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High gain low voltage PNP power transistor

Features

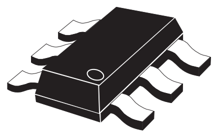
- Very low collector to emitter saturation voltage
- DC current gain > 100 (h_{FE})
- 3 A continuous collector current (I_C)

Applications

- Power management in portable equipments
- Switching regulator in battery charger applications

Description

The device is manufactured in low voltage PNP Planar Technology with "Base Island" layout. The resulting Transistor shows exceptional high gain performance coupled with very low saturation voltage.



SOT23-6L

Figure 1. Internal schematic diagram

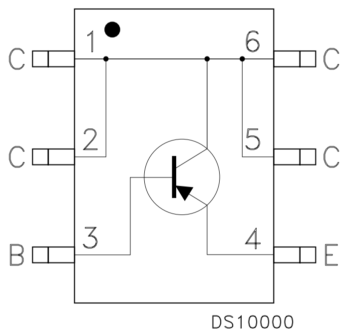


Table 1. Device summary

Order code	Marking	Package	Packaging
STT818B	818B	SOT23-6L	Tape & reel

Contents

1 Electrical ratings

Table 2. Absolute maximum rating

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base voltage ($I_E = 0$)	-30	V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	-30	V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	-5	V
I_C	Collector current	-3	A
I_{CM}	Collector peak current ($t_P < 5ms$)	-6	A
I_B	Base current	-0.2	A
I_{BM}	Base peak current ($t_P < 5ms$)	-0.5	A
P_{tot}	Total dissipation at $T_{amb} = 25°C$	1.2	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
$R_{thj-amb}$ (1)	Thermal resistance junction-ambient	max	104.2	°C/W

1. Package mounted on FR4 pcb 25mm x 25mm.

2 Electrical characteristics

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

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current (I_E =0)	V_{CB} = -30 V V_{CB} = -30 V T_C = 125°C			-0.1 -20	µA µA
I_{EBO}	Collector-cut-off current (I_C = 0)	V_{EB} = -5 V			-0.1	µA
$V_{(BR)CEO}$(1)	Collector-emitter breakdown voltage (I_B = 0)	I_C = -10 mA	-30			V
$V_{CE(sat)}$(1)	Collector-emitter saturation voltage	I_C = -0.5 A I_B = -5 mA I_C = -1.2 A I_B = -12 mA I_C = -2 A I_B = -20 mA		-0.075 -0.21	-0.15 -0.3 -0.5	V V V
$V_{BE(sat)}$(1)	Base-emitter saturation voltage	I_C = -0.5 A I_B = -5 mA I_C = -1.2A I_B = -12 mA I_C = -2A I_B = -20 mA		-0.74	-1.1 -1.1 -1.2	V V V
h_{FE}(1)	DC current gain	I_C = -0.5 A V_{CE} = -1 V I_C = -2.5 A V_{CE} = -3 V	100 100			
$V_{BE(ON)}$(1)	Base-emitter voltage	I_C = -0.5 A V_{CE} = -2 V		-0.71	-1.1	V

1. Pulse duration = 300 µs, duty cycle 1.5 %.

2.1 Electrical characteristics (curves)

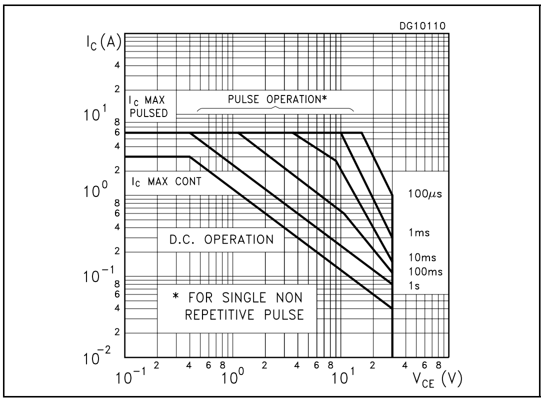


Figure 2. Safe operating area

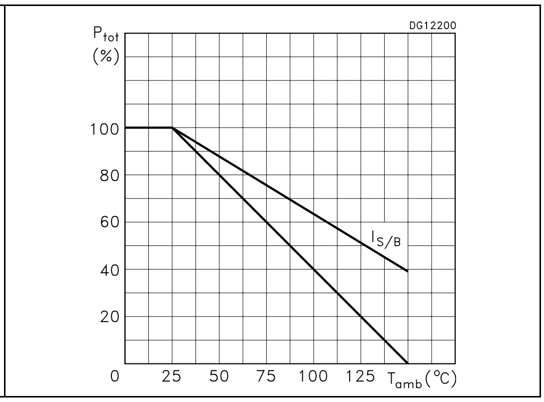


Figure 3. Derating curve

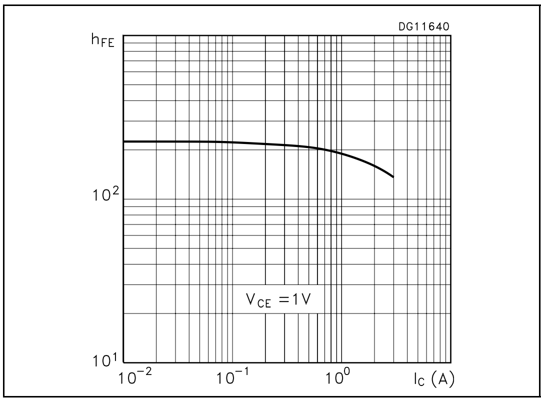


Figure 4. DC Current Gain

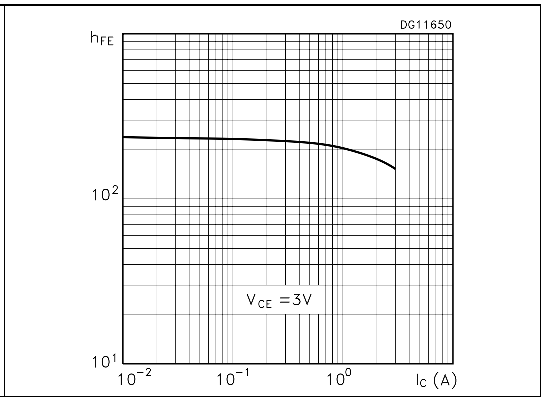


Figure 5. DC Current Gain

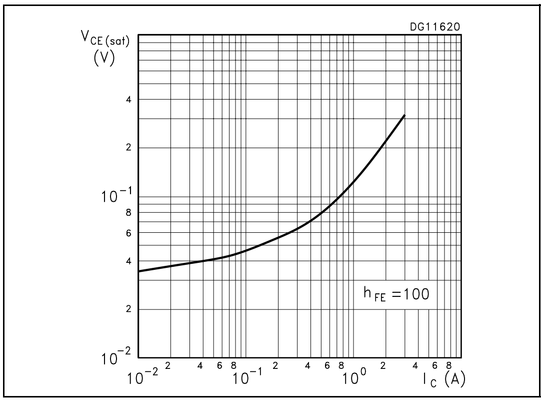


Figure 6. Collector-emitter saturation voltage

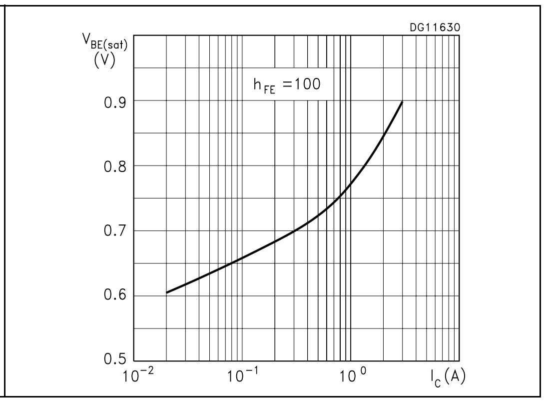


Figure 7. Base-emitter saturation voltage

Figure 8. Switching times resistive load

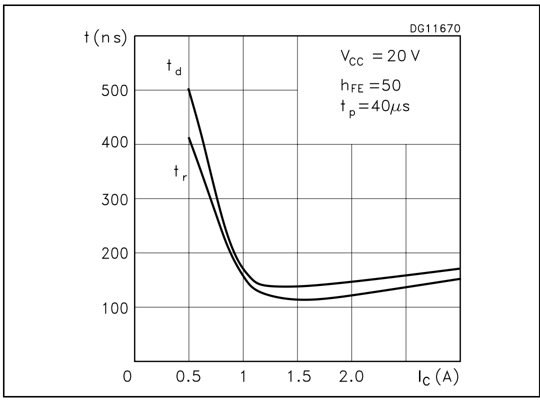
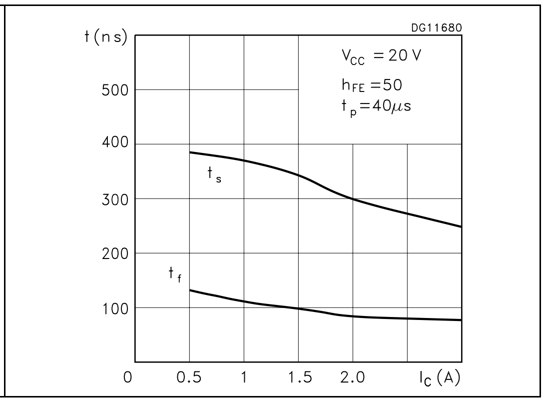


Figure 9. Switching times resistive load

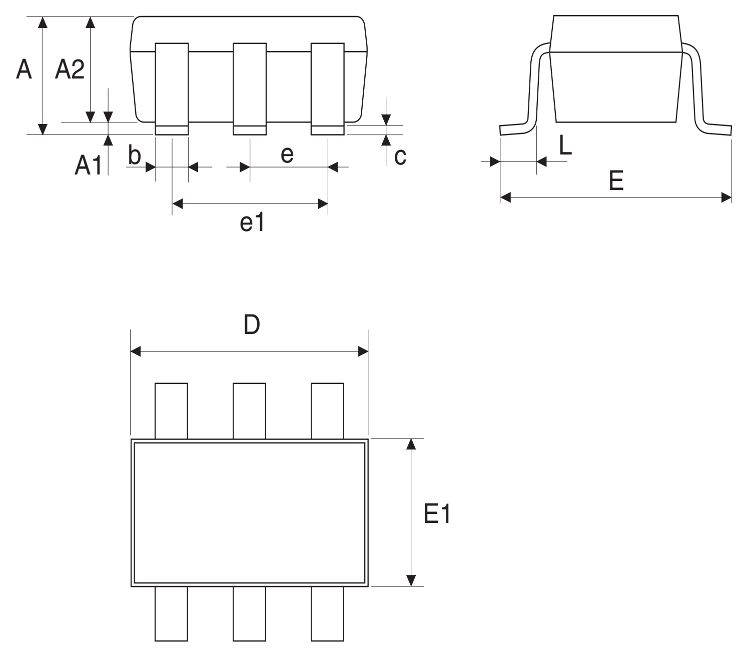


3 Package mechanical data

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

SOT23-6L MECHANICAL DATA

DIM.	mm			mils		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	0.90		1.45	0.035		0.057
A1	0.00		0.15	0.000		0.006
A2	0.90		1.30	0.035		0.051
b	0.25		0.50	0.010		0.020
C	0.09		0.20	0.004		0.008
D	2.80		3.10	0.110		0.122
E	2.60		3.00	0.102		0.118
E1	1.50		1.75	0.059		0.069
L	0.35		0.55	0.014		0.022
e		0.95			0.037	
e1		1.90			0.075	



4 Revision history

Table 5. Document revision history

Date	Revision	Changes
12-Jul-2002	4	No content change; the document has been reformatted
08-Aug-2007	5	Updated *Figure 3*