

NPN power Darlington transistor

Features

- Good h_{FE} linearity
- High f_T frequency
- Monolithic Darlington configuration with integrated antiparallel collector-emitter diode

Application

- Linear and switching industrial equipment

Description

The device is manufactured in planar technology with “base island” layout and monolithic Darlington configuration.

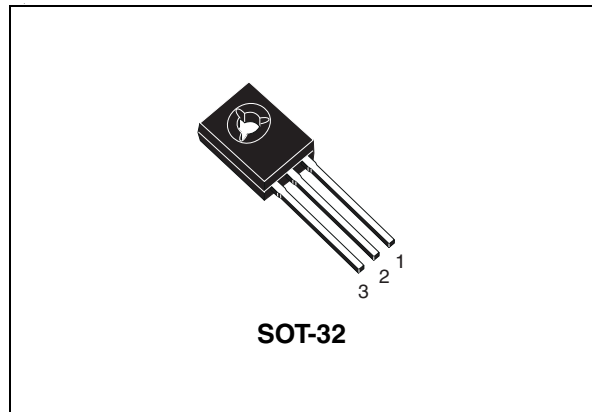


Figure 1. Internal schematic diagram

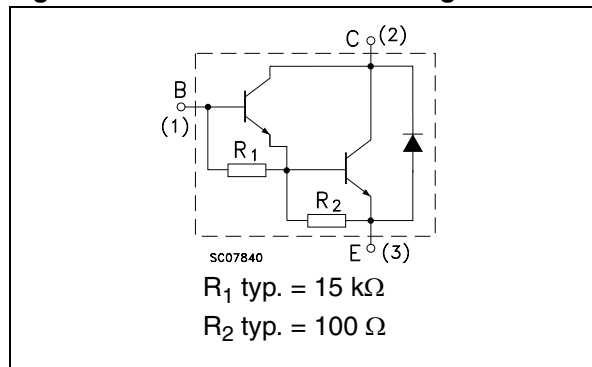


Table 1. Device summary

Order code	Marking	Package	Packaging
MJE802	MJE802	SOT-32	Tube

1 Absolute maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base voltage ($I_E = 0$)	80	V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)		
V_{EBO}	Emitter-base voltage ($I_C = 0$)	5	V
I_C	Collector current	4	A
I_{CM}	Collector peak current	8	A
I_B	Base current	0.1	A
P_{TOT}	Total dissipation at $T_{case} = 25\text{ °C}$	40	W
T_{STG}	Storage temperature	-65 to 150	°C
T_J	Max. operating junction temperature	150	°C

2 Electrical characteristics

$T_{case} = 25\text{ }^\circ\text{C}$; unless otherwise specified.

Table 3. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current ($I_E = 0$)	$V_{CB} = 80\text{ V}$ $V_{CB} = 80\text{ V}, T_C = 125\text{ }^\circ\text{C}$		-	0.1 0.5	mA
I_{CEO}	Collector cut-off current ($I_B = 0$)	$V_{CE} = 80\text{ V}$		-	0.1	mA
I_{EBO}	Emitter cut-off current ($I_C = 0$)	$V_{EB} = 5\text{ V}$		-	2	mA
$V_{CEO(sus)}^{(1)}$	Collector-emitter sustaining voltage ($I_B = 0$)	$I_C = 50\text{ mA}$	80	-		V
$V_{CE(sat)}^{(1)}$	Collector-emitter saturation voltage	$I_C = 1.5\text{ A}$ $I_B = 30\text{ mA}$		-	2.5	V
		$I_C = 4\text{ A}$ $I_B = 40\text{ mA}$		-	3	
$V_{BE(on)}$	Base-emitter on voltage	$I_C = 1.5\text{ A}$ $V_{CE} = 3\text{ V}$		-	2.5	V
		$I_C = 4\text{ A}$ $V_{CE} = 3\text{ V}$			3	
$h_{FE}^{(1)}$	DC current gain	$I_C = 1.5\text{ A}$ $V_{CE} = 3\text{ V}$	750	-		
		$I_C = 4\text{ A}$ $V_{CE} = 3\text{ V}$	100	-		
h_{fe}	Small signal current gain	$I_C = 1.5\text{ A}$ $V_{CE} = 3\text{ V}$ $f = 1\text{ MHz}$	1	-		

1. Pulse test: pulse duration $300 \leq \mu\text{s}$, duty cycle $\leq 2\%$.

2.1 Typical characteristic (curves)

Figure 2. DC current gain ($V_{CE} = 3\text{ V}$) **Figure 3. DC current gain ($V_{CE} = 5\text{ V}$)**

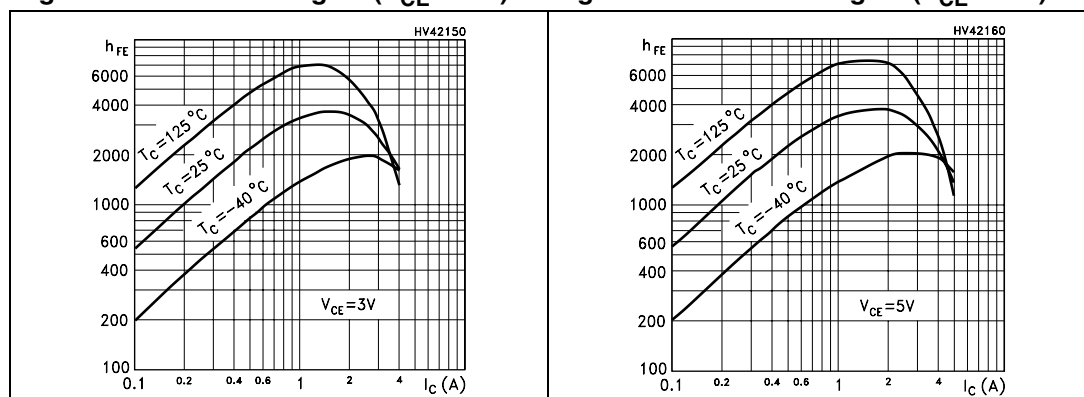


Figure 4. Collector-emitter saturation voltage

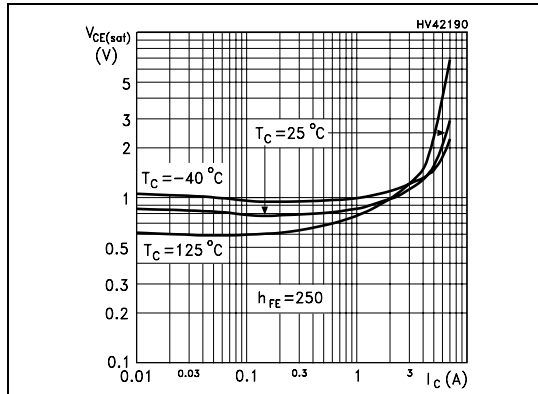


Figure 5. Base-emitter saturation voltage

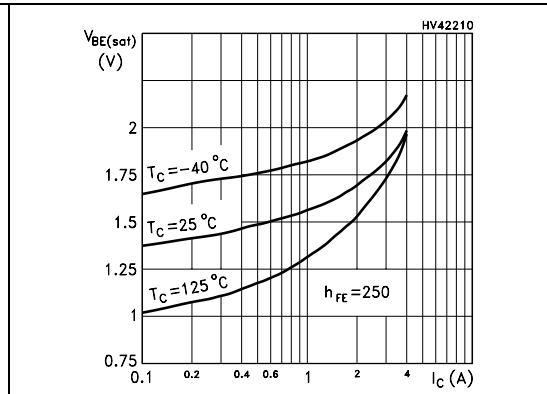


Figure 6. Base-emitter on voltage

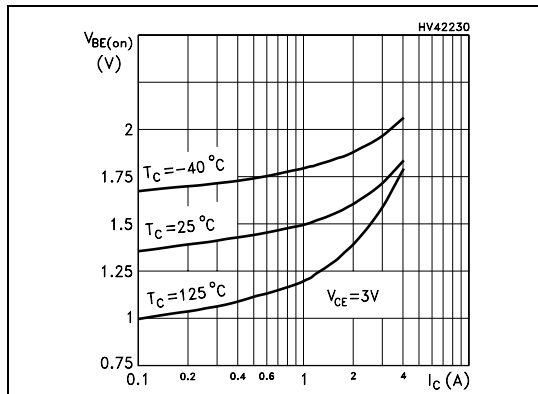


Figure 7. Resistive load switching time (on)

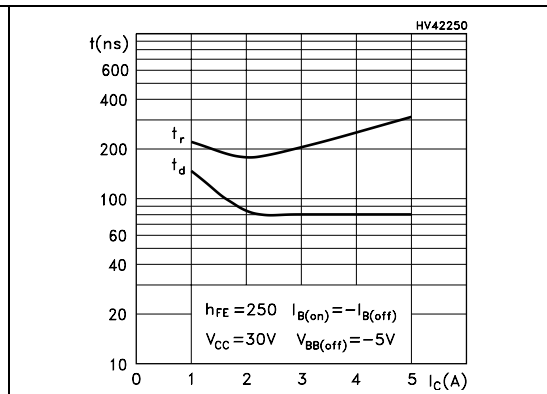
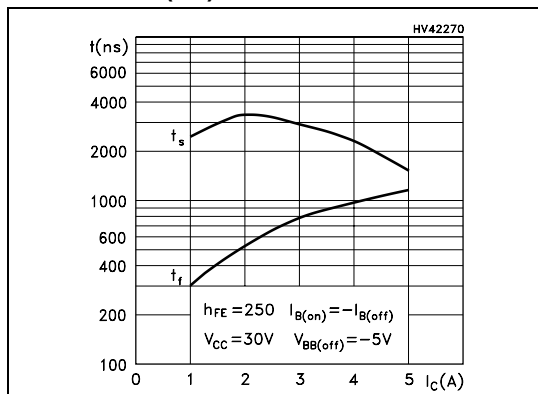


Figure 8. Resistive load switching time (off)

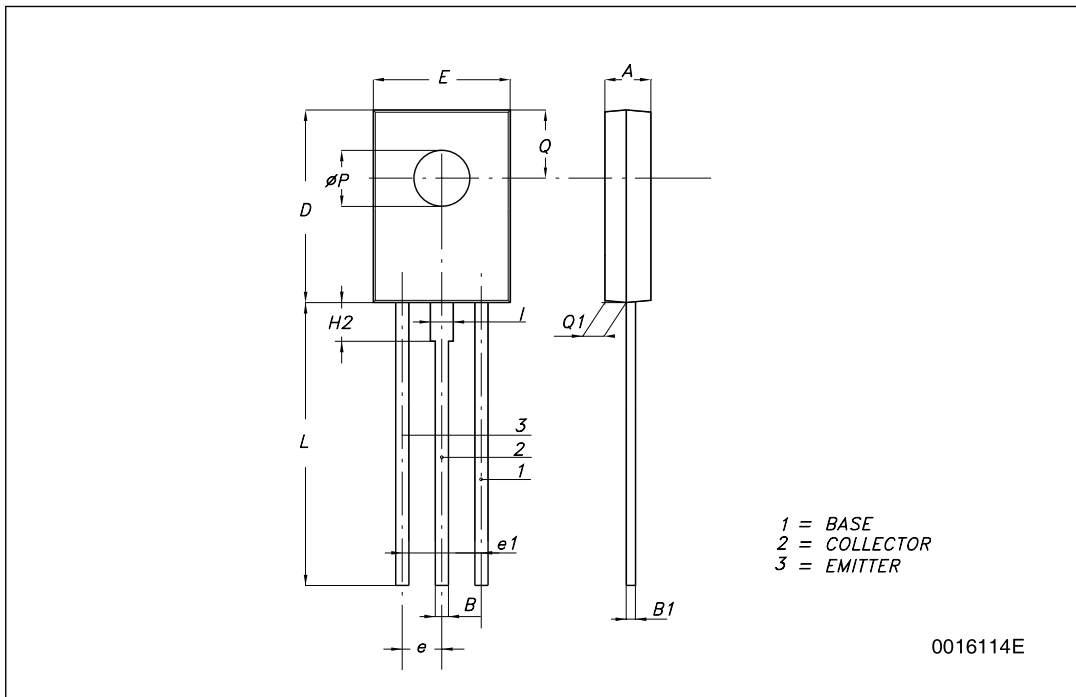


3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK[®] packages, depending on their level of environmental compliance. ECOPACK[®] specifications, grade definitions and product status are available at: www.st.com. ECOPACK[®] is an ST trademark.

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
21-Jun-2004	3	Document migration, no content change.
28-Aug-2009	4	Modified SOT-32 mechanical data.

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