

NPN power transistors

Features

- NPN transistors

Applications

- Audio, power linear and switching application

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 BD236 and BD238 respectively.

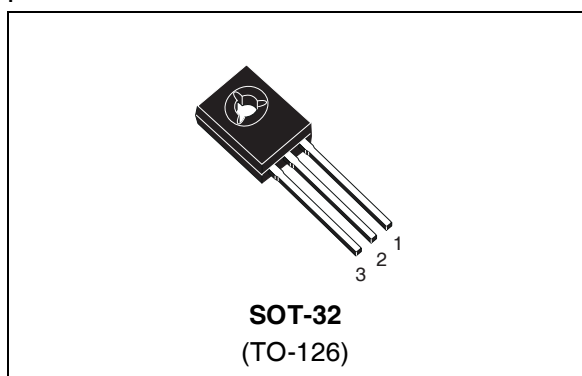


Figure 1. Internal schematic diagram

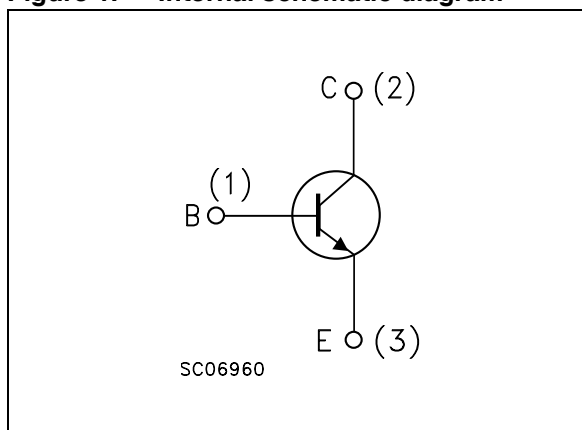


Table 1. Device summary

Order code	Marking	Package	Packaging
BD235	BD235	SOT-32	Tube
BD237	BD237	SOT-32	Tube

1 Absolute maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value		Unit
		BD235	BD237	
V_{CBO}	Collector-base voltage ($I_E = 0$)	60	100	V
V_{CER}	Collector-emitter voltage ($R_{BE} = 1k\Omega$)	60	100	V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	60	80	V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	5		V
I_C	Collector current	2		A
I_{CM}	Collector peak current ($t_p < ms$)	6		A
P_{TOT}	Total dissipation at $T_{case} = 25^\circ C$	25		W
T_{stg}	Storage temperature	-65 to 150		$^\circ C$
T_J	Max. operating junction temperature	150		$^\circ C$

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_{CBO}	Collector cut-off current ($I_{\text{E}} = 0$)	$V_{\text{CB}} = \text{rated } V_{\text{CBO}}$ $V_{\text{CB}} = \text{rated } V_{\text{CBO}} T_{\text{C}} = 150^{\circ}\text{C}$			0.1 2	mA mA
I_{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 ($I_{\text{B}} = 0$)	$I_{\text{C}} = 100\text{mA}$ for BD235 for BD237	60 80			V V
$V_{\text{CE(sat)}}^{(1)}$	Collector-emitter saturation voltage	$I_{\text{C}} = 1\text{A}$ $I_{\text{B}} = 0.1\text{A}$			0.6	V
$V_{\text{BE}}^{(1)}$	Base-emitter voltage	$I_{\text{C}} = 1\text{A}$ $V_{\text{CE}} = 2\text{V}$			1.3	V
$h_{\text{FE}}^{(1)}$	DC current gain	$I_{\text{C}} = 150\text{mA}$ $V_{\text{CE}} = 2\text{V}$ $I_{\text{C}} = 1\text{A}$ $V_{\text{CE}} = 2\text{V}$	40 25			

1. Pulsed duration = 300 ms, duty cycle $\geq 1.5\%$.

2.1 Electrical characteristic (curves)

Figure 2. Safe operating area

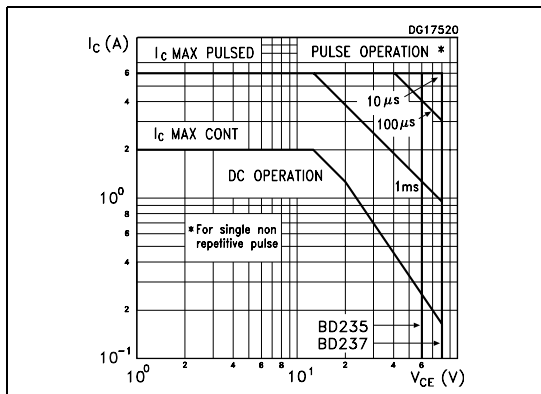


Figure 3. Derating curves

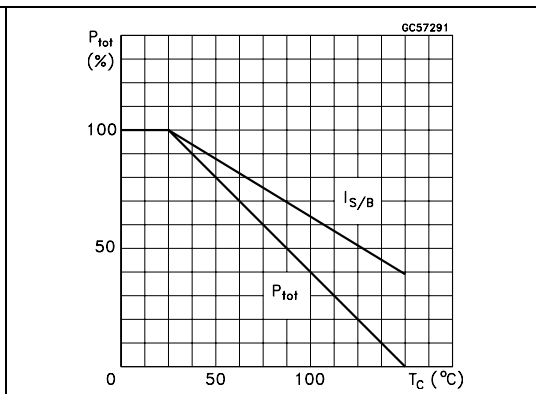


Figure 4. DC current gain

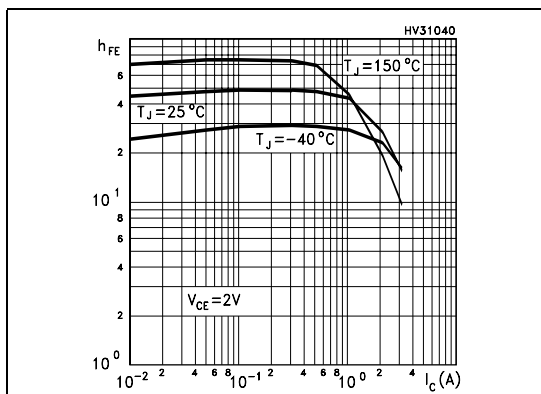


Figure 5. DC current gain

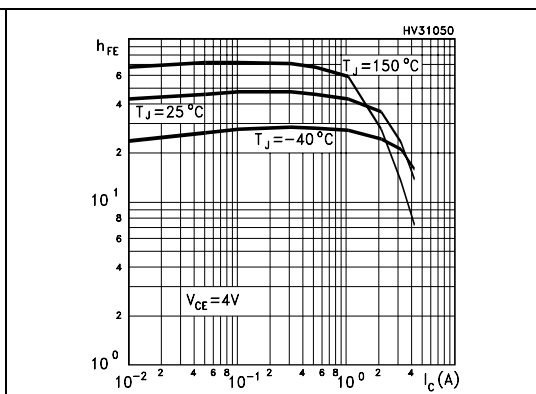


Figure 6. Collector-emitter saturation voltage

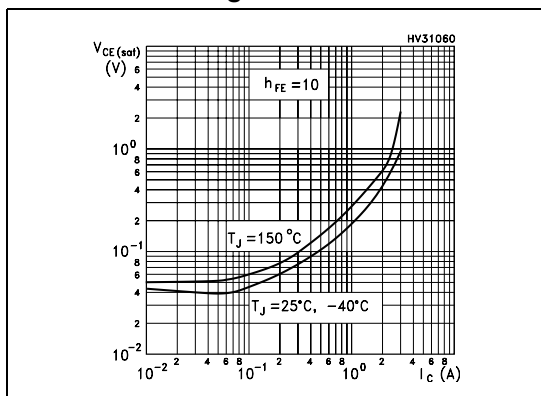


Figure 7. Base-emitter saturation voltage

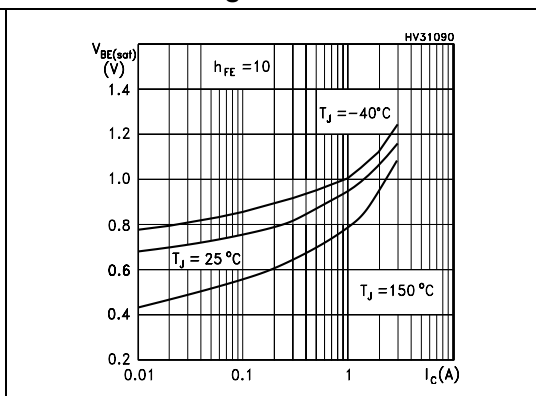


Figure 8. Base-emitter on voltage

Figure 9. Resistive load switching time

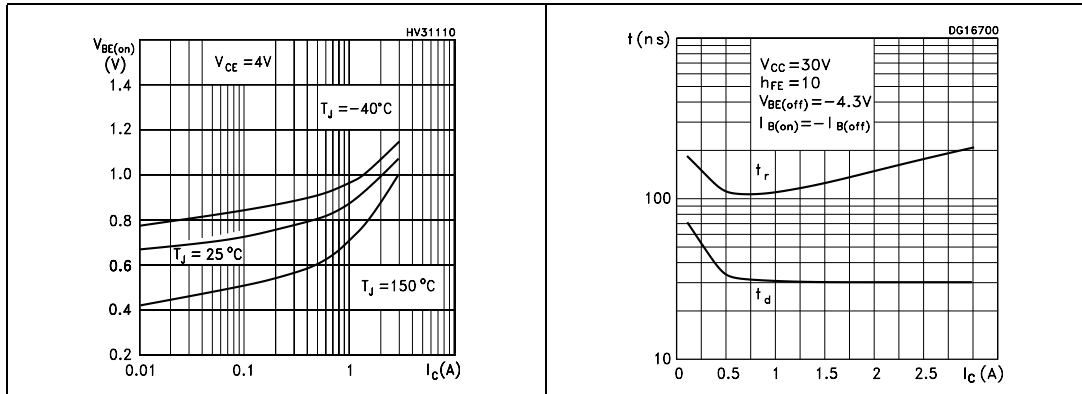
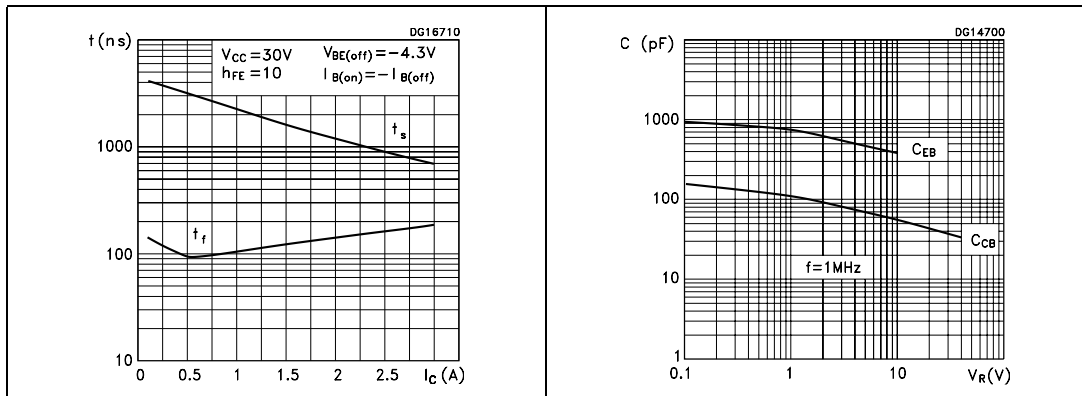
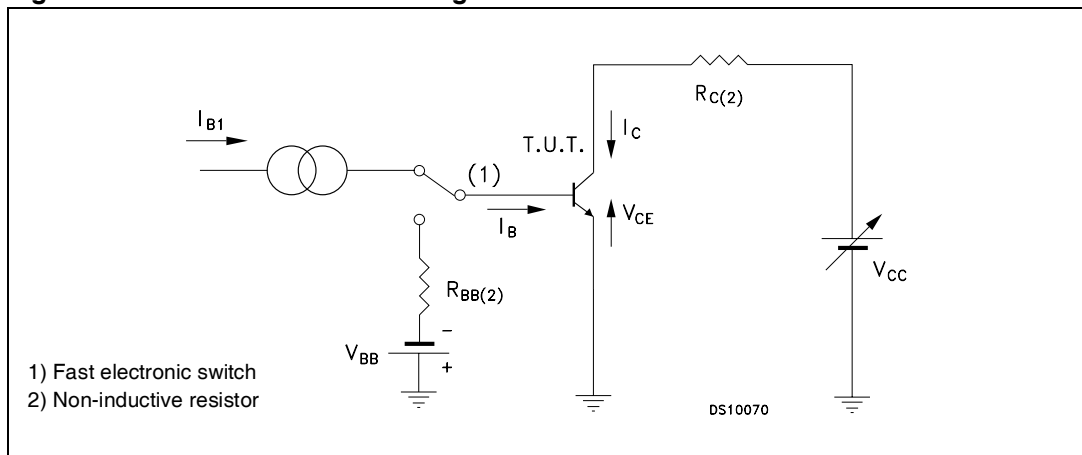


Figure 10. Resistive load switching time Figure 11. Capacitance curves



2.2 Test circuit

Figure 12. Resistive load switching test circuit

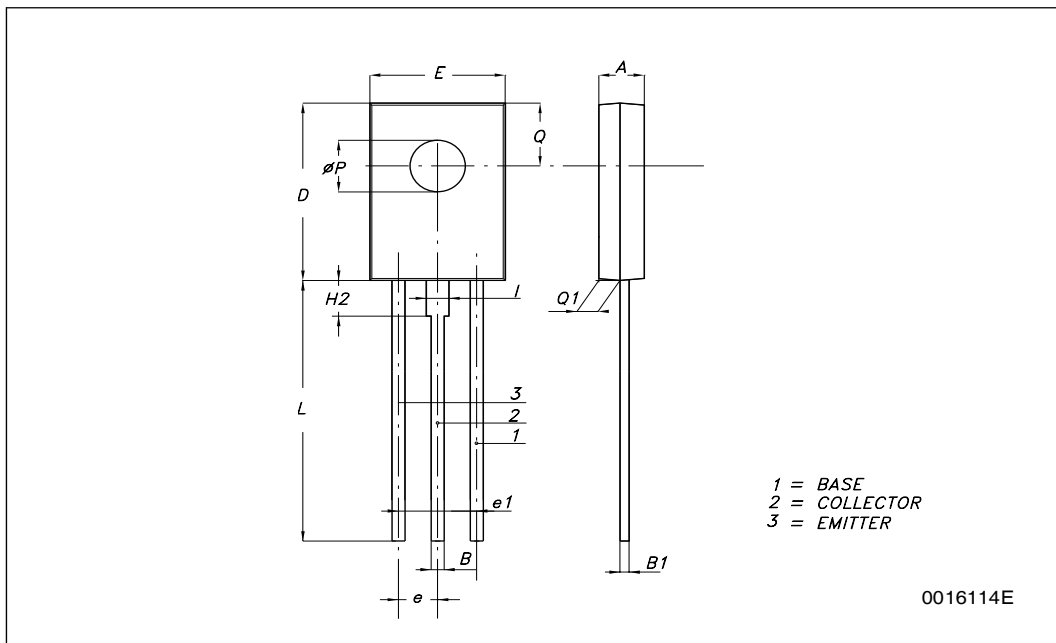


3 Package mechanical data

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

SOT-32 (TO-126) mechanical data

DIM.	mm.		
	MIN.	TYP	MAX.
A	2.4		2.9
B	0.64		0.88
B1	0.39		0.63
D	10.5		11.05
E	7.4		7.8
e	2.04	2.29	2.54
e1	4.07	4.58	5.08
L	15.3		16
P	2.9		3.2
Q		3.8	
Q1	1		1.52
H2		2.15	
I		1.27	



4 Revision history

Table 4. Revision history

Date	Revision	Changes
11-Feb-2003	1	Initial Release
09-Jul-2007	2	Figures: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and figure 12 have been added.

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