BD533 BD535 BD537
BD534 BD536

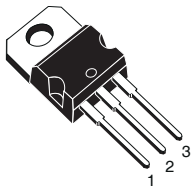
Complementary power transistors

Features

- BD533, BD535, and BD537 are NPN transistors

Description

The devices are manufactured in Planar technology with “Base Island” layout. The resulting transistor shows exceptional high gain performance coupled with very low saturation voltage. The PNP types are BD534 and BD536.



TO-220

Figure 1. Internal schematic diagrams

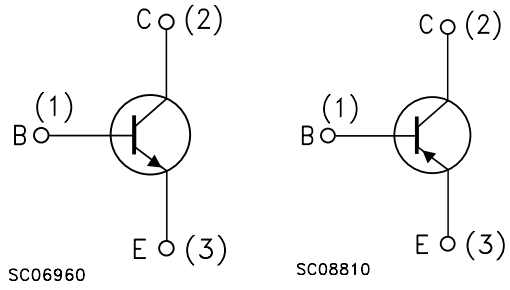


Table 1. Device summary

Order code	Marking	Package	Packaging
BD533 BD534 BD535 BD536 BD537	BD533 BD534 BD535 BD536 BD537	TO-220	Tube

1 Absolute maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter		Value			Unit
		NPN	BD533	BD535	BD537	
		PNP	BD534	BD536		
V_{CBO}	Collector-base voltage (I_E = 0)		45	60	80	V
V_{CES}	Collector-emitter voltage (V_B = 0)		45	60	80	V
V_{CEO}	Collector-base voltage (I_B = 0)		45	60	80	V
V_{EBO}	Emitter-base voltage (I_C = 0)		5			V
I_C	Collector current		8			A
I_B	Base current		1			A
P_{TOT}	Total dissipation at T_{case} = 25°C		50			W
T_{stg}	Storage temperature		-65 to 150			°C
T_J	Max. operating junction temperature		150			°C

Note: For PNP types voltage and current values are negative

Table 3. Electrical characteristics

(T_{case} = 25°C; unless otherwise specified)

Table 4. Electrical characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current (I_E = 0)	V_{CB} = rated V_{CBO}			0.1	mA
I_{CES}	Collector cut-off current (V_{BE} = 0)	for BD533/534 V_{CE} = 45 V for BD535/536 V_{CE} = 60 V for BD537 V_{CE} = 80 V			0.1 0.1 0.1	mA mA mA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB} = 5V			1	mA
$V_{CEO(sus)}$ (1)	Collector-emitter sustaining voltage (I_B = 0)	I_C = 100mA for BD533/534 for BD535/536 for BD537	45 60 80			V V V
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	I_C = 2A I_B = 0.2A I_C = 6A I_B = 0.6A		0.8	0.8	V V
V_{BE} (1)	Base-emitter voltage	I_C = 2A V_{CE} = 2V			1.5	V
h_{FE} (1)	DC current gain	I_C = 10mA V_{CE} = 5V for BD533/534 for BD535/536 for BD537 I_C = 500mA V_{CE} = 2V I_C = 2A V_{CE} = 2V for BD533/534 for BD535/536 for BD537	 20 20 15 40 25 25 15			

1. Pulsed duration = 300 ms, duty cycle ≥1.5%.

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

1.1 Electrical characteristic (curves)

Figure 2. Safe operating area

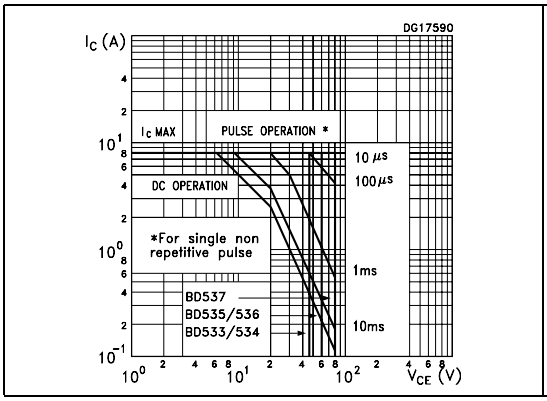


Figure 3. Derating curve

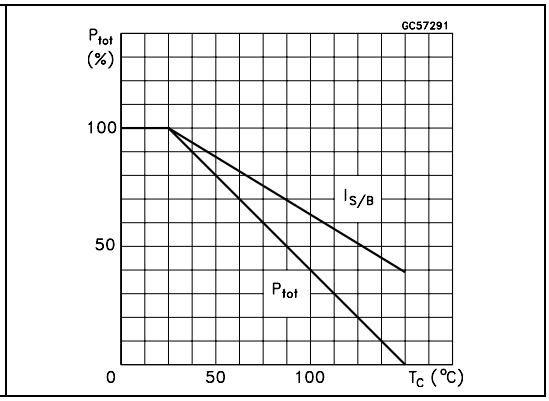


Figure 4. DC current gain (NPN)

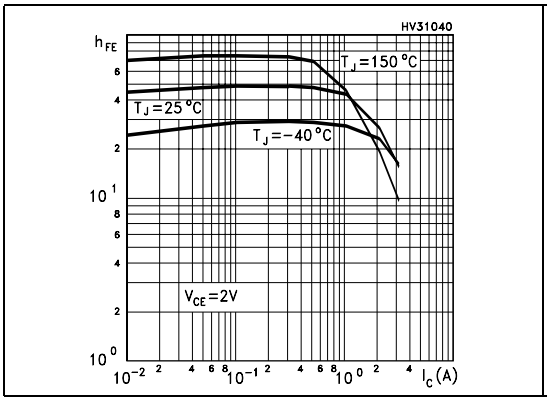


Figure 5. DC current gain (PNP)

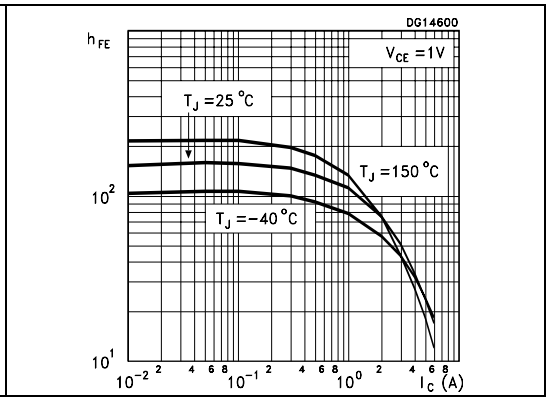


Figure 6. DC current gain (NPN)

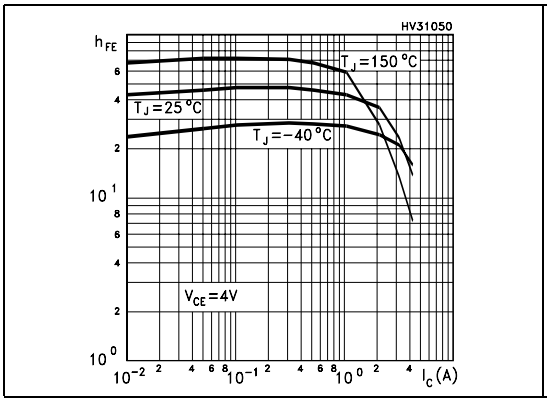


Figure 7. DC current gain (PNP)

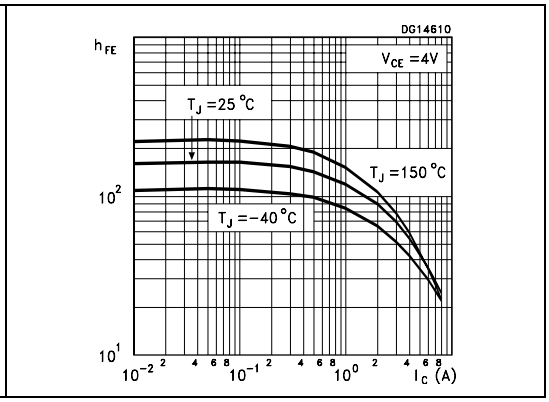


Figure 8. Collector-emitter saturation voltage (NPN)

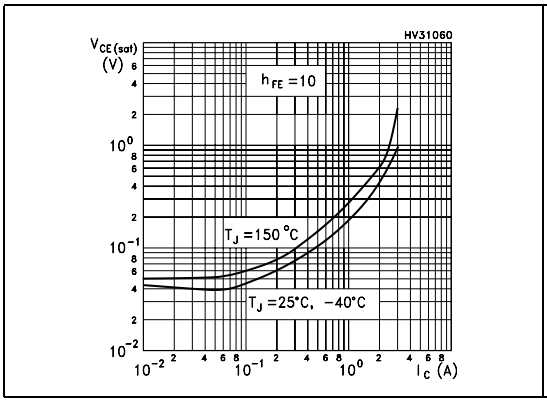


Figure 9. Collector-emitter saturation voltage (PNP)

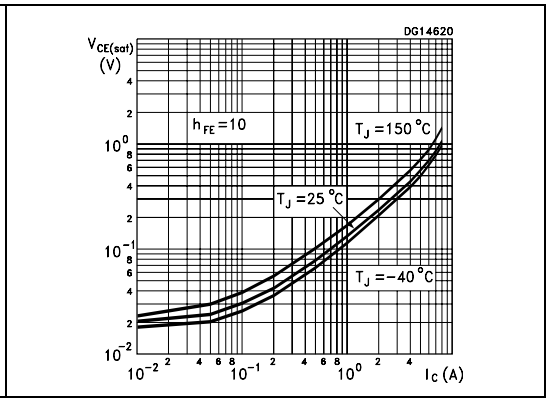


Figure 10. Base-emitter saturation voltage (NPN)

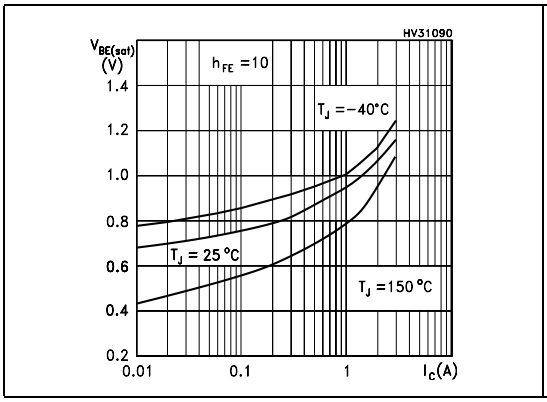


Figure 11. Base-emitter saturation voltage (PNP)

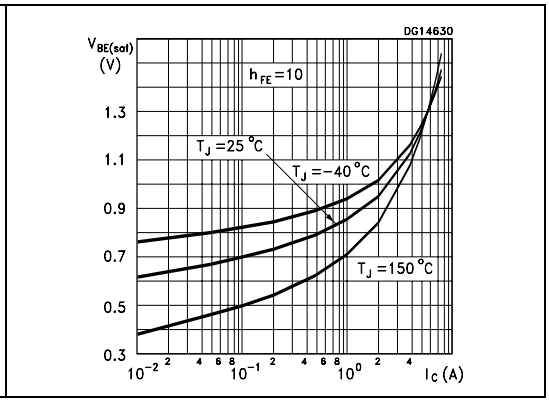


Figure 12. Base-emitter on voltage (NPN)

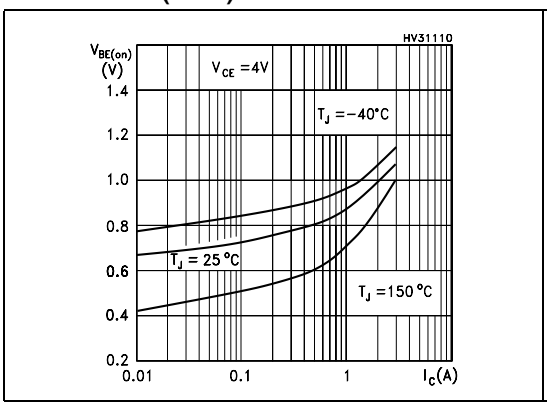


Figure 13. Base-emitter on voltage (PNP)

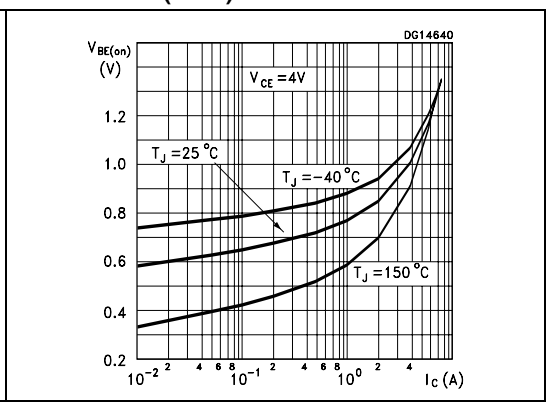


Figure 14. Resistive load switching time (NPN)

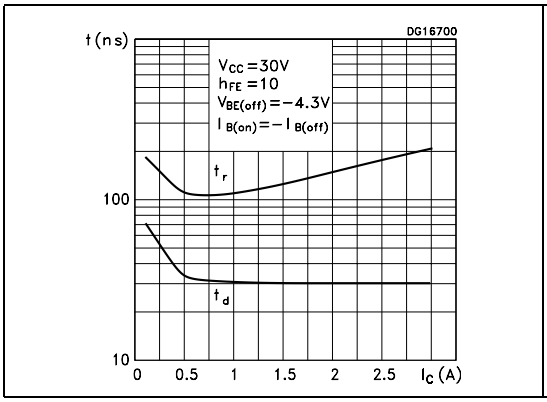


Figure 15. Resistive load switching time (PNP)

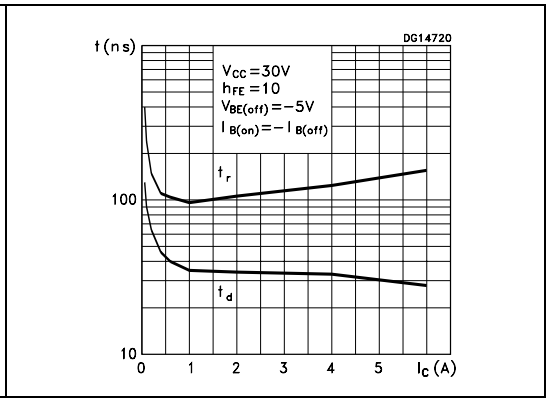


Figure 16. Resistive load switching time (NPN)

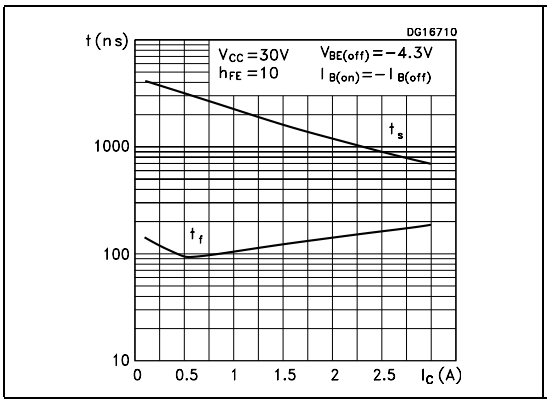


Figure 17. Resistive load switching time (PNP)

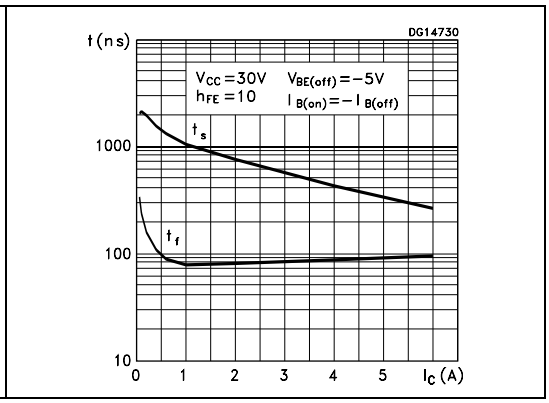


Figure 18. Collector-base and collector-emitter capacitance (NPN)

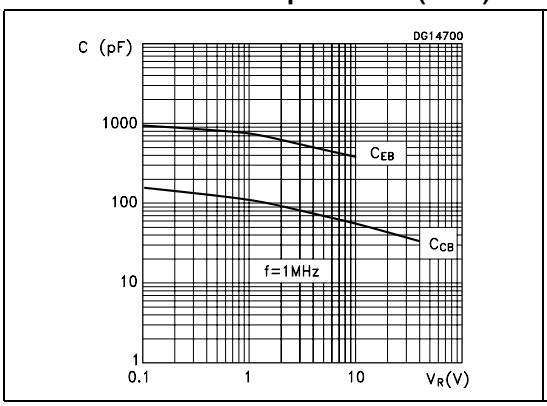
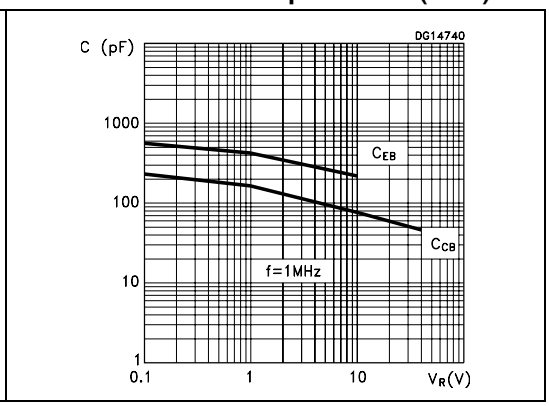
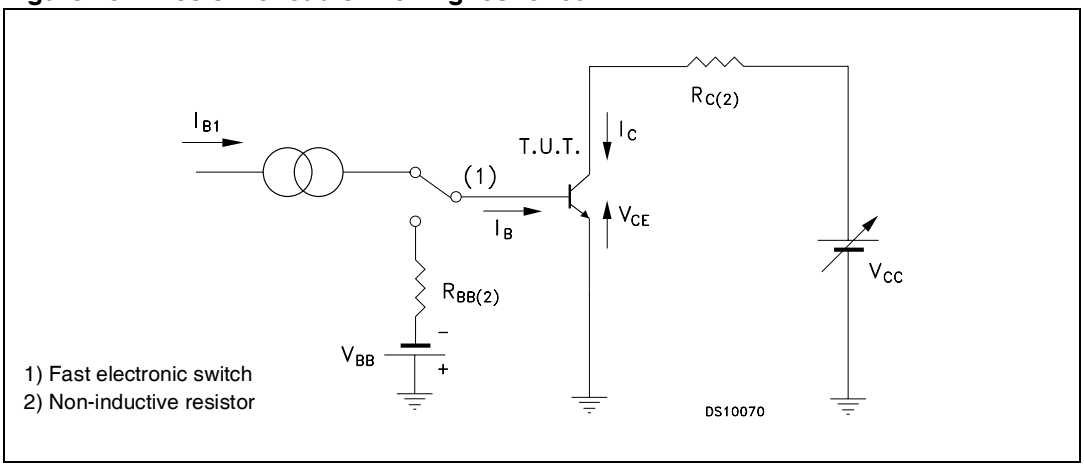


Figure 19. Collector-base and collector-emitter capacitance (PNP)



1.2 Test circuits

Figure 20. Resistive load switching test circuit

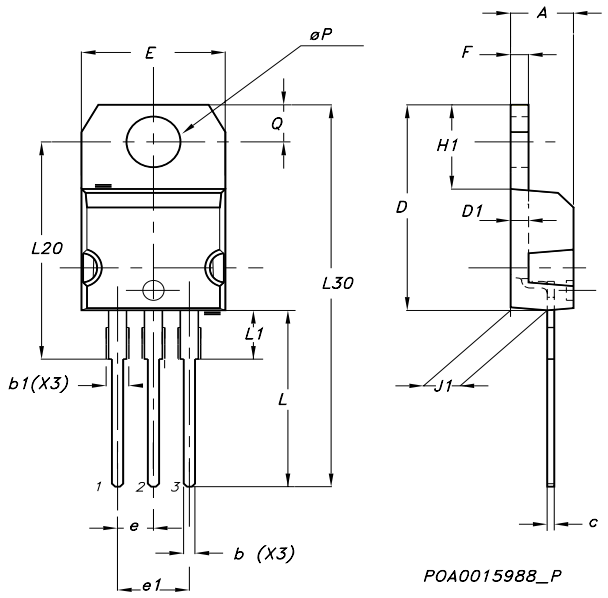


2 Package mechanical data

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

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



3 Revision history

Table 5. Revision history

Date	Revision	Changes
01-Jun-1997	1	Initial Release
11-Feb-2003	2	Minor text changes
27-Mar-2007	3	Figure 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 and figure 20 added
23-Jul-2007	4	Figure 2 and figure 3 added

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