

## Complementary power transistors

### Features

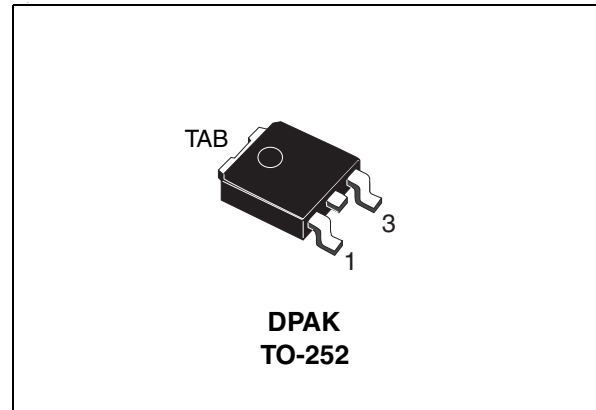
- The devices are qualified for automotive application
- Low collector-emitter saturation voltage
- Fast switching speed
- Surface-mounting TO-252 (DPAK) power package in tape and reel (suffix "T4")

### Applications

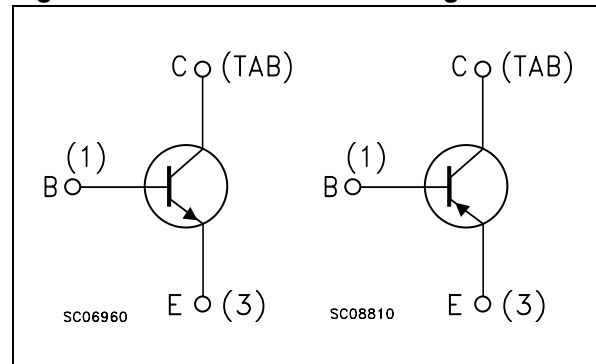
- Power amplifier
- Switching circuits

### Description

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
MJD44H11T4-A	MJD44H11	NPN	DPAK	Tape and reel
MJD45H11T4-A	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 $T_{case} = 25\text{ °C}$	20	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	6.25	°C/W

# 2 Electrical characteristics

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

**Table 4. Electrical characteristics**

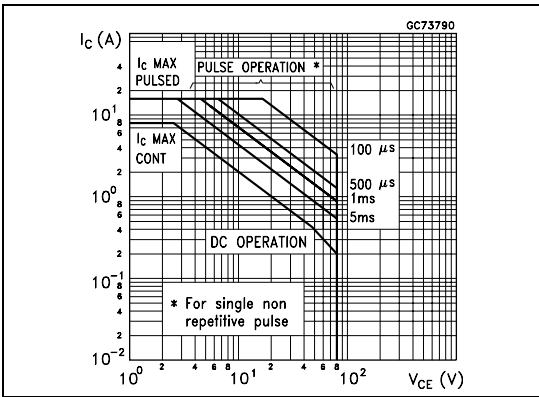
Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{\text{CEO(sus)}}^{(1)}$	Collector-emitter sustaining voltage ( $I_B = 0$ )	$I_C = 30\text{ mA}$	80	-		V
$I_{\text{CES}}$	Collector cut-off current ( $V_{\text{BE}} = 0$ )	$V_{\text{CE}} = 80\text{ V}$		-	10	$\mu\text{A}$
$I_{\text{EBO}}$	Emitter 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  $\leq 2\%$ .

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

## 2.1 Typical characteristic (curves)

**Figure 2. Safe operating area**



**Figure 3. Derating curves**

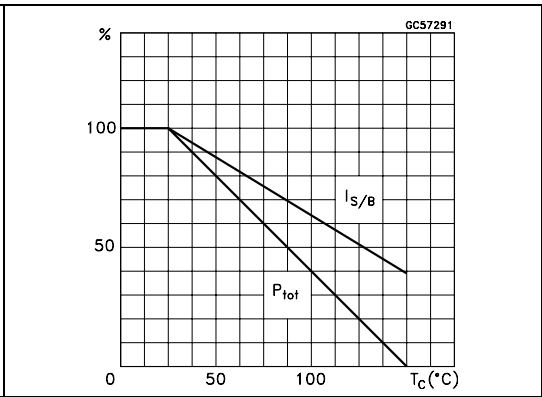


Figure 4. DC current gain (NPN)

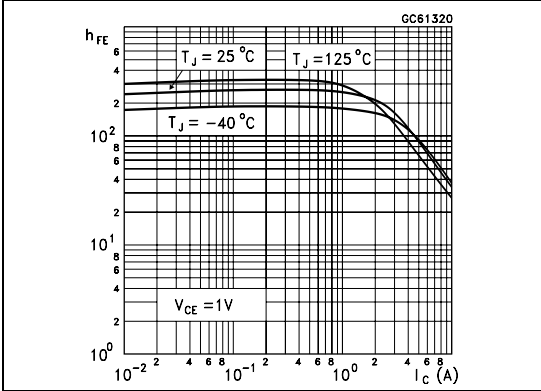


Figure 5. DC current gain (PNP)

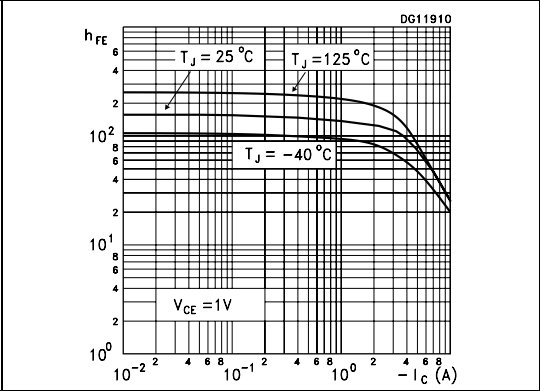


Figure 6. Collector-emitter saturation voltage (NPN)

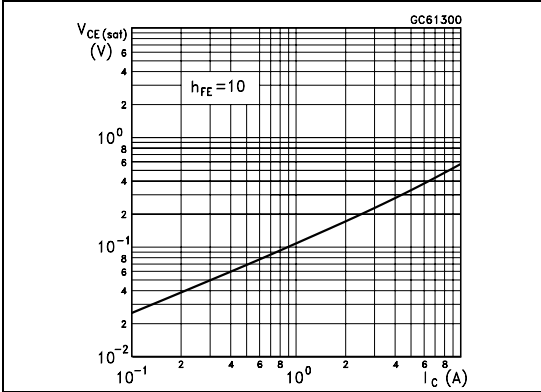
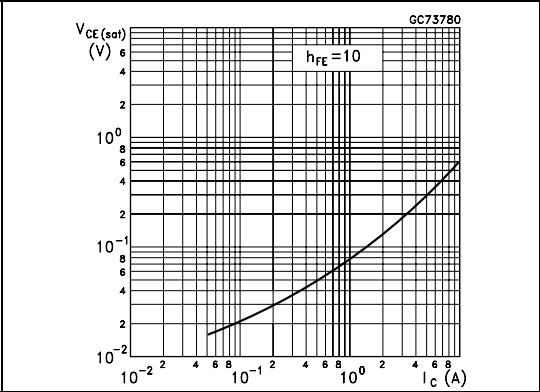


Figure 7. Collector-emitter saturation voltage (PNP)

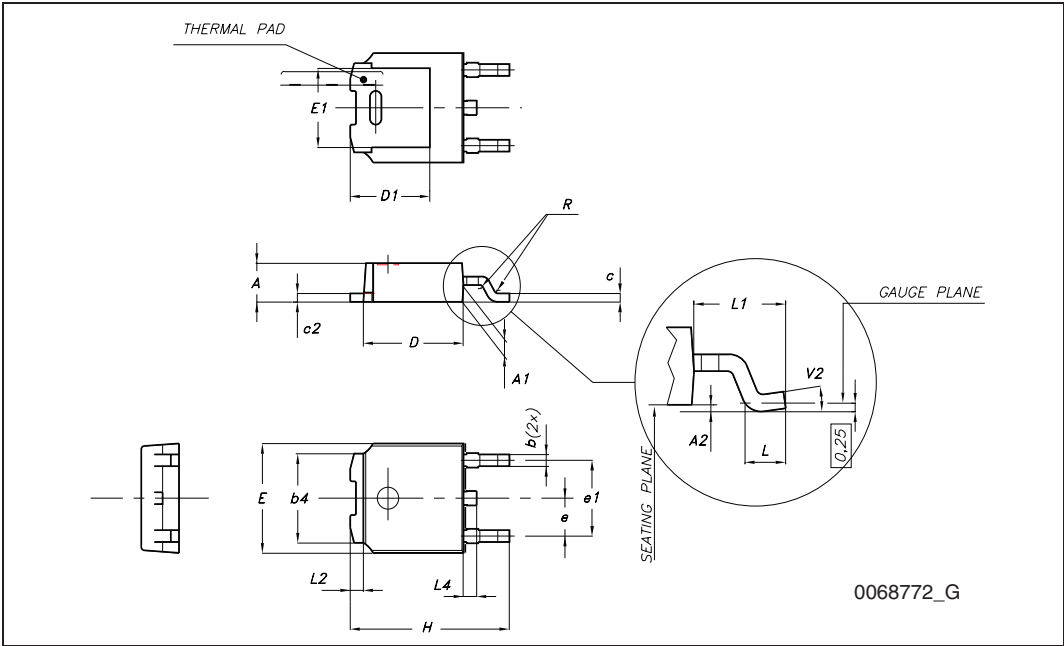


### 3      **Package mechanical data**

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TO-252 (DPAK) 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		
L1		2.80	
L2		0.80	
L4	0.60		1
R		0.20	
V2	0°		8°



## 4 Revision history

**Table 5. Document revision history**

Date	Revision	Changes
06-Aug-2009	1	Initial release.

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