



## STX790A

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

Type	Marking
STX790A	X790A

- VERY LOW COLLECTOR TO EMITTER SATURATION VOLTAGE
- DC CURRENT GAIN,  $h_{FE} > 100$
- 3 A CONTINUOUS COLLECTOR CURRENT
- 60 V BREAKDOWN VOLTAGE ( $V_{(BR)CER}$ )
- TO-92 PACKAGE SUITABLE FOR THROUGH-HOLE PCB ASSEMBLY

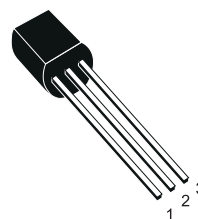
#### APPLICATIONS

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

#### DESCRIPTION

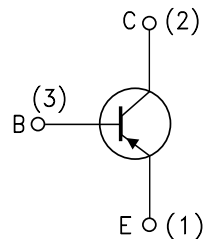
The device is manufactured in low voltage PNP Planar Technology by using a "Base Island" layout.

The resulting Transistor shows exceptional high gain performance coupled with very low saturation voltage.



TO-92

#### INTERNAL SCHEMATIC DIAGRAM



SC12765

#### 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	0.9	W
$T_{stg}$	Storage Temperature	-65 to 150	°C
$T_j$	Max. Operating Junction Temperature	150	°C

## STX790A

### THERMAL DATA

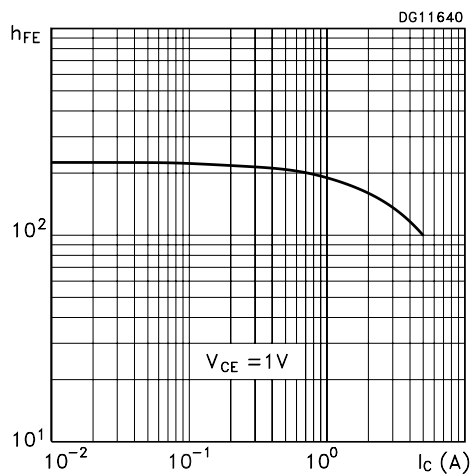
R <sub>thj-case</sub>	Thermal Resistance Junction-Case	Max	44.6	°C/W
R <sub>thj-amb</sub>	Thermal Resistance Junction-Ambient	Max	139	°C/W

### ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

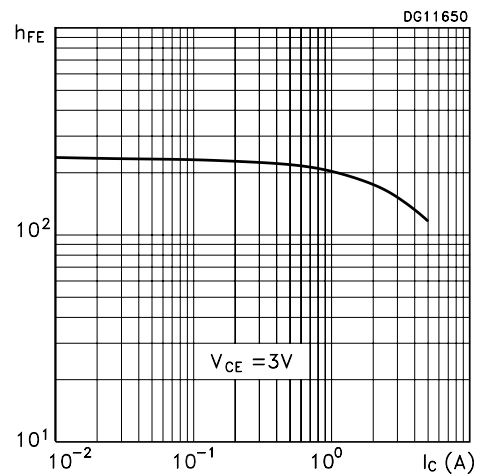
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CBO</sub>	Collector Cut-off Current (I <sub>E</sub> = 0)	V <sub>CB</sub> = -30 V V <sub>CB</sub> = -30 V T <sub>j</sub> = 100 °C			-0.1 -10	μA μA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = -4 V			-1	μA
V <sub>(BR)CER</sub> *	Collector-Emitter Breakdown Voltage (R <sub>BE</sub> = 47Ω)	I <sub>C</sub> = -10 mA	-60			V
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage (I <sub>E</sub> = 0)	I <sub>C</sub> = -100 μA	-60			V
V <sub>(BR)EBO</sub>	Emitter-Base Breakdown Voltage (I <sub>C</sub> = 0)	I <sub>E</sub> = -100 μA	-5			V
V <sub>CE(sat)</sub> *	Collector-Emitter Saturation Voltage	I <sub>C</sub> = -0.5A I <sub>B</sub> = -5mA I <sub>C</sub> = -1A I <sub>B</sub> = -10mA I <sub>C</sub> = -2A I <sub>B</sub> = -20mA I <sub>C</sub> = -3A I <sub>B</sub> = -30mA I <sub>C</sub> = -3A I <sub>B</sub> = -30mA T <sub>j</sub> = 100 °C			-0.15 -0.3 -0.5 -0.7 -0.9	V V V V V
V <sub>BE(sat)</sub> *	Base-Emitter Saturation Voltage	I <sub>C</sub> = -1 A I <sub>B</sub> = -10 mA		-0.8	-1.0	V
V <sub>BE(on)</sub>	Base-Emitter Turn-On Voltage	I <sub>C</sub> = -1 A V <sub>CE</sub> = -2 V		-0.8	-1	V
h <sub>FE</sub> *	DC Current Gain	I <sub>C</sub> = -10 mA V <sub>CE</sub> = -2 V I <sub>C</sub> = -500 mA V <sub>CE</sub> = -2 V I <sub>C</sub> = -1 A V <sub>CE</sub> = -2 V I <sub>C</sub> = -2 A V <sub>CE</sub> = -1 V I <sub>C</sub> = -3 A V <sub>CE</sub> = -1V	100 100 100 100 90	200 200 160 130	300 300	
f <sub>T</sub>	Transition Frequency	I <sub>C</sub> = -50 mA V <sub>CE</sub> = -5V f = 50MHz	100			MHz
t <sub>d</sub> t <sub>r</sub> t <sub>s</sub> t <sub>f</sub>	RESISTIVE LOAD Delay Time RiseTime StorageTime Fall Time	I <sub>C</sub> = -3 A I <sub>B1</sub> = - I <sub>B2</sub> = -60 mA V <sub>CC</sub> = -20 V (see figure 1)		180 160 250 80	220 210 300 100	ns ns ns ns

\* Pulsed: Pulse duration = 300 μs, duty cycle ≤ 1.5 %

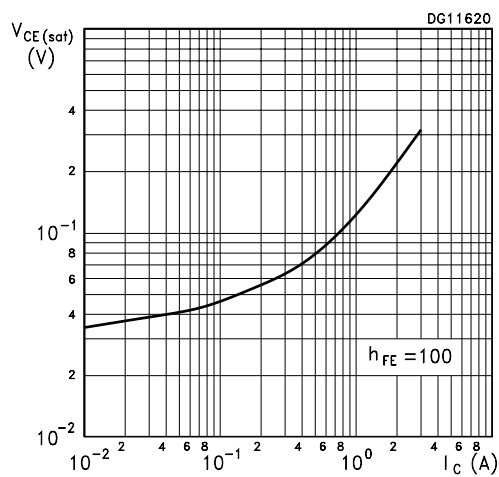
DC Current Gain



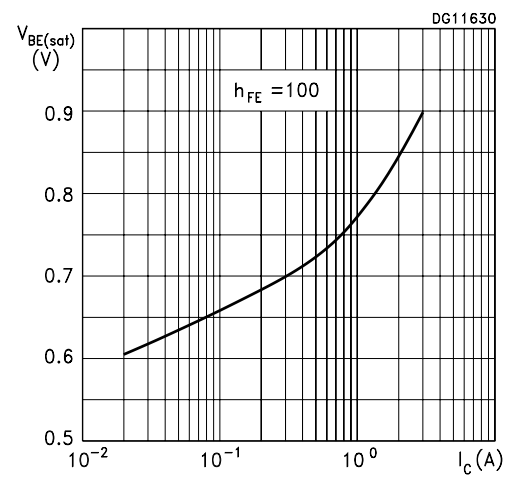
DC Current Gain



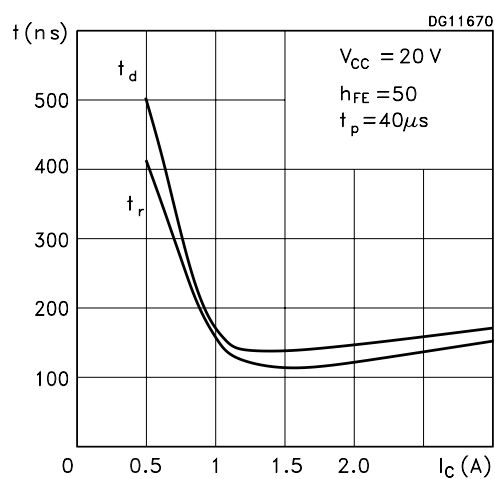
Collector-Emitter Saturation Voltage



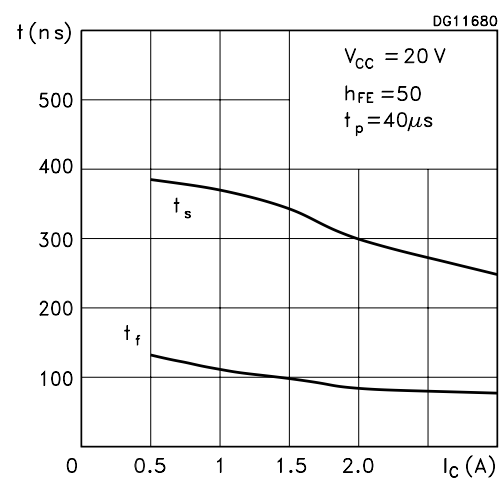
Base-Emitter Saturation Voltage

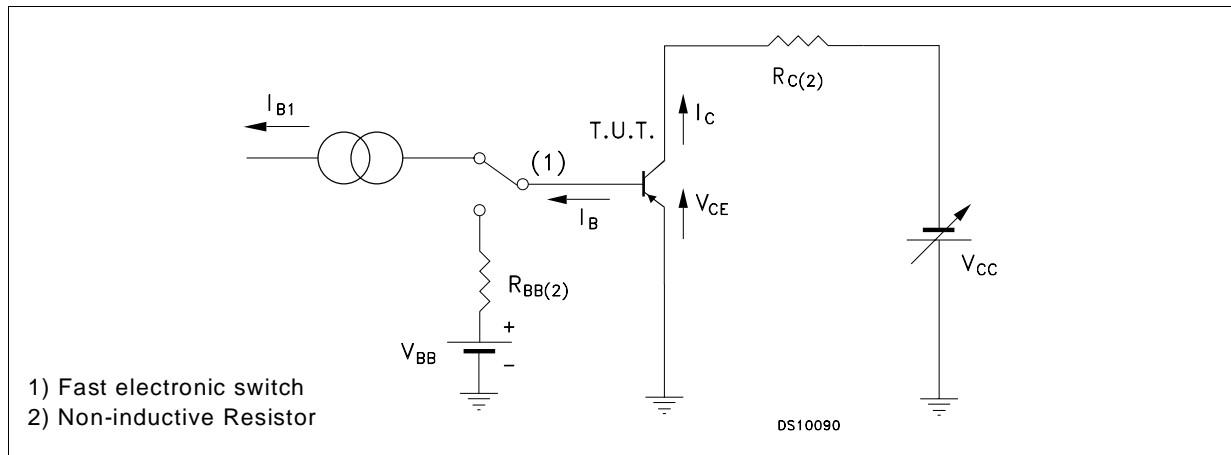


Switching Times Resistive Load



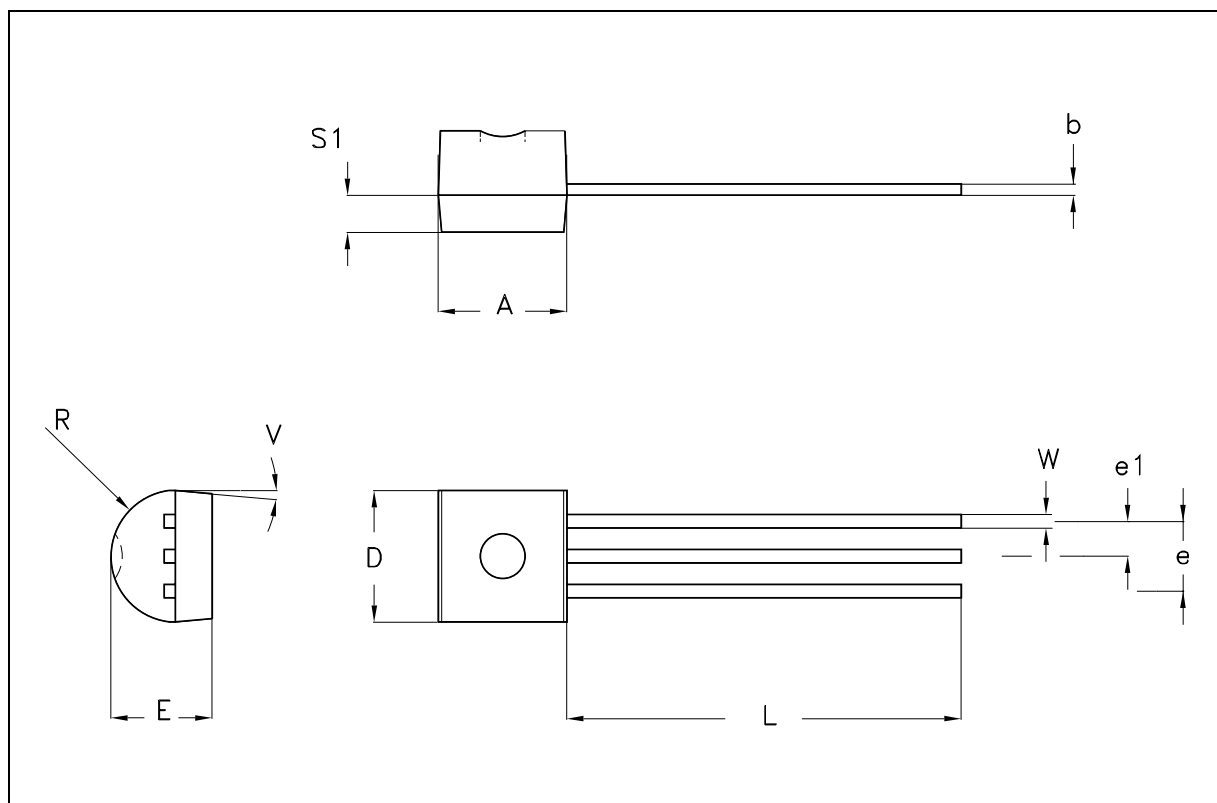
Switching Times Resistive Load



**Figure 1:** Resistive Load Switching Test Circuit.

## TO-92 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.32		4.95	0.170		0.195
b	0.36		0.51	0.014		0.020
D	4.45		4.95	0.175		0.194
E	3.30		3.94	0.130		0.155
e	2.41		2.67	0.095		0.105
e1	1.14		1.40	0.045		0.055
L	12.70		15.49	0.500		0.609
R	2.16		2.41	0.085		0.094
S1	1.14		1.52	0.045		0.059
W	0.41		0.56	0.016		0.022
V	4 degree		6 degree	4 degree		6 degree



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