Contents

1 Absolute maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base voltage (I_E = 0)	100	V
V_{CEO}	Collector-emitter voltage (I_B = 0)	100	V
V_{EBO}	Emitte-base voltage (I_C = 0)	5	V
I_C	Collector current	6	A
I_{CM}	Collector peak current (t_P < 5ms)	10	A
I_B	Base current	3	A
P_{TOT}	Total dissipation at T_{case} = 25°C	65	W
T_{stg}	Storage temperature	-65 to 150	°C
T_J	Max. operating junction temperature	150	°C

Note: For PNP types voltage and current values are negative

2 Electrical characteristics

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

Table 3. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CEO}	Collector cut-off current (I_B = 0)	V_{CE} = 60 V			0.7	mA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB} = 5 V			1	mA
I_{CES}	Collector cut-off current (V_{BE} = 0)	V_{CE} = 100 V			0.4	mA
$V_{CEO(sus)}$(1)	Collector-emitter sustaining voltage (I_B = 0)	I_C = 30 mA	100			V
$V_{CE(sat)}$(1)	Collector-emitter saturation voltage	I_C = 6 A I_B = 0.6 A			1.5	V
$V_{BE(on)}$(1)	Base-emitter voltage	I_C = 6 A V_{CE} = 4 V			2	V
h_{FE}(1)	DC current gain	I_C = 0.3 A V_{CE} = 4 V I_C = 3 A V_{CE} = 4 V Group R Group O Group Y	30 15 15 24 42		 75 28 44 75	

1. Pulsed duration = 300 ms, duty cycle ≥1.5%.

Note: 1 Product is pre-selected in DC current gain (group R, group O and group Y). STMicroelectronics reserves the right to ship either groups according to production availability. Please contact your nearest STMicroelectronics sales office for delivery details.

Note: For PNP types voltage e current values are negative.

2.1 Typical characteristic (curves)

Figure 2. DC current gain (NPN)

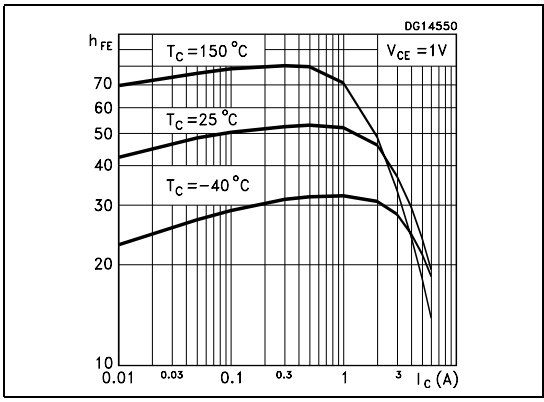


Figure 3. DC current gain (PNP)

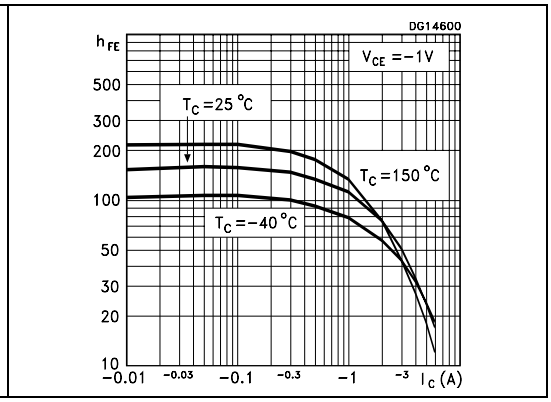


Figure 4. DC current gain (NPN)

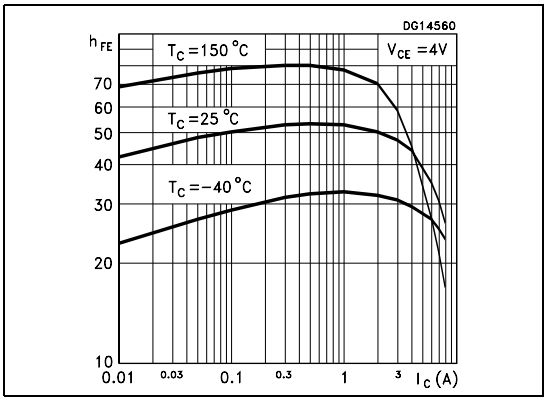


Figure 5. DC current gain (PNP)

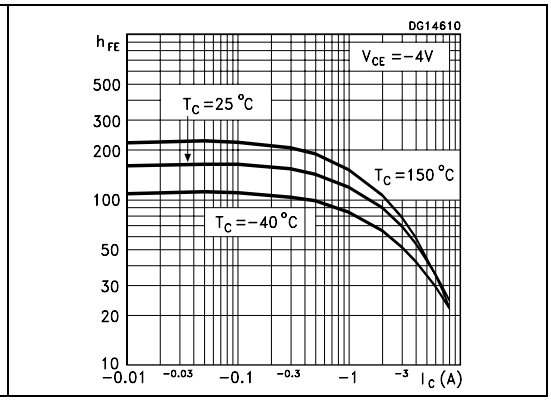


Figure 6. Collector-emitter saturation voltage (NPN)

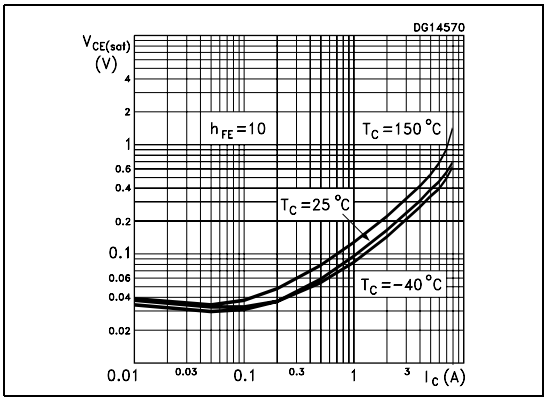


Figure 7. Collector-emitter saturation voltage (PNP)

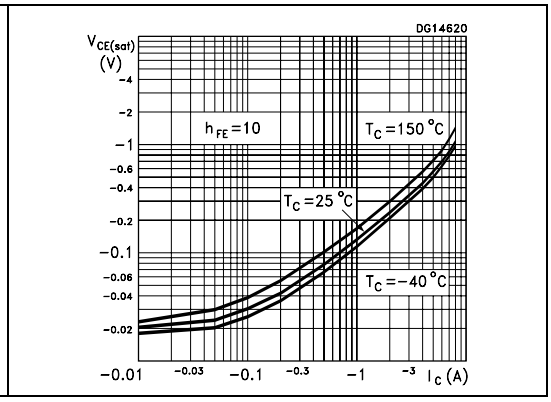


Figure 8. Base-emitter saturation voltage (NPN)

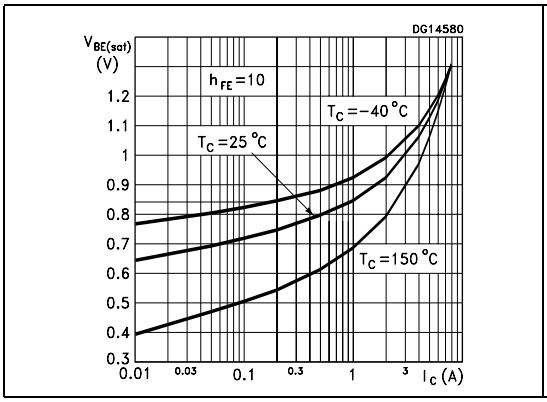


Figure 9. Base-emitter saturation voltage (PNP)

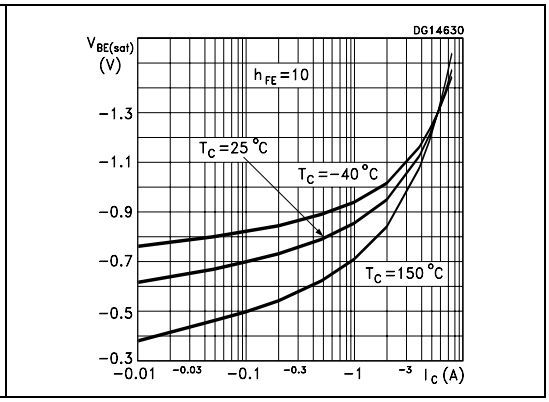


Figure 10. Base-emitter voltage (NPN)

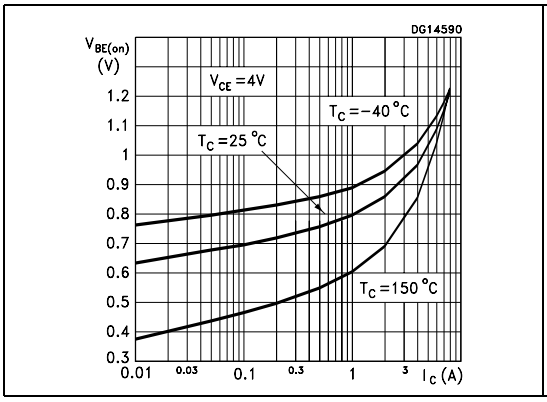


Figure 11. Base-emitter voltage (PNP)

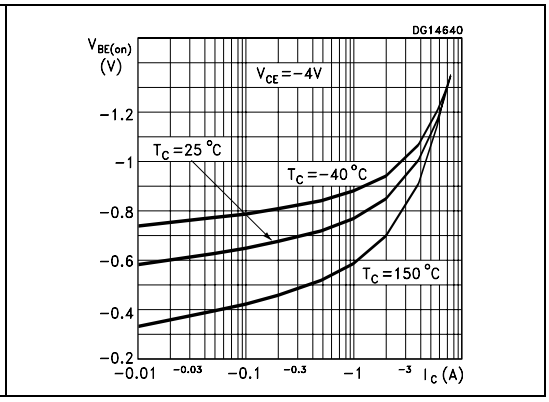


Figure 12. Resistive load switching time (NPN)

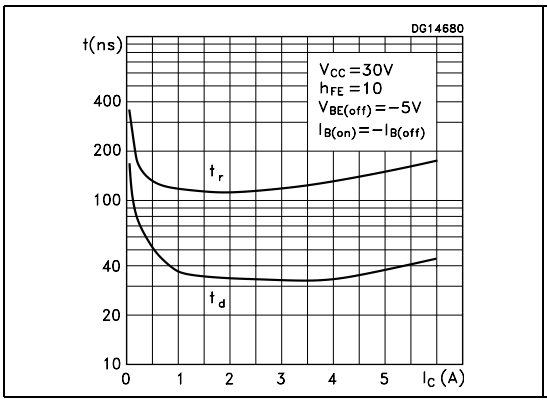


Figure 13. Resistive load switching time (PNP)

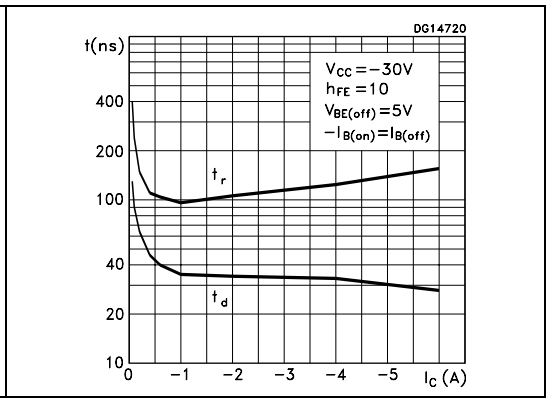


Figure 14. Resistive load switching time (NPN)

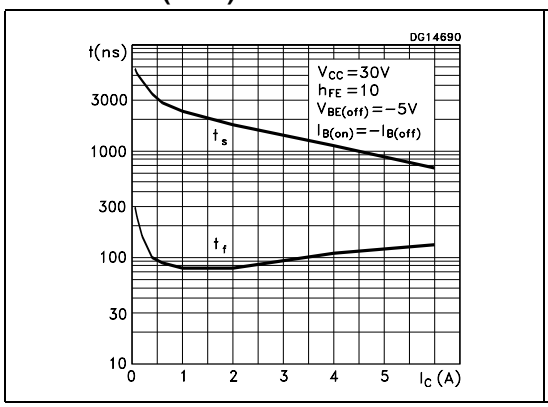


Figure 15. Resistive load switching time (PNP)

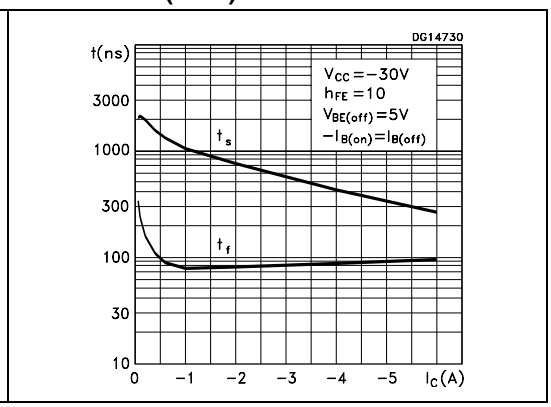


Figure 16. Collector-base and collector-emitter capacitance (NPN)

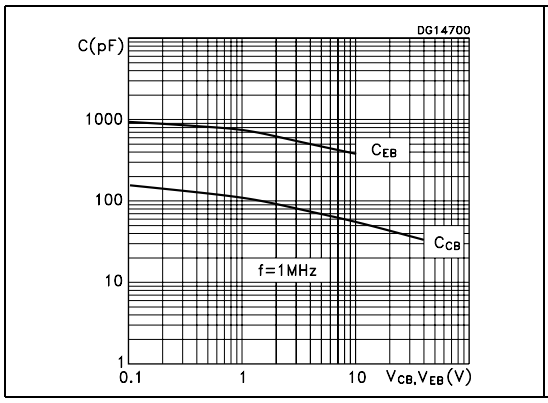
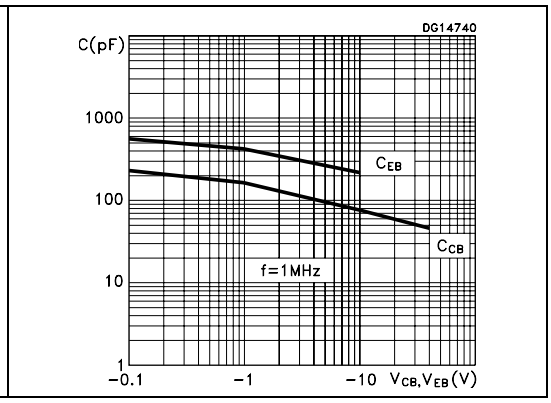
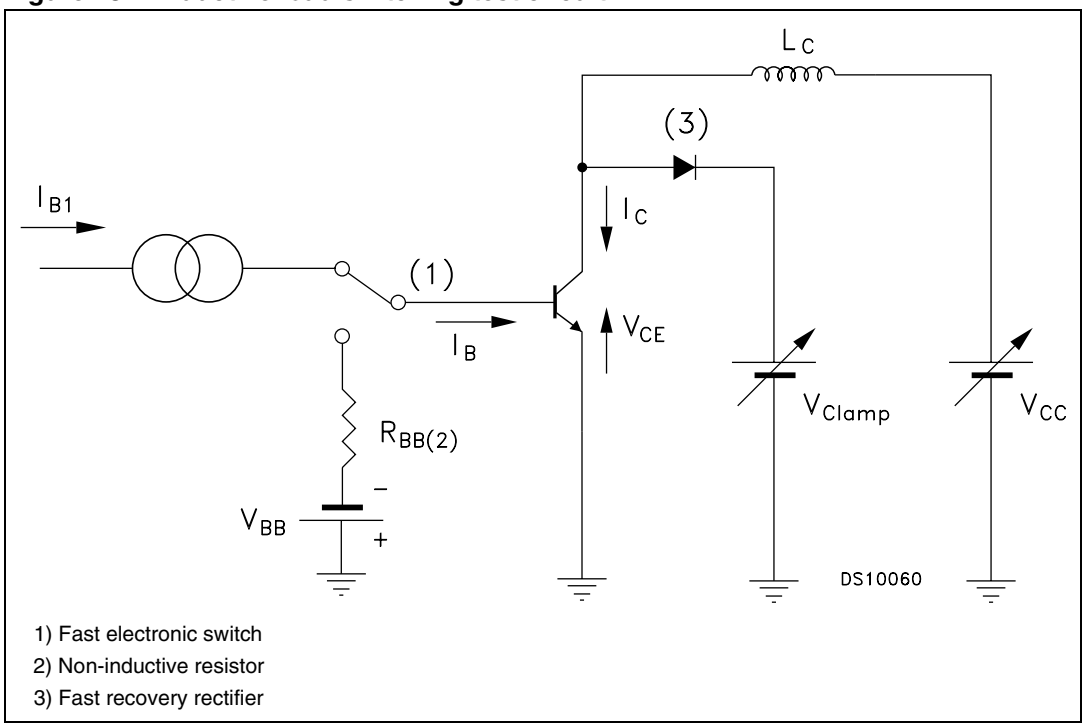


Figure 17. Collector-base and collector-emitter capacitance (PNP)



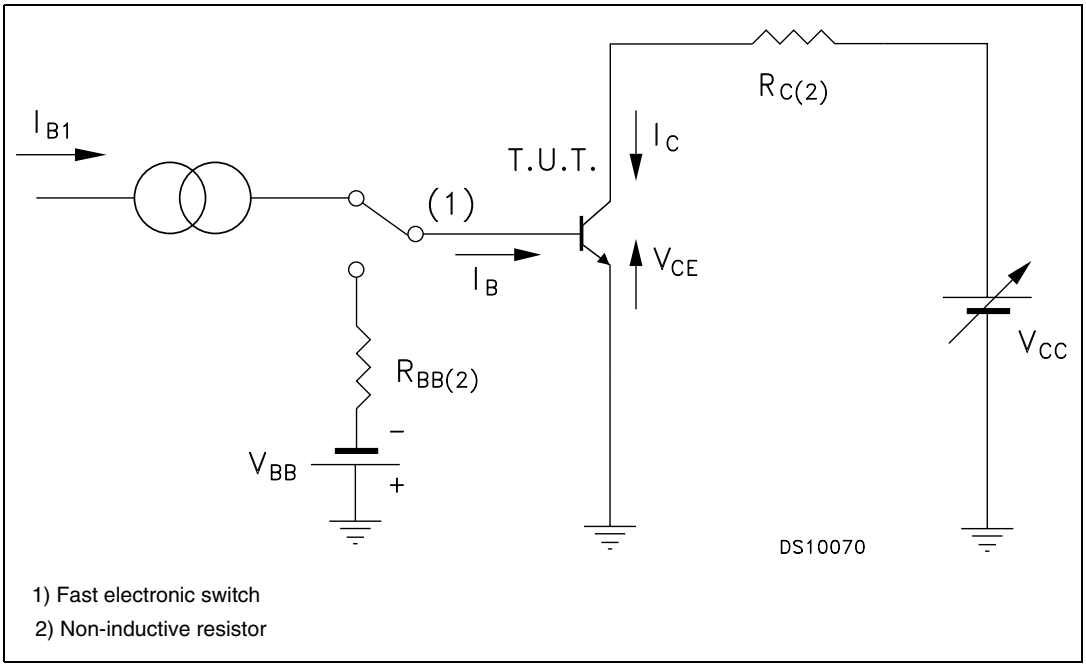
2.2 Test circuit

Figure 18. Inductive load switching test circuit



1) Fast electronic switch
2) Non-inductive resistor
3) Fast recovery rectifier

Figure 19. Resistive load switching test circuit



1) Fast electronic switch
2) Non-inductive resistor

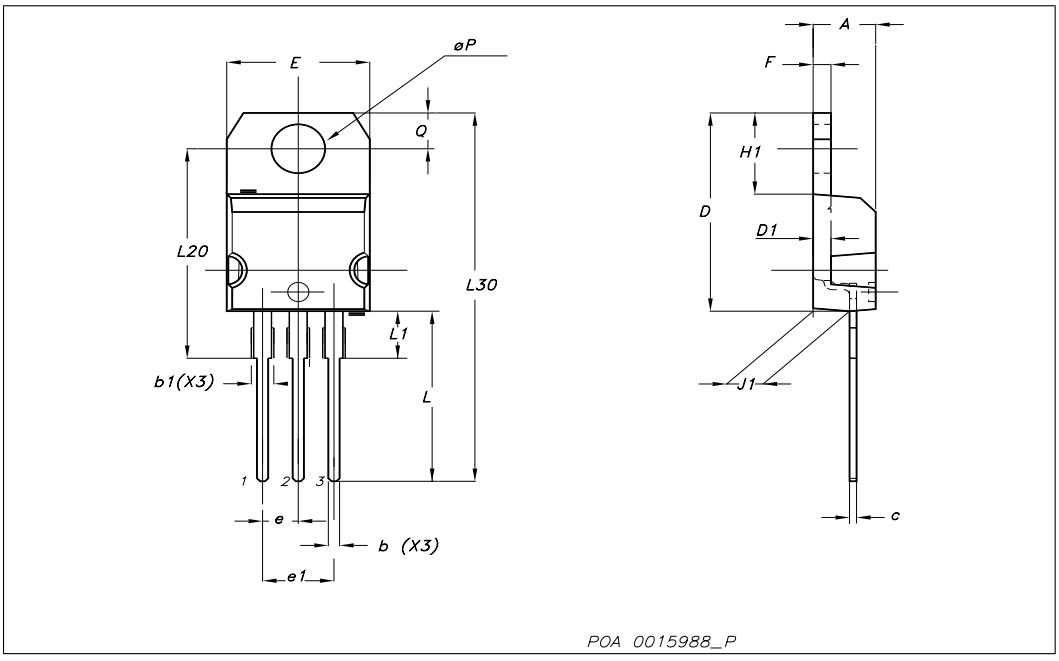
Note: For PNP types voltage e current values are negative.

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

TO-220 mechanical data

Dim	mm			inch		
	Min	Typ	Max	Min	Typ	Max
A	4.40		4.60	0.173		0.181
b	0.61		0.88	0.024		0.034
b1	1.14		1.70	0.044		0.066
c	0.49		0.70	0.019		0.027
D	15.25		15.75	0.6		0.62
D1		1.27			0.050	
E	10		10.40	0.393		0.409
e	2.40		2.70	0.094		0.106
e1	4.95		5.15	0.194		0.202
F	1.23		1.32	0.048		0.051
H1	6.20		6.60	0.244		0.256
J1	2.40		2.72	0.094		0.107
L	13		14	0.511		0.551
L1	3.50		3.93	0.137		0.154
L20		16.40			0.645	
L30		28.90			1.137	
∅P	3.75		3.85	0.147		0.151
Q	2.65		2.95	0.104		0.116



4 Revision history

Table 4. Document revision history

Date	Revision	Changes
24-Oct-2006	1	Initial release
19-Nov-2007	2	Content reworked to improve readability, no technical changes

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