

### 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.

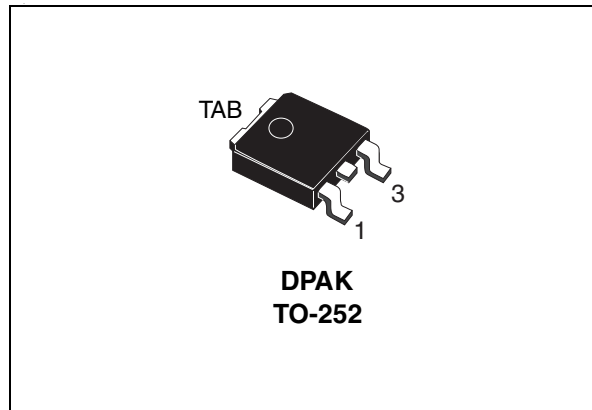


Figure 1. Internal schematic diagram

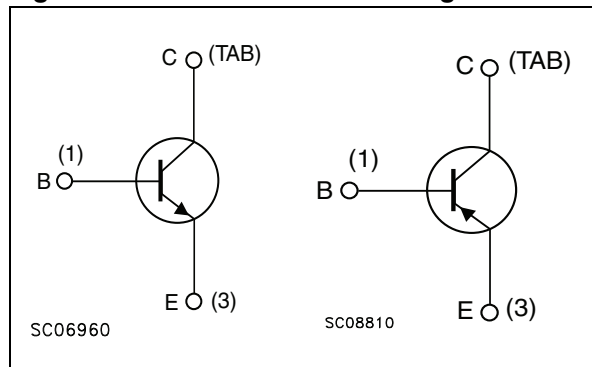


Table 1. Device summary

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**

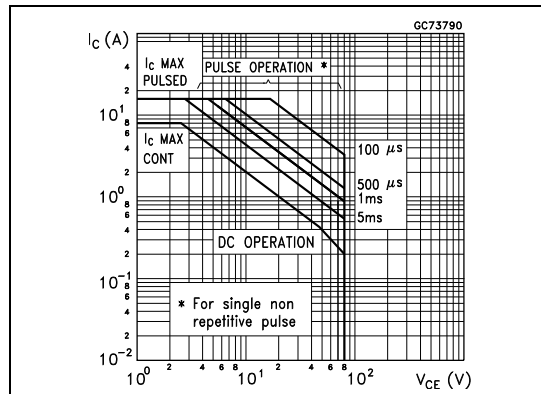
Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{CEO(sus)}^{(1)}$	Collector-emitter sustaining voltage ( $I_B = 0$ )	$I_C = 30\text{ mA}$	80	-		V
$I_{CES}$	Collector cut-off current ( $V_{BE} = 0$ )	$V_{CE} = 80\text{ V}$		-	10	$\mu\text{A}$
$I_{EBO}$	Emitter cut-off current ( $I_C = 0$ )	$V_{EB} = 5\text{ V}$		-	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**

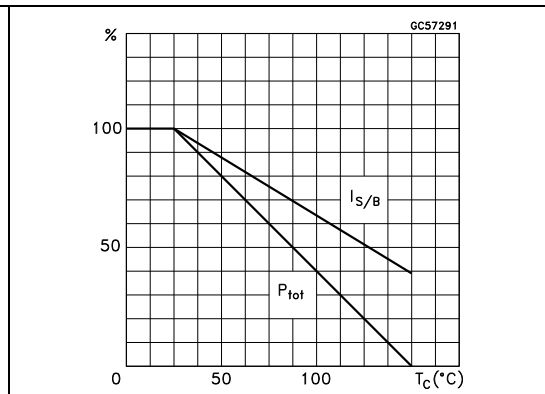


Figure 4. DC current gain (NPN)

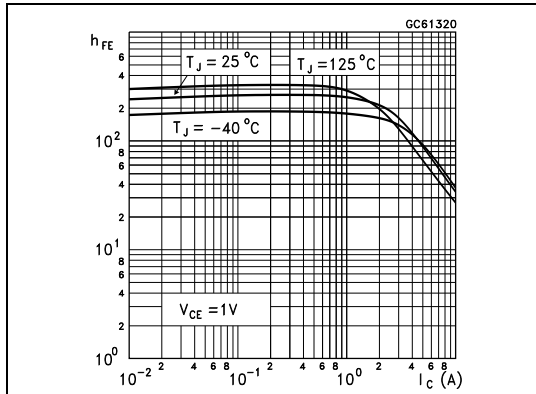


Figure 5. DC current gain (PNP)

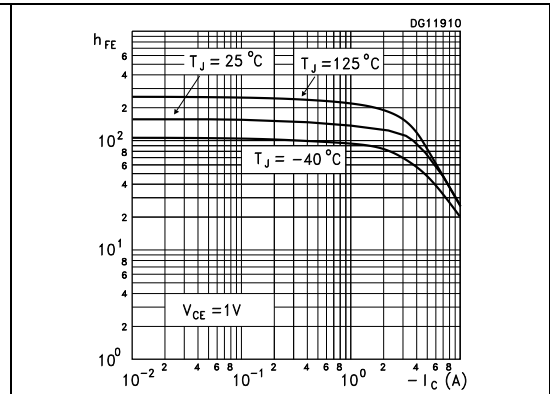


Figure 6. Collector-emitter saturation voltage (NPN)

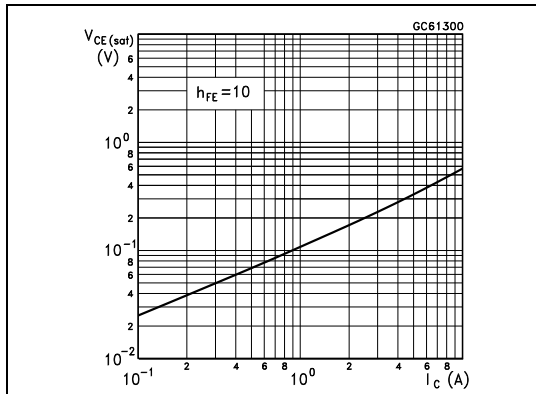
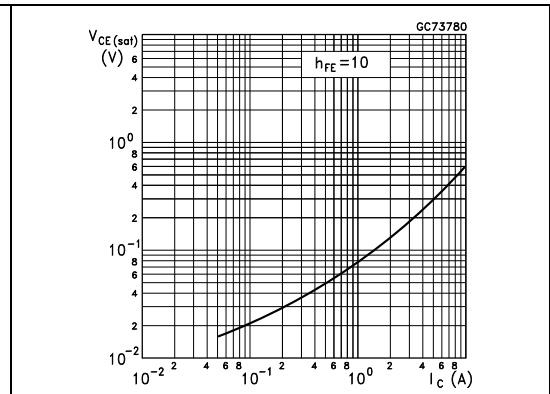


Figure 7. Collector-emitter saturation voltage (PNP)



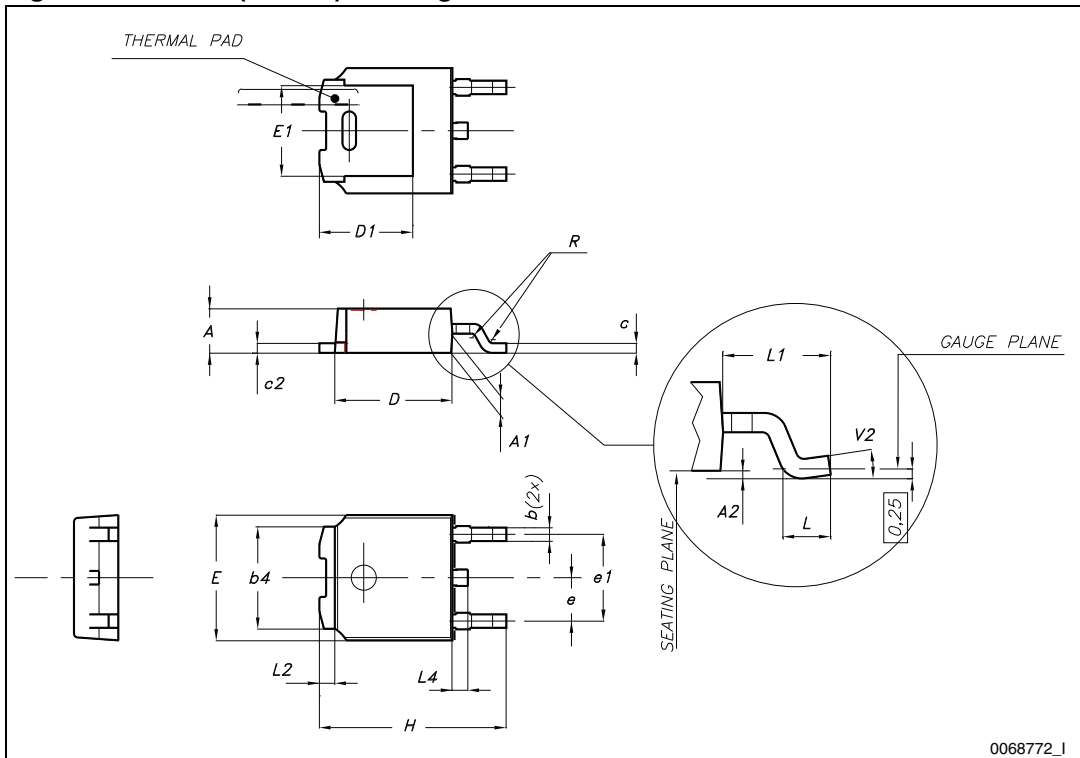
### 3 Package mechanical data

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

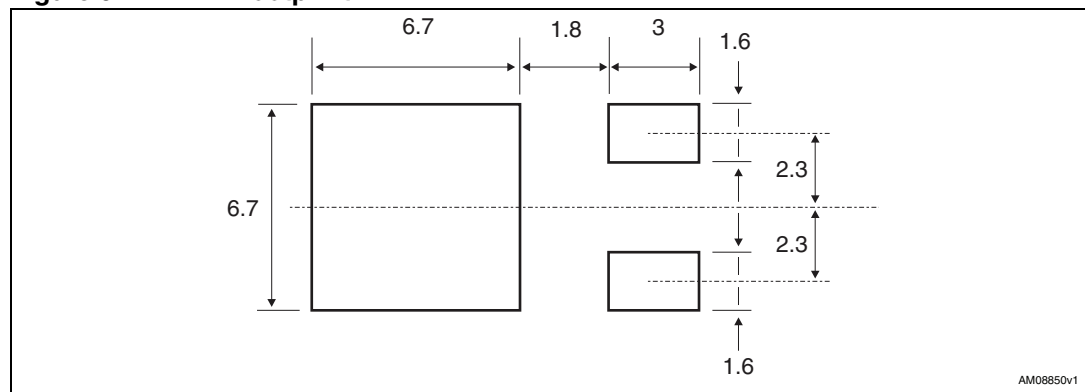


## 4 Packaging mechanical data

**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)

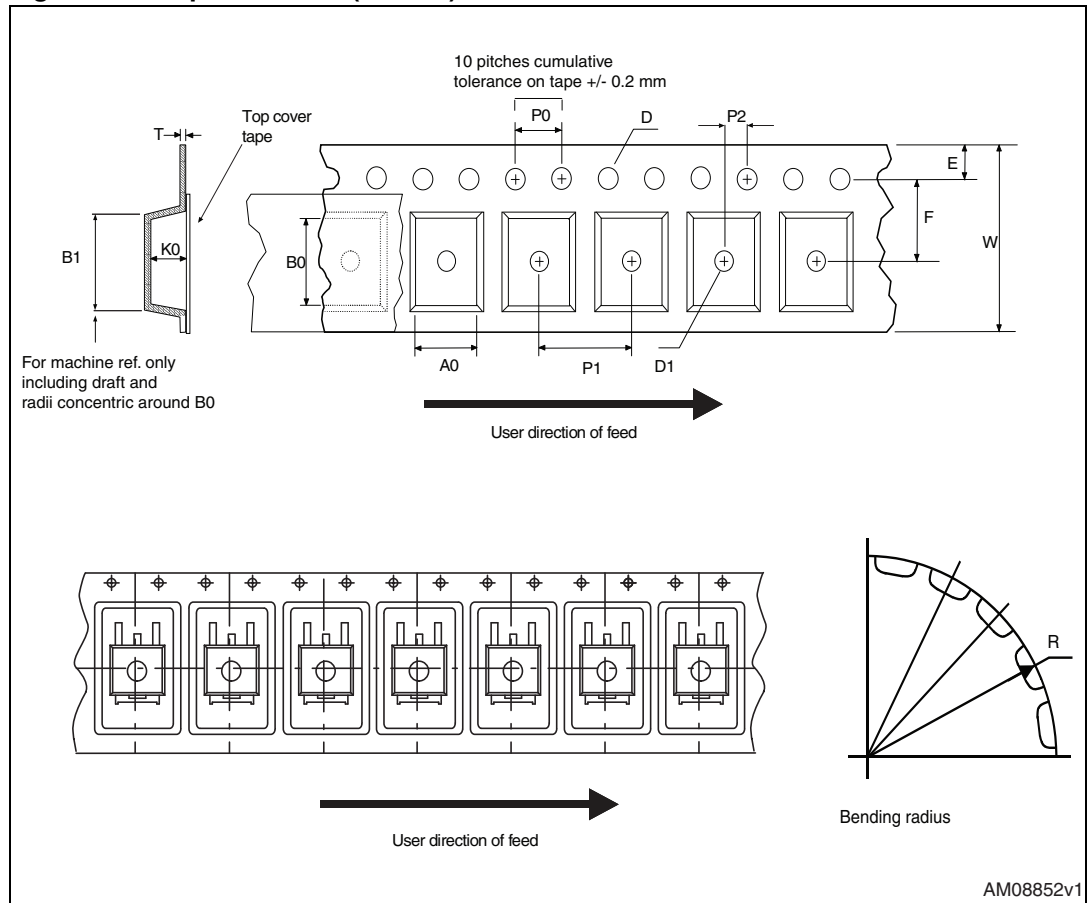
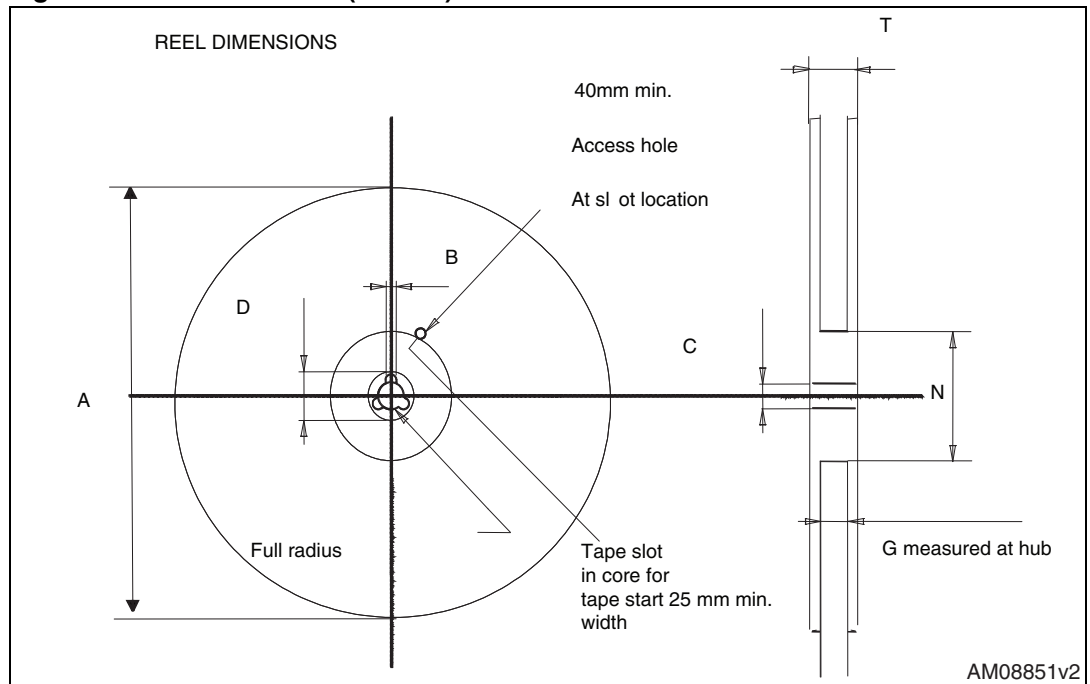


Figure 11. Reel for DPAK (TO-252)



## 5 Revision history

**Table 7. Document revision history**

Date	Revision	Changes
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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