

# **STN888**

## HIGH CURRENT, HIGH PERFORMANCE, LOW VOLTAGE PNP TRANSISTOR

### Features

- VERY LOW COLLECTOR TO EMITTER SATURATION VOLTAGE
- D.C. CURRENT GAING, h<sub>FE</sub> > 100
- 5 A CONTINUOUS COLLECTOR CURRENT
- SOT-223 PLASTIC PACKAGE FOR SURFACE MOUNTING CIRCUITS
- AVAILABLE IN TAPE & REEL PACKING
- IN COMPLIANCE WITH THE 2002/93/EC EUROPEAN DIRECTIVE

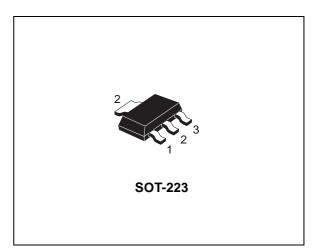
### Applications

- POWER MANAGEMENT IN PORTABLE EQUIPMENT
- VOLTAGE REGULATION IN BIAS SUPPLY CIRCUITS
- SWITCHING REGULATOR IN BATTERY CHARGER APPLICATIONS
- HEAVY LOAD DRIVER

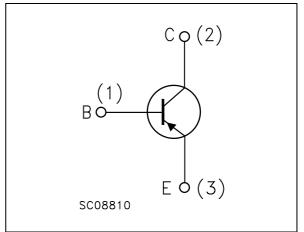
## Description

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

## **Order Codes**



## **Internal Schematic Diagram**



Part Number	Marking	Package	Packing
STN888	N888	SOT-223	Tape & Reel

Symbol	Parameter	Value	Unit
V <sub>CBO</sub>	Collector-Base Voltage (I <sub>E</sub> = 0)	-45	V
V <sub>CEO</sub>	Collector-Emitter Voltage (I <sub>B</sub> = 0)	-30	V
$V_{\text{EBO}}$	Emitter-Base Voltage ( $I_C = 0$ )	-6	V
۱ <sub>C</sub>	Collector Current	-5	А
I <sub>CM</sub>	Collector Peak Current (t <sub>P</sub> < 5ms)	-10	А
P <sub>TOT</sub>	Total dissipation at $T_c = 25^{\circ}C$	1.6	W
T <sub>stg</sub>	Storage Temperature	-65 to 150	°C
Τ <sub>J</sub>	Max. Operating Junction Temperature	150	°C

#### Table 1. Absolute Maximum Rating

### Table 2. Thermal Data

Symbol	Parameter	Value	Unit
R <sub>thj-amb</sub>	Thermal Resistance Junction-Ambient Max	78	°C/W



## 2 Electrical Characteristics

 $(T_{CASE} = 25^{\circ}C; unless otherwise specified)$ 

Symbol	Parameter	Test Cond	itions	Min.	Тур.	Max.	Unit
I <sub>CBO</sub>	Collector Cut-off Current (I <sub>E</sub> = 0)	V <sub>CB</sub> = -30V V <sub>CB</sub> = -30V	T <sub>C</sub> = 100°C			-10 -100	μΑ μΑ
I <sub>EBO</sub>	Emitter Cut-off Current $(I_C = 0)$	V <sub>EB</sub> = -6V				-10	μA
V <sub>(BR)CEO</sub> Note: 1	Collector-Emitter Breakdown Voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = -10mA		-30			V
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage (I <sub>E</sub> = 0)	Ι <sub>C</sub> = -100μΑ		-45			V
V <sub>(BR)EBO</sub>	Emitter-Base Breakdown Voltage (I <sub>C</sub> = 0)	I <sub>E</sub> = -100μA		-6			V
V <sub>CE(sat)</sub> Note: 1	Collector-Emitter Saturation Voltage	$I_C = -500 \text{mA}$ $I_C = -2 \text{A}$ $I_C = -5 \text{A}$ $I_C = -6 \text{A}$	$I_B = -5mA$ $I_B = -50mA$ $I_B = -250mA$ $I_B = -250mA$		-0.7	-0.15 -0.35 -0.70	V V V V
		I <sub>C</sub> = -8A I <sub>C</sub> = -10A	I <sub>B</sub> = -400mA I <sub>B</sub> = -500mA		-1.2		V
V <sub>BE(sat)</sub> Note: 1	Base-Emitter Saturation Voltage	I <sub>C</sub> = -2A I <sub>C</sub> = -6A	I <sub>B</sub> = -50mA I <sub>B</sub> = -250mA		-1.2	-1.1	V V
	DC Current Gain	I <sub>C</sub> = -10mA	$V_{CE} = -1 V$	120	200		
		I <sub>C</sub> = -500mA	$V_{CE} = -1 V$	100	200	300	
h <sub>FE</sub> [ Note: 1		I <sub>C</sub> = -5 A	$V_{CE} = -1 V$	70	100		
		$I_{C} = -5 \text{ A}  V_{CE} = -1$	V $t_j = 100^{\circ}C$		100		
		I <sub>C</sub> = -8 A	V <sub>CE</sub> = -1 V		55		
		I <sub>C</sub> = -10 A	V <sub>CE</sub> = -1 V		35		
t <sub>d</sub>	INDUCTIVE LOAD Delay Time	I <sub>C</sub> = -3A	V <sub>CC</sub> = -20V		180	220	ns
t <sub>r</sub> t <sub>s</sub> t <sub>f</sub>	Rise Time Storage Time Fall Time	I <sub>B1</sub> = -I <sub>B2</sub> =-60mA (see Figure 7)			160 250 80	210 300 100	ns ns ns

#### Table 3. Electrical Characteristics

Note: 1 Pulsed duration =  $300 \ \mu$ s, duty cycle  $\leq 1.5\%$ .



DG11690

 $I_{c}(A)$ 

## 2.1 Typical Characteristics

#### Figure 1. DC Current Gain

Figure 2. DC Current Gain

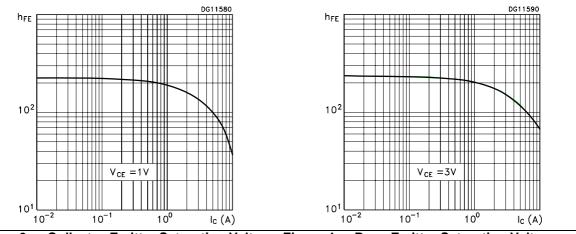


Figure 3. Collector-Emitter Saturation Voltage Figure 4. Base-Emitter Saturation Voltage

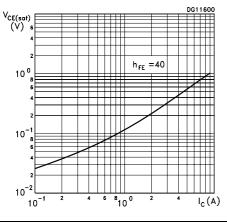
V<sub>BE(sat)</sub> (V)

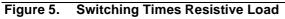
1.5

1.4

1.3 1.2 1.1 1.0

0.9 0.8 0.7 0.6 0.5 10<sup>-;</sup>





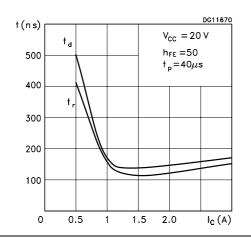
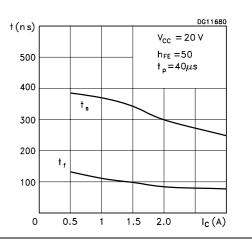


Figure 6. Switching Times Resistive Load

10-1

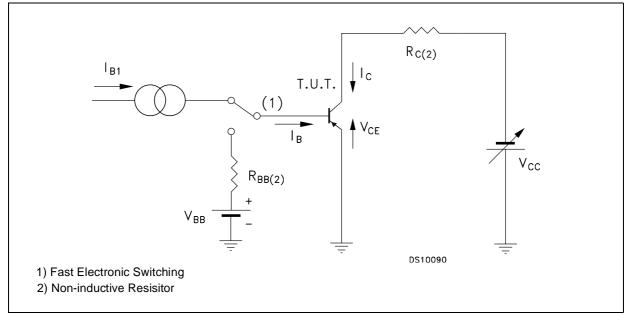
10<sup>0</sup>

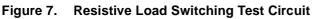


 $h_{FE} = 40$ 



## 3 Test Circuits







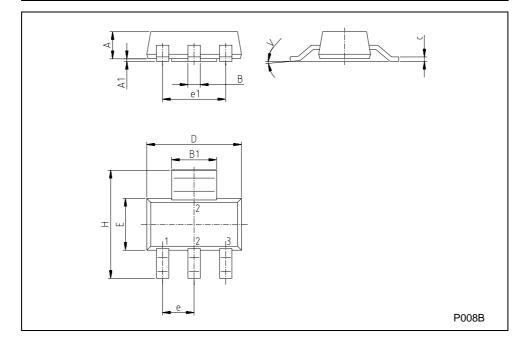
## 4 Package Mechanical Data

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



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 <sup>°</sup>			10 <sup>°</sup>	
A1		0.02					

### SOT-223 MECHANICAL DATA





# 5 Revision History

Date	Revision	Changes
03-Aug-2005	1	Initial release.



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