

STN851

LOW VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

PRELIMINARY DATA

Ordering Code	Marking	Shipment
STN851	N851	Tape & Reel

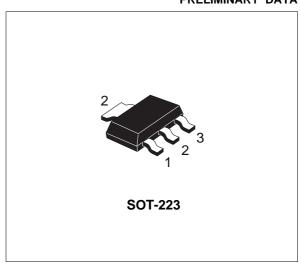
- VERY LOW COLLECTOR TO EMITTER SATURATION VOLTAGE
- HIGH CURRENT GAIN CHARACTERISTIC
- FAST-SWITCHING SPEED
- SURFACE-MOUNTING SOT-223 MEDIUM POWER PACKAGE IN TAPE & REEL

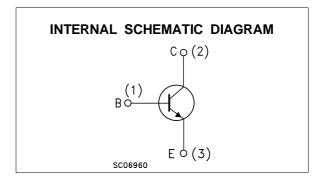
APPLICATIONS:

- EMERGENCY LIGHTING
- VOLTAGE REGULATORS
- RELAY DRIVERS
- HIGH EFFICIENCY LOW VOLTAGE SWITCHING APPLICATIONS



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





ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage (I _E = 0)	150	V
V_{CEO}	Collector-Emitter Voltage (I _B = 0)	60	V
V_{EBO}	Emitter-Base Voltage (I _C = 0)	7	V
Ic	Collector Current	5	Α
I _{CM}	Collector Peak Current (t _p < 5 ms)	10	Α
I_B	Base Current	1	Α
I_{BM}	Base Peak Current (t _p < 5 ms)	2	Α
P_{tot}	Total Dissipation at T _{amb} = 25 °C	1.6	W
T_{stg}	Storage Temperature	-65 to 150	°C
Tj	Max. Operating Junction Temperature	150	°C

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THERMAL DATA

R _{thj-amb} Thermal Resistance Junction-ambient Max 78 °C/V
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[•] Device mounted on a P.C.B. area of 1 cm²

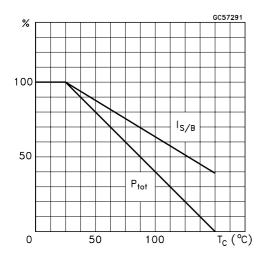
ELECTRICAL CHARACTERISTICS ($T_{case} = 25$ $^{\circ}C$ unless otherwise specified)

Symbol	Parameter	Test C	Min.	Тур.	Max.	Unit	
Ісво	Collector Cut-off Current (I _E = 0)	V _{CB} = 120 V V _{CB} = 120 V	T _j = 100 °C			50 1	nA μA
I _{EBO}	Emitter Cut-off Current (I _C = 0)	V _{EB} = 7 V				10	nA
V _(BR) CBO	Collector-Base Breakdown Voltage (I _E = 0)	I _C = 100 μA		150			V
V _{(BR)CEO*}	Collector-Emitter Breakdown Voltage (I _B = 0)	I _C = 10 mA		60			V
V _{(BR)EBO}	Emitter-Base Breakdown Voltage (I _C = 0)	ΙΕ = 100 μΑ		7			V
V _{CE(sat)} *	Collector-Emitter Saturation Voltage	I _C = 100 mA I _C = 1 A I _C = 2 A I _C = 5 A	$I_B = 5 \text{ mA}$ $I_B = 50 \text{ mA}$ $I_B = 50 \text{ mA}$ $I_B = 200 \text{ mA}$		10 70 140 320	50 120 250 500	mV mV mV
$V_{BE(sat)^*}$	Base-Emitter Saturation Voltage	I _C = 4 A	$I_B = 200 \text{ mA}$		1	1.15	V
$V_{BE(on)^*}$	Base-Emitter On Voltage	I _C = 4 A	$V_{CE} = 1 V$		0.89	1	V
h _{FE} *	DC Current Gain	I _C = 10 mA I _C = 2 A I _C = 5 A I _C = 10 A	V _{CE} = 1 V V _{CE} = 1 V V _{CE} = 1 V V _{CE} = 1 V	150 150 90 30	300 270 140 50	350	
f⊤	Transition frequency	V _{CE} = 10 V	$I_C = 100 \text{ mA}$		130		MHz
Ссво	Collector-Base Capacitance	V _{CB} = 10 V	f = 1 MHz		50		pF
t _{on} t _s t _f	RESISTIVE LOAD Turn- on Time Storage Time Fall Time	I _C = 1 A I _{B1} = - I _{B2} = 0.1 A	Vcc = 10 V		50 1.35 120		ns µs ns

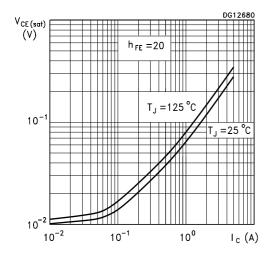
^{*} Pulsed: Pulse duration = 300µs, duty cycle = 1.5 %

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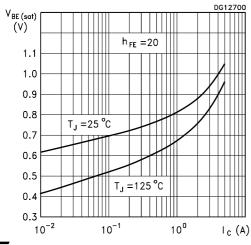
Derating Curve



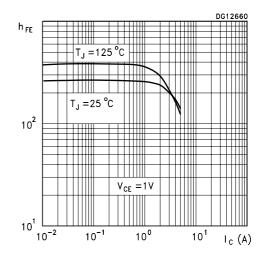
Collector-Emitter Saturation Voltage



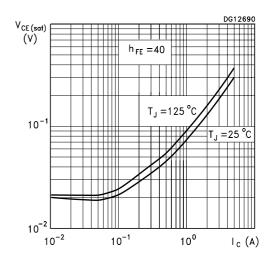
Base-Emitter Saturation Voltage



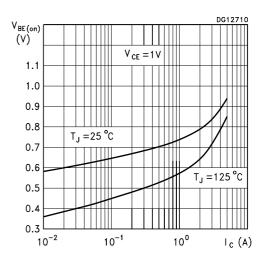
DC Current Gain



Collector-Emitter Saturation Voltage

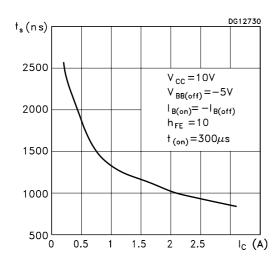


Base-Emitter On Voltage

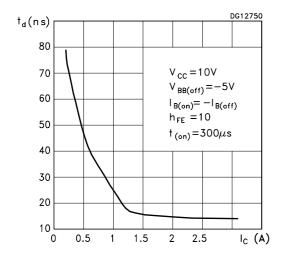


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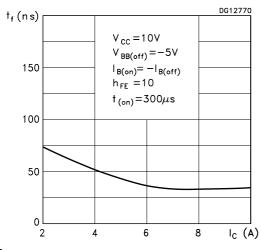
Switching Times Resistive Load



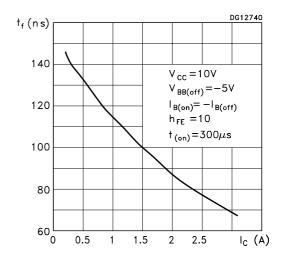
Switching Times Resistive Load



Switching Times Inductive Load



Switching Times Resistive Load



Switching Times Inductive Load

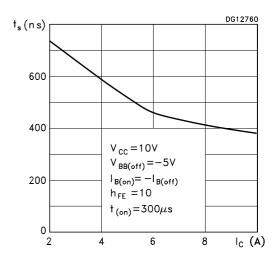
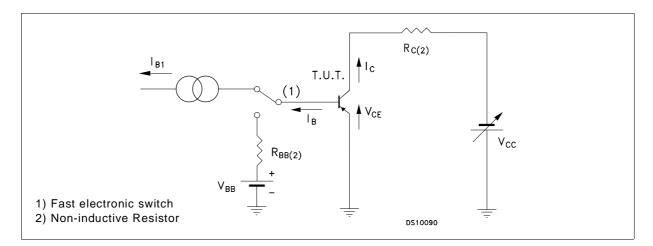
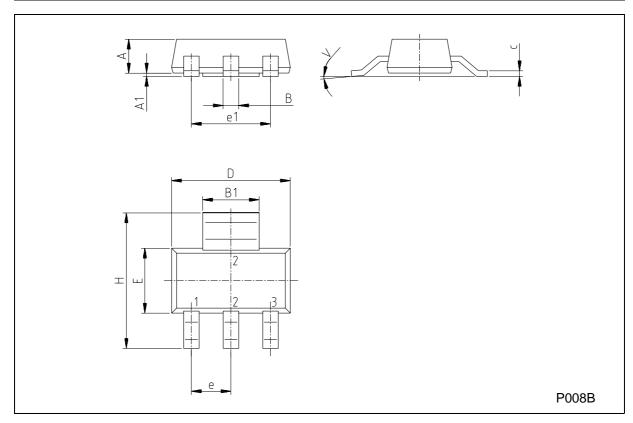


Figure 1: Resistive Load Switching Test Circuit.



SOT-223 MECHANICAL DATA

DIM.	mm			inch			
Dim:	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
А			1.80			0.071	
В	0.60	0.70	0.80	0.024	0.027	0.031	
B1	2.90	3.00	3.10	0.114	0.118	0.122	
С	0.24	0.26	0.32	0.009	0.010	0.013	
D	6.30	6.50	6.70	0.248	0.256	0.264	
е		2.30			0.090		
e1		4.60			0.181		
E	3.30	3.50	3.70	0.130	0.138	0.146	
Н	6.70	7.00	7.30	0.264	0.276	0.287	
V			10°			10°	
A1		0.02					



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