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## Complementary power transistors

### Features

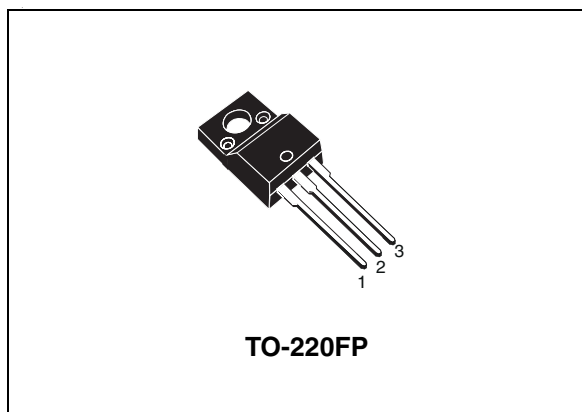
- Low collector-emitter saturation voltage
- Fast switching speed

### Applications

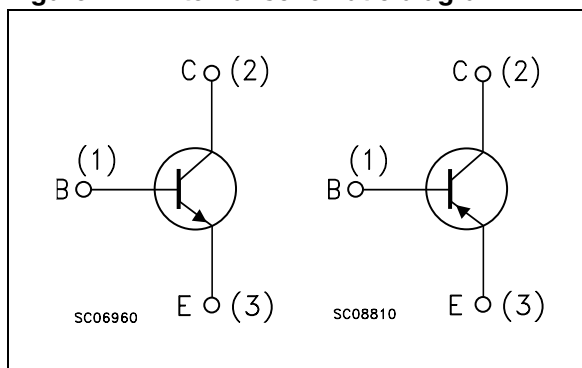
- Power amplifier
- Switching circuits

### Description

These low voltage transistors are housed in fully isolated TO-220FP packages and form a complementary pair. They are manufactured in multi epitaxial planar technology for general purpose in linear and switching applications.



**Figure 1. Internal schematic diagram**



**Table 1. Device summary**

Order codes	Marking	Polarity	Package	Packaging
D44H11FP	D44H11FP	NPN	TO-220FP	Tube
D45H11FP	D45H11FP	PNP	TO-220FP	Tube

# 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	10	A
$I_{CM}$	Collector peak current	20	A
$P_{TOT}$	Total dissipation at $T_{case} = 25\text{ °C}$	36	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	3.5	°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 ( $I_{\text{B}} = 0$ )	$I_{\text{C}} = 30\text{ mA}$	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 ( $I_{\text{C}} = 0$ )	$V_{\text{EB}} = 5\text{ V}$		-	50	$\mu\text{A}$
$V_{\text{CE(sat)}}^{(1)}$	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. DC current gain (NPN)

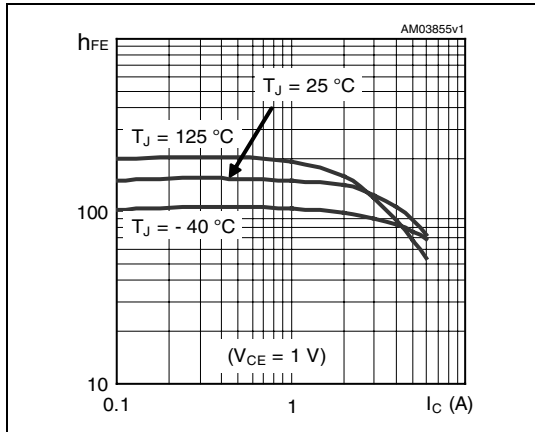


Figure 3. DC current gain (PNP)

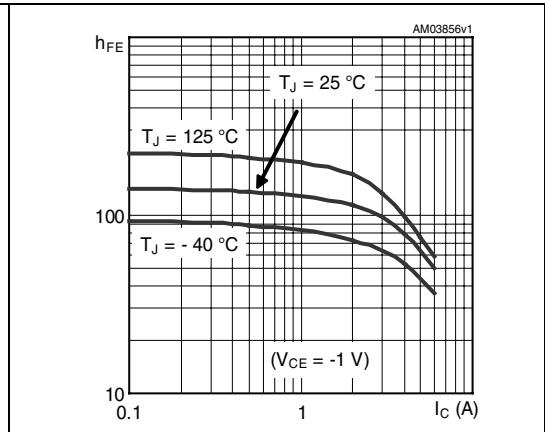


Figure 4. Saturation voltage (NPN)

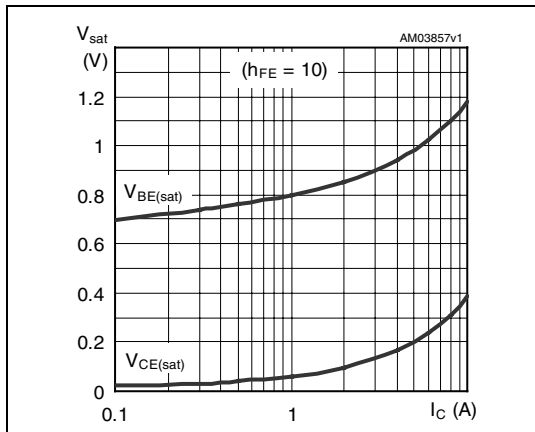
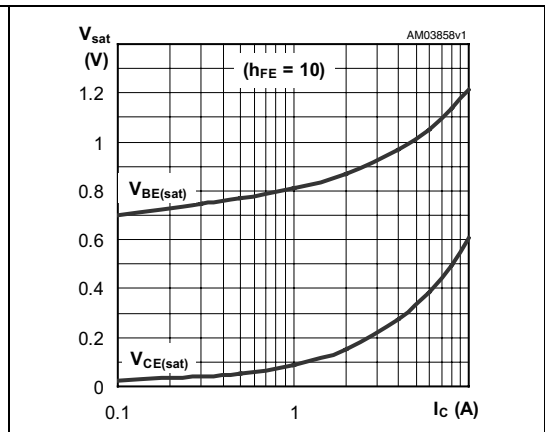


Figure 5. Saturation voltage (PNP)



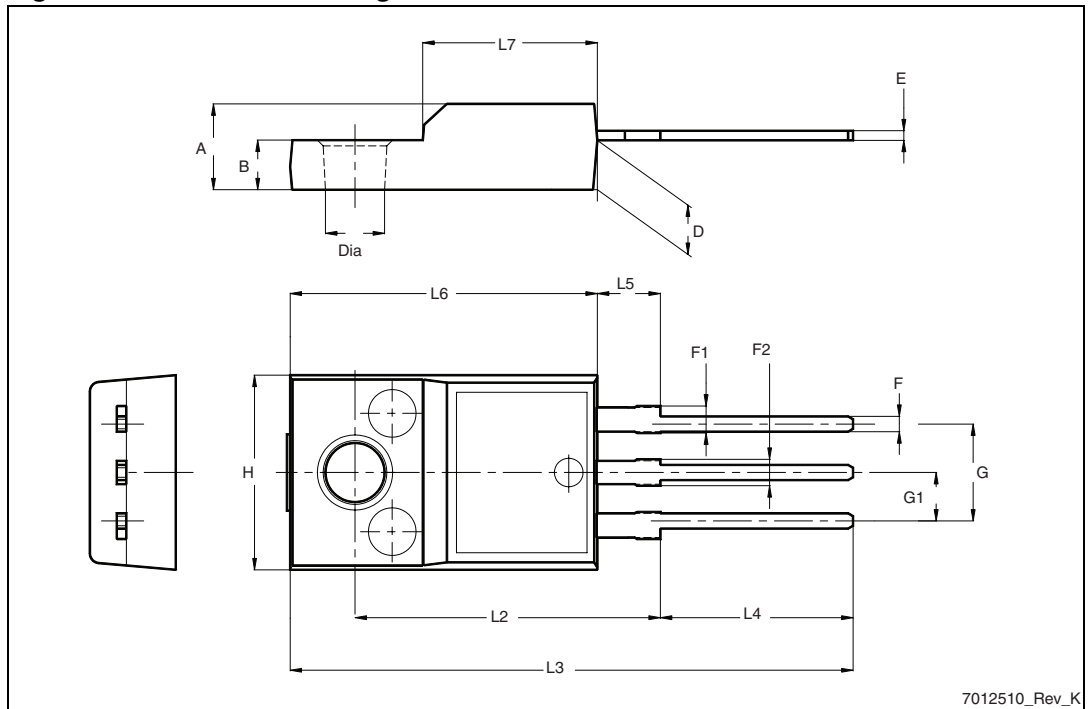
### 3 Package mechanical data

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. TO-220FP mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	4.4		4.6
B	2.5		2.7
D	2.5		2.75
E	0.45		0.7
F	0.75		1
F1	1.15		1.70
F2	1.15		1.70
G	4.95		5.2
G1	2.4		2.7
H	10		10.4
L2		16	
L3	28.6		30.6
L4	9.8		10.6
L5	2.9		3.6
L6	15.9		16.4
L7	9		9.3
Dia	3		3.2

Figure 6. TO-220FP drawing



## 4 Revision history

**Table 6. Document revision history**

Date	Revision	Changes
06-Aug-2009	1	Initial release.
22-Oct-2009	2	Document status promoted from preliminary data to datasheet, updated $I_C$ current value on <a href="#">Table 2: Absolute maximum ratings</a> , inserted new <a href="#">Section 2.1: Electrical characteristics (curves)</a> and updated package mechanical data (see <a href="#">Table 5</a> and <a href="#">Figure 6</a> )
11-Mar-2011	3	Updated $V_{CE(sat)}$ and $V_{BE(sat)}$ maximum values on <a href="#">Table 4: Electrical characteristics</a>

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