

## NPN power transistor

### Features

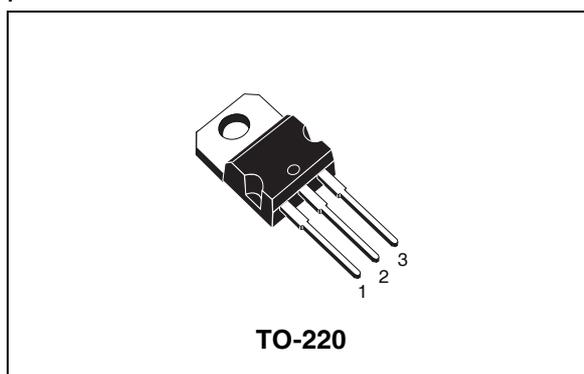
- This device is qualified for automotive application
- NPN transistor

### Applications

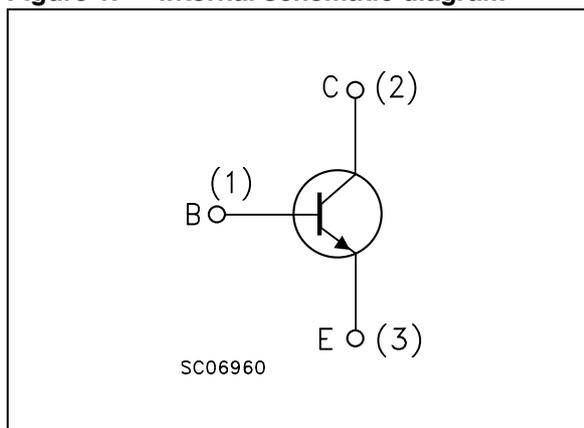
- Audio, general purpose switching and amplifier transistors

### 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.



**Figure 1. Internal schematic diagram**



**Table 1. Device summary**

Order code	Marking	Package	Packaging
BD241A-A	BD241A	TO-220	Tube

# 1 Absolute maximum ratings

**Table 2. Absolute maximum ratings**

Symbol	Parameter	Value	Unit
$V_{CER}$	Collector-emitter voltage ( $R_{BE} = 100\Omega$ )	70	V
$V_{CEO}$	Collector-emitter voltage ( $I_B = 0$ )	60	V
$V_{EBO}$	Emitter-base voltage ( $I_C = 0$ )	5	V
$I_C$	Collector current	3	A
$I_{CM}$	Collector peak current ( $t_p < ms$ )	5	A
$I_B$	Base current	1	A
$P_{TOT}$	Total dissipation at $T_{case} = 25^\circ C$	40	W
$T_{stg}$	Storage temperature	-65 to 150	$^\circ C$
$T_J$	Max. operating junction temperature	150	$^\circ C$

## 2 Electrical characteristics

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

**Table 3. Electrical characteristics**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CES}$	Collector cut-off current ( $V_{BE} = 0$ )	$V_{CE} = \text{rated } V_{CEO}$			0.2	mA
$I_{CEO}$	Collector cut-off current ( $I_B = 0$ )	for BD241A $V_{CE} = 30V$ for BD241C $V_{CE} = 60V$			0.3 0.3	mA mA
$I_{EBO}$	Emitter cut-off current ( $I_C = 0$ )	$V_{EB} = 5V$			1	mA
$V_{CEO(sus)}^{(1)}$	Collector-emitter sustaining voltage ( $I_B = 0$ )	$I_C = 30mA$ for BD241A for BD241C	60 100			V V
$V_{CE(sat)}^{(1)}$	Collector-emitter saturation voltage	$I_C = 3A$ $I_B = 0.6A$			1.2	V
$V_{BE}^{(1)}$	Base-emitter voltage	$I_C = 3A$ $V_{CE} = 4V$			1.8	V
$h_{FE}^{(1)}$	DC current gain	$I_C = 1A$ $V_{CE} = 4V$ $I_C = 3A$ $V_{CE} = 4V$	25 10			

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

### 2.1 Electrical characteristic (curves)

**Figure 2. Safe operating area**

**Figure 3. Derating curve**

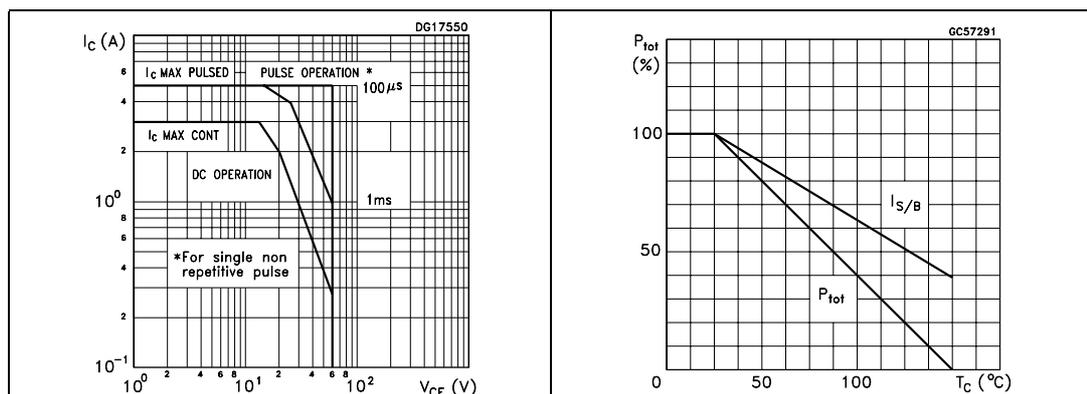


Figure 4. DC current gain

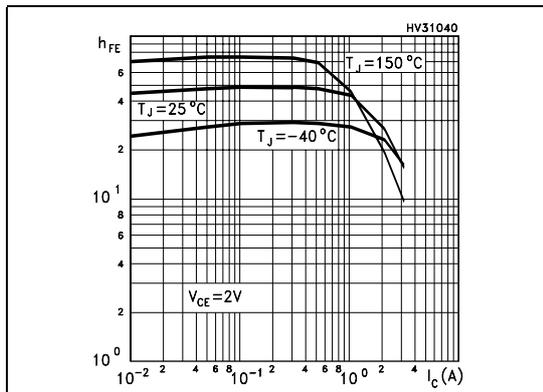


Figure 5. DC current gain

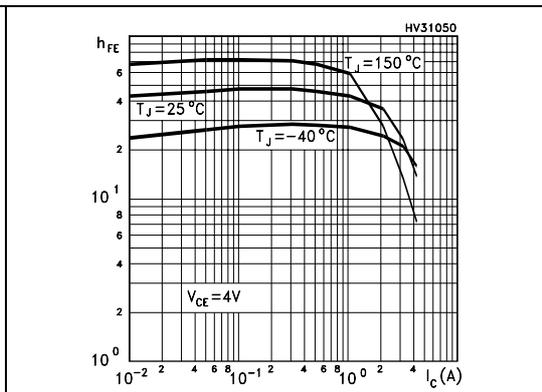


Figure 6. Collector-emitter saturation voltage

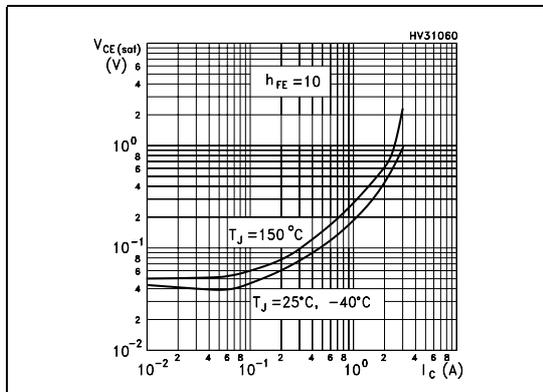


Figure 7. Base-emitter saturation voltage

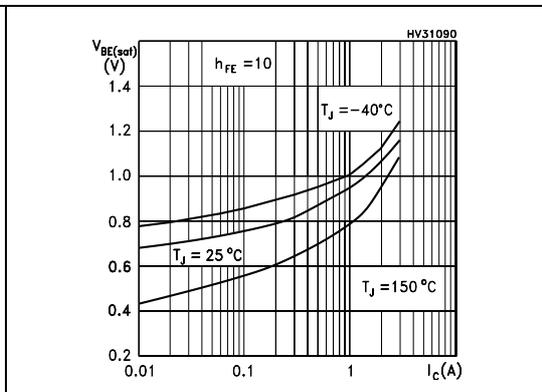


Figure 8. Base-emitter on voltage

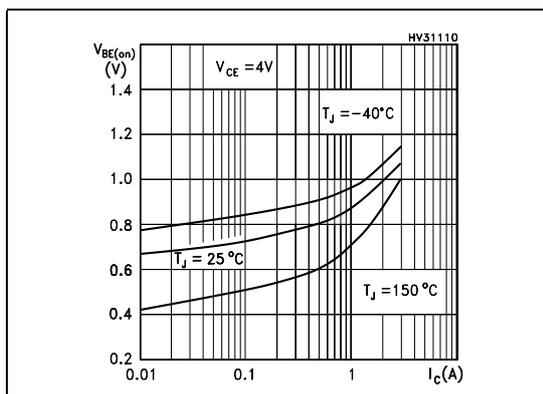


Figure 9. Resistive load switching time

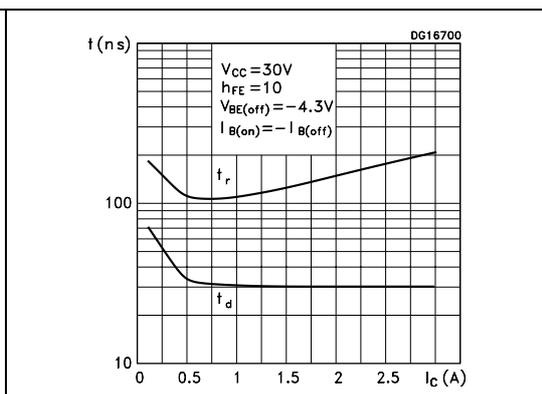
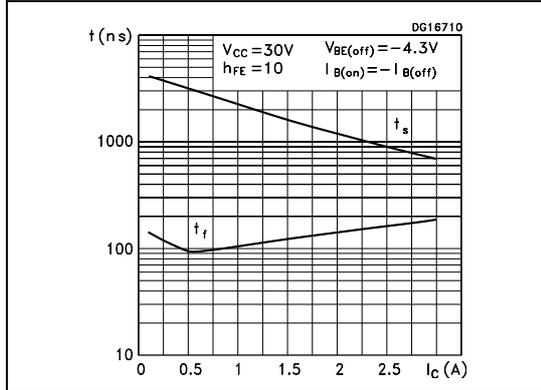
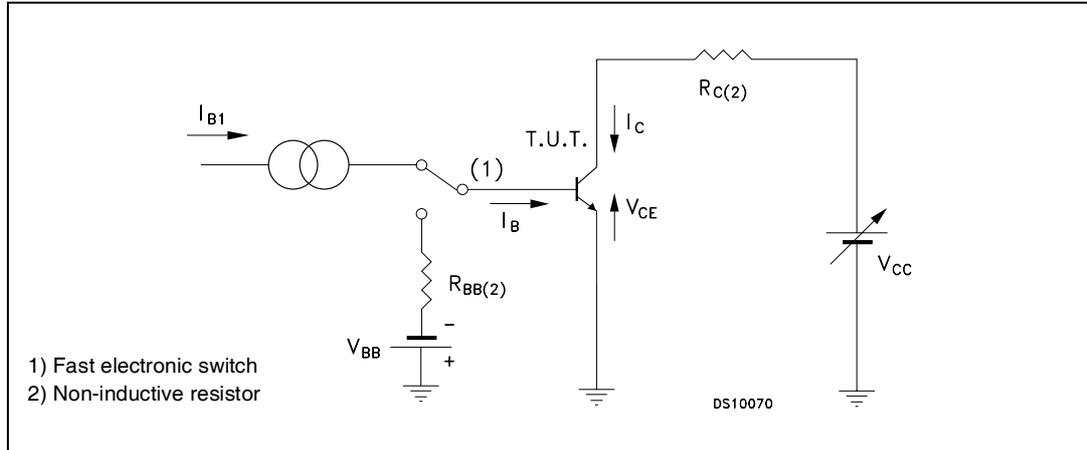


Figure 10. Resistive load switching time



## 2.2 Test circuits

Figure 11. Resistive load switching test circuit

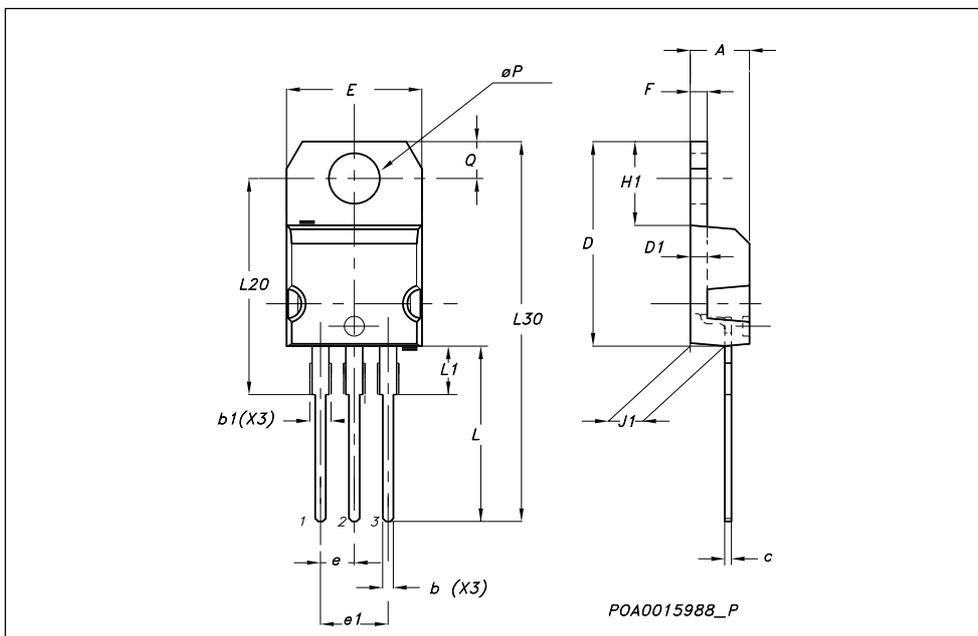


### 3 Package mechanical data

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](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**

Date	Revision	Changes
10-Jul-2007	1	Initial Release

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