

Contents

1	Electrical ratings	3
2	Electrical characteristics	4
2.1	Electrical characteristics (curves)	5
2.2	Test circuits	7
3	Package mechanical data	8
4	Revision history	11

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CES}	Collector-emitter voltage ($V_{BE} = 0$)	700	V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	400	V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	9	V
I_C	Collector current	4	A
I_{CM}	Collector peak current ($t_P < 5$ ms)	8	A
I_B	Base current	2	A
I_{BM}	Base peak current ($t_P < 5$ ms)	4	A
P_{TOT}	Total dissipation at $T_c \leq 25$ °C	75	W
T_{STG}	Storage temperature	- 65 to 150	°C
T_J	Max. operating junction temperature	150	°C

Table 3. Thermal data

Symbol	Parameter	Value	Unit
$R_{thj-case}$	Thermal resistance junction-case max	1.7	°C/W
$R_{thj-amb}$	Thermal resistance junction-amb max	62.5	°C/W

2 Electrical characteristics

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

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector cut-off current ($V_{BE} = 0$)	$V_{CE} = 700\text{ V}$ $V_{CE} = 700\text{ V}$ $T_C = 125^\circ\text{C}$			1 5	mA mA
I_{EBO}	Emitter cut-off current ($I_C = 0$)	$V_{EB} = 9\text{ V}$			1	mA
$V_{CEO(sus)}^{(1)}$	Collector-emitter sustaining voltage ($I_B = 0$)	$I_C = 10\text{ mA}$	400			V
$V_{CE(sat)}^{(1)}$	Collector-emitter saturation voltage	$I_C = 1\text{ A}$ $I_B = 0.2\text{ A}$ $I_C = 2\text{ A}$ $I_B = 0.5\text{ A}$ $I_C = 4\text{ A}$ $I_B = 1\text{ A}$			0.5 0.6 1	V V V
$V_{BE(sat)}^{(1)}$	Base-emitter saturation voltage	$I_C = 1\text{ A}$ $I_B = 0.2\text{ A}$ $I_C = 2\text{ A}$ $I_B = 0.5\text{ A}$			1.2 1.6	V V
$h_{FE}^{(1)(2)}$	DC current gain	$I_C = 1\text{ A}$ $V_{CE} = 5\text{ V}$ Group A Group C Group D Group E Group F $I_C = 2\text{ A}$ $V_{CE} = 5\text{ V}$	15 16 21 26 31 8		32 22 27 32 37 40	
t_s t_f	Resistive load Storage time Fall time	$I_C = 2\text{ A}$ $V_{CC} = 125\text{ A}$ $I_{B1} = -I_{B2} = 0.4\text{ A}$ $t_p = 30\text{ }\mu\text{s}$	1.5	0.2	3	μs μs

1. Pulse test: pulse duration = 300 μs , duty cycle $\leq 2\%$.
2. Product is pre-selected in DC current gain (group A, C, D, E and F). STMicroelectronics reserves the right to ship either groups according to production availability. Please contact your nearest STMicroelectronics sales office for delivery details

2.1 Electrical characteristics (curves)

Figure 2. Safe operating area

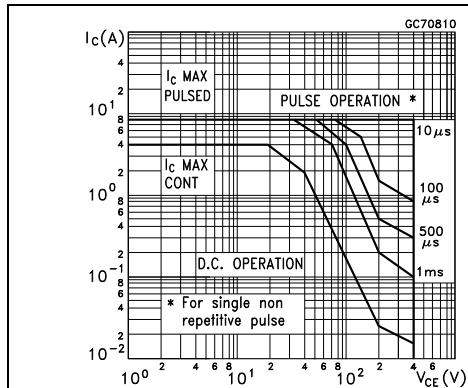


Figure 3. Derating curve

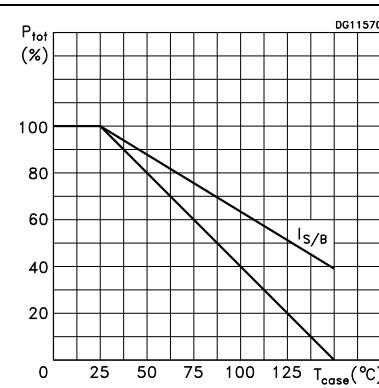


Figure 4. DC current gain ($V_{CE} = 1.5$ V) Figure 5. DC current gain ($V_{CE} = 5$ V)

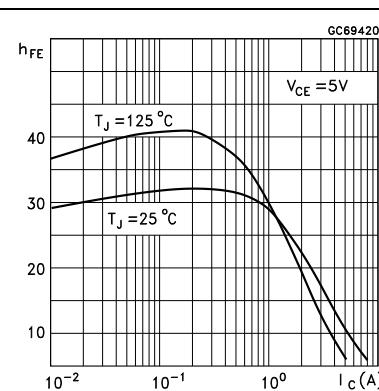
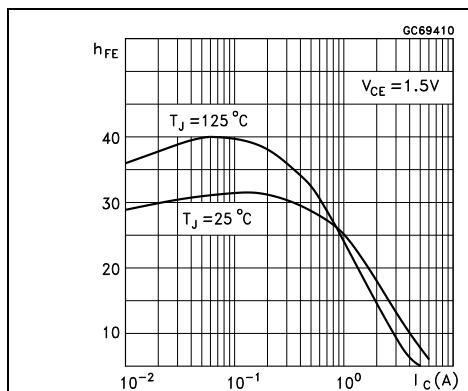


Figure 6. Collector-emitter saturation voltage

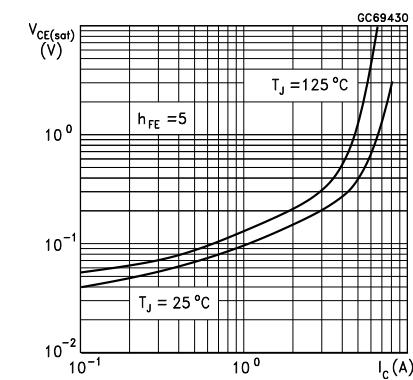


Figure 7. Base-emitter saturation voltage

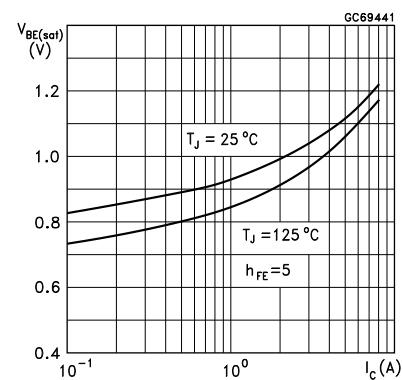
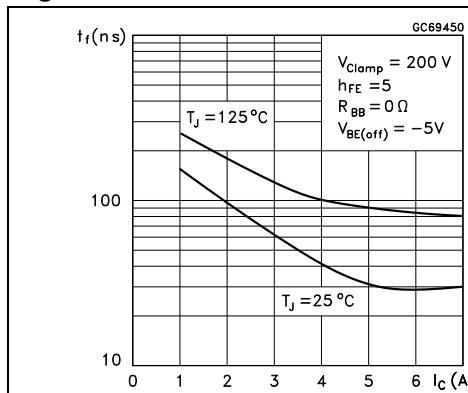
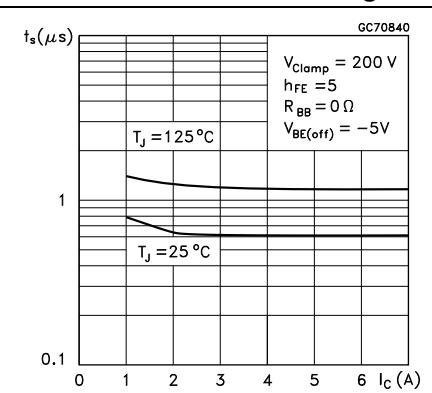
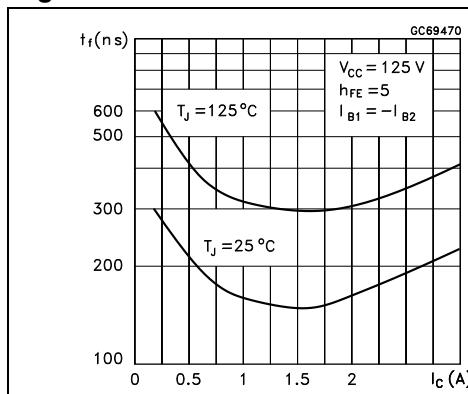
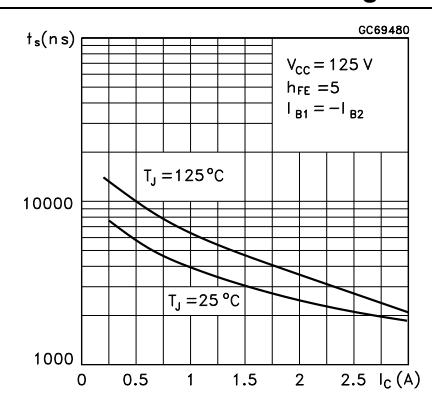
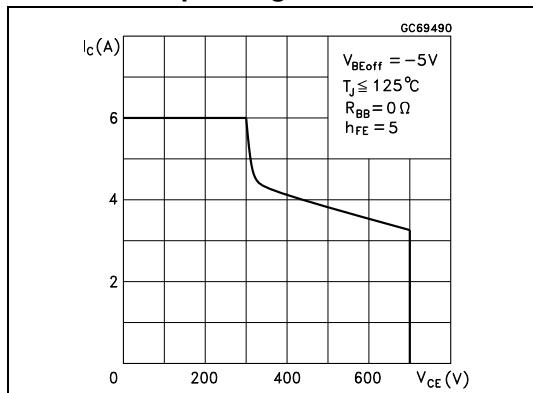


Figure 8. Inductive load fall time**Figure 9. Inductive load storage time****Figure 10. Resistive load fall time****Figure 11. Resistive load storage time****Figure 12. Reverse biased safe operating area**

2.2 Test circuits

Figure 13. Inductive load switching test circuit

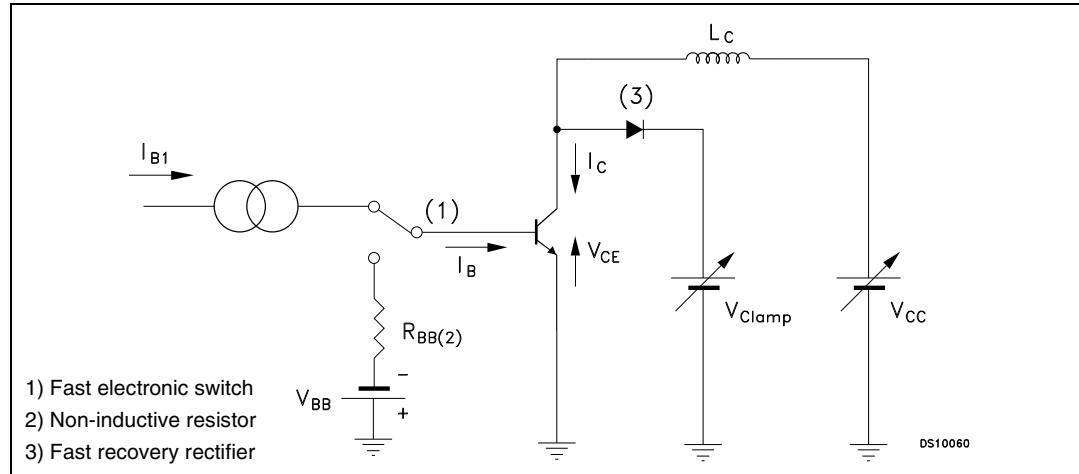
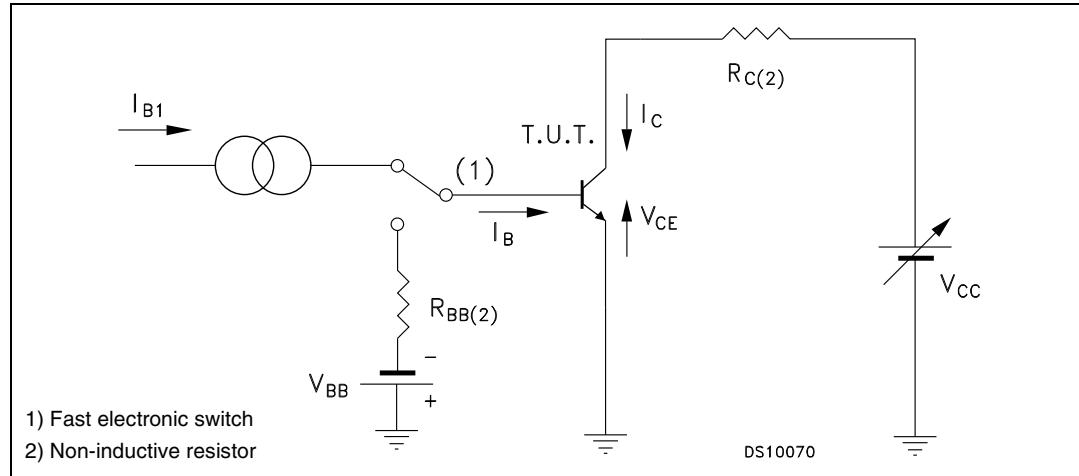


Figure 14. Resistive load switching test circuit



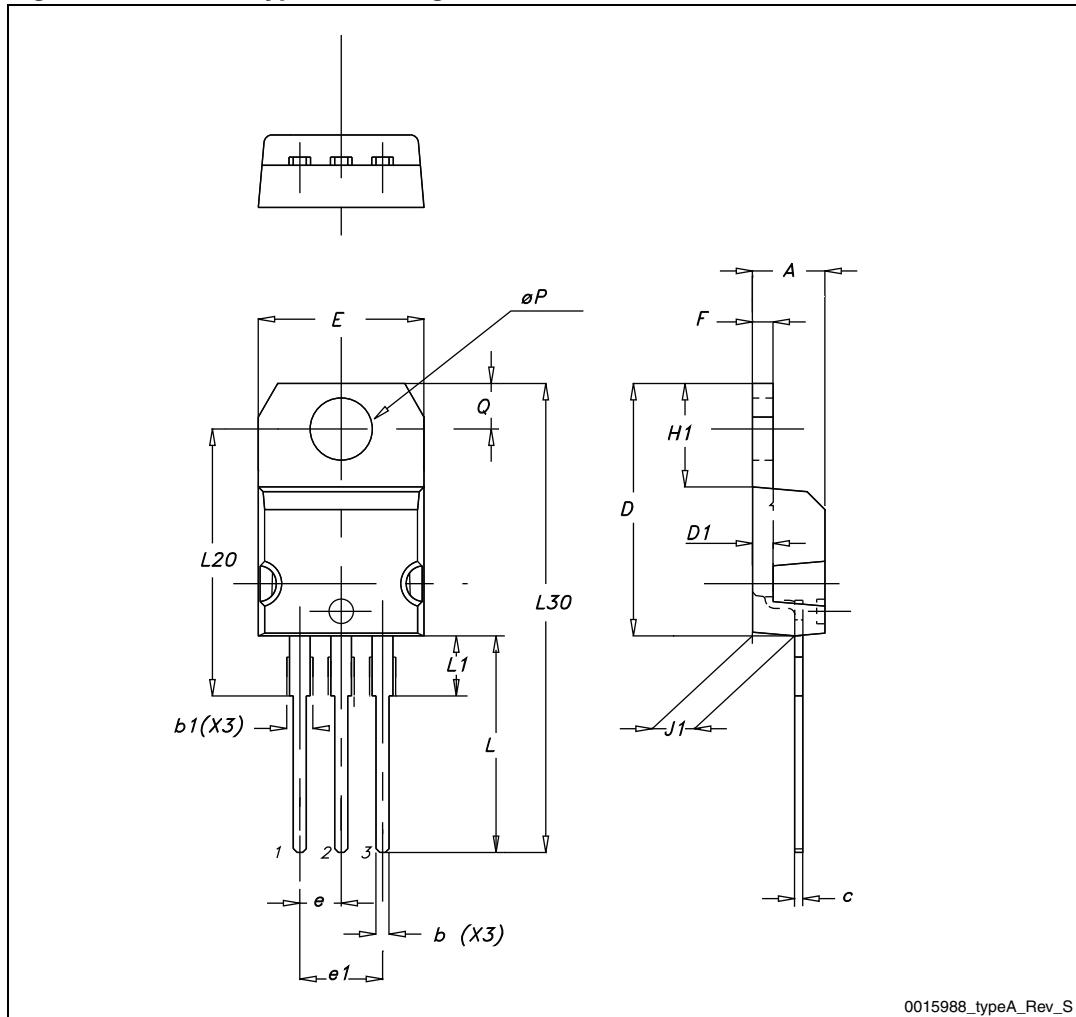
3 Package mechanical data

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.

Table 5. TO-220 type A mechanical data

Dim.	mm.		
	Min.	Typ.	Max.
A	4.40		4.60
b	0.61		0.88
b1	1.14		1.70
c	0.48		0.70
D	15.25		15.75
D1		1.27	
E	10		10.40
e	2.40		2.70
e1	4.95		5.15
F	1.23		1.32
H1	6.20		6.60
J1	2.40		2.72
L	13		14
L1	3.50		3.93
L20		16.40	
L30		28.90	
ØP	3.75		3.85
Q	2.65		2.95

Figure 15. TO-220 type A drawing



4 Revision history

Table 6. Document revision history

Date	Revision	Changes
21-Jun-2004	6	
22-Aug-2007	7	Updated mechanical data according to PCN APM-PWR/07/2804
12-Oct-2007	8	Updated marking in <i>Table 1</i>
15-Feb-2012	9	<ul style="list-style-type: none">– Updated marking in <i>Table 1</i>– Inserted: <i>Table 3</i>– Modified: h_{FE} in <i>Table 4</i>– Updated mechanical data
15-May-2012	10	Updated marking in <i>Table 1</i> and <i>4</i>

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