

## Low voltage PNP power transistor

### Features

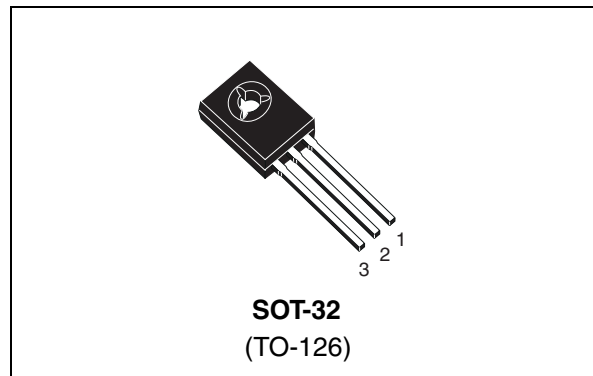
- Low saturation voltage
- PNP transistor

### Applications

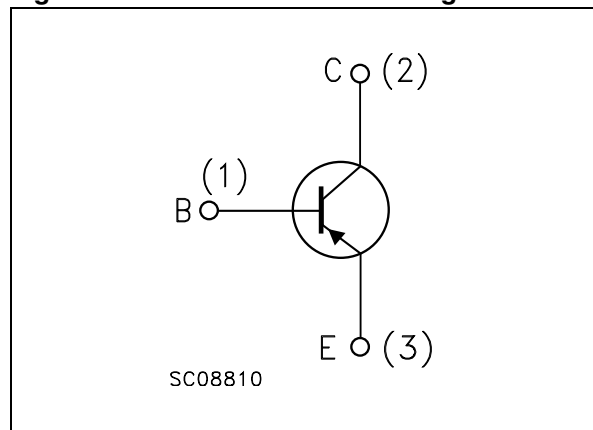
- Audio, power linear and switching applications

### 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 NPN type is BD237.



**Figure 1. Internal schematic diagram**



**Table 1. Device summary**

Order code	Marking	Package	Packaging
BD238	BD238	SOT-32	Tube

# 1 Absolute maximum ratings

**Table 2. Absolute maximum ratings**

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

## 2 Electrical characteristics

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

**Table 3. Electrical characteristics**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$I_{\text{CBO}}$	Collector cut-off current ( $I_{\text{E}} = 0$ )	$V_{\text{CB}} = -100\text{ V}$ $V_{\text{CB}} = -100\text{ V } T_{\text{c}} = 150\text{ °C}$		-	-0.1 -2	mA 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 ( $I_{\text{B}} = 0$ )	$I_{\text{C}} = -100\text{ mA}$	-80	-		V
$V_{\text{CE(sat)}}^{(1)}$	Collector-emitter saturation voltage	$I_{\text{C}} = -1\text{ A} \quad I_{\text{B}} = -0.1\text{ A}$		-	-0.6	V
$V_{\text{BE(on)}}^{(1)}$	Base-emitter on voltage	$I_{\text{C}} = -1\text{ A} \quad V_{\text{CE}} = -2\text{ V}$		-	-1.3	V
$h_{\text{FE}}^{(1)}$	DC current gain	$I_{\text{C}} = -150\text{ mA} \quad V_{\text{CE}} = -2\text{ V}$ $I_{\text{C}} = -1\text{ A} \quad V_{\text{CE}} = -2\text{ V}$	40 25	-		

1. Pulsed duration = 300  $\mu\text{s}$ , duty cycle = 1.5 %.

## 2.1 Electrical characteristic (curves)

Figure 2. Safe operating area

Figure 3. Derating curves

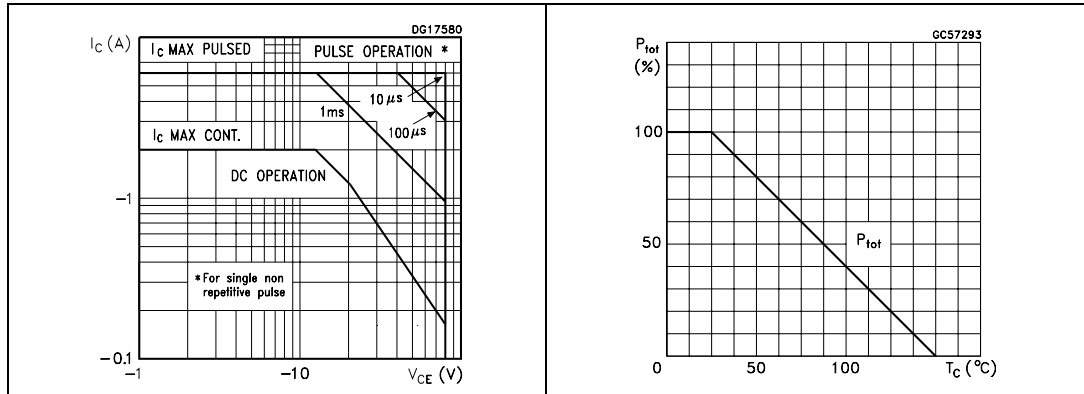


Figure 4. DC current gain ( $V_{CE} = -2$  V)

Figure 5. DC current gain ( $V_{CE} = -4$  V)

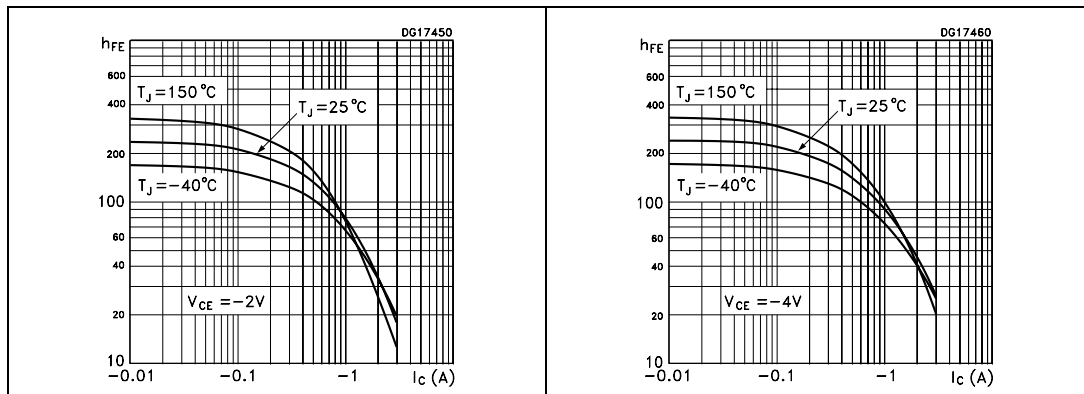


Figure 6. Collector-emitter saturation voltage

Figure 7. Base-emitter saturation voltage

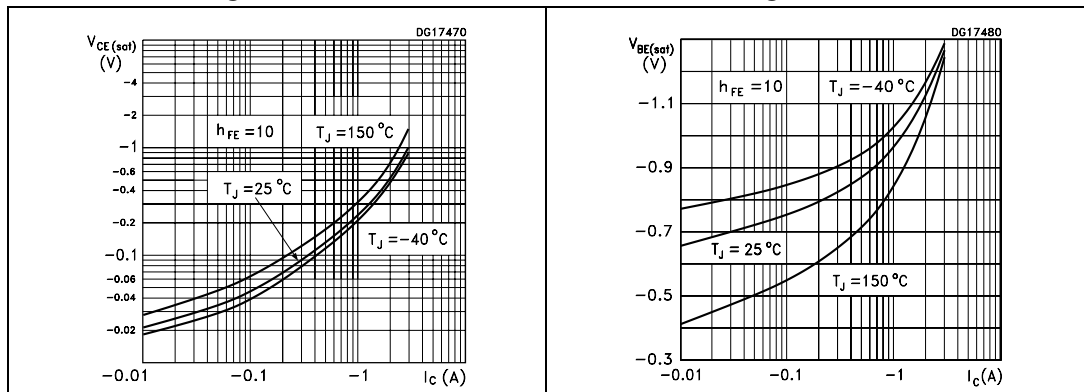


Figure 8. Base-emitter on voltage

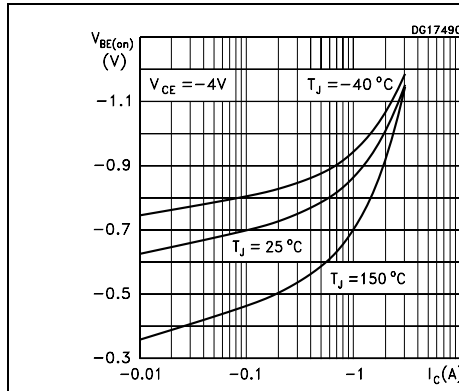


Figure 9. Resistive load switching time (on)

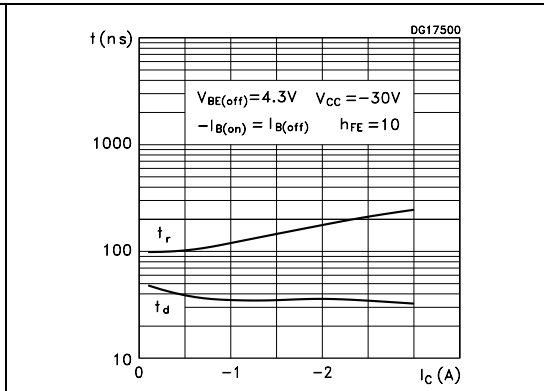
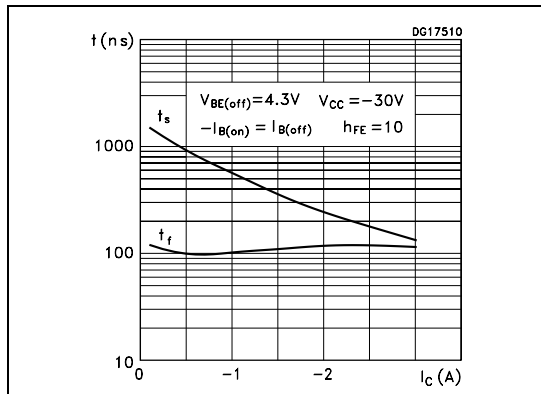
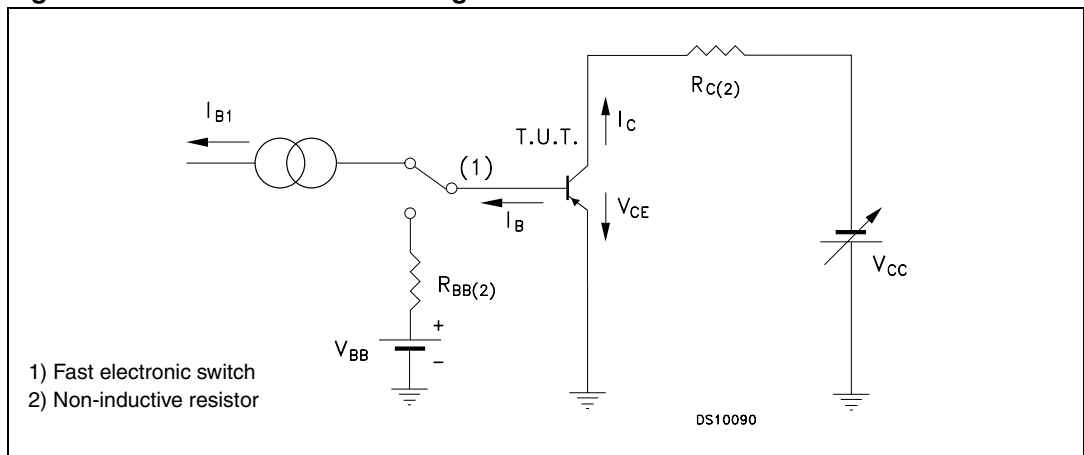


Figure 10. Resistive load switching time (off)



## 2.2 Test circuit

Figure 11. Resistive load switching test circuit

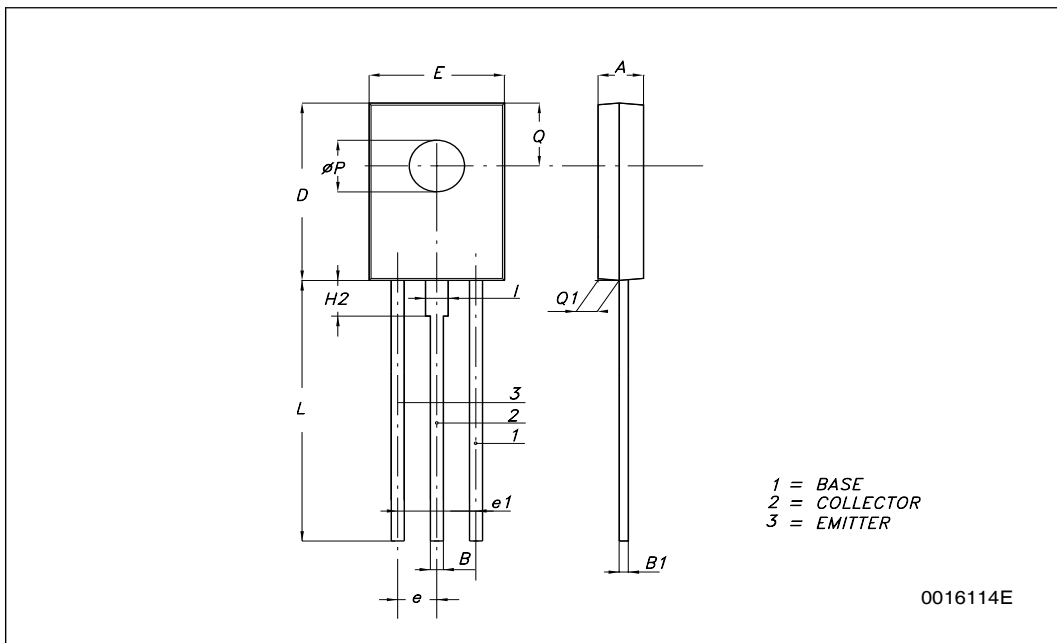


### 3 Package mechanical data

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**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. Document revision history**

Date	Revision	Changes
03-Jun-2009	1	Initial release



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