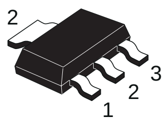
STN851

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 POWER PACKAGE IN TAPE & REEL



SOT-223

APPLICATIONS:

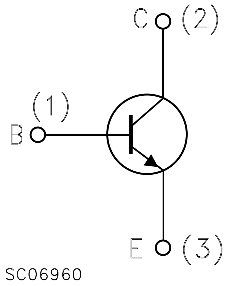
- EMERGENCY LIGHTING
- VOLTAGE REGULATORS
- RELAY DRIVERS
- HIGH EFFICIENCY LOW VOLTAGE SWITCHING CIRCUITS

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.

INTERNAL SCHEMATIC DIAGRAM



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)	20	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

$R_{thj\text{-}amb}$■	Thermal Resistance Junction-ambient	Max	78	°C/W

■ Device mounted on P.C.B. with area of 1 cm^2

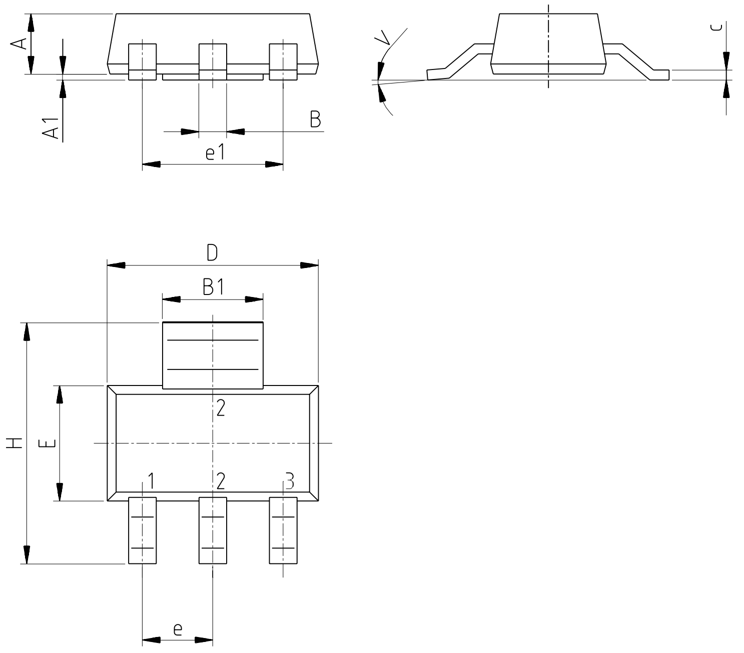
ELECTRICAL CHARACTERISTICS (T_j = 25 °C unless otherwise specified)

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_E = 10 mA	60			V
$V_{(BR)EBO}$*	Emitter-Base Breakdown Voltage (I_C = 0)	I_C = 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	50 120 200 450	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	
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} = 100 mA		 50 1.35 120		 ns µs ns

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

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

STMicroelectronics GROUP OF COMPANIES
Australia - Brazil - Canada - China - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco
Singapore - Spain - Sweden - Switzerland - United Kingdom - United States.
© http://www.st.com