



# 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

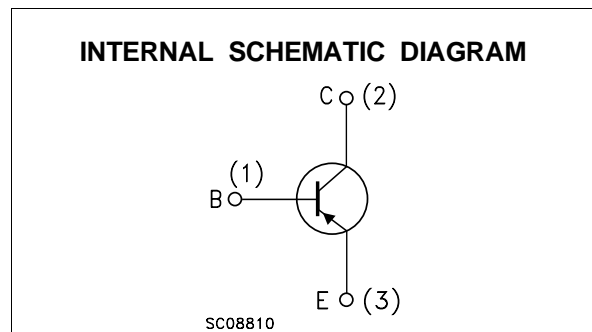
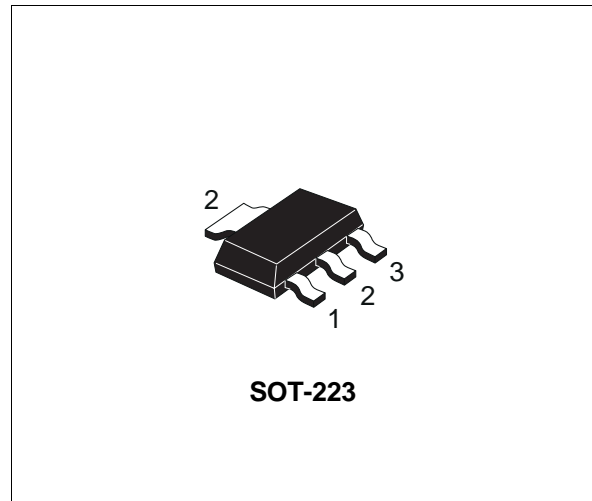
### APPLICATIONS

- 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

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## THERMAL DATA

$R_{thj-amb}$	Thermal Resistance Junction-Ambient	Max	78	$^{\circ}\text{C}/\text{W}$
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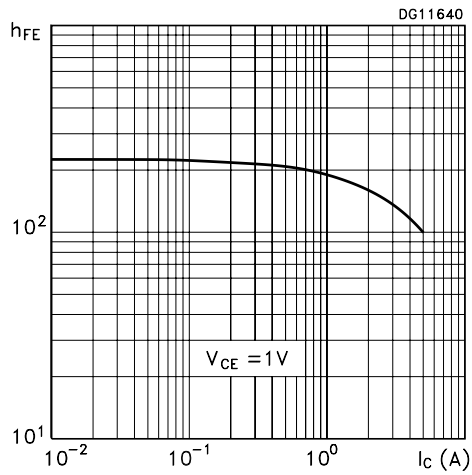
• Device mounted on a PCB area of  $1\text{ cm}^2$ .

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

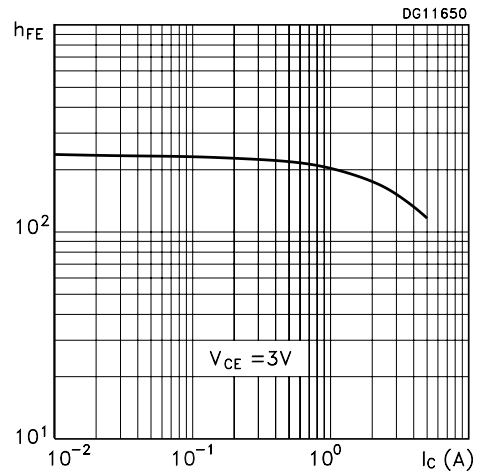
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector Cut-off Current ( $I_E = 0$ )	$V_{CB} = -30\text{ V}$ $V_{CB} = -30\text{ V}$ $T_j = 100\text{ }^{\circ}\text{C}$			-0.1 -10	$\mu\text{A}$ $\mu\text{A}$
$I_{EBO}$	Emitter Cut-off Current ( $I_C = 0$ )	$V_{EB} = -4\text{ V}$			-1	$\mu\text{A}$
$V_{(BR)CER*}$	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  $\leq 1.5\%$

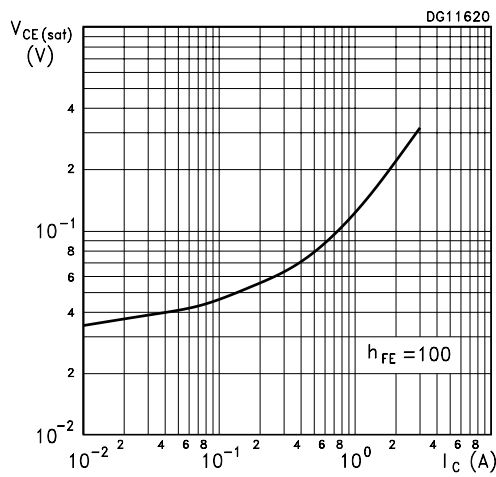
DC Current Gain



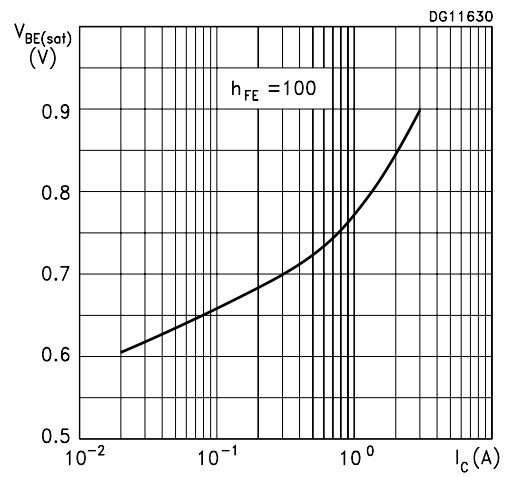
DC Current Gain



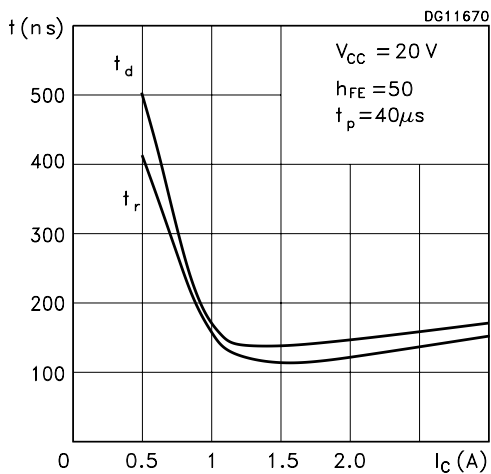
Collector-Emitter Saturation Voltage



Base-Emitter Saturation Voltage



Switching Times Resistive Load



Switching Times Resistive Load

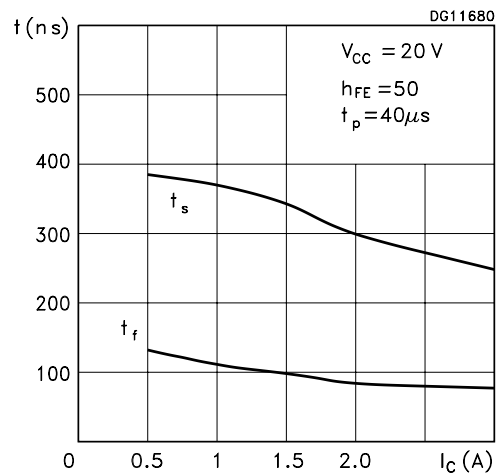
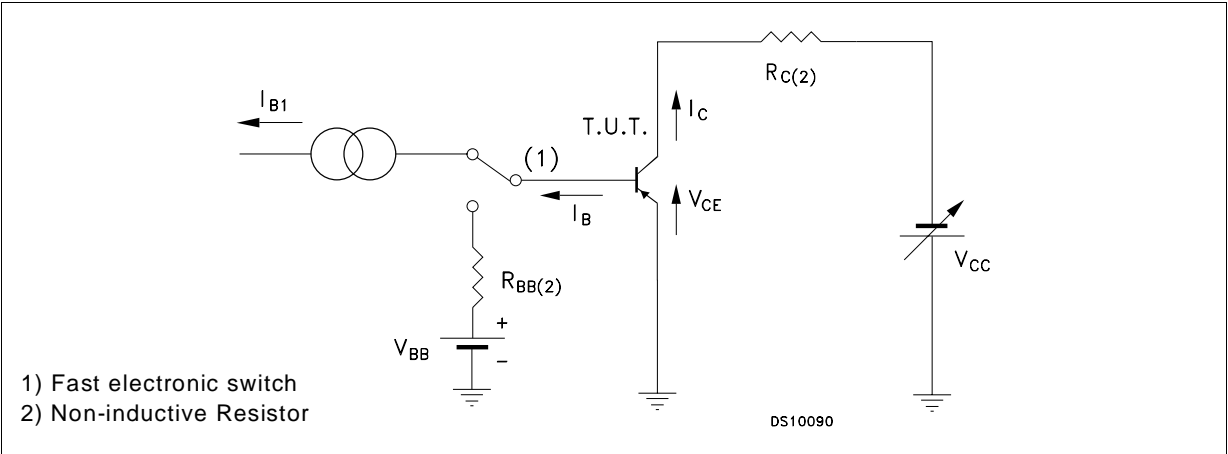
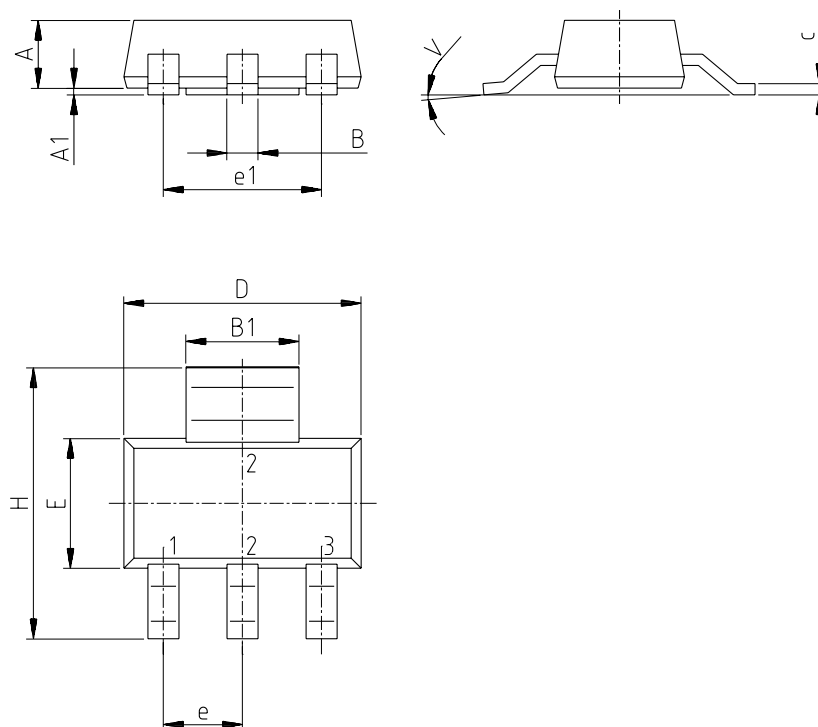


Figure 1: Resistive Load Switching Test Circuit.



## 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				



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