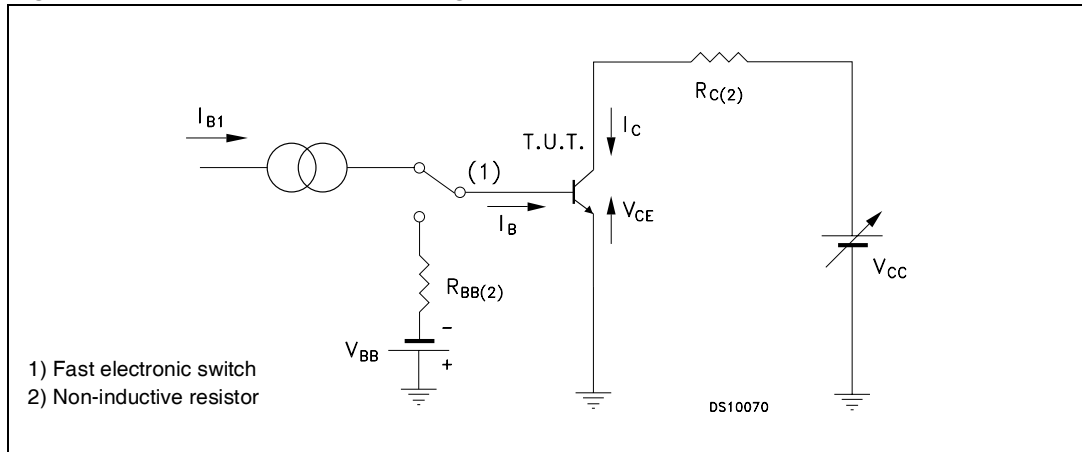


Figure 10. Resistive load switching time



2.2 Test circuits

Figure 11. Resistive load switching test circuit

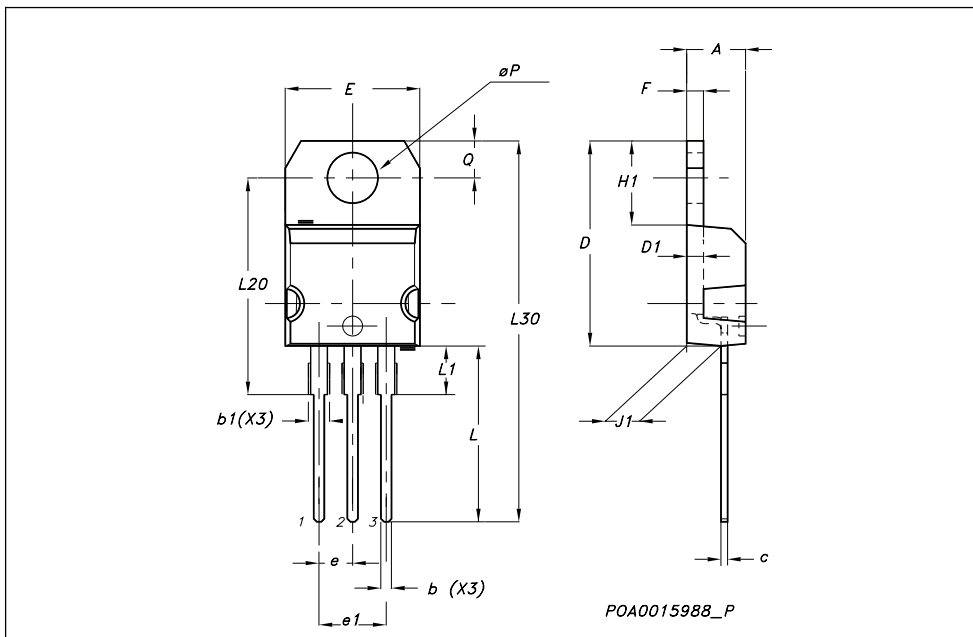


3 Package mechanical data

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

TO-220 Mechanical data

| DIM. | mm. | | |
|------|-------|-------|-------|
| | MIN. | TYP | MAX. |
| A | 4.40 | | 4.60 |
| b | 0.61 | | 0.88 |
| b1 | 1.14 | | 1.70 |
| c | 0.49 | | 0.70 |
| D | 15.25 | | 15.75 |
| D1 | | 1.27 | |
| E | 10 | | 10.40 |
| e | 2.40 | | 2.70 |
| e1 | 4.95 | | 5.15 |
| F | 1.23 | | 1.32 |
| H1 | 6.20 | | 6.60 |
| J1 | 2.40 | | 2.72 |
| L | 13 | | 14 |
| L1 | 3.50 | | 3.93 |
| L20 | | 16.40 | |
| L30 | | 28.90 | |
| øP | 3.75 | | 3.85 |
| Q | 2.65 | | 2.95 |



4 Revision history

Table 4. Revision history

| Date | Revision | Changes |
|-------------|----------|---|
| 01-Dec-2000 | 1 | Initial Release |
| 10-Jul-2007 | 2 | Figure 2 and figure 3, have been added. |

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