

## Complementary power transistors

### Features

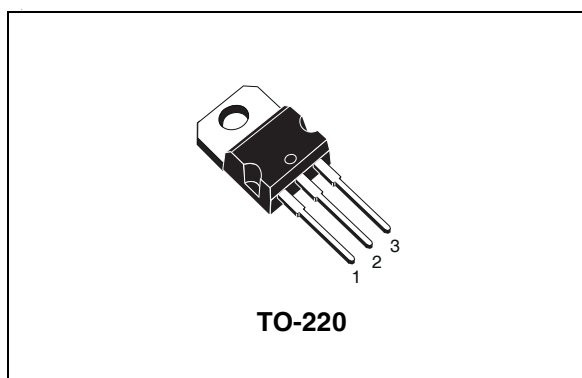
- Complementary NPN-PNP devices

### Applications

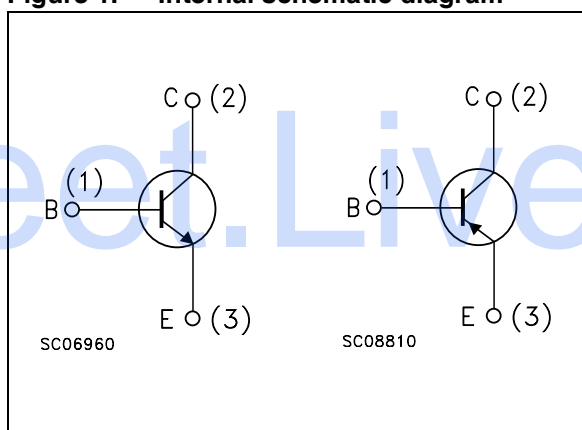
- Power linear and switching

### Description

The device is manufactured in Planar technology with "Base Island" layout. The resulting transistor shows exceptional high gain performance coupled with very low saturation voltage. The PNP type is BD244C.



**Figure 1. Internal schematic diagram**



**Table 1. Device summary**

Order code	Marking	Package	Packaging
BD243C	BD243C	TO-220	Tube
BD244C	BD244C		

# 1 Absolute maximum ratings

**Table 2. Absolute maximum ratings**

Symbol	Parameter	Value		Unit
		BD243C (NPN)	BD244C (PNP)	
$V_{CBO}$	Collector-base voltage ( $I_E = 0$ )	100		V
$V_{CEO}$	Collector-emitter voltage ( $I_B = 0$ )	100		V
$V_{EBO}$	Emitter-base voltage ( $I_C = 0$ )	5		V
$I_C$	Collector current	6		A
$I_{CM}$	Collector peak current ( $t_P < 5\text{ms}$ )	10		A
$I_B$	Base current	2		A
$P_{TOT}$	Total dissipation at $T_C = 25^\circ\text{C}$	65		W
$T_{stg}$	Storage temperature	-65 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

## 2 Electrical characteristics

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

**Table 3. Electrical characteristics**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{\text{CES}}$	Collector cut-off current ( $V_{\text{BE}} = 0$ )	$V_{\text{CE}} = 100\text{V}$			0.4	mA
$I_{\text{CEO}}$	Collector cut-off current ( $I_{\text{B}} = 0$ )	$V_{\text{CE}} = 60\text{V}$			0.7	mA
$I_{\text{EBO}}$	Emitter cut-off current ( $I_{\text{C}} = 0$ )	$V_{\text{EB}} = 5\text{V}$			1	mA
$V_{\text{CEO(sus)}}^{(1)}$	Collector-emitter sustaining voltage ( $I_{\text{B}} = 0$ )	$I_{\text{C}} = 30\text{mA}$	100			V
$V_{\text{CE(sat)}}^{(1)}$	Collector-emitter saturation voltage	$I_{\text{C}} = 6\text{A}$ $I_{\text{B}} = 1\text{A}$			1.5	V
$V_{\text{BE}}^{(1)}$	Base-emitter voltage	$I_{\text{C}} = 6\text{A}$ $I_{\text{B}} = 1\text{A}$			2	V
$h_{\text{FE}}^{(1)}$	DC current gain	$I_{\text{C}} = 0.3\text{mA}$ $V_{\text{CE}} = 4\text{V}$ $I_{\text{C}} = 3\text{A}$ $V_{\text{CE}} = 4\text{V}$	30 15			

1. Pulsed duration = 300 ms, duty cycle  $\leq 2\%$ .

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

## 2.1 Typical characteristics

Figure 2. Safe operating area

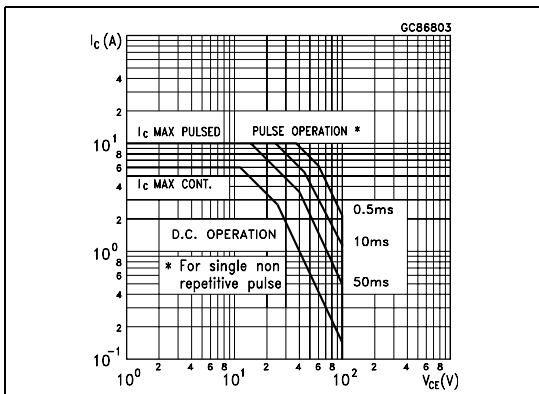


Figure 3. Derating curve

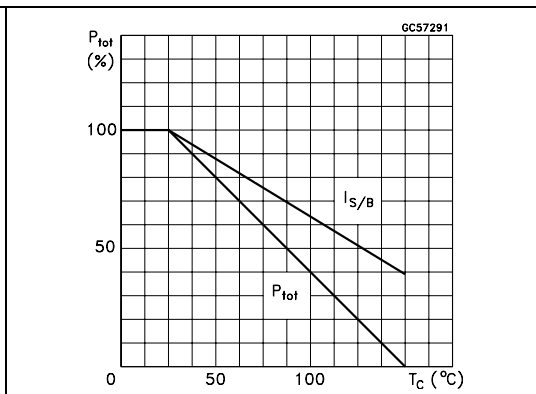


Figure 4. DC current gain (NPN)

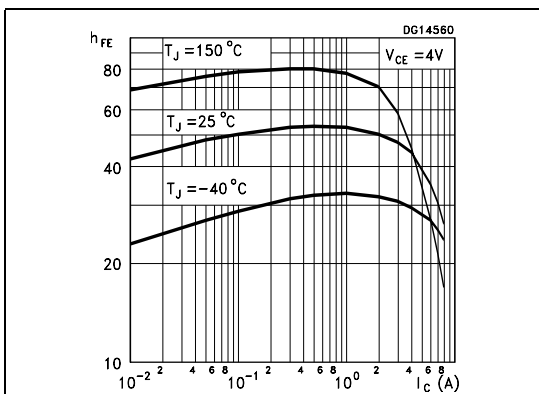


Figure 5. DC current gain (PNP)

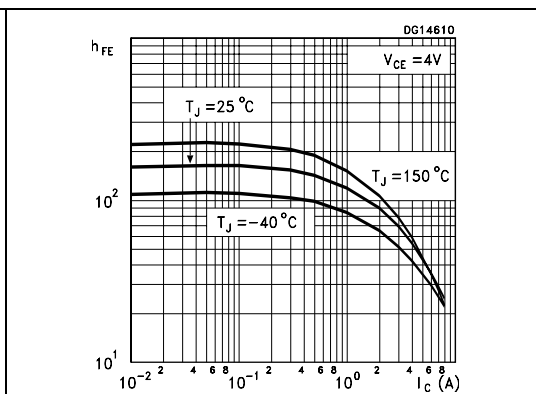


Figure 6. Collector-emitter saturation voltage (NPN)

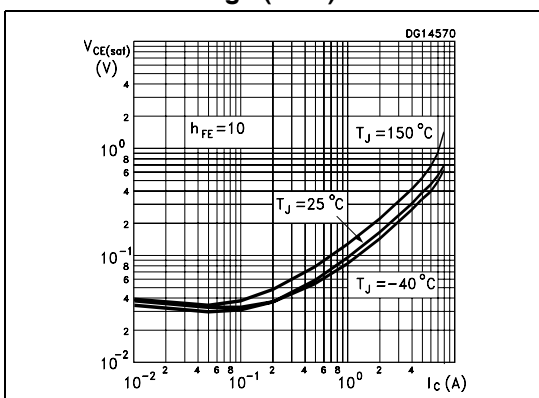
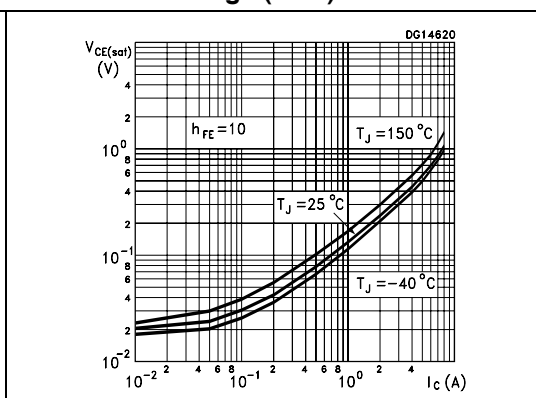
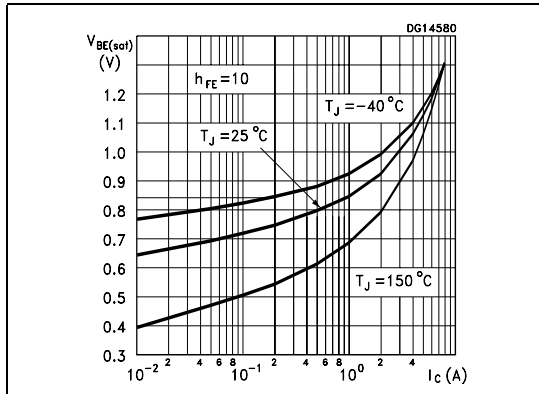


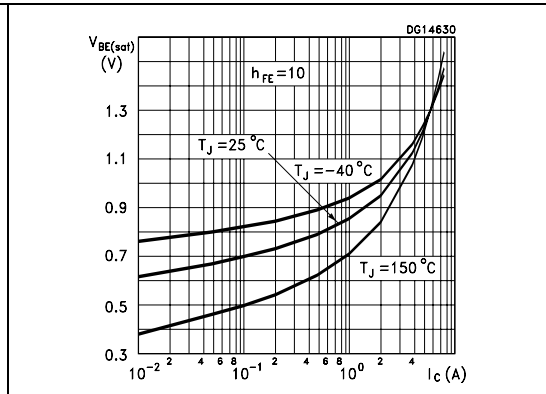
Figure 7. Collector-emitter saturation voltage (PNP)



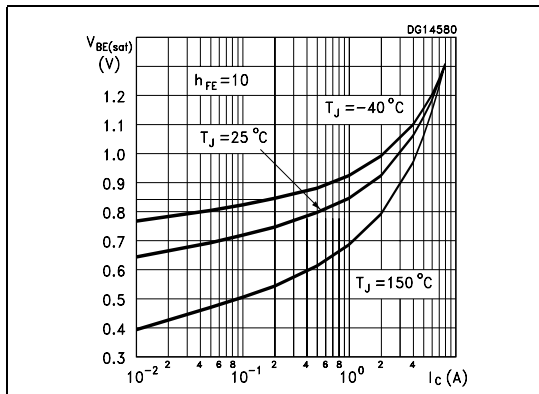
**Figure 8. Base-emitter saturation voltage (NPN)**



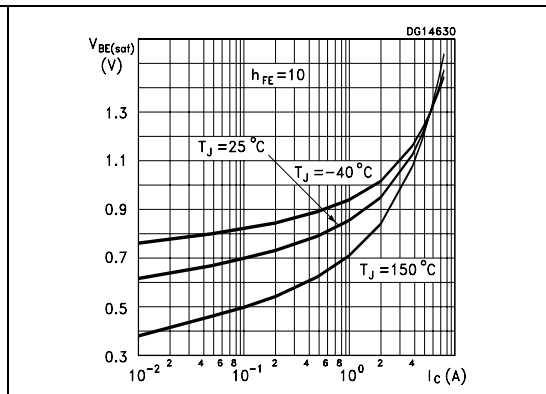
**Figure 9. Base-emitter saturation voltage (PNP)**



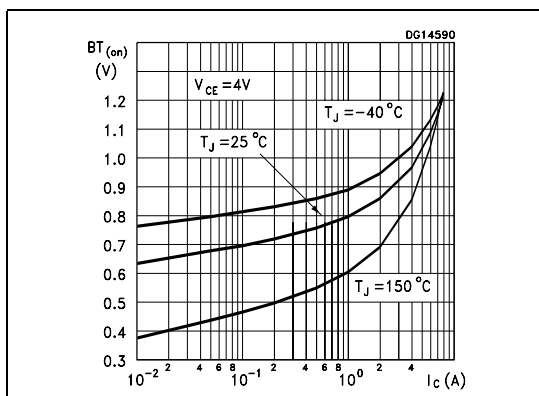
**Figure 10. Base-emitter saturation voltage (NPN)**



**Figure 11. Base-emitter saturation voltage (PNP)**



**Figure 12.  $BT_{(ON)}$  time (NPN)**



**Figure 13.  $BT_{(ON)}$  time (PNP)**

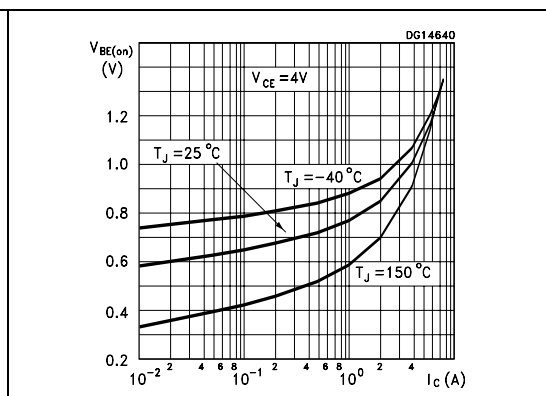


Figure 14. Resistive load switching time (NPN)      Figure 15. Resistive load switching time (PNP)

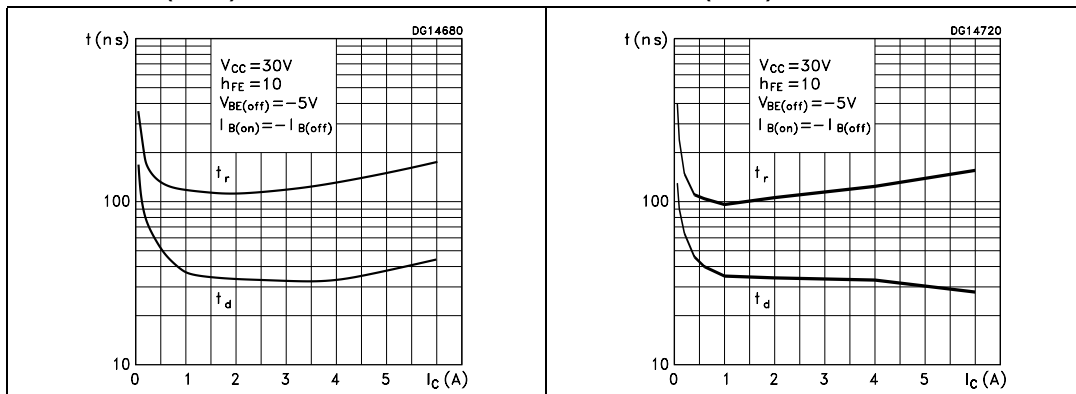


Figure 16. Resistive load switching time (NPN)      Figure 17. Resistive load switching time (PNP)

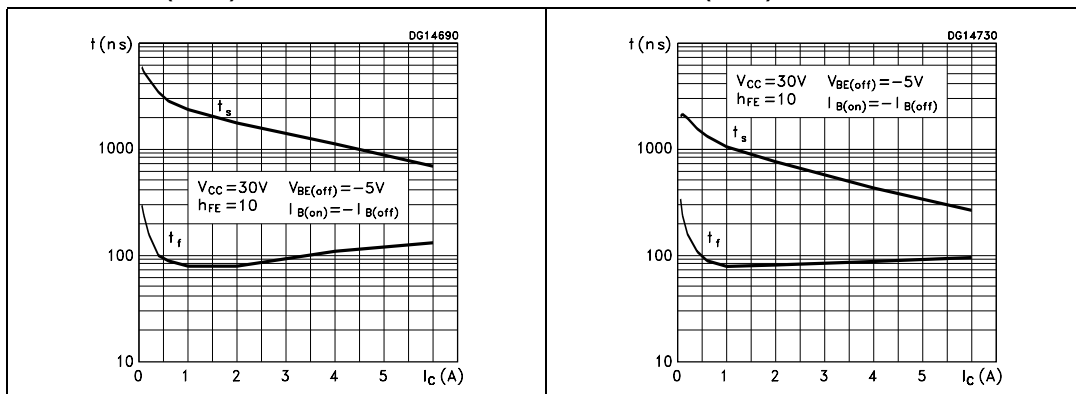
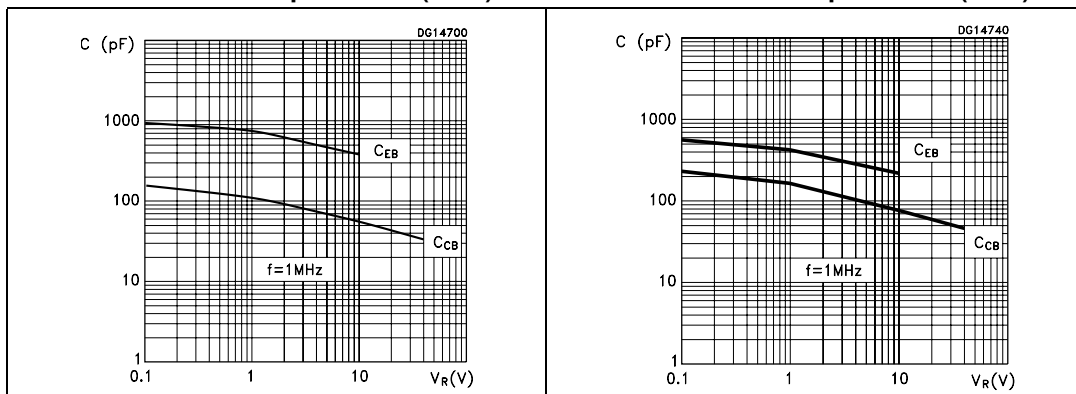


Figure 18. Collector-base and collector-emitter capacitance (NPN)      Figure 19. Collector-base and collector-emitter capacitance (PNP)

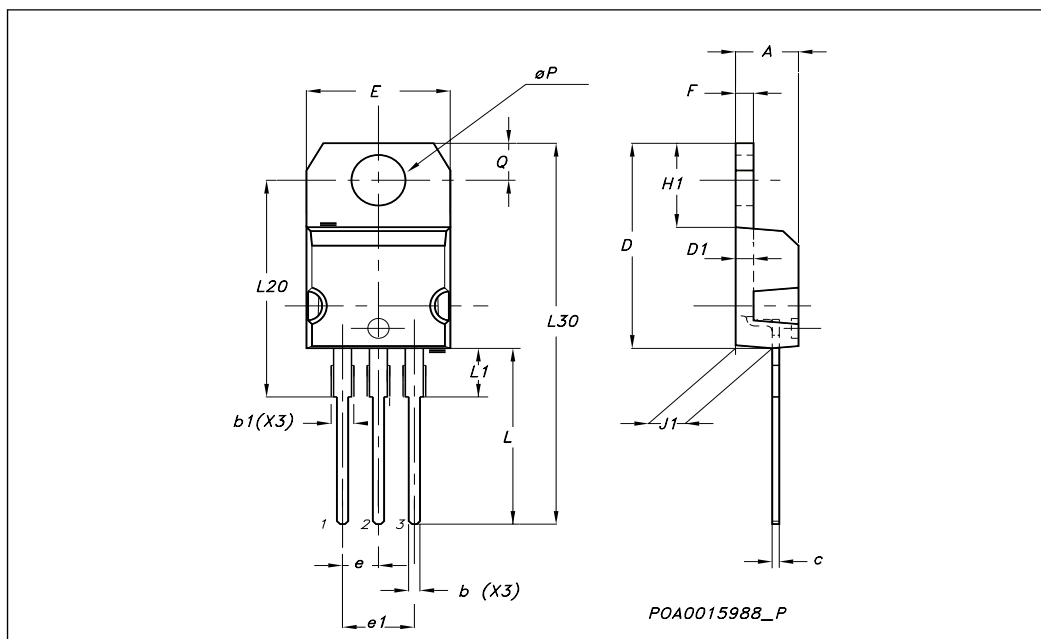


### 3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: [www.st.com](http://www.st.com)

**TO-220 Mechanical data**

DIM.	mm.		
	MIN.	TYP	MAX.
A	4.40		4.60
b	0.61		0.88
b1	1.14		1.70
c	0.49		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	
øP	3.75		3.85
Q	2.65		2.95





## 4 Revision history

**Table 4. Revision history**

<b>Date</b>	<b>Revision</b>	<b>Changes</b>
13-Sep-2005	4	New datasheet according to MLD-PWR/05/1267
25-Jul-2007	5	Figures 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 and figure 19, added

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