BD239C

NPN power transistor

Features

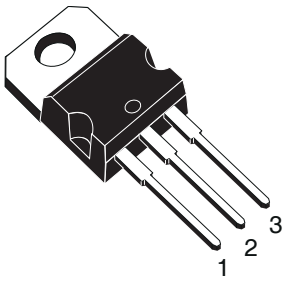
- NPN transistor

Applications

- General purpose switching and amplifier transistor

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 the BD240C.



TO-220

Figure 1. Internal schematic diagram

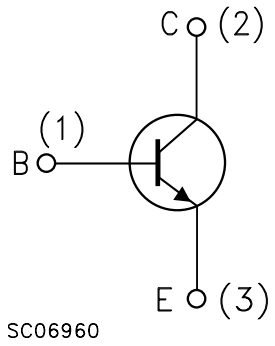


Table 1. Device summary

Order code	Marking	Package	Packaging
BD239C	BD239C	TO-220	Tube

1 Electrical ratings

Table 2. Absolute maximum rating

Symbol	Parameter	Value	Unit
V_{CER}	Collector-emitter voltage (R_{BE} = 100Ω)	115	V
V_{CEO}	Collector-base voltage (I_B = 0)	100	V
V_{EBO}	Emitter-base voltage (I_C = 0)	5	V
I_C	Collector current	2	A
I_{CM}	Collector peak current	4	A
I_B	Base current	0.6	A
P_{TOT}	Total dissipation at $T_{case} \leq 25°C$	30	W
P_{TOT}	Total dissipation at $T_{amb} \leq 25°C$	2	W
T_{stg}	Storage temperature	-65 to 150	°C
T_J	Max. operating junction temperature	150	°C

2 Electrical characteristics

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

Table 3. Electrical characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector cut-off current (V_{BE} = 0)	V_{CE} = 100V			0.2	mA
I_{CEO}	Collector cut-off current (I_B = 0)	V_{CE} = 60V			0.3	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 = 30mA	100			V
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	I_C = 1A I_B = 0.2A			0.7	V
V_{BE} (1)	Base-emitter voltage	I_C = 1A V_{CE}= 4V			1.3	V
h_{FE}	DC current gain	I_C = 0.2A V_{CE} = 4V I_C = 1A V_{CE} = 4V	40 15			

Note (1) Pulsed duration = 300 µs, duty cycle ≤1.5%

2.1 Electrical characteristic (curves)

Figure 2. Safe operating area

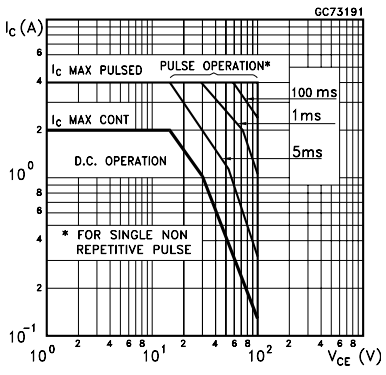


Figure 3. Derating curve

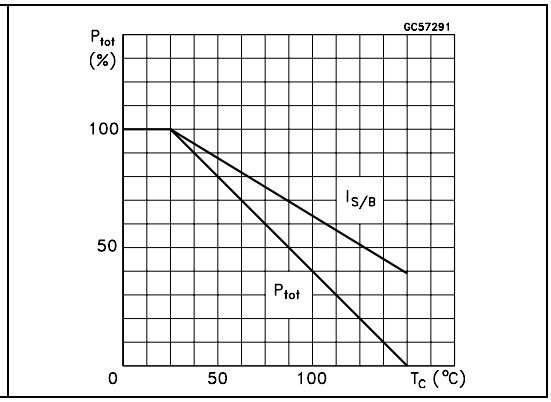


Figure 4. DC current gain

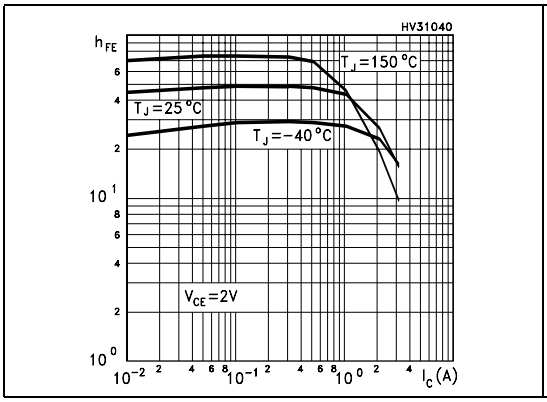


Figure 5. DC current gain

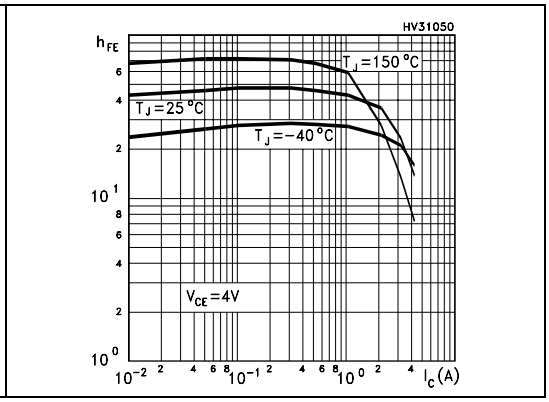


Figure 6. Collector-emitter saturation voltage

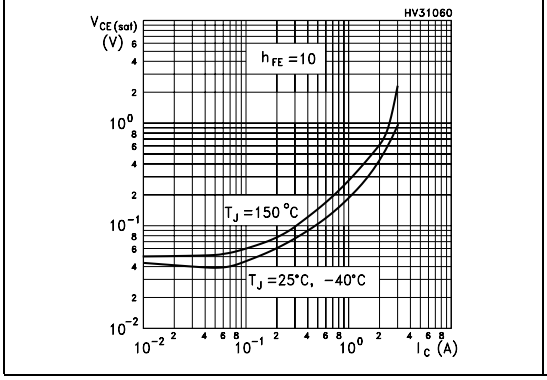


Figure 7. Base-emitter saturation voltage

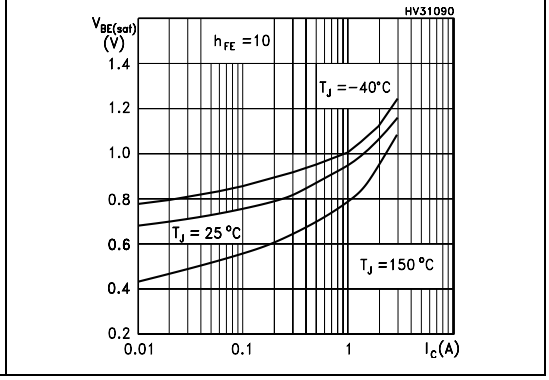


Figure 8. Base-emitter on voltage

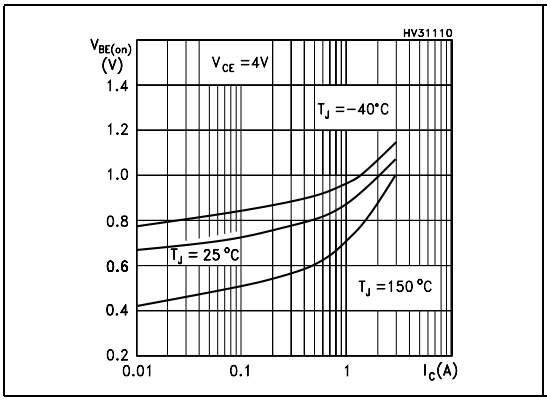


Figure 9. Resistive load switching time

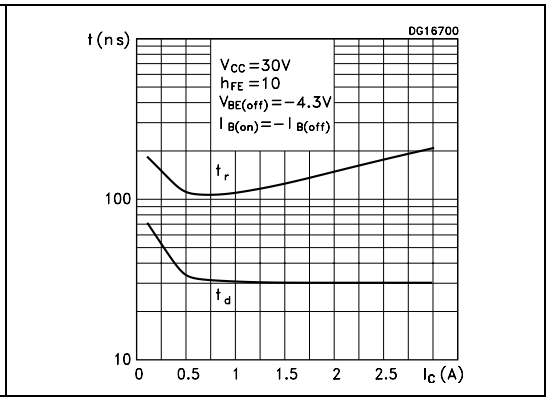
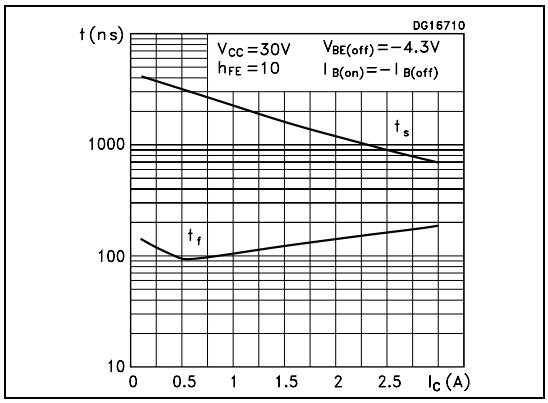
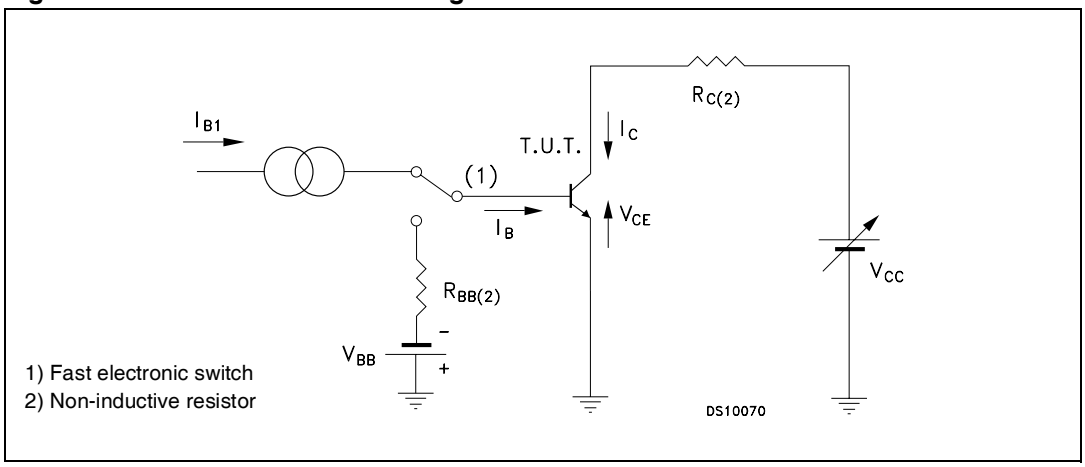


Figure 10. Resistive load switching time



2.2 Test circuit

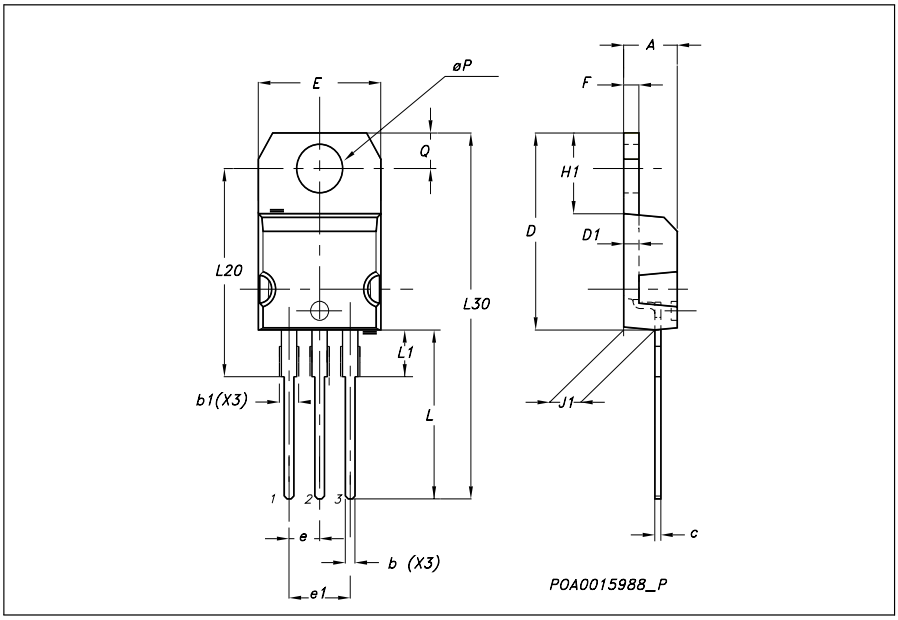
Figure 11. Resistive load switching test circuit



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

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

Date	Revision	Changes
01-April-1999	1	Initial release.
02-Jul-2007	2	Figures 2,3,4,5,6,7,8,9 and figure 10 have been added.

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