### 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.

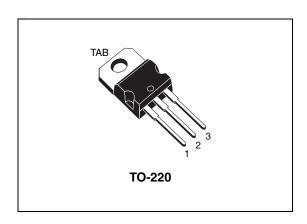


Figure 1. Internal schematic diagram

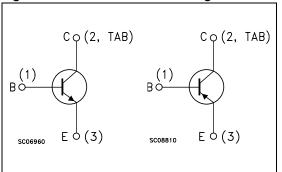


Table 1. Device summary

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

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# 1 Absolute maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V	Collector-emitter voltage (I <sub>B</sub> = 0) D44H8 - D45H8	60	V
V <sub>CEO</sub>	Collector-emitter voltage (I <sub>B</sub> = 0) D44H11 - D45H11	80	V
V <sub>EBO</sub>	Emitter-base voltage (I <sub>C</sub> = 0)	5	V
I <sub>C</sub>	Collector current	10	Α
I <sub>CM</sub>	Collector peak current	20	Α
P <sub>TOT</sub>	Total dissipation at T <sub>case</sub> = 25 °C	50	W
T <sub>STG</sub>	Storage temperature	-55 to 150	°C
TJ	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 <sub>thJC</sub>	Thermal resistance junction-case max	2.5	°C/W
R <sub>thJA</sub>	Thermal resistance junction-ambient max	62.5	°C/W

### 2 Electrical characteristics

 $T_{case}$  = 25 °C; unless otherwise specified.

Table 4. Electrical characteristics

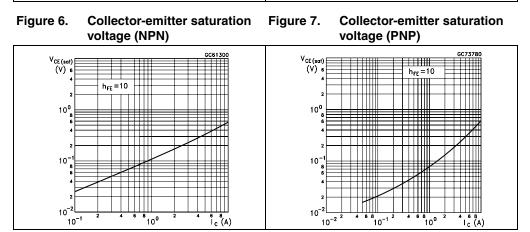
Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
V <sub>CEO(sus)</sub> <sup>(1)</sup>	Collector-emitter sustaining voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = 100 mA D44H8 - D45H8 D44H11 - D45H11	60 80	-		٧
I <sub>CES</sub>	Collector cut-off current (V <sub>BE</sub> = 0)	V <sub>CE</sub> = rated V <sub>CEO</sub>		-	10	μΑ
I <sub>EBO</sub>	Emitter cut-off current (I <sub>C</sub> = 0)	V <sub>EB</sub> = 5 V		-	100	μΑ
V <sub>CE(sat)</sub> <sup>(1)</sup>	Collector-emitter saturation voltage	I <sub>C</sub> = 8 A I <sub>B</sub> = 0.4 A		-	1	٧
V <sub>BE(sat)</sub> <sup>(1)</sup>	Base-emitter saturation voltage	I <sub>C</sub> = 8 A I <sub>B</sub> = 0.8 A		-	1.5	V
h <sub>FE</sub> <sup>(1)</sup>	DC current gain	$I_C = 2 A$ $V_{CE} = 1 V$	60	-		
		I <sub>C</sub> = 4 A V <sub>CE</sub> = 1 V	40	-		

<sup>1.</sup> Pulse test: pulse duration  $\leq$  300 µs, duty cycle  $\leq$  2 %.

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

### 2.1 Electrical characteristics (curves)

Figure 2. Safe operating area **Derating curve** Figure 3. I<sub>C</sub> (A) Ic MAX
PULSED PULSE OPERATION \* 10<sup>1</sup> 100 10°, DC OPERATION 50 D44H8-D45H8 10<sup>-1</sup> \* For single non repetitive pulse 10<sup>-2</sup> | 10<sup>1</sup>  $V_{CE}(V)$ 50 100 T<sub>C</sub>(°C)



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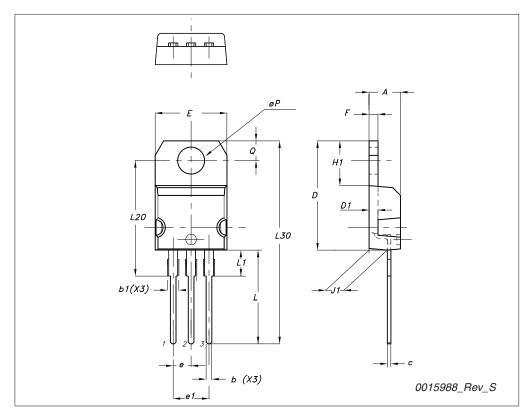
## 3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of  $\mathsf{ECOPACK}^{\mathbb{B}}$  packages, depending on their level of environmental compliance.  $\mathsf{ECOPACK}^{\mathbb{B}}$  specifications, grade definitions and product status are available at:  $\mathit{www.st.com}$ .  $\mathsf{ECOPACK}^{\mathbb{B}}$  is an ST trademark.



#### TO-220 type A mechanical data

Dim	mm			
Dim	Min	Тур	Max	
A	4.40		4.60	
b	0.61		0.88	
b1	1.14		1.70	
С	0.48		0.70	
D	15.25		15.75	
D1		1.27		
E	10		10.40	
е	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		
ØP	3.75		3.85	
Q	2.65		2.95	



# 4 Revision history

Table 5. Document revision history

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

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