

## Complementary power transistors

### Features

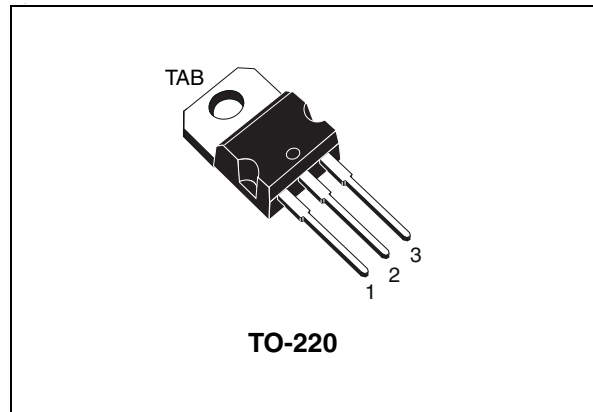
- Low collector-emitter saturation voltage
- Fast switching speed

### Applications

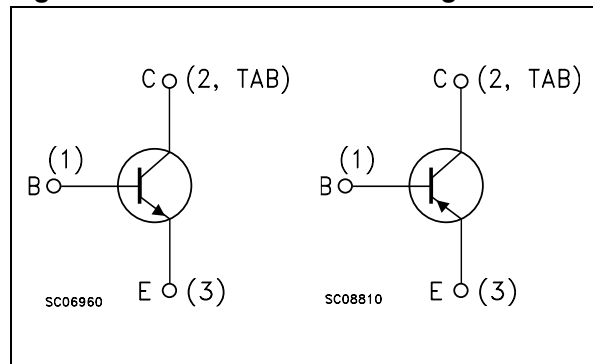
- Power amplifier
- Switching circuits

### 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 ( $I_{\text{B}} = 0$ )	$I_{\text{C}} = 100\text{ mA}$ D44H8 - D45H8 D44H11 - D45H11	60 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 ( $I_{\text{C}} = 0$ )	$V_{\text{EB}} = 5\text{ V}$		-	100	$\mu\text{A}$
$V_{\text{CE(sat)}}^{(1)}$	Collector-emitter saturation voltage	$I_{\text{C}} = 8\text{ A}$ $I_{\text{B}} = 0.4\text{ A}$		-	1	V
$V_{\text{BE(sat)}}^{(1)}$	Base-emitter saturation voltage	$I_{\text{C}} = 8\text{ A}$ $I_{\text{B}} = 0.8\text{ A}$		-	1.5	V
$h_{\text{FE}}^{(1)}$	DC current gain	$I_{\text{C}} = 2\text{ A}$ $V_{\text{CE}} = 1\text{ V}$	60	-		
		$I_{\text{C}} = 4\text{ A}$ $V_{\text{CE}} = 1\text{ V}$	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

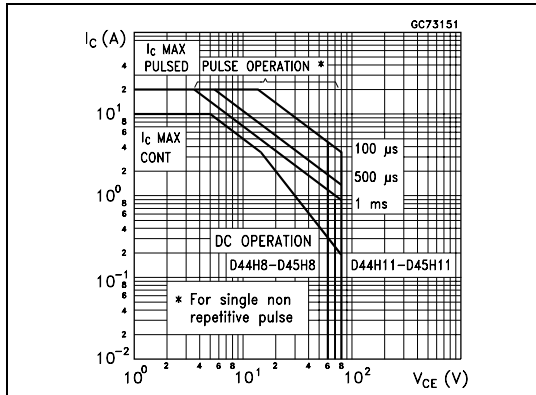


Figure 3. Derating curve

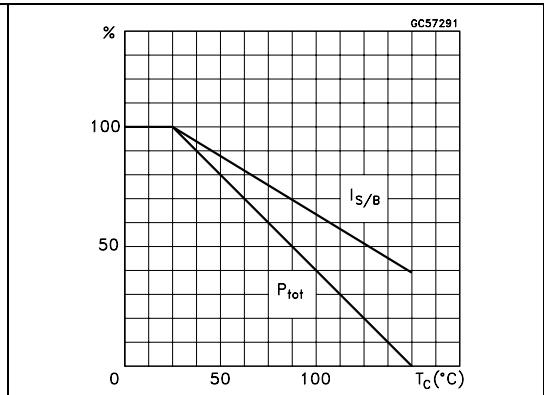


Figure 4. DC current gain (NPN)

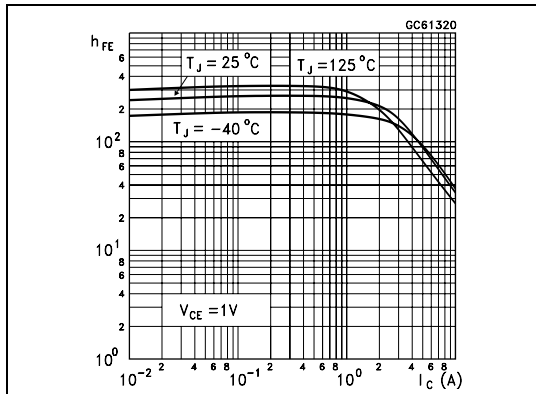


Figure 5. DC current gain (PNP)

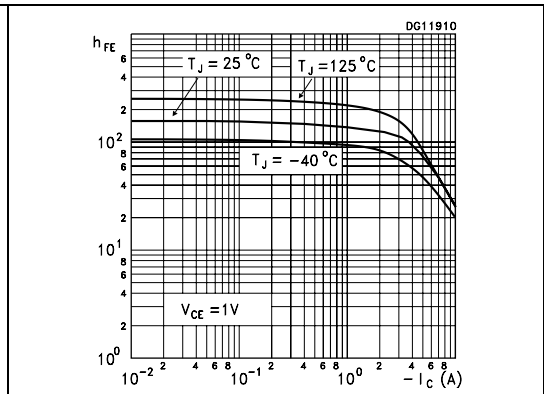


Figure 6. Collector-emitter saturation voltage (NPN)

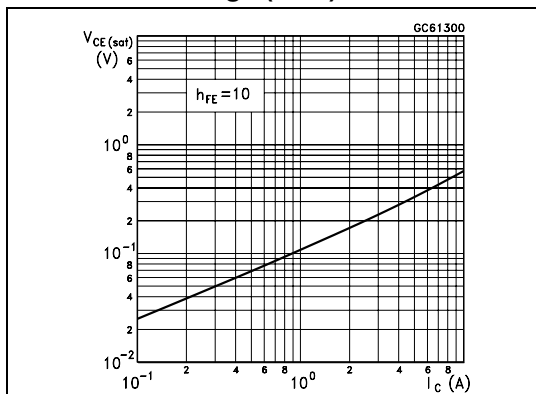
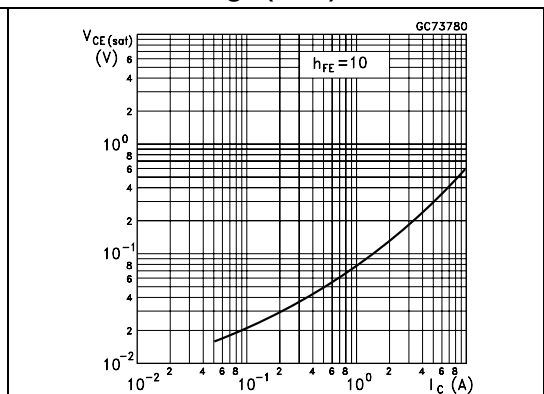


Figure 7. Collector-emitter saturation voltage (PNP)

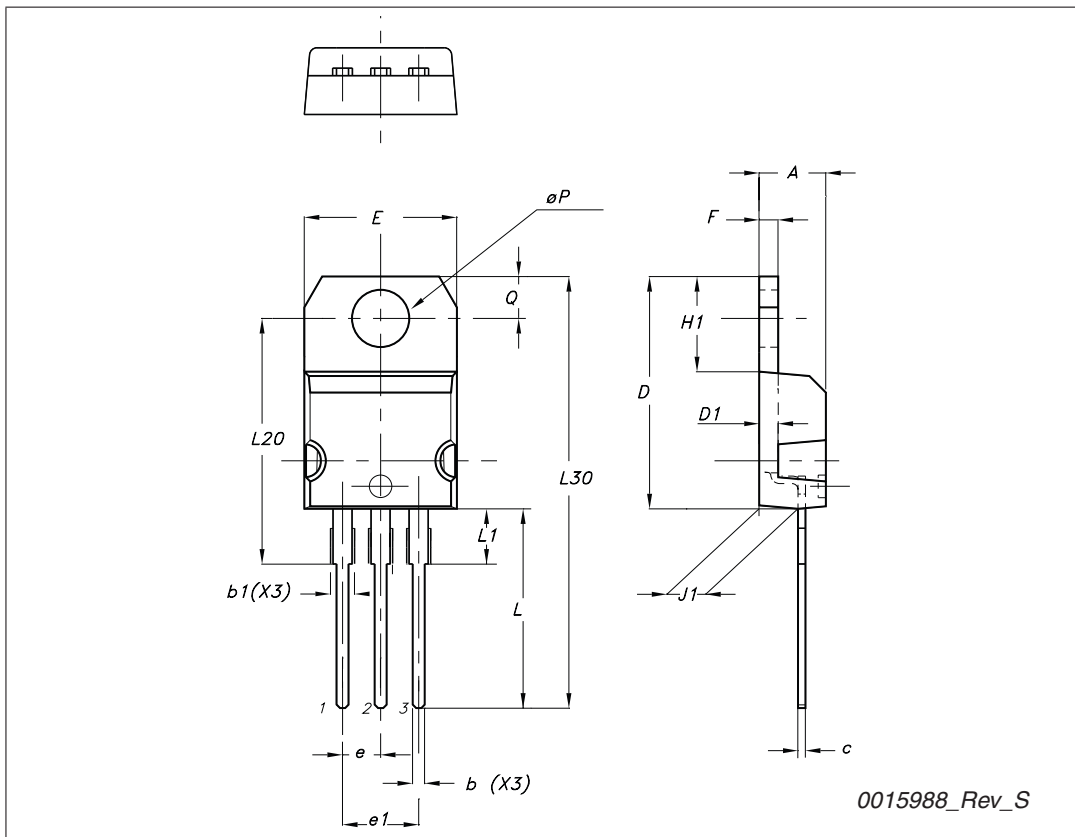


### 3 Package mechanical data

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	
∅P	3.75		3.85
Q	2.65		2.95



## 4 Revision history

**Table 5. Document revision history**

<b>Date</b>	<b>Revision</b>	<b>Changes</b>
21-Jun-2004	4	Document migration, no content change.
20-Oct-2009	5	Updated mechanical data.

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