

## NPN power transistors

### Features

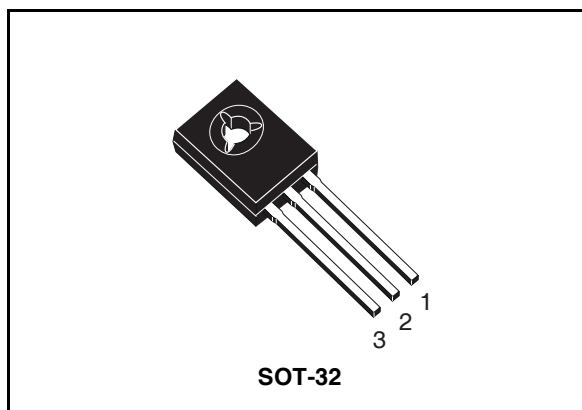
- NPN transistors

### Applications

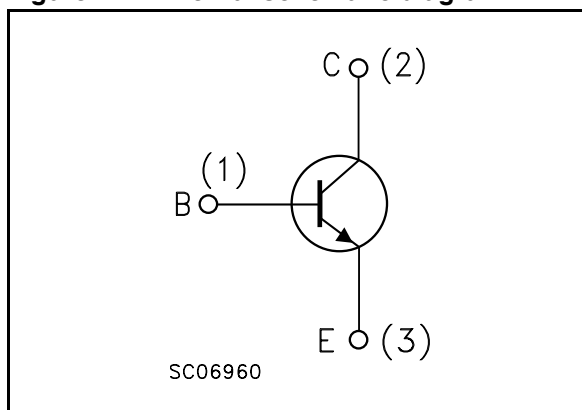
- Linear and switching industrial equipment

### 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 PNP type of 2N5192 is 2N5195.



**Figure 1. Internal schematic diagram**



**Table 1. Devices summary**

Order code	Marking	Package	Packaging
2N5191	2N5191	SOT-32	Tube
2N5192	2N5192	SOT-32	Tube

# 1 Electrical ratings

**Table 2. Absolute maximum rating**

Symbol	Parameter	Value		Unit
		2N5191	2N5192	
$V_{CBO}$	Collector-base voltage ( $I_E = 0$ )	60	80	V
$V_{CEO}$	Collector-base 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	7		A
$I_B$	Base current	1		A
$P_{TOT}$	Total dissipation at $T_{case} = 25^\circ\text{C}$	40		W
$T_{stg}$	Storage temperature	-65 to 150		$^\circ\text{C}$
$T_J$	Max. operating junction temperature	150		$^\circ\text{C}$

## 2 Electrical characteristics

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

**Table 3. Electrical characteristics**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{\text{CBO}}$	Collector cut-off current ( $I_{\text{E}} = 0$ )	$V_{\text{CB}} = \text{rated } V_{\text{CBO}}$			0.1	mA
$I_{\text{CEX}}$	Collector cut-off current ( $V_{\text{BE}} = -1.5\text{V}$ )	$V_{\text{CE}} = \text{rated } V_{\text{CEO}}$ $V_{\text{CE}} = \text{rated } V_{\text{CEO}} \quad T_{\text{c}}=125^{\circ}\text{C}$			0.1 2	mA mA
$I_{\text{CEO}}$	Collector cut-off current ( $I_{\text{B}} = 0$ )	$V_{\text{CE}} = \text{rated } V_{\text{CEO}}$			1	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 2N5191 for 2N5192	60 80			V V
$V_{\text{CE(sat)}}^{(1)}$	Collector-emitter saturation voltage	$I_{\text{C}} = 1.5\text{A} \quad I_{\text{B}} = 0.15\text{A}$ $I_{\text{C}} = 4\text{A} \quad I_{\text{B}} = 1\text{A}$			0.6 1.4	V V
$V_{\text{BE}}^{(1)}$	Base-emitter voltage	$I_{\text{C}} = 1.5\text{A} \quad V_{\text{CE}} = 2\text{V}$			1.2	V
$h_{\text{FE}}$	DC current gain	$I_{\text{C}} = 1.5\text{A} \quad V_{\text{CE}} = 2\text{V}$ for 2N5191 for 2N5192 $I_{\text{C}} = 4\text{A} \quad V_{\text{CE}} = 2\text{V}$ for 2N5191 for 2N5192	25 20 10 7		100 80	

Note (1) Pulsed duration = 300  $\mu\text{s}$ , duty cycle  $\leq 1.5\%$

## 2.1 Electrical characteristic (curves)

Figure 2. DC current gain

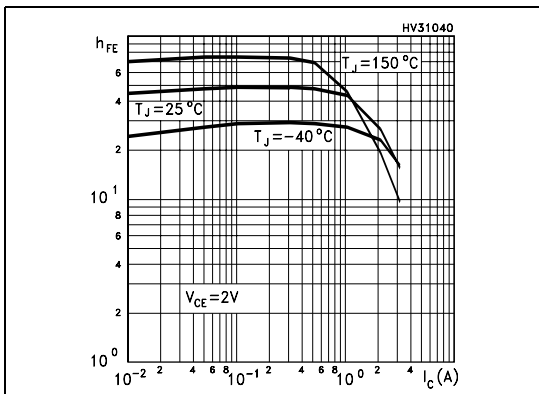


Figure 3. DC current gain

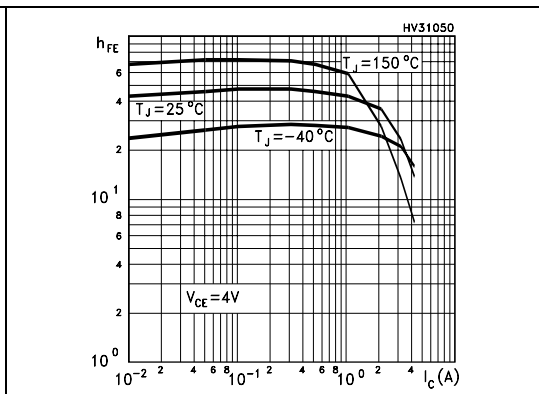


Figure 4. Collector-emitter saturation voltage

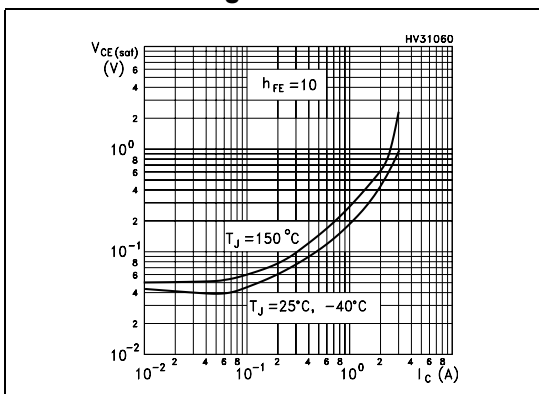


Figure 5. Base-emitter saturation voltage

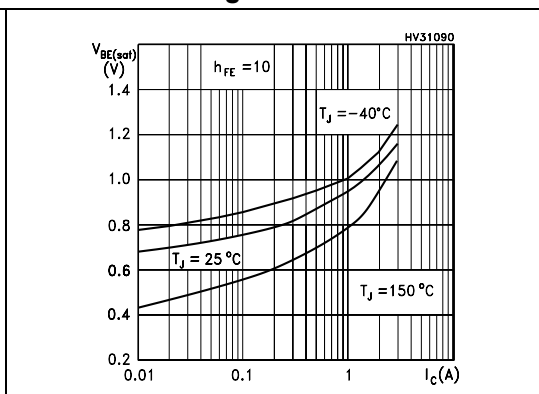


Figure 6. Base-emitter on voltage

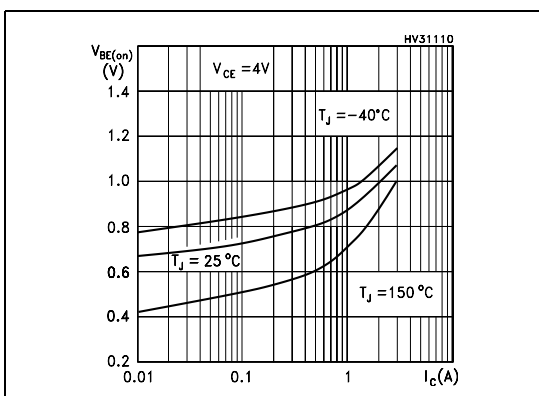


Figure 7. Resistive load switching time

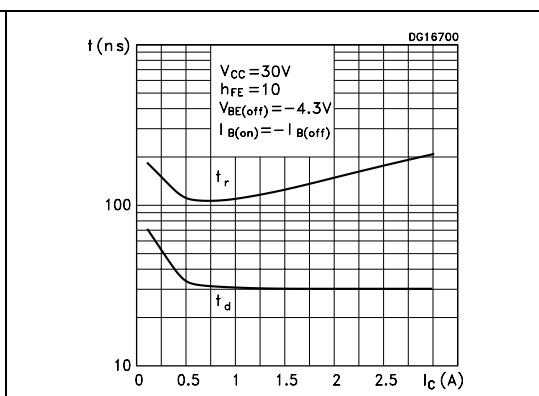
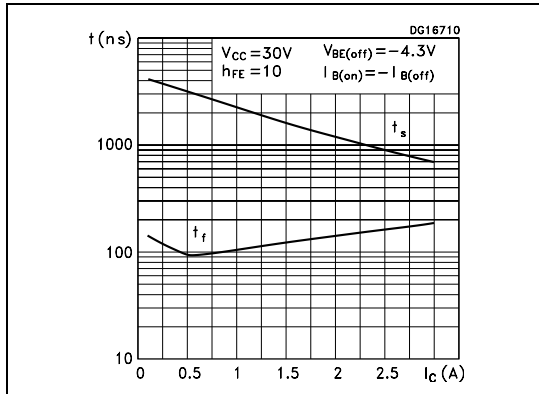
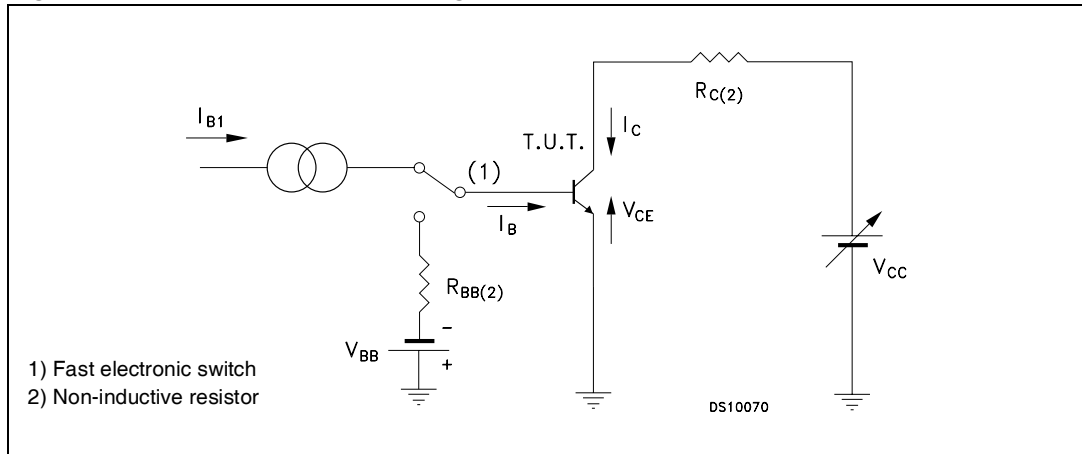


Figure 8. Resistive load switching time



## 2.2 Test circuit

Figure 9. Resistive load switching test circuit

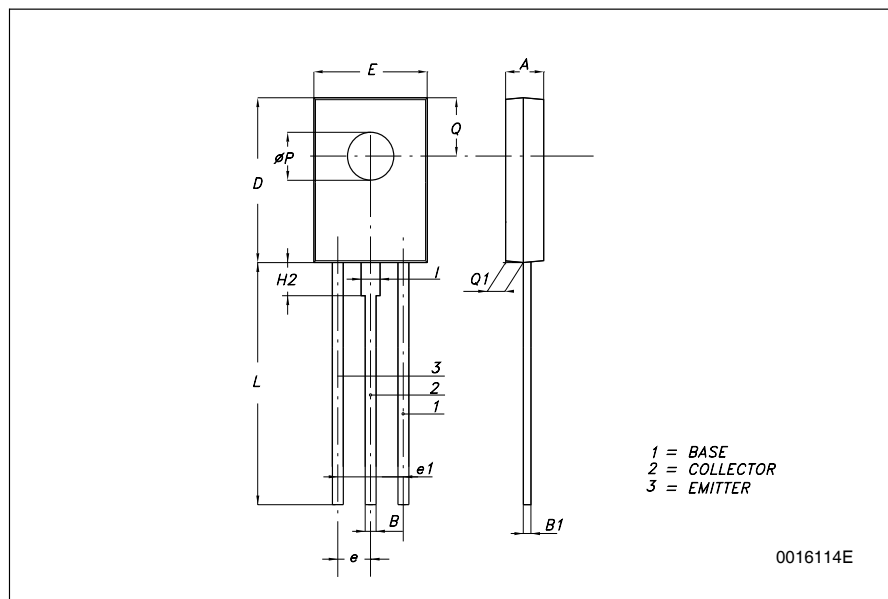


### 3 Package mechanical data

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. Revision history**

<b>Date</b>	<b>Revision</b>	<b>Changes</b>
01-Dec-2000	1	Initial release.
14-Jan-2004	2	Technical migration from ST-Press to EDOCS
28-Jun-2007	3	Figures 2,3,4,5,6,7, 8 and figure 9 have been added.



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