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STN951

Low voltage fast-switching PNP power transistor

Features

- Very low collector-emitter saturation voltage
- High current gain characteristic
- Fast switching speed
- Surface mounting device in medium power SOT-223 package

Applications

- Emergency lighting
- Voltage regulators
- Relay drivers
- High efficiency low voltage switching applications

Description

The device is manufactured in PNP planar technology by using a "Base Island" layout. The resulting transistor shows exceptional high gain performances coupled with very low saturation voltage.

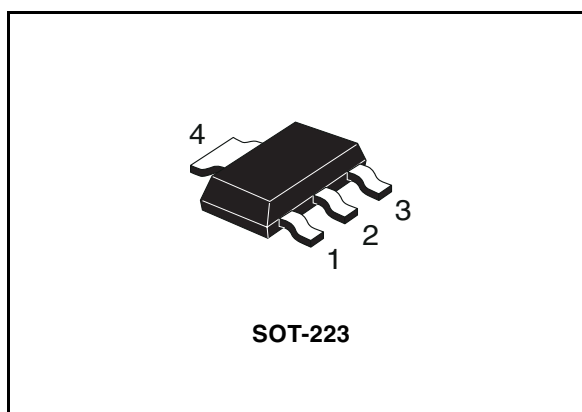


Figure 1. Internal schematic diagram

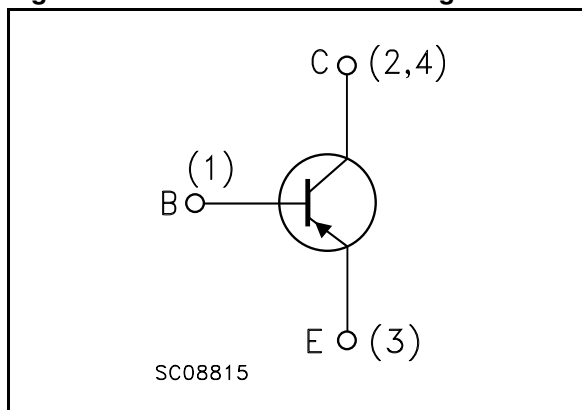


Table 1. Device summary

Order codes	Marking	Package	Packaging
STN951	N951	SOT-223	Tape and reel

Contents

1	Electrical ratings	3
2	Electrical characteristics	4
3	Package mechanical data	5
4	Revision history	7

STN951

Electrical ratings

1 Electrical ratings

Table 2. Absolute maximum rating

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base voltage ($I_E = 0$)	-60	V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	-60	V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	-6	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

Table 3. Thermal data

Symbol	Parameter	Value	Unit
$R_{thj-amb}^{(1)}$	Thermal resistance junction-amb max	78	°C/W

1. Device mounted on PCB area of 1cm²

Electrical characteristics

STN951

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} = -60 V			-0.1	μA
I _{EBO}	Emitter cut-off current (I _C = 0)	V _{EB} = -5 V			-0.1	μA
V _{(BR)CBO} ⁽¹⁾	Collector-base Breakdown voltage (I _E = 0)	I _C = -100 μA	-60			V
V _{(BR)CEO} ⁽¹⁾	Collector-emitter Breakdown voltage (I _B = 0)	I _C = -10 mA	-60			V
V _{(BR)EBO} ⁽¹⁾	Emitter-base Breakdown voltage (I _C = 0)	I _E = -100 μA	-6			V
V _{CE(sat)} ⁽¹⁾	Collector-emitter saturation voltage	I _C = -100 mA I _B = -5 mA		-10	-50	mV
		I _C = -1 A I _B = -50 mA		-70	-120	mV
		I _C = -2 A I _B = -50 mA		-140	-250	mV
		I _C = -5 A I _B = -200 mA		-350	-500	mV
V _{BE(sat)} ⁽¹⁾	Base-emitter saturation voltage	I _C = -4 A I _B = -200 mA		-1	-1.15	V
V _{BE(on)} ⁽¹⁾	Base-emitter on voltage	I _C = -4 A V _{CE} = -1 V		-0.89	-1	V
h _{FE} ⁽¹⁾	DC current gain	I _C = -10 mA V _{CE} = -1 V	150	300		
		I _C = -2 A V _{CE} = -1 V	150	270	350	
		I _C = -5 A V _{CE} = -1 V	65	90		
		I _C = -10 A V _{CE} = -1 V	10	25		
f _T	Transition frequency	V _{CE} = -10 V I _C = -100 mA		130		MHz
C _{CBO}	Collector-base capacitance (I _E = 0)	V _{CB} = -10 V f = 1 MHz		60		pF
t _{on} t _s t _f	Resistive load Turn-on time	I _C = -1 A V _{CC} = -30 V I _{B1} = - I _{B2} = -0.1 A		80		ns
	Storage time			600		ns
	Fall time			70		ns

1. Pulse duration = 300 μs, duty cycle ≤ 2 %

3 Package mechanical data

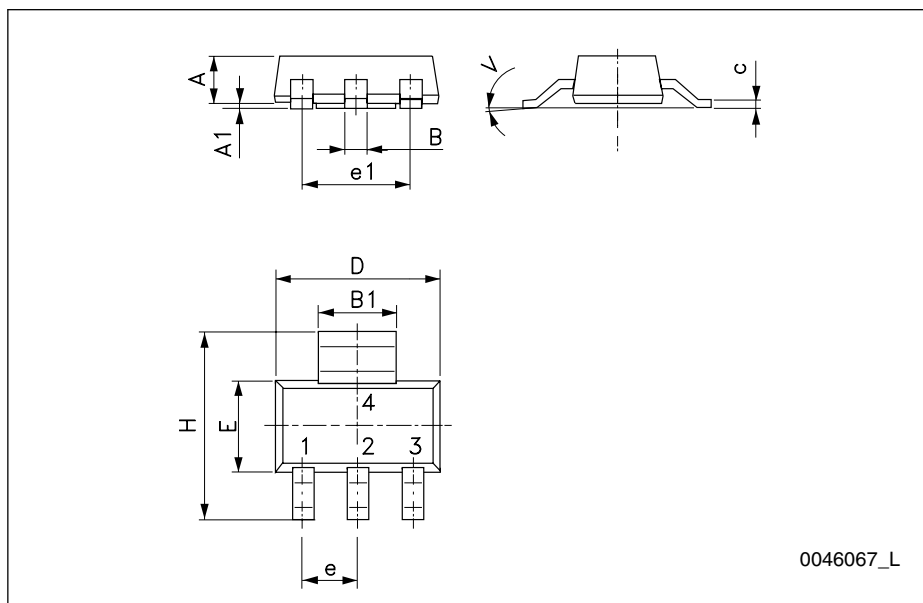
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Package mechanical data

STN951

SOT-223 mechanical data

DIM.	mm.		
	min.	typ	max.
A			1.80
A1	0.02		0.1
B	0.60	0.70	0.85
B1	2.90	3.00	3.15
c	0.24	0.26	0.35
D	6.30	6.50	6.70
e		2.30	
e1		4.60	
E	3.30	3.50	3.70
H	6.70	7.00	7.30
V			10°



4 Revision history

Table 5. Document revision history

Date	Revision	Changes
03-Oct-2006	1	Initial release.
30-Nov-2006	2	The emitter base voltage value has been modified
13-Oct-2008	3	Document status promoted from preliminary data to datasheet

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