

**STN851**

LOW VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

PRELIMINARY DATA

Ordering Code	Marking	Shipment
STN851	N851	Tape & Reel

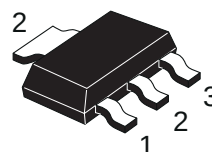
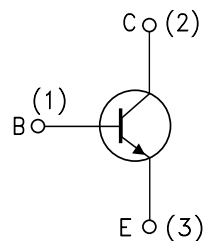
- VERY LOW COLLECTOR TO EMITTER SATURATION VOLTAGE
- HIGH CURRENT GAIN CHARACTERISTIC
- FAST-SWITCHING SPEED
- SURFACE-MOUNTING SOT-223 MEDIUM POWER PACKAGE IN TAPE & REEL

APPLICATIONS:

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

DESCRIPTION

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.

**SOT-223****INTERNAL SCHEMATIC DIAGRAM**

SC06960

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
I_C	Collector Current	5	A
I_{CM}	Collector Peak Current ($t_p < 5$ ms)	10	A
I_B	Base Current	1	A
I_{BM}	Base Peak Current ($t_p < 5$ ms)	2	A
P_{tot}	Total Dissipation at $T_{amb} = 25$ °C	1.6	W
T_{stg}	Storage Temperature	-65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

THERMAL DATA

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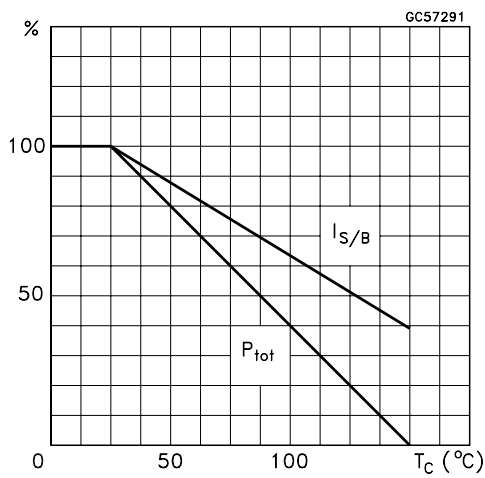
• Device mounted on a P.C.B. area of 1 cm²

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

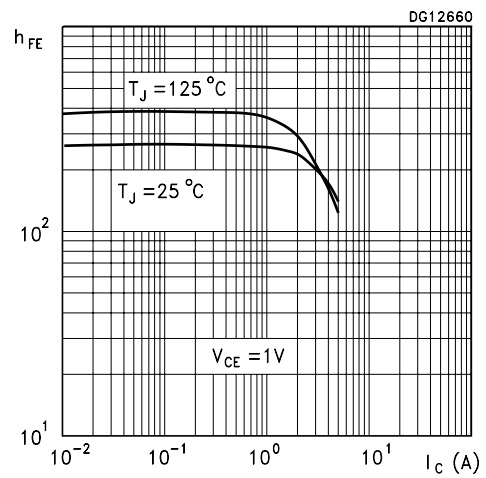
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I _{CBO}	Collector Cut-off Current (I _E = 0)	V _{CB} = 120 V V _{CB} = 120 V T _j = 100 °C			50 1	nA μA
I _{EBO}	Emitter Cut-off Current (I _C = 0)	V _{EB} = 7 V			10	nA
V _{(BR)CBO}	Collector-Base Breakdown Voltage (I _E = 0)	I _C = 100 μA	150			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)	I _E = 100 μA	7			V
V _{CE(sat)} *	Collector-Emitter Saturation Voltage	I _C = 100 mA I _B = 5 mA I _C = 1 A I _B = 50 mA I _C = 2 A I _B = 50 mA I _C = 5 A I _B = 200 mA		10 70 140 320	50 120 250 500	mV mV mV mV
V _{BE(sat)} *	Base-Emitter Saturation Voltage	I _C = 4 A I _B = 200 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 V _{CE} = 1 V I _C = 2 A V _{CE} = 1 V I _C = 5 A V _{CE} = 1 V I _C = 10 A V _{CE} = 1 V	150 150 90 30	300 270 140 50	350	
f _T	Transition frequency	V _{CE} = 10 V I _C = 100 mA		130		MHz
C _{CBO}	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 V _{CC} = 10 V I _{B1} = - I _{B2} = 0.1 A		50 1.35 120		ns μs ns

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

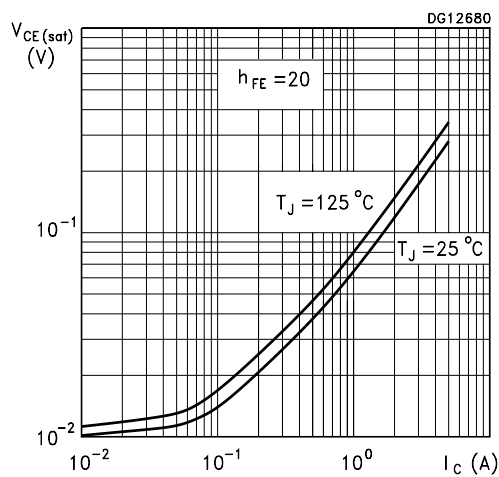
Derating Curve



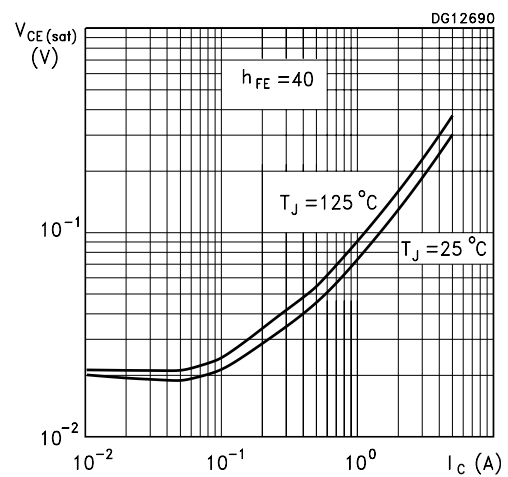
DC Current Gain



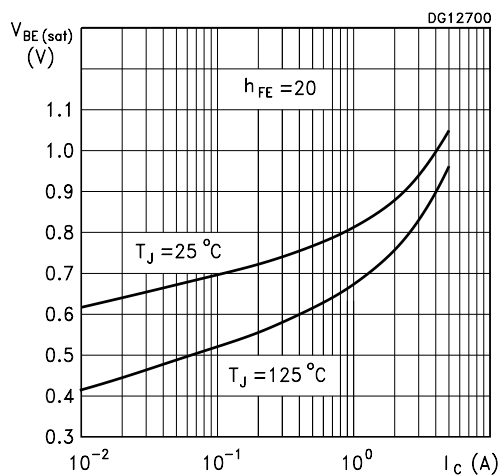
Collector-Emitter Saturation Voltage



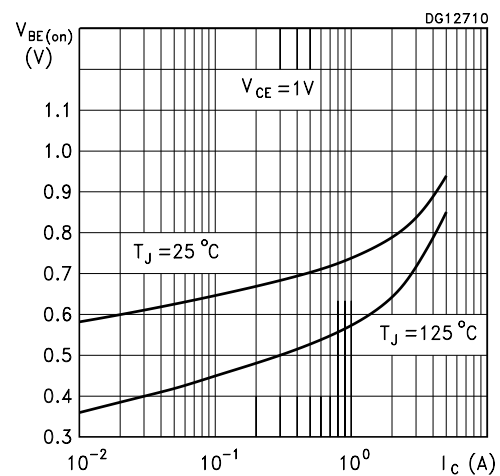
Collector-Emitter Saturation Voltage



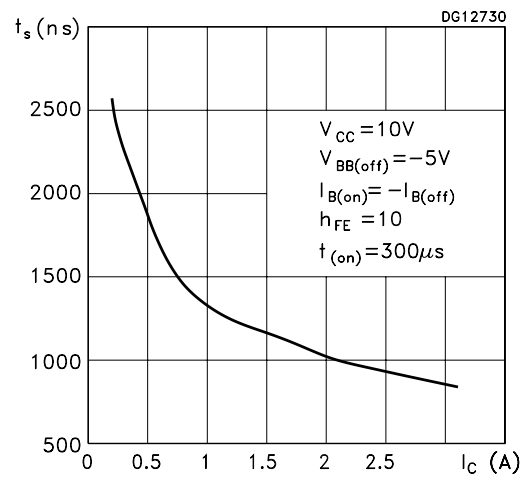
Base-Emitter Saturation Voltage



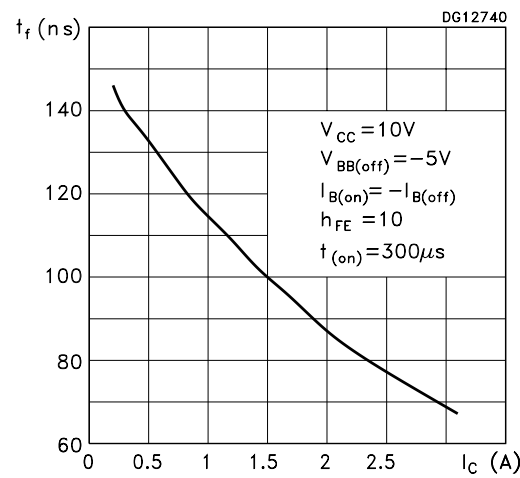
Base-Emitter On Voltage



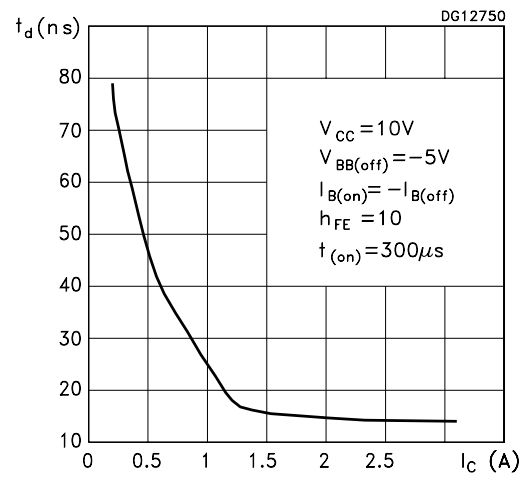
Switching Times Resistive Load



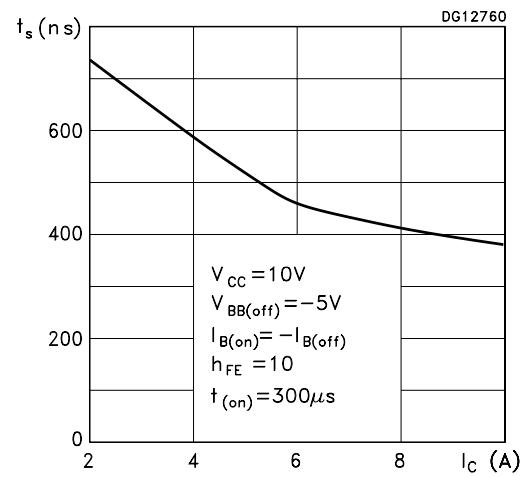
Switching Times Resistive Load



Switching Times Resistive Load



Switching Times Inductive Load



Switching Times Inductive Load

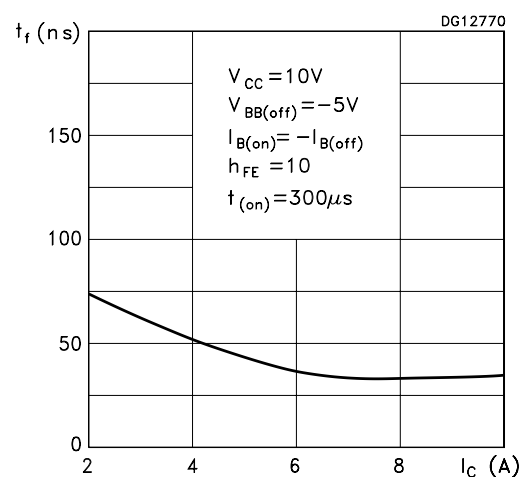
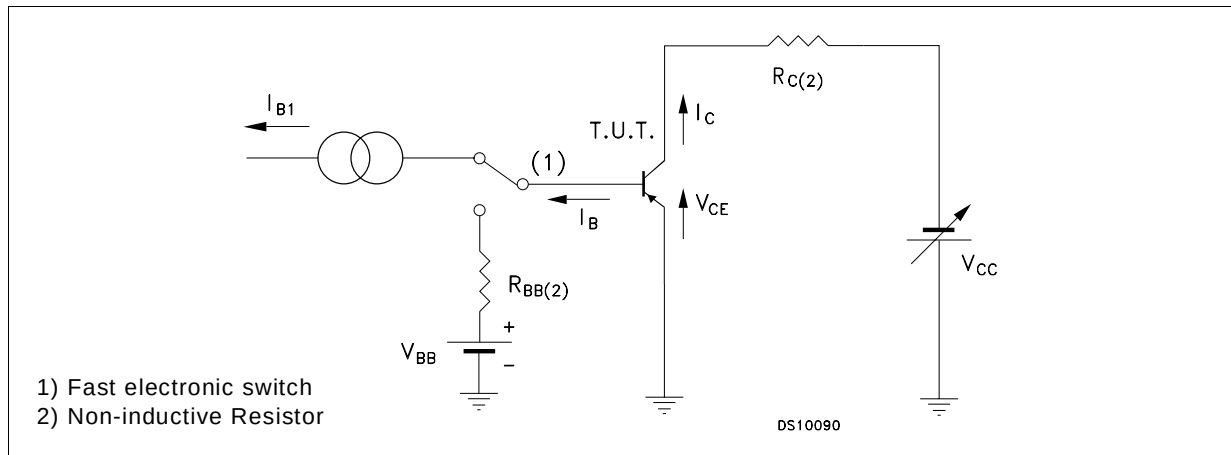
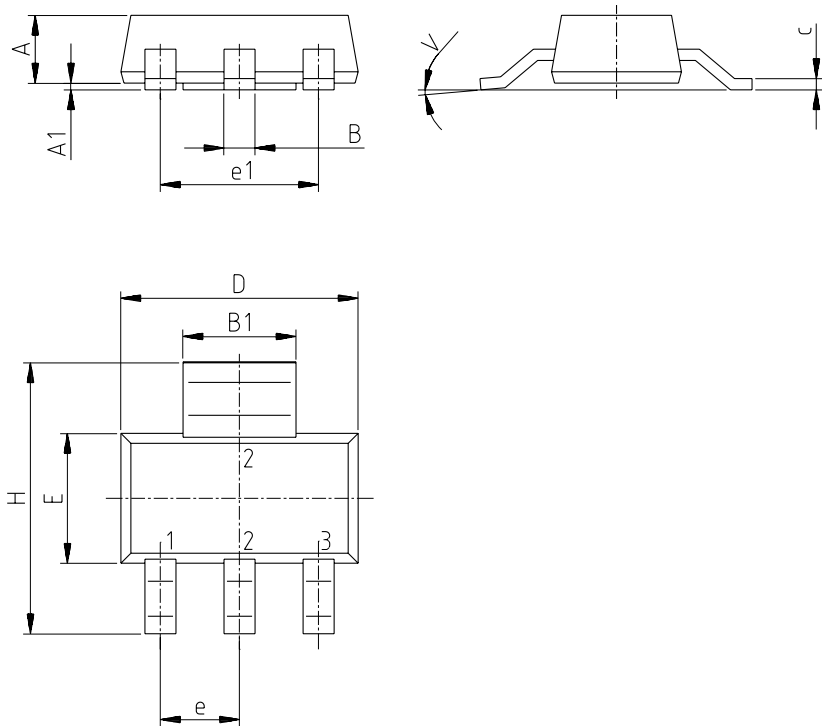


Figure 1: Resistive Load Switching Test Circuit.

SOT-223 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.80			0.071
B	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
c	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
e		2.30			0.090	
e1		4.60			0.181	
E	3.30	3.50	3.70	0.130	0.138	0.146
H	6.70	7.00	7.30	0.264	0.276	0.287
V			10°			10°
A1		0.02				



P008B

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