



# STD790A

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

Type	Marking
STD790A	D790A

- VERY LOW COLLECTOR TO EMITTER SATURATION VOLTAGE
- DC CURRENT GAIN,  $h_{FE} > 100$
- 3 A CONTINUOUS COLLECTOR CURRENT
- 60 V BREAKDOWN VOLTAGE ( $V_{(BR)CER}$ )
- SURFACE MOUNTING DPAK (TO-252) POWER PACKAGE IN TAPE & REEL (Suffix "T4")

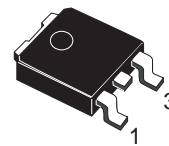
### APPLICATIONS

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

### DESCRIPTION

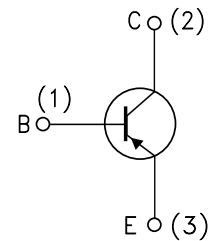
The device is manufactured in low voltage PNP Planar Technology by using a "Base Island" layout.

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



**DPAK  
(TO-252)**  
(Suffix "T4")

### INTERNAL SCHEMATIC DIAGRAM



SC08810

### 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 $T_C = 25$ °C	15	W
$T_{stg}$	Storage Temperature	-65 to 150	°C
$T_j$	Max. Operating Junction Temperature	150	°C

## STD790A

### THERMAL DATA

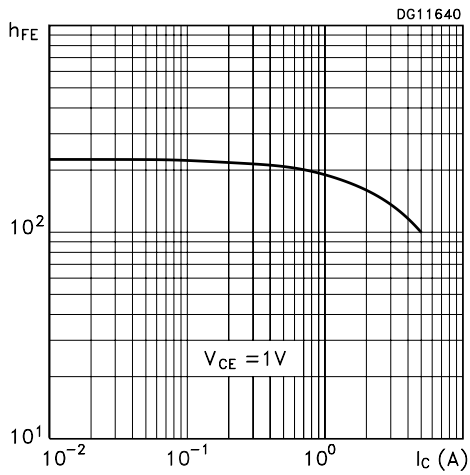
$R_{thj-case}$	Thermal Resistance Junction-Case	Max	8.33	$^{\circ}C/W$
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### ELECTRICAL CHARACTERISTICS ( $T_{case} = 25^{\circ}C$ unless otherwise specified)

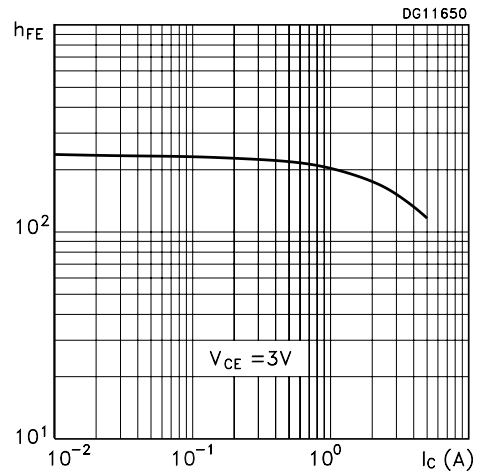
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector Cut-off Current ( $I_E = 0$ )	$V_{CB} = -30 V$ $V_{CB} = -30 V$ $T_j = 100^{\circ}C$			-0.1 -10	$\mu A$ $\mu A$
$I_{EBO}$	Emitter Cut-off Current ( $I_C = 0$ )	$V_{EB} = -4 V$			-1	$\mu A$
$V_{(BR)CER}^*$	Collector-Emitter Breakdown Voltage ( $R_{BE} = 47\Omega$ )	$I_C = -10 mA$	-60			V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ( $I_E = 0$ )	$I_C = -100 \mu A$	-60			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ( $I_C = 0$ )	$I_E = -100 \mu A$	-5			V
$V_{CE(sat)}^*$	Collector-Emitter Saturation Voltage	$I_C = -0.5A$ $I_B = -5mA$ $I_C = -1A$ $I_B = -10mA$ $I_C = -2A$ $I_B = -20mA$ $I_C = -3A$ $I_B = -30mA$ $I_C = -3A$ $I_B = -30mA$ $T_j = 100^{\circ}C$			-0.15 -0.3 -0.5 -0.7 -0.9	V V V V V
$V_{BE(sat)}^*$	Base-Emitter Saturation Voltage	$I_C = -1 A$ $I_B = -10 mA$		-0.8	-1.0	V
$V_{BE(on)}$	Base-Emitter Turn-On Voltage	$I_C = -1 A$ $V_{CE} = -2 V$		-0.8	-1	V
$h_{FE}^*$	DC Current Gain	$I_C = -10 mA$ $V_{CE} = -2 V$ $I_C = -500 mA$ $V_{CE} = -2 V$ $I_C = -1 A$ $V_{CE} = -2 V$ $I_C = -2 A$ $V_{CE} = -1 V$ $I_C = -3 A$ $V_{CE} = -1V$	100 100 100 100 90	200 200 160 130	300 300	
$f_T$	Transition Frequency	$I_C = -50 mA$ $V_{CE} = -5V$ $f = 50MHz$	100			MHz
$t_d$ $t_r$ $t_s$ $t_f$	RESISTIVE LOAD Delay Time RiseTime StorageTime Fall Time	$I_C = -3 A$ $I_{B1} = - I_{B2} = -60 mA$ $V_{CC} = -20 V$ (see figure 1)		180 160 250 80	220 210 300 100	ns ns ns ns

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

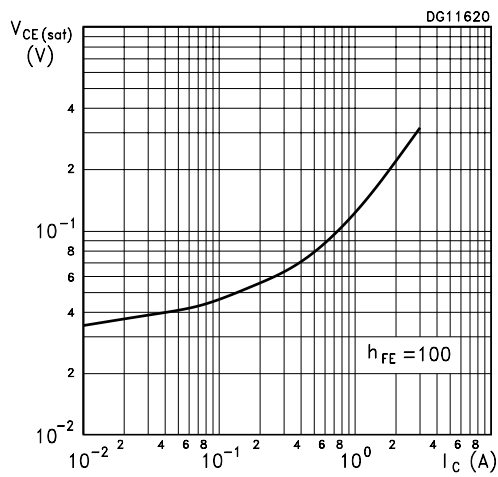
DC Current Gain



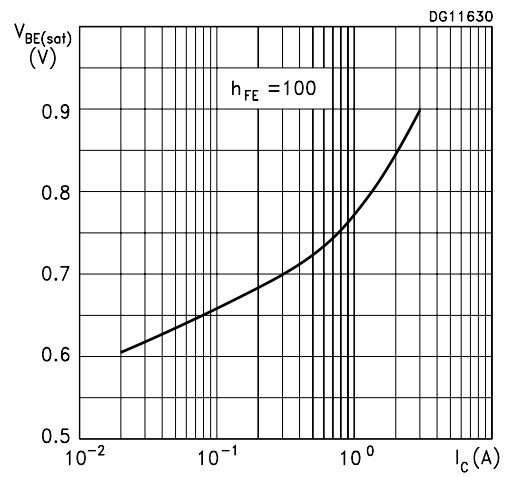
DC Current Gain



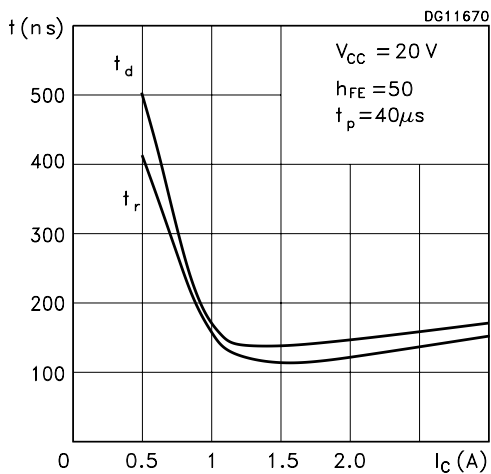
Collector-Emitter Saturation Voltage



Base-Emitter Saturation Voltage



Switching Times Resistive Load



Switching Times Resistive Load

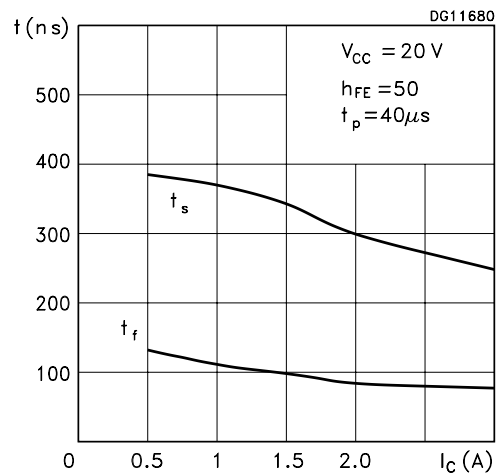
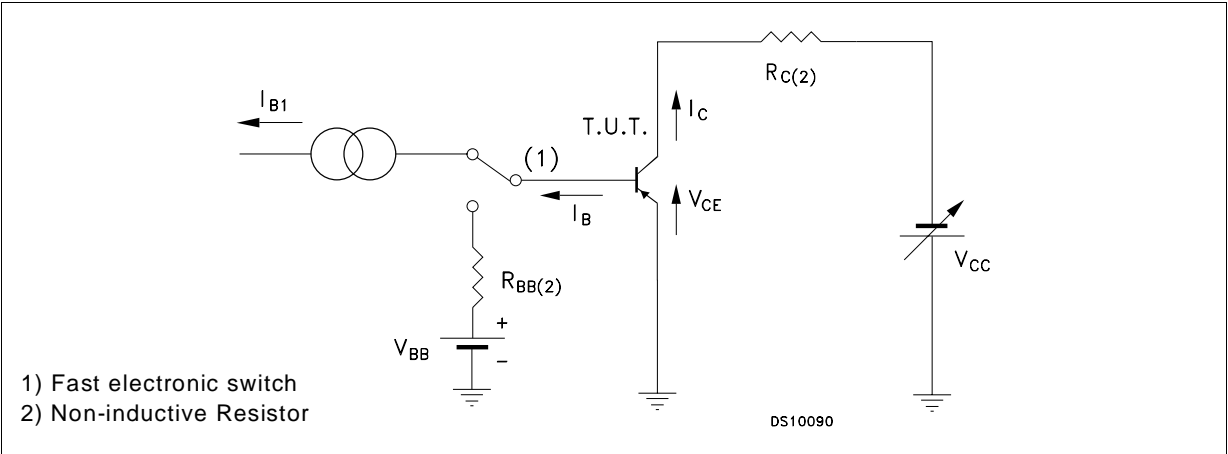
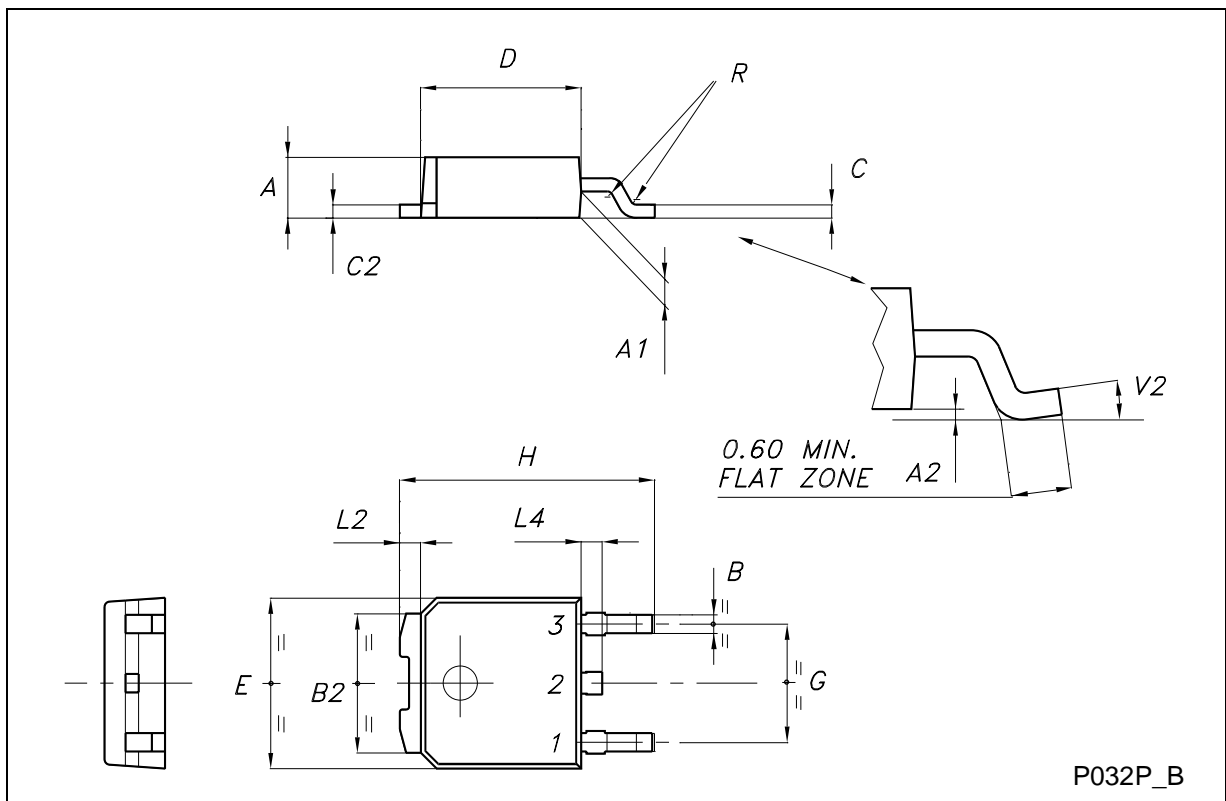


Figure 1: Resistive Load Switching Test Circuit.



**TO-252 (DPAK) MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	2.20		2.40	0.087		0.094
A1	0.90		1.10	0.035		0.043
A2	0.03		0.23	0.001		0.009
B	0.64		0.90	0.025		0.035
B2	5.20		5.40	0.204		0.213
C	0.45		0.60	0.018		0.024
C2	0.48		0.60	0.019		0.024
D	6.00		6.20	0.236		0.244
E	6.40		6.60	0.252		0.260
G	4.40		4.60	0.173		0.181
H	9.35		10.10	0.368		0.398
L2		0.8			0.031	
L4	0.60		1.00	0.024		0.039
V2	0°		8°	0°		0°



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