



## STN888

# HIGH CURRENT, HIGH PERFORMANCE, LOW VOLTAGE PNP TRANSISTOR

### Features

- VERY LOW COLLECTOR TO EMITTER SATURATION VOLTAGE
- D.C. CURRENT GAIN,  $h_{FE} > 100$
- 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

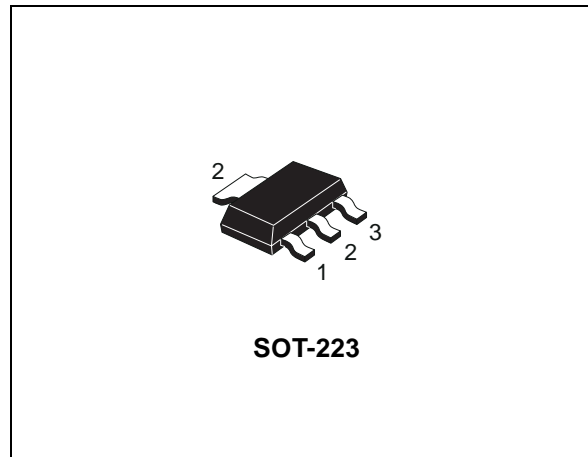
- POWER MANAGEMENT IN PORTABLE EQUIPMENT
- VOLTAGE REGULATION IN BIAS SUPPLY CIRCUITS
- SWITCHING REGULATOR IN BATTERY CHARGER APPLICATIONS
- HEAVY LOAD DRIVER

### Description

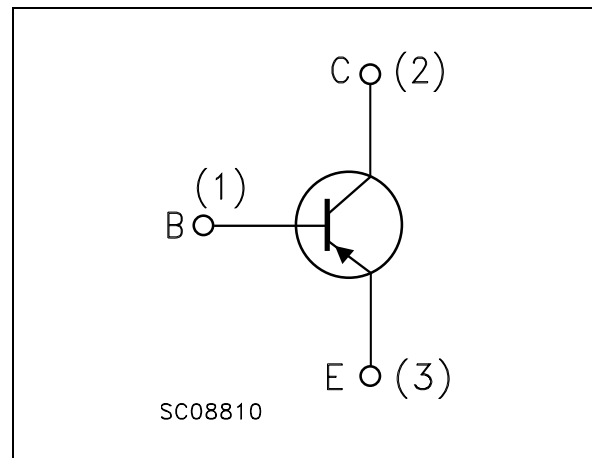
The device is manufactured in low voltage PNP Planar Technology by using a "Base Island" layout. The resulting transistor shows exceptional high gain performance coupled with very low saturation voltage.

### Order Codes

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



### Internal Schematic Diagram



# 1 Absolute Maximum Ratings

**Table 1. Absolute Maximum Rating**

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage ( $I_E = 0$ )	-45	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	-30	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	-6	V
$I_C$	Collector Current	-5	A
$I_{CM}$	Collector Peak Current ( $t_P < 5\text{ms}$ )	-10	A
$P_{TOT}$	Total dissipation at $T_C = 25^\circ\text{C}$	1.6	W
$T_{stg}$	Storage Temperature	-65 to 150	$^\circ\text{C}$
$T_J$	Max. Operating Junction Temperature	150	$^\circ\text{C}$

**Table 2. Thermal Data**

Symbol	Parameter	Value	Unit
$R_{thj-amb}$	Thermal Resistance Junction-Ambient	Max 78	$^\circ\text{C}/\text{W}$

## 2 Electrical Characteristics

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

**Table 3. Electrical Characteristics**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector Cut-off Current ( $I_E = 0$ )	$V_{CB} = -30V$			-10	$\mu A$
		$V_{CB} = -30V$ $T_C = 100^{\circ}C$			-100	$\mu A$
$I_{EBO}$	Emitter Cut-off Current ( $I_C = 0$ )	$V_{EB} = -6V$			-10	$\mu A$
$V_{(BR)CEO}$ <i>Note: 1</i>	Collector-Emitter Breakdown Voltage ( $I_B = 0$ )	$I_C = -10mA$	-30			V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ( $I_E = 0$ )	$I_C = -100\mu A$	-45			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ( $I_C = 0$ )	$I_E = -100\mu A$	-6			V
$V_{CE(sat)}$ <i>Note: 1</i>	Collector-Emitter Saturation Voltage	$I_C = -500mA$ $I_B = -5mA$			-0.15	V
		$I_C = -2A$ $I_B = -50mA$			-0.35	V
		$I_C = -5A$ $I_B = -250mA$			-0.70	V
		$I_C = -6A$ $I_B = -250mA$		-0.7		V
		$I_C = -8A$ $I_B = -400mA$		-1.0		V
		$I_C = -10A$ $I_B = -500mA$		-1.2		V
$V_{BE(sat)}$ <i>Note: 1</i>	Base-Emitter Saturation Voltage	$I_C = -2A$ $I_B = -50mA$			-1.1	V
		$I_C = -6A$ $I_B = -250mA$		-1.2		V
$h_{FE}$ <i>Note: 1</i>	DC Current Gain	$I_C = -10mA$ $V_{CE} = -1V$	120	200		
		$I_C = -500mA$ $V_{CE} = -1V$	100	200	300	
		$I_C = -5A$ $V_{CE} = -1V$	70	100		
		$I_C = -5A$ $V_{CE} = -1V$ $t_j = 100^{\circ}C$		100		
		$I_C = -8A$ $V_{CE} = -1V$		55		
		$I_C = -10A$ $V_{CE} = -1V$		35		
$t_d$ $t_r$ $t_s$ $t_f$	INDUCTIVE LOAD Delay Time Rise Time Storage Time Fall Time	$I_C = -3A$ $V_{CC} = -20V$ $I_{B1} = -I_{B2} = -60mA$ (see Figure 7)				
				180	220	ns
				160	210	ns
				250	300	ns
			80	100	ns	

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

## 2.1 Typical Characteristics

Figure 1. DC Current Gain

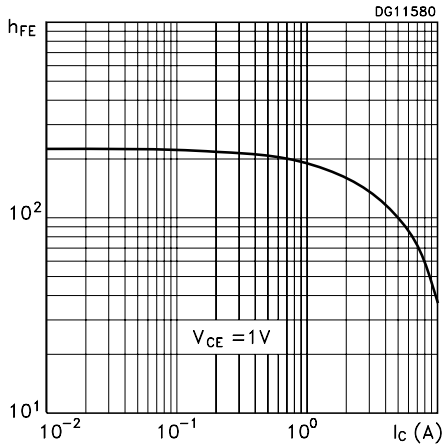


Figure 2. DC Current Gain

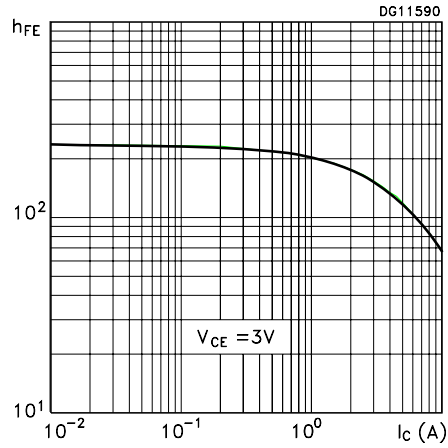


Figure 3. Collector-Emitter Saturation Voltage Figure 4. Base-Emitter Saturation Voltage

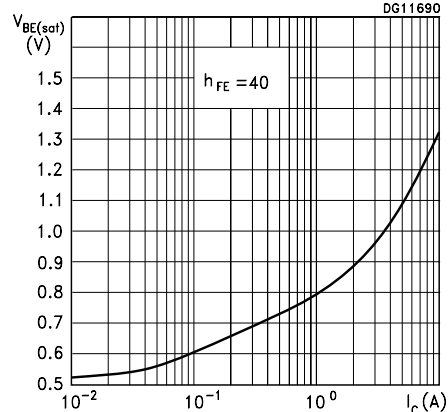
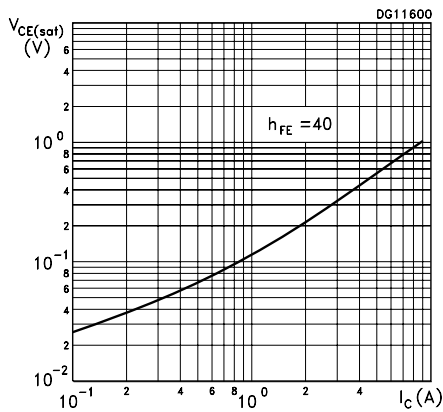


Figure 5. Switching Times Resistive Load

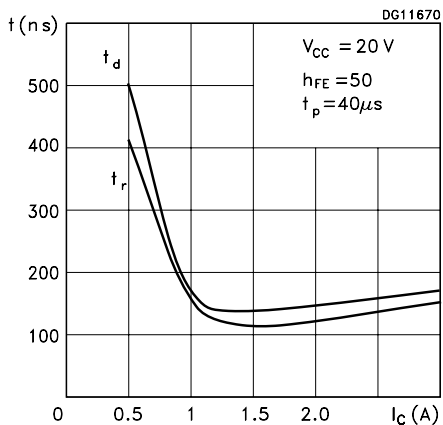
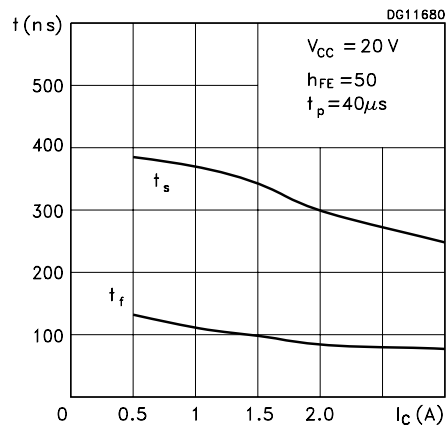
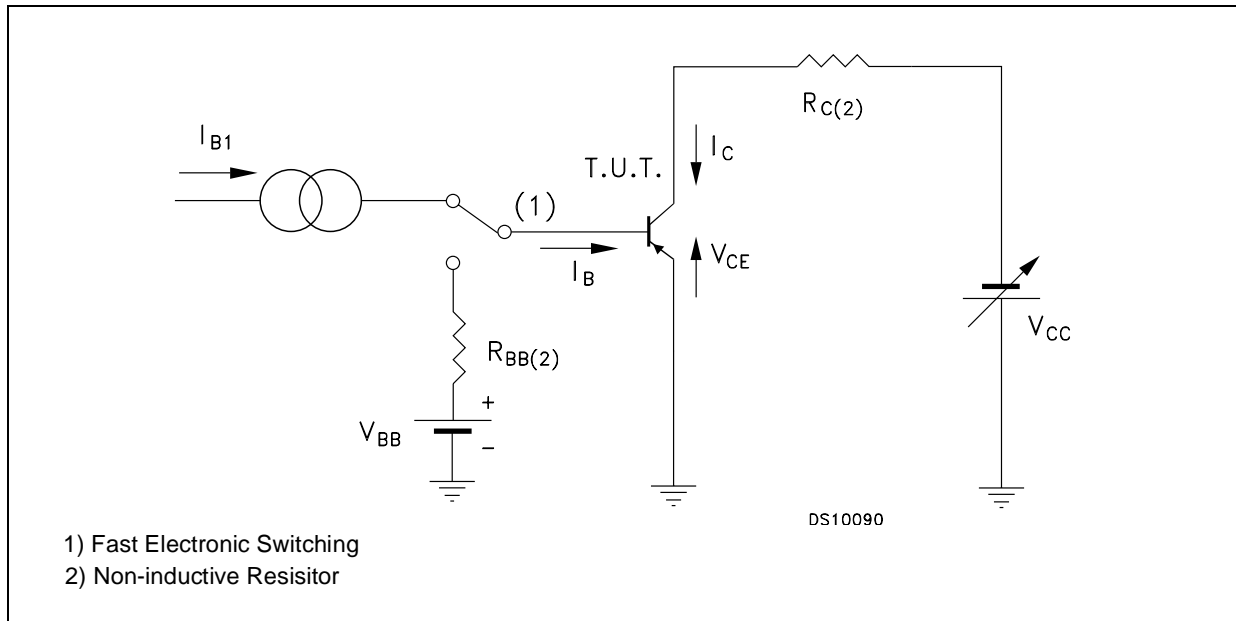


Figure 6. Switching Times Resistive Load



### 3 Test Circuits

Figure 7. Resistive Load Switching Test Circuit

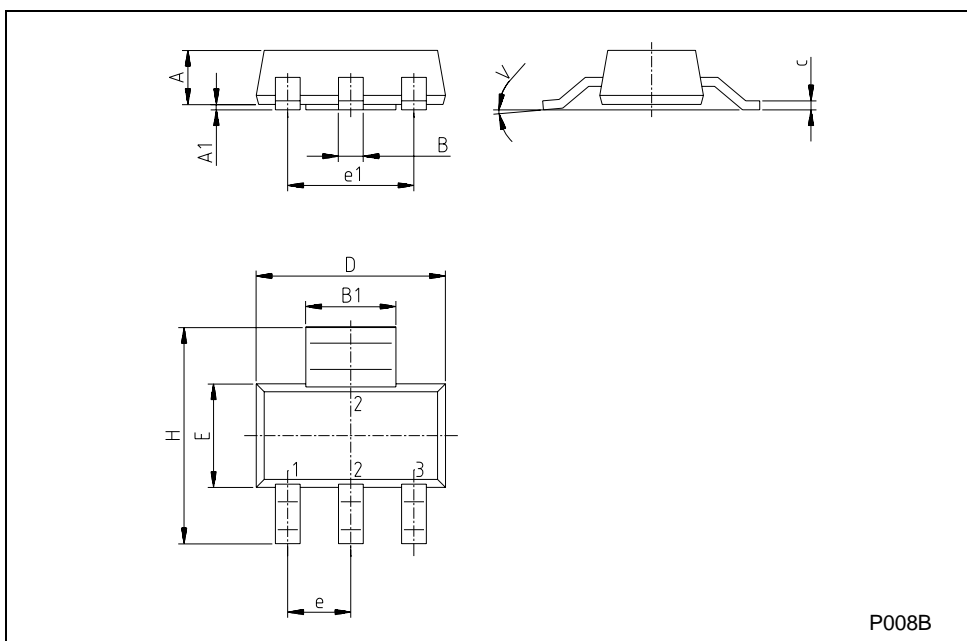


## 4 Package Mechanical Data

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](http://www.st.com)

**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				



## 5 Revision History

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



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