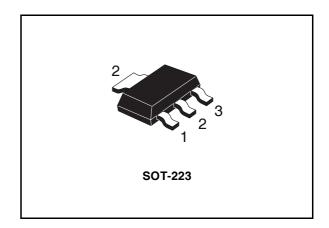


STN790A

Medium Current, High Performance, Low Voltage PNP Transistor

General features

- Very low Collector to Emitter saturation voltage
- D.C. Current gain, h_{FE} >100
- 3A continuous collector current
- 40V breakdown voltage (V_{(BR)CER})
- SOT-223 plastic package for surface mounting circuits
- Available in tape & reel packing
- In compliance with the 2002/93/EC European Directive



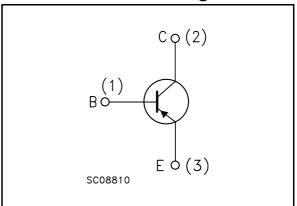
Description

The device in 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.

Applications

- Power management in portable equipment
- Voltage regulation in bias supply circuits
- Switching regulator in battery charger applications
- Heavy load driver

Internal schematic diagram



Order codes

Part I	Part Number Marking		Package	Packing		
STI	N790A	N790A	SOT-223	Tape & reel		

Contents

1	Elect	rical ratings	3
2	Elec	trical characteristics	7
	2.1	Electrical characteristics (curves)	ō
	2.2	Test circuits	-
3	Pack	age mechanical data	7
4	Revi	sion history	2

STN790A Electrical ratings

1 Electrical ratings

Table 1. Absolute maximum rating

Symbol	Parameter	Value	Unit
V _{CBO}	Collector-base voltage (I _E = 0)	-40	V
V _{CER}	Collector-emitter voltage ($R_{BE} = 47\Omega$)	-40	V
V _{CEO}	Collector-emitter voltage (I _B = 0)	-30	V
V _{EBO}	Emitter-base voltage ($I_C = 0$)	-5	V
I _C	Collector current	-3	Α
I _{CM}	Collector peak current (t _P < 5ms)	-6	Α
P _{tot}	Total dissipation at T _c = 25°C	1.6	W
T _{stg}	Storage temperature	-65 to 150	°C
TJ	Max. operating junction temperature	150	°C

Table 2. Thermal data

S	Symbol	Parameter	Value	Unit
F	R _{thj-amb}	Thermal resistance junction-ambient (1) max	78	°C/W

^{1.} Device mounted on PCB area of 1 cm².

Electrical characteristics STN790A

2 Electrical characteristics

 $(T_{case} = 25^{\circ}C \text{ unless otherwise specified})$

Table 3. Electrical characteristics

Symbol	Parameter Test Con		nditions	Min.	Тур.	Max.	Unit
I _{CBO}	Collector cut-off current (I _E =0)	$V_{CB} = -30V$ $V_{CB} = -30V$;	T _C = 100°C			-10 100	μ Α μ Α
I _{EBO}	Emitter cut-off current (I _C =0)	V _{EB} = -4V				-10	μΑ
V _{(BR)CEO} (2)	Collector-emitter breakdown voltage (I _B =0)	I _C = -10mA		-30			V
V _{(BR)CER} (2)	Collector-emitter breakdown voltage (R _{BE} = 47Ω)	I _C = -10mA		-40			V
V _{(BR)CBO}	Collector-base breakdown voltage (I _E =0)	I _C = -100μA		-40			V
V _{(BR)EBO}	Emitter-base breakdown voltage (I _C =0)	I _E = -100μA		-5			V
V _{CE(sat)} (2)	Collector-emitter saturation voltage	$I_{C} = -0.5A$ $I_{C} = -1.2A$ $I_{C} = -2A$ $I_{C} = -3A$	$I_B = -20 \text{mA}$			-0.15 -0.25 -0.5 -0.7	V V V
		$I_C = -3A$ $T_J = 100^{\circ}C$	I _B = -100mA			-0.9	V
V _{BE(sat)} (2)	Base-emitter saturation voltage	I _C = -1A	I _B = -10mA		-0.8	-1	V
V _{BE(on)} (2)	Base-emitter on voltage	I _C = -1A	V _{CE} = -2V		-0.8	-1	٧
h _{FE} ⁽²⁾	DC current gain	$I_{C} = -10\text{mA}$ $I_{C} = -500\text{mA}$ $I_{C} = -1\text{A}$ $I_{C} = -2\text{A}$ $I_{C} = -3\text{A}$	$V_{CE} = -2V$ $V_{CE} = -2V$	100 100 100 100 90	200 200 160 130	400 400	

Table 3. Electrical characteristics

Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
f _t	Transition frequency	$I_C = -50 \text{mA}$ $V_{CE} = -5V$ f = 50 MHz		100		MHz
t _d t _r t _s	Resistive load Delay time Rise time Storage time Fall time	$I_{C} = -3A$ $V_{CC} = -20V$ $I_{B1} = -I_{B2} = -60 \text{mA}$ (see figure 7)		180 160 250 80	220 210 300 100	ns ns ns

Note (2) Pulsed duration = 300 μ s, duty cycle \leq 1.5%

2.1 Electrical characteristics (curves)

Figure 1. DC current gain

Figure 2. DC current gain

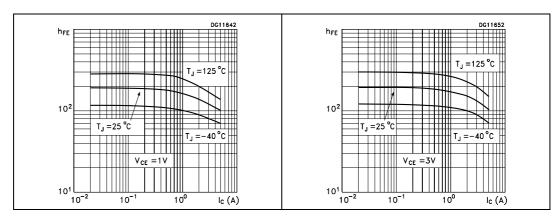
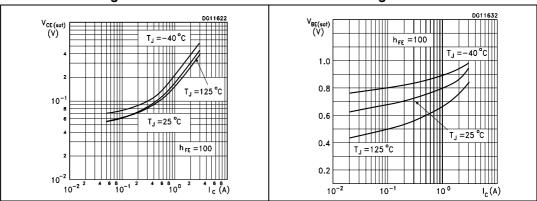
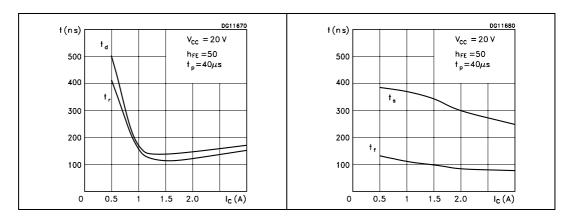


Figure 3. Collector-emitter saturation Figure 4. Base-emitter saturation voltage voltage



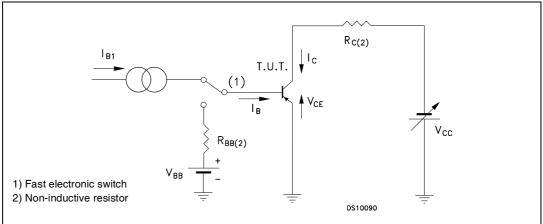
Electrical characteristics STN790A

Figure 5. Switching time resistive load Figure 6. Switching time resistive load



2.2 Test circuits

Figure 7. Resistive load switching test circuit



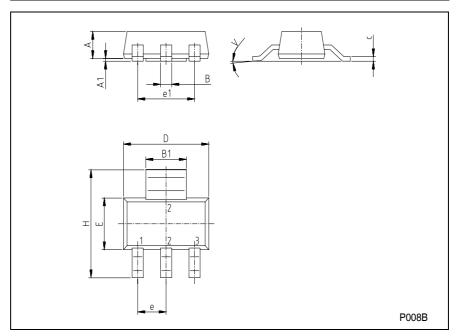
3 Package mechanical data

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

577

SOT-223 MECHANICAL DATA

DIM.		mm		inch			
Diw.	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°			10°	
A1		0.02					



STN790A Revision history

4 Revision history

Table 4. Revision history

Date	Revision	Changes		
24-Mar-2004	1	Initial release.		
05-Sep-2005	2	New template		
24-Mar-2006	3	Updated to new template.		

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57