

## PNP power transistors

### Features

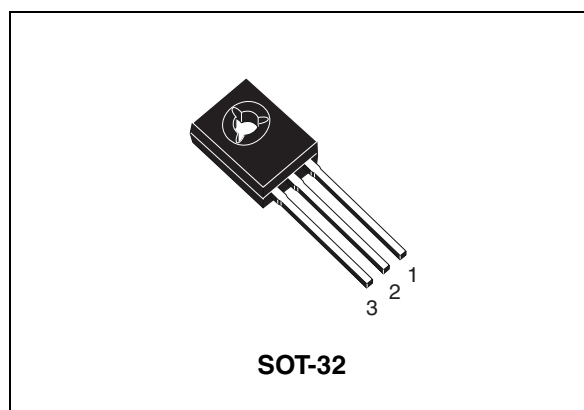
- PNP transistors

### Applications

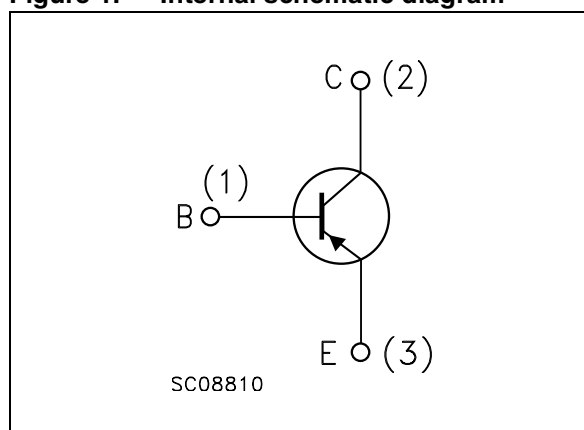
- Linear and switching industrial equipment

### 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 NPN types are BD439 and BD441.



**Figure 1. Internal schematic diagram**



**Table 1. Device summary**

Order code	Marking	Package	Packaging
BD440	BD440	SOT-32	Tube
BD442	BD442		

# 1 Absolute maximum ratings

**Table 2. Absolute maximum ratings**

Symbol	Parameter	Value		Unit
		BD440	BD442	
$V_{CBO}$	Collector-base voltage ( $I_E = 0$ )	-60	-80	V
$V_{CES}$	Collector-emitter voltage ( $V_{BE} = 0$ )	-60	-80	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	-4		A
$I_{CM}$	Collector peak current ( $t_p < 10$ ms)	-7		A
$I_B$	Base current	-1		A
$P_{TOT}$	Total dissipation at $T_{case} = 25$ °C	36		W
$T_{stg}$	Storage temperature	-65 to 150		°C
$T_J$	Max. operating junction temperature	150		°C

## 2 Electrical characteristics

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

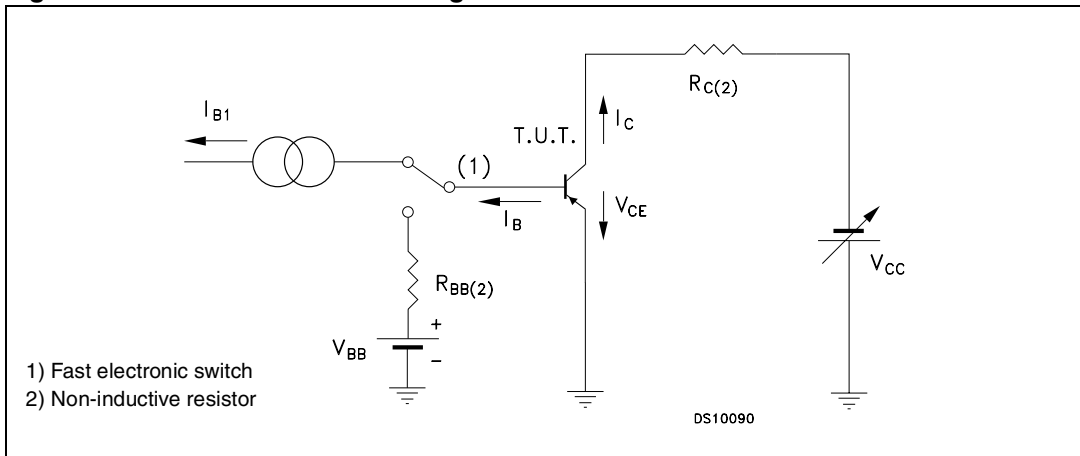
**Table 3. Electrical characteristics**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$I_{\text{CBO}}$	Collector cut-off current ( $I_{\text{E}} = 0$ )	for BD440 $V_{\text{CB}} = -60\text{ V}$ for BD442 $V_{\text{CB}} = -80\text{ V}$			-0.1 -0.1	mA mA
$I_{\text{CES}}$	Collector cut-off current ( $V_{\text{BE}} = 0$ )	for BD440 $V_{\text{CE}} = -60\text{ V}$ for BD442 $V_{\text{CE}} = -80\text{ V}$			-0.1 -0.1	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 ( $I_{\text{B}} = 0$ )	$I_{\text{C}} = -100\text{ mA}$ for BD440 for BD442	-60 -80			V V
$V_{\text{CE(sat)}}^{(1)}$	Collector-emitter saturation voltage	$I_{\text{C}} = -2\text{ A}$ $I_{\text{B}} = -0.2\text{ A}$			-0.8	V
$V_{\text{BE}}^{(1)}$	Base-emitter voltage	$I_{\text{C}} = -10\text{ mA}$ $V_{\text{CE}} = -5\text{ V}$ $I_{\text{C}} = -2\text{ A}$ $V_{\text{CE}} = -1\text{ V}$		-0.58	-1.5	V V
$h_{\text{FE}}^{(1)}$	DC current gain	$I_{\text{C}} = -10\text{ mA}$ $V_{\text{CE}} = -5\text{ V}$ for BD440 for BD442 $I_{\text{C}} = -500\text{ mA}$ $V_{\text{CE}} = -1\text{ V}$ for BD440 for BD442 $I_{\text{C}} = -2\text{ A}$ $V_{\text{CE}} = -1\text{ V}$ for BD440 for BD442	20 15 40 40 25 15	130 130 140 140		

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

## 2.1 Test circuit

Figure 2. Resistive load switching test circuit

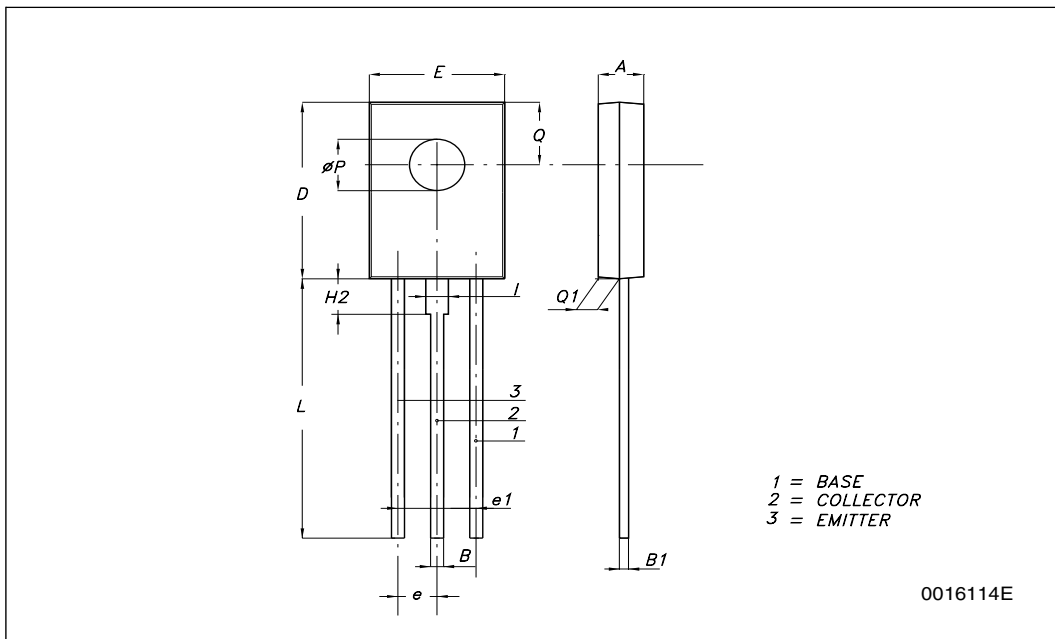


### 3 Package mechanical data

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)

**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
08-Feb-2008	1	Initial Release

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