

### Features

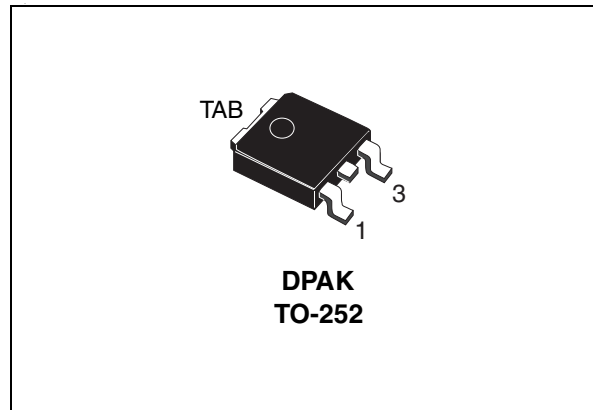
- Low collector-emitter saturation voltage
- Fast switching speed
- Surface-mounting TO-252 (DPAK) power package in tape and reel (suffix "T4")

### Applications

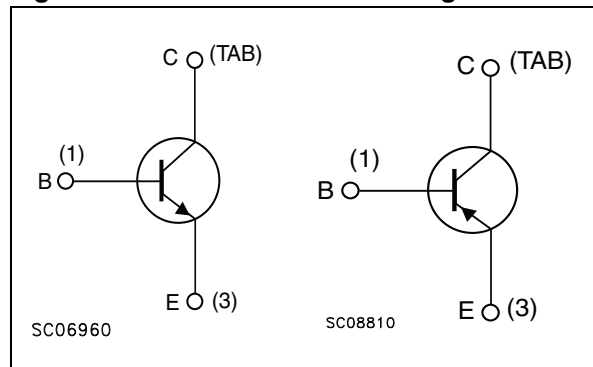
- Power amplifier
- Switching circuits

### Description

These devices are manufactured using 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
MJD44H11T4	MJD44H11	NPN	DPAK	Tape and reel
MJD45H11T4	MJD45H11	PNP	DPAK	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	8	A
$I_{CM}$	Collector peak current	16	A
$P_{TOT}$	Total dissipation at $T_{case} = 25^\circ\text{C}$	20	W
$T_{STG}$	Storage temperature	-55 to 150	$^\circ\text{C}$
$T_J$	Max. operating junction temperature	150	$^\circ\text{C}$

*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	6.25	$^\circ\text{C/W}$

## 2 Electrical characteristics

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

**Table 4. Electrical characteristics**

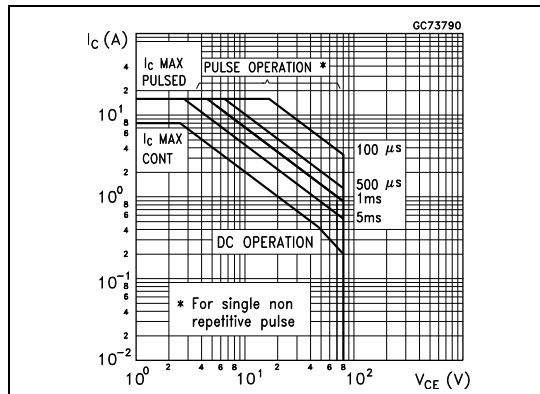
Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{CEO(sus)}^{(1)}$	Collector-emitter sustaining voltage ( $I_B = 0$ )	$I_C = 30\text{ mA}$	80	-		V
$I_{CES}$	Collector cut-off current ( $V_{BE} = 0$ )	$V_{CE} = 80\text{ V}$		-	10	$\mu\text{A}$
$I_{EBO}$	Emitter cut-off current ( $I_C = 0$ )	$V_{EB} = 5\text{ V}$		-	50	$\mu\text{A}$
$V_{CE(sat)}^{(1)}$	Collector-emitter saturation voltage	$I_C = 8\text{ A}$ $I_B = 0.4\text{ A}$		-	1	V
$V_{BE(sat)}^{(1)}$	Base-emitter saturation voltage	$I_C = 8\text{ A}$ $I_B = 0.8\text{ A}$		-	1.5	V
$h_{FE}^{(1)}$	DC current gain	$I_C = 2\text{ A}$ $V_{CE} = 1\text{ V}$	60	-		
		$I_C = 4\text{ A}$ $V_{CE} = 1\text{ V}$	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 Typical characteristic (curves)

**Figure 2. Safe operating area**



**Figure 3. Derating curves**

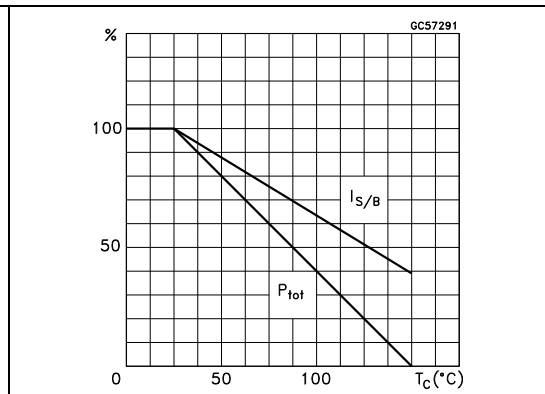


Figure 4. DC current gain (NPN)

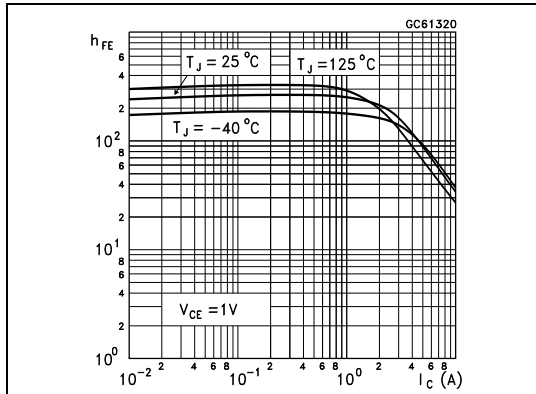


Figure 5. DC current gain (PNP)

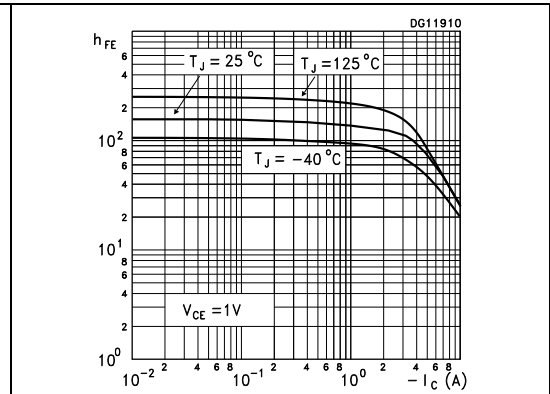


Figure 6. Collector-emitter saturation voltage (NPN)

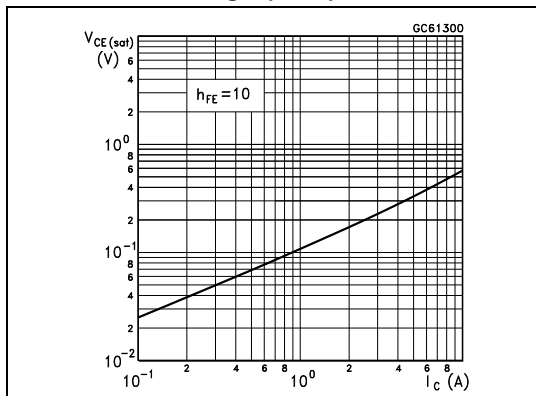
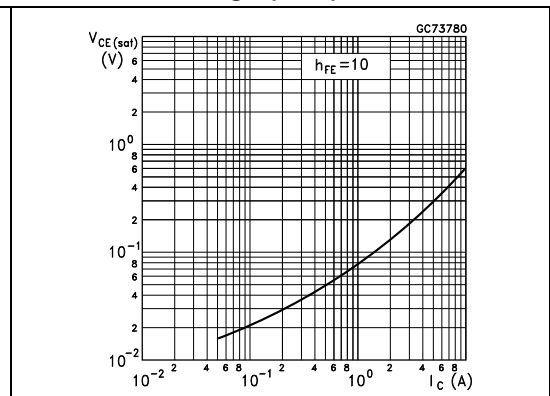


Figure 7. Collector-emitter saturation voltage (PNP)



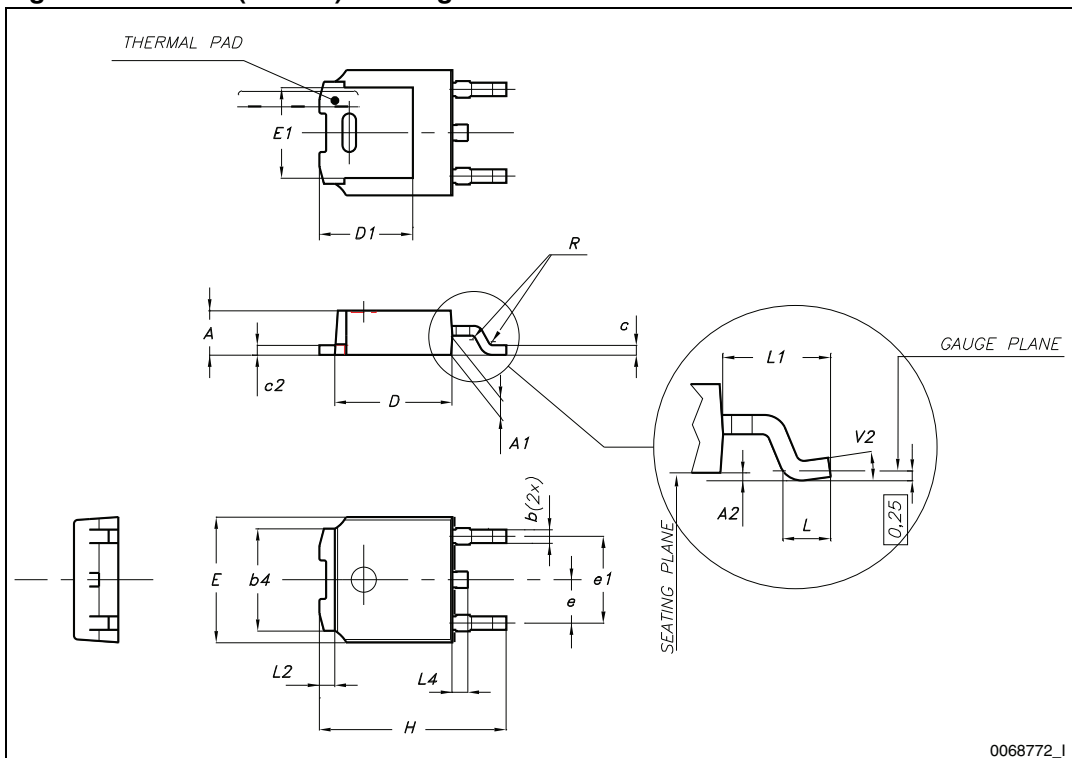
### 3 Package mechanical data

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.

Table 5. DPAK (TO-252) mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	2.20		2.40
A1	0.90		1.10
A2	0.03		0.23
b	0.64		0.90
b4	5.20		5.40
c	0.45		0.60
c2	0.48		0.60
D	6.00		6.20
D1		5.10	
E	6.40		6.60
E1		4.70	
e		2.28	
e1	4.40		4.60
H	9.35		10.10
L	1		1.50
L1		2.80	
L2		0.80	
L4	0.60		1
R		0.20	
V2	0°		8°

Figure 8. DPAK (TO-252) drawing

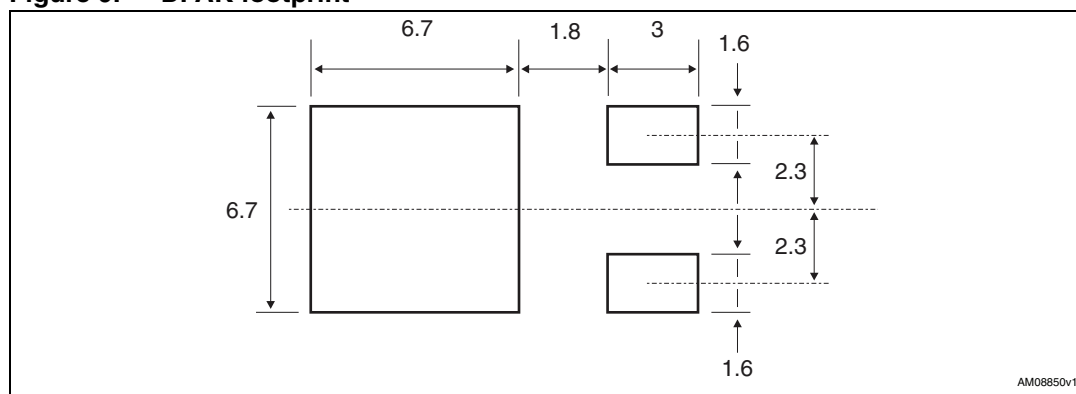


## 4 Packaging mechanical data

**Table 6. DPAK (TO-252) tape and reel mechanical data**

Tape			Reel		
Dim.	mm		Dim.	mm	
	Min.	Max.		Min.	Max.
A0	6.8	7	A		330
B0	10.4	10.6	B	1.5	
B1		12.1	C	12.8	13.2
D	1.5	1.6	D	20.2	
D1	1.5		G	16.4	18.4
E	1.65	1.85	N	50	
F	7.4	7.6	T		22.4
K0	2.55	2.75			
P0	3.9	4.1	Base qty.		2500
P1	7.9	8.1	Bulk qty.		2500
P2	1.9	2.1			
R	40				
T	0.25	0.35			
W	15.7	16.3			

**Figure 9. DPAK footprint<sup>(a)</sup>**



a. All dimensions are in millimeters



Figure 10. Tape for DPAK (TO-252)

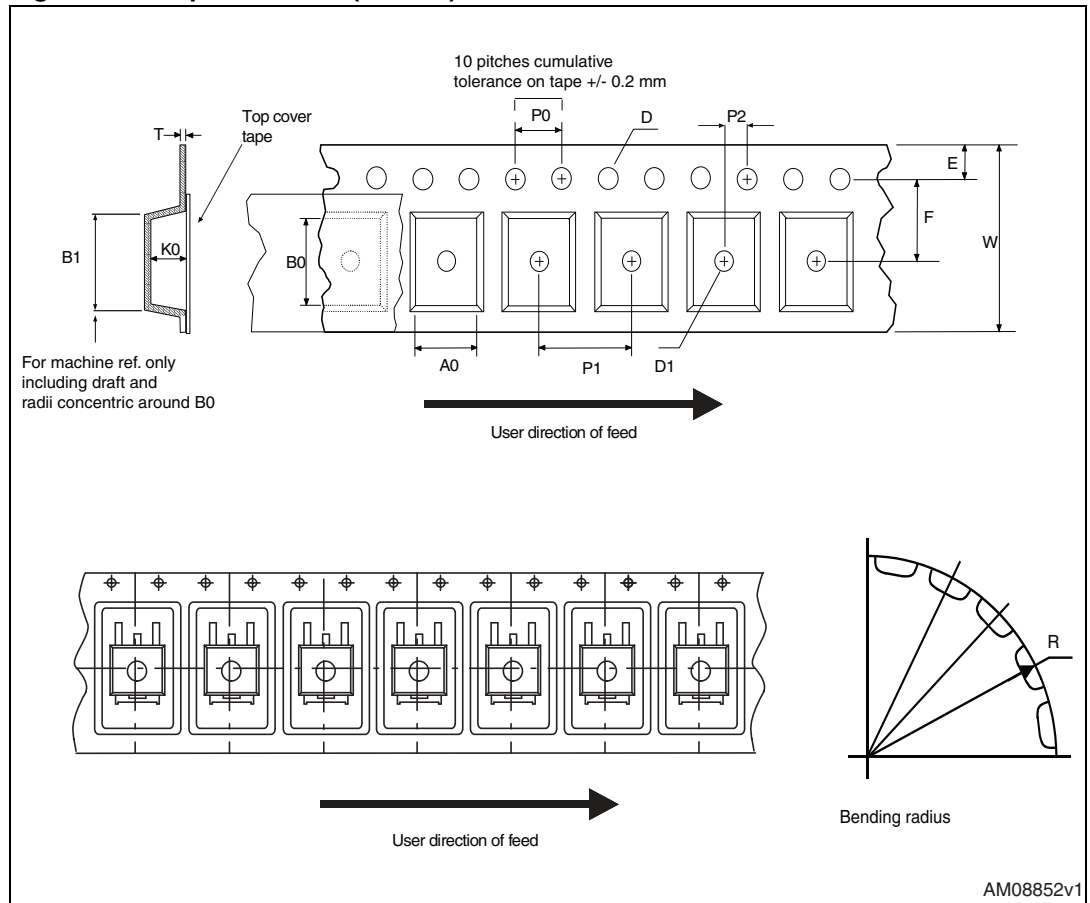
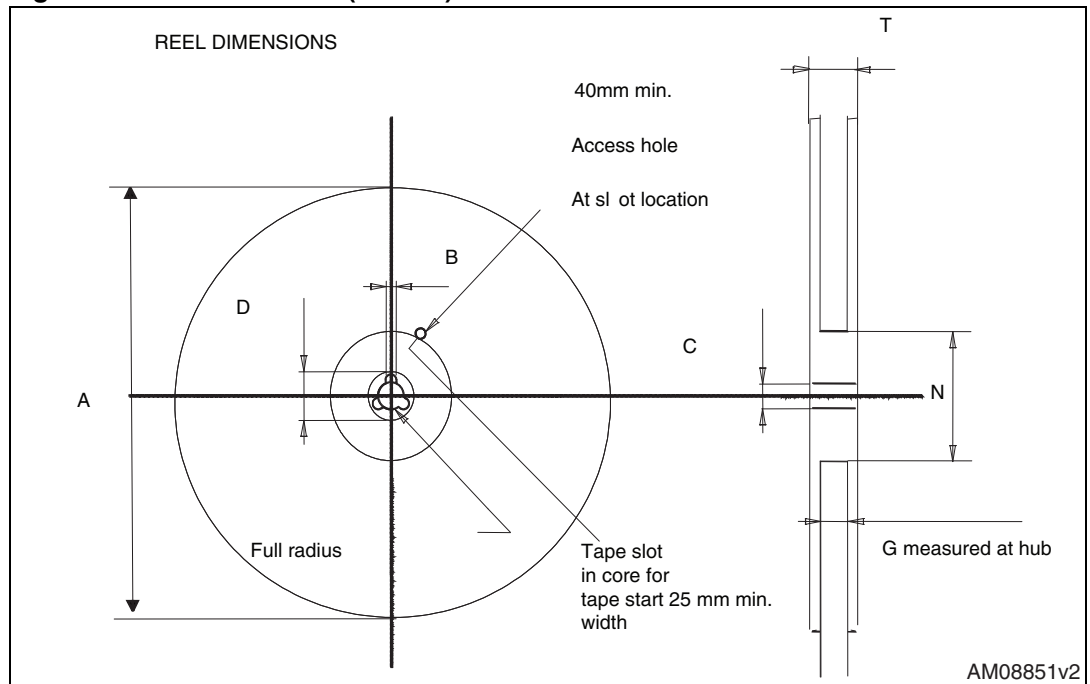


Figure 11. Reel for DPAK (TO-252)



## 5 Revision history

**Table 7. Document revision history**

<b>Date</b>	<b>Revision</b>	<b>Changes</b>
21-Jun-2004	2	Document migration, no content change.
06-Aug-2009	3	Updated mechanical data.
18-May-2012	4	Updated: mechanical data Inserted: packaging mechanical data

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