

Complementary power transistors

Features

- Low collector-emitter saturation voltage
- Fast switching speed

Applications

- Power amplifier
- Switching circuits

Description

The devices are manufactured in low voltage multi epitaxial planar technology. They are intended for general purpose linear and switching applications.

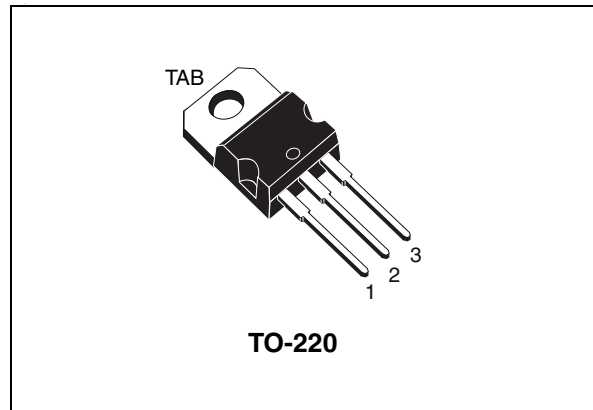


Figure 1. Internal schematic diagram

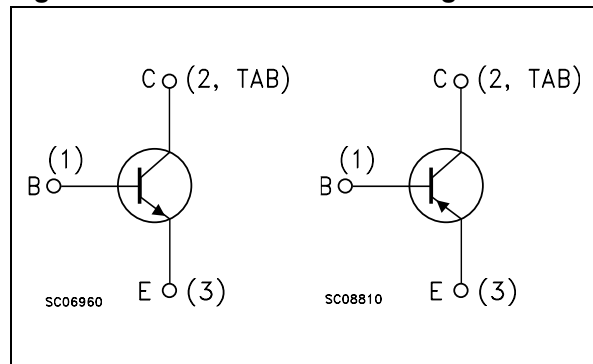


Table 1. Device summary

| Order codes | Marking | Polarity | Package | Packaging |
|-------------|---------|----------|---------|-----------|
| D44H8 | D44H8 | NPN | TO-220 | Tube |
| D44H11 | D44H11 | NPN | TO-220 | Tube |
| D45H8 | D45H8 | PNP | TO-220 | Tube |
| D45H11 | D45H11 | PNP | TO-220 | Tube |

1 Absolute maximum ratings

Table 2. Absolute maximum ratings

| Symbol | Parameter | Value | Unit |
|-----------|---------------------------------------------------------|------------|------|
| V_{CEO} | Collector-emitter voltage ($I_B = 0$) D44H8 - D45H8 | 60 | V |
| | Collector-emitter voltage ($I_B = 0$) D44H11 - D45H11 | 80 | V |
| V_{EBO} | Emitter-base voltage ($I_C = 0$) | 5 | V |
| I_C | Collector current | 10 | A |
| I_{CM} | Collector peak current | 20 | A |
| P_{TOT} | Total dissipation at $T_{case} = 25\text{ °C}$ | 50 | W |
| T_{STG} | Storage temperature | -55 to 150 | °C |
| T_J | Max. operating junction temperature | 150 | °C |

Note: For PNP types voltage and current values are negative.

Table 3. Thermal data

| Symbol | Parameter | Value | Unit |
|------------|-----------------------------------------|-------|------|
| R_{thJC} | Thermal resistance junction-case max | 2.5 | °C/W |
| R_{thJA} | Thermal resistance junction-ambient max | 62.5 | °C/W |

2 Electrical characteristics

$T_{\text{case}} = 25\text{ }^{\circ}\text{C}$; unless otherwise specified.

Table 4. Electrical characteristics

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|-----------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|----------|------|------|---------------|
| $V_{\text{CEO(sus)}}^{(1)}$ | Collector-emitter sustaining voltage ($I_{\text{B}} = 0$) | $I_{\text{C}} = 100\text{ mA}$ D44H8 - D45H8 D44H11 - D45H11 | 60 80 | - | | V |
| I_{CES} | Collector cut-off current ($V_{\text{BE}} = 0$) | $V_{\text{CE}} = \text{rated } V_{\text{CEO}}$ | | - | 10 | μA |
| I_{EBO} | Emitter cut-off current ($I_{\text{C}} = 0$) | $V_{\text{EB}} = 5\text{ V}$ | | - | 100 | μA |
| $V_{\text{CE(sat)}}^{(1)}$ | Collector-emitter saturation voltage | $I_{\text{C}} = 8\text{ A}$ $I_{\text{B}} = 0.4\text{ A}$ | | - | 1 | V |
| $V_{\text{BE(sat)}}^{(1)}$ | Base-emitter saturation voltage | $I_{\text{C}} = 8\text{ A}$ $I_{\text{B}} = 0.8\text{ A}$ | | - | 1.5 | V |
| $h_{\text{FE}}^{(1)}$ | DC current gain | $I_{\text{C}} = 2\text{ A}$ $V_{\text{CE}} = 1\text{ V}$ | 60 | - | | |
| | | $I_{\text{C}} = 4\text{ A}$ $V_{\text{CE}} = 1\text{ V}$ | 40 | - | | |

1. Pulse test: pulse duration $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

Note: For PNP types voltage and current values are negative.

2.1 Electrical characteristics (curves)

Figure 2. Safe operating area

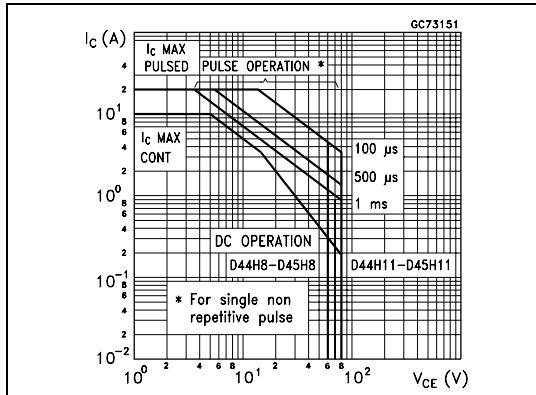


Figure 3. Derating curve

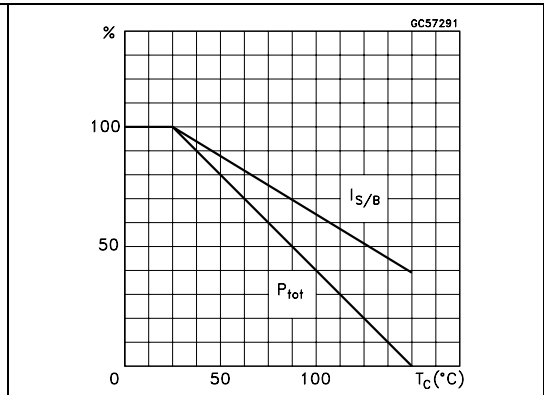


Figure 4. DC current gain (NPN)

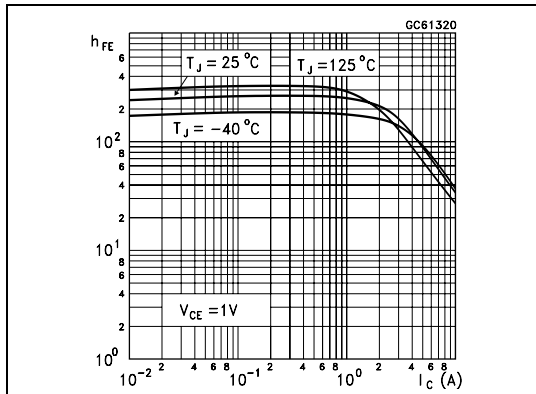


Figure 5. DC current gain (PNP)

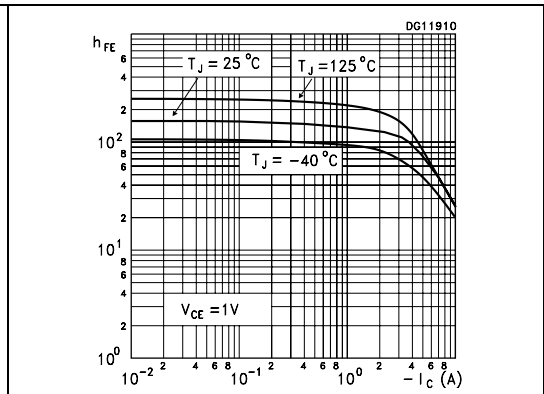


Figure 6. Collector-emitter saturation voltage (NPN)

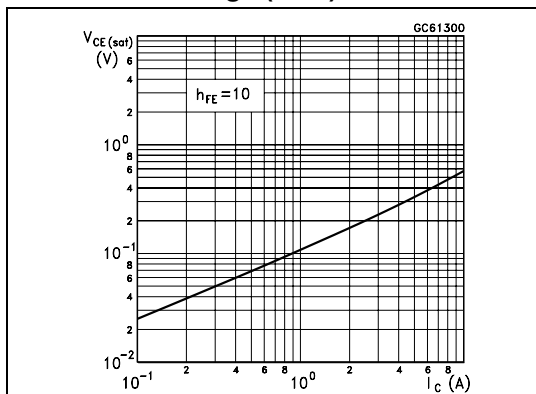
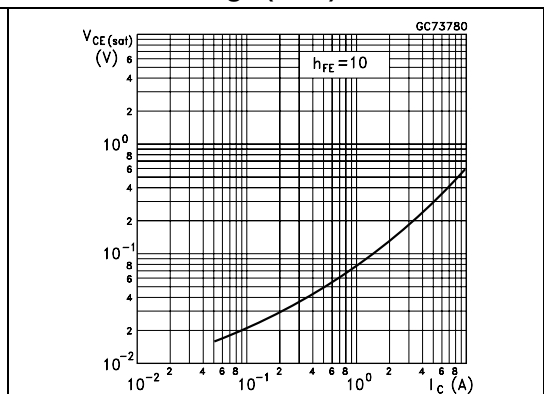


Figure 7. Collector-emitter saturation voltage (PNP)

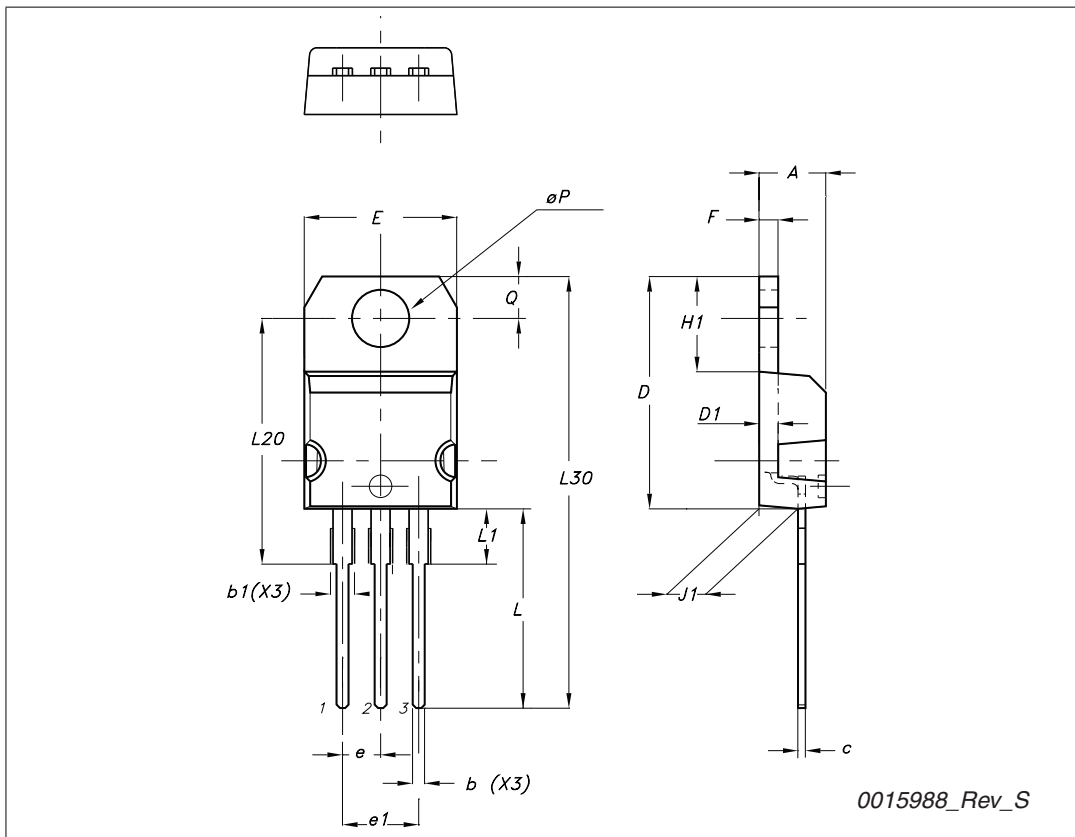


3 Package mechanical data

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TO-220 type A mechanical data

| Dim | mm | | |
|-----|-------|-------|-------|
| | Min | Typ | Max |
| A | 4.40 | | 4.60 |
| b | 0.61 | | 0.88 |
| b1 | 1.14 | | 1.70 |
| c | 0.48 | | 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 | |
| ∅P | 3.75 | | 3.85 |
| Q | 2.65 | | 2.95 |



4 Revision history

Table 5. Document revision history

| Date | Revision | Changes |
|-------------|----------|----------------------------------------|
| 21-Jun-2004 | 4 | Document migration, no content change. |
| 20-Oct-2009 | 5 | Updated mechanical data. |

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