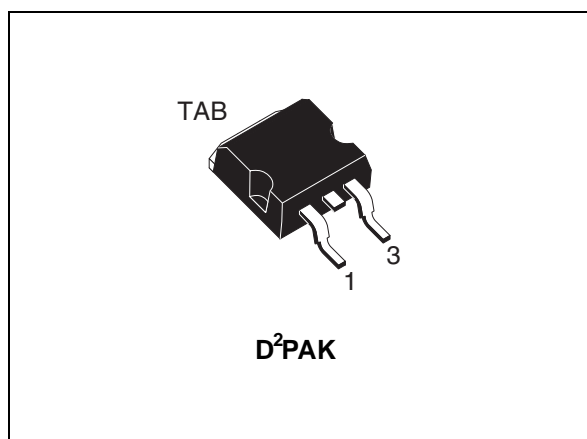


## Low voltage NPN power transistor

Datasheet - production data



### Features

- Low collector-emitter saturation voltage
- Fast switching speed

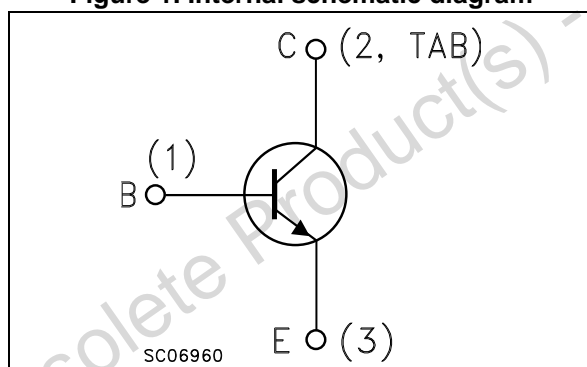
### Applications

- Power amplifier
- Switching circuits

### Description

This device is an NPN transistor manufactured using new low voltage planar technology with double metal process. The result is a transistor which boasts exceptionally high gain performance coupled with very low saturation voltage.

**Figure 1. Internal schematic diagram**



**Table 1. Device summary**

| Order codes | Marking  | Package | Packaging     |
|-------------|----------|---------|---------------|
| MJB44H11T4  | MJB44H11 | D²PAK   | Tape and reel |

# 1 Absolute maximum ratings

**Table 2. Absolute maximum ratings**

| Symbol    | Parameter                                      | Value      | Unit |
|-----------|--|------------|------|
| $V_{CEO}$ | Collector-emitter voltage ( $I_B = 0$ )        | 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   |

**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 ( $I_B = 0$ ) | $I_C = 30\text{ mA}$                            | 80   | -    |      | V             |
| $I_{\text{CES}}$            | Collector cut-off current ( $V_{\text{BE}} = 0$ )  | $V_{\text{CE}} = 80\text{ V}$                   |      | -    | 10   | $\mu\text{A}$ |
| $I_{\text{EBO}}$            | Emitter cut-off current ( $I_C = 0$ )              | $V_{\text{EB}} = 5\text{ V}$                    |      | -    | 50   | $\mu\text{A}$ |
| $V_{\text{CE(sat)}}^{(1)}$  | 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  $\leq 2\%$ .

## 2.1 Electrical characteristics (curves)

Figure 2. Safe operating area

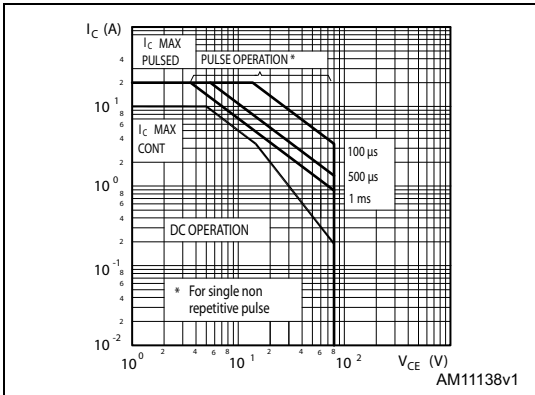


Figure 3. Derating curve

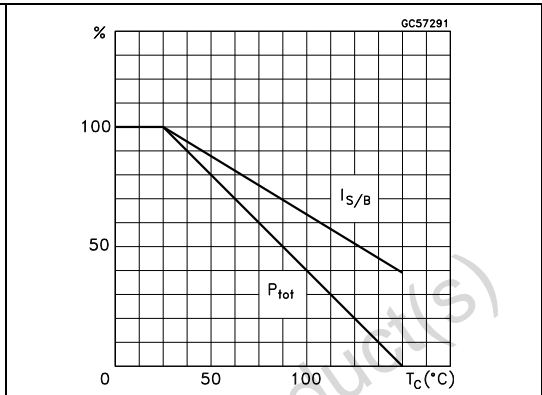


Figure 4. DC current gain

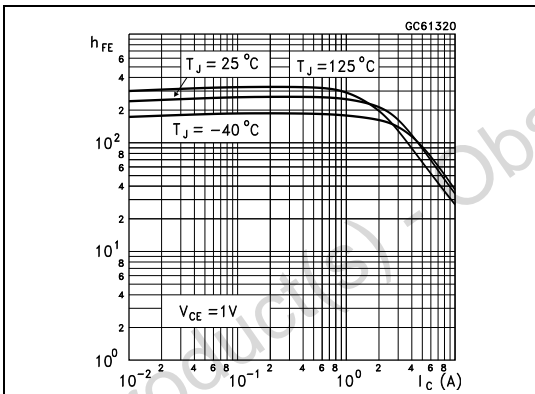
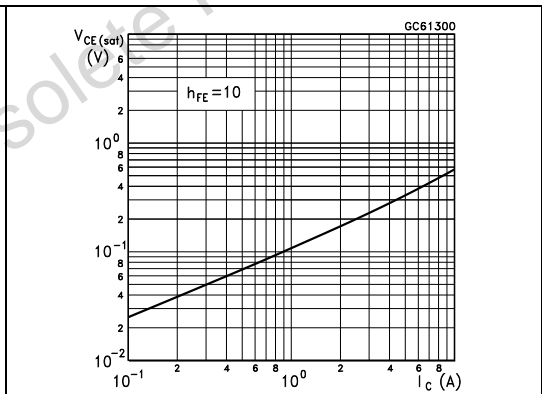


Figure 5. Collector-emitter saturation voltage



### 3 Package mechanical data

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

Figure 6. D<sup>2</sup>PAK (TO-263) drawing

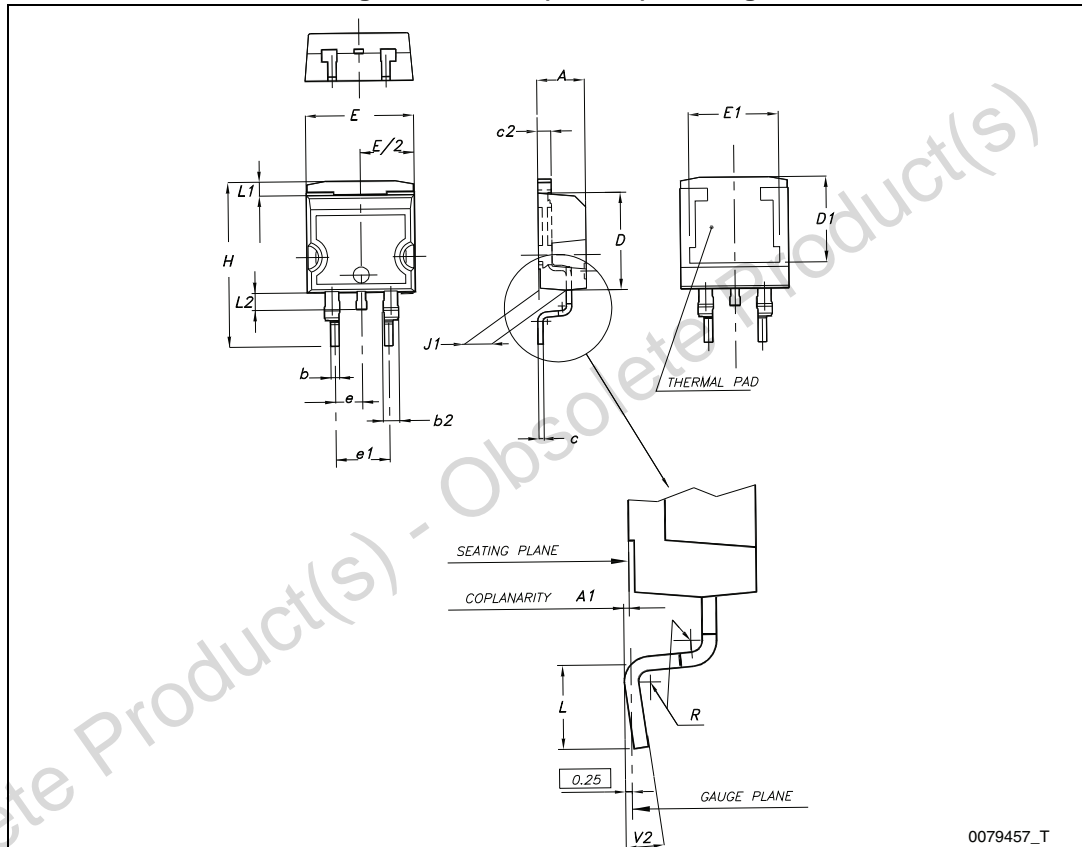
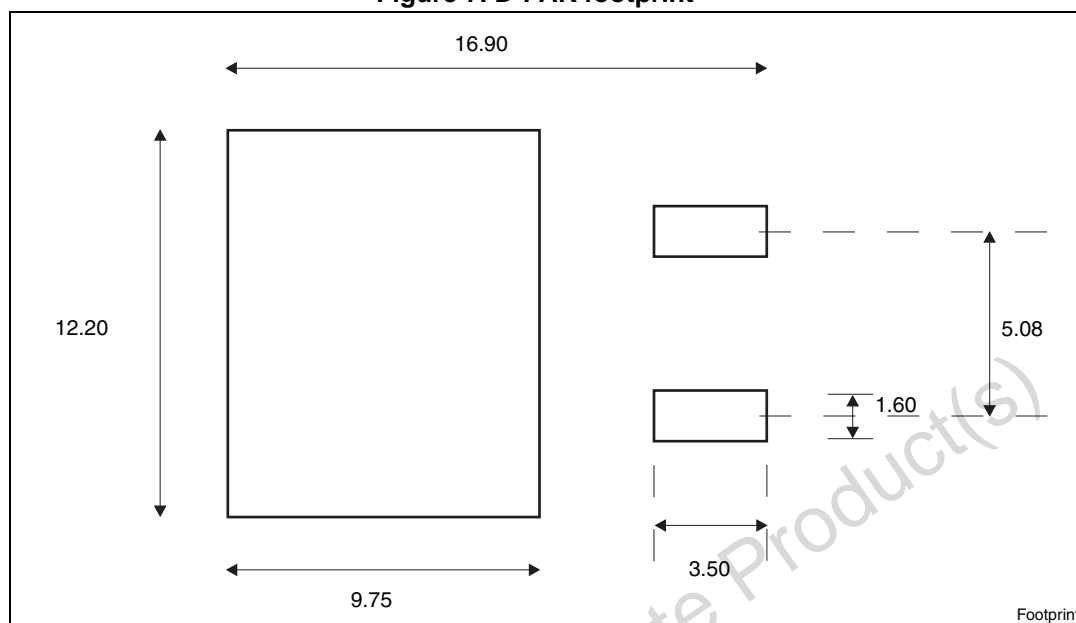


Table 5. D<sup>2</sup>PAK (TO-263) mechanical data

| Dim. | mm   |      |       |
|------|------|------|-------|
|      | Min. | Typ. | Max.  |
| A    | 4.40 |      | 4.60  |
| A1   | 0.03 |      | 0.23  |
| b    | 0.70 |      | 0.93  |
| b2   | 1.14 |      | 1.70  |
| c    | 0.45 |      | 0.60  |
| c2   | 1.23 |      | 1.36  |
| D    | 8.95 |      | 9.35  |
| D1   | 7.50 |      |       |
| E    | 10   |      | 10.40 |
| E1   | 8.50 |      |       |
| e    |      | 2.54 |       |
| e1   | 4.88 |      | 5.28  |
| H    | 15   |      | 15.85 |
| J1   | 2.49 |      | 2.69  |
| L    | 2.29 |      | 2.79  |
| L1   | 1.27 |      | 1.40  |
| L2   | 1.30 |      | 1.75  |
| R    |      | 0.4  |       |
| V2   | 0°   |      | 8°    |

Figure 7. D<sup>2</sup>PAK footprint<sup>(a)</sup>

a. All dimension are in millimeters

## 4 Packaging mechanical data

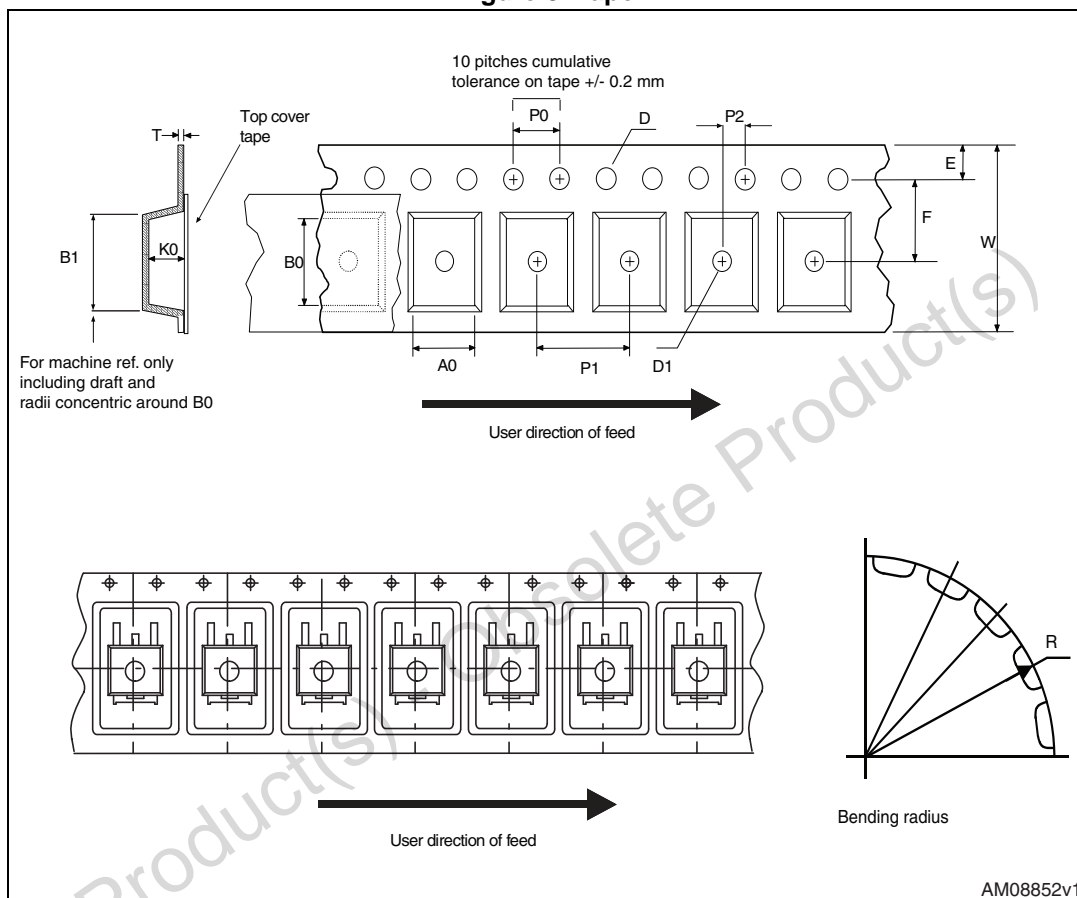
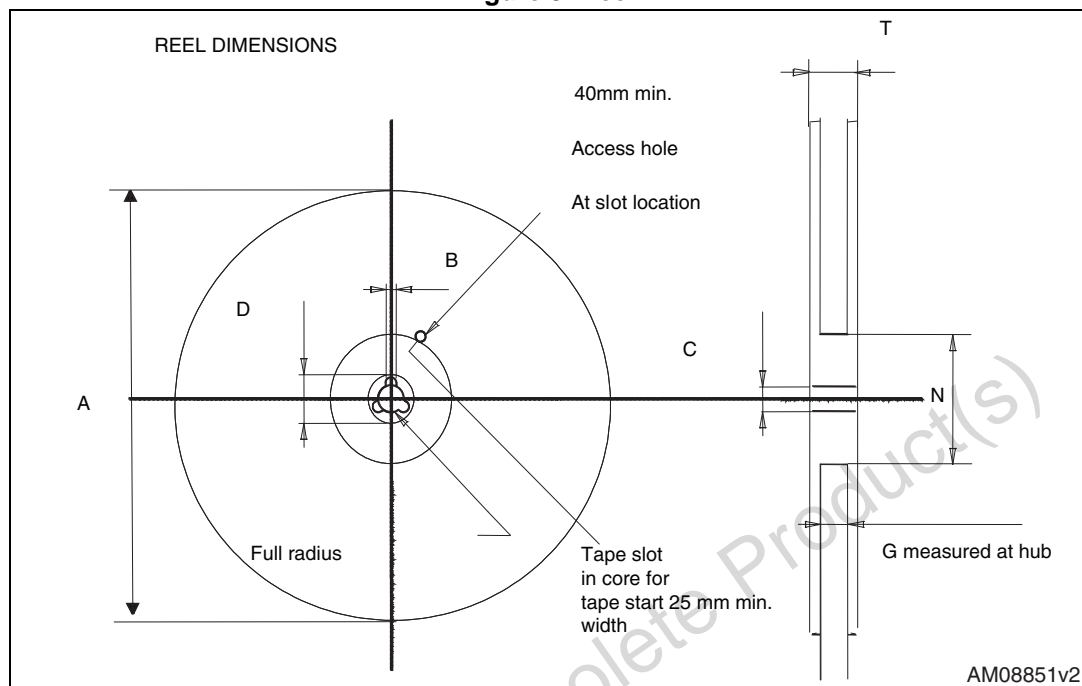
**Figure 8. Tape**

Figure 9. Reel

Table 6. D<sup>2</sup>PAK (TO-263) tape and reel mechanical data

| Tape |      |      | Reel     |      |      |
|------|------|------|----------|------|------|
| Dim. | mm   |      | Dim.     | mm   |      |
|      | Min. | Max. |          | Min. | Max. |
| A0   | 10.5 | 10.7 | A        |      | 330  |
| B0   | 15.7 | 15.9 | B        | 1.5  |      |
| D    | 1.5  | 1.6  | C        | 12.8 | 13.2 |
| D1   | 1.59 | 1.61 | D        | 20.2 |      |
| E    | 1.65 | 1.85 | G        | 24.4 | 26.4 |
| F    | 11.4 | 11.6 | N        | 100  |      |
| K0   | 4.8  | 5.0  | T        |      | 30.4 |
| P0   | 3.9  | 4.1  |          |      |      |
| P1   | 11.9 | 12.1 | Base qty |      | 1000 |
| P2   | 1.9  | 2.1  | Bulk qty |      | 1000 |
| R    | 50   |      |          |      |      |
| T    | 0.25 | 0.35 |          |      |      |
| W    | 23.7 | 24.3 |          |      |      |

## 5 Revision history

**Table 7. Document revision history**

| Date        | Revision | Changes  |
|-------------|----------|--|
| 23-Jan-2012 | 1        | Initial release.   |
| 12-May-2014 | 2        | Updated <a href="#">Section 3: Package mechanical data</a> .<br>Added <a href="#">Section 4: Packaging mechanical data</a> . |

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