



STN790A

MEDIUM CURRENT, HIGH PERFORMANCE, LOW VOLTAGE PNP TRANSISTOR

Type	Marking
STN790A	N790A

- VERY LOW COLLECTOR TO EMITTER SATURATION VOLTAGE
- DC CURRENT GAIN, $h_{FE} > 100$
- 3 A CONTINUOUS COLLECTOR CURRENT
- 60 V BREAKDOWN VOLTAGE ($V_{(BR)CER}$)
- SOT-223 PLASTIC PACKAGE FOR SURFACE MOUNTING CIRCUITS
- AVAILABLE IN TAPE AND REEL PACKING

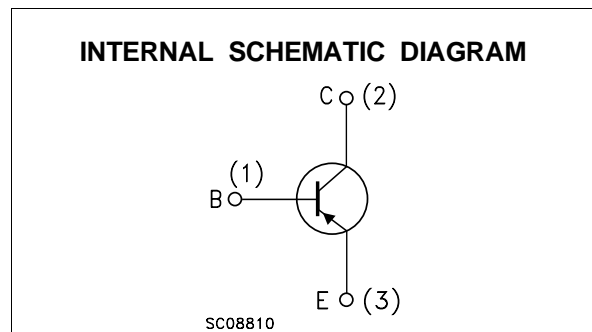
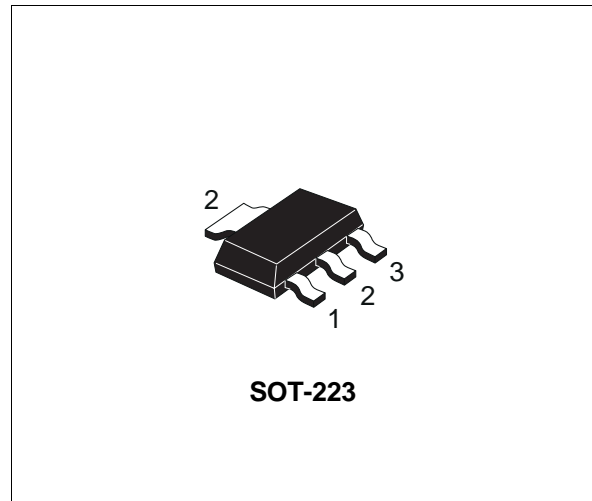
APPLICATIONS

- SWITCHING REGULATOR IN BATTERY CHARGER APPLICATIONS
- SUITABLE FOR AUTOMOTIVE APPLICATIONS ($V_{(BR)CER} > 60V$)
- VOLTAGE REGULATION IN BIAS SUPPLY CIRCUITS
- 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.



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage ($I_E = 0$)	-60	V
V_{CER}	Collector-Emitter Voltage ($R_{BE} = 47\Omega$)	-60	V
V_{EBO}	Emitter-Base Voltage ($I_C = 0$)	-5	V
I_C	Collector Current	-3	A
I_{CM}	Collector Peak Current ($t_p < 5$ ms)	-6	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

STN790A

THERMAL DATA

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

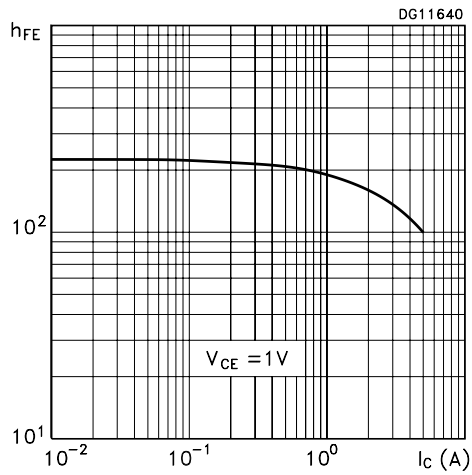
• Device mounted on a PCB area of 1 cm^2 .

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

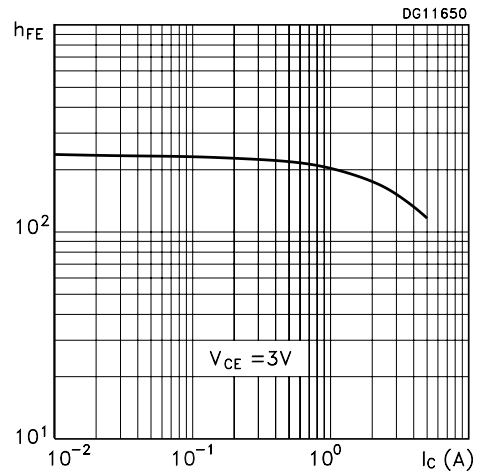
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current ($I_E = 0$)	$V_{CB} = -30\text{ V}$ $V_{CB} = -30\text{ V}$ $T_j = 100\text{ }^{\circ}\text{C}$			-0.1 -10	μA μA
I_{EBO}	Emitter Cut-off Current ($I_C = 0$)	$V_{EB} = -4\text{ V}$			-1	μA
$V_{(BR)CER*}$	Collector-Emitter Breakdown Voltage ($R_{BE} = 47\Omega$)	$I_C = -10\text{ mA}$	-60			V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ($I_E = 0$)	$I_C = -100\text{ }\mu\text{A}$	-60			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ($I_C = 0$)	$I_E = -100\text{ }\mu\text{A}$	-5			V
$V_{CE(sat)*}$	Collector-Emitter Saturation Voltage	$I_C = -0.5\text{ A}$ $I_B = -5\text{ mA}$ $I_C = -1\text{ A}$ $I_B = -10\text{ mA}$ $I_C = -2\text{ A}$ $I_B = -20\text{ mA}$ $I_C = -3\text{ A}$ $I_B = -30\text{ mA}$ $I_C = -3\text{ A}$ $I_B = -30\text{ mA}$ $T_j = 100\text{ }^{\circ}\text{C}$			-0.15 -0.3 -0.5 -0.7 -0.9	V V V V V
$V_{BE(sat)*}$	Base-Emitter Saturation Voltage	$I_C = -1\text{ A}$ $I_B = -10\text{ mA}$		-0.8	-1.0	V
$V_{BE(on)}$	Base-Emitter Turn-On Voltage	$I_C = -1\text{ A}$ $V_{CE} = -2\text{ V}$		-0.8	-1	V
h_{FE*}	DC Current Gain	$I_C = -10\text{ mA}$ $V_{CE} = -2\text{ V}$ $I_C = -500\text{ mA}$ $V_{CE} = -2\text{ V}$ $I_C = -1\text{ A}$ $V_{CE} = -2\text{ V}$ $I_C = -2\text{ A}$ $V_{CE} = -1\text{ V}$ $I_C = -3\text{ A}$ $V_{CE} = -1\text{ V}$	100 100 100 100 90	200 200	300 300	
f_T	Transition Frequency	$I_C = -50\text{ mA}$ $V_{CE} = -5\text{ V}$ $f = 50\text{ MHz}$	100			MHz
t_d	RESISTIVE LOAD Delay Time	$I_C = -3\text{ A}$ $I_{B1} = -I_{B2} = -60\text{ mA}$ $V_{CC} = -20\text{ V}$ (see figure 1)		180	220	ns
t_r	RiseTime			160	210	ns
t_s	StorageTime			250	300	ns
t_f	Fall Time			80	100	ns

* Pulsed: Pulse duration = $300\text{ }\mu\text{s}$, duty cycle $\leq 1.5\%$

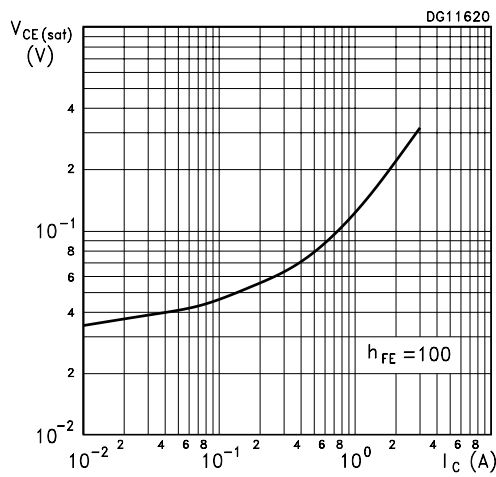
DC Current Gain



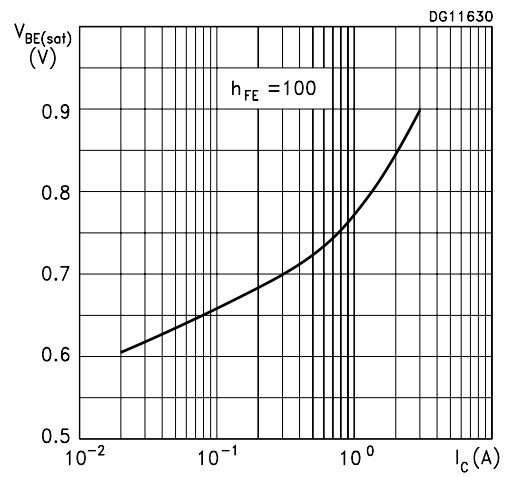
DC Current Gain



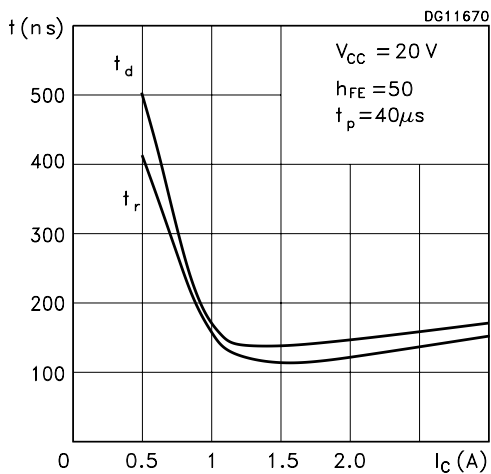
Collector-Emitter Saturation Voltage



Base-Emitter Saturation Voltage



Switching Times Resistive Load



Switching Times Resistive Load

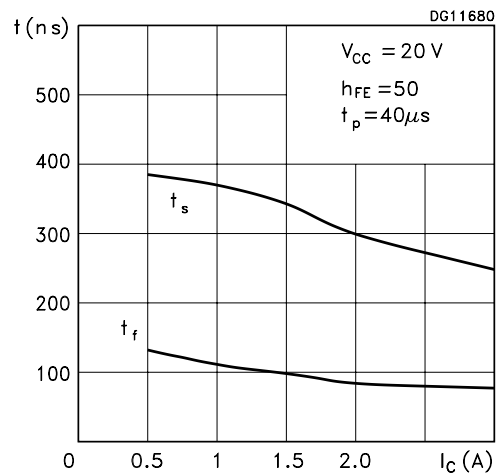
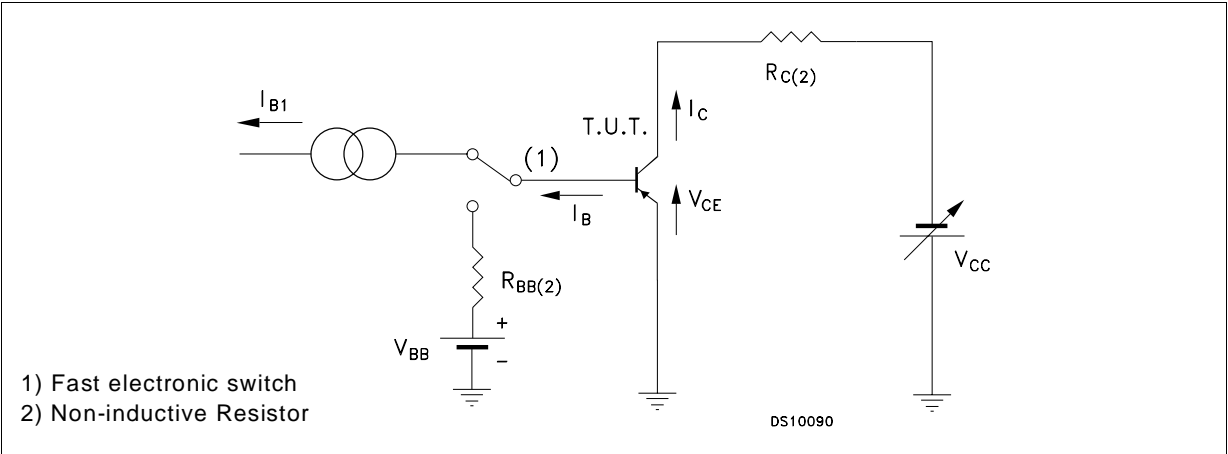
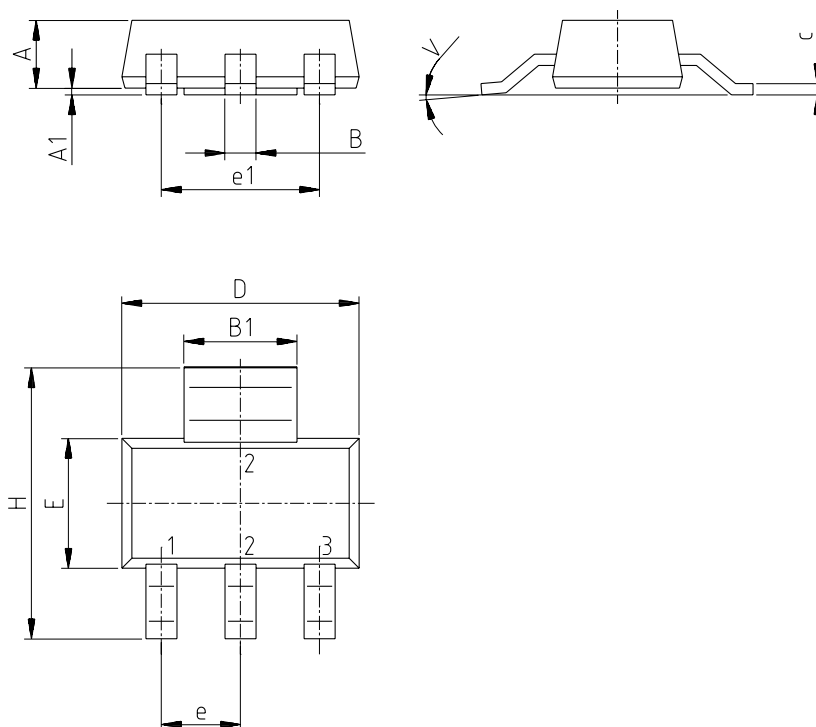


Figure 1: Resistive Load Switching Test Circuit.



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

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specification mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a trademark of STMicroelectronics

© 2003 STMicroelectronics – Printed in Italy – All Rights Reserved

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>