



# D44H8 - D44H11 D45H8 - D45H11

## Complementary power transistors

### Features

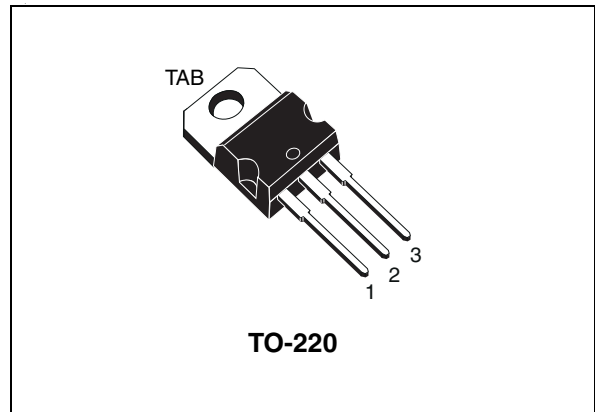
- Low collector-emitter saturation voltage
- Fast switching speed

### Applications

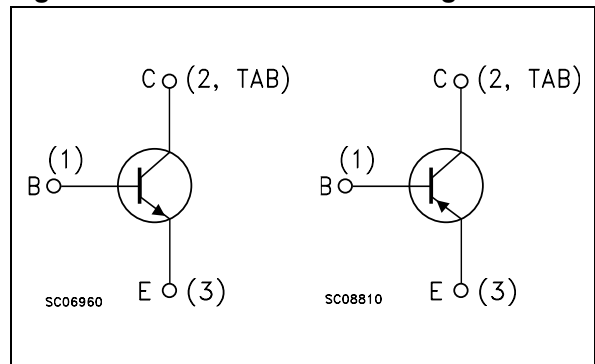
- Power amplifier
- Switching circuits

### 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 ( $I_B = 0$ ) | $I_C = 100\text{ mA}$<br>D44H8 - D45H8<br>D44H11 - D45H11 | 60<br>80 | -    |      | V             |
| $I_{\text{CES}}$            | Collector cut-off current ( $V_{\text{BE}} = 0$ )  | $V_{\text{CE}} = \text{rated } V_{\text{CEO}}$            |          | -    | 10   | $\mu\text{A}$ |
| $I_{\text{EBO}}$            | Emitter cut-off current ( $I_C = 0$ )              | $V_{\text{EB}} = 5\text{ V}$                              |          | -    | 100  | $\mu\text{A}$ |
| $V_{\text{CE(sat)}}^{(1)}$  | Collector-emitter saturation voltage               | $I_C = 8\text{ A}$ $I_B = 0.4\text{ A}$                   |          | -    | 1    | V             |
| $V_{\text{BE(sat)}}^{(1)}$  | Base-emitter saturation voltage                    | $I_C = 8\text{ A}$ $I_B = 0.8\text{ A}$                   |          | -    | 1.5  | V             |
| $h_{\text{FE}}^{(1)}$       | DC current gain                                    | $I_C = 2\text{ A}$ $V_{\text{CE}} = 1\text{ V}$           | 60       | -    |      |               |
|                             |                                                    | $I_C = 4\text{ A}$ $V_{\text{CE}} = 1\text{ V}$           | 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

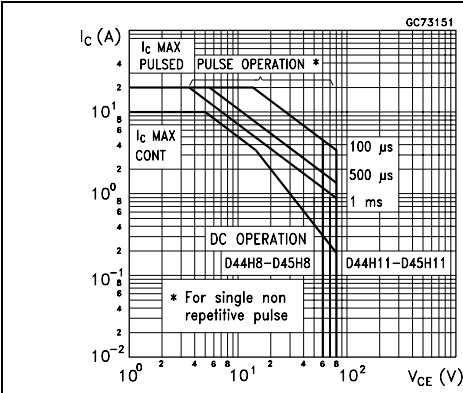


Figure 3. Derating curve

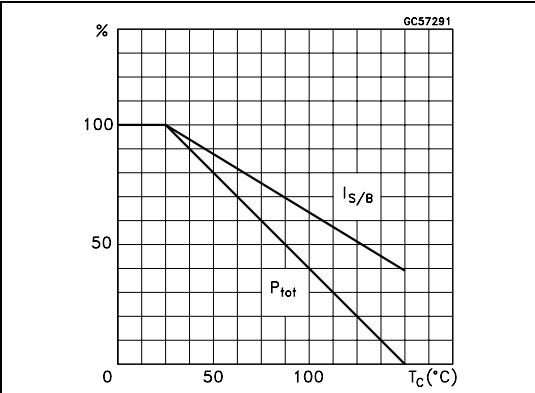


Figure 4. DC current gain (NPN)

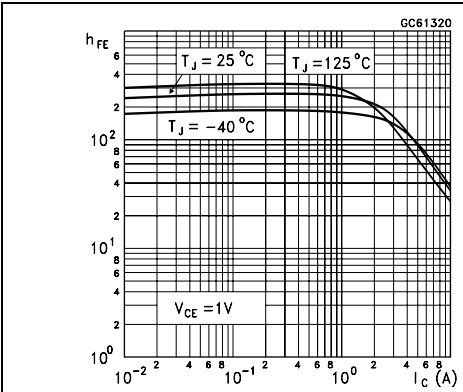


Figure 5. DC current gain (PNP)

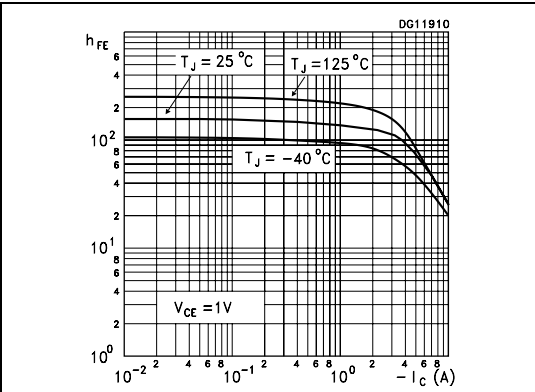


Figure 6. Collector-emitter saturation voltage (NPN)

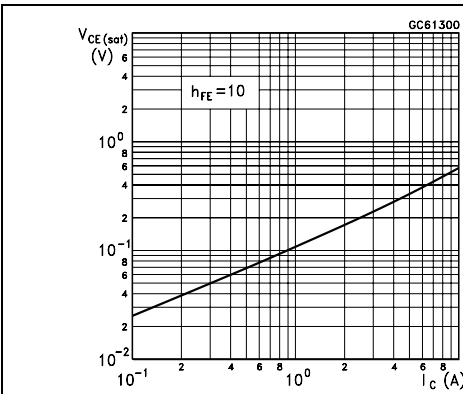
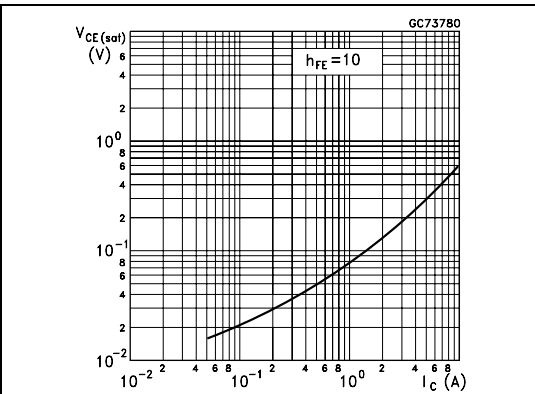


Figure 7. Collector-emitter saturation voltage (PNP)

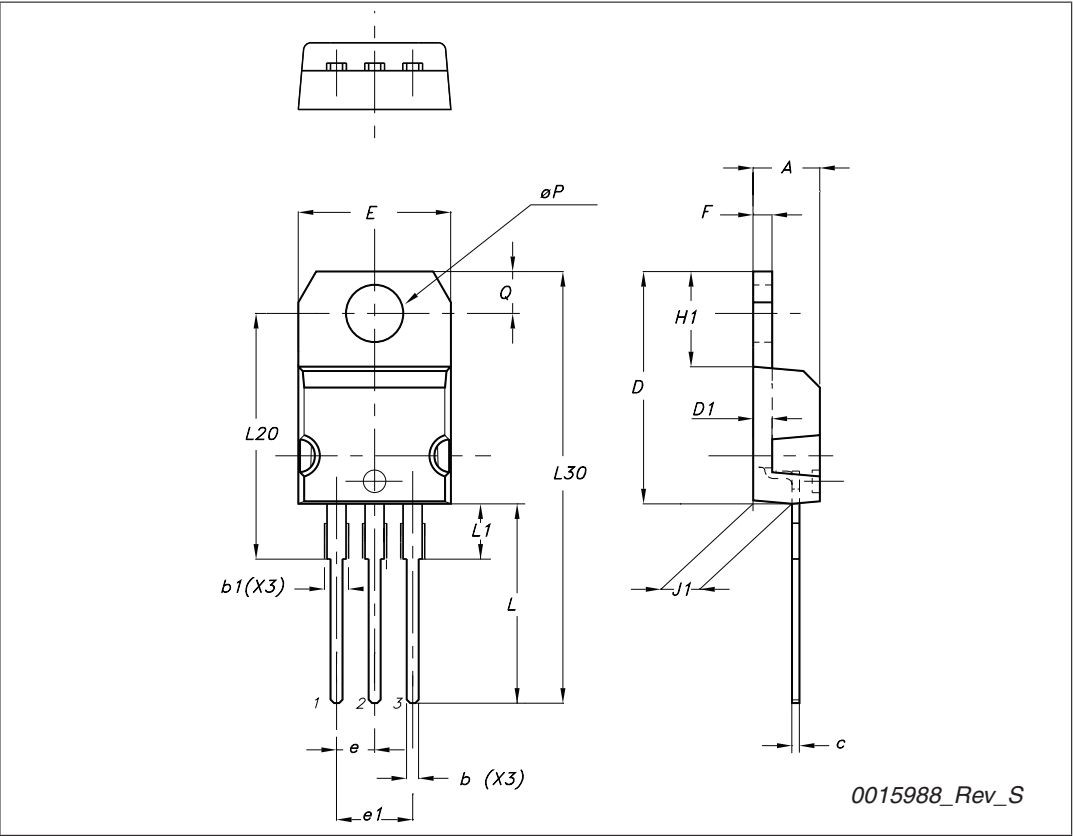


### 3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK<sup>®</sup> is an ST trademark.

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 |       |
| ØP  | 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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