

Complementary power transistors

Features

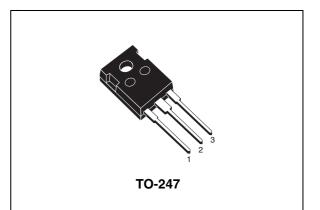
- Low collector-emitter saturation voltage
- Complementary NPN PNP transistors

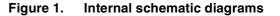
Applications

- General purpose
- Audio amplifier

Description

The devices are manufactured in planar technology with "base island" layout. The resulting transistors show exceptional high gain performance coupled with very low saturation voltage.





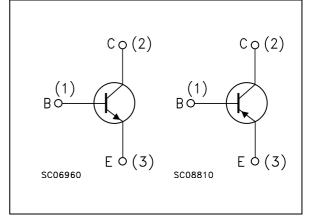


Table 1. Device summary

| Order code | Marking | Package | Packaging |
|------------|---------|---------|-----------|
| TIP35C | TIP35C | TO-247 | Tube |
| TIP36C | TIP36C | 10-247 | Tube |

| September | 2008 |
|-----------|------|
|-----------|------|

1 Electrical ratings

Table 2.Absolute maximum ratings

| Symbol | Parameter | | Value | Unit |
|------------------|--|-----|------------|------|
| | | NPN | | |
| | | PNP | TIP36C | |
| V _{CBO} | Collector-base voltage ($I_E = 0$) | - | 100 | V |
| V _{CEO} | Collector-emitter voltage ($I_B = 0$) | | 100 | V |
| V _{EBO} | Emitter-base voltage (I _C = 0) | | 5 | V |
| ۱ _C | Collector current | | 25 | А |
| I _{CM} | Collector peak current (t _P < 5 ms) | | 50 | А |
| Ι _Β | Base current | | 5 | А |
| P _{tot} | Total dissipation at T _{case} = 25 °C | | 125 | W |
| T _{stg} | Storage temperature | | -65 to 150 | °C |
| TJ | Max. operating junction temperature | | 150 | °C |

For PNP type voltage and current values are negative.

Table 3. Thermal data

| Symbol | Parameter | Value | Unit |
|-----------------------|--------------------------------------|-------|------|
| R _{thj-case} | Thermal resistance junction-case max | 1 | °C/W |

2 Electrical characteristics

(T_{case} = 25 °C; unless otherwise specified)

| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|--------------------------------------|---|---|----------|------|----------|--------|
| I _{CEO} | Collector cut-off current $(I_B = 0)$ | V _{CE} = 60 V | | | 1 | mA |
| I _{EBO} | Emitter cut-off current (I _C = 0) | V _{EB} = 5 V | | | 1 | mA |
| I _{CES} | Collector cut-off current $(V_{BE} = 0)$ | V _{CE} = 100 V | | | 0.7 | mA |
| V _{CEO(sus)} ⁽¹⁾ | Collector-emitter sustaining voltage (I _B = 0) | I _C = 30 mA | 100 | | | v |
| V _{CE(sat)} ⁽¹⁾ | Collector-emitter saturation voltage | $I_{C} = 15 \text{ A}$ $I_{B} = 1.5 \text{ A}$ $I_{C} = 25 \text{ A}$ $I_{B} = 5 \text{ A}$ | | | 1.8 4 | V V |
| V _{BE(on)} ⁽¹⁾ | Base-emitter voltage | $I_{C} = 15 \text{ A} \qquad V_{CE} = 4 \text{ V} \\ I_{C} = 25 \text{ A} \qquad V_{CE} = 4 \text{ V}$ | | | 2 4 | V V |
| h _{FE} ⁽¹⁾ | DC current gain | $I_{C} = 1.5 \text{ A} \qquad V_{CE} = 4 \text{ V} \\ I_{C} = 15 \text{ A} \qquad V_{CE} = 4 \text{ V}$ | 25 10 | | 50 | |
| f _T | Transition frequency | I _C = 1 A V _{CE} = 10 V f = 1 MHz | 3 | | | MHz |

 Table 4.
 Electrical characteristics

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

For PNP type voltage and current are negative.

Electrical characteristic (curves) 2.1

DC current gain for NPN type Figure 3. Figure 2. DC current gain for PNP type

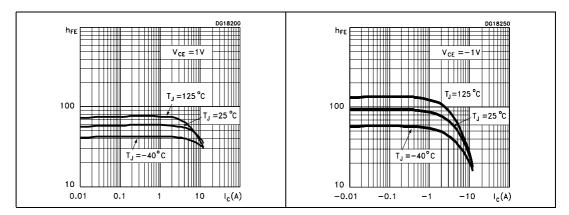


Figure 4. DC current gain for NPN type Figure 5. DC current gain for PNP type

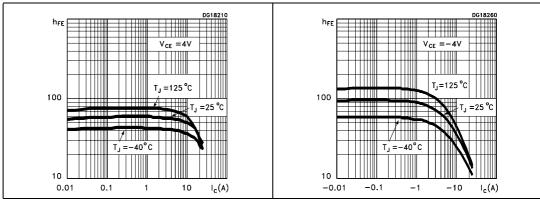
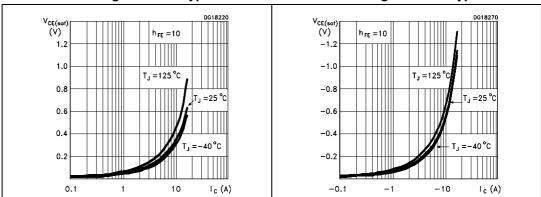
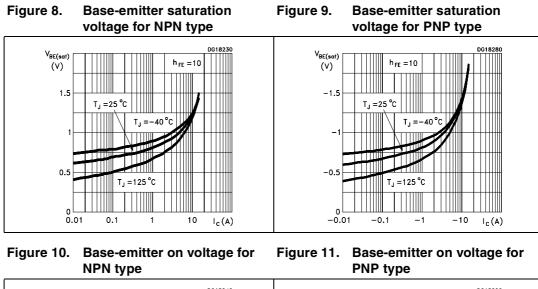


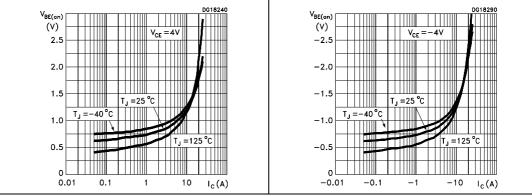
Figure 6. **Collector-emitter saturation** Figure 7. voltage for NPN type

Collector-emitter saturation voltage for PNP type







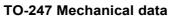


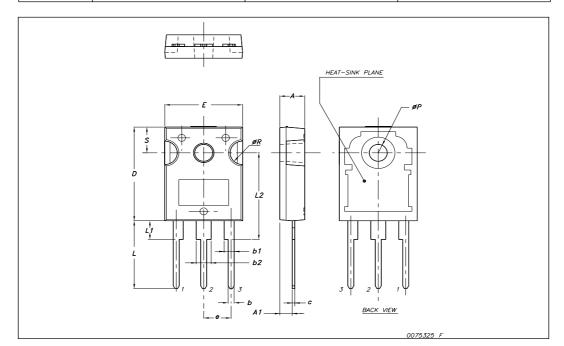
3 Package mechanical data

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*



| Dim. | | mm. | 1 |
|------|-------|-------|-------|
| | Min. | Тур | Max. |
| A | 4.85 | | 5.15 |
| A1 | 2.20 | | 2.60 |
| b | 1.0 | | 1.40 |
| b1 | 2.0 | | 2.40 |
| b2 | 3.0 | | 3.40 |
| с | 0.40 | | 0.80 |
| D | 19.85 | | 20.15 |
| E | 15.45 | | 15.75 |
| е | | 5.45 | |
| L | 14.20 | | 14.80 |
| L1 | 3.70 | | 4.30 |
| L2 | | 18.50 | |
| øР | 3.55 | | 3.65 |
| øR | 4.50 | | 5.50 |
| S | | 5.50 | |





4 Revision history

Table 5.Document revision history

| Date | Revision | Changes |
|-------------|----------|--|
| 07-Sep-2003 | 3 | |
| 07-Mar-2008 | 4 | Package change from TO-218 to TO-247. |
| 23-Sep-2008 | 5 | Added figures 2, 3, 4, 5, 6, 7, 8, 9, 10,11. |



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